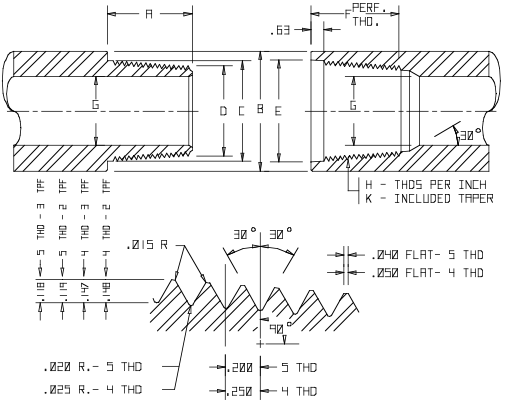
SECTION 1 -Tool Joints
Contents



API REGULAR THREAD DIMENSIONS

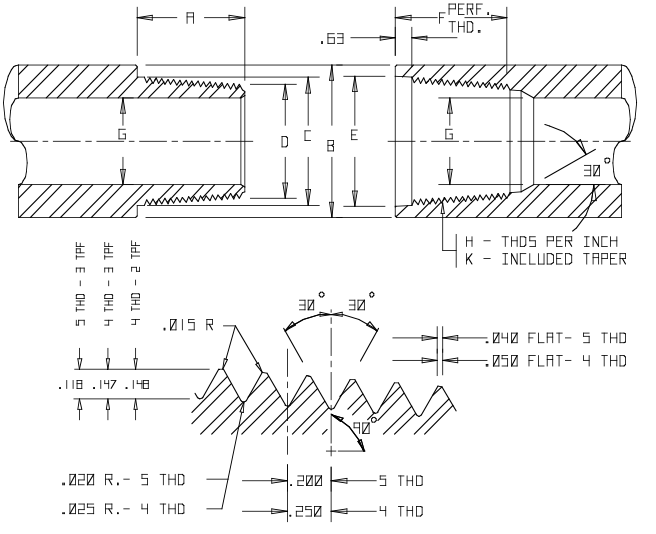
SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	K TPF
1-1/4	2-5/8	2-3/16	1-23/32	1-5/16	1-3/4	3	5/8	7	2
2-3/8	3	3-1/8	2-5/8	1-7/8	2-11/16	3-3/8	1	5	3
2-7/8	3-1/2	3-3/4	3	2-1/8	3-1/16	3-7/8	1-1/4	5	3
3-1/2	3-3/4	4-1/4	3-1/2	2-9/16	3-9/16	4-1/8	1-1/2	5	3
4-1/2	4-1/4	5-1/2*	4-5/8	3-9/16	4-11/16	4-5/8	2-1/4	5	3
5-1/2	4-3/4	6-3/4	5-33/64	4-21/64	5-37/64	5-1/8	2-3/4	4	3
6-5/8	5	7-3/4	6	5-5/32	6-1/16	5-3/8	3-1/2	4	2
7-5/8	5-1/4	8-7/8	7	5-11/16	7-3/32	5-5/8	4	4	3
8-5/8	5-3/8	10	7-61/64	6-37/64	8-3/64	5-3/4	4-3/4	4	3

SIZE	NOTES
1-1/4	Non-API.
4-1/2	*5-3/4" Optional O.D.
6-5/8	Threaded portion same as 5-1/2" Union Tool Full-Hole.
7-5/8	Obsolete API connection.
8-5/8	Obsolete API connection.

UNION TOOL REGULAR

(OBSOLETE CONNECTIONS)

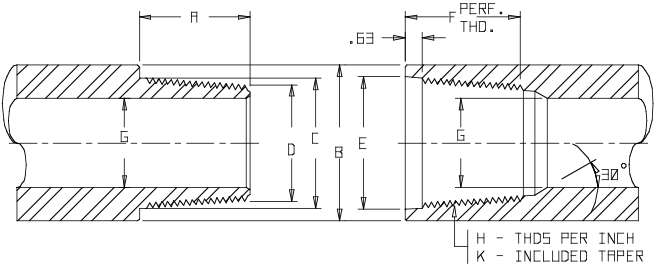
SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	K TPF
3	3-3/4	4-1/4	3-1/4	2-5/16	3-5/16	4-1/8	1-1/2	5	3
4	4-1/4	5-3/4	4-1/2	3-51/64	4-9/16	4-5/8	2-1/4	5	2
5	4-5/8	6-3/4	5-33/64	4-21/64	5-37/64	5-1/8	2-3/4	4	3
6	5	7-3/4	6	5-5/32	6-1/16	5-3/8	3-1/2	4	2

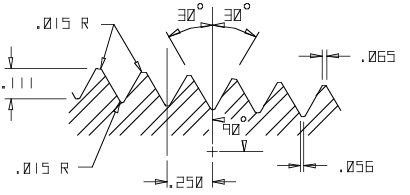


API FULL HOLE

SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	K TPF
2-7/8	3-1/2	4-1/4	3-5/8	2-3/4	3-11/16	3-9/16	2-1/8	5	3
3-1/2	3-3/4	4-5/8	4	3-1/16	4-3/64	4-3/8	2-1/8*	5	3
4	4-1/2	5-1/4	4-9/32	3-17/32	4-11/32	5-1/8	2-13/16	4**	2
4-1/2	4	5-3/4	4-51/64	3-51/64	4-7/8	4-5/8	3	5	3
5-1/2	5	7	5-53/64	5	5-29/32	5-5/8	4	4	2
6-5/8	5	8	6-3/4	5-59/64	6-27/32	5-5/8	5	4	2

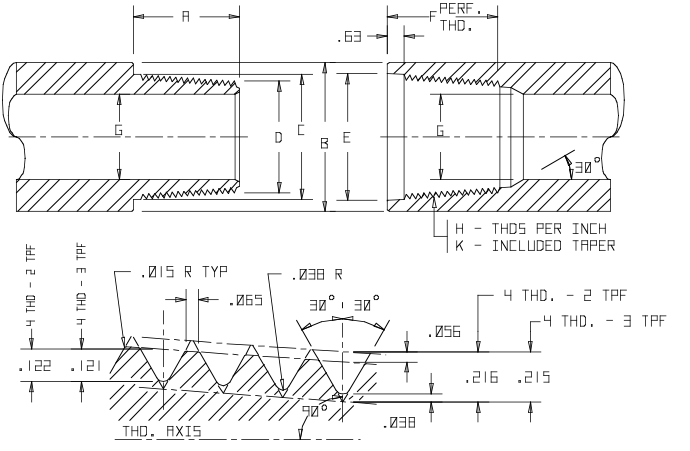
SIZE	NOTES
2-7/8	Not API standard.
3-1/2	* I.D. changed from 2-7/16", May 1979 (API).
4	** Thread form same as API I.F. joint.





API INTERNAL FLUSH

SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	K TPF
2-3/8	3	3-3/8	2-7/8	2-3/8	2-15/16	3-5/8	1-3/4	4	2
2-7/8	3-1/2	4-1/8	3-25/64	2-13/16	3-29/64	4-1/8	2-1/8	4	2
3-1/2	4	4-3/4	4-1/64	3-11/32	4-5/64	4-5/8	2-11/16	4	2
4	4-1/2	5-3/4	4-53/64	4-5/64	4-29/32	5-1/8	3-1/4	4	2
4-1/2	4-1/2	6-3/8	5-1/4	4-1/2	5-5/16	5-1/8	3-3/4	4	2
5-1/2	5	7-3/8	6-25/64	5-9/16	6-29/64	5-5/8	4-13/16	4	2

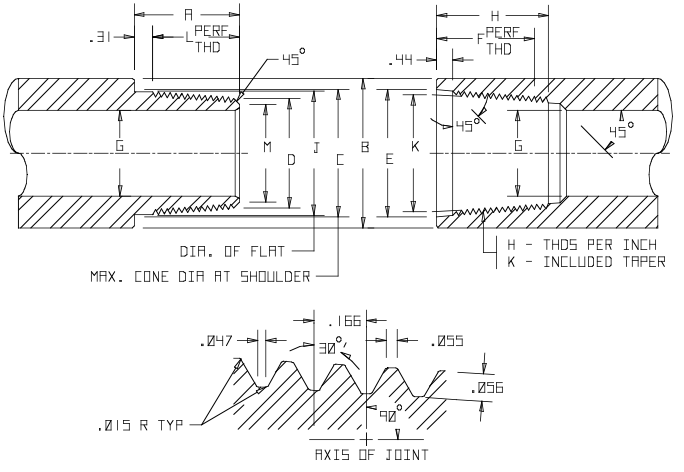


API NUMBERED CONNECTIONS

O.D.'S AND I.D.'S LISTED DENOTE API STANDARD FOR DRILL PIPE CONNECTIONS

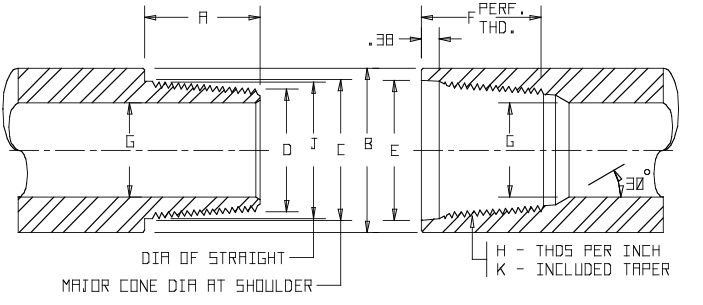
SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	K TPF
NC 10	1-1/2	1-3/8	1.190	1.002	1.204	2-1/8	0.719	6	1-1/2
NC 12	1-3/4	1-5/8	1.392	1.173	1.406	2-3/8	0.906	6	1-1/2
NC 13	1-3/4	1-13/16	1.518	1.299	1.532	2-3/8	0.937	6	1-1/2
NC 16	1-3/4	2-1/8	1.736	1.517	1.751	2-3/8	1.000	6	1-1/2
NC 23	3	3-1/8	2.563	2.063	2-5/8	3-5/8	1-1/4	4	2
NC 26	3	3-3/8	2.876	2.376	2-15/16	3-5/8	1-3/4	4	2
NC 31	3-1/2	4-1/8	3.391	2.808	3-29/64	4-1/8	2-1/8	4	2
NC 35	3-3/4	4-3/4	3.739	3.114	3-13/16	4-3/8	2-1/4	4	2
NC 38	3-3/4	4-3/4	4.016	3.349	4-5/64	4-5/8	2-11/16	4	2
NC 40	4-1/2	5-1/4	4.280	3.530	4-11/32	5-1/8	2-13/16	4	2
NC 44	4-1/2	5-3/4	4.625	3.875	4-11/16	5-1/8	3-1/8	4	2
NC 46	4-1/2	6	4.834	4.084	4-29/32	5-1/8	3-1/4	4	2
NC 50	4-1/2	6-3/8	5.250	4.500	5-5/16	5-1/8	3-3/4	4	2
NC 56	5	7	5.876	4.626	6-15/16	5-5/8	3-3/4	4	3
NC 61	5-1/2	8	6.438	5.063	6-1/2	6-1/8	4	4	3
NC 70	6	9-1/4	7.313	5.813	7-3/8	6-5/8	4-1/2	4	3
NC 77	6-1/2	10-3/4	8.000	6.376	8-1/16	7-1/8	4-3/4	4	3

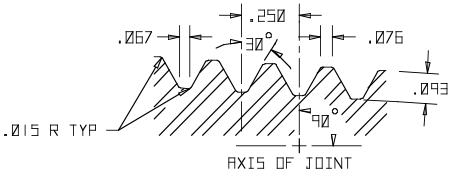
SIZE	NOTES
NC 10	DIMENSIONS ARE TENTATIVE.
NC 12	DIMENSIONS ARE TENTATIVE.
NC 13	DIMENSIONS ARE TENTATIVE.
NC 16	DIMENSIONS ARE TENTATIVE.
NC 23	DIMENSIONS ARE TENTATIVE.
NC 77	DIMENSIONS ARE TENTATIVE.



AMERICAN MT

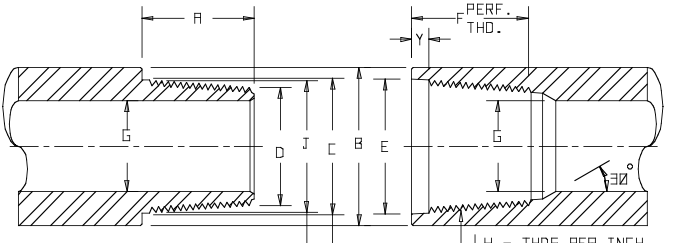
SIZE	A	B	C	D	E	F	G	H	J	K	L	M
1	1-1/2	1-9/16	1.281	1.093	1.301	1-1/2	3/4	2	1.233	1.183	1-1/8	61/64
1-1/4	2	1-3/4	1.469	1.218	1.489	2	3/4	2-1/2	1.421	1.371	1-5/8	1-3/32
1-1/2	2	2	1.668	1.418	1.688	2	1	2-1/2	1.621	1.570	1-5/8	1-9/32

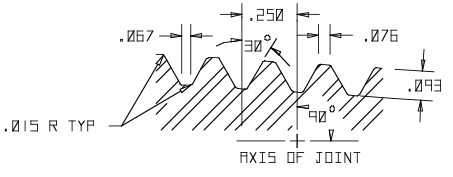




AMERICAN P.A.C.

SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	J (in.)	K TPF
2-3/8	2-3/8	2-7/8	2-23/64	2-1/16	2-27/64	2-1/2	1-3/8	4	2-5/16	1-1/2
2-7/8	2-3/8	3-1/8	2-17/32	2-15/64	2-19/32	2-1/2	1-1/2	4	2-31/64	1-1/2
3-1/2	3-1/4	3-3/4	3-3/64	2-41/64	3-7/64	3-3/8	2	4	3	1-1/2



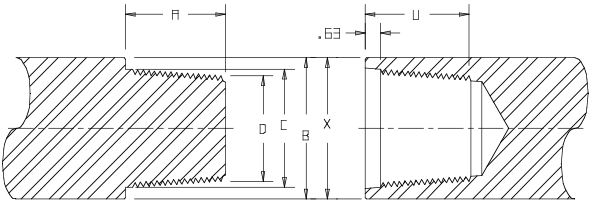


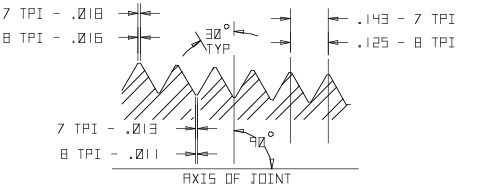
AMERICAN OPEN HOLE

SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	J (in.)	K TPF	Y (in.)
2-3/8	2-3/8	3-1/4	2-3/4	2-29/64	2-13/16	2-1/2	1-13/16	4	2-45/64	1-1/2	3/8
2-7/8	2-7/8	3-7/8	3-9/64	2-25/32	3-7/32	3	2.151	4	3-7/64	1-1/2	3/8
3-1/2	3-1/4	4-3/4	3-57/64	3-31/64	3-61/64	3-3/8	2-11/16	4	3-27/32	1-1/2	5/8
4	4	5-1/2	4-37/64	4-5/64	4-41/64	4-1/8	3-1/4	4	4-17/32	1-1/2	5/8

AMERICAN OPEN HOLE LIGHTWEIGHT AND TUBING

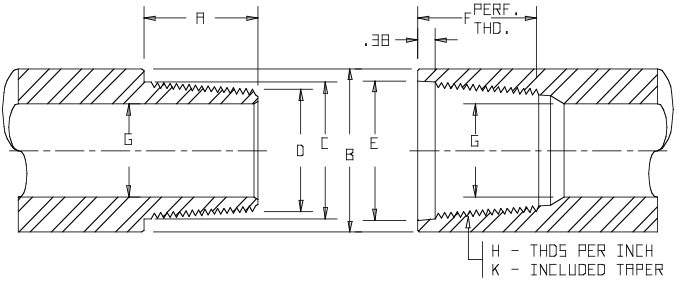
SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	J (in.)	K TPF	Y (in.)
2-3/8	2-3/8	3-1/8	2-3/4	2-29/64	2-13/16	2-1/2	1.995	4	2-45/64	1-1/2	3/8
2-7/8	2-1/2	3-3/4	3-9/64	2-53/64	3-7/32	3	2.441	4	3-7/64	1-1/2	3/8
3-1/2	3-1/4	4-1/2	3-57/64	3-31/64	3-61/64	3-3/8	2.992	4	3-27/32	1-1/2	5/8
4	3-1/2	5-1/4	4-37/64	4-9/64	4-41/64	4-1/8	3.476	4	4-17/32	1-1/2	5/8
4-1/2	3-3/4	5-3/4	4-59/64	4-29/64	4-63/64	3-7/8	3.958	4	4-7/8	1-1/2	5/8

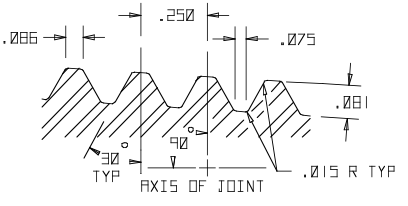




CABLE TOOL JOINTS

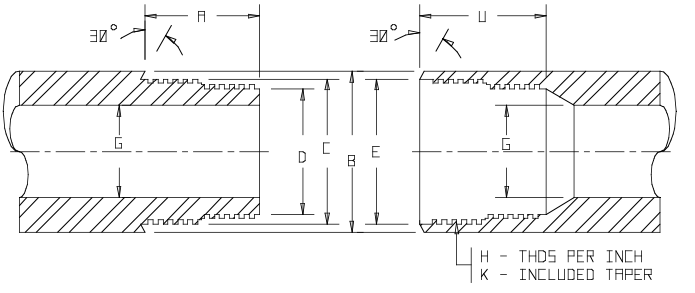
SIZE	A (in.)	B (in.)	C (in.)	D (in.)	H TPI	K TPF	U (in.)	X (in.)
7/8 X 1-1/4-10	2-1/4	1-7/8	1-5/16	15/16	10	2	3	1-15/16
7/8 X 1-1/2-10	2-5/8	2-1/4	1-19/32	27/32	10	3-7/16	3-3/8	2-3/8
1 X 1-1/2- 8	2	2	1-31/64	61/64	8	3	2-3/4	2-1/16
1-1/8 X 1-3/4- 8	2-1/2	2-1/2	1-47/64	1-7/64	8	3	3-1/4	2-5/8
1-1/8 X 1-3/4- 8	2-1/2	2-1/2	1-49/64	1-7/32	8	2-5/8	3-1/4	2-5/8
1-1/2 X 2-1/4- 8	3	3-1/8	2-15/64	1-31/64	8	3	3-3/4	3-1/4
1-5/8 X 2-1/2- 8	3-1/2	3-1/2	2-1/2	1-5/8	8	3	4-1/4	3-5/8
1-5/8 X 2-5/8- 7	3-1/2	3-5/8	2-43/64	1-51/64	7	3	4-1/4	3-3/4
1-3/4 X 2-3/4- 8	3-1/2	3-3/4	2-3/4	1-3/4	8	3-7/16	4-14	3-7/8
2 X 3 - 7	4	4-1/4	3-7/64	2-7/64	7	3	4-3/4	4-3/8
2 X 3 - 7	4	4-1/4	3-1/16	2	7	3-3/16	4-3/4	4-3/8
2-1/4 X 3-1/4- 7	4	4-1/2	3-5/16	2-17/64	7	3-1/8	4-3/4	4-3/4
2-1/4 X 3-1/4- 7	4	4-1/2	3-9/32	2-9/32	7	3	4-3/4	4-3/4
2-1/2 X 3-1/2- 7	4-1/4	5	3-37/64	2-33/64	7	3	5	5-1/4
2-3/4 X 3-3/4- 7	4-1/2	5-1/4	3-13/16	2-11/16	7	3	5-1/4	5-1/2
3 X 4 - 7	4-3/4	6	4	2-13/16	7	3	5-1/2	6-1/4
3 X 4 - 7	4-3/4	6	4	2-47/64	7	3-3/16	5-1/2	6-1/4
3-1/4 X 4-1/4- 7	5	6-1/4	4-19/64	3-3/64	7	3	5-3/4	6-1/2
3-1/2 X 4-1/2- 7	5-1/2	6-1/2	4-21/32	3-9/32	7	3	6-1/4	6-3/4
4 X 5 - 7	5-1/2	7	5-1/16	3-11/16	7	3	6-1/4	7-3/8
4 X 5 - 7	5	7	5-1/16	3-13/16	7	3	5-3/4	7-3/8
4 X 5-1/2- 7	6-1/2	7-1/2	5-1/2	3-7/8	7	3	7-1/4	7-7/8
4-1/4 X 6 - 7	7	8-1/4	6	4-1/4	7	3	7-3/4	8-5/8





GULF TUBING TOOL JOINTS

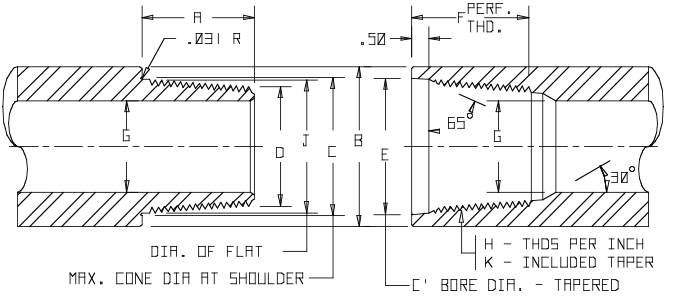
SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	K TPF
A-200 2-3/8	2-3/8	3.060	2.720	2.423	2.739	2-3/4	1.995	4	1-1/2
A-250 2-7/8	2-3/8	3.668	3.294	2.997	3.314	2-3/4	2.441	4	1-1/2
A-300 3	2-3/4	4.500	3.978	3.634	4.000	3	2.992	4	1-1/2

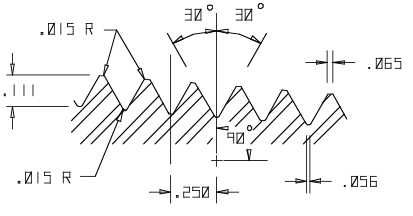


HYDRIL JOINTS

TYPE	SIZE	WEIGHT (lbs./ft.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	G (in.)	H TPI	K TPF	U (in.)
IF	2-3/8	6.65	3-15/16	3-3/8	2-13/16	2-21/64	2-13/16	1-3/4	3	1/2	3-59/64
	2-7/8	10.40	3-57/64	3-7/8	3-3/16	2-45/64	3-3/16	2-7/64	3	1/2	3-59/64
	2-7/8	11.80	3-57/64	3-7/8	3-3/16	2-45/64	3-3/16	2	3	1/2	3-59/64
	3-1/2	13.30	3-61/64	4-1/2	3-27/32	3-23/64	3-27/32	2-3/4	3	1/2	3-31/32
	3-1/2	15.50	3-61/64	4-1/2	3-27/32	3-23/64	3-27/32	2-9/16	3	1/2	3-31/32
	4-1/2	16.60	4	6	5-13/64	4-35/64	5-7/32	3-3/4	3	1/2	4-1/64
	4-1/2	20.00	4	6	5-13/64	4-35/64	5-7/32	3-3/4	3	1/2	4-1/64
	*5	20.50	4-23/32	6-5/8	5-25/32	5-1/64	5-51/64	4-3/16	2	1/2	4-3/4
F	2-3/8	6.65	2-5/8	2-3/8	1-59/64	1-43/64	1-15/16	1	4	1/2	2-15/32
	2-7/8	10.40	3-21/32	2-7/8	2-23/64	1-29/32	2-3/8	1-1/16	4	1/2	3-1/2
	3-1/2	13.30	4-1/16	3-1/2	2-13/16	2-21/64	2-13/16	1-1/2	3	1/2	3-59/64
	4	14.00	3-59/64	4-1/16	3-5/16	2-55/64	3-11/32	2	3	1/2	3-29/32
	4-1/2	16.60	3-61/64	4-1/2	3-27/32	3-23/64	3-27/32	2-3/16	3	1/2	3-31/32
	*5	19.50	4-5/16	5	4-3/16	3-35/64	4-13/64	2-5/16	3	1/2	4
	5-1/2	21.90	4-1/4	5-9/16	4-21/32	4-1/64	4-43/64	2-3/4	3	1/2	4-1/32
	*6-5/8	25.20	5-5/16	6-5/8	5-11/16	4-29/32	5-45/64	3-1/2	2	1/2	5-1/8
EIU	3-1/2	13.30	4-1/4	4-5/8	3-47/64	3-17/64	3-3/4	2-7/16	3	1/2	4
	4	14.00	4-5/16	5-9/16	4-21/64	4-1/64	4-43/64	3-1/8	3	1/2	4-1/32
	4-1/2	20.00	4-7/16	5-3/4	4-47/64	4-3/32	4-3/4	3-5/32	3	1/2	4-1/8
	5-1/2	21.90	5-1/2	7	5-53/64	5-1/16	5-27/32	4	2	1/2	5-1/8
	*6-5/8	25.20	5-1/2	8	6-7/8	6-7/64	6-57/64	5	2	1/2	5-1/8

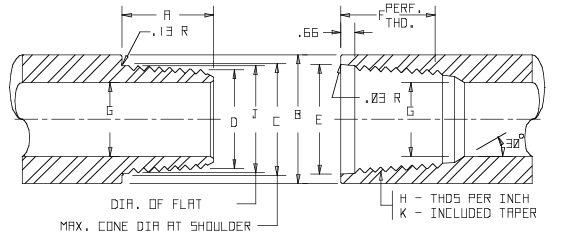
* OBSOLETE HYDRIL CONNECTION.

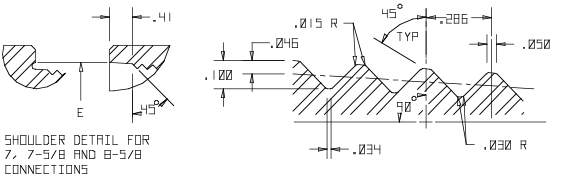




HUGHES DOUBLE STREAMLINE

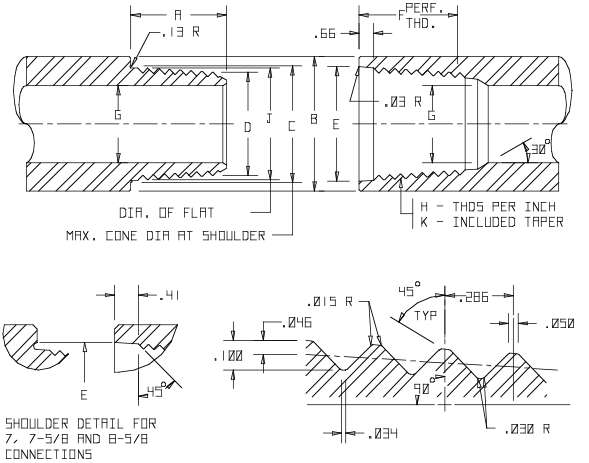
SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	J (in.)	K TPF
3-1/2	3-7/8	3-7/8	3-21/64	2-11/16	3-23/64	4-14	1-13/16	4	3-15/64	2
4	4	4-1/2	3-57/64	3-7/32	3-59/64	4-3/8	2-3/8	4	3-51/64	2
4-1/2	4-1/2	5	4-9/32	3-17/32	4-5/16	4-7/8	2-11/16	4	4-3/16	2





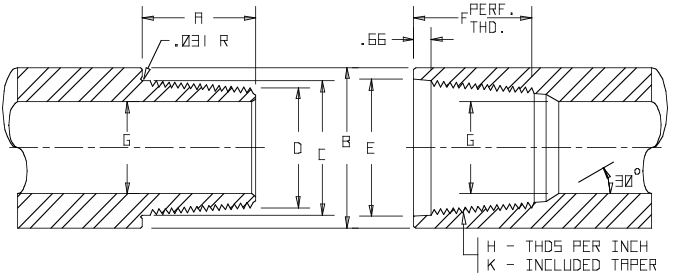
HUGHES H - 90

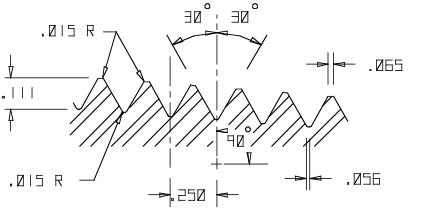
SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	J (in.)	K TPF	L (in.)
		5					2-5/8 - 2-3/4				4-13/16
		5-1/8					2-1/2 - 2-3/4				4-13/16
3-1/2	3-7/8	5-1/4	4-1/8	3-31/64	4-3/16	4-7/16	2 - 2-5/8	3-1/2	3-15/16	2	5
		5-3/8					2 - 2-1/4				5
		5-1/2					2 - 2-1/8				5
		5-1/2					2-7/8 - 3				5-5/16
		5-5/8					2-1/2 - 2-7/8				5-5/16
4	4-1/8	5-3/4	4-1/2	3-13/16	4-9/16	4-11/16	2-1/4 - 2-7/8	3-1/2	4-5/16	2	5-1/2
		5-7/8					2 - 2-3/4				5-1/2
		6					2 - 2-1/2				5-12
		6					3 - 3-1/4				5-3/4
		6-1/8					2-3/4 - 3				5-3/4
4-1/2	4-3/8	6-1/4	4-53/64	4-7/64	4-57/64	4-15/16	2-1/2 - 3	3-1/2	4-41/64	2	6
		6-3/8					2 - 3				6
		6-1/2					2 - 2-3/4				6
		6-1/2					2-7/8 - 3-1/4				6-1/8
		6-5/8					2-1/2 - 3				6-1/8
5	4-5/8	6-3/4	5-7/64	4-21/64	5-11/64	5-3/16	2-1/4 - 3	3-1/2	4-59/64	2	6-3/8
		6-7/8					2-1/4 - 2-3/4				6-3/8
		7					2-1/2			6-3/8	
		6-3/4					3-1/8 - 3-3/8				6-3/8
		6-7/8					3 - 3-1/4				6-5/8
		7					2-3/4 - 3-1/4				6-5/8
5-1/2	4-5/8	7-1/8	5-3/8	4-39/64	5-7/16	5-3/16	2-1/4 - 3-1/4	3-1/2	5-3/16	2	6-5/8
		7-1/4					2-1/4 - 3				6-5/8
		7-3/8					2-1/4 - 2-3/4				6-5/8
		7-1/2					2-1/4 - 2-1/2				6-5/8



HUGHES H-90 (CONTINUED)

SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	J (in.)	K TPF	L (in.)
		7-5/8					3-3/8 - 3-5/8				7-1/4
		7-3/4					3-1/4 - 3-1/2				7-1/2
		7-7/8					3 - 3-1/2				7-1/2
6-5/8	4-7/8	8	6	5-3/16	6-1/16	5-11/16	2-1/2 - 3-1/2	3-1/2	5-13/16	2	7-1/2
		8-1/8					2-1/2 - 3-1/4				7-1/2
		8-1/4					2-1/2 - 3				7-1/2
		8-1/4					3-1/2 - 3-3/4				8
		8-3/8					2-3/4 - 3-3/4				8
		8-1/2					2-3/4 - 3-3/4				8-1/4
7	5-3/8	8-5/8	6-1/2	5-5/32	7-1/8	5-15/16	2-3/4 - 3-1/2	3-1/2	6-3/8	3	8-1/4
		8-3/4					2-3/4 - 3-1/4				8-1/4
		9					2-3/4 - 3				8-5/8
		9-1/2					3-1/2 - 4				9-1/4
		9-5/8					3 - 4				9-1/4
		9-3/4					3 - 4				9-1/4
7-5/8	6	9-7/8	7-25/64	5-57/64	8	6-9/16	3 - 4	3-1/2	7-17/64	3	9-5/8
		10					3 - 3-3/4				9-5/8
		10-1/4					3 - 3-1/4				9-5/8
		10-3/4					3-1/2 - 4				10-1/2
		11					3 - 4				10-1/2
8-5/8	6-1/2	11-1/4	8-17/64	6-41/64	9-3/8	7-1/16	3 - 4	3-1/2	8-9/64	3	10-3/4
		11-1/2					3 - 3-1/4				10-3/4

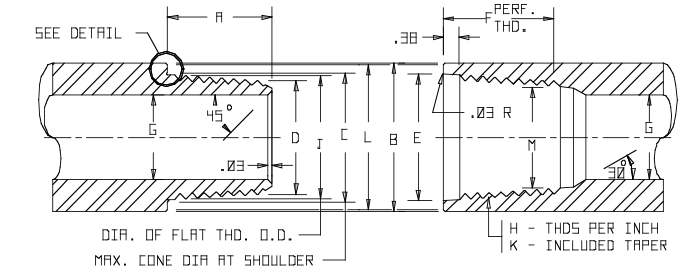


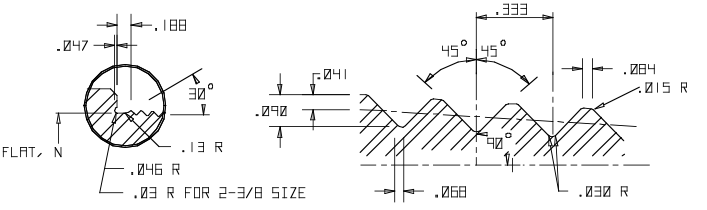


HUGHES SLIM HOLE

SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	K TPF
2-3/8	2-7/8	2-7/8	2-7/16	1-31/32	2-1/2	3-1/4	1-13/16	4	2
2-78	2-7/8	3-3/8	2-7/8	2-25/64	2-15/16	3-1/4	1-3/4	4	2
3-1/2	3-3/8	4-1/8	3-25/64	2-53/64	3-29/64	3-3/4	2-1/8	4	2
4	3-3/8	4-5/8	3-13/16	3-1/4	3-7/8	3-3/4	2-7/16	4	2
4-1/2	3-7/8	5	4-1/64	3-3/8	4-5/64	4-1/4	2-11/16	4	2

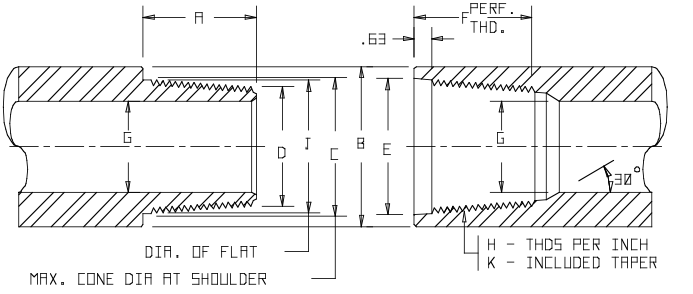
SIZE	NOTES
2-3/8	OBSOLETE CONNECTION.

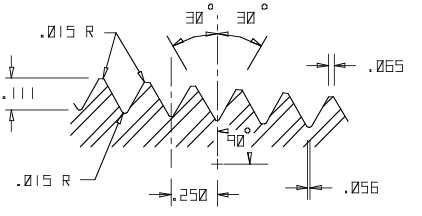




HUGHES SLIMLINE H - 90

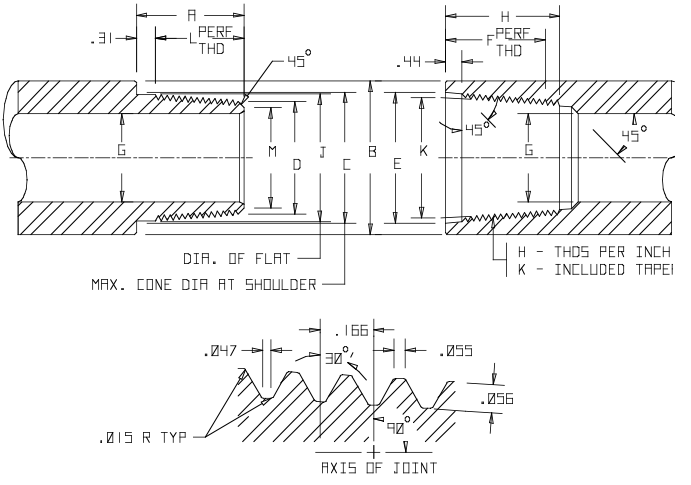
SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	J (in.)	K TPF	L (in.)	M (in.)	N (in.)
		3-1/8									3-1/16		
2-3/8	2-3/4	3-1/4	2.725	2.439	2-49/64	3-1/16	1-1/2	3	2-43/64	1-1/4	3-3/16	2-1/4	2-5/8
		3-3/4					2-1/8 - 2-1/4				3-5/8		
		3-7/8					2-1/8 - 2-1/4				3-23/32		
		4					2-1/8 - 2-1/4				3-13/16		
2-7/8	2-7/8	4	3.196	2.897	3-15/64	3-3/8	2	3	3-5/32	1-1/4	3-13/16	2-45/64	3-3/32
		4-1/8					1-3/4 - 2				3-29/32		
		4-1/4					1-1/2 - 1-3/4				4		
		4-5/8					2-3/8 - 2-3/4				4-7/16		
		4-3/4					2-1/2 - 2-3/4				4-17/32		
		4-7/8					2-5/8				4-5/8		
3-1/2	3-1/8	4-7/8	3.835	3.509	3-7/8	3-3/8	2-3/8 - 2-1/2	3	3-25/32	1-1/4	4-5/8	3-11/32	3-47/64
		5					2 - 2-3/8				4-23/32		
		5-1/8					1-3/4 - 2-1/8				4-13/16		





HUGHES EXTRA HOLE

SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	J (in.)	K TPF
2-7/8	3-7/8	4-1/4	3-21/64	2-11/16	3-23/64	4-1/2	1-7/8	4	3-15/64	2
3-1/2	3-3/8	4-3/4	3-13/16	3-1/4	3-7/8	3-15/16	2-7/16	4	—	2
4-1/2	4-3/8	6-1/4	4-53/64	4-7/64	4-29/32	4-15/16	3-1/4	4	—	2
5	4-1/2	6-3/8	5-1/4	4-1/2	5-5/16	4-7/8	3-3/4	4	—	2

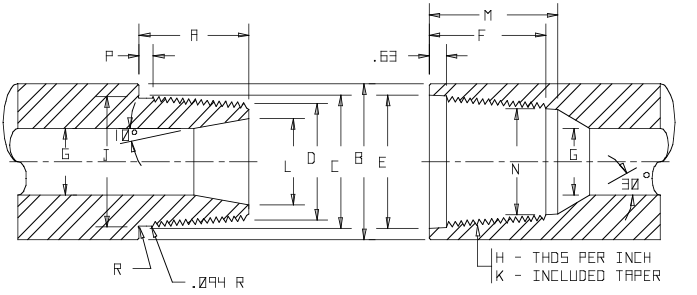


HUGHES EXTERNAL FLUSH

SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	J (in.)	K TPF
2-3/8	2-3/8	2-1/2	2-7/64	1-23/32	2-1/16*	3-1/4	1	6	2-1/64	2
2-7/8	2-5/8	3	2-1/2	2-1/16	2-17/32	3	1-1/16	6	—	2
3-1/2	3-1/4	3-5/8	3	2-29/64	3-1/32	4	1-1/2	4	—	2
3-1/2	3-1/4	3-11/16	3	2-29/64	3-1/32	4	1-1/2	4	—	2
4-1/2	3-3/8	4-11/16	3-13/16	3-1/4	3-7/8	4-1/4	2-3/16	4	—	2
4-1/2	3-3/8	4-17/32	3-13/16	3-1/4	3-7/8	4-1/4	2-3/16	4	—	2

SIZE	NOTE
2-3/8	THREADED PART SAME AS OR INTERCHANGES WITH 2-3/8" HOMCO (EXTERNAL FLUSH) "LITTLE INCH".
3-1/2	THREADED PART SAME AS OR INTERCHANGES WITH 3-1/2" F.H. REED EXTERNAL FLUSH.
4-1/2	THREADED PART SAME AS OR INTERCHANGES WITH 3-1/2" HUGHES EXTRA HOLE, 3-1/2" REED EXTRA HOLE, 4" HUGHES SLIM HOLE, 4-1/2" F.H. REED EXTERNAL FLUSH.

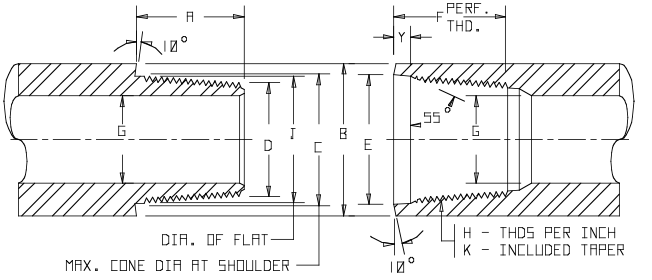
* STRAIGHT COUNTERBORE.

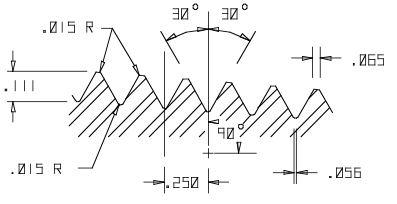


HUMBLE "X" TYPE JOINT

SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	J (in.)	K TPF	L (in.)	M (in.)	N (in.)	P (in.)	R (in.)
X-1247	4-1/2	4-3/4	3-57/64	3-9/64	3-15/16	4-5/8	2	4	3-1/2	2	2-3/8	5-1/8	3-7/64	5/8	7/64
X-1248	5	5-1/4	4-1/64	3-3/16	4-5/64	5	2	4	3-11/16	2	2-3/8	5-5/8	3-15/64	5/8	1/8
X-1249	5	6-1/8	4-53/64	4	4-7/8	5-1/8	2-3/4	4	4-1/2	2	3-1/4	5-5/8	4-1/32	1/2	1/8
X-1250	5-1/4	6-3/4	5-1/4	4-3/8	5-5/16	5-3/8	2-3/4	4	4-7/8	2	3-1/2	5-7/8	4-3/8	1/2	1/8
X-1251	6	8	6	5	6-1/16	6-1/8	2-3/4	4	5-9/16	2	4	6-5/8	5	1/2	1/8

SIZE	NOTES
X-1247	INTERCHANGEABLE WITH 4" REED DOUBLE STREAMLINE. PIN IS 1/2" LONGER THANSTANDARD. REFER TO REED DOUBLE STREAMLINE FOR THREAD PROFILE.
X-1248	INTERCHANGEABLE WITH 3-1/2" API I.F. PIN IS 1" LONGER THAN STANDARD. REFER TO API I.F. FOR THREAD PROFILE.
X-1249	INTERCHANGEABLE WITH 5" REED DOUBLE STREAMLINE. PIN IS 1/2" LONGER THANSTANDARD. REFER TO REED DOUBLE STREAMLINE FOR THREAD PROFILE.
X-1250	INTERCHANGEABLE WITH 4-1/2" API I.F. PIN IS 3/4" LONGER THAN STANDARD. REFER TO API I.F. FOR THREAD PROFILE.
R X-1251	INTERCHANGEABLE WITH 6-5/8" API REGULAR. PIN IS 1" LONGER THAN STANDARD. REFER TO API REGULAR FOR THREAD PROFILE.



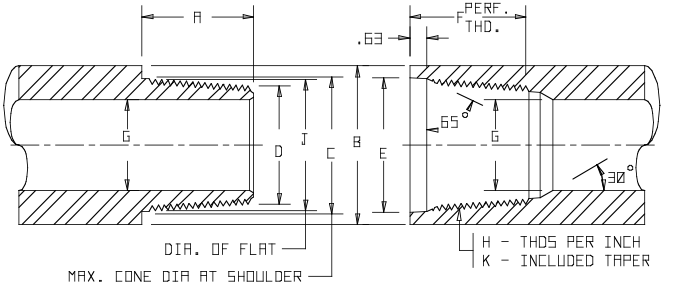


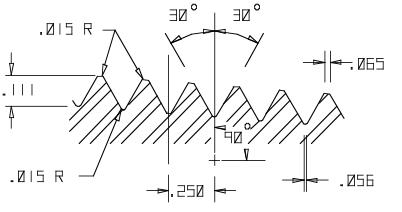
REED EXTERNAL FLUSH

SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	J (in.)	K TPF	Y (in.)
2-3/8 REG	2-5/8	2-3/8	2	1-9/16	1-15/16*	3	7/8	4	1-57/64	2	1/2
2-3/8 F.H.	2-5/8	2-1/2	2-1/8	1-11/16	2-1/16*	3	1	4	2-1/64	2	1/2
2-7/8 F.H.	3	3	2-13/32	1-29/32	2-3/8*	3-3/8	1-1/4	4	2-5/16	2	1/2
3-1/2 F.H.	3-1/4	3-5/8	3	2-29/64	3-1/32	4	1-1/2	4	—	2	21/32
4-1/2 F.H.	3-3/8	4-11/16	3-13/16	3-1/4	3-7/8	4-1/4	2-3/16	4	—	2	21/32

SIZE	NOTES
3-1/2 F.H.	THREAD SAME AS 3-1/2" HUGHES EXTERNAL FLUSH.
4-1/2 F.H.	THREAD SAME AS 4-1/2" HUGHES EXTERNAL FLUSH - 4" HUGHES SLIM HOLE 3-1/2" HUGHES EXTRA HOLE - 3-1/2" REED EXTRA HOLE.

* STRAIGHT COUNTERBORE.



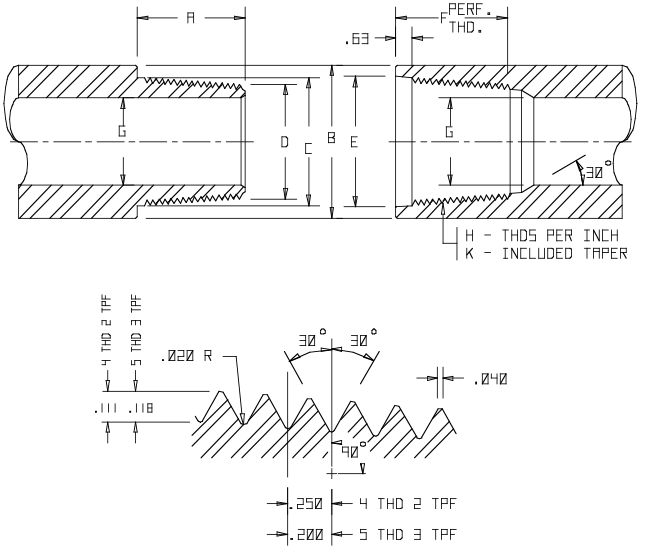


REED DOUBLE STREAMLINE

SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	J (in.)	K TPF
2-7/8	3-1/2	3-1/4	2-45/64	2-1/8	2-5/8*	3-7/8	1-1/4	4	2-19/32	2
3-1/2	4	3-7/8	3-21/64	2-21/32	3-1/4*	4-3/8	1-13/16	4	3-15/64	2
4	4	4-1/2	3-57/64	3-7/32	3-27/32*	4-3/8	2-3/8	4	3-51/64	2
4-1/2	4-1/2	5	4-9/32	3-17/32	4-1/4*	4-7/8	2-11/16	4	4-13/64	2
5	4-1/2	5-9/16	4-53/64	4-5/64	4-55/64	4-7/8	3-3/8	4	4-3/4	2
5-1/2	4-1/2	6-1/8	5-1/4	4-1/2	5-5/16	4-7/8	3-3/4	4	5-3/16	2

SIZE	NOTES
4	THREAD SAME AS 4" HUGHES DOUBLE STREAMLINE.
5	THREAD SAME AS 4" API I.F. (NC 46) - 4-1/2" REED XTRA HOLE.

* STRAIGHT COUNTERBORE.



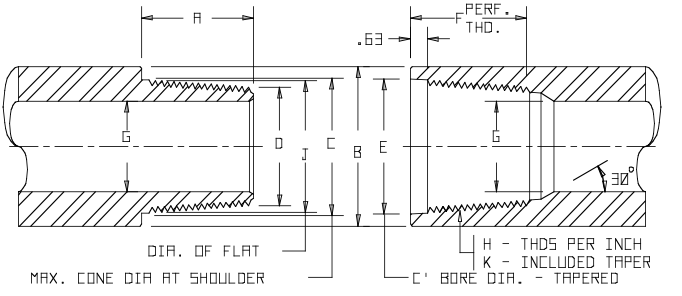
REED WIDE OPEN (W.O.) TOOL JOINTS

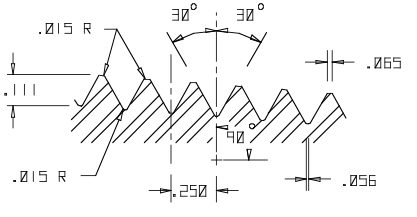
SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	K TPF
2-3/8	2-3/8	3-3/8	2-13/16	2-27/64	2-55/64	2-7/16	2	4	2
2-7/8	3	4-1/8	3-21/64	2-53/64	3-3/8	3-1/16	2-7/16	4	2
3-1/2	3-1/2	4-3/4	4-1/64	3-7/16	4-5/64	4-1/16	3	4	2
4	4-1/2	5-3/4	4-53/64	4-3/32	4-29/32	4-9/16	3-7/16	4	2
4-1/2	4-1/2	6-1/8	5-1/4	4-1/2	5-5/16	4-9/16	3-7/8	4	2

SIZE	NOTES
3-1/2	THREAD SAME AS 3-1/2" API I.F. (NC38), 4-1/2" SLIM HOLE.
4	THREAD SAME AS 4" API I.F. (NC46), 4-1/2" EXTRA HOLE, DOUBLE STREAMLINE - 4-1/2 M.O.
4-1/2	THREAD SAME AS 4-1/2" API I.F. (NC50), 5" EXTRA HOLE, 5-1/2" DOUBLE STREAMLINE, 5" M.O.

REED FULL HOLE

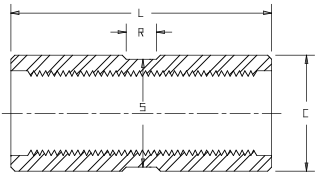
SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	K TPF
2-3/8	3	3-3/8	2-25/32	2-1/32	2-27/32	3-3/8	1-7/16	5	3
2-7/8	3-1/2	4	3-11/32	2-15/32	3-13/32	3-7/8	1-7/8	5	3





REED EXTRA HOLE

SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)	H TPI	J (in.)	K TPF
2-7/8	4	4-1/4	3-21/64	2-5/8	3-23/64	4	1-7/8	4	3-15/64	2
3-1/2	3-1/2	4-3/4	3-13/16	3-15/64	3-7/8	3-7/8	2-7/16	4	3-45/64	2
4-1/2	4-1/2	6	4-53/64	4-5/64	4-57/64	4-7/8	3-1/4	4	4-23/32	2
5	4-1/2	6-3/8	5-1/4	4-1/2	5-5/16	4-7/8	3-3/4	4	5-9/64	2



SUCKER ROD COUPLINGS

FULL SIZE AND SUBCOUPLING						SLIMHOLE AND SUBCOUPLING		
SIZE	O.D. C (in.)	LENGTH L (in.)	WRENCH LENGTH R (in.)	FLAT DIST. BETWEEN S (in.)	USED WITH MIN.TUBING SIZE O.D. (in.)	O.D. C (in.)	LENGTH L (in.)	USED WITH MIN.TUBING SIZE O.D. (in.)
1/2	—	—	—	—	—	1	2-3/4	1.660
5/8	1-1/2	4	1-1/4	1-3/8	2-1/16	1-1/4	4	1.990
3/4	1-5/8	4	1-1/4	1-1/2	2-3/8	1-1/2	4	2-1/16
7/8	1-13/16	4	1-1/4	1-5/8	2-7/8	1-5/8	4	2-3/8
1	2-3/16	4	1-1/2	1-7/8	3-1/2	2	4	2-7/8
1-1/8	2-3/8	4-1/2	1-5/8	2-1/8	3-1/2	—	—	—

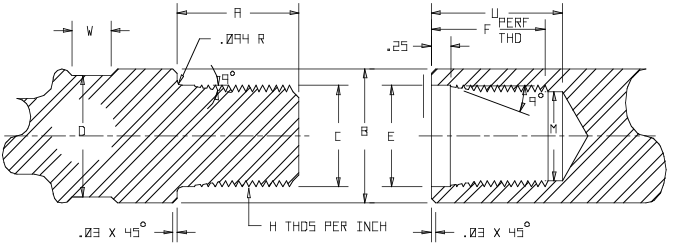
DATA REPRINTED FROM TABLE 4.1 & 4.2, PP 6 & 7, 24 ED., API SPEC 11B, OCTOBER 1, 1990.

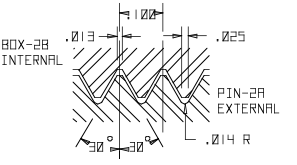
SUCKER ROD STRENGTH TABLE

ROD SIZE - INCHES		**1/2**	**5/8**	**3/4**	**7/8**	**1**
ROD AREA - SQUARE INCHES		**.196**	**.306**	**.442**	**.601**	**.785**
J&L TYPE 7 WITH ULTIMATE	YIELD	13,700	21,400	30,900	42,100	55,000
TENSILE STRENGTH OF 86,000	ULTIMATE	16,800	26,300	38,000	51,700	67,500
PSI & YIELD OF 70,000 PSI.	TORQUE*	70	140	171	381	570
J&L TYPE 2 WITH ULTIMATE	YIELD	—	19,900	28,700	39,100	51,000
TENSILE STRENGTH OF 100,000	ULTIMATE	—	30,600	44,200	60,100	78,500
PSI & YIELD OF 65,000 PSI.	TORQUE*	65	130	159	353	530
J&L TYPE 1 WITH ULTIMATE	YIELD	—	20,900	30,300	41,200	53,800
TENSILE STRENGTH OF 100,000	ULTIMATE	—	30,600	44,200	60,100	78,500
PSI & YIELD OF 68,500 PSI.	TORQUE*	68-1/2	136	168	372	560
J&L TYPE 12 WITH ULTIMATE	YIELD	—	29,400	42,300	57,700	75,300
TENSILE STRENGTH OF 120,000	ULTIMATE	—	37,700	53,000	72,000	94,200
PSI & YIELD OF 96,000 PSI.	TORQUE*	96	192	235	476	783

DATA REPRINTED FROM API SPEC 11B, APRIL 1974.

* TORQUE (FT-LBS) BASED ON ROD O.D. AT YIELD.





SUCKER ROD CONNECTIONS

SIZE	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	H TPI	M (in.)	U (in.)	W TPF
1/2	1.125	1.000	.750	3/4	.767	1.29	10	.642	1-5/8	5/8
5/8	1.250	1.250*	.936	1-1/4	.955	1.41	10	.830	1-3/4	7/8
3/4	1.437	1.500	1.061	1-1/4	1.080	1.60	10	.955	1-15/16	1
7/8	1.625	1.625	1.186	1-1/4	1.205	1.79	10	1.080	2-1/8	1
1	1.875	2.000	1.374	1-1/2	1.393	2.07	10	1.267	2-1/2	1-5/16
1-1/8	2.125	2.250	1.561	1-5/8	1.580	2.31	10	1.455	2-3/4	1-1/2

* THIS IS THE DIMENSION FOR PIN - BY- PIN SUCKER RODS, THE DIMENSION FOR BOX AND PIN SUCKER RODS IS 1.375.

DATA REPRINTED FROM TABLE 3.1, 5.1 & 5.2, PP 5, 12 & 13, 24 ED., API SPEC 11B, OCT. 1, 1990.

ROTARY SHOULDERED CONNECTION INTERCHANGE LIST

COMMON NAME		PIN BASE DIAMETER (TAPERED)	THREADS PER in.	TAPER in/ft	THREAD FORM*	SAME AS OR INTERCHANGES WITH
STYLE	SIZE					
INTERNAL FLUSH (I.F.)	2-3/8"	2.876	4	2	V-0.065 (V-0.038 rad)	2-7/8" SLIM HOLE N.C. 26**
	2-7/8"	3.391	4	2	V-0.065 (V-0.038 rad)	3-1/2" SLIM HOLE N.C. 31**
	3-1/2"	4.016	4	2	V-0.065 (V-0.038 rad)	4-1/2" SLIM HOLE N.C. 38**
	4"	4.834	4	2	V-0.065 (V-0.038 rad)	4-1/2" EXTRA HOLE N.C. 46**
	4-1/2"	5.250	4	2	V-0.065 (V-0.038 rad)	5" EXTRA HOLE N.C. 50** 5-1/2" DOUBLE STREAMLINE
FULL HOLE (F.H.)	4"	4.280	4	2	V-0.065 (V-0.038 rad)	4-1/2" DOUBLE STREAMLINE N.C. 40**
EXTRA HOLE (X.H.) (E.H.)	2-7/8"	3.327	4	2	V-0.065 (V-0.038 rad)	3-1/2" DOUBLE STREAMLINE
	3-1/2"	3.812	4	2	V-0.065 (V-0.038 rad)	4" SLIM HOLE 4-1/2" EXTERNAL HOLE
	4-1/2"	4.834	4	2	V-0.065 (V-0.038 rad)	4" INTERNAL FLUSH N.C. 46**
	5"	5.250	4	2	V-0.065 (V-0.038 rad)	4-1/2" INTERNAL FLUSH N.C. 50** 5-1/2" DOUBLE STREAMLINE
SLIM HOLE (S.H.)	2-7/8"	2.876	4	2	V-0.065 (V-0.038 RAD)	2-3/8" INTERNAL FLUSH n.c. 26**
	3-1/2"	3.391	4	2	V-0.065 (V-0.038 rad)	2-7/8" INTERNAL FLUSH N.C. 31**
	4"	3.812	4	2	V-0.065 (V-0.038 rad)	3-1/2" EXTRA HOLE 4-1/2" EXTERNAL FLUSH
	4-1/2"	4.016	4	2	V-0.065 (V-0.038 rad)	3-1/2" INTERNAL FLUSH N.C. 38**
DOUBLE STREAMLINE (DSL)	3-1/2"	3.327	4	2	V-0.065 (V-0.038 rad)	2-7/8" EXTRA HOLE
	4-1/2"	4.280	4	2	V-0.065 (V-0.038 rad)	4" FULL HOLE N.C. 40**
	5-1/2"	5.250	4	2	V-0.065 (V-0.038 rad)	4-1/2" INTERNAL FLUSH 5" EXTRA HOLE N.C. 50**
NUMBERED CONN (N.C.)	26	2.876	4	2	V-0.038 rad	2-3/8" INTERNAL FLUSH 2-7/8" SLIM HOLE
	31	3.391	4	2	V-0.038 rad 3	2-7/8" INTERNAL FLUSH -1/2" SLIM HOLE
	38	4.016	4	2	V-0.038 rad	3-1/2" INTERNAL FLUSH 4-1/2" SLIM HOLE
	40	4.280	4	2	V-0.038 rad	4" FULL HOLE 4-1/2" DOUBLE STREAMLINE
	46	4.834	4	2	V-0.038 rad	4" INTERNAL FLUSH 4-1/2" EXTRA HOLE
	50	5.250	4	2	V-0.038 rad	4-1/2"" INTERNAL FLUSH 5" EXTRA HOLE 5-1/2" DOUBLE STREAMLINE
EXTERNAL FLUSH (E.F.)	4-1/2"	3.812	4	2	V-0.065 (V-0.038 rad)	4" SLIM HOLE 3-1/2" EXTRA HOLE

* CONNECTIONS WITH TWO THREAD FORMS SHOWN MAY BE MACHINED WITH EITHER THREAD FORM WITHOUTAFFECTING GAGING OR INTERCHANGEABILITY.

** NUMBERED CONECTIONS (N.C.) MAY BE MACHINED ONLY WITH THE V-0.038 RADIUS THREAD FORM.

DATA REPRINTED FROM TABLE 2.14, P.23, 14 ED., API RP7G, AUGUST 1, 1990.

SMALL DIAMETER TOOL JOINTS

DIMENSION AND STRENGTH DATA*

JOINT	O.D. (in.)	I.D. (in.)	TENSILE YIELD STRENGTH (lbs.)	TORSION YIELD STRENGTH (ft.-lbs.)	RECOMMENDED MAKE-UP TORQUE (ft.-lbs.)
1 AM. M.T.	1-9/16	3/4	68,100	765	500
1 AM. M.T.	1-9/16	13/16	58,080	650	450
1 AM. M.T. - DSI	1-9/16	3/4	68,100	1,300	500
1-1/4 AM. M.T.	1-3/4	1	69,698	865	500
1-1/4 AM. M.T.	1-3/4	7/8	93,984	1,265	650
1-1/4 AM. M.T.	1-3/4	13/16	104,808	1,265	650
1-1/4 AM. M.T.	1-3/4	3/4	115,000	1,265	650
1-1/4 F.J. (REG.)	2-3/16	5/8	155,300	2,150	1,075
1-1/4 AM. M.T.-DSI	1-3/4	7/8	93,984	1,800	650
1-1/2 AM. M.T.	2	1	127,100	1,770	950
1-1/2 AM. M.T.	2	1-5/32	92,136	1,285	700
1-1/2 AM. M.T.	2	1-1/8	99,528	1,385	750
1-1/2 AM. M.T.	2	1-1/16	113,784	1,585	900
1-1/2 AM. M.T. - DSI	2	1	127,100	2,800	950
1-9/16 HOMCO SLIMLINE	1-9/16	.937	71,120	900	450
1-5/8 BAASH ROSS	1.660	3/4	89,375	1,050	525
1-13/16 HOMCO SLIMLINE	1-13/16	1	111,000	900	450
1-13/16 HOMCO F.J.	1-13/16	3/4	113,000	1,600	800
1-13/16 PRT	1-13/16	3/4	110,700	1,595	800
1-13/16 WILSON F.J.	1-13/16	3/4	113,000	1,600	800
2-1/16 AM. M.T. - DSI	2.330	1-1/4	135,036	3,500	1,100
2-1/4 PRT	2-1/4	3/4	181,900	4,600	2,300
2-1/4 T.S.S.	2-1/4	1	142,500	2,100	500
2-3/8 AM. PAC	2-7/8	1-3/8	238,440	4,800	2,400
2-3/8 AM. PAC DSI**	2-7/8	1-1/2	201,900	6,490	3250
2-3/8 API REG. DSI**	3-1/8	1	375,500	8,045	4,020
2-3/8 HOMCO F.J.	2-1/2	1	203,100	3,350	1,670
2-3/8 WILSON F.J.	2-1/2	1-1/16	138,000	4,490	2,250
2-7/8 AM. O.H.	3-7/8	2.151	345,360	8,900	4,450
2-7/8 AM. O.H. - Light weight	3-3/4	2.441	223,680	5,700	2,850
2-7/8 AM. PAC	3-1/8	1-1/2	269,470	5,800	2,900
2-7/8 AM. PAC DSI**	3-1/8	1-1/2	269,470	7,290	3,650
3-1/8 PRT	3-1/8	1	323,000	12,285	6,140
3-1/2 AM. PAC	3-3/4	2	352,800	8,800	4,400
4-1/4 PRT	4-1/4	2	507,600	26,500	13,250

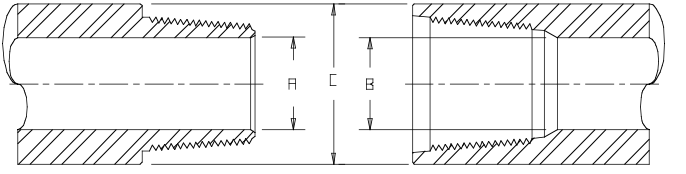
* STRENGTHS BASED ON A MATERIAL YIELD OF 120,000 PSI. CHECK APPLICABLE PIPE FOR COMPARATIVE VALUES IN TENSION AND TORSION.

** DOUBLE SHOULDER INTERNAL - SPECIAL TRI-STATE MODIFICATION.

LARGE DIAMETER TOOL JOINTS

DIMENSION AND STRENGTH DATA
API AND NON - API

SIZE	CONNECTION TYPE	BOX O.D. (in.)	PIN I.D. (in.)	TENSILE YIELD STRENGTH (lbs.)	TORSION YIELD STRENGTH (ft.-lbs.)	RECOMMENDED MAKE-UP TORQUE (ft.-lbs.)
	API REG.	3-1/8	1	375,500	7,500	3,700
2-3/8	API I.F.	3-3/8	1-3/4	313,680	6,800	3,400
	APIREG.	3-3/4	1-1/4	493,600	13,000	6,500
	API I.F.	4-1/8	2-1/8	447,130	11,800	5,900
2-7/8	HUGHES S.H.	3-3/8	1-3/4	313,680	6,800	3,400
	HUGHES X-HOLE	4-1/4	1-7/8	505,080	13,400	6,700
	API REG.	4-1/4	1-1/2	727,400	15,100	7,500
	API F.H.	4-5/8	2-1/8	779,900	16,300	8,100
	API I.F.	4-3/4	2-11/16	587,310	18,100	9,100
3-1/2	HUGHES D.S.L.	3-7/8	1-13/16	561,120	14,000	7,000
	HUGHES S.H.	4-1/8	2-1/8	447,130	11,800	6,000
	HUGHES X-HOLE	4-3/4	2-7/16	570,940	17,100	8,550
	HUGHES H-90	5	2-3/4	663,130	23,500	11,800
	HUGHES H-90	5-1/4	2-3/4	663,130	23,800	11,800
	API F.H.	5-1/4	2-13/16	757,500	23,500	11,800
4	A PI I.F.	6	3-1/4	901,170	33,600	16,900
	HUGHES S.H.	4-5/8	2-9/16	512,040	15,000	7,500
	HUGHES H-90	5-1/2	2-13/16	913,470	35,400	17,700
	API REG.	5-1/2	2-1/4	1,262,000	30,000	15,000
	API F.H.	5-3/4	3	1,017,000	35,400	17,700
	API I.F.	6-3/8	3-3/4	944,000	37,800	18,900
4-1/2	HUGHES X-HOLE	6-1/4	3-1/4	901,150	34,000	17,000
	HUGHES H-90	6	3-1/4	938,150	38,900	19,500
	HUGHES H-90	6	3	1,085,410	45,200	22,600
5	HUGHES X-HOLE	6-3/8	3-3/4	939,100	37,700	18,900
	API REG.	6-3/4	2-3/4	1,779,000	61,000	30,000
5-1/2	API F.H.	7	4	1,265,760	56,300	28,000
	API I.F.	7-3/8	4-13/16	1,265,500	77,600	38,800
	API REG.	7-3/4	3-1/2	1,867,000	86,000	43,000
6-5/8	API F.H.	8	5	1,448,800	74,200	37,100



RECOMMENDED MAXIMUM AND MINIMUM TOOL JOINT DIMENSIONS

JOINTS		NOM.	NOM.	A	B	C	
SIZE	TYPE	O.D. (in.)	I.D. (in.)	MAX.	MAX.	MIN.	MAX.
	API REG.	3-1/8	1	1-1/8	1-5/8	2-15/16	3-1/4
2-3/8	API I.F.	3-3/8	1-3/4	1-3/4	2	3-3/16	3-5/8
	HYDRIL I.F.	3-3/8	1-3/4	1-3/4	1-7/8	3-1/8	3-5/8
	API REG.	3-3/4	1-1/4	1-3/8	1-7/8	3-1/2	4
	F.H.	4-1/4	2-1/8	2-1/8	2-3/8	4-1/16	4-5/8
2-7/8	API I.F.	4-1/8	2-1/8	2-1/8	2-1/2	3-7/8	4-3/8
	HYDRIL I.F.	3-7/8	2-1/8	2-3/16	2-3/16	3-5/8	4-1/8
	HUGHES EXTRA HOLE	4-1/4	1-7/8	1-7/8	2-1/8	4	4-58
3	UNION TOOL	4-1/4	1-1/2	1-1/2	2-1/8	3-3/4	4-1/2
	API REG.	4-1/4	1-1/2	1-3/4	2-1/4	4	4-5/8
	API F.H.	4-5/8	2-1/8	2-7/16	2-3/4	4-1/2	5
3-1/2	API I.F.	4-3/4	2-11/16	2-11/16	3	4-1/2	5
	HYDRIL I.F.	4-1/2	2-3/4	2-3/4	2-13/16	4-3/8	4-7/8
	HUGHES EXTRA HOLE	4-3/4	2-7/16	2-7/16	2-3/4	4-1/2	5
	API F.H.	5-1/4	2-13/16	2-13/16	3-1/4	5	5-3/8
4	API I.F.	5-3/4	3-1/4	3-5/16	3-1/2	5-1/2	6
	UNION TOOL	5-3/4	2-1/4	2-7/8	3-1/2	5-3/8	6
	API REG.	5-3/4	2-1/4	2-5/8	3-1/4	5-3/8	6
	API F.H.	5-3/4	3	3-5/32	3-1/2	5-1/2	6
4-1/2	API I.F.	6-3/8	3-3/4	3-3/4	4-1/8	5-7/8	6-1/2
	HYDRIL I.F.	6	3-3/4	3-7/8	4	5-13/16	6-1/4
	HUGHES EXTRA HOLE	6-1/4	3-1/4	3-1/4	3-3/8	5-5/8	6-1/4
	API REG.	6-3/4	2-3/4	3-1/4	3-7/8	6-3/8	7
5-1/2	API F.H.	7	4	4	4-1/2	6-1/2	7-1/4
	API I.F.	7-3/8	4-13/16	4-13/16	5-1/4	7-1/8	7-7/8
	API REG.	7-3/4	3-1/2	4	4-3/4	7-1/8	7-7/8
6-5/8	API F.H.	8	5	5	5-1/2	7-1/2	8-1/4
	API I.F.	8-1/2	5-29/32	5-29/32	6-1/4	8-3/8	9
7-5/8	API REG.	8-7/8	4	4-1/4	5-1/4	8-1/8	9
8-5/8	API REG.	10	4-3/4	5-1/4	6-1/4	9	10-1/8

Tool Joints - Interchangeability Charts

Size	Joint OD	Joint ID	Interchangeable With
API Regular			
2-3/8	3-1/8	1	- - -
2-7/8	3-3/4	1-1/4	- - -
3-1/2	4-1/4	1-1/2	- - -
4-1/2	5-1/2	2-1/4	- - -
5-1/2	6-3/4	2-3/4	5 Union Tool Regular
6-5/8	7-3/4	3-1/2	5 Union Tool F.H. 6 Union Tool Regular
7-5/8	8-7/8	4	- - -
8-5/8	10	4-3/4	- - -
Union Tool Regular			
3	4-1/4	1-1/2	- - -
4	5-3/4	2-1/4	- - -
5	6-3/4	2-3/4	5-1/2 API Regular
6	7-3/4	3-1/2	6-5/8 API Regular
API Full Hole			
2-7/8	4-1/4	2-1/8	- - -
3-1/2	4-5/8	2-7/16	- - -
4	5-1/4	2-13/16	4-1/2 Reed Double Streamline
4-1/2	5-3/4	3	- - -
5-1/2	7	4	- - -
6-5/8	6	5	
Union Tool Full Hole			
4-1/2	6	3	- - -
5-1/2	7-1/4	3-1/2	6-5/8 API Regular
6-5/8	8-3/8	4-15/16	- - -
API Internal Flush, Hughes and Reed I.F.			
2-3/8	3-3/8	1-3/4	2-7/8 Slim Hole
2-7/8	4-1/8	2-1/8	3-1/2 Slim Hole
3-1/2	4-3/4	2-11/16	3-1/2 Reed Wide Open 4-1/2 Slim Hole
4	5-3/4	3-1/4	4 Reed Wide Open 4-1/2 Hughes Xtra Hole 4-1/2 Reed Xtra Hole 5 Read Double Streamline
4-1/2	6-1/8	1 3-3/4	4-1/2 Reed Wide Open

Tool Joints - Interchangeability Charts

Size	Joint OD	Joint ID	Interchangeable With
API Internal Flush, Hughes and Reed I.F. (cont.)			
4-1/2	6-1/8	3-3/4	5 Hughes Xtra Hole 5 Reed Xtra Hole 5-1/2 Reed Double Streamline
5-1/2	7-3/8	4-13/16	- - -
Hughes Acme Regular			
2-3/8	3-1/8	1	- - -
2-7/8	3-3/4	1-1/4	- - -
3-1/2	4-1/4	1-7/8	- - -
4-1/2	5-1/2	2-1/2	- - -
5-1/2	6-3/4	3	- - -
6-5/8	7-3/4	3-1/2	- - -
Hughes Acme Streamline, Reed Acme Full Hole			
2-3/8	3-3/8	1-7/16	- - -
2-7/8	4	1-9/16	- - -
3-1/2	4-5/8	2-7/16	- - -
4-1/2	5-3/4	3	- - -
5-1/2	7	4	- - -
Hughes Xtra Hole			
2-718	4-1/4	1-7/8	2-7/8 Reed Xtra Hole 3-1/2 Reed Double Streamline 3-1/2 Hughes Double Streamline
3-1/2	4-3/4	2-7/16	3-1/2 Reed Xtra Hole 4 Hughes Slim Hole 4-1/2 Hughes External Flush 4-1/2 F.H. Reed External Flush
4-1/2	6	3-1/4	4 API I.F. 4-1/2 Reed Xtra Hole 5 Reed Double Streamline
5	6-1/4	3-3/4	4-1/2 API I.F. 5 Reed Xtra Hole 5-1/2 Reed Double Streamline
Hughes External Flush			
2-3/8	2-1/2	1	2-3/8 Homco External Flush
2-7/8	3	1-1/16	- - -
3-1/2	3-5/8	1-1/2	3-1/2 F.H. Reed External Flush

Tool Joints - Interchangeability Charts

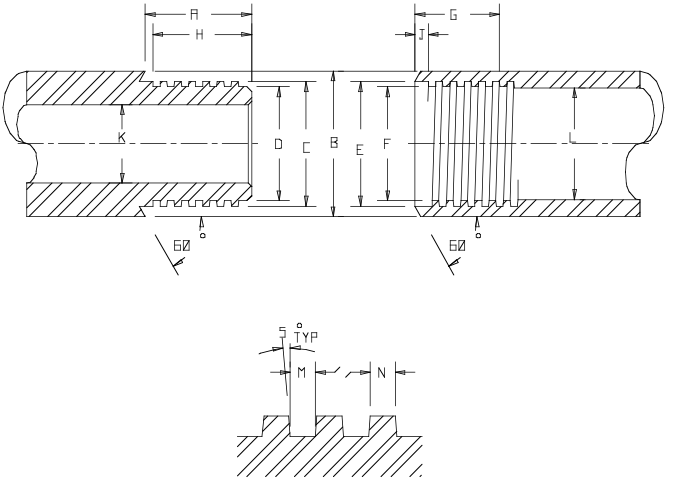
Size	Joint OD	Joint ID	Interchangeable With
Hughes External Flush (cont)			
4-1/2	4-11/16	2-3/16	3-1/2 Reed Xtra Hole 3-1/2 Hughes Xtra Hole 4 Hughes Slim Hole 4-1/2 F.H. Reed External Flush
Hughes Slim Hole, Reed Slim Hole			
2-3/8	2-7/8	1-1/4	- - -
2-7/8	3-3/8	1-3/4	2-3/8 API I.F.
3-1/2	4	2-1/8	2-7/8 API I.F.
4	4-1/2	2-9/16	3-1/2 Hughes Xtra Hole 3-1/2 Reed Xtra Hole 4-1/2 Hughes External Flush 4-1/2 F.H. Reed External Flush
4-1/2	5	2-11/16	13-1/2 API I.F.
Hughes Double Streamline			
3-1/2	3-7/8	1-13/16	2-7/8 Hughes Xtra Hole 3-1/2 Reed Double Streamline
4	4-1/2	2-3/8	4 Reed Double Streamline
4-1/2	5	2-11/16	4-1/2 Reed Double Streamline
Read External Flush			
2-3/8 Reg	2-3/8	7/8	- - -
2-3/8 F.H.	2-1/2	1	- - -
2-7/8 F.H.	3	1-1/4	- - -
3-1/2 F.H.	3-5/8	1-1/2	3-1/2 Hughes External Flush
4-1/2 F.H.	4-11/16	2-3/16	3-1/2 Hughes Xtra Hole 3-1/2 Reed Xtra Hole 4 Hughes Slim Hole 4-1/2 Hughes External Flush
Reed Double Streamline			
2-7/8	3-1/4	1-1/4	- - -
3-1/2	3-7/8	1-13/16	2-7/8 Hughes Xtra Hole 2-7/8 Reed Xtra Hole 3-1/2 Hughes Double Streamline
4	4-1/2	2 3/8	4 Hughes Double Streamline
4-1/2	5	2-11/16	4-1/2 Hughes Double Streamline
5	5-9/16	3-3/8	4 API I.F. 4-1/2 Hughes Xtra Hole

Tool Joints - Interchangeability Charts

Size	Joint OD	Joint ID	Interchangeable With
Reed Double Streamline			
5	5-9/16	3-3/8	4-1/2 Reed Xtra Hole
5-1/2	6-1/8	3-3/4	4-1/2 API I.F. 5 Hughes Xtra Hole 5 Reed Xtra Hole
Reed Full Hole			
2-3/8 2-7/8	3-3/8 4	1-7/16 1-7/8	- - - - - -
Reed Xtra Hole (Semi-Internal Flush)			
2-7/8	4-1/4	1-7/8	3-1/2 Reed Double Streamline
3-1/2	4-3/4	2-7/16	3-1/2 Hughes Xtra Hole 4 Hughes Slim Hole 4-1/2 Hughes External Flush 4-1/2 F.H. Reed External Flush
4-1/2	6	3-1/4	4 API I.F. 4-1/2 Hughes Xtra Hole 5 Reed Double Streamline
5	6-3/8	3-3/4	4-1/2 API I.F. 5 Hughes Xtra Hole 5-1/2 Reed Double Streamline
Reed Open Hole, Reed Full Opening			
2-3/8 2-7/8 3-1/2 4 4-1/2	3-1/8 3-3/4 3-5/8 5-1/4 5-3/4	2 2-7/16 3 3-15/32 3-31/32	2-3/8 American Open Hole 2-7/8 American Open Hole 3-1/2 American Open Hole 4 American Open Hole - - -
Reed Wide Open (W.O.)			
2-3/8 2-7/8	3-3/8 4-1/8	2 2-7/16	- - - - - -
3-1/2	4-3/4	3	3-1/2 API I.F. 4-1/2 Slim Hole
4	5-3/4	3-7/16	4 API I.F. 4-1/2 Reed Xtra Hole 4-1/2 Hughes Xtra Hole 5 Reed Double Streamline
4-1/2	6-1/8	3-7/8	14-1/2 API I.F.

Tool Joints - Interchangeability Charts

Size	Joint OD	Joint ID	Interchangeable With
Reed Wide Open (W.O.)			
4-1/2	6-1/8	3-7/8	5 Reed Xtra Hole 5 Hughes Xtra Hole 5-1/2 Reed Double Streamline
American P.A.C.			
2-3/8	2-7/8	1-3/8	- - -
2-7/8	3-1/8	1-1/2	- - -
3-1/2	3-3/4	2	- - -
American Open Hole			
2-3/8	3-1/4	1-13/16	2-3/8 Reed0penHole (F.O.)
2-7/8	3-7/8	2.151	2-7/8 Reed Open Hole (F.O.)
3-1/2	4-3/4	2-11/16	3-1/2 Reed Open Hole (F.O.)
4	5-1/2	3-1/4	4 Reed Open Hole (F.O.)

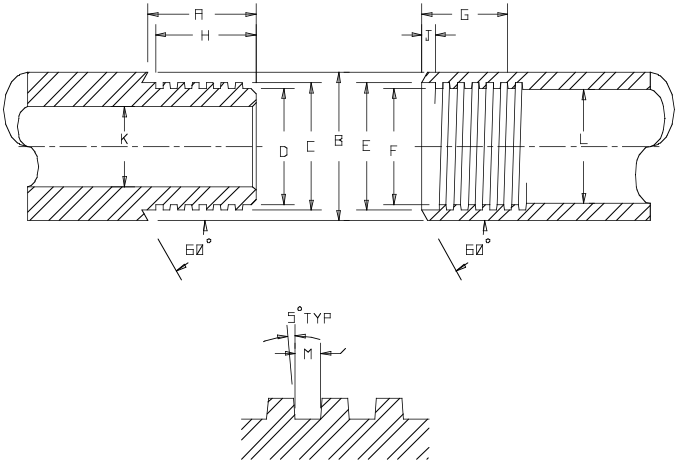


"X" SERIES DRILL ROD

SYMBOL	A	B	C		D		E		F		G
			MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	
E ROD (3 THD)	1.50	1.312	.999	.997	.874	.870	1.003	1.001	.878	.876	1.625
A ROD (3 THD)	1.75	1.625	1.264	1.262	1.139	1.134	1.268	1.266	1.143	1.141	1.875
B ROD (5 THD)	1.87	1.906	1.405	1.403	1.280	1.275	1.409	1.407	1.284	1.282	2.000
N ROD (4 THD)	2.37	2.375	1.874	1.872	1.686	1.681	1.878	1.876	1.690	1.688	2.500
N ROD (3 THD)	2.37	2.375	1.874	1.872	1.686	1.681	1.878	1.876	1.690	1.688	2.500

"X" SERIES DRILL ROD

SYMBOL	H	J	K	L	M (BOX)		M (PIN)		N (BOX)		N (PIN)	
					MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.
E ROD (3 THD)	1.437	.25	.437	.843	.1680	.1617	.1657	.1617	.1608	.1544	.1608	.1563
A ROD (3 THD)	1.687	.25	.562	1.265	.1680	.1617	.1657	.1617	.1608	.1544	.1608	.1563
B ROD (5 THD)	1.812	.25	.625	1.406	.1014	.0950	.0990	.0950	.0941	.0877	.0941	.0897
N ROD (4 THD)	2.312	.31	1.000	2.000	.1236	.1173	.1212	.1173	.1163	.1099	.1164	.1120
N ROD (3 THD)	2.312	.31	1.000	2.000	.1653	.1590	.1653	.1590	.1581	.1517	.1581	.1517

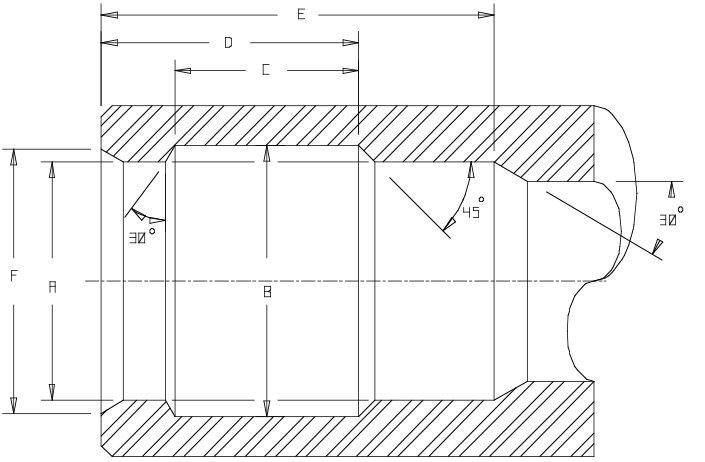


"W" SERIES DRILL ROD

SYMBOL	A	B	C		D		E		F	
			MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.
EW ROD (3 THD)	1.562	1.375	1.062	1.060	.937	.932	1.066	1.064	.941	.939
AW ROD (3 THD)	1.875	1.750	1.374	1.372	1.249	1.244	1.378	1.376	1.253	1.251
BW ROD (3 THD)	2.250	2.125	1.684	1.682	1.527	1.522	1.688	1.686	1.531	1.529
NW ROD (3 THD)	2.750	2.625	2.218	2.216	2.030	2.025	2.222	2.220	2.034	2.032

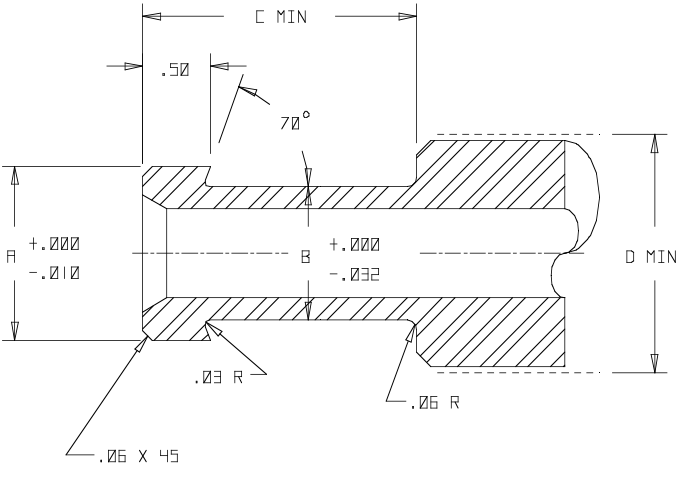
"W" SERIES DRILL ROD

SYMBOL	G	H	J	K	L	M(BOX)		M(PIN)	
						MAX.	MIN.	MAX.	MIN.
EW ROD (3 THD)	1.562	1.437	.312	.437	1.062	.1680	.1617	.1657	.1617
AW ROD (3 THD)	1.875	1.750	.375	.625	1.437	.1680	.1617	.1657	.1617
BW ROD (3 THD)	2.250	2.125	.375	.750	1.812	.1665	.1604	.1641	.1604
NW ROD (3 THD)	2.750	2.625	.375	1.375	2.312	.1651	.1590	.1627	.1590



INTERNAL FISHING NECKS

SIZE	A (in.)		B (in.)		C	D	E	F (in.)	
	MAX	MIN	MAX	MIN	(in.)	(in.)	(in.)	MAX	MIN
1-1/4	.90	.88	1.05	1.03	1	1.38	2	1.03	1.00
1-1/2	1.08	1.06	1.24	1.22	1-1/2	2	3	1.19	1.16
2	1.40	1.38	1.58	1.56	1-1/2	2	3	1.62	1.59
2-1/2	1.83	1.81	1.99	1.97	1-1/2	2	3	1.94	1.91
3	2.33	2.31	2.52	2.50	1-1/2	2	3	2.50	2.47
3-1/2	2.64	2.62	2.83	2.81	1-1/2	2	3	2.81	2.78
4	3.14	3.12	3.33	3.31	1-1/2	2	3	3.38	3.35
5	4.02	4.00	4.21	4.19	1-1/2	2	3	4.19	4.16



EXTERNAL FISHING NECKS

MINIMUM TUBING SIZE IN WHICH NECK MAY BE RUN	A (in.)	B (in.)	C** (in.)	D*** (in.)	PULLING TOOL	
					OTIS	CAMCO
1.660	.875	.688	2-3/4	1-5/16	1-3/16 RB 1-5/16 SM*	1-1/4 JDC* 1-5/16 JDC
1.660	1.000	.813	2-3/4	1-7/16	1-1/4 RB 1-1/2 RB*	1-3/8 JDC*
1.900	1.188	1.000	2-1/4	1-1/2	1-1/2 RB* 1-1/2 SB	1-1/2 JDC* 1-1/2 JUC
2-3/8	1.375	1.188	2-3/8	1-15/16	2 RB* 2 SB	2 JDC* 2 JUC
2-7/8	1.750	1.500	2-1/4	2-3/8	2-1/2 RB* 2-1/2 SB	2-1/2 JDC* 2-1/2 JUC
3-1/2	2.313	2.063	2-1/4	2-7/8	3 RB* 3 SB	3 JDC* 3 JUC

* THESE DIMENSIONS ARE BASED ON USING THE PULLING TOOLS (OVERSHOTS) MOST COMMONLY FOUND ON WIRE LINE SERVICE TRUCKS. THEY ARE THE OTIS RB, RS, SB, AND SS, AND THE CAMCO JDC, JUC, JDS, AND JUS. THE RB, RS, JUC, AND JUS ARE ALL JAR-UP RELEASE TOOLS, AND THE OTHERS ARE JAR-DOWN RELEASE.

** THE MINIMUM RECOMMENDED DISTANCE TO ALLOW AN OTIS SB OR CAMCO JDC PULLING TOOL TO RELEASE.

*** THE LEAST RECOMMENDED DIAMETER IMMEDIATELY SURROUNDING THE FISHING NECK TO ALLOW THE OVERSHOT DOGS ROOM TO LATCH AND UNLATCH.

SECTION 2 - Drill Pipe

Contents

API DRILL PIPE REQUIREMENTS

DRIFT TEST

DRILL PIPE SIZE	DRIFT MANDREL LENGTH	DRIFT MANDREL DIAMETER
ALL EU (EXCEPT 3.5", 13.3#)	4"	I.D. MINUS 3/16"

TENSILE REQUIREMENTS

GRADE	YIELD STRENGTH		TENSILE STRENGTH
	MIN. PSI	MAX. PSI	MINIMUM PSI
D*	55,000	—	95,000
E	75,000	105,000	100,000
X-95	95,000	125,000	105,000
G-105	105,000	135,000	115,000
S-135	135,000	165,000	145,000

*GRADE "D" IS NO LONGER LISTED IN API.

RANGE LENGTHS

	RANGE 1 (ft.)	RANGE 2 (ft.)	RANGE 3 (ft.)
TOTAL RANGE LENGTH, INCLUDES.....	18-22	27-30	38-45
RANGE LENGTH FOR 95% OR MORE OF CARLOAD:			
PERMISSIBLE LENGTH, MINIMUM.....	20	—	—
PERMISSIBLE VARIATION, MAXIMUM.....	2	—	—
RANGE LENGTH FOR 90% OR MORE OF CARLOAD:			
PERMISSIBLE LENGTH, MINIMUM.....	—	27	38
PERMISSIBLE VARIATION, MAXIMUM.....	—	2	3

TOLERANCES

DRILL PIPE SIZE (in.)	DIMENSION	TOLERANCE (in.)
2.375 - 3.500	O.D.**	+ 3/32, - 1/32
4 - 5		+ 7/64, - 0.75% O.D.
5.500 - 6.625		+ 1/8, - 0.75% O.D.
ALL SIZES	WALL THICKNESS	- 12.5%
	I.D.	GOVERNED BY O.D. TOLERANCES
	ECCENTRICITY: O.D.	.093 MAX. (TOTAL INDICATOR READING)
	ECCENTRICITY: I.D.	1/16 MAX. (1/8" TOTAL INDICATOR READING)
	OVALITY (ON UPSET)	.093 MAXIMUM

** MEASUREMENTS MADE IMMEDIATELY BEHIND THE UPSET FOR A DISTANCE OF APPROXIMATELY 5" FOR SIZES 5.5" O.D. AND SMALLER, AND A DISTANCE APPROXIMATELY EQUAL TO THE O.D. FOR SIZES LARGER THAN 5.5".

DATA REPRINTED FROM SECT. 6.7, P 14, TABLE 6.3, P 17, 2ND ED., API SPEC. 5D, MAR. 1, 1991.

MECHANICAL PROPERTIES OF NEW TOOL JOINTS AND NEW GRADE E DRILL PIPE

DRILL PIPE DATA					TOOL JOINT DATA							DRILL PIPE DATA	
	WEIGHT (lbs/ft)		UPSET		CONNECTION				STRENGTH		REC.[1]	STRENGTH	
O.D. (in.)	Nom WT.	Approx. WT.*	TYPE	O.D.[2] (in.)	TYPE	O.D. (in.)	I.D. (in.)	Drift I.D. (in.)	Tensile Yield** (lbs.)	Torsion Yield (ft.-lbs.)	Make-Up Torque (ft.-lbs.)	Tensile Yield (lbs.)	Torsion Yield*** (ft.-lbs.)
2-3/8	4.85	5.16	EU	2-9/16	NC26 (IF)	3-3/8	1-3/4	1.625	313,681	6,478	3,239	97,817	4,763
		4.89	EU	2-9/16	OH	3-1/8	2	1.807	206,416	4,525	2,263	97,817	4,763
		4.97	EU	2-9/16	SLH90	3-1/4	2	1.850	202,670	5,127	2,564	97,817	4,763
		5.06	EU	2-9/16	WO	3-3/8	2	1.807	205,369	4,533	2,267	97,817	4,763
	6.65	6.92	EU	2-9/16	NC26 (IF)	3-3/8	1-3/4	1.625	313,681	6,478	3,239	138,214	6,250
		6.83	EU	2-9/16	OH	3-1/4	1-3/4	1.625	294,774	6,298	3,149	138,214	6,250
		6.71	IU	2-1/2	PAC	2-7/8	1-3/8	1.250	238,634	4,690	2,345	138,214	6,250
		6.73	EU	2-9/16	SLH90	3-1/4	2	1.670	202,670	5,127	2,564	138,214	6,250
2-7/8	6.85	7.36	EU	3-3/16	NC31 (IF)	4-1/8	2-1/8	2.000	447,130	11,869	5,935	135,902	8,083
		6.85	EU	3-3/16	OH	3-3/4	2-7/16	2.253	223,937	5,589	2,795	135,902	8,083
		6.96	EU	3-3/16	SLH90	3-7/8	2-7/16	2.296	260,783	7,630	3,815	135,902	8,083
		7.19	EU	3-3/16	WO	4-1/8	2-7/16	2.253	289,264	7,511	3,756	135,902	8,083
	10.40	10.76	EU	3-3/16	NC31 (IF)	4-1/8	2-1/8	1.963	447,130	11,869	5,935	214,344	11,554
		10.51	EU	3-3/16	OH	3-7/8	2-5/32	1.963	345,705	8,818	4,409	214,344	11,554
		10.15	IU	3	PAC	3-1/8	1-1/2	1.375	273,164	5,735	2,868	214,344	11,554
		10.51	EU	3-3/16	SLH90	3-7/8	2-5/32	2.006	382,551	11,294	5,647	214,344	11,554
		10.99	IU	3	XH	4-1/4	1-7/8	1.750	516,757	13,595	6,798	214,344	11,554
		10.28	IU	3	NC26 (SH)	3-3/8	1-3/4	1.625	313,681	6,478	3,239	214,344	11,554
3-1/2	9.50	10.44	EU	3-7/8	NC38 (IF)	4-3/4	2-11/16	2.563	587,308	18,107	9,054	194,264	14,146
		9.89	EU	3-7/8	OH	4-1/2	3	2.804	392,295	11,867	5,934	194,264	14,146
		10.05	EU	3-7/8	SLH90	4-5/8	3	2.847	366,445	12,646	6,323	194,264	14,146
		10.20	EU	3-7/8	WO	4-3/4	3	2.804	434,198	13,333	6,667	194,264	14,146
	13.30	14.41	EU	3-7/8	H90	5-1/4	2-3/4	2.619	663,633	23,847	11,924	271,569	18,551
		13.77	EU	3-7/8	NC38 (IF)	4-3/4	2-11/16	2.457	587,308	18,107	9,054	271,569	18,551
		13.77	EU	3-7/8	OH	4-3/4	2-11/16	2.414	559,806	17,305	8,653	271,569	18,551
		13.40	IU	3-5/8	NC31 (SH)	4-1/8	2-1/8	2.000	447,130	11,869	5,935	271,569	18,551
		13.94	EU	3-7/8	XH	4-3/4	2-7/16	2.313	584,542	17,493	8,747	271,569	18,551
	15.50	16.39	EU	3-7/8	NC38 (IF)	5	2-9/16	2.414	649,158	20,326	10,163	322,775	21,086
4	11.85	13.07	IU	4-3/16	H90	5-1/2	2-13/16	2.688	914,246	35,441	17,721	230,755	19,474
		13.51	EU	4-1/2	NC46 (IF)	6	3-1/4	3.125	901,164	33,625	16,813	230,755	19,474
		12.10	EU	4-1/2	OH	5-1/4	3-15/32	3.287	621,623	21,967	10,984	230,755	19,474
		12.91	EU	4-1/2	WO	5-3/4	3-7/16	3.313	800,590	29,469	14,735	230,755	19,474

SEE FOOTNOTES ON FOLLOWING PAGE.

MECHANICAL PROPERTIES OF NEW TOOL JOINTS AND NEW GRADE E DRILL PIPE

DRILL PIPE DATA					TOOL JOINT DATA							DRILL PIPE DATA	
	WEIGHT (lbs/ft)		UPSET		CONNECTION				STRENGTH		REC.[1]	STRENGTH	
O.D. (in.)	Nom WT.	Approx. WT.*	TYPE	O.D.[2] (in.)	TYPE	O.D. (in.)	I.D. (in.)	Drift I.D. (in.)	Tensile Yield** (lbs.)	Torsion Yield (ft.-lbs.)	Make-Up Torque (ft.-lbs.)	Tensile Yield (lbs.)	Torsion Yield*** (ft.-lbs.)
		15.06	IU	4-3/16	NC40 (FH)	5-1/4	2-13/16	2.688	711,611	23,487	11,744	285,359	23,288
		15.41	IU	4-3/16	H90	5-1/2	2-13/16	2.688	914,246	35,441	17,721	285,359	23,288
	14.00	15.85	EU	4-1/2	NC46(IF)	6	3-1/4	3.125	901,164	33,625	16,813	285,359	23,288
		15.03	EU	4-1/2	OH	5-1/2	3-1/4	3.125	760,142	27,279	13,640	285,359	23,288
4		14.37	IU	4-3/16	SH	4-5/8	2-9/16	2.438	525,637	15,581	7,791	285,359	23,288
		16.81	IU	4-3/16	NC40(FH)	5-1/4	2-11/16	2.563	776,406	25,673	12,837	324,118	25,810
	15.70	17.07	IU	4-3/16	H90	5-1/2	2-13/16	2.688	914,246	35,441	17,721	324,118	25,810
		17.51	EU	4-1/2	NC46(IF)	6	3-1/4	3.095	901,164	33,625	16,813	324,118	25,810
		15.21	IU	4-11/16	H90	6	3-1/4	3.125	938,984	39,021	19,511	270,034	25,907
	13.75	14.93	EU	5	NC50 (IF)	6-3/8	3-3/4	3.625	939,095	37,676	18,838	270,034	25,907
		14.06	EU	5	OH	5-3/4	3-31/32	3.770	555,131	20,965	10,483	270,034	25,907
		14.79	EU	5	WO	6-1/8	3-7/8	3.750	868,775	34,440	17,220	270,034	25,907
		18.14	IEU	4-11/16	FH	6	3	2.875	976,156	34,780	17,390	330,558	30,807
		17.81	IEU	4-11/16	H90	6	3-1/4	3.125	938,984	39,021	19,511	330,558	30,807
	16.60	17.98	EU	5	NC50 (IF)	6-3/8	3-3/4	3.625	939,095	37,676	18,838	330,558	30,807
		17.10	EU	5	OH	5-7/8	3-3/4	3.625	714,267	27,272	13,636	330,558	30,807
4-1/2		16.79	IEU	4-11/16	NC38(SH)	5	2-11/16	2.563	587,308	18,346	9,173	330,558	30,807
		18.37	IEU	4-11/16	NC46(IF)	6-1/4	3-1/4	3.125	901,164	33,993	16,997	330,558	30,807
		21.63	IEU	4-11/16	FH	6	3	2.875	976,156	34,780	17,390	412,358	36,901
	20.00	21.63	IEU	4-11/16	H90	6	3	2.875	1,086,246	45,258	22,629	412,358	36,901
		21.62	EU	5	NC50 (IF)	6-3/8	3-5/8	3.452	1,025,980	41,235	20,618	412,358	36,901
		22.09	IEU	4-11/16	NC46(XH)	6-1/4	3	2.875	1,048,426	39,659	19,830	412,358	36,901
	22.82	24.07	EU	5	NC50 (IF)	6-3/8	3-5/8	3.452	1,025,980	41,235	20,618	471,239	40,912
		24.59	IEU	4-11/16	NC46(XH)	6-1/4	3	2.875	1,048,426	39,659	19,830	471,239	40,912
	19.50	22.26	IEU	5-1/8	5-1/2 FH	7	3-3/4	3.625	1,448,407	61,352	30,676	395,595	41,167
5		20.89	IEU	5-1/8	NC50(XH)	6-3/8	3-3/4	3.625	939,095	37,676	18,838	395,595	41,167
	25.60	28.26	IEU	5-1/8	5-1/2 FH	7	3-1/2	3.375	1,619,231	61,352	30,676	530,144	52,257
		26.89	IEU	5-1/8	NC50(XH)	6-3/8	3-1/2	3.375	1,109,920	44,673	22,337	530,144	52,257
5-1/2	21.90	23.77	IEU	5-11/16	FH	7	4	3.875	1,265,802	55,933	27,967	437,116	50,710
	24.70	26.33	IEU	5-11/16	FH	7	4	3.875	1,265,802	55,933	27,967	497,222	56,574
6-5/8	25.20	27.30	IEU	6-3/4	FH	8	5	4.875	1,448,800	74,200	37,100	489,470	70,580

* TOOL JOINT PLUS DRILL PIPE.

** THE TENSILE STRENGTH OF THE TOOL JOINT PIN IS BASED ON 120,000 PSI YIELD AND THE CROSS SECTIONAL AREA AT THE ROOT OF THE THREAD 5/8 INCH FROM THE SHOULDER.

*** TORSIONAL YIELD STRENGTH BASED ON SHEAR STRENGTH OF 57.7% OF THE MINIMUM YIELD STRENGTH.

1 RECOMMENDED MAKE-UP TORQUE IS HALF OF TOOL JOINT TORSIONAL YIELD.

2 DATA OBTAINED FROM TABLE 4.2, PP 12 & 13, 37 ED.,API SPEC. 7, AUGUST 1, 1990.

DATA REPRINTED FROM TABLE 2.10, PP 13 & 14, 14 ED., API RP7G, AUGUST 1, 1990.

MECHANICAL PROPERTIES OF NEW TOOL JOINTS AND NEW HIGH STRENGTH DRILL PIPE

DRILL PIPE DATA						TOOL JOINT DATA							DRILL PIPE DATA	
	WEIGHT (lbs/ft)		UPSET			CONNECTION				STRENGTH		REC.[1]	STRENGTH	
O.D. (in.)	Nom WT.	Approx. WT.*	Type	Grade	O.D.[2] (in.)	TYPE	O.D. (in.)	I.D. (in.)	Drift I.D. (in.)	Tensile Yield** (lbs.)	Torsion Yield (ft.-lbs.)	Make-Up Torque (ft.-lbs.)	Tensile Yield (lbs.)	Torsion Yield*** (ft.-lbs.)
2-3/8	6.65	7.01	EU	X-95	2-9/16	NC26(IF)	3-3/8	1-3/4	1.625	313,681	6,478	3,239	175,072	7,917
		6.89	EU	X-95		SLH90	3-1/4	1-13/16	1.670	270,043	6,884	3,442	175,072	7,917
		7.01	EU	G-105		NC26(IF)	3-3/8	1-3/4	1.625	313,681	6,478	3,239	193,500	8,751
		6.89	EU	G-105		SLH90	3-1/4	1-13/16	1.670	270,043	6,884	3,442	193,500	8,751
2-7/8	10.40	10.96	EU	X-95	3-3/16	NC31(IF)	4-1/8	2	1.875	495,726	13,195	6,598	271,503	14,635
		10.84	EU	X-95		SLH90	4	2	1.875	443,756	13,226	6,613	271,503	14,635
		10.96	EU	G-105		NC31(IF)	4-1/8	2	1.875	495,726	13,195	6,598	300,082	16,176
		10.84	EU	G-105		SLH90	4	2	1.875	443,756	13,226	6,613	300,082	16,176
		11.38	EU	S-135		NC31(IF)	4-3/8	1-5/8	1.500	623,844	16,944	8,472	385,820	20,798
		11.12	EU	S-135		SLH90	4-1/8	1-5/8	1.500	571,874	17,226	8,613	385,820	20,798
3-1/2	13.30	14.63	EU	X-95	3-7/8	H90	5-1/4	2-3/4	2.619	663,633	23,847	11,924	343,988	23,498
		14.41	EU	X-95		NC38(IF)	5	2-9/16	2.438	649,158	20,326	10,163	343,988	23,498
		14.07	EU	X-95		SLH90	4-3/4	2-9/16	2.438	595,806	20,879	10,440	343,988	23,498
		14.49	EU	G-105		NC38(IF)	5	2-7/16	2.313	708,063	22,213	11,107	380,197	25,972
		14.07	EU	G-105		SLH90	4-3/4	2-9/16	2.438	595,806	20,879	10,440	380,197	25,972
		14.69	EU	S-135		NC38(IF)	5	2-1/8	2.000	842,440	26,022	13,011	488,825	33,392
		14.69	EU	S-135		SLH90	5	2-1/8	2.000	789,087	28,078	14,039	488,825	33,392
		15.04	EU	S-135		NC40(4FH)	5-3/8	2-7/16	2.313	897,161	29,930	14,965	488,825	33,392
	15.50	16.69	EU	X-95		NC38(IF)	5	2-7/16	2.313	708,063	22,213	11,107	408,848	26,708
		16.88	EU	G-105		NC38(IF)	5	2-1/8	2.000	842,440	26,022	13,011	451,885	29,520
		16.96	EU	G-105		NC40(4FH)	5-1/4	2-9/16	2.438	838,257	27,760	13,880	451,885	29,520
		17.56	EU	S-135		NC40(4FH)	5-1/2	2-1/4	2.125	979,996	32,943	16,472	580,995	37,954
4	14.00	15.30	IU	X-95	4-3/16	NC40(4FH)	5-1/4	2-11/16	2.563	776,406	25,673	12,837	361,454	29,498
		15.55	IU	X-95	4-3/16	H90	5-1/2	2-13/16	2.688	914,246	35,441	17,721	361,454	29,498
		16.14	EU	X-95	4-1/2	NC46(IF)	6	3-1/4	3.125	901,164	33,625	16,813	361,454	29,498
		15.90	IU	G-105	4-3/16	NC40(FH)	5-1/2	2-7/16	2.313	897,161	30,114	15,057	399,502	32,603
		15.55	IU	G-105	4-3/16	H90	5-1/2	2-13/16	2.688	914,246	35,441	17,721	399,502	32,603
		16.14	EU	G-105	4-1/2	NC46(IF)	6	3-1/4	3.125	901,164	33,625	16,813	399,502	32,603
		16.18	IU	S-135	4-3/16	NC40(FH)	5-1/2	2	1.875	1,080,135	36,363	18,182	513,646	41,918
		15.55	IU	S-135	4-3/16	H90	5-1/2	2-13/16	2.688	914,246	35,441	17,721	513,646	41,918
		16.38	EU	S-135	4-1/2	NC46(IF)	6	3	2.875	1,048,426	39,229	19,615	513,646	41,918
	15.70	17.55	IU	X-95	4-3/16	NC40(FH)	5-1/2	2-7/16	2.313	897,161	30,114	15,057	410,550	32,692
		17.17	IU	X-95	4-3/16	H90	5-1/2	2-13/16	2.688	914,246	35,441	17,721	410,550	32,692
		17.75	EU	X-95	4-1/2	NC46(IF)	6	3-1/4	3.125	901,164	33,625	16,813	410,550	32,692
		17.55	IU	G-105	4-3/16	NC40(FH)	5-1/2	2-7/16	2.313	897,161	30,114	15,057	453,765	36,134
		17.17	IU	G-105	4-3/16	H90	5-1/2	2-13/16	2.688	914,246	35,441	17,721	453,765	36,134
		17.75	EU	G-105	4-1/2	NC46(IF)	6	3-1/4	3.125	901,164	33,625	16,813	453,765	36,134
		18.03	EU	S-135	4-1/2	NC46(IF)	6	3	2.875	1,048,426	39,229	19,615	583,413	46,458
4-1/2	16.60	18.62	IEU	X-95	4-11/16	FH	6	3	2.875	976,156	34,780	17,390	418,707	39,022
		18.39	IEU	X-95	4-11/16	H90	6	3-1/4	3.125	938,984	39,021	19,511	418,707	39,022
		18.34	EU	X-95	5	NC50(IF)	6-3/8	3-3/4	3.625	939,095	37,676	18,838	418,707	39,022
		18.88	IEU	X-95	4-11/16	NC46(XH)	6-1/4	3	2.875	1,048,426	39,659	19,830	418,707	39,022
		18.62	IEU	G-105	4-11/16	FH	6	3	2.625	976,156	34,780	17,390	462,781	43,130
		18.39	IEU	G-105	4-11/16	H90	6	3	3.125	938,984	39,021	19,511	462,781	43,130
		18.34	EU	G-105	5	NC50(IF)	6-3/8	3-3/4	3.625	939,095	37,676	18,838	462,781	43,130
		18.88	IEU	G-105	4-11/16	NC46(XH)	6-1/4	3	2.875	1,048,426	39,659	19,830	462,781	43,130

SEE FOOTNOTES ON FOLLOWING PAGE.

MECHANICAL PROPERTIES OF NEW TOOL JOINTS AND NEW HIGH STRENGTH DRILL PIPE

DRILL PIPE DATA						TOOL JOINT DATA							DRILL PIPE DATA	
	WEIGHT (lbs/ft)		UPSET			CONNECTION				STRENGTH		REC.[1]	STRENGTH	
O.D. (in.)	Nom WT.	Approx. WT.*	Type	Grade	O.D.[2] (in.)	TYPE	O.D. (in.)	I.D. (in.)	Drift I.D. (in.)	Tensile Yield** (lbs.)	Torsion Yield (ft.-lbs.)	Make-Up Torque (ft.-lbs.)	Tensile Yield (lbs.)	Torsion Yield*** (ft.-lbs.)
4-1/2	16.60	19.28	IEU	S-135	4-11/16	FH	6-1/4	2-1/2	2.375	1,235,337	44,769	22,385	595,004	55,453
		18.42	IEU	S-135	4-11/16	H90	6	3	2.875	938,984	39,021	19,511	595,004	55,453
		18.61	EU	S-135	5	NC50(IF)	6-3/8	3-1/2	3.375	1,109,920	44,673	22,337	595,004	55,453
		19.09	IEU	S-135	4-11/16	NC46(XH)	6-1/4	2-3/4	2.625	1,183,908	44,871	22,436	595,004	55,453
	20	22.29	IEU	X-95	4-11/16	FH	6	2-1/2	2.375	1,235,337	43,247	21,624	522,320	46,741
		21.79	IEU	X-95	4-11/16	H90	6	3-1/4	3.125	938,984	39,021	19,511	522,320	46,741
		22.13	EU	X-95	5	NC50(IF)	6-3/8	3-1/2	3.375	1,109,920	44,673	22,337	522,320	46,741
		22.56	IEU	X-95	4-11/16	NC46(XH)	6-1/4	2-3/4	2.625	1,183,908	44,871	22,436	522,320	46,741
		22.29	IEU	G-105	4-11/16	FH	6	2-1/2	2.375	1,235,337	43,247	21,624	577,301	51,661
		21.90	IEU	G-105	4-11/16	H90	6	3	2.875	1,086,246	45,258	22,629	577,301	51,661
		22.13	EU	G-105	5	NC50(IF)	6-3/8	3-1/2	3.375	1,109,920	44,673	22,337	577,301	51,661
		22.75	IEU	G-105	4-11/16	NC46(XH)	6-1/4	2-1/2	2.375	1,307,608	49,630	24,815	577,301	51,661
		23.22	EU	S-135	5	NC50(IF)	6-5/8	3	2.875	1,416,225	55,708	27,854	742,244	66,421
		22.93	IEU	S-135	4-11/16	NC46(XH)	6-1/4	2-1/4	2.125	1,419,527	53,936	26,968	742,244	66,421
	22.82	25.43	IEU	X-95	4-11/16	FH	6-1/4	2-1/4	2.125	1,347,256	48,912	24,456	596,903	51,821
		24.58	EU	X-95	5	NC50(IF)	6-3/8	3-1/2	3.375	1,109,920	44,673	22,337	596,903	51,821
		25.06	IEU	X-95	4-11/16	NC46(XH)	6-1/4	2-3/4	2.625	1,183,908	44,871	22,436	596,903	51,821
		25.13	EU	G-105	5	NC50(IF)	6-1/2	3-1/4	3.125	1,268,963	51,447	25,724	659,735	57,276
		25.25	IEU	G-105	4-11/16	NC46(XH	6-1/4	2-1/2	2.375	1,307,608	49,630	24,815	659,735	57,276
		25.83	EU	S-135	5	NC50(IF)	6-5/8	2-3/4	2.625	1,551,706	62,387	31,194	848,230	73,641
5	19.50	22.46	IEU	X-95	5-1/8	5-1/2 FH	7	3-3/4	3.625	1,448,407	61,352	30,676	501,087	52,144
		22.08	IEU	X-95		H90	6-1/2	3-1/4	3.125	1,176,429	51,870	25,935	501,087	52,144
		21.44	IEU	X-95		NC50(XH)	6-3/8	3-1/2	3.375	1,109,920	44,673	22,337	501,087	52,144
		22.46	IEU	G-105		5-1/2 FH	7	3-3/4	3.625	1,448,407	61,352	30,676	553,833	57,633
		22.32	IEU	G-105		H90	6-1/2	3	2.875	1,323,691	58,469	29,235	553,833	57,633
		21.92	IEU	G-105		NC50(XH)	6-1/2	3-1/4	3.125	1,268,963	51,447	25,724	553,833	57,633
		23.40	IEU	S-135		5-1/2 FH	7-1/4	3-1/2	3.375	1,619,231	72,483	36,242	712,070	74,100
		22.60	IEU	S-135		NC50(XH)	6-5/8	2-3/4	2.625	1,551,706	62,387	31,194	712,070	74,100
	25.60	28.45	IEU	X-95		5-1/2 FH	7	3-1/2	3.375	1,619,231	61,352	30,676	671,515	66,192
		27.86	IEU	X-95		NC50(XH)	6-1/2	3	2.875	1,416,225	55,708	27,854	671,515	66,192
		29.01	IEU	G-105	5-1/8	5-1/2 FH	7-1/4	3-1/2	3.375	1,619,231	72,483	36,242	742,201	73,159
		28.32	IEU	G-105		NC50(XH)	6-5/8	2-3/4	2.625	1,551,706	62,387	31,194	742,201	73,159
		29.35	IEU	S-135		5-1/2 FH	7-1/4	3-1/4	3.125	1,778,274	77,151	38,576	954,259	94,062
5-1/2	21.90	24.37	IEU	X-95		FH	7	3-3/4	3.625	1,448,407	61,352	30,676	553,681	64,233
		24.64	IEU	X-95	5-11/16	H90	7	3-1/2	3.125	1,269,528	59,185	29,593	553,681	64,233
		25.21	IEU	G-105		FH	7-1/4	3-1/2	3.375	1,619,231	72,483	36,242	611,963	70,994
		26.63	IEU	S-135		FH	7-1/2	3	2.875	1,925,536	87,170	43,585	786,809	91,278
	24.70	27.76	IEU	X-95		FH	7-1/4	3-1/2	3.375	1,619,231	72,483	36,242	629,814	71,660
		27.76	IEU	G-105	5-11/16	FH	7-1/4	3-1/2	3.375	1,619,231	72,483	36,242	696,111	79,204
		28.87	IEU	S-135		FH	7-1/2	3	2.875	1,925,536	87,170	43,585	894,999	101,833

* TOOL JOINT PLUS DRILL PIPE.

** THE TENSILE STRENGTH OF THE TOOL JOINT PIN IS BASED ON 120,000 PSI YIELD AND THE CROSS SECTIONAL AREA AT THE ROOT OF THE THREAD 5/8 INCH FROM THE SHOULDER.

*** TORSIONAL YIELD STRENGTH BASED ON SHEAR STRENGTH OF 57.7% OF THE MINIMUM YIELD STRENGTH.

1 RECOMMENDED MAKE-UP TORQUE IS HALF OF TOOL JOINT TORSIONAL YIELD.

2 DATA OBTAINED FROM TABLE 4.2, PP 12 & 13, 37 ED., API SPEC 7, AUGUST 1, 1990.

DATA REPRINTED FROM TABLE 2-11, PP 15, 16, & 17, 14 ED., API RP7G, AUGUST 1, 1990.

NEW DRILL PIPE

DIMENSIONAL DATA AND PERFORMANCE PROPERTIES

O.D. (In.)	Weight (lbs./ft.) T&C	Weight (lbs./ft.) Plain End	I.D. (In.)	Wall Thick-ness (In.)	Section Area Body of Pipe (Sq. In.)	Grade	Torsional Yield Strength (ft.-lbs.)	Tensile Yield Strength** (lbs.)	Collapse Pressure (PSI)	Burst Pressure (PSI)
2-3/8	4.85*	4.43	1.995	.190	1.3042	D†	3,490	71,730	8,100	
						E	4,760	97,820	11,040	10,500
						X-95	6,030	123,900	13,980	13,300
						G-105	6,670	136,940	15,460	14,700
						S-135	8,570	176,070	19,070	18,900
	6.65	6.26	1.815	.280	1.8429	D†	4,580	101,360	11,440	11,350
						E	6,250	138,220	15,600	15,470
						X-95	7,920	175,080	19,760	19,600
						G-105	8,750	193,500	21,840	21,660
						S-135	11,250	248,790	28,080	27,850
2-7/8	6.85*	6.16	2.441	.217	1.8120	D†	5,930	99,660	7,680	
						E	8,080	135,900	10,470	9,910
						X-95	10,240	172,140	12,940	12,550
						G-105	11,320	190,260	14,010	13,870
						S-135	14,550	244,620	17,030	17,830
	10.40	9.72	2.151	.362	2.8579	D†	8,470	157,180	12,110	12,120
						E	11,550	214,340	16,510	16,530
						X-95	14,640	271,500	20,910	20,930
						G-105	16,180	300,080	23,110	23,140
						S-135	20,800	385,820	29,720	29,750
3-1/2	9.50	8.81	2.992	.254	2.5902	D†	10,370	142,460	7,400	
						E	14,150	194,270	10,000	9,520
						X-95	17,920	246,070	12,060	12,070
						G-105	19,800	271,970	13,050	13,340
						S-135	25,460	349,680	15,750	17,150
	13.30	12.31	2.764	.368	3.6209	D†	13,600	199,150	10,350	10,120
						E	18,550	271,570	14,110	13,800
						X-95	23,500	343,990	17,880	17,480
						G-105	25,970	380,190	19,760	19,320
						S-135	33,390	488,820	25,400	24,840
	15.50	14.63	2.602	.449	4.3037	D†	15,460	236,700	12,300	12,350
						E	21,090	322,780	16,770	16,840
						X-95	26,710	408,850	21,250	21,330
						G-105	29,520	451,690	23,480	23,570
						S-135	37,950	581,000	30,190	30,310

*THESE SIZES/WEIGHTS NOT INCLUDED IN API SPECIFICATION 5D, FIRST ED., MARCH 15, 1988.

**TENSILE STRENGTH FOR THE CONNECTION EXCEEDS THAT OF THE PIPE. USE PIPE STRENGTH AS GUIDE.

†GRADE "D" IS NO LONGER LISTED IN API.

DATA REPRINTED FROM TABLES 2.1, 2.2, & 2.3, PP 6-8, 14 ED., API RP7G, AUGUST 1, 1990.

NEW DRILL PIPE

DIMENSIONAL DATA AND PERFORMANCE PROPERTIES

O.D. (In.)	Weight (lbs./ft.) T&C	Weight (lbs./ft.) Plain End	I.D. (In.)	Wall Thick-ness (In.)	Section Area Body of Pipe (Sq. In.)	Grade	Torsional Yield Strength (ft.-lbs.)	Tensile Yield Strength** (lbs.)	Collapse Pressure (PSI)	Burst Pressure (PSI)
4	11.85*	10.46	3.476	.262	3.0767	D†	14,280	169,220	6,590	
						E	19,470	230,750	8,380	8,600
						X-95	24,670	292,290	9,980	10,890
						G-105	27,260	323,050	10,710	12,040
						S-135	35,050	415,350	12,620	15,470
	14.00	12.93	3.340	.330	3.8048	D†	17,080	209,260	8,330	7,940
						E	23,290	285,360	11,350	10,830
						X-95	29,500	361,460	14,380	13,720
						G-105	32,600	399,500	15,900	15,160
						S-135	41,920	513,650	20,140	19,490
	15.70*	14.69	3.240	.380	4.3216	D†	18,930	237,690	9,460	9,140
						E	25,810	324,120	12,900	12,470
						X-95	32,690	410,550	16,340	15,790
						G-105	36,130	453,770	18,050	17,460
						S-135	46,460	583,410	23,210	22,440
4-1/2	13.75	12.24	3.958	.271	3.6004	D†	19,000	198,020	5,720	
						E	25,910	270,030	7,200	7,900
						X-95	32,820	342,040	8,410	10,010
						G-105	36,270	378,040	8,960	11,070
						S-135	46,630	486,050	10,280	14,230
	16.60	14.98	3.826	.337	4.4074	D†	22,590	242,410	7,620	7,210
						E	30,810	330,560	10,390	9,830
						X-95	39,020	418,700	12,770	12,450
						G-105	43,130	462,780	13,820	13,760
						S-135	55,450	595,000	16,800	17,690
	20.00	18.69	3.640	.430	5.4981	D†	27,060	302,400	9,510	9,200
						E	36,900	412,360	12,960	12,540
						X-95	46,740	522,320	16,420	15,890
						G-105	51,660	577,300	18,150	17,560
						S-135	66,420	742,240	23,330	22,580
	22.82	21.36	3.500	.500	6.2832	D†				
						E	40,910	47,140	14.820	14,580
						X-95	51,820	59,690	18,770	18470
						G-105	57,280	659,740	18,900	18,380
						S-135	73,640	948,230	24,300	23,630

* THESE SIZES/WEIGHTS NOT INCLUDED IN API SPECIFICATION 5D, FIRST ED., MARCH 15, 1988.

** TENSILE STRENGTH FOR THE CONNECTION EXCEEDS THAT OF THE PIPE. USE PIPE STRENGTH AS GUIDE.

† GRADE "D" IS NO LONGER LISTED IN API.

DATA REPRINTED FROM TABLES 2.1, 2.2, & 2.3, PP 6-8, 14 ED., API RP7G, AUGUST 1, 1990.

NEW DRILL PIPE

DIMENSIONAL DATA AND PERFORMANCE PROPERTIES

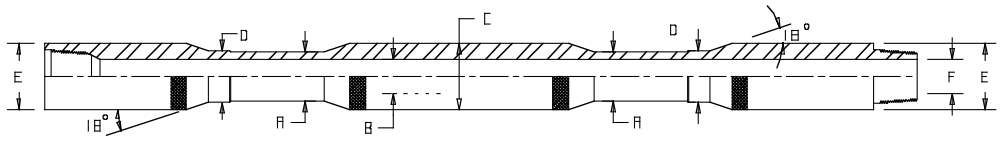
O.D. (In.)	Weight (lbs./ft.) T&C	Weight (lbs./ft.) Plain End	I.D. (In.)	Wall Thick-ness (In.)	Section Area Body of Pipe (Sq. In.)	Grade	Torsional Yield Strength (ft.-lbs.)	Tensile Yield Strength** (lbs.)	Collapse Pressure (PSI)	Burst Pressure (PSI)
5	16.25	14.87	4.408	.296	4.3743	D†	25,700	204,590	5,560	
						E	35,040	328,070	6,940	7,770
						X-95	44,390	415,560	8,110	9,840
						G-105	49,060	459,300	8,620	10,880
						S-135	63,080	590,530	9,830	13,990
	19.50	17.93	4.276	.362	5.2746	D†	30,190	290,100	7,390	6,970
						E	41,170	395,600	10,000	9,960
						X-95	52,140	501,090	12,030	12,040
						G-105	57,600	553,830	13,000	13,300
						S-135	74,100	712,070	15,670	17,110
	25.60	24.03	4.000	.500	7.0686	D†	38,320	388,770	9,900	9,620
						E	52,260	530,150	13,500	13,130
						X-95	66,190	671,520	17,100	16,630
						G-105	73,160	742,200	18,900	18,380
						S-135	94,060	954,260	24,300	23,630
5-1/2	19.20*	16.87	4.892	.304	4.9624	D†	32,320	272,930	4,910	
						E	44,070	372,180	6,040	7,250
						X-95	55,830	471,430	6,940	9,190
						G-105	61,700	521,050	7,310	10,160
						S-135	79,330	669,930	8,090	13,060
	21.90	19.81	4.778	.361	5.8282	D†	37,190	320,550	6,610	6,320
						E	50,710	437,120	8,410	8,610
						X-95	64,230	553,680	10,020	10,910
						G-105	70,990	611,960	10,750	12,060
						S-135	91,280	786,810	12,680	15,510
	24.70	22.54	4.670	.415	6.6296	D†	41,490	364,630	7,670	7,260
						E	56,570	497,220	10,460	9,900
						X-95	71,660	629,810	12,930	12,540
						G-105	79,200	696,110	14,000	13,860
						S-135	101,830	895,000	17,020	17,830
6-5/8	25.20	22.19	5.965	.330	6.5262	D†	51,760	358,940	4,010	4,790
						E	70,580	489,470	4,790	6,540
						X-95	89,400	619,990	5,310	8,280
						G-105	98,810	685,250	5,490	9,150
						S-135	127,050	881,040	6,040	11,770

* THESE SIZES/WEIGHTS NOT INCLUDED IN API SPECIFICATION 5D, FIRST ED., MARCH 15, 1988.

** TENSILE STRENGTH FOR THE CONNECTION EXCEEDS THAT OF THE PIPE. USE PIPE STRENGTH AS GUIDE.

† GRADE "D" IS NO LONGER LISTED IN API.

DATA REPRINTED FROM TABLES 2.1, 2.2, & 2.3, PP 6-8, 14 ED., API RP7G, AUGUST 1, 1990.



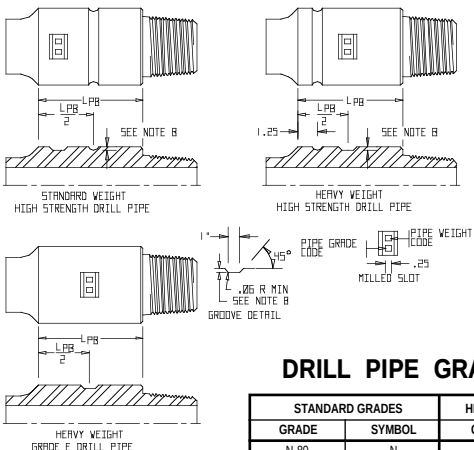
DRILCO "HEVI-WATE" DRILL PIPE
DIMENSIONAL DATA AND PERFORMANCE PROPERTIES

NOM. SIZE (in.) A	TUBE						TOOL JOINT						WEIGHT			
	NOM. TUBE DIM.		UPSET SEC.		PERFORM. PROP.		DIMENSION			SPERFORMANCE PROPERTIES			APPROX. WT. INCL. TUBE & JOINT (lbs.)			
	I.D. (in.) B	WALL THICK (in.)	CENTER (in.) C	ENDS (in.) D	TENSILE YIELD (lbs.)	TORSIONAL YIELD (Ft. lbs.)	CONNECTION	O.D. (in.) E	I.D. (in.) F	TENSILE YIELD (lbs.)	TORSIONAL YIELD (Ft. lbs.)	MAKE-UP TORQUE (Ft. lbs.)	RANGE II		RANGE III	
													WT/ FT.	WT/JT 30 FT.	WT/ FT.	WT/JT 45 FT.
3-1/2	2-1/16	.719	4	3-5/8	345,400	19,535	NC38:3-1/2 IF	4-3/4	2-3/16	748,750	17,575	9,900	26	810	—	—
4	2-9/16	.719	4-1/2	4-1/8	407,550	28,745	NC40:4 FH	5-1/4	2-11/16	711,475	23,525	13,250	28	870	—	—
4-1/2	2-3/4	.875	5	4-5/8	548,075	40,625	NC46:4 IF	6-1/4	2-7/8	1,024,500	38,800	21,800	42	1290	40	1745
5	3	1.000	5-1/2	5-1/8	691,185	56,365	NC50:4-1/2 IF	6-1/2	3-1/8	1,266,000	51,375	29,400	50	1550	48	2090

ALUMINUM DRILL PIPE
DIMENSIONAL DATA AND PERFORMANCE PROPERTIES

SIZE O.D. (in.)	WEIGHT (lbs/ft)		I.D. (in.)	UPSET (in.)	WALL THICKNESS (in.)	SECTION AREA BODY OF PIPE (Sq. in.)	TORSION YIELD STRENGTH (Ft. lbs.)	TENSILE YIELD STRENGTH** (lbs.)	COLLAPSE PRESSURE (PSI)	BURST PRESSURE (PSI)
	T&C	PLAIN END								
3-1/2 (3.70)	7.87	6.36	2.675	3.875	.512	5.126	19,830	297,000	12,320	15,500
4 (4.20)	9.68	7.17	3.280	4.625	.460	5.405	23,580	313,500	10,050	12,250
4-1/2 (4.60)	10.75	8.35	3.600	5.031	.500	6.440	33,000	373,500	10,000	12,180
5 (5.150)	13.20	9.99	4.100	5.688	.525	7.628	44,000	442,000	9,470	11,400

TENSION STRENGTH FOR THE CONNECTION EXCEEDS THAT OF THE PIPE.
USE PIPE STRENGTH AS GUIDE.
COURTESY: REYNOLDS METALS COMPANY.



DRILL PIPE GRADE CODE

STANDARD GRADES		HIGH STRENGTH GRADES	
GRADE	SYMBOL	GRADE	SYMBOL
N-80	N	X-95	X
E	E	G-105	G
C-75	C	S-135	S
		V-150	V

DRILL PIPE WEIGHT CODE

SIZE O.D. (in.)	NOM. WT. (lbs./ft.)	WALL THICKNESS (in.)	WEIGHT CODE NUMBER
2-3/8	4.85	.190	1
	6.65*	.280	2
2-7/8	6.85	.217	1
3-1/2	10.40*	.362	2
	9.50	.254	1
	13.30*	.368	2
	15.50	.449	3
4	11.85	.262	1
	14.00*	.330	2
	15.70	.380	3
4-1/2	13.75	.271	1
	16.60*	.337	2
	20.00	.430	3
	22.82	.500	4
	24.66	.550	5
5	25.50	.575	6
	16.25	.296	1
	19.50*	.362	2
	25.60	.500	3
5-1/2	19.20	.304	1
	21.90*	.361	2
	24.70	.415	3
6-5/8	25.20*	.330	2

*DESIGNATES STANDARD WEIGHT FOR DRILL PIPE SIZE.
DATA REPRINTED FROM FIG. 10.2, P 73, 14 ED., API RP7G, AUGUST 1, 1990.

NOTE A: STANDARD WEIGHT GRADE E DRILL PIPE DESIGNATED BY AN ASTERISK (*) IN THE DRILL PIPE WEIGHT CODE WILL HAVE NO GROOVE OR MILLED SLOT FOR IDENTIFICATION. GRADE E HEAVY WEIGHT DRILL PIPE WILL HAVE A MILLED SLOT ONLY, IN THE CENTER OF THE TONG SPACE.

NOTE B: GROOVE RADIUS APPROXIMATELY 3/8". GROOVE AND MILLED SLOT TO BE 1/4" DEEP ON 5-1/4" OD AND LARGER TOOL JOINTS, 3/16" DEEP ON 5" OD AND SMALLER TOOL JOINTS.

NOTE C: STENCIL THE GRADE CODE SYMBOL AND WEIGHT CODE NUMBER CORRESPONDING TO GRADE AND WEIGHT OF PIPE IN MILLED SLOT OF PIN. STENCIL WITH 1/4" HIGH CHARACTERS SO MARKING MAY BE READ WITH DRILL PIPE HANGING IN ELEVATORS.

LPB = PIN TONG SPACE LENGTH (SEE TABLE 4-2, API SPEC 7).

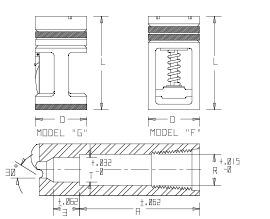
SPECIFICATION GUIDE

BAKER DRILL PIPE FLOATS AND VALVES

SIZES TOOL JOINT TYPES	1R	1F-2R	2F-3R	3F	3-1/2 IF	4R	4F	5R	5F-6R	6F
API REGULAR	2-3/8	2-7/8	3-1/2			4-1/2		5-1/2 - 5-9/16*	6-5/8**	8-5/8
HUGHES OR REED ACME REGULAR	2-3/8	2-7/8	3-1/2			4-1/2		5-1/2 - 5-9/16	6-5/8	
UNION TOOL	2-3/8	2-7/8 3-1/2					4-1/2	5-1/2 - 5-9/16*	6-5/8**	
API FULL HOLE		2-3/8	2-7/8	3-1/2§	4		4-1/2§		5-1/2 - 5-9/16§	6-5/8§
REED ACME FULL HOLE				3-1/2§			4-1/2§		5-1/2 - 5-9/16§	
HUGHES ACME STREAMLINE		2-3/8	2-7/8	3-1/2§			4-1/2§		5-1/2 - 5-9/16§	
HUGHES XTRA HOLE			2-7/8	3-1/2			4-1/2	5		
REED SEMI- INTERNAL FLUSH				3-1/2			4-1/2			
API INTERNAL FLUSH		2-3/8	2-7/8		3-1/2		4	4-1/2		
HYDRIL TYPE "IF" (INT. FLUSH EXT. UPSET)		2-3/8§	2-7/8§	3-1/2§				4-1/2§	5	
HYDRIL "EIU" (EXT. INT. UPSET)				3-1/2		4	4-1/2		5-1/2 - 5-9/16	6-5/8
HYDRIL TYPE "F" (EXT. FLUSH)	2-7/8 3-1/2§			4-1/2 5		5-1/2 - 5-9/16		6-5/8		
HUGHES EXT.FLUSH ACME TYPE		3-1/2	4-1/2			5-1/2 - 5-9/16		6-5/8		
HUGHES EXT. FLUSH FULL HOLE TYPE				4-1/2						

* INTERCHANGEABLE.. SIZES AVAILABLE IN BOTH MODEL "F" AND MODEL "G"; ALL OTHER ARE AVAILABLE IN MODEL "F" ONLY.

** INTERCHANGEABLE.. § FLOAT BODY IN THESE SIZES HAS SMALLER ID THAN STANDARD TOOL JOINT.



DIMENSIONAL DATA

SIZE VALVE	D DIAMETER OF VALVE	R (D + 1/32) DIAMETER OF RECESS FOR VALVE	L LENGTH OF VALVE	T* DIAMETER OF RECESS FOR TOTCO SPIDER
1R	1-21/32	1-11/16	5-7/8	1-5/16
1F-2R	1-29/32	1-15/16	6-1/4	1-1/2
2F-3R	2-13/32	2-7/16	6-1/2	1-29/32
3F	2-13/16	2-27/32	10	2-7/16
3-1/2IF	3-1/8	3-5/32	10	2-11/16

SIZE VALVE	D DIAMETER OF VALVE	R (D + 1/32) DIAMETER OF RECESS FOR VALVE	L LENGTH OF VALVE	T* DIAMETER OF RECESS FOR TOTCO SPIDER
4R	3-15/32	3-1/2	8-5/16	2-15/16
4F	3-21/32	3-11/16	12	3-1/4
5R	3-7/8	3-29/32	9-3/4	3-3/8
5F-6R	4-25/32	4-13/16	11-3/4	4-9/32
6F	5-11/16	5-23/32	14-5/8	5-3/16

*IF THIS DIAMETER IS THE SAME, OR SMALLER THAN STANDARD TOOL JOINT ID, DISREGARD IT.

SECTION 3 - Drill Collars & Connections

Contents

DRILL COLLARS

CONNECTIONS AND RECOMMENDED MAKE-UP TORQUE[1]

(SEE REMARKS ON PAGE 3-4)

CONNECTION			MINIMUM MAKE-UP TORQUE IN FOOT-POUNDS[2]							
SIZE		O.D.	BORE OF DRILL COLLAR (in inches)							
(in.)	TYPE	(in.)	1	1-1/4	1-1/2	1-3/4	2	2-1/4	2-1/2	2-13/16
		3	*2,500	*2,500	*2,500					
API	NC 23	3-1/8	*3,300	*3,300	*2,600					
		3-1/4	4,000	3,400	2,600					
		3		*2,200	*2,200	*2,200				
2-3/8	regular	3-1/8		*3,000	*3,000	2,600				
		3-1/4		*3,900	*3,300	2,600				
		3		*3,800	*3,800	2,900				
2-7/8	PAC[3]	3-1/8		*4,900	4,200	2,900				
		3-1/4		5,200	4,200	2,900				
2-3/8	API I.F.	3-1/2		*4,600	*4,600	3,700				
API	NC 26	3-3/4		5,500	4,700	3,700				
2-7/8	regular	3-1/2		*3,800	*3,800	*3,800				
		3-3/4		*6,000	5,800	5,000				
		3-7/8		6,500	5,800	5,000				
2-7/8	SLIM HOLE									
2-7/8	EXTRA HOLE	3-3/4		*4,100	*4,100	*4,100				
3-1/2	DBL STREAMLINE	3-7/8		*5,300	*5,300	*5,300				
2-7/8	MOD. OPEN	4-1/8		*8,000	*8,000	7,400				
2-7/8	API I.F.	3-7/8		*4,600	*4,600	*4,600	*4,600			
API	NC 31	4-1/8		*7,300	*7,300	*7,300	6,800			
3-1/2	regular	4-1/8		*6,500	*6,500	*6,500	*6,500	*6,500		
		4-1/4		*7,900	*7,900	*7,900	*7,900	7,200		
		4-1/2		*10,900	10,500	*9,600	8,500	7,300		
3-1/2	SLIM HOLE	4-1/4		*8,800	*8,800	8,100	6,800			
		4-1/2		10,000	9,300	8,100	6,800			
API	NC 35	4-1/2				*8,900	*8,900	*8,900	7,400	
		4-3/4				12,100	10,800	9,200	7,400	
		5				12,100	10,800	9,200	7,400	
3-1/2	EXTRA HOLE	4-1/4				*5,100	*5,100	*5,100	*5,100	
4	SLIM HOLE	4-1/2				*8,400	*8,400	*8,400	8,200	
3-1/2	MOD. OPEN	4-3/4				*11,900	11,700	10,000	8,200	
		5				13,200	11,700	10,000	8,200	
		5-1/4				13,200	11,700	10,000	8,200	
3-1/2	API I.F.	4-3/4				*9,900	*9,900	*9,900	*9,900	8,300
API	NC 38	5				*13,800	*13,800	12,800	10,900	8,300
4-1/2	SLIM HOLE	5-1/4				16,000	14,600	12,800	10,900	8,300
		5-1/2				16,000	14,600	12,800	10,900	8,300
3-1/2	H-90 [4]	4-3/4				*8,700	*8,700	*8,700	*8,700	*8,700
		5				*12,700	*12,700	*12,700	*12,700	10,400
		5-1/4				*16,900	16,700	15,000	13,100	10,400
		5-1/2				18,500	16,700	15,000	13,100	10,400
4	FULL HOLE	5				*10,800	*10,800	*10,800	*10,800	*10,800
API	NC 40	5-1/4				*15,100	*15,100	*15,100	14,800	12,100
4	MOD. OPEN	5-1/2				*19,700	18,600	16,900	14,800	12,100
4-1/2	DBL STREAMLINE	5-3/4				20,400	18,600	16,900	14,800	12,100
		6				20,400	18,600	16,900	14,800	12,100

BAKER OIL TOOLS
A Baker Hughes company

DRILL COLLARS

CONNECTIONS AND RECOMMENDED MAKE-UP TORQUE[1]

(SEE REMARKS ON PAGE 3-4)

CONNECTION			MINIMUM MAKE-UP TORQUE IN FOOT-POUNDS[2]					
SIZE		O.D.	BORE OF DRILL COLLAR (in inches)					
(in.)	TYPE	(in.)	2	2-1/4	2-1/2	2-13/16	3	3-1/4
4	H-90 [4]	5-1/4	*12,500	12,500	12,500	*12,500		
		5-1/2	*17,300	17,300	17,300	16,500		
		5-3/4	*22,300	21,500	19,400	16,500		
		6	23,500	21,500	19,400	16,500		
		6-1/4	23,500	21,500	19,400	16,500		
4-1/2	API REGULAR	5-1/2	*15,400	*15,400	*15,400	*15,400		
		5-3/4	*20,300	*20,300	19,400	16,200		
		6	23,400	21,600	19,400	16,200		
		6-1/4	23,400	21,600	19,400	16,200		
API	NC 44	5-3/4	*20,600	*20,600	*20,600	18,000		
		6	25,000	23,300	21,200	18,000		
		6-1/4	25,000	23,300	21,200	18,000		
		6-1/2	25,000	23,300	21,200	18,000		
4-1/2	API FULL HOLE	5-1/2	*12,900	*12,900	*12,900	*12,900	*12,900	
		5-3/4	*17,900	*17,900	*17,900	*17,900	17,700	
		6	*23,300	*23,300	22,800	19,800	17,700	
		6-1/4	27,000	25,000	22,800	19,800	17,700	
		6-1/2	27,000	25,000	22,800	19,800	17,700	
4-1/2	EXTRA HOLE	5-3/4		*17,600	*17,600	*17,600	*17,600	
API	NC 46	6		*23,200	*23,200	22,200	20,200	
4	API I.F.	6-1/4		28,000	25,500	22,200	20,200	
4-1/2	SEMI I.F.	6-1/2		28,000	25,500	22,200	20,200	
5	DBL STREAMLINE	6-3/4		28,000	25,500	22,200	20,200	
4-1/2	MOD. OPEN							
4-1/2	H-90 [4]	5-3/4		*17,600	*17,600	*17,600	*17,600	
		6		*23,400	*23,400	23,000	21,000	
		6-1/4		28,500	26,000	23,000	21,000	
		6-1/2		28,500	26,000	23,000	21,000	
		6-3/4		28,500	26,000	23,000	21,000	
5	H-90 [4]	6-1/4		*25,000	*25,000	*25,000	*25,000	
		6-1/2		*31,500	*31,500	29,500	27,000	
		6-3/4		35,000	33,000	29,500	27,000	
		7		35,000	33,000	29,500	27,000	
4-1/2	API I.F.	6-1/4		*22,800	*22,800	*22,800	*22,800	*22,800
API	NC 50	6-1/2		*29,500	*29,500	*29,500	*29,500	26,500
5	EXTRA HOLE	6-3/4		*36,000	35,500	32,000	30,000	26,500
5	MOD.OPEN	7		38,000	35,500	32,000	30,000	26,500
5-1/2	DBL STREAMLINE	7-1/4		38,000	35,500	32,000	30,000	26,500
5	SEMI I.F.							
5-1/2	H-90 [4]	6-3/4		*34,000	*34,000	*34,000	34,000	
		7		*41,500	40,000	36,500	34,000	
		7-1/4		42,500	40,000	36,500	34,000	
		7-1/2		42,500	40,000	36,500	34,000	

DRILL COLLARS

CONNECTIONS AND RECOMMENDED MAKE-UP TORQUE[1]

(SEE REMARKS ON PAGE 3-4)

CONNECTION			MINIMUM MAKE-UP TORQUE IN FOOT-POUNDS[2]						
SIZE		O.D.	BORE OF DRILL COLLAR (in inches)						
(in.)	TYPE	(in.)	2-1/4	2-1/2	2-13/16	3	3-1/4	3-1/2	3-3/4
5-1/2	API REGULAR	6-3/4	*31,500	*31,500	*31,500	*31,500			
		7	*39,000	*39,000	36,000	33,500			
		7-1/4	42,000	39,500	36,000	33,500			
		7-1/2	42,000	39,500	36,000	33,500			
5-1/2	API FULL HOLE	7		*32,500	*32,500	*32,500	*32,500		
		7-1/4		*40,500	*40,500	*40,500	*40,500		
		7-1/2		*49,000	47,000	45,000	41,500		
		7-3/4		51,000	47,000	45,000	41,500		
API	NC 56	7-1/4		*40,000	*40,000	*40,000	*40,000		
		7-1/2		*48,500	48,000	45,000	42,000		
		7-3/4		51,000	48,000	45,000	42,000		
		8		51,000	48,000	45,000	42,000		
6-5/8	API REGULAR	7-1/2		*46,000	*46,000	*46,000	*46,000		
		7-3/4		*55,000	53,000	50,000	47,000		
		8		57,000	53,000	50,000	47,000		
		8-1/4		57,000	53,000	50,000	47,000		
6-5/8	H-90[4]	7-1/2		*46,000	*46,000	*46,000	*46,000		
		7-3/4		*55,000	*55,000	53,000	49,500		
		8		59,500	56,000	53,000	49,500		
		8-1/4		59,500	56,000	53,000	49,500		
API	NC 61	8		*54,000	*54,000	*54,000	*54,000		
		8-1/4		*64,000	*64,000	*64,000	61,000		
		8-1/2		72,000	68,000	65,000	61,000		
		8-3/4		72,000	68,000	65,000	61,000		
		9		72,000	68,000	65,000	61,000		
5-1/2	API I.F.	8		*56,000	*56,000	*56,000	*56,000	*56,000	
		8-1/4		*66,000	*66,000	*66,000	63,000	59,000	
		8-1/2		74,000	70,000	67,000	63,000	59,000	
		8-3/4		74,000	70,000	67,000	63,000	59,000	
		9		74,000	70,000	67,000	63,000	59,000	
		9-1/4		74,000	70,000	67,000	63,000	59,000	
6-5/8	API FULL HOLE	8-1/2			*67,000	*67,000	*67,000	*67,000	66,500
		8-3/4			*78,000	*78,000	76,000	72,000	66,500
		9			83,000	80,000	76,000	72,000	66,500
		9-1/4			83,000	80,000	76,000	72,000	66,500
		9-1/2			83,000	80,000	76,000	72,000	66,500
API	NC 70	9			*75,000	*75,000	*75,000	*75,000	*75,000
		9-1/4			*88,000	*88,000	*88,000	*88,000	*88,000
		9-1/2			*101,000	*101,000	100,000	95,000	90,000
		9-3/4			107,000	105,000	100,000	95,000	90,000
		10			107,000	105,000	100,000	95,000	90,000
		10-1/4			107,000	105,000	100,000	95,000	90,000
API	NC 77	10				*107,000	*107,000	*107,000	*107,000
		10-1/4				*122,000	*122,000	*122,000	*122,000
		10-1/2				*138,000	*138,000	133,000	128,000
		10-3/4				143,000	138,000	133,000	128,000
		11				143,000	138,000	133,000	128,000

DRILL COLLARS

CONNECTIONS AND RECOMMENDED MAKE-UP TORQUE[1]

CONNECTION			MINIMUM MAKE-UP TORQUE IN FOOT-POUNDS[2]				
SIZE		O.D.	BORE OF DRILL COLLAR (in inches)				
(in.)	TYPE	(in.)	2-13/16	3	3-1/4	3-1/2	3-3/4
7	H-90 [4]	8	*53,000	*53,000	*53,000	*53,000	
		8-1/4	*63,000	*63,000	*63,000	60,500	
		8-1/2	71,500	68,500	65,000	60,500	
7-5/8	API REGULAR	8-1/2		*60,000	*60,000	*60,000	*60,000
		8-3/4		*71,000	*71,000	*71,000	*71,000
		9		*83,000	*83,000	79,000	74,000
		9-1/4		88,000	83,000	79,000	74,000
		9-1/2		88,000	83,000	79,000	74,000
7-5/8	H-90 [4]	9		*72,000	*72,000	*72,000	*72,000
		9-1/4		*85,500	*85,500	*85,500	*85,500
		9-1/2		*98,000	*98,000	*98,000	95,500
8-5/8	API REGULAR	10		*108,000	*108,000	*108,000	*108,000
		10-1/4		*123,000	*123,000	*123,000	123,000
		10-1/2		139,000	134,000	129,000	123,000
8-5/8	H-90 [4]	10-1/4		*112,500	*112,500	*112,500	*112,500
		10-1/2		*128,500	*128,500	*128,500	*128,500
7	H-90 [4]	8-3/4	*67,500	*67,500	66,500	62,000	
	(with low torque face)	9	74,000	71,000	66,500	62,000	
7-5/8	API REGULAR	9-1/4		*72,000	*72,000	*72,000	*72,000
	(with low torque face)	9-1/2		*85,000	*85,000	82,000	77,000
		9-3/4		91,000	87,000	82,000	77,000
		10		91,000	87,000	82,000	77,000
7-5/8	H-90 [4]	9-3/4		*91,000	*91,000	*91,000	*91,000
	(with low torque face)	10		*105,000	*105,000	103,500	98,000
		10-1/4		112,500	108,000	103,500	98,000
		10-1/2		112,500	108,000	103,500	98,000
8-5/8	API REGULAR	10-3/4		*112,000	*112,000	*112,000	*112,000
	(with low torque face)	11		*129,000	*129,000	*129,000	*129,000
8-5/8	H-90 [4]	10-3/4		*92,500	*92,500	*92,500	*92,500
	(with low torque face)	11		*110,000	*110,000	*110,000	*110,000
		11-1/4		*128,000	*128,000	*128,000	*128,000

NOTE: IN EACH CONNECTION SIZE AND TYPE GROUP, TORQUE VALUES APPLY TO ALL CONNECTION TYPES IN THE GROUP WHEN USED WITH THE SAME DRILL COLLAR OUTSIDE COLLAR DIAMETER AND BORE; I.E., 2-3/8" API I.F., API NC 26 AND 2-7/8" SLIM HOLE CONNECTIONS USED WITH 3-1/2" X 1-1/4" DRILL COLLARS ALL HAVE THE SAME MINIMUM MAKE-UP TORQUE OF 4600 FT.LBS. AND THE BOX IS THE WEAKER MEMBER.

* TORQUE FIGURES PRECEDED BY AN ASTERISK INDICATE THE BOX AS THE WEAKER MEMBER FOR THE CORRESPONDING OUTSIDE DIAMETER (O.D.) AND BORE. THE PIN IS THE WEAKER MEMBER FOR ALL OTHER TORQUE VALUES.

[1] RECOMMENDED MAKE-UP TORQUE CALCULATIONS ASSUME THE THOROUGH APPLICATION TO ALL THREADS AND SHOULDERS OF A THREAD COMPOUND WHICH CONTAINS EITHER 40 - 60% BY WEIGHT FINELY POWDERED METALIC ZINC OR 60% BY WEIGHT FINELY POWDERED METALIC LEAD AND NEVER MORE THAN 0.3% SULFUR. CALCULATIONS ALSO ASSUME USE OF THE MODIFIED JACK SCREW FORMULA CONTAINED IN API RP7G, APPENDIX A, PARAGRAPH A.8, AND A UNIT STRESS OF 62,500 PSI IN THE BOX OR PIN, WHICHEVER IS WEAKER.

[2] NORMAL TORQUE RANGE IS TABULATED VALUE PLUS 10%. HIGHER VALUES MAY BE USED UNDER EXTREME CONDITIONS.

[3] MAKE-UP TORQUE FOR 2-7/8" PAC BASED ON 87,500 PSI STRESS AND OTHER FACTORS IN 1, ABOVE.

[4] MAKE-UP TORQUE FOR H-90 BASED ON 56,200 PSI STRESS AND OTHER FACTORS IN 1, ABOVE.

DATA REPRINTED FROM TABLE 3.2, PP 34-36, 14 ED., API RP7G, AUGUST 1, 1990.

DRILL COLLAR WEIGHT (POUNDS PER FOOT)

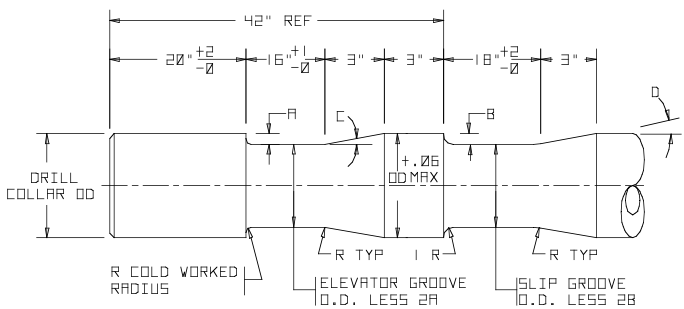
COLLAR	DRILL COLLAR I.D. (inches)												
O.D. (in.)	1	1-1/4	1-1/2	1-3/4	2	2-1/4	2-1/2	2-13/16	3	3-1/4	3-1/2	3-3/4	4
2-7/8	19	18	16										
3	21	20	18										
3-1/8	22	22	20										
3-1/4	26	24	22										
3-1/2	30	29	27										
3-3/4	35	33	32										
4	40	39	37	35	32	29							
4-1/8	43	41	39	37	35	32							
4-1/4	46	44	42	40	38	35							
4-1/2	51	50	48	46	43	41							
4-3/4			54	52	50	47	44						
5			61	59	56	53	50						
5-1/4			68	65	63	60	57						
5-1/2			75	73	70	67	64	60					
5-3/4			82	80	78	75	72	67	64	60			
6			90	88	85	83	79	75	72	68			
6-1/4			98	96	94	91	88	83	80	76	72		
6-1/2			107	105	102	99	96	91	89	85	80		
6-3/4			116	114	111	108	105	100	98	93	89		
7			125	123	120	117	114	110	107	103	98	93	84
7-1/4			134	132	130	127	124	119	116	112	108	103	93
7-1/2			144	142	139	137	133	129	126	122	117	113	102
7-3/4			154	152	150	147	144	139	136	132	128	123	112
8			165	163	160	157	154	150	147	143	138	133	122
8-14			176	174	171	168	165	160	158	154	149	144	133
8-1/2			187	185	182	179	176	172	169	165	160	155	150
9			210	208	206	203	200	195	192	188	184	179	174
9-1/2			234	232	230	227	224	220	216	212	209	206	198
9-3/4			248	245	243	240	237	232	229	225	221	216	211
10			261	259	257	254	251	246	243	239	235	230	225
11			317	315	313	310	307	302	299	295	291	286	281
12			379	377	374	371	368	364	361	357	352	347	342

NOTE 1 TO DETERMINE WEIGHTS OF STANDARD DRILL COLLARS NOT SHOWN USE THE FOLLOWING FORMULA: (AREA O.D. - AREA I.D.) X 3.408 = WT./FT. SEE "DIAMETER AREA TABLE" IN SECTION 7.

NOTE 2 TO DETERMINE APPROXIMATE WEIGHTS OF SPIRAL DRILL COLLARS, FIND THE POUNDS PER FOOT FOR A COLLAR OF THE SAME SIZE IN THE ABOVE CHART AND MULTIPLY BY 96%; FOR EXAMPLE, A COLLAR WITH AN O.D. OF 6" AND AN I.D. OF 2" = 85 POUNDS PER FOOT ABOVE; 85 X .96 = 81.6 POUNDS PER FOOT (AN APPROXIMATION).

NOTE 3 TO DETERMINE CLASS WEIGHTS, MULTIPLY BY NUMBER OF FEET; FOR EXAMPLE A 30' CLASS COLLAR WITH AN O.D. OF 6" AND AN I.D. OF 2" WEIGHS 85 POUNDS PER FOOT; 85 X 30 = 2,550 POUNDS.

DATA REPRINTED FROM TABLE 3.1, P 33, 14 ED., API RP7G, AUGUST 1, 1990.



DRILL COLLAR GROOVES FOR ELEVATORS & SLIPS

GROOVE DIMENSIONS BASED ON DRILL COLLAR O.D.					
DRILL COLLAR O.D. RANGES	**ELEVATOR GROOVE DEPTH A***	**R**	**C****	**SLIP GROOVE DEPTH B***	**D****
4 - 4-5/8	7/32	1/8	4°	3/16	3-1/2°
4-3/4 - 5-5/8	1/4	1/8	5°	3/16	3-1/2°
5-3/4 - 6-5/8	5/16	1/8	6°	1/4	5°
6-3/4 - 8-5/8	3/8	3/16	7-1/2°	1/4	5°
8-3/4 - LARGER	7/16	1/4	9°	1/4	5°

* A AND B DIMENSIONS ARE FROM THE NOMINAL O.D.'S OF NEW DRILL COLLARS.

** ANGLE C AND D DIMENSIONS ARE REFERENCE AND APPROXIMATIONS.

NOTE:API RP7G STATES: THESE DIMENSIONS ARE NOT TO BE CONSTRUED AS API STANDARD.
DATA REPRINTED FROM FIG.10.7, P 85, 14 ED., API RP7G, AUGUST 1, 1990.

RATED CAPACITY OF ELEVATORS AND SPIDERS

BJ TYPE LYT ELEVATORS ..... 20 TONS
BJ TYPE MYT ELEVATORS ..... 40 TONS
BJ TYPE YT TUBING ELEVATORS ..... 75 TONS
BJ TYPE YC CASING ELEVATORS ..... 75 TONS
BJ SLIP GRIP CASING ELEVATORS 7-5/8 .... 150 TONS
BJ SLIP CASING ELEVATORS 10-3/4 ..... 200 TONS
BJ SLIP GRIP CASING ELEVATORS 13-3/8 ..... 200 TONS
10-3/4 BJ SLIP GRIP CASING ELEVATORS AND/OR SPIDER ... 500 TONS
13-3/8 BJ CASING SPIDER ..... 400 TONS
13-3/8 BJ SLIP GRIP CASING ELEVATOR AND/OR SPIDER ..... 350 TONS

BJ "A" SERIES COLLAR TYPE ELEVATORS
RATED CAPACITIES IN TONS

SIZE (O.D.) (in.)	SLA 100	TA-150	TA-100	TA-65	TA-35	AA	MAA	RA
1.050	—	—	—	—	35	—	—	—
1.315	—	—	—	—	35	—	—	—
1.660	—	—	—	65	35	—	—	—
1.900	—	—	—	65	35	—	—	—
2-3/8	—	—	100	65	35	—	175	125
2-7/8	—	—	100	65	35	—	175	125
3-1/2	—	—	100	65	—	250	175	125
4	—	—	100	65	—	275	225	150
4-1/2	—	—	100	65	—	275	225	150
5-1/2	100	150	—	—	—	300	250	175
6-5/8	100	150	—	—	—	300	250	175
7	100	150	—	—	—	300	250	175
7-5/8	100	150	—	—	—	—	—	—
8-5/8	100	150	—	—	—	—	—	—

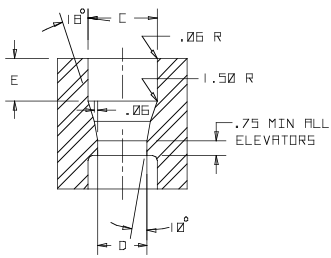
BJ "G" SERIES 18° TYPE ELEVATORS
CAPACITIES IN TONS

SIZE (O.D.) (in.)	GG	MGG	RG	MG
2-3/8	—	—	150	100
2-7/8	—	—	150	100
3-1/2 (F.H. &I.F.)	—	250	150	100
4	350	250	175	100
4-1/2 (REG. & F.H.)	350	250	175	100
4-1/2 - 5 (I.F.)	350	250	200	100
5-1/2	350	250	200	—

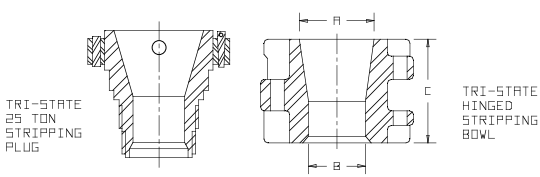
BJ TYPE "SLX" SIDE DOOR COLLAR TYPE ELEVATORS
RATED CAPACITIES IN TONS

SIZE (O.D.) (in.)	GG	MGG	RG	MG
1.600 - 1.900	65	—	—	—
2-3/8 - 2-7/8	65	100	—	—
3-1/2	—	100	—	—
4	—	100	—	—
4-1/2 (REG, F.H.)	—	100	—	—
5 - 5-1/2 - 4-1/2 (I.F.)	—	100	—	—
6-5/8 - 7	—	—	150	—
7-5/8 - 8-5/8	—	—	150	—
9-5/8	—	—	150	—
10-3/4	—	—	150	—
11-3/4	—	—	150	—
13-3/8	—	—	150	—
16	—	—	150	—
18-5/8	—	—	150	—
20	—	—	150	—
24-1/2	—	—	—	250

BAASH-ROSS 18° ELEVATOR BORE CHART

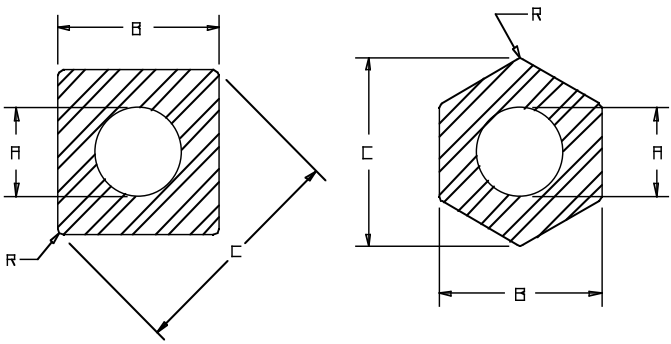


DRILL PIPE SIZE		NECK DIA.	C TOP BORE	D CENTER BORE	E T-100	E T-150	E T-250 & T-350
2-3/8	I.F.	2-9/16	4-1/4	2-21/32	—	—	—
2-7/8	R. & F.H.	3	4-3/8	3-3/32	—	1-5/8	—
	I.F.	3-3/16	4-3/4	3-9/32	—	1-5/8	—
3-1/2	R. & F.H.	3-11/16	5-1/4	3-25/32	—	1-5/8	—
	I.F.	3-7/8	5-1/2	3-31/32	—	1-5/8	—
4	F.H.	4-3/16	6-1/2	4-9/32	1-1/2	1-5/8	3-3/8
	I.F.	4-1/2	6-3/4	4-25/32	1-1/2	1-5/8	3-3/8
4-1/2	R. & F.H.	4-11/16	6-3/4	4-25/32	1-1/2	1-5/8	3-3/8
	I.F.	5	7-1/8	5-1/4	1-1/2	1-5/8	3-3/8
5	EIU	5-1/8	7-1/8	5-1/4	1-1/2	1-5/8	3-3/8
5-1/2	R. & F.H.	5-11/16	7-7/8	5-13/16	—	1-5/8	3-3/8



BAKER OIL TOOLS HINGED STRIPPING BOWLS

	50 TON CAPACITY		100 TON CAPACITY		150 TON CAPACITY
A	6-7/8	7-1/2	*7-9/16	*9-7/8	*13-1/16
B	5	6-3/8	5-1/2	7	10-1/8
C	6	6	10	10	12



SQUARE KELLYS

DIMENSIONS

KELLY SIZE (API)	UPPER BOX CONNECTION*		LOWER* PIN CONNECTION	MAX. BORE A (in.)	ACROSS FLATS B (in.)	ACROSS CORNER C (in.)	RADIUS R (in.)
	STANDARD	OPTIONAL					
2-1/2	6-5/8 REG.	4-1/2 REG.	2-3/8 I.F. (NC26)	1-1/4	2-1/2	3-9/32	5/16
3	6-5/8 REG.	4-1/2 REG.	2-7/8 I.F. (NC31)	1-3/4	3	3-15/16	3/8
3-1/2	6-5/8 REG.	4-1/2 REG.	3-1/2 I.F. (NC38)	2-1/4	3-1/2	4-17/32	1/2
4-1/4	6-5/8 REG.	4-1/2 REG.	4 I.F. (NC46)	2-13/16	4-1/4	5-9/16	1/2
4-1/4	6-5/8 REG.	4-1/2 REG.	4-1/2 I.F. (NC50)	2-13/16	4-1/4	5-9/16	1/2
5-1/4	6-5/8 REG.	—	5-1/2 F.H.	3-1/4	5-1/4	6-29/32	5/8
5-1/4	6-5/8 REG.	—	NC56	3-1/4	5-1/4	6-29/32	5/8
6**	6-5/8 REG.	—	6-5/8 REG.	3-1/2	6	7-7/8	3/4

* BOX - LEFT HAND CONNECTION; PIN - RIGHT HAND CONNECTION.

** NON API.

DATA REPRINTED FROM TABLE 3.2, P 9, 37 ED., API SPEC 7, AUGUST 1, 1990.

BAKER OIL TOOLS
A Baker Hughes company

HEXAGON KELLYS

DIMENSIONS

KELLY SIZE (API)	UPPER BOX CONNECTION*		LOWER* PIN CONNECTION	MAX. BORE A (in.)	ACROSS FLATS B (in.)	ACROSS CORNER C (in.)	RADIUS R (in.)
	STANDARD	OPTIONAL					
3	6-5/8 REG.	4-1/2 REG.	2-3/8 I.F. (NC26)	1-1/2	3	3-3/8	1/4
3-1/2	6-5/8 REG.	4-1/2 REG.	2-7/8 I.F. (NC31)	1-3/4	3-1/2	3-31/32	1/4
4-1/4	6-5/8 REG.	4-1/2 REG.	3-1/2 I.F. (NC38)	2-1/4	4-1/4	4-13/16	5/16
5-1/4	6-5/8 REG.	—	4 I.F. (NC46)	3	5-1/4	5-31/32	3/8
5-1/4	6-5/8 REG.	—	4-1/2 I.F. (NC50)	3-1/4	5-1/4	5-31/32	3/8
6	6-5/8 REG.	—	5-1/2 F.H.	3-1/2	6	6-13/16	3/8
6	6-5/8 REG.	—	NC56	3-1/2	6	6-13/16	3/8

* BOX - LEFT HAND CONNECTION; PIN - RIGHT HAND CONNECTION.

DATA REPRINTED FROM TABLE 3.3, P 10, 37 ED., API SPEC 7, AUGUST 1, 1990.

KELLY WEIGHTS

POUNDS PER FOOT
(DRIVE SECTION)
SQUARE KELLY

ACROSS FLAT	BORE OF SQUARE KELLY											
	1-1/16	1-1/4	1-1/2	1-3/4	2	2-1/4	2-1/2	2-3/4	2-7/8	3	3-1/4	3-1/2
2-1/2	18.3	17.1										
3		25.8	24.0	21.8								
3-1/2			35.6	33.5	31.0	28.2						
4-1/4						47.9	44.7	41.3	39.3			
5-1/4								73.5	71.6	69.7	65.5	
6												89.6

HEXAGON KELLY

ACROSS FLAT	BORE OF SQUARE KELLY											
	1-1/4	1-1/2	1-3/4	2	2-1/4	2-1/2	2-3/4	2-7/8	3	3-1/4	3-1/2	4
3	22.3	20.5										
3-1/2		30.1	27.9	25.4	22.6							
3-3/4		35.3	33.2	30.7	27.9							
4-1/4					39.6	36.4	32.9	31.0				
4-27/32					56.4	53.3	49.8	47.9	45.9	41.7		
5-1/4							60.9	59.0	57.1	52.9	48.4	
6											73.2	63.2

MAXIMUM CONE DIMENSIONS

REED ROCK BIT COMPANY
MILLED TOOTH THREE CONE ROCK BITS

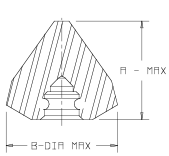
SIZE RANGE	A	B
3-3/4	1-27/32	2-31/64
3-7/8	1-27/32	2-35/64
4-5/8 - 4-3/4	2-1/4	3-1/16
5-7/8 - 6	2-53/64	3-53/64
6-1/8 - 6-1/4	3-1/32	4-1/32
6-1/2 - 6-5/8	3-11/64	4-17/64
6-3/4	3-9/32	4-25/64
7-5/8 - 7-3/4	3-23/32	4-59/64
7-7/8	3-31/32	5-17/64
8-3/8 - 8-5/8	4-13/64	5-45/64
8-3/4	4-7/32	5-55/64
9-1/2 - 9-5/8	4-27/32	6-25/64
9-7/8	4-15/16	6-29/64
10-5/8	5-9/32	7-1/64
11	5-7/32	7-21/64
12	5-7/8	7-3/4
12-1/4	6-1/32	8
13-1/2	6-53/64	8-27/32
13-3/4	6-53/64	9-1/16
14-3/4 - 15	7-5/16	9-57/64
17-1/2	8-3/4	11-9/32
18-1/2	9-1/32	11-25/32

MAXIMUM CONE DIMENSIONS

REED ROCK BIT COMPANY
INSERT TYPE THREE CONE ROCK BITS

SIZE RANGE	A	B
6-1/8 - 6-1/4	2-15/32	3-13/16
6-1/2 - 6-5/8	2-41/64	4-1/8
6-3/4	2-25/32	4-3/16
7-5/8 - 7-3/4	3-1/8	4-11/16
7-7/8	3-23/64	5-1/8
8-3/8 - 8-5/8	3-9/16	5-1/2
8-3/4	3-11/16	5-19/32
9-1/2 - 9-5/8	4-3/16	5-7/8
9-7/8	4-9/32	6-5/16
10-5/8	4-7/16	6-1/2
11	4-19/32	6-5/8
12	5-3/16	7-3/8
12-1/4	5-3/8	8
17-1/2	7-1/2	10-1/2

DATA REPRINTED WITH PERMISSION FROM REED ROCK BIT COMPANY.



MAXIMUM CONE DIMENSIONS
SMITH TOOL THREE CUTTER ROCK BITS

SIZE RANGE	A	B
5-5/8	2-7/8	3-13/16
5-7/8 - 6-1/4	3-7/64	4-3/16
6-1/2 - 6-3/4	3-13/32	4-35/64
7-3/8	4-45/64	4-27/32
7-5/8 - 8	3-31/32	5-17/64
8-1/8 - 8-1/2	4-1/8	5-26/32
8-5/8 - 9	4-17/32	6-1/32
9-1/8 - 9-1/2	4-9/32	6-13/32
9-5/8 - 9-7/8	4-15/16	6-41/64
10-1/2 - 11-1/2	5-27/64	7-5/32
12 - 12-1/4	6-1/8	7-61/64
13-3/4	7	9
15	7-5/8	9-5/8
17-1/2	8-1/2	11-3/8
26	12-5/8	15-3/4

MAXIMUM CONE DIMENSIONS
SMITH TOOL TWO-CONE ROCK BIT

SIZE RANGE	A	B
6-1/2 - 6-3/4	2-49/64	4-41/64
7-5/8 - 8	3-11/32	5-5/8
8-5/8 - 9	3-27/32	5-3/4
9-5/8 - 9-7/8	4-19/64	6-41/64
12 - 12-1/4	5-11/64	8-23/32

DATA REPRINTED WITH PERMISSION FROM 1978-79. SMITH TOOL CATALOG.

MAXIMUM CONE DIMENSIONS
HUGHES TOOL COMPANY ROCK BITS

SIZE RANGE	A	B
3-3/4	1-29/32	2-15/32
3-7/8	1-29/32	2-17/32
4-1/8	1-31/32	2-41/64
4-3/4	2-41/64	3-3/16
5-7/8	2-15/16	3-25/32
6	2-49/64	3-31/32
6-1/8	2-51/64	4-1/64
6-1/4	3-1/64	4-1/64
6-1/2	3-7/64	4-13/64
6-3/4	3-5/16	4-11/32
7-7/8	3-23/32	5-17/64
8-3/8	4-7/64	5-27/64
8-1/2	4-1/4	5-25/32
8-3/4	4-5/16	5-15/16
9-1/2	4-43/64	6-31/64
9-7/8	4-55/64	6-43/64
10-5/8	5-23/64	7
11	5-17/32	6-61/64
12-1/4	6-5/64	8-3/32
13-3/4	6-9/32	8-51/64
14-3/4	7-3/64	9-17/32
17-1/2	8-27/64	10-49/64
20	9-1/16	12-19/64
24	10-49/64	15-31/64
26	11-7/32	16-21/32

DATA REPRINTED WITH PERMISSION FROM HUGHES TOOL COMPANY.

API CASING - BIT SIZES AND CLEARANCES

CASING DATA				DRILL BIT SPECIFICATIONS								
				8 ROUND AND BUTTRESS CASING					X-LINE CASING			
O.D.	WEIGHT T&C	I.D. 8 R.D. & BUTT.	UPSET I.D. X-LINE	SIZE	CONN. API	WT.	CLEARANCE		SIZE	CONN. API	WT.	CLEARANCE
(in.)	(lbs.-ft.)	(in.)	(in.)	(in.)	REG.	(lbs.)	DEC.	FRAC.	(in.)	REG.	(lbs.)	DEC.	FRAC.
	9.50	4.090	—	3-7/8			.215	7/32	—	—	—	—	—
	10.50	4.052	—	3-7/8			.177	11/64	—	—	—	—	—
4-1/2	11.60	4.000	—	3-7/8	2-3/8	10	.125	1/8	—	—	—	—	—
	13.50	3.920	—	3-3/4			.170	11/64	—	—	—	—	—
	11.50	4.560	—	4-1/4			.310	5/16	—	—	—	—	—
	13.00	4.494	—	4-1/4			.244	1/4	—	—	—	—	—
5	15.00	4.408	4.198	4-1/4	2-3/8	11	.158	5/32	4-1/8	2-3/8	11	.073	5/64
	18.00	4.276	4.198	4-1/8			.151	5/32	4-1/8	2-3/8	11	.073	5/64
	14.00	5.012	—	4-3/4	2-7/8	16	.262	17/64	—	—	—	—	—
	15.50	4.950	4.736	4-3/4	2-7/8	16	.200	13/64	4-5/8	2-7/8	16	.111	7/64
5-1/2	17.00	4.892	4.701	4-3/4	2-7/8	16	.142	9/64	4-5/8	2-7/8	16	.076	5/64
	20.00	4.778	4.701	4-5/8	2-7/8	16	.153	5/32	4-5/8	2-7/8	16	.076	5/64
	23.00	4.670	4.610	4-1/2	2-3/8	12	.170	11/64	4-1/2	2-3/8	12	.110	7/64
	20.00	6.049	—	5-7/8	3-1/2	29	.174	17/64	—	—	—	—	—
	24.00	5.921	5.781	5-5/8	3-1/2	24	.296	19/64	5-5/8	3-1/2	24	.156	5/32
6-5/8	28.00	5.791	5.731	5-5/8	3-1/2	24	.166	11/64	5-5/8	3-1/2	24	.106	7/64
	32.00	5.675	5.615	4-3/4	2-7/8	15	.925	59/64	4-3/4	2-7/8	15	.865	55/64
	17.00	6.538	—	6-1/4		30	.288	9/32	—	—	—	—	—
	20.00	6.456	—	6-1/4		30	.206	13/64	—	—	—	—	—
	23.00	6.366	6.171	6-1/8		30	.241	1/4	6-1/8	3-1/2	30	.046	3/64
	26.00	6.276	6.171	6-1/8		30	.151	5/32	6-1/8	3-1/2	30	.046	3/64
7	29.00	6.184	6.123	6	3-1/2	29	.184	3/16	6	3-1/2	29	.123	1/8
	32.00	6.094	6.032	6		29	.219	7/32	5-7/8	3-1/2	29	.157	5/32
	35.00	6.004	5.940	5-7/8		29	.129	1/8	5-7/8	3-1/2	29	.065	1/16
	38.00	5.920	5.860	5-7/8		24	.295	3/64	5-5/8	3-1/2	24	.235	15/64

DIAMETRICAL CLEARANCES LISTED ABOVE ARE BASED ON THE INSIDE DIAMETER OF CASING (OR JOINT I.D. FOR X-LINE CASING).

CASING DATA OBTAINED FROM TABLES 6.1 & 6.3, PP 54 & 61, API SPEC 5C7, 3RD ED., DEC. 1, 1990.

BAKER OIL TOOLS
A Baker Hughes company

API CASING - BIT SIZES AND CLEARANCES

CASING DATA				DRILL BIT SPECIFICATIONS										
				8 ROUND AND BUTTRESS CASING					X-LINE CASING					
O.D.	WEIGHT T&C	I.D. 8 R.D. & BUTT.	UPSET I.D. X-LINE	SIZE	CONN. API	WT.	CLEARANCE		SIZE	CONN. API	WT.	CLEARANCE	
(in.)	(lbs.-ft.)	(in.)	(in.)	(in.)	REG.	(lbs.)	DEC.	FRAC.	(in.)	REG.	(lbs.)	DEC.	FRAC.
	24.00	7.025	—	6-3/4		45	.275	9/32	—	—	—	—	—
	26.40	6.969	6.770	6-3/4		45	.219	7/32	6-5/8	3-1/2	38	.145	9/64
7-5/8	29.70	6.875	6.770	6-5/8	3-1/2	38	.250	1/4	6-5/8	3-1/2	38	.145	9/64
	33.70	6.765	6.705	6-5/8		38	.140	9/64	6-5/8	3-1/2	38	.085	5/64
	39.00	6.625	6.565	6-1/4		30	.375	3/8	6-1/4	3-1/2	30	.315	5/16
	24.00	8.097	—	7-7/8	4-1/2	73	.222	7/32	—	—	—	—	—
	28.00	8.017	—	7-7/8	4-1/2	73	.142	9/64	—	—	—	—	—
	32.00	7.921	7.725	7-5/8	4-1/2	68	.271	17/64	7-5/8	4-1/2	68	.100	3/32
8-5/8	36.00	7.825	7.725	7-5/8	4-1/2	68	.200	13/64	7-5/8	4-1/2	68	.100	3/32
	40.00	7.725	7.663	6-3/4	3-1/2	42	.975	31/32	6-3/4	3-1/2	42	.913	29/32
	44.00	7.625	7.565	6-3/4	3-1/2	42	.875	7/8	6-3/4	3-1/2	42	.815	13/16
	49.00	7.511	7.451	6-3/4	3-1/2	42	.761	49/64	6-3/4	3-1/2	42	.706	45/64
	32.30	9.001	—	8-3/4		90	.251	1/4	—	—	—	—	—
	36.00	8.921	—	8-3/4		90	.171	11/64	—	—	—	—	—
	40.00	8.835	8.665	8-5/8		89	.210	13/64	8-1/2	4-1/2	86	.165	11/64
9-5/8	43.50	8.755	8.665	8-1/2	4-1/2	86	.255	1/4	8-1/2	4-1/2	86	.165	11/64
	47.00	8.681	8.621	8-1/2		86	.181	3/16	8-1/2	4-1/2	86	.121	1/8
	53.50	8.535	8.475	8-3/8		86	.160	5/32	8-3/8	4-1/2	86	.100	7/64
	32.75	10.192	—	9-7/8	5-1/2	135	.317	5/16	—	—	—	—	—
	40.50	10.050	—	9-7/8	OR	135	.175	11/64	—	—	—	—	—
10-3/4	45.50	9.950	9.719	9-5/8	6-5/8	135	.325	21/64	9-5/8	6-5/8	135	.094	3/32
	51.00	9.850	9.629	9-5/8	4-1/2	135	.225	7/32	9-1/2	6-5/8	135	.129	1/8
	55.50	9.760	9.629	9-1/2	4-1/2	135	.260	17/64	9-1/2	6-5/8	135	.129	1/8
	42.00	11.084	—	10-5/8		145	.459	29/64					
	47.00	11.000	—	10-5/8		145	.375	3/8					
11-3/4	54.00	10.880	—	10-5/8	6-5/8	145	.255	1/4	(NO X-LINE IN THIS SIZE)				
	60.00	10.772	—	10-5/8		145	.147	5/32					

DIAMETRICAL CLEARANCES LISTED ABOVE ARE BASED ON THE INSIDE DIAMETER OF CASING (OR JOINT I.D. FOR X-LINE CASING).

CASING DATA OBTAINED FROM TABLES 6.1 & 6.3, PP 54 & 61, API SPEC 5C7, 3RD ED., DEC. 1, 1990.

API CASING - BIT SIZES AND CLEARANCES

CASING DATA			DRILL BIT SPECIFICATIONS				
O.D.	WEIGHT T&C	I.D.	SIZE	CONN. API	WT.	CLEARANCE	
(in.)	(lbs.-ft.)	(in.)	(in.)	REG.	(lbs.)	DEC.	FRAC.
	48.00	12.715	12-1/4		211	.465	15/32
	54.50	12.615	12-1/4		211	.365	23/64
13-3/8	61.00	12.515	12-1/4	6-5/8	211	.265	17/64
	68.00	12.415	12-1/4		211	.165	11/64
	72.00	12.347	12		201	.347	11/32
	65.00	15.250	15	6-5/8		.250	1/4
16	75.00	15.125	14-3/4	OR	300	.375	3/8
	84.00	15.010	14-3/4	7-5/8		.260	17/64
18-5/8	87.50	17.755	17-1/2	6-5/8 OR 7-5/8	500	.255	1/4
	94.00	19.124	18-1/2	6-5/8		.624	5/8
20	106.50	19.000	18-1/2	OR	615	.500	1/2
	133.00	18.730	18-1/2	7-5/8		.230	15/64

DIAMETRICAL CLEARANCES LISTED ABOVE ARE BASED ON THE INSIDE DIAMETER OF CASING (OR JOINT I.D. FOR X-LINE CASING).

CASING DATA OBTAINED FROM TABLES 6.1 & 6.3, PP 54 & 61, API SPEC 5C7, 3RD ED., DEC. 1, 1990.

SECTION 4 - Stretch Data

Contents

Tubing, Drill Pipe, and Casing Stretch Data

The stretch or elongation of oil well tubular material resulting from an applied pulling force is a commonly required determination. Robert Hooke (1635-1702), discovered the law (Hooke's Law) that strain or distortion is proportional to stress or force if the elastic limit of the material is not exceeded. (The elastic limit of a material is the maximum stress that can be developed within it without causing permanent deformation, or permanent stretch in oil field terms.)

The amount of stretch that will occur when a pull force is applied varies with the amount of pull, the length of material being stretched, the elasticity of the material, and its cross-sectional area, as given in the general stretch formula that follows, provided the elastic limit is not exceeded.

General Stretch Formula:

$$\Delta L = \frac{F \times L \times 12}{E \times a_s}$$

where ΔL = stretch, in inches
F = pull force, in pounds
L = length, in feet
E = modulus of elasticity, in pounds per square inch (for steel, E = 30,000,000 psi)
a_s = cross-sectional area (wall area or OD area minus ID area for tubular material), in square inches

Note:
It is a common misconception that the rate of stretch for oil field tubular material also is affected by the grade of steel (J-55, N-80, etc.). This is not true.

Higher grades of steel have greater elastic limits and can therefore be stretched farther before reaching their elastic limits than can the lower grades, but the rate of stretch is the same for all grades. The only factors that affect the rate of stretch are those shown in the preceeding general stretch formula.

Stretch Tables:
Stretch tables in this section (Pages 4-6 through 4-10) cover a wide range of sizes and weights of tubing, drill pipe, and casing.

Columnar tabulations in the tables show outside diameter weight per foot, inside diameter, pipe wall cross-sectional area, Stretch Constant (S.C.) and Free Point Constant (F.P.C.).

Determining Stretch:
Amount of stretch is determined by using the correct Stretch Constant from the tables in the following formula:

$$\Delta L = F \times L \times S.C.$$

where ΔL = stretch, in inches
F = pull force, in thousands of pounds
L = length, in thousands of feet
S.C. = charted Stretch Constant, in inches of stretch per thousand pounds of pull per thousand feet of length

Example:
Determine the amount of stretch for 30,000 pounds of pull on 6,500 feet of 2.375 OD, 4.7 lb/ft, 1.995 ID tubing.

$$\Delta L = F \times L \times S.C.$$
$$= 30 \times 6.5 \times 0.30675$$
$$= 59.8 \text{ inches of stretch}$$

Determining Free Point:

The charted Free Point Constant makes it possible to determine very easily the length of pipe being stretched, commonly referred to as determining the free point in a string of stuck or anchored pipe, when the amount of pull force and amount of stretch are known. Read the correct Free Point Constant from the chart for the pipe involved, and use in the following formula:

$$L = \frac{\Delta L \times F.P.C.}{F}$$

where: L = *minimum length of free pipe, or length being stretched, in feet.
ΔL = stretch, in inches
F = pull force, in thousands of pounds
F.P.C. = charted Free Point Constant

***Because of friction forces, which cannot be determined readily, the actual length of free pipe may be longer than calculated. The formula necessarily assumes complete absence of friction.**

Example:

Determine the minimum length of free pipe being stretched when a string of 4-1/2 OD, 16.60 lb/ft drill pipe stretches 18.6 inches with an applied pull of 25,000 pounds.

$$L = \frac{\Delta L}{F} \times F.P.C.$$

$$= \frac{18.6}{25} \times 11{,}017.5$$

= 8,197 feet, or approximately 8,200 feet

Calculation of Stretch Constants and Free Point Constants:

For any pipe sizes not included in the tabulated stretch chart data, Stretch Constants and Free Point Constants can be calculated as follows:

$$S.C. = \frac{0.4}{a_s}$$

$$F.P.C. = 2500 \times a_s$$

where:

a_s = pipe wall cross-sectional area,in square inches

Example:

Determine the Stretch Constant for 2.375 OD, 4.7 lb/ft tubing which has a pipe wall cross-sectional area (a_s) of 1.304 square inches.

$$S.C. = \frac{0.4}{a_s}$$
$$= \frac{0.4}{1.304}$$
$$= 0.30675$$

Example:

Determine the Free Point Constant for 4-1/2 OD, 16.60 lb/ft drill pipe which has a pipe wall cross-sectional area (a_s) of 4.407 square inches.

$$F.P.C. = 2500 \times a_s$$
$$= 2500 \times 4.407$$
$$= 11{,}017.5$$

Stretch Graphs:

Stretch graphs are included in this section (Pages 4-11 through 4-21) for 1.660 through 7 OD external upset or non-upset API tubing in the most common weight and wall thickness for each size. For tubing having any other cross-sectional wall area, stretch must be determined from the general stretch formula or from the stretch charts also included in this section.

Each stretch graph involves only three variables: amount of pull force, depth (or length), and amount of stretch. When any two of the variables are known, the third can be read directly from the graph as follows:

1. If **depth** and **pull force** are known, the amount of stretch can be found.

2. If **depth** and **stretch** are known, the amount of pull can be found.

3. If **pull force** and **stretch** are known, the depth or length of tubing being stretched can be found.

Tubing Stretch Table

OD (in.)	Weight (lb/ft)	ID (in.)	Wall Area (sq. in.)	Stretch Constant (in./1000 lb /1000 ft)	Free Point Constant
1.050 (3/4)	1.14	0.824	0.333	1.20120	832.5
	1.20	0.824	0.333	1.20120	832.5
1.315 (1)	1.30	1.125	0.364	1.09890	910.0
	1.43	1.097	0.413	0.96852	1032.5
	1.63	1.065	0.467	0.85653	1167.5
	1.70	1.049	0.494	0.80972	1235.0
	1.72	1.049	0.494	0.80972	1235.0
	1.80	1.049	0.494	0.80972	1235.0
1.660 (1-1/4)	2.10	1.410	0.603	0.66335	1507.5
	2.30	1.380	0.669	0.59791	1672.5
	2.33	1.380	0.669	0.59791	1672.5
	2.40	1.380	0.669	0.59791	1672.5
1.900 (1-1/2)	2.40	1.650	0.697	0.57389	1742.5
	2.60	1.610	0.799	0.50063	1997.5
	2.72	1.610	0.799	0.50063	1997.5
	2.75	1.610	0.799	0.50063	1997.5
	2.76	1.610	0.799	0.50063	1997.5
	2.90	1.610	0.799	0.50063	1997.5
2.000 (2)	3.30	1.670	0.951	0.42061	2377.5
	3.40	1.670	0.951	0.42061	2377.5
2.063 (2-1/16)	2.66	1.813	0.761	0.52562	1902.5
	3.25	1.751	0.935	0.42781	2337.5
	3.30	1.751	0.935	0.42781	2337.5
	3.40	1.751	0.935	0.42781	2337.5
2.375 (2-3/8)	3.10	2.125	0.884	0.45249	2210.0
	3.32	2.107	0.943	0.42418	2357.5
	4.00	2.041	1.158	0.34542	2895.0
	4.60	1.995	1.304	0.30675	3260.0
	4.70	1.995	1.304	0.30675	3260.0
	5.30	1.939	1.477	0.27082	3692.5
	5.80	1.867	1.692	0.23641	4230.0
	5.95	1.867	1.692	0.23641	4230.0
	6.20	1.853	1.733	0.23081	4332.5
	7.70	1.703	2.152	0.18587	5380.0

Tubing Stretch Table

OD (in.)	Weight (lb/ft)	ID (in.)	Wall Area (sq. in.)	Stretch Constant (in./1000 lb /1000 ft)	Free Point Constant
	4.36	2.579	1.268	0.31546	3170.0
	4.64	2.563	1.333	0.30008	3332.5
	6.40	2.441	1.812	0.22075	4530.0
	6.50	2.441	1.812	0.22075	4530.0
	7.90	2.323	2.254	0.17746	5635.0
2.875	8.60	2.259	2.484	0.16103	6210.0
(2-7/8)	8.70	2.259	2.484	0.16103	6210.0
	8.90	2.243	2.540	0.15748	6350.0
	9.50	2.195	2.708	0.14771	6770.0
	10.40	2.151	2.858	0.13996	7145.0
	11.00	2.065	3.143	0.12727	7857.5
	11.65	1.995	3.366	0.11884	8415.0
	5.63	3.188	1.639	0.24405	4097.5
	5.75	3.188	1.639	0.24405	4097.5
	7.70	3.068	2.228	0.17953	5570.0
	9.20	2.992	2.590	0.15444	6475.0
	9.30	2.992	2.590	0.15444	6475.0
	10.20	2.922	2.915	0.13722	7287.5
3.500	10.30	2.922	2.915	0.13722	7287.5
(3-1/2)	12.80	2.764	3.621	0.11047	9052.5
	12.95	2.750	3.682	0.10864	9205.0
	13.70	2.673	4.010	0.09975	10025.0
	14.70	2.601	4.308	0.09285	10770.0
	15.10	2.602	4.304	0.09294	10760.0
	15.80	2.524	4.618	0.08662	11545.0
	17.05	2.440	4.945	0.08089	12362.5
	9.40	3.548	2.680	0.14925	6700.0
	9.50	3.548	2.680	0.14925	6700.0
4.000	10.80	3.476	3.077	0.13000	7692.5
(4)	10.90	3.476	3.077	0.13000	7692.5
	11.00	3.476	3.077	0.13000	7692.5
	11.60	3.428	3.337	0.11987	8342.5
	13.40	3.340	3.805	0.10512	9512.5
	12.60	3.958	3.600	0.11111	9000.0
	12.75	3.958	3.600	0.11111	9000.0
4.500	15.10	3.826	4.407	0.09076	11017.5
(4-1/2)	15.50	3.826	4.407	0.09076	11017.5
	16.90	3.754	4.836	0.08271	12090.0
	19.20	3.640	5.498	0.07275	13745.0

Drill Pipe Stretch Table

OD (in.)	Nominal Weight (lb/ft)	ID (in.)	Wall Area (sq. in.)	Stretch Constant (in./1000 lb /1000 ft)	Free Point Constant
	4.85	1.995	1.304	0.30675	3260.0
(2-3/8)	6.65	1.815	1.843	0.21704	4607.5
	6.85	2.441	1.812	0.22075	4530.0
(2-7/8)	10.40	2.151	2.858	0.13996	7145.0
	9.50	2.992	2.590	0.15444	6475.0
(3-1/2)	13.30	2.764	3.621	0.11047	9052.5
	15.50	2.602	4.304	0.09294	10760.0
	11.85	3.476	3.077	0.13000	7692.5
(4)	14.00	3.340	3.805	0.10512	9512.5
	13.75	3.958	3.600	0.11111	9000.0
	16.60	3.826	4.407	0.09076	11017.5
(4-1/2)	18.10	3.754	4.836	0.08271	12090.0
	20.00	3.640	5.498	0.07275	13745.0
	16.25	4.408	4.374	0.09145	10935.0
(5)	19.50	4.276	5.275	0.07583	13187.5
	21.90	4.778	5.828	0.06863	14570.0
(5-1/2)	24.70	4.670	6.630	0.06033	16575.0
(6-5/8)	25.20	5.965	6.526	0.06129	16315.0

Casing Stretch Table

OD (in.)	Nominal Weight (lb/ft)	ID (in.)	Wall Area (sq. in.)	Stretch Constant (in./1000 lb /1000 ft)	Free Point Constant
(4-1/2)	9.50	4.090	2.766	0.14461	6915.0
	10.50	4.052	3.009	0.13293	7522.5
	11.60	4.000	3.338	0.11983	8345.0
	13.50	3.920	3.836	0.10428	9590.0
	15.10	3.826	4.407	0.09076	11017.5
	16.90	3.740	4.918	0.08133	12295.0
(5)	11.50	4.560	3.304	0.12107	8260.0
	13.00	4.494	3.773	0.10602	9432.5
	15.00	4.408	4.374	0.09145	10935.0
	18.00	4.276	5.275	0.07583	13187.5
	20.80	4.156	6.069	0.06591	15172.5
(5-1/2)	14.00	5.012	4.029	0.09928	10072.5
	15.50	4.950	4.514	0.08861	11285.0
	17.00	4.892	4.962	0.08061	12405.0
	20.00	4.778	5.828	0.06863	14570.0
	23.00	4.670	6.630	0.06033	16575.0
(6-5/8)	20.00	6.049	5.734	0.06976	14335.0
	24.00	5.921	6.937	0.05766	17342.5
	28.00	5.791	8.133	0.04918	20332.5
	32.00	5.675	9.177	0.04359	22942.5
(7)	17.00	6.538	4.912	0.08143	12280.0
	20.00	6.456	5.749	0.06958	14372.5
	23.00	6.366	6.656	0.06010	16640.0
	26.00	6.276	7.549	0.05299	18872.5
	29.00	6.184	8.449	0.04734	21122.5
	32.00	6.094	9.317	0.04293	23292.5
	35.00	6.004	10.172	0.03932	25430.0
	38.00	5.920	10.959	0.03650	27397.5
(7-5/8)	24.00	7.025	6.904	0.05794	17260.0
	26.40	6.969	7.519	0.05320	18797.5
	29.70	6.875	8.541	0.04683	21352.5
	33.70	6.765	9.720	0.04115	24300.0
	39.00	6.625	11.192	0.03574	27980.0

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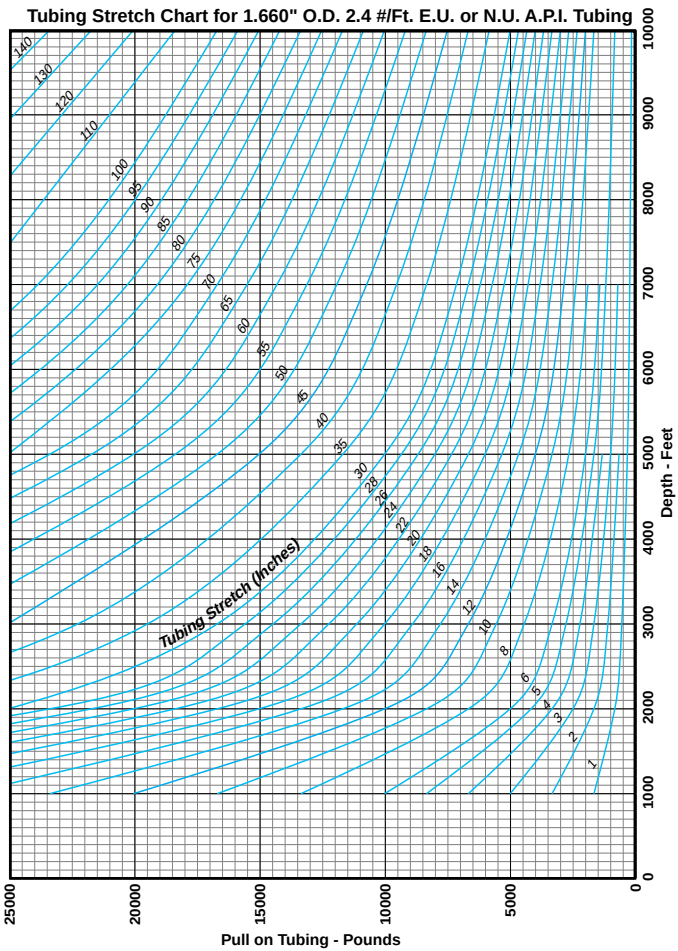
Casing Stretch Table

OD (in.)	Nominal Weight (lb/ft)	ID (in.)	Wall Area (sq. in.)	Stretch Constant (in./1000 lb /1000 ft)	Free Point Constant
	24.00	8.097	6.934	0.05769	17335.0
	28.00	8.017	7.947	0.05033	19867.5
	32.00	7.921	9.149	0.04372	22872.5
(8-5/8)	36.00	7.825	10.336	0.03870	25840.0
	40.00	7.725	11.557	0.03461	28892.5
	44.00	7.625	12.673	0.03156	31682.5
	49.00	7.511	14.118	0.02833	35295.0
	32.30	9.001	9.128	0.04382	22820.0
	36.00	8.921	10.254	0.03901	25635.0
	40.00	8.835	11.454	0.03492	28635.0
(9-5/8)	43.50	8.755	12.559	0.03185	31397.5
	47.00	8.681	13.572	0.02947	33930.0
	53.50	8.535	15.546	0.02573	38865.0
	32.75	10.192	9.178	0.04358	22945.0
	40.50	10.050	11.435	0.03498	28587.5
	45.50	9.950	13.006	0.03076	32515.0
(10-3/4)	51.00	9.850	14.561	0.02747	36402.5
	55.50	9.760	15.947	0.02508	39867.5
	60.70	9.660	17.473	0.02289	43682.5
	65.70	9.560	18.982	0.02107	47455.0
	42.00	11.084	11.944	0.03349	29860.0
(11-3/4)	47.00	11.000	13.401	0.02985	33502.5
	54.00	10.880	15.463	0.02587	38657.5
	60.00	10.772	17.300	0.02312	43250.0
	48.00	12.715	13.524	0.02958	33810.0
	54.50	12.615	15.514	0.02578	38785.0
(13-3/8)	61.00	12.515	17.487	0.02287	43717.5
	68.00	12.415	19.445	0.02057	48612.5
	72.00	12.347	20.768	0.01926	51920.0
	65.00	15.250	18.408	0.02173	46020.0
(16)	75.00	15.124	21.414	0.01868	53535.0
	84.00	15.010	24.112	0.01659	60280.0
(20)	94.00	19.124	26.918	0.01486	67295.0

Tubing Stretch Chart for 1.660" O.D. 2.4 #/Ft. E.U. or N.U. A.P.I. Tubing



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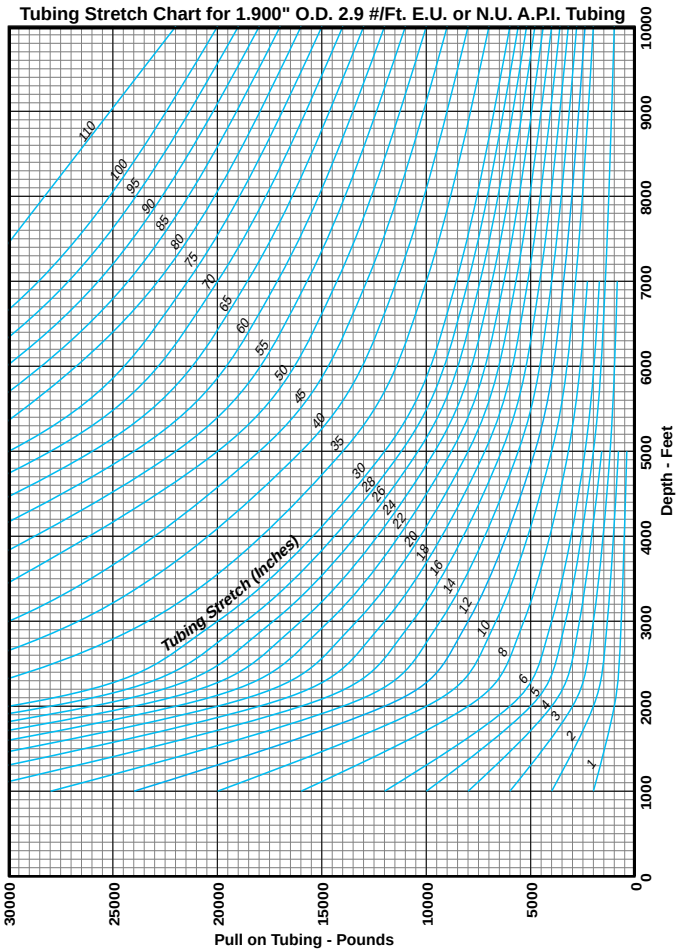
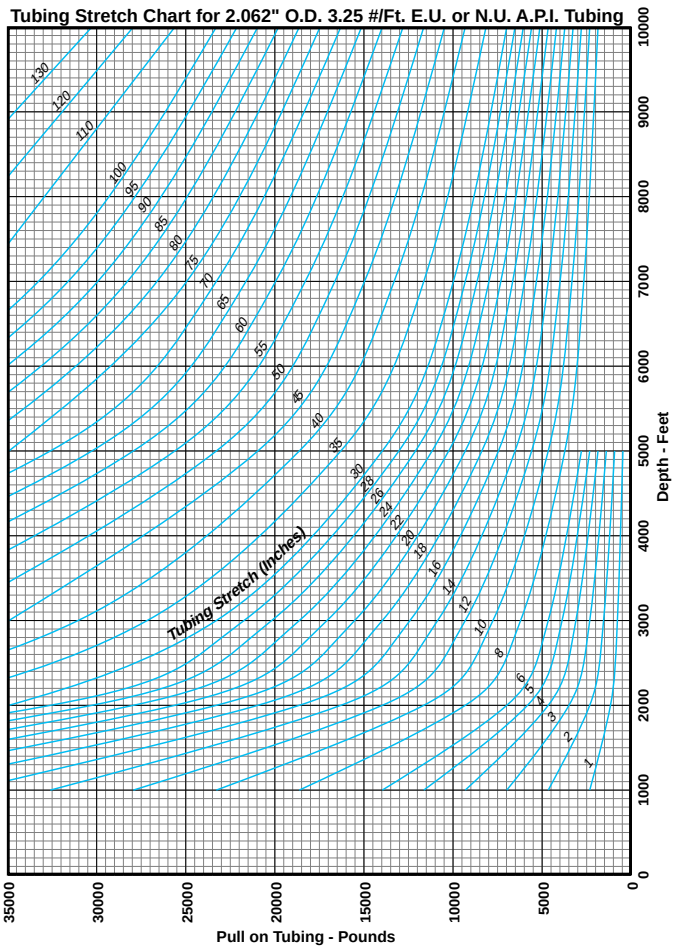
Tubing Stretch Chart for 1.900" O.D. 2.9 #/Ft. E.U. or N.U. A.P.I. Tubing



Tubing Stretch Chart for 2.062" O.D. 3.25 #/Ft. E.U. or N.U. A.P.I. Tubing



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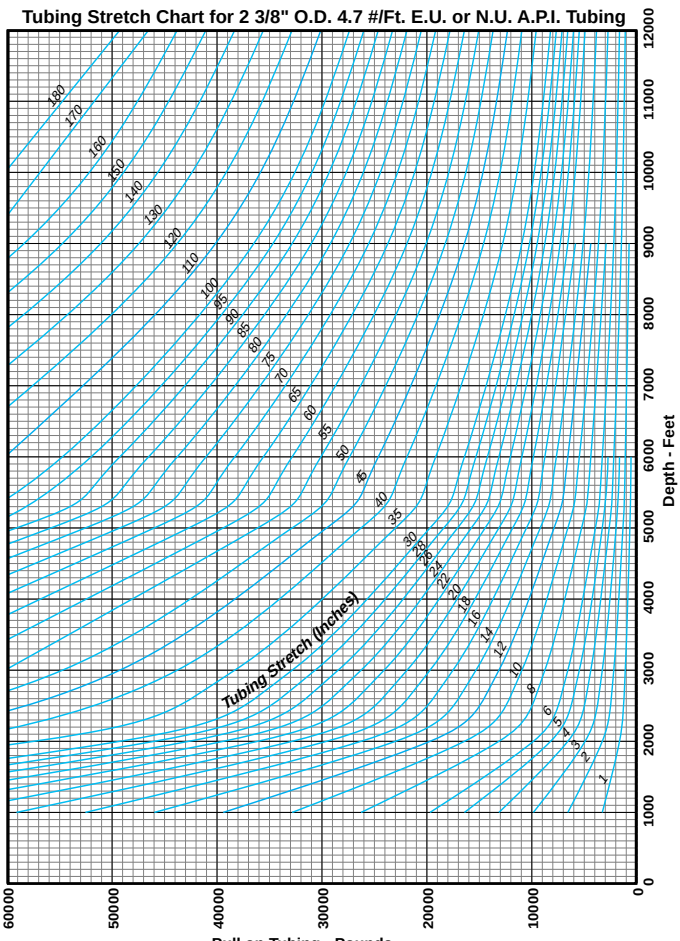
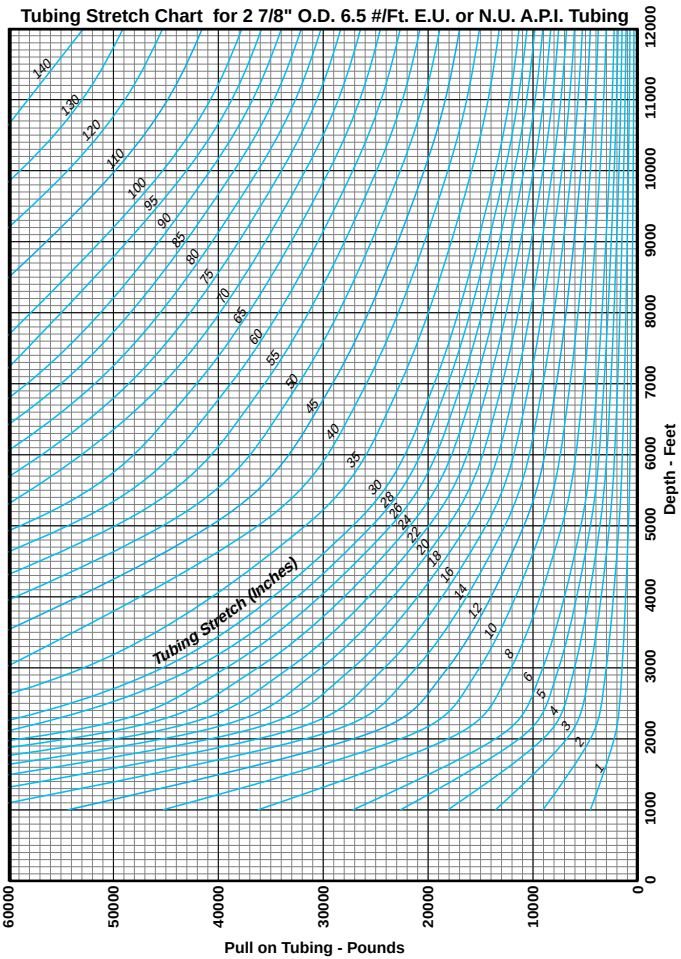
Tubing Stretch Chart for 2 3/8" O.D. 4.7 #/Ft. E.U. or N.U. A.P.I. Tubing



Tubing Stretch Chart for 2 7/8" O.D. 6.5 #/Ft. E.U. or N.U. A.P.I. Tubing



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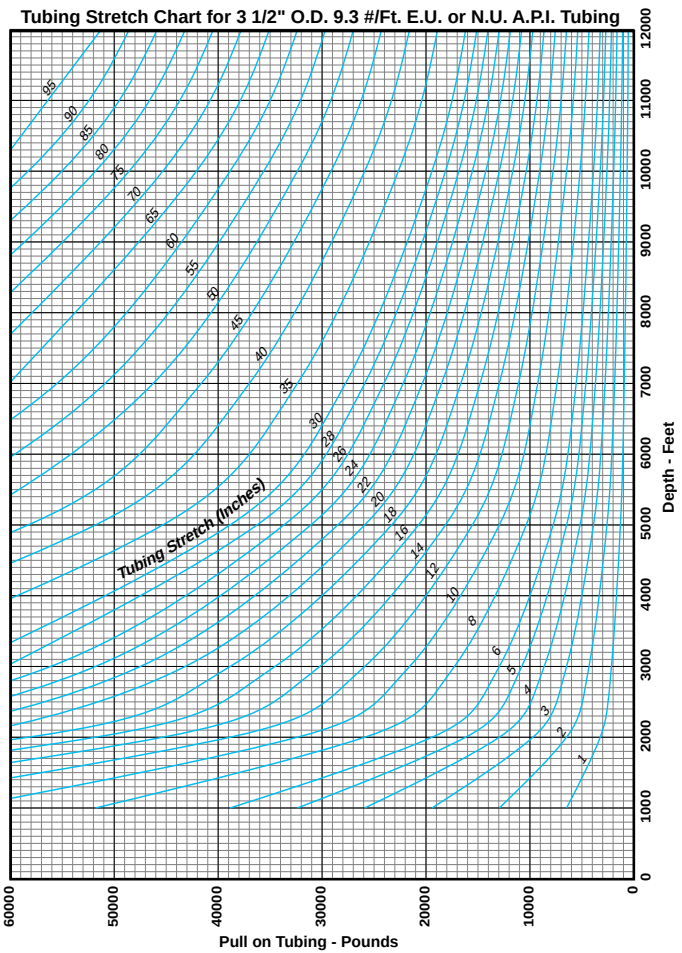
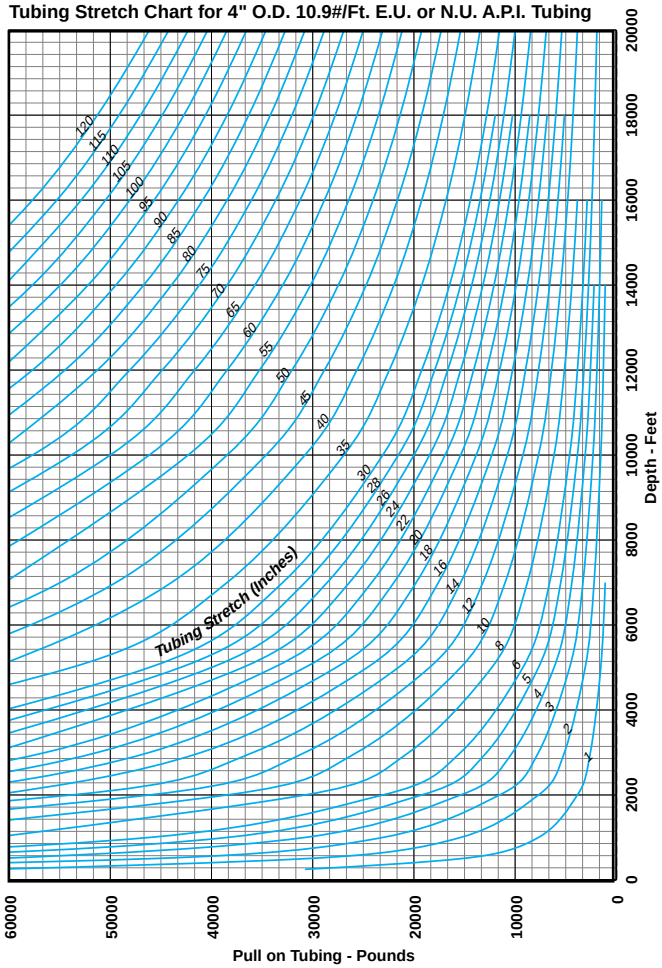
Tubing Stretch Chart for 3 1/2" O.D. 9.3 #/Ft. E.U. or N.U. A.P.I. Tubing



Tubing Stretch Chart for 4" O.D. 10.9#/Ft. E.U. or N.U. A.P.I. Tubing



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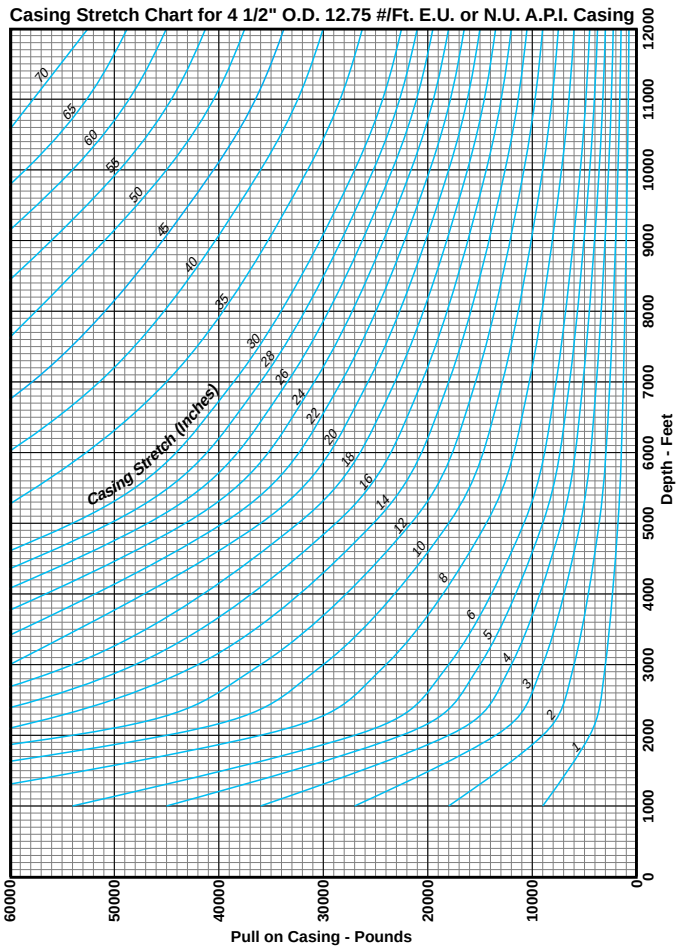
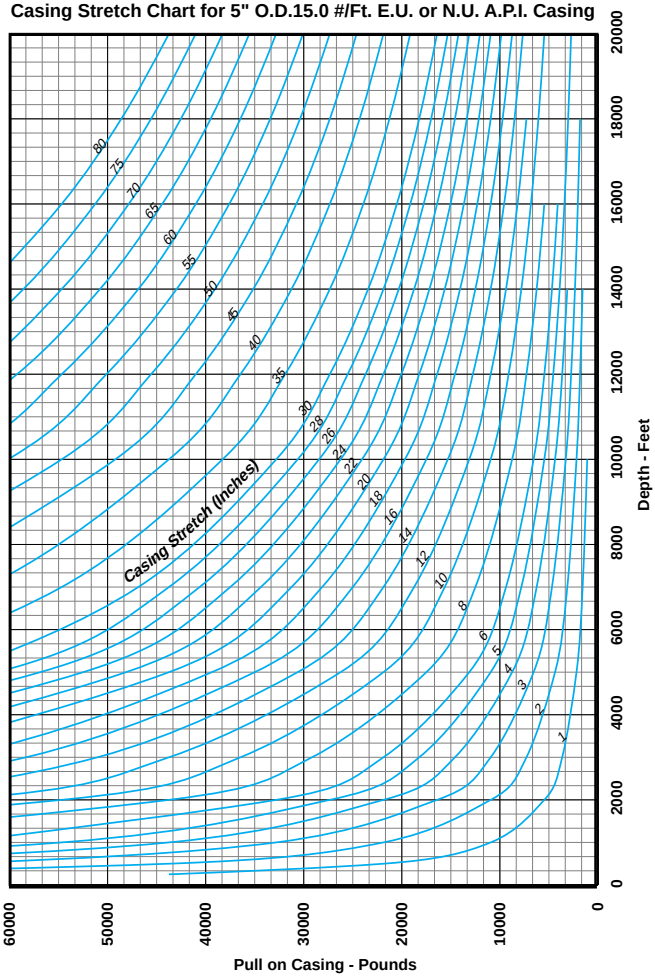
Casing Stretch Chart for 4 1/2" O.D. 12.75 #/Ft. E.U. or N.U. A.P.I. Casing



Casing Stretch Chart for 5" O.D.15.0 #/Ft. E.U. or N.U. A.P.I. Casing



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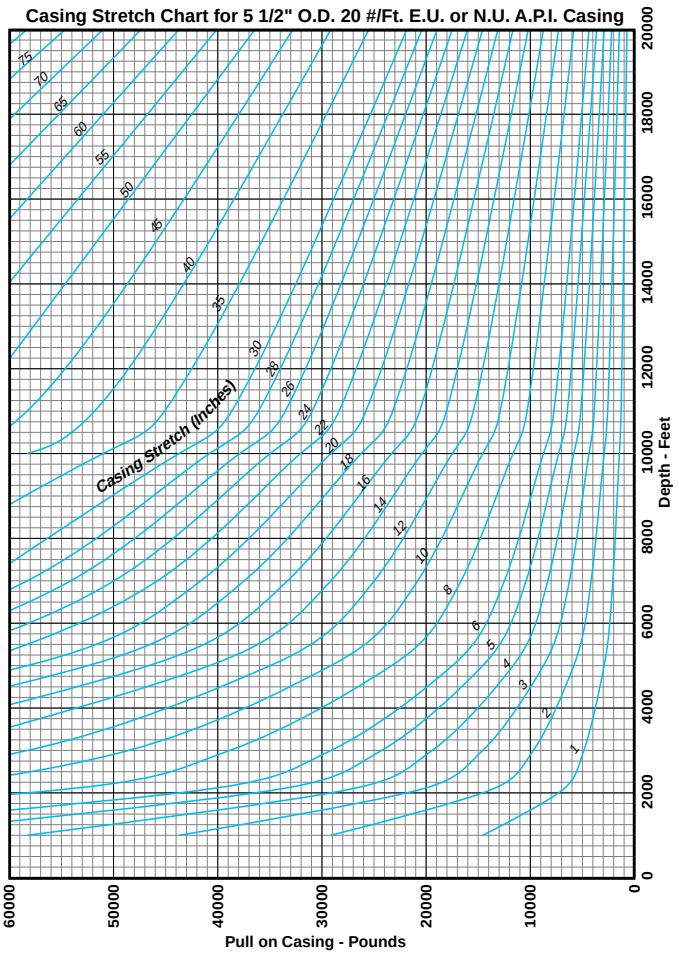
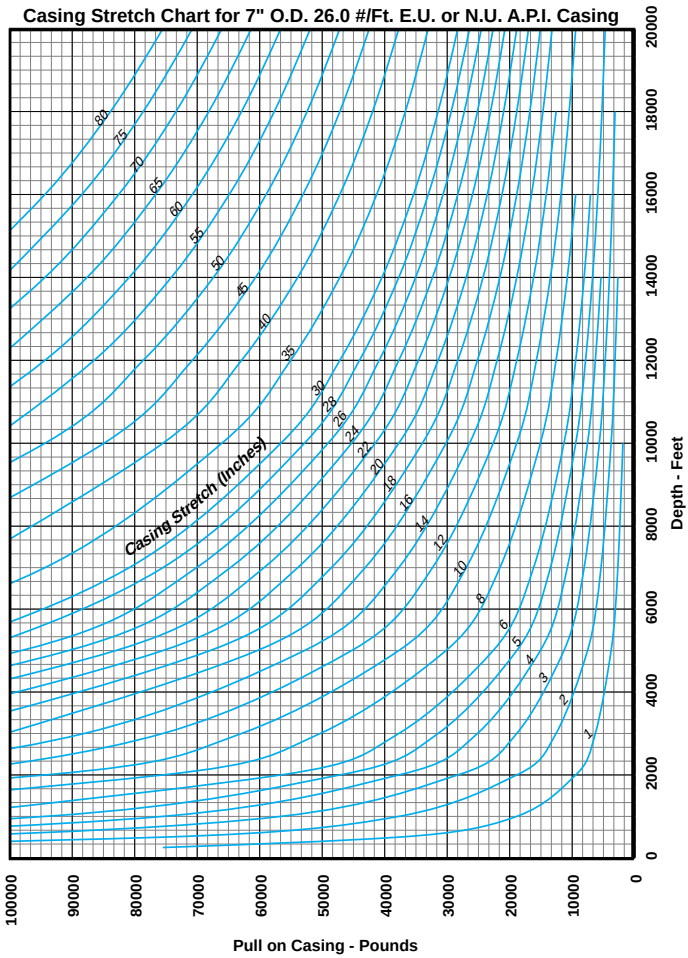
Casing Stretch Chart for 5 1/2" O.D. 20 #/Ft. E.U. or N.U. A.P.I. Casing




Casing Stretch Chart for 7" O.D. 26.0 #/Ft. E.U. or N.U. A.P.I. Casing
Casing Stretch (Inches)
80
75
70
65
60
55
50
45
40
35
30
28
26
24
22
20
18
16
14
12
10
8
6
5
4
3
2
1
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
20000
Depth - Feet
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
Pull on Casing - Pounds

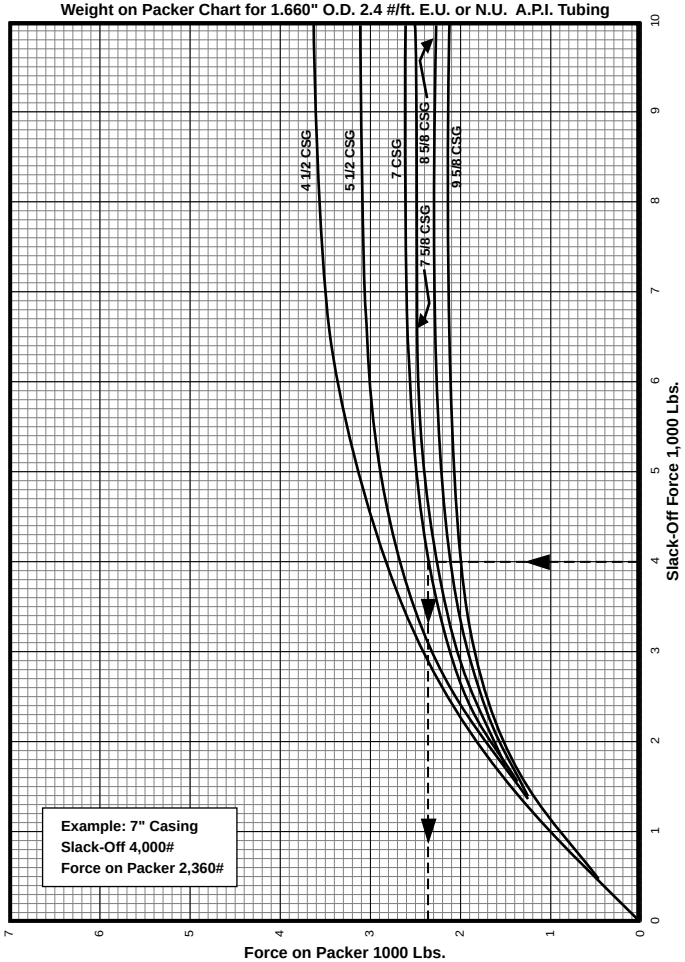
Set-Down and Slack Off Weights

When a string of tubing is lowered to put weight on bottom, as in setting a packer, the tubing buckles in the form of a helix and a significant amount of the applied weight is supported by friction between the tubing and casing. The accompanying slack off graphs (Pages 4-23 through 4-28) indicate the magnitude of the effect of friction and provide a means of determining the approximate amount of weight applied on bottom as the tubing is lowered and the weight loss is measured at the surface. Graphs are provided for most common tubing/casing combinations.

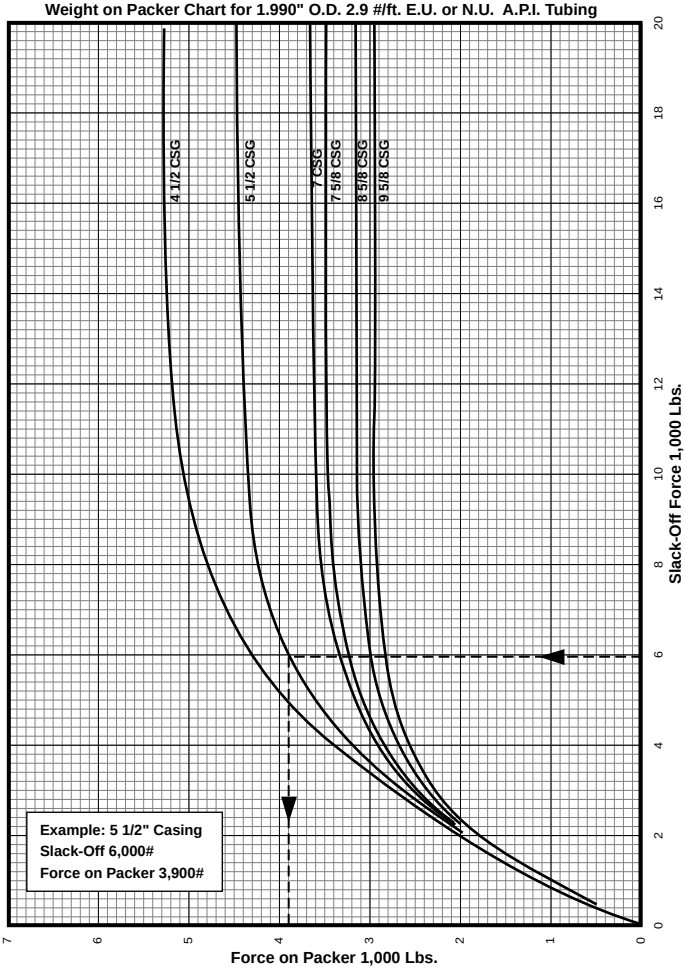
The graphs were developed from mathematical calculations using an assumed average value for the coefficient of friction. They are presented for information and may not be exactly accurate for any specific case because of the possibility that the coefficient of friction actually involved may vary from the assumed value; however, actual tests run in a variety of well fluids indicate that variations are relatively small.

In situations where the amount of effective tubing weight on bottom may be marginal or inadequate to completely pack off a set-down type packer, it is suggested that an attempt be made to pressure the casing. Pressure in the casing/tubing annulus tends to straighten the tubing and put more weight on the packer. Casing pressure will also increase the pack off force in the packing element of a partially packed off set-down type packer.

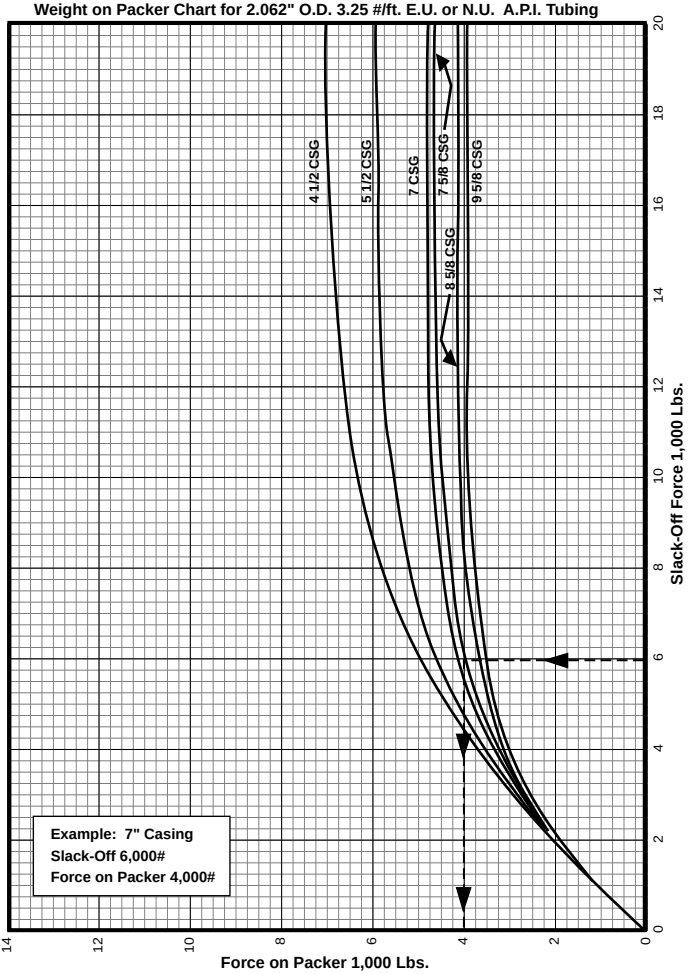
Weight on Packer Chart for 1.660" O.D. 2.4 #/ft. E.U. or N.U. A.P.I. Tubing



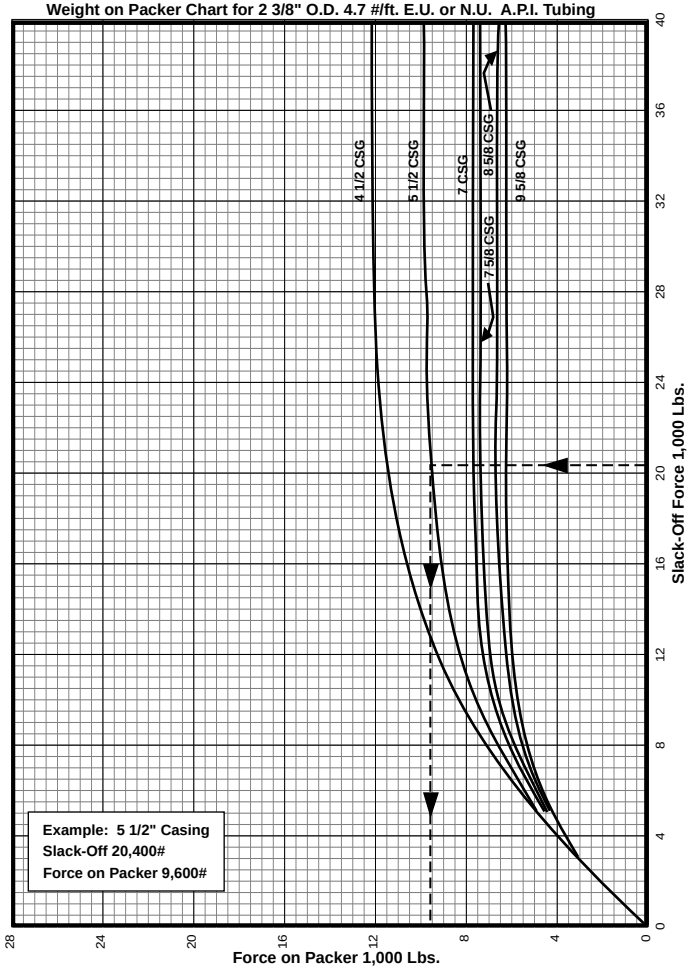
Weight on Packer Chart for 1.990" O.D. 2.9 #/ft. E.U. or N.U. A.P.I. Tubing



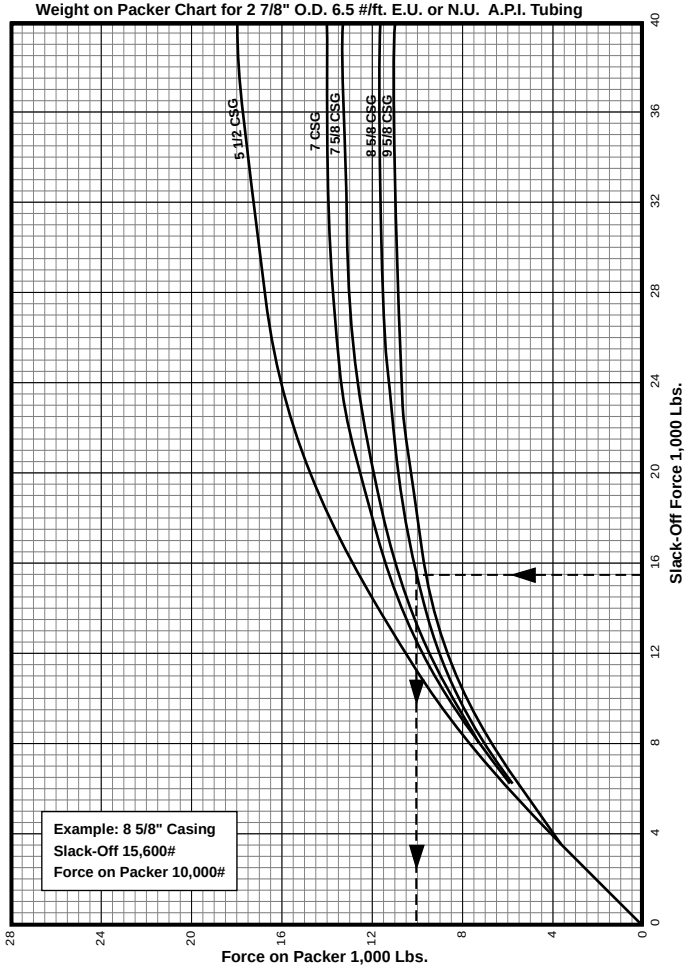
Weight on Packer Chart for 2.062" O.D. 3.25 #/ft. E.U. or N.U. A.P.I. Tubing



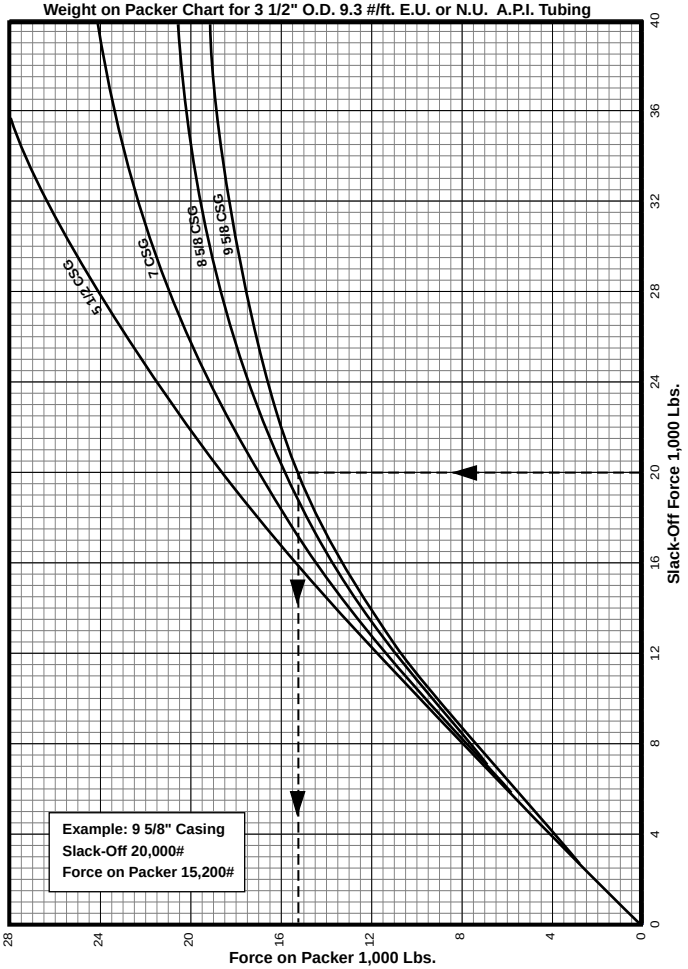
Weight on Packer Chart for 2 3/8" O.D. 4.7 #/ft. E.U. or N.U. A.P.I. Tubing



Weight on Packer Chart for 2 7/8" O.D. 6.5 #/ft. E.U. or N.U. A.P.I. Tubing



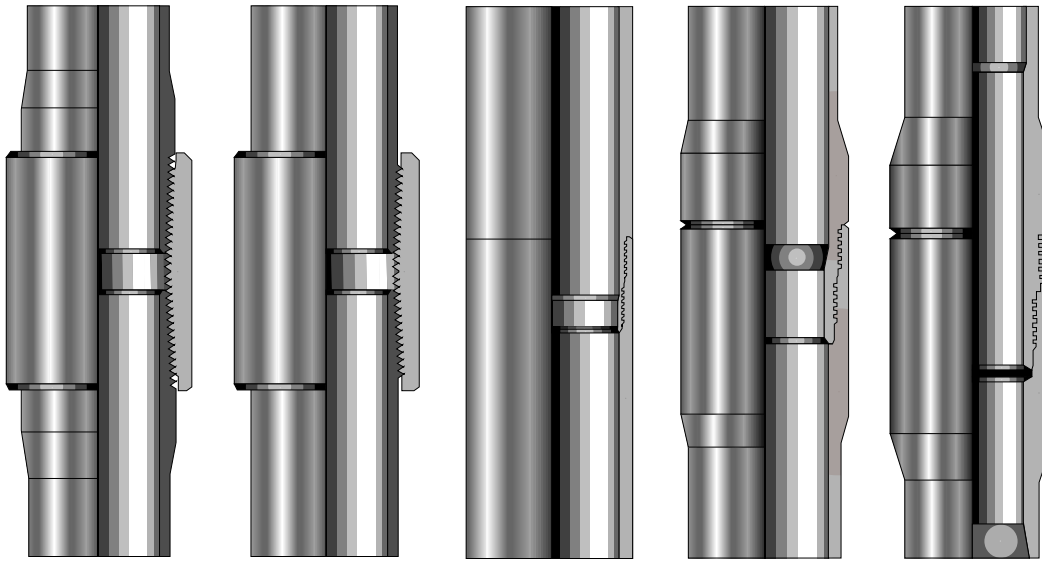
Weight on Packer Chart for 3 1/2" O.D. 9.3 #/ft. E.U. or N.U. A.P.I. Tubing



SECTION 5 - Tubing Data

Contents

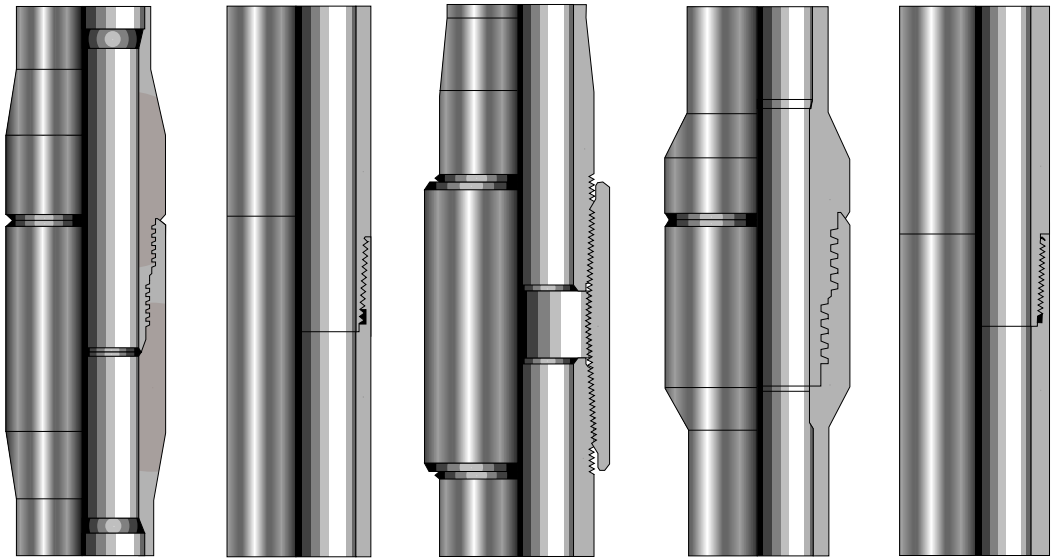
Tubing Joint Identification



API External Upset | API Non-Upset | Enerpro RFC | Enerpro RSU-8 | Enerpro RTS-6

Schematic drawings appearing here are designed for identification purposes only, and are not drawn to scale. Certain features on several joints have been enlarged or accentuated as an aid to field identification.

Tubing Joint Identification



Enerpro RTS-8, PR

Grant TFW/Atlas Bradford FL-3S/FL-4S

Grant TFW/Atlas Bradford Modified API Coupling

Grant TFW/Atlas Bradford ST-C/CST-C

Grant TFW/Atlas Bradford ST-L

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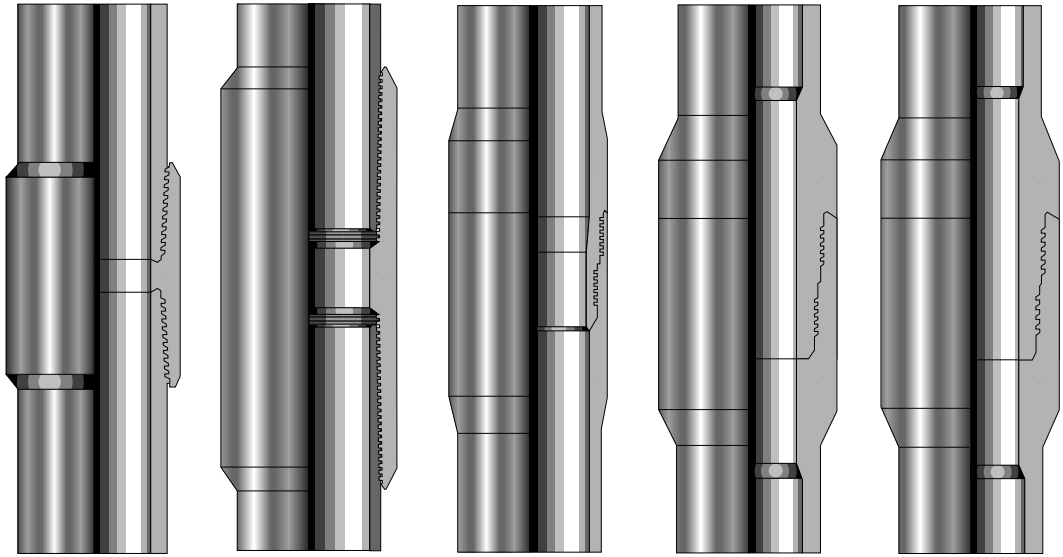
Tubing Joint Identification



Grant TFW/Atlas
Bradford TC-4S

GB Acme

Hydril A-95

Hydril CS

Hydril PH-4

Schematic drawings appearing here are designed for identification purposes only, and are not drawn to scale. Certain features on several joints have been enlarged or accentuated as an aid to field identification.

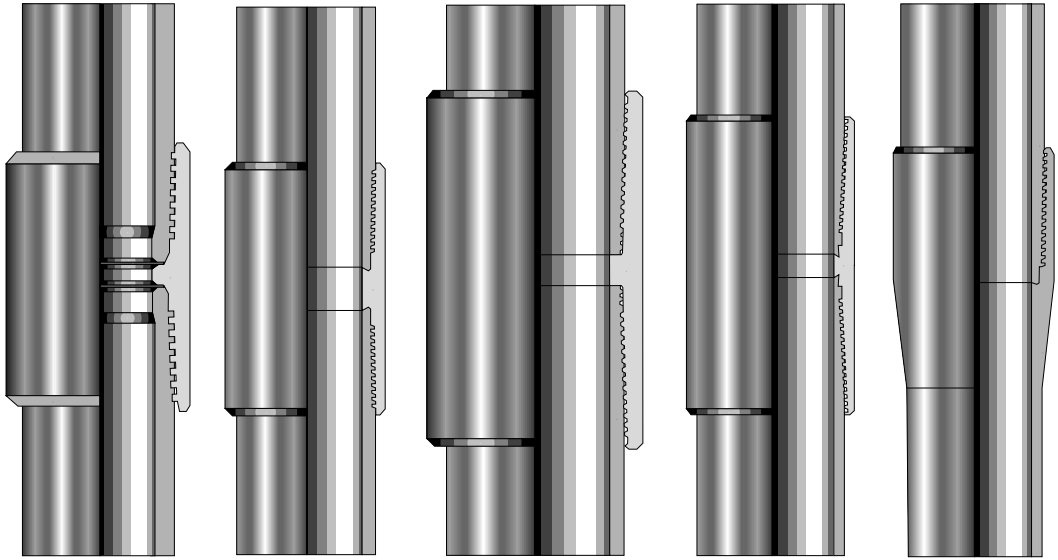
Tubing Joint Identification

Hydril PH-6 | Hydril Type 501 Wedge Thread | Hydril Type 503 Wedge Thread | Hydril Type 511 Wedge Thread | Hydril Type 561 Wedge Thread

Schematic drawings appearing here are designed for identification purposes only, and are not drawn to scale. Certain features on several joints have been enlarged or accentuated as an aid to field identification.

BAKER OIL TOOLS
A Baker Hughes company

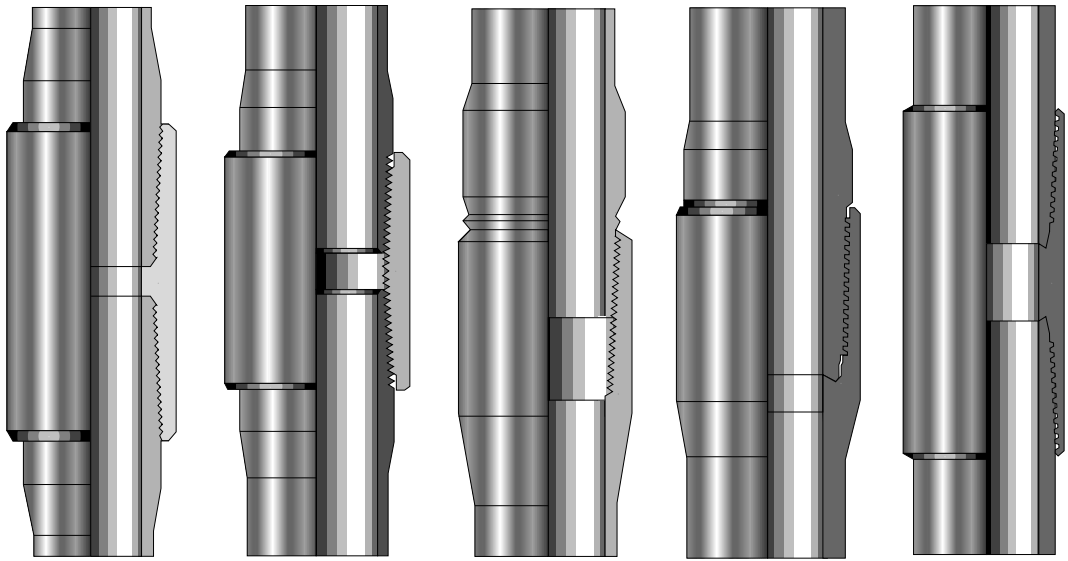
Tubing Joint Identification



Hydril Type 563 & 565 Wedge Threads | Kawasaki/ Hunting Fox | Mannesmann MAT | Mannesmann TDS Coupled | Mannesmann TDS Integral

Schematic drawings appearing here are designed for identification purposes only, and are not drawn to scale. Certain features on several joints have been enlarged or accentuated as an aid to field identification.

Tubing Joint Identification



Smith Fiberglass Products SDT | Star Fiber Glass Systems Act Coupled | Star Fiber Glass Systems Act Integral | Mini VAM | New VAM

Schematic drawings appearing here are designed for identification purposes only, and are not drawn to scale. Certain features on several joints have been enlarged or accentuated as an aid to field identification.

BAKER OIL TOOLS

API Tubing Requirements

DRIFT TEST

TUBING SIZE	DRIFT MANDREL LENGTH	DRIFT MANDREL DIAMETER
2-7/8 AND SMALLER	42"	I.D. MINUS 3/32"
3-1/2 AND larger	42"	I.D. MINUS 1/8"

TENSILE REQUIREMENTS

	YIELD STRENGTH		TENSILE STRENGTH
GRADE	MIN. PSI	MAX. PSI	MINIMUM PSI
H-40	40,000	80,000	60,000
J-55	55,000	80,000	75,000
k-55	55,000	80,000	95,000
L-80	80,000	95,000	95,000
N-80	80,000	110,000	100,000
C-90	90,000	105,000	100,000
C-95	95,000	110,000	105,000
T-95	95,000	110,000	105,000
P-110	110,000	140,000	125,000
Q-125	125,000	150,000	135,000

RANGE LENGTHS

	RANGE 1 (ft.)	RANGE 2 (ft.)	RANGE 3 (ft.)
TOTAL RANGE LENGTH, INCLUsive	20-24	28-32	—
RANGE LENGTH FOR 100% OF CAR LOAD: PERMISSIBLE LENGTH, MINIMUM	20	28	—
PERMISSIBLE VARIATION, MAXIMUM	2	2	—

TOLERANCES

TUBING SIZE O.D. (in.)	TYPE	DIMENSION	TOLERANCE (in.)
1.050 - 3.500 4 4.50	EUE	O.D.	+ 3/32, - 1/32 + 7/64, - 0.75% O.D. + 7/64, - 0.75% O.D.
4 AND SMALLER 4.50 AND LARGER	NUE	O.D.	+ 0.031, - 0.031 + 1.00%*, - 0.50%
	—	WALL THICKNESS	- 12.5%
ALL SIZES	—	i.d.	Governed by O.D. and Weight Tolerances

* UPPER LIMIT OF O.D. SHALL NOT EXCEED 0.125 INCHES.

DATA REPRINTED FROM TABLE 4.1 & 6.7, PP 21 & 65, 3RD ED., API SPEC 5CT, DEC. 1, 1990.

Interchangeability of 10 RD Integral Joint Tubing Thread

Description	Joint OD	ID	Equivalent Thread Form	Joints Interchangeable with 10 Rd Integral Joint
1.315 OD 10 Rd API Integral Jt	1.550	.970	1.315 NU 10 Rd	Atlas, Aztec, Jal-Con-Weld 55, J & L Aztec, W.C. Norris, Kilby Steel SW Pipe
1.660 OD 10 Rd API Integral Jt	1.880	1.301	1.660 NU 10 Rd	Atlas, Aztec, Jal-Con-Weld 55, J & L Aztec, Southwestern Pipe, W.C. Norris, Kilby Steel, Tex-Tube
1.900 OD 10 Rd API Integral Jt	2.110	1.531	1.900 NU 10 Rd	Atlas, Aztec, Jal-Con-Weld 55, J & L Aztec, Southwestern Pipe, W.C. Norris, Kilby Steel, Tex-Tube
2.000 OD 10 Rd Integral Jt	2.340	1.649	1.900 EU 10 Rd	Atlas
2.063 OD 10 Rd API Integral Jt	2.325	1.672	1.900 EU 10 Rd	Atlas, Aztec, Jal-Con-Weld 55, J & L Aztec, Southwestern Pipe, W.C. Norris, Kilby Steel, Tex-Tube, Youngstown YCO50
2.375 OD 10 Rd Integral Jt	2.625	1.926	2.375 NU 10 Rd	Atlas, Aztec, Jal-Con-Weld 55, J & L Aztec
2.875 OD 10 Rd Integral Jt	3.150	2.372	2.875 NU 10 Rd	Aztec, Jal-Con-Weld 55, J & L Aztec

Dimensional Data and Minimum Performance Properties of Tubing Made To API Specifications*

OD (in.) *(mm)*	Nominal Weight: T&C Non-Up (lb/ft)	Nominal Weight: T&C Upset (lb/ft)	Nominal Weight: Int. Jt. (lb/ft)	Wall Thickness (in.) *(mm)*	ID (in.) *(mm)*	Threaded and Coupled: Drift Dia. (in.) *(mm)*	Threaded and Coupled: Coupling OD: Non-Up (in.) *(mm)*	Threaded and Coupled: Coupling OD: Upset Reg. (in.) *(mm)*	Threaded and Coupled: Coupling OD: Upset Spec. (in.) *(mm)*	Int. Joint: Drift Dia. (in.) *(mm)*	Int. Joint: Box OD (in.) *(mm)*	Grade	Collapse Resistance (psi)	Internal Yield Pressure (psi)	Joint Yield Strength: T&C Non-Up (lb)	Joint Yield Strength: T&C Upset (lb)	Joint Yield Strength: Integral Joint (lb)
1.050 *26,7*	1.14	1.20		.113 *2,87*	.824 *21,0*	.730 *18,54*	1.313 *33,35*	1.660 *42,16*				H-40 J-55 C-75 L/N-80	7,680 10,560 14,410 15,370	7,530 10,360 14,120 15,070	6,360 8,740 11,920 12,710	13,310 18,290 24,950 26,610	
1.315 *33,4*	1.70	1.80	1.72	.133 *3,38*	1.049 *26,6*	.955 *24,26*	1.660 *42,16*	1.900 *48,26*		.955 *24,26*	1.550 *39,37*	H-40 J-55 C-75 L/N-80	7,270 10,000 13,640 14,550	7,080 9,730 13,270 14,160	10,960 15,060 20,540 21,910	19,760 27,160 37,040 39,510	15,970 21,960 29,940 31,940
			2.10	.125 *3,17*	1.410 *41,9*					1,286 *32,66*	1.880 *47,75*	H-40 J-55	5,570 7,660	5,270 7,250			22,180 30,500
1.660 *42,2*	2.30	2.40	2.33	.140 *3,56*	1.380 *35,1*	1.286 *32,66*	2.054 *52,17*	2.200 *55,88*		1.286 *32,66*	1.880 *47,75*	H-40 J-55 C-75 L/N-80	6,180 8,490 11,580 12,360	5,900 8,120 11,070 11,810	15,530 21,360 29,120 31,060	26,740 36,770 50,140 53,480	22,180 30,500 41,600 44,370
1.900 *48,3*			2.40	.125 *3,17*	1.650 *41,9*					1.516 *38,51*	2.110 *53,59*	H-40 J-55	4,920 6,640	4,610 6,330			26,890 36,970

*Data reprinted from API Bulletin 5C2, Eighteenth Edition, March 1982.
See page 5-13 for upset diameter.

Dimensional Data and Minimum Performance Properties of Tubing Made To API Specifications*

OD (in.) *(mm)*	Nominal Weight T&C Non-Up (lb/ft)	Nominal Weight T&C Upset (lb/ft)	Nominal Weight Int. Jt. (lb/ft)	Wall Thickness (in.) *(mm)*	ID (in.) *(mm)*	Threaded and Coupled Drift Dia. (in.) *(mm)*	Threaded and Coupled Coupling OD Non-Up (in.) *(mm)*	Threaded and Coupled Coupling OD Upset Reg. (in.) *(mm)*	Threaded and Coupled Coupling OD Upset Spec. (in.) *(mm)*	Int. Joint Drift Dia. (in.) *(mm)*	Int. Joint Box OD (in.) *(mm)*	Grade	Collapse Resistance (psi)	Internal Yield Pressure (psi)	Joint Yield Strength T&C Non-Up (lb)	Joint Yield Strength T&C Upset (lb)	Joint Yield Strength Integral Joint (lb)
1.900 *48,3*	2.75	2.90	2.76	.145 *3,68*	1.610 *40,9*	1.516 *38,50*	2.200 *55,88*	2.500 *63,50*		1.516 *38,51*	2.110 *53,59*	H-40 J-55 C-75 L/N-80	5,640 7,750 10,570 11,280	5,340 7,350 10,020 10,680	19,090 26,250 35,800 38,180	31,980 43,970 59,960 63,960	26,890 36,970 50,420 53,780
2.063 *52,4*			3.25	.156 *3,96*	1.751 *44,5*					1.657 *42,09*	2.325 *59,06*	H-40 J-55 C-75 L/N-80	5,590 7,690 10,480 11,180	5,290 7,280 8,920 10,590			35,690 49,070 66,910 71,370
2.375 *60,3*	4.00			.167 *4,24*	2.041 *51,8*	1.947 *49,45*	2.875 *73,03*					H-40 J-55 C-75 L/N-80	5,230 7,190 9,520 9,980	4,920 6,770 9,230 9,840	30,130 41,430 56,500 60,260		
	4.60	4.70		.190 *4,83*	1,995 *50,6*	1.901 *48,29*	2.875 *73,03*	3.063 *77,80*	2.910 *73,91*			H-40 J-55 C-75 L/N-80 P-105	5,890 8,100 11,040 11,780 15,460	5,600 7,700 10,500 11,200 14,700	35,960 49,450 67,430 71,930 94,410	52,170 71,730 97,820 104,340 136,940	

See page 5-13 for upset diameter.

Dimensional Data and Minimum Performance Properties of Tubing Made To API Specifications*

OD (in.) *(mm)*	Nominal Weight			Wall Thickness (in.) *(mm)*	ID (in.) *(mm)*	Threaded and Coupled				Int. Joint		Grade	Collapse Resistance (psi)	Internal Yield Pressure (psi)	Joint Yield Strength		
	T&C Non-Up (lb/ft)	T&C Upset (lb/ft)	Int. Jt. (lb/ft)			Drift Dia. (in.) *(mm)*	Coupling OD			Drift Dia. (in.) *(mm)*	Box OD (in.) *(mm)*				T&C Non-Up (lb)	T&C Upset (lb)	Integral Joint (lb)
							Non-Up (in.) *(mm)*	Upset Reg. (in.) *(mm)*	Upset Spec. (in.) *(mm)*								
2.375 *60,3*	5.80	5.95		.254 *6,45*	1.867 *47,4*	1.773 *45,03*	2.875 *73,03*	3.063 *77,80*	2.910 *73,91*			C-75 L/N-80 P-105	14,330 15,280 20,060	14,040 14,970 19,650	96,560 102,990 135,180	126,940 135,400 177,710	
2.875 *73,0*	6.40	6.50		.217 *5,51*	2.441 *62,0*	2.347 *59,61*	3.500 *88,90*	3.668 *93,17*	3.460 *87,88*			H-40 J-55 C-75 L/N-80 P-105	5,580 7,680 10,470 11,160 14,010	5,280 7,260 9,910 10,570 13,870	52,780 72,580 98,970 105,570 138,560	72,480 99,660 135,900 144,960 190,260	
	7.80	7.90		.276 *7,01*	2.323 *59,0*	2.229 *56,6*	3.500 *88,9*	3.668 *93,17*	3.460 *87,88*			C-75 L/N-80 P-105	13,020 13,890 18,220	12,600 13,440 17,640	132,100 140,900 184,900	169,000 180,300 236,600	
	8.60	8.70		.308 *7,82*	2.259 *57,4*	2.165 *54,99*	3.500 *88,90*	3.668 *93,17*	3.460 *87,88*			C-75 L/N-80 P-105	14,350 15,300 20,090	14,060 15,000 19,690	149,360 159,310 209,100	186,290 198,710 260,810	
3.500 *88,9*	7.70			.216 *5,49*	3.068 *77,9*	2.943 *74,75*	4.250 *107,95*					H-40 J-55 C-75 L/N-80	4,630 5,970 7,540 7,870	4,320 5,940 8,100 8,640	65,070 89,470 122,010 130,140		

*Data reprinted from API Bulletin 5C2, Eighteenth Edition, March 1982.
See page 5-13 for upset diameter.

Dimensional Data and Minimum Performance Properties of Tubing Made To API Specifications*

OD (in.) *(mm)*	Nominal Weight			Wall Thickness (in.) *(mm)*	ID (in.) *(mm)*	Threaded and Coupled				Int. Joint		Grade	Collapse Resistance (psi)	Internal Yield Pressure (psi)	Joint Yield Strength		
	T&C Non-Up (lb/ft)	T&C Upset (lb/ft)	Int. Jt. (lb/ft)			Drift Dia. (in.) *(mm)*	Coupling OD			Drift Dia. (in.) *(mm)*	Box OD (in.) *(mm)*				T&C Non-Up (lb)	T&C Upset (lb)	Integral Joint (lb)
							Non-Up (in.) *(mm)*	Upset Reg. (in.) *(mm)*	Upset Spec. (in.) *(mm)*								
3.500 *88,9*	9.20	9.30		.254 *6,45*	2.992 *76,0*	2.867 *72,82*	4.250 *107,95*	4.500 *114,30*	4.180 *106,17*			H-40 J-55 C-75 L/N-80 P-105	5,380 7,400 10,040 10,530 13,050	5,080 6,980 9,520 10,160 13,340	79,540 109,370 149,140 159,090 208,800	103,610 142,460 194,260 202,220 271,970	
	10.20			.289 *7,34*	2.922 *74,2*	2.797 *71,04*	4.250 *107,95*					H-40 J-55 C-75 L/N-80	6,060 8,330 11,360 12,120	5,780 7,950 10,840 11,560	92,550 127,250 173,530 185,100		
	12.70	12.95		.375 *9,52*	2.750 *69,9*	2.625 *66,68*	4.250 *107,95*	4.500 *114,30*	4.180 *106,17*			C-75 L/N-80 P-105	14,350 15,310 20,090	14,060 15,000 19,690	230,990 246,390 323,390	276,120 294,530 386,570	
4.000 *101,6*	9.50			.226 *5,74*	3.548 *90,1*	3.423 *86,94*	4.750 *120,65*					H-40 J-55 C-75 L/N-80	4,060 5,110 6,350 6,590	3,960 5,440 7,420 7,910	72,000 99,010 135,010 144,010		

See page 5-13 for upset diameter.

Dimensional Data and Minimum Performance Properties of Tubing Made To API Specifications*

OD (in.) *(mm)*	Nominal Weight			Wall	ID (in.) *(mm)*	Threaded and Coupled				Int. Joint		Grade	Col- lapse Resis- tance (psi)	Internal Yield Pres- sure (psi)	Joint Yield Strength		
	T&C Non- Up (lb/ft)	T&C Upset (lb/ft)	Int. Jt. (lb/ft)	Thick- ness (in.) *(mm)*		Drift Dia. (in.) *(mm)*	Coupling OD			Drift Dia. (in.) *(mm)*	Box OD (in.) *(mm)*				T&C Non-Up (lb)	T&C Upset (lb)	In- tegral Joint (lb)
							Non- Up (in.) *(mm)*	Upset Reg. (in.) *(mm)*	Upset Spec. (in.) *(mm)*								
4.000 *101,6*		11.00		.262 *6,65*	3.476 *88,3*	3.351 *85,12*		5.000 *127,00*				H-40 J-55 C-75 L/N-80	4,900 6,590 8,410 8,800	4,590 6,300 8,600 9,170		123,070 169,220 230,750 246,140	
4.500 *114,3*	12.60	12.75		.271 *6,88*	3.958 *100,5*	3.833 *97,36*	5.200 *132,08*	5.563 *141,3*				H-40 J-55 C-75 L/N-80	4,500 5,720 7,200 7,500	4,220 5,800 7,900 8,430	104,360 143,500 195,680 208,730	144,020 198,030 270,040 288,040	

*Data reprinted from API Bulletin 5C2, Eighteenth Edition, March 1982.

API TUBING – T&C EXTERNAL UPSET DIAMETERS

API Size - OD (in.)	Weight T&C (lbs/ft)	Upset Dia. (in.)	API Size - OD (in.)	Weight T&C (lbs/ft)	Upset Dia. (in.)	API Size - OD (in.)	Weight T&C (lbs/ft)	Upset Dia. (in.)
3/4 (1.050)	1.20	1.315	2-3/8	4.70	2.594	3-1/2	9.30	3.750
1 (1.315)	1.80	1.469		5.95	2.594		12.95	3.750
1-1/4 (1.660)	2.40	1.812	2-7/8	6.50	3.094	4	11.00	4.250
1-1/2 (1.900)	2.90	2.094		7.90	3.094	4-1/2	12.75	4.750
				8.70	3.094			

Threads cut with 3/4" taper per foot. 10 threads per inch from 3/4" thru 1-1/2" tubing. 8 threads per inch from 2-3/8" thru 4-1/2" tubing.
Data obtained from: Table 2.6, P 11, 13 Ed., API Std 5B, May 31, 1988. Table 8.4, P 70, 3rd Ed., API Spec 5Ct, Dec. 1, 1990.

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) *(mm)*	Weight (lb/ft) Plain End	Weight (lb/ft) Nom.	Tubular Wall (in.) *(mm)*	Tubular ID (in.) *(mm)*	Tubular Drift (in.) *(mm)*	Type of Joint	Joint ID* (in.)	Joint ID* *(mm)*	Joint Regular OD (in.)	Joint Regular OD *(mm)*	Joint Special OD (in.)	Joint Special OD *(mm)*	Inter-changeable With**
1.050 *26,7*	1.13	1.20	.113 *2,87*	.824 *20,93*	.730 *18,54*	GST Streamline Hydril CS, Atlas Bradford ST-C MINI-VAM	 .687 .807	 *17,45* *20,49*	1.310 1.327 1.299	*33,27* *33,71* *32,99*	1.300	*33,02*	
	1.47	1.50	.154 *3,91*	.742 *18,85*	.648 *16,46*	Hydril CS, Atlas Bradford ST-C MINI-VAM	.687 .728	*17,45* *18,49*	1.327 1.339	*33,71* *34,01*			
1.315 *33,4*	1.68	1.80	.133 *3,38*	1.049 *26,64*	.955 *24,26*	Atlas Bradford DSS-HT & IJ-3SS GST Streamline Hydril CS, Atlas Bradford ST-C MINI-VAM	 .985 .970 1.004	 *25,02* *24,64* *25,50*	 1.562 1.550 1.552 1.555	 *39,67* *39,37* *39,42* *39,49*	 1.525	 *38,74*	***
	2.17	2.25	.179 *4,55*	.957 *24,31*	.848 *21,54*	Hydril CS, Atlas Bradford ST-C MINI-VAM	.864 .906	*21,95* *23,01*	1.600 1.614	*40,64* *40,99*			
1.660 *42,2*	2.27	2.40	.140 *3,56*	1.380 *35,05*	1.286 *32,66*	Atlas Bradford DSS-HT & IJ-3SS GST Streamline Hydril A-95 Hydril CS, Atlas Bradford ST-C MINI-VAM	 1.301 1.300 1.300 1.307	 *33,05* *33,02* *33,02* *33,19*	 1.893 1.880 1.898 1.883 1.913	 *48,08* *47,75* *48,21* *47,83* *48,59*	 1.858 1.858	 *47,19* *47,19*	*** CS A-95
	2.99	3.02	.191 *4,85*	1.278 *32,46*	1.184 *30,07*	Hydril CS, Atlas Bradford ST-C MINI-VAM	1.218 1.205	*30,94* *30,60*	1.927 1.976	*48,95* *50,19*			A-95

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) *(mm)*	Weight (lb/ft) Plain End	Weight (lb/ft) Nom.	Tubular Wall (in.) *(mm)*	Tubular ID (in.) *(mm)*	Tubular Drift (in.) *(mm)*	Type of Joint	Joint ID* (in.)	Joint ID* *(mm)*	Joint Regular OD (in.)	Joint Regular OD *(mm)*	Joint Special OD (in.)	Joint Special OD *(mm)*	Inter-changeable With**
1.660 *42,2*	3.09	3.24	.198 *5,03*	1.264 *32,11*	1.170 *29,72*	Hydril CS	1.200	*30,48*	1.927	*48,95*			A-95
1.900 *48,3*	2.75	2.90	.145 *3,68*	1.610 *40,89*	1.516 *38,51*	Atlas Bradford DSS-HT & IJ-3SS GST Streamline Hydril A-95 Hydril CS, Atlas Bradford ST-C Mannesmann Omega MINI-VAM	1.531 1.530 1.530 1.594 1.535	*38,89* *38,86* *38,86* *40,49* *38,98*	2.123 2.110 2,134 2,113 2.039 2.142	*53,92* *53,59* *54,20* *53,67* *51,79* *54,40*	 2.094 2.094	 *53,19* *53,19*	... CS A-95
	3.63	3.64	.200 *5,08*	1.500 *38,1*	1.406 *35,71*	Hydril CS, Atlas Bradford ST-C MINI-VAM	1.440 1.429	*36,58* *36,29*	2.162 2.220	*54,91* *56,38*			A-95
	3.93	4.19	.219 *5,56*	1.462 *37,13*	1.368 *34,75*	Hydril CS	1.390	*35,31*	2.179	*55,35*			A-95
2.000 *50,8*	3.23	3.4	.165 *4,19*	1.670 *42,42*	1.576 *40,03*	National Buttress Pittsburgh 8 Acme			2.500 2.500	*63,50* *63,50*	2.300 2.300	*58,42* *58,42*	
2.063 *52,4*	3.18	3.4	.156 *3,96*	1.750 *44,45*	1.656 *42,06*	Atlas Bradford DSS-HT & IJ-3SS GST Streamline	1.700	*43,18*	2.340 2.310	*59,44* *58,67*			***
		3.25				Hydril A-95 Hydril CS, Atlas Bradford ST-C MINI-VAM	1.700 1.700 1.677	*43,18* *43,18* *42,59*	2.325 2.330 2.331	*59,06* *59,18* *59,20*	2.300 2.295	*58,42* *58,29*	CS A-95

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) *(mm)*	Weight (lb/ft) Plain End	Weight (lb/ft) Nom.	Tubular Wall (in.) *(mm)*	Tubular ID (in.) *(mm)*	Tubular Drift (in.) *(mm)*	Type of Joint	Joint ID* (in.)	Joint ID* *(mm)*	Joint Regular OD (in.)	Joint Regular OD *(mm)*	Joint Special OD (in.)	Joint Special OD *(mm)*	Inter-changeable With**
2.063 *52,4*	4.41	4.5	.225 *5,71*	1.613 *40,97*	1.519 *38,58*	Hydril CS, Atlas Bradford ST-C	1.550	*39,37*	2.460	*62,48*	2.407	*61,14*	A-95
						VAM	1.622	*41,20*	2.447	*62,15*			
						MINI-VAM	1.539	*39,10*	2.433	*61,80*			
2.375 *60,3*	4.43	4.7	.190 *4,83*	1.995 *50,67*	1.901 *48,92*	Atlas Bradford DSS-HT & IJ 3SS & IJ-4S	1.945	*49,40*	2.710	*68,83*			***
						Atlas Bradford TC-4S			2.750	*69,85*			
						Atlas Bradford FL-4S	1.926	*48,92*	2.375	*60,32*			
						Atlas Bradford ST-L	1.920	*48,77*	2.375	*60,32*			
						Interlock TC Nu-Lock	1.950	*49,53*	2.875	*73,03*	2.700	*68,58*	
						Interlock IJ Nu-Lock	1.948	*49,48*	2.700	*68,58*			
						Extreme Line	1.935	*49,15*	3.000	*76,20*			
						GST Streamline			2.700	*68,58*			
						Hydril A-95	1.945	*49,40*	2.700	*68,58*	2.630	*66,80*	CS
						Hydril CS, Atlas Bradford ST-C	1.945	*49,40*	2.700	*68,58*	2.655	*67,44*	A-95
						Hydril CFJ-P	1.945	*49,40*	2.525	*64,14*			5.3 CFJ-P
		4.6				Hydril Super FJ	1.945	*49,40*	2.437	*61,90*			
						Interlock Seal Lock PC	1.995	*50,7*	2.875	*73,0*			
						Mannesmann MAT	1.995	*50,7*	2.875	*73,0*			
						Mannesmann TDS	1.995	*50,7*	2.875	*73,0*	2.700	*68,6*	
						VAM	1.929	*49,00*	2.697	*68,50*	2.618	*66,49*	
						VAM AF	1.929	*49,00*	2.854	*72,50*			
						New VAM			2.707	*68,75*	2.628	*66,75*	VAM, AF, AG
						VAM ACE			2.697	*68,50*	2.618	*66,50*	
						Mannesmann Omega	1.988	*50,49*	2.551	*64,80*			
		4.7				NKK NK-2SC			3.000	*76,2*	2.906	*73,8*	
		4.6				Buttress & 8 Acme			2.875	*73,03*	2.700	*68,58*	

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) *(mm)*	Weight (lb/ft)		Tubular			Type of Joint	Joint						Inter-changeable With**
							ID*		Regular OD		Special OD		
	Plain End	Nom.	Wall (in.) *(mm)*	ID (in.) *(mm)*	Drift (in.) *(mm)*		(in.)	*(mm)*	(in.)	*(mm)*	(in.)	*(mm)*	
2.375 *60,3*	5.01	5.3	.218 *5,54*	1.939 *49,22*	1.845 *46,84*	Atlas Bradford DSS-HT & IJ-3SS & IJ-4S	1.890	*48,01*	2.710	*68,83*			***
						Atlas Bradford TC-4S			2.750	*69,85*			
						Interlock IJ Nu-Lock	1.892	*48,06*	2.750	*69,85*			
						Hydril CS, Atlas Bradford ST-C	1.890	*48,01*	2.750	*69,85*	2.700	*68,58*	A-95
						Hydril CFJ-P	1.890	*48,01*	2.525	*64,14*			4.7 CFJ-P
						NKK NK-2SC			3.000	*76,2*	2.906	*73,8*	
		5.1				VAM	1.929	*49,00*	2.697	*68,50*	2.618	*66,50*	
						VAM AF	1.929	*49,00*	2.854	*72,50*			
						New VAM			2.736	*69,50*	2.628	*66,75*	VAM, AF, AG
						VAM ACE			2.776	*70,57*	2.657	*67,50*	
		5.2				Interlock Seal Lock PC	1.939		2.875	*73,03*			
	5.75	5.95	.254 *6,45*	1.867 *47,42*	1.773 *45,04*	Atlas Bradford DSS-HT & IJ-3SS & IJ-4S	1.805	*45,85*	2.910	*73,91*			***
						Atlas Bradford TC-4S			2.800	*71,12*			
						Atlas Bradford FL-4S	1.823	*46,30*	2.375	*60,33*			
						Atlas Bradford ST-L	1.789		2.375	*60,33*			
		5.8				Interlock Seal Lock PC	1.867	*47,4*	2.875	*73,03*			
		5.95				Interlock IJ Nu-Lock	1.820	*46,23*	2.800	*71,12*			
						Extreme Line	1.807	*45,90*	3.000	*76,20*			
						Hydril PH-6, Atlas Bradford ST-F	1.805	*45,85*	2.906	*73,81*	2.782	*70,66*	

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) *(mm)*	Weight (lb/ft)		Tubular			Type of Joint	Joint						Inter-changeable With**
							ID*		Regular OD		Special OD		
	Plain End	Nom.	Wall (in.) *(mm)*	ID (in.) *(mm)*	Drift (in.) *(mm)*		(in.)	*(mm)*	(in.)	*(mm)*	(in.)	*(mm)*	
	5.75	5.8	.254 *6,45*	1.867 *47,42*	1.773 *45,04*	Mannesmann Omega	1.867	*47,4*	2.614	*66,40*			
						Mannesmann MAT	1.867	*47,4*	2.875	*73,0*			
						Mannesmann TDS	1.867	*47,4*	2.875	*73,0*	2.700	*68,6*	
						NKK NK-2SC			3.000	*76,2*	2.906	*73,8*	
						VAM	1.929	*49,0*	2.776	*70,51*	2.697	*68,50*	
						VAM AF	1.929	*49,0*	2.854	*72,50*			
						New VAM			2.785	*70,75*	2.707	*68,75*	VAM, AF, AG
						VAM ACE			2.776	*70,51*	2.697	*68,50*	
	5.89	6.2	.261 *6,63*	1.853 *47,07*	1.759 *44,68*	Atlas Bradford DSS-HT & IJ-3SS & IJ-4S Atlas Bradford TC-4S Hydril PH-6	1.795 1.795	*45,59* *45,59*	2.910 2.800 2.937	*73,91* *71,12* *74,60*	2.794	*70,97*	***
2.375 *60,3*	6.26	6.65	.280 *7,12*	1.815 *46,06*	1.721 *43,71*	Atlas Bradford FL-4S	1.771	*44,96*					
		6.3				VAM AF	1.866	*47,40*	2.953	*75,00*			
	7.3	7.7	.336 *8,53*	1.703 *43,24*	1.609 *40,86*	Atlas Bradford DSS-HT & IJ 3SS & IJ-4S Atlas Bradford TC-4S Hydril PH-6	1.645 1.645	*41,78* *41,78*	3.135 2.900 3.125	*79,63* *73,66* *79,38*	2.924	*74,27*	***
		7.3				VAM AF	1.866	*47,40*	2.953	*75,00*			
2.875 *73,0*	6.16	6.5	.217 *5,51*	2.441 *62,00*	2.347 *59,61*	Atlas Bradford DSS-HT & IJ 3SS & IJ-4S Atlas Bradford ST-L	2.379 2.377	*60,43*	3.230 2.875	*82,04* *83,31*			***

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) *(mm)*	Weight (lb/ft) Plain End	Weight (lb/ft) Nom.	Tubular Wall (in.) *(mm)*	Tubular ID (in.) *(mm)*	Tubular Drift (in.) *(mm)*	Type of Joint	Joint ID* (in.)	Joint ID* *(mm)*	Joint Regular OD (in.)	Joint Regular OD *(mm)*	Joint Special OD (in.)	Joint Special OD *(mm)*	Inter-changeable With**
		6.5				Atlas Bradford TC-4S			3.250	*82,55*			
						Atlas Bradford FL-4S	2.372	*60,25*	2.875	*73,03*			
						Atlas Bradford ST-L	2.377	*60,38*	2.875	*73,03*			
						Interlock TC Nu-Lock	2.396	*60,86*	3.500	88,90	3.220	*81,79*	
		6.4				Interlock Seal Lock	2.441	*62,00*	3.500	88,90	3.220	*81,79*	
		6.5				Interlock IJ Nu-Lock	2.394	*60,81*	3.220	*81,79*			
						Extreme Line	2.381	*60,48*	3.500	*88,90*			
						GST Streamline			3.220	*81,79*			
2.875 *73,0*	6.16		.217 *5,51*	2.441 *62,00*	2.347 *59,61*	Hydril A-95	2.375	*60,33*	3.200	*81,28*	3.155	*88,14*	CS
						Hydril CS, Atlas Bradford ST-C	2.371	*60,22*	3.210	*81,53*	3.166	*80,42*	A-95
						Hydril CFJ-P	2.375	*60,33*	3.000	*76,20*			
		6.4				Hydril Super FJ	2.375	*60,33*	2.968	*75,39*			
						Mannesmann Omega			3.079	*78,21*			
						Mannesmann MAT	2.441	*62,00*	3.500	*88,90*			
						Mannesmann TDS	2.441	*62,00*	3.500	*88,90*	3.228	*82,00*	
		6.5				NKK NK-2SC			3.500	88,9	3.416	*86,77*	
		6.4				National Buttress			3.500	*88,90*	3.220	*81,79*	
						Pittsburgh 8 Acme			3.500	*88,90*	3.220	*81,79*	
						VAM	2.374	*60,30*	3.197	*81,20*	3.150	*80,10*	
						VAM AF	2.374	*60,30*	3.425	*87,0*			
						New VAM			3.240	*82,30*	3.159	*80,25*	VAM, AF, AG
						VAM ACE			3.230	*82,04*	3.142	*79,80*	
	6.48	7.9	.276 *7,01*	2.323 *59,00*	2.229 *56,61*	Atlas Bradford DSS-HT & IJ-3SS & IJ-4S	2.265	*57,53*	3.385	*85,98*			***

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) *(mm)*	Weight (lb/ft) Plain End	Weight (lb/ft) Nom.	Tubular Wall (in.) *(mm)*	Tubular ID (in.) *(mm)*	Tubular Drift (in.) *(mm)*	Type of Joint	Joint ID* (in.)	Joint ID* *(mm)*	Joint Regular OD (in.)	Joint Regular OD *(mm)*	Joint Special OD (in.)	Joint Special OD *(mm)*	Inter-changeable With**
2.875 *73,0*	6.48	7.8	.276 *7,01*	2.323 *59,00*	2.229 *56,61*	Mannesmann MAT	2.323	*59,00*	3.500	*88,90*			
						Mannesmann TDS	2.323	*59,00*	3.500	*88,90*	3.228	*82,00*	
		7.9				Atlas BradfordTC-4S			3,375	*85,73*			
						Atlas Bradford FL-4S	2.279	*57,89*	2.875	*73,03*			
						Atlas Bradford ST-L	2.247	*57,08*	2.875	*73,03*			
						Interlock IJ Nu-Lock	2.276	*57,81*	3.375	*85,72*			
						Hydrif PH-6, Atlas Bradford ST-P	2.265	*57,53*	3.437	*87,30*	3.312	*84,12*	
						NKK NK-2SC			3.626	*92,1*	3.500	*88,9*	
		7.7				VAM	2.374	*60,30*	3.327	*84,51*	3.264	*82,91*	
						VAM AF	2.374	*60,30*	3.425	*87,0*			
						New VAM			3.337	*84,75*	3.274	*83,15*	VAM, AF, AG
						VAM ACE			3.327	*84,50*	3.230	*82,05*	
	8.44		.308 *7,82*	2.259 *57,36*	2.165 *55,00*	Interlock Seal Lock PC	2.323	*59,00*	3.500	*88,90*			
		8.7				Atlas Bradford DSS-HT & IJ-3SS & IJ-4S	2.200	*55,88*	3.510	*89,15*			***
						Atlas Bradford TC-4S			3.375	*85,73*			
						Atlas Bradford FL-4S	2.215	*56,26*	2.875	*73,03*			
						Atlas Bradford ST-L	2.196	*55,78*	2.875	*73,03*			
						Interlock IJ Nu-Lock	2.212	*56,18*	3.375	*85,72*			
						Extreme Line	2.199	*55,85*	3.625	*92,08*			
						Hydril PH-6, Atlas Bradford ST-P	2.200	*55,88*	3.500	*88,90*	3.365	*85,47*	
		8.6				Interlock Seal Lock PC	2.259	*57,40*	3.500	*88,90*			
						Mannesmann Omega			3.154	*80,11*			
						Mannesmann MAT	2.259	*57,40*	3.500	*88,90*			
						Mannesmann TDS	2.259	*57,40*	3.500	*88,90*	3.228	*82,00*	
		8.7				NKK NK-2SC			3.626	*92,1*	3.500	*88,9*	

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) *(mm)*	Weight (lb/ft)		Tubular			Type of Joint	Joint						Inter-changeable With**
							ID*		Regular OD		Special OD		
	Plain End	Nom.	Wall (in.) *(mm)*	ID (in.) *(mm)*	Drift (in.) *(mm)*		(in.)	*(mm)*	(in.)	*(mm)*	(in.)	*(mm)*	
2.875 *73,0*	8.44	8.6	.308 *7,82*	2.259 *57,36*	2.165 *55,80*	VAM VAM AF New VAM VAM ACE	2.323 2.323	*59,0* *59,0*	3.327 3.425 3.364 3.355	*84,51* *87,0* *85,45* *85,22*	3.264 3.274 3.264	*82,91* *83,15* *82,90*	VAM, AF, AG
	9.78	9.5	.340 *8,64*	2.195 *55,75*	2.101 *53,37*	Atlas Bradford DSS-HT & IJ-3SS & IJ-4S Atlas Bradford TC-4S Interlock IJ Nu-Lock Hydril PH-6, Atlas Bradford ST-P	 2.133 2.148 2.130	 *54,18* *54,56* *54,10*	 3.635 3.450 3.450 3.625	 *92,33* *87,63* *87,63* *92,08*	 3.419	 *86,84*	***
	9.69	10.4 9.8	.362 *9,19*	2.151 *54,64*	2.057 *52,26*	VAM VAM AF New VAM VAM ACE	2.260 2.260	*57,40* *57,40*	3.500 3.583 3.435 3.426	*88,9* *91,0* *87,25* *87,02*	3.327 3.337 3.327	*84,5* *84,75* *84,50*	VAM, AF, AG
	10.39	10.7	.392 *9,96*	2.091 *53,11*	1.997 *50,72*	Hydril PH-6	2.030	*51,56*	3.687	*93,65*	3.509	*89,13*	
	10.66	11.0	.405 *10,28*	2.065 *52,46*	1.972 *50,08*	Atlas Bradford DSS-HT & IJ-SS & IJ-4S Atlas Bradford TC-4S Interlock IJ Nu-Lock Hydril PH-4	 2.003 2.018 2.000	 *50,88* *51,26* *50,80*	 3.760 3.500 3.500 3.750	 *95,50* *88,90* *88,90* *95,25*			***
		10.7				VAM VAM AF VAM ACE	2.205 2.260	*56,0* *57,4*	3.453 3.583 3.480	*87,71* *91,0* *88,39*	 3.354	 *85,20*	

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) *(mm)*	Weight (lb/ft) Plain End	Weight (lb/ft) Nom.	Tubular Wall (in.) *(mm)*	Tubular ID (in.) *(mm)*	Tubular Drift (in.) *(mm)*	Type of Joint	Joint ID* (in.)	Joint ID* *(mm)*	Joint Regular OD (in.)	Joint Regular OD *(mm)*	Joint Special OD (in.)	Joint Special OD *(mm)*	Inter-changeable With**
2.875 *73,0*	11.44	11.65	.440 *11,18*	1.995 *50,67*	1.901 *48,29*	Atlas Bradford DSS-HT & IJ-3SS & IJ-4S	1.933	*49,10*	3.760	*95,50*			***
						Atlas Brad. TC-4S			3.550	*90,17*			
						Interlock IJ Nu-Lock	1.948	*49,40*	3.500	*88,90*			
						Hydril PH-4	1.945	*49,40*	3.750	*95,25*			
						NKK NK-2SC			3.669	*93,2*			
3.500 *88,9*	7.57	7.7	.216 *5,49*	3.068 *77,93*	2.943 *74,75*	Atlas Bradford FL-4S	2.968	*75,39*	3.500	*88,90*			
						Mannesmann Omega	3.067	*77,90*	3.701	*94,01*			
						Mannesmann MAT	3.068	*77,90*	4.250	*108,00*			
						VAM	2.972	*75,49*	3.803	*96,60*			
						VAM AF	2.972	*75,5*	4.213	*107,0*			
						New VAM			3.841	*97,55*			
						VAM ACE			3.830	*95,20*			
	8.81	9.3	.254 *6,45*	2.992 *76,00*	2.867 *72,82*	Atlas Bradford DSS-HT & IJ 3SS & IJ-4S	2.920	*74,16*	3.875	*98,43*			***
						Atlas Brad. TC-4S			3.950	*100,33*			
						Atlas Bradford FL-4S	2.917	*74,09*	3.500	*88,90*			
						Atlas Bradford ST-L	2.992	*75,10*	3.500	*88,90*			
						Interlock TC Nu-Lock	2.947	*74,85*	4.250	*107,95*	3.865	*98,17*	
						Interlock IJ Nu-Lock	2.927	*74,35*	3.900	*99,06*			
						Extreme Line	2.907	*73,84*	4.250	*107,95*			

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) *(mm)*	Weight (lb/ft)		Tubular			Type of Joint	Joint						Inter-changeable With**
							ID*		Regular OD		Special OD		
	Plain End	Nom.	Wall (in.) *(mm)*	ID (in.) *(mm)*	Drift (in.) *(mm)*		(in.)	*(mm)*	(in.)	*(mm)*	(in.)	*(mm)*	
3.500 *88,9*	8.81	9.3	.254 *6,45*	2.992 *76,00*	2.867 *72,82*	GST Streamline			3.865	*98,17*			
						Hydril A-95	2.920	*74,17*	3.905	*99,19*	3.805	*96,65*	CS
						Hydril CS, Atlas Bradford ST-C	2.920	*74,17*	3.915	*99,44*	3.859	*98,02*	A-95
						Hydril CFJ-P	2.920	*74,17*	3.609	*91,67*			10.3 CFJ-P
		9.2				Hydril Super FJ	2.930	*74,42*	3.594	*91,29*			
						Interlock Seal-Lock PC	2.992	*76,00*	4.250	*107,95*			
						Mannesmann Omega	2.992	*76,00*	4.250	*107,95*			
						Mannesmann MAT	2.992	*76,00*	4.250	*108,00*			
						Mannesmann TDS	2.992	*76,00*	4.250	*108,00*	3.866	*98,20*	
		9.3				NKK NK-2SC			4.252	*108*	4.087	*103,8*	
		9.2				National Buttress			4.250	*107,95*	3.865	*98,17*	
						Pittsburgh 8 Acme			4.250	*107,95*	3.865	*98,17*	
						VAM	3.012	*76,5*	3.862	*98,1*	3.803	*96,6*	
						VAM AF	3.012	*76,5*	4.213	*107,0*			
						New VAM			3.900	*99,05*	3.803	*96,6*	VAM, AF, AG
						VAM ACE			3.890	*98,8*	3.799	*96,5*	
	9.91	10.3	.289 *7,34*	2.922 *74,22*	2.797 *71,04*	Atlas Bradford							
						DSS-HT & IJ-3SS & IJ-4S	2.878	*73,10*	3.947	*100,25*			***
						Atlas Brad. TC-4S			3.950	*100,33*			
						Atlas Bradford FL-4S	2.847	*72,31*	3.500	*88,90*			
						Atlas Bradford ST-L	2.845	*72,26*	3.500	*88,90*			
						Interlock IJ Nu Lock	2.857	*72,57*	3.950	*100,3*			
						Hydril CS, Atlas Bradford ST-C	2.878	*73,10*	3.955	*100,46*	3.914	*99,42*	A-95
						Hydril CFJ-P	2.878	*73,10*	3.609	*91,67*			9.3 CFJ-P

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) *(mm)*	Weight (lb/ft)		Tubular			Type of Joint	Joint						Inter-changeable With**
							ID*		Regular OD		Special OD		
	Plain End	Nom.	Wall (in.) *(mm)*	ID (in.) *(mm)*	Drift (in.) *(mm)*		(in.)	*(mm)*	(in.)	*(mm)*	(in.)	*(mm)*	
3.500 *88,9*	9.91	10.2	.289 *7,34*	2.922 *74,22*	2.797 *71,04*	Hydril Super FJ	2.860	*74,19*	3.594	*91,29*			
						Interlock Seal-Lock PC	2.922	*76,00*	4.250	*108,00*			
						Mannesmann MAT	2.922	*76,00*	4.250	*108,00*			
						Mannesmann TDS	2.922	*76,00*	4.250	*108,00*	3.866	*98,20*	
						NKK NK-2SC			4.252	*108,00*	4.087	*103,8*	
						VAM	2.972	*75,5*	3.917	*99,49*	3.862	*98,1*	
						VAM AF	2.972	*75,5*	4.213	*107,0*			
						New VAM			3.961	*100,6*	3.862	*98,1*	
						VAM ACE			3.950	*100,33*	3.852	*97,85*	
	12.31	12.7	.368 *9,35*	2.764 *70,21*	2.639 *67,03*	Atlas Bradford FL-4S	2.689	*68,30*	3.500	*88,90*			
		12.8				Hydril Super FJ	2.700	*68,58*	3.594	*91,29*			
	12.52	12.95	.375 *9,52*	2.750 *69,86*	2.625 *66,68*	Atlas Bradford DSS-HT & IJ 3SS & IJ-4S	2.687	*68,25*	4.260	*108,20*			***
						Atlas Brad. TC-4S			4.100	*104,14*			
						Atlas Bradford FL-4S	2.675	*67,95*	3.500	*88,90*			
						Atlas Bradford ST-L	2.652	*67,36*	3.500	*88,90*			
						Interlock IJ Nu-Lock Extreme Line	2.685	*68,20*	4.250	*107,95*			
						Hydril CFJ	2.687	*68,25*	3.750	*95,25*			15.8 CFJ
						Hydril Super FJ	2.685	*68,20*	3.594	*91,29*			
						Hydril PH-6, Atlas Bradford ST-C	2.687	*68,25*	4.312	*109,52*	4.189	*106,4*	

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) *(mm)*	Weight (lb/ft) Plain End	Weight (lb/ft) Nom.	Tubular Wall (in.) *(mm)*	Tubular ID (in.) *(mm)*	Tubular Drift (in.) *(mm)*	Type of Joint	Joint ID* (in.)	Joint ID* *(mm)*	Joint Regular OD (in.)	Joint Regular OD *(mm)*	Joint Special OD (in.)	Joint Special OD *(mm)*	Inter-changeable With**
3.500 *88,90*		12.7	.375 *9,52*	2.750 *69,86*	2.625 *66,68*	Interlock Seal-Lock PC	2.750	*69,90*	4.250	*108,00*			
						Mannesmann Omega	2.750	*69,90*					
						Mannesmann MAT	2.750	*69,90*	4.250	*108,00*			
						Mannesmann TDS	2.750	*69,90*	4.250	*108,00*	3.866	*98,20*	
	12.52	12.95				NKK NK-2SC			4.252	*108*	4.200	*106,7*	
		12.7				VAM	2.925	*47,30*	4.035	*102,49*	3.969	*100,8*	***
						VAM AF	2.925	*74,3*	4.213	*107,0*			
						New VAM			4.079	*103,60*	3.961	*100,60*	
						VAM ACE			4.069	*103,35*	3.951	*100,35*	
	13.6	13.7	.413 *10,49*	2.673 *67,89*	2.548 *64,72*	VAM	2.835	*72,01*	4.138	*105,11*	4.035	*102,5*	
						VAM AF	2.835	*72,0*	4.449	*113,0*			
						New VAM			4.138	*105,11*	4.045	*102,75*	
						VAM ACE			4.138	*105,10*	4.000	*101,60*	
	14.62	15.5	.449 *11,40*	2.602 *66,09*	2.477 *62,92*	Atlas Bradford FL-4S	2.527	*64,19*	3.500	*88,90*			12.8 FJ/SFJ
						Hydril Super FJ	2.540	*64,52*	3.594	*91,29*			
						NKK NK-2SC			4.374	*111,1*	4.252	*108*	
						VAM	2.835	*72,0*	4.138	*105,11*	4.035	*102,5*	
						VAM AF	2.835	*72,0*	4.449	*113,0*			
						New VAM			4.193	*106,50*	4.045	*102,75*	
						VAM ACE			4.200	*106,68*	4.035	*102,50*	
	15.37	15.8	.476 *12,09*	2.548 *64,72*	2.423 *61,54*	Atlas Brad. DSS-HT & IJ-3SS & IJ-4S	2.470	*62,74*	4.385	*111,38*			***
						Atlas Bradford TC-4S			4.200	*106,68*			
						Atlas Bradford ST-L	2.489	*63,22*	3.500				
						Interlock IJ Nu-Lock	2.483	*63,07*	4.250	*107,95*			
						Hydril CFJ	2.485	*63,12*	3.875	*98,43*			12.95 CFJ
						Hydril PH-6, Atlas Bradford ST-C	2.485	*63,12*	4.500	*114,30*	4.367	*110,9*	
	15.68	15.8	.488 *12,40*	2.524 *64,10*	2.399 *60,92*	VAM	2.835	*72,0*	4.193	*106,5*	4.138	*105,1*	
						VAM AF	2.835	*72,0*	4.449	*113,0*			
						New VAM			4.211	*106,95*	4.138	*105,10*	
						VAM ACE			4.200	*106,68*	4.069	*103,35*	

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) *(mm)*	Weight (lb/ft) Plain End	Weight (lb/ft) Nom.	Tubular Wall (in.) *(mm)*	Tubular ID (in.) *(mm)*	Tubular Drift (in.) *(mm)*	Type of Joint	Joint ID* (in.)	Joint ID* *(mm)*	Joint Regular OD (in.)	Joint Regular OD *(mm)*	Joint Special OD (in.)	Joint Special OD *(mm)*	Inter-changeable With**
3.500 *88,9*	16.28	16.7	.510 *12,95*	2.480 *62,99*	2.355 *59,82*	Atlas Brad. IJ-3SS	2.420	*61,47*	4.525	*114,94*			***
						Atlas Brad. IJ-4S	2.420	*61,47*	4.573	*116,2*			
						Atlas Brad. TC-4S			4.250	*107,95*			
						Interlock IJ Nu-Lock	2.415	*61,34*	4,250	*107,95*			
						Hydril PH-4	2.406	*61,11*	4.500	*114,3*			
	16.81	17.05	.530 *13,46*	2.440 *61,98*	2.315 *58,80*	Atlas Brad. TC-4S			4.300	*109,2*			
						Extreme Line	2.398	*60,91*	4.374	*111,10*			
						Hydril PH-4	2.375	*60,33*	4.562	*115,87*			
						NKK NK-2SC			4.374	*111,1*			
4.000 *101,6*	9.11	9.5	.226 *5,74*	3.548 *90,12*	3.423 *86,45*	Atlas Bradford ST-L	3.468	*88,09*	4.000	*101,60*			
						Atlas Bradford FL-4S	3.448	*87,58*	4.000	*101,60*			
						Mannesmann Omega	3.547	*90,09*	4.209	*106,91*			
						Mannesmann MAT	3.548	*90,10*	4.750	*120,7*			
						VAM	3.457	*87,8*	4.327	*109,9*			
						VAM AF	3.457	*87,8*	4.606	*117,0*			
						New VAM			4.348	*110,45*			
						VAM ACE			4.339	*110,21*			
	10.46	11.0	.262 *6,65*	3.476 *88,29*	3.351 *85,12*	Atlas Bradford DSS-HT & IJ 3SS & IJ-4S	3.401	*86,39*	4.385	*111,38*			***
						Atlas Brad. TC-4S			4.450	*113,03*			
						Atlas Bradford FL-4S	3.401	*86,39*	4.000	*101,60*			
						Hydril A-95	3.395	*86,23*	4.405	*111,89*	4.315	*109,60*	CS
						Hydril CS, Atlas Bradford ST-C	3.395	*86,23*	4.417	*112,19*	4.359	*110,72*	A-95

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) *(mm)*	Weight (lb/ft)		Tubular			Type of Joint	Joint						Inter-changeable With**
							ID*		Regular OD		Special OD		
	Plain End	Nom.	Wall (in.) *(mm)*	ID (in.) *(mm)*	Drift (in.) *(mm)*		(in.)	*(mm)*	(in.)	*(mm)*	(in.)	*(mm)*	
4.000 *101,6*	10.46	11.0	.262 *6,65*	3.476 *88,29*	3.351 *85,12*	Hydril CFJ-P	3.395	*86,23*	4.100	*104,14*			11.6 SFJ
						Hydril Super FJ	3.395	*86,23*	4.094	*103,99*			
						Mannesmann Omega	3.476	*88,29*	4.236	*107,59*			
						Mannesmann MAT	3.476	*88,3*	4.750	*120,7*			
						Mannesmann TDS	3.476	*88,3*	4.750	*120,7*	4.343	*110,3*	
						NKK NK-2SC			4.606	*117*	4.528	*115*	
		10.9				Pittsburgh 8 Acme			4.750	*120,65*	4.400	*111,76*	
						National Buttress			4.750	*120,65*	4.400	*111,76*	
						VAM	3.492	*88,7*	4.366	*110,90*	4.327	*109,9*	
						VAM AF	3.492	*88,7*	4.606	*117,0*			
						New VAM			4.407	*111,95*	4.327	*109,9*	
						VAM ACE			4.388	*111,71*	4.317	*109,65*	
	11.34	11.6	.286 *7,26*	3.428 *87,07*	3.303 *83,90*	Atlas Bradford FL-4S	3.353	*85,17*	4.000	*101,60*			11 FJ/SFJ
						Atlas Bradford ST-L	3.347	*85,01*	4.000	*101,60*			
						Hydril Super FJ	3.350	*85,09*	4.094	*103,99*			
	12.93	13.4	.330 *8,38*	3.340 *84,84*	3.215 *81,67*	Atlas Bradford DSS-HT & IJ-3SS & IJ-4S	3.275	*83,18*	4.572	*116,13*			***
						Atlas Brad. TC-4S			4.525	*114,94*			
		14.0				Atlas Bradford FL-4S	3.265	*82,93*	4.000	*101,60*			
						Atlas Bradford ST-L	3.274	*83,16*	4.000	*101,60*			
		13.4				Hydril Super FJ	3.260	*82,80*	4.094	*103,99*			
						Hydril PH-6	3.275	*83,19*	4.625	*117,48*	4.514	*114,7*	
						NKK NK-2SC			4.921	*125*	4.606	*117*	

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) *(mm)*	Weight (lb/ft)		Tubular			Type of Joint	Joint						Inter-changeable With**
							ID*		Regular OD		Special OD		
	Plain End	Nom.	Wall (in.) *(mm)*	ID (in.) *(mm)*	Drift (in.) *(mm)*		(in.)	*(mm)*	(in.)	*(mm)*	(in.)	*(mm)*	
4.000 *101,6*	12.93	13.0	.330 *8,38*	3.340 *84,84*	3.215 *81,67*	VAM VAM AF New VAM VAM ACE	3.457 3.457	*87,81* *87,8*	4.468 4.606 4.516 4.505	*113,49* *117,0* *114,70* *114,43*	4.366	*110,9*	
	14.66	14.8	.380 *9,65*	3.240 *82,3*	3.115 *79,13*	VAM VAM AF New VAM VAM ACE	3.346 3.346	*85,0* *85,0*	4.606 4.764 4.606 4.606	*117,0* *121,0* *117,0* *117,0*	4.469	*113,5*	
	16.36	16.5	.430 *10,92*	3.140 *79,76*	3.015 *76,59*	VAM VAM AF New VAM VAM ACE	3.346 3.346	*85,0* *85,0*	4.606 4.764 4.656 4.646	*117,0* *121,0* *118,25* *118,01*			
	18.69	19.0	.500 *12,70*	3.000 *76,20*	2.875 *73,03*	Atlas Brad. TC-4S Hydril PH-4, Atlas Brad. ST-P NKK NK-2SC	2.920	*74,17*	4.800 5.000 4.921	*121,9* *127,00* *125*			
	22.08	22.8	.610 *15,49*	2.780 *70,61*	2.655 *67,44*	Atlas Brad. DSS-HT & IJ-3SS & IJ-4S	2.705	*68,71*	4.885	*124,08*			***
		22.5				Hydril PH-4 NKK NK-2SC	2.700	*68,58*	5.187 4.921	*131,75* *125*			
4.500 *114,3*	9.4	9.5	.205 *5,21*	4.090 *103,89*	3.965 *100,71*	Atlas Bradford FL-4S Atlas Bradford ST-L	3.990 4.010	*101,35* *101,85*	4.500 4.500	*114,30* *114,30*			
	10.23	10.5	.224 *5,69*	4.052 *102,92*	3.927 *99,75*	Atlas Bradford FL-4S VAM VAM AF New VAM VAM ACE	3.952 3.984 3.984	*100,38* *101,2* *101,2*	4.500 4.862 5.118 4.862 4.862	*114,30* *123,5* *130,0* *123,5* *123,5*	4.803	*122,0*	

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) (mm)	Weight (lb/ft) Plain End	Weight (lb/ft) Nom.	Tubular Wall (in.) (mm)	Tubular ID (in.) (mm)	Tubular Drift (in.) (mm)	Type of Joint	Joint ID* (in.)	Joint ID* (mm)	Joint Regular OD (in.)	Joint Regular OD (mm)	Joint Special OD (in.)	Joint Special OD (mm)	Inter-changeable With**
4.500 *114,3*	11.35 12.24	11.6	.250 *6,35*	4.000 *101,60*	3.875 *98,43*	Atlas Bradford FL-4S Atlas Bradford ST-L VAM VAM AF New VAM VAM ACE	3.925 3.944 3.984 3.984	*99,70* *100,18* *101,2* *101,2*	4.500 4.500 4.862 5.118 4.862 4.862	*114,30* *114,30* *123,5* *130,0* *123,5* *123,5*	4.803	*122,0*	
		12.75				Atlas Bradford DSS-HT & IJ-3SS & IJ-4S Atlas Brad. TC-4S	3.883	*98,63*	4.940 4.950	*125,48* *125,7*			***
		12.6	.271 *6,88*	3.958 *100,53*	3.833 *97,36*	Atlas Bradford FL-4S Atlas Bradford ST-L	3.883 3.886	*98,63* *98,70*	4.500 4.500	*114,30* *114,30*			
		12.75				Hydril A-95 Hydril CS Hydril CFJ-P	3.865 3.865 3.865	*98,17* *98,17* *98,17*	4.910 4.920 4.609	*124,71* *124,97* *117,07*	4.825 4.861	*122,56* *123,47*	CS A-95
		12.6				Hydril Super FJ Mannesmann Omega Mannesmann MAT Mannesmann TDS	3.880 3.957 3.958 3.958	*98,55* *100,51* *100,50* *100,50*	4.594 4.744 5.200 5.200	*116,69* *120,50* *132,10* *132,10*	5.000	*127,0*	13.5 SFJ
		12.75				NKK NK-2SC			5.201	*132,1*	5.078	*129*	
		12.6				National Buttress Pittsburgh 8 Acme VAM VAM AF New VAM VAM ACE	3.984 3.984	*101,2* *101,2*	5.200 5.200 4.862 5.118 4.892 4.961	*132,08* *132,08* *123,49* *130,0* *124,25* *126,01*	4.920 4.920 4.803	*124,97* *124,97* *122,0*	

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) *(mm)*	Weight (lb/ft) Plain End	Weight (lb/ft) Nom.	Tubular Wall (in.) *(mm)*	Tubular ID (in.) *(mm)*	Tubular Drift (in.) *(mm)*	Type of Joint	Joint ID* (in.)	Joint ID* *(mm)*	Joint Regular OD (in.)	Joint Regular OD *(mm)*	Joint Special OD (in.)	Joint Special OD *(mm)*	Inter-changeable With**
						Atlas Brad. DSS-HT & IJ-3SS & IJ-4S	3.845	*97,66*	4.940	*125,48*			***
						Atlas Bradford TC-4S			4.950	*125,7*			
						Atlas Bradford ST-L	3.854	*97,89*	4.500	*114,30*			
						Atlas Bradford FL-4S	3.845	*97,66*	4.500	*114,30*			
						Hydril CS	3.840	*97,54*	4.955	*125,86*	4.890	*124,21*	A-95
			.290	3.920	3.795	Hydril Super FJ	3.840	*97,54*	4.594	*116,69*			12.6 SFJ
						Mannesmann MAT	3.920	*99,60*	5.200	*132,10*			
	13.04	13.5	*7,37*	*99,57*	*96,39*	Mannesmann TDS	3.920	*99,60*	5.200	*132,10*	5.000	*127,0*	
						NKK NK-2SC			5.201	*132,1*	5.078	*129*	
						VAM	3.984	*101,2*	4.961	*126,0*	4.803	*122,0*	
						VAM AF	3.984	*101,2*	5.118	*130,0*			
						New VAM			4.961	*126,0*			
						VAM ACE			4.961	*126,0*			
4.500 *114,3*		15.5				Atlas Brad. DSS-HT & IJ-3SS & IJ-4S	3.765	*95,63*	5.060	*128,52*			***
						Atlas Brad. TC-4S			5.100	*129,5*			
		15.1				Atlas Bradford ST-L	3.776	*95,91*	4.500	*114,30*			
			.337	3.826	3.701	Atlas Bradford FL-4S	3.751	*95,28*	4.500	*114,30*			
	14.98	15.5	*8,56*	*97,18*	*94,01*	Hydril PH-6, Atlas Bradford ST-C	3.765	*95,63*	5.125	*130,18*	5.021	*127,5*	
						Mannesmann MAT	3.826	*97,20*	5.200	*132,10*			
		15.1				Mannesmann TDS	3.826	*97,20*	5.200	*132,10*	5.000	*127,0*	
		15.5				NKK NK-2SC			5.201	*132,1*	5.078	*129*	
		15.1				VAM	3.933	*99,9*	4.961	*126,0*	4.882	*124,0*	
						VAM AF	3.933	*99,9*	5.118	*130,0*			
						New VAM			5.010	*127,25*			
						VAM ACE			5.005	*127,13*			
			.373	3.754	3.629	Atlas Brad. DSS-HT & IJ-3SS & IJ-4S	3.679	*93,45*	5.150	*130,81*			***
	16.44	16.9	*9,47*	*95,35*	*92,18*	Atlas Brad. TC-4S			5.100	*129,5*			
						Atlas Bradford FL-4S	3.679	*93,45*	4.500	*114,3*			

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) *(mm)*	Weight (lb/ft) Plain End	Weight (lb/ft) Nom.	Tubular Wall (in.) *(mm)*	Tubular ID (in.) *(mm)*	Tubular Drift (in.) *(mm)*	Type of Joint	Joint ID* (in.)	Joint ID* *(mm)*	Joint Regular OD (in.)	Joint Regular OD *(mm)*	Joint Special OD (in.)	Joint Special OD *(mm)*	Inter-changeable With**
4.500 *114,3*	16.72	16.9	.380 *9,65*	3.740 *95,00*	3.615 *91,83*	VAM	3.854	*97,9*	5.106	*129,7*			
						VAM AF	3.854	*97,9*	5.472	*139,0*			
						New VAM			5.106	*129,7*			
						VAM ACE			5.106	*129,7*			
	18.69	19.2	.430 *10,92*	3.640 *92,46*	3.515 *89,28*	Atlas Bradford DSS-HT & IJ3SS & IJ-4S	3.565	*90,55*	5.260	*133,6*			***
						Atlas Brad. TC-4S			5.200	*132,08*			
						Atlas Bradford ST-P	3.560	*90,42*	5.312	*134,92*	5.170	*131,3*	
						Hydril PH-6	3.560	*90,42*	5.312	*134,92*	5.170	*131,3*	
		18.8				VAM	3.854	*97,9*	5.106	*129,7*			
						VAM AF	3.854	*97,9*	5.472	*139,0*			
						New VAM			5.146	*130,7*			
						VAM ACE			5.201	*132,11*			
		19.2	.443 *11,25*	3.614 *91,80*	3.489 *88,62*	NKK NK-2SC			5.563	*141,3*	5.315	*135,0*	
	21.36	21.6	.500 *12,70*	3.500 *88,90*	3.375 *85,73*	Atlas Brad. DSS-HT & IJ-3SS & IJ-4S	3.425	*86,99*	5.375	*136,53*			***
						Atlas Brad. TC-4S			5.300	*134,62*			
						Hydril PH-4	3.420	*86,87*	5.500	*139,70*			
						VAM	3.854	*97,9*	5.201	*132,1*			
						New VAM			5.280	*134,11*			
						VAM ACE			5.280	*134,11*			

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) *(mm)*	Weight (lb/ft) Plain End	Weight (lb/ft) Nom.	Tubular Wall (in.) *(mm)*	Tubular ID (in.) *(mm)*	Tubular Drift (in.) *(mm)*	Type of Joint	Joint ID* (in.)	Joint ID* *(mm)*	Joint Regular OD (in.)	Joint Regular OD *(mm)*	Joint Special OD (in.)	Joint Special OD *(mm)*	Inter-changeable With**
4.500 *114,3*	21.36	21.6	.500 *12,70*	3.500 *88,90*	3.375 *85,73*	VAM AF NKK NK-2SC	3.854	*97,9*	5.472 5.563	*139,0* *141,3*	5.315	*135,0*	
		24.0	.560 *14,22*	3.380 *85,85*	3.255 *82,68*	Hydril PH-4 NKK NK-2SC	3.300	*83,82*	5.562 5.563	*141,27* *141,3*			
	23.56	24.6				VAM VAM AF New VAM VAM ACE	3.854 3.854	*97,9* *97,9*	5.280 5.472 5.333 5.322	*134,1* *139,0* *135,45* *135,18*			
	26.04	26.5	.630 *16,00*	3.240 *82,29*	3.115 *79,12*	Hydril PH-4 NKK NK-2SC	3.160	*80,26*	5.687 5.563	*144,45* *141,3*			
5 *127*	14.87	15	.296 *7,52*	4.408 *112,0*	4.283 *108,8*	Hydril TAC-1	4.328	*109,9*	5.370	*136,4*			
	17.93	18	.362 *9,19*	4.276 *108,6*	4.151 *105,4*	Hydril CS Hydril TAC-1	4.196 4.196	*106,6* *106,6*	5.515 5.455	*140,1* *138,6*			
	20.01	20.3	.408 *10,36*	4.184 *106,3*	4.059 *103,1*	Hydril CS	4.104	*104,2*	5.585	*141,9*			
	23.09	23.2	.478 *12,14*	4.044 *102,7*	3.919 *99,54*	Hydril CS Hydril CFJ-P	3.964 3.960	*100,7* *100,6*	5.700 5.100	*144,8* *129,5*			
	26.56	27	.560 *14,22*	3.880 *98,55*	3.755 *95,38*	Hydril CS	3.800	*96,52*	5.835	*148,2*			
5-1/2 *139,7*	16.87	17	.304 *7,72*	4.892 *124,3*	4.767 *121,1*	Hydril CS Hydril TAC-1	481.2 4.812	*122,2* *122,2*	5.920 5.900	*150,4* *149,9*			

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) *(mm)*	Weight (lb/ft) Plain End	Weight (lb/ft) Nom.	Tubular Wall (in.) *(mm)*	Tubular ID (in.) *(mm)*	Tubular Drift (in.) *(mm)*	Type of Joint	Joint ID* (in.)	Joint ID* *(mm)*	Joint Regular OD (in.)	Joint Regular OD *(mm)*	Joint Special OD (in.)	Joint Special OD *(mm)*	Inter-changeable With**
	19.81	20	.361 *9,17*	4.788 *121,6*	4.653 *118,2*	Hydril CS Hydril TAC-1	4.698 4.698	*119,3* *119,3*	6.005 6.000	*152,5* *152,4*			
5-1/2 *139,7*	22.54	23	.415 *10,54*	4.670 *118,6*	4.545 *115,4*	Hydril CS Hydril TAC-1	4.590 4.590	*116,6* *116,6*	6.090 6.035	*154,7* *153,3*			
	25.54	26	.476 *12,09*	4.548 *115,5*	4.423 *112,3*	Hydril CS	4.468	*113,5*	6.185	*157,1*			
	28.13	28.4	.530 *13,46*	4.440 *112,8*	4.315 *109,6*	Hydril CS	4.360	*110,7*	6.275	*159,4*			
	23.58	24	.352 *8,94*	5.921 *150,4*	5.796 *147,2*	Hydril TAC	5.841	*148,4*	7.072	*179,6*			
	27.65	28	.417 *10,59*	5.791 *147,1*	5.666 *143,9*	Hydril CS	5.710	*145,0*	7.210	*183,1*			
6-5/8 *168,3*	31.20	32	.475 *12,07*	5.675 *144,2*	5.550 *141,0*	Hydril CS	5.595	*142,1*	7.300	*185,4*			
	34.20	35	.525 *3,34*	5.575 *141,6*	5.450 *138,4*	Hydril CS	5.495	*139,6*	7.380	*187,5*			
7	22.63	23	.317 *8,05*	6.366 *161,7*	6.241 *158,5*	Hydril TAC	6.286	*159,7*	7.444	*189,1*			
7,8	25.66	26	.362 *9,19*	6.276 *159,4*	61.51 *156,2*	Hydril TAC	6.196	*157,4*	7.444	*189,1*			

Dimensional Data on Selected Heavy Weight and Non-API Tubing

OD (in.) *(mm)*	Weight (lb/ft) Plain End	Weight (lb/ft) Nom.	Tubular Wall (in.) *(mm)*	Tubular ID (in.) *(mm)*	Tubular Drift (in.) *(mm)*	Type of Joint	Joint ID* (in.)	Joint ID* *(mm)*	Joint Regular OD (in.)	Joint Regular OD *(mm)*	Joint Special OD (in.)	Joint Special OD *(mm)*	Inter-changeable With**
7 *177,8*	28.72	29	.408 *10,36*	6.184 *157,1*	6.059 *153,9*	Hydril CS Hydril TAC	6.104 6.104	*155,0* *155,0*	7.570 7.572	*192,3* *192,3*			
	31.68	32	.453 *11,51*	6.094 *154,8*	5.969 *151,6*	Hydril CS Hydril TAC	6.014 6.014	*152,8* *152,8*	7.640 7.580	*194,1* *192,5*			
	34.58	35	.498 *12,65*	6.004 *152,5*	5.879 *149,3*	Hydril CS	5.924	*150,5*	7.710	*195,8*			
	37.26	38	.540 *13,72*	5.920 *150,4*	5.795 *147,2*	Hydril CS	5.840	*148,3*	7.775	*197,5*			
	40.39	41	.590 *14,99*	5.820 *147,8*	5.695 *144,7*	Hydril CS	5.740	*145,8*	7.855	*199,5*			

* Joint ID listed only when bored, otherwise same as tubular ID.

** IJ and T & C joints listed are mechanically interchangeable through entire weight range in each size. Flush joints are not interchangeable from one weight to another in same size except as indicated for some special Hydril weights.

*** DS-HT, DSS-H, IJ-3S and IJ-3SS joints are mechanically interchangeable although mixed connections can render the metal-to-metal pin nose seal of the IJ-3S and IJ 3SS joints ineffective. Atlas Bradford ST-C is interchangeable with Hydril CS. Atlas Bradford ST-P is interchangeable with Hydril PH-G.

Atlas Bradford ST-C is interchangeable with Hydril CS.
Atlas Bradford ST-P is interchangeable with Hydril PH-6.

Performance Data for Selected Heavy Weight and Non-API Tubulars*

OD (in.) *(mm)*	Wall Thickness (in.) *(mm)*	Weight (lb/ft)		Grade	Collapse Pressure (psi) *(kg/sq cm)*	Internal Yield Pressure (psi) *(kg/sq cm)*	Tensile Strength (lb) *(kg)*
		Plain End	Nominal - Dependent on Type of Joint				
1.050 *26,7*	.154 *3,91*	1.47	1.5	J-55	13,770 *968*	14,120 *993*	24,000 *10.900*
				C-75	18,770 *1.320*	19,250 *1.353*	33,000 *15.000*
				L/N-80	20,020 *1.408*	20,530 *1.443*	35,000 *15.900*
				P-105	26,280 *1.848*	26,950 *1.895*	46,000 *20.900*
1.315 *33,4*	.179 *4,55*	2.17	2.25	J-55	12,940 *910*	13,100 *921*	35,000 *15.900*
				C-75	17,640 *1.240*	17,870 *1.256*	48,000 *21.800*
				N-80	18,820 *1.323*	19,060 *1.340*	51,000 *23.100*
				P-105	24,700 *1.737*	25,010 *1.758*	67,000 *30.400*
1.660 *42,2*	.191 *4,85*	2.99	3.02	J-55	11,200 *787*	11,070 *778*	48,000 *21.800*

Performance Data for Selected Heavy Weight and Non-API Tubulars*

OD (in.) *(mm)*	Wall Thickness (in.) *(mm)*	Weight (lb/ft)		Grade	Collapse Pressure (psi) *(kg/sq cm)*	Internal Yield Pressure (psi) *(kg/sq cm)*	Tensile Strength (lb) *(kg)*
		Plain End	Nominal - Dependent on Type of Joint				
1.660 *42,2*	.191 *4,85*	2.99	3.02	C-75	15,270 *1.074*	15,100 *1.062*	66,000 *29.900*
				L/N-80	16,290 *1.145*	16,110 *1.133*	71,000 *32.200*
				P-105	21,380 *1.503*	21,140 *1.486*	93,000 *42.200*
	.198 *5,03*	3.09	3.24	J-55	11,560 *813*	11,480 *807*	50,000 *22.700*
				C-75	15,760 *1.108*	15,660 *1.101*	68,000 *30.800*
				L/N-80	16,810 *1.182*	16,700 *1.174*	73,000 *33.100*
				P-105	22,060 *1.551*	21,920 *1.541*	95,000 *43.100*
1.900 *48,3*	.200 *5,08*	3.63	3.64	J-55	10,360 *728*	10,130 *712*	57,000 *25.900*
				C-75	14,130 *993*	13,820 *972*	80,000 *36.300*

Performance Data for Selected Heavy Weight and Non-API Tubulars*

OD (in.) *(mm)*	Wall Thickness (in.) *(mm)*	Weight (lb/ft)		Grade	Collapse Pressure (psi) *(kg/sq cm)*	Internal Yield Pressure (psi) *(kg/sq cm)*	Tensile Strength (lb) *(kg)*
		Plain End	Nominal - Dependent on Type of Joint				
1.900 *48,3*	.200 *5,08*	3.63	3.64	L/N-80	15,070 *1.060*	14,740 *1.036*	84,000 *38.100*
				P-105	19,780 *1.391*	19,340 *1.360*	110,000 *49.900*
	.219 *5,56*	3.93	4.19	J-55	11,220 *789*	11,090 *780*	64,000 *29.000*
				C-75	15,300 *1.076*	15,130 *1.064*	87,000 *39.500*
				L/N-80	16,320 *1.147*	16,140 *1.135*	93,000 *42.200*
				P-105	21,420 *1.506*	21,180 *1.489*	121,000 *54.900*
2.000 *50,8*	.165 *4,19*	3.23	3.4	J-55	8,320 *585*	7,940 *558*	52,320 *23.730*
				C-75	11,350 *798*	10,830 *761*	71,330 *32.360*
				L/N-80	12,110 *851*	11,550 *812*	76,080 *34.510*

Performance Data for Selected Heavy Weight and Non-API Tubulars*

OD (in.) *(mm)*	Wall Thickness (in.) *(mm)*	Weight (lb/ft)		Grade	Collapse Pressure (psi) *(kg/sq cm)*	Internal Yield Pressure (psi) *(kg/sq cm)*	Tensile Strength (lb) *(kg)*
		Plain End	Nominal - Dependent on Type of Joint				
2.000 *50,8*	.165 *4,19*	3.23	3.4	P-105	15,890 *1.117*	15,160 *1.066*	99,800 *45.296*
2.062 *52,4*	.225 *5,71*	4.41	4.5	J-55	10,690 *752*	10,500 *738*	71,000 *32.200*
				C-75	14,580 *1.025*	14,320 *1.007*	97,000 *44.000*
				L/N-80	15,550 *1.093*	15,270 *1.074*	104,000 *47.200*
				P-105	20,410 *1.435*	20,050 *1.410*	136,000 *61.700*
2.375 *60,3*	.218 *5,54*	5.01	5.1-5.3	J-55	9,170 *645*	8,840 *622*	81,000 *36.700*
				C-75	12,510 *880*	12,050 *847*	111,000 *50.300*
				L/N-80	13,340 *938*	12,860 *904*	118,000 *53.500*
				P-105	17,510 *1.231*	16,870 *1.186*	155,00 *70.300*

Performance Data for Selected Heavy Weight and Non-API Tubulars*

OD (in.) *(mm)*	Wall Thickness (in.) *(mm)*	Weight (lb/ft)		Grade	Collapse Pressure (psi) *(kg/sq cm)*	Internal Yield Pressure (psi) *(kg/sq cm)*	Tensile Strength (lb) *(kg)*
		Plain End	Nominal - Dependent on Type of Joint				
2.375 *60,3*	.261 *6,63*	5.89	6.2	J-55	10,760 *757*	10,580 *744*	95,000 *43.100*
				C-75	14,670 *1.031*	14,420 *1.014*	130,000 *59.000*
				L/N-80	15,650 *1.100*	15,390 *1.082*	139,000 *63.100*
				P-105	20,540 *1.444*	20,200 *1.420*	182,000 *82.600*
	.280 *7,12*	6.26	6.3-6.5	J-55	11,440 *804*	11,350 *798*	101,000 *45.800*
				C-75	15,600 *1.097*	15,740 *1.088*	138,000 *62.600*
				L/N-80	16,640 *1.170*	16,500 *1.160*	147,000 *66.700*
				P-105	21,840 *1.536*	21,660 *1.523*	193,000 *87.500*
	.366 *8,53*	7.3	7.3-7.7	J-55	13,360 *939*	13,620 *958*	118,000 *53.500*

Performance Data for Selected Heavy Weight and Non-API Tubulars*

OD (in.) *(mm)*	Wall Thickness (in.) *(mm)*	Weight (lb/ft)		Grade	Collapse Pressure (psi) *(kg/sq cm)*	Internal Yield Pressure (psi) *(kg/sq cm)*	Tensile Strength (lb) *(kg)*
		Plain End	Nominal - Dependent on Type of Joint				
2.375 *60,3*	.336 *8,53*	7.3	7.3-7.7	C-75	18,220 *1.281*	18,570 *1.306*	161,000 *73.000*
				L/N-80	19,430 *1.366*	18,810 *1.393*	172,000 *78.000*
				P-105	25,510 *1.794*	26,010 *1.829*	226,000 *102.500*
2.875 *73,0*	.276 *7,01*	6.48	7.7-7.9	J-55	9,550 *671*	9,250 *650*	124,000 *56.200*
				C-75	13,020 *915*	12,600 *886*	169,000 *76.700*
				L/N-80	13,890 *977*	13,450 *946*	180,000 *81.600*
				P-105	18,230 *1.282*	17,650 *1.241*	236,000 *107.000*
	.308 *7,82*	8.44	8.7	J-55	10,530 *740*	10,320 *726*	137,000 *62.100*
				C-75	14,350 *1.009*	14,060 *989*	186,000 *84.400*

Performance Data for Selected Heavy Weight and Non-API Tubulars*

OD (in.) *(mm)*	Wall Thickness (in.) *(mm)*	Weight (lb/ft)		Grade	Collapse Pressure (psi) *(kg/sq cm)*	Internal Yield Pressure (psi) *(kg/sq cm)*	Tensile Strength (lb) *(kg)*
		Plain End	Nominal - Dependent on Type of Joint				
2.875 *73,0*	.308 *7,82*	8.44	8.7	L/N-80	15,300 *1.076*	15,000 *1.055*	199,000 *90.300*
				P-105	20,090 *1.413*	19,690 *1.384*	261,000 *118.400*
	.340 *8,64*	9.18	9.5	J-55	11,470 *806*	11,390 *801*	149,000 *67.600*
				C-75	15,640 *1.100*	15,520 *1.091*	203,000 *92.100*
				L/N-80	16,690 *1.173*	16,560 *1.164*	217,000 *98.400*
				P-105	21,900 *1.540*	21,730 *1.528*	285,000 *129.300*
	.362 *9,19*	9.69	9.7-10.4	J-55	12,110 *851*	12,120 *852*	157,000 *71.200*
				C-75	16,510 *1.161*	16,530 *1.162*	214,000 *97.100*
				L/N-80	17,610 *1.238*	17,630 *1.240*	229,000 *103.900*
				P-105	23,110 *1.625*	23,140 *1.627*	300,000 *136.100*

Performance Data for Selected Heavy Weight and Non-API Tubulars*

OD (in.) *(mm)*	Wall Thickness (in.) *(mm)*	Weight (lb/ft)		Grade	Collapse Pressure (psi) *(kg/sq cm)*	Internal Yield Pressure (psi) *(kg/sq cm)*	Tensile Strength (lb) *(kg)*
		Plain End	Nominal - Dependent on Type of Joint				
2.875 *73,0*	.392 *9,96*	10.39	10.7	J-55	12,960 *911*	13,120 *922*	168,000 *76.200*
				C-75	17,610 *1.242*	17,890 *1.258*	229,000 *103.900*
				L/N-80	18,850 *1.325*	19,090 *1.342*	245,000 *111.100*
				P-105	24,740 *1.739*	25,050 *1.761*	321,000 *145.600*
	.405 *10,28*	10.66	10.7-11.0	J-55	13,310 *936*	13,570 *954*	173,000 *78.500*
				C-75	18,150 *1.276*	18,490 *1.300*	236,000 *107.000*
				L/N-80	19,360 *1.361*	19,730 *1.387*	251,000 *113.900*
				P-105	25,410 *1.787*	25,890 *1.820*	329,000 *149.200*
	.440 *11,18*	11.4	11.65	J-55	14,260 *1.003*	14,730 *1.036*	185,000 *83.900*

Performance Data for Selected Heavy Weight and Non-API Tubulars*

OD (in.) *(mm)*	Wall Thickness (in.) *(mm)*	Weight (lb/ft)		Grade	Collapse Pressure (psi) *(kg/sq cm)*	Internal Yield Pressure (psi) *(kg/sq cm)*	Tensile Strength (lb) *(kg)*
		Plain End	Nominal - Dependent on Type of Joint				
2.875 *73,0*	.440 *11,18*	11.44	11.65	C-75	19,440 *1.367*	20,090 *1.412*	252,000 *114.300*
				L/N-80	20,740 *1.458*	21,430 *1.507*	269,000 *122.000*
				P-105	27,220 *1.914*	28,120 *1.977*	353,000 *160.100*
3.500 *88,9*	.368 *9,35*	12.31	12.7-12.8	J-55	10,350 *728*	10,120 *712*	199,000 *90.300*
				C-75	14,110 *992*	13,800 *970*	272,000 *123.400*
				L/N-80	15,060 *1.059*	14,730 *1.036*	290,000 *131.500*
				P-105	19,760 *1.389*	19,320 *1.389*	380,000 *172.400*
	.413 *10,49*	13.6	13.7	J-55	11,520 *810*	11,440 *804*	222,000 *100.700*
				C-75	15,710 *1.105*	15,600 *1.097*	302,000 *137.000*

Performance Data for Selected Heavy Weight and Non-API Tubulars*

OD (in.) *(mm)*	Wall Thickness (in.) *(mm)*	Weight (lb/ft)		Grade	Collapse Pressure (psi) *(kg/sq cm)*	Internal Yield Pressure (psi) *(kg/sq cm)*	Tensile Strength (lb) *(kg)*
		Plain End	Nominal - Dependent on Type of Joint				
3.500 *88,9*	.413 *10,49*	13.6	13.7	L/N-80	16,760 *1.178*	16,640 *1.170*	322,000 *146.100*
				P-105	21,990 *1.546*	21,8404 *1.536*	423,000 *191.900*
	.449 *11,40*	14.62	14.7-15.5	J-55	12,300 *865*	12,370 *870*	237,000 *107.500*
				C-75	16,770 *1.179*	16,870 *1.186*	323,000 *146.500*
				L/N-80	17,890 *1.258*	17,990 *1.265*	345,000 *156.500*
				P-105	23,480 *1.651*	23,610 *1.660*	452,000 *205.000*
	.476 *12,09*	15.37	15.8	J-55	12,930 *909*	13,090 *920*	249,000 *112.900*
				C-75	17,630 *1.240*	17,850 *1.255*	339,000 *153.800*
				L/N-80	18,800 *1.322*	19,040 *1.339*	362,000 *164.200*
				P-105	24,680 *1.735*	24,990 *1.757*	475,000 *215.500*

Performance Data for Selected Heavy Weight and Non-API Tubulars*

OD (in.) *(mm)*	Wall Thickness (in.) *(mm)*	Weight (lb/ft)		Grade	Collapse Pressure (psi) *(kg/sq cm)*	Internal Yield Pressure (psi) *(kg/sq cm)*	Tensile Strength (lb) *(kg)*
		Plain End	Nominal - Dependent on Type of Joint				
3.500 *88,9*	.488 *12,39*	15.68	15.8	J-55	13,200 *928*	13,420 *944*	254,000 *115.200*
				C-75	18,000 *1.266*	18,300 *1.287*	346,000 *156.900*
				L/N-80	19,200 *1.350*	19,520 *1.372*	369,000 *167.400*
				P-105	25,200 *1.772*	25,610 *1.801*	485,000 *220.000*
	.510 *12,95*	16.28	16.7	J-55	13,690 *963*	14,020 *986*	264,000 *119.800*
				C-75	18,670 *1.313*	19,130 *1.345*	359,000 *162.800*
				L/N-80	19,920 *1.401*	20,400 *1.434*	383,000 *173.700*
				P-105	26,140 *1.838*	26,770 *1.882*	503,000 *228.200*
	.530 *13,46*	16.81	17.05	J-55	14,130 *993*	14,580 *1.025*	272,000 *123.400*

Performance Data for Selected Heavy Weight and Non-API Tubulars*

OD (in.) *(mm)*	Wall Thickness (in.) *(mm)*	Weight (lb/ft)		Grade	Collapse Pressure (psi) *(kg/sq cm)*	Internal Yield Pressure (psi) *(kg/sq cm)*	Tensile Strength (lb) *(kg)*
		Plain End	Nominal - Dependent on Type of Joint				
3.500 *88,9*	.530 *13,46*	16.81	17.05	C-75	19,270 *1,355*	19,880 *1,398*	371,000 *168.300*
				L/N-80	20,560 *1.446*	21,200 *1,491*	396,000 *179.600*
				P-105	26,980 *1.897*	27,830 *1,957*	519,000 *235.400*
4.000 *101,6*	.286 *7,26*	11.34	11.6	J-55	7,300 *513*	6,880 *484*	183,000 *83.000*
				C-75	9,790 *688*	9,390 *660*	250,000 *113.400*
				L/N-80	10,270 *722*	10,010 *704*	267,000 *121.100*
				P-105	12,690 *892*	13,140 *924*	350,000 *158.800*
	.330 *8,38*	12.93	13.0 - 13.4 - 14.0	J-55	8,330 *586*	7,940 *558*	209,000 *94.800*
				C-75	11,350 *798*	10,830 *761*	285,000 *129.300*

Performance Data for Selected Heavy Weight and Non-API Tubulars*

OD (in.) *(mm)*	Wall Thickness (in.) *(mm)*	Weight (lb/ft)		Grade	Collapse Pressure (psi) *(kg/sq cm)*	Internal Yield Pressure (psi) *(kg/sq cm)*	Tensile Strength (lb) *(kg)*
		Plain End	Nominal - Dependent on Type of Joint				
4.000 *101,6*	.330 *8,38*	12.93	13.0 - 13.4 - 14.0	L/N-80	12,110 *851*	11,550 *812*	304,900 *137.900*
				P-105	15,900 *1.118*	15,160 *1.066*	400,000 *181.400*
	.380 *9,65*	14.66	14.8	J-55	9,460 *665*	9,140 *643*	238,000 *108.00*
				C-75	12,900 *907*	12,470 *877*	324,000 *147.000*
				L/N-80	13,760 *967*	13,300 *935*	346,000 *156.900*
				P-105	18,060 *1.270*	17,460 *1.228*	454,000 *205.900*
	.430 *10,92*	16.36	16.5	J-55	10,550 *742*	10,350 *728*	265,000 *120.200*
				C-75	14,390 *1.012*	14,110 *992*	362,000 *164.200*
				L/N-80	15,350 *1.079*	15,050 *1.058*	386,000 *175.100*

Performance Data for Selected Heavy Weight and Non-API Tubulars*

OD (in.) *(mm)*	Wall Thickness (in.) *(mm)*	Weight (lb/ft)		Grade	Collapse Pressure (psi) *(kg/sq cm)*	Internal Yield Pressure (psi) *(kg/sq cm)*	Tensile Strength (lb) *(kg)*
		Plain End	Nominal - Dependent on Type of Joint				
4.000 *101,6*	.430 *10,92*	16.36	16.5	P-105	20,150 *1.417*	19,750 *1.389*	506,000 *229.500*
				J-55	12,030 *846*	12,030 *846*	302,000 *137.000*
	.500 *12,70*	18.69	19.0	C-75	16,410 *1.154*	16,410 *1.154*	412,000 *186.900*
				L/N-80	17,500 *1.230*	17,500 *1.230*	440,000 *199.600*
				P-105	22,970 *1.615*	22,970 *1.615*	577,000 *261.700*
	.610 *15,49*	22.08	22.5 - 22.8	J-55	14,220 *1.000*	14,680 *1.032*	357,000 *161.900*
				C-75	19,390 *1.363*	20,020 *1.408*	487,000 *220.900*
				L/N-80	20,680 *1.454*	21,350 *1.501*	520,000 *235.900*
				P-105	27,140 *1.908*	28,020 *1.970*	682,000 *309.400*

Performance Data for Selected Heavy Weight and Non-API Tubulars*

OD (in.) *(mm)*	Wall Thickness (in.) *(mm)*	Weight (lb/ft)		Grade	Collapse Pressure (psi) *(kg/sq cm)*	Internal Yield Pressure (psi) *(kg/sq cm)*	Tensile Strength (lb) *(kg)*
		Plain End	Nominal - Dependent on Type of Joint				
4.500 *114,3*	.205 *5,21*	9.4	9.5	J-55	3,310 *233*	4,380 *308*	151,000 *68.500*
	.224 *5,69*	10.23	10.5	J-55	4,010 *282*	4,790 *337*	165,000 *74.800*
	.250 *6,35*	11.35	11.6	J-55	4,960 *349*	5,350 *376*	184,000 *83.500*
				C-75	6,130 *431*	7,290 *513*	250,000 *113.400*
				L/N-80	6,350 *446*	7,780 *547*	267,000 *121.100*
				P-105	7,560 *532*	10,690 *752*	350,000 *158.800*
	.290 *7,37*	13.04	13.5	J-55	6,420 *451*	6,200 *436*	211,000 *95.700*
				C-75	8,170 *574*	8,460 *595*	288,000 *130.600*
				L/N-80	8,540 *600*	9,020 *634*	307,000 *139.300*
				P-105	10,350 *728*	11,840 *832*	403,000 *182.800*

Performance Data for Selected Heavy Weight and Non-API Tubulars*

OD (in.) *(mm)*	Wall Thickness (in.) *(mm)*	Weight (lb/ft)		Grade	Collapse Pressure (psi) *(kg/sq cm)*	Internal Yield Pressure (psi) *(kg/sq cm)*	Tensile Strength (lb) *(kg)*
		Plain End	Nominal - Dependent on Type of Joint				
4.500 *114,3*	.337 *8,56*	14.98	15.1 - 15.5	J-55	7,620 *536*	7,210 *507*	242,000 *109.800*
				C-75	10,390 *730*	9,830 *691*	331,000 *150.100*
				L/N-80	11,090 *780*	10,480 *737*	353,000 *160.100*
				P-105	13,820 *972*	13,760 *967*	463,000 *210.000*
	.373 *9,47*	16.44	16.9	C-75	11,400 *801*	10,880 *765*	363,000 *164.700*
				L/N-80	12,160 *855*	11,600 *816*	387,000 *175.500*
				P-105	15,960 *1.122*	15,230 *1.071*	508,000 *230.400*
	.430 *10,92*	18.69	19.2	J-55	9,510 *669*	9,200 *647*	302,000 *137.000*
				C-75	12,960 *876*	12,540 *882*	412,000 *186.900*

Performance Data for Selected Heavy Weight and Non-API Tubulars*

OD (in.) *(mm)*	Wall Thickness (in.) *(mm)*	Weight (lb/ft)		Grade	Collapse Pressure (psi) *(kg/sq cm)*	Internal Yield Pressure (psi) *(kg/sq cm)*	Tensile Strength (lb) *(kg)*
		Plain End	Nominal - Dependent on Type of Joint				
4.500 *114,3*	.430 *10,92*	18.69	19.2	L/N-80	13,830 *972*	13,380 *941*	439,000 *199.100*
				P-105	18,150 *1.276*	17,560 *1.235*	577,000 *261.700*
	.500 *12,70*	21.36	21.6	J-55	10,860 *764*	10,690 *752*	346,000 *156.900*
				C-75	14,810 *1.041*	14,580 *1.025*	471,000 *213.600*
				L/N-80	15,800 *1.111*	15,560 *1.094*	503,000 *228.200*
				P-105	20,740 *1.458*	20,420 *1.436*	660,000 *299.400*
	.560 *14,22*	23.56	24.6	J-55	11,990 *843*	11,980 *842*	381,000 *172.800*
				C-75	16,340 *1.149*	16,330 *1.148*	520,000 *235.900*
				L/N-80	17,430 *1.225*	17,420 *1,225*	555,000 *251.700*
				P-105	22,880 *1.609*	22,870 *1.608*	728,000 *330.200*

Performance Data for Selected Heavy Weight and Non-API Tubulars*

OD (in.) *(mm)*	Wall Thickness (in.) *(mm)*	Weight (lb/ft)		Grade	Collapse Pressure (psi) *(kg/sq cm)*	Internal Yield Pressure (psi) *(kg/sq cm)*	Tensile Strength (lb) *(kg)*
		Plain End	Nominal - Dependent on Type of Joint				
4.500 *114,3*	.630 *16,00*	26.04	26.5	J-55	13,240 *931*	13,480 *948*	421,000 *191.000*
				C-75	18,060 *1.270*	18,380 *1.292*	575,000 *260.800*
				L/N-80	19,260 *1.354*	19,600 *1.378*	613,000 *278.100*
				P-105	25,280 *1.777*	25,730 *1.809*	804,000 *364.700*

*Based on pipe body and calculated for J-55 = 55,000 lb yield, C-75 75,000 lb yield, L-80 and N-80 80,000 lb yield, and P-105 = 105,000 lb yield.

QT-700® Coiled Tubing Technical Data
Provided by Quality Tubing, Inc., Houston, Texas

Tube Dimensions (Inches)				Tube Area (Sq. In.)		Weight (Lb/Ft)	Load Capacity (Lbs)		Pressure Capacity (PSI)				Torque (Lb-Ft)		Internal Capacity Per 1000 Ft		Extrnl Displcmnt Per 1000 Ft	
O.D. Nom.	Wall Nom.	Wall Min.	I.D. Nom.	Wall Nom.	I.D. Nom.	Nom.	Yield Min.	Ultimate Min.	Yield Min.	Test 80%	Burst Min.	Collapse Min.	Yield Nom.	Ultimate Nom.	Gals.	Bbls.	Gals.	Bbls.
1.000	0.080	0.075	0.840	0.231	0.554	0.786	16185	18497	10500	8400	13427	5152	329	438	28.79	0.690	40.80	0.971
1.000	0.087	0.082	0.826	0.250	0.536	0.848	17460	19960	11470	9100	14600	11120	306	408	27.84	0.663	40.80	0.971
1.000	0.095	0.090	0.810	0.270	0.515	0.918	18900	21600	12600	10000	16130	12030	326	435	26.77	0.637	40.80	0.971
1.000	0.102	0.097	0.796	0.288	0.498	0.978	20140	23020	13570	10800	17480	12820	343	457	25.85	0.616	40.80	0.971
1.000	0.109	0.104	0.782	0.305	0.480	1.037	21350	24400	14560	11600	18830	13590	359	478	24.95	0.594	40.80	0.971
1.250	0.080	0.075	1.090	0.294	0.933	1.000	20583	23524	8400	6720	10580	7631	539	719	48.47	1.150	63.75	1.518
1.250	0.087	0.082	1.076	0.318	0.909	1.081	22250	25420	9180	7300	11520	8820	504	673	47.24	1.125	63.75	1.518
1.250	0.095	0.090	1.060	0.345	0.882	1.172	24120	27570	10080	8000	12720	9830	540	720	45.84	1.091	63.75	1.518
1.250	0.102	0.097	1.046	0.368	0.859	1.251	25750	29420	10860	8600	13770	10490	570	760	44.64	1.063	63.75	1.518
1.250	0.109	0.104	1.032	0.391	0.836	1.328	27350	31250	11640	9300	14830	11140	599	798	43.45	1.035	63.75	1.518
1.250	0.125	0.120	1.000	0.442	0.785	1.502	30920	35340	13440	10700	17280	12600	660	881	40.80	0.971	63.75	1.518
1.250	0.134	0.129	0.982	0.470	0.757	1.597	32880	37580	14440	11500	18680	13390	692	923	39.34	0.937	63.75	1.518
1.250	0.156	0.151	0.938	0.536	0.691	1.823	37530	42890	16910	13500	22110	15290	764	1018	35.90	0.855	63.75	1.518
1.500	0.095	0.090	1.310	0.419	1.348	1.426	29350	33540	8400	6700	10490	7480	808	1078	70.02	1.667	91.80	2.186
1.500	0.102	0.097	1.296	0.448	1.319	1.523	31350	35830	9050	7200	11350	8480	856	1141	68.53	1.632	91.80	2.186
1.500	0.109	0.104	1.282	0.476	1.291	1.619	33340	38100	9700	7700	12220	9430	902	1202	67.06	1.597	91.80	2.186
1.500	0.125	0.120	1.250	0.540	1.227	1.836	37790	43190	11200	8900	14220	10690	1001	1334	63.75	1.518	91.80	2.186
1.500	0.134	0.129	1.232	0.575	1.192	1.955	40250	46000	12040	9600	15360	11380	1053	1404	61.93	1.474	91.80	2.186
1.500	0.156	0.151	1.188	0.659	1.108	2.239	46100	52690	14090	11200	18180	13040	1172	1563	57.58	1.371	91.80	2.186
1.750	0.109	0.104	1.532	0.562	1.843	1.910	39330	44950	8320	6600	10380	7260	1267	1689	95.76	2.280	124.95	2.975
1.750	0.125	0.120	1.500	0.638	1.767	2.169	44660	51050	9600	7600	12070	9210	1413	1883	91.80	2.186	124.95	2.975
1.750	0.134	0.129	1.482	0.680	1.725	2.313	47620	54420	10320	8200	13040	9890	1491	1988	89.61	2.134	124.95	2.975
1.750	0.156	0.151	1.438	0.781	1.624	2.656	54680	62490	12080	9600	15420	11360	1670	2227	84.37	2.009	124.95	2.975
1.750	0.175	0.170	1.400	0.866	1.539	2.944	60610	69270	13590	10800	17500	12600	1812	2416	79.97	1.904	124.95	2.975

QT-700® Coiled Tubing Technical Data
Provided by Quality Tubing, Inc., Houston, Texas

Tube Dimensions (Inches)				Tube Area (In.)		Weight (Lb/Ft)	Load Capacity (Lbs)		Pressure Capacity (PSI)				Torque (Lb-Ft)		Internal Capacity Per 1000 Ft		Extrnl Displcmnt Per 1000 Ft	
O.D. Nom.	Wall Nom.	Wall Min.	I.D. Nom.	Wall Nom.	I.D. Nom.	Nom.	Yield Min.	Ultimate Min.	Yield Min.	Test 80%	Burst Min.	Collapse Min.	Yield Nom.	Ultimate Nom.	Gals.	Bbls.	Gals.	Bbls.
2.000	0.109	0.104	1.782	0.648	2.494	2.201	45320	51800	7280	5800	9020	5610	1694	2259	129.56	3.085	163.20	3.886
2.000	0.125	0.120	1.750	0.736	2.405	2.503	51540	58900	8400	6700	10490	7310	1896	2528	124.95	2.975	163.20	3.886
2.000	0.134	0.129	1.732	0.786	2.356	2.671	54980	62840	9030	7200	11320	8260	2005	2673	122.39	2.914	163.20	3.886
2.000	0.156	0.151	1.688	0.904	2.238	3.072	63260	72290	10570	8400	13370	10060	2257	3009	116.25	2.768	163.20	3.886
2.000	0.175	0.170	1.650	1.003	2.138	3.411	70230	80260	11890	9500	15170	11170	2459	3279	111.08	2.645	163.20	3.886
2.000	0.188	0.183	1.624	1.070	2.071	3.638	74910	85610	12810	10200	16420	11920	2590	3453	107.60	2.562	163.20	3.886
2.000	0.203	0.198	1.594	1.146	1.996	3.896	80220	91680	13860	11000	17860	12760	2733	3644	103.67	2.468	163.20	3.886
2.375	0.109	0.104	2.157	0.776	3.654	2.638	54310	62070	6130	4900	7540	3780	2452	3270	189.83	4.520	230.14	5.479
2.375	0.125	0.120	2.125	0.884	3.547	3.004	61850	70680	7070	5600	8750	5210	2755	3673	184.24	4.387	230.14	5.479
2.375	0.134	0.129	2.107	0.943	3.487	3.207	66030	75470	7600	6000	9440	6010	2920	3893	181.13	4.313	230.14	5.479
2.375	0.156	0.151	2.063	1.088	3.343	3.697	76120	87000	8900	7100	11150	7980	3304	4406	173.64	4.134	230.14	5.479
2.375	0.175	0.170	2.025	1.210	3.221	4.112	84660	96760	10020	8000	12640	9550	3617	4823	167.31	3.983	230.14	5.479
2.375	0.188	0.183	1.999	1.292	3.138	4.391	90410	103330	10780	8600	13670	10200	3822	5095	163.04	3.882	230.14	5.479
2.375	0.203	0.198	1.969	1.385	3.045	4.709	96960	110810	11670	9300	14860	10940	4048	5397	158.18	3.766	230.14	5.479
2.875	0.125	0.120	2.625	1.080	5.412	3.671	75590	86390	5840	4600	7170	3260	4151	5535	281.14	6.694	337.24	8.029
2.875	0.134	0.129	2.607	1.154	5.338	3.923	80770	92310	6280	5000	7730	3930	4408	5877	277.29	6.602	337.24	8.029
2.875	0.156	0.151	2.563	1.333	5.159	4.530	93270	106600	7350	5800	9120	5560	5014	6685	268.01	6.381	337.24	8.029
2.875	0.175	0.170	2.525	1.484	5.007	5.046	103900	118750	8270	6600	10330	6960	5512	7349	260.12	6.193	337.24	8.029
2.875	0.188	0.183	2.499	1.587	4.905	5.395	111080	126950	8910	7100	11160	7920	5841	7787	254.80	6.067	337.24	8.029
2.875	0.203	0.198	2.469	1.704	4.788	5.793	119280	136320	9640	7700	12130	9030	6207	8276	248.71	5.922	337.24	8.029
3.500	0.134	0.129	3.232	1.417	8.204	4.817	99180	113350	5160	4100	6300	2490	6700	8933	426.19	10.147	499.80	11.900
3.500	0.156	0.151	3.188	1.639	7.982	5.571	114710	131100	6040	4800	7420	3500	7653	10203	414.66	9.873	499.80	11.900
3.500	0.175	0.170	3.150	1.828	7.793	6.215	127960	146240	6790	5400	8400	4650	8444	11259	404.84	9.639	499.80	11.900
3.500	0.188	0.183	3.124	1.956	7.665	6.650	136920	156490	7320	5800	9070	5440	8969	11959	398.18	9.481	499.80	11.900
3.500	0.203	0.198	3.094	2.103	7.518	7.148	147180	168210	7920	6300	9860	6350	9559	12746	390.57	9.299	499.80	11.900

NOTES: 1. The effect of Axial Tension on Pressure Rating has **not** been applied to the above data. 2. Above data is for new tubing at minimum strength.

Maximum Working Pressure is a function of tube condition and is determined by the user.

QT-800® Coiled Tubing Technical Data
Provided by Quality Tubing, Inc., Houston, Texas

Tube Dimensions (Inches)				Tube Area (Sq. In.)		Weight (Lb/Ft)	Load Capacity (Lbs)		Pressure Capacity (PSI)				Torque (Lb-Ft)		Internal Capacity Per 1000 Ft		Extrnl Displcmnt Per 1000 Ft	
O.D. Nom.	Wall Nom.	Wall Min.	I.D. Nom.	Wall Nom.	I.D. Nom.	Nom.	Yield Min.	Ultimate Min.	Yield Min.	Test 80%	Burst Min.	Collapse Min.	Yield Nom.	Ultimate Nom.	Gals.	Bbls.	Gals.	Bbls.
1.000	0.080	0.198	0.840	0.231	0.554	0.786	16185	18497	11200	8960	14229	5890	288	383	28.79	0.690	40.80	0.971
1.000	0.087	0.082	0.826	0.250	0.536	0.848	19960	22450	13110	10400	16430	12700	350	466	27.84	0.663	40.80	0.971
1.000	0.095	0.090	0.810	0.270	0.515	0.918	21600	24300	14400	11500	18150	13750	373	497	26.77	0.637	40.80	0.971
1.000	0.102	0.097	0.796	0.288	0.498	0.978	23020	25890	15510	12400	19660	14650	392	522	25.85	0.616	40.80	0.971
1.000	0.109	0.104	0.782	0.305	0.480	1.037	24400	27450	16640	13300	21190	15530	410	546	24.95	0.594	40.80	0.971
1.250	0.080	0.198	1.090	0.294	0.933	1.000	20583	23524	8960	7168	11230	7134	472	629	48.47	1.150	63.75	1.518
1.250	0.087	0.082	1.076	0.318	0.909	1.081	25420	28600	10490	8300	12960	9800	576	769	47.24	1.125	63.75	1.518
1.250	0.095	0.090	1.060	0.345	0.882	1.172	27570	31020	11520	9200	14310	11230	617	823	45.84	1.091	63.75	1.518
1.250	0.102	0.097	1.046	0.368	0.859	1.251	29420	33100	12410	9900	15490	11990	652	869	44.64	1.063	63.75	1.518
1.250	0.109	0.104	1.032	0.391	0.836	1.328	31250	35160	13310	10600	16690	12730	684	913	43.45	1.035	63.75	1.518
1.250	0.125	0.120	1.000	0.442	0.785	1.502	35340	39760	15360	12200	19440	14400	755	1006	40.80	0.971	63.75	1.518
1.250	0.134	0.129	0.982	0.470	0.757	1.597	37580	42280	16510	13200	21010	15310	791	1055	39.34	0.937	63.75	1.518
1.250	0.156	0.151	0.938	0.536	0.691	1.823	42890	48250	19320	15400	24870	17470	873	1164	35.90	0.855	63.75	1.518
1.500	0.095	0.090	1.310	0.419	1.348	1.426	33540	37730	9600	7600	11800	8260	924	1232	70.02	1.667	91.80	2.186
1.500	0.102	0.097	1.296	0.448	1.319	1.523	35830	40310	10340	8200	12770	9410	978	1304	68.53	1.632	91.80	2.186
1.500	0.109	0.104	1.282	0.476	1.291	1.619	38100	42860	11090	8800	13740	10560	1030	1374	67.06	1.597	91.80	2.186
1.500	0.125	0.120	1.250	0.540	1.227	1.836	43190	48590	12800	10200	16000	12220	1144	1525	63.75	1.518	91.80	2.186
1.500	0.134	0.129	1.232	0.575	1.192	1.955	46000	51750	13760	11000	17290	13010	1204	1605	61.93	1.474	91.80	2.186
1.500	0.156	0.151	1.188	0.659	1.108	2.239	52690	59280	16100	12800	20460	14900	1340	1786	57.58	1.371	91.80	2.186
1.750	0.109	0.104	1.532	0.562	1.843	1.910	44950	50570	9500	7600	11680	8010	1448	1930	95.76	2.280	124.95	2.975
1.750	0.125	0.120	1.500	0.638	1.767	2.169	51050	57430	10970	8700	13580	10250	1614	2152	91.80	2.186	124.95	2.975
1.750	0.134	0.129	1.482	0.680	1.725	2.313	54420	61220	11790	9400	14670	11310	1704	2271	89.61	2.134	124.95	2.975
1.750	0.156	0.151	1.438	0.781	1.624	2.656	62490	70300	13800	11000	17350	12990	1908	2545	84.37	2.009	124.95	2.975
1.750	0.175	0.170	1.400	0.866	1.539	2.944	69270	77930	15540	12400	19690	14400	2071	2761	79.97	1.904	124.95	2.975

QT-800® Coiled Tubing Technical Data
Provided by Quality Tubing, Inc., Houston, Texas

Tube Dimensions (Inches)				Tube Area (Sq. In.)		Weight (Lb/Ft)	Load Capacity (Lbs)		Pressure Capacity (PSI)				Torque (Lb-Ft)		Internal Capacity Per 1000 Ft		Extrnl Displcmnt Per 1000 Ft	
O.D. Nom.	Wall Nom.	Wall Min.	I.D. Nom.	Wall Nom.	I.D. Nom.	Nom.	Yield Min.	Ultimate Min.	Yield Min.	Test 80%	Burst Min.	Collapse Min.	Yield Nom.	Ultimate Nom.	Gals.	Bbls.	Gals.	Bbls.
2.000	0.109	0.104	1.782	0.648	2.494	2.201	51800	58270	8320	6600	10150	6090	1936	2581	129.56	3.085	163.20	3.886
2.000	0.125	0.120	1.750	0.736	2.405	2.503	58900	66260	9600	7600	11800	8060	2167	2889	124.95	2.975	163.20	3.886
2.000	0.134	0.129	1.732	0.786	2.356	2.671	62840	70690	10320	8200	12730	9160	2291	3055	122.39	2.914	163.20	3.886
2.000	0.156	0.151	1.688	0.904	2.238	3.072	72290	81330	12080	9600	15050	11500	2579	3439	116.25	2.768	163.20	3.886
2.000	0.175	0.170	1.650	1.003	2.138	3.411	80260	90300	13590	10800	17070	12770	2810	3747	111.08	2.645	163.20	3.886
2.000	0.188	0.183	1.624	1.070	2.071	3.638	85610	96310	14640	11700	18470	13620	2960	3946	107.60	2.562	163.20	3.886
2.000	0.203	0.198	1.594	1.146	1.996	3.896	91680	103140	15840	12600	20100	14590	3123	4164	103.67	2.468	163.20	3.886
2.375	0.109	0.104	2.157	0.776	3.654	2.638	62070	69830	7000	5600	8480	3980	2802	3737	189.83	4.520	230.14	5.479
2.375	0.125	0.120	2.125	0.884	3.547	3.004	70680	79520	8080	6400	9850	5630	3149	4198	184.24	4.387	230.14	5.479
2.375	0.134	0.129	2.107	0.943	3.487	3.207	75470	84900	8690	6900	10620	6570	3337	4449	181.13	4.313	230.14	5.479
2.375	0.156	0.151	2.063	1.088	3.343	3.697	87000	97870	10170	8100	12540	8840	3776	5035	173.64	4.134	230.14	5.479
2.375	0.175	0.170	2.025	1.210	3.221	4.112	96760	108850	11450	9100	14220	10810	4134	5512	167.31	3.983	230.14	5.479
2.375	0.188	0.183	1.999	1.292	3.138	4.391	103330	116250	12320	9800	15380	11660	4368	5823	163.04	3.882	230.14	5.479
2.375	0.203	0.198	1.969	1.385	3.045	4.709	110810	124660	13330	10600	16720	12500	4626	6168	158.18	3.766	230.14	5.479
2.875	0.125	0.120	2.625	1.080	5.412	3.671	86390	97190	6670	5300	8070	3470	4744	6326	281.14	6.694	337.24	8.029
2.875	0.134	0.129	2.607	1.154	5.338	3.923	92310	103840	7170	5700	8700	4150	5038	6717	277.29	6.602	337.24	8.029
2.875	0.156	0.151	2.563	1.333	5.159	4.530	106600	119920	8400	6700	10260	6030	5730	7640	268.01	6.381	337.24	8.029
2.875	0.175	0.170	2.525	1.484	5.007	5.046	118750	133590	9460	7500	11620	7660	6300	8399	260.12	6.193	337.24	8.029
2.875	0.188	0.183	2.499	1.587	4.905	5.395	126950	142820	10180	8100	12560	8770	6675	8900	254.80	6.067	337.24	8.029
2.875	0.203	0.198	2.469	1.704	4.788	5.793	136320	153360	11010	8800	13650	10050	7094	9458	248.71	5.922	337.24	8.029
3.500	0.134	0.129	3.232	1.417	8.204	4.817	113350	127520	5890	4700	7090	2640	7657	10209	426.19	10.147	499.80	11.900
3.500	0.156	0.151	3.188	1.639	7.982	5.571	131100	147490	6900	5500	8350	3650	8746	11661	414.66	9.873	499.80	11.900
3.500	0.175	0.170	3.150	1.828	7.793	6.215	146240	164520	7770	6200	9450	4990	9650	12867	404.84	9.639	499.80	11.900
3.500	0.188	0.183	3.124	1.956	7.665	6.650	156490	176050	8360	6600	10210	5900	10251	13668	398.18	9.481	499.80	11.900
3.500	0.203	0.198	3.094	2.103	7.518	7.148	168210	189230	9050	7200	11090	6950	10925	14567	390.57	9.299	499.80	11.900

NOTES: 1. The effect of Axial Tension on Pressure Rating has **not** been applied to the above data. 2. Above data is for new tubing at minimum strength.
Maximum Working Pressure is a function of tube condition and is determined by the user.

Dimensions, Specifications, and Physical Properties of Centron® Fiberglass Epoxy Integral Joint Tubing Manufactured by Centron Corporation, Mineral Wells, Texas

Size	Inside Diameter Inches	Nominal Wall Thickness Inches	Outside Diameter Inches	Nominal Box Dia. Inches	Weight lbs/ft.	Weight lbs/Joint	Rated Operating Values				Typical Ultimate Values [1]			
							Static Internal Pressure [4]		Extemal Collapse PSI	Rated Axial Load lbs	Short [3] Term Weep PSI	External Collapse PSI	Axial Thread Load lbs	Axial Wall Load lbs
							75°F PSI	150°F PSI						
1-1/2														
DH2000	1.60	.175	1.95	2.95	0.93	27.4	2000	1500	2000	6500	5000	5000	35000	29000
DH2500	1.60	.215	2.03	3.05	1.15	33.9	2500	1875	2500	8500	5500	6200	35000	36000
DH3000	1.60	.255	2.11	3.15	1.40	41.3	3000	2250	3000	10000	6000	7500	35000	44000
DH3500	1.60	.275	2.15	3.25	1.63	48.1	3500	2625	3500	12000	6500	9000	35000	52000
DH4000	1.60	.310	2.22	3.40	1.85	54.6	4000	3000	4000	13500	7000	11000	35000	60000
2-3/8														
DH1500	1.95	.200	2.35	3.35	1.29	38.1	1500	1125	1500	10000	4500	4000	50000	36000
DH2000	1.95	.240	2.43	3.45	1.53	45.1	2000	1500	2000	12000	5000	5000	50000	45000
DH2500	1.95	.275	2.50	3.55	1.72	50.7	2500	1875	2500	14000	5500	6200	50000	57000
DH3000	1.95	.310	2.57	3.65	2.04	60.2	3000	2250	3000	16000	6000	7500	50000	66000
DH3500	1.95	.330	2.61	3.70	2.18	64.2	3500	2625	3500	17000	6500	9000	50000	70000
2-7/8														
DH1500	2.48	.225	2.93	4.00	1.78	52.5	1500	1125	1500	14000	4500	3600	60000	55000
DH2000	2.48	.275	3.03	4.20	2.09	61.7	2000	1500	2000	17000	5000	5000	60000	71000
DH2500	2.48	.325	3.13	4.40	2.61	77.0	2500	1875	2500	20000	5500	6000	60000	85000
DH3000	2.48	.360	3.20	4.50	2.93	86.4	3000	2250	3000	22000	6000	8000	60000	96000

Dimensions, Specifications, and Physical Properties of Centron® Fiberglass Epoxy Integral Joint Tubing Manufactured by Centron Corporation, Mineral Wells, Texas

Size	Inside Diameter Inches	Nominal Wall Thickness Inches	Outside Diameter Inches	Nominal Box Dia. Inches	Weight lbs/ft.	Weight lbs/Joint	Rated Operating Values				Typical Ultimate Values [1]			
							Static Internal Pressure [4]		External Collapse PSI	Rated Axial Load lbs	Short [3] Term Weep PSI	External Collapse PSI	Axial Thread Load lbs	Axial Wall Load lbs
							75°F PSI	150°F PSI						
3-1/2														
DH1200	2.98	.225	3.43	4.50	2.10	62.0	1200	900	1200	16000	3600	2500	70000	67000
DH1500	2.98	.250	3.48	4.70	2.30	68.0	1500	1125	1400	18000	4500	2800	70000	76000
DH2000	2.98	.300	3.58	4.85	2.80	82.6	2000	1500	2000	21000	5000	4500	70000	92000
DH2500	2.98	.350	3.68	4.90	3.36	99.1	2500	1875	2500	26000	5500	6800	70000	109000
4-1/2														
DH1200	3.98	.250	4.48	5.60	2.93	86.0	1200	900	600	22000	3600	1300	90000	99000
DH1500	3.98	.300	4.58	5.75	3.52	103.0	1500	1125	1100	26000	4500	2200	90000	120000
DH2000	3.98	.385	4.75	5.85	4.62	156.0	2000	1500	1400	31000	5000	2900	90000	136000
DH2500	3.98	.475	4.93	6.00	5.94	175.0	2500	1875	2000	36000	5500	4000	90000	150000

1. CENTRON® Tubing can be used in many applications to 180°F and in some cases above. In all applications, chemical compatibility must be established and physical capabilities of the tubing for the expected conditions must be determined. Contact Centron Corporation for technical assistance. Ultimate properties listed are at 75°F.
2. Quasi - steady
3. Unrestrained across the joint strength.
4. Rated operating pressures are at rated axial load.

GENERAL PHYSICAL PROPERTIES

Density 0.07 lbs/in^3 (Sp. Gr. = 1.95)
Axial Modulus of Elasticity . . . 2.7 x 10^6 PSI (18.6 x 10^3 MPa)
Hoop Modulus . . . 4.0 x 10^6 PSI (27.4 x 10^3 MPa)

Axial Tensile Strength . . . 30,000 PSI (207 MPa)
Thermal Coefficient of Expansion . . . 7.0 x 10^{-6} in/in/°F. (1.26 x 10^{-5} m/m°C)
Data reprinted from November 1983 Literature.

BAKER OIL TOOLS
A Baker Hughes company

Specifications and Physical Properties of Fiberglass Tubing Manufactured by Sepma, Mulhouse, France

Nominal Diameter	2-3/8	2-7/8	3-1/2	3-1/2	4-1/2	4-1/2
Physical Specifications						
Outside Diameter (in.)	2.375	2.875	3.5	3.66	4.5	4.72
Inside Diameter (in.)	1.97	2.44	2.95	2.95	3.94	3.94
Total Wall Thickness (in.)	0.20	0.22	0.27	0.35	0.28	0.39
Outside Diameter Coupling	3.52	4.17	4.95	4.95	6.12	6.12
Weight Per Foot (lb/ft)	1.27	1.67	2.49	3.46	3.43	5.23
Density	1.8	1.8	1.8	1.8	1.8	1.8
Maximum Operating Specifications at 190°F						
Internal Pressure (psi)	1400	1300	1350	1900	1100	1750
External Pressure (psi)	850	850	870	1700	800	1500
Tensile Across Joint (lbs)	8150	13000	16500	28900	22250	33400
Performance Properties						
Burst Pressure (psi)	3478	3070	3308	3850	2614	3200
Collapse Pressure (psi)	2175	1595	1987	2900	1030	2400
Tensile Joint Strength (lbs)	23440	31020	49160	50900	66400	68200

Threads are similar to API Spec. 5AR 8 RD and with T&C Connections.
Data provided by Coflexip.

Specifications and Physical Properties of Fiberglass Tubing Manufactured by Smith Fiberglass Products Inc., Little Rock, Arkansas

Size	Nominal I.D.	Nominal O.D.	Nominal Wall Thickness	Make-Up Length	Nominal Coupling O.D.	Weight	Fill Capacity	Pressure Rating	Tensile Rating	Collapse Rating	Ultimate Burst	Ultimate Collapse	Ultimate Tensile
1-1/2	1.50	1.77	.14	2.1	2.7	0.71	2.2	1,500	6,850	1,100	4,800	3,300	24,000
	1.50	1.87	.19	2.1	2.7	0.92	2.2	2,000	9,300	2,250	6,300	6,750	31,100
	1.50	1.98	.24	2.1	2.7	1.17	2.2	2,500	11,100	4,000	6,800	10,000+	33,250
	1.50	2.04	.27	2.1	2.7	1.32	2.2	3,000	11,500	4,500	7,300	10,000+	35,200
2-3/8	2.16	2.48	.16	2.6	3.0	1.06	4.5	1,000	9,200	800	4,200	1,900	30,600
	2.00	2.38	.19	2.6	3.3	1.22	3.9	1,500	11,700	1,200	5,800	3,600	41,400
	2.00	2.50	.25	2.6	3.3	1.57	3.9	2,000	15,400	2,350	6,600	7,100	46,200
	1.88	2.42	.27	2.6	3.3	1.66	3.4	2,500	16,200	3,400	7,100	10,000+	48,700
	1.88	2.50	.31	2.6	3.5	1.91	3.4	3,000	16,900	4,500	7,700	10,000+	50,700
2-7/8	2.43	2.79	.18	2.9	3.5	1.45	5.7	1,000	12,500	800	4,200	1,900	40,700
	2.43	2.89	.23	2.9	3.9	1.77	5.7	1,500	15,900	1,200	5,500	3,600	49,700
	2.43	2.98	.28	2.9	3.9	2.14	5.7	2,000	18,100	2,000	6,200	5,800	54,500
	2.23	2.85	.31	2.9	3.9	2.27	4.8	2,500	19,900	3,100	6,700	9,400	59,800
	2.23	2.98	.38	2.9	4.0	2.75	4.8	3,000	20,100	4,500	7,100	10,000+	60,400
3-1/2	3.19	3.64	.23	3.1	4.3	2.20	9.9	1,000	20,500	750	4,000	1,800	65,100
	3.00	3.51	.26	3.1	4.7	2.45	8.7	1,500	23,200	1,100	5,500	3,250	78,400
	3.00	3.64	.32	3.1	4.7	3.00	8.7	2,000	26,100	2,000	6,000	5,800	83,400
	2.72	3.51	.39	3.1	4.7	3.50	7.2	2,500	28,300	3,400	6,500	10,000+	85,100
	2.72	3.64	.46	3.1	4.9	4.09	7.2	3,000	28,900	4,500	6,400	10,000+	86,500
4-1/2	4.00	4.54	.27	3.4	5.3	3.39	15.5	1,000	29,000	600	4,000	1,500	90,000
	4.00	4.64	.32	3.4	5.8	3.92	15.5	1,500	33,000	900	5,000	2,700	103,000
	3.75	4.55	.40	3.4	5.8	4.75	13.7	2,000	36,000	1,600	5,600	4,700	108,700
	3.35	4.31	.48	3.4	5.8	5.42	10.9	2,500	38,300	3,400	6,000	10,000+	115,100

Dimensions, Specifications, and Physical Properties of Star® Fiberglass Tubing Manufactured by Fiber Glass Systems, Inc., San Antonio and Big Spring, Texas (Operating Temperature 200°F)**

1500 DHT*

Size	Nominal (in)	1-1/2	2-3/8	2-7/8	3-1/2	4	4-1/2
Pressure	Rating (psi) (1)	1500	1500	1500	1500	1500	1500
	Star Ultimate (psi) (2)	3,000	3,900	3,100	2,500	2,500	2,200
	ASTM Ultimate D-1 599 (2)	5,500	6,000	5,300	4,700	4,700	4,700
Tensile	Rating (lbs) (1)	5,000	11,500	14,000	18,500	25,000	34,000
	Star Ultimate (lbs) (2)	20,000	42,000	55,000	71,000	85,000	95,000
Collapse	Rating (psi) (1)	1,500	2,400	2,000	1,600	1,800	1,800
	ASTM Ultimate D-2924	4,500	4,800	4,200	3,300	3,600	3,700
Nominal Pipe Dimensions	Inside Diameter (in)	1.44	1.94	2.36	2.95	3.37	3.95
	Min. Drift Dia. (in)	1.38	1.88	2.30	2.89	3.31	3.89
	Outside Diameter (in)	1.71	2.31	2.75	3.38	3.86	4.53
	Wall Thickness (in)	0.14	0.18	0.19	0.21	0.25	0.29
	T&C Coupled Weight (lbs/ft)	0.64	1.17	1.51	2.06	2.68	3.61
	IJ Weight (lbs/ft)	0.72	1.11	1.42	1.92	—	3.44
	Joint Length (ft)	30 Nom. API Range 2, 28 to 32					
Joining System	T&C Collar O.D. (in) (3)	2.80	3.25	3.80	4.60	5.00	5.80
	IJ Box O.D. (in) (3)	2.60	3.20	3.80	4.45	—	5.80
	Pin Upset O.D. (in)	2.15	2.60	3.10	3.75	4.25	4.80
	Thread size (in)	1.90	2-3/8	2-7/8	3-1/2	4	4-1/2
	Thread Length (in)	2.36	2.94	3.25	3.50	4.00	4.38
	Make-up Length Loss (in/jt)	2.11	2.69	3.00	3.25	3.75	4.13
	Thread type (4)	EUE 1ORD	EUE 8RD	EUE 8RD	EUE 8RD	EUE 8RD	EUE 8RD
Moduli	Hoop (psi x 10^6)	3.4	4.5	4.6	4.6	4.6	4.9
	Axial (psi x 10^6)	2.6	2.9	2.9	2.8	3.0	2.9
	Poisson's Ratio (minor)	0.38	0.25	0.25	0.25	0.24	0.22

BAKER OIL TOOLS
A Baker Hughes company

Dimensions, Specifications, and Physical Properties of Star® Fiberglass Tubing Manufactured by Fiber Glass Systems, Inc., San Antonio and Big Spring, Texas (Operating Temperature 200°F)**

2000 DHT*

Size	Nominal (in)	1-1/2	2-3/8	2-7/8	3-1/2	4	4-1/2
Pressure	Rating (psi) (1)	2000	2000	2000	2000	2000	2000
	Star Ultimate (psi) (2)	4,000	4,600	3,700	3,000	3,200	3,200
	ASTM Ultimate D-1599 (2)	7,200	7,000	6,200	5,900	5,800	5,900
Tensile	Rating (lbs) (1)	7,500	14,500	18,000	25,000	34,000	45,000
	Star Ultimate (lbs) (2)	25,000	46,000	58,000	74,000	90,000	100,000
Collapse	Rating (psi) (1)	2,800	2,800	2,400	2,300	2,300	2,300
	ASTM Ultimate D-2924	5,700	5,600	4,900	4,700	4,600	4,600
Nominal Pipe Dimensions	Inside Diameter (in)	1.44	1.94	2.36	2.95	3.37	3.95
	Min. Drift Dia. (in)	1.38	1.88	2.30	2.89	3.31	3.89
	Outside Diameter (in)	1.78	2.38	2.82	3.51	3.99	4.69
	Wall Thickness (in)	0.17	0.22	0.23	0.28	0.31	0.37
	T&C Coupled Weight (lbs/ft)	0.85	1.39	1.77	2.62	3.33	4.56
	IJ Weight (lbs/ft)	0.78	1.34	1.70	2.52	—	4.44
	Joint Length (ft)	30 Nom. API Range 2, 28 to 32					
Joining System	T&C Collar O.D. (in) (3)	2.80	3.40	4.00	4.80	5.25	6.10
	IJ Box O.D. (in) (3)	2.70	3.40	4.00	4.70	—	6.20
	Pin Upset O.D. (in)	2.15	2.60	3.10	3.75	4.25	4.80
	Thread size (in)	1.90	2-3/8	2-7/8	3-1/2	4	4-1/2
	Thread Length (in)	2.36	2.94	3.25	3.50	4.00	4.38
	Make-up Length Loss (in/jt)	2.11	2.69	3.00	3.25	3.75	4.13
	Thread type (4)	EUE 1ORD	EUE 8RD	EUE 8RD	EUE 8RD	EUE 8RD	EUE 8RD
Moduli	Hoop (psi x 10^6)	4.0	4.5	4.5	4.6	4.6	5.0
	Axial (psi x 10^6)	3.0	3.1	3.1	2.9	3.0	2.9
	Poisson's Ratio (minor)	0.31	0.25	0.24	0.25	0.24	0.22

Dimensions, Specifications, and Physical Properties of Star® Fiberglass Tubing Manufactured by Fiber Glass Systems, Inc., San Antonio and Big Spring, Texas (Operating Temperature 200°F)**

2500 DHT*

Size	Nominal (in)	1-1/2	2-3/8	2-7/8	3-1/2	4	4-1/2
Pressure	Rating (psi) (1)	2500	2500	2500	2500	2500	2500
	Star Ultimate (psi) (2)	5,100	5,600	4,500	4,100	3,900	3,900
	ASTM Ultimate D-1599 (2)	8,600	8,600	7,600	6,600	7,000	6,800
Tensile	Rating (lbs) (1)	10,000	17,000	22,000	30,000	40,000	55,000
	Star Ultimate (lbs) (2)	25,000	47,000	60,000	80,000	90,000	110,000
Collapse	Rating (psi) (1)	3,300	3,300	3,000	2,600	2,700	2,700
	ASTM Ultimate D-2924	6,700	6,800	6,100	5,200	5,600	5,400
Nominal Pipe Dimensions	Inside Diameter (in)	1.44	1.94	2.36	2.95	3.37	3.95
	Min. Drift Dia. (in)	1.38	1.88	2.30	2.89	3.31	3.89
	Outside Diameter (in)	1.85	2.50	2.95	3.58	4.14	4.81
	Wall Thickness (in)	0.21	0.28	0.30	0.31	0.39	0.43
	T&C Coupled Weight (lbs/ft)	1.02	1.76	2.25	2.97	4.13	5.34
	IJ Weight (lbs/ft)	0.96	1.71	2.20	2.87	—	5.26
	Joint Length (ft)	30 Nom. API Range 2, 28 to 32					
Joining System	T&C Collar O.D. (in) (3)	2.90	3.60	4.20	5.10	5.55	6.40
	IJ Box O.D. (in) (3)	2.80	3.50	4.20	4.90	—	6.50
	Pin Upset O.D. (in)	2.15	2.60	3.10	3.75	4.25	4.80
	Thread size (in)	1.90	2-3/8	2-7/8	3-1/2	4	4-1/2
	Thread Length (in)	2.36	2.94	3.25	3.50	4.00	4.38
	Make-up Length Loss (in/jt)	2.11	2.69	3.00	3.25	3.75	4.13
	Thread type (4)	EUE 1ORD	EUE 8RD	EUE 8RD	EUE 8RD	EUE 8RD	EUE 8RD
Moduli	Hoop (psi x 10^6)	4.0	4.7	4.8	4.5	4.8	5.0
	Axial (psi x 10^6)	3.2	2.9	2.9	3.0	2.9	3.0
	Poisson's Ratio (minor)	0.30	0.24	0.24	0.25	0.23	0.21

***Notes**

1. **Ratings -** All ratings are maximum operating limits. Exceeding these limits will void the warranty on Star pipe.
2. **Ultimates -** Star uses an extended test period to determine ultimate values for pressure and tensile. There is a significant increase in these factors if the ASTM test method is employed. The typical mode of failure for pressure is a weep and for tensile it is an across the joint shear.
3. **Collars -** Smaller O.D. collars available upon request, subject to application approval. Any order for integral joint product may include up to 15% threaded and coupled pipe.
4. **Threads -** EUE 1ORD and EUE 8RD threads conform to API 5B Table 2.6a (L4 is minimum). O.D. 8RD casing threads conform to API 5B Table 2.3 (L4 is minimum).
5. **Thermal Properties -** Coef. of thermal conductivity 2.5 BTU in./HR/SQ FT/DEG.F. (3,1 cal.cm/hr/cm^2 /deg c); Coef. of thermal expansion (axial) 8.7 x 10^{-6} IN/IN/DEG.F. (1,7 cm/cm/deg c).
6. **Flow Factors -** HazenWilliams c = 150; Effective Roughness 0.00006 in.
7. **Physical Properties -** Density (lbs/cu.in) 122; Density (kgs/cu.cm) 3,38; Specific gravity 1.96.

**Data reprinted from Star® Fiber Glass Systems, Inc., literature dated January 1, 1993.

Specifications of Fiberglass Tubing Manufactured by the Tubular Fiberglass Company, Houston, Texas

	2-3/8	2-7/8	3-1/2	4-1/2
Red Box 1250				
OD (inches)	2.24	2.79	3.38	4.47
ID (inches)	2.00	2.50	3.00	4.00
Wall Thickness (inches)	0.12	0.15	0.18	0.24
Box OD (inches) max.	3.35	3.88	4.68	5.67
Weight (lb/ft)	0.8	1.2	1.8	2.9
Internal Pressure Rating (psi)	1,250	1,250	1,250	1,250
Collapse Pressure Rating (psi)	900	900	900	900
Joint Tensile Pating (lbs)	11,900	18,100	26,800	47,200
8rd Thread Type	2-3/8 EUE Long	2-7/8 EUE Long	3-1/2 EUE Long	4-1/2 EUE Long
Red Box 1500				
OD (inches)	2.29	2.85	3.44	4.57
ID (inches)	2.00	2.50	3.00	4.00
Wall Thickness (inches)	0.15	0.18	0.22	0.29
Box OD (inches) max.	3.35	3.88	4.66	5.67
Weight (lbslft)	1.0	1.4	2.0	3.4
Internal Pressure Rating (psi)	1,500	1,500	1,500	1,500
Collapse Pressure Rating (psi)	1,500	1,500	1,500	1,500
Joint Tensile Rating (lbs)	14,600	22,300	32,900	47,800
8rd Thread Type	2-3/8 EUE Long	2-7/8 EUE Long	3-1/2 EUE Long	4-1/2 EUE Long
Red Box 2000				
OD (inches)	2.40	2.97	3.60	4.78
ID (inches)	2.00	2.50	3.00	4.00
Wall Thickness (inches)	0.20	0.24	0.30	0.39
Box OD (inches) max.	3.35	3.88	4.66	5.67
Weight (lbs/ft)	1.3	1.8	2.7	4.6
Internal Pressure Rating (psi)	2,000	2,000	2,000	2,000
Collapse Pressure Rating (psi)	2,600	2,600	2,600	2,600
Joint Tensile Rating (lbs)	18,300	24,900	33,200	47,800
8rd Thread Type	2-3/8 EUE Long	2-7/8 EUE Long	3-1/2 EUE Long	4-1/2 EUE Long

Specifications of Fiberglass Tubing Manufactured by the Tubular Fiberglass Company, Houston, Texas

	2-3/8	2-7/8	3-1/2	4-1/2
Red Box 2500				
OD (inches)	250	3.11	3.77	5.01
ID (inches)	2.00	2.50	3.00	4.00
Wall Thickness (inches)	0.25	0.31	0.38	0.51
Box OD (inches) max.	3.35	3.88	4.68	5.67
Weight (lb/ft)	1.6	2.3	3.4	5.9
Internal Pressure Rating (psi)	2,500	2,500	2,500	2,500
Collapse Pressure Rating (psi)	3,300	3,300	3,300	3,300
Joint Tensile Rating (lbs)	16,300	24,900	33,200	47,800
8rd Thread Type	2-3/8 EUE Long	2-7/8 EUE Long	3-1/2 EUE Long	4-1/2 EUE Long
Red Box 3000				
OD (inches)	2.63	3.25	3.95	
ID (inches)	2.00	2.50	3.00	
Wall Thickness (inches)	0.32	0.39	0.47	
Box OD (inches) max.	3.35	3.88	4.66	—
Weight (lb/ft)	1.9	2.9	4.3	
Internal Pressure Rating (psi)	3,000	3,000	3,000	
Collapse Pressure Rating (psi)	4,000	4,000	4,000	
Joint Tensile Rating (lbs)	18,300	24,900	33,200	
8rd Thread Type	2-3/8 EUE Long	2-7/8 EUE Long	3-1/2 EUE Long	

Recommended Tubing Joint Make-Up Torque

Values shown are applicable to standard couplings with standard box OD and are based on use of an API modified-type thread lubricant according to API Bulletin 5A2. Other thread lubricants might require correction factors for make-up torque. Contact manufacturers of premium threads for their recommendations.

Tubing Make-Up Torque Guide Non-Upset
Recommended Make-Up Torque*

OD (in.)	OD (mm)	Weight (lb/ft)	Grade	Torque (ft-lb) (kg-m) Minimum		Optimum		Maximum	
1.050	26,7	1.14	H-40	110	15	140	20	180	25
			J-55	140	20	180	25	230	32
			C-75	170	24	230	32	290	40
			N-80	190	26	250	35	310	43
1.315	3,4	1.70	H-40	160	22	210	29	260	36
			J-55	200	28	270	37	340	47
			C-75	270	37	360	50	450	62
			N-80	290	40	380	53	480	66
1.660	2,2	2.30	H-40	200	28	270	37	340	47
			J-55	260	36	350	48	440	61
			C-75	350	48	460	64	580	80
			N-80	370	51	490	68	610	84
1.900	3,3	2.75	H-40	240	33	320	44	400	55
			J-55	310	43	410	57	500	69
			C-75	410	57	540	75	680	94
			N-80	430	59	570	79	700	97
2.375	60,3	4.00	H-40	350	50	470	65	590	80
			J-55	460	65	610	85	760	105
			C-75	600	55	800	110	1000	140
			N-80	640	90	850	120	1060	145
		4.60	H-40	420	60	560	75	700	95
			J-55	550	75	730	100	910	125
			C-75	720	100	960	135	1200	165
			N-80	770	105	1020	140	1280	175
			P-105	960	135	1280	175	1600	220
		5.80	C-75	1040	145	1380	190	1730	240
			N-80	1100	150	1460	200	1830	255
			P-105	1380	190	1840	255	2300	320
2.875	3,0	6.40	H-40	600	85	800	110	1000	140
			J-55	790	110	1050	145	1310	180
			C-75	1040	145	1380	190	1730	240
			N-80	1100	150	1470	205	1840	255
			P-105	1390	190	1850	255	2310	320
		8.60	C-75	1570	215	2090	290	2600	360
			N-80	1660	230	2210	305	2760	380
			P-105	2090	290	2790	385	3490	485

* Data reprinted from API Bulletin RP5C1. "Recommended Practice for Care and Use of Casing, Tubing, and Drill Pipe," Twelfth Edition, March, 1981.

Non-Upset
Recommended Make-Up Torque*

OD (in.)	OD (mm)	Weight (lb/ft)	Grade	Torque (ft-lb) (kg-m) Minimum		Optimum		Maximum	
3.500	88,9	7.70	H-40	690	95	920	125	1150	160
			J-55	910	125	1210	165	1510	210
			C-75	1200	165	1600	220	2000	275
			N-80	1280	175	1700	235	2130	295
		9.20	H-40	840	115	1120	155	1400	195
			J-55	1110	155	1480	205	1850	255
			C-75	1460	200	1950	270	2440	335
			N-80	1550	215	2070	285	2590	360
			P-105	1970	270	2620	360	3280	455
		10.20	H-40	980	135	1310	180	1640	225
			J-55	1290	180	1720	240	2150	295
			C-75	1700	235	2270	315	2840	395
			N-80	1810	250	2410	335	3010	415
		12.70	C-75	2270	315	3030	420	3790	525
			N-80	2410	335	3210	445	4010	555
			P-105	3050	420	4060	560	5080	700
4.000	101,6	9.50	H-40	710	100	940	130	1180	165
			J-55	930	130	1240	170	1550	215
			C-75	1230	170	1640	225	2050	285
			N-80	1310	180	1740	240	2180	300
4.500	114,3	12.60	H-40	990	135	1320	185	1650	230
			J-55	1310	180	1740	240	2180	300
			C-75	1730	240	2300	320	2880	400
			N-80	1830	255	2440	335	3050	420

* Data reprinted from API Bulletin RP5C1. "Recommended Practice for Care and Use of Casing, Tubing, and Drill Pipe," Twelfth Edition, March, 1981.

External Upset
Recommended Make-Up Torque*

OD (in.)	OD (mm)	Weight (lb/ft)	Grade	Torque (ft-lb) (kg-m) Minimum		Optimum		Maximum	
1,050	26,7	1.20	H-40	350	50	460	65	580	80
			J-55	450	60	600	85	750	105
			C-75	590	80	780	110	980	135
			N-80	620	85	830	115	1040	145
1.315	33,4	1.80	H-40	330	45	440	60	550	75
			J-55	430	60	570	80	710	100
			C-75	560	75	740	100	930	130
			N-80	590	80	790	110	990	135
1.660	42,2	2.40	H-40	400	55	530	75	660	90
			J-55	520	70	690	95	860	120
			C-75	680	95	910	125	1140	160
			N-80	720	100	960	135	1200	165
1.900	48,3	2.90	H-40	500	70	670	95	840	115
			J-55	660	90	880	120	1100	150
			C-75	860	120	1150	160	1440	200
			N-80	920	125	1220	170	1530	210
2.375	60,3	4.70	H-40	740	100	990	135	1240	170
			J-55	970	135	1290	180	1610	225
			C-75	1280	175	1700	235	2130	295
			N-80	1350	185	1800	250	2250	310
			P-105	1700	235	2270	315	2840	395
		5.95	C-75	1590	220	2120	295	2650	365
			N-80	1680	230	2240	310	2800	385
			P-105	2120	295	2830	390	3540	490
2.875	73,0	6.50	H-40	940	130	1250	175	1560	215
			J-55	1240	170	1650	230	2060	285
			C-75	1630	225	2170	300	2710	375
			N-80	1730	240	2300	320	2880	400
			P-105	2180	300	2910	400	3640	505
		8.70	C-75	2140	295	2850	395	3560	490
			N-80	2270	315	3020	420	3780	525
			P-105	2860	395	3810	525	4760	660
3.500	88,9	9.30	H-40	1300	180	1730	240	2160	300
			J-55	1710	235	2280	315	2850	395
			C-75	2260	315	3010	415	3760	520
			N-80	2400	330	3200	445	4000	555
			P-105	3040	420	4050	560	5060	700

* Data reprinted from API Bulletin RP5C1. "Recommended Practice for Care and Use of Casing, Tubing, and Drill Pipe," Twelfth Edition, March, 1981.

External Upset
Recommended Make-Up Torque*

OD (in.)	OD (mm)	Weight (lb/ft)	Grade	Torque (ft-lb) (kg-m) Minimum		Optimum		Maximum	
3.500	88,9	12.95	C-75	3030	420	4040	560	5050	700
			N-80	3220	445	4290	595	5360	740
			P-105	4070	365	5430	750	6790	940
4.000	101,6	11.00	H-40	1460	200	1940	270	2430	335
			J-55	1920	265	2560	355	3200	445
			C-75	2540	350	3390	470	4240	585
			N-80	3420	175	4560	630	5700	790
4.500	114,3	12.75	H-40	1620	225	2160	300	2700	375
			J-55	2150	295	2860	395	3180	440
			C-75	2840	395	3780	525	4730	655
			N-80	3020	420	4020	555	5030	695

* Data reprinted from API Bulletin RP5C1. "Recommended Practice for Care and Use of Casing, Tubing, and Drill Pipe," Twelfth Edition, March, 1981.

Integral Joint
Recommended Make-Up Torque*

OD (in.)	OD (mm)	Weight (lb/ft)	Grade	Torque (ft-lb) (kg-m) Minimum		Optimum		Maximum	
1.315	33,4	1.72	H-40	230	30	310	45	390	55
			J-55	300	40	400	55	500	70
			C-75	390	55	520	70	650	90
			N-80	410	55	550	75	690	95
1.660	42,2	2.10 & 2.33	H-40	280	40	380	55	480	65
			J-55	380	55	500	70	630	85
		2.33	C-75	490	70	650	90	810	110
			N-80	620	70	690	95	860	120
1.900	48,3	2.40 & 2.76	H-40	340	45	450	69	560	75
			J-55	440	60	580	80	730	100
		2.76	C-75	570	80	760	105	950	110
			N-80	610	85	810	110	1010	140
2.063	52,4	3.25	H-40	430	60	570	80	710	100
			J-55	560	75	740	100	920	125
			C-75	730	100	970	135	1210	165
			N-80	770	910	1030	142	1290	180

* Data reprinted from API Bulletin RP5C1. "Recommended Practice for Care and Use of Casing, Tubing, and Drill Pipe," Twelfth Edition, March, 1981.

Atlas Bradford IJ-3SS/DSS
Connection Torque Values

Size	Nominal	J-55/C-75		L-80/P-105	
O.D.	Weight	Min.	Max.	Min.	Max.
in.	ft-lbs	ft-lbs	ft-lbs	ft-lbs	ft-lbs
2-3/8	4.70	1000	1300	1200	1700
	5.30	1100	1400	1400	1900
	5.95	1300	1600	1600	2200
	6.20	1500	1800	1800	2400
	7.70	1800	2100	2000	2600
2-7/8	6.50	1300	1600	1800	2500
	7.90	1400	1700	2600	3400
	8.70	1600	1900	3000	4000
	8.90	1600	1900	3000	4000
	9.50	2100	2800	3500	4300
	10.40	2100	2800	3500	4300
	11.00	2500	3200	4000	4800
	11.65	2700	3400	4500	5300
3-1/2	9.30	2100	2600	2400	3400
	10.30	2200	2700	2800	3800
	12.80	2500	3000	3200	4200
	12.95	2500	3000	3500	4600
	15.50	2800	3400	4200	5200
	15.80	2800	3400	4500	5800
	16.70	2900	3600	4500	5800
4	9.50	2100	2500	2400	2800
	11.00	2300	2800	2500	3000
	11.60	2500	3100	2800	3700
	13.40	2500	3100	2800	3700
	22.50	2900	3500	3400	4300
4-1/2	12.75	2400	2900	3000	3600
	13.50	2400	2900	3000	3600
	15.50	2700	3200	3300	3900
	16.90	2800	3300	3400	4000
	19.20	3000	3500	3700	4300
	21.60	3100	3600	3900	4500

Atlas Bradford Premium Connections is a product line produced by Grant TFW™. Data reprinted from Grant TFW™ 1993 Catalog.

Atlas Bradford ST-C and CST-C Make-Up Torque

Size	Nominal	J-55		L-80/N-80		P-110	
O.D.	Weight	Min.	Max.	Min.	Max.	Min.	Max.
in.	lbs/ft	ft-lbs	ft-lbs	ft-lbs	ft-lbs	ft-lbs	ft-lbs
3/4	1.20	200	250	300	375	300	375
	1.50	200	250	300	375	300	375
1	1.80	300	375	400	500	400	500
	2.25	300	375	400	500	400	500
1-1/4	2.40	400	500	600	750	600	750
	3.02	400	500	600	750	600	750
1-1/2	2.90	600	750	800	1000	800	1000
	3.64	600	750	800	1000	800	1000
2-1/16	3.25	700	875	900	1125	900	1125
	4.50	700	875	900	1125	900	1125
2-3/8	4.70	1100	1375	1500	1875	1500	1875
	5.30	1100	1375	1500	1875	1500	1875
2-7/8	6.50	1500	1875	2100	2625	2100	2625
3-1/2	9.30	2500	3125	3000	3750	3000	3750
	10.30	2500	3125	3000	3750	3000	3750
4	11.00	3000	3750	3500	4375	3500	4375
4-1/2	12.75	3500	4375	4500	5625	4500	5625
	13.50	3500	4375	4500	5625	4500	5625

Note: The torque values listed are recommended. The actual torque required can be affected by field conditions such as temperature, thread compound, speed of makeup, weather conditions, etc.

Atlas Bradford ST-P and CST-P Make-Up Torque

Size	Nominal	L-80/N-80		P-110	
O.D.	Weight	Min.	Max.	Min.	Max.
in.	ft-lbs	ft-lbs	ft-lbs	ft-lbs	ft-lbs
2-3/8	5.95	2200	2800	2700	3400
	6.20	2200	2800	2700	3400
	7.70	2200	2800	2700	3400
2-7/8	7.90	3000	3800	3500	4400
	8.70	3000	3800	3500	4400
	9.50	4500	5700	5500	6900
3-1/2	12.95	5500	6900	7000	8800
	15.80	5500	6900	7000	8800
4	13.40	5500	6900	7000	8800
4-1/2	15.50	6000	7500	7500	9400
	19.20	7500	9400	9500	11900

Note: The torque values listed are recommended. The actual torque required can be affected by field conditions such as temperature, thread compound, speed of makeup, weather conditions, etc.

Atlas Bradford Premium Connections is a product line produced by Grant TFW™. Data reprinted from Grant TFW™ 1993 Catalog.

Atlas Bradford TC-4S
Make-Up Torque

Size	Nominal	L-80/P-105	
O.D.	Weight	Min.	Max.
in.	ft-lbs	ft-lbs	ft-lbs
2-3/8	4.70	1200	1400
	5.30	1500	1750
	5.95	1800	2050
	6.20	1800	2100
	7.70	1900	2200
2-7/8	6.50	1400	1650
	7.90	2000	2300
	8.70	2400	2800
	9.50	2400	2800
	11.00	2800	3300
	11.65	3000	3500
3-1/2	9.30	2100	2450
	10.30	2600	3050
	12.95	3400	4000
	15.80	4000	4700
	16.70	4000	4700
	17.05	4000	4700
4	11.00	2300	2700
	13.40	3600	4200
	19.00	5500	6500
4-1/2	12.75	3600	4200
	13.50	4000	4700
	15.50	4200	4900
	16.90	4800	5600
	19.20	5800	6800
	21.60	6000	7000

Atlas Bradford Premium Connections is a product line produced by Grant TFW™. Data reprinted from Grant TFW™ 1993 Catalog.

Atlas Bradford IJ-4S
Make-Up Torque[1]

OD (in)	Weight (lb/ft)	Torque Grade J-55	Torque Grade C-75 & N-80	Torque Grade P-105
2-3/8	4.7	1100	1300	1500
	5.3	1300	1500	1700
	5.95	1500	1700	1900
	6.2	1700	1900	2100
	7.7	2000	2200	2400
2-7/8	6.5	1600	1800	2200
	7.9	2200	2600	3000
	8.7	2600	3000	3500
	9.5	3000	3500	4000
	11.0	3600	4000	4400
	11.65	4000	4500	5000
3-1/2	9.3	2200	2600	3000
	10.3	2600	3000	3500
	12.95	3000	3500	4000
	15.8	4000	4500	5000
	16.7	4500	5000	5500
4	11.0	2400	2800	3200
	13.4	3200	3600	4000
	22.5	4000	4500	5000
4-1/2	12.75	2500	3000	3500
	13.5	3000	3500	4000
	15.5	3500	4000	4500
	16.9	4000	4500	5000
	19.2	4500	5000	5500
	21.6	5000	1 5500	6000

[1] Maximum torque is 125% of minimum.

Atlas Bradford Premium Connections is a product line produced by Grant TFW™.

BAKER OIL TOOLS
A Baker Hughes company

Atlas Bradford FL-4S Make-Up Torque

Size	Plain End	J-55/K-55		L-80/N-80		P-110	
O.D.	Weight	Min.	Max.	Min.	Max.	Min.	Max.
in.	lbs/ft	ft-lbs	ft-lbs	ft-lbs	ft-lbs	ft-lbs	ft-lbs
2-3/8	4.43	400	500	500	600	550	650
	5.75	400	500	500	600	600	700
2-7/8	6.16	600	700	800	900	800	1000
	7.66	600	700	800	900	800	1000
3-1/2	7.58	900	1000	1100	1300	1150	1350
	8.81	900	1000	1400	1600	1600	1800
	9.91	1000	1200	1400	1600	1600	1800
	12.52	1300	1500	1500	1700	1700	1900
4	9.11	1100	1400	1300	1500	1400	1600
	10.46	1200	1500	1400	1600	1400	1750
	11.34	1300	1600	1600	1900	2200	2600
4-1/2	9.40	1800	2300	1800	2300	1800	2400
	10.23	1800	2300	1800	2300	1800	2400
	10.79	1800	2300	2200	2800	2300	3000
	11.35	2100	2600	2200	2900	2300	3100
	12.24	2100	2600	2200	3000	2400	3300
	13.04	2200	2700	2300	3100	2800	3400
5	11.23	1200	1800	1200	1800	1200	1800
	12.83	1200	1800	1200	1800	1200	1800
	14.87	3000	3600	3000	3900	3600	4300
	17.93	3000	3600	3100	3700	3600	4300
5-1/2	13.70	1900	2400	1900	2500	1900	2500
	15.35	2300	2700	2800	3400	3100	3600
	1 6.87	2400	2900	3000	3600	4000	4600
	19.81	2800	3300	3400	4100	4400	5200
	22.54	2900	3400	4400	5200	4600	5600

Atlas Bradford Premium Connections is a product line produced by Grant TFW™. Data reprinted from Grant TFW™ 1993 Catalog.

Atlas Bradford ST-L Make-Up Torque

Size	Nominal	J-55/K-55		L-80/Q-125	
O.D.	Weight	Min.	Max.	Min.	Max.
in.	ft-lbs	ft-lbs	ft-lbs	ft-lbs	ft-lbs
2-3/8	4.43	400	600	500	700
	5.75	600	800	800	1000
2-7/8	6.16	600	800	800	1000
	7.66	800	1000	1000	1400
	8.44	1000	1200	1100	1500
3-1/ 2	8.81	1050	1350	1400	1800
	9.91	1050	1350	1400	1800
	12.52	1600	2000	2000	2600
	15.37	2000	2600	2500	3300
4	9.11	1000	1200	1200	1600
	10.46	1150	1450	1400	1800
	11.34	1200	1600	1600	2000
	12.93	1450	1900	1800	2400
4-1/2	9.40	900	1100	1100	1500
	10.23	950	1250	1200	1600
	10.79	1150	1450	1400	1800
	11.35	1150	1450	1500	1900
	12.24	1300	1700	1700	2100
	13.04	1400	1800	1800	2400
	14.98	1700	2100	2200	2800

Atlas Bradford Premium Connections is a product line produced by Grant TFW™. Data reprinted from Grant TFW™ 1993 Catalog.

Extreme Line Recommended Make-Up Torque*

OD		Weight		Torque (ft-lb) *(kg-m)*			
(in.)	*(mm)*	(lb/ft)	Grade	Optimum		Maximum	
2.375	*60,3*	4.70 & 5.95	J-55	1700	*235*	2300	*320*
			N-80	1700	*235*	2800	*385*
			P-105	1700	*235*	3300	*455*
2.875	*73,0*	6.5 & 8.7	J-55	2100	*290*	2600	*360*
			N-80	2100	*290*	3100	*430*
			P-105	2100	*290*	3600	*500*
3.500	*88,9*	9.3 & 12.95	J-55	2400	*330*	3000	*415*
			N-80	2400	*330*	3500	*485*
			P-105	2400	*330*	4000	*555*

* Data reprinted from API Bulletin RP5C1. "Recommended Practice for Care and Use of Casing, Tubing, and Drill Pipe," Twelfth Edition, March, 1981.

Hydril CS and A-95
Minimum Make-Up Torque*

OD (in.)	*(mm)*	Weight (lb/ft)	Torque (ft-lb) *(kg-m)* Grade J-55	*(kg-m)*	Torque (ft-lb) *(kg-m)* Grade L-80, N-80 & P-110	*(kg-m)*
1.050	*26,7*	1.2 & 1.5	200	*30*	300	*40*
1.315	*33,4*	1.8 & 2.25	300	*40*	400	*55*
1.660	*42,2*	2.4, 3.02 & 3.24	400	*55*	600	*85*
1.900	*48,3*	2.9, 3.64 & 4.19	600	*85*	800	*110*
2.063	*52,4*	3.25 & 4.50	700	*95*	900	*125*
2.375	*60,3*	4.7 & 5.3	1100	*150*	1500	*205*
2.875	*73,0*	6.5	1500	*205*	2100	*290*
3.500	*88,9*	9.3 & 10.3	2500	*345*	3000	*415*
4.000	*101,6*	11.0	3000	*415*	3500	*485*
4.500	*114,3*	12.75 & 13.5	3500	*485*	4500	*620*

*Data reprinted from Hydril Bulletin No. 9204. Hydril recommends using a figure of 12-1/2% over minimum to ensure that minimum torque is obtained since many factors influence torque application. Torque should never exceed 25% over minimum.

Hydril CS (5" to 7" OD) Connection Minimum Make-Up Torque*

Important Note: Torque for these products should never exceed 15% over minimum.

OD (in.)	(mm)	Weight (lb/ft)	Torque (ft-lb) (kg-m) Grade J-55 K-55		Grade L-80 N-80		Grade P-110	
5	127,0	18.0	5000	690	6900	950	9200	1290
		20.3	5200	720	7100	980	9400	1320
		23.2	6900	950	9500	1330	12500	1750
		27.0	7300	1010	9900	1390	12900	1810
5-1/2	139,7	17.0	4200	580	5800	810	7700	1080
		20.0	6200	870	8500	1190	11200	1570
		23.0	6500	910	8800	1230	11600	1620
		26.0	8500	1190	11500	1610	15200	2130
		28.4	8800	1230	11900	1670	15600	2180
6-5/8	168,3	28.0	9800	1370	13600	1900	18200	2550
		32.0	10300	1440	14100	1970	18700	2620
		35.0	10700	1500	14500	2030	19100	2670
7	177,8	29.0	10800	1510	15000	2100	20200	2830
		32.0	11100	1550	15400	2160	20500	2870
		35.0	11500	1610	15800	2210	20900	2930
		38.0	14500	2030	19900	2790	26500	3710
		41.0	14900	2090	20400	2860	26900	3770

*Data reprinted from Hydril Bulletin No. 9204. Hydril recommends using a figure of 12-1/2% over minimum to ensure that minimum torque is obtained since many factors influence torque application.

Hydril PH-6
Minimum Make-Up Torque*

OD (in.)	OD (mm)	Weight (lb/ft)	Torque (ft-lb) (kg-m) Grade L-80 & N-80		Grade P-110	
2.375	60,3	5.95, 6.20 & 7.70	2200	305	2700	375
		7.9 & 8.7	3000	415	3500	485
2,875	73,0	9.5 & 10.7	4500	620	5500	760
3,500	88,9	12.95 & 15.8	5500	760	7000	970
4,000	101,6	13.4	5500	760	7000	970
		15.5	6000	830	7500	1035
4,500	114,3	19.2	7500	1035	9500	1315

Hydril PH-4
Minimum Make-Up Torque*

OD (in.)	OD (mm)	Weight (lb/ft)	Torque (ft-lb) (kg-m) Grade L-80 & N-80		Grade P-110	
2.875	73,0	11.0 & 11.65	5000	690	6500	900
		16.7	7500	1035	9500	1315
3.500	88,9	17.05	8000	1105	10000	1385
		19.0	8500	1175	10500	1450
4.000	101,6	22.5	9500	1315	11500	1590
		21.6	9500	1315	12000	1660
4.500	114,3	24.0	10000	1385	13000	1800
		26.5	11500	1590	14500	2005

*Data reprinted from Hydril Bulletin No. 9204. Hydril recommends using a figure of 12-1/2% over minimum to ensure that minimum torque is obtained since many factors influence torque application. Torque should never exceed 25% over minimum.

MANNESMANN TDS TUBING
RECOMMENDED MAKE-UP TORQUES

CARBON STEEL

OD (in) *(mm)*	WT. (lb/ft)	SMYS 1000 psi	MAKE-UP TORQUE							
			REGULAR COUPLING				SPECIAL CLEARANCE			
			minimum		maximum		minimum		maximum	
			(FT-LB)	*(Nm)*	(FT-LB)	*(Nm)*	(FT-LB)	*(Nm)*	(FT-LB)	*(Nm)*
		55	740	1000	920	1250	440	600	590	800
		75	890	1200	1100	1500	590	800	740	1000
		80	1000	1350	1220	1650	660	900	810	1100
	4.60	85	1020	1380	1240	1680	700	950	850	1150
		90	1030	1400	1250	1700	740	1000	890	1200
		95	1070	1450	1330	1800	810	1100	960	1300
2-3/8		105 & 110	1100	1500	1400	1900	850	1150	1030	1400
		55	810	1100	960	1300	440	600	590	800
60,3		75	1100	1500	1330	1800	590	800	740	1000
		80	1180	1600	1400	1900	660	900	810	1100
	5.80	85	1220	1650	1480	2000	700	950	850	1150
		90	1250	1700	1550	2100	740	1000	890	1200
		95	1330	1800	1620	2200	810	1100	960	1300
		105 & 110	1480	2000	1840	2500	850	1150	1030	1400
		55	1100	1500	1330	1800	770	1050	960	1300
		75	1330	1800	1550	2100	960	1300	1180	1600
		80	1360	1850	1700	2300	1000	1350	1220	1650
	6.40	85	1420	1930	1770	2400	1040	1410	1290	1750
		90	1480	2000	1840	2500	1070	1450	1360	1850
		95	1550	2100	1920	2600	1110	1500	1400	1900
		105 & 110	1770	2400	2210	3000	1250	1700	1550	2100
		55	1290	1750	1620	2200	770	1050	960	1300
2-7/8		75	1620	2200	1990	2700	960	1300	1220	1650
		80	1660	2250	2070	2800	1000	1350	1250	1700
73,0	7.80	85	1750	2370	2180	2960	1060	1440	1330	1800
		90	1840	2500	2290	3100	1110	1500	1400	1900
		95	1920	2600	2360	3200	1180	1600	1480	2000
		105 & 110	2070	2800	2660	3600	1330	1800	1700	2300
		55	1440	1950	1840	2500	810	1100	1030	1400
		75	1840	2500	2210	3000	1000	1350	1250	1700
		80	1920	2600	2360	3200	1030	1400	1290	1750
	8.60	85	2030	2750	2510	3400	1110	1500	1390	1880
		90	2140	2900	2660	3600	1180	1600	1480	2000
		95	2210	3000	2730	3700	1250	1700	1550	2100
		105 & 110	2360	3200	2950	4000	1400	1900	1770	2400
		55	1920	2600	2210	3000	1360	1850	1700	2300
		75	2140	2900	2730	3700	1620	2200	2070	2800
		80	2360	3200	2950	4000	1730	2350	2140	2900
3-1/2	9.20	85	2400	3250	3030	4110	1790	2430	2200	3010
88,9		90	2430	3300	3100	4200	1840	2500	2290	3100
		95	2660	3600	3320	4500	1920	2600	2360	3200
		105 & 110	2950	4000	3690	5000	2210	3000	2730	3700

Data provided by Mannesmann.

BAKER OIL TOOLS
A Baker Hughes company

MANNESMANN TDS TUBING
RECOMMENDED MAKE-UP TORQUES

CARBON STEEL

OD (in) *(mm)*	WT. (lb/ft)	SMYS 1000 psi	MAKE-UP TORQUE							
			REGULAR COUPLING				SPECIAL CLEARANCE			
			minimum		maximum		minimum		maximum	
			(FT-LB)	*(Nm)*	(FT-LB)	*(Nm)*	(FT-LB)	*(Nm)*	(FT-LB)	*(Nm)*
3-1/2 *88,9*	10.20	55	2140	2900	2430	3300	1480	2000	1840	2000
		75	2360	3200	3020	4100	1770	2400	2210	3000
		80	2580	3500	3250	4400	1840	2500	2290	3100
		85	2620	3550	3320	4500	1880	2550	2360	3200
		90	2660	3600	3390	4600	1920	2600	2430	3300
		95	2880	3900	3610	4900	1990	2700	2510	3400
		105 & 110	3320	4500	4200	5700	2290	3100	2880	3900
	12.70	55	2360	3200	2660	3600	1660	2250	2100	2850
		75	2880	3900	3610	4900	1990	2700	2510	3400
		80	2950	4000	3690	5000	2070	2800	2580	3500
		85	3210	4350	4060	5500	2140	2900	2660	3610
		90	3470	4700	4430	6000	2210	3000	2730	3700
		95	3690	5000	4650	6300	2290	3100	2800	3800
		105 & 110	4500	6100	5610	7600	2660	3600	3320	4500
4 *101,6*	10.80	55	2290	3100	2800	3800	1620	2200	1990	2700
		75	2580	3500	3250	4400	1840	2500	2360	3200
		80	2730	3700	3390	4600	1990	2700	2510	3400
		85	2880	3900	3620	4910	2070	2810	2590	3510
		90	3020	4100	3840	5200	2140	2900	2660	3600
		95	3170	4300	3980	5400	2290	3100	2800	3800
		105 & 110	3540	4800	4420	6000	2580	3500	3250	4400
4-1/2 *114,3*	12.60	55	2660	3600	3320	4500	2660	3600	3320	4500
		75	3100	4200	3840	5200	3100	4200	3840	5200
		80	3170	4300	3910	5300	3170	4300	3910	5300
		85	3250	4410	4060	5500	3250	4410	4060	5500
		90	3320	4500	4200	5700	3320	4500	4200	5700
		95	3390	4600	4280	5800	3390	4600	4280	5800
		105 & 110	3980	5400	4940	6700	3980	5400	4940	6700
	13.50	55	2800	3800	3540	4800	2730	3700	3390	4600
		75	3320	4500	4200	5700	3170	4300	3980	5400
		80	3470	4700	4350	5900	3320	4500	4130	5600
		85	3660	4960	4570	6200	3470	4700	4320	5860
		90	3840	5200	4790	6500	3610	4900	4500	6100
		95	3980	5400	4940	6700	3690	5000	4570	6200
		105 & 110	4350	5900	5460	7400	4350	5900	5380	7300
	15.10	55	3390	4600	4200	5700	2800	3800	3470	4700
		75	3840	5200	4790	6500	3390	4600	4280	5800
		80	4060	5500	5020	6800	3470	4700	4350	5900
		85	4200	5690	5240	7100	3620	4910	4540	6160
		90	4350	5900	5460	7400	3760	5100	4720	6400
		95	4500	6100	5610	7600	3840	5200	4790	6500
		105 & 110	4870	6600	6050	8200	4500	6100	5610	7600

Data provided by Mannesmann.

MANNESMANN TDS TUBING
RECOMMENDED MAKE-UP TORQUES

13% chromium steel MW Cr 13

OD (in) *(mm)*	WT. (lb/ft)	GRADE	MAKE-UP TORQUE							
			REGULAR COUPLING				SPECIAL CLEARANCE			
			minimum		maximum		minimum		maximum	
			(FT-LB)	*(Nm)*	(FT-LB)	*(Nm)*	(FT-LB)	*(Nm)*	(FT-LB)	*(Nm)*
	4.60	MW Cr 13-80	1000	1350	1220	1650	660	900	810	1100
2-3/8	5.80		1110	1500	1400	1900	660	900	810	1100
	4.60	MW Cr 13-95	1070	1450	1330	1800	770	1050	960	1300
60,3	5.80		1330	1800	1620	2200	770	1050	960	1300
	6.40		1360	1850	1700	2300	1000	1350	1220	1650
2-7/8	7.80	MW Cr 13-80	1660	2250	2070	2800	1000	1350	1250	1700
	8.60		1920	2600	2360	3200	1030	1400	1290	1750
73,0	6.40		1550	2100	1920	2600	1110	1500	1400	1900
	7.80	MW Cr 13-95	1920	2600	2360	3200	1180	1600	1480	2000
	8.60		2210	3000	2730	3700	1250	1700	1550	2100
	9.20		2360	3200	2950	4000	1730	2350	2140	2900
3-1/2	10.20	MW Cr 13-80	2580	3500	3250	4400	1840	2500	2290	3100
	12.70		2950	4000	3690	5000	2070	2800	2580	3500
88,9	9.20		2660	3600	3320	4500	1920	2600	2360	3200
	10.20	MW Cr 13-95	2880	3900	3610	4900	1990	2700	2510	3400
	12.70		3690	5000	4650	6300	2290	3100	2800	3800
4	10.80	MW Cr 13-80	2730	3700	3390	4600	1990	2700	2510	3400
101,6	10.80	MW Cr 13-95	3170	4300	3980	5400	2290	3100	2800	3800
	12.60		3760	5100	4650	6300	3170	4300	3910	5300
	13.50	MW Cr 13-80	4130	5600	5240	7100	3320	4500	4130	5600
4-1/2	15.10		4600	6200	5750	7800	3390	4600	4280	5800
	12.60		4070	5520	5140	6970	3390	4600	4280	5800
114,3	13.50	MW Cr 13-95	4780	6480	5930	8040	3690	5000	4570	6200
	15.10		5220	7080	6550	8880	3760	5100	4720	6400

Data provided by Mannesmann.

New VAM® and VAM® ACE
Recommended Make-Up Torque*

BOX / PIN	NEW VAM NEW VAM M.S. (1)	VAM VAM ATAC	VAM AG VAM AF	NEW VAM S.C. VAM S.C. (2)
NEW VAM **NEW VAM M.S.** (1)	NEW VAM torque	NEW VAM torque	NEW VAM minimum torque ± 10 %	NEW VAM torque
VAM **VAM ATAC**	NEW VAM torque	NEW VAM torque	NEW VAM minimum torque ± 10 %	NEW VAM torque
VAM AG **VAM AF**	NEW VAM torque	NEW VAM torque	NEW VAM minimum torque ± 10 %	NEW VAM torque
NEW VAM S.C. **VAM S.C.** (2)	NEW VAM torque	NEW VAM torque	NEW VAM minimum torque ± 10 %	NEW VAM torque

(1) M.S. = Matched Strength (2) S.C. = Special Clearance

Example: *31/2"* - 9.20 - L80 VAM box and NEW VAM pin:
use 3250 ft.lb ± 10% i.e. min. : 2930 ft.lb
opt. : 3250 ft.lb
max.: 3570 ft.lb

Example: *31/2"* - 9.20 - L80 VAM AG box and NEW VAM pin:
use 2930 ft.lb ± 10%.

1. The reference value is the optimum make-up torque. Minimum and maximum are at minus and plus 10% of optimum. For ease of use, these have been listed in foot-pounds. These figures apply when using a thread compound with a friction correction factor equal to 1.0.
2. **NEW VAM** threads are compatible with the previous VAM, VAM ATAC, VAM AG & VAM AF connections. The following chart instructs which torque is applicable when previous products and NEW VAM are assembled together in the same string, on pipe or accessory connections.
3. **The VAM ACE thread is not compatible with any existing VAM product.**

Data reprinted from VAM literature dated October 1985.

Vallourec New VAM®
Recommended Make-Up Torque*

Size (O.D.)	Nominal Wt.	Wall Thickness	55 ksi			75-80-85 ksi			90-95-100 ksi			105-110-115 ksi			120-125-130 ksi			135-140 ksi			145-150-155 ksi		
			min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.
in. *mm.*	lb./ft.	in. *mm.*	ft.lb *m.kg*																				
	4.60	.190 *4,83*	1050	1160 *160*	1270	1440	1590 *220*	1740	1630	1810 *250*	1990	1830	2030 *280*	2230	2080	2310 *320*	2540	2280	2530 *350*	2780	2420	2680 *370*	2940
2-3/8	5.10	.218 *5,54*	1050	1160 *160*	1270	1440	1590 *220*	1740	1700	1880 *260*	2060	1890	2100 *290*	2310	2080	2310 *320*	2540	2280	2530 *350*	2780	2480	2750 *380*	3020
60,32	5.80	.254 *6,45*	1110	1230 *170*	1350	1500	1660 *230*	1820	1760	1950 *270*	2140	1960	2170 *300*	2380	2160	2390 *330*	2620	2340	2600 *360*	2860	2540	2820 *390*	3100
	6.40	.217 *5,51*	1570	1740 *240*	1910	2160	2390 *330*	2620	2540	2820 *390*	3100	2870	3180 *440*	3490	3190	3540 *490*	3890	3520	3910 *540*	4300	3780	4200 *580*	4620
2-7/8	7.70	.276 *7,01*	1700	1880 *260*	2060	2280	2530 *350*	2780	2610	2890 *400*	3170	3000	3330 *460*	3660	3330	3690 *510*	4050	3650	4050 *560*	4450	3910	4340 *600*	4770
73,02	8.60	.308 *7,82*	1890	2100 *290*	2310	2540	2820 *390*	3100	2930	3250 *450*	3570	3390	3760 *520*	4130	3780	4200 *580*	4620	4110	4560 *630*	5010	4430	4920 *680*	5410
	9.80	.362 *9,19*	2160	2390 *330*	2620	2930	3250 *450*	3570	3390	3760 *520*	4130	3850	4270 *590*	4690	4300	4770 *660*	5240	4690	5210 *720*	5730	5080	5640 *780*	6200
	7.70	.216 *5,49*	2080	2310 *320*	2540	2800	3110 *430*	3420	3260	3620 *500*	3980	3650	4050 *560*	4450	4110	4560 *630*	5010	4430	4920 *680*	5410	4760	5280 *730*	5800
	9.20	.254 *6,45*	2160	2390 *330*	2620	2930	3250 *450*	3570	3390	3760 *520*	4130	3850	4270 *590*	4690	4300	4770 *660*	5240	4630	5140 *710*	5650	4950	5500 *760*	6050
	10.20	.289 *7,34*	2420	2680 *370*	2940	3330	3690 *510*	4050	3850	4270 *590*	4690	4370	4850 *670*	5330	4880	5420 *750*	5960	5340	5930 *820*	6520	5740	6370 *880*	7000
3-1/2	12.70	.375 *9,53*	2870	3180 *440*	3490	3850	4270 *590*	4690	4430	4920 *680*	5410	5020	5570 *770*	6120	5670	6290 *870*	6910	6120	6800 *940*	7480	6510	7230 *1000*	7950
88,90	13.70	.413 *10,49*	3330	3690 *510*	4050	4500	4990 *690*	5480	5220	5790 *800*	6360	5930	6580 *910*	7230	6840	7590 *1050*	8340	7470	8300 *1150*	9130	7830	8700 *1200*	9570
	14.70	.449 *11,4*	3850	4270 *590*	4690	5280	5860 *810*	6440	5860	6510 *900*	7160	6840	7590 *1050*	8340	7470	8300 *1150*	9130	8150	9050 *1250*	9950	8780	9750 *1350*	10720
	15.80	.476 *12,09*	3910	4340 *600*	4770	5340	5930 *820*	6520	5860	6510 *900*	7160	6840	7590 *1050*	8340	7470	8300 *1150*	9130	8150	9050 *1250*	9950	8780	9750 *1350*	10720

Vallourec New VAM®
Recommended Make-Up Torque*

Size (O.D.)	Nominal Wt.	Wall Thickness	55 ksi			75-80-85 ksi			90-95-100 ksi			105-110-115 ksi			120-125-130 ksi			135-140 ksi			145-150-155 ksi		
			min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.
in. *mm.*	lb./ft.	in. *mm.*											ft.lb *m.kg*											
4 *101,6*	9.50	.226 *5,74*	2610	2890 *400*	3170	3590	3980 *550*	4370	4170	4630 *640*	5090	4690	5210 *720*	5730	5220	5790 *800*	6360	5670	6290 *870*	6910	6120	6800 *940*	7480
	10.90	.262 *6,65*	2740	3040 *420*	3340	3710	4120 *570*	4530	4300	4770 *660*	5240	4880	5420 *750*	5960	5400	6000 *830*	6600	5860	6510 *900*	7160	6320	7020 *970*	7720
	13.00	.330 *8,38*	3130	3470 *480*	3810	4300	4770 *660*	5240	4950	5500 *760*	6050	5600	6220 *860*	6840	6320	7020 *970*	7720	6840	7590 *1050*	8340	7470	8300 *1150*	9130
	14.80	.380 *9,65*	3910	4340 *600*	4770	5400	6000 *830*	6600	6250	6940 *960*	7630	7170	7960 *1100*	8750	8150	9050 *1250*	9950	8780	9750 *1350*	10720	9500	10500 *1450*	11500
	16.50	.430 *10,92*	4040	4480 *620*	4920	5480	6080 *840*	6680	6390	7090 *980*	7790	7170	7960 *1100*	8750	8150	9050 *1250*	9950	9150	10150 *1400*	11150	9850	10850 *1500*	11850
4-1/2 *114,3*	10.50	.224 *5,69*	3060	3400 *470*	3740	4040	4480 *620*	4920	4690	5210 *720*	5730	5280	5860 *810*	6440	5930	6580 *910*	7230	6390	7090 *980*	7790	6840	7590 *1050*	8340
	11.60	.250 *6,35*	3130	3470 *480*	3810	4170	4630 *640*	5090	4820	5350 *740*	5880	5400	6000 *830*	6600	6060	6730 *930*	7400	6510	7230 *1000*	7950	7170	7960 *1100*	8750
	12.60	.271 *6,88*	3190	3540 *490*	3890	4300	4770 *660*	5240	4950	5500 *760*	6050	5540	6150 *850*	6760	6190	6870 *950*	7550	6510	7230 *1000*	7950	7170	7960 *1100*	8750
	13.50	.290 *7,37*	3330	3690 *510*	4050	4430	4920 *680*	5410	5080	5640 *780*	6200	5740	6370 *880*	7000	6320	7020 *970*	7720	7170	7960 *1100*	8750	7470	8300 *1150*	9130
	15.10	.337 *8,56*	3780	4200 *580*	4620	5220	5790 *800*	6360	5990	6650 *920*	7310	6840	7590 *1050*	8340	7470	8300 *1150*	9130	8150	9050 *1250*	9950	8780	9750 *1350*	10720
	16.90	.380 *9,65*	4560	5060 *700*	5560	6250	6940 *960*	7630	7170	7960 *1100*	8750	8150	9050 *1250*	9950	9150	10150 *1400*	11150	10100	11200 *1550*	12300	11100	12300 *1700*	13500
	18.80	.430 *10,92*	4690	5210 *720*	5730	6390	7090 *980*	7790	7470	8300 *1150*	9130	8460	9400 *1300*	10340	9500	10500 *1450*	11500	10450	11550 *1600*	12650	11100	12300 *1700*	13500
	21.60	.500 *12,7*	5540	6150 *850*	6760	7830	8700 *1200*	9570	9150	10150 *1400*	11150	10850	11950 *1650*	13050	11700	13000 *1800*	14300	12450	13750 *1900*	15050	13050	14450 *2000*	15850
	24.60	560 *14,22*	5670	6290 *870*	6910	8150	9050 *1250*	9950	9500	10500 *1450*	11500	10850	11950 *1650*	13050	12100	13400 *1850*	14700	12450	13750 *1900*	15050	13050	14450 *2000*	15850

Vallourec New VAM®
Recommended Make-Up Torque*

Size (O.D.)	Nominal Wt.	Wall Thickness	55 ksi			75-80-85 ksi			90-95 -100 ksi			105-110-115 ksi			120-125-130 ksi			135-140 ksi			145 -150-155 ksi		
			min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.
in. *mm.*	lb./ft.	in. *mm.*	ft.lb *m.kg*																				
5 *127,0*	13.00	.253 *6,43*	3780	4200 *580*	4620	4110	4560 *630*	5010	4370	4850 *670*	5330	4560	5060 *700*	5560	4760	5280 *730*	5800	4950	5500 *760*	6050	5140	5710 *790*	6280
	15.00	.296 *7,52*	4230	4700 *650*	5170	4630	5140 *710*	5650	4820	5350 *740*	5880	5020	5570 *770*	6120	5280	5860 *810*	6440	5480	6080 *840*	6680	5670	6290 *870*	6910
	18.00	.362 *9,19*	5140	5710 *790*	6280	5540	6150 *850*	6760	5800	6440 *890*	7080	6060	6730 *930*	7400	6390	7090 *980*	7790	6510	7230 *1000*	7950	6840	7590 *1050*	8340
	20.30	.408 *10,36*	6190	6870 *950*	7550	6840	7590 *1050*	8340	7170	7960 *1100*	8750	7470	8300 *1150*	9130	7830	8700 *1200*	9570	8150	9050 *1250*	9950	8460	9400 *1300*	10340
	20.80	.422 *10,72*	6320	7020 *970*	7720	6840	7590 *1050*	8340	7170	7960 *1100*	8750	7830	8700 *1200*	9570	8150	9050 *1250*	9950	8460	9400 *1300*	10340	8780	9750 *1350*	10720
	21.40	.437 *11,1*	6450	7160 *990*	7870	7170	7960 *1100*	8750	7470	8300 *1150*	9130	7830	8700 *1200*	9570	8150	9050 *1250*	9950	8460	9400 *1300*	10340	8780	9750 *1350*	10720
	23.20	.478 *12,14*	6840	7590 *1050*	8340	7470	8300 *1150*	9130	7830	8700 *1200*	9570	8150	9050 *1250*	9950	8460	9400 *1300*	10340	8780	9750 *1350*	10720	9150	10150 *1400*	11150
	24.10	.500 *12,7*	6840	7590 *1050*	8340	7470	8300 *1150*	9130	7830	8700 *1200*	9570	8460	9400 *1300*	10340	8780	9750 *1350*	10720	9150	10150 *1400*	11150	9500	10500 *1450*	11500
5-1/2 *139,7*	15.50	.275 *6,99*	4230	4700 *650*	5170	4630	5140 *710*	5650	4880	5420 *750*	5960	5140	5710 *790*	6280	5400	6000 *830*	6600	5670	6290 *870*	6910	5860	6510 *900*	7160
	17.00	.304 *7,72*	4560	5060 *700*	5560	4950	5500 *760*	6050	5220	5790 *800*	6360	5480	6080 *840*	6680	5740	6370 *880*	7000	5990	6650 *920*	7310	6190	6870 *950*	7550
	20.00	.361 *9,17*	5340	5930 *820*	6520	5860	6510 *900*	7160	6120	6800 *940*	7480	6450	7160 *990*	7870	6840	7590 *1050*	8340	7170	7960 *1100*	8750	7170	7960 *1100*	8750
	23.00	.415 *10,54*	6390	7090 *980*	7790	7170	7960 *1100*	8750	7470	8300 *1150*	9130	7830	8700 *1200*	9570	8460	9400 *1300*	10340	8780	9750 *1350*	10720	9150	10150 *1400*	11150
	26.80	.476 *12,09*	6840	7590 *1050*	8340	7470	8300 *1150*	9130	8150	9050 *1250*	9950	8460	9400 *1300*	10340	8780	9750 *1350*	10720	9500	10500 *1450*	11500	9850	10850 *1500*	11850

Vallourec New VAM®
Recommended Make-Up Torque*

Size (O.D.)	Nominal Wt.	Wall Thickness	55 ksi			75-80-85 ksi			90-95 -100 ksi			105-110-115 ksi			120-125-130 ksi			135-140 ksi			145 -150-155 ksi		
			min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.
in. *mm.*	lb./ft.	in. *mm.*	ft.lb *m.kg*																				
6-5/8 *168,3*	20.00	.288 *7,32*	5080	5640 *780*	6200	5740	6370 *880*	7000	6060	6730 *930*	7400	6450	7160 *990*	7870	6840	7590 *1050*	8340	7170	7960 *1100*	8750	7470	8300 *1150*	9130
	23.20	.330 *8,38*	5600	6220 *860*	6840	6250	6940 *960*	7630	6510	7230 *1000*	7950	7170	7960 *1100*	8750	7470	8300 *1150*	9130	7830	8700 *1200*	9570	8150	9050 *1250*	9950
	24.00	.352 *8,94*	6250	6940 *960*	7630	7170	7960 *1100*	8750	7470	8300 *1150*	9130	7830	8700 *1200*	9570	8460	9400 *1300*	10340	8780	9750 *1350*	10720	9150	10150 *1400*	1115
	28.00	.417 *10,59*	7830	8700 *1200*	9570	8780	9750 *1350*	10720	9500	10500 *1450*	11500	10100	11200 *1550*	12300	10450	11550 *1600*	12650	11100	12300 *1700*	13500	11700	13000 *1800*	14300
	32.00	.475 *12,07*	8150	9050 *1250*	9950	9500	10500 *1450*	11500	10100	11200 *1550*	12300	10450	11550 *1600*	12650	11100	12300 *1700*	13500	11700	13000 *1800*	14300	12450	13750 *1900*	15050
	35.00	.525 *13,34*	8780	9750 *1350*	10720	9850	10850 *1500*	11850	10450	11550 *1600*	12650	11100	12300 *1700*	13500	11700	13000 *1800*	14300	12450	13750 *1900*	15050	12700	14100 *1950*	1550
7 *177,8*	23.00	.317 *8,05*	5600	6220 *860*	6840	6320	7020 *970*	7720	6840	7590 *1050*	8340	7170	7960 *1100*	8750	7470	8300 *1150*	9130	8150	9050 *1250*	9950	8460	9400 *1300*	10340
	26.00	.362 *9,19*	6510	7230 *1000*	7950	7470	8300 *1150*	9130	7830	8700 *1200*	9570	8460	9400 *1300*	10340	9150	10150 *1400*	11150	9500	10500 *1450*	11500	9850	10850 *1500*	11850
	29.00	.408 *10,36*	7470	8300 *1150*	9130	8460	9400 *1300*	10340	9150	10150 *1400*	11150	9850	10850 *1500*	11850	10450	11550 *1600*	12650	11100	12300 *1700*	13500	11450	12650 *1750*	13850
	32.00	.453 *11,51*	8150	9050 *1250*	9950	9150	10150 *1400*	11150	9850	10850 *1500*	11850	10450	11550 *1600*	12650	11100	12300 *1700*	13500	11700	13000 *1850*	14300	12100	13400 *1900*	14700
	35.00	.498 *12,65*	8460	9400 *1300*	10340	9500	10500 *1450*	11500	10100	11200 *1550*	12300	10850	11950 *1650*	13050	11450	12650 *1750*	13850	12100	13400 *1850*	14700	12450	13750 *1900*	15050
	38.00	.540 *13,72*	8780	9750 *1350*	10720	10100	11200 *1550*	12300	10450	11550 *1600*	12650	11100	12300 *1700*	13500	11700	13000 *1800*	14300	12450	13750 *1900*	15050	13050	14450 *2000*	15850
	41.00	.590 *14,99*	9500	10500 *1450*	11500	10450	11550 *1600*	12650	11100	12300 *1700*	13500	11700	13000 *1800*	14300	12450	13750 *1900*	15050	13050	14450 *2000*	15850	13700	15200 *2100*	16700
	44.00	.640 *16,26*	11100	12300 *1700*	13500	12450	13750 *1900*	15050	13050	14450 *2000*	15850	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	46.00	.670 *17,02*	11700	13000 *1800*	14300	12700	14100 *1950*	15500	13050	14450 *2000*	15850	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400

Vallourec New VAM®
Recommended Make-Up Torque*

Size (O.D.)	Nominal Wt.	Wall Thickness	55 ksi			75-80-85 ksi			90-95-100 ksi			105-110-115 ksi			120-125-130 ksi			135-140 ksi			145-150-155 ksi		
			min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.
in. *mm.*	lb./ft.	in. *mm.*	ft.lb *m.kg*																				
7-5/8 *193,7*	26.40	.328 *8,33*	6450	7160 *990*	7870	7170	7960 *1100*	8750	7830	8700 *1200*	9570	8150	9050 *1250*	9950	8780	9750 *1350*	10720	9500	10500 *1450*	11500	9850	10850 *1500*	11850
	29.70	.375 *9,53*	7470	8300 *1150*	9130	8460	9400 *1300*	10340	9150	10150 *1400*	11150	9850	10850 *1500*	11850	10450	11550 *1600*	12650	11100	12300 *1700*	13500	11450	12650 *1750*	13850
	33.70	.430 *10,92*	9150	10150 *1400*	11150	10450	11550 *1600*	12650	11100	12300 *1700*	13500	12100	13400 *1850*	14700	12700	14100 *1950*	15500	13700	15200 *2100*	16700	14400	15900 *2200*	17400
	35.80	.465 *11,81*	9500	10500 *1450*	11500	10850	11950 *1650*	13050	11700	13000 *1800*	14300	12450	13750 *1900*	15050	13050	14450 *2000*	15850	13700	15200 *2100*	16700	14400	15900 *2200*	17400
	39.00	.500 *12,70*	9850	10850 *1500*	11850	11100	12300 *1700*	13500	12100	13400 *1850*	14700	12700	14100 *1950*	15500	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	42.80	.562 *14,27*	10850	11950 *1650*	13050	12100	13400 *1850*	14700	12700	14100 *1950*	15500	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	45.30	.595 *15,11*	11100	12300 *1700*	13500	12450	13750 *1900*	15050	13050	14450 *2000*	15850	13700	15200 *2100*	16700	14400	15910 *2200*	1740	14400	15900 *2200*	17400	14400	15900 *2200*	17400
8-5/8 *219,1*	28.00	.304 *7,72*	6840	7590 *1050*	8340	7830	8700 *1200*	9570	8460	9400 *1300*	10340	9150	10150 *1400*	11150	9850	10850 *1500*	11850	10450	11550 *1600*	12650	10850	11950 *1650*	13050
	32.00	.352 *8,94*	7470	8300 *1150*	9130	8460	9400 *1300*	10340	9150	10150 *1400*	11150	9850	10850 *1500*	11850	10450	11550 *1600*	12650	11100	12300 *1700*	13500	11700	13000 *1800*	14300
	36.00	.400 *10,16*	9150	10150 *1400*	11150	10450	11550 *1600*	12650	11100	12300 *1700*	13500	12100	13400 *1850*	14700	13050	14450 *2000*	15850	13700	15200 *2100*	16700	14400	15900 *2200*	17400
	40.00	.450 *11,43*	9850	10850 *1500*	11850	11100	12300 *1700*	13500	12100	13400 *1850*	14700	12700	14100 *1950*	15500	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	44.00	.500 *12,7*	10450	11550 *1600*	12650	11700	13000 *1800*	14300	12700	14100 *1950*	15500	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	49.00	.557 *14,15*	11 100	12300 *1700*	13500	12450	13750 *1900*	15050	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	52.00	.595 *15,11*	11700	13000 *1800*	14300	13050	14450 *2000*	15850	13700	16200 *2100*	16700	4400	15900 *2200*	17400	4400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400

Vallourec New VAM®
Recommended Make-Up Torque*

Size (O.D.)	Nominal Wt.	Wall Thickness	55 ksi			75-80-85 ksi			90-95 -100 ksi			105-110-115 ksi			120-125-130 ksi			135-140 ksi			145 -150-155 ksi		
			min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.
in. *mm.*	lb./ft.	in. *mm.*	ft.lb *m.kg*																				
9-5/8 *244,5*	36.00	.352 *8,94*	7830	8700 *1200*	9570	9150	10150 *1400*	11150	10100	11200 *1550*	12300	10850	11960 *1650*	13050	11700	13000 *1800*	14300	12450	13750 *1900*	15050	13050	14450 *2000*	15850
	40.00	.395 *10,03*	9500	10500 *1450*	11500	11100	12300 *1700*	13500	12100	13400 *1850*	14700	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	43.50	.435 *11,05*	10850	11950 *1650*	13050	12700	14100 *1950*	15500	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	47.00	.472 *11,99*	11100	12300 *1700*	13500	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	53.50	.545 *13,84*	12100	13400 *1850*	14700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	58.40	.595 *15,11*	12700	14100 *1950*	15500	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	59.40	.609 *15,47*	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	62.80	.625 *15,88*	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
10-3/4 *273,1*	40.50	.350 *8,89*	8460	9400 *1300*	10340	10100	11200 *1550*	12300	11100	12300 *1700*	13500	12100	13400 *1850*	14700	13050	14450 *2000*	15850	13700	15200 *2100*	16700	14400	15900 *2200*	17400
	43.50	.400 *10,16*	10450	11550 *1600*	12650	12700	14100 *1950*	15500	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	51.00	.450 *11,43*	11100	12300 *1700*	13500	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	55.50	.495 *12,57*	11700	13000 *1800*	14300	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	60.70	.545 *13,84*	12450	13750 *1900*	15050	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	65.70	.595 *15,11*	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400

Vallourec New VAM®
Recommended Make-Up Torque*

Size (O.D.)	Nominal Wt.	Wall Thickness	55 ksi			75-80-85 ksi			90-95 -100 ksi			105-110-115 ksi			120-125-130 ksi			135-140 ksi			145 -150-155 ksi		
			min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.
in. *mm.*	lb./ft.	in. *mm.*	ft.lb *m.kg*																				
	47.00	.375 *9,53*	9500	10500 *1450*	11500	11450	12650 *1750*	13850	12700	14100 *1950*	15500	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
11-3/4	54.00	.435 *11,05*	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
298,5	60.00	.489 *12,42*	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	65.00	.534 *13,56*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	54.50	.380 *9,65*	10450	11550 *1600*	12650	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	61.00	.430 *10,92*	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	68.00	.480 *12,19*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
13-3/8	72.00	.514 *13,06*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
339,7	77.00	.550 *13,97*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	80.70	.580 *14,73*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	85.00	.608 *15,44*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	86.00	.625 *15,88*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400

Vallourec VAM® ACE
Recommended Make-Up Torque*

Size (O.D.)	Nominal Wt.	Wall Thickness	55 ksi			75-80-85 ksi			90-95 -100 ksi			105-110-115 ksi			120-125-130 ksi			135-140 ksi			145 -150-155 ksi		
			min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.
in. *mm.*	lb./ft.	in. *mm.*	ft.lb *m.kg*																				
2-3/8 *60,32*	4.60	.190 *4,83*	850	940 *130*	1030	910	1010 *140*	1110	980	1080 *150*	1180	1050	1160 *160*	1270	1110	1230 *170*	1350	1240	1370 *190*	1500	1310	1450 *200*	1590
	5.10	.218 *5,54*	850	940 *130*	1030	910	1010 *140*	1110	980	1080 *150*	1180	1050	1160 *160*	1270	1110	1230 *170*	1350	1240	1370 *190*	1500	1310	1450 *200*	1590
	5.80	.254 *6,45*	1050	1160 *160*	1270	1170	1300 *180*	1430	1240	1370 *190*	1500	1370	1520 *210*	1670	1440	1590 *220*	1740	1570	1740 *240*	1910	1630	1810 *250*	1990
	6.30	.280 *7,11*	1310	1450 *200*	1590	1440	1590 *220*	1740	1500	1660 *230*	1820	1630	1810 *250*	1990	1830	2030 *280*	2230	1960	2170 *300*	2380	2020	2240 *310*	2460
	7.30	.336 *8,53*	1630	1810 *250*	1990	1960	2170 *300*	2380	2020	2240 *310*	2460	2160	2390 *330*	2620	2280	2530 *350*	2780	2480	2750 *380*	3020	2610	2890 *400*	3170
2-7/8 *73,02*	6.40	.217 *5,51*	1310	1450 *200*	1590	1630	1810 *250*	1990	1760	1950 *270*	2140	1960	2170 *300*	2380	2080	2310 *320*	2540	2220	2460 *340*	2700	2280	2530 *350*	2780
	7.70	.276 *7,01*	1630	1810 *250*	1990	1830	2030 *280*	2230	2020	2240 *310*	2460	2220	2460 *340*	2700	2340	2600 *360*	2860	2480	2750 *380*	3020	2610	2890 *400*	3170
	8.60	.308 *7,82*	1960	2170 *300*	2380	2220	2460 *340*	2700	2420	2680 *370*	2940	2610	2890 *400*	3170	2800	3110 *430*	3420	3000	3330 *460*	3660	3130	3470 *480*	3810
	9.80	.362 *9,19*	2280	2530 *350*	2780	2800	3110 *430*	3420	3060	3400 *470*	3740	3260	3620 *500*	3980	3590	3980 *550*	4370	3780	4200 *580*	4620	3910	4340 *600*	4770
	10.70	.405 *10,29*	2610	2890 *400*	3170	3130	3470 *480*	3810	3450	3830 *530*	4210	3780	4200 *580*	4620	4110	4560 *630*	5010	4370	4850 *670*	5330	4560	5060 *700*	5560

Vallourec VAM® ACE
Recommended Make-Up Torque*

Size (O.D.)	Nominal Wt.	Wall Thickness	55 ksi			75-80-85 ksi			90-95 -100 ksi			105-110-115 ksi			120-125-130 ksi			135-140 ksi			145 -150-155 ksi		
			min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.
in. *mm.*	lb./ft.	in. *mm.*	ft.lb *m.kg*																				
3-1/2 *88,90*	7.70	.216 *5,49*	1570	1740 *240*	1910	1760	1950 *270*	2140	1890	2100 *290*	2310	2080	2310 *320*	2540	2220	2460 *340*	2700	2340	2600 *360*	2860	2480	2750 *380*	3020
	9.20	.254 *6,45*	2220	2460 *340*	2700	2540	2820 *390*	3100	2740	3040 *420*	3340	2930	3250 *450*	3570	3130	3470 *480*	3810	3260	3620 *500*	3980	3390	3760 *520*	4130
	10.20	.289 *7,34*	2800	3110 *430*	3420	3130	3470 *480*	3810	3330	3690 *510*	4050	3590	3980 *550*	4370	3850	4270 *590*	4690	4040	4480 *620*	4920	4230	4700 *650*	5170
	12.70	.375 *9,52*	3910	4340 *600*	4770	4430	4920 *680*	5410	4760	5280 *730*	5800	5080	5640 *780*	6200	5540	6150 *850*	6760	6060	6730 *930*	7400	6510	7230 *1000*	7950
	13.70	.413 *10,49*	4230	4700 *650*	5170	4880	5420 *750*	5960	5220	5750 *800*	6360	5860	6510 *900*	7160	6190	6870 *950*	7550	6510	7230 *1000*	7950	6840	7590 *1050*	8340
	14.70	.450 *11,43*	4880	5420 *750*	5960	5540	6150 *850*	6760	6190	6870 *950*	7550	6840	7590 *1050*	8340	7170	7960 *1100*	8750	7470	8300 *1150*	9130	7830	8700 *1200*	9570
	15.80	.476 *12,09*	5220	5790 *800*	6360	5860	6510 *900*	7160	6510	7230 *1000*	7950	7170	7960 *1100*	8750	7830	8700 *1200*	9570	8150	9050 *1250*	9950	8460	9400 *1300*	10340
4 *101,60*	9.50	.226 *5,74*	2280	2530 *350*	2780	2610	2890 *400*	3170	2930	3250 *450*	3570	3260	3620 *500*	3980	3590	3980 *550*	4370	3780	4200 *580*	4620	3910	4340 *600*	4770
	10.90	.262 *6,65*	2930	3250 *450*	3570	3450	3830 *530*	4210	3780	4200 *580*	4620	4110	4560 *630*	5010	4430	4920 *680*	5410	4690	5210 *720*	5730	4880	5420 *750*	5960
	13.00	.330 *8,38*	3260	3620 *500*	3980	3910	4340 *600*	4770	4230	4700 *650*	5170	4560	5060 *700*	5560	4880	5420 *750*	5960	5220	5790 *800*	6360	5540	6150 *850*	6760
	14.80	.380 *9,65*	4230	4700 *650*	5170	5080	5640 *780*	6200	5540	6150 *850*	6760	6060	6730 *930*	7400	6510	7230 *1000*	7950	6840	7590 *1050*	8340	7170	7960 *1100*	8750
	16.50	.430 *10,92*	4880	5420 *750*	5960	5860	6510 *900*	7160	6510	7230 *1000*	7950	7170	7960 *1100*	8750	7830	8700 *1200*	9570	8150	9050 *1250*	9950	8460	9400 *1300*	10340

Vallourec VAM® ACE
Recommended Make-Up Torque*

Size (O.D.)	Nominal Wt.	Wall Thickness	55 ksi			75-80-85 ksi			90-95-100 ksi			105-110-115 ksi			120-125-130 ksi			135-140 ksi			145-150-155 ksi		
			min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.
in. *mm.*	lb./ft.	in. *mm.*	ft.lb *m.kg*																				
	10.50	.224	2480	2750	3020	3000	3330	3660	3260	3620	3980	3590	3980	4370	3910	4340	4770	4110	4560	5010	4230	4700	5170
		5,69		*380*			*460*			*500*			*550*			*600*			*630*			*650*	
	11.60	.250	2930	3250	3570	3590	3980	4370	3910	4340	4770	4230	4700	5170	4560	5060	5560	4880	5420	5960	5220	5790	6360
		6,35		*450*			*550*			*600*			*650*			*700*			*750*			*800*	
	12.60	.271	2930	3250	3570	3260	3620	3980	3590	3980	4370	3910	4340	4770	4230	4700	5170	4560	5060	5560	4880	5420	5960
		6,88		*450*			*500*			*550*			*600*			*650*			*700*			*750*	
	13.50	.290	3260	3620	3980	3780	4200	4620	4110	4560	5010	4430	4920	5410	4880	5420	5960	5220	5790	6360	5540	6150	6760
		7,37		*500*			*580*			*630*			*680*			*750*			*800*			*850*	
4-1/2	15.10	.337	3910	4340	4770	4880	5420	5960	5220	5790	6360	5540	6150	6760	5860	6510	7160	6190	6870	7550	6510	7230	7950
114,30		*8,56*		*600*			*750*			*800*			*850*			*900*			*950*			*1000*	
	16.90	.380	4880	5420	5960	5860	6510	7160	6190	6870	7550	6510	7230	7950	7170	7960	8750	7470	8300	9130	7830	8700	9570
		9,65		*750*			*900*			*950*			*1000*			*1100*			*1150*			*1200*	
	17.70	.402	5220	5790	6360	6190	6870	7550	6840	7590	8340	7470	8300	9130	8150	9050	9950	8780	9750	10720	9150	10150	11150
		10,21		*800*			*950*			*1050*			*1150*			*1250*			*1350*			*1400*	
	18.80	.430	5860	6510	7160	6840	7590	8340	7470	8300	9130	8150	9050	9950	8780	9750	10720	9500	10500	11500	9850	10850	11850
		10,92		*900*			*1050*			*1150*			*1250*			*1350*			*1450*			*1500*	
	21.60	.500	7170	7960	8750	8460	9400	10340	9150	10150	11150	9850	10850	11850	10450	11550	12650	11000	12300	13500	11700	13000	14300
		12,70		*1100*			*1300*			*1400*			*1500*			*1600*			*1700*			*1800*	
	24.60	.560	8460	9400	10340	10450	11550	12650	11100	12300	13500	11700	13000	14300	12450	13750	15050	13050	14450	15850	13700	15200	16700
		14,22		*1300*			*1600*			*1700*			*1800*			*1900*			*2000*			*2100*	

Vallourec VAM® ACE
Recommended Make-Up Torque*

Size (O.D.)	Nominal Wt.	Wall Thickness	55 ksi			75-80-85 ksi			90-95 -100 ksi			105-110-115 ksi			120-125-130 ksi			135-140 ksi			145 -150-155 ksi		
			min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.
in. *mm.*	lb./ft.	in. *mm.*	ft.lb *m.kg*																				
5 *127,0*	13.00	.253 *6,43*	3260	3620 *500*	3980	3590	3980 *550*	4370	3910	4340 *600*	4770	4230	4700 *650*	5170	4560	5060 *700*	5560	4880	5420 *750*	5960	5220	5790 *800*	6360
	15.00	.296 *7,52*	3260	3620 *500*	3980	3590	3980 *550*	4370	3910	4340 *600*	4770	4230	4700 *650*	5170	4560	5060 *700*	5560	4880	5420 *750*	5960	5220	5790 *800*	6360
	18.00	.362 *9,19*	4230	4700 *650*	5170	5220	5790 *800*	6360	5860	6510 *900*	7160	6190	6870 *950*	7550	6840	7590 *1050*	8340	7470	8300 *1150*	9130	7830	8700 *1200*	9570
	20.30	.408 *10,36*	5220	5790 *800*	6360	6510	7230 *1000*	7950	7170	7960 *1100*	8750	7830	8700 *1200*	9570	8460	9400 *1300*	10340	9150	10150 *1400*	11150	9850	10850 *1500*	11850
	20.80	.422 *10,72*	5540	6150 *850*	6760	6510	7230 *1000*	7950	7170	7960 *1100*	8750	8150	9050 *1250*	9950	8780	9750 *1350*	10720	9500	10500 *1450*	11500	9850	10850 *1500*	11850
	21.40	.437 *11,10*	5860	6510 *900*	7160	7170	7960 *1100*	8750	7830	8700 *1200*	9570	8460	9400 *1300*	10340	9150	10150 *1400*	11150	9850	10850 *1500*	11850	10450	11550 *1600*	12650
	23.20	.478 *12,14*	6510	7230 *1000*	7950	8460	9400 *1300*	10340	9150	10150 *1400*	11150	10100	11200 *1550*	12300	11100	12300 *1700*	13500	11700	13000 *1800*	14300	12450	13750 *1900*	15050
	24.10	.500 *12,70*	7170	7960 *1100*	8750	9150	10150 *1400*	11150	9850	10850 *1500*	11850	11100	12300 *1700*	13500	11700	13000 *1800*	14300	12450	13750 *1900*	15050	13050	14450 *2000*	15850
5-1/2 *139,7*	15.50	.275 *6,99*	2610	2890 *400*	3170	3260	3620 *500*	3980	3590	3980 *550*	4370	3910	4340 *600*	4770	4230	4700 *650*	5170	4560	5060 *700*	5560	4560	5060 *700*	5560
	17.00	.304 *7,72*	3590	3980 *550*	4370	4560	5060 *700*	5560	4880	5420 *750*	5960	5220	5790 *800*	6360	5540	6150 *850*	6760	5860	6510 *900*	7160	6190	6870 *950*	7550
	20.00	.361 *9,17*	4880	5420 *750*	5960	5860	6510 *900*	7160	6510	7230 *1000*	7950	6840	7590 *1050*	8340	7470	8300 *1150*	9130	7830	8700 *1200*	9570	8150	9050 *1250*	9950
	23.00	.415 *10,54*	5860	6510 *900*	7160	7170	7960 *1100*	8750	7830	8700 *1200*	9570	8780	9750 *1350*	10720	9500	10500 *1450*	11500	10100	11200 *1550*	12300	10450	11550 *1600*	1265
	26.80	.476 *12,09*	7470	8300 *1150*	9130	9500	10500 *1450*	11500	10450	11550 *1600*	12650	11450	12650 *1750*	13850	12450	13750 *1900*	15050	13700	15200 *2100*	16700	14400	15900 *2200*	17400
	28.40	.530 *13,46*	9150	10150 *1400*	11150	11450	12650 *1750*	13850	12450	13750 *1900*	15050	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400

Vallourec VAM® ACE
Recommended Make-Up Torque*

Size (O.D.)	Nominal Wt.	Wall Thickness	55 ksi			75-80-85 ksi			90-95 -100 ksi			105-110-115 ksi			120-125-130 ksi			135-140 ksi			145 -150-155 ksi		
			min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.
in. *mm.*	lb./ft.	in. *mm.*	ft.lb *m.kg*																				
6-5/8 *168,3*	20.00	.288 *7,32*	3590	3980 *550*	4370	4560	5060 *700*	5560	4880	5420 *750*	5960	5220	5790 *800*	6360	5540	6150 *850*	6760	5860	6510 *900*	7160	5860	6510 *900*	7160
	24.00	.352 *8,94*	5220	5790 *800*	6360	6510	7230 *1000*	7950	7170	7960 *1100*	8750	7470	8300 *1150*	9130	8150	9050 *1250*	9950	8780	9750 *1350*	10720	9150	10150 *1400*	11150
	28.00	.417 *10,59*	7170	7960 *1100*	8750	8460	9400 *1300*	10340	I9150	10150 *1400*	11150	9850	10850 *1500*	11850	11100	12300 *1700*	13500	11700	13000 *1800*	14300	12450	13750 *1900*	15050
	32.00	.475 *12,06*	9150	10150 *1400*	11150	10450	11550 *1600*	12650	11700	13000 *1800*	14300	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	35.00	.525 *13,33*	10450	11550 *1600*	12650	12450	13750 *1900*	15050	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
7 *177,8*	23.00	.317 *8,05*	4230	4700 *650*	5170	5220	5790 *800*	6360	5540	6150 *850*	6760	5860	6510 *900*	7160	6510	7230 *1000*	7950	6840	7590 *1050*	8340	7170	7960 *1100*	8750
	26.00	.362 *9,20*	5860	6510 *900*	7160	7170	7960 *1100*	8750	7830	8700 *1200*	9570	8460	9400 *1300*	10340	9150	10150 *1400*	11150	9850	10850 *1500*	11850	10450	11550 *1600*	12650
	29.00	.408 *10,36*	7170	7960 *1100*	8750	8460	9400 *1300*	10340	9150	10150 *1400*	11150	10450	11550 *1600*	12650	11100	12300 *1700*	13500	11700	13000 *1800*	14300	12450	13750 *1900*	15050
	32.00	.453 *11,51*	8460	9400 *1300*	10340	9850	10850 *1500*	11850	11100	12300 *1700*	13500	12450	13750 *1900*	15050	113050	14450 *2000*	15850	13700	15200 *2100*	16700	14400	15900 *2200*	17400
	35.00	.498 *12,65*	9850	10850 *1500*	11850	11700	13000 *1800*	14300	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	38.00	.540 *13,72*	11100	12300 *1700*	13500	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	41.00	.590 *14,99*	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400

Vallourec VAM® ACE
Recommended Make-Up Torque*

Size (O.D.)	Nominal Wt.	Wall Thickness	55 ksi			75-80-85 ksi			90-95 -100 ksi			105-110-115 ksi			120-125-130 ksi			135-140 ksi			145 -150-155 ksi		
			min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.
in. *mm.*	lb./ft.	in. *mm.*	ft.lb *m.kg*																				
7-5/8 *193,7*	26.40	.328 *8,33*	4880	5420 *750*	5960	5540	6150 *850*	6760	6190	6870 *950*	7550	6840	7590 *1050*	8340	7470	8300 *1150*	9130	7830	8700 *1200*	9570	8150	9050 *1250*	9950
	29.70	.375 *9,52*	6510	7230 *1000*	7950	7830	8700 *1200*	9570	8460	9400 *1300*	10340	9150	10150 *1400*	11150	9850	10850 *1500*	11850	10450	11550 *1600*	12650	10850	11950 *1650*	13050
	33.70	.430 *10,92*	7830	8700 *1200*	9570	9150	10150 *1400*	11150	10450	11550 *1600*	12650	11100	12300 *1700*	13500	11700	13000 *1800*	14300	12450	13750 *1900*	15050	13050	14450 *2000*	15850
	35.80	.465 *11,81*	9150	10150 *1400*	11150	10450	11550 *1600*	12650	11700	13000 *1800*	14300	12450	13750 *1900*	15050	13050	14450 *2000*	15850	13700	15200 *2100*	16700	14400	15900 *2200*	17400
	39.00	.500 *12,70*	10450	11550 *1600*	12650	11700	13000 *1800*	14300	13050	14450 *2000*	15850	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	42.80	.562 *14,27*	12450	13750 *1900*	15050	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	45.30	.595 *15,11*	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
8-5/8 *219,1*	28.00	.304 *7,72*	4880	5420 *750*	5960	5540	6150 *850*	6760	5860	6510 *900*	7160	6190	6870 *950*	7550	6510	7230 *1000*	7950	6840	7590 *1050*	8340	7170	7960 *1100*	8750
	32.00	.352 *8,94*	5860	6510 *900*	7160	6510	7230 *1000*	7950	7170	7960 *1100*	8750	7830	8700 *1200*	9570	8460	9400 *1300*	10340	9150	10150 *1400*	11150	9500	10500 *1450*	11500
	36.00	.400 *10,16*	7170	7960 *1100*	8750	8150	9050 *1250*	9950	9150	10150 *1400*	11150	9850	10850 *1500*	11850	10450	11550 *1600*	12650	11100	12300 *1700*	13500	11700	13000 *1800*	14300
	40.00	.450 *11,43*	9150	10150 *1400*	11150	10450	11550 *1600*	12650	11700	13000 *1800*	14300	12450	13750 *1900*	15050	13050	14450 *2000*	15850	13700	15200 *2100*	16700	14400	15900 *2200*	17400
	44.00	.500 *12,70*	11100	12300 *1700*	13500	12450	13750 *1900*	15050	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	49.00	.557 *14,15*	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	56.00	.595 *15,11*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400

Vallourec VAM® ACE
Recommended Make-Up Torque*

Size (O.D.)	Nominal Wt.	Wall Thickness	55 ksi			75-80-85 ksi			90-95 -100 ksi			105-110-115 ksi			120-125-130 ksi			135-140 ksi			145 -150-155 ksi		
			min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.
in. *mm.*	lb./ft.	in. *mm.*	ft.lb *m.kg*																				
9-5/8 *244,5*	36.00	.352 *8,94*	6510	7230 *1000*	7950	7830	8700 *1200*	9570	8460	9400 *1300*	10340	9150	10150 *1400*	11150	9850	10850 *1500*	11850	10450	11550 *1600*	12650	11100	12300 *1700*	13500
	40.00	.395 *10,03*	7830	8700 *1200*	9570	9150	10150 *1400*	11150	10450	11550 *1600*	12650	11100	12300 *1700*	13500	12450	13750 *1900*	15050	13050	14450 *2000*	15850	13700	15200 *2100*	16700
	43.50	.435 *11,05*	9850	10850 *1500*	11850	11100	12300 *1700*	13500	12450	13750 *1900*	15050	13050	1445 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	47.00	.472 *11,99*	11700	13000 *1800*	14300	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	53.50	.545 *13,84*	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	58.40	.595 *15,11*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	59.40	.609 *15,47*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	62.80	.625 *15,87*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
10-3/4 *273,1*	40.50	.350 *8,89*	7170	7960 *1100*	8750	8460	9400 *1300*	10340	9850	10850 *1500*	11850	10450	11550 *1600*	12650	11100	12300 *1700*	13500	11700	13000 *1800*	14300	12450	13750 *1900*	15050
	45.50	.400 *10,16*	9150	10150 *1400*	11150	10450	11550 *1600*	12650	11700	13000 *1800*	14300	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	51.00	.450 *11,43*	11100	12300 *1700*	13500	12450	13750 *1900*	15050	13700	15200 *22100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	55.50	.495 *12,57*	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	60.70	.545 *13,84*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	65.70	.595 *15,11*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400

Vallourec VAM® ACE
Recommended Make-Up Torque*

Size (O.D.)	Nominal Wt.	Wall Thickness	55 ksi			75-80-85 ksi			90-95 -100 ksi			105-110-115 ksi			120-125-130 ksi			135-140 ksi			145 -150-155 ksi		
			min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.
in. *mm.*	lb./ft.	in. *mm.*	ft.lb *m.kg*																				
	47.00	.375 *9,52*	9850	10850 *1500*	11850	11100	12300 *1700*	13500	11700	13000 *1800*	14300	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
11-3/4	54.00	.435 *11,05*	12450	13750 *1900*	15050	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
298,5	60.00	.489 *12,42*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	65.00	.534 *13,56*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15990 *2200*	17400
	54.50	.380 *9,65*	11100	12300 *1700*	13500	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	61.00	.430 *10,92*	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	68.00	.480 *12,19*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
13-3/8	72.00	.514 *13,06*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
339,7	77.00	.550 *13,97*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	80.70	.580 *14,73*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	85.00	.608 *15,44*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	86.00	.625 *15,88*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400

Vallourec Mini-VAM® Joint
Recommended Make-Up Torque*

Body Diameter	Weight Lb/Ft	Wall Thick-ness mm	Drawing VLR St.d	J-55			C-75 - N-80			P-105		
				Min.	Optim.	Max.	Min.	Optim.	Max.	Min.	Optim.	Max.
1.050	1.16	.113	429.02	110	150	200	150	200	250	150	200	250
	1.60	.154										
1.315	1.72	.133	430.02	150	200	350	250	300	450	250	300	450
	2.20	.179										
1.660	2.33	.140	431.02	250	350	500	400*	300	650	400*	500	650
	3.05	.191										
1.900	2.76	.145	432.02	300	450	550	450*	600	700	450*	600	700
	4.10	.200										
2.063	3.25	.156	433.02	400	500	650	550	650	850	550	650	850
	4.50	.225										

Values resulting from mill tests.

*Although prepared with the greatest care and attention the technical information appearing in this catalog is for general information only due in particular to the evolving nature of the numerous factors involved in this compilation Vallourec accepts no responsibility for this information and customers should therefore carry out all necessary investigations to choose for themselves the technical solution, suited to the installation and operating conditions under which our products will be used.

DIMENSIONAL DATA

LINE PIPE - STANDARD WEIGHT, THREADED - DIMENSIONAL DATA

SIZE NOM. (in.)	O.D. (in.)	I.D. (in.)	WEIGHT PER FOOT PLAIN (lbs.)	WEIGHT PER FOOT T & C (lbs.)	THDS. PER IN.	TAPER PER FT.	MALE THD. LENGTH (in.)	COUPLING LENGTH (in.)	COUPLING DIAMETER (in.)
1/8	.405	.269	.24	.25	.27	3/4	.392	1-1/16	.563
1/4	.540	.364	.42	.43	18	3/4	.595	1-5/8	.719
3/8	.675	.493	.57	.57	18	3/4	.601	1-5/8	.875
1/2	.840	.622	.85	.86	14	3/4	.782	2-1/8	1.063
3/4	1.050	.824	1.13	1.14	14	3/4	.794	2-1/8	1.313
1	1.315	1.049	1.68	1.70	11-1/2	3/4	.985	2-5/8	1.576
1-1/4	1.660	1.380	2.27	2.30	11-1/2	3/4	1.009	2-3/4	2.054
1-1/2	1.900	1.610	2.72	2.75	11-1/2	3/4	1.025	2-3/4	2.200
2	2.375	2.067	3.65	3.75	11-1/2	3/4	1.058	2-7/8	2.875
2-1/2	2.875	2.469	5.79	5.90	8	3/4	1.571	4-1/8	3.375
3	3.500	3.068	7.58	7.70	8	3/4	1.634	4-1/4	4.000
3-1/2	4.000	3.548	9.11	9.25	8	3/4	1.684	4-3/8	4.625
4	4.500	4.026	10.79	11.00	8	3/4	1.734	4-1/2	5.200
5	5.563	5.047	14.62	15.00	8	3/4	1.840	4-5/8	6.296
6	6.625	6.065	18.97	19.45	8	3/4	1.946	4-7/8	7.390
8	8.625	8.071	24.70	25.55	8	3/4	2.146	5-1/4	9.625
8	8.625	7.981	28.55	29.35	8	3/4	2.146	5-1/4	9.625
10	10.750	10.192	31.20	32.75	8	3/4	2.359	5-3/4	11.750
10	10.750	10.136	34.24	35.75	8	3/4	2.359	5-3/4	11.750
10	10.750	10.020	40.48	41.85	8	3/4	2.359	5-3/4	11.750
12	12.750	12.090	43.77	45.45	8	3/4	2.559	6-1/8	14.000
12	12.750	12.000	49.56	51.15	8	3/4	2.559	6-1/8	14.000
14D	14.000	13.250	54.57	57.00	8	3/4	2.684	6-3/8	15.000
16D	16.000	15.250	62.58	65.30	8	3/4	2.884	6-3/4	17.000
18D	18.000	17.250	70.59	73.00	8	3/4	3.084	7-1/8	19.000
20D	20.000	19.250	78.60	81.00	8	3/4	3.284	7-5/8	21.000

DATA OBTAINED FROM: TABLE 6.1 & 8.1, PP 29 & 46, 39 ED., API SPEC 5L, JUNE 1, 1991.
TABLE 2.1, P 8, 13 ED., API STD 5B, MAY 31, 1988.

STANDARD STEEL PIPE

DIMENSION AND STRENGTH DATA

Size Nom. (in.)	O.D. (in.)	Standard - Weight I.D. (in.)	Wall Thick-ness (in.)	WT/FT Plain (lbs.)	Grade A Test Pressure PSI	Extra-Strong I.D. (in.)	Wall Thick-ness (in.)	WT/FT Plain (lbs.)	Grade A Test Pressure PSI	Double-Extra-Strong I.D. (in.)	Wall Thick-ness (in.)	WT/FT Plain (lbs.)	Grade A Test Pressure PSI
1/8	.405	.269	.068	.24	700	.215	.095	.31	850				
1/4	.540	.364	.088	.42	700	.302	.119	.54	850				
3/8	.675	.493	.091	.57	700	.423	.126	.74	850				
1/2	.840	.622	.109	.85	700	.546	.147	1.09	850	.252	.294	1.71	1,000
3/4	1.050	.824	.113	1.13	700	.742	.154	1.47	850	.434	.308	2.44	1,000
1	1.315	1.049	.133	1.68	700	.957	.179	2.17	850	.599	.358	3.66	1,000
1-1/4	1.660	1.380	.140	2.27	1,200	1.278	.191	3.00	1,800	.896	.382	5.21	2,200
1-1/2	1.900	1.610	.145	2.72	1,200	1.500	.200	3.63	1,800	1.100	.400	6.41	2,200
2	2.375	2.067	.154	3.65	2,330	1.939	.218	5.02	2,500	1.503	.436	9.03	2,500
2-1/2	2.875	2.469	.203	5.79	2,500	2.323	.276	7.66	2,500	1.771	.552	13.69	2,500
3	3.500	3.068	.216	7.58	2,220	2.900	.300	10.25	2,500	2.300	.600	18.58	2,500
3-1/2	4.000	3.548	.226	9.11	2,930	3.364	.318	12.50	2,800				
4	4.500	4.026	.237	10.79	1,900	3.826	.337	14.98	2,700	3.152	.674	27.54	2,800
5	5.563	5.047	.258	14.62	1,670	4.813	.375	20.78	2,430	4.063	.750	38.55	2,800
6	6.625	6.065	.280	18.97	1,520	5.761	.432	28.57	2,350	4.897	.864	53.16	2,800
8	8.625	7.981	.322	28.55	1,340	7.625	.500	43.39	2,090	6.875	.875	72.42	2,800
10	10.750	10.020	.365	40.48	1,220	9.750	.500	54.74	1,670	8.750	1.000	104.13	2,800
12	12.750	12.000	.375	49.56	1,060	11.750	.500	65.42	1,410	10.750	1.000	125.49	2,800

DATA OBTAINED FROM TABLE 6.2, PP 31 - 42, 39 ED., API SPEC 5L, JUNE 1, 1991.

SECTION 6 - Casing Data

Contents

API Casing Requirements

DRIFT TEST*

CASING SIZE	DRIFT MANDREL LENGTH	DRIFT MANDREL DIAMETER
8-5/8" AND SMALLER	6"	I.D. MINUS 1/8"
9-5/8" TO 13-3/8"	12"	I.D. MINUS 5/32"
16" AND LARGER	12"	I.D. MINUS 3/16"

TENSILE REQUIREMENTS

GRADE	YIELD STRENGTH		TENSILE STRENGTH
	MIN. PSI	MAX. PSI	MINIMUM PSI
H-40	40,000	80,000	60,000
J-55	55,000	80,000	75,000
K-55	55,000	80,000	95,000
C-90	90,000	105,000	100,000
L-80	80,000	95,000	95,000
N-80	80,000	110,000	100,000
T-95	95,000	110,000	105,000
P-110	110,000	140,000	125,000
Q-125	125,000	150,000	135,000

RANGE LENGTHS*

	RANGE 1 (ft.)	RANGE 2 (ft.)	RANGE 3 (ft.)
TOTAL RANGE LENGTH, INCLUSIVE	16-25	25-34	34-48
RANGE LENGTH FOR 95% or more OF CAR LOAD: PERMISSIBLE LENGTH, MINIMUM	18	28	36
PERMISSIBLE VARIATION, MAXIMUM	6	5	6

TOLERANCES

CASING SIZE O.D. (in.)	TYPE	DIMENSION	TOLERANCE (in.)
4.000 - 5.000 5.500 - 8.625 9.625 & LARGER	UPSET	O.D. (D)[1]	+ 7/64, – .75% O.D. + 1/8, – .75% O.D. + 5/32, – .75% O.D.
4.5 AND LARGER	NON UPSET	O.D. (D)[1]	+ 1.00%; – .50%
ALL	—	WALL THICKNESS	- 12.5%
SIZES	—	I.D.	Governed by O.D. Tolerances

* Values listed also apply to liners.

[1] Measurements made immediately behind the upset for a distance oF approximately 5 inches for sizes 5.5 inches O.D. and smaller, and a distance approximately equal to the O.D. for sizes larger than 5.5 inches.

[2] Upper limit tolerance of O.D. shall not exceed 0.125 inches.

Data obtained from Tables 4.1, 5.1, 6.7, 6.8, PP.21, 51 & 65, 3RD ED., API SPEC 5CT.

BAKER OIL TOOLS
A Baker Hughes company

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
4-1/2 *114,3*	9.50	.205 *5,21*	4.090 *103,9*	3.965 *100,7*	5.000 *127,0*	4.500(25)(8) *114,3*	4.010(25) *101,9* 3.990(8) *101,3*	H-40 J-55 K-55	2,760 3,310 3,310
	10.50	.224 *5,69*	4.052 *102,9*	3.927 *99,75*	5.000 *127,0*	4.651(23) *118,1* 4.500(25)(8) *114,3* 4.921(30)(31) *125,0* 4.824(28) *122,5* 4.862(9a,b) *123,5*	3.996(30) *101,5* 3.952(8)(25) *100,4* 3.959(22) *100,5* 3.977(23) *101,0*	J-55 K-55	4,010 4,010
	11.60	.250 *6,35*	4.000 *101,6*	3.875 *98,43*	5.000 *127,0*	4.500(25)(8) *114,3* 4.695(23) *119,2* 4.867(28) *123,6* 4,719(1) *119,9* 4.862(9)(9a) *123,5* 5.000(27) *127,0* 4.921(31) *125,0* 4.874(9b) *123,8*	3.996(30) *101,5* 3.930(25) *99,8* 3.907(22) *99,2* 3.920(1) *99,57* 3.925(8) *99,69*	J-55 K-55 C-75 N-80 C-95 P-110 L-80 Q-125	4,960 4,960 6,100 6,350 7,030 7,580 6,350 15,840
	12.60	.271 *6,88*	3.958 *100,5*	3.833 *97,36*	5.000 *127,0*	4.901(28) *124,5* 4.584(21) *116,4* 4.981(28) *126,5* 4.729(23) *120,1* 4,719(1) *119,9* 4.950(7) *125,7*	3.880(1) *98,55* 3.996(30) *101,5* 3.878(1) *98,50* 3.883(8)(23) *98,63*	K-55 C-75 N-80	5,720 7,200 7,500

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
3,190 4,380 4,380	3,190 4,380 4,380			111 152 152	77 101 112		74(25) 74(25)	62(8) 62(8)	
4,790 4,790	4,790 4,790			165 165	132 146		143(22) 69(8) 181(22) 165(9a,b) 80(25)	129(23) 165(9a, b) 176(23) 165(30)(31)	80(25) 69(8) 166(28)
5,350 5,350 7,290 7,780 9,240 10,690 7,780 16,380	5,350 5,350	5,350 5,350 7,290 7,780 9,240 10,690 7,780 16,380	5,350 5,350 7,290 7,780 9,240 10,690 7,780 15,300	184 184 250 267 317 367 267 551	154 170	162 180 212 223 234 279 212 438	160(22) 95(8) 174(8) 97(25) 184(30)(27) 174(8) 250(9a) 138(8) 218(23) 193(8) 224(22) 229(8) 267(22) 367(9a,b) 141(25) 267(30,31) 216(8)	163(23) 184(9a) 203(22) 95(8) 184(28)(31) 208(1) 250(9b) 219(1) 141(25) 317(9,9a,b) 229(23) 273(1) 272(23) 367(30)(27) 138(8) 190(8) 417(9a,b)	97(25) 184(9b) 207(23) 184(9a, b) 131(8) 214(22) 267(9ab,27,28) 167(8)(25) 164(8) 194(25) 367(28.31) 190(8) 267(9a,b) 220(25)
5,790 7,900 8,440 10,010				199 271 289 343			148(8) 198(9a,b) 188(8) 270(9a,b) 198(8,31,30) 260(21) 208(8) 188(9c)	231(23) 198(28,31) 233(1) 245(1) 180(9c) 255(23) 342(9a,b)	247(21) 198(30) 171(9c) 243(23) 288(9a,b,28) 273(21)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
4-1/2 *114,3*	13.50 13.60	.290 *7,37*	3.920 *99,60*	3.795 *96,39*	5,000 *127,0*	4.588(21) *126,0* 4.500(25,8) *116,5* 5.000(27)(30) *127,0* 4.932(28) *125,2* 4.719(1) *119,9* 4.750(5) *120,6* 4.950(7) *125,7* 4.961(9a,b, 31) *126,0* 4.759(23) *120,8*	3.996(30) *101,5* 3.854(25) *97,9* 3.920(7) *99,6* 3.840(1)(5) (21) *97,54* 3.845(8)(23) *97,66* 3.846(9c) *88,5*	K-55 C-75 N-80 C-95 P-110 V-150 L-80	6,420 8,140 8,540 9,660 10,680 12,880 8,540
	15.10	.337 *8,56*	3.826 *97,20*	3.701 *94,01*	5.000 *127,0*	5.118(27) *130,0* 5.079(30,31) *129,0* 4.500(25)(8) *114,3* 4.750(1) *120,7* 4.594(3) *116,7* 4.835(5) *122,8* 5.010(9a) *127,2* 4.961(9) *126,0* 4.597(21) *116,8* 5.005(28) *127,1*	3.945(30) *100,2* 3.776(25) *95,9* 3.746(1)(2) (5)(21) *95,15(3)* 3.751(8) *95,27* 3.756(9c) *95,4*	K-55 C-75 N-80 C-95 P-110 V-150 Q-125	7,620 10,390 11,080 14,350 18,110 15,840
	16.6 16.8 17.1	.373 *9,47*	3.754 *95,35*	3.629 *92,17*	5.000 *127,0*	4.750(1) *120,6* 4.500 (2)(8) *114,3* 4.634(3) *117,7* 5.100(7) *129,5*	3.674(1)(3) *93,32* 3.679(8) *93,45*	K-55 C-75 N-80 C-95 P-110 V-150	8,360 11,400 12,160 14,440 16,720 22,110

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
6,200				211			200(8) 120(25) 211(9a,b,28)	252(23) 111(8) 193(9c)	269(21) 211(7,27) 211(31,30)
8,460		8,460	8,460	288		257	200(8) 288(9a,b)	255(1)	193(9c)
9,020		9,020	9,020	307		270	211(8,31) 174(25) 307(7,9a,b)	268(1) 283(21) 307(22,28,27)	265(23) 161(8) 203(9c)
10,710		10,710	10,710	364		284	222(8) 207(25) 364(7)	364(9) 297(21) 364(9a,b)	279(23) 191(8) 214(9c)
12,410		12,410	12,410	422		338	264(8) 240(25) 422(7) 422(28)	335(1) 354(21) 422(9a,b) 422(31)	332(23) 221(8) 422(30)(27) 254(9c)
16,920				576			327(25) 575(7)	429(5) 325(9c)	302(8) 575(9a,b)
9,020		9,020	9,020	307		257	174(25) 307(9a, b)	161(8) 307(30,31)	307(7) 193(9c)
7,210				242			222(2) 242(9ab,28)	143(25) 242(31,27,30)	128(8)
9,830				331			220(2) 331(9a,b)	308(1)	247(9c)
10,480				353			242(8,31,30) 208(25) 353(9a,b)	324(1) 186(8) 353(28,27)	321(21) 260(9c)
				419			255(8) 247(25) 419(9a,b)	414(9) 220(8)	337(21) 273(9c)
14,420		14,420	13,460	485		406	303(8) 286(25) 485(30,31)	405(1) 255(8) 485(27)(28)	401(21) 485(9a,b) 326(9c)
19,660				661			521(5) 348(8)	397(3) 417(9c)	390(25) 661(9a,b)
16,380		16,380	15,300	551		438	433(21) 551(9a)	325(25) 551(9b)	290(8) 352(9c)
7,980 10,880 11,600 13,780 15,960 21,760				266 363 387 459 532 725			299(8) 314(8) 330(8) 393(8)	241(2) 255(3) 335(1) 418(1)	

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
4-1/2 *114,3*	16.9	.380 *9,65*	3.740 *95,00*	3.615 *91,83*		5.100(7) *129,5* 4.605(21) *116,9* 5.106(9,9a) *129,7* 4.500(8) *114,3* 5.118(27) *130,0*	3.661(21) *93,0* 3.679(8) 93,4 3.754(7) *95,4* 3.673(9c) *93,3*	C-95 P-110 V-150	14,690 17,010 22,890
	18.8 20.0	.430 *10,92*	3.640 *92,46*	3.515 *89,29*		5.146(9a) *232,3* 4.615(21) *117,2* 5.142(28) *130,6* 4.750(1) *120,6* 4.500(2)(8) *114,3* 4.594(3) *116,7* 4.993(5) *126,8* 5.200(7) *132,1* 5.106(9) *129,7* 5.201(9b) *132,1*	3.575(9c) *90,8* 3.560(1)(2)(3)(21) *90,42(5)* 3.565(8) *90,55*	K-55 C-75 N-80 C-95 P-110 V-150	9,510 12,960 13,830 16,420 19,010 25,930
	21.6	.500 *12,7*	3.500 *88,9*	3.375 *85,72*		5.146(9a) *130,7* 5.201(9b) *132,1* 4.629(21) *117,6* 4.700(3) *119,4* 4.940(6) *125,5* 5.300(7) *134,6* 5.201(9) *132,1* 4.500(8) *114,3* 5.244(27)	3.420(21) *86,9* 3.433 87,2 3.500(3)(7) *88,9* 3.425(8) *87,00*	K-55 C-75 N-80 P-110 V-150	10,860 14,810 15,800 21,730 29,630
	24.6	.560 *14,22*	3.380 *85,85*	3.255 *82,68*		*133,2* 5.280(9a.b) *134,1* 5.333(9a) *135,5* 5.322(9b) *135,2* 5.101(6) *129,6* 5.280(9)	3.315(9c) *84,2*	N-80 P-110 V-150	17,430 23,970 32,690

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
14,040				467			459(7) 289(8)	467(9) 327(9c)	379(21) 467(9a,b)
16,260				541			532(7) 335(8)	541(9,27) 389(9c)	452(21) 541(9a,b)
22,170				738			725(7) 738(9a,b)	457(8)	498(9c)
9,200				302			340(8) 302(9a,b)	291(2) 302(28)	191(8)
12,540				412			220(2) 412(9a,b)	308(1)	340(9c)
13,380				440			303(3) 358(9c)	278(8) 440(9a,b)	440(28)
15,890				522			375(8) 376(9c)	330(8) 522(9a,b)	455(21)
18,390				605			543(5) 382(8) 605(9a,b)	541(21) 521(8) 605(28)	447(9c)
25,080				825			825(9) 572(9c)	659(5) 825(9a,b)	521(8)
10,690 14,580 15,560				345 471 503			219(8) 344(3) 502(9) 503(9a,b)	346(7,27) 388(9c) 319(8) 409(9c)	346(9a,b) 471(9a,b) 503(7,27)
21,390				691			453(3) 438(8)	601(6) 691(7,27,9ab)	632(21) 511(9c)
29,170				942			941(9) 942(7,9a,b)	769(6) 552(9c)	598(8)
17,420 23,960 32,670				554 762 1,040			554(9) 682(6) 873(6)	452(9c) 564(9c) 722(9c)	555(9a,b) 763(9a,b) 1040(9a,b)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
4-1/2 *114,3*	26.5	.630 *16,0*	3.240 *82,3*	3.115 *79,12*		5.311(6) *134,9*		N-80 P-110 V-150	19,260 26,490 36,120
5 *127,0*	11.5	2.20 *5,59*	4.560 *115,8*	4.435 *112,6*	5.563 *141,3*	5.000(8) *127,0* 5.500(7) *139,7*	4.460(8) *113,3*	J-55 K-55	3,060 3,060
	13.0	.253 *6,43*	4.494 *114,1*	4.369 *111,0*	5.563 *141,3*	5.364(28) *136,2* 5.563(9b,31) *141,3* 5.587(9a) *141,9* 5.185 *131,7* 5.219(1) *132,6* 5.375(7) *136,5* 5.563(9) *141,3* 5.511(30) *140,0* 5.000(25,8) *127,0*	4.494(7) *114,1* 4.421(25) *112,3* 4.414(1) *112,1* 4.419(8)(23) *112,2* 4.468(30) *113,5*	J-55 K-55 C-75 N-80	4,140 4,140 4,990 5,140
	15.0	.296 *7,52*	4.408 *112,0*	4.283 *108,8*	5.563 *141,3*	5.092(2) *129,3* 5.435(28) *13,8* 5.255(23) *133,5* 5.563(9b,31) *141,3* 5.587(9a) *141,9* 5.219(1) *132,6* 5.370(4) *136,4* 5.265(5) *133,7* 5.450(7) *138,4* 5.563(9,27) *141,3* 5.360(10) *136,1* 5.362(17)	4.335(9c) *110,1* 4.347(25) *110,4* 4.408(7) *112,0* 4.328(1)(21) *109,9(4)(5)* 4.333(8)(23) *110,1* 4.208(17) *106,9* 4.468(30) *113,5*	J-55 K-55 C-75 N-80 C-95 P-110 V-150 L-80 C-90	5,560 5,500 6,970 7,250 8,090 8,830 10,260 7,250 7,840

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
	Short	Long			Round Thread				
					Short	Long			
19,600 26,950 36,750				613 842 1,149			773(6) 989(6)		
4,240 4,420	4,240 4,240			182 182	133 147		75(8) 141(8)	75(8)	
4,870	4,870	4,870	4,870	208	169	182	185(23) 108(8)	113(25) 208(9a)	190(7) 208(9b)
4,870	4,870	4,870	4,870	208	186	201	235(23) 190(7) 208(30)	197(8) 108(8) 208(28)	113(25) 208(9a,b) 208(31)
6,640				283			237(1)		
7,090				302			247(23) 276(7)	302(9,30) 157(8)	164(25) 241(28)
5,700	5,700	5,700	5,700	241	207	223	229(23) 223(7)	137(25) 241(9a)	126(8) 241(9b)
5,700	5,700	5,700	5,700	241	228	246	290(23) 126(8) 241(30,31)	299(21) 223(7) 241(27)	137(25) 241(9a,b) 241(28)
7,700		7,700	7,70	328		295	228(8) 328(9b)	294(1) 219(9c)	328(9a)
8,290		8,290	8,290	350		311	240(8) 315(21) 184(8) 350(9b)	309(1) 231(9c) 324(7) 350(27)	305(23) 200(25) 350(9a) 350(28)
9,840		9,840	9,840	416		326	321(23) 237(25) 416(9a)	330(21) 218(8) 416(9b)	385(7) 242(9c)
11,400				481			514(4) 393(21) 445(7) 288(9c)	387(1) 274(25) 481(9a,b) 481(27)	382(23) 253(8) 481(30,31) 481(28)
15,540				656			656(9,9a,b) 345(8)	495(5) 607(7)	374(25) 369(9c)
8,290		8,290	8,290	350		295	200(25)	184(8)	324(7)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
5 *127,0*	18.0	.362 *9,19*	4.276 *108,6*	4.151 *105,4*	5.563 *141,3*	5.587(9a) 141,9 5.572(9b) 141,5 5.000(25)(8) *127,0* 5.563(27) *141,3* 5.630(30) *143,0* 5.105(21) *129,6* 5.250(1) *133,3* 5.359(3) *136,1* 5.420(4) *137,7* 5.385(5) *136,8* 5.550(7) *141,0* 5.563(9,16,31) *141,3* 5.360(10) *136,1* 5.184(13) *131,7* 5.362(17) *136,2* 5.540(28) *140,7*	4.209(9c) *106,9* 4.189(25) *106,4* 4.276(7) *108,6* 4.196(1)(2)(3)(13) *106,6(4)(5)* 4.201(8)(23) *106,7* 4.208(17) *106,9*	K-55 C-75 N-80 C-95 P-110 V-150 Q-125 L-80 C-90	7,390 10,000 10,490 12,010 13,470 16,860 14,820
	20.3	.408 *10,36*	4.184 *106,3*	4.059 *103,1*		5.609(28) *142,5* 5.114(21) *129,9* 5.094(3) *129,4* 5.420(4) *137,7* 5.465(5) *138,8* 5.214(13) *132,4* 5.563(16) *141,3* 5.402(17) *137,2* 5.000(8,25) 127,0	4.104(2)(3) (25((13)(21) *104,2* (4)(5) 4.109(8) *104,4* 4.134(17) *105,0* 4.118(9c) *104,6*	K-55 C-75 N-80 P-110 V-150	8,240 11,240 11,990 16,490 21,470

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
6,970				290			169(25) 182(8)	267(2) 290(27,28,30)	272(7) 290(31,9a,b)
9,500		9,500	9,290	396		376	326(8) 396(9b)	353(1) 304(9c)	396(9a)
10,140		10,140	9,910	422		396	499(4) 246(25) 265(8) 422(27)(28)	300(3) 393(23) 422(9a) 320(9c)	370(21) 396(7) 422(9b,30)
12,040		12,040	11,770	501		416	360(8) 292(25) 501(9b)	314(8) 470(7) 336(9c)	413(23) 501(9a) 393(21)
13,940		13,940	13,620	580		495	465(13) 400(9c) 544(7) 580(27)	354(2) 491(23) 364(8) 580(30)	462(21) 338(25) 580(9a,b) 580(28)(31)
19,000				791			791(9,9a,b) 461(25) 512(9c)	639(5) 742(7)	499(21) 497(8)
15,840				659			384(25) 659(9a) 499(21) 246(25) 422(9a,b) 475(9a,b)	619(7) 659(9b) 396(7) 304(9c) 501(9b)	414(8) 432(9c) 265(8) 422(30,31)
7,850				324			368(8) 302(9a)	201(8) 324(9b)	214(25) 324(27,28)
10,710				441			506(4) 441(9b)	362(9c)	412(9a)
11,420				471			432(13) 311(25) 471(9b)	281(2) 382(9c) 471(27,28)	292(8) 440(9a)
15,710				647			575(5) 402(8) 605(9a)	406(2) 428(25) 647(9b)	575(21) 477(9c) 647(27,28)
21,420				883			737(5) 584(25) 883(9b)	576(3) 610(9c)	548(8) 825(9a)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
5 *127,0*	20.8	.422 *10,72*	4.156 *105,6*	4.031 *102,4*		5.630(28) *143,0* 5.117(21) *130,0* 5.094(3) *129,4* 5.650(7) *143,5* 5.000(8)(25) *127,0* 5.587(9a) *141,9* 5.750(9b) *146,1*	4.156(7) *105,6* 4.076(2)(3)(21) *103,5* 4.081(8)(25) *103,6* 4.091(9c) *103,9*	K-55 C-75 N-80 P-110 V-150	8,500 11,590 12,360 17,000 22,870
	21.4	.437 *11,10*	4.126 *104,8*	4.001 *101,6*	5.563 *141,3*	5.119(21) *130,02* 5.652(28) *143,6* 5.750(7) *146,0* 5.000(25) *127,0* 5.563(9) *141,3* 5.261(13) *133,6* 5.750(9b) *146,0* 5.587(9a) *141,9* 5.756(30) *146,2* 5.563(31) *141,3*	4.126(7) *104,8* 4.046(13)(21) *102,8* 4.055(25) *103,0* 4.059(9c) *103,1*	L-80 C-95 P-110 N-80 Q-125 C-75 C-90	12,760 15,150 17,550

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
	Short	Long			Round Thread				
					Short	Long			
8,120				334			211(8) 302(9a)	316(7) 334(9b,28)	205(25)
11,080				455			375(8) 412(9a)	267(2) 445(9b)	380(9c)
11,820				486			360(3) 459(7)	281(2) 298(25)	307(8) 400(9c)
16,250				668			486(9b,28) 450(3) 632(7)	440(9a) 351(2) 410(25)	422(8) 500(9c)
22,160				910			605(9a) 576(3) 862(7) 825(9a)	597(21) 910(9b) 559(25)	668(9b,28) 575(8) 640(9c)
12,240		10,810	9,910	501		466	510(12) 475(7) 501(9b)	445(13) 335(25) 501(30)(31)	471(21) 440(9a) 388(9c)
14,530		12,840	11,770	595		515	521(21) 397(25) 429(9c)	537(9) 522(9a)	564(7) 595(9b,31)
16,820		14,870	13,620	689		613	671(12) 653(7) 605(9a) 689(30) 475(7) 501(28) 742(7) 551(9c) 412(9a) 495(9a)	586(13) 460(25) 510(9c) 689(31) 335(25) 408(9c) 523(25) 787(9b) 470(9b) 564(9b)	620(21) 689(28) 689(9b) 440(9a) 501(9b) 687(9a) 388(9c)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thickness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Collapse Resistance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
5 *127,0*	23.2	.478 *12,14*	4.044 *102,7*	3.919 *99,54*		5.736(27) *145,7* 5.128(21) *130,3* 5.756(30) *146,2* 5.000(8) *127,0* 5.250(1) *133,3* 5.150(3) *130,8* 5.420(4) *137,7* 5.581(5) *141,8* 5.750(7) *146,1* 5.563(9)(16) *141,3* 5.360(10) *136,1* 5.268(13) *133,8* 5.504(17) *139,8* 5.587(9a) *141,9* 5.750(9b) *146,0* 5.711(28) *145,0*	4.044(7) *102,7* 3.987(25) *101,3* 3.976(9c) *101,0* 3.964(1)(2)(3)(13)(21) *100,7(4)(5)* 3.969(8) *100,8* 3.994(17) *101,4*	K-55 C-75 N-80 C-95 P-110 V-150 Q-125 L-80 C-90	9,510 12,970 13,830 16,430 19,020 25,940 21,620
	24.2	.500 *12,7*	4.000 *101,6*	3.875 *98,42*	5.563 *141,3*	5.563(31) *141,3* 5.150(3) *130,8* 5.750(7) *146,1* 5.563(9)(16) *141,3* 5.303(13) *134,7* 5.504(17) *139,8*	3.937(9c) *?* 3.920(2)(3)(13) *99,57* 3.925(8) *99,7* 3.950(17) *100,3*	K-55 N-80 P-110 V-150	9,900 14,400 19,800 27,000

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
9,200				373			311(9)	356(2,7)	237(8)
							252(25)		
								373(30,28)	373(27,31)
							302(9a)	374(9b)	
12,550				509			419(8)	353(1)	435(9c)
							412(9a)	509(9b)	
13,380				543			532(4)	360(3)	367(25)
							517(7)	344(8)	457(9c)
							543(27,30)	543(28,9b)	440(9a)
15,890				645			463(8)	539(13)	436(25)
							409(8)	563(21)	614(7)
							480(9c)	522(9a)	543(27,31,9b)
18,400				747			689(5)	351(2)	505(25)
							473(8)	671(21)	711(7)
							605(9a)	572(9c)	
							747(30,28)	747(27,31)	747(9b)
25,100				1,019			881(5)	576(3)	574(25)
							970(7)	645(8)	1019(9b)
							825(9a)	732(9c)	747(38)
							747(27)	747(28)	610(31)
20,910				849			724(21)	808(7)	538(8)
							688(25)	687(9a)	849(9b)
							617(9c)		
							517(7)	344(8)	367(25)
							435(9c)	140(9a)	543(9b)
							543(30)	443(31)	
							495(9a)	611(9b)	
9,630				389			437(8)	389(27)	
14,000		10,810	9,910	565		567	537(12)	281(2)	457(9c)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thickness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Collapse Resistance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
5 *127,0*		.500				5.132(21) *130,4* 5.768(27) *146,5* 5.587(9a) *142,0* 5.806(9b) *147,5* 5.756(30)	3.920(21) *99,6*	C-95 P-110 Q-125 C-75 L-80	17,100 22,500
	24.1	*12,7*				*146,2* 5.742(28) *145,9*		C-90 N-80	
						5.563(31) *141,3*			
	26.7	.562 *14,27*	3.876 *98,4*	3.751 *95,3*		5.247(24) *133,3* 5.317(13) *135,0*	3.796(13)(24) *96,4*	L-80 C-95 P-110	15,960 18,960 21,950
	29.2	.625 *15,87*	3.750 *95,2*	3.625 *92,1*		5.244(24) *133,2* 5.319(13) *135,1*	3.670(13)(24) *93,2*	L-80 C-95 P-110	17,500 20,780 24,060
						5.241(24) *133,1*		L-80	18,960
	31.6	.687 *17,45*	3.626 *92,1*	3.501 *88,9*		5.320(13) *135,1* 5.238(24) *133,0*	3.546(13)(24) *90,1*	C-95 P-110	22,520 26,070
	34.0	.750 *19,05*	3.500 *88,9*	3.375 *85,7*		5.322(13) *135,2*	3.420(13)(24) *86,9*	L-80 C-95 P-110	20,400 24,230 28,050
						5.660(23) *143,8*	4.937(23) *125,4*		

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
16,630 21,880				672 884			591(21) 704(21) 778(28) 687(9a) 412(9a) 440(9a) 443(31) 495(9a) 440(9a)	522(9a) 605(9a) 777(30) 884(9b) 530(9b) 566(9b) 636(9b) 566(9b)	672(9b) 778(9b) 610(31) 760(21) 565(30) 565(28)
15,740 18,690 21,640				627 744 862			580(13) 641(13) 763(24)	 641(24) 763(13)	
17,500 20,780 24,060				687 816			626(13) 692(13)	 692(24)	
  ~~19,240~~ 22,840 26,450				945 ~~745~~ 884 1,024			824(13) ~~665(13)~~ 735(24) 875(24)	824(24) 735(13) 875(13)	
~~21,000~~ 24,940 28,880				~~801~~ 951 1,101			~~703(13)~~ 777(13) 925(13)	 777(24) 925(24)	
3,110 4,270 4,270	3,110 4,270 4,270			161 222 222	130 172 189		195(23) 247(23) ~~118(25)~~	92(8) 92(8)	118(25) 172(8)
5,820				302				249(1)	

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
5-1/2 *139,7*	15.5	.275 *6,98*	4.950 *125,7*	4.825 *122,6* 4.653(10) *118,2*	6.050 153,7	5.713(23) *145,1* 5.500(8)(25) *139,7* 6.050(27) *153,7* 6.043(30) *153,5* 5.750(1) *146,1* 5.900(4) *149,8(9)* 6.000(7) *152,4* 5.860(10) *148,8* 5.862(17) *148,9* 6.051(9b)(31)	4.890(25) *124,2* 4.870(1)(4) *123,7* 4.875(8,23) *123,18* 4.746(17) *120,5* 4.950(7) *125,7*	J-55 K-55 C-75 N-80 P-110	4,040 4,040 4,860 4,990 5,620
	17.0	.304 *7,72*	4.892 *124,3*	4.767 *121,1* 4.653 (10) *118,2*	6.050 *153,7* 5.500(8)(25) *139,7*	*153,7* 6.075(9a) *154,3* 5.905(28) *150,0* 5.500(8,25) *139,7* 6.043(30) *153,5* 6.050(27) *153,7* 5.598(21) *142,2* 5.761(23) *146,3* 5.781(1) *146,8* 5.900(4) *149,9* 6.000(7) *152,4* 6.050(9) *153,7* 5.860(10) *148,8* 5.862(17) *148,9* 6.075(9a) *154,3*	4.819(9c) *122,4* 4.812(1)(4)(21) *122,2* 4.817(8,23) *122,4* 4.711(17) *119,7* 4.892(7) *124,3* 4.817(25) *122,4*	J-55 K-55 C-75 N-80 C-95 P-110 V-150	4,910 4,910 6,070 6,280 6,930 7,480 8,300

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
4,810	4,810	4,810	4,810	248	202	217	230(23) 130(8)	229(7) 248(9a)	122(25) 248(9b)
4,810	4,810	4,810	4,810	248	222	239	248(9) 291(23) 248(28,31)	236(8) 248(9a,b) 130(8)	229(7) 248(30,27) 122(25)
6,560				339			339(9a)	294(1)	
7,000				362			361(9a) 188(8)	421(4) 178(25)	361(27,28) 332(7)
9,620				497			497(9a,27)	497(28,31)	
5,320	5,320	5,320	5,320	273	229	247	262(23) 144(25)	253(7) 273(9a)	143(8) 273(9b)
5,320	5,320	5,320	5,320	273	252	272	273(9) 143(8) 273(30,27)	332(23) 144(25) 253(7)	339(21) 273(9a,b) 273(28,31)
7,250		7,250	7,250	372		327	259(8) 372(9a)	337(1) 372(9b)	242(9c)
7,740		7,740	7,740	397		348	273(8) 357(21) 209(8) 397(9b)	355(1) 368(7) 210(25) 397(27)	350(23) 255(9c) 397(9a) 397(28)
9,190		9,190	9,190	471		374	287(8) 437(7) 250(25)	367(23) 268(9c) 471(9a)	375(21) 248(8) 471(9b)
10,640		10,640	10,640	546		445	582(4) 446(21) 319(9c) 546(30,22)	444(1) 506(7) 289(25) 546(28)(31)	437(23) 287(8) 546(9a,b) 546(27)
14,510				744			736(19) 691(7)	744(9a,b) 391(8)	408(9c) 394(25)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
5-1/2 *139,7*	20.0	.361 *9,17*	4.778 *121,4*	4.653 *118,2*	6.050 *153,7*	6.046(30) *153,6* 5.500(7)(25) *139,7* 5.852(23) *148,6* 5.608(21) *142,4* 5.781(1) *146,8* 5.625(3) *142,9* 6.000(4) *152,4* 5.888(5) *149,6* 6.150(7)(8)(9b) *156,2* 6.050(9)(16)(27) *153,7* 5.860(10) *148,8* 5.862(17) *148,9* 6.075(9a) *154,3* 6.045(28) *153,5* 6.051(31) *153,7*	4.778(8) *121,4* 4.709(9c) *119,6* 4.698(23,22, 21,25,29) *119,3* (4)(5) 4.703(8)(23) *119,5* 4.711(17) *119,7* 4.703(7,23) *119,5*	K-55 C-75 N-80 C-95 P-110 V-150	6,610 8,440 8,830 10,000 11,100 13,480

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
6,310				321			321(9,9a,b)	321(31,27)	321(30,28)
8,610		8,610	8,430	437		403	202(7) 360(8) 437(9b)	301(8) 416(1) 325(9c)	189(25) 437(9a)
9,190		9,190	8,990	466		428	379(8) 434(23) 274(25) 466(28)	311(2) 294(7) 466(9a,b) 342(9c)	414(21) 438(8) 466(27)
10,910		10,910	10,680	554		460	398(8) 349(7) 554(9a)	434(21) 520(8) 554(9b)	456(23) 326(25) 359(9c)
12,640		12,640	12,360	641		548	689(4) 543(23) 377(25) 641(28)	414(3) 404(7) 641(9a,b) 641(31)	517(21) 602(8) 641(30,27) 427(9c)
17,220				874			707(5) 874(9a,b) 820(8)	536(3) 547(9c) 514(25)	865(19) 550(7)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
5-1/2 *139,7*	23.0	.415 *10,54*	4.670 *118,6*	4.545 *115.4*	6.050 *153,7*	5.619(21) *142,7* 5.936(23) *150,8* 6.046(30) *153,6* 6.150(27) *156,1* 5.781(1) *146,8* 5.625(3) *142,9* 6.000(4) *152,4* 5.984(5) *152,0* 6.150(7)(9b) *156,2* 6.050(9)(16) *153,7* 5.860(10) *148,8* 5.720(13) *145,3* 6.004(17) *152,5* 5.500(8)(25) *139,7* 6.075(9a) *154,3* 6.128(28) *155,7* 6.051(31) *153,7*	4.602(9c) *116,9* 4.590(1)(2)(3)(13)(21) *116,6(4)(5)* 4.595(8)(23) *116,7* 4.619(17) *117,3* 4.670(7) *118,6* 4.600(25) *116,8*	K-55 C-75 N-80 C-95 P-110 V-150 Q-125	7,670 10,400 11,160 12,920 14,520 18,390 16,060
	23.8	.437 *11,10*	4.626 *117,5*	4.501 *114,3*		5.756(13) *146,2*	4.546(13) *115,5*	L-80 C-95 P-110	11,700 13,900 15,920

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
7,270				365			336(9) 326(31) 231(8)	329(9a) 365(9b) 229(25)	345(7) 365(27,28)
9,900		9,260	8,430	497		473	409(8) 497(9b)	416(1) 401(9c)	448(9a)
10,560		9,880	8,990	530		502	431(8) 422(9c) 478(9a)	311(2) 502(7) 530(9b)	335(8) 344(25) 530(27,28)
12,540		11,730	10,680	630		540	452(8) 541(21) 596(7) 630(9b)	512(13) 443(9c) 396(25)	537(23) 398(8) 568(9a)
14,520		13,580	12,360	729		643	788(4) 644(21) 690(7) 657(9a) 652(31)	515(3) 639(23) 459(25) 729(30,27)	527(9c) 461(8) 659(9a) 729(28,9b)
19,810				994			835(5) 941(7) 995(9b)	659(3) 675(9c) 626(25)	896(9a) 629(8)
16,510				829			995(21) 784(7) 829(9b)	570(9c) 521(25)	524(8) 747(9a)
11,120 13,210 15,300				556 660 765				493(13) 544(13) 648(13)	

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
5-1/2 *1139,7*	26.0	.476 *12,01*	4.548 *115,5*	4.423 *112,3*		6.260(27) *159,0* 5.500(25)(8) *139,7* 5.631(21) *143,0* 5.781(1) *146,8* 5.625(3) *142,9* 6.068(4) *154,1* 6.087(5) *154,6* 6.325(7) *160,7* 6.050(9)(16) *153,7* 5.768(13) *146,5* 6.004(17) *152,5*	4.480(9c) *113,8* 4.534(2)(3)(21) *115,2* 4.468(1)(13)(25) *113,5(4)(5)* 4.473(8) *113,6* 4.498(17) *114,2* 4.548(7) *115,6*	K-55 C-75 N-80 C-95 P-110 V-150 Q-125	8,700 11,860 12,650 15,020 17,390 23,720 19,760
						6.075(9a) *154,3* 6.244(9b) *158,6* 6.220(28) *158,0* 6.051(31) *153,7*			
	26.8	.500 *12,7*	4.500 *114,3*	4,375 *111,1*		6.260(30) *159,0* 5.807(13) *147,5* 5.635(21) *143,1* 5.500(8)(25) *139,7* 5.790(3) *147,1* 5.982(6) *151,9*	4,420(13)(21) *112,3* 4.370(9c) *111,0* 4.360(3) *110,7*	L-80 C-95 P-110 C-75 N-80	13,220 15,700 18,180 13,060 13,930
	28.4	.530 *13,46*	4.440 *112,8*	4.315 *109,6*		6.325(7) *160,7* 6.050(16) *153,7*	4.365(8) *110,9* 4.390(17) *111,5*	P-110	19,160

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
8,330				413			464(8)	329(9a)	413(9b,28,27)
11,360				563	464(8)		670(4) 478(9c)	416(1) 563(9b)	448(9a)
12,120				601	488(8)	503(3)	311(2) 503(9c)	438(1) 601(9b)	478(9a) 601(28,27)
14,390				714	513(8)		593(13) 528(9c)	581(9) 714(9b)	602(21) 568(9a)
16,660				826	610(8)	629(3)	717(21) 826(9b)	548(1) 826(28,27)	629(9c) 657(9a)
22,720				1,127		805(3)	976(5) 898(9a) 756(25)	717(3) 1127(9b) 714(8)	805(9c) 1073(7)
18,930				939			774(21) 747(9a)	679(9c)	939(9b)
12,730 15,110 17,500				628 746 864			568(13) 628(13) 748(13) 864(30)	474(31) 649(21) 773(21)	628(30) 652(31)
12,650				621			523(3) 621(9b)	511(8)	512(9c)
13,490				662			612(6) 421(8)	539(9c) 633(7)	662(9b) 384(25)

BAKER OIL TOOLS
A Baker Hughes company

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
5-1/2 *139,7*	29.7	.562 *14,27*	4.376 *111,1*	4.251 *108,0*		5.743(24) *145,9* 6.400(7) *162,6* 5.837(13) *148,3* 5.500(8)(25) *139,7*	4.376(7) *111,2* 4.301(8) *109,2* 4.296(13)(24) *109,1* 4.468(25) *113,5*	L-80 C-95 P-110	14,680 17,430 20,180
	32.3	.612 *15,54*	4.276 *108,6*	4.151 *105,4*		5.770(24) *146,5* 5.581(3) *141,8* 6.184(6) *157,1* 6.050(16) *153,7* 6.201(17) *157,5* 5.500(18)(25) *139,7*	4.196(24) *106,6* 4.276(3) *108,6* 4.201(8) *106,7* 4.226(17) *107,3* 4.276(7) *108,6*	N-80 P-110 V-150 C-95 Q-125	15,820 21,760 29,670 18,790 24,720
						6.450(7) *163,8* 5.500(8) *139,7*	4.421(25) *112,3*		
	32.6	.625 *15,87*	4.250 *108,0*	4.125 *104,8*		5.770(24) *146,6* 5.847(13) *148,5*	4.170(13)(24) *105,9*	L-80 C-95 P-110	16,120 19,140 22,160
	35.3	.687 *17,45*	4.126 *104,8*	4.001 *101,6*		5.767(24) *146,5* 5.849(13) *148,6*	4.046(13)(24) *102,8*	L-80 C-95 P-110	17,490 20,770 24,050
	36.4	.705 *17,91*	4.090 *103,9*	3.965 *100,7*		5.766(24) *146,4* 5.681(3) *144,3* 6.445(6) *163,7* 6.050(16) *153,7* 6.303(17) *160,1*	4.010(24) *101,9* 4.090(3) *103,9* 4.040(17) *102,6*	C-95 N-80 P-110 V-150 Q-125	21,230 17,880 24,590 33,530 27,940
						5.764(24) *146,4*		L-80 C-95	18,840 22,380

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
14,310 16,990 19,670				697 828 959			422(8) 408(25) 712(13,24) 794(7) 848(13,24) 920(7)	644(13) 513(8) 513(8) 484(25) 594(8) 560(25)	669(7)
15,580 21,420 29,210 18,500 24,340				752 1,034 1,410 893 1,175			611(8) 432(25) 441(18) 994(7) 1214(6) 898(8) 768(24) 988(24)	453(3) 479(8) 948(6) 594(25) 1356(7)	723(7) 915(24) 658(8) 810(25)
15,910 18,890 21,880				766 909 1,053			712(13) 786(13) 936(13)	786(24) 936(24)	
17,490 20,770 24,040				831 987			755(13) 835(13)	835(24)	
				1,143			994(13)	994(24)	
21,310 17,950 24,680 33,650 28,040				1,009 850 1,168 1,593 1,328			836(24) 453(3) 1,101(6) 1,409(6) 1,074(24)	995(24)	

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
5-1/2 *139,7*	40.5	.812 *20,62*	3.876 *98,5*	3.751 *95,3*		5.761(24) *146,3* 5.852(13) *148,6*	3.796(13)(24) *96,4*	L-80 C-95 P-110	20,130 23,910 27,690
6 *152,4*	18.0	.288 *7,32*	5.424 *137,8*	5.299 *134,6*	6.625 *168,3*			H-40 J-55 N-80	2,780 3,620 4,740
	20.0	.324 *8,23*	5.352 *135,9*	5.227 *132,8*	6.625 *168,3*	7.413(9a) *188,3*		N-80	5,690
	23.0	.380	5.240	5.115	6.625				
		9,65	*133,1*	*129,9*	*168,3*			N-80 P-110	7,180 10,380
	26.0	.434 *11,02*	5.132 *130,4*	5.007 *127,2*	6.625 *168,3*	6.625(25)(8) *168,3* 6.818(23) *173,2* 6.938(1) *176,2*	5.987(25) *152,1*	P-110 H-40 J-55	12,380 2,520 2,970
6-5/8 *168,3*	20.0	.288 *7,32*	6.049 *153,7*	5.924 *150,5*	7.390 *187,7*	7.100(7) *180,3* 7.390(9) *187,7* 7.048(28) *179,0* 7.413(9a) *188,3* 6.736(21) *171,1* 6.625(8) *168,3*	5.970(1) *151,6* 5.974(8)(23) *151,7* 6.049(7) *153,6* 5.886(9c) *149,5*	K-55 N-80 C-95	2,970 3,480 3,830
						7.390(27)	5.890(21)		

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
	Short	Long			Round Thread				
					Short	Long			
20,670 24,550 28,420				957 1,136 1,315			841(13) 929(13) 1,106(13)	929(24) 1,106(24)	
	3,360 4,620	 6,720		206 283 412	179 239	 279 323			
		7,560		461		366			
		8,870 12,190		737 536		432 565			
		13,920		833		646			
3,040 4,180 4,180 6,090 7,230	3,040 4,180 4,180	4,180 4,180	4,180 4,180	229 315 315 459 545	184 245 267	266 290	284(23) 292(7) 315(9) 180(25) 315(9a) 459(9a,b) 240(8) 545(9a,b) 504(7)	180(25) 315(9a) 300(8) 165(8) 315(9b) 388(1) 424(7) 310(25)	165(8) 315(9b) 360(23) 292(7) 315(28) 261(25) 284(8)
9,590 6,970				718 522			449(8) 718(9a) 341(8) 522(9a)	519(21) 378(8) 394(21) 275(8)	445(9c) 338(9c)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
						7.413(9a) *188,3* 6.625(25)(8) *168,3* 6.740(21) *171,2* 6.925(23) *175,9* 6.938(1) *176,2* 7.072(4) *179,6* 7.200(7) *182,9* 7.390(9a,b,27) *187,7* 7.000(10) *177,8* 7.004(17) *177,9* 7.390(30)(31)			
	24.0	.352 *8,94*	5.92 *150,4*	5.796 *147,2* 5.730 (10) *145,5*	7.390 *187,7*		5.976(30) *151,8* 5.878(25) *149,3* 5.921(7) *150,4* 5.840(1)(4) *148,3* 5.846(8)(23) *148,5* 5.792(17) *147,1* 5.841(21) *148,4* 5.846(9c)	J-55 K-55 C-75 N-80 C-95 P-110	4,560 4,560 5,550 5,760 6,310 6,730
6-5/8 *168,3*						*187,7* 7.155(28) *181,7* 6.625(25)(8) *168,3* 6.752(21) *171,5* 7.029(23) *178,5* 6.969(1) *177,0* 6.750(3) *171,5* 7.072(4) *179,6* 7.300(7) *185,4* 7.390(9)(16)(27) *187,7* (30)(31) 7.000(10) *177,8* 7.004(17) *177,9* 7.413(9a) *188,3* 7.390(9b)	*148,5* 5.902(30) *149,9* 5.724(9c) *145,4* 5.791(7) *147,1* 5.710(1)(2) (3) *145,0(4)* 5.716(8)(23) *145,2* 5.741(17) *145,8* 5.711(21) *145,1* 5.711(25) *145,1*	V-150 K-55 C-75 N-80 C-95 P-110 V-150	7,350 6,170 7,830 8,170 9,200 10,140 12,130
	28.0	.417 *10,59*	5.791 *147,1*	5.666 *143,9*	7.390 *187,7*				

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
5,110	5,110	5,110	5,110	382	314	340	228(25) 382(9a)	227(8) 382(9b)	358(7)
5,110	5,110	5,110	5,110	382	342	372	382(9) 228(25) 381(30) 382(27)	362(8) 227(8) 382(9a) 382(28)	471(23) 358(7) 382(9b) 381(31)
6,970		6,970	6,970	520		453	483(1)	379(9c)	520(9a,b)
7,440		7,440	7,440	555		481	642(4) 462(21) 332(25) 555(9a,b)	508(1) 399(9c) 330(8) 555(27)	496(23) 462(21) 520(8) 555(28)
8,830		8,830	8,830	659		546	521(23)	485(21)	419(9c)
10,230		10,230	10,230	763		641	394(25(659(9a) 802(4) 578(21) 453(8) 763(9a,b)	391(8) 659(9b) 635(1) 499(9c) 716(7) 763(27)(28)	618(9) 620(23) 457(25) 763(30) 763(31)
13,960				1,041			639(9c) 618(8)	1041(9a,b) 976(7)	623(25)
6,060				447			447(9,28) 299(25)	447(9a,b,30) 282(8)	447(27,31) 424(7)
8,260		8,260	8,260	610		552	502(8) 610(9b)	593(1) 493(9c)	610(9a)
8,810		8,810	8,810	651		586	529(8) 612(23) 519(9c) 651(9b)	431(2) 616(7) 411(8) 651(27)	633(21) 435(25) 651(9a) 651(28)
10,460		10,460	10,460	773		665	555(8) 732(7) 773(9a)	665(21) 517(25) 773(9b)	642(23) 488(8) 545(9c)
12,120		12,120	12,120	895		781	950(4) 764(23) 565(8) 895(27)(30)	586(3) 847(7) 895(9a) 895(28)(31)	792(21) 598(25) 895(9b) 649(9c)
16,510				1,220			750(3) 1155(7)	830(9c) 816(25)	1220(9a,b) 770(8)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
6-5/8 *168,3*	32.0	.475 12,06	5.675 *144,2*	5.550 *141,0*	7.390 *187,7*	6.625(8) *168,8* 7.413(9a) *188,3* 6.763(21) *171,8* 6.625(25) *168,3* 6.781(3) *172,2* 7.152(4) *181,7* 7.400(7) *188,0* 7.390(9)(16) *187,7* 7.000(10) *177,8* 6.890(13) *175,0* 7.055(17) *179,2*	5.902(30) *149,9* 5.610(9c)(25) *142,5* 5.600(8) *142,2* 5.595(2)(3)(13)(21) *142,1(4)* 5.600(8) *142,2* 5.624(17) *142,8* 5.675(7) *144,1*	K-55 C-75 N-80 C-95 P-110 V-150 Q-125	7,320 9,800 10,320 11,810 13,200 16,510 14,530
						7.390(27)(9b) *187,7* 7.390(30)(31) *187,7* 7.352(28) *186,7*			
	33.0	.500 *12,7*	5.625 *142,9*	5.500 *139,7*		6.768(21) *171,9* 6.932(13) *176,1* 7.413(9a) *188,3* 6.773(21) *172,0*	5.545(13)(21) *140,8*	L-80 C-95 P-110	11,160 12,920 14,530
	34.5	.525 *13,34*	5.575 *141,6*	5.450 *138,4*		6.781(3) *172,2* 6.974(13) *177,1*	5.508(9c) *140,0* 5.495(13)(21) *139,6*	N-80 P-110	11,670 15,850
	35.0					7.463(9b) *189,6* 7.428(28) *188,7* 6.921(24)		V-150	20,290

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
6,900				504			505(9,30) 344(25)	505(9a,b,27) 320(8)	505(28,31) 481(7)
9,410		9,410	9,200	688		638	567(8)	688(9a,b)	575(9c)
10,040		10,040	9,820	734		677	678(13) 465(8)	431(2) 700(7)	500(25) 734(9a)
11,920		11,920	11,660	872		769	734(9b) 626(8) 552(8) 872(9b)	734(28,27) 764(21) 831(7) 635(9c)	605(9c) 594(25) 872(9a)
13,800		13,800	13,500	1,009		904	1,079(4) 688(25) 1009(9a) 1010(28,27)	703(3) 639(8) 1009(9b) 1009(31)	910(21) 962(7) 1009(30) 756(9c)
18,820				1,377			900(3) 938(25)	968(9c) 872(8)	1377(9a,b) 1312(7)
15,680				1,147			983(21) 1093(7)	781(25) 1147(9a,b)	726(8) 816(9c)
10,570 12,550				770			685(13)		
14,530				914 1,058			757(13) 901(13)	807(21) 961(21)	
11,090				805			763(13) 773(9a)	599(3) 805(9b,28)	679(9c)
15,250				1,107			954(13) 848(9c)	749(3) 1063(9a)	1014(21) 1107(9b,28)
20,880				1,509			1030(13) 1509(9b)	959(3) 1450(9a)	1086(9c)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
6-5/8 *168,3*	40.2	.625 *15,87*	5.375 *136,5*	5.250 *133,3*		6.887(24) *174,9* 7.004(13) *177,9*	5,300(8) *134,6* 5.295(13)(24) *134,5*	L-80 C-95 P-110	13,670 16,230 18,800
	43.7	.687 *17,45*	5.251 *133,4*	5.126 *130,2*		6.951(24) *176,6* 7.037(13) *178,7*	5.171(13)(24) *131,3*	L-80 C-95 P-110	14,870 17,660 20,450
	47.1	.750 *19,05*	5.125 *130,2*	5.000 *127,0*		6.948(24) *176,5* 7.040(13) *178,8*	5.045(13)(24) *128,1*	L-80 C-95 P-110	16,060 19,070 22,090
	50.4	.812 *20,62*	5.001 *127,0*	4.876 *123,8*		6.945(24) *176,4* 7.041(13) *178,8*	4.921(13)(24) *125,0*	L-80 C-95 P-110	17,210 20,430 23,660
	53.7	.875 *22,22*	4.875 *123,8*	4.750 *120,6*		7.043(13) *178,9* 7.42(14) *188,5* 6.942(24) *176,3*	4.795(13)(24) 121,8	L-80 C-95 P-110	18,340 21,780 25,220
	56.8	.937	4.751	4.626		7.42(14)		L-80	19,430
		23,80	*120,7*	*117,5*					
						188,5		X-90	21,860
	59.9	1.000 *25,40*	4.625 *117,5*	4.500 *114,3*		7.42(14) *188,5*		L-80 X-90	20,510 23,070
	62.9	1.062 *26,97*	4.501 *114,3*	4.376 *111,1*		7.42(14) *188,5*		L-80 X-90	21,540 24,230
	65.8	1.125 *28,57*	4.375 *111,1*	4.250 *107,9*		7.42(14) *188,5*		L-80 X-90	22,560 25,380
	71.3	1.250 *31,75*	4.125 *104,8*	4.000 *101,6*		7.42(14) *188,5*		L-80 X-90	24,490 27,550

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
13,210 15,680 18,160				942 1,119 1,296			739(8) 817(8) 973(8)	857(13) 947(13) 1,127(13)	947(24) 1,128(24)
14,520 17,240 19,960				1,025 1,217 1,410			937(13) 1,035(13) 1,232(13)	1,035(24) 1,233(24)	
15,850 18,820 21,790				1,107 1,315 1,523			1,027(13) 1,135(13) 1,351(13)	1,135(24) 1,351(24)	
17,160 20,380 23,590				1,186 1,409 1,631			1,080(13) 1,194(13) 1,421(13)	1,194(24) 1,421(24)	
18,490 21,960 25,420				1,264 1,502 1,738			1,408(14) 1,253(13) 1,491(13)	1,133(13) 1,253(24) 1,491(24)	
19,800 22,280				1,339 1,507			1,408(14) 1,483(14)		
21,130 23,770				1,414 1,590			1,498(14) 1,576(14)		
22,440 25,250				1,485 1,670			1,586(14) 1,669(14)		
23,770 26,750				1,555 1,749			1,670(14) 1,758(14)		
26,420 29,720				1,689 1,900			1,754(14) 1,846(14)		
2,310	2,310			196	122				

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
7 *177,8*	20.0	.272 *6,91*	6.456 *164,0*	6.331 *160,8*	7.656 *194,5*	7.384(28) *187,6* 7.000(8)(25) *177,8* 7.312(1) *185,7* 7.450(7) *189,2* 7.149(23) *181,6*	6.456(7) *164,8* 6.376(1) *161,9* 6.381(8) *162,1* 6.394(25) *162,4*	H-40 J-55 K-55 C-75	1,970 2,270 2,270 2,660
	23.0	.317 *8,05*	6.366 *161,7*	6.241 *158,5* 6.151 (10) *156,2*	7.656 *194,5*	7.657(29,31,30) *194,5* 7.656(27) *194,5* 7.226(23) *183,5* 7.000(8)(25) *177,8* 7.312(1) *185,7* 7.444(4) *189,1* 7.600(7) *193,0* 7.656(9)(26) *194,5* 7.390(10) *187,7* 7.394(17) *187,8* 7.681(9a) *195,1* 7.657(9b) *194,5* 7.462(28) *189,5*	6.291(9c) *159,8* 6.316(25) *160,4* 6.286(1)(4) *159,7* 6.291(8)(23) *159,8* 6.182(17) *157,0* 6.366(7) *161,7* 6.398(29) *162,5*	J-55 K-55 C-75 N-80 C-95	3,270 3,270 3,770 3,830 4,150

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
2,720 3,740	2,720 3,740			230 316	176 234		291(7) 275(23) 176(25)	165(8) 291(7)	176(25) 165(8)
3,740	3,740			316	234		348(23) 165(8)	291(7) 176(25)	316(28)
5,100				431			360(1)	315(28)	
4,360	4,360	4,360	4,360	366	284	313	341(26) 341(7)	192(8) 366(9a,b)	213(25) 366(30,29)
4,360	4,360	4,360	4,360	366	309	341	366(9,29)	432(23)	341(26)
5,940		5,940	5,940	499		416	192(8) 366(9a,b) 348(8) 499(9a)	213(25) 366(27,30) 446(1) 499(9b)	341(7) 366(28,31) 323(9c)
6,340		6,340	6,340	532		442	620(4) 496(26) 496(7) 532(28)	469(1) 279(8) 532(9a,b) 340(9c)	455(23) 310(25) 532(27)
7,530		7,530	7,530	632		505	384(8) 368(25) 632(9b)	589(26) 589(7) 357(9c)	332(8) 632(9a)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thickness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Collapse Resistance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
7 *177,8*	26.0	.362 *9,19*	6.276 *159,4*	6.151 *156,2*	7.656 *194,5*	7.538(28) *191,5* 7.120(21) *180,8* 7.000(8)(25) *177,8* 7.312(1) *185,7* 7.125(3) *181,0* 7.444(4) *189,1* 7.600(7) *193,0* 7.656(9)(16) *194,5* (26)(27) 7.390(10) *187,7* 7.394(17) *187,8* 7.657(29) (31)(9b)(30) *194,5* 7.681(9a) *195,1* 7.301(23) *185,4*	6.211(25) *157,8* 6.276(7) *159,4* 6.196(1)(2) (3)(21) *157,4(4)* 6.201(8,23) *157,5* 6.182(17) *157,0* 6.307(29) *160,2* 6.209(9c) *157,7*	J-55 K-55 C-75 N-80 C-95 P-110 V-150	4,320 4,320 5,250 5,410 5,870 6,230 6,890
	29.0	.408 *10,36*	6.184 *157,1*	6.059 *153,9*	7.656 *194,5*	7.128(21) *181,1* 7.614(28) *193,4)* 7.376(23) *187,4* 7.312(1) *185,7* 7.125(3) *181,0* 7.572(4) *192,3* 7.465(5) *189,6* 7.800(7) *198,1* 7.656(9)(16) *194,5* (26)(27) 7.390(10) *187,7* 7.394(17) *187,8* 7.000(25)(8) *177,8* 7.681(9a)	6.118(9c) *155,4* 6.035(21) *153,3* 6.109(23) *155,2* 6.160(2)(3)(21) *156,5* 6.104(1)(25) *155,0(4)(5)* 6.109(8) *155,2* 6.134(17) *155,8* 6.184(7) *157,1* 6.307(29) *160,2*	K-55 C-75 N-80 C-95 P-110 V-150	5,400 6,760 7,020 7,820 8,510 9,800

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
4,980	4,980	4,980	4,980	415	334	367	261(8) 390(26)	390(7) 415(9a)	246(25) 415(9b)
4,980	4,980	4,980	4,980	415	364	401	415(9) 261(8) 390(26) 415(28)	514(23) 390(7) 415(9a,b) 415(31)	532(21) 246(25) 415(30,27) 415(29)
6,790		6,790	6,790	566		489	466(8) 566(9a)	531(1) 566(9b)	408(9c)
7,240		7,240	7,240	604		519	491(8) 560(21) 358(25) 604(27)	400(2) 380(8) 567(26) 604(28)	541(23) 567(7) 604(9a,b) 429(9c)
8,600		8,600	8,600	717		593	515(8) 451(8) 674(26)	568(23) 674(7) 717(9a,b)	588(21) 425(25) 451(9c)
9,960		9,960	9,960	830		693	885(4) 700(21) 492(25) 830(27,30) 830(29)	698(l) 522(8) 780(26) 830(28) 537(9c)	676(23) 780(7) 830(9a,b) 830(31)
13,580				1,132			1110(19) 1132(9a,b) 1064(7,26)	688(3) 712(8)	687(9c) 671(25)
5,610				465			465(9,9a,b) 465(31) 294(8)	465(29,27) 440(7,26)	465(28,30) 297(25)
7,650		7,650	7,650	634		562	522(8) 634(9b)	610(1) 494(9c)	634(9a)
8,160		8,160	8,160	676		597	549(8) 629(23) 639(7) 427(8)	441(2) 741(21) 432(25) 676(9a)	646(21) 712(23) 639(26) 676(9b)
9,690		9,690	9,690	803		683	676(27) 577(8) 759(7) 507(8)	676(28) 679(21) 513(25) 803(9a,b)	520(9c) 660(23) 759(26) 546(9c)
11,220		11,220	11,220	929		797	996(4) 786(23) 879(26) 929(27) 650(9c)	802(1) 879(7) 588(8) 929(28,29) 930(30)	808(21) 594(25) 929(9a,b) 930(31)
15,300				1,267			1,038(5) 831(9c) 810(25)	802(3) 1267(9a,b) 801(8)	1243(19) 1199(26,27)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
7 177,8	32.0	.453 *11,51*	6.094 *154,8*	5.969 *151,6*	7,656 *194,5*	7.153(21) *181,7* 7.772(27) *197,4* 7.448(23) *189,2* 7.000(8)(25) *177,8* 7.344(1) *186,5* 7.156(3) *181,8* 7.572(4) *192,3* 7.547(5) *191,7* 7.800(7) *198,1* 7.656(9)(16)(26) *194,5* 7.390(10) *187,7* 7.283(13) *185,0* 7.543(17) *191,6* 7.657(29,30,31) *194,5* 7.681(9a) *195,1* 7.909(9b) *200,9* 7.686(28) *195,2*	6.050(23) *153,7* 6.028(9c) *153,1* 6.014(25) *152,8* 6.038(1)(2)(5) *153,4* 6.035(3,21) *153,3* 6.014 *152,8(4)* 6.019(8) *152,9* 6.054(13) *153,8* 6.042(17) *153,5* 6.184(7) *157,1* 6.094(7) *154,8* 6.307(29) *160,2*	K-55 C-75 N-80 C-95 P-110 V-150	6,460 8,230 8,600 9,730 10,760 13,020

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
6,230				512			512(29,9b) 499(9a)	487(26,7) 324(8)	324(26) 512(27,28)
8,490		8,490	7,930	699		633	512(30,31) 575(8) 699(9b)	640(1) 576(9c)	680(9a)
9,060		9,060	8,460	745		672	481(2) 471(8) 500(25) 745(23)	607(9c) 709(26) 725(9a) 745(28,27)	709(7) 745(9b)
10,760		10,760	10,050	885		768	636(8) 748(23) 842(7) 885(9b)	718(13) 560(8) 593(25) 637(9c)	778(21) 842(26) 861(9a)
12,460		12,460	11,640	1,025		897	1,103(4) 891(23) 975(7) 1,025(9b) 1025(30)	842(1) 648(8) 687(25) 1,025(27) 759(9c)	926(21) 975(26) 997(9a) 1025(28,29) 1,023(31)
16,980				1,397			1,176(5) 1360(9a) 1329(26,7)	914(3) 1398(9b) 971(9c)	1370(19) 884(8) 937(25)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
7 *177,8*	35.0	.498 *12,65*	6.004 *152,5*	5.879 *149,3*	7.656 *194,5*	7.909(9b) *200,9* 7.756(28) *197,0* 7.145(21) *185,5* 7.000(25)(8) *177,8* 7.344(1) *186,5* 7.187(3) *182,5* 7.572(4) *192,3* 7.627(5) *193,7* 7.800(7) *198,1* 7.656(9)(16) *194,5* 7.530(10) *191.3* 7.288(13) *185,1* 7.543(17) *191,6* 7.772(27) *197,4*	5.924(28) *150,5* 5.937(9c) *150,8* 5.924(1)(2) (3)(13)(21) *150,5(4)(5)* 5.929(8) *150,6* 5.949(17) *151,1* 6.004(7) *152,5* 6.307(29,30) *160,2*	K-55 C-75 N-80 C-95 P-110 V-150 Q-125	7,270 9,710 10,180 11,640 13,020 16,230 14,320
						7.657(29,31) *194,5*			

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
6,850				559			560(30) 559(27,28) 380(25)	512(31) 499(9a) 854(8)	559(29,9b) 534(7)
9,340		8,680	7,930	763		703	628(8) 763(9b)	640(1) 633(9c)	680(9a)
9,960		9,240	8,460	814		746	661(8) 553(25) 814(9b)	534(2) 516(8) 814(27,28)	777(7) 725(9a) 666(9c)
11,830		10,970	10,050	966		853	799(13) 923(7)	905(9) 657(25)	862(21) 612(8)
13,700		12,700	11,640	1,119		996	861(9a) 1,196(4) 1069(7) 997(9a) 1119(27,28)	966(9b) 842(1) 760(25) 1119(9b) 1023(31)	699(9c) 1026(21) 709(8) 1119(29,30) 832(9c)
18,660				1,526			1,313(5) 1360(9a) 1526(9b)	926(3) 1457(7) 1037(25)	1065(9c) 967(8)
15,560				1,272			1108(21) 806(8) 899(9c)	1214(7) 1133(9a) 1069(7)	864(25) 1272(9b)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
7 *177,8*	38.0	.540 *13,72*	5.920 *150,4*	5.795 *147,2*	7.656 *194,5*	7.657(29,30,31) *194,5* 7.886(27) *200,3* 7.169(21) *182,1* 7.000(8)(25) *177,8* 7.344(1) *186,5* 7.187(3) *182,5* 7.635(4) *193,9* 7.700(5) *195,6* 7.940(7) *201,7* 7.656(9)(16) *194,5* 7.530(10) *191,3* 7.358(13) *186,9* 7.701(17) *195,6* 7.681(9a) *195,1* 7.909(9b) *200,9* 7.821(28) *198,6*	5.840(25) *148,3* 5.920(7) *150,4* 5.910(2)(3)(21) *150,1* 5.840(1)(13) *148,3(4)(5)* 5.845(8) *148,5* 5.869(17) *149,1* 6.307(29,30) *160,2* 5.854(9c) *148,7*	K-55 C-75 N-80 C-95 P-110 V-150 Q-125	7,830 10,680 11,390 13,420 15,110 19,240 16,740

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
7,420				603			512(31) 603(29,9b) 414(25)	383(8) 603(27,30)	578(7) 499(9a)
10,120		8,660	7,930	822		767	677(8) 822(9b)	640(1) 680(9c)	680(9a)
10,800		9,240	8,460	877		814	712(8) 840(7) 877(9b)	534(2) 602(25) 877(27,28)	557(8) 725(9a) 716(9c)
12,820		10,970	10,050	1,041		931	879(13) 661(8) 861(9a)	905(9) 998(7) 1041(9b)	941(21) 714(25) 751(9c)
14,850		12,700	11,640	1,205		1,087	1284(4) 765(8) 997(9a) 1205(30) 1130(29)	842(1) 1155(7) 1023(31) 1206(27) 894(9c)	1120(21) 827(25) 1205(9b) 1206(28)
20,240				1,644			1439(5) 1640(9b) 1575(8)	1052(3) 1145(9c) 1128(25)	1360(9a) 1044(7)
16,880				1,370			1210(21) 940(25) 966(9c)	870(8) 1133(9a)	1313(7) 1370(9b)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
7 *177,8*	41.0	.590 *14,98*	5.820 *147,8*	5.695 *144,7*		7.163(21) *181,9*			
						7.259(24) *184,4*			
						7.681(9a) *195,1*			
						7.940(9b) *201,7*			
						7.000(25)(8) *177,8*	5.752(9b) *146,1*		
						7.360(1) *186,9*	5.820(7) *147,8*	N-80	12,350
						7.246(3) *184,0*	5.740(1)(3) (13)(24)(21) *145,8*	C-95	14,670
						7.600(6) *193,0*	5.745(8)(25) *145,9*		
						7.940(7) *201,7*	5.770(17) *146,6*	P-110	16,990
						7.656(9)(16) *194,5*	5.675(21) *144,1*		
						7.363(13) *187,0*		V-150	23,160
						7.701(17) *195,6*			
						7.895(28) *200,5*			
						7.300(24) *185,4*			
						7.200(21) *182,9*			
						7.886(27) *200,3*			
						7.200(21) *182,9*	5.675(21) *144,1*		
	42.7	.625 *15,87*	5.750 *146,0*	5.626 *142,9*		7.420(13) *188,5*	5.670(13)(24) *144,0*	L-80 C-95 P-110	13,010 15,450 17,890
						8.000(7) *203,2*			
						7.300(24) *185,4*			
						7.000(25) *177,8*			
						7.323(24) *186,0*	5.720(7) *145,3*	C-95	15,780
						7.684(6) *195,2*	5.640(24) *143,2*		
	44.0	.640 *16,25*	5.720 *145,3*	5.595 *142,1*		8.000(7) *203,2*	5.540(3) *140,7*	P-110	18,280
						7.656(9)(16) *194,5*		V-150	24,920
						7.701(17) *195,6*	5.759(25) *146,3*		

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
11,800				950			919(13) 914(7) 774(9c)	657(3) 605(8) 950(9b,27)	647(25) 725(9a) 950(28)
14,010				1,129			879(9) 965(24) 1129(9b) 718(8)	811(8) 861(9a) 769(25)	1,026(21) 812(9c) 1085(7)
16,220				1,306			1,039(1) 1,149(24) 1307(9b)	1,160(6) 997(9a) 1307(27,28)	1,221(21) 967(9c) 890(25)
22,120				1,782			1257(7) 1,387(9) 1360(9a) 1714(7)	832(8) 1,484(6) 1782(9b) 1134(8)	1238(9c) 1214(25)
12,500 14,840 17,190				1,001 1,189 1,377			932(13) 1,030(13) 1,226(13)	1,030(24) 1,226(24)	1,079(21) 1,285(21)
15,200				1,215			879(9) 861(9a) 471(7)	1,273(6) 718(8)	1,030(24) 790(25)
17,600				1,407			1,017(9)(6) 997(9a) 1356(7)	1,226(24) 832(8)	1407(28) 914(25)
24,000				1,918			1,387(9) 1134(8)	1,629(6) 1247(25)	1360(9a) 1850(7)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
7 *177,8*	45.4 46	.670 *17,02*	5.660 *143,8*	5.535 *140,6*		7.298(24) *185,4* 7.683(9a) *195,1* 7.278(3) *184,9* 7.733(5) *196,4* 8.060(7) *204,7* 7.419(13) *188,4* 7.656(16) *194,5* 7.783(17) *197,7* 8.011(28) *203,5*	5.660(3) *143,8* 5.585(8) *141,9* 5.580(13)(24) *141,7* 5.610(17) *142,5*	C-95 P-110 V-150	16,450 19,040 25,970
	46.4	.687 *17,45*	5.626 *142,9*	5.501 *139,7*		7.311(24) *185,7* 7.434(13) *188,8*	5.546(13)(24) *140,9*	L-80 C-95 P-110	14,160 16,820 19,470
	49.5	.730 *18,54*	5.540 *140,7*	5.415 *137,5*		7.344(24) *186,5* 7.000(8)(25) *177,8* 7.941(6) *201,7* 7.656(16) *194,5* 7.783(17) *197,7* 7.435(13) *188,8* 8.094(28) *205,6*	5.540(3) *140,7* 5.460(13,24) *138,7* 5.490(17) *139,4*	P-110 V-150	20,550 28,020
	50.1	.750 *19,05*	5.500 *139,7*	5.375 *136,5*		7.343(24) *186,5* 7.436(13) *188,9*	5.420(13)(24) *137,7*	L-80 C-95 P-110	15,310 18,180 21,050
	53.6	.812 *20,62*	5.376 *136,5*	5.251 *133,4*		7.340(24) 186,4 7.438(13) *188,9*	5.296(13)(24) *134,5*	L-80 C-95 P-110	16,410 19,480 22,560
	57.1	.875 *22,22*	5.250 *133,4*	5.125 *130,2*		7.337(24) 186,3 7,440(13) *189,0* 7.84(14)	5.170(13)(24) *131,3*	L-10 C-95 P-110	17,500 20,780 24,060

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
15,910 18,430 25,120				1,266 1,466 1,998			828(8) 1,018(3) 1,466(28) 1,715(6)	1,089(13) 1,340(6)	1,089(24) 1,296(24)
13,740 16,320 18,890				1,090 1,294 1,499			1,013(13) 1,120(13) 1,333(13)	1,120(24) 1,333(24)	
20,080 27,380				1,582 2,157			1,063(3) 1,582(28) 1,403(3)	1,472(6) 1,884(6)	1,419(24)
15,000 17,810 20,620				1,178 1,399 1,620			1,077(13) 1,191(13) 1,418(13)	1,192(24) 1,419(24)	
16,240 19,280 22,330				1,263 1,500 1,736			1,162(13) 1,285(13) 1,529(13)	1,285(24) 1,529(24)	
17,500 20,780 24,060				1,347 1,600 1,852			1,499(14) 1,348(13) 1,605(13)	1,220(13) 1,348(24) 1,605(24)	

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
						7.334(24) 186,3 7.441(13)		L-80	18,550
	60.5	.937							
			5.126						
				5.001					
						189,0			
		23,80	*130,2*	*127,0*		7.84(14)	5.046(13,24)	C-95	22,030
						199,1	*128,2*	P-110	25,510
	63.9	1.000	5.000	4.875		7.84(14)		L-80	19,590
		25,40	*127,0*	*123,8*		*199,1*		P-110	26,940
7	67.1	1.062	4.876	4.751		7.84(14)		L-80	20,590
177,8		*26,97*	*123,8*	*120,7*		*199,1*		P-110	28,310
	70.3	1.125	4.750	4.625		7.84(14)		L-80	21,580
		28,57	*120,7*	*117,5*		*199,1*		P-110	29,670
	76.3	1.250	4.500	4.375		7.84(14)		L-80	23,470
		31,75	*114,3*	*111,1*		*199,1*		P-110	32,270
						7.625(8)(25)	6.950(8)		
						193,7	*176,5*		
	24.0	.300	7.025	6.900	8.500	8.125(7)	6.862(25)	H-40	2,040
		7,62	*178,4*	*175,3*	*215,9*	*206,4*	*174,3*		
							7.025(7)		
							178,4		
						8.528(9a)			
						216,6			
						7.743(21)			
						196,7			
						7.868(23)			
						199,8		J-55	2,890
						7.625(8)(25)	6.984(30)		
						193,7	*177,4*	K-55	2,890
						7.938(1)	6.898(9c)		
						201,6	*175,2*		
						7.750(3)	6.969(7)		
						196,8	*177,0*	C-75	3,280
				6.844		8.125(4)	6.889(1)(3)(21)		
				173,8		*206,4*	*175,0* (4)(25)	N-80	3,400
7-5/8		.328	6.969	6.750	8.500	8.125(7)	6.894(8)(23)		
193,7	26.4	*8,33*	*177,0*	(10)	*215,9*	*206,4*	*175,1*		
				171,5		8.504(9)	6.782(17)		
						216,0	*172,3*	C-95	3,710
						8.010(10)	7.008(29)		
						203,5	*178,0*		
						8.012(17)			
						203,5		P-110	3,900
						8.500(29,30) (27,9b,26,31)			

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
18,740 22,250 25,770				1,428 1,695 1,963			1,275(13) 1,409(13) 1,678(13)	1,596(14) 1,409(24) 1,678(24)	
20,000 27,500				1,508 2,073				1,691(14)	
21,240 29,200				1,585 2,179				1,782(14)	
22,500 30,940				1,661				1,873(14)	
25,000 34,380				2,284 1,806 2,484				2,045(14)	
2,750	2,750			276	212				
4,140	4,140	4,140	4,140	414	315	346	386(26) 386(7)	217(8) 414(9a)	241(25) 414(9b)
4,140	4,140	4,140	4,140	414	342	377	414(9) 386(26) 386(7) 414(27)	487(23) 217(8) 414(9a,b) 414(31)	529(21) 241(25) 414(28,30) 414(29)
5,650		5,650	5,650	564		461	393(8) 564(9b)	511(1) 370(9c)	564(9a)
6,020		6,020	6,020	602		490	414(8) 557(21) 350(25) 602(9a,b)	400(3) 562(26) 390(9c) 602(27)	513(23) 316(8) 562(7) 602(28)
7,150		7,150	7,150	714		560	434(8) 667(26) 667(7) 409(9c)	539(23) 376(8) 714(9a)	585(21) 415(25) 714(9b)
8,280				827			876(4) 827(28) 481(7) 827(30,31)	641(23) 772(8) 827(9a,b) 487(9c)	696(21) 435(25) 827(28,29)
11,290				1,128			1102(19)	1128(9a,b)	623(9c)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thickness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Collapse Resistance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
7-5/8 *193,7*	29.7	.375 *9,52*	6.875 *174,7*	6.750 *171,5*	8.500 *215,9*	7.752(21) *196,9* 7.947(23) *201,8* 7.625(8)(25) *193,7* 7.938(1) *201,6* 7.750(3) *196,8* 8.250(4) *209,6* 8.300(7) *210,8* 8.504(9) *216,0* 8.010(10) *203,5* 8.500(9b,16,26, 27,29,30,31) *215,9*	6.984(30) *177,4* 6.803(9c) *172,8* 6.795(25) *172,6* 6.795(1)(3)(21) *172,6(4)* 6.800(8)(23) *172,7* 6.782(17) *172,3* 6.875(7) *174,7*	C-75 N-80 C-95 P-110 V-150	4,670 4,790 5,120 5,350 6,060
	33.7	.430 *10,92*	6.765 *171,9*	6.640 *168,7*	8.500 *215,9*	8.012(17) *203,5* 8.528(9a) *216,6* 8.178(28) *207,7* 8.037(23) *204,1* 8.528(9a) *216,6* 7.752(1) *196,9* 7.750(3) *196,8* 8.250(4) *209,6* 8.135(5) *206,6* 8.300(7) *210,8* 8.504(9) *216,0* 8.010(10) *203,5* 8.500(16,26,27) *215,9* (29,31,9b) 8.012(17) *203,5* 7.625(8)(25)	6.890(29) *175,0* 6.697(9c) *170,1* 6.685(1)(3)(25) *169,8* (4)(5)(21) 6.690(8)(23) *169,9* 6.716(17) *170,6* 6.765(7) *171,8* 6.890(29,30) *175,0*	K-55 C-75 N-80 C-95 P-110 V-150	5,090 6,320 6,560 7,260 7,870 8,860

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
6,450		6,450	6,450	641		542	527(8) 641(9b)	608(1) 467(9c)	641(9a)
6,890		6,890	6,890	683		575	555(8) 643(26) 444(25) 683(27)	612(23) 430(8) 683(9a,b) 491(9c)	636(21) 643(7) 683(28)
8,180		8,180	8,180	811		659	583(8) 668(21) 764(7) 811(9b)	811(9) 764(26) 527(25) 516(9c)	643(23) 511(8) 811(9a)
9,470		9,470	9,470	940		769	1,003(4) 795(21) 885(7) 940(28) 939(30)	800(1) 885(26) 611(25) 940(27) 939(31)	765(23) 592(8) 940(9a,b) 614(9c) 940(29)
12,910				1,281			786(9c) 1281(9,9a,b)	785(3) 1207(26,7)	807(8) 833(25)
5,430				535			535(30,28)	535(31,29)	535(9a,b)
7,400		7,400	7,400	729		635	535(27) 338(8) 600(8) 729(9b)	507(7,26) 682(1) 579(9c)	357(25) 729(9a)
7,900		7,900	7,900	778		674	632(8) 726(23) 491(8) 778(28)	572(3) 738(7) 738(26) 778(27)	762(21) 519(25) 778(9a,b) 610(9c)
8,180		8,180	8,180	923		772	663(8) 763(23) 584(8) 923(9b)	923(9) 876(7) 876(26) 640(9c)	801(21) 617(25) 923(9a)
10,860		10,860	10,860	1,069		901	1,148(4) 908(23) 676(8) 1069(27,28) 762(9c)	671(2) 1014(7) 1041(26) 1069(30,31)	953(21) 714(25) 1069(9a,b) 1069(29)
14,800				1,458			1,212(5) 1458(9a,b) 974(25)	914(3) 975(9c) 921(8)	1424(19) 1383(7) 1383(26)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
7-5/8 *193,7*	39.0	.500 *12,70*	6.625 *168,3*	6.500 *165,1*	8.500 *215,9*	7.775(21) *197,5* 8.528(9a) *216,6* 7.625(8)(25) *193,7* 8.016(1) *203,6* 7.812(3) *198,4* 8.250(4) *209,6* 8.262(5) *209,9* 8.450(7) *214,6* 8.504(9) *216,0* 8.010(10) *203,5* 7.924(13) *201,3* 8.500(9b,16,30 26,27,29,31) *215,9* 8.240(17) *209,3* 8.382(28) *212,9*	6.555(9c) *166,5* 5.565(25) *166,7* 6.545(1)(3) (13)(21) *166,2(4)(5)* 6.550(8) *166,4* 6.575(17) *167,0* 6.625(7) *168,3* 6.890(29,30) *175,0*	C-75 N-80 C-95 P-110 V-150 Q-125 L-80	8,430 8,820 9,980 11,060 13,450 12,060 8,820
	42.8	.562 *14,27*	6.501 *165,1*	6.376 *161,9*	8.500 *215,9*	8.528(9a) *216,6* 8.513(9b) *216,2* 7.787(21) *197,8* 8.020(13) *203,7* 8.504(9) *216,0* 8.479(28) *215,4* 8.500(27) (29)(30)(31) *215,9* 7.625(25) *193,7*	6.890(29)(30) *175,0* 6.421(13)(21) *163,1* 6.453(25) *163,9* 6.433(9c) *163,4*	L-80 C-95 P-110 Q-125 N-80	10,810 12,400 13,910 15,350 10,810

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
8,610		8,610	8,610	839			691(8) 839(9b)	738(1) 693(9c)	839(9a)
9,180		9,180	9,180	895			1,064(4) 856(26,7)	631(3) 571(25)	729(9c)
9,380		9,380	9,380	923			569(8) 764(8) 930(21)	895(9a,b) 878(13) 676(8)	895(27,28) 766(9c) 1016(26)
12,620		12,620	12,620	1,231			678(25) 1,131(5) 1108(21) 785(25)	1016(7) 746(2) 782(8) 1176(7)	1063(9a,b) 912(9c) 1176(26) 1231(9a,b)
17,220				1,679			1231(29,27) 1,448(5) 1167(9c) 1070(25)	1231(28,31) 1,010(3) 1067(8)	1231(30) 1679(9a,b) 1604(7,26)
14,340				1,399			1196(21) 892(25) 1399(9b)	889(8) 1337(7) 985(9c)	1337(26) 1399(9a)
9,180		9,180	9,180	895			895(31) 856(7,26)	895(9a,b) 569(8)	693(9c) 571(25)
10,320		10,320	9,790	998		892	998(9) 998(9a,b) 998(29)	911(13) 998(30) 771(9c)	693(25) 998(31)
12,250		12,250	11,620	1,185		1,037	1,185(9)	1,007(13)	1,068(21)
14,190		11,800	12,680	1,372		1,210	823(25) 1,372(9) 953(25) 1372(27,28)	1,185(9a,b) 1,199(13) 1,372(9a,b) 1372(31,29)	852(9c) 1,272(21) 1372(30) 1014(9c)
1,6120				1,559			1373(21) 1559(9b)	1084(25) 1095(9c)	1559(9a)
10,320		10,320	9,790	998		905	998(9a,b)	811(9c)	693(25)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thickness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Collapse Resistance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
7-5/8 *193,7*	45.3	.595 *15,11*	6.435 *163,5*	6.310 *160,3*		7.885(24) *200,3* 8.528(9a) *216,6* 8.564(9b) *217,5* 8.000(1) *203,2* 7.812(3) *198,4* 8.312(4) *211,1* 8.427(5) *214,0* 8.550(7) *217,2* 8.504(9) *216,0* 7.994(13) *203,0* 8.500(15,30) *215,9* (29,31) 8.240(17) *209,3* 7.793(21) *197,9*	6.435(7) *163,2* 6.409(25) *162,8* 6.355(1)(3) (13)(24)(21) *161,4(4)(5)* 6.360(8) *161,5* 6.385(17) *162,2* 6.890(29,30) *175,0*	K-55 C-75 N-80 P-110 V-150 C-95 Q-125 L-80	7,910 10,790 11,510 15,420 19,680 17,110 11,510
	47.1	.625 *15,87*	6.375 *161,9*	6.250 *158,7*	8.500 *215,9*	~~8.529(29)~~ *216,6* 7.625(25)(8) *193,7* 7.921(24) *201,2* 7.625(8,25) *193,7* 8.500(7,31,29,26) *215,9* 8.543(30) 217,0 8.044(13) *204,3* 7.799(21) *198,1* 8.626(27) *219,1* 8.528(9a) *216,6*	6.375(7) *161,9* 6.359(25) *161,5* 6.300(8) *160,0* 6.295(13,21,24) *159,9* 6.890(29,30) *175,0*	L-80 C-95 P-110 Q-125	12,040 14,300 16,550 18,810
								C-75	11,290

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
7,510				723			811(8) 723(31,9b) 460(8)	709(9a) 506(25)	723(30,29) 695(7)
10,240				986			1,098(4) 986(9b)	761(1)	967(9a)
10,920				1,051			730(2) 1011(7) 1051(9b)	801(1) 669(8) 1051(28)	735(25) 1032(9a)
15,020				1,446			1,375(5) 1270(24) 920(8)	977(3) 1011(25) 1419(9a)	1352(21) 1391(7) 1445(29)
20,480				1,971			1446(30) 1971(9b) 1,760(5) 1379(25) 1136(21) 1201(7) 1248(9b)	1446(31,9b) 1446(9b,30) 1,250(3) 1254(8) 1067(24) 794(8) 1445(28)	1896(7) 1935(9a) 873(25) 1225(9a)
17,070				1,643			1461(21) 1580(7) 1643(9b)	1372(24) 1045(8)	1149(25) 1612(9a)
10,920		10,500	9,790	1,051		947	1051(31,9b) 1011(7)	1032(9a) 669(8)	735(25)
11,480		10,490	9,790	1,100		997	1,021(13) 772(25) 1100(30,29)	819(8) 1060(7) 1053(31)	689(8) 1032(9a) 797(26)
13,630		12,460	11,620	1,306		1,159	1,300(12) 1258(7) 1128(24)	819(8) 1225(9a) 946(26)	917(25) 1188(21)
15,780		11,800	12,680	1,512		1,353	1,343(13) 1414(21) 1457(7) 1512(27,29)	1,077(8) 948(8) 1419(9a) 1096(26)	1343(24) 1062(25) 1512(30) 1447(31)
17,930				1,718			1527(21) 1207(25) 1245(26)	1450(24) 1656(7)	1077(8) 1612(9a)
10,760 11,480		9,840	9,190	1,031		953	967(9a)		
		10,490	9,790	1,100		1,013			1032(9a)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
7-5/8 *193,7*	51.2	.687 *17,45*	6.251 *158,8*	6.126 *155,6*		8.500(7) *215,9* 7.625(25,8) *193,7* 8.094(13) *205,6* 8.004(24) *203,3*	6.402(25) *162,6* 6.176(8) *156,9* 6.171(13)(24) *156,7* 6.251(7) *158,8*	L-80 P-110	13,120 18,040
	52.8	.712 *18,08*	6.201 *157,5*	6.076 *154,3*		8.003(24) *203,3* 7.725(3) *196,2* 7.650(18)	6.121(3)(24) *155,5* 6.141(8) *156,0*	N-80 P-110 V-150	13,550 18,640 25,420
	55.3	.750 *19,05*	6.125 *155,6*	6.000 *152,4*		8.001(24) *203,2* 8.096(13) *205,6*	6.045(13)(24) *153,5*	L-80 P-110	14,190 19,510
	59.2	.812 *20,62*	6.001 *152,4*	5.876 *149,2*		7.998(24) *203,1* 8.098(13) *205,7* 7.724(18) *196,2*	5.921(13)(24) *150,4*	L-80 P-110	15,220 20,930
	63.2	.875 *22,22*	5.875 *149,2*	5.750 *146,0*		7.994(24) *203,0* 8.100(13) *205,7* 8.54(14) *216,9*	5.795(13)(24) *147,2*	L-80 P-110	16,250 22,350
	66.9	.937 *23,80*	5.751 *146,0*	5.626 *142,9*		7.991(24) *203,0* 8.102(13) *205,8* 8.54(14) *216,9*	5.671(13)(24) *144,0*	L-80 P-110	17,250 23,710
	70.7	1.000 *25,40*	5.625 *142,9*	5.500 *139,7*		7.989(24) 202,9 8.104(13) *205,8* 8.54(14)	5.545(13)(24) *140,8*	L-80 P-110	18,230 25,070

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
12,610 17,340				1,198 1,647			819(8) 1,077(8)	1,107(13) 1,456(13)	1,456(24)
13,070 17,980 24,510				1,237 1,701 2,319			1,005(8) 1,127(3) 1,442(3)	901(3) 1,191(18)	1,475(24)
13,770 18,930				1,296 1,782			1,221(13) 1,606(13)	1,606(24)	
14,910 20,500				1,390 1,912			1,304(13) 1,191(18)	874(18) 1,715(13)	1,715(24)
16,070 22,090				1,484 2,041			1,651(14) 1,801(13)	1,369(13) 1,801(24)	
17,200 23,660				1,575 2,166			1,759(14) 1,881(13)	1,430(13) 1,881(24)	
18,360 25,250				1,665 2,289			1,866(14) 1,967(13)	1,495(13) 1,967(24)	
19,500 21,940				1,752 1,971			1,969(14) 2,072(14)		
20,660 23,240				1,838 2,067			2,071(14) 2,180(14)		

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
7-5/8 *193,7*	82.1	1.200 *30,48*	5.225 *132,7*	5.100 *129,5*		8.54(14) *216,9*		L-80 X-90	21,220 23,870
	84.8	1.250 *31,75*	5.125 *130,2*	5.000 *127,0*		8.54(14) *216,9*		L-80 X-90	21,930 24,670
7-3/4 *196,8*	46.1	.595 *15,11*	6.560 *166,6*	6.500 *165,1*	8.500 *215,9*	8.500(26) *215,9* 7.937(21) *201,6* 8.025(24) *203,8* 8.125(1) *206,4* 7.938(3) *201,6* 8.700(7) *221,0* 8.148(13) *207,0* 7.750(8,25) *196,8* 8.625(31) *219,1* 8.626(30) *219,1*	6.545(25) *166,2* 6.535(3)(21) *166,0* 6.560(8) *166,6* 6.530(13)(24) *165,9* 6.560(7) *166,6* 6.996(30) *176,7*	K-55 N-80 S-95 S-105 P-110 V-150	7,800 11,340 12,650 13,960 14,980 19,050
	46.0	.640 *16,26*	6.470 *164,3*	6.345 *161,2*		7.945(21) *201,8* 8.084(24) *205,3* 8.222(13) *208,8*	6.405(24) *162,7* 6.395(8) *162,4* 6.390(13) *162,3* 6.410(21) *162,8* 8.044(25) *204,3*	L-80 P-110	12,120 16,670
8-5/8 *219,1*	24.0	.264 *6,71*	8.097 *205,7*	7.972 *202,5*	9.625 *244,5*	8.625(25) *219,1* 8.625(25) *219,1* 9.625(26,27) *244,5*	8.022(8) *203,8* 7.974(25) *202,6*	J-55 K-55	1,370 1,370
	28.0	.304 *7,72*	8.017 *203,7*	7.892 *200,5*	9.625 *244,5*	9.125(7) *231,8* 9.650(9a) *245,1*	7.942(8) *201,7* 8.017(7) *203,6*	H-40 K-55	1,640 1,880

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
22,030 24,790				1,938 2,180			2,188(14) 2,304(14)		
22,950 25,820				2,003 2,253				2,267(14) 2,386(14)	
7,390 10,750 12,760 12,760 14,780 20,150		12,460 12,460	11,620 11,620	1,070 1,271		992 1,065	745(8) 698(3) 1,201(21) 873(3) 1471(30,31) 1,118(3)	736(30,31) 1,105(24) 1,365(21)	1,256(24)
11,560 15,900				1,144 1,573			748(8) 984(8) 1,428(21)	1,039(13) 1,367(13)	1,367(24)
2,950 2,950	2,950 2,950			381 381	244 263		208(25) 208(25)	362(8)	
2,470 3,390	2,470			318 437	233		415(8) 249(25)	437(9a,b)	406(7,26)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
8-5/8 *219,1*	32.0	.352 *8,94*	7.921 *201,2*	7.796 *198,0* 7.700 (10) *195,6*	9.625 *244,5*	9.145(28) *232,3* 9.650(9a) *245,1* 9.626(9b) *244,5* 8.938(1) *227,0* 8.750(3) *222,2* 9.135(4) *232,0* 9.250(7) *235,0* 9.625(9,27,26) *244,5* (31,29) 9.120(10) *231,6* 9.122(17) *231,7* 8.625(25,30) *219,1* 8.889(23)	7.972(29,30) *202,5* 7.892(25) *200,5* 7.811(1)(3) *198,4* 7.841(4) *199,2* 7.846(8) *199,3* 7.737(17) *196,5* 7.921(23,7) *201,2* 7.654(9c) *194,4*	H-40 J-55 K-55 C-75 N-80 P-110	2,210 2,530 2,530 2,950 3,050 3,430
	36.0	.400 *10,16*	7.825 *198,8*	7.700 *195,6*	9.625 *244,5*	*225,8* 9.650(9a) *245,1* 8.764(21) *222,6* 8.970(23) *227,8* 8.938(1) *227,0* 8.750(3) *222,2* 9.135(4) *232,0* 9.250(7) *235,0* 9.625(9)(16) *244,5* 9.120(10) *231,6* 9.122(17) *231,7* 8.625(25) *219,1* 9.227(28) *234,4* 9.625(31)(26)	7.753(25) *197,0* 7.745(1)(3)(21) *196,7* (4) 7.750(8)(23) *196,9* 7.737(17) *196,5* 7.825(7) *198,8* 7.874(29) *200,0* 7.756(9c) *194,4*	J-55 K-55 C-75 N-80 C-95 P-110 L-80	3,450 3,450 4,020 4,100 4,360 4,700 4,100

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
2,860	2,860			366	279				
3,930	3,930	3,930	3,930	503	372	417	471(23)	298(25)	472(26)
							472(7)		
								503(9a,b)	503(31)
3,930	3,930	3,930	3,930	503	402	452	478(8)	503(9)	597(23)
							298(25)	472(26,7)	503(9a,b)
							503(28)	503(30,31)	503(29,27)
5,360				686			807(4)	576(1)	686(9a,b)
							474(9c)		
5,710				732			1,005(13)	493(3)	732(27,28)
							732(9a,b)	499(9c)	434(25)
							687(7,26)		
7,860				1,006			1,256(13)	1006(27,28)	1006(9a,b)
							1006(29,31)	1144(30)	623(9c)
							944(26,7)	597(25)	
4,460	4,460	4,460	4,460	568	434	486	537(7)	538(26)	375(25)
							568(9a)	568(9b)	
4,460	4,460	4,460	4,460	568	468	526	568(9,29)	706(23)	720(21)
							537(7)	538(26)	375(25)
							568(9a,b)	569(30,31)	568(27,28)
6,090		6,090	6,090	775		648	638(8)	689(1)	775(9a,b)
							587(9c)		
6,490		6,490	6,490	827		688	672(8)	579(3)	743(23)
							758(24)	782(7)	782(26)
							546(25)	827(9a,b)	827(31,27)
							568(28)	827(28)	617(9c))
7,710		7,710	7,710	982		789	705(8)	976(19)	982(9a,b)
							928(7,26)	780(23)	795(21)
							648(9c)	546(25)	1,209(4)
8,930				1,137			1137(27)	947(21)	1137(9a,b)
							1137(28,31)	817(23)	1292(30)
							1075(7,26)	1137(29)	772(9c)
6,490		6,490	6,490	827		678	827(31)	827(9a,b)	587(9c)
							782(7,26)	648(25)	

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
8-5/8 *219,1*	40.0	.450 *11,43*	7.725 *196,2*	7.600 *193,0*	9.625 *244,5*	9.311(28) *236,5* 9.626(9b) *244,5* 9.650(9a) *245,1* 8.938(1) *227,0* 8.750(3) *222,2* 9.135(4) *232,0* 9.500(7) *241,3* 9.625(9,16,29,31) *244,5* (26,27,30) 9.120(10) *231,6* 9.122(17) *231,7* 8.625(25)	7.661(9c) *194,6* 7.665(25) *194,7* 7.725(7) *196,2* 7.645(1)(3)(21) *194,2(4)* 7.650(8) *194,3* 7.674(17) *194,9* 7.671(23) *194,9* 7.874(29,30) *200,0*	K-55 C-75 N-80 C-95 P-110 V-150 L-80	4,400 5,350 5,520 6,010 6,380 7,040 5,520
	44.0	.500 *12,70*	7.625 *193,7*	7.500 *190,5*	9.625 *244,5*	219,1 8.773(21) 222,8 9.053(23) 230,0 8.782(21) *223,1* 9.626(9b) *244,5* 9.393(28) *238,6* 9.031(1) *229,4* 8.750(3) *222,2* 9.300(4) *236,2* 9.500(7) *241,3* 9.625(9,16,30,29) *244,5* (31,26,27) 9.120(10) *231,6* 8.977(13) *228,0* 9.185(17) *233,3* 9.134(23) *232,0*	7.563(9c) *192,1* 7.681(25) *195,1* 7.625(7) *193,7* 7.545(1)(3) (13)(21) *191,6(4)* 7.550(8,23) *191,8* 7.575(17) *192,4* 7.874(29,30) *200,0*	K-55 C-75 N-80 C-95 P-110 V-150 L-80	5,350 6,680 6,950 7,730 8,400 9,645 6,950

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
5,020				636			636(9,27) 636(30,28)	428(25) 636(29,31)	605(7,26) 636(9a,b)
6,850		6,850	6,850	867		742	714(8) 703(9c)	797(1)	867(9a,b)
7,300		7,300	7,300	925		788	1,088(4) 874(21) 880(26) 925(27)	585(2) 622(25) 925(9a) 925(28)	862(23) 880(7) 925(9b) 740(9c)
8,670		8,670	8,670	1,098		904	789(8) 918(21) 1044(26)	1098(9) 739(25) 1098(9a,b)	905(23) 1044(7) 776(9c)
10,040		10,040	10,040	1,271		1,055	931(8) 1093(21) 1209(26) 924(9c)	849(3) 856(25) 1271(9a,b) 1271(28,31)	1078(23) 1209(7) 1444(30) 1271(29,27)
13,700				1,734			1,087(3) 1167(25)	1734(9a,b) 1649(7,26)	1183(9c)
7,300		7,300	7,300	925		776	622(25) 925(9a) 924(31)	880(7) 925(9b) 925(29)	880(26) 924(30) 703(9c)
5,580				702			702(9,27) 702(30,29)	671(26,7) 702(9a,b)	408(25) 702(31)
7,610		7,610	7,610	957		834	788(8) 957(9b)	927(1) 794(9c)	957(9a)
8,120		8,120	8,120	1,021		887	942(13) 976(26,7) 836(9c)	980(21) 594(25) 1021(27)	978(22,23) 1021(9a,b) 1021(28)
9,640		9,640	9,640	1,212		1,017	871(8) 1027(23) 1212(9a,b)	1,212(9) 1159(26,7) 878(9c)	1029(21) 705(25)
11,160		11,160	11,160	1,404		1,186	1,510(4) 1222(23) 1404(9a,b) 1045(9c)	947(3) 1342(26,7) 1404(27,29) 1595(30)	1225(21) 817(25) 1404(28,31)
15,210				1,915			1914(9a,b) 1337(9c)	1,212(3) 1830(7,26)	1859(19) 1113(25)
8,120		8,120	8,120	1,021		874	976(26,7)	594(25)	1021(9a,b)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
						8.625(25) *219,1* 8.793(21) *223,3* 9.225(23) *234,3* 9.032(1) *229,4* 8.750(3) *222,2* 9.300(4) *236,2* 9.500(7) *241,3*	7.449(9c) *189,2* 7.595(25) *193,0* 7.450(21) *189,2* 7.431(1)(3) (13) *188,7(4)*	K-55 C-75 N-80 C-95 P-110	6,440 8,200 8,580 8,690 10,720
	49.0	.557 *14,15*	7.511 *190,8*	7.386 *187,6*	9.625 *244,5*	9.625(9,16,31,29) *244,5* (30,27) 9.120(10) *231,6* 9.012(13) *228,9* 9.303(17) *236,3*	7.436(8,23) *188,9* 7.460(17) *189,5* 7.874(29,30) *200,0*	V-150 Q-125 L-80	12,950 11,660 8,580
						9.650(9a) *245,1* 9.626(9b) *244,5*			
						9.484(28) *240,9*			
8-5/8 *219,1*	49.1	.562 *14,27*	7.501 *190,5*	7.376 *187,3*		9.021(13) *229,1* 9.626(9b) *244,5* 8.801(21) *223,5* 8.812(3) *223,8*	7.421(13) *188,5* 7.374(9c) 187,3 7.355(3)	L-80 P-110 C-75	8,710 10,920 9,210
	52.0	.595 *15,11*	7.435 *188,8*	7.310 *185,7*		9.625(9,16,27) *244,5* 9.303(17) *236,3*	*186,8* 7.385(17) *187,6*	N-80 P-110 V-150	9,650 12,260 15,160
						9.650(9a) *245,1* 9.544(28) *242,4* 8.884(24) *225,7* 9.650(9a) *245,1* 8.806(21) *223,7*			
	54.0	.625 *15,87*	7.375 *187,3*	7.250 *184,1*		9.010(13) *228,9* 9.626(93)	7.295(13,21,24) *185,3*	L-80 P-110	10,510 13,470

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
6,220				776			459(25) 776(28,29)	776(27,30) 776(9a,b)	776(31)
8,480		8,480	8,480	1,059		939	872(8) 1059(9b)	950(1) 929(9c)	1059(9a)
9,040		9,040	9,040	1,129		997	1,073(13) 1129(27)	667(25) 1129(28)	1129(9a,b) 978(9c)
10,740		10,740	10,740	1,341		1,144	964(8) 792(25)	1,113(10) 1341(9a,b)	1176(21) 1027(9c)
12,430		12,430	12,430	1,553		1,335	1,677(4) 917(25) 1553(27,28)	1,113(3) 1553(9a,b) 1553(31,29)	1401(21) 1765(30) 1223(9c)
16,940				2,120			2,118(9) 2118(9a,b)	1,424(3) 1565(9c)	1251(25)
14,130				1,765			1042(25) 1765(9b)	1513(21) 1320(9c)	1765(9a)
9,040		9,040	9,040	1,129		983	667(25) 1129(31)	1129(9a,b) 1129(29)	1129(30) 929(9c)
9,120									
12,540				1,139 1,556				1,030(13) 1,355(13)	
9,050 9,660 13,280				1,126 1,201 1,651			1126(9,9a,b) 1201(27,28) 1,651(9,27)	929(9c) 1201(9a,b) 1,163(3)	978(9c) 1,482(21)
18,110				2,252			1651(28) 1,489(3)	1651(9a,b) 2252(9a,b)	1223(9c) 1565(9c)
10,140				1,257			1,128(13)		

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thickness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Collapse Resistance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
8-5/8 *219,1*	58.7	.687 *17,45*	7.251 *184,2*	7.126 *181,0*		8.970(24) *227,8* 9.112(13) *231,4*	7.171(13)(24) *182,1*	L-80 P-110	11,730 15,990
	63.5	.750 *19,05*	7.125 *181,0*	7.000 *177,8*		9.054(24) *230,0* 9.152(13) *232,5*	7.045(13)(24) *178,9*	L-80 P-110	12,700 17,470
	68.1	.812 *20,62*	7.001 *177,8*	6.876 *174,6*		9.051(24) *229,9* 9.154(13) *232,5*	6.921(13)(24) *175,8*	L-80 P-110	13,650 18,760
	72.7	.875 *22,22*	6.875 *174,6*	6.750 *171,5*		9.047(24) *229,8* 9.156(13) *232,6*	6.795(13)(24) *172,6*	L-80 P-110	14,590 20,050
	77.1	.937 *23,80*	6.751 *171,5*	6.626 *168,3*		9.044(24) *229,7* 9.159(13) *232,6*	6.671(13)(24) *169,4*	L-80 P-110	15,490 21,300
8-3/4‡ *222,3*	49.7	.557 *14,15*	7.636 *194,0*	7.500 *190,5*	9.625 *244,5*			S-95 S-105	10,260 11,100
9-5/8 *244,5*	32.3	.312 *7,92*	9.001 *228,7*	8.845 *224,7*	10.625 *269,9*	10.250(7) *260,4*		H-40	1,400
	36.0	.352 *8,94*	8.921 *226,6*	8.765 *222,6*	10,625 *269,9*	10.650(9a) *270,0* 10.626(30) *220,0* 10.149(28) *257,8* 10.000 *254,0 (1)* 9.750(3) *247,7* 10.165(4) *258,2* 10.250(7) *260,4* 10.625(9b) (27,31,29) *269,9* 10.142(17) *257,6* 9.625(25) *244,5* 9.883(23) *251,0*	8.819(9c) *224,0* 8.888(25) *225,8* 8.846(23) *224,7* 8.781(1)(3) *223,0* 8.811(4) *223,8* 8.677(17) *220,4* 8.819(9c) *225,7* 8.976(30) *228,0*	H-40 J-55 K-55 C-75 N-80 P-110	1,740 2,020 2,020 2,320 2,370 2,470

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
11,150 15,330				1,371 1,885			1,259(13) 1,656(13)	1,656(24)	
12,170 16,740				1,484 2,041			1,372(13) 1,805(13)	1,805(24)	
13,180 18,120				1,594 2,192			1,500(13) 1,973(13)	1,973(24)	
14,200 19,530				1,704 2,343			1,606(13) 2,113(13)	2,113(24)	
15,210 20,910				1,810 2,489			1,688(13) 2,221(13)	2,221(24)	
10,580 10,580		10,580 10,580	10,580 10,580	1,362 1,362		1,017 1,095	1,232(12) 1,273(12)		
2,270	2,270			365	254				
2,560 3,520 3,520 4,800 5,120 7,040	2,560 3,520 3,520	3,520 3,520	3,520 3,520	410 564 564 789 820 1,128	294 394 423	453 489	517(23) 564(9b) 564(9) 564(9a,b) 564(31) 646(1) 553(3) 820(9a,b) 1,208(4) 1128(29,31) 1282(30)	338(25) 564(30) 655(23) 564(27) 564(29) 769(9a,b) 492(25) 548(9c) 676(25) 1128(9a,b)	564(9a) 338(25) 564(28,30) 521(9c) 820(27,28) 1128(27,28) 685(9c)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thickness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Collapse Resistance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
9-5/8 244,5	40.0	.395 *10,03*	8.835 *224,4*	8.679 *220,4* 8.599 (10) *218,4*	10.625 *269,9*	9.957(23) *252,9* 10.626(30) *269,9* 10.650(9a) *270,5* 10.224(28) *259,7* 10.000(1) *254,0* 9.750(3) *247,7* 10.165(4) *258,2* 10.250(7) *260,4* 10.625(9,9b) (16,27,31,29) *269,9* 10.100(10) *256,5* 10.142(17) *257,6* 9.625(25) *244,5*	8.878(30) *225,5* 8.756(9c) *222,4* 8.796(23) *223,3* 8.755(1)(3) *222,4* 8.725(4) *221,6* 8.677(17) *220,4* 8.810(25) *223,8*	J-55 K-55 C-75 N-80 C-95 P-110 L-80	2,570 2,570 2,980 3,090 3,330 3,480 3,090
	43.5	.435 *11,05*	8.755 *222,4*	8.599 *218,4*	10.625 *269,9*	10.650(9a) *270,5* 10.626(30) *269,9* 10.293(28) *261,4* 10.000(1) *254,0* 9.750(3) *247,7* 10.165(4) *258,2* 10.500(7) *266,7* 10.625(9,31, 26,16,9b, 27,29) *269,9* 10.100(10) *256,5* 10.197(17) *259,0* 10.025(23) *254,6* 9.778(21) *248,4* 9.625(8,25) *244,5*	8.755(7) *222,4* 8.648(25) *219,7* 8.675(1)(3)(21) *220,3* 8.655(4) *219,8* 8.677(17,9c) *220,4* 8.690(8) *220,7* 8.680(23) *220,5* 8.878(30) *225,5*	K-55 C-75 N-80 C-95 P-110 V-150 L-80	3,250 3,750 3,810 4,130 4,430 4,750 3,810

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
3,950	3,950	3,950	3,950	630	452	520	378(25)	630(9a,b)	630(30,27)
3,950	3,950	3,950	3,950	630	486	561	630(9)	765(23)	378(25)
							630(9a,b,30)	630(27,28)	630(31,29)
5,390		5,390	5,390	859		694	1,031(4)	760(1)	859(9a,b)
							635(9c)		
5,750		5,750	5,750	916		737	636(3)	805(23)	549(25)
							916(9a,b)	916(27,28)	668(9c)
6,820		6,820	6,820	1,088		847	1,088(9)	652(25)	1088(9a,b)
							701(9c)		
7,900									
				1,260			755(25)	1260(27,28)	1432(30)
							1260(29,31)	1260(9a,b)	835(9c)
5,750		5,750	5,750	916		727	549(25)	916(30)	916(9a,b)
							916(31,29)	635(9c)	
4,350				691			691(9,9a,b)	454,8	656(7)
							656(26)	463(25)	691(27,28)
							691(30,31)	691(29)	
5,930		5,930	5,930	942		776	865(1)	942(9a,b)	740(9c)
6,330		6,330	6,330	1,005		825	713(3)	912(23)	931(21)
							660(8)	954(7,26)	673(25)
							1005(9a,b)	1005(27,28)	779(9c)
7,510		7,510	7,510	1,193		948	958(23)	978(21)	784(8)
							1133(7,26)	800(25)	818(9c)
							1193(9a,b)		
8,700		8,700	8,700	1,381		1,106	891(3)	1,139(1)	1140(23)
							1164(21)	907(8)	1312(7,26)
							926(25)	974(9c)	1570(30)
							1381(27,28)	1381(31,29)	1381(9a,b)
11,860				1,818			1,141(3)	1,884(9,9a,b)	1246(9c)
							1237(8)	1790(7,26)	1263(25)
6,330		6,330	6,330	1,005		813	660(8)	954(7,26)	673(25)
							1005(9a,b)	1005(30,31)	1005(29)
							740(9c)		

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
9-5/8 *244,5*	47.0	.472 *11,99*	8.681 *220,5*	8.525 *216,5*	10.625 *269,9*	10.355(28) *263,0*	8.878(30) *225,5*	K-55	3,880
						10.650(9a) *270,5*			
						10.626(30) *269,9*			
						10.355(29) *263,0*			
						10.000(1) *254,0*	8.606(23) *218,6*	C-75	4,630
						9.750(3) *247,7*	8.681(7,21) *225,1*	N-80	4,760
						10.165(4) *258,2*	8.601(1,21) *218,5(3)*	C-95	5,080
						10.500(7) *266,7*	8.581(4) *218,0*	P-110	5,310
						10.625(9,31,29) (9b,27,26,16) *269,9*	8.661(13) *220,0* 8.603(17)		
						10.100(10) *256,6*	*218,5*	V-150	6,020
						10.036(13) *254,9*	8.610(8) *218,7*	Q-125	5,630
						10.197(17) *259,0*	8.651(25) *219,7*	L-80	4,760
						9.625(25,8) *244,5*	8.602(9c) *218,5*		
						10.087(23) *256,20*			
						9.784(21)			

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
4,720				746			746(9,27,31) 493(25)	712(7,26) 746(28,29,30)	461(8) 746(9a,b)
6,440		6,440	6,440	1,018		852	962(1)	1018(9a,b)	838(9c)
6,870		6,870	6,870	1,086		905	785(3) 1036(26) 1086(9a,b)	1028(21) 670(8) 1086(27,28)	1035(7) 717(25) 882(9c)
8,150		8,150	8,150	1,289		1,040	1,026(13) 796(8) 926(9c)	1080(21) 851(25)	1230(7,26) 1289(9a,b)
9,440		9,440	9,440	1,493		1,213	982(3) 1424(7,26) 986(25) 1493(27,28)	1,265(1) 921(8) 1493(9a,b) 1493(29)	1285(21) 1697(30) 1493(31) 1103(9c)
12,870				2,036			1,257(3,8) 1942(7,26)	2036(9,9a,b) 1344(25)	1411(9c)
10,730				1,697			1388(21) 1120(25)	1618(7,26) 1697(9a,b)	1047(8) 1191(9c)
6,870		6,870	6,870	1,086		893	1035(7) 1086(9a,b) 1086(29)	670(8) 1086(30) 838(9c)	717(25) 1086(31) 1036(26)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
9-5/8 *244,5*	53.5	.545 *13,84*	8.535 *216,8*	8.379 *212,8*	10.625 *269,9*	10.650(9a) *270,5* 10.626(30) *269,9* 10.476(28) *266,1* 10.062(1) *255,6* 9.750(3) *247,7* 10.165(4) *258,2* 10.292(5) *261,4* 10.500(7) *266,7* 10.625(9,9b, 29,8,27,26,31) *269,9* 10.100(10) *256,5* 10.070(13) *255,8* 10.335(17) *262,5* 9.625(31,25,8) *244,5* 9.821(21) *249,5*	8.565(25) *217,6* 8.535(5,21) *216,8(1)* 8.542(3) *217,0* 8.435(4) *214,2* 8.460(8) *214,9* 8.515(13) *216,3* 8.457(17,9c) *214,8* 8.878(30) *225,5*	K-55 C-75 N-80 C-95 P-110 V-150 Q-125 L-80	5,130 6,380 6,620 7,330 7,930 8,970 8,440 6,620
	58.4	.595 *15,11*	8.435 *214,2*	8.279 *210,3* 8.375 (11) *212,7*	10.625 *269,9*	9.625(25) *244,5* 10.556(28) *268,1* 9.830(21) *249,7* 9.844(3) *250,0* 10.165(4) *258,2* 10.383(5) *263,7* 10.575(7) *268,6* 10.625(9,9b)	8.358(9c) *212,3* 8.435(7) *214,2* 8.472(25) *215,2* 8.355(3)(4) *212,2(5)* 8.357(17) *212,3* 8.445(21)	C-75 N-80 S-95 P-110 V-150	7,570 7,890 9,950 9,750 11,570

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
5,450				855			820(7,26) 538(25) 855(29,30)	855(27,28) 556(8) 855(31,9a)	
7,430		7,430	7,430	1,166		999	1076(1)	1166(9a,b)	963(9c)
7,930		7,930	7,930	1,244		1,062	916(3) 782(25) 1244(28)	1193(7,26) 1244(9a,b) 1014(9c)	809(8) 1244(27)
9,410		9,410	9,410	1,477		1,220	1,297(10) 1417(7,26) 1065(9c)	1,477(9) 961(8) 1477(9a,b)	1267(21) 929(25)
10,900		10,900	10,900	1,710		1,422	1,544(10) 1641(7,26) 1267(9c)	1,415(1) 1076(25) 1710(9a,b)	1508(21) 1710(28,29)
14,860				2,332			1710(30) 1,466(3) 2238(26)	1710(27,31) 1,935(5) 1517(8)	1113(8) 2238(7) 1467(25)
12,390				1,943			2332(9a) 1628(21) 1223(25)	1622(9c) 1865(7,26) 1943(9a,b)	1264(8) 1943(30)
7,930		7,930	7,930	1,244		1,047	1369(9c) 1193(7,26) 1244(9a,b) 1244(29)	809(8) 1244(30) 963(9c)	782(25) 1244(31)
8,110				1,266			1,270(9)	1266(9a,b)	1047(9c)
8,650				1,350			1,311(4) 1350(9a,b)	878(25) 1102(9c)	1350(28) 1300(7)
10,280		10,280	10,280	1,604		1,357	1350(27)	1604(9a,b)	1157(9c)
11,900				1,857			1,679(5) 1207(25) 1857(9a,b)	1,312(3) 1788(7) 1377(9c)	1622(21) 1857(27,28)
16,230				2,530			2,149(5) 2438(7)	1,679(3) 2532(9a,b)	1646(25) 1763(9c)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
9-5/8 *244,5*	59.4	.609 *15,47*	8.407 *213,5*	8.251 *209,6*	10.625 *269,9*	9.873(24) *250,8* 10.650(9a) *270,5* 10.625(9,9b) *269,9* 10.010(13) *254,3* 8.331(9c) *211,6* 10.579(28) *268,7*	8.327(13)(24) *211,5* 8.331(9c) *211,6*	L-80 P-110	8,250 10,260
	61.1	.625 *15,87*	8.375 *212,7*	8.219 *208,8*	10.625 *269,9*	10.650(9a) *270,5* 10.637(9b) *270,1* 10.625(9)(16)(27) *269,9* 10.433(17) *265,0* 9.889(24) *251,2* 10.579(28) *268,7*	8.295(24) 8.297(17) *210,7*	C-95 S-95 P-110 V-150	9,800 10,500 10,840 13,130
	64.9	.672 *17,07*	8.281 *210,3*	8.125 *206,4*	10.625 *269,9*	10.625(31) *269,9* 10.650(30) *270,5* 10.111(13) *256,8* 9.965(24) *253,1*	8.819(30) *224,0* 8.201(13)(24) *208,3*	L-80 P-110	9,860 12,550
	70.3	.734 *18,64*	8.157 *207,2*	8.001 *203,2*	10.625 *269,9*	10.047(24) *255,2* 10.145(13) *257,7*	8.077(13)(24) *205,2*	L-80 P-110	11,270 14,800
	71.8	.750 *19,05*	8.125 *206,4*	7.969 *202,4*	10.625 *269,9*	10.060(24) *255,5* 9.625(8) *244,5*	8.045(24) *204,3* 8.050(8) *204,5*	P-110 V-150	15,810 19,640
	75.6					10.099(24) *256,5*	7.951(24) *202,0*		
		.797 *20,24*	8.031 *204,0*	7.875 *200,0*		10.210(13) *259,3* 10.102(24) *256,6*	7.951(13) *201,9*	L-80 P-110	12,150 16,710

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
8,860 12,180		12,180	12,140	1,380 1,897		1,603	1380(9,9a,b) 1,897(9,28) 1898(9a,b)	1,238(13) 1,629(13) 1405(9c)	1068(9c) 1,629(24)
10,800 10,800 12,500 17,050		10,800	10,490	1,680 1,679 1,944 2,650		1,430	1,411(24) 1,679(9a,b) 1,680(24) 265(9a,b)	1679(9a,b) 1944(27)	 1944(9a,b)
9,770 13,440		13,240	12,140	1,512 2,079		1,778	1,389(13) 2,089(12) 2362(30)	1512(30) 1,828(13) 2056(31)	1495(31) 1828(24)
10,680 14,680		13,240	12,140	1,640 2,255		1,948	1,522(13) 2,002(13)	2,196(12)	2002(24)
15,000 20,450		18,060	16,560	2,300 3,137		2,672	2051(24) 2,692(12)	1076(8) 2019(8)	1481(8)
11,590 15,940				1,768 2,431			1,668(13) 2,195(13)	 2195(24)	
12,490 17,180				1,892 2,602			1,784(13) 2,347(13)	 2347(24)	

BAKER OIL TOOLS
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Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thickness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Collapse Resistance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
9-5/8 *244,5*	86.0	.922 *23,42*	7.781 *197,6*	7.625 *193,7*		10.098(24) *256,5* 10.214(13) *259,4*	7.701(13)(24) *195,6*	L-80 P-110	13,860 19,060
	91.0	.984 *24,99*	7.657 *194,5*	7.501 *190,5*		10.095(24) *256,5* 10.216(13) *259,5*	7.577(13)(24) *192,5*	L-80 P-110	14,690 20,190
	92.7	1.000 *25,40*	7.625 *193,7*	7.500 *190,5*				C-75 P-110	13,970 20,480
9-3/4‡ *247,7*	59.2	.595 *15,11*	8.560 *217,4*	8.500 *215,9*	10.625 *269,9*	9.956(21) *252,9*	8.570(21) *217,7*	S-95 S-105	9,750 10,470
9-7/8‡ *250,8*	62.8	.625 *15,88*	8.625 *219,1*	8.500 (11) *215,9*	10.625 *269,9*	10.065(21) *255,7* 10.147(24) *257,8* 10.825(30,31) *275,0* 10.000(3) *254,0* 10.280(13) *261,1* 10.700(7) *271,8* 9.875(25) *250,9*	8.514(25) *216,3* 9.102(30) *231,2* 8.535(3)(21) *216,8* 8.565(13)(24) *217,5* 8.625(7) *219,1*	S-95 P-110 S-105	10,180 10,260 11,010
10-3/4 *273,0*	32.75	.279 *7,09*	10.192 *258,8*	10.036 *254,9*	11.750 *298,5*	11.300(7) *287,0*		H-40	880
	40.5	.350 *8,89*	10.050 *255,3*	9.894 *251,3*	11.750 *298,5*	11.772(9a) *299,0* 10.863(23) *275,9* 11.188(1) *284,2* 11.300(7) *287,0* 11.750(9,27,7) (9b,29,31,26) *298,5* 11.274(28) *286,4*	10.050(7) *225,3* 11.110(30) *282,2* 10.098(29) *256,5* 9.910(1) *251,7* 10.021(25) *254,5* 9.949(9c) 252,7 9.975(23)	H-40 J-55 K-55 C-75	1,420 1,580 1,580 1,720

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
13,410 18,440				2,017 2,773			1,920(13) 2,527(13)	2,527(24)	
14,310 19,680				2,137 2,938			2,004(13) 2,637(13)	2,637(24)	
13,640 20,000				2,032 2,981					
10,150 10,150		10,150 10,150	10,150 10,150	1,626 1,626		1,204 1,279	1,469(12) 1,524(12)	1,425(21) 1,425(21)	
10,520 12,180 10,520		10,520 10,520	10,490 10,490	1,725 1,998 1,725		1,123 1,210	1,385(12) 1,707(13) 1,405(25) 1,437(12)	1,579(21) 988(3) 1,998(31)	1,502(24) 1,927(7)
1,820	1,820			367	205				
2,280 3,130 3,130 4,270	2,280 3,130 3,130		3,130 3,130	457 629 629 858	314 420 450		545(23) 629(9a) 629(9,28) 377(25) 629(31) 858(9,9a,b)	590(7,26) 629(9b) 690(23) 629(9a,b) 629(29) 720(1)	377(25) 629(28) 590(7,26) 629(27) 569(9c)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
10-3/4 *273,0*	45.5	.400 *10,16*	9.950 *252,7*	9.794 *248,5*	11.750 *298,8*	11.772(9a) *299,0* 11.363(28) *288,6* 11.188(1) *284,2* 10.875(3) *276,2* 11.500(7) *292,1* 11.750(9) *298,5* 11.460(10) *291,1* 11.461(17) *291,1* 10.950(23) 278,1 10.750(25) *273,1* 11.750(27,31) (9b,29,26) *298,5*	9.922(23) *252,0* 9.992(30) *253,8* 9.980(29) *253,5* 9.870(1) *250,7(3)* 9.872(17) *250,7* 9.950(7) *252,7* 9.949(25) 252,7 9.850(9c) *250,2*	J-55 K-55 C-75 N-80 P-110	2,090 2,090 2,410 2,480 2,610
	51.0	.450 *11,43*	9.850 *250,1*	9.694 *246,2*	11.750 *298,5*	11.449(28) *290,8* 11.037(23) *280,3* 11.750(27,29,9b) *298,5* 11.188(1) *284,2* 10.875(3) *276,2* 11.500(7) *292,1* 11.750(9) (16)(26)(31) *298,5* 11.460(10) *291,1* 11,461(17) *291,1* 10.914(21) *277,2* 11.772(9a) *299,0* 10.750(25) *273,1*	9.775(23) *248,3* 9.980(29) *253,5* 9.992(30) *253,8* 9.770(1)(3)(21) *248,2* 9.772(17) *248,2* 9.850(7) *250,19* 9.764(25) *248,0* 9.748(9c) *247,6*	J-55 K-55 C-75 N-80 C-95 P-110 L-80	2,700 2,700 3,100 3,220 3,490 3,670

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
3,580	3,580		3,580	715	493		653(23) 715(9a,b)	677(7,26) 725(28)	429(25)
3,580	3.580		3,580	715	528		715(9) 429(25) 715(31)	827(23) 715(9a,b) 715(29,28)	677(7,26) 715(27)
4,880				975			975(9,9a,b)	869(1)	718(9c)
5,210				1,041			1040(9,9a,b) 624(25) 1040(29,30)	722(3) 756(9c) 1040(31)	984(7,26) 1040(27,28)
7,160				1,430			1353(7,26) 945(9c) 1431(27,28)	858(25) 1423(29)	1431(9a,b) 1431(31)
4,030	4,030		4,030	801	565		762(7,26)	541(25)	801(9a,b)
4,030	4,030		4,030	801	606		801(9) 762(7) 801(31,29)	762(26) 801(9a,b)	541(25) 801(27,28)
5,490	5,490		5,490	1,092	756		1,017(1)	1092(9a,b)	866(9c)
5,860	5,860		5,860	1,165	804		832(3) 786(25) 911(9c)	1030(23) 1109(7,26) 1165(27,28)	1077(21) 1310(9a,b) 1165(9a,b)
6,960	6,960		6,960	1,383	927		1081(23) 934(25) 957(9c)	1130(21) 1317(7)	1317(26) 1383(9a,b)
8,060	8,060		8,060	1,602	1,080		1,338(1) 1525(26) 1602(31,27) 1602(9a,b) 786(25) 1165(9a,b)	1287(23) 1081(25) 1594(29) 1602(28) 1109(26,7) 1165(31,29)	1346(21) 1524(7) 1139(9c) 1602(9a,b) 866(9c)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
10-3/4 *273,0*	55.5	.495 *12,57*	9.760 *247,9*	9.604 *243,9*	11.750 *298,5*	10.750(25) *273,1* 10.922(21) *277,4* 11.010(3) *279,7* 11.188(1) *284,2* 10.875(3) *276,2* 11.700(7) *297,2* 11.750 (9)(16) *298,5* 11.460(10) *291,1* 11.461(17) *291,1* 11.750(9b,29, 27,31,26) 11.772(9a) *299,0*	9.685(23) *246,0* 9.980(29) *253,5* 9.992(30) *253,8* 9.680(1)(3)(21) *245,9* 9.682(17) *245,9* 9.815(25) *249,3* 9.760(7) *248,0* 9.665(9c) *245,5*	K-55 C-75 N-80 C-95 P-110 V-150 L-80	3,320 3,950 4,020 4,300 4,630 5,040
	60.7	.545 *13,84*	9.660 *245,4*	9.504 *241,4*	11.750 *298,5*	11.526(28) *292,8* 11.610(28) *294,9* 11.094(23) *281,8* 11.772(9a) *299,0* 11.250(1) *285,7* 10.906(3) *277,0* 11.424(5) *290,2* 11.700(7) *297,2* 11.750(9b,31, 9,29,16,27,26) *298,5* 11.460(10) *291,1* 11.208(13) *284,7* 11.602(17) *294,7* 10.931(21) *277,6* 10.750(25,29) *273,0*	9.567(9c) *243,0* 9.992(30) *253,8* 9.580(1)(3)(21) *243,3(5)* 9.585(8)(23) *243,4* 9.630(13) *244,6* 9.582(17) *243,4* 9.764(29) *248,0* 9.660(7) *245,4* 9.746(25) *247,5*	K-55 C-75 N-80 C-95 P-110 V-150 Q-125	4,160 5,020 5,160 5,566 5,860 6,560 6,070

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
4,430				877			877(9,9a,b)	526(25)	839(26)
							838(7)	877(27,31)	877(28,29)
6,040	6,040		6,040	1,196	843		1,196(9)	1,148(l)	1196(9a,b)
							991(9c)		
6,450	6,450		6,450	1,276	895		1150(23)	1209(21)	765(25)
							1220(26,7)	1276(9a,b)	1276(27)
							1276(28)	1043(9c)	
7,660	7,660		7,660	1,515	1,032		1,159(3)	1208(23)	1270(21)
							908(25)	1448(26,7)	1515(9a,b)
							1095(9c)		
8,860	8,860		8,860	1,754	1,203		1438(23)	1,511(1)	1512(21)
							1051(25)	1677(26,7)	1754(9a,b)
							1754(28)	1754(27)	1754(31)
							1745(29)	1304(9c)	
12,090				2,392			1434(25)	2287(26,7)	2392(9a,b)
							1669(9c)		
							765(25)	1220(26,7)	1276(9a,b)
							1276(31)	1276(29)	991(9c)
4,880				961			922(7,26)	670(25)	961(9a,b)
							961(27,31)	961(28)	
6,650				1,310			1,080(8)	1,279(1)	1310(9a,b)
							1092(9c)		
7,100				1,390			976(3)	1342(7,26)	974(25)
							1398(9a,b,27)	1149(9c)	1398(28)
8,436				1,648			1,660(9)	1,375(13)	1407(21)
							1363(23)	1593(7,26)	1157(25)
							1660(9a,b)	1207(9c)	
9,760	9,760		9,760	1,922	1,338		1,220(3)	1,683(1)	1675(21)
							1622(23)	1845(7,26)	1339(25)
							1922(9a,b)	1922(28)	1922(27)
							1922(31)		
								1912(29)	
									1437(9c)
13,310				2,620			1,561(3)	2,178(5)	2516(7,26)
							1826(25)	2621(9a,b)	1839(9c)
11,090				2,184			1809(21)	1752(23)	2096(7,26)
							1522(25)	2184(9a,b)	1552(9c)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
10-3/4 *273,0*	65.7	.595 *15,11*	9.560 *242,8*	9.404 *238,9*	11.750 *298,5*	11.693(28) *297,0* 11.177(23) *283,9* 11.772(9a) *299,0* 11.313(1) *287,9* 11.000(3) *279,4* 11.517(5) *292,5* 11.700(7) *297,2* 11.750(9,31, 16,9b,29,27) *298,5* 11.213(13) *248,8* 11.602(17) *294,7*	9.468(9c) *240,5* 9.764(29) *248,0* 9.992(30) *253,8* 9.547(1)(23) *242,5* 9.545(3)(21) *242,4* 9.530(13) *242,1* 9.482(17) *240,8* 9.560(7) *242,8* 9.678(25) *245,8*	K-55 C-75 N-80 C-95 P-110 V-150 Q-125	4,920 6,080 6,300 6,950 7,490 8,330 7,920
						10.966(21) *278,5* 10.750(25) *273,1*			
	71.1	.650 *16,51*	9.450 *240,0*	9.294 *236,1*	11.750 *298,5*	11.750(27) *298,5* 11.602(17) *294,7* 11.700(17) *297,2*	9.372(17) *238,0*	C-95 S-95 P-110 V-150	8,470 9,600 9,280 10,890
	73.2	.672 *17,07*	9.406 *238,9*	9.250 *234,9*	11.750 *298,5*	11.184(13) *284,1* 11.041(24) *280,4* 11.131(24) *282,8*	9.326(13,24) *236,9* 9.328(17) *237,0*	L-80 P-110	8,060 9,990
	79.2	.734 *18,64*	9.282 *235,8*	9.126 *231,8*	11.750 *298,5*	11.298(1) *287,0* 11.287(13) *286,7* 11.139(24) *282,9*	9.190(1) *233,4* 9.202(13)(24) *233,7*	L-80 P-110	9,480 12,010
	85.3	.797	9.156	9.000		11.378(1) *289,0*	9.049(1) *229,8*	L-80	10,920

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
5,330				1,134			1005(7) 1044(27,31)	626(25) 1044(28,29)	1044(9a,b)
7,260				1,424			1,186(8,9c)	1,410(1)	1424(9a,b)
7,750				1,519			1,127(3) 1519(9a,b,27)	1462(7) 1249(9c)	910(25) 1519(28)
9,200				1,803			1,803(9) 1513(23) 1803(9a,b)	1,527(13) 1737(7) 1311(9c)	1559(21) 1081(25)
10,650	10,650		10,650	2,088	1,472		1,408(3) 1801(23) 2088(9a,b) 2088(31)	1,855(1) 2011(7) 2088(28) 2077(29)	1856(21) 1252(25) 2088(27) 1561(9c)
14,530				2,847			1,803(3) 1707(25)	2,420(5) 2847(9a,b)	2742(7) 1998(9c)
12,110				2,373			2227(21) 1422(25) 1685(9c)	1945(23) 2373(9a)	2285(7) 2088(9b)
10,050				1,856			2,420		
10,050	9,710		9,480	1,959	1,403		1,971(12)		
11,640	11,200		10,980	2,269	1,618		2269(27)		
15,070	15,070		14,970	3,094	2,174		2,966(12)		
8,750				1,702			1,545(13)		
12,030	11,240		10,980	2,340	1,676		2033(13,24)	2,328(12)	2340(27)
9,560				1,848			1,712(13)	1,620(1)	
13,140	11,240		10,980	2,540	1,837		2253(13,24)	2,025(1)	
10,380				1,994			1,850(13)	1,864(1)	
14,270				2,741			2434(13,24)	2,330(1)	

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
10-3/4 *273,0*	91.2	.859	9.032	8.876		11.223(24) 285,1 11.383(13)	8.952(13)(24)	L-80	11,760
		21,82	*229,4*	*225,4*					
						289,1	*227,4*	P-110	16,080
						11.283(24) 286,6			
	~~97.1~~	~~.922~~ *23,42*	~~8.906~~ *226,2*	~~8.750~~ *222,2*		~~11.402(13)~~ *289,6*	~~8.826(13,24)~~ *224,2*	~~L-80~~ P-110	~~12,550~~ 17,250
						11.280(24) 286,5			
	~~102.9~~	~~.984~~ *24,99*	~~8.782~~ *223,1*	~~8.626~~ *219,1*		~~11.405(13)~~ *289,7*	~~8.702(13,24)~~ *221,0*	~~L-80~~ P-110	~~13,300~~ 18,290
11-3/4 *298,5*						~~11.276(24)~~ 286,4	~~8.576(24)~~ 217,8		
	108.7	1.047 *26,59*	8.656 *219,9*	8.500 *215,9*		11.407(13) *289,7*	8.576(13,24) *217,8*	L-80 ~~P-110~~	14,070 ~~19,340~~
	109	1.033 *26,25*	8.684 *220,6*	8.528 *216,6*		11.024(18) *280,0*		C-75 P-110	13,030 19,110
	42.0	.333 *8,46*	11.084 *281,5*	10.928 *277,6*	12.750 *323,9*			H-40	1,070
						12.772(9a) *324,0*	11.043(29) *280,5*		
						12.750(27, 31,9b,29) *323,9*	11.055(30) *280,8*		
	~~47.0~~	~~.375~~ *9,52*	~~11.000~~ *279,4*	~~10.844~~ *275,4*	~~12.750~~ *323,9*	12.188(1) *309,6* 11.938(3) *303,2*	10.860(1) *275,8* 10.890(3) *276,6*	J-55 ~~K-55~~ C-75	1,510 ~~1,510~~ 1,620
						12.322(28) *313,0*	10.925(23) *277,5*	N-80	
						11.892(23) *302,1*			
						12.428(28) *315,7*			
						12.750(27, 31,29,9b) *323,9*	10.925(29,30) *277,5*		
	54.0	.435 *11,05*	10.880 *276,3*	10.724 *272,4*	12.750 *323,9*	12.188(1) *309,6* 11.938(3) *303,2*	10.800(1,3) *274,3* 11.043(29) 280,5	J-55 K-55 C-75	2,070 2,070 2,380
						11.988(23)	10.805(23)	N-80	

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
11,190 15,380				2,135 2,936			2,013(13) 2648(13,24)		
12,010 16,510				2,277 3,131			2,114(13) 2,782(13,24)		
12,810 17,620				2,415 3,321			2,304(13) 3,032(13,24)		
13,640 18,750				2,553 3,511			2,432(13) 3,200(13,24)		
12,610 18,500				2,365 3,469			1,476(18) 1,942(18)		
1,980	1,980			478	307				
3,070 3,070 4,190	3,070 3,070		3,070 3,070	737 737 1,005 1,072	477 509		648(23) 820(23) 737(27,28) 872(1) 706(3)	737(9a,b) 737(9a) 737(31,29) 1005(9a,b) 1072(9a,b)	 737(9b) 1072(27,28)
3,560 3,560 4,860	3,560 3,560		3,560 3,560	850 850 1,160 1,237	568 606		797(23) 1009(23) 850(27,28) 1,068(1) 876(3)	850(9a,b) 850(9a) 850(31,29) 1160(9a,b) 1237(9a,b)	 850(9b) 1237(27,28)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
11-3/4 *298,5*	60.0	.489 *12,42*	10.772 *273,6*	10.616 *269,6*	12.750 *323,9*	11.928(21,23) *303,0* 12.772(9a) *324,4* 12.750(27, 29,31,9b) *450,9* 12.188(1) *309,6* 11.938(3) *303,2* 12.522(28) *318,1* 11.750(25) *298,5* 12.559(28) *319,0* 11.750(25) *298,5* 11.965(21,23) *304,0*	10.687(23) *271,4* 10.925(30) *277,5* 10.692(1)(21) *271,6(3)* 10.828(25) *275,0* 10.682(25) *271,3* 10.672(23) *271,1*	J-55 K-55 C-75 N-80 C-95 P-110 V-150 Q-125 L-80 K-55 C-75 N-80	2,660 2,660 3,070 3,180 3,440 3,610 3,680 3,680 3,290 3,810 3,870
	65.0	.534 *13,56*	10.682 *271, 3*	10.526 *267,4*	12.750 *323,9*	12.188(1) *309,6* 12.000(3) *304,8*	10.650(1) *270,5* 10.670(3)(21) *271,0*	S-95 P-110	5,740 4,490
	66.7	.547 *3,89*	10.656 *270,17*	10.500 *266,7*	12.750 *323,8*	12.750(26,9b) *323,9* 12.772(9a) *324,4* 12.750(26) *323,8*		V-150 C-95 P-110	4,850 4,400 4,740
	71.0	582 *14,78*	10.586 *268,9*	10.430 *264,9*	12.750 *323,8*	11.975(21) *304,2* 12.125(23) *308,0* 12.250(1) *311,1* 11.750(25) *298,5*	10.504(21) *266,8* 10.501(23) *266,7* 10.474(1) *266,0* 10.700(25) *271,8*	L-80 S-95 P-110 V-150	4,870 7,280 5,540 6,180
	73.6	.609 *15,47*	10.532 *267,5*	10.376 *263,6*	12.750 *323,8*			C-95 P-110	5,900 6,260

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
4,010	4,010		4,010	952	649		570(25)	909(26)	952(9a,b)
4,010	4,010		4,010	952	693		570(25)	909(26)	952(9a,b)
							951(27,31)	951(28,29)	
5,460	5,460		5,460	1,298	869		1,242(1)	1298(9a,b)	
5,830	5,830		5,830	1,384	924		1,060(3)	1255(21)	1226(23)
							830(25)	1323(26)	1384(9a,b)
							1384(27)	1384(28)	1384(31)
6,920	6,920		6,920	1,644	1,066		1,596(12)	1318(21)	1287(23)
							985(25)	1571(26)	1644(9a,b)
8,010				1,903			1,324(3)	1,635(1)	1569(21)
							1533(23)	1141(25)	1819(26)
							1877(29)	1903(9a,b)	1903(27)
							1903(28)	1903(31)	
10,920				2,595			1,695(3)	1555(25)	2480(26)
							2595(9a,b)		
9,100				2,163			1694(21)	1655(23)	1296(25)
							2067(26)	2163(9a,b)	
							830(25)	1323(26)	1384(9a,b,29)
4,370				1,035			993(26)	609(25)	1035(9a,b,28)
5,960				1,411			1,368(1)	1035(9a,b)	
6,360				1,505			1,164(3)	1400(21)	1326(23)
							1444(26)	885(25)	1505(9a,b)
							1506(28)		
7,560	7,560		7,560	1,788	1,189		1,781(12)	1540(21)	1459(23)
							1788(9a,b)		
8,750				2,070			1,455(3)	1,800(1)	1750(21)
							1657(23)	1985(26)	1217(25)
							2070(9a,b)	2070(28)	
11,930				2,822			1,863(3)	2707(26)	1660(25)
							2822(9a,b)		
7,740	7,740		7,740	1,829	1,208		1,776(12)	1756(26)	
8,960	8,960		8,960	2,118	1,408		2,089(12)	2033(26)	
6,930				1,633			1,274(1)	979(25)	1572(26)
8,230	8,230		8,230	1,940	1,306		1,933(12)	1722(21)	1605(23)
9,530				2,246			1,592(1)	1957(21)	1910(23)
							1346(25)	2162(26)	
13,000				3,063			2948(26)	1836(25)	
8,620	8,620		8,620	2,025	1,358		1,967(12)		
9,980	9,980		9,980	2,345	1,582		2,312(12)		
7,360				1,729			1,376(1)		
10,120				2,377			1,720(1)	2054(23)	
13,810				3,242					

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
	79.0	.656 *16,66*	10.438 *265,1*	10.282 *261,2*		12.250(1) *311,1* 12.248(23)	10.326(1) *262,3* 10.353(23)	L-80 P-110 V-150	6,420 7,650 8,570
						311,1	*263,0*		
11-3/4 *298,5*	80.5	.672 *17,07*	10.406 *264,3*	10.250 *260,4*	12.750 *323,8*			C-95 P-110	7,500 8,130
	83.0	.691 *17,55*	10.368 *263,3*	10.212 *259,4*		12.250(1) *311,1*	10.256(1) *260,5*	L-80 P-110 V-150	7,150 8,700 10,060
	87.2	.734 *18,64*	10.282 *261,2*	10.126 *257,2*	12.750 *323,8*			C-95 P-110	9,060 9,980
11-7/8‡ *301,6*	71.8	.582 *14,78*	10.711 *272,1*	10.625 *269,9*	12.750 *323,8*	12.072(21) *306,6* 12.270(23) *311,7* 12.320(1) *312,9* 11.875(25) *301,6*	10.670(21) *270,0* 10.672(1)(23) *271,1* 10.825(25) *275,0*	S-95 P-110	7,190 5,300
						12.750(26) *323,9*			
	48.0	.330 *8,38*	12.715 *322,9*	12.559 *319,0*	14.375 *365,1*			H-40	770
13-3/8 *339,7*	54.5	.380 *9,65*	12.615 *320,4*	12.459 *316,5*	14.375 *365,1*	13.518(23) *343,4* 14.398(9a) *365,7* 14.375(9,9b,31) *365,1*	12.677(29,30) *322,0* 12.540(23) 318,5	J-55 K-55 N-80 P-110	1,130 1,130 1,130 1,130
						14.375(27,29) *365,1*			
	61.0	.430 *10,92*	12.515 *317,9*	12.359 *313,9*	14.375 *365,1*	14.398(9a) *365,7* 14.375(9b,31) *365,1* 14,375(9)(27) *365,1* 13.562(3) *344,5* 13.607(23) *345,6*	12.559(29,30) *319,0* 12.435(3) *315,8* 12.425(8) *315,6* 12.544(25) *318,6*	J-55 K-55 C-75 N-80	1,540 1,540 1,660 1,670
						13.375(25) *339,7*	12.440(23) *316,0*		

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
7,820 10,750 14,660				1,829 2,515 3,430			1,486(1) 1,858(1)	2,206(23)	
9,510 11,010	8,950 10,360		8,740 10,120	2,222 2,573	1,509 1,757		2,158(12) 2,537(12)		
8,230 11,320 15,440				1,920 2,641 3,601			1,585(1) 1,982(1)		
10,390 12,030	8,950 10,360		8,740 10,120	2,413 2,794	1,655 1,928		2,236(12) 2,661(12)		
8,150 9,430	8,150		8,150	1,962 2,271	1,153		1,735(12) 1,805(1) 1361(25)	1728(21) 1964(21) 2186(26)	1696(23) 1927(23)
1,730	1,730			541	322				
2,730 2,730 3,980 5,470	2,730 2,730		2,730 2,730	853 853 1,241 1,629	514 547		693(23) 853(9) 853(27) 1241(27) 1,708(9)	853(9a,b) 878(23) 853(29) 1706(9a,b)	853(9a,b) 1706(27)
3,090 3,090 4,220 4,500	3,090 3,090		3,090 3,090	962 962 1,312 1,400	595 633		836(23) 962(9) 962(9a,b) 997(8) 956(3) 838(25)	576(25) 1058(23) 962(27,31) 1312(9a,b) 1399(9a,b)	962(9a,b) 576(25) 1399(27)

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thickness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Collapse Resistance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
13-3/8 *339,7*	68.0	.480 *12,19*	12.415 *315,3*	12.259 *311,4*	14.375 *365,1*	13.694(23) *347,8* 14.375(27,29,31) *365,1* 14.398(9a) *365,8* 13.812(1) *350,8* 13.562(3) *344,5* 14.375(9,9b,26) *365,1* 13.564(21) *344,5* 13.375(25) *339,7*	12.340(23) *313,4* 12.559(29,30) 319,0 12.305(1)(21) *312(3)* 12.325(8) *313,1* 12.474(25) *316,8*	J-55 K-55 C-75 N-80 C-95 L-80 P-110	1,950 1,950 2,220 2,270 2,330
	72.0	.514 *13,06*	12.347 *313,6*	12.191 *309,7*	14.375 *365,1*	13.602(21) *345,5* 13.753(23) *349,3* 13.812(1) *350,8* 13.562(3) *344,5* 14.375(9,26, 29,31,27,9b) *365,1* 14.398(9a) *365,7* 13.375(25) *339,7*	12.317(23) *312,9* 12.298(1) *312,4* 12.257(5) *311,3* 12.559(29,30) *319,0* 12.300(25) *312,4*	K-55 C-75 N-80 C-95 P-110 L-80 Q-125	2,230 2,590 2,670 2,820 2,880
	77.0	.550 *13,97*	12.275 *311,8*	12.119 *307,8*	14.375 *365,1*	14.398(9a) *365,7* 14.375(26,9b) *365,1* 13.812(1) *350,8* 13.375(25) *339,7*	12.376(25) *314,4* 12.165(1) *309,0* 12.185(8) *309,5*	C-75 N-80	2,990 3,100
	80.7	.580 *14,73*	2.215 *310,3*	12.059 *306,3*	14.375 *365,1*	13.725(23) *348,6* 14.375(9b) *365,1* 14.398(9a) *365,7*	12.140(23)	S-80 S-95	4,800 4,990

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
3,450	3,450		3,450	1,069	675		1,180(8) 1021(26)	979(23) 1069(9a,b)	641(25)
3,450	3,450		3,450	1,069	718		1,069(9) 641(25) 1069(27)	1240(23) 1021(26) 1069(31)	1332(21) 1069(9a,b) 1069(29)
4,710				1,458			1,458(9)	1,273(1)	1458(9a,b)
5,020				1,556			1,151(3) 932(25)	1305(23) 1486(26)	1402(21) 1556(9a,b,27)
5,970				1,847			1,770(9) 1847(9a,b) 932(25)	1107(22) 1486(26)	1764(26) 1556(9a,b)
							1556(31) 1282(25) 2079(29)	1556(27) 2043(26) 2139(27,31)	1545(29) 2139(9a,b)
3,700				1,142			789(25) 1142(27,31)	1094(26) 1142(29)	1142(9a,b)
5,040	5,040		5,040	1,558	978		1,308(8)	1,398(1)	1558(9a,b)
5,380	5,380		5,380	1,661	1,040		1,284(3) 1147(25) 1661(27)	1433(23) 1592(26)	1529(21) 1661(9a,b)
6,390	6,390		6,390	1,973	1,204		1,973(9) 1362(25)	1505(23) 1890(26)	1605(21) 1973(9a,b)
7,400	7,400		7,400	2,284	1,402		2,284(9) 1577(25) 2284(27) 1147(25) 1661(31)	1792(23) 2188(26) 2284(31) 1592(26) 1650(29)	1911(21) 2284(9a,b) 2221(29) 1661(9a,b)
							1792(25)	2487(26)	2596(9a,b)
5,400 5,760	5,400 5,760		5,400 5,760	1,662 1,773	1,054 1,122		1,308(8) 1,611(1) 1773(9a,b)	1,531(1) 1703(26)	1662(9a,b) 1062(25)
4,170 7,210	4,170 7,210		4,170 7,210	1,282 2,215	1,118 1,389		1812(23)		

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
13-3/8 *339,7*	85.0	.608 *15,44*	12.159 *308,8*	12.003 *304,9*	14.375 *365,1*	14.420(9b) *366,3* 13.773(23) *349,8* 13.812(1) *350,8* 14.398(9a) *365,7* 13.375(25) *339,7*	12.084(23) *306,9* 12.049(1) *306,0* 12.297(25) *312,3*	C-75 N-80 P-110	3,810 3,870 4,490
	86.0	.625 *15,87*	12.125 *308,0*	11.969 *304,0*	14.375 *365,1*	13.801(23) *350,5* 14.420(9b) *366,3* 14.398(9a) *365,7*	12.050(23)	S-95	6,240
	92.0	.672 *17,07*	12.031 *305,6*	11.875 *301,6*	14.375 *365,1*	14.000(1) *355,6*	11.921(1) *302,8*	C-75 N-80 P-110	4,910 5,050 5,700
	98.0	.719 *18,26*	11.937 *303,2*	11.781 *299,2*	14.375 *365,1*	14.000(1) *355,6*	11.827(1) *300,4*	C-75 N-80 P-110	5,720 5,910 6,930
	100.3	.734 *18,64*	11.907 *302,4*	11.751 *298,5*	14.375 *365,1*			C-95 P-110	6,810 7,320
13-1/2‡ *342,9*	81.4	.580 *14,73*	12.340 *313,4*	12.250 (11) *311,2*	14.375 *365,1*	14.500(29) *368,3* 13.740(21) *349,0*	12.559(29) *319,0* 12.291(21) *312,1*	S-95	4,860
13-5/8‡ *346,1*	88.2	.625 *15,88*	12.375 *314,3*	12.250 (11) *311,2*	14.375 *365,1*	14.375(26) *365,1* 13.875(21) *352,4* 14.025(23) 356,2 13.950(1) *354,3* 13.783(3) *350,1* 13.625(25) *346,1*	12.290(21) *312,2* 12.298(1) *312,4* 12.300(8)(23) *312,4* 12.290(3) *312,2* 12.295(25) *312,23*	C-75 S-95 P-110	3,910 5,930 4,590
14 *355,6*	* 92.68	.650 *16,51*	12.700 *322,6*	12.544 *318,6*		14.500(1) *368,3*	12.590(1) *319,8*	L-80 P-110	4,110 4,710
	* 99.43	.700 *17,78*	12.600 *320,0*	12.444 *316,1*		14.500(1) *368,3*	12.490(1) *317,2*	L-80 P-110	4,990 5,620
	* 106.13	.750 *19,05*	12.500 *317,5*	12.344 *313,5*		14.625(1) *371,5*	12.390(1) *314,7*	L-80 P-110	5,870 6,860

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
5,970 6,360 8,750	5,970 6,360		5,970 6,360	1,829 1,951 2,682	1,177 1,252		1,741(1) 1,832(1) 1951(9a,b) 2,290(1) 2682(9a,b)	1341(9a,b) 1752(23) 2190(23)	 1169(25) 1608(25)
7,770	7,770		7,750	2,378	1,507		2,333(12) 2378(9b)	1995(23)	2364(9a)
6,590 7,030 9,670	 9,190		 8,980	2,011 2,145 2,950	 1,878		1,973(1) 2,077(1) 2,868(12)	 2,596(1)	
7,060 7,530 10,350				2,144 2,287 3,145			2,128(1) 2,240(1) 2,800(1)		
9,120 10,560	7,940 9,190		7,750 8,980	2,769 3,206	1,771 2,062		2,534(12) 3,017(12)		
7,140	7,140		7,140	2,236	1,225		1,948(12)	1984(21)	
6,020 7,630 8,830	7,630		7,630	1,914 2,425 2,807	1,178		1,300(3) 1,885(12) 1,711(3) 2307(23)	1,464(1) 2146(21) 1,927(1) 2710(26)	 2030(23) 2438(21) 1985(25)
6,500 8,940				2,181 2,999			2,061(1) 2,576(1)	2,170(20) 2,924(20)	
7,000 9,630				2,340 3,217			2,259(1) 2,824(1)		
7,500 10,310				2,498 3,434			2,456(1) 3,070(1)		

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thick-ness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Col-lapse Resis-tance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
14 *355,6*	* 112.78	.800 *20,32*	12.400 *315,0*	12.244 *311,0*		14.625(1) *371,5*	12.290(1) *312,2*	L-80 P-110	6,740 8,110
	* 119.38	.850 *21,59*	12.300 *312,4*	12.144 *308,5*		14.625(1) *371,5*	12.190(1) *309,6*	L-80 P-110	7,620 9,360
16 *406,4*	65.0	.375 *9,52*	15.250 *387,4*	15.062 *382,6*	17.000 *431,8*	17.000(26) *431,8*		H-40	670
	75.0	.438 *11,13*	15.124 *384,1*	14.936 *379,4*	17.000 *431,8*	16.155(23) *410,3* 17.105(15) *434,5*	15.049(23) *382,2* 15.000(15) *381,0*	J-55 K-55	1,020 1,020
	84.0	.495 *12,57*	15.010 *381,3*	14.822 *376,5*	17.000 *431,8*	17.000(26) *431,8* 16.257(23) *412,9*	14.935(23) *379,3* 15.000(15) *381,0*	J-55 K-55	1,410 1,410
	84	.500 *12,70*	15.000 *381,0*	14.812 *376,2*		17.105(15) *434,5*	15.000(15) *381,0*	X-52 X-60	1,410 1,480
	109.0	.656 *16,6*	14.688 *373,1*	14.500 *368,3*	17.000 *431,8*	16.465(23) *418,2* 16.706(24) *424,3* 17.000(26) *431,8*	14.613(23) *371,2* 14.608(24) *371,0*	K-55 L-80 P-110	2,560 3,080 3,470
	128.0	.781 *19,84*	14.438 *366,7*	14.250 *362,0*	17.000 *431,8*	17.000(26) *431,8* 16.706(24) *424,3*	14.358(24) *364,7*	L-80 P-110	4,700 5,260
	146.0	.906 *23,01*	14.188 *360,4*	14.000 *355,6*	17.000 *431,8*	16.706(24) *424,3*	14.108(24) *358,3*	L-80 P-110	6,620 7,930
18-5/8 *473,1*	87.5	435 *11,05*	17.755 *451,0*	17.567 *446,2*	19.625 *498,5*	18.835(23) *478,4* 19.625(15) *498,5* 20.000(26) *508,0*	17.573(15) *446,3* 17.655(23) *448,4*	H-40 J-55 K-55	630 630 630
	94.5	.468 *11,89*	17.689 *449,3*	17.501 *444,5*		18.835(23) *478,4* 19.625(15) *498,5*	17.605(23) *447,2* 17.573(15) *446,4*	K-55 X-60	780 780
	97.7	.486 *12,34*	17.653 *448,4*	17.465 *443,6*		18.882(23) *479,6* 19.625(15) *498,5*	17.553(23) *445,8* 17.573(15) *446,4*	K-55 X-60	880 880
	106.0	.531 *13,49*	17.563 *446,1*	17.375 *441,3*	20.000 *508,0*			K-55	1,140
	117.5	.593 *15,06*	17.439 *443,0*	17.251 *438,2*	20.000 *508,0*			K-55	1,500

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
8,000 11,000				2,654 3,649			2,652(1) 3,315(1)		
8,500 11,690				2,809 3,863			2,846(1) 3,557(1)		
1,640	1,640		1,640	736	439		614(12)		
2,630 2,630	2,630 2,630		2,630 2,630	1,178 1,178	710 752		987(23) 2,156(15)	1120(26) 1251(23)	1120(26)
2,980 2,980	2,980 2,980		2,980 2,980	1,326 1,326	817 885		1183(23) 2,156(15)	1269(26) 1498(23)	1269(26)
2,840 3,280				1,266 1,461			2,156(15) 2,156(15)		
3,950 5,740 7,890	3,950 5,740 7,890		3,950 5,740 7,890	1,739 2,530 3,478	1,181 1,578 2,151		1,965(12) 2,441(12) 3,302(12)	2147(23) 2147(23) 2825(23)	1682(26) 2446(26) 3363(26)
6,830 9,400	5,800 7,970		6,080 8,350	2,987 4,108	1,900 2,590		2,883(12) 3,899(12)	2678(24) 3524(24)	2904(26) 3993(26)
7,930 10,900	5,800 7,970		6,080 8,350	3,437 4,726	2,216 3,021		2,993(12) 3,938(12)	3190(24) 4197(24)	
1,630 2,250 2,250	1,630 2,250 2,250		2,250 2,250	994 1,367 1,367	559 754 794		2,182(15) 1084(23) 1373(23)	1300(26) 1300(26)	
2,420 2,640				1,468 1,602			2,182(15) 2,182(15)	1498(23)	
2,510 2,740				1,523 1,662			2,182(15) 2,182(15)	1633(23)	
2,740	2,740		2,740	1,660	998		1,733(12)		
3,060	3,060		3,060	1,848	1,129		1,929(12)		

Dimensional Data and Minimum Performance Properties of Casing

OD (in.) *(mm)*	Weight w/Cplg (lb/ft)	Wall Thickness (in.) *(mm)*	ID (in.) *(mm)*	Drift Dia. (in.) *(mm)*	Coupling or Joint OD		Bored Pin ID (in.) *(mm)*	Grade	Collapse Resistance (psi) **
					Round or Buttress (in.) *(mm)*	Other (in.) *(mm)*			
20 *508*	94.0	.438 *11,13*	19.124 *485,7*	18.936 *481,01*	21.000 *533,4*	21.000(15,26) *533,4*	19.000(15) *482,6*	H-40 J-55 K-55	520 520 520
	106.5	.500 *12,70*	19.000 *482,6*	18.812 *477,8*	21.000 *533,4*	21.000(15,26) *533,4*	19.000(15) *482,6*	J-55 K-55	770 770
	131.0	.625 *15,87*	18.750 *476,3*	18.562 *471,5*		21.000(15) *533,4*	18.730(15) *475,7*	X-52 X-60	1,410 1,480
	133.0	.635 *16,13*	18.730 *475,7*	18.542 *471,0*	21.000 *533,4*	21.000(15,26) *533,4*	19.000(15) *482,6*	J-55 K-55	1,500 1,500
	163.0	.781 *19,84*	18.438 *468,3*	18.250 *463,6*	21.000 *533,4*			L-80 P-110	2,770 3,030
	169.0	.812 *20,62*	18.376 *466,7*	18.188 *462,0*		21.000(15,26) *533,4*	18.376(15) *466,7*	K-55 X-60	2,500 2,590
	175.0	.843 *21,41*	18.314 *465,2*	18.126 *460,4*	21.000 *533,4*			L-80 P-110	3,270 3,740
	187.0	.906 *23,01*	18.188 *462,0*	18.000 *457,2*	21.000 *533,4*			L-80 P-110	3,830 4,450

*Joint strength of Hydril (except NCT) and Mannesmann casing threads calculated using minimum ultimate tensile strength (psi) C-75 and L-80 = 95,000 N-80 = 100,000; C-95 = 105,000; P-110 = 125,000. Atlas Bradford joint strength is equal to the connection critical area times the minimum yield strength of the material. Hydril NCT is connection parting load. Joint strength of Vallourec VAM casing calculated as elastic limit based on API Bulletin 5C3 Section 4.4 relating to tubing joint strength. Joint strength of various threads is listed and identified for some representative grades. This will provide an approximation of joint efficiency in other grades.

** Collapse Resistance, Internal Yield Pressure, and Joint Yield Strengths are minimum values with no safety factor, reproduced from API Bulletin 5C2, Bulletin on Performance Properties of Casing and Tubing, and from published literature of manufacturers of premium threads and tubular goods. All Atlas Bradford connections, with the exception of a few FL-4S casing sizes, are rated to the API pipe body ratings in burst and collapse.

‡ These casing sizes have standard API 8 Round or Buttress threads or, in some sizes, certain Hydril or Atlas Bradford premium threads, of the next smaller OD and the threads are interchangeable. For example, 7-3/4 in. casing will have the same thread as standard 7-5/8 in. casing and will use standard casing collars.

Dimensional Data and Minimum Performance Properties of Casing

Internal Yield Pressure (psi)**				Body Yield Strength (1000 lb) **	Joint Yield Strength (1000 lb)**				
Plain End or Extreme Line	Round Thread		Buttress Thread		Threaded and Coupled Joint		Other*		
					Round Thread				
	Short	Long			Short	Long			
1,530 2,110 2,110	1,530 2,110 2,110	1,530 2,110 2,110	 2,110 2,110	1,077 1,480 1,480	581 784 824	 907 955	1,041(12) 1,402(12) 1,479(12)	 1409(26) 2,524(15)	 1409(26)
2,410 2,410	2,400 2,400	2,400 2,400	2,320 2,320	1,685 1,685	913 960	1,057 1,113	1,596(12) 1,683(12)	1613(26) 2,524(15)	1613(26)
2,840 3,280				1,978 2,283			2,848(15) 2,848(15)		
3,060 3,060	2,400 2,400	2,400 2,400	2,320 2,320	2,125 2,125	1,192 1,253	1,380 1,453	2,012(12) 2,123(12)	2053(26) 2,848(15)	2053(26)
5,470 7,520	4,710 6,470		4,920 6,760	3,772 5,187	2,114 2,885	2,423 3,306	3,478(12) 4,744(12)		
3,910 4,260	3,200		3,400	2,692 2,937	1,631		3,028(15) 3,028(15)	2,689(12)	2620(26)
5,900 8,110	4,710 6,470		4,920 6,760	4,059 5,581	2,291 3,127	2,626 3,583	3,725(12) 4,902(12)		
6,340 8,720	4,710 6,470		4,920 6,760	4,348 5,978	2,470 3,371	2,831 3,863	3,725(12) 4,902(12)		

Data for premium threads and tubular goods are identified as follows:

(1) Hydril TS Tripleseal
(2) Hydril FJ-P Flush Joint
(joint OD and ID same as pipe)
(3) Hydril Super FJ-P
(4) Hydril Super EU
(5) Hydril CTS
(6) Hydril CTS-4
(7) NL Atlas-Bradford TC-4S
(8) NL Atlas-Bradford FL-4S
(9) Vallourec VAM
(9a) New VAM
(9b) VAM ACE
(9c) VAM FJL
(10) Extreme Line
(11) Lone Star Steel Company
(12) Buttress Thread
(13) Hydril MAC
(14) Hydril Supreme HTC
(15) Hydril NCT
(16) NKK NK-2SC
(17) NKK NK-EL
(18) Mannesmann MUST
(19) Mannesmann BDS
(20) Mannesmann Big Omega
(21) Hydril Supreme LX
(22) Hydril 500 Type 511
(23) Hydril 500 Type 521
(24) Hydril Mac-II
(25) Atlas Bradford ST-L
(26) Atlas Bradford BTB
(27) NKK NK 3SB
(28) Kawasaki Fox
(29) Dalmine Antares
(30) Dalmine Antares MS 28
(31) Dalmine Antares MS

DIMENSIONAL DATA

COMPOSITE CASING DIMENSIONAL DATA

NON API & DISCONTINUED API CASING

SIZE O.D. (in.)	WEIGHT (ft.-lbs.) NOM. T&C	WEIGHT (ft.-lbs.) PLAIN END	INSIDE DIA. (in.)	DRIFT DIA. (in.)
4-1/2	6.75	6.59	4.216	4.091
	—	8.64	4.124	3.999
	11.00	10.79	4.062	3.937
	—	11.77	3.980	3.855
	12.60	12.24	3.958	3.833
	16.60	16.52	3.754	3.629
	17.70	—	3.696	3.571
	18.80	18.69	3.640	3.515
	19.10	18.96	3.626	3.501
	21.60	—	3.500	3.375
	24.60	—	3.380	3.255
	26.50	—	3.240	3.115
4-3/4	7.25	7.11	4.460	4.335
	9.50	9.39	4.364	4.239
	—	12.47	4.230	4.105
	*16.00	15.75	4.082	3.957
	18.00	17.52	4.000	3.875
	20.00	19.40	3.910	3.785
	21.00	20.66	3.850	3.725
5	8.00	7.80	4.696	4.571
	12.80	12.53	4.506	4.381
	20.30	20.01	4.184	4.059
	20.80	20.63	4.156	4.031
	21.00	20.67	4.154	4.029
	23.20	23.09	4.044	3.919
	24.20	24.03	4.000	3.875
	—	25.34	3.938	3.813
5-1/4	8.50	8.32	4.944	4.819
	10.00	9.85	4.886	4.761
	13.00	12.89	4.768	4.643
	16.00	15.91	4.648	4.523
5-1/2	9.00	8.79	5.192	5.068
	*13.00	12.84	5.044	4.919
	*15.00	14.71	4.974	4.849
	—	15.08	4.960	4.835
	—	13.86	4.730	4.605
	25.00	24.76	4.580	4.455

SIZE O.D. (in.)	WEIGHT (ft.lbs.) NOM. T&C	WEIGHT (ft.lbs.) PLAIN END	INSIDE DIA. (in.)	DRIFT DIA. (in.)
5-1/2	26.00	25.54	4.548	4.423
	26.80	26.70	4.500	4.375
	—	28.18	4.438	4.313
	29.70	29.64	4.376	4.251
	32.00	31.95	4.276	4.151
	—	32.54	4.250	4.125
	36.40	—	4.090	3.965
5-9/16	15.00	14.62	5.047	4.922
	—	20.78	4.813	4.688
5-3/4	*14.00	13.55	5.290	5.165
	*17.00	16.35	5.190	5.065
	*19.50	19.10	5.090	4.965
	*22.50	21.79	4.990	4.865
	25.20	24.43	4.890	4.765
6	10.50	10.22	5.672	5.547
	12.00	11.79	5.620	5.495
	14.00	13.82	5.552	5.472
	*15.00	14.65	5.542	5.399
	*16.00	15.35	5.500	5.375
	—	16.52	5.460	5.335
	17.00	16.81	5.450	5.325
	*18.00	17.57	5.424	5.299
	*20.00	19.64	5.352	5.227
	*23.00	22.81	5.240	5.115
	26.00	25.58	5.140	5.012
6-5/8	12.00	11.65	6.287	6.162
	13.00	12.72	6.255	6.130
	*17.00	16.69	6.135	6.010
	—	18.33	6.085	5.960
	19.45	18.97	6.065	5.940
	22.00	21.42	5.989	5.864
	25.20	22.18	5.965	5.840
	26.50	26.21	5.837	5.712
	*29.00	28.57	5.761	5.636
	34.00	33.61	5.595	5.047
7	13.00	12.65	6.652	6.527
	—	19.41	6.460	6.335

* Discontinued API Casing.

DIMENSIONAL DATA

COMPOSITE CASING DIMENSIONAL DATA

NON API & DISCONTINUED API CASING

SIZE O.D. (in.)	WEIGHT (ft.-lbs.) NOM. T&C	WEIGHT (ft.-lbs.) PLAIN END	INSIDE DIA. (in.)	DRIFT DIA. (in.)
7	33.00	31.88	6.384	6.259
	*22.00	21.54	6.398	6.273
	*24.00	23.64	6.336	6.151
	*28.00	27.73	6.214	6.089
	29.50	29.25	6.168	6.043
	*30.00	29.71	6.154	6.029
	33.70	33.17	6.048	5.923
	34.00	33.42	6.040	5.915
	35.30	34.71	6.000	5.875
	40.00	39.89	5.836	5.711
	—	40.39	5.820	5.695
	42.70	42.55	5.750	5.625
	44.00	43.47	5.720	5.595
	—	45.30	5.660	5.535
	—	47.10	5.562	5.500
	—	48.88	5.540	5.415
	—	50.06	5.500	5.375
	—	52.97	5.400	5.275
	—	53.72	5.374	5.260
	—	55.49	5.312	5.187
7-5/8	14.75	14.39	7.263	7.138
	*20.00	19.69	7.125	7.000
	—	21.21	7.085	6.960
	36.00	35.20	6.705	6.580
	38.00	36.98	6.655	6.530
	42.50	42.39	6.501	6.376
	45.30	44.67	6.435	6.310
	—	47.74	6.345	6.250
	51.20	50.97	6.249	6.125
	—	52.57	6.201	6.076
	—	55.07	6.125	6.000
	—	59.15	5.999	5.875
7-3/4	46.10	45.47	6.560	6.500
	—	48.60	6.470	6.375
	—	51.89	6.374	6.250
	—	56.07	6.250	6.125
8	16.00	15.52	7.628	7.503
	20.00	19.57	7.528	7.403
	—	23.09	7.440	7.315
	26.00	25.22	7.386	7.261
8-1/8	*28.00	26.67	7.485	7.360
	*32.00	30.64	7.385	7.260
	*35.50	34.56	7.285	7.160
	*39.50	38.42	7.185	7.060
	41.70	40.70	7.125	7.000

SIZE O.D. (in.)	WEIGHT (ft.lbs.) NOM. T&C	WEIGHT (ft.lbs.) PLAIN END	INSIDE DIA. (in.)	DRIFT DIA. (in.)
8-5/8	17.50	16.94	8.249	8.124
	20.00	19.49	8.191	8.066
	25.55	24.70	8.071	7.946
	—	24.96	8.065	7.940
	29.35	28.55	7.981	7.856
	32.40	31.27	7.917	7.792
	*38.00	37.22	7.775	7.590
	*43.00	42.32	7.651	7.526
	48.00	46.95	7.537	7.412
	52.00	51.03	7.435	7.310
8-3/4	49.70	—	7.636	7.500
9	19.00	18.42	8.608	8.483
	—	26.98	8.420	8.295
	*34.00	32.78	8.290	8.165
	*38.00	36.91	8.196	8.071
	50.20	49.21	7.910	7.785
	*55.00	53.32	7.812	7.687
	*40.00	38.92	8.150	8.025
	*45.00	44.02	8.032	7.907
9-5/8	*29.30	28.04	9.063	8.907
	38.00	36.57	8.885	8.760
	42.00	40.63	8.799	8.674
	58.40	57.38	8.435	8.279
	59.40	58.64	8.407	8.251
	—	60.08	8.375	8.250
	61.10	60.71	8.375	8.219
	64.90	64.26	8.281	8.125
	—	65.67	8.249	8.093
	70.30	69.70	8.157	8.001
	71.80	71.09	8.125	7.969
	—	76.51	7.999	7.843
9-3/4	59.20	—	8.560	8.500
9-7/8	62.80	—	8.625	8.500
10	22.75	21.85	9.582	9.457
	30.25	29.37	9.434	9.309
	—	30.07	9.420	9.295
	41.50	41.01	9.200	9.075
	45.50	44.22	9.120	8.995
	50.50	49.96	9.016	8.891
	55.50	55.13	8.908	8.783
10-3/4	35.75	34.24	10.136	10.011
	40.00	38.66	10.054	9.929
	45.00	43.68	9.960	9.835
	48.00	46.76	9.902	9.777

* Discontinued API Casing.

DIMENSIONAL DATA

COMPOSITE CASING DIMENSIONAL DATA

NON API & DISCONTINUED API CASING

SIZE O.D. (in.)	WEIGHT (ft.-lbs.) NOM. T&C	WEIGHT (ft.-lbs.) PLAIN END	INSIDE DIA. (in.)	DRIFT DIA. (in.)
10-3/4	54.00	52.96	9.784	9.659
	—	54.74	9.750	9.625
	71.10	69.89	9.450	9.294
	73.20	72.33	9.406	9.250
	79.20	78.52	9.282	9.126
	81.00	79.10	9.250	9.094
11	26.75	25.78	10.552	10.396
	—	35.39	10.380	10.224
11-3/4	*38.00	36.69	11.150	10.996
	—	40.25	11.090	10.934
	65.00	—	10.682	10.526
	66.70	65.45	10.656	10.500
	71.00	—	10.586	10.430
	73.60	72.46	10.532	10.376
	80.50	79.51	10.406	10.250
	87.20	86.36	10.282	10.126
12	31.50	30.51	11.514	11.358
	40.00	38.46	11.384	11.228
	—	38.70	11.350	11.194
12-3/4	43.00	41.19	12.130	11.974
	45.45	43.77	12.090	11.934
	51.15	49.56	12.000	11.844
	53.00	51.48	11.970	11.814
	—	65.42	11.750	11.594
13	36.50	35.25	12.482	12.326
	40.00	38.17	12.438	12.282
	45.00	43.33	12.360	12.204
	—	47.29	12.300	12.144
	50.00	48.47	12.282	12.126
	54.00	52.52	12.220	12.064
13-3/8	77.00	—	10.711	10.625
	80.70	—	12.215	12.059
	*83.00	81.86	12.175	12.019
	85.00	82.90	12.159	12.003
	86.00	—	12.125	11.969
	92.60	91.17	12.031	11.875
	98.00	97.16	11.937	11.781
13-1/2	81.40	—	12.340	12.250
13-5/8	88.20	—	12.375	12.250
14	42.00	40.45	13.448	13.292
	50.00	47.89	13.344	13.188
	—	51.02	13.300	13.144
	57.00	54.57	13.250	13.094
15	47.50	45.71	14.418	14.262
	61.15	58.57	14.250	14.094
	—	59.33	14.240	14.084
16	52.50	50.63	15.396	15.209
	*55.00	52.36	15.375	15.188
	—	63.39	15.240	15.053
	70.00	66.80	15.198	15.011
	109.00	107.50	14.688	14.500
	128.00	126.94	14.438	14.250
	146.00	146.05	14.188	14.000
17	73.20	69.70	16.214	16.027
18	—	70.58	17.250	17.063
	78.00	75.74	17.194	17.007
	81.20	76.84	17.182	16.995
	—	81.60	17.130	16.943
	—	81.97	17.126	16.939
	84.00	82.06	17.124	16.937
	87.50	85.44	17.088	16.900
	96.50	94.72	16.986	16.799
18-5/8	78.00	75.00	17.855	17.668
	—	73.09	17.875	17.688
	96.50	93.96	17.655	17.468
20	90.00	87.22	19.166	18.979
	90.00	85.58	19.182	18.995
	90.00	84.75	19.190	19.003
	—	104.10	19.000	18.818
	133.00	—	18.750	18.563
	169.00	—	18.376	18.188
21-1/2	92.50	89.03	20.710	20.523
	103.00	100.07	20.610	20.423
	114.00	111.05	20.510	20.323
22	92.50	89.78	21.222	21.035
	—	101.00	21.125	20.938
	103.00	100.41	21.128	20.941
	114.00	111.67	21.028	20.841
	—	114.80	21.000	20.813
24	100.50	97.60	23.226	23.039
	113.00	110.22	23.124	22.937
	304.00	—	21.500	21.313
24-1/2	100.50	92.60	23.750	23.563
	113.00	109.28	23.650	23.463
30	235.00	—	28.500	28.313
	310.00	—	28.000	27.813

* Discontinued API Casing.

Casing Make-Up Torque Guide
Short Thread Recommended Make-Up Torque*

OD (in.) *(mm)*	Nominal Weight (lb/ft)	Grade	Torque (ft-lb) *(kg-m)*					
			Minimum		Optimum		Maximum	
		H-40	580	*80*	770	*105*	960	*130*
	9.5	J-55	760	*105*	1010	*140*	1260	*175*
4-1/2		K-55	840	*115*	1120	*155*	1400	*195*
114,3	10.5	J-55	990	*135*	1320	*180*	1650	*230*
		K-55	1100	*150*	1460	*200*	1830	*255*
	11.6	J-55	1160	*160*	1540	*215*	1930	*265*
		K-55	1280	*175*	1700	*235*	2130	*295*
	11.5	J-55	1000	*140*	1330	*185*	1660	*230*
		K-55	1100	*150*	1470	*205*	1840	*255*
5	13.0	J-55	1270	*175*	1690	*235*	2110	*290*
127		K-55	1400	*195*	1860	*255*	2330	*320*
	15.0	J-55	1550	*215*	2070	*285*	2590	*360*
		K-55	1710	*235*	2280	*315*	2850	*395*
		H-40	980	*135*	1300	*180*	1630	*225*
	14.0	J-55	1290	*180*	1720	*240*	2150	*295*
5-1/2		K-55	1420	*195*	1890	*260*	2360	*325*
139,7	15.5	J-55	1520	*210*	2020	*280*	2530	*350*
		K-55	1670	*230*	2220	*310*	2780	*380*
	17.0	J-55	1720	*240*	2290	*320*	2860	*390*
		K-55	1890	*260*	2520	*350*	3150	*430*
		H-40	1380	*190*	1840	*250*	2300	*320*
	20.0	J-55	1840	*250*	2450	*340*	3060	*420*
6-5/8		K-55	2000	*280*	2670	*370*	3340	*460*
168,3	24.0	J-55	2360	*330*	3140	*430*	3930	*540*
		K-55	2570	*360*	3420	*470*	4230	*580*
	17.0	H-40	920	*125*	1220	*170*	1530	*210*
		H-40	1320	*185*	1760	*245*	2200	*305*
	20.0	J-55	1760	*245*	2340	*325*	2930	*405*
7		K-55	1910	*265*	2540	*350*	3180	*440*
177,8	23.0	J-55	2130	*295*	2840	*390*	3550	*490*
		K-55	2320	*320*	3090	*430*	3860	*530*
	26.0	J-55	2510	*350*	3340	*460*	4180	*580*
		K-55	2730	*380*	3640	*500*	4550	*630*
7-5/8	24.0	H-40	1590	*220*	2120	*290*	2650	*370*
193,7	26.4	J-55	2360	*330*	3150	*440*	3940	*540*
		K-55	2570	*360*	3420	*470*	4280	*590*

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OD (in.) *(mm)*	Nominal Weight (lb/ft)	Grade	Torque (ft-lb) *(kg-m)*					
			Minimum		Optimum		Maximum	
8-5/8 *219,1*	24.0	J-55	1830	*250*	2440	*340*	3050	*420*
		K-55	1970	*270*	2630	*360*	3290	*450*
	28.0	H-40	1750	*240*	2330	*320*	2910	*400*
	32.0	H-40	2090	*290*	2790	*390*	3490	*480*
		J-55	2790	*390*	3720	*510*	4650	*640*
		K-55	3020	*420*	4020	*560*	5030	*690*
	36.0	J-55	3260	*450*	4340	*600*	5430	*750*
		K-55	3510	*490*	4680	*650*	5850	*810*
9-5/8 *244,5*	32.3	H-40	1910	*265*	2540	*350*	3180	*440*
	36.0	H-40	2210	*310*	2940	*410*	3680	*510*
		J-55	2960	*410*	3940	*540*	4930	*680*
		K-55	3170	*440*	4230	*580*	5290	*730*
	40.0	J-55	3390	*470*	4520	*620*	5650	*780*
		K-55	3650	*500*	4860	*670*	6080	*840*
10-3/4 *273*	32.75	H-40	1540	*215*	2050	*280*	2560	*350*
	40.5	H-40	2360	*330*	3140	*430*	3930	*540*
		J-55	3150	*440*	4200	*580*	5250	*730*
		K-55	3380	*470*	4500	*620*	5630	*780*
	45.5	J-55	3700	*510*	4930	*680*	6160	*850*
		K-55	3960	*550*	5280	*730*	6600	*910*
	51.0	J-55	4240	*590*	5850	*780*	7060	*980*
		K-55	4550	*630*	6060	*840*	7580	*1050*
		C-75	5670	*780*	7560	*1050*	9450	*1300*
		L-80	5960	*820*	7940	*1100*	9930	*1370*
		N-80	6030	*830*	8040	*1110*	10050	*1390*
		C-95	6950	*960*	9270	*1280*	11590	*1600*
		P-110	8100	*1120*	10800	*1490*	13500	*1870*
	55.5	C-75	6320	*870*	8430	*1170*	10540	*1460*
		L-80	6630	*920*	8840	*1220*	11050	*1530*
		N-80	6710	*930*	8950	*1240*	11190	*1550*
		C-95	7740	*1070*	10320	*1430*	12900	*1780*
		P-110	9020	*1250*	12030	*1660*	15040	*2080*
	60.7	P-110	10040	*1390*	13380	*1850*	16730	*2310*
	65.7	P-110	11040	*1530*	14720	*2040*	18400	*2540*

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OD (in.) *(mm)*	Nominal Weight (lb/ft)	Grade	Torque (ft-lb) *(kg-m)*					
			Minimum		Optimum		Maximum	
	42.0	H-40	2300	*320*	3070	*420*	3840	*530*
	47.0	J-55	3580	*500*	4770	*660*	5960	*820*
		K-55	3820	*530*	5090	*700*	6360	*880*
	54.0	J-55	4260	*590*	5680	*790*	7100	*980*
11-3/4		K-55	4550	*630*	6060	*840*	7580	*1050*
298,5	60.0	J-55	4870	*670*	6490	*900*	8110	*1120*
		K-55	5200	*720*	6930	*960*	8660	*1200*
		C-75	6520	*900*	8690	*1200*	10860	*1500*
		L-80	6850	*950*	9130	*1260*	11410	*1580*
		N-80	6930	*960*	9240	*1280*	11550	*1600*
		C-95	8000	*1110*	10660	*1470*	13330	*1840*
		P-110	9320	*1290*	12420	*1720*	15530	*2150*
	48.0	H-40	2420	*330*	3220	*450*	4030	*560*
	54.5	J-55	3860	*530*	5140	*710*	6430	*890*
		K-55	4100	*570*	5470	*760*	6840	*940*
	61.0	J-55	4460	*620*	5950	*820*	7440	*1030*
		K-55	4750	*660*	6330	*870*	7910	*1090*
	68.0	J-55	5060	*700*	6750	*930*	8440	*1170*
		K-55	5390	*750*	7180	*990*	8980	*1240*
13-3/8		C-75	6800	*940*	9060	*1250*	11330	*1570*
339,7		L-80	7140	*990*	9520	*1320*	11900	*1650*
		N-80	7220	*1000*	9630	*1330*	12040	*1670*
		C-95	8360	*1160*	11140	*1540*	13930	*1930*
		P-110	9730	*1350*	12970	*1790*	16210	*2240*
	72.0	C-75	7340	*1020*	9780	*1350*	12230	*1690*
		L-80	7720	*1070*	10290	*1420*	12860	*1780*
		N-80	7800	*1080*	10400	*1440*	13000	*1800*
		C-95	9030	*1250*	12040	*1660*	15050	*2080*
		P-110	10520	*1450*	14020	*1940*	17530	*2420*
	65.0	H-40	4390	*610*				
16	75.0	J-55	7100	*980*				
406,4		K-55	7520	*1040*				
	84.0	J-55	8170	*1130*				
		K-55	8650	*1200*				
18-5/8	87.5	H-40	5590	*770*				
473,1		J-55	7540	*1040*				
		K-55	7940	*1100*				
	94.0	H-40	5810	*800*				
		J-55	7840	*1080*				
		K-55	8240	*1140*				
20	106.5	J-55	9130	*1260*				
508		K-55	9600	*1330*				
	133.0	J-55	11920	*1650*				
		K-55	12530	*1730*				

* Data reported from API Bulletin RP5C1, Recommended Practice for Care and Use of Casing,Tubing, and Drill Pipe, Twelfth-Edition, March 1981.

BAKER OIL TOOLS
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Casing Make-Up Torque Guide
Long Thread Recommended Make-Up Torque*

OD (in.) *(mm)*	Nominal Weight (lb/ft)	Grade	Torque (ft-lb) *(kg-m)*					
			Minimum		Optimum		Maximum	
4-1/2 *114 ,3*	11.6	J-55	1220	*170*	1620	*225*	2030	*280*
		K-55	1350	*185*	1800	*250*	2250	*310*
		C-75	1610	*225*	2150	*295*	2690	*370*
		L-80	1670	*230*	2230	*310*	2790	*390*
		N-80	1710	*235*	2280	*315*	2850	*395*
		C-95	1940	*270*	2580	*355*	3230	*445*
		P-110	2270	*315*	3020	*420*	3780	*525*
	13.5	C-75	1950	*270*	2600	*360*	3250	*450*
		L-80	2030	*280*	2710	*370*	3390	*470*
		N-80	2070	*285*	2760	*380*	3450	*475*
		C-95	2350	*325*	3130	*430*	3910	*540*
		P-110	2750	*380*	3660	*510*	4580	*630*
	15.1	P-110	3300	*460*	4400	*610*	5500	*760*
5 *127*	13.0	J-55	1370	*190*	1820	*250*	2280	*315*
		K-55	1510	*210*	2010	*280*	2510	*350*
	15.0	J-55	1670	*230*	2230	*310*	2790	*380*
		K-55	1850	*255*	2460	*340*	3080	*420*
		C-75	2220	*310*	2960	*410*	3700	*510*
		L-80	2310	*320*	3080	*430*	3850	*530*
		N-80	2360	*330*	3140	*430*	3930	*540*
		C-95	2670	*370*	3560	*490*	4450	*610*
		P-110	3130	*430*	4170	*580*	5210	*720*
	18.0	C-75	2830	*390*	3770	*520*	4710	*650*
		L-80	2950	*410*	3950	*550*	4910	*680*
		N-80	3000	*410*	4000	*550*	5000	*690*
		C-95	3410	*470*	4550	*630*	5690	*790*
		P-110	3980	*550*	5310	*730*	6640	*920*
	21.4	C-75	3500	*480*	4660	*640*	5830	*810*
		L-80	3650	*500*	4860	*670*	6080	*840*
		N-80	3710	*510*	4950	*680*	6190	*860*
		C-95	4220	*580*	5620	*780*	7030	*970*
		P-110	4940	*680*	6580	*910*	8230	*1140*
	24.1	C-75	4040	*560*	5390	*750*	6740	*930*
		L-80	4210	*580*	5610	*780*	7010	*970*
		N-80	4290	*590*	5720	*790*	7150	*990*
		C-95	4880	*670*	6500	*900*	8130	*1120*
		P-110	5700	*790*	7600	*1050*	9500	*1310*
5-1/2 *139,7*	15.5	J-55	1630	*225*	2170	*300*	2710	*370*
		K-55	1790	*250*	2390	*330*	2990	*410*
	17.0	J-55	1850	*255*	2470	*340*	3090	*430*
		K-55	2040	*280*	2720	*380*	3400	*470*
		C-75	2450	*340*	3270	*450*	4090	*560*
		L-80	2560	*350*	3410	*470*	4260	*590*
		N-80	2610	*360*	3480	*480*	4350	*600*
		C-95	2970	*410*	3960	*550*	4950	*680*
		P-110	3470	*480*	4620	*640*	5780	*800*
	20.0	C-75	3020	*420*	4030	*560*	5040	*700*
		L-80	3150	*440*	4200	*580*	5250	*730*
		N-80	3210	*440*	4280	*590*	5350	*740*
		C-95	3650	*500*	4870	*670*	6090	*840*
		P-110	4270	*590*	5690	*790*	7110	*980*

* Data reported from API Bulletin RP5C1, Recommended Practice for Care and Use of Casing,Tubing, and Drill Pipe, Twelfth-Edition, March 1981.

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Long Thread Recommended Make-Up Torque*

OD (in.) *(mm)*	Nominal Weight (lb/ft)	Grade	Torque (ft-lb) *(kg-m)*					
			Minimum		Optimum		Maximum	
5-1/2 *139,7*	23.0	C-75	3550	*490*	4730	*650*	5910	*820*
		L-80	3700	*510*	4930	*680*	6160	*850*
		N-80	3770	*520*	5020	*690*	6280	*870*
		C-95	4290	*590*	5720	*790*	7150	*990*
		P-110	5010	*690*	6680	*920*	8350	*1150*
6-5/8 *168,3*	20.0	J-55	2000	*280*	2660	*370*	3330	*460*
		K-55	2180	*300*	2900	*400*	3630	*500*
	24.0	J-55	2550	*350*	3400	*470*	4250	*590*
		K-55	2790	*390*	3720	*510*	4650	*640*
		C-75	3400	*470*	4530	*630*	5660	*780*
		L-80	3550	*490*	4730	*650*	5910	*820*
		N-80	3610	*500*	4810	*670*	6010	*830*
		C-95	4120	*570*	5490	*760*	6860	*950*
		P-110	4810	*670*	6410	*890*	8010	*1110*
	28.0	C-75	4140	*570*	5520	*760*	6900	*950*
		L-80	4320	*600*	5760	*800*	7200	*1000*
		N-80	4400	*610*	5860	*810*	7330	*1010*
		C-95	5020	*690*	6690	*930*	8360	*1160*
		P-110	5860	*810*	7810	*1080*	9760	*1350*
	32.0	C-75	4790	*660*	6380	*880*	7980	*1100*
		L-80	5000	*690*	6660	*920*	8330	*1150*
		N-80	5080	*700*	6770	*940*	8460	*1170*
		C-95	5810	*800*	7740	*1070*	9680	*1340*
		P-110	6780	*940*	9040	*1250*	11300	*1560*
7 *117,8*	23.0	J-55	2350	*330*	3130	*430*	3910	*540*
		K-55	2560	*350*	3410	*470*	4260	*590*
		C-75	3120	*430*	4160	*580*	5200	*720*
		L-80	3260	*450*	4350	*600*	5440	*750*
		N-80	3320	*460*	4420	*611*	5530	*760*
		C-95	3790	*520*	5050	*700*	6310	*870*
	26.0	J-55	2750	*380*	3670	*510*	4590	*630*
		K-55	3010	*420*	4010	*550*	5010	*690*
		C-75	3670	*510*	4890	*680*	6110	*840*
		L-80	3830	*530*	5110	*710*	6390	*880*
		N-80	3890	*540*	5190	*720*	6490	*900*
		C-95	4450	*620*	5930	*820*	7410	*1020*
		P-110	5200	*720*	6930	*960*	8660	*1200*
	29.0	C-75	4220	*580*	5620	*780*	7030	*970*
		L-80	4400	*610*	5870	*810*	7340	*1020*
		N-80	4480	*620*	5970	*830*	7460	*1030*
		C-95	5120	*710*	6830	*940*	8540	*1180*
		P-110	5980	*830*	7970	*1100*	9960	*1380*

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OD (in.) *(mm)*	Nominal Weight (lb/ft)	Grade	Torque (ft-lb) *(kg-m)*					
			Minimum		Optimum		Maximum	
7 *177,8*	32.0	C-75	4750	*660*	6330	*880*	7910	*1090*
		L-80	4960	*690*	6610	*910*	8260	*1140*
		N-80	5040	*700*	6720	*930*	8400	*1160*
		C-95	5760	*800*	7680	*1060*	9600	*1330*
		P-110	6730	*930*	8970	*1240*	11210	*1550*
	35.0	C-75	5270	*730*	7030	*970*	8790	*1220*
		L-80	5510	*760*	7340	*1020*	9180	*1270*
		N-80	5600	*770*	7460	*1030*	9330	*1290*
		C-95	6400	*890*	8530	*1180*	10660	*1470*
		P-110	7470	*1030*	9960	*1380*	12450	*1720*
	38.0	C-75	5750	*800*	7670	*1060*	9590	*1330*
		L-80	6010	*830*	8010	*1110*	10010	*1380*
		N-80	6110	*850*	8140	*1130*	10180	*1410*
		C-95	6980	*970*	9310	*1290*	11640	*1610*
		P-110	8150	*1130*	10870	*1500*	13590	*1880*
7-5/8 *193,7*	26.4	J-55	2600	*360*	3460	*480*	4330	*600*
		K-55	2830	*390*	3770	*520*	4710	*650*
		C-75	3460	*480*	4610	*640*	5760	*800*
		L-80	3620	*500*	4820	*670*	6030	*830*
		N-80	3680	*510*	4900	*680*	6130	*850*
		C-95	4200	*580*	5600	*770*	7000	*970*
	29.7	C-75	4070	*560*	5420	*750*	6780	*940*
		L-80	4250	*590*	5670	*780*	7090	*980*
		N-80	4310	*600*	5750	*800*	7190	*990*
		C-95	4940	*680*	6590	*910*	8240	*1140*
		P-110	5770	*800*	7690	*1060*	9610	*1330*
	33.7	C-75	4760	*660*	6350	*880*	7940	*1100*
		L-80	4980	*690*	6640	*920*	8300	*1150*
		N-80	5060	*700*	6740	*930*	8430	*1160*
		C-95	5790	*800*	7720	*1070*	9650	*1330*
		P-110	6760	*930*	9010	*1250*	11260	*1560*
	39.0	C-75	5630	*780*	7510	*1040*	9390	*1300*
		L-80	5900	*820*	7860	*1090*	9830	*1360*
		N-80	5980	*830*	7980	*1100*	9980	*1380*
		C-95	6860	*950*	9140	*1260*	11430	*1580*
		P-110	8000	*1110*	10660	*1470*	13330	*1840*
	42.8	C-75	6390	*880*	8520	*1180*	10650	*1470*
		L-80	6680	*920*	8910	*1230*	11140	*1540*
		N-80	6800	*940*	9060	*1250*	11330	*1570*
		C-95	7780	*1080*	10370	*1430*	12960	*1790*
		P-110	9080	*1260*	12100	*1670*	15130	*2090*

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			Minimum		Optimum		Maximum	
7-5/8 *193,7*	47.1	C-75	7150	*990*	9530	*1320*	11910	*1650*
		L-80	7480	*1030*	9970	*1380*	12460	*1720*
		N-80	7600	*1050*	10130	*1400*	12660	*1750*
		C-95	8690	*1200*	11590	*1600*	14490	*2000*
		P-110	10150	*1400*	13530	*1870*	16910	*2340*
8-5/8 *219,1*	32.0	J-55	3130	*430*	4170	*580*	5210	*720*
		K-55	3390	*470*	4520	*630*	5650	*780*
	36.0	J-55	3650	*500*	4860	*670*	6080	*840*
		K-55	3950	*550*	5260	*730*	6580	*910*
		C-75	4860	*670*	6480	*900*	8100	*1120*
		L-80	5090	*700*	6780	*940*	8480	*1170*
		N-80	5160	*710*	6880	*950*	8600	*1190*
		C-95	5920	*820*	7890	*1090*	9860	*1360*
	40.0	C-75	5570	*770*	7420	*1030*	9280	*1280*
		L-80	5820	*800*	7760	*1070*	9700	*1340*
		N-80	5910	*820*	7880	*1090*	9850	*1360*
		C-95	6780	*940*	9040	*1250*	11300	*1560*
		P-110	7910	*1090*	10550	*1460*	13190	*1820*
	44.0	C-75	6260	*870*	8340	*1150*	10430	*1440*
		L-80	6560	*910*	8740	*1210*	10930	*1510*
		N-80	6650	*920*	8870	*1230*	11090	*1530*
		C-95	7630	*1060*	10170	*1410*	12710	*1760*
		P-110	8900	*1230*	11860	*1640*	14830	*2050*
	49.0	C-75	7040	*970*	9390	*1300*	11740	*1620*
		L-80	7370	*1020*	9830	*1360*	12290	*1700*
		N-80	7480	*1030*	9970	*1380*	12460	*1720*
		C-95	8580	*1190*	11440	*1580*	14300	*1980*
		P-110	10010	*1380*	13350	*1850*	16690	*2310*
9-5/8 *244,5*	36.0	J-55	3400	*470*	4530	*630*	5660	*780*
		K-55	3670	*510*	4890	*680*	6110	*850*
	40.0	J-55	3900	*540*	5200	*720*	6500	*900*
		K-55	4210	*580*	5610	*780*	7010	*970*
		C-75	5210	*720*	6940	*960*	8680	*1200*
		L-80	5450	*750*	7270	*1010*	9090	*1260*
		N-80	5530	*760*	7370	*1020*	9210	*1270*
		C-95	6350	*880*	8470	*1170*	10590	*1460*
	43.5	C-75	5820	*800*	7760	*1070*	9700	*1340*
		L-80	6100	*840*	8130	*1120*	10160	*1410*
		N-80	6190	*860*	8250	*1140*	10310	*1420*
		C-95	7110	*980*	9480	*1310*	11850	*1640*
		P-110	8300	*1150*	11060	*1530*	13830	*1910*

Casing Make-Up Torque Guide
Long Thread Recommended Make-Up Torque*

OD (in.) *(mm)*	Nominal Weight (lb/ft)	Grade	Torque (ft-lb) *(kg-m)*					
			Minimum		Optimum		Maximum	
9-5/8 *244,5*	47.0	C-75	6390	*880*	8520	*1180*	10650	*1470*
		L-80	6700	*930*	8930	*1240*	11160	*1540*
		N-80	6790	*940*	9050	*1250*	11310	*1560*
		C-95	7800	*1080*	10400	*1440*	13000	*1800*
		P-110	9100	*1260*	12130	*1680*	15160	*2100*
	53.5	C-75	7490	*1040*	9990	*1380*	12490	*1730*
		L-80	7850	*1090*	10470	*1450*	13090	*1810*
		N-80	7970	*1100*	10620	*1470*	13280	*1840*
		C-95	9150	*1270*	12200	*1690*	15250	*2110*
		P-110	10670	*1480*	14220	*1970*	17780	*2460*
20 *508*	94.0	J-55	9070	*1250*				
		K-55	9550	*1320*				
	106.5	J-55	10570	*1460*				
		K-55	11130	*1540*				
	133.0	J-55	13800	*1910*				
		K-55	14530	*2010*				

*Data reported from API Bulletin RP5C1, Recommended Practice for Care and Use of Casing,Tubing, and Drill Pipe, Twelfth-Edition, March 1981.

Atlas-Bradford TC-4S Make-Up Torque

Size	Nominal	L-80/P-110	
O.D.	Weight	Minimum	Maximum
in.	lbs/ft	ft-lbs	ft-lbs
5	13.00	3500	4400
	15.00	3500	4400
	18.00	4600	6900
	20.80	6000	7900
	23.20	7000	9800
	24.20	8000	10000
5-1/2	15.50	3500	4400
	17.00	6000	7300
	20.00	6000	7300
	23.00	7000	9200
	26.00	8500	10000
	28.40	8500	10000
	29.70	8500	10000
	32.30	11000	12700
	35.00	11000	12700
6-5/8	20.00	6000	7300
	24.00	6000	7300
	28.00	7000	9200
	32.00	7000	9200
7	20.00	6000	7300
	23.00	6100	7400
	26.00	8000	9200
	29.00	9000	11500
	32.00	10000	12700
	35.00	10000	12700
	38.00	10500	13300
	41.00	10500	13300
	44.00	11000	13800
	46.00	12000	15000

Size	Nominal	L-80/P-110	
O.D.	Weight	Minimum	Maximum
in.	lbs/ft	ft-lbs	ft-lbs
7-5/8	24.00	6800	8300
	26.40	6800	8300
	29.70	7800	9200
	33.70	9000	11500
	39.00	11000	13800
	45.30	11000	13800
	47.10	11500	14200
	51.20	11500	14200
7-3/4	46.10	12000	13800
8-5/8	28.00	7000	8500
	32.00	7000	8500
	36.00	8100	9800
	40.00	8300	10000
	44.00	9500	11800
9-5/8	43.50	8300	10000
	47.00	10000	12000
	53.50	16000	18400
	58.40	16000	18400
9-7/8	62.80	16200	19200
10-3/4	40.50	9100	11000
	45.50	9100	11000
	51.00	10000	12000
	55.50	12500	15000
	60.70	12500	15000
	65.70	14000	17000

Atlas Bradford Premium Connections is a product line produced by Grant TFW™. Data reprinted from Grant TFW™ 1993 Catalog.

BAKER OIL TOOLS
A Baker Hughes company

Atlas-Bradford ST-L Make-Up Torque

Size	Plain End	J-55/K-55		L-80/Q-125	
O.D.	Wt.	Min.	Max.	Min.	Max.
in.	lbs/ft	ft-lbs	ft-lbs	ft-lbs	ft-lbs
5	12.83	1400	1600	1800	2200
	14.87	1700	2100	2100	2700
	17.93	2100	2700	2700	3500
	20.01	2500	3300	3200	4200
	20.63	2500	3300	3200	4200
	23.08	3000	3800	3800	4900
	24.03	2700	3500	3400	4400
5-1/2	13.70	1400	1800	1800	2200
	15.35	1500	1900	2200	2800
	16.87	1750	2250	2400	3200
	19.81	1900	2500	2900	3700
	22.54	2200	3000	3700	4700
	25.54	3300	4300	4200	5400
	28.13	3500	4800	4000	5200
	29.64	3150	4050	4200	5400
	31.95	3500	4500	4500	5700
6-5/8	19.49	2100	2700	2700	3500
	23.58	2700	3500	3400	4400
	27.65	3500	4800	4500	5900
	31.20	4100	5300	5200	6600
7	16.70	1700	2100	2200	2800
	19.54	2100	2700	2600	3400
	22.63	2500	3300	3200	4200
	25.66	3300	4200	4200	5400
	28.72	3700	4700	4700	6100
	31.67	4100	5300	5200	6800
	34.58	4500	5900	5800	7400
	37.26	5000	6400	6300	8100
	40.39	5400	7000	6900	8900
	43.47	5400	7000	6900	8900
	45.30	5700	7300	7200	9200
	48.88	6500	8300	8200	10600
7-5/8	23.47	2600	3400	3300	4300
	25.56	2900	3700	3700	4800
	29.04	3700	4700	4600	6000
	33.04	4300	5500	5400	7000
	38.05	4900	6300	6200	8000
	44.67	6000	7800	7600	9800
	46.73	6300	8100	8000	10300
	50.91	5900	7600	7500	9700
	52.57	6000	7800	7700	9900

Size	Plain End	J-55/K-55		L-80/Q-125	
O.D.	Wt.	Min.	Max.	Min.	Max.
in.	lbs/ft	ft-lbs	ft-lbs	ft-lbs	ft-lbs
7-3/4	45.47	6100	7900	7800	10000
8-5/8	23.57	2400	3200	3100	4100
	27.02	3000	3800	3800	4800
	31.10	3600	4600	4500	5900
	35.14	4500	5700	5700	7300
	39.29	5100	6500	6500	8300
	43.39	4900	6300	6200	8000
9-5/8	38.94	4500	5700	5700	7300
	42.69	5600	7200	7100	9100
	46.14	5300	8100	8000	10200
	52.85	7100	9100	8900	11500
	57.38	7200	9200	9100	11700
9-7/8	61.74	8400	10800	10700	13800
10-3/4	38.88	4500	5700	5700	7300
	44.22	5100	6500	6500	8300
	49.50	6600	8400	8200	10600
	54.21	6300	8100	8000	10200
	59.40	6900	8900	8700	11200
	64.53	7400	9600	9400	12100
11-3/4	58.81	6800	8800	8600	11000
	63.97	7300	9300	9200	11800
	69.42	8100	10350	10100	13000
	73.47	8500	10900	10700	13800
11-7/8	70.19	8100	10400	10100	13000
13-3/8	59.45	6900	8900	8700	11200
	66.10	7600	9800	9700	12500
	70.60	9500	12300	10900	13800
	75.33	8800	11200	11000	14200
	82.90	9600	12400	12200	15600
13-5/8	86.78	11900	15300	15100	19500

Atlas Bradford Premium Connections is a product line produced by Grant TFW™. Data reprinted from Grant TFW™ 1993 Catalog.

Atlas-Bradford FL-4S Make-Up Torque

Size O.D.	Nom. Weight	Recommended Torque Range							
		K-55		L-80/C-95			P-110/Q-125		
		Min.	Max.	Min.	Opt.	Max.	Min.	Opt.	Max.
in.	lbs/ft	ft-lbs	ft-lbs	ft-lbs	ft-lbs	ft-lbs	ft-lbs	ft-lbs	ft-lbs
5	11.50	1200	1800	1200	1600	1800	1200	1600	1800
	13.00	1200	1800	1200	1600	1800	1200	1600	1800
	15.00	3000	3600	3000	3600	3900	3600	3900	4300
	18.00	3000	3600	3100	3400	3700	3600	3900	4300
	20.30	3100	3700	3200	3500	3800	4000	4400	4800
	20.80	3100	3700	3200	3500	3800	4000	4400	4800
	23.60	3500	4200	3800	4100	4600	4100	4500	4900
	24.20	3500	4200	3800	4100	4600	4100	4500	4900
5-1/2	14.00	1900	2400	1900	2200	2500	1900	2200	2500
	15.50	2300	2700	2800	3100	3400	3100	3300	3600
	17.00	2400	2900	3000	3300	3600	4000	4300	4600
	20.00	—	—	3400	3700	4100	4400	4800	5200
	23.00	—	—	4400	4800	5200	4600	5000	5600
	26.00	—	—	4500	4900	5400	5300	5800	6400
	28.40	—	—	4700	5100	5700	5800	6200	6900
	29.70	—	—	4900	5500	6000	6200	6800	7200
	32.30	—	—	5500	5800	6400	6600	7100	7600
6-5/8	20.00	3000	4000	3000	3500	4000	3100	3600	4200
	23.20	3200	4200	3300	3800	4300	3600	4100	4700
	24.00	3300	4300	5200	5700	6200	6000	6500	6800
	28.00	—	—	5400	5900	6400	6200	6700	7000
	32.00	—	—	5500	6000	6500	6300	6800	7100
	40.80	—	—	6500	7200	7500	7500	8000	8500
7	17.00	2500	3500	2800	3300	3800	2900	3400	3900
	20.00	2500	3500	2800	3300	3800	2900	3400	3900
	23.00	3800	4400	4900	5400	5900	5100	5600	6100
	26.00	—	—	6000	6600	7200	6400	7000	7400
	29.00	—	—	6000	6600	7200	6400	7000	7400
	32.00	—	—	6500	7100	7500	7500	8300	8700
	35.00	—	—	6900	7600	8000	7600	8400	8800
	38.00	—	—	7500	8200	8700	7800	8600	9000
	41.00	—	—	8000	8600	9200	8500	9400	10000
	46.00	—	—	8200	8900	9500	9000	9800	10500
	49.50	—	—	10000	10800	11500	10000	10800	11500
7-5/8	24.00	4000	4800	4500	4900	5500	4700	5100	5800
	26.40	4300	5100	6200	6800	7300	7000	7700	8100
	29.70	4400	5200	6200	6800	7300	7200	7900	8300
	33.70	—	—	6400	7000	7400	7400	8100	8500
	39.00	—	—	6500	7100	7500	7500	8200	8600
	45.30	—	—	7000	7700	8100	8000	8700	9200
	47.10	—	—	7100	7800	8200	8100	8800	9300
	51.20	—	—	8300	8800	9400	9900	10500	11500
	53.06	—	—	9000	9500	10100	10000	10700	11700
7-3/4	46.10	—	—	9000	9700	10400	9500	10500	10900
8-5/8	24.00	4500	5600	4500	4800	6200	4600	4900	6300
	28.00	4500	5600	4500	4800	6200	4600	4900	6300
	29.35	5000	6000	4900	5200	6600	5000	5300	6700
	32.00	5500	6500	7000	7700	8200	7200	7900	8400
	36.00	—	—	7200	7900	8300	7400	8100	8500
	40.00	—	—	8000	8800	9200	8200	9000	9400
	44.00	—	—	8500	9300	9800	9500	10500	11000
	49.00	—	—	8800	9500	10100	9700	10700	11200
9-5/8	43.50	5000	5800	5400	5900	6300	6200	6800	7200
	47.00	—	—	6500	7000	7500	7400	8000	8500
	53.50	—	—	8000	8800	9200	10500	11600	12100
	71.80	—	—	12000	13200	15000	14000	16000	18000

Atlas Bradford Premium Connections is a product line produced by Grant TFW™. Data provided by Grant TFW™.

Hydril Series 500 Type 511
Minimum Make-Up Torque*

OD		Weight	Torque All Grades	
(in.)	(mm)	(lb/ft)	(ft-lb)	(Nm)
2.063	52.4	3.25	400	540
2.375	60.3	4.60	600	810
		5.10	700	950
2.875	73.0	6.40	750	1020
3.500	88.9	9.20	1250	1700
		10.20	1400	1900
4.000	101.6	9.50	1300	1760
		11.00	1500	2030
		11.60	1600	2170
4.500	114.3	10.50	1500	2030
		11.00	1600	2170
		11.60	1650	2240

* MANY FACTORS INFLUENCE TORQUE APPLICATION. TO INSURE THAT MINIMUM TORQUE IS ATTAINED, HYDRIL RECOMMENDS A TARGET TORQUE OF 15% OVER MINIMUM.

Data provided by Hydril.

Hydril Series 500 Type 521
Minimum Make-Up Torque*

OD		Weight	Torque All Grades		OD		Weight	Torque All Grades	
(in.)	(mm)	(lb/ft)	(ft-lb)	(Nm)	(in.)	(mm)	(lb/ft)	(ft-lb)	(Nm)
4.000	101.6	9.50	2600	3500	10.750	273.1	40.50	10000	13600
		11.00	3100	4200			45.50	11800	16000
		11.60	3400	4600			51.00	13600	18400
4.500	114.3	10.50	3100	4200			55.50	17700	24000
		11.00	3300	4500			60.70	19900	27000
		11.60	3600	4900			65.70	22100	30000
		12.60	3900	5300	11.750	298.5	47.00	11400	15500
		13.50	4200	5700			54.00	13600	18400
5.000	127.0	13.00	4100	5600			60.00	17900	24300
		15.00	4900	6600			65.00	19600	26600
		18.00	6100	8300			71.00	22400	30400
5.500	139.7	14.00	4000	5400			74.60	24000	32500
		15.50	4600	6200			78.80	25700	34800
		17.00	5200	7100	11.875	301.6	71.80	22600	30600
		20.00	6300	8500	13.375	339.7	54.50	15200	20600
		23.00	7300	9900			61.00	17600	23900
6.625	168.3	20.00	5500	7500			68.00	20100	27300
		24.00	6900	9400			72.00	21800	29600
		28.00	8300	11300			77.00	27700	37600
		32.00	9600	13000			80.70	29500	40000
7.000	177.8	20.00	5200	7100			85.00	31200	42300
		23.00	6200	8400			86.00	32200	43700
		26.00	7200	9800	13.625	346.1	88.20	32400	43900
		29.00	8300	11300	15.000	381.0	77.43	21900	29700
		32.00	9300	12600	16.000	406.4	75.00	20100	27300
7.625	193.7	26.40	7200	9800			84.00	23300	31600
		29.70	8400	11400			84.80	23600	32000
		33.70	9800	13300			94.70	26600	36100
8.625	219.1	32.00	8600	11700			109.00	39500	53600
		36.00	10200	13800			118.00	43600	59100
		40.00	11600	15700	16.125	409.6	95.60	23300	31600
		44.00	13000	17600	18.625	473.1	87.50	26100	35400
		49.00	14600	19800			94.50	27400	37200
9.625	244.5	36.00	9200	12500			97.70	29200	39600
		40.00	10500	14200			109.35	44500	60300
		43.50	11700	15900			112.00	46000	62400
		47.00	12800	17400					
		53.50	14900	20200					

* MANY FACTORS INFLUENCE TORQUE APPLICATION. TO INSURE THAT MINIMUM TORQUE IS ATTAINED, HYDRIL RECOMMENDS A TARGET TORQUE OF 15% OVER MINIMUM.

Data provided by Hydril.

Hydril Series 500 Type 563 Minimum Make-Up Torque*

OD (in.)	OD (mm)	Weight (lb/ft)	Torque All Grades (ft-lb)	Torque All Grades (Nm)
5.000	127.0	13.00	4500	6100
		15.00	5500	7500
		18.00	6500	8800
		21.40	9700	13200
		23.20	10900	14800
		24.10	11300	15300
5.500	139.7	14.00	4500	6100
		15.50	5200	7100
		17.00	5800	7900
		20.00	6600	8900
		23.00	7700	10400
		26.00	11000	14900
		26.80	12000	16300
		28.40	12500	17000
		29.70	16100	21800
		32.60	17600	23900
6.625	168.3	20.00	5900	8000
		24.00	7500	10200
		28.00	8600	11700
		32.00	9900	13400
7.000	177.8	20.00	5600	7600
		23.00	6700	9100
		26.00	7800	10600
		29.00	8400	11400
		32.00	9500	12900
		35.00	14800	20100
		38.00	16200	22000
		41.00	17300	23500
		42.70	18700	25400
7.625	193.7	26.40	7800	10600
		29.70	8600	11700
		33.70	10100	13700
		39.00	16100	21800
		42.80	17800	24100
		45.30	19000	25800
7.750	196.9	46.10	19700	26700
		48.60	20900	28300
8.625	219.1	32.00	9400	12700
		36.00	10500	14200
		40.00	12000	16300
		44.00	18200	24700
		49.00	19800	26800
		52.00	21200	28700
		54.00	22600	30600
9.625	244.5	36.00	10000	13600
		40.00	10800	14600
		43.50	11900	16100
		47.00	13200	17900
		53.50	15500	21000
		58.40	22600	30600
		59.40	23200	31500
		61.10	24000	32500
9.875	250.8	62.80	24000	32500
10.750	273.1	40.50	12200	16500
		45.50	13500	18300
		51.00	15500	21000
		55.50	22800	30900
		60.70	25000	33900
		65.70	27000	36600
		73.20	31000	42000
11.750	298.5	47.00	13000	17600
		54.00	15400	20900
		60.00	22500	30500
		65.00	24000	32500
		71.00	27000	36600
		75.00	28000	38000
		79.00	31000	42000
11.875	301.6	71.80	27000	36600
13.375	339.7	54.50	17400	23600
		61.00	20000	27100
		68.00	21000	28500
		72.00	23000	31200
		77.00	34000	46100
		80.70	36000	48800
		85.00	36000	48800
		86.00	37000	50200
13.500	342.9	81.40	31000	42000
13.625	346.1	88.20	37000	50200
14.000	355.6	92.68	45000	61000
		99.43	51000	69200
		106.13	54000	73200
		112.78	56000	75900
16.000	406.4	75.00	24000	32500
		84.00	26000	35300
		109.00	49000	66400
		118.00	52000	70500
18.625	473.1	87.50	29000	39300
		94.50	31000	42000
		97.70	31000	42000
		109.35	49000	66400
		112.00	50000	67800
		136.00	59000	80000

* MANY FACTORS INFLUENCE TORQUE APPLICATION. TO INSURE THAT MINIMUM TORQUE IS ATTAINED, HYDRIL RECOMMENDS A TARGET TORQUE OF 15% OVER MINIMUM.

Data provided by Hydril.

Hydril SuPreme LX
Minimum Make-Up Torque*

OD		Weight	Torque Grade							
			L-80/N-80		T-95/HC-95		P-110		Q-125	
(in.)	(mm)	(lb/ft)	(ft-lb)	(Nm)	(ft-lb)	(Nm)	(ft-lb)	(Nm)	(ft-lb)	(Nm)
4.500	114.3	12.60	1900	2600	2100	2800	2200	3000	2400	3300
		13.50	2000	2700	2200	3000	2400	3300	2600	3500
		15.10	2600	3500	3000	4100	3200	4300	3400	4600
		17.00	2400	3300	2700	3700	2900	3900	3100	4200
		18.80	2700	3700	2900	3900	3100	4200	3300	4500
		21.60	3300	4500	3600	4900	3800	5200	4100	5600
5.000	127.0	15.00	2400	3300	2700	3700	2900	3900	3100	4200
		18.00	2900	3900	3200	4300	3400	4600	3700	5000
		20.30	2900	3900	3200	4300	3500	4700	3800	5200
		20.80	3100	4200	3400	4600	3600	4900	3900	5300
		21.40	3200	4300	3500	4700	3800	5200	4000	5400
		23.20	3500	4700	3800	5200	4100	5600	4400	6000
		24.10	3700	5000	4000	5400	4300	5800	4700	6400
5.500	139.7	17.00	2800	3800	3100	4200	3400	4600	3700	5000
		20.00	3300	4500	3600	4900	3900	5300	4200	5700
		23.00	3400	4600	3800	5200	4100	5600	4500	6100
		26.00	4000	5400	4400	6000	4800	6500	5200	7100
		26.80	4500	6100	4900	6600	5300	7200	5700	7700
6.625	168.3	22.60	5200	7100	5900	8000	6500	8800	7200	9800
		24.00	5600	7600	6200	8400	6900	9400	7500	10200
		24.60	5700	7700	6400	8700	7000	9500	7700	10400
		28.00	4700	6400	5200	7100	5800	7900	6300	8500
		32.00	5400	7300	6000	8100	6500	8800	7000	9500
		33.00	5800	7900	6400	8700	7000	9500	7600	10300
		34.50	6100	8300	6700	9100	7400	10000	8000	10800
7.000	177.8	23.00	4700	6400	5200	7100	5800	7900	6400	8700
		26.00	5200	7100	5800	7900	6300	8500	6900	9400
		29.00	4700	6400	5300	7200	5800	7900	6400	8700
		32.00	5400	7300	6000	8100	6500	8800	7100	9600
		35.00	5900	8000	6600	8900	7200	9800	7800	10600
		38.00	6200	8400	6800	9200	7400	10000	8100	11000
		41.00	7200	9800	7900	10700	8600	11700	9300	12600
		42.70	8400	11400	9200	12500	9900	13400	11000	14900
7.625	193.7	26.40	5800	7900	6600	8900	7300	9900	8100	11000
		29.70	6400	8700	7200	9800	7900	10700	8700	11800
		33.70	5800	7900	6500	8800	7200	9800	7900	10700
		39.00	6800	9200	7400	10000	8100	11000	8800	11900
		42.80	7400	10000	8200	11100	9000	12200	9800	13300
		45.30	7900	10700	8700	11800	9500	12900	10000	13600
		47.10	8700	11800	9600	13000	11000	14900	12000	16300

BAKER OIL TOOLS
A Baker Hughes company

Hydril SuPreme LX
Minimum Make-Up Torque*

OD		Weight	Torque Grade							
			L-80/N-80		T-95/HC-95		P-110		Q-125	
(in.)	(mm)	(lb/ft)	(ft-lb)	(Nm)	(ft-lb)	(Nm)	(ft-lb)	(Nm)	(ft-lb)	(Nm)
7.750	196.9	46.10	8500	11500	9400	12700	10000	13600	11000	14900
		48.60	9400	12700	10300	14000	11000	14900	12000	16300
		54.20	11000	14900	12000	16300	13000	17600	14000	19000
8.625	219.1	36.00	7100	9600	8000	10800	8900	12100	9900	13400
		40.00	7900	10700	8900	12100	9800	13300	11000	14900
		44.00	8600	11700	9600	13000	11000	14900	12000	16300
		49.00	11000	14900	12000	16300	13000	17600	14000	19000
		52.00	10000	13600	11000	14900	12000	16300	14000	19000
		54.00	11000	14900	12000	16300	13000	17600	14000	19000
9.625	244.5	43.50	8800	11900	9900	13400	11000	14900	12000	16300
		47.00	9500	12900	11000	14900	12000	16300	13000	17600
		53.50	11000	14900	13000	17600	14000	19000	15000	20300
		58.40	14000	19000	15000	20300	16000	21700	18000	24400
9.750	247.7	59.20	14000	19000	16000	21700	17000	23100	19000	25800
9.875	250.8	62.80	14000	19000	16000	21700	17000	23100	19000	25800
10.000	254.0	66.95	15000	20300	17000	23100	18000	24400	20000	27100
		68.42	15000	20300	17000	23100	18000	24400	20000	27100
10.750	273.1	51.00	11000	14900	12000	16300	13000	17600	15000	20300
		55.50	12000	16300	14000	19000	15000	20300	16000	21700
		60.70	14000	19000	16000	21700	18000	24400	19000	25800
		65.70	15000	20300	17000	23100	18000	24400	20000	27100
11.750	298.5	60.00	14000	19000	16000	21700	18000	24400	20000	27100
		65.00	15000	20300	17000	23100	19000	25800	21000	28500
		71.00	19000	25800	21000	28500	23000	31200	25000	33900
11.875	301.6	71.80	18000	24400	21000	28500	23000	31200	25000	33900
12.000	304.8	74.80	20000	27100	22000	29800	25000	33900	27000	36600
12.063	306.4	78.10	20000	27100	22000	29800	25000	33900	27000	36600
13.375	339.7	68.00	17000	23100	20000	27100	22000	29800	24000	32500
		72.00	18000	24400	21000	28500	23000	31200	25000	33900
		77.00	22000	29800	24000	32500	27000	36600	29000	39300
		80.70	24000	32500	27000	36600	30000	40700	33000	44700
		85.00	25000	33900	28000	38000	31000	42000	34000	46100
		86.00	26000	35300	29000	39300	32000	43400	35000	47500
13.500	342.9	81.40	21000	28500	23000	31200	26000	35300	28000	38000
13.625	346.1	88.20	25000	33900	28000	38000	31000	42000	35000	47500

* MANY FACTORS INFLUENCE TORQUE APPLICATION. TO INSURE THAT MINIMUM TORQUE IS ATTAINED, HYDRIL RECOMMENDS A TARGET TORQUE OF 15% OVER MINIMUM.

Data provided by Hydril.

MANNESMANN BDS CASING
RECOMMENDED MAKE-UP TORQUES

CARBON STEEL

OD (in) (mm)	WT. (lb/ft)	SMYS 1000 psi	MAKE-UP TORQUE							
			REGULAR COUPLING				SPECIAL CLEARANCE			
			minimum		maximum		minimum		maximum	
			(FT-LB)	(Nm)	(FT-LB)	(Nm)	(FT-LB)	(Nm)	(FT-LB)	(Nm)
4-1/2 (114.3)	16.90	55	3840	5200	4790	6500	3100	4200	3840	5200
		75	4200	5700	5240	7100	3610	4900	4570	6200
		80	4350	5900	5380	7300	3760	5100	4720	6400
		85	4650	6300	5790	7850	4060	5500	5090	6900
		90	4940	6700	6200	8400	4350	5900	5460	7400
		95	5090	6900	6340	8600	4500	6100	5610	7600
		110	5900	8000	7380	10000	5090	6900	6340	8600
		125	6790	9200	8480	11500	5900	8000	7380	10000
	21.60	55	3980	5400	5020	6800	3320	4500	4130	5600
		75	4790	6500	6050	8200	3980	5400	4940	6700
		80	4940	6700	6200	8400	4130	5600	5160	7000
		85	5200	7050	6500	8810	4430	6000	5530	7500
		90	5460	7400	6790	9200	4720	6400	5900	8000
		95	5610	7600	7010	9500	4870	6600	6050	8200
		110	6490	8800	8110	11000	5460	7400	6790	9200
		125	7380	10000	9220	12500	6200	8400	7740	10500
5 (127,0)	15.00	55	3020	4100	3610	4900	2660	3600	3240	4400
		75	3170	4300	3980	5400	3020	4100	3840	5200
		80	3320	4500	4130	5600	3170	4300	3980	5400
		85	3540	4800	4430	6010	3430	4650	4320	5860
		90	3760	5100	4720	6400	3690	5000	4650	6300
		95	3910	5300	4870	6600	3840	5200	4790	6500
		110	4280	5800	5310	7200	4280	5800	5310	7200
		125	4430	6000	5530	7500	4430	6000	5530	7500
	18.00	55	3540	4800	4430	6000	2800	3800	3540	4800
		75	4130	5600	5160	7000	3540	4800	4430	6000
		80	4280	5800	5310	7200	3690	5000	4570	6200
		85	4430	6010	5420	7350	3770	5110	4720	6400
		90	4570	6200	5530	7500	3840	5200	4870	6600
		95	4720	6400	5900	8000	3980	5400	5020	6800
		110	5310	7200	6640	9000	4940	6700	6200	8400
		125	5900	8000	7380	10000	5610	7600	7010	9500
	21.40	55	4060	5500	4940	6700	3390	4600	4280	5800
		75	4500	6100	5310	7200	3910	5300	4790	6500
		80	4870	6600	5750	7800	4130	5600	5020	6800
		85	5020	6810	5860	7950	4280	5800	5200	7050
		90	5160	7000	5970	8100	4430	6000	5380	7300
		95	5310	7200	6200	8400	4570	6200	5530	7500
		110	5830	7900	6930	9400	5460	7400	6710	9100
		125	6340	8600	7670	10400	6120	8300	7380	10000
	23.20	55	4280	5800	5160	7000	3610	4900	4430	6000
		75	4650	6300	5460	7400	4060	5500	4940	6700
		80	5090	6900	5900	8000	4280	5800	5160	7000
		85	5240	7100	6090	8260	4430	6000	5350	7250
		90	5380	7300	6270	8500	4570	6200	5530	7500
		95	5530	7500	6420	8700	4720	6400	5680	7700
		110	6050	8200	7150	9700	5830	7900	7080	9600
		125	6710	9100	7820	10600	6340	8600	7670	10400
	24.10	55	4350	5900	5240	7100	3690	5000	4500	6100
		75	4720	6400	5530	7500	4130	5600	5090	6900
		80	5240	7100	5970	8100	4350	5900	5310	7200
		85	5390	7310	6230	8450	4540	6160	5460	7400
		90	5530	7500	6490	8800	4720	6400	5610	7600
		95	5680	7790	6640	9000	4870	6600	5900	8000
		110	6270	8500	7380	10000	6050	8200	7380	10000
		125	6860	9300	7970	10800	6560	8900	7820	10600

Data provided by Mannesmann.

BAKER OIL TOOLS
A Baker Hughes company

MANNESMANN BDS CASING
RECOMMENDED MAKE-UP TORQUES

CARBON STEEL

OD (in) (mm)	WT. (lb/ft)	SMYS 1000 psi	MAKE-UP TORQUE							
			REGULAR COUPLING				SPECIAL CLEARANCE			
			minimum		maximum		minimum		maximum	
			(FT-LB)	(Nm)	(FT-LB)	(Nm)	(FT-LB)	(Nm)	(FT-LB)	(Nm)
5-1/2 (139,7)	15.50	55	2950	4000	3610	4900	2800	3800	3540	4800
		75	3170	4300	3980	5400	3170	4300	3980	5400
		80	3320	4500	4130	5600	3320	4500	4130	5600
		85	3470	4700	4350	5900	3470	4700	4350	5900
		90	3610	4900	4570	6200	3610	4900	4570	6200
		95	3760	5100	4720	6400	3760	5100	4720	6400
		110	4060	5500	5090	6900	4060	5500	5090	6900
		125	4200	5700	5310	7200	4200	5700	5310	7200
	17.00	55	3500	4400	4060	5500	2880	3900	3610	4900
		75	3840	5200	4870	6600	3690	5000	4650	6300
		80	3980	5400	5020	6800	3840	5200	4790	6500
		85	4210	5710	5320	7210	4100	5560	5130	6960
		90	4430	6000	5610	7600	4350	5900	5460	7400
		95	4570	6200	5750	7800	4500	6100	5610	7600
		110	4940	6700	6200	8400	4940	6700	6200	8400
		125	5160	7000	6490	8800	5160	7000	6490	8800
	20.00	55	3760	5100	4790	6500	3170	4300	3980	5400
		75	5020	6800	6270	8500	4130	5600	5240	7100
		80	5160	7000	6420	8700	4280	5800	5380	7300
		85	5460	7400	6830	9260	4610	6250	5790	7850
		90	5750	7800	7230	9800	4940	6700	6200	8400
		95	5900	8000	7380	10000	5030	6900	6340	8600
		110	6270	8500	7890	10700	5680	7700	7150	9700
		125	6640	9000	8330	11300	6340	8600	7970	10800
	23.00	55	4200	5700	5310	7200	3540	4800	4500	6100
		75	5460	7400	6860	9300	4570	6200	5750	7800
		80	5610	7600	7010	9500	4720	6400	5900	8000
		85	5980	8110	7490	10160	5050	6850	6350	8610
		90	6340	8600	7970	10800	5380	7300	6790	9200
		95	6490	8800	8110	11000	5530	7500	6930	9400
		110	6860	9300	8630	11700	6270	8500	7890	10700
		125	7230	9800	9070	12300	6930	9400	8700	11800
	26.00	55	4570	6200	5680	7700	3910	5300	4870	6600
		75	5970	8100	7380	10000	5020	6800	6200	8400
		80	6200	8400	7600	10300	5160	7000	6340	8600
		85	6570	8910	8080	10960	5530	7500	6710	9100
		90	6930	9400	8560	11600	5900	8000	7080	9600
		95	7080	9600	8700	11800	6050	8200	7230	9800
		110	7450	10100	9220	12500	7010	9500	8560	11600
		125	7820	10600	9660	13100	7520	10200	9070	12300
	28.40	55	5020	6800	6050	8200	4350	5900	5380	7300
		75	6420	8700	7740	10500	5460	7400	6640	9000
		80	6640	9000	7970	10800	5610	7600	6790	9200
		85	7010	9500	8410	11400	5940	8050	7120	9650
		90	7380	10000	8850	12000	6270	8500	7450	10100
		95	7520	10200	9000	12200	6420	8700	7600	10300
		110	7970	10800	9590	13000	7740	10500	9290	12600
		125	8410	11400	10030	13600	8040	10900	9590	13000
6-5/8 (168,23)	20.00	55	4430	6000	5160	7000	3910	5300	4870	6600
		75	4430	6000	5530	7500	4200	5700	5310	7200
		80	4790	6500	5900	8000	4430	6000	5530	7500
		85	5050	6850	6160	8350	4730	6410	5940	8050
		90	5310	7200	6420	8700	5020	6800	6340	8600
		95	5530	7500	6640	9000	5310	7200	6640	9000
		110	5900	8000	7380	10000	5900	8000	7380	10000
		125	6490	8800	8110	11000	6490	8800	8110	11000

Data provided by Mannesmann.

MANNESMANN BDS CASING
RECOMMENDED MAKE-UP TORQUES

CARBON STEEL

OD (in) (mm)	WT. (lb/ft)	SMYS 1000 psi	MAKE-UP TORQUE							
			REGULAR COUPLING				SPECIAL CLEARANCE			
			minimum		maximum		minimum		maximum	
			(FT-LB)	(Nm)	(FT-LB)	(Nm)	(FT-LB)	(Nm)	(FT-LB)	(Nm)
6-5/8 (168,23)	24.00	55	4720	6400	5900	8000	4570	6200	5750	7800
		75	5900	8000	7380	10000	5750	7800	7080	9600
		80	6270	8500	7740	10500	5900	8000	7380	10000
		85	6680	9060	8190	11100	6270	8500	7900	10710
		90	7080	9600	8630	11700	6640	9000	8410	11400
		95	7300	9900	8850	12000	7080	9600	8850	12000
		110	7380	10000	9590	13000	7380	10000	9590	13000
		125	8110	11000	10330	14000	8110	11000	10330	14000
	28.00	55	5900	8000	7380	10000	5090	6900	6340	8600
		75	8110	11000	9880	13400	6270	8500	7820	10600
		80	8560	11600	10330	14000	6490	8800	8110	11000
		85	9080	12310	10960	14860	6790	9210	8700	11800
		90	9590	1300	11580	15700	7080	9600	9290	12600
		95	9810	13300	11800	16000	7380	10000	9590	13000
		110	10330	14000	12540	17000	8850	12000	11060	15000
		125	11060	15000	13280	18000	9590	13000	11800	16000
	32.00	55	7080	9600	8850	12000	5310	7200	6640	9000
		75	9590	13000	11360	15400	6560	8900	8110	11000
		80	10030	13600	11800	16000	7080	9600	8850	12000
		85	10550	14300	12430	16850	7380	10000	9370	12700
		90	11070	15000	13060	17700	7670	10400	9880	13400
		95	11280	15300	13280	18000	8120	11000	10330	14000
		110	11800	16000	14010	19000	9590	13000	11800	16000
		125	12170	16500	14380	19500	10330	14000	12540	17000
	35.00	55	8110	11000	10330	13000	5530	7500	6860	9300
		75	11070	15000	12830	17400	6790	9200	8560	11600
		80	11510	15600	13280	18000	7380	10000	9150	12400
		85	12030	16310	13540	18360	7750	10510	9740	13200
		90	12540	16000	13790	18700	8110	11000	10330	14000
		95	12020	16300	14010	19000	8480	11500	10690	14500
		110	12540	17000	14750	20000	9960	13500	12170	16500
		125	12910	17500	15120	20500	11060	15000	13280	18000
7 (177,8)	23.00	55	5160	7000	5610	7600	4430	6000	5610	7600
		75	5530	7500	7010	9500	5530	7500	7010	9500
		80	5900	8000	7380	10000	5900	8000	7380	10000
		85	6010	8150	7560	10250	6010	8150	7560	10250
		90	6120	8300	7740	10500	6120	8300	7740	10500
		95	6490	8800	8110	11000	6490	8800	8110	11000
		110	6860	9300	8480	11500	6860	9300	8480	11500
		125	7380	10000	9590	13000	7380	10000	9590	13000
	26.00	55	5530	7500	7010	9500	4650	6300	6120	8300
		75	6710	9100	8480	11500	6120	8300	7740	10500
		80	7080	9600	8850	12000	6490	8800	8110	11000
		85	7410	10050	9300	12610	6750	9150	8670	11750
		90	7740	10500	9740	13200	7010	9500	9220	12500
		95	8110	11000	10330	14000	7380	10000	9590	13000
		110	9590	13000	11800	16000	8850	12000	11060	15000
		125	10330	14000	12540	17000	10330	14000	12540	17000
	29.00	55	6710	9100	8480	11500	5160	7000	6560	8900
		75	8480	11500	10690	14500	6710	9100	8480	11500
		80	8850	12000	11060	15000	7080	9600	8850	12000
		85	9220	12500	11430	15500	7410	10050	9410	12760
		90	9590	13000	11800	16000	7740	10500	9960	13500
		95	10330	14000	12540	17000	8120	11000	10330	14000
		110	11070	15000	13280	18000	9590	13000	11800	16000
		125	11800	16000	14010	19000	11060	15000	13280	18000

Data provided by Mannesmann.

MANNESMANN BDS CASING
RECOMMENDED MAKE-UP TORQUES

CARBON STEEL

OD (in) (mm)	WT. (lb/ft)	SMYS 1000 psi	MAKE-UP TORQUE							
			REGULAR COUPLING				SPECIAL CLEARANCE			
			minimum		maximum		minimum		maximum	
			(FT-LB)	(Nm)	(FT-LB)	(Nm)	(FT-LB)	(Nm)	(FT-LB)	(Nm)
7 (177,8)	32.00	55	7010	9500	9220	12500	5530	7500	7010	9500
		75	9220	12500	11430	15500	7010	9500	9220	12500
		80	9590	13000	11800	16000	7380	10000	9590	13000
		85	9960	13500	12170	16500	7930	10750	10140	13750
		90	10330	14000	12540	17000	8480	11500	10690	14500
		95	11070	15000	13280	18000	8850	12000	11060	15000
		110	12170	16500	14380	19500	10330	14000	12540	17000
		125	12540	17000	14750	20000	11800	16000	14010	19000
	39.00	55	7380	10000	9590	13000	5900	8000	7380	10000
		75	9960	13500	12170	16500	7380	10000	9590	13000
		80	10330	14000	12540	17000	7740	10500	9960	13500
		85	10700	14510	12910	17500	8480	11500	10700	14510
		90	11070	15000	13280	18000	9220	12500	11430	15500
		95	11800	16000	14010	19000	9590	13000	11800	16000
		110	12540	17000	14750	20000	11060	15000	13280	18000
		125	12910	17500	15120	20500	12540	17000	14750	20000
	38.00	55	7740	10500	9960	13500	6200	8400	7740	10500
		75	10690	14500	12910	17500	7740	10500	9960	13500
		80	11070	15000	13280	18000	8110	11000	10330	14000
		85	11440	15510	13650	18500	8850	12000	11070	15010
		90	11800	16000	14010	19000	9590	13000	11800	16000
		95	12540	17000	14750	20000	9960	13500	12170	16500
		110	12910	17500	15120	20500	11800	16000	14010	19000
		125	13280	18000	15490	21000	13280	18000	15490	21000
	41.00	55	8110	11000	10330	14000	6420	8700	7970	10800
		75	11060	15000	13280	18000	8120	11000	10330	14000
		80	11430	15500	13650	18500	8480	11500	10690	14500
		85	11800	16000	14020	19010	9220	12500	11430	15500
		90	12170	16500	14380	19500	9960	13500	12170	16500
		95	12910	17500	15120	20500	10330	14000	12540	17000
		110	13280	18000	15490	21000	12170	16500	14380	19500
		125	13650	18500	15860	21500	13650	18500	15860	21500
7-5/8 (193,7)	26.40	55	5380	7300	6270	8500	3980	5400	5020	6800
		75	6050	8200	7670	10400	4720	6400	6050	8200
		80	6490	8800	8110	11000	5160	7000	6490	8800
		85	6750	9150	8480	11500	5350	7250	6750	9150
		90	7010	9500	8850	12000	5530	7500	7010	9500
		95	7380	10000	9220	12500	5900	8000	7380	10000
		110	8110	11000	10330	14000	7080	9600	8850	12000
		125	8850	12000	11060	15000	8110	11000	10330	14000
	29.70	55	6490	8800	8110	11000	4430	6000	5530	7500
		75	7820	10600	10030	13600	5610	7600	7010	9500
		80	8110	11000	10330	14000	5610	7600	7010	9500
		85	8670	11750	10880	14750	6020	8160	7560	10250
		90	9220	12500	11430	15500	6420	8700	8110	11000
		95	9590	13000	11800	16000	6790	9200	8480	11500
		110	11060	15000	13280	18000	7380	10000	9590	13000
		125	11800	16000	14010	19000	8850	12000	11060	15000
	33.70	55	7380	10000	9590	13000	5020	6800	6270	8500
		75	9960	13500	12170	16500	6120	8300	7740	10500
		80	10330	14000	12540	17000	6490	8800	8110	11000
		85	10880	14750	13090	17750	6750	9150	8480	11500
		90	11430	15500	13640	18500	7010	9500	8850	12000
		95	11800	16000	14010	19000	7380	10000	9220	12500
		110	12540	17000	14750	20000	8850	12000	11060	15000
		125	12540	17000	14750	20000	10330	14000	12540	17000

Data provided by Mannesmann.

MANNESMANN BDS CASING RECOMMENDED MAKE-UP TORQUES

CARBON STEEL

OD (in) (mm)	WT. (lb/ft)	SMYS 1000 psi	MAKE-UP TORQUE							
			REGULAR COUPLING				SPECIAL CLEARANCE			
			minimum		maximum		minimum		maximum	
			(FT-LB)	(Nm)	(FT-LB)	(Nm)	(FT-LB)	(Nm)	(FT-LB)	(Nm)
7-5/8 (193,7)	39.00	55	8850	12000	11060	15000	5830	7900	7080	9600
		75	11060	15000	13280	18000	6640	9000	8480	11500
		80	11800	16000	14010	19000	7080	9600	8850	12000
		85	11990	16260	14200	19250	7780	10550	9770	13250
		90	12170	16500	14380	19500	8480	11500	10690	14500
		95	12540	17000	14750	20000	8850	12000	11060	15000
		110	14010	19000	16230	22000	10690	14500	12910	17500
		125	14010	19000	16230	22000	11800	16000	14010	19000
	42.80	55	9590	13000	11800	16000	6270	8500	7520	10200
		75	11800	16000	14010	19000	7080	9600	9220	12500
		80	12500	17000	14750	20000	7740	10500	9960	13500
		85	12890	17480	15120	20500	8850	12000	11070	15010
		90	13280	18000	15490	21000	9960	13500	12170	16500
		95	14010	19000	16230	22000	10690	14500	12910	17500
		110	15120	20500	17330	23500	11430	15500	13650	18500
		125	16600	22500	18810	25500	13650	18500	15860	21500
	45.30	55	10330	14000	12540	17000	6790	9200	8110	11000
		75	12540	17000	14750	20000	7740	10500	9960	13500
		80	13280	18000	15490	21000	8480	11500	10690	14500
		85	13650	18500	15860	21500	9590	13000	11800	16000
		90	14010	19000	16230	22000	10690	14500	12910	17500
		95	14750	20000	16600	22500	11430	15500	13650	18500
		110	15860	21500	18070	24500	12170	16500	14380	19500
		125	17330	23500	19550	26500	14380	19500	16600	22500
8-5/8 (219.1)	32.00	55	6490	8800	8110	11000	4720	6400	5900	8000
		75	7010	9500	9960	13500	5530	7500	7010	9500
		80	7380	10000	9590	13000	5900	8000	7380	10000
		85	8120	11010	10330	14010	6490	8800	8120	11010
		90	8850	12000	11060	15000	7080	9600	8850	12000
		95	9220	12500	11430	15500	7380	10000	9220	12500
		110	10330	14000	12540	17000	8110	11000	10330	14000
		125	11060	15000	13280	18000	8850	12000	11060	15000
	36.00	55	7380	10000	9590	13000	5310	7200	6640	9000
		75	8480	11500	10690	14500	6710	9100	8480	11500
		80	8850	12000	11060	15000	7080	9600	8850	12000
		85	9590	13000	11800	16000	7600	10300	9590	13000
		90	10320	14000	12540	17000	8110	11000	10320	14000
		95	10690	14500	12910	17500	8480	11500	10690	14500
		110	11800	16000	14010	19000	9590	13000	11800	16000
		125	12540	17000	14750	20000	10330	14000	12540	17000
	40.00	55	8850	12000	11060	15000	5900	8000	7380	10000
		75	10690	14500	12910	17500	7380	10000	9590	13000
		80	11060	15000	13280	18000	7740	10500	9960	13500
		85	11800	16000	14020	19010	8670	11750	10880	14750
		90	12540	17000	14750	20000	9590	13000	11800	16000
		95	12910	17500	15120	20500	9960	13500	12170	16500
		110	14010	19000	16230	22000	11800	16000	14010	19000
		125	14750	20000	16970	23000	12540	17000	14750	20000
	44.00	55	10330	14000	12540	17000	6490	8800	8110	11000
		75	12170	16500	14380	19500	8480	11500	10690	14500
		80	12540	17000	14750	20000	8850	12000	11060	15000
		85	13280	18010	15490	21000	9770	13250	11990	16290
		90	14010	19000	16230	22000	10690	14500	12910	17500
		95	14380	19500	16600	22500	11060	15000	13280	18000
		110	15490	21000	17700	24000	12540	17000	14750	20000
		125	16600	22500	18810	25500	13280	18000	15490	21000

Data provided by Mannesmann.

MANNESMANN BDS CASING
RECOMMENDED MAKE-UP TORQUES

CARBON STEEL

OD (in) (mm)	WT. (lb/ft)	SMYS 1000 psi	MAKE-UP TORQUE							
			REGULAR COUPLING				SPECIAL CLEARANCE			
			minimum		maximum		minimum		maximum	
			(FT-LB)	(Nm)	(FT-LB)	(Nm)	(FT-LB)	(Nm)	(FT-LB)	(Nm)
8 5/8 (219,1)	49.00	55	11800	16000	14010	19000	7080	9600	8850	12000
		75	13640	18500	15860	21500	9220	12500	11430	15500
		80	14010	19000	16230	22000	9590	13000	11800	16000
		85	14750	20000	16970	23010	10700	14510	12910	17500
		90	15490	21000	17700	24000	11800	16000	14010	19000
		95	15860	21500	18070	24500	12170	16500	14380	19500
		110	16600	22500	18810	25500	14010	19000	16230	22000
		125	16600	22500	18810	25500	14380	19500	16600	22500
	52.00	55	12540	17000	14750	20000	7740	10500	9510	12900
		75	14380	19500	16600	22500	9960	13500	12170	16500
		80	15120	20500	17330	23500	10330	14000	12540	17000
		85	15680	21260	17890	24260	11440	15510	13650	18510
		90	16230	22000	18440	25000	12540	17000	14750	20000
		95	16600	22500	18810	25500	12910	17500	15120	20500
		110	16600	22500	18810	25500	14750	20000	16970	23000
		125	16600	22500	18810	25500	15120	20500	17330	23500
9-5/8 (244.5)	40.00	55	8110	11000	10320	14000	5900	8000	7380	10000
		75	10330	14000	12540	17000	8110	11000	10330	14000
		80	10690	14500	12910	17500	8480	11500	10690	14500
		85	11620	15750	13830	18750	9410	12760	11620	15750
		90	12540	17000	14750	20000	10330	14000	12540	17000
		95	13280	18000	15490	21000	10690	14500	12910	17500
		110	15490	21000	17700	24000	12540	17000	14750	21000
		125	17330	23500	19550	26500	14380	19500	16600	22500
	43.50	55	9590	13000	11800	16000	7080	9600	8850	12000
		75	11800	16000	14010	19000	9590	13000	11800	16000
		80	12170	16500	14380	19500	9960	13500	12170	16500
		85	13090	17750	15310	20760	10880	14750	10390	17750
		90	14010	19000	16230	22000	11800	16000	14010	19000
		95	14750	20000	16970	23000	12170	16500	14380	19500
		110	17330	23500	19550	26500	14010	19000	16230	22000
		125	17330	23500	19550	26500	15860	21500	18070	24500
	47.00	55	11060	15000	13280	18000	7740	10500	9960	13500
		75	12540	17000	14750	20000	10320	14000	12540	17000
		80	12910	17500	15120	20500	10690	14500	12910	17500
		85	14390	19510	16600	22510	11620	15750	13830	18750
		90	15860	21500	18070	24500	12540	17000	14750	20000
		95	16600	22500	18810	25500	12910	17500	15120	20500
		110	17330	23500	19550	26500	14750	20000	16970	23000
		125	17330	23500	19550	26500	17330	23500	19550	26500
	53.50	55	12540	17000	14750	20000	8850	12000	11060	15000
		75	14010	19000	16230	22000	11800	16000	14010	19000
		80	14380	19500	16600	22500	12170	16500	14380	19500
		85	15860	21500	18080	24510	13090	17750	15310	20760
		90	17330	23500	19550	26500	14010	19000	16230	22000
		95	17330	23500	19550	26500	14380	19500	16600	22500
		110	17330	23500	19550	26500	16230	22000	18440	25000
		125	17330	23500	19550	26500	17330	23500	19550	26500
	58.40	55	13640	18500	15860	21500	9590	13000	11800	16000
		75	15120	20500	17330	23500	12910	17500	15120	20500
		80	15490	21000	17700	24000	13280	18000	15490	21000
		85	16410	22250	18630	25260	14760	20010	16970	23010
		90	17330	23500	19550	26500	16230	22000	18440	25000
		95	17330	23500	19550	26500	16600	22500	18810	25500
		110	17330	23500	19550	26500	17330	23500	19550	26500
		125	17330	23500	19550	26500	17330	23500	19550	26500

Data provided by Mannesmann.

MANNESMANN BDS CASING
RECOMMENDED MAKE-UP TORQUES

CARBON STEEL

OD (in) (mm)	WT. (lb/ft)	SMYS 1000 psi	MAKE-UP TORQUE							
			REGULAR COUPLING				SPECIAL CLEARANCE			
			minimum		maximum		minimum		maximum	
			(FT-LB)	(Nm)	(FT-LB)	(Nm)	(FT-LB)	(Nm)	(FT-LB)	(Nm)
9-5/8 (244.5)	61.10	55	14380	19500	16600	22500	10180	13800	12390	16800
		75	15860	21500	18070	24500	13640	18500	15860	21500
		80	16230	22000	18440	25000	14010	19000	16230	22000
		85	16780	22750	19000	25760	15670	21250	17890	24260
		90 TO 125	17330	23500	19550	26500	17330	23500	19550	26500
10-3/4 (273,10)	40.50	55	8110	11000	10330	14000	6490	8800	8110	11000
		75	11060	15000	13280	18000	8850	12000	11060	15000
		80	11800	16000	14010	19000	9590	13000	11800	16000
		85	12720	17250	14940	20260	10330	14010	12540	17000
		90	13640	18500	15860	21500	11060	15000	13280	18000
		95	14380	19500	16600	22500	11800	16000	14010	19000
		110	16600	22500	18810	25500	14010	19000	16230	22000
		125	18440	25000	20650	28000	16230	22000	18440	25000
	45.50	55	11060	15000	13280	18000	7380	10000	9590	13000
		75	12540	17000	14750	20000	10330	14000	12540	17000
		80	13280	18000	15490	21000	11060	15000	13280	18000
		85	14020	19010	16230	22000	11800	16000	14020	19010
		90	14750	20000	16970	23000	12540	17000	14750	20000
		95	15490	21000	17700	24000	13280	18000	15490	21000
		110	17700	24000	19910	27000	15490	21000	17700	24000
		125	18440	25000	20650	28000	17700	24000	19910	27000
	51.00	55	12540	17000	14750	20000	8850	12000	11060	15000
		75	14010	19000	16230	22000	12540	17000	14750	20000
		80	14750	20000	16970	23000	13280	18000	15490	21000
		85	15680	21260	17890	24260	14020	19010	16230	22000
		90	16600	22500	18810	25500	14750	20000	16970	23000
		95	17330	23500	19550	26500	15490	21000	17700	24000
		110	18440	25000	20650	28000	16970	23000	19180	26000
		125	18440	25000	20650	28000	18440	25000	20650	28000
	55.50	55	14380	19500	16600	22500	9960	13500	12170	16500
		75	15860	21500	18070	24500	13640	18500	15860	21500
		80	16600	22500	18810	25500	14380	19500	16600	22500
		85	17520	23750	19730	26750	15120	20500	17340	23510
		90	18440	25000	20650	28000	15860	21500	18070	24500
		95	18440	25000	20650	28000	16970	23000	19180	26000
		110	18440	25000	20650	28000	18440	25000	20650	28000
		125	18440	25000	20650	28000	18440	25000	20650	28000
	60.70	55	16230	22000	18440	25000	11060	15000	13280	18000
		75	17700	24000	19910	27000	15120	20500	17330	23500
		80	18440	25000	20650	28000	15860	21500	18070	24500
		85	18440	25000	20650	28000	16420	22260	18620	25250
		90	18440	25000	20650	28000	16970	23000	19180	26000
		95 TO 125	18440	25000	20650	28000	18440	25000	20650	28000
	65.70	55	18440	25000	20650	28000	12540	17000	14750	20000
		75	18440	25000	20650	28000	16230	22000	18440	25000
		80	18440	25000	20650	28000	16970	23000	19180	26000
		85	18440	25000	20650	28000	17710	24010	19920	27010
		90 TO 125	18440	25000	20650	28000	18440	25000	20650	28000

***NOTE -** FOR BDS CONNECTIONS IN GRADES HIGHER THAN 125 ksi SMYS, PLEASE CONTACT YOUR NEAREST MANNESMANN REPRESENTATIVE.

Data provided by Mannesmann.

MANNESMANN BDS CASING
RECOMMENDED MAKE-UP TORQUES

CARBON STEEL

OD (in) (mm)	WEIGHT (lb/ft)	SMYS 1000 psi	MAKE-UP TORQUE minimum (FT-LB)	minimum (Nm)	maximum (FT-LB)	maximum (Nm)	optimum (FT-LB)	optimum (Nm)
	47.00		12540	17000	14750	20000	13280	18000
	54.00		15490	21000	17700	24000	16230	22000
	60.00	55	18440	25000	20650	28000	19180	26000
	65.00							
	71.00		19180	26000	21390	29000	19910	27000
	75.00							
	47.00		14750	20000	16970	23000	15490	21000
	54.00		17700	24000	19910	27000	18440	25000
	60.00							
	65.00	75	19180	26000	21390	29000	19910	27000
	71.00							
	75.00							
11-3/4	47.00		16230	22000	18440	25000	16970	23000
	54.00							
	60.00							
	65.00	80	19180	26000	21390	29000	19910	27000
	71.00							
(298,4)	75.00							
	47.00		17710	24010	19920	27010	18450	25010
	54.00							
	60.00							
	65.00	85	19180	26000	21390	29000	19910	27000
	71.00							
	75.00							
		90						
	ALL	TO	19180	26000	21390	29000	19910	27000
	WTS.	125						
	54.50		16970	23000	19180	26000	17700	24000
	61.00							
	68.00							
13-3/8	72.00	55	19910	27000	22130	30000	20650	28000
	77.00							
	80.70							
(339,7)	85.00							
		75						
	ALL	TO	19910	27000	22130	30000	20650	28000
	WTS.	125						

**NOTE - FOR BDS CONNECTIONS IN GRADES HIGHER THAN 125 ksi SMYS, PLEASE CONTACT YOUR NEAREST MANNESMANN REPRESENTATIVE.

Data provided by Mannesmann.

MANNESMANN BDS CASING
RECOMMENDED MAKE-UP TORQUES

13% chromium steel MW Cr 13

OD (in) (mm)	WT. (lb/ft)	GRADE	MAKE-UP TORQUE							
			REGULAR COUPLING				SPECIAL		CLEARANCE	
			minimum		maximum		minimum		maximum	
			(FT-LB)	(Nm)	(FT-LB)	(Nm)	(FT-LB)	(Nm)	(FT-LB)	(Nm)
4-1/2 (114,3)	16.20	MW Cr 13-80	5240	7100	6400	8700	3760	5100	4720	6400
	21.60		5900	8000	7450	10100	4130	5600	5160	7000
	16.20	MW Cr 13-95	6110	8280	7610	10320	4500	6100	5610	7600
	21.60		6730	9120	8410	11400	4870	6600	6050	8200
5 (127,0)	15.00	MW Cr 13-80	4000	5400	4950	6700	3170	4300	3980	5400
	18.00		5160	7000	6340	8600	3690	5000	4570	6200
	15.00	MW Cr 13-95	4510	6120	5660	7670	3690	5000	4650	6300
	18.00		5660	7670	7080	9600	4280	5800	5310	7200
5-1/2 (139,7)	15.50	MW Cr 13-80	4000	5400	4950	6700	3320	4500	4130	5600
	17.00		4800	6500	6000	8130	3840	5200	4800	6500
	20.00		6200	8400	7670	10400	4280	5800	5380	7300
	23.00		6700	9100	8400	11400	4720	6400	5900	8000
	15.50	MW Cr 13-95	4510	6120	5660	7670	3760	5100	4720	6400
	17.00		5480	7430	6900	9360	4500	6100	5610	7600
	20.00		7080	9600	8860	12010	5090	6900	6340	8600
	23.00		7790	10560	9730	13190	5530	7500	6930	9400
6-5/8 (168,23)	20.00	MW Cr 13-80	5300	7190	6650	9020	4430	6000	5530	7500
	24.00		7080	9600	8850	12000	5900	8000	7380	10000
	28.00		9750	13200	12390	16800	6490	8800	8110	11000
	32.00		9750	13200	12390	16800	7080	9600	8850	12000
	20.00	MW Cr 13-95	6370	8640	7970	10810	5310	7200	6640	9000
	24.00		8500	11520	10620	14400	7080	9600	8850	12000
	28.00		11510	15610	14160	19200	7380	10000	9590	13000
	32.00		11510	15610	14160	19200	8110	11000	10330	14000
7 (177,8)	23.00	MW Cr 13-80	6800	9200	8500	11500	5900	8000	7380	10000
	26.00		8150	11050	10180	13800	6490	8800	8110	11000
	29.00		10180	13800	12750	17300	7080	9600	8850	12000
	32.00		11050	15000	13570	18400	7380	10000	9590	13000
	35.00		11050	15000	13570	18400	7740	10500	9960	13500
	38.00		11050	15000	13570	18400	8110	11000	10330	14000
	23.00	MW Cr 13-95	7460	10110	9330	12650	6490	8800	8110	11000
	26.00		9330	12650	11880	16110	7380	10000	9590	13000
	29.00		12720	17250	15270	20700	8110	11000	10330	14000
	32.00		13570	18400	16110	21840	8850	12000	11060	15000
	35.00		13570	18400	16110	21840	9590	13000	11800	16000
	38.00		13570	18400	16110	21840	9960	13500	12170	16500
7 5/8 (193,7)	26.40	MW Cr 13-80	7800	10600	9750	13200	5160	7000	6490	8800
	29.70		9750	13200	12390	16800	5610	7600	7010	9500
	33.70		12390	16800	15050	20400	6490	8800	8110	11000
	39.00		12390	16800	15050	20400	7080	9600	8850	12000
	26.40	MW Cr 13-95	8860	12010	11060	15000	5900	8000	7380	10000
	29.70		11510	15610	14160	19200	6790	9200	8480	11500
	33.70		14160	19200	16810	22790	7380	10000	9220	12500
	39.00		14160	19200	16810	22790	8550	12000	11060	15000
8 5/8 (219,1)	32.00	MW Cr 13-80	8850	12000	11500	15600	5900	8000	7380	10000
	36.00		10620	14400	13280	18000	7080	9600	8850	12000
	40.00		13280	18000	15930	21600	7740	10500	9960	13500
	44.00		15050	20410	17700	24000	8850	12000	11060	9590
	49.00		15050	20410	17700	24000	9590	13000	11800	16000
	32.00	MW Cr 13-95	10620	14400	13270	17990	7080	9600	8110	11000
	36.00		12400	16810	15050	20410	8110	11000	10330	14000
	40.00		15050	20410	17700	24000	9590	13000	11800	16000
	44.00		15050	20410	17700	24000	11060	15000	13280	18000
	49.00		15050	20410	17700	24000	11800	16000	14010	19000

Data provided by Mannesmann.

BAKER OIL TOOLS
A Baker Hughes company

MANNESMANN BDS CASING RECOMMENDED MAKE-UP TORQUES

13% chromium steel MW Cr 13

OD (in) (mm)	WT. (lb/ft)	GRADE	MAKE-UP TORQUE							
			REGULAR COUPLING				SPECIAL CLEARANCE			
			minimum		maximum		minimum		maximum	
			(FT-LB)	(Nm)	(FT-LB)	(Nm)	(FT-LB)	(Nm)	(FT-LB)	(Nm)
9-5/8 (244,5)	40.00	MW Cr 13-80	12390	16800	15050	20400	8110	11000	10330	14000
	43.50		14160	19200	16820	22800	9590	13000	11800	16000
	47.00		15050	20410	17700	24000	10330	14000	12540	17000
	53.00		15050	20410	17700	24000	11800	16000	14010	19000
	40.00	MW Cr 13-95	15050	20410	17700	24000	10330	14000	12540	17000
	43.50		15050	20410	17700	24000	11800	16000	14010	19000
	47.00		15050	20410	17700	24000	12540	17000	14750	20000
	53.00		15050	20410	17700	24000	12540	17000	14750	20000

MANNESMANN MUST CASING RECOMMENDED MAKE-UP TORQUES

OD (in) (mm)	WEIGHT (lb/ft)	WALL (in)	TYPE*	GRADE	MAKE-UP TORQUE			
					FT-LB		Nm	
					min.	max.	min.	max.
5-1/2 (139,7)	32	0.612	NU	C-75	5200	6600	7000	9000
				L-80	5200	6600	7000	9000
				C-95	6600	8100	9000	11000
				P-110	8100	9600	11000	13000
7-5/8 (193,7)	59	0.811	NU	C-75	11060	13280	15000	18000
				L-80	11060	13280	15000	18000
				C-95	12540	15490	17000	21000
				P-110	14010	16960	19000	23000
7-5/8 (193,7)	53	0.712	IU	C-75	11060	13280	15000	18000
				L-80	11060	13280	15000	18000
				C-95	12540	15490	17000	21000
				P-110	14010	16960	19000	23000
10-3/4 (273,1)	109	1.033	NU	C-75	14750	18440	20000	25000
				L-80	14750	18440	20000	25000
				C-95	14750	18440	20000	25000
				P-110	14750	18440	20000	25000
10-3/4 (273,1)	109	1.033	IEU	C-75	14750	18440	20000	25000
				L-80	14750	18440	20000	25000
				C-95	14750	18440	20000	25000
				P-110	14750	18440	20000	25000

*CONNECTION TYPE:

Non Upset	NU
Internal Upset	IU
Internal-External Upset	IEU

ADDITIONAL INFORMATION

FOR INFORMATION AND RUNNING RECOMMENDATIONS FOR THE FOLLOWING CONNECTIONS, PLEASE CONTACT YOUR NEAREST MANNESMANN REPRESENTATIVE:

	SIZE RANGE
MOS	7-5/8" — 16"
HPC	5" — 16"
BDS-TG (Tubing)	5", 5-1/2", & 7"
MID OMEGA	9-5/8" — 13-5/8"

Data provided by Mannesmann.

MANNESMANN BIG OMEGA CASING RECOMMENDED MAKE-UP TORQUES**

OD	WEIGHT	WALL	OPTIMUM MAKE-UP TORQUE VALUES WITH (WITH API MODIFIED THREAD COMPOUND)					
			J-55 K-55	C-75 N-80 L-80	C-95 P-110	J-55 K-55	C-75 N-80 L-80	C-95 P-110
(in) (mm)	(lb/ft)	(in)	FT-LB (± 1500 FT-LB)			Nm (± 2000 Nm)		
	82.50	0.562	8500	9500	11000	11500	13000	15000
14	94.80	0.656	9000	10000	11000	12000	13500	15000
(355,6)	99.30	0.688	9000	10000	11000	12000	13500	15000
	111.00	0.779	9000			12000		
	75.00	0.438	8000			10500		
	84.00	0.495	8500	9500		11500	13000	
16	94.50	0.562	9500	10500		13000	14000	
(406,4)	109.00	0.656	10000	11000		13500	15000	
	118.00	0.715	10500	11500		14000	15500	
	128.00	0.781	11000	12000		15000	16500	
	87.50	0.435	9500	10500		13000	14000	
	96.50	0.485	10500	11500		14000	15500	
18 5/8	109.35	0.563	11500	12500		15500	17000	
(473,1)	112.00	0.579	11500	12500	14000	15500	17000	19000
	136.00	0.693	12000	13000	15000	16500	17500	20500
	94.00	0.438	9500			13000		
	106.50	0.500	10500			14000		
20	117.00	0.563	11000	12500	14500	15000	17000	20000
(508,0)	133.00	0.635	11500	13000	15500	15500	17500	21000
	147.00	0.709	12000	13500	15500	16500	18500	21000
	169.00	0.812	12000	13500	16000	16500	18500	22000
	162.00	0.635	12000	13000		16500	18000	
24	174.00	0.688	12000	13000		16500	18000	
(609,6)	189.00	0.750	12500	13500		17000	18500	
	203.00	0.812	13000			18000		
	140.00	0.531	11500			15500		
24 1/2	165.00	0.635	12500	13500		17000	18500	
(622,3)	182.00	0.709	13000	14000		17500	19000	
	207.00	0.812	13500			18500		
	207.00	0.750	13500	14500		18500	20000	
26	223.00	0.812	14500	15500		20000	21000	
(660,4)	237.00	0.866	15000	16500	20500	20500	22500	28000
	270.00	1.000	15500	17500		21000	24000	

Commonly experienced torque factors:

API modified thread compound 1.0

Liquid-O-Ring 104 .75

For additional torque factors, please consult thread compound manufacturer.

** With Big Omega connections, a triangle stamp serves as additional orientation for proper make-up. Proper make-up is obtained when the coupling face has advanced to a point between 5/16" from the triangle base and not closer than 1/4" from the apex of the triangle. Nominal make-up occurs when the coupling face has advanced to the base of the triangle. Make-up torques may be adjusted to produce this position make-up.

Data provided by Mannesmann.

VAM® FJL Recommended Make-Up Torque*

Size (O.D.)	Nominal Wt.	Wall Thickness	75-80-85 ksi			90-95 -100 ksi			105-110-115 ksi			120-125-130 ksi			135-140 ksi			145 -150-155 ksi		
			min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.
in. *mm.*	lb./ft.	in. *mm.*									ft.lb *m.kg*									
4-1/2 *114,3*	11.60	0.25 *6,35*	1960	2176 *300*	2380	2160	2390 *330*	2620	2420	2680 *370*	2940	2680	2970 *410*	3260	2940	3260 *450*	3580	3190	3540 *490*	3890
	12.60	0.271 *6,88*	2020	2240 *310*	2460	2220	2460 *340*	2700	2480	2750 *380*	3020	2740	3040 *420*	3340	3000	3330 *460*	3660	3260	3620 *500*	3980
	13.50	0.29 *7,37*	2090	2320 *320*	2550	2280	2530 *350*	2780	2540	2820 *390*	3100	2800	3110 *430*	3410	3060	3400 *470*	3740	3330	3690 *510*	4050
	15.10	0.337 *8,56*	2280	2530 *350*	2780	2480	2750 *380*	3020	2740	3040 *420*	3340	3000	3330 *460*	3660	3190	3S40 *490*	3890	3520	3910 *540*	4300
	16.90	0.380 *9,65*	2480	2750 *380*	3020	2740	3040 *420*	3340	3000	3330 *460*	3690	3260	3620 *500*	3980	3520	3910 *540*	4300	3850	4270 *590*	4690
	18.80	0.430 *10,92*	2680	2970 *410*	3260	2940	3260 *450*	3580	3330	3690 *510*	4050	3590	3980 *550*	4370	3850	4270 *590*	4690	4230	4700 *650*	5170
	21.60	0.500 *12,70*	3000	3330 *460*	3660	3260	3620 *500*	3980	3650	4050 *560*	4450	3910	4340 *600*	4770	4300	4770 *660*	5240	4560	5060 *700*	5560
	24.60	0.560 *14,22*	3000	3330 *460*	3660	3520	3910 *540*	4300	3910	4340 *600*	4770	4230	4700 *650*	5170	4560	5060 *700*	6560	4890	5430 *750*	5970
5 *127,0*	13.00	0.25 *6,43*	1630	1810 *250*	1990	1890	2100 *290*	2310	2160	2390 *330*	2620	2420	2880 *370*	2940	2610	2890 *400*	3170	2800	3110 *430*	3420
	15.00	0.296 *7,52*	1760	1950 *270*	2140	2020	2240 *310*	2460	2280	2530 *350*	2780	2480	2750 *380*	3020	2680	2970 *410*	3260	2940	3260 *450*	3580
	18.00	0.362 *9,19*	2870	3180 *440*	3490	3000	3330 *460*	3660	3260	3620 *500*	3980	3590	3980 *550*	4370	3850	4270 *590*	4690	4170	4630 *640*	5090
	20.30	0.408 *10,36*	3190	3540 *490*	3890	3390	3760 *520*	4130	3590	3980 *550*	4370	3780	4200 *580*	4620	4040	4480 *620*	4920	4370	4850 *670*	5330
	20.80	0.422 *10,72*	3450	3830 *530*	4210	3590	3980 *550*	4370	3710	4120 *570*	4530	3850	4270 *590*	4690	4110	4560 *630*	5010	4220	4920 *680*	5410
	21.40	0.437 *11,10*	3520	3910 *540*	4300	3780	4200 *580*	4620	3910	4340 *600*	4770	4040	4480 *620*	4920	4230	4700 *650*	5170	4500	4990 *690*	5480
	23.20	0.478 *12,14*	3590	3980 *550*	4370	3910	4340 *600*	4770	4230	4700 *650*	5170	4630	5140 *710*	5650	4760	5280 *730*	5800	4890	5430 *750*	5970
	24.10	0.500 *12,70*	3650	4050 *560*	4450	4040	4480 *620*	4920	4430	4920 *660*	5410	4760	5280 *730*	5800	4890	5430 *750*	5970	5020	5570 *770*	6120
5-1/2 *139,7*	15.50	0.275 *6,99*	2420	2680 *370*	2940	2740	3040 *420*	3340	3130	3470 *480*	3810	3450	3830 *530*	4210	3780	4200 *580*	4620	4040	4480 *620*	4920
	17.00	0.304 *7,72*	2540	2820 *390*	3100	2870	3180 *440*	3490	3190	3540 *490*	3890	3590	3980 *550*	4370	3850	4270 *590*	4690	3810	4230 *640*	4650
	20.00	0.361 *9,17*	3190	3540 *490*	3890	3650	4050 *560*	4450	4040	4480 *620*	4920	4500	4990 *690*	5480	4890	5430 *750*	5970	5340	5930 *820*	6520
	23.00	0.415 *10,54*	3850	4270 *590*	4690	3970	4410 *610*	4850	4370	4850 *670*	5330	4760	5280 *730*	5800	5140	5710 *790*	6280	5540	6150 *850*	6760
	26.00	0.476 *12,09*	3810	4230 *640*	4650	4430	4920 *680*	5410	4690	5210 *720*	5730	5080	5640 *780*	6200	5480	6080 *840*	6680	5860	6510 *900*	7160
	28.40	0.530 *13,46*	4430	4920 *680*	5410	5080	5640 *780*	6200	5280	5860 *810*	6440	5400	6000 *830*	6600	5800	6440 *890*	7080	6190	6870 *950*	7550

Data reprinted from VAM literature, RDPF-91, dated January 1991.

1 ksi = 1000 psi

VAM® FJL
Recommended Make-Up Torque*

Size (O.D.)	Nominal Wt.	Wall Thickness	75-80-85 ksi			90-95 -100 ksi			105-110-115 ksi			120-125-130 ksi			135-140 ksi			145 -150-155 ksi		
			min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.
in. *mm.*	lb./ft.	in. *mm.*	ft.lb *m.kg*																	
6-5/8 *168,3*	23.20	0.300 *8,38*	4230	4700	5170	4890	5430	5970	5540	6150	6760	6190	6070	7550	6840	7600	8360	7490	5320	9150
	24.00	0.352 *8,94*	4370	4850	5330	5020	5570	6120	5670	6290	6910	6320	7020	7720	6840	7600	8360	7490	8320	9150
	28.00	0.417 *10,59*	4690	5210	5730	5340	5930	6520	5990	6650	7310	6510	7230	7950	7170	7960	8750	7820	8680	9540
	32.00	0.475 *12,07*	5020	5570	6120	5670	6290	6910	6320	7020	7720	6840	7600	8360	7490	8320	9150	8140	9040	9940
	35.00	0.525 *13,34*	5340	5930	6520	5990	6650	7310	6510	7230	7950	7170	7960	8750	7820	8680	9540	8460	9400	10340
7 *177,8*	23.00	0.317 *8,05*	5280	5860	6440	6060	6730	7400	6840	7600	8360	7490	8320	9150	8460	9400	10340	9150	10150	11150
	26.00	0.362 *9,19*	5480	6080	6680	6250	6940	7630	7170	7960	8750	7820	8680	9540	8460	9400	10340	9150	10150	11150
	29.00	0.408 *10,36*	5740	6370	7000	6510	7230	7950	7170	7960	8750	8140	9040	9940	8800	9770	10740	9500	10500	11500
	32.00	0.453 *11,51*	6060	6730	7400	6840	7600	8360	7490	8320	9150	8460	9400	10340	9150	10150	11150	9850	10850	11850
	35.00	0.498 *12,65*	6390	7090	7790	7170	7960	8750	7820	8680	9540	8800	9770	10740	9500	10500	11500	10100	11200	12300
	38.00	0.54 *13,72*	6840	7600	8360	7490	8320	9150	8140	9040	9940	9150	10150	11150	9850	10850	11850	10450	11550	12650
	41.00	0.590 *14,99*	7170	7960	8750	7820	8680	9540	8800	9770	10740	9500	10500	11500	10100	11200	12300	10850	11950	13050

Data reprinted from VAM literature, RDPF-91, dated January 1991.

1 Ksi = 1000 psi

VAM® FJL
Recommended Make-Up Torque*

Size (O.D.)	Nominal Wt.	Wall Thickness	75-80-85 ksi			90-95 -100 ksi			105-110-115 ksi			120-125-130 ksi			135-140 ksi			145 -150-155 ksi		
			min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.
in. *mm.*	lb./ft.	in. *mm.*	ft.lb *m.kg*																	
	26.40	0.328	6390	7090	7790	7490	8320	9150	8460	9400	10340	9500	10500	11500	10100	11200	12300	11100	12300	13500
		8,33		*980*			*1150*			*1300*			*1450*			*1550*			*1700*	
	29.70	0.375	6510	7230	7950	7490	8320	9150	8460	9400	10340	9500	10500	11500	10450	11550	12650	11450	12650	13850
		9,53		*1000*			*1150*			*1300*			*1450*			*1600*			*1750*	
7-5/8	33.70	0.430	6840	7600	8360	7820	8680	9540	8800	9770	10740	9850	10850	11850	10850	11950	13050	11450	12650	13850
193,7		*10,92*		*1050*			*1200*			*1350*			*1500*			*1650*			*1750*	
	35.80	0.465	7170	7960	9750	8140	9040	9940	9150	10150	11150	10100	11200	12300	10850	11950	13050	11700	13000	14300
		11,81		*1100*			*1250*			*1400*			*1550*			*1650*			*1800*	
	39.00	0.500	7490	8320	9150	8460	9400	10340	9500	10500	11500	10450	11550	12650	11100	12300	13500	12100	13400	14700
		12,70		*1150*			*1300*			*1450*			*1600*			*1700*			*1850*	
	42.80	0.562	7820	8680	9540	8800	9770	10740	9850	10850	11850	10850	11950	13050	11700	13000	14300	12450	13750	15050
		14,27		*1200*			*1350*			*1500*			*1650*			*1800*			*1900*	
	32.00	0.352	8140	9040	9940	9500	10500	11500	10850	11950	13050	12100	13400	14700	13050	14450	15850	14400	15900	17400
		8,94		*1250*			*1450*			*1650*			*1850*			*2000*			*2200*	
	36.00	0.400	8460	9400	10340	9850	10850	11850	11100	12300	13500	12450	13750	15050	13050	14450	15850	14400	15900	17400
		10,16		*1300*			*1500*			*1700*			*1900*			*2000*			*2200*	
8-5/8	40.00	0.450	8800	9770	10740	10100	11200	12300	11100	12300	13500	12450	13750	15050	13700	15200	16700	14400	15900	17400
219,1		*11,43*		*1350*			*1550*			*1700*			*1900*			*2100*			*2200*	
	44.00	0.500	9150	10150	11500	10450	11550	12650	11700	13000	14300	13050	14450	15850	13700	15200	16700	14400	15900	17400
		12,70		*1400*			*1600*			*1800*			*2000*			*2100*			*2200*	
	49.00	0.557	9850	10850	11850	10850	11950	13050	12100	13400	14700	13050	14450	15850	14400	15900	17400	14400	15900	17400
		14,15		*1500*			*1650*			*1850*			*2000*			*2200*			*2200*	
	52.00	0.595	10100	11200	12300	11450	12650	13850	12700	14100	15500	13700	15200	16700	14400	15900	17400	14400	15900	17400
		15,11		*1550*			*1750*			*1950*			*2100*			*2200*			*2200*	

Data reprinted from VAM literature, RDPF-91, dated January 1991.

1 Ksi = 1000 psi

VAM® FJL
Recommended Make-Up Torque*

Size (O.D.)	Nominal Wt.	Wall Thickness	75-80-85 ksi			90-95 -100 ksi			105-110-115 ksi			120-125-130 ksi			135-140 ksi			145 -150-155 ksi		
			min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.	min.	opt.	max.
in. *mm.*	lb./ft.	in. *mm.*	ft.lb *m.kg*																	
9-5/8 *244,5*	36.00	0.352 *8,94*	10100	11200	12300	11700	13000 *1800*	14300	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	40.00	0.395 *10,03*	10450	11550 *1600*	12650	12100	13400 *1850*	14700	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	43.50	0.435 *11,05*	10850	11950 *1650*	13050	12450	13750 *1900*	15050	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	47.00	0.472 *11,99*	11100	12300 *1700*	13500	12700	14100 *1950*	15500	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	53.50	0.545 *13,84*	11700	13000 *1800*	14300	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	58.40	0.595 *15,11*	12100	13400 *1850*	14700	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	59.40	0.609 *15,47*	12100	13400 *1850*	14700	13700	15200 *2200*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	61.10	0.625 *15,88*	12450	13750 *1900*	15050	13700	15200 *2100*	16700	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
10-3/4 *273,0*	40.50	0.350 *8,89*	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	45.50	0.400 *10,16*	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	51.00	0.450 *11,43*	13050	14450 *2000*	15850	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	55.50	0.495 *12,57*	13700	15200 *2100*	16700	14440	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	60.70	0.545 *13,84*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400
	65.70	0.595 *15,11*	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400	14400	15900 *2200*	17400

Data reprinted from VAM literature dated January 1991.

BAKER OIL TOOLS
A Baker Hughes company

Specifications of Fiberglass Casing Manufactured by the Tubular Fiberglass Company, Houston, Texas

Red Box 1250	4-1/2"	5-1/2"	6-5/8"	7-5/8"	9-5/8"
OD (inches)	4.46	4.93	6.10	6.96	8.82
ID (inches)	4.00	4.41	5.44	6.21	7.84
Wall Thickness (inches)	0.24	0.26	0.33	0.38	0.49
Coupling OD (inches)	5.67	6.78	8.00	9.23	11.60
Weight (lb/ft)	2.90	3.70	5.50	7.20	11.90
Burst Rating (psi)	1,250	1,250	1,250	1,250	1,250
Collapse Rating (psi)	900	900	900	900	1,000
Joint Tensile Rating (lbs)	47,200	54,500	73,600	90,700	114,800
8rd Thread Form	4-1/2 EUE Long	5-1/2 LTC	6-5/8 LTC	7-5/8 LTC	9-5/8 LTC

Red Box 1500	4-1/2"	5-1/2"	6-5/8"	7-5/8"	9-5/8"
OD (inches)	4.57	5.05	6.24	7.13	9.03
ID (inches)	4.00	4.41	5.44	6.21	7.84
Wall Thickness (inches)	0.29	0.32	0.40	0.46	0.59
Coupling OD (inches)	5.67	6.78	8.00	9.23	11.60
Weight (lb/ft)	3.40	4.30	6.50	8.50	14.00
Burst Rating (psi)	1,500	1,500	1,500	1,500	1,500
Collapse Rating (psi)	1,500	1,500	1,500	1,500	1,700
Joint Tensile Rating (lbs)	47,800	54,500	73,600	90,700	114,800
8rd Thread Form	4-1/2 EUE Long	5-1/2 LTC	6-5/8 LTC	7-5/8 LTC	9-5/8 LTC

Red Box 2000	4-1/2"	5-1/2"	6-5/8"	7-5/8"	9-5/8"
OD (inches)	4.78	5.28	6.54	7.46	9.47
ID (inches)	4.00	4.41	5.44	6.21	7.84
Wall Thickness (inches)	0.39	0.44	0.55	0.63	0.81
Coupling OD (inches)	5.67	6.78	8.00	9.23	11.60
Weight (lb/ft)	4.60	5.70	8.70	11.40	18.60
Burst Rating (psi)	2,000	2,000	2,000	2,000	2,000
Collapse Rating (psi)	2,600	2,600	2,700	2,700	2,700
Joint Tensile Rating (lbs)	47,800	54,500	73,600	90,700	114,800
8rd Thread Form	4-1/2 EUE Long	5-1/2 LTC	6-5/8 LTC	7-5/8 LTC	9-5/8 LTC

Red Box 2500	4-1/2"	5-1/2"	6-5/8"	7-5/8"	9-5/8"
OD (inches)	5.01	5.53	6.85	7.82	9.82
ID (inches)	4.00	4.41	5.44	6.21	7.84
Wall Thickness (inches)	0.51	0.56	0.71	0.81	0.99
Coupling OD (inches)	5.80	6.78	8.08	9.27	11.73
Weight (lb/ft)	5.90	7.30	11.20	14.50	23.80
Burst Rating (psi)	2,500	2,500	2,500	2,500	2,500
Collapse Rating (psi)	3,300	3,300	3,400	3,400	3,400
Joint Tensile Rating (lbs)	47,200	54,500	73,600	90,700	114,800
8rd Thread Form	4-1/2 EUE Long	5-1/2 LTC	6-5/8 LTC	7-5/8 LTC	9-5/8 LTC

Specifications of Star Fiberglass Casing Manufactured by Fiber Glass Systems, Inc., San Antonio and Big Spring, Texas

1500 DHC*

Size	Nominal (in)	5-1/2	7	9-5/8
Pressure	Rating (psi) (1)	1500	1500	1500
	Star Ultimate (psi) (2)	2,600	2,400	2,400
	ASTM Ultimate D-1599 (psi) (2)	4,600	4,500	4,700
Tensile	Rating (lbs) (1)	48,000	75,000	130,000
	Star Ultimate (lbs) (2)	120,000	140,000	200,000
Collapse	Rating (psi) (1)	1,800	1,800	1,800
	ASTM Ultimate D-2924	3,600	3,600	3,700
Nominal Pipe Dimensions	Inside Diameter (in)	4.75	5.95	7.75
	Min. Drift Dia. (in)	4.69	5.89	7.69
	Outside Diameter (in)	5.43	6.78	8.87
	Wall Thickness (in)	0.34	0.42	0.56
	T&C Coupled Weight (lbs/ft)	4.90	7.61	13.95
	IJ Weight (lbs/ft)	—	7.24	—
	Joint Length (ft)	30 Nom. API Range 2,28 to 32		
Joining System	T&C Collar O.D. (in) (3)	6.60	8.40	11.50
	IJ Box O.D. (in) (3)	—	8.40	—
	Pin Upset O.D. (in)	5.55	7.05	9.65
	Thread size (in)	5-1/2	7	9-5/8
	Thread Length (in)	4.75	4.88	5.13
	Make-up Length Loss (in/jt)	4.50	4.63	4.88
	Thread type (4)	OD 8RD	OD 8RD	OD 8RD
Moduli	Hoop (psi x 10^6)	4.5	4.4	4.8
	Axial (psi x 10^6)	3.0	3.0	2.9
	Poisson's Ratio (minor)	0.24	0.26	0.23

See notes.

Specifications of Star Fiberglass Casing Manufactured by Fiber Glass Systems, Inc., San Antonio and Big Spring, Texas

2000 DHC*

Size	Nominal (in)	5-1/2	7	9-5/8
Pressure	Rating (psi) (1)	2000	2000	2000
	Star Ultimate (psi) (2)	3,100	3,000	2,900
	ASTM Ultimate D-1599 (psi) (2)	5,500	5,600	4,800
Tensile	Rating (lbs) (1)	58,000	90,000	160,000
	Star Ultimate (lbs) (2)	130,000	150,000	210,000
Collapse	Rating (psi) (1)	2,100	2,200	2,200
	ASTM Ultimate D-2924	4,300	4,400	4,400
Nominal Pipe Dimensions	Inside Diameter (in)	4.75	5.95	7.75
	Min. Drift Dia. (in)	4.69	5.89	7.69
	Outside Diameter (in)	5.57	6.99	9.10
	Wall Thickness (in)	0.41	0.52	0.68
	T&C Coupled Weight (lbs/ft)	5.91	9.40	16.63
	IJ Weight (lbs/ft)	—	9.06	—
	Joint Length (ft)	30 Nom. API Range 2,28 to 32		
Joining System	T&C Collar O.D. (in) (3)	7.00	8.75	11.90
	IJ Box O.D. (in) (3)	—	8.70	—
	Pin Upset O.D. (in)	5.55	7.05	9.65
	Thread size (in)	5-1/2	7	9-5/8
	Thread Length (in)	4.75	4.88	5.13
	Make-up Length Loss (in/jt)	4.50	4.63	4.88
	Thread type (4)	OD 8RD	OD 8RD	OD 8RD
Moduli	Hoop (psi x 10^6)	4.50	4.4	4.9
	Axial (psi x 10^6)	3.0	3.0	2.9
	Poisson's Ratio (minor)	0.24	0.25	0.22

***Notes**

1. **Ratings -** All ratings are maximum operating limits. Exceeding these limits will void the warranty on Star pipe.
2. **Ultimates -** Star uses an extended test period to determine ultimate values for pressure and tensile. There is a significant increase in these factors if the ASTM test method is employed. The typical mode of failure for pressure is a weep and for tensile it is an across the joint shear.
3. **Collars -** Smaller O.D. collars available upon request, subject to application approval. Any order for integral joint product may include up to 15% threaded and coupled pipe.
4. **Threads -** EUE 1ORD and EUE 8RD threads conform to API 5B Table 2.6a (L4 is minimum). O.D. 8RD casing threads conform to API 5B Table 2.3 (L4 is minimum).
5. **Thermal Properties -** Coef. of thermal conductivity 2.5 BTU in./HR/SQ FT/DEG.F. (3,1 cal.cm/hr/cm^2 /deg c); Coef. of thermal expansion (axial) 8.7 x 10^{-6} IN/IN/DEG.F. (1,7 cm/cm/deg c).
6. **Flow Factors -** HazenWilliams c = 150; Effective Roughness 0.00006 in.
7. **Physical Properties -** Density (lbs/cu.in) 122; Density (kgs/cu.cm) 3,38; Specific gravity 1.96.

Data reprinted from Star® Fiber Glass Systems, Inc., literature dated January 1, 1993.

Specifications of Centron Fiberglass Epoxy Integral Joint Casing Manufactured by Centron Corporation, Mineral Wells, Texas

Size	Nominal Wall Tk. (inches)	Outside Diameter (Inches)	Maximum Box O.D. (Inches)	Wt/Ft. (Pounds)	Performance Properties @ 75°F					
					Maximum Operating Conditions			Ultimate Physical Values		
					External Collapse (PSI)	Internal Operating (PSI)	Axial Load (Lbs)	Internal Weep (PSI)	External Collapse (PSI)	Axial Wall Load (Lbs)
4-1/2										
DHC150	.150	4.28	5.40	1.75	150	1000	9.0	2500	350	23
DHC200	.200	4.38	5.50	2.40	300	1250	12	3100	750	30
DHC250	.250	4.48	5.60	3.00	550	1500	15	3750	1350	39
DHC300	.300	4.58	5.70	3.60	900	1800	18	4300	2200	48
DHC350	.350	4.68	5.80	4.25	1350	2000	21	4500	3300	57
DHC400	.400	4.78	5.90	4.90	1850	2500	25	5000	4600	65
5										
DHC150	.150	4.63	5.25	1.90	110	900	9.5	2250	275	25
DHC175	.175	4.68	5.40	2.20	160	1000	11	2500	400	29
DHC200	.200	4.73	5.50	2.53	240	1200	13	3000	600	34
DHC250	.250	4.83	5.60	3.20	440	1400	16	3500	1100	43
DHC280	.280	4.89	5.75	3.61	600	1600	18	4000	1600	48
5-1/2										
DHC150	.150	5.15	6.30	2.10	80	800	10	2000	200	28
DHC175	.175	5.20	6.35	2.45	120	900	13	2250	300	32
DHC200	.200	5.25	6.40	2.85	180	1000	14	2500	440	38
DHC250	.250	5.35	6.50	3.60	320	1250	18	3100	800	48
DHC300	.300	5.45	6.60	4.40	520	1500	22	3750	1300	58
DHC350	.350	5.55	6.70	5.15	SW	1800	26	4300	2000	68
DHC400	.400	5.65	6.80	5.90	1150	2000	30	4500	2800	78

Specifications of Centron Fiberglass Epoxy Integral Joint Casing Manufactured by Centron Corporation, Mineral Wells, Texas

Size	Nominal Wall Tk. (inches)	Outside Diameter (Inches)	Maximum Box O.D. (Inches)	Wt/Ft. (Pounds)	Performance Properties @ 75°F					
					Maximum Operating Conditions			Ultimate Physical Values		
					External Collapse (PSI)	Internal Operating (PSI)	Axial Load (Lbs)	Internal Weep (PSI)	External Collapse (PSI)	Axial Wall Load (Lbs)
6-5/8										
DHC200	.200	6.500	8.10	3.52	90	800	18	2000	225	47
DHC250	.250	6.600	8.20	4.50	170	1000	22	2500	425	59
DHC300	.300	6.700	8.35	5.40	290	1250	27	3100	725	72
DHC350	.350	6.800	8.50	6.50	440	1500	32	3750	1100	85
DHC400	.400	6.900	8.65	7.35	620	1650	37	4125	1550	95
DHC450	.450	7.000	8.80	8.40	850	1800	42	4300	2100	111
DHC500	.500	7.100	8.95	9.30	1150	2000	48	4500	2800	120
7										
DHC200	.200	6.800	8.10	3.75	80	800	18	2000	200	49
DHC250	.250	6.900	8.20	4.75	150	1000	24	2500	380	60
DHC300	.300	7.000	8.35	5.70	250	1200	29	3000	625	74
DHC350	.350	7.100	8.40	7.60	400	1400	34	3500	950	86
DHC400	.400	7.200	8.45	7.70	550	1600	39	4000	1350	100
DHC450	.450	7.300	8.55	8.65	750	1750	44	4300	1850	115
DHC500	.500	7.400	8.65	9.65	1000	2000	50	4500	2400	128
9-5/8										
DHC250	.250	8.920	10.10	6.10	70	750	30	1875	175	78
DHC300	.300	9.020	10.25	7.45	120	900	37	2250	300	95
DHC350	.350	9.120	10.40	8.70	180	1000	44	2500	450	114
DHC400	.400	9.220	10.55	9.95	260	1200	50	3000	650	130
DHC450	.450	9.320	10.70	11.25	360	1400	57	3500	900	148
DHC500	.500	9.420	10.90	12.60	480	1500	64	3750	1200	165

Centron® Casing Joints are 29.5' overall with a made-up length of 29.125'.
Data provided by Centron Corporation literature dated 7/92.

1. Ultimate values are at 75°F. 2. Elevated temperature ratings are lower.
3. Chemical compatibility must be determined before use.

Specifications and Physical Properties of Fiberglass Casing Manufactured by Sepma, Mulhouse, France

Nominal Diameter	5-1/2	7	7	7-5/8	8-5/8	9-5/8	10-3/4	13-3/8
Physical Specifications								
Outside Diameter in inches	5.5	7	7	7.625	8.625	9.625	10.750	15.35
Inside Diameter in inches	4.92	6.30	5.91	6.90	7.87	8.58	9.84	13.78
Total Wall Thickness in inches	0.29	0.35	0.55	0.37	0.38	0.52	0.45	0.78
Outside Diameter Coupling in inches	6.50	8.25	8.25	9.125	9.75	11.25	12.625	17.79
Weight Per Foot (lb/ft)	4.1	6.3	9.4	7.4	8.4	12.9	13.1	26.6
Density	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Maximum Operating Specifications at 190°F								
Internal Pressure (psi)	880	850	1380	825	740	940	710	905
External Pressure (psi)	425	425	1000	355	255	355	285	350
Tensile Across Joint (lbs)	27500	44000	48500	50900	59500	79000	65000	100000
Performance Properties								
Burst Pressure (psi)	2148	2085	3471	2014	1895	2407	1842	2150
Collapse Pressure (psi)	890	1571	2143	557	420	855	810	850
Tensile Joint Strength (lbs)	124.340	196.190	307.890	226.000	165.000	246.000	154.000	218.340

Note: Upon request, certain dimensions can be changed in order to obtain different characteristics.
As per API 15 AR
Data provided by Coflexip.

Standard and Line Pipe Data

Seamless, Electric Weld, Plain End

Size Nom.	Size O.D.	Wall Thickness	WT. Plain End		Schedule	Mill Test Pressure	
						Grade A	Grade B
(in.)	(in.)	(in.)	(ft.-lbs.)	Class	No.	PSI	PSI
		.188	27.73			600	700
		.203	29.91			650	760
		.210	30.93			670	790
		.219	32.23			700	820
		.250	36.71			800	940
		.281	41.17			900	1,050
		.312	45.61		20	1,000	1,170
		.344	50.17			1,110	1,290
		.375	54.57	Std.	30	1,210	1,410
		.406	58.94			1,300	1,520
		.438	63.44		40	1,410	1,640
		.459	67.78			1,510	1,760
14	14.000	.500	72.09	XS		1,610	1,880
		.562	80.66			1,810	2,110
		.594	85.05		60	1,910	2,230
		.625	89.28			2,010	2,340
		.688	97.81			2,210	2,580
		.750	106.13		80	2,410	2,800
		.812	114.37			2,610	2,800
		.938	130.85		100	2,800	2,800
		1.094	150.79		120	2,800	2,800
		1.250	170.21		140	2,800	2,800
		1.406	189.11		160	2,800	2,800
		1.500	200.25			2,800	2,800
		2.000	256.32			2,800	2,800
		.188	31.75			530	620
		.203	34.25			570	670
		.219	36.91			620	720
		.250	42.05			700	820
		.281	47.17			790	920
		.312	52.27		20	880	1,020
		.344	57.52			970	1,130
		.375	62.58	Std.	30	1,050	1,230
		.406	67.62			1,140	1,330
16	16.000	.438	72.80			1,230	1,440
		.469	77.79			1,320	1,540
		.500	82.77	XS	40	1,410	1,640
		.562	92.66			1,580	1,840
		.625	102.63			1,760	2,050
		.656	107.50		60	1,840	2,150
		.688	112.51			1,930	2,260
		.750	122.15			2,110	2,460
		.812	131.71			2,280	2,660
		.844	136.61		80	2,370	2,770

Courtesy of United States Steel.
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Some O.D.'s , walls, and grades are Non-API.

Standard and Line Pipe Data

Seamless, Electric Weld, Plain End

Size Nom.	Size O.D.	Wall Thickness	WT. Plain End		Schedule	Mill Test Pressure	
						Grade A	Grade B
(in.)	(in.)	(in.)	(ft.-lbs.)	Class	No.	PSI	PSI
		1.031	164.82		100	2,800	2,800
		1.219	192.43		120	2,800	2,800
16	16.000	1.438	223.64		140	2,800	2,800
		1.594	245.25		160	2,800	2,800
		1.618	248.52			2,800	2,800
		2.000	299.04			2,800	2,800
		.219	41.59			550	640
		.250	47.39			630	730
		.281	53.18			700	820
		.312	58.94		20	780	910
		.344	64.87			860	1,000
		.375	70.59	Std.		940	1,090
		.406	76.29			1,010	1,180
		.438	82.15		30	1,090	1,280
		.469	87.81			1,170	1,370
		.500	93.45	XS		1,250	1,460
18	18.000	.562	104.67		40	1,400	1,640
		.625	115.98			1,560	1,820
		.688	127.21			1,720	2,010
		.750	138.17		60	1,880	2,190
		.812	149.06			2,030	2,370
		.938	170.92		80	2,340	2,740
		1.156	207.96		100	2,800	2,800
		1.375	244.14		120	2,800	2,800
		1.500	264.33			2,800	2,800
		1.562	274.22		140	2,800	2,800
		1.652	288.43			2,800	2,800
		.219	46.27			490	570
		.250	52.73			560	660
		.281	59.18			630	740
		.312	65.60			700	820
		.344	72.21			770	900
		.375	78.60	Std.	20	840	980
		.406	84.96			910	1,070
		.438	91.51			990	1,150
		.469	97.83			1,060	1,230
20	20.000	.500	104.13	XS	30	1,130	1,310
		.562	116.67			1,260	1,480
		.594	123.11		40	1,340	1,560
		.625	129.33			1,410	1,640
		.688	141.90			1,550	1,810
		.750	154.19			1,690	1,970
		.812	166.40		60	1,830	2,130
		1.031	208.87		80	2,320	2,710
		1.281	256.10		100	2,750	2,750
		1.375	273.51			2,800	2,800

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Standard and Line Pipe Data

Seamless, Electric Weld, Plain End

Size Nom.	Size O.D.	Wall Thickness	WT. Plain End		Schedule	Mill Test Pressure	
						Grade A	Grade B
(in.)	(in.)	(in.)	(ft.-lbs.)	Class	No.	PSI	PSI
		.375	86.61	Std.	20	770	890
		.406	93.63			830	970
		.438	100.86			900	1,050
		.469	107.85			960	1,120
		.500	114.81	XS	30	1,020	1,190
		.562	128.67			1,150	1,340
22	22.000	.625	142.68			1,280	1,490
		.688	156.60			1,410	1,640
		.750	170.21			1,530	1,790
		.812	183.75			1,660	1,940
		.875	197.41		60	1,790	2,090
		1.125	250.81		80	2,300	2,500
		1.219	270.55			2,500	2,500
		.250	63.41			470	550
		.281	71.18			530	610
		.312	78.93			580	680
		.344	86.91			640	750
		.375	94.62	Std.	20	700	820
		.406	102.31			760	890
		.438	110.22			820	960
		.469	117.86			880	1,030
		.500	125.49	XS		940	1,090
24	24.000	.562	140.68		30	1,050	1,230
		.625	156.03			1,170	1,370
		.688	171.29		40	1,290	1,500
		.750	186.23			1,410	1,640
		.812	201.09			1,520	1,780
		.875	216.10			1,640	1,910
		.938	231.03			1,760	2,050
		.969	238.35		60	1,820	2,120
		1.219	296.58		90	2,280	2,660
		1.312	317.91			2,340	2,340
		.250	68.75			430	500
		.281	77.18			490	570
		.312	85.60			540	630
		.344	94.26			600	690
		.375	102.63	Std.		650	760
		.406	110.98			700	820
		.438	119.57			760	880
26	26.000	.469	127.88			810	950
		.500	136.17	XS	20	870	1,010
		.562	152.68			970	1,130
		.625	169.38			1,080	1,260
		.656	177.56			1,140	1,320
		.688	185.99			1,190	1,390
		.750	202.25			1,300	1,510
		.875	234.79			1,510	1,770
		1.188	314.81			2,000	2,000

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Standard and Line Pipe Data

Double Submerged Arc Weld and Plain End

Size Nom. (in.)	Size O.D. (in.)	Wall Thickness (in.)	WT. Plain End (ft.-lbs.)	Mill Test Pressure Grade A PSI	Mill Test Pressure Grade B PSI
30	30.000	.250	79.43	380	440
		.281	89.19	420	490
		.312	98.93	470	550
		.344	108.95	520	600
		.375	118.65	560	660
		.406	128.32	610	710
		.438	138.29	660	770
		.469	147.92	700	820
		.500	157.53	750	880
		.562	176.69	840	980
		.625	196.08	940	1,090
		.656	205.59	980	1,150
		.688	215.38	1,030	1,200
		.750	234.29	1,130	1,310
32	32.000	.250	84.77	350	410
		.281	95.19	400	460
		.312	105.59	440	510
		.344	116.30	480	560
		.375	126.66	530	620
		.406	136.99	570	670
		.438	147.64	620	720
		.469	157.94	660	770
		.500	168.21	700	820
		.562	188.70	790	920
		.625	209.43	880	1,030
		.656	219.60	920	1,080
		.688	230.08	970	1,130
		.750	250.31	1,050	1,230

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Standard and Line Pipe Data

Double Submerged Arc Weld and Plain End

Size Nom. (in.)	Size O.D. (in.)	Wall Thickness (in.)	WT. Plain End (ft.-lbs.)	Mill Test Pressure Grade A PSI	Mill Test Pressure Grade B PSI
34	34.000	.250	90.11	330	390
		.281	101.19	370	430
		.312	112.25	410	480
		.344	123.65	460	530
		.375	134.67	500	580
		.406	145.67	540	630
		.438	157.00	580	680
		.469	167.95	620	720
		.500	178.89	660	770
		.562	200.70	740	870
		.625	222.78	830	970
		.656	233.61	870	1,010
		.688	244.77	910	1,060
		.750	266.33	990	1,160
36	36.000	.250	95.45	310	360
		.281	107.20	350	410
		.312	118.92	390	450
		.344	131.00	430	500
		.375	142.68	470	550
		.406	154.34	510	590
		.438	166.35	550	640
		.469	177.97	590	680
		.500	189.57	630	730
		.562	212.70	700	820
		.625	236.13	780	910
		.656	247.62	820	960
		.688	259.47	860	1,000
		.750	282.35	940	1,090

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Standard and Line Pipe Data

Double Submerged Arc Weld and Plain End

Size Nom. (in.)	Size O.D. (in.)	Wall Thickness (in.)	WT. Plain End (ft.-lbs.)	Mill Test Pressure Grade A PSI	Mill Test Pressure Grade B PSI
40	40.000	.312	132.25	350	410
		.344	145.69	390	450
		.375	158.70	420	490
		.406	171.68	460	530
		.438	185.06	490	570
		.469	198.01	530	620
		.500	210.93	560	660
		.562	236.71	630	740
		.625	262.83	700	820
		.688	288.86	770	900
		.750	314.39	840	980
42	42.000	.312	138.91	330	390
		.344	153.04	370	430
		.375	166.71	400	470
		.406	180.35	430	510
		.438	194.42	470	550
		.469	208.03	500	590
		.500	221.61	540	630
		.562	248.72	600	700
		.625	276.18	670	780
		.688	303.55	740	860
		.750	330.41	800	940
44	44.000	.344	160.39	280	330
		.375	174.72	310	360
		.406	189.03	330	390
		.438	203.78	360	420
		.469	218.04	380	450
		.500	232.29	410	480
		.562	260.72	460	540
		.625	289.53	510	600
		.688	318.25	560	660
		.750	346.43	610	720

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The weight per foot of pipe with threads and couplings is based on a length of 20 ft. including the coupling.

A-106 pipe furnished plain end only. A-53 and A-120 pipe furnished plain end or threaded and coupled, as ordered.

Dimensions and plain end weights are based on ANSI Standard B36.10 - 1970.

Standard and Line Pipe Data

Double Submerged Arc Weld and Plain End

Size Nom. (in.)	Size O.D. (in.)	Wall Thickness (in.)	WT. Plain End (ft.-lbs.)	Mill Test Pressure Grade A PSI	Mill Test Pressure Grade B PSI
46	46.000	.344	167.74	270	310
		.375	182.73	290	340
		.406	197.70	320	370
		.438	213.13	340	400
		.469	228.06	370	430
		.500	242.97	390	460
		.562	272.73	440	510
		.625	302.88	490	570
		.688	332.95	540	630
		.750	362.45	590	680
		.812	391.88	640	740
		.875	421.69	680	800
		.938	451.42	730	860
		1.000	480.60	780	910
48	48.000	.375	190.74	280	330
		.406	206.37	300	360
		.438	222.49	330	380
		.469	238.08	350	410
		.500	253.65	380	440
		.562	284.73	420	490
		.625	316.23	470	550
		.688	347.64	520	600
		.750	378.47	560	650
		.812	409.22	610	710
		.875	440.38	660	770
		.938	471.46	700	820
		1.000	501.96	750	880

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Dimensions and plain end weights are based on ANSI Standard B36.10 - 1970.

SECTION 7 - Capacity

Contents

Tubing Sizes and Capacities

OD (in.) *(mm)*	Weight (lb/ft) NU	Weight (lb/ft) EU	Weight (lb/ft) IJ	ID (in.) *(mm)*	Wall (in.) *(mm)*	Gallons per Lineal Foot	Lineal Feet per Gallon	Cubic Feet per Lineal Foot	Lineal Feet per Cubic Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*
1.050 *26,67*	1.14	1.20	1.20	.824 *20,93*	.113 *2,87*	.02770	36.10	.003703	270.04	.0006595	1516	*,3440*
		1.50	1.50	.742 *18,85*	.154 *3,91*	.02246	44.52	.003003	333.02	.0005348	1870	*,2789*
1.315 *33,4*	1.70	1.80	1.80	1.049 *26,64*	.133 *3,38*	.04490	22.27	.006001	166.6	.001070	934.6	*,557*
			2.25	.957 *24,31*	.179 *4,55*	.03737	26.76	.004995	200.2	.0008896	1124	*,4641*
1.660 *42,16*	2.30	2.40	2.10	1.410 *35,81*	.125 *3,17*	.08111	12.33	.01084	92.22	.001931	517.9	*1,007*
			2.40	1.380 *35,05*	.140 *3,56*	.07780	12.85	.01040	96.19	.001852	540.0	*,9662*
			3.02	1.278 *32,46*	.191 *4,85*	.06664	15.01	.008908	112.3	.001587	630.1	*,8275*

Tubing Sizes and Capacities

OD (in.) *(mm)*	Weight (lb/ft)			ID (in.) *(mm)*	Wall (in.) *(mm)*	Gallons per Lineal Foot	Lineal Feet per Gallon	Cubic Feet per Lineal Foot	Lineal Feet per Cubic Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*
	NU	EU	IJ									
			2.40	1.650 *41,91*	.125 *3,17*	.1111	9.003	.01485	67.35	.002645	378.1	*1,380*
1.900 *48,26*	2.75	2.90	2.90	1.610 *40,89*	.145 *3,68*	.1058	9.447	.01415	70.67	.002520	396.8	*1,314*
			3.64	1.500 *38,1*	.200 *5,08*	.09180	10.89	.01227	81.49	.002186	457.5	*1,140*
2.000 *50,8*	3.40			1.670 *42,42*	.165 *4,19*	.1138	8,787	.01521	65.75	.002709	369.1	*1,413*
2.063 *52,4*			3.25	1.751 *44,48*	.156 *3,96*	.1251	7,994	.01672	59.80	.002979	335.7	*1,554*
2.375 *60,3*	4.00			2.041 *51,84*	.167 *4,24*	.1700	5,884	.02272	44.01	.004047	247.1	*2,111*

Tubing Sizes and Capacities

OD (in.) *(mm)*	Weight (lb/ft) NU	EU	IJ	ID (in.) *(mm)*	Wall (in.) *(mm)*	Gallons per Lineal Foot	Lineal Feet per Gallon	Cubic Feet per Lineal Foot	Lineal Feet per Cubic Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*
2.375 *60,3*	4.60	4.70	4.70	1.995 *50,67*	.190 *4,83*	.1626	6.152	.02173	46.02	.003870	258.4	*2,019*
			5.30	1.939 *49,25*	.218 *5,53*	.1534	6.519	.02051	48.77	.003652	273.8	*1,905*
	5.80	5.95		1.867 *47,42*	.254 *6,45*	.1422	7.032	.01901	52.60	.003386	295.3	*1,766*
			6.20	1.853 *47,07*	.261 *6,63*	.1401	7.138	.01873	53.39	.003336	299.8	*1,740*
			7.70	1.703 *43,26*	.336 *8,53*	.1183	8.451	.01582	63.21	.002818	354.9	*1,469*
2.875 *73*	6.40	6.50	6.50	2.441 *62,00*	.217 *5,51*	.2433	4.109	.03253	30.74	.005794	172.6	*3,021*
			7.90	2.323 *59,00*	.276 *7,01*	.2202	4.542	.02943	33.96	.005241	190.8	*2,735*

Tubing Sizes and Capacities

OD (in.) *(mm)*	Weight (lb/ft)			ID (in.) *(mm)*	Wall (in.) *(mm)*	Gallons per Lineal Foot	Lineal Feet per Gallon	Cubic Feet per Lineal Foot	Lineal Feet per Cubic Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*
	NU	EU	IJ									
	8.60	8.70	8.70	2.259 *57,38*	.308 *7,82*	.2082	4.803	.02783	35.93	.004958	201.7	*2,586*
			9.50	2.195 *55,75*	.340 *8,64*	.1966	5.087	.02628	38.06	.004679	213.7	*2,441*
2.875 *73*			10.70	2.091 *53,11*	.392 *9,96*	.1784	5.606	.02385	41.93	.004248	235.4	*2,215*
			11.00	2.065 *52,46*	.405 *10,29*	.1740	5.748	.02326	43.00	.004143	241.4	*2,161*
			11.65	1.995 *50,67*	.440 *11,18*	.1626	6.152	.02173	46.02	.003870	258.4	*2,019*
3.500 *88,9*	7.70			3.068 *77,93*	.216 *5,49*	.3840	2.604	.05134	19.48	.009141	109.4	*4,769*
	9.20	9.30	9.30	2.992 *76,00*	.254 *6,45*	.3656	2.735	.04888	20.46	.008706	114.9	*4,540*

Tubing Sizes and Capacities

OD (in.) *(mm)*	Weight (lb/ft) NU	EU	IJ	ID (in.) *(mm)*	Wall (in.) *(mm)*	Gallons per Lineal Foot	Lineal Feet per Gallon	Cubic Feet per Lineal Foot	Lineal Feet per Cubic Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*
3.500 *88,9*	10.20	12.95	10.30	2.922 *74,22*	.289 *7,34*	.3487	2.868	.04661	21.46	.008301	120.5	*4,330*
			12.80	2.764 *70,21*	.368 *9,35*	.3117	3.208	.04167	24.00	.007423	134.7	*3,871*
	12.70		12.95	2.750 *69,85*	.375 *9,52*	.3085	3.241	.04125	24.24	.007347	136.1	*3,831*
			15.80	2.548 *64,72*	.476 *12,09*	.2649	3.775	.03541	28.24	.006305	158.6	*3,290*
			16.70	2.480 *62,99*	.510 *12,95*	.2509	3.985	.03354	29.81	.005973	167.4	*3,116*
4.000 *101,6*	9.50	11.00	11.00	3.548 *90,12*	.226 *5,74*	.5138	1.946	.06869	14.56	.01223	81.75	*6,381*
				3.476 *88,29*	.262 *6,65*	.4935	2.027	.06597	15.16	.01175	85.12	*6,129*

Tubing Sizes and Capacities

OD (in.) *(mm)*	Weight (lb/ft) NU	EU	IJ	ID (in.) *(mm)*	Wall (in.) *(mm)*	Gallons per Lineal Foot	Lineal Feet per Gallon	Cubic Feet per Lineal Foot	Lineal Feet per Cubic Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*
4.000 *101,6*			11.60	3.428 *87,07*	.286 *7,26*	.4794	2.086	.06409	15.60	.01142	87.56	*5,953*
			13.40	3.340 *84,84*	.330 *8,38*	.4551	2.197	.06084	16.44	.01084	92.26	*5,652*
4.500 *114,3*	12.60	12.75	12.75	3.958 *100,5*	.271 *6,88*	.6397	1.563	.08552	11.69	.01523	65.64	*7,944*
			13.50	3.920 *99,57*	.290 *7,37*	.6269	1.595	.08381	11.93	.01493	66.97	*7,785*
			15.50	3.826 *97,18*	.337 *8,56*	.5972	1.674	.07984	12.53	.01422	70.32	*7,416*
			19.20	3.640 *92,46*	.430 *10,92*	.5406	1.850	.07226	13.84	.01287	77.70	*6,713*

Casing Sizes and Capacities

OD (in.)	Weight (lb/ft)	ID (in.)	Capacity					Weight *(kg/m)*	ID *(mm)*	Wall Thickness *(mm)*	OD *(mm)*
			Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*				
4-1/2	9.50	4.090	0.6825	0.0912	0.01624	61.539	*8,478*	*14,136*	*103,9*	*5,21*	*114,3*
	10.50	4.052	0.6698	0.0895	0.01594	62.699	*8,320*	*15,624*	*102,9*	*5,68*	*114,3*
	11.60	4.000	0.6528	0.0872	0.01554	64.340	*8,108*	*17,260*	*101,6*	*6,34*	*114,3*
	12.60	3.958	0.6391	0.0854	0.01521	65.712	*7,939*	*18,748*	*100,5*	*6,88*	*114,3*
	13.50	3.920	0.6269	0.0838	0.01492	66.993	*7,788*	*20,088*	*99,6*	*7,37*	*114,3*
	15.10	3.826	0.5972	0.0798	0.01421	70.325	*7,418*	*22,468*	*97,1*	*8,55*	*114,3*
	16.60	3.754	0.5749	0.0768	0.01368	73.048	*7,142*	*24,700*	*95,3*	*9,47*	*114,3*
	17.70	3.697	0.5576	0.0745	0.01327	75.318	*6,926*	*26,337*	*93,9*	*10,19*	*114,3*
	18.80	3.640	0.5405	0.0722	0.01287	77.696	*6,714*	*27,974*	*92,4*	*10,92*	*114,3*
4-3/4	16.00	4.082	0.6798	0.0908	0.01618	61.781	*8,444*	*23,808*	*103,6*	*8,48*	*120,6*
5	11.50	4.560	0.8483	0.1134	0.02019	49.507	*10,538*	*17,112*	*115,8*	*5,58*	*127,0*
	13.00	4.494	0.8239	0.1101	0.01961	50.972	*10,235*	*19,344*	*114,1*	*6,42*	*127,0*
	15.00	4.408	0.7927	0.1059	0.01887	52.980	*9,847*	*22,320*	*111,9*	*7,51*	*127,0*
	18.00	4.276	0.7459	0.0997	0.01776	56.302	*9,266*	*26,784*	*108,6*	*9,19*	*127,0*
	20.30	4.184	0.7142	0.0954	0.01700	58.805	*8,871*	*30,206*	*106,2*	*10,36*	*127,0*
	21.00	4.154	0.7040	0.0941	0.01676	59.658	*8,745*	*31,248*	*105,5*	*10,74*	*127,0*
	23.20	4.044	0.6672	0.0891	0.01588	62.947	*8,288*	*34,521*	*102,7*	*12,14*	*127,0*
5-1/2	13.00	5.044	1.0380	0.1387	0.02471	40.462	*12,893*	*19,344*	*128,1*	*5,79*	*139,7*
	14.00	5.012	1.0249	0.1370	0.02440	40.980	*12,730*	*20,832*	*127,3*	*6,19*	*139,7*

Casing Sizes and Capacities

OD (in.)	Weight (lb/ft)	ID (in.)	Capacity					Weight *(kg/m)*	ID *(mm)*	Wall Thickness *(mm)*	OD *(mm)*
			Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*				
5-1/2	15.00	4.974	1.0094	0.1349	0.02403	41.609	*12,538*	*22,320*	*126,3*	*6,68*	*139,7*
	15.50	4.950	0.9997	0.1336	0.02380	42.013	*12,417*	*23,064*	*125,7*	*6,98*	*139,7*
	17.00	4.892	0.9764	0.1305	0.02324	43.015	*12,128*	*25,296*	*124,2*	*7,72*	*139,7*
	20.00	4.778	0.9314	0.1245	0.02217	45.093	*11,569*	*29,760*	*121,3*	*9,16*	*139,7*
	23.00	4.670	0.8898	0.1189	0.02118	47.202	*11,052*	*34,224*	*118,6*	*10,54*	*139,7*
	26.00	4.548	0.8439	0.1128	0.02009	49.769	*10,482*	*38,688*	*115,5*	*12,09*	*139,7*
5-3/4	14.00	5.290	1.1417	0.1526	0.02718	36.786	*14,182*	*20,832*	*134,3*	*5,84*	*146,0*
	17.00	5.190	1.0989	0.1469	0.02616	38.217	*13,651*	*25,296*	*131,8*	*7,11*	*146,0*
	19.50	5.090	1.0570	0.1413	0.02516	39.734	*13,130*	*29,016*	*129,2*	*8,38*	*146,0*
	22.50	4.990	1.0159	0.1358	0.02418	41.342	*12,619*	*33,480*	*126,7*	*9,65*	*146,0*
	25.20	4.890	0.9756	0.1304	0.02322	43.051	*12,118*	*37,497*	*124,2*	*10,92*	*146,0*
6	15.00	5.524	1.2449	0.1664	0.02964	33.736	*15,464*	*22,320*	*140,3*	*6,04*	*152,4*
	16.00	5.500	1.2342	0.1649	0.02938	34.031	*15,330*	*23,808*	*139,7*	*6,35*	*152,4*
	17.00	5.450	1.2118	0.1619	0.02885	34.658	*15,053*	*25,296*	*138,4*	*6,98*	*152,4*
	18.00	5.424	1.2003	0.1604	0.02857	34.991	*14,909*	*26,784*	*137,7*	*7,31*	*152,4*
	20.00	5.352	1.1686	0.1562	0.02782	35.939	*14,516*	*29,760*	*135,9*	*8,22*	*152,4*
	23.00	5.240	1.1202	0.1497	0.02667	37.492	*13,915*	*34,224*	*133,0*	*9,65*	*152,4*
	26.00	5.140	1.0779	0.1440	0.02566	38.965	*13,389*	*38,688*	*130,5*	*10,92*	*152,4*

Casing Sizes and Capacities

OD (in.)	Weight (lb/ft)	ID (in.)	Capacity					Weight (kg/m)	ID (mm)	Wall Thickness (mm)	OD (mm)
			Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*				
6-5/8	13.00	6.255	1.5963	0.2133	0.03800	26.311	*19,828*	*19,344*	*158,8*	*4,69*	*168,2*
	17.00	6.135	1.5356	0.2052	0.03656	27.350	*19,075*	*25,296*	*155,8*	*6,22*	*168,2*
	20.00	6.049	1.4928	0.1995	0.03554	28.134	*18,544*	*29,760*	*153,6*	*7,31*	*168,2*
	22.00	5.989	1.4634	0.1956	0.03484	28.700	*18,177*	*32,736*	*152,1*	*8,07*	*168,2*
	24.00	5.921	1.4303	0.1912	0.03405	29.363	*17,767*	*35,712*	*150,3*	*8,94*	*168,2*
	26.00	5.855	1.3986	0.1869	0.03330	30.029	*17,373*	*38,688*	*148,7*	*9,77*	*168,2*
	28.00	5.791	1.3682	0.1829	0.03257	30.696	*16,995*	*41,664*	*147,0*	*10,59*	*168,2*
	29.00	5.761	1.3541	0.1810	0.03223	31.017	*16,820*	*43,152*	*146,3*	*10,97*	*168,2*
	32.00	5.675	1.3139	0.1756	0.03128	31.964	*16,321*	*47,616*	*144,1*	*12,06*	*168,2*
	34.00	5.595	1.2772	0.1707	0.03040	32.885	*15,864*	*50,592*	*142,1*	*13,08*	*168,2*
7	17.00	6.538	1.7440	0.2331	0.04152	24.083	*21,663*	*25,296*	*166,0*	*5,86*	*177,8*
	20.00	6.456	1.7005	0.2273	0.04048	24.698	*21,123*	*29,760*	*163,9*	*6,90*	*177,8*
	22.00	6.398	1.6701	0.2232	0.03976	25.148	*20,745*	*32,736*	*162,5*	*7,64*	*177,8*
	23.00	6.366	1.6534	0.2210	0.03936	25.402	*20,538*	*34,224*	*161,6*	*8,05*	*177,8*
	24.00	6.336	1.6379	0.2189	0.03899	25.643	*20,345*	*35,712*	*160,9*	*8,43*	*177,8*
	26.00	6.276	1.6070	0.2148	0.03826	26.135	*19,961*	*38,688*	*159,4*	*9,19*	*177,8*
	28.00	6.214	1.5754	0.2105	0.03750	26.659	*19,569*	*41,664*	*157,8*	*9,98*	*177,8*
	29.00	6.184	1.5602	0.2085	0.03714	26.919	*19,380*	*43,152*	*157,0*	*10,36*	*177,8*
	30.00	6.154	1.5451	0.2065	0.03678	27.182	*19,193*	*44,640*	*156,3*	*10,74*	*177,8*

Casing Sizes and Capacities

OD (in.)	Weight (lb/ft)	ID (in.)	Capacity					Weight *(kg/m)*	ID *(mm)*	Wall Thickness *(mm)*	OD *(mm)*
			Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*				
	32.00	6.094	1.5151	0.2025	0.03607	27.720	*18,820*	*47,616*	*154,7*	*11,50*	*177,8*
	33.70	6.048	1.4923	0.1944	0.03553	28.143	*18,537*	*50,145*	*153,6*	*12,09*	*177,8*
	34.00	6.040	1.4884	0.1989	0.03543	28.218	*18,488*	*50,592*	*153,4*	*12,19*	*177,8*
	35.00	6.004	1.4707	0.1966	0.03501	28.557	*18,269*	*52,080*	*152,5*	*12,64*	*177,8*
7	35.30	6.000	1.4688	0.1963	0.03497	28.595	*18,244*	*52,526*	*152,4*	*12,69*	*177,8*
	38.00	5.920	1.4298	0.1911	0.03404	29.373	*17,761*	*56,543*	*150,3*	*13,71*	*177,8*
	40.00	5.836	1.3896	0.1857	0.03308	30.225	*17,261*	*59,520*	*148,2*	*14,78*	*177,8*
	41.00	5.820	1.3819	0.1847	0.03290	30.391	*17,166*	*61,008*	*147,8*	*14,98*	*177,8*
	44.00	5.720	1.3349	0.1784	0.03178	31.463	*16,581*	*65,472*	*145,2*	*16,25*	*177,8*
	20.00	7.125	2.0712	0.2768	0.04931	20.278	*25,728*	*29,760*	*180,9*	*6,35*	*193,6*
	24.00	7.025	2.0135	0.2691	0.04793	20.859	*25,010*	*35,712*	*178,4*	*7,62*	*193,6*
	26.40	6.969	1.9815	0.2648	0.04717	21.196	*24,613*	*39,283*	*177,0*	*8,33*	*193,6*
7-5/8	29.70	6.875	1.9284	0.2577	0.04591	21.799	*23,954*	*44,193*	*174,6*	*9,52*	*193,6*
	33.70	6.765	1.8672	0.2496	0.04445	22.493	*23,193*	*50,145*	*171,8*	*10,92*	*193,6*
	36.00	6.705	1.8342	0.2451	0.04367	22.898	*22,784*	*53,568*	*170,3*	*11,68*	*193,6*
	38.00	6.655	1.8069	0.2415	0.04302	23.243	*22,445*	*56,543*	*169,0*	*12,31*	*193,6*
	39.00	6.625	1.7907	0.2393	0.04263	23.454	*22,243*	*58,032*	*168,2*	*12,69*	*193,6*
	45.30	6.435	1.6894	0.2258	0.04022	24.860	*20,986*	*67,406*	*163,4*	*15,11*	*193,6*
7-3/4	46.10	6.560	1.7558	0.2347	0.04180	23.921	*21,807*	*68,596*	*166,6*	*15,11*	*196,8*

Casing Sizes and Capacities

OD (in.)	Weight (lb/ft)	ID (in.)	Capacity					Weight *(kg/m)*	ID *(mm)*	Wall Thickness *(mm)*	OD *(mm)*
			Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*				
8	26.00	7.386	2.2257	0.2975	0.05299	18.870	*27,647*	*38,688*	*187,6*	*7,97*	*203,2*
8-1/8	28.00	7.485	2.2858	0.3055	0.05442	18.374	*28,393*	*41,664*	*190,1*	*8,12*	*206,3*
	32.00	7.385	2.2251	0.2974	0.05297	18.875	*27,639*	*47,616*	*187,5*	*9,39*	*207,3*
	35.50	7.285	2.1653	0.2894	0.05155	19.397	*26,896*	*52,824*	*185,0*	*10,66*	*206,3*
	39.50	7.185	2.1062	0.2815	0.05014	19.941	*26,163*	*58,776*	*182,4*	*11,93*	*206,3*
8-5/8	24.00	8.097	2.6749	0.3575	0.06368	15.701	*33,226*	*35,712*	*205,6*	*6,70*	*219,0*
	28.00	8.017	2.6223	0.3505	0.06243	16.016	*32,573*	*41,664*	*203,6*	*7,72*	*219,0*
	32.00	7.921	2.5598	0.3421	0.06094	16.407	*31,797*	*47,616*	*201,1*	*8,94*	*219,0*
	36.00	7.825	2.4982	0.3339	0.05947	16.812	*31,031*	*53,568*	*198,7*	*10,15*	*219,0*
	38.00	7.775	2.4663	0.3296	0.05872	17.029	*30,636*	*56,543*	*197,4*	*10,79*	*219,0*
	40.00	7.725	2.4347	0.3254	0.05796	17.250	*30,243*	*59,520*	*196,2*	*11,42*	*219,0*
	43.00	7.651	2.3883	0.3192	0.05686	17.585	*29,666*	*63,984*	*194,3*	*12,36*	*219,0*
	44.00	7.625	2.3721	0.3170	0.05647	17.706	*29,465*	*65,472*	*193,6*	*12,69*	*219,0*
	48.00	7.537	2.3176	0.3098	0.05518	18.121	*28,789*	*71,424*	*191,4*	*13,81*	*219,0*
	49.00	7.511	2.3017	0.3076	0.05480	18.247	*28,591*	*72,912*	*190,7*	*14,14*	*219,0*
8-3/4	49.70	7.636	2.3789	0.3180	0.05664	17.655	*29,550*	*73,953*	*193,9*	*14,14*	*222,2*
9	34.00	8.290	2.8039	0.3748	0.06675	14.979	*34,829*	*50,592*	*210,5*	*9,01*	*228,6*
	38.00	8.196	2.7407	0.3663	0.06525	15.324	*34,043*	*56,543*	*208,1*	*10,21*	*228,6*

Casing Sizes and Capacities

OD (in.)	Weight (lb/ft)	ID (in.)	Capacity					Weight *(kg/m)*	ID *(mm)*	Wall Thickness *(mm)*	OD *(mm)*
			Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*				
9	40.00	8.150	2.7100	0.3622	0.06452	15.498	*33,662*	*59,520*	*207,0*	*10,79*	*228,6*
	45.00	8.032	2.6321	0.3518	0.06266	15.957	*32,695*	*66,960*	*204,0*	*12,29*	*228,6*
	50.20	7.910	2.5527	0.3412	0.06077	16.453	*31,709*	*74,697*	*200,9*	*13,84*	*228,6*
	55.00	7.812	2.4899	0.3328	0.05928	16.868	*30,928*	*81,840*	*198,4*	*15,08*	*228,6*
9-5/8	29.30	9.063	3.3512	0.4479	0.07978	12.533	*41,627*	*43,598*	*230,2*	*7,13*	*244,4*
	32.30	9.001	3.3055	0.4418	0.07870	12.706	*41,059*	*48,062*	*228,6*	*7,92*	*244,4*
	36.00	8.921	3.2470	0.4340	0.07730	12.935	*40,333*	*53,568*	*226,5*	*8,94*	*244,4*
	38.00	8.885	3.2208	0.4305	0.07668	13.040	*40,008*	*56,543*	*225,6*	*9,39*	*244,4*
	40.00	8.835	3.1847	0.4257	0.07582	13.188	*39,559*	*59,520*	*224,4*	*10,03*	*244,4*
	42.00	8.799	3.1588	0.4222	0.07520	13.296	*39,237*	*62,496*	*223,4*	*10,49*	*244,4*
	43.50	8.755	3.1273	0.4180	0.07445	13.430	*38,846*	*64,728*	*222,3*	*11,04*	*244,4*
	47.00	8.681	3.0746	0.4110	0.07320	13.660	*38,192*	*69,936*	*220,4*	*11,98*	*244,4*
	53.50	8.535	2.9721	0.3973	0.07076	14.131	*36,918*	*79,608*	*216,7*	*13,84*	*244,4*
	58.40	8.435	2.9028	0.3880	0.06911	14.468	*36,058*	*86,899*	*214,2*	*15,11*	*244,4*
	61.10	8.375	2.8617	0.3825	0.06813	14.676	*35,547*	*90,916*	*212,7*	*15,87*	*244,4*
	71.80	8.125	2.6934	0.3600	0.06412	15.593	*33,456*	*106,838*	*206,3*	*19,04*	*244,4*
9-3/4	59.20	8.560	2.9895	0.3996	0.07117	14.049	*37,135*	*86,089*	*217,4*	*15,11*	*247,6*
9-7/8	62.80	8.625	3.0351	0.4057	0.07226	13.838	*37,701*	*93,446*	*219,0*	*15,87*	*250,8*

Casing Sizes and Capacities

OD (in.)	Weight (lb/ft)	ID (in.)	Capacity					Weight *(kg/m)*	ID *(mm)*	Wall Thickness *(mm)*	OD *(mm)*
			Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*				
10	33.00	9.384	3.5928	0.4802	0.08554	11.690	*44,628*	*49,104*	*238,3*	*7,82*	*254,0*
	41.50	9.200	3.4533	0.4616	0.08221	12.162	*42,895*	*61,752*	*233,6*	*10,16*	*254,0*
	45.50	9.120	3.3935	0.4536	0.08079	12.376	*42,152*	*67,704*	*231,6*	*11,17*	*254,0*
	50.50	9.016	3.3165	0.4433	0.07896	12.664	*41,196*	*75,144*	*229,0*	*12,49*	*254,0*
	55.50	8.908	3.2375	0.4327	0.07708	12.973	*40,215*	*82,584*	*226,2*	*13,86*	*254,0*
	61.20	8.790	3.1523	0.4213	0.07505	13.323	*39,157*	*91,065*	*223,2*	*15,36*	*254,0*
10-3/4	32.75	10.192	4.2381	0.5665	0.10090	9.910	*52,644*	*48,732*	*258,8*	*7,08*	*273,0*
	35.75	10.136	4.1917	0.5603	0.09980	10.020	*52,067*	*53,196*	*257,4*	*7,79*	*273,0*
	40.50	10.050	4.1209	0.5508	0.09811	10.192	*51,188*	*60,264*	*255,2*	*8,89*	*273,0*
	45.50	9.950	4.0393	0.5399	0.09617	10.398	*50,174*	*67,704*	*252,7*	*10,16*	*273,0*
	48.00	9.902	4.0004	0.5347	0.09524	10.499	*49,691*	*71,424*	*251,5*	*10,76*	*273,0*
	51.00	9.850	3.9585	0.5291	0.09424	10.610	*49,171*	*75,888*	*250,1*	*11,43*	*273,0*
	54.00	9.784	3.9056	0.5220	0.09298	10.753	*48,514*	*80,352*	*248,5*	*12,26*	*273,0*
	55.50	9.760	3.8865	0.5195	0.09253	10.806	*48,276*	*82,584*	*247,9*	*12,57*	*273,0*
	60.70	9.660	3.8072	0.5089	0.09064	11.031	*47,292*	*90,321*	*245,3*	*13,84*	*273,0*
	65.70	9.560	3.7288	0.4984	0.08877	11.263	*46,318*	*97,761*	*242,8*	*15,11*	*273,0*
	71.10	9.450	3.6435	0.4870	0.08674	11.527	*45,258*	*105,796*	*240,0*	*16,51*	*273,0*
	76.00	9.350	3.5668	0.4768	0.08492	11.775	*44,305*	*113,087*	*237,4*	*17,78*	*273,0*
	81.00	9.250	3.4909	0.4666	0.08311	12.031	*43,363*	*120,528*	*234,9*	*19,05*	*273,0*

Casing Sizes and Capacities

OD (in.)	Weight (lb/ft)	ID (in.)	Capacity					Weight *(kg/m)*	ID *(mm)*	Wall Thickness *(mm)*	OD *(mm)*
			Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*				
11-3/4	38.00	11.150	5.0723	0.6780	0.12076	8.280	*63,006*	*56,543*	*283,2*	*7,62*	*298,4*
	42.00	11.084	5.0124	0.6700	0.11934	8.379	*62,262*	*62,496*	*281,5*	*8,45*	*298,4*
	47.00	11.000	4.9368	0.6599	0.11753	8.507	*61,322*	*69,936*	*279,4*	*9,52*	*298,4*
	54.00	10.880	4.8296	0.6456	0.11498	8.696	*59,992*	*80,352*	*276,3*	*11,04*	*298,4*
	60.00	10.772	4.7342	0.6328	0.11271	8.871	*58,807*	*89,280*	*273,6*	*12,42*	*298,4*
	65.00	10.682	4.6554	0.6223	0.11084	9.021	*57,828*	*96,720*	*271,3*	*13,56*	*298,4*
	71.00	10.586	4.5721	0.6111	0.10885	9.186	*56,793*	*105,648*	*268,8*	*14,78*	*298,4*
11-7/8	71.80	10.711	4.6808	0.6257	0.11144	8.973	*58,142*	*106,838*	*272,0*	*14,78*	*301,6*
12	40.00	11.384	5.2874	0.7068	0.12588	7.943	*65,678*	*59,520*	*289,1*	*7,82*	*304,8*
12-3/4	43.00	12.130	6.0031	0.8024	0.14292	6.996	*74,568*	*63,984*	*308,1*	*7,87*	*323,8*
	53.00	11.970	5.8458	0.7814	0.13918	7.184	*72,614*	*78,864*	*304,0*	*9,90*	*323,8*
13	40.00	12.438	6.3119	0.8437	0.15027	6.654	*78,403*	*59,520*	*315,9*	*7,13*	*330,2*
	45.00	12.360	6.2329	0.8332	0.14840	6.738	*77,423*	*66,960*	*313,9*	*8,12*	*330,2*
	50.00	12.282	6.1545	0.8227	0.14653	6.824	*76,449*	*74,400*	*311,9*	*9,11*	*330,2*
	54.00	12.220	6.0925	0.8144	0.14505	6.893	*75,679*	*80,352*	*310,3*	*9,90*	*330,2*
13-3/8	48.00	12.715	6.5961	0.8817	0.15704	6.367	*81,934*	*71,424*	*322,9*	*8,38*	*339,7*
	54.50	12.615	6.4928	0.8679	0.15458	6.468	*80,651*	*81,096*	*320,4*	*9,65*	*339,7*
	61.00	12.515	6.3903	0.8542	.15214	6.572	*79,377*	*90,768*	*317,8*	*10,92*	*339,7*

Casing Sizes and Capacities

OD (in.)	Weight (lb/ft)	ID (in.)	Capacity					Weight (kg/m)	ID (mm)	Wall Thickness (mm)	OD (mm)
			Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*				
13-3/8	68.00	12.415	6.2885	0.8406	0.14972	6.678	*78,114*	*101,184*	*315,3*	*12,19*	*339,7*
	72.00	12.347	6.2198	0.8314	0.14808	6.752	*77,260*	*107,136*	*313,6*	*13,05*	*339,7*
	77.00	12.275	6.1475	0.8217	0.14636	6.832	*76,362*	*114,576*	*311,7*	*13,97*	*339,7*
	83.00	12.175	6.0478	0.8084	0.14399	6.944	*75,123*	*123,504*	*309,2*	*15,24*	*339,7*
	85.00	12.159	6.0319	0.8063	0.14361	6.963	*74,925*	*126,480*	*308,8*	*15,44*	*339,7*
	92.00	12.031	.9055	0.7894	0.14060	7.112	*73,356*	*136,896*	*305,5*	*17,06*	*339,7*
	98.00	11.937	5.8136	0.7771	0.13841	7.224	*72,214*	*145,824*	*303,1*	*18,26*	*339,7*
13-1/2	81.40	12.340	6.2128	0.8305	0.14792	6.760	*77,173*	*121,123*	*313,4*	*14,73*	*342,9*
13-5/8	88.20	12.375	6.2481	0.8352	0.14876	6.722	*77,611*	*131,241*	*314,3*	*15,87*	*346,0*
14	50.00	13.344	7.2649	0.9711	0.17296	5.781	*90,241*	*74,400*	*338,9*	*8,33*	*355,6*
16	55.00	15.375	9.6447	1.2892	0.22962	4.354	*119,802*	*81,840*	*390,5*	*7,93*	*406,4*
	65.00	15.250	9.4885	1.2683	0.22591	4.426	*117,862*	*96,720*	*387,3*	*9,52*	*406,4*
	70.00	15.198	9.4239	1.2597	0.22437	4.456	*117,060*	*104,160*	*386,0*	*10,18*	*406,4*
	75.00	15.125	9.3336	1.2476	0.22222	4.499	*115,938*	*111,600*	*384,1*	*11,11*	*406,4*
	84.00	15.010	9.1922	1.2287	0.21885	4.569	*114,182*	*124,992*	*381,2*	*12,57*	*406,4*
	109.00	14.688	8.8020	1.1766	0.20956	4.771	*109,335*	*162,192*	*373,0*	*16,66*	*406,4*
18	78.00	17.194	12.0618	1.6123	0.28717	3.482	*149,827*	*116,064*	*436,7*	*10,23*	*457,2*

Casing Sizes and Capacities

OD (in.)	Weight (lb/ft)	ID (in.)	Capacity					Weight *(kg/m)*	ID *(mm)*	Wall Thickness *(mm)*	OD *(mm)*
			Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*				
18	87.50	17.088	11.9135	1.5925	0.28364	3.525	*147,985*	*130,200*	*434,0*	*11,58*	*457,2*
	96.50	16.986	11.7717	1.5736	0.28027	3.567	*146,224*	*143,592*	*431,4*	*12,87*	*457,2*
18-5/8	73.09	17.875	13.0362	1.7426	0.31037	3.221	*161,930*	*108,757*	*454,0*	*9,52*	*473,0*
	78.00	17.855	13.0070	1.7387	0.30968	3.229	*161,568*	*116,064*	*453,5*	*9,77*	*473,0*
	87.50	17.755	12.8617	1.7193	0.30622	3.265	*159,763*	*130,200*	*450,9*	*11,04*	*473,0*
	96.50	17.655	12.7173	1.7000	0.30278	3.302	*157,969*	*143,592*	*448,4*	*12,31*	*473,0*
20	90.00	19.166	14.9872	2.0034	0.35682	2.802	*186,165*	*133,920*	*486,8*	*10,59*	*508,0*
	94.00	19.124	14.9216	1.9946	0.35526	2.814	*185,350*	*139,872*	*485,7*	*11,12*	*508,0*
	106.50	19.000	14.7288	1.9688	0.35067	2.851	*182,954*	*158,472*	*482,6*	*12,70*	*508,0*
	133.00	18.730	14.3131	1.9133	0.34077	2.934	*177,791*	*197,904*	*475,7*	*16,12*	*508,0*

Drill Pipe Sizes and Capacities

These figures do not include any allowances for pipe upsets and tool joints.

OD (in.)	Weight (lb/ft) IU	EU	IU and EU	ID (in.)	Capacity: Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*
2-3/8	4.85	4.85		1.995	.1624	.02171	.003866	258.7	*2,017*
	6.65	6.65		1.815	.1344	.01797	.003200	312.5	*1,670*
2-7/8	6.45			2.469	.2487	.03325	.005922	168.9	*3,089*
	6.85	6.85		2.441	.2431	.03250	.005788	172.8	*3,020*
	8.35			2.323	.2202	.02943	.005242	190.8	*2,735*
	10.40	10.40	10.40	2.151	.1888	.02523	.004494	222.5	*2,345*
3-1/2	8.50			3.063	.3828	.05117	.009114	109.7	*4,755*
	9.50	9.50		2.992	.3652	.04882	.008696	115.0	*4,537*
	11.20			2.900	.3431	.04587	.008169	122.4	*4,262*
	13.30	13.30	13.30	2.764	.3117	.04167	.007421	134.7	*3,872*
	15.50	15.50	15.50	2.602	.2762	.03693	.006577	152.0	*3,431*
4	11.85	11.85		3.476	.4930	.06590	.01174	85.20	*6,123*
	14.00	14.00	14.00	3.340	.4551	.06084	.01084	92.28	*5,654*
	15.70		15.30	3.240	.4283	.05725	.01020	98.07	*5,320*
4-1/2	12.75			4.000	.6528	.08726	.01554	64.34	*8,109*
	13.75	13.75		3.958	.6392	.08544	.01522	65.71	*7,939*

Drill Pipe Sizes and Capacities

These figures do not include any allowances for pipe upsets and tool joints.

OD (in.)	Weight (lb/ft) IU	EU	IU and EU	ID (in.)	Capacity: Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*
4-1/2	16.60	16.60	16.60	3.826	.5972	.07984	.01422	70.32	*7,419*
		18.15	18.15	3.754	.5750	.07686	.01369	73.05	*7,142*
	20.00	20.00	20.00	3.640	.5406	.07226	.01287	77.70	*6,715*
5	16.25		16.25	4.408	.7928	.1060	.01887	52.98	*9,847*
	19.50		19.50	4.276	.7460	.09972	.01776	56.30	*9,266*
	20.50	20.50		4.214	.7245	.09685	.01725	57.97	*9,000*
5-1/2	21.90		21.90	4.778	.9314	.1245	.02218	45.09	*11,57*
	24.70		24.70	4.670	.8898	.1189	.02119	47.20	*11,05*
5-9/16	19.00			4.975	1.0098	.1350	.02404	41.60	*12,54*
	22.20		22.20	4.859	.9633	.1288	.02293	43.60	*11,97*
	25.25			4.733	.9140	.1222	.02176	45.96	*11,35*
6-5/8	22.20			6.065	1.5008	.2006	.03573	27.97	*18,64*
	25.20		25.20	5.965	1.4517	.1941	.03456	28.92	*18,03*
	31.90			5.761	1.3541	.1810	.03224	31.00	*16,82*
7-5/8	29.25			6.969	1.9815	.2649	.04718	21.18	*24,61*
9-5/8	40.00			7.825	2.4985	.3340	.05949	16.80	*31,04*

BAKER OIL TOOLS
A Baker Hughes company

SECTION 8 - Annular Volume

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Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 1.050 in., 26,7 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	4.00	2.041	0.1249	0.0167	0.00297	336.069	*1,552*	*5,952*	*4,24*	
	4.70	1.995	0.1174	0.0156	0.00279	357.752	*1,458*	*6,993*	*4,82*	
2-3/8	5.95	1.867	0.0972	0.0129	0.00231	431.959	*1,207*	*8,853*	*6,45*	*60,3*
	6.20	1.853	0.0951	0.0127	0.00226	441.610	*1,181*	*9,225*	*6,62*	
	7.70	1.703	0.0733	0.0098	0.00174	572.641	*0,911*	*11,457*	*8,53*	
	6.50	2.441	0.1981	0.0264	0.00471	211.994	*2,461*	*9,672*	*5,51*	
	7.90	2.323	0.1751	0.0234	0.00417	239.749	*2,176*	*11,755*	*7,01*	
2-7/8	8.70	2.259	0.1632	0.0218	0.00388	257.323	*2,027*	*12,945*	*7,82*	*73,0*
	9.50	2.195	0.1515	0.0202	0.00360	277.065	*1,883*	*14,135*	*8,63*	
	10.70	2.091	0.1334	0.0178	0.00317	314.835	*1,657*	*15,921*	*9,95*	
	11.00	2.065	0.1289	0.0172	0.00307	325.595	*1,602*	*16,368*	*10,28*	
	7.70	3.068	0.3390	0.0453	0.00807	123.878	*4,211*	*11,457*	*5,48*	
	9.20	2.992	0.3202	0.0428	0.00762	131.146	*3,978*	*13,689*	*6,45*	
	10.20	2.922	0.3033	0.0405	0.00722	138.448	*3,768*	*15,177*	*7,34*	
3-1/2	12.95	2.750	0.2635	0.0352	0.00627	159.356	*3,273*	*19,269*	*9,52*	*88,9*
	15.80	2.548	0.2199	0.0293	0.00523	190.998	*2,731*	*23,510*	*12,09*	
	16.70	2.480	0.2059	0.0275	0.00490	203.934	*2,558*	*24,849*	*12,95*	
	17.05	2.440	0.1979	0.0264	0.00471	212.207	*2,458*	*25,370*	*13,46*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 1.050 in., 26,7 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
4	9.50	3.548	0.4686	0.0626	0.01115	89.627	*5,821*	*14,135*	*5,74*	*101,6*
	11.00	3.476	0.4479	0.0598	0.01066	93.755	*5,564*	*16,368*	*6,65*	
	11.60	3.428	0.4344	0.0580	0.01034	96.673	*5,396*	*17,260*	*7,26*	
	12.60	3.364	0.4167	0.0557	0.00992	100.787	*5,176*	*18,748*	*8,07*	
	13.40	3.340	0.4101	0.0548	0.00976	102.400	*5,094*	*19,939*	*8,38*	
4-1/2	9.50	4.090	0.6375	0.0852	0.01517	65.881	*7,919*	*14,135*	*5,20*	*114,3*
	10.50	4.052	0.6249	0.0835	0.01487	67.212	*7,762*	*15,624*	*5,68*	
	11.60	4.000	0.6078	0.0812	0.01447	69.101	*7,550*	*17,260*	*6,35*	
	12.60	3.958	0.5941	0.0794	0.01414	70.687	*7,380*	*18,748*	*6,88*	
	13.50	3.920	0.5819	0.0777	0.01385	72.171	*7,228*	*20,088*	*7,36*	
	15.10	3.826	0.5522	0.0738	0.01314	76.053	*6,859*	*22,468*	*8,55*	
	16.60	3.754	0.5299	0.0708	0.01261	79.248	*6,583*	*24,700*	*9,47*	
	17.70	3.697	0.5126	0.0685	0.01220	81.927	*6,368*	*26,337*	*10,19*	
	18.80	3.640	0.4956	0.0662	0.01179	84.747	*6,156*	*27,974*	*10,92*	
4-3/4	16.00	4.082	0.6348	0.0848	0.01511	66.158	*7,885*	*23,808*	*8,48*	*120,6*
5	11.50	4.560	0.8033	0.1073	0.01912	52.279	*9,979*	*17,112*	*5,58*	*127,0*
	13.00	4.494	0.7790	0.1041	0.01854	53.915	*9,676*	*19,344*	*6,42*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 1.050 in., 26,7 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	15.00	4.408	0.7477	0.0999	0.01780	56.167	*9,288*	*22,320*	*7,51*	
	18.00	4.276	0.7010	0.0937	0.01669	59.915	*8,707*	*26,784*	*9,19*	
5	20.30	4.184	0.6692	0.0894	0.01593	62.758	*8,313*	*30,206*	*10,36*	*127,0*
	21.00	4.154	0.6590	0.0880	0.01569	63.729	*8,186*	*31,248*	*10,74*	
	23.20	4.044	0.6222	0.0831	0.01481	67.498	*7,729*	*34,521*	*12,14*	
	13.00	5.044	0.9930	0.1327	0.02364	42.295	*12,335*	*19,344*	*5,79*	
	14.00	5.012	0.9799	0.1309	0.02333	42.861	*12,172*	*20,832*	*6,19*	
	15.00	4.974	0.9644	0.1289	0.02296	43.549	*11,979*	*22,320*	*6,68*	
5-1/2	15.50	4.950	0.9547	0.1276	0.02273	43.993	*11,859*	*23,064*	*6,98*	*139,7*
	17.00	4.892	0.9314	0.1245	0.02217	45.093	*11,569*	*25,296*	*7,72*	
	20.00	4.778	0.8864	0.1184	0.02110	47.381	*11,011*	*29,760*	*9,16*	
	23.00	4.670	0.8448	0.1129	0.02011	49.716	*10,494*	*34,224*	*10,54*	
	26.00	4.548	0.7989	0.1067	0.01902	52.571	*9,924*	*38,688*	*12,09*	
	14.00	5.290	1.0967	0.1466	0.02611	38.295	*13,623*	*20,832*	*5,84*	
	17.00	5.190	1.0540	0.1408	0.02509	39.848	*13,092*	*25,296*	*7,11*	
5-3/4	19.50	5.090	1.0120	0.1352	0.02409	41.500	*12,571*	*29,016*	*8,38*	*146,0*
	22.50	4.990	0.9709	0.1297	0.02311	43.258	*12,060*	*33,480*	*9,65*	
	25.20	4.890	0.9306	0.1244	0.02215	45.131	*11,559*	*37,497*	*10,92*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 1.050 in., 26,7 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	15.00	5.524	1.2000	0.1604	0.02857	35.000	*14,906*	*22,320*	*6,04*	
	16.00	5.500	1.1892	0.1589	0.02831	35.318	*14,771*	*23,808*	*6,35*	
	17.00	5.450	1.1668	0.1559	0.02778	35.994	*14,494*	*25,296*	*6,98*	
6	18.00	5.424	1.1553	0.1544	0.02750	36.353	*14,351*	*26,784*	*7,31*	*152,4*
	20.00	5.352	1.1236	0.1502	0.02675	37.377	*13,957*	*29,760*	*8,22*	
	23.00	5.240	1.0752	0.1437	0.02560	39.060	*13,356*	*34,224*	*9,65*	
	26.00	5.140	1.0329	0.1380	0.02459	40.661	*12,830*	*38,688*	*10,92*	
	13.00	6.255	1.5513	0.2073	0.03693	27.074	*19,269*	*19,344*	*4,69*	
	17.00	6.135	1.4906	0.1992	0.03549	28.176	*18,516*	*25,296*	*6,22*	
	20.00	6.049	1.4479	0.1935	0.03447	29.008	*17,985*	*29,760*	*7,31*	
	22.00	5.989	1.4184	0.1896	0.03377	29.610	*17,619*	*32,736*	*8,07*	
6-5/8	24.00	5.921	1.3853	0.1851	0.03298	30.317	*17,208*	*35,712*	*8,94*	*168,2*
	26.00	5.855	1.3536	0.1809	0.03222	31.027	*16,814*	*38,688*	*9,77*	
	28.00	5.791	1.3232	0.1768	0.03150	31.740	*16,437*	*41,664*	*10,59*	
	29.00	5.761	1.3091	0.1750	0.03116	32.083	*16,261*	*43,152*	*10,97*	
	32.00	5.675	1.2690	0.1696	0.03021	33.097	*15,763*	*47,616*	*12,06*	
	34.00	5.595	1.2322	0.1647	0.02933	34.085	*15,306*	*50,592*	*13,08*	
7	17.00	6.538	1.6990	0.2271	0.04045	24.720	*21,104*	*25,296*	*5,86*	*177,8*

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 1.050 in., 26,7 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	20.00	6.456	1.6555	0.2213	0.03941	25.369	*20,564*	*29,760*	*6,90*	
	22.00	6.398	1.6251	0.2172	0.03869	25.844	*20,186*	*32,736*	*7,64*	
	23.00	6.366	1.6084	0.2150	0.03829	26.112	*19,979*	*34,224*	*8,05*	
	24.00	6.336	1.5929	0.2129	0.03792	26.367	*19,786*	*35,712*	*8,43*	
	26.00	6.276	1.5620	0.2088	0.03719	26.888	*19,403*	*38,688*	*9,19*	
	28.00	6.214	1.5304	0.2045	0.03643	27.443	*19,010*	*41,664*	*9,98*	
	29.00	6.184	1.5152	0.2025	0.03607	27.718	*18,822*	*43,152*	*10,36*	
7	30.00	6.154	1.5001	0.2005	0.03571	27.997	*18,634*	*44,640*	*10,74*	*177,8*
	32.00	6.094	1.4702	0.1965	0.03500	28.568	*18,262*	*47,616*	*11,50*	
	33.70	6.048	1.4474	0.1934	0.03446	29.018	*17,979*	*50,145*	*12,09*	
	34.00	6.040	1.4434	0.1929	0.03436	29.097	*17,930*	*50,592*	*12,19*	
	35.00	6.004	1.4257	0.1905	0.03394	29.458	*17,710*	*52,080*	*12,65*	
	35.30	6.000	1.4238	0.1903	0.03389	29.499	*17,686*	*52,526*	*12,70*	
	38.00	5.920	1.3849	0.1851	0.03297	30.327	*17,202*	*56,543*	*13,72*	
	40.00	5.836	1.3446	0.1797	0.03201	31.236	*16,702*	*59,520*	*14,78*	
	41.00	5.820	1.3370	0.1787	0.03183	31.414	*16,607*	*61,008*	*14,99*	
	44.00	5.720	1.2899	0.1724	0.03071	32.560	*16,022*	*65,472*	*16,26*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 1.315 in., 33,4 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
2-7/8	6.50	2.441	0.1725	0.0230	0.00410	243.409	*2,143*	*9,672*	*5,51*	*73,0*
	7.90	2.323	0.1496	0.0200	0.00356	280.723	*1,858*	*11,755*	*7,01*	
	8.70	2.259	0.1376	0.0184	0.00327	305.123	*1,709*	*12,945*	*7,82*	
	9.50	2.195	0.1260	0.0168	0.00300	333.282	*1,565*	*14,135*	*8,63*	
	10.70	2.091	0.1078	0.0144	0.00256	389.489	*1,339*	*15,921*	*9,95*	
	11.00	2.065	0.1034	0.0138	0.00246	406.091	*1,284*	*16,368*	*10,28*	
3-1/2	7.70	3.068	0.3134	0.0419	0.00746	133.982	*3,893*	*11,457*	*5,48*	*88,9*
	9.20	2.992	0.2946	0.0393	0.00701	142.525	*3,660*	*13,689*	*6,45*	
	10.20	2.922	0.2778	0.0371	0.00661	151.191	*3,450*	*15,177*	*7,34*	
	12.95	2.750	0.2379	0.0318	0.00566	176.477	*2,956*	*19,269*	*9,52*	
	15.80	2.548	0.1943	0.0259	0.00462	216.129	*2,413*	*23,510*	*12,09*	
	16.70	2.480	0.1803	0.0241	0.00429	232.843	*2,240*	*24,849*	*12,95*	
	17.05	2.440	0.1723	0.0230	0.00410	243.690	*2,140*	*25,370*	*13,46*	
4	9.50	3.548	0.4430	0.0592	0.01054	94.800	*5,503*	*14,135*	*5,74*	*101,6*
	11.00	3.476	0.4224	0.0564	0.01005	99.430	*5,247*	*16,368*	*6,65*	
	11.60	3.428	0.4088	0.0546	0.00973	102.718	*5,079*	*17,260*	*7,26*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 1.315 in., 33,4 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
4	12.60 13.40	3.364 3.340	0.3911 0.3845	0.0522 0.0514	0.00931 0.00915	107.375 109.208	*4,858* *4,777*	*18,748* *19,939*	*8,07* *8,38*	*101,6*
4-1/2	9.50 10.50 11.60 12.60 13.50 15.10 16.60 17.70 18.80	4.090 4.052 4.000 3.958 3.920 3.826 3.754 3.697 3.640	0.6119 0.5993 0.5822 0.5686 0.5563 0.5266 0.5044 0.4870 0.4700	0.0818 0.0801 0.0778 0.0760 0.0743 0.0704 0.0674 0.0651 0.0628	0.01456 0.01426 0.01386 0.01353 0.01324 0.01253 0.01200 0.01159 0.01119	68.634 70.080 72.136 73.866 75.487 79.745 83.266 86.228 89.358	*7,601* *7,444* *7,232* *7,063* *6,911* *6,542* *6,265* *6,050* *5,838*	*14,135* *15,624* *17,260* *18,748* *20,088* *22,468* *24,700* *26,337* *27,974*	*5,20* *5,68* *6,35* *6,88* *7,36* *8,55* *9,47* *10,19* *10,92*	*114,3*
4-3/4	16.00	4.082	0.6092	0.0814	0.01450	68.935	*7,568*	*23,808*	*8,48*	*120,6*
5	11.50 13.00 15.00	4.560 4.494 4.408	0.7778 0.7534 0.7222	0.1039 0.1007 0.0965	0.01851 0.01793 0.01719	53.998 55.745 58.156	*9,661* *9,358* *8,970*	*17,112* *19,344* *22,320*	*5,58* *6,42* *7,51*	*127,0*

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 1.315 in., 33,4 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
5	18.00	4.276	0.6754	0.0902	0.01608	62.183	*8,390*	*26,784*	*9,19*	*127,0*
	20.30	4.184	0.6436	0.0860	0.01532	65.251	*7,995*	*30,206*	*10,36*	
	21.00	4.154	0.6334	0.0846	0.01508	66.302	*7,868*	*31,248*	*10,74*	
	23.20	4.044	0.5966	0.0797	0.01420	70.390	*7,411*	*34,521*	*12,14*	
5-1/2	13.00	5.044	0.9674	0.1293	0.02303	43.413	*12,017*	*19,344*	*5,79*	*139,7*
	14.00	5.012	0.9543	0.1275	0.02272	44.010	*11,854*	*20,832*	*6,19*	
	15.00	4.974	0.9388	0.1255	0.02235	44.736	*11,662*	*22,320*	*6,68*	
	15.50	4.950	0.9291	0.1242	0.02212	45.203	*11,541*	*23,064*	*6,98*	
	17.00	4.892	0.9058	0.1210	0.02156	46.366	*11,252*	*25,296*	*7,72*	
	20.00	4.778	0.8608	0.1150	0.02049	48.788	*10,693*	*29,760*	*9,16*	
	23.00	4.670	0.8192	0.1095	0.01950	51.267	*10,176*	*34,224*	*10,54*	
	26.00	4.548	0.7733	0.1033	0.01841	54.309	*9,606*	*38,688*	*12,09*	
5-3/4	14.00	5.290	1.0711	0.1431	0.02550	39.209	*13,305*	*20,832*	*5,84*	*146,0*
	17.00	5.190	1.0284	0.1374	0.02448	40.839	*12,774*	*25,296*	*7,11*	
	19.50	5.090	0.9864	0.1318	0.02348	42.576	*12,253*	*29,016*	*8,38*	
	22.50	4.990	0.9453	0.1263	0.02250	44.428	*11,742*	*33,480*	*9,65*	
	25.20	4.890	0.9050	0.1209	0.02154	46.407	*11,242*	*37,497*	*10,92*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 1.315 in., 33,4 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
6	15.00	5.524	1.1744	0.1569	0.02796	35.762	*14,588*	*22,320*	*6,04*	*152,4*
	16.00	5.500	1.1636	0.1555	0.02770	36.094	*14,454*	*23,808*	*6,35*	
	17.00	5.450	1.1413	0.1525	0.02717	36.800	*14,176*	*25,296*	*6,98*	
	18.00	5.424	1.1297	0.1510	0.02689	37.176	*14,033*	*26,784*	*7,31*	
	20.00	5.352	1.0981	0.1467	0.02614	38.248	*13,640*	*29,760*	*8,22*	
	23.00	5.240	1.0497	0.1403	0.02499	40.011	*13,039*	*34,224*	*9,65*	
	26.00	5.140	1.0073	0.1346	0.02398	41.694	*12,513*	*38,688*	*10,92*	
6-5/8	13.00	6.255	1.5257	0.2039	0.03632	27.528	*18,952*	*19,344*	*4,69*	*168,2*
	17.00	6.135	1.4650	0.1958	0.03488	28.668	*18,198*	*25,296*	*6,22*	
	20.00	6.049	1.4223	0.1901	0.03386	29.529	*17,667*	*29,760*	*7,31*	
	22.00	5.989	1.3928	0.1861	0.03316	30.154	*17,301*	*32,736*	*8,07*	
	24.00	5.921	1.3598	0.1817	0.03237	30.887	*16,891*	*35,712*	*8,94*	
	26.00	5.855	1.3281	0.1775	0.03162	31.624	*16,497*	*38,688*	*9,77*	
	28.00	5.791	1.2977	0.1734	0.03089	32.365	*16,119*	*41,664*	*10,59*	
	29.00	5.761	1.2835	0.1715	0.03056	32.722	*15,943*	*43,152*	*10,97*	
	32.00	5.675	1.2434	0.1662	0.02960	33.778	*15,445*	*47,616*	*12,06*	
	34.00	5.595	1.2066	0.1613	0.02872	34.808	*14,988*	*50,592*	*13,08*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 1.315 in., 33,4 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	17.00	6.538	1.6734	0.2237	0.03984	25.098	*20,787*	*25,296*	*5,86*	
	20.00	6.456	1.6299	0.2178	0.03880	25.767	*20,247*	*29,760*	*6,90*	
	22.00	6.398	1.5995	0.2138	0.03808	26.257	*19,869*	*32,736*	*7,64*	
	23.00	6.366	1.5829	0.2115	0.03768	26.534	*19,662*	*34,224*	*8,05*	
	24.00	6.336	1.5673	0.2095	0.03731	26.797	*19,469*	*35,712*	*8,43*	
	26.00	6.276	1.5364	0.2053	0.03658	27.335	*19,085*	*38,688*	*9,19*	
	28.00	6.214	1.5048	0.2011	0.03582	27.909	*18,693*	*41,664*	*9,98*	
	29.00	6.184	1.4897	0.1991	0.03546	28.194	*18,504*	*43,152*	*10,36*	
7	30.00	6.154	1.4746	0.1971	0.03510	28.482	*18,317*	*44,640*	*10,74*	*177,8*
	32.00	6.094	1.4446	0.1931	0.03439	29.074	*17,944*	*47,616*	*11,50*	
	33.70	6.048	1.4218	0.1900	0.03385	29.540	*17,661*	*50,145*	*12,09*	
	34.00	6.040	1.4178	0.1895	0.03375	29.622	*17,612*	*50,592*	*12,19*	
	35.00	6.004	1.4002	0.1871	0.03333	29.996	*17,392*	*52,080*	*12,64*	
	35.30	6.000	1.3982	0.1869	0.03329	30.038	*17,368*	*52,526*	*12,70*	
	38.00	5.920	1.3593	0.1817	0.03236	30.898	*16,885*	*56,543*	*13,71*	
	40.00	5.836	1.3190	0.1763	0.03140	31.842	*16,384*	*59,520*	*14,78*	
	41.00	5.820	1.3114	0.1753	0.03122	32.026	*16,290*	*61,008*	*14,93*	
	44.00	5.720	1.2643	0.1690	0.03010	33.219	*15,705*	*65,472*	*16,25*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 1.660 in., 42,2 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	6.50	2.441	0.1306	0.0174	0.00311	321.411	*1,623*	*9,672*	*5,51*	
	7.90	2.323	0.1077	0.0144	0.00256	389.832	*1,338*	*11,755*	*7,01*	
2-7/8	8.70	2.259	0.0957	0.0128	0.00228	438.530	*1,189*	*12,945*	*7,82*	*73,0*
	9.50	2.195	0.0841	0.0112	0.00200	499.141	*1,045*	*14,135*	*8,63*	
	10.70	2.091	0.0659	0.0088	0.00157	636.762	*0,819*	*15,921*	*9,95*	
	11.00	2.065	0.0615	0.0082	0.00146	682.371	*0,764*	*16,368*	*10,28*	
	7.70	3.068	0.2716	0.0363	0.00646	154.639	*3,373*	*11,457*	*5,48*	
	9.20	2.992	0.2528	0.0337	0.00601	166.133	*3,140*	*13,689*	*6,45*	
	10.20	2.922	0.2359	0.0315	0.00561	178.027	*2,930*	*15,177*	*7,34*	
3-1/2	12.95	2.750	0.1961	0.0262	0.00466	214.159	*2,436*	*19,269*	*9,52*	*88,9*
	15.80	2.548	0.1524	0.0203	0.00362	275.494	*1,893*	*23,510*	*12,09*	
	16.70	2.480	0.1385	0.0185	0.00329	303.240	*1,720*	*24,840*	*12,95*	
	17.05	2.440	0.1304	0.0174	0.00310	321.901	*1,620*	*25,370*	*13,46*	
	9.50	3.548	0.4011	0.0536	0.00955	104.695	*4,983*	*14,135*	*5,74*	
4	11.00	3.476	0.3805	0.0508	0.00906	110.372	*4,726*	*16,368*	*6,65*	*101,6*
	11.60	3.428	0.3670	0.0490	0.00873	114.438	*4,558*	*17,260*	*7,26*	
	12.60	3.364	0.3492	0.0466	0.00831	120.249	*4,338*	*18,748*	*8,07*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 1.660 in., 42,2 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
4	13.40	3.340	0.3427	0.0458	0.00815	122.552	*4,257*	*19,939*	*8,38*	*101,6*
4-1/2	9.50	4.090	0.5700	0.0762	0.01357	73.676	*7,081*	*14,135*	*5,20*	*114,3*
	10.50	4.052	0.5574	0.0745	0.01327	75.344	*6,924*	*15,624*	*5,68*	
	11.60	4.000	0.5403	0.0722	0.01286	77.726	*6,712*	*17,260*	*6,35*	
	12.60	3.958	0.5267	0.0704	0.01254	79.738	*6,542*	*18,748*	*6,88*	
	13.50	3.920	0.5145	0.0687	0.01225	81.631	*6,391*	*20,088*	*7,36*	
	15.10	3.826	0.4848	0.0648	0.01154	86.633	*6,022*	*22,468*	*8,55*	
	16.60	3.754	0.4625	0.0618	0.01101	90.804	*5,745*	*24,700*	*9,47*	
	17.70	3.697	0.4452	0.0595	0.01060	94.338	*5,530*	*26,337*	*10,19*	
	18.80	3.640	0.4281	0.0572	0.01019	98.098	*5,318*	*27,974*	*10,92*	
4-3/4	16.00	4.082	0.5674	0.0758	0.01350	74.022	*7,048*	*23,808*	*8,48*	*120,6*
5	11.50	4.560	0.7359	0.0983	0.01752	57.070	*9,141*	*17,112*	*5,58*	*127,0*
	13.00	4.494	0.7115	0.0951	0.01694	59.026	*8,838*	*19,344*	*6,42*	
	15.00	4.408	0.6803	0.0909	0.01619	61.736	*8,450*	*22,320*	*7,51*	
	18.00	4.276	0.6335	0.0846	0.01508	66.293	*7,869*	*26,784*	*9,19*	
	20.30	4.184	0.6018	0.0804	0.01432	69.791	*7,475*	*30,206*	*10,36*	
	21.00	4.154	0.5916	0.0790	0.01408	70.995	*7,348*	*31,248*	*10,74*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 1.660 in., 42,2 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
5	23.20	4.044	0.5548	0.0741	0.01320	75.703	*6,891*	*34,521*	*12,14*	*127,0*
5-1/2	13.00	5.044	0.9256	0.1237	0.02203	45.377	*11,497*	*19,344*	*5,79*	*139,7*
	14.00	5.012	0.9124	0.1219	0.02172	46.030	*11,334*	*20,832*	*6,19*	
	15.00	4.974	0.8969	0.1199	0.02135	46.824	*11,142*	*22,320*	*6,68*	
	15.50	4.950	0.8872	0.1186	0.02112	47.337	*11,021*	*23,064*	*6,98*	
	17.00	4.892	0.8639	0.1154	0.02057	48.613	*10,732*	*25,296*	*7,72*	
	20.00	4.778	0.8190	0.1094	0.01949	51.283	*10,173*	*29,760*	*9,16*	
	23.00	4.670	0.7773	0.1039	0.01850	54.029	*9,656*	*34,224*	*10,54*	
	26.00	4.548	0.7314	0.0977	0.01741	57.418	*9,086*	*38,688*	*12,09*	
5-3/4	14.00	5.290	1.0293	0.1375	0.02450	40.804	*12,785*	*20,832*	*5,84*	*146,0*
	17.00	5.190	0.9865	0.1318	0.02348	42.573	*12,254*	*25,296*	*7,11*	
	19.50	5.090	0.9446	0.1262	0.02249	44.463	*11,733*	*29,016*	*8,38*	
	22.50	4.990	0.9034	0.1207	0.02151	46.487	*11,222*	*33,480*	*9,65*	
	25.20	4.890	0.8631	0.1153	0.02055	48.658	*10,722*	*37,497*	*10,92*	
6	15.00	5.524	1.1325	0.1513	0.02696	37.085	*14,068*	*22,320*	*6,04*	*152,4*
	16.00	5.500	1.1217	0.1499	0.02670	37.441	*13,934*	*23,808*	*6,35*	
	17.00	5.450	1.0994	0.1469	0.02617	38.202	*13,656*	*25,296*	*6,98*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 1.660 in., 42,2 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
6	18.00	5.424	1.0878	0.1454	0.02590	38.607	*13,513*	*26,784*	*7,31*	*152,4*
	20.00	5.352	1.0562	0.1411	0.02514	39.764	*13,120*	*29,760*	*8,22*	
	23.00	5.240	1.0078	0.1347	0.02399	41.674	*12,518*	*34,224*	*9,65*	
	26.00	5.140	0.9654	0.1290	0.02298	43.502	*11,992*	*38,688*	*10,92*	
6-5/8	13.00	6.255	1.4838	0.1983	0.03532	28.305	*18,432*	*19,344*	*4,69*	*168,2*
	17.00	6.135	1.4232	0.1902	0.03388	29.511	*17,678*	*25,296*	*6,22*	
	20.00	6.049	1.3804	0.1845	0.03286	30.425	*17,147*	*29,760*	*7,31*	
	22.00	5.989	1.3509	0.1805	0.03216	31.089	*16,781*	*32,736*	*8,07*	
	24.00	5.921	1.3179	0.1761	0.03137	31.868	*16,370*	*35,712*	*8,94*	
	26.00	5.855	1.2862	0.1719	0.03062	32.654	*15,977*	*38,688*	*9,77*	
	28.00	5.791	1.2558	0.1678	0.02989	33.445	*15,599*	*41,664*	*10,59*	
	29.00	5.761	1.2416	0.1659	0.02956	33.825	*15,423*	*43,152*	*10,97*	
	32.00	5.675	1.2015	0.1606	0.02860	34.955	*14,925*	*47,616*	*12,06*	
	34.00	5.595	1.1647	0.1557	0.02773	36.059	*14,468*	*50,592*	*13,08*	
7	17.00	6.538	1.6315	0.2181	0.03884	25.742	*20,266*	*25,296*	*5,86*	*177,8*
	20.00	6.456	1.5881	0.2122	0.03781	26.447	*19,726*	*29,760*	*6,90*	
	22.00	6.398	1.5576	0.2082	0.03708	26.963	*19,349*	*32,736*	*7,64*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 1.660 in., 42,2 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	23.00	6.366	1.5410	0.2059	0.03669	27.255	*19,142*	*34,224*	*8,05*	
	24.00	6.336	1.5254	0.2039	0.03631	27.533	*18,948*	*35,712*	*8,43*	
	26.00	6.276	1.4946	0.1997	0.03558	28.101	*18,565*	*38,688*	*9,19*	
	28.00	6.214	1.4630	0.1955	0.03483	28.708	*18,172*	*41,664*	*9,98*	
	29.00	6.184	1.4478	0.1935	0.03447	29.009	*17,984*	*43,152*	*10,36*	
	30.00	6.154	1.4327	0.1915	0.03411	29.315	*17,796*	*44,640*	*10,74*	
	32.00	6.094	1.4027	0.1875	0.03339	29.941	*17,424*	*47,616*	*11,50*	
7	33.70	6.048	1.3799	0.1844	0.03285	30.436	*17,141*	*50,145*	*12,09*	*177,8*
	34.00	6.040	1.3760	0.1839	0.03276	30.523	*17,092*	*50,592*	*12,19*	
	35.00	6.004	1.3583	0.1815	0.03234	30.921	*16,872*	*52,080*	*12,64*	
	35.30	6.000	1.3563	0.1813	0.03229	30.965	*16,848*	*52,526*	*12,70*	
	38.00	5.920	1.3174	0.1761	0.03136	31.880	*16,364*	*56,543*	*13,71*	
	40.00	5.836	1.2771	0.1707	0.03040	32.886	*15,864*	*59,520*	*14,78*	
	41.00	5.820	1.2695	0.1697	0.03022	33.083	*15,769*	*61,008*	*14,98*	
	44.00	5.720	1.2224	0.1634	0.02910	34.357	*15,185*	*65,472*	*16,25*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 1.900 in., 48,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	7.70	3.068	0.2367	0.0316	0.00563	177.409	*2,940*	*11,457*	*5,48*	
	9.20	2.992	0.2179	0.0291	0.00518	192.704	*2,707*	*13,689*	*6,45*	
	10.20	2.922	0.2010	0.0268	0.00478	208.892	*2,497*	*15,177*	*7,34*	
3-1/2	12.95	2.750	0.1612	0.0215	0.00383	260.453	*2,003*	*19,269*	*9,52*	*88,9*
	15.80	2.548	0.1175	0.0157	0.00279	357.159	*1,460*	*23,510*	*12,09*	
	16.70	2.480	0.1036	0.0138	0.00246	405.228	*1,287*	*24,849*	*12,95*	
	17.05	2.440	0.0956	0.0127	0.00227	439.256	*1,187*	*25,370*	*13,46*	
	9.50	3.548	0.3663	0.0489	0.00872	114.658	*4,550*	*14,135*	*5,74*	
	11.00	3.476	0.3456	0.0462	0.00823	121.502	*4,293*	*16,368*	*6,65*	
4	11.60	3.428	0.3321	0.0444	0.00790	126.448	*4,125*	*17,260*	*7,26*	*101,6*
	12.60	3.364	0.3144	0.0420	0.00748	133.581	*3,905*	*18,748*	*8,07*	
	13.40	3.340	0.3078	0.0411	0.00732	136.429	*3,824*	*19,939*	*8,38*	
	9.50	4.090	0.5352	0.0715	0.01274	78.474	*6,648*	*14,135*	*5,20*	
	10.50	4.052	0.5226	0.0698	0.01244	80.370	*6,491*	*15,624*	*5,68*	
4-1/2	11.60	4.000	0.5055	0.0675	0.01203	83.086	*6,279*	*17,260*	*6,35*	*114,3*
	12.60	3.958	0.4918	0.0657	0.01171	85.390	*6,109*	*18,748*	*6,88*	
	13.50	3.920	0.4796	0.0641	0.01142	87,564	*5,958*	*20,088*	*7,36*	
	15.10	3.826	0.4499	0.0601	0.01071	93.345	*5,589*	*22,468*	*8,55*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 1.900 in., 48,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
4-1/2	16.60	3.754	0.4276	0.0571	0.01018	98.205	*5,312*	*24,700*	*9,47*	*114,3*
	17.70	3.697	0.4103	0.0548	0.00977	102.352	*5,097*	*26,337*	*10,19*	
	18.80	3.640	0.3932	0.0525	0.00936	106.793	*4,885*	*27,974*	*10,92*	
4-3/4	16.00	4.082	0.5325	0.0711	0.01267	78.867	*6,615*	*23,808*	*8,48*	*120,6*
5	11.50	4.560	0.7010	0.0937	0.01669	59.908	*8,708*	*17,112*	*5,58*	*127,0*
	13.00	4.494	0.6767	0.0904	0.01611	62.066	*8,405*	*19,344*	*6,42*	
	15.00	4.408	0.6454	0.0862	0.01536	65.070	*8,017*	*22,320*	*7,51*	
	18.00	4.276	0.5987	0.0800	0.01425	70.153	*7,436*	*26,784*	*9,19*	
	20.30	4.184	0.5669	0.0757	0.01349	74.082	*7,042*	*30,206*	*10,36*	
	21.00	4.154	0.5567	0.0744	0.01325	75.440	*6,915*	*31,248*	*10,74*	
	23.20	4.044	0.5199	0.0695	0.01237	80.778	*6,458*	*34,521*	*12,14*	
5-1/2	13.00	5.044	0.8907	0.1190	0.02120	47.153	*11,064*	*19,344*	*5,79*	*139,7*
	14.00	5.012	0.8776	0.1173	0.02089	47.858	*10,901*	*20,832*	*6,19*	
	15.00	4.974	0.8621	0.1152	0.02052	48.717	*10,709*	*22,320*	*6,68*	
	15.50	4.950	0.8524	0.1139	0.02029	49.273	*10,588*	*23,064*	*6,98*	
	17.00	4.892	0.8291	0.1108	0.01974	50.657	*10,299*	*25,296*	*7,72*	
	20.00	4.778	0.7841	0.1048	0.01866	53.562	*9,740*	*29,760*	*9,16*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 1.900 in., 48,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
5-1/2	23.00 26.00	4.670 4.548	0.7425 0.6966	0.0992 0.0931	0.01767 0.01658	56.566 60.291	*9,223* *8,653*	*34,224* *38,688*	*10,54* *12,09*	*139,7*
5-3/4	14.00 17.00 19.50 22.50 25.20	5.290 5.190 5.090 4.990 4.890	0.9944 0.9517 0.9097 0.8686 0.8283	0.1329 0.1272 0.1216 0.1161 0.1107	0.02367 0.02265 0.02166 0.02068 0.01972	42.235 44.132 46.167 48.353 50.706	*12,352* *11,821* *11,300* *10,789* *10,289*	*20,832* *25,296* *29,016* *33,480* *37,497*	*5,84* *7,11* *8,38* *9,65* *10,92*	*146,0*
6	15.00 16.00 17.00 18.00 20.00 23.00 26.00	5.524 5.500 5.450 5.424 5.352 5.240 5.140	1.0977 1.0869 1.0645 1.0530 1.0213 0.9729 0.9306	0.1467 0.1452 0.1423 0.1407 0.1365 0.1300 0.1244	0.02613 0.02587 0.02534 0.02507 0.02431 0.02316 0.02215	38.262 38.642 39.453 39.885 41.121 43.167 45.131	*13,635* *13,501* *13,223* *13,080* *12,687* *12,085* *11,559*	*22,320* *23,808* *25,296* *26,784* *29,760* *34,224* *38,688*	*6,04* *6,35* *6,98* *7,31* *8,22* *9,65* *10,92*	*152,4*
6-5/8	13.00 17.00 20.00	6.255 6.135 6.049	1.4490 1.3883 1.3456	0.1936 0.1855 0.1798	0.03449 0.03305 0.03203	28.986 30.252 31.213	*17,999* *17,245* *16,714*	*19,344* *25,296* *29,760*	*4,69* *6,22* *7,31*	*168,2*

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 1.900 in., 48,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
6-5/8	22.00	5.989	1.3161	0.1759	0.03133	31.912	*16,348*	*32,736*	*8,07*	*168,2*
	24.00	5.921	1.2830	0.1715	0.03054	32.734	*15,937*	*35,712*	*8,94*	
	26.00	5.855	1.2513	0.1672	0.02979	33.563	*15,544*	*38,688*	*9,77*	
	28.00	5.791	1.2209	0.1632	0.02906	34.399	*15,166*	*41,664*	*10,59*	
	29.00	5.761	1.2068	0.1613	0.02873	34.802	*14,990*	*43,152*	*10,97*	
	32.00	5.675	1.1667	0.1559	0.02777	35.999	*14,492*	*47,616*	*12,06*	
	34.00	5.595	1.1299	0.1510	0.02690	37.171	*14,035*	*50,592*	*13,08*	
7	17.00	6.538	1.5967	0.2134	0.03801	26.304	*19,833*	*25,296*	*5,86*	*177,8*
	20.00	6.456	1.5532	0.2076	0.03696	27.040	*19,293*	*29,760*	*6,90*	
	22.00	6.398	1.5228	0.2035	0.03625	27.580	*18,916*	*32,736*	*7,64*	
	23.00	6.366	1.5061	0.2013	0.03586	27.886	*18,709*	*34,224*	*8,05*	
	24.00	6.336	1.4906	0.1992	0.03548	28.176	*18,515*	*35,712*	*8,43*	
	26.00	6.276	1.4597	0.1951	0.03475	28.772	*18,132*	*38,688*	*9,19*	
	28-00	6.214	1.4281	0.1909	0.03400	29.409	*17,739*	*41,664*	*9,98*	
	29.00	6.184	1.4129	0.1888	0.03364	29.725	*17,551*	*43,152*	*10,36*	
	30.00	6.154	1.3978	0.1868	0.03328	30.046	*17,363*	*44,640*	*10,74*	
	32.00	6.094	1.3678	0.1828	0.03256	30.705	*16,991*	*47,616*	*11,50*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 1.900 in., 48,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	33.70	6.048	1.3451	0.1798	0.03202	31.225	*16,708*	*50,145*	*12,09*	
	34.00	6.040	1.3411	0.1792	0.03193	31.317	*16,659*	*50,592*	*12,19*	
	35.00	6.004	1.3234	0.1769	0.03151	31.735	*16,439*	*52,080*	*12,64*	
7	35.30	6.000	1.3215	0.1766	0.03146	31.782	*16,415*	*52,526*	*12,70*	
	38.00	5.920	1.2826	0.1714	0.03053	32.746	*15,931*	*56,543*	*13,71*	*177,8*
	40.00	5.836	1.2423	0.1660	0.02957	33.808	*15,431*	*59,520*	*14,78*	
	41.00	5.820	1.2347	0.1650	0.02939	34.017	*15,336*	*61,008*	*14,98*	
	44.00	5.720	1.1876	0.1587	0.02827	35.365	*14,752*	*65,472*	*16,25*	
	20.00	7.125	1.9239	0.2571	0.04580	21.830	*23,898*	*29,760*	*6,35*	
	24.00	7.025	1.8662	0.2494	0.04443	22.506	*23,181*	*35,712*	*7,62*	
	26.40	6.969	1.8342	0.2451	0.04367	22.898	*22,784*	*39,283*	*8,33*	
	29.70	6.875	1.7811	0.2380	0.04240	23.580	*22,124*	*44,193*	*9,52*	
7-5/8	33.70	6.765	1.7199	0.2299	0.04094	24.420	*21,364*	*50,145*	*10,92*	*193,6*
	36.00	6.705	1.6869	0.2255	0.04016	24.897	*20,954*	*53,568*	*11,68*	
	38.00	6.655	1.6597	0.2218	0.03951	25.306	*20,616*	*56,543*	*12,31*	
	39.00	6.625	1.6434	0.2196	0.03912	25.556	*20,414*	*58,032*	*12,70*	
	45.30	6.435	1.5422	0.2061	0.03671	27.234	*19,156*	*67,406*	*15,11*	
7-3/4	46.10	6.560	1.5030	0.2009	0.03578	27.943	*18,670*	*68,596*	*17,65*	*196,8*

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.063 in., 52,4 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	9.50	4.090	0.5088	0.0680	0.01211	82.539	*6,320*	*14,135*	*5,20*	
	10.50	4.052	0.4962	0.0663	0.01181	84.639	*6,164*	*15,624*	*5,68*	
	11.60	4.000	0.4791	0.0640	0.01140	87.656	*5,951*	*17,260*	*6,35*	
	12.60	3.958	0.4655	0.0622	0.01108	90.224	*5,782*	*18,748*	*6,88*	
4-1/2	13.50	3.920	0.4533	0.0605	0.01079	92.655	*5,630*	*20,088*	*7,36*	*114,3*
	15.10	3.826	0.4235	0.0566	0.01008	99.153	*5,261*	*22,468*	*8,55*	
	16.60	3.754	0.4013	0.0536	0.00955	104.654	*4,985*	*24,700*	*9,47*	
	17.70	3.697	0.3840	0.0513	0.00914	109.377	*4,769*	*26,337*	*10,19*	
	18.80	3.640	0.3669	0.0490	0.00873	114.463	*4,557*	*27,974*	*10,92*	
4-3/4	16.00	4.082	0.5061	0.0676	0.01205	82.974	*6,287*	*23,808*	*8,48*	*120,6*
	11.50	4.560	0.6747	0.0901	0.01606	62.248	*8,381*	*17,112*	*5,58*	
	13.00	4.494	0.6503	0.0869	0.01548	64.582	*8,078*	*19,344*	*6,42*	
	15.00	4.408	0.6191	0.0827	0.01474	67.840	*7,690*	*22,320*	*7,51*	
5	18.00	4.276	0.5723	0.0765	0.01362	73.384	*7,109*	*26,784*	*9,19*	*127,0*
	20.30	4.184	0.5405	0.0722	0.01287	77.694	*6,715*	*30,206*	*10,36*	
	21.00	4.154	0.5303	0.0709	0.01262	79.189	*6,588*	*31,248*	*10,74*	
	23.20	4.044	0.4935	0.0659	0.01175	85.092	*6,131*	*34,521*	*12,14*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.063 in., 52,4 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	13.00	5.044	0.8643	0.1155	0.02058	48.590	*10,737*	*19,344*	*5,79*	
	14.00	5.012	0.8512	0.1137	0.02026	49.340	*10,573*	*20,832*	*6,19*	
	15.00	4.974	0.8357	0.1117	0.01989	50.254	*10,381*	*22,320*	*6,68*	
	15.50	4.950	0.8260	0.1104	0.01966	50.845	*10,260*	*23,064*	*6,98*	*139,7*
5-1/2	17.00	4.892	0.8027	0.1073	0.01911	52.320	*9,971*	*25,296*	*7,72*	
	20.00	4.778	0.7577	0.1012	0.01804	55.425	*9,412*	*29,760*	*9,16*	
	23.00	4.670	0.7161	0.0957	0.01705	58.647	*8,895*	*34,224*	*10,54*	
	26.00	4.548	0.6702	0.0896	0.01595	62.662	*8,325*	*38,688*	*12,09*	
	14.00	5.290	0.9681	0.1294	0.02304	43.384	*12,025*	*20,832*	*5,84*	
	17.00	5.190	0.9253	0.1236	0.02203	45.389	*11,494*	*25,296*	*7,11*	
5-3/4	19.50	5.090	0.8834	0.1180	0.02103	47.544	*10,973*	*29,016*	*8,38*	*146,0*
	22.50	4.990	0.8422	0.1125	0.02005	49.866	*10,462*	*33,480*	*9,65*	
	25.20	4.890	0.8019	0.1072	0.01909	52.372	*9,961*	*37,497*	*10,92*	
	15.00	5.524	1.0713	0.1432	0.02550	39.203	*13,307*	*22,320*	*6,04*	
6	16.00	5.500	1.0605	0.1417	0.02525	39.603	*13,173*	*23,808*	*6,35*	*152,4*
	17.00	5.450	1.0382	0.1387	0.02471	40.455	*12,896*	*25,296*	*6,98*	
	18.00	5.424	1.0266	0.1372	0.02444	40.909	*12,753*	*26,784*	*7,31*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.063 in., 52,4 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
6	20.00	5.352	0.9950	0.1330	0.02369	42.211	*12,359*	*29,760*	*8,22*	*152,4*
	23.00	5.240	0.9466	0.1265	0.02253	44.369	*11,758*	*34,224*	*9,65*	
	26.00	5.140	0.9042	0.1208	0.02152	46.447	*11,232*	*38,688*	*10,92*	
6-5/8	13.00	6.255	1.4226	0.1901	0.03387	29.523	*17,671*	*19,344*	*4,69*	*168,2*
	17.00	6.135	1.3619	0.1820	0.03242	30.838	*16,918*	*25,296*	*6,22*	
	20.00	6.049	1.3192	0.1763	0.03140	31.837	*16,387*	*29,760*	*7,31*	
	22.00	5.989	1.2897	0.1724	0.03070	32.564	*16,021*	*32,736*	*8,07*	
	24.00	5.921	1.2567	0.1679	0.02992	33.420	*15,610*	*35,712*	*8,94*	
	26.00	5.855	1.2250	0.1637	0.02916	34.286	*15,216*	*38,688*	*9,77*	
	28.00	5.791	1.1946	0.1596	0.02844	35.158	*14,838*	*41,664*	*10,59*	
	29.00	5.761	1.1804	0.1578	0.02810	35.580	*14,663*	*43,152*	*10,97*	
	32.00	5.675	1.1403	0.1524	0.02715	36.832	*14,164*	*47,616*	*12,06*	
	34.00	5.595	1.1035	0.1475	0.02627	38.059	*13,707*	*50,592*	*13,08*	
7	17.00	6.538	1.5703	0.2099	0.03738	26.746	*19,506*	*25,296*	*5,86*	*177,8*
	20.00	6.456	1.5268	0.2041	0.03635	27.507	*18,966*	*29,760*	*6,90*	
	22.00	6.398	1.4964	0.2000	0.03562	28.066	*18,588*	*32,736*	*7,64*	
	23.00	6.366	1.4798	0.1978	0.03523	28.382	*18,381*	*34,224*	*8,05*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.063 in., 52,4 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	*Weight (kg/m)*	*Wall (mm)*	*OD (mm)*
7	24.00	6.336	1.4642	0.1957	0.03486	28.684	*18,188*	*35,712*	*8,43*	*177,8*
	26.00	6.276	1.4333	0.1916	0.03412	29.301	*17,805*	*38,688*	*9,19*	
	28.00	6.214	1.4017	0.1873	0.03337	29.962	*17,412*	*41,664*	*9,98*	
	29.00	6.184	1.3866	0.1853	0.03301	30.290	*17,224*	*43,152*	*10,36*	
	30.00	6.154	1.3715	0.1833	0.03265	30.623	*17,036*	*44,640*	*10,74*	
	32.00	6.094	1.3415	0.1793	0.03194	31.308	*16,664*	*47,616*	*11,50*	
	33.70	6.048	1.3187	0.1762	0.03139	31.849	*16,380*	*50,145*	*12,09*	
	34.00	6.040	1.3148	0.1757	0.03130	31.944	*16,331*	*50,592*	*12,19*	
	35.00	6.004	1.2971	0.1733	0.03088	32.380	*16,112*	*52,080*	*12,64*	
	35.30	6.000	1.2951	0.1731	0.03083	32.429	*16,087*	*52,526*	*12,70*	
	38.00	5.920	1.2562	0.1679	0.02990	33.433	*15,604*	*56,543*	*13,71*	
	40.00	5.836	1.2159	0.1625	0.02895	34.541	*15,104*	*59,520*	*14,78*	
	41.00	5.820	1.2083	0.1615	0.02876	34.759	*15,009*	*61,008*	*14,98*	
	44.00	5.720	1.1612	0.1552	0.02764	36.168	*14,424*	*65,472*	*16,25*	
7-5/8	20.00	7.125	1.8975	0.2536	0.04517	22.133	*23,571*	*29,760*	*6,35*	*193,6*
	24.00	7.025	1.8398	0.2459	0.04380	22.828	*22,853*	*35,712*	*7,62*	
	26.40	6.969	1.8078	0.2416	0.04304	23.232	*22,456*	*39,283*	*8,33*	
	29.70	6.875	1.7547	0.2345	0.04177	23.935	*21,797*	*44,193*	*9,52*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.063 in., 52,4 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
7-5/8	33.70	6.765	1.6935	0.2263	0.04032	24.800	*21,036*	*50,145*	*10,92*	*193,6*
	36.00	6.705	1.6606	0.2219	0.03953	25.292	*20,627*	*53,568*	*11,68*	
	38.00	6.655	1.6333	0.2183	0.03888	25.714	*20,288*	*56,543*	*12,31*	
	39.00	6.625	1.6170	0.2161	0.03850	25.973	*20,086*	*58,032*	*12,70*	
	45.30	6.435	1.5158	0.2026	0.03609	27.707	*18,829*	*67,406*	*15,11*	
7-3/4	46.10	6.560	1.4767	0.1974	0.03515	28.442	*18,342*	*68,596*	*17,65*	*196,8*

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.375 in., 60,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	9.50	4.090	0.4523	0.0604	0.01077	92.847	*5,619*	*14,135*	*5,20*	
	10.50	4.052	0.4397	0.0587	0.01046	95.512	*5,462*	*15,624*	*5,68*	
	11.60	4.000	0.4226	0.0565	0.01006	99.372	*5,250*	*17,260*	*6,35*	
	12.60	3.958	0.4090	0.0546	0.00973	102.686	*5,080*	*18,748*	*6,88*	
4-1/2	13.50	3.920	0.3968	0.0530	0.00944	105.846	*4,929*	*20,088*	*7,36*	*114,3*
	15.10	3.826	0.3671	0.0490	0.00874	114.412	*4,560*	*22,468*	*8,55*	
	16.60	3.754	0.3448	0.0460	0.00821	121.800	*4,283*	*24,700*	*9,47*	
	17.70	3.697	0.3275	0.0437	0.00779	128.244	*4,068*	*26,337*	*10,19*	
	18.80	3.640	0.3104	0.0414	0.00739	135.293	*3,856*	*27,974*	*10,92*	
4-3/4	16.00	4.082	0.4497	0.0601	0.01070	93.398	*5,585*	*23,808*	*8,48*	*120,6*
	11.50	4.560	0.6182	0.0826	0.01471	67.936	*7,679*	*17,112*	*5,58*	
	13.00	4.494	0.5938	0.0793	0.01413	70.725	*7,376*	*19,344*	*6,42*	
	15.00	4.408	0.5626	0.0752	0.01339	74.652	*6,988*	*22,320*	*7,51*	
5	18.00	4.276	0.5158	0.0689	0.01228	81.420	*6,407*	*26,784*	*9,19*	*127,0*
	20.30	4.184	0.4841	0.0647	0.01152	86.761	*6,013*	*30,206*	*10,36*	
	21.00	4.154	0.4738	0.0633	0.01128	88.629	*5,886*	*31,248*	*10,74*	
	23.20	4.044	0.4371	0.0584	0.01040	96.089	*5,429*	*34,521*	*12,14*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.375 in., 60,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	13.00	5.044	0.8078	0.1079	0.01923	51.988	*10,035*	*19,344*	*5,79*	
	14.00	5.012	0.7947	0.1062	0.01892	52.847	*9,872*	*20,832*	*6,19*	
	15.00	4.974	0.7792	0.1041	0.01855	53.897	*9,679*	*22,320*	*6,68*	
5-1/2	15.50	4.950	0.7695	0.1028	0.01832	54.577	*9,559*	*23,064*	*6,98*	*139,7*
	17.00	4.892	0.7462	0.0997	0.01776	56.281	*9,269*	*25,296*	*7,72*	
	20.00	4.778	0.7012	0.0937	0.01669	59.890	*8,711*	*29,760*	*9,16*	
	23.00	4.670	0.6596	0.0881	0.01570	63.670	*8,194*	*34,224*	*10,54*	
	26.00	4.548	0.6137	0.0820	0.01461	68.430	*7,624*	*38,688*	*12,09*	
	14.00	5.290	0.9116	0.1218	0.02170	46.073	*11,323*	*20,832*	*5,84*	
	17.00	5.190	0.8688	0.1161	0.02068	48.340	*10,792*	*25,296*	*7,11*	
5-3/4	19.50	5.090	0.8269	0.1105	0.01968	50.792	*10,271*	*29,016*	*8,38*	*146,0*
	22.50	4.990	0.7857	0.1050	0.01870	53.451	*9,760*	*33,480*	*9,65*	
	25.20	4.890	0.7454	0.0996	0.01774	56.341	*9,259*	*37,497*	*10,92*	
	15.00	5.524	1.0148	0.1356	0.02416	41.386	*12,606*	*22,320*	*6,04*	
6	16.00	5.500	1.0040	0.1342	0.02390	41.831	*12,472*	*23,808*	*6,35*	*152,4*
	17.00	5.450	0.9817	0.1312	0.02337	42.783	*12,194*	*25,296*	*6,98*	
	18.00	5.424	0.9701	0.1296	0.02309	43.291	*12,051*	*26,784*	*7,31*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.375 in., 60,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
6	20.00	5.352	0.9385	0.1254	0.02234	44.751	*11,658*	*29,760*	*8,22*	*152,4*
	23.00	5.240	0.8901	0.1189	0.02119	47.185	*11,056*	*34,224*	*9,65*	
	26.00	5.140	0.8477	0.1133	0.02018	49.542	*10,530*	*38,688*	*10,92*	
6-5/8	13.00	6.255	1.3661	0.1826	0.03252	30.743	*16,969*	*19,344*	*4,69*	*168,2*
	17.00	6.135	1.3055	0.1745	0.03108	32.172	*16,216*	*25,296*	*6,22*	
	20.00	6.049	1.2627	0.1688	0.03006	33.261	*15,685*	*29,760*	*7,31*	
	22.00	5.989	1.2332	0.1648	0.02936	34.056	*15,319*	*32,736*	*8,07*	
	24.00	5.921	1.2002	0.1604	0.02857	34.994	*14,908*	*35,712*	*8,94*	
	26.00	5.855	1.1685	0.1562	0.02782	35.943	*14,514*	*38,688*	*9,77*	
	28.00	5.791	1.1381	0.1521	0.02709	36.904	*14,137*	*41,664*	*10,59*	
	29.00	5.761	1.1239	0.1502	0.02676	37.368	*13,961*	*43,152*	*10,97*	
	32.00	5.675	1.0838	0.1448	0.02580	38.751	*13,463*	*47,616*	*12,06*	
	34.00	5.595	1.0470	0.1399	0.02492	40.113	*13,006*	*50,592*	*13,08*	
7	17.00	6.538	1.5138	0.2023	0.03604	27.744	*18,804*	*25,296*	*5,86*	*177,8*
	20.00	6.456	1.4704	0.1965	0.03500	28.564	*18,264*	*29,760*	*6,90*	
	22.00	6.398	1.4399	0.1924	0.03428	29.167	*17,886*	*32,736*	*7,64*	
	23.00	6.366	1.4233	0.1902	0.03388	29.509	*17,679*	*34,224*	*8,05*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.375 in., 60,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	24.00	6.336	1.4077	0.1881	0.03351	29.835	*17,486*	*35,712*	*8,43*	
	26.00	6.276	1.3769	0.1840	0.03278	30.504	*17,103*	*38,688*	*9,19*	
	28.00	6.214	1.3453	0.1798	0.03203	31.220	*16,710*	*41,664*	*9,98*	
	29.00	6.184	1.3301	0.1778	0.03166	31.576	*16,522*	*43,152*	*10,36*	
	30.00	6.154	1.3150	0.1757	0.03130	31.939	*16,334*	*44,640*	*10,74*	
	32.00	6.094	1.2850	0.1717	0.03059	32.684	*15,962*	*47,616*	*11,50*	
7	33.70	6.048	1.2622	0.1687	0.03005	33.274	*15,679*	*50,145*	*12,09*	*177,8*
	34.00	6.040	1.2583	0.1682	0.02995	33.379	*15,630*	*50,592*	*12,19*	
	35.00	6.004	1.2406	0.1658	0.02953	33.854	*15,410*	*52,080*	*12,64*	
	35.30	6.000	1.2386	0.1655	0.02949	33.908	*15,386*	*52,526*	*12,70*	
	38.00	5.920	1.1997	0.1603	0.02856	35.008	*14,902*	*56,543*	*13,71*	
	40.00	5.836	1.1594	0.1549	0.02760	36.224	*14,402*	*59,520*	*14,78*	
	41.00	5.820	1.1518	0.1539	0.02742	36.463	*14,307*	*61,008*	*14,98*	
	44.00	5.720	1.1047	0.1476	0.02630	38.017	*13,723*	*65,472*	*16,25*	
	20.00	7.125	1.8411	0.2461	0.04383	22.813	*22,869*	*29,760*	*6,35*	
7-5/8	24.00	7.025	1.7833	0.2383	0.04245	23.551	*22,152*	*35,712*	*7,62*	*193,6*
	26.40	6.969	1.7513	0.2341	0.04169	23.981	*21,755*	*39,283*	*8,33*	
	29.70	6.875	1.6983	0.2270	0.04043	24.731	*21,095*	*44,193*	*9,52*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.375 in., 60,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
7-5/8	33.70	6.765	1.6370	0.2188	0.03897	25.656	*20,335*	*50,145*	*10,92*	*193,6*
	36.00	6.705	1.6041	0.2144	0.03819	26.183	*19,925*	*53,568*	*11,68*	
	38.00	6.655	1.5768	0.2107	0.03754	26.636	*19,587*	*56,543*	*12,31*	
	39.00	6.625	1.5606	0.2086	0.03715	26.913	*19,385*	*58,032*	*12,70*	
	45.30	6.435	1.4593	0.1950	0.03474	28.780	*18,127*	*67,406*	*15,11*	
7-3/4	46.10	6.560	1.4202	0.1898	0.03381	29.574	*17,641*	*68,596*	*17,65*	*196,8*
8	26.00	7.386	1.9956	0.2667	0.04751	21.046	*24,788*	*38,688*	*7,79*	*203,2*
8-1/8	28.00	7.485	2.0556	0.2747	0.04894	20.431	*25,534*	*41,664*	*8,12*	*206,3*
	32.00	7.385	1.9950	0.2666	0.04749	21.053	*24,781*	*47,616*	*9,39*	
	35.50	7.285	1.9351	0.2586	0.04607	21.704	*24,037*	*52,824*	*10,66*	
	39.50	7.185	1.8761	0.2507	0.04466	22.387	*23,304*	*58,776*	*11,93*	
8-5/8	24.00	8.097	2.4447	0.3268	0.05820	17.180	*30,367*	*35,712*	*6,70*	*219,0*
	28.00	8.017	2.3921	0.3197	0.05695	17.557	*29,714*	*41,664*	*7,72*	
	32.00	7.921	2.3297	0.3114	0.05546	18.028	*28,939*	*47,616*	*8,94*	
	36.00	7.825	2.2680	0.3031	0.05400	18.518	*28,173*	*53,568*	*10,16*	
	38.00	7.775	2.2362	0.2989	0.05324	18.782	*27,777*	*56,543*	*10,79*	
	40.00	7.725	2.2046	0.2947	0.05248	19.051	*27,384*	*59,520*	*11,43*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.375 in., 60,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
8-5/8	43.00	7.651	2.1582	0.2885	0.05138	19.461	*26,808*	*63,984*	*12,36*	*219,0*
	44.00	7.625	2.1420	0.2863	0.05099	19.608	*26,607*	*65,472*	*12,70*	
	48.00	7.537	2.0875	0.2790	0.04970	20.119	*25,930*	*71,424*	*13,81*	
	49.00	7.511	2.0715	0.2769	0.04932	20.274	*25,732*	*72,912*	*14,14*	
8-3/4	49.70	7.636	2.1488	0.2872	0.05116	19.545	*26,692*	*73,953*	*14,14*	*222,2*
9	34.00	8.290	2.5738	0.3440	0.06127	16.318	*31,970*	*50,592*	*9,01*	*228,6*
	38.00	8.196	2.5105	0.3356	0.05977	16.729	*31,185*	*56,543*	*10,21*	
	40.00	8.150	2.4799	0.3315	0.05904	16.936	*30,804*	*59,520*	*10,79*	
	45.00	8.032	2.4019	0.3210	0.05718	17.485	*29,836*	*66,960*	*12,29*	
	50.20	7.910	2.3226	0.3104	0.05529	18.083	*28,850*	*74,697*	*13,84*	
	55.00	7.812	2.2597	0.3020	0.05380	18.586	*28,069*	*81,840*	*15,08*	
9-5/8	29.30	9.063	3.1210	0.4172	0.07430	13.457	*38,768*	*43,598*	*7,13*	*244,4*
	32.30	9.001	3.0753	0.4111	0.07322	13.657	*38,201*	*48,062*	*7,92*	
	36.00	8.921	3.0168	0.4032	0.07182	13.921	*37,474*	*53,568*	*8,94*	
	38.00	8.885	2.9907	0.3997	0.07120	14.043	*37,149*	*56,543*	*9,39*	
	40.00	8.835	2.9545	0.3949	0.07034	14.215	*36,700*	*59,520*	*10,03*	
	42.00	8.799	2.9286	0.3914	0.06972	14.341	*36,379*	*62,496*	*10,49*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.375 in., 60,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
9-5/8	43.50	8.755	2.8971	0.3872	0.06897	14.497	*35,987*	*64,728*	*11,04*	*244,4*
	47.00	8.681	2.8445	0.3802	0.06772	14.765	*35,333*	*69,936*	*11,98*	
	53.50	8.535	2.7419	0.3665	0.06528	15.317	*34,059*	*79,608*	*13,84*	
	58.40	8.435	2.6727	0.3572	0.06363	15.714	*33,199*	*86,899*	*15,11*	
	61.10	8.375	2.6316	0.3517	0.06265	15.960	*32,688*	*90,916*	*15,87*	
	71.80	8.125	2.4633	0.3292	0.05864	17.050	*30,598*	*106,838*	*19,05*	
9-3/4	59.20	8.560	2.7594	0.3688	0.06569	15.221	*34,276*	*88,089*	*15,11*	*247,6*
9-7/8	62.80	8.625	2.8050	0.3749	0.06678	14.973	*34,842*	*93,446*	*15,87*	*250,8*
10	33.00	9.384	3.3626	0.4495	0.08006	12.490	*41,769*	*49,104*	*7,82*	*254,0*
	41.50	9.200	3.2231	0.4308	0.07673	13.031	*40,036*	*61,752*	*10,16*	
	45.50	9.120	3.1633	0.4228	0.07531	13.277	*39,294*	*67,704*	*11,17*	
	50.50	9.016	3.0864	0.4125	0.07348	13.608	*38,338*	*75,144*	*12,49*	
	55.50	8.908	3.0074	0.4020	0.07160	13.965	*37,357*	*82,584*	*13,86*	
	61.20	8.790	2.9222	0.3906	0.06957	14.372	*36,298*	*91,065*	*15,36*	
10-3/4	32.75	11.192	4.0080	0.5357	0.09542	10.479	*49,786*	*48,732*	*7,08*	*273,0*
	35.75	10.136	3.9615	0.5295	0.09432	10.602	*49,209*	*53,196*	*7,79*	
	40.50	10.050	3.8907	0.5201	0.09263	10.795	*48,329*	*60,264*	*8,89*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.375 in., 60,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	45.50	9.950	3.8091	0.5091	0.09069	11.026	*47,315*	*67,704*	*10,16*	
	48.00	9.902	3.7702	0.5039	0.08976	11.140	*46,832*	*71,424*	*10,76*	
	51.00	9.850	3.7283	0.4983	0.08876	11.265	*46,312*	*75,888*	*11,43*	
	54.00	9.784	3.6755	0.4913	0.08750	11.427	*45,655*	*80,352*	*12,26*	
10-3/4	55.50	9.760	3.6563	0.4887	0.08705	11.487	*45,417*	*82,584*	*12,57*	*273,0*
	60.70	9.660	3.5771	0.4781	0.08516	11.741	*44,433*	*90,321*	*13,84*	
	65.70	9.560	3.4987	0.4676	0.08330	12.004	*43,459*	*97,761*	*15,11*	
	71.10	9.450	3.4134	0.4562	0.08126	12.304	*42,399*	*105,796*	*16,51*	
	76.00	9.350	3.3367	0.4460	0.07944	12.587	*41,447*	*113,087*	*17,78*	
	81.00	9.250	3.2608	0.4358	0.07763	12.880	*40,504*	*120,528*	*19,05*	
	38.00	11.150	4.8422	0.6472	0.11528	8.673	*60,147*	*56,543*	*7,62*	
	42.00	11.084	4.7823	0.6392	0.11386	8.782	*59,404*	*62,496*	*8,45*	
	47.00	11.000	4.7066	0.6291	0.11206	8.923	*58,464*	*69,936*	*9,52*	
11-3/4	54.00	10.880	4.5995	0.6148	0.10950	9.131	*57,133*	*80,352*	*11,04*	*298,4*
	60.00	10.772	4.5041	0.6020	0.10723	9.325	*55,948*	*89,280*	*12,42*	
	65.00	10.682	4.4253	0.5915	0.10536	9.491	*54,969*	*96,720*	*13,56*	
	71.00	10.586	4.3420	0.5804	0.10337	9.673	*53,935*	*105,648*	*14,78*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.875 in., 73,0 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	9.50	4.090	0.3452	0.0461	0.00822	121.647	*4,288*	*14,135*	*5,20*	
	10.50	4.052	0.3326	0.0444	0.00791	126.264	*4,131*	*15,624*	*5,68*	
	11.60	4.000	0.3155	0.0421	0.00751	133.099	*3,919*	*17,260*	*6,35*	
	12.60	3.958	0.3019	0.0403	0.00718	139.111	*3,750*	*18,748*	*6,88*	
4-1/2	13.50	3.920	0.2897	0.0387	0.00689	144.976	*3,598*	*20,088*	*7,36*	*114,3*
	15.10	3.826	0.2600	0.0347	0.00619	161.540	*3,229*	*22,468*	*8,55*	
	16.60	3.754	0.2377	0.0317	0.00566	176.670	*2,953*	*24,700*	*9,47*	
	17.70	3.697	0.2204	0.0294	0.00524	190.560	*2,737*	*26,337*	*10,19*	
	18.80	3.640	0.2033	0.0271	0.00484	206.550	*2,525*	*27,974*	*10,92*	
4-3/4	16.00	4.082	0.3426	0.0457	0.00815	122.594	*4,255*	*23,808*	*8,48*	*120,6*
	11.50	4.560	0.5111	0.0683	0.01216	82.171	*6,349*	*17,112*	*5,58*	
	13.00	4.494	0.4867	0.0650	0.01158	86.287	*6,046*	*19,344*	*6,42*	
	15.00	4.408	0.4555	0.0608	0.01084	92.203	*5,658*	*22,320*	*7,51*	
5	18.00	4.276	0.4087	0.0546	0.00973	102.753	*5,077*	*26,784*	*9,19*	*127,0*
	20.30	4.184	0.3770	0.0503	0.00897	111.408	*4,682*	*30,206*	*10,36*	
	21.00	4.154	0.3667	0.0490	0.00873	114.508	*4,556*	*31,248*	*10,74*	
	23.20	4.044	0.3300	0.0441	0.00785	127.275	*4,099*	*34,521*	*12,14*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.875 in., 73,0 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
5-1/2	13.00	5.044	0.7007	0.0936	0.01668	59.933	*8,704*	*19,344*	*5,79*	*139,7*
	14.00	5.012	0.6876	0.0919	0.01637	61.078	*8,541*	*20,832*	*6,19*	
	15.00	4.974	0.6721	0.0898	0.01600	62.484	*8,349*	*22,320*	*6,68*	
	15.50	4.950	0.6624	0.0885	0.01577	63.401	*8,228*	*23,064*	*6,98*	
	17.00	4.892	0.6391	0.0854	0.01521	65.711	*7,939*	*25,296*	*7,72*	
	20.00	4.778	0.5941	0.0794	0.01414	70.685	*7,380*	*29,760*	*9,16*	
	23.00	4.670	0.5525	0.0738	0.01315	76.011	*6,863*	*34,224*	*10,54*	
	26.00	4.548	0.5066	0.0677	0.01206	82.894	*6,293*	*38,688*	*12,09*	
5-3/4	14.00	5.290	0.8045	0.1075	0.01915	52.206	*9,993*	*20,832*	*5,84*	*146,0*
	17.00	5.190	0.7617	0.1018	0.01813	55.137	*9,462*	*25,296*	*7,11*	
	19.50	5.090	0.7198	0.0962	0.01713	58.350	*8,941*	*29,016*	*8,38*	
	22.50	4.990	0.6786	0.0907	0.01615	61.886	*8,430*	*33,480*	*9,65*	
	25.20	4.890	0.6383	0.0853	0.01519	65.793	*7,929*	*37,497*	*10,92*	
6	15.00	5.524	0.9077	0.1213	0.02161	46.269	*11,275*	*22,320*	*6,04*	*152,4*
	16.00	5.500	0.8969	0.1199	0.02135	46.826	*11,141*	*23,808*	*6,35*	
	17.00	5.450	0.8746	0.1169	0.02082	48.022	*10,864*	*25,296*	*6,98*	
	18.00	5.424	0.8630	0.1153	0.02054	48.663	*10,720*	*26,784*	*7,31*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.875 in., 73,0 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
6	20.00	5.352	0.8314	0.1111	0.01979	50.516	*10,327*	*29,760*	*8,22*	
	23.00	5.240	0.7830	0.1046	0.01864	53.639	*9,726*	*34,224*	*9,65*	*152,4*
	26.00	5.140	0.7406	0.0990	0.01763	56.706	*9,200*	*38,688*	*10,92*	
6-5/8	13.00	6.255	1.2590	0.1683	0.02997	33.359	*15,639*	*19,344*	*4,69*	
	17.00	6.135	1.1984	0.1601	0.02853	35.047	*14,886*	*25,296*	*6,22*	
	20.00	6.049	1.1556	0.1544	0.02751	36.344	*14,354*	*29,760*	*7,31*	
	22.00	5.989	1.1261	0.1505	0.02681	37.295	*13,988*	*32,736*	*8,07*	
	24.00	5.921	1.0931	0.1461	0.02602	38.422	*13,578*	*35,712*	*8,94*	*168,2*
	26.00	5.855	1.0614	0.1418	0.02527	39.570	*13,184*	*38,688*	*9,77*	
	28.00	5.791	1.0310	0.1378	0.02454	40.737	*12,806*	*41,664*	*10,59*	
	29.00	5.761	1.0168	0.1359	0.02421	41.304	*12,631*	*43,152*	*10,97*	
	32.00	5.675	0.9767	0.1305	0.02325	43.000	*12,132*	*47,616*	*12,06*	
	34.00	5.595	0.9399	0.1256	0.02237	44.683	*11,675*	*50,592*	*13,08*	
7	17.00	6.538	1.4067	0.1880	0.03349	29.856	*17,474*	*25,296*	*5,86*	
	20.00	6.456	1.3633	0.1822	0.03245	30.808	*16,934*	*29,760*	*6,90*	*177,8*
	22.00	6.398	1.3328	0.1781	0.03173	31.511	*16,556*	*32,736*	*7,64*	
	23.00	6.366	1.3162	0.1759	0.03133	31.910	*16,349*	*34,224*	*8,05*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.875 in., 73,0 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	24.00	6.336	1.3006	0.1738	0.03096	32.291	*16,156*	*35,712*	*8,43*	
	26.00	6.276	1.2698	0.1697	0.03023	33.077	*15,772*	*38,688*	*9,19*	
	28.00	6.214	1.2382	0.1655	0.02948	33.921	*15,380*	*41,664*	*9,98*	
	29.00	6.184	1.2230	0.1634	0.02911	34.341	*15,191*	*43,152*	*10,36*	
	30.00	6.154	1.2079	0.1614	0.02875	34.771	*15,004*	*44,640*	*10,74*	
	32.00	6.094	1.1779	0.1574	0.02804	35.656	*14,631*	*47,616*	*11,50*	
	33.70	6.048	1.1551	0.1544	0.02750	36.359	*14,348*	*50,145*	*12,09*	
7	34.00	6.040	1.1512	0.1538	0.02740	36.484	*14,299*	*50,592*	*12,19*	*177,8*
	35.00	6.004	1.1335	0.1515	0.02698	37.053	*14,080*	*52,080*	*12,64*	
	35.30	6.000	1.1315	0.1512	0.02694	37.117	*14,055*	*52,526*	*12,70*	
	38.00	5.920	1.0926	0.1460	0.02601	38.439	*13,572*	*56,543*	*13,71*	
	40.00	5.836	1.0523	0.1406	0.02505	39.911	*13,072*	*59,520*	*14,78*	
	41.00	5.820	1.0447	0.1396	0.02487	40.201	*12,977*	*61,008*	*14,98*	
	44.00	5.720	0.9976	0.1333	0.02375	42.099	*12,392*	*65,472*	*16,25*	
	20.00	7.125	1.7340	0.2317	0.04128	24.222	*21,538*	*29,760*	*6,35*	
7-5/8	24.00	7.025	1.6762	0.2240	0.03990	25.056	*20,821*	*35,712*	*7,62*	*193,6*
	26.40	6.969	1.6443	0.2198	0.03914	25.543	*20,424*	*39,283*	*8,33*	
	29.70	6.875	1.5912	0.2127	0.03788	26.395	*19,765*	*44,193*	*9,52*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.875 in., 73,0 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
7-5/8	33.70	6.765	1.5299	0.2045	0.03642	27.452	*19,004*	*50,145*	*10,92*	*193,6*
	36.00	6.705	1.4970	0.2001	0.03564	28.056	*18,595*	*53,568*	*11,68*	
	38.00	6.655	1.4697	0.1964	0.03499	28.577	*18,256*	*56,543*	*12,31*	
	39.00	6.625	1.4534	0.1942	0.03460	28.896	*18,054*	*58,032*	*12,70*	
	45.30	6.435	1.3522	0.1807	0.03219	31.060	*16,797*	*67,406*	*15,11*	
7-3/4	46.10	6.560	1.3131	0.1755	0.03126	31.986	*16,310*	*68,596*	*17,65*	*196,8*
8	26.00	7.386	1.8885	0.2524	0.04496	22.240	*23,458*	*38,688*	*7,79*	*203,2*
8-1/8	28.00	7.485	1.9485	0.2604	0.04639	21.554	*24,204*	*41,664*	*8,12*	*206,3*
	32.00	7.385	1.8879	0.2523	0.04494	22.247	*23,450*	*47,616*	*9,39*	
	35.50	7.285	1.8280	0.2443	0.04352	22.975	*22,707*	*52,824*	*10,66*	
	39.50	7.185	1.7690	0.2364	0.04211	23.742	*21,974*	*58,776*	*11,93*	
8-5/8	24.00	8.097	2.3376	0.3124	0.05565	17.967	*29,037*	*35,712*	*6,70*	*219,0*
	28.00	8.017	2.2850	0.3054	0.05440	18.380	*28,384*	*41,664*	*7,72*	
	32.00	7.921	2.2226	0.2971	0.05291	18.896	*27,608*	*47,616*	*8,94*	
	36.00	7.825	2.1609	0.2888	0.05145	19.436	*26,842*	*53,568*	*10,16*	
	38.00	7.775	2.1291	0.2846	0.05069	19.726	*26,447*	*56,543*	*10,79*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.875 in., 73,0 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	40.00	7.725	2.0975	0.2803	0.04993	20.024	*26,054*	*59,520*	*11,43*	
	43.00	7.651	2.0511	0.2741	0.04883	20.477	*25,477*	*63,984*	*12,36*	
8-5/8	44.00	7.625	2.0349	0.2720	0.04844	20.640	*25,276*	*65,472*	*12,70*	*219,0*
	48.00	7.537	1.9804	0.2647	0.04715	21.207	*24,600*	*71,424*	*13,81*	
	49.00	7.511	1.9644	0.2626	0.04677	21.380	*24,402*	*72,912*	*14,14*	
9-3/4	49.70	7.636	2.0417	0.2729	0.04861	20.571	*25,361*	*73,053*	*14,14*	*222,2*
	34.00	8.290	2.4667	0.3297	0.05872	17.027	*30,640*	*50,592*	*9,01*	
	38.00	8.196	2.4034	0.3212	0.05722	17.475	*29,854*	*56,543*	*10,21*	
9	40.00	8.150	2.3728	0.3171	0.05649	17.701	*29,473*	*59,520*	*10,79*	*228,6*
	45.00	8.032	2.2948	0.3067	0.05463	18.302	*28,506*	*66,960*	*12,29*	
	50.20	7.910	2.2155	0.2961	0.05274	18.957	*27,520*	*74,697*	*13,84*	
	55.00	7.812	2.1526	0.2877	0.05125	19.511	*26,739*	*81,840*	*15,08*	
	29.30	9.063	3.0139	0.4028	0.07175	13.935	*37,438*	*43,598*	*7,13*	
	32.30	9.001	2.9682	0.3967	0.07067	14.149	*36,870*	*48,062*	*7,92*	
9-5/8	36.00	8.921	2.9097	0.3889	0.06927	14.434	*36,144*	*53,568*	*8,94*	*244,4*
	38.00	8.885	2.8836	0.3854	0.06865	14.565	*35,819*	*56,543*	*9,39*	
	40.00	8.835	2.8474	0.3806	0.06779	14.750	*35,370*	*59,520*	*10,03*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.875 in., 73,0 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
9-5/8	42.00	8.799	2.8215	0.3771	0.06717	14.885	*35,048*	*62,496*	*10,46*	*244,4*
	43.50	8.755	2.7900	0.3729	0.06642	15.053	*34,657*	*64,728*	*11,04*	
	47.00	8.681	2.7374	0.3659	0.06517	15.343	*34,003*	*69,936*	*11,98*	
	53.50	8.535	2.6348	0.3522	0.06273	15.940	*32,729*	*79,608*	*13,84*	
	58.40	8.435	2.5656	0.3429	0.06108	16.370	*31,869*	*86,899*	*15,11*	
	61.10	8.375	2.5245	0.3374	0.06010	16.637	*31,358*	*90,916*	*15,87*	
	71.80	8.125	2.3562	0.3149	0.05609	17.825	*29,267*	*106,838*	*19,05*	
9-3/4	59.20	8.560	2.6523	0.3545	0.06314	15.835	*32,946*	*88,089*	*15,11*	*247,6*
9-7/8	62.80	8.625	2.6979	0.3606	0.06423	15.568	*33,512*	*93,446*	*15,87*	*250,8*
10	33.00	9.384	3.2555	0.4351	0.07751	12.901	*40,439*	*49,104*	*7,82*	*254,0*
	41.50	9.200	3.1160	0.4165	0.07419	13.478	*38,706*	*61,752*	*10,16*	
	45.50	9.120	3.0562	0.4085	0.07276	13.742	*37,963*	*67,704*	*11,17*	
	50.50	9.016	2.9793	0.3982	0.07093	14.097	*37,007*	*75,144*	*12,49*	
	55.50	8.908	2.9003	0.3877	0.06905	14.481	*36,026*	*82,584*	*13,86*	
	61.20	8.790	2.8151	0.3763	0.06702	14.919	*34,968*	*91,065*	*15,36*	
10-3/4	32.75	10.192	3.9009	0.5214	0.09287	10.766	*48,455*	*48,732*	*7,08*	*273,0*
	35.75	110.136	3.8544	0.5152	0.09177	10.896	*47,878*	*53,196*	*7,79*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 2.875 in., 73,0 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	40.50	10.050	3.7836	0.5057	0.09008	11.100	*46,999*	*60,264*	*8,89*	
	45.50	9.950	3.7020	0.4948	0.08814	11.345	*45,985*	*67,704*	*10,16*	
	48.00	9.902	3.6631	0.4896	0.08721	11.465	*45,502*	*71,424*	*10,76*	
	51.00	9.850	3.6212	0.4840	0.08621	11.598	*44,981*	*75,888*	*11,43*	
	54.00	9.784	3.5684	0.4770	0.08495	11.770	*44,325*	*80,352*	*12,26*	
10-3/4	55.50	9.760	3.5492	0.4744	0.08450	11.833	*44,087*	*82,584*	*12,57*	*273,0*
	60.70	9.660	3.4700	0.4638	0.08261	12.103	*43,103*	*90,321*	*13,84*	
	65.70	9.560	3.3916	0.4533	0.08075	12.383	*42,129*	*97,761*	*15,11*	
	71.10	9.450	3.3063	0.4419	0.07871	12.703	*41,069*	*105,796*	*16,51*	
	76.00	9.350	3.2296	0.4317	0.07689	13.005	*40,116*	*113,087*	*17,78*	
	81.00	9.250	3.1537	0.4215	0.07508	13.318	*39,174*	*120,528*	*19,05*	
	38.00	11.150	4.7351	0.6329	0.11273	8.870	*58,817*	*56,543*	*7,62*	
	42.00	11.084	4.6752	0.6249	0.11131	8.983	*58,073*	*62,496*	*8,45*	
	47.00	11.000	4.5995	0.6148	0.10951	9.131	*57,133*	*69,936*	*9,52*	
11-3/4	54.00	10.880	4.4924	0.6005	0.10695	9.349	*55,803*	*80,352*	*11,04*	*298,4*
	60.00	10.772	4.3970	0.5877	0.10468	9.552	*54,618*	*89,280*	*12,42*	
	65.00	10.682	4.3182	0.5772	0.10281	9.726	*53,639*	*96,720*	*13,56*	
	71.00	10.586	4.2349	0.5661	0.10082	9.917	*52,604*	*105,648*	*14,78*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 3.500 in., 88,9 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
5-1/2	13.00	5.044	0.5382	0.0719	0.01281	78.035	*6,685*	*19,344*	*5,79*	*139,7*
	14.00	5.012	0.5251	0.0701	0.01250	79.986	*6,522*	*20,832*	*6,19*	
	15.00	4.974	0.5096	0.0681	0.01213	82.416	*6,330*	*22,320*	*6,68*	
	15.50	4.950	0.4999	0.0668	0.01190	84.018	*6,209*	*23,064*	*6,98*	
	17.00	4.892	0.4766	0.0637	0.01134	88.124	*5,920*	*25,296*	*7,72*	
	20.00	4.778	0.4316	0.0576	0.01027	97.307	*5,361*	*29,760*	*9,16*	
	23.00	4.670	0.3900	0.0521	0.00928	107.694	*4,844*	*34,224*	*10,54*	
	26.00	4.548	0.3441	0.0460	0.00819	122.054	*4,274*	*38,688*	*12,09*	
5-3/4	14.00	5.290	0.6419	0.0858	0.01528	65.427	*7,974*	*20,832*	*5,84*	*146,0*
	17.00	5.190	0.5991	0.0800	0.01426	70.096	*7,442*	*25,296*	*7,11*	
	19.50	5.090	0.5572	0.0744	0.01326	75.372	*6,921*	*29,016*	*8,38*	
	22.50	4.990	0.5161	0.0689	0.01228	81.378	*6,411*	*33,480*	*9,65*	
	25.20	4.890	0.4758	0.0636	0.01132	88.272	*5,910*	*37,497*	*10,92*	
6	15.00	5.524	0.7451	0.0996	0.01774	56.362	*9,256*	*22,320*	*6,04*	*152,4*
	16.00	5.500	0.7344	0.0981	0.01748	57.191	*9,122*	*23,808*	*6,35*	
	17.00	5.450	0.7120	0.0951	0.01695	58.985	*8,844*	*25,296*	*6,98*	
	18.00	5.424	0.7005	0.0936	0.01667	59.956	*8,701*	*26,784*	*7,31*	
	20.00	5.352	0.6688	0.0894	0.01592	62.794	*8,308*	*29,760*	*8,22*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 3.500 in., 88,9 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
6	23.00	5.240	0.6204	0.0829	0.01477	67.692	*7,707*	*34,224*	*9,65*	*152,4*
	26.00	5.140	0.5781	0.0772	0.01376	72.651	*7,181*	*38,688*	*10,92*	
6-5/8	13.00	6.255	1.0965	0.1465	0.02610	38.304	*13,620*	*19,344*	*4,69*	*168,2*
	17.00	6.135	1.0358	0.1384	0.02466	40.548	*12,866*	*25,296*	*6,22*	
	20.00	6.049	0.9930	0.1327	0.02364	42.293	*12,335*	*29,760*	*7,31*	
	22.00	5.989	0.9636	0.1288	0.02294	43.586	*11,969*	*32,736*	*8,07*	
	24.00	5.921	0.9305	0.1243	0.02215	45.134	*11,559*	*35,712*	*8,94*	
	26.00	5.855	0.8988	0.1201	0.02140	46.726	*11,165*	*38,688*	*9,77*	
	28.00	5.791	0.8684	0.1160	0.02067	48.363	*10,787*	*41,664*	*10,59*	
	29.00	5.761	0.8543	0.1142	0.02034	49.163	*10,611*	*43,152*	*10,97*	
	32.00	5.675	0.8141	0.1088	0.01938	51.586	*10,113*	*47,616*	*12,06*	
	34.00	5.595	0.7774	0.1039	0.01850	54.027	*9,656*	*50,592*	*13,08*	
7	17.00	6.538	1.2442	0.1663	0.02962	33.757	*15,455*	*25,296*	*5,86*	*177,8*
	20.00	6.456	1.2007	0.1605	0.02858	34.979	*14,915*	*29,760*	*6,90*	
	22.00	6.398	1.1703	0.1564	0.02786	35.888	*14,537*	*32,736*	*7,64*	
	23.00	6.366	1.1536	0.1542	0.02746	36.406	*14,330*	*34,224*	*8,05*	
	24.00	6.336	1.1381	0.1521	0.02709	36.904	*14,137*	*35,712*	*8,43*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 3.500 in., 88,9 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	*Weight (kg/m)*	*Wall (mm)*	*OD (mm)*
	26.00	6.276	1.1072	0.1480	0.02636	37.933	*13,753*	*38,688*	*9,19*	
	28.00	6.214	1.0756	0.1437	0.02560	39.047	*13,361*	*41,664*	*9,98*	
	29.00	6.184	1.0604	0.1417	0.02524	39.606	*13,172*	*43,152*	*10,36*	
	30.00	6.154	1.0453	0.1397	0.02488	40.178	*12,985*	*44,640*	*10,74*	
	32.00	6.094	1.0153	0.1357	0.02417	41.364	*12,612*	*47,616*	*11,50*	
	33.70	6.048	0.9925	0.1326	0.02363	42.314	*12,329*	*50,145*	*12,09*	
7	34.00	6.040	0.9886	0.1321	0.02353	42.483	*12,280*	*50,592*	*12,19*	*177,8*
	35.00	6.004	0.9709	0.1297	0.02311	43.257	*12,060*	*52,080*	*12,64*	
	35.30	6.000	0.9690	0.1295	0.02307	43.344	*12,036*	*52,526*	*12,70*	
	38.00	5.920	0.9300	0.1243	0.02214	45.158	*11,553*	*56,543*	*13,71*	
	40.00	5.836	0.8898	0.1189	0.02118	47.202	*11,052*	*59,520*	*14,78*	
	41.00	5.820	0.8821	0.1179	0.02100	47.609	*10,958*	*61,008*	*14,98*	
	44.00	5.720	0.8351	0.1116	0.01988	50.294	*10,373*	*65,472*	*16,25*	
	20.00	7.125	1.5714	0.2100	0.03741	26.727	*19,519*	*29,760*	*6,35*	
7-5/8	24.00	7.025	1.5137	0.2023	0.03603	27.747	*18,802*	*35,712*	*7,62*	*193,6*
	26.40	6.969	1.4817	0.1980	0.03527	28.346	*18,405*	*39,283*	*8,33*	
	29.70	6.875	1.4286	0.1909	0.03401	29.399	*17,745*	*44,193*	*9,52*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 3.500 in., 88,9 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
7-5/8	33.70	6.765	1.3674	0.1827	0.03255	30.715	*16,985*	*50,145*	*10,92*	*193,6*
	36.00	6.705	1.3344	0.1783	0.03177	31.474	*16,575*	*53,568*	*11,68*	
	38.00	6.655	1.3071	0.1747	0.03112	32.130	*16,237*	*56,543*	*12,31*	
	39.00	6.625	1.2909	0.1725	0.03073	32.535	*16,035*	*58,032*	*12,70*	
	45.30	6.435	1.1896	0.1590	0.02832	35.304	*14,777*	*67,406*	*15,11*	
7-3/4	46.10	6.560	1.1505	0.1538	0.02739	36.505	*14,291*	*68,596*	*17,65*	*196,8*
8	26.00	7.386	1.7259	0.2307	0.04109	24.334	*21,439*	*38,688*	*7,79*	*203,2*
8-1/8	28.00	7.485	1.7860	0.2387	0.04252	23.516	*22,185*	*41,664*	*8,12*	*206,3*
	32.00	7.385	1.7253	0.2306	0.04107	24.343	*21,431*	*47,616*	*9,39*	
	35.50	7.285	1.6655	0.2226	0.03965	25.218	*20,688*	*52,824*	*10,66*	
	39.50	7.185	1.6064	0.2147	0.03824	26.145	*19,954*	*58,776*	*11,93*	
8-5/8	24.00	8.097	2.1751	0.2907	0.05178	19.309	*27,018*	*35,712*	*6,70*	*219,0*
	28.00	8.017	2.1225	0.2837	0.05053	19.788	*26,364*	*41,664*	*7,72*	
	32.00	7.921	2.0600	0.2753	0.04904	20.388	*25,589*	*47,616*	*8,94*	
	36.00	7.825	1.9984	0.2671	0.04757	21.017	*24,823*	*53,568*	*10,16*	
	38.00	7.775	1.9665	0.2628	0.04682	21.357	*24,428*	*56,543*	*10,79*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 3.500 in., 88,9 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
8-5/8	40.00	7.725	1.9349	0.2586	0.04606	21.706	*24,035*	*59,520*	*11,43*	*219,0*
	43.00	7.651	1.8885	0.2524	0.04496	22.240	*23,458*	*63,984*	*12,36*	
	44.00	7.625	1.8723	0.2502	0.04457	22.432	*23,257*	*65,472*	*12,70*	
	48.00	7.537	1.8178	0.2430	0.04328	23.104	*22,581*	*71,424*	*13,81*	
	49.00	7.511	1.8019	0.2408	0.04290	23.308	*22,382*	*72,912*	*14,14*	
8-3/4	49.70	7.636	1.8791	0.2512	0.04474	22.350	*23,342*	*73,953*	*14,14*	*222,2*
9	34.00	8.290	2.3041	0.3080	0.05485	18.228	*28,621*	*50,592*	*9,01*	*228,8*
	38.00	8.196	2.2409	0.2995	0.05335	18.742	*27,835*	*56,543*	*10,21*	
	40.00	8.150	2.2102	0.2954	0.05262	19.003	*27,454*	*59,520*	*10,79*	
	45.00	8.032	2.1323	0.2850	0.05076	19.697	*26,486*	*66,960*	*12,29*	
	50.20	7.910	2.0529	0.2744	0.04887	20.458	*25,501*	*74,697*	*13,84*	
	55.00	7.812	1.9901	0.2660	0.04738	21.104	*24,720*	*81,840*	*15,08*	
9-5/8	29.30	9.063	2.8514	0.3811	0.06788	14.729	*35,419*	*43,598*	*7,13*	*244,4*
	32.30	9.001	2.8057	0.3750	0.06680	14.969	*34,851*	*48,062*	*7,92*	
	36.00	8.921	2.7472	0.3672	0.06540	15.288	*34,124*	*53,568*	*8,94*	
	38.00	8.885	2.7210	0.3637	0.06478	15.435	*33,800*	*56,543*	*9,39*	
	40.00	8.835	2.6849	0.3589	0.06392	15.643	*33,351*	*59,520*	*10,03*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 3.500 in., 88,9 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
9-5/8	42.00	8.799	2.6590	0.3554	0.06330	15.795	*33,027*	*62,496*	*10,49*	*244,4*
	43.50	8.755	2.6275	0.3512	0.06255	15.985	*32,637*	*64,728*	*11,04*	
	47.00	8.681	2.5748	0.3442	0.06130	16.311	*31,984*	*69,936*	*11,98*	
	53.50	8.535	2.4723	0.3304	0.05886	16.988	*30,710*	*79,608*	*13,84*	
	58.40	8.435	2.4030	0.3212	0.05721	17.478	*29,850*	*86,899*	*15,11*	
	61.10	8.375	2.3619	0.3157	0.05623	17.782	*29,338*	*90,916*	*15,87*	
	71.80	8.125	2.1936	0.2932	0.05222	19.146	*27,248*	*106,838*	*19,05*	
9-3/4	59.20	8.560	2.4897	0.3328	0.05927	16.869	*30,926*	*88,089*	*15,11*	*247,6*
9-7/8	62.80	8.625	2.5353	0.3389	0.06036	16.566	*31,492*	*93,446*	*15,87*	*250,8*
10	33.00	9.384	3.0930	0.4134	0.07364	13.579	*38,420*	*49,104*	*7,82*	*254,0*
	41.50	9.200	2.9535	0.3948	0.07031	14.220	*36,687*	*61,752*	*10,16*	
	45.50	9.120	2.8937	0.3868	0.06889	14.514	*35,944*	*67,704*	*11,17*	
	50.50	9.016	2.8167	0.3765	0.06706	14.911	*34,988*	*75,144*	*12,49*	
	55.50	8.908	2.7377	0.3659	0.06518	15.341	*34,007*	*82,584*	*13,86*	
	61.20	8.790	2.6525	0.3545	0.06315	15.834	*32,949*	*91,065*	*15,36*	
10-3/4	32.75	10.192	3.7383	0.4997	0.08900	11.235	*46,436*	*48,732*	*7,08*	*273,0*

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 3.500 in., 88,9 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	35.75	10.136	3.6919	0.4935	0.08790	11.376	*45,859*	*53,196*	*7,79*	
	40.50	10.050	3.6211	0.4840	0.08621	11.599	*44,979*	*60,264*	*8,89*	
	45.50	9.950	3.5395	0.4731	0.08427	11.866	*43,966*	*67,704*	*10,16*	
	48.00	9.902	3.5006	0.4679	0.08334	11.998	*43,483*	*71,424*	*10,76*	
	51.00	9.850	3.4587	0.4623	0.08234	12.143	*42,962*	*75,888*	*11,43*	
	54.00	9.784	3.4058	0.4552	0.08108	12.332	*42,305*	*80,352*	*12,26*	
	55.50	9.760	3.3867	0.4527	0.08063	12.401	*42,068*	*82,584*	*12,57*	*273,0*
10-3/4	60.70	9.660	3.3074	0.4421	0.07874	12.698	*41,084*	*90,321*	*13,84*	
	65.70	9.560	3.2290	0.4316	0.07688	13.007	*40,109*	*97,761*	*15,11*	
	71.10	9.450	3.1437	0.4202	0.07484	13.360	*39,050*	*105,796*	*16,51*	
	76.00	9.350	3.0670	0.4099	0.07302	13.694	*38,097*	*113,087*	*17,78*	
	81.00	9.250	2.9911	0.3998	0.07121	14.041	*37,154*	*120,528*	*19,05*	
	38.00	11.150	4.5725	0.6112	0.10886	9.185	*56,798*	*56,543*	*7,62*	
	42.00	11.084	4.5126	0.6032	0.10744	9.307	*56,054*	*62,496*	*8,45*	
	47.00	11.000	4.4370	0.5931	0.10563	9.466	*55,114*	*69,936*	*9,52*	
11-3/4	54.00	10.880	4.3298	0.5788	0.10308	9.700	*53,783*	*80,352*	*11,04*	*298,4*
	60.00	10.772	4.2344	0.5660	0.10081	9.918	*52,598*	*89,280*	*12,42*	
	65.00	10.682	4.1556	0.5555	0.09894	10.106	*51,620*	*96,720*	*13,56*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 3.500 in., 88,9 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
11-3/4	71.00	10.586	4.0723	0.5443	0.09695	10.313	*50,585*	*105,648*	*14,78*	*298,4*
11-7/8	71.80	10.711	4.1810	0.5589	0.09954	10.045	*51,934*	*106,838*	*14,78*	*301,6*
12	40.00	11.384	4.7876	0.6400	0.11398	8.772	*59,470*	*59,520*	*7,82*	*304,8*
12-3/4	43.00	12.130	5.5033	0.7356	0.13102	7.631	*68,360*	*63,984*	*7,87*	*323,8*
	53.00	11.970	5.3460	0.7146	0.12728	7.856	*66,406*	*78,864*	*9,90*	
13	40.00	12.438	5.8121	0.7769	0.13837	7.226	*72,195*	*59,520*	*7,13*	
	45.00	12.360	5.7331	0.7663	0.13650	7.325	*71,215*	*66,960*	*8,12*	*330,2*
	50.00	12.282	5.6547	0.7559	0.13463	7.427	*70,241*	*74,400*	*9,11*	
	54.00	12.220	5.5927	0.7476	0.13315	7.509	*69,471*	*80,352*	*9,90*	
13-3/8	48.00	12.715	6.0963	0.8149	0.14514	6.889	*75,726*	*71,424*	*8,38*	
	54.50	12.615	5.9930	0.8011	0.14268	7.008	*74,442*	*81,096*	*9,65*	
	61.00	12.515	5.8905	0.7874	0.14024	7.130	*73,169*	*90,768*	*10,92*	
	68.00	12.415	5.7887	0.7738	0.13782	7.255	*71,905*	*101,184*	*12,19*	*339,7*
	72.00	12.347	5.7200	0.7646	0.13618	7.342	*71,052*	*107,136*	*13,05*	
	77.00	12.275	5.6477	0.7549	0.13446	7.436	*70,154*	*114,576*	*13,97*	
	83.00	12.175	5.5480	0.7416	0.13209	7.570	*68,914*	*123,504*	*15,24*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 3.500 in., 88,9 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
13-3/8	85.00	12.159	5.5321	0.7395	0.13171	7.592	*68,717*	*126,480*	*15,44*	*339,7*
	92.00	12.031	5.4057	0.7226	0.12870	7.769	*67,148*	*136,896*	*17,06*	
	98.00	11.937	5.3138	0.7103	0.12651	7.904	*66,006*	*145,824*	*18,26*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 4.000 in., 101,6 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	*Weight (kg/m)*	*Wall (mm)*	*OD (mm)*
	13.00	5.044	0.3852	0.0514	0.00917	109.028	*4,785*	*19,344*	*5,79*	
	14.00	5.012	0.3721	0.0497	0.00885	112.875	*4,622*	*20,832*	*6,19*	
	15.00	4.974	0.3566	0.0476	0.00849	117.776	*4,429*	*22,320*	*8,68*	
5-1/2	15.50	4.950	0.3469	0.0463	0.00825	121.075	*4,309*	*23,064*	*6,98*	*139,7*
	17.00	4.892	0.3236	0.0432	0.00770	129.788	*4,019*	*25,296*	*7,72*	
	20.00	4.778	0.2786	0.0372	0.00663	150.739	*3,461*	*29,760*	*9,16*	
	23.00	4.670	0.2370	0.0316	0.00564	177.218	*2,943*	*34,224*	*10,54*	
	26.00	4.548	0.1911	0.0255	0.00455	219.764	*2,374*	*38,688*	*12,09*	
	14.00	5.290	0.4889	0.0653	0.01164	85.900	*6,073*	*20,832*	*5,84*	
	17.00	5.190	0.4461	0.0596	0.01062	94.132	*5,542*	*25,296*	*7,11*	
5-3/4	19.50	5.090	0.4042	0.0540	0.00962	103.899	*5,021*	*29,016*	*8,38*	*146,0*
	22.50	4.990	0.3631	0.0485	0.00864	115.666	*4,510*	*33,480*	*9,65*	
	25.20	4.890	0.3228	0.0431	0.00768	130.109	*4,009*	*37,497*	*10,92*	
	15.00	5.524	0.5921	0.0791	0.01409	70.924	*7,355*	*22,320*	*6,04*	
	16.00	5.500	0.5814	0.0777	0.01384	72.241	*7,221*	*23,808*	*6,35*	
6	17.00	5.450	0.5590	0.0747	0.01331	75.128	*6,944*	*25,296*	*6,98*	*152,4*
	18.00	5.424	0.5475	0.0731	0.01303	76.710	*6,801*	*26,784*	*7,31*	
	20.00	5.352	0.5158	0.0689	0.01228	81.418	*6,407*	*29,760*	*8,22*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 4.000 in., 101,6 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
6	23.00	5.240	0.4674	0.0624	0.01112	89.847	*5,806*	*34,224*	*9,65*	*152,4*
	26.00	5.140	0.4251	0.0568	0.01012	98.798	*5,280*	*38,688*	*10,92*	
6-5/8	13.00	6.255	0.9435	0.1261	0.02246	44.516	*11,719*	*19,344*	*4,69*	
	17.00	6.135	0.8828	0.1180	0.02101	47.575	*10,966*	*25,296*	*6,22*	
	20.00	6.049	0.8400	0.1123	0.02000	49.996	*10,435*	*29,760*	*7,31*	
	22.00	5.989	0.8106	0.1083	0.01929	51.813	*10,069*	*32,736*	*8,07*	
	24.00	5.921	0.7775	0.1039	0.01851	54.015	*9,658*	*35,712*	*8,94*	
	26.00	5.855	0.7458	0.0997	0.01775	56.312	*9,264*	*38,688*	*9,77*	*168,2*
	28.00	5.791	0.7154	0.0956	0.01703	58.705	*8,887*	*41,664*	*10,59*	
	29.00	5.761	0.7013	0.0937	0.01669	59.889	*8,711*	*43,152*	*10,97*	
	32.00	5.675	0.6611	0.0883	0.01574	63.523	*8,213*	*47,616*	*12,06*	
	34.00	5.595	0.6244	0.0834	0.01486	67.266	*7,756*	*50,592*	*13,08*	
7	17.00	6.538	1.0912	0.1458	0.02598	38.490	*13,554*	*25,296*	*5,86*	
	20.00	6.456	1.0477	0.1400	0.02494	40.087	*13,014*	*29,760*	*6,90*	
	22.00	6.398	1.0173	0.1359	0.02422	41.286	*12,636*	*32,736*	*7,64*	*177,8*
	23.00	6.366	1.0006	0.1337	0.02382	41.973	*12,429*	*34,224*	*8,05*	
	24.00	6.336	0.9851	0.1316	0.02345	42.636	*12,236*	*35,712*	*8,43*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 4.000 in., 101,6 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	26.00	6.276	0.9542	0.1275	0.02271	44.015	*11,853*	*38,688*	*9,19*	
	28.00	6.214	0.9226	0.1233	0.02196	45.522	*11,460*	*41,664*	*9,98*	
	29.00	6.184	0.9074	0.1213	0.02160	46.283	*11,272*	*43,152*	*10,36*	
	30.00	6.154	0.8923	0.1192	0.02124	47.067	*11,084*	*44,640*	*10,74*	
	32.00	6.094	0.8623	0.1152	0.02053	48.703	*10,712*	*47,616*	*11,50*	
7	33.70	6.048	0.8395	0.1122	0.01998	50.025	*10,429*	*50,145*	*12,09*	*177,8*
	34.00	6.040	0.8356	0.1117	0.01989	50.261	*10,380*	*50,592*	*12,19*	
	35.00	6.004	0.8179	0.1093	0.01947	51.348	*10,160*	*52,080*	*12,64*	
	35.30	6.000	0.8160	0.1090	0.01942	51.472	*10,135*	*52,526*	*12,70*	
	38.00	5.920	0.7770	0.1038	0.01850	54.049	*9,652*	*56,543*	*13,71*	
	40.00	5.836	0.7368	0.0984	0.01754	57.004	*9,152*	*59,520*	*14,76*	
	41.00	5.820	0.7291	0.0974	0.01736	57.599	*9,057*	*61,008*	*14,98*	
	44.00	5.720	0.6821	0.0911	0.01624	61.575	*8,472*	*65,472*	*16,25*	
	20.00	7.125	1.4184	0.1896	0.03377	29.610	*17,619*	*29,760*	*6,36*	
	24.00	7.025	1.3607	0.1818	0.03239	30.867	*16,902*	*35,712*	*7,62*	
7-5/8	26.40	6.969	1.3287	0.1776	0.03163	31.610	*16,504*	*39,283*	*8,33*	*193,6*
	29.70	6.875	1.2756	0.1705	0.03037	32.925	*15,845*	*44,193*	*9,52*	
	33.70	6.765	1.2144	0.1623	0.02891	34.585	*15,085*	*50,145*	*10,92*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 4.000 in., 101,6 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	36.00	6.705	1.1814	0.1579	0.02812	35.550	*14,675*	*53,568*	*11,68*	
	38.00	6.655	1.1541	0.1542	0.02747	36.390	*14,336*	*56,543*	*12,31*	*193,6*
7-5/8	39.00	6.625	1.1379	0.1521	0.02709	36.909	*14,134*	*58,032*	*12,70*	
	45.30	6.435	1.0366	0.1385	0.02468	40.514	*12,877*	*67,406*	*15,11*	
7-3/4	46.10	6.560	0.9975	0.1333	0.02375	42.104	*12,391*	*68,596*	*17,65*	*196,8*
8	26.00	7.386	1.5729	0.2102	0.03745	26.701	*19,538*	*38,688*	*7,79*	*203,2*
	28.00	7.485	1.6330	0.2182	0.03888	25.719	*20,284*	*41,664*	*8,12*	
8-1/8	32.00	7.385	1.5723	0.2101	0.03743	26.712	*19,531*	*47,616*	*9,39*	*206,3*
	35.50	7.285	1.5125	0.2021	0.03601	27.769	*18,787*	*52,824*	*10,66*	
	39.50	7.185	1.4534	0.1942	0.03460	28.897	*18,054*	*58,776*	*11,93*	
	24.00	8.097	2.0221	0.2703	0.04814	20.771	*25,117*	*35,712*	*6,70*	
	28.00	8.017	1.9695	0.2632	0.04689	21.325	*24,464*	*41,664*	*7,72*	
	32.00	7.921	1.9070	0.2549	0.04540	22.023	*23,688*	*47,616*	*8,94*	
8-5/8	36.00	7.825	1.8454	0.2466	0.04393	22.759	*22,922*	*53,568*	*10,16*	*219,0*
	38.00	7.775	1.8135	0.2424	0.04317	23.159	*22,527*	*56,543*	*10,79*	
	40.00	7.725	1.7819	0.2382	0.04242	23.570	*22,134*	*59,520*	*11,43*	
	43.00	7.651	1.7355	0.2320	0.04132	24.200	*21,558*	*63,984*	*12,36*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 4.000 in., 101,6 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
8-5/8	44.00	7.625	1.7193	0.2298	0.04093	24.428	*21,356*	*65,472*	*12,70*	*219,0*
	48.00	7.537	1.6648	0.2225	0.03963	25.227	*20,680*	*71,424*	*13,81*	
	49.00	7.511	1.6489	0.2204	0.03925	25.471	*20,482*	*72,912*	*14,14*	
8-3/4	49.70	7.636	1.7261	0.2307	0.04109	24.331	*21,441*	*73,953*	*14,14*	*222,2*
9	34.00	8.290	2.1511	0.2875	0.05121	19.525	*26,720*	*50,592*	*9,01*	*228,6*
	38.00	8.196	2.0879	0.2791	0.04971	20.116	*25,935*	*56,543*	*10,21*	
	40.00	8.150	2.0572	0.2750	0.04898	20.416	*25,554*	*59,520*	*10,79*	
	45.00	8.032	1.9793	0.2645	0.04712	21.219	*24,586*	*66,960*	*12,29*	
	50.20	7.910	1.8999	0.2539	0.04523	22.106	*23,600*	*74,697*	*13,84*	
	55.00	7.812	1.8371	0.2455	0.04373	22.862	*22,819*	*81,840*	*15,08*	
9-5/8	29.30	9.063	2.6984	0.3607	0.06424	15.565	*33,518*	*43,598*	*7,13*	*244,4*
	32.30	9.001	2.6527	0.3546	0.06315	15.833	*32,951*	*48,062*	*7,92*	
	36.00	8.921	2.5942	0.3467	0.06176	16.190	*32,224*	*53,568*	*8,94*	
	38.00	8.885	2.5680	0.3432	0.06114	16.355	*31,899*	*56,543*	*9,39*	
	40.00	8.835	2.5319	0.3384	0.06028	16.588	*31,450*	*59,520*	*10,03*	
	42.00	8.799	2.5060	0.3349	0.05966	16.760	*31,128*	*62,496*	*10,49*	
	43.50	8.755	2.4745	0.3307	0.05891	16.973	*30,737*	*64,728*	*11,04*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 4.000 in., 101,6 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
9-5/8	47.00	8.681	2.4218	0.3237	0.05766	17.342	*30,083*	*69,936*	*11,98*	*244,4*
	53.50	8.535	2.3193	0.3100	0.05522	18.109	*28,809*	*79,608*	*13,84*	
	58.40	8.435	2.2500	0.3007	0.05357	18.666	*27,949*	*86,899*	*15,11*	
	61.10	8.375	2.2089	0.2952	0.05259	19.014	*27,438*	*90,916*	*15,87*	
	71.80	8.125	2.0406	0.2727	0.04858	20.582	*25,347*	*106,838*	*19,05*	
9-3/4	59.20	8.560	2.3367	0.3123	0.05563	17.974	*29,026*	*88,089*	*15,11*	*247,6*
9-7/8	62.80	8.625	3.3823	0.3184	0.05672	17.630	*29,592*	*93,446*	*15,87*	*250,8*
10	33.00	9.384	2.9400	0.3930	0.06999	14.286	*36,519*	*49,104*	*7,82*	*254,0*
	41.50	9.200	2.8005	0.3743	0.06667	14.997	*34,786*	*61,752*	*10,16*	
	45.50	9.120	2.7407	0.3663	0.06525	15.324	*34,043*	*67,704*	*11,17*	
	50.50	9.016	2.6637	0.3560	0.06342	15.767	*33,088*	*75,144*	*12,49*	
	55.50	8.908	2.5847	0.3455	0.06154	16.249	*32,107*	*82,584*	*13,86*	
	61.20	8.790	2.4995	0.3341	0.05951	16.803	*31,048*	*91,065*	*15,36*	
10-3/4	32.75	10.192	3.5853	0.4792	0.08536	11.714	*44,535*	*48,732*	*7,08*	*273,0*
	35.75	10.136	3.5389	0.4730	0.08425	11.868	*43,959*	*53,196*	*7,79*	
	40.50	10.050	3.4681	0.4636	0.08257	12.110	*43,079*	*60,264*	*8,89*	
	45.50	9.950	3.3865	0.4526	0.08062	12.402	*42,065*	*67,704*	*10,16*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 4.000 in., 101,6 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	48.00	9.902	3.3476	0.4474	0.07970	12.546	*41,582*	*71,424*	*10,76*	
	51.00	9.850	3.3057	0.4418	0.07870	12.705	*41,062*	*75,888*	*11,43*	
	54.00	9.784	3.2528	0.4348	0.07744	12.912	*40,405*	*80,352*	*12,26*	
	55.50	9.760	3.2337	0.4322	0.07699	12.988	*40,167*	*82,584*	*12,57*	
10-3/4	60.70	9.660	3.1544	0.4216	0.07510	13.314	*39,183*	*90,321*	*13,84*	*273,0*
	65.70	9.560	3.0760	0.4111	0.07323	13.654	*38,209*	*97,761*	*15,11*	
	71.10	9.450	2.9907	0.3997	0.07120	14.043	*37,149*	*105,796*	*16,51*	
	76.00	9.350	2.9140	0.3895	0.06937	14.413	*36,196*	*113,087*	*17,78*	
	81.00	9.250	2.8381	0.3793	0.06757	14.798	*35,254*	*120,528*	*19,05*	
	38.00	11.150	4.4195	0.5907	0.10522	9.503	*54,897*	*56,543*	*7,62*	
	42.00	11.084	4.3596	0.5827	0.10379	9.634	*54,154*	*62,496*	*8,45*	
	47.00	11.000	4.2840	0.5726	0.10199	9.804	*53,214*	*69,936*	*9,52*	
11-3/4	54.00	10.880	4.1768	0.5583	0.09944	10.055	*51,883*	*80,352*	*11,04*	*298,4*
	60.00	10.772	4.0814	0.5455	0.09717	10.290	*50,698*	*89,280*	*12,42*	
	65.00	10.682	4.0026	0.5350	0.09529	10.493	*49,719*	*96,720*	*13,56*	
	71.00	10.586	3.9193	0.5239	0.09331	10.716	*48,684*	*105,648*	*14,78*	
11-7/8	71.80	10.711	4.0280	0.5384	0.09590	10.427	*50,034*	*106,838*	*14,78*	*301,6*

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 4.000 in., 101,6 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
1 2	40.00	11.384	4.6346	0.6195	0.11034	9.062	*57,570*	*59,520*	*7,82*	*304,8*
12-3/4	43.00	12.130	5.3503	0.7152	0.12738	7.850	*66,460*	*63,984*	*7,87*	*323,8*
	53.00	11.970	5.1930	0.6941	0.12364	8.087	*64,505*	*78,864*	*9,90*	
13	40.00	12.438	5.6591	0.7564	0.13473	7.421	*70,295*	*59,520*	*7,13*	
	45.00	12.360	5.5801	0.7459	0.13285	7.526	*69,314*	*66,960*	*8,12*	
	50.00	12.282	5.5017	0.7354	0.13099	7.634	*68,340*	*74,400*	*9,11*	*330,2*
	54.00	12.220	5.4397	0.7271	0.12951	7.721	*67,570*	*80,352*	*9,90*	
13-3/8	48.00	12.715	5.9433	0.7944	0.14150	7.066	*73,826*	*71,424*	*8,38*	
	54.50	12.615	5.8400	0.7806	0.13904	7.191	*72,542*	*81,096*	*9,65*	
	61.00	12.515	5.7375	0.7669	0.13660	7.320	*71,268*	*90,768*	*10,92*	
	68.00	12.415	5.6357	0.7533	0.13418	7.452	*70,005*	*101,184*	*12,19*	
	72.00	12.347	5.5670	0.7441	0.13254	7.544	*69,152*	*107,136*	*13,05*	*339,7*
	77.00	12.275	5.4947	0.7345	0.13082	7.643	*68,253*	*114,576*	*13,97*	
	83.00	12.175	5.3950	0.7211	0.12844	7.785	*67,014*	*123,504*	*15,24*	
	85.00	12.159	5.3791	0.7190	0.12807	7.808	*66,817*	*126,480*	*15,44*	
	92.00	12.031	5.2527	0.7021	0.12506	7.995	*65,247*	*136,896*	*17,06*	
	98.00	11.937	5.1608	0.6898	0.12287	8.138	*64,106*	*145,824*	*18,26*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 4.500 in., 114,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
6	15.00	5.524	0.4187	0.0559	0.00997	100.290	*5,202*	*22,320*	*6,04*	*152,4*
	16.00	5.500	0.4080	0.0545	0.00971	102.944	*5,067*	*23,808*	*6,35*	
	17.00	5.450	0.3856	0.0515	0.00918	108.906	*4,790*	*25,296*	*6,98*	
	18.00	5.424	0.3741	0.0500	0.00890	112.264	*4,647*	*26,784*	*7,31*	
	20.00	5.352	0.3424	0.0457	0.00815	122.641	*4,254*	*29,760*	*8,22*	
	23.00	5.240	0.2940	0.0393	0.00700	142.827	*3,652*	*34,224*	*9,65*	
	26.00	5.140	0.2517	0.0336	0.00599	166.857	*3,126*	*38,688*	*10,92*	
6-5/8	13.00	6.255	0.7701	0.1029	0.01833	54.539	*9,565*	*19,344*	*4,69*	*168,2*
	17.00	6.135	0.7094	0.0948	0.01689	59.203	*8,812*	*25,296*	*6,22*	
	20.00	6.049	0.6666	0.0891	0.01587	62.999	*8,281*	*29,760*	*7,31*	
	22.00	5.989	0.6372	0.0851	0.01517	65.913	*7,915*	*32,736*	*8,07*	
	24.00	5.921	0.6041	0.0807	0.01438	69.518	*7,504*	*35,712*	*8,94*	
	26.00	5.855	0.5724	0.0765	0.01362	73.368	*7,110*	*38,688*	*9,77*	
	28.00	5.791	0.5420	0.0724	0.01290	77.485	*6,733*	*41,664*	*10,59*	
	29.00	5.761	0.5279	0.0705	0.01256	79.560	*6,557*	*43,152*	*10,97*	
	32.00	5.675	0.4877	0.0652	0.01161	86.105	*6,059*	*47,616*	*12,06*	
	34.00	5.595	0.4510	0.0602	0.01073	93.128	*5,602*	*50,592*	*13,08*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 4.500 in., 114,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	17.00	6.538	0.9178	0.1226	0.02185	45.762	*11,400*	*25,296*	*5,86*	
	20.00	6.456	0.8743	0.1168	0.02081	48.037	*10,860*	*29,760*	*6,90*	
	22-00	6.398	0.8439	0.1128	0.02009	49.768	*10,482*	*32,736*	*7,64*	
	23.00	6.366	0.8272	0.1105	0.01969	50.771	*10,275*	*34,224*	*8,05*	
	24.00	6.336	0.8117	0.1085	0.01932	51.744	*10,082*	*35,712*	*8,43*	
	26.00	6.276	0.7808	0.1043	0.01859	53.789	*9,699*	*38,688*	*9,19*	
	28.00	6.214	0.7492	0.1001	0.01783	56.058	*9,306*	*41,664*	*9,98*	
	29.00	6.184	0.7340	0.0981	0.01747	57.217	*9,118*	*43,152*	*10,36*	
7	30.00	6.154	0.7189	0.0961	0.01711	58.418	*8,930*	*44,640*	*10,74*	*177,8*
	32.00	6.094	0.6889	0.0921	0.01640	60.961	*8,558*	*47,616*	*11,50*	
	33.70	6.048	0.6661	0.0890	0.01586	63.046	*8,275*	*50,145*	*12,09*	
	34.00	6.040	0.6622	0.0885	0.01576	63.422	*8,226*	*50,592*	*12,19*	
	35.00	6.004	0.6445	0.0861	0.01534	65.162	*8,006*	*52,080*	*12,64*	
	35.30	6.000	0.6426	0.0859	0.01529	65.361	*7,982*	*52,526*	*12,70*	
	38.00	5.920	0.6036	0.0806	0.01437	69.573	*7,498*	*56,543*	*13,71*	
	40.00	5.836	0.5634	0.0753	0.01341	74.549	*6,998*	*59,520*	*14,78*	
	41.00	5.820	0.5557	0.0742	0.01323	75.569	*6,903*	*61,008*	*14,98*	
	44.00	5.720	0.5087	0.0680	0.0121	82.564	*6,318*	*65,472*	*16,25*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 4.500 in., 114,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
7-5/8	20.00	7.125	1.2450	0.1664	0.02964	33.734	*15,465*	*29,760*	*6,35*	*193,6*
	24.00	7.025	1.1873	0.1587	0.02826	35.375	*14,748*	*35,712*	*7,62*	
	26.40	6.969	1.1553	0.1544	0.02750	36.354	*14,351*	*39,283*	*8,33*	
	29.70	6.875	1.1022	0.1473	0.02624	38.105	*13,691*	*44,193*	*9,52*	
	33.70	6.765	1.0410	0.1391	0.02479	40.346	*12,931*	*50,145*	*10,92*	
	36.00	6.705	1.0080	0.1347	0.02400	41.665	*12,521*	*53,568*	*11,68*	
	38.00	6.655	0.9807	0.1311	0.02335	42.823	*12,182*	*56,543*	*12,31*	
	39.00	6.625	0.9645	0.1289	0.02296	43.545	*11,981*	*58,032*	*12,70*	
	45.30	6.435	0.8632	0.1154	0.02055	48.652	*10,723*	*67,406*	*15,11*	
7-3/4	46.10	6.560	0.8241	0.1101	0.01962	50.963	*10,237*	*68,596*	*17,65*	*196,8*
8	26.00	7.386	1.3995	0.1870	0.03332	30.010	*17,384*	*38,688*	*7,80*	*203,2*
8-1/8	28.00	7.485	1.4596	0.1951	0.03475	28.775	*18,130*	*41,664*	*8,12*	*206,3*
	32.00	7.385	1.3989	0.1870	0.03330	30.023	*17,377*	*47,616*	*9,39*	
	35.50	7.285	1.3391	0.1790	0.03188	31.365	*16,633*	*52,824*	*10,66*	
	39.50	7.185	1.2800	0.1711	0.03047	32.811	*15,900*	*58,776*	*11,93*	
8-5/8	24.00	8.097	1.8487	0.2471	0.04401	22.719	*22,963*	*35,712*	*6,70*	*219,0*

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 4.500 in., 114,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
8-5/8	28.00	8.017	1.7961	0.2400	0.04276	23.384	*22,310*	*41,664*	*7,72*	*219,0*
	32.00	7.921	1.7336	0.2317	0.04127	24.226	*21,535*	*47,616*	*8,94*	
	36.00	7.825	1.6720	0.2235	0.03980	25.120	*20,768*	*53,568*	*10,16*	
	38.00	7.775	1.6401	0.2192	0.03905	25.607	*20,373*	*56,543*	*10,79*	
	40.00	7.725	1.6085	0.2150	0.03829	26.110	*19,980*	*59,520*	*11,43*	
	43.00	7.651	1.5621	0.2088	0.03719	26.886	*19,404*	*63,984*	*12,36*	
	44.00	7,625	1.5459	0.2066	0.03680	27.168	*19,202*	*65,472*	*12,70*	
	48.00	7.537	1.4914	0.1993	0.03551	28.160	*18,526*	*71,424*	*13,81*	
	49.00	7.511	1.4755	0.1972	0.03513	28.465	*18,328*	*72,912*	*14,14*	
8-3/4	49.70	7.636	1.5527	0.2075	0.03697	27.048	*19,288*	*73,953*	*14,14*	*222,2*
9	34.00	8.290	1.9777	0.2643	0.04708	21.236	*24,566*	*50,592*	*9,01*	*228,6*
	38.00	8.196	1.9145	0.2559	0.04558	21.938	*23,781*	*56,543*	*10,21*	
	40.00	8.150	1.8838	0.2518	0.04485	22.295	*23,400*	*59,520*	*10,79*	
	45.00	8.032	1.8059	0.2414	0.04299	23.257	*22,432*	*66,960*	*12,29*	
	50.20	7.910	1.7265	0.2308	0.04110	24.326	*21,446*	*74,697*	*13,84*	
	55.00	7.812	1.6637	0.2223	0.03961	25.245	*20,665*	*81,840*	*15,08*	
9-5/8	29.30	9.063	2.5250	0.3375	0.06011	16.633	*31,364*	*43,598*	*7,13*	*244,4*

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 4.500 in., 114,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
	32.30	9.001	2.4793	0.3314	0.05903	16.940	*30,797*	*48,062*	*7,92*	
	36.00	8.921	2.4208	0.3236	0.05763	17.349	*30,070*	*53,568*	*8,94*	
	38.00	8.885	2.3946	0.3201	0.05701	17.539	*29,745*	*56,543*	*9,39*	
	40.00	8.835	2.3585	0.3152	0.05615	17.808	*29,296*	*59,520*	*10,03*	
	42.00	8.799	2.3326	0.3118	0.05553	18.005	*28,974*	*62,496*	*10,49*	
9-5/8	43.50	8.755	2.3011	0.3076	0.05478	18.252	*28,583*	*64,728*	*11,04*	*244,4*
	47.00	8.681	2.2484	0.3005	0.05353	18.679	*27,929*	*69,936*	*11,98*	
	53.50	8.535	2.1459	0.2868	0.05109	19.572	*26,655*	*79,608*	*13,84*	
	58.40	8.435	2.0766	0.2776	0.04944	20.225	*25,795*	*86,899*	*15,11*	
	61.10	8.375	2.0355	0.2721	0.04846	20.633	*25,284*	*90,916*	*15,87*	
	71.80	8.125	1.8672	0.2496	0.04445	22.493	*23,194*	*106,838*	*19,05*	
9-3/4	59.20	8.560	2.1633	0.2891	0.05150	19.414	*26,872*	*88,089*	*15,11*	*247,6*
9-7/8	62.80	8.625	2.2089	0.2952	0.05259	19.014	*27,438*	*93,446*	*15,87*	*250,8*
	33.00	9.384	2.7666	0.3698	0.06587	15.181	*34,365*	*49,104*	*7,82*	
10	41.50	9.200	2.6271	0.3511	0.06254	15.987	*32,632*	*61,752*	*10,16*	*254,0*
	45.50	9.120	2.5673	0.3431	0.06112	16.359	*31,890*	*67,704*	*11,17*	
	50.50	9.016	2.4903	0.3329	0.05929	6.865	*30,934*	*75,144*	*12,49*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 4.500 in., 114,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
10	55.50	8.908	2.4113	0.3223	0.05741	17.417	*29,953*	*82,584*	*13,86*	*254,0*
	61.20	8.790	2.3261	0.3109	0.05538	18.055	*28,894*	*91,065*	*15,36*	
10-3/4	32.75	10.192	3.4119	0.4561	0.08123	12.309	*42,382*	*48,732*	*7,08*	*273,0*
	35.75	10.136	3.3655	0.4498	0.08012	12.479	*41,805*	*53,196*	*7,79*	
	40.50	10.050	3.2947	0.4404	0.07844	12.748	*40,925*	*60,264*	*8,89*	
	45.50	9.950	3.2131	0.4295	0.07650	13.071	*39,911*	*67,704*	*10,16*	
	48.00	9.902	3.1742	0.4243	0.07557	13.231	*39,428*	*71,424*	*10,76*	
	51.00	9.850	3.1323	0.4187	0.07457	13.408	*38,908*	*75,888*	*11,43*	
	54.00	9.784	3.0794	0.4116	0.07331	13.639	*38,251*	*80,352*	*12,26*	
	55.50	9.760	3.0603	0.4090	0.07286	13.724	*38,013*	*82,584*	*12,57*	
	60.70	9.660	2.9810	0.3984	0.07097	14.089	*37,029*	*90,321*	*13,84*	
	65.70	9.560	2.9026	0.3880	0.06910	14.469	*36,055*	*97,761*	*15,11*	
	71.10	9.450	2.8173	0.3766	0.06707	14.908	*34,995*	*105,796*	*16,51*	
	76.00	9.350	2.7406	0.3663	0.06525	15.325	*34,043*	*113,087*	*17,78*	
	81.00	9.250	2.6647	0.3562	0.06344	15.761	*33,100*	*120,528*	*19,05*	
11-3/4	38.00	11.150	4.2461	0.5676	0.10109	9.891	*52,743*	*56,543*	*7,62*	*298,4*
	42.00	11.084	4.1862	0.5596	0.09967	10.033	*52,000*	*62,496*	*8,45*	
	47.00	11.000	4.1106	0.5494	0.09786	10.217	*51,060*	*69,936*	*9,52*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 4.500 in., 114,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
11-3/4	54.00	10.880	4.0034	0.5351	0.09531	10.491	*49,729*	*80,352*	*11,04*	*298,4*
	60.00	10.772	3.9080	0.5224	0.09304	10.747	*48,544*	*89,280*	*12,42*	
	65.00	10.682	3.8292	0.5118	0.09117	10.968	*47,565*	*96,720*	*13,56*	
	71.00	10.586	3.7459	0.5007	0.08918	11.212	*46,531*	*105,648*	*14,78*	
11-7/8	71.80	10.711	3.8546	0.5152	0.09177	10.896	*47,880*	*106,838*	*14,78*	*301,6*
12	40.00	11.384	4.4612	0.5963	0.10621	9.414	*55,416*	*59,520*	*7,82*	*304,8*
12-3/4	43.00	12.130	5.1769	0.6920	0.12325	8.113	*64,306*	*63,984*	*7,87*	*323,8*
	53.00	11.970	5.0196	0.6710	0.11951	8.367	*62,352*	*78,864*	*9,90*	
13	40.00	12.438	5.4857	0.7333	0.13060	7.656	*68,141*	*59,520*	*7,13*	*330,2*
	45.00	12.360	5.4067	0.7227	0.12872	7.768	*67,160*	*66,960*	*8,12*	
	50.00	12.282	5.3283	0.7122	0.12686	7.882	*66,186*	*74,400*	*9,11*	
	54.00	12.220	5.2663	0.7039	0.12538	7.975	*65,416*	*80,352*	*9,90*	
13-3/8	48.00	12.715	5.7699	0.7713	0.13737	7.279	*71,672*	*71,424*	*8,38*	*339,7*
	54.50	12.615	5.6666	0.7574	0.13491	7.412	*70,388*	*81,096*	*9,65*	
	61.00	12.515	5.5641	0.7437	0.13247	7.548	*69,114*	*90,768*	*10,92*	
	68.00	12.415	5.4623	0.7301	0.13005	7.689	*67,851*	*101,184*	*12,19*	
	72.00	12.347	5.3936	0.7210	0.12841	7.787	*66,998*	*107,136*	*13,05*	

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 4.500 in., 114,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
14-3/8	77.00 83.00 85.00 92.00 98.00	12.275 12.175 12.159 12.031 11.937	5.3213 5.2216 5.2057 5.0793 4.9874	0.7113 0.6980 0.6958 0.6789 0.6667	0.12669 0.12432 0.12394 0.12093 0.11874	7.892 8.043 8.068 8.268 8.421	*66,099* *64,860* *64,663* *63,094* *61,952*	*114,576* *123,504* *126,480* *136,896* *145,824*	*13,97* *15,24* *15,44* *17,06* *18,26*	*339,7*
13-1/2	81.40	12.340	5.3866	0.7200	0.1284	7.797	*66,910*	*121,123*	*14,73*	*342,9*
13-5/8	88.20	12.375	5.4219	0.7247	0.12908	7.746	*67,348*	*131,241*	*15,87*	*346,0*
14	50.00	13.344	6.4387	0.8607	0.15329	6.523	*79,979*	*74,400*	*8,33*	*355,6*
16	55.00 65.00 70.00 75.00 84.00 109.00	15.375 15.250 15.198 15.125 15.010 14.688	8.8185 8.6623 8.5977 8.5074 8.3660 7.9758	1.1788 1.1579 1.1493 1.1372 1.1183 1.0661	0.20995 0.20624 0.20470 0.20255 0.19918 0.18989	4.762 4.848 4.885 4.937 5.020 5.266	*109,540* *107,599* *106,797* *105,675* *103,919* *99,072*	*81,840* *96,720* *104,160* *111,600* *124,992* *162,192*	*7,93* *9,52* *10,18* *11,11* *12,57* *16,66*	*406,4*
18	78.00 87.50	17.194 17.088	11.2356 11.0873	1.5019 1.4821	0.26750 0.26397	3.738 3.788	*139,564* *137,722*	*116,064* *130,200*	*10,23* *11,53*	*457,2*

Annular Volume Between One String of Tubing and Casing

No allowance made for upsets and couplings

Tubing OD 4.500 in., 114,3 mm

Casing			Capacity					Casing		
OD (in.)	Weight (lb/ft)	ID (in.)	Gallons per Lineal Foot	Cubic Feet per Lineal Foot	Barrels per Lineal Foot	Lineal Feet per Barrel	*Liters per Meter*	Weight *(kg/m)*	Wall *(mm)*	OD *(mm)*
18	96.50	16.986	10.9455	1.4631	0.26060	3.837	*135,961*	*143,592*	*12,87*	*457,2*
18-5/8	73.09	17.875	12.2100	1.6321	0.29070	3.439	*151,667*	*108,757*	*9,52*	*473,0*
	78.00	17.855	12.1808	1.6282	0.29001	3.448	*151,305*	*116,064*	*9,77*	
	87.50	17.755	12.0355	1.6088	0.28655	3.489	*149,500*	*130,200*	*11,04*	
	96.50	17.655	11.8911	1.5895	0.28311	3.532	*147,706*	*143,592*	*12,31*	
20	90.00	19.166	14.1610	1.8930	0.33715	2.965	*175,902*	*133,920*	*10,59*	*508,0*
	94.00	19.124	14.0954	1.8842	0.33559	2.979	*175,087*	*139,872*	*11,12*	
	106.50	19.000	13.9025	1.8584	0.33100	3.021	*172,692*	*158,472*	*12,70*	
	133.00	18.730	13.4869	1.8028	0.32110	3.114	*167,529*	*197,904*	*16,12*	

External Volume of Tubing

No allowance made for upsets and couplings

Tubing OD		External Volume			
(in.)	*(mm)*	Gallons per lineal Foot	Cubic feet per Lineal Foot	Barrels per lineal Foot	*Liters per Meter*
1.050	*26,7*	0.0450	0.0060	0.00107	*0,558*
1.315	*33,4*	0.0705	0.0094	0.00168	*0,876*
1.660	*42,2*	0.1124	0.0150	0.00268	*1,398*
1.900	*48,3*	0.1473	0.0197	0.00351	*1,831*
2.063	*52,4*	0.1736	0.0232	0.00413	*2,154*
2.375	*60,3*	0.2301	0.0308	0.00548	*2,858*
2.875	*73,0*	0.3372	0.0451	0.00803	*4,188*
3.500	*88,9*	0.4998	0.0668	0.01190	*6,207*
4.000	*101,6*	0.6528	0.0873	0.01554	*8,105*
4.500	*114,3*	0.8262	0.1104	0.01967	*10,259*
5.000	*127,0*	1.0198	0.1363	0.02428	*12,667*
5.500	*139,7*	1.2342	0.1650	0.02938	*15,326*
6.625	*168,2*	1.7907	0.2394	0.04263	*22,237*
7.000	*177,8*	1.9992	0.2673	0.04760	*24,826*
7.625	*193,6*	2.3722	0.3171	0.05648	*29,457*

Annular Volume with Multiple Tubing Strings

To determine the annular volume between two or more strings of tubing and the surrounding casing, select the external volume factor, in the units desired, as given in the **EXTERNAL VOLUME OF TUBING** chart for the second string of tubing. Subtract this figure from the annular volume factor, in the same units, for the first string of tubing, as found on pages 8-1 through 8-67. The result will be the factor for annular volume between the two strings tubing and the casing. This factor, multiplied by the length of the tubing strings, will provide the total annular volume in whatever units of measurement were selected.

If three or more strings of tubing are involved, subtract the external volume factor for the third and additional strings just as was done for the second string.

Example:
Two strings of tubing, first string 2-7/8 in. OD EU 8 Rd 6.5 lb/ft, second string 2-3/8 in. OD Hydril CS 4.7 lb/ft, 6500 ft long, inside 7 in. 29 lb casing.

Annular volume required in barrels.

Annular volume between first string and casing, in barrels per lineal foot, from page 8-37	0.02911
LESS external volume of second string, in barrels per lineal foot, from page 8-68	0.00548
Annular volume between the two strings of tubing and the casing, in barrels per lineal foot	0.02363

0.02363 x 6500 = 153.6 *barrels annular volume*

Example:
Three strings of tubing, first and second string 2-3/8 in. OD EU 8 Rd 4.7 lb/ft, third string 2-1/16 in. OD IJ 3.25 lb/ft, 2100 m long, inside 7-5/8 in. 33.7 lb casing.

Annular volume required in liters.

Annular volume between first string and casing, in liters per meter, from page 8-30	20,335
LESS external volume of second string, in liters per meter, from page 8-68	2,858
	17,477
LESS external volume of third string, in liters per meter, from page 8-68	2,154
Annular volume between the three strings of tubing and the casing, in liters per meter	15,323

15,323 x 2100 = 32,178 *liters annular volume*

SECTION 9 - Flanges & Blowout Preventers

Contents

FLANGES WITH RING GROOVES

OBSOLETE SERIES 300-720 PSI WORK PRESSURE

FLANGE SIZE NOM.	CASING SIZE O.D.	O.D. OF FLANGE	MINIMUM FLANGE THICKNESS	DIA. OF BOLT CIRCLE	BOLT			PITCH DIA. OF RING & GROOVE	API RING
					NO.	SIZE	LENGTH°		
1-1/4	1.660	5-1/4	1	3-7/8	4	5/8	3-3/4	2-3/8	R-18
1-1/2	1.900	6-1/8	1-1/16	4-1/2	4	3/4	4-1/4	2-11/16	R-20
2	2-3/8	6-1/2	1-3/16	5	8	5/8	4-1/2	3-1/4	R-23
2-1/2	2-7/8	7-1/2	1-5/16	5-7/8	8	3/4	5	4	R-26
3	3-1/2	8-1/4	1-7/16	6-5/8	8	3/4	5-1/4	4-7/8	R-31
3-1/2	4	9	1-1/2	7-1/4	8	3/4	5-1/2	5-3/16	R-34
4	4-3/4	10	1-9/16	7-7/8	8	3/4	5-3/4	5-7/8	R-37
5	5-1/2	11	1-11/16	9-1/4	8	3/4	5-3/4	7-1/8	R-41
6	6 6-5/8 7	12-1/2	1-3/4	10-5/8	12	3/4	6	8-5/16	R-45
8	7-5/8 9	15	1-15/16	13	12	7/8	6-1/2	10-5/8	R-49
10	9-5/8 10-3/4	17-1/2	2-3/16	15-1/4	16	1	7-5/8	12-3/4	R-53
12	11-3/4 13-3/8	20-1/2	2-5/16	17-3/4	16	1-1/8	7-7/8	15	R-57
16	16	25-1/2	2-9/16	22-1/2	20	1-1/4	9	18-1/2	R-65
20	18-5/8 20	30-1/2	2-7/8	27	24	1-1/4	9-3/4	23	R-73

ALL DIMENSIONS GIVEN ABOVE ARE CITED IN INCHES.

° REQUIRED STUD LENGTH WITH TWO NUTS.

FLANGES WITH RING GROOVES

OBSOLETE SERIES 400-960 PSI WORKING PRESSURE

FLANGE SIZE NOM.	CASING SIZE O.D.	O.D. OF FLANGE	MINIMUM FLANGE THICKNESS	DIA. OF BOLT CIRCLE	BOLT			PITCH DIA. OF RING & GROOVE	API RING
					NO.	SIZE	LENGTH°		
1-1/4	1.660	5-1/4	1-1/16	3-7/8	4	5/8	3-3/4	2-3/8	R-18
1-1/2	1.900	6-1/8	1-1/8	4-1/2	4	3/4	4-1/2	2-11/16	R-20
2	2-3/8	6-1/2	1-5/16	5	8	5/8	4-3/4	3-1/4	R-23
2-1/2	2-7/8	7-1/2	1-7/16	5-7/8	8	3/4	5-1/4	4	R-26
3	3-1/2	8-1/4	1-9/16	6-5/8	8	3/4	5-1/2	4-7/8	R-31
3-1/2	4	9	1-11/16	7-1/4	8	7/8	5-3/4	5-3/16	R-34
4	4-3/4	10	1-11/16	7-7/8	8	7/8	6-1/4	5-7/8	R-37
5	5-1/2	11	1-13/16	9-1/4	8	7/8	7-1/8	7-1/8	R-41
6	6 6-5/8 7	12-1/2	1-15/16	10-5/8	12	7/8	7-3/8	8-5/16	R-45
8	7-5/8 9	15	2-3/16	13	12	1	8-3/8	10-5/8	R-49
10	9-5/8 10-3/4	17-1/2	2-7/16	15-1/4	16	1-1/8	9-1/4	12-3/4	R-53
12	11-3/4 13-3/8	20-1/2	2-9/16	17-3/4	16	1-1/4	8-1/2	15	R-57
16	16	25-1/2	2-13/16	22-1/2	20	1-3/8	9-1/4	18-1/2	R-65
20	18-5/8 20	30-1/2	3-1/8	27	24	1-1/2	10-1/4	23	R-73

ALL DIMENSIONS GIVEN ABOVE ARE CITED IN INCHES.

° REQUIRED STUD LENGTH WITH TWO NUTS.

BAKER OIL TOOLS
A Baker Hughes company

FLANGES WITH RING GROOVES

API TYPE 6 B FOR 2,000 P.S.I. WORKING PRESSURE
(OLD SERIES 600)

FLANGE SIZE NOM.	OLD NOM SIZE OF FLANGE	CASING SIZE O.D.	O.D. OF FLANGE	MINIMUM FLANGE THICKNESS	DIA. OF BOLT CIRCLE	BOLT			PITCH DIA. OF RING & GROOVE	API RING
						NO.	SIZE	LENGTH°		
*	1-1/4	1.660	5-1/4	1-1/16	3-7/8	4	5/8	3-3/4	2-3/8	R-18
1-13/16	1-1/2	1.900	6-1/8	1-1/8'	4-1/2	4	3/4	4-1/4	2-11/16	R-20
2-1/16	2	2-3/8	6-1/2	1-5/16	5	8	5/8	4-1/2	3-1/4	R-23
2-9/16	2-1/2	2-7/8	7-1/2	1-7/16	5-7/8	8	3/4	5	4	R-26
3-1/8	3	3-1/2	8-1/4	1-9/16	6-5/8	8	3/4	5-1/4	4-7/8	R-31
*	3-1/2	4	9	1-11/16	7-1/4	8	7/8	5-3/4	5-3/16	R-34
4-1/16	4	4-1/2	10-3/4	1-13/16	8-1/2	8	7/8	6	5-7/8	R-37
5-1/8	5	5-1/2	13	2-1/16	10-1/2	8	1	6-3/4	7-1/8	R-41
7-1/16	6	6 6-5/8 7	14	2-3/16	11-1/2	12	1	7	8-5/16	R-45
9	8	7-5/8 9	16-1/2	2-1/2	13-3/4	12	1-1/8	8	10-5/8	R-49
11	10	9-5/8 10-3/4	20	2-13/16	17	16	1-1/4	8-3/4	12-3/4	R-53
13-5/8	12	11-3/4 13-3/8	22	2-15/16	19-1/4	20	1-1/4	9	15	R-57
16-3/4	16	16	27	3-5/16	23-3/4	20	1-1/2	10-1/4	18-1/2	R-65
17-3/4	18		29-1/4	3-9/16	25-3/4	20	1-5/8	11	21	R-69
21-1/4	20	18-5/8 20	32	3-7/8	28-1/2	24	1-5/8	11-3/4	23	R-73

ALL DIMENSIONS GIVEN ABOVE ARE CITED IN INCHES.
° REQUIRED STUD LENGTH WITH TWO NUTS.
INACTIVE - SPECIAL ORDER ONLY.
* OBSOLETE BY API.

FLANGES WITH RING GROOVES

API TYPE 6B FOR 3,000 PSI WORKING PRESSURE
(OLD SERIES 900)

FLANGE SIZE NOM.	OLD NOM SIZE OF FLANGE	CASING SIZE O.D.	O.D. OF FLANGE	MINIMUM FLANGE THICKNESS	DIA. OF BOLT CIRCLE	BOLT			PITCH DIA. OF RING & GROOVE	API RING
						NO.	SIZE	LENGTH°		
*	1-1/4	1.660	6-1/4	1-3/8	4-3/8	4	7/8	5	2-3/8	R-18
1-13/16	1-1/2	1.900	7	1-1/2	4-7/8	4	1	5-1/2	2-11/16	R-20
2-1/16	2	2-3/8	8-1/2	1-13/16	6-1/2	8	7/8	6	3-3/4	R-24
2-9/16	2-1/2	2-7/8	9-5/8	1-15/16	7-1/2	8	1	6-1/2	4-1/4	R-27
3-1/8	3	3-1/2	9-1/2	1-13/16	7-1/2	8	7/8	6	4-7/8	R-31
*	3-1/2	4	10-3/4	1-15/16	8-1/2	8	1	6-1/2	5-1/16	R-34
4-1/16	4	4-1/2	11-1/2	2-1/16	9-1/4	8	1-1/8	7	5-7/8	R-37
5-1/8	5	5-1/2	13-3/4	2-5/16	11	8	1-1/4	7-3/4	7-1/8	R-41
7-1/16	6	6 6-5/8 7	15	2-1/2	12-1/2	12	1-1/8	8	8-5/16	R-45
9	8	7-5/8 9	18-1/2	2-13/16	15-1/2	12	1-3/8	9	10-5/8	R-49
11	10	9-5/8 10-1/2	21-1/2	3-1/16	18-1/2	16	1-3/8	9-1/2	12-3/4	R-53
13-5/8	12	11-3/4 13-3/8	24	3-7/16	21	20	1-3/8	10-1/4	15	R-57
16-3/4	16	16	27-3/4	3-15/16	24-1/4	20	1-5/8	11-3/4	18-1/2	R-66
17-3/4	18		31	4-1/2	27	20	1-7/8	13-3/4	21	R-70
20-3/4	20	18-5/8 20	33-3/4	4-3/4	29-1/2	20	2	14-1/2	23	R-74

ALL DIMENSIONS GIVEN ABOVE ARE CITED IN INCHES.
° REQUIRED STUD LENGTH WITH TWO NUTS.
INACTIVE - SPECIAL ORDER ONLY.
* OBSOLETE BY API. OBSOLETE BY API.

FLANGES WITH RING GROOVES

API TYPE 6B FOR 5,000 PSI WORKING PRESSURE
(OLD SERIES 1500)

FLANGE SIZE NOM.	OLD NOM SIZE OF FLANGE	CASING SIZE O.D.	O.D. OF FLANGE	MINIMUM FLANGE THICKNESS	DIA. OF BOLT CIRCLE	BOLT			PITCH DIA. OF RING & GROOVE	API RING
						NO.	SIZE	LENGTH°		
*	1	1.315	5-7/8	1-3/8	4	4	7/8	5	2	R-16
*	1-1/4	1.660	6-1/4	1-3/8	4-3/8	4	7/8	5	2-3/8	R-18
1-3/16	1-1/2	1.900	7	1-1/2	4-7/8	4	1	5-1/2	2-11/16	R-20
2-1/16	2	2-3/8	8-1/2	1-13/16	6-1/2	8	7/8	6	3-3/4	R-24
2-9/16	2-1/2	2-7/8	9-5/8	1-15/16	7-1/2	8	1	6-1/2	4-1/4	R-27
3-1/8	3	3-1/2	10-1/2	2-3/16	8	8	1-1/8	7-1/4	5-3/8	R-35
*	3-1/2	4	11	2-5/16	8-1/2	8	1-1/8	7-1/2	5-7/8	R-37
4-1/16	4	4-1/2	12-1/4	2-7/16	9-1/2	8	1-1/4	8	6-3/8	R-39
5-1/8	5	5-1/2	14-3/4	3-3/16	11-1/2	8	1-1/2	10	7-5/8	R-44
7-1/16	6	6 6-5/8 7	15-1/2	3-5/8	12-1/2	12	1-3/8	10-3/4	8-5/16	R-46
9	8	7-5/8 9	19	4-1/16	15-1/2	12	1-5/8	12	10-5/8	R-50
11	10	9-5/8 10-3/4	23	4-11/16	19	12	1-7/8	13-3/4	12-3/4	R-54
13-5/8	12	11-3/4 13-3/8	26-1/2	4-7/16	23-1/4	16	1-5/8	12-1/2	15.270	BX-160
16-3/4	16	16	30-3/8	5-1/8	26-5/8	16	1-7/8	14-1/2	18.127	BX-162
18-3/4			35-5/8	6-17/32	31-5/8	20	2	17-1/2	21.179	BX-163
21-1/4	20	20	39	7-1/8	34-7/8	24	2	18-3/4	23.833	BX-165

ALL DIMENSIONS GIVEN ABOVE ARE CITED IN INCHES.
° REQUIRED STUD LENGTH WITH TWO NUTS.
INACTIVE - SPECIAL ORDER ONLY.
* OBSOLETE BY API.

FLANGES WITH RING GROOVES

API TYPE 6BX FOR 10,000 PSI WORKING PRESSURE

FLANGE SIZE NOM.	OLD NOM SIZE OF FLANGE	CASING SIZE O.D.	O.D. OF FLANGE	MINIMUM FLANGE THICKNESS	DIA. OF BOLT CIRCLE	BOLT			PITCH DIA. OF RING & GROOVE	API RING
						NO.	SIZE	LENGTH°		
1-11/16	1-1/4	1.660	7-3/16	1-21/32	5-9/16	8	3/4	5	2.443	BX-150
1-13/16	1-1/2	1.900	7-3/8	1-21/32	5-3/4	8	3/4	5	2.596	BX-151
2-1/16	2	2-3/8	7-7/8	1-47/64	6-1/4	8	3/4	5-1/4	2.897	BX-152
2-9/16	2-1/2	2-7/8	9-1/8	2-1/64	7-1/4	8	7/8	6	3.492	BX-153
3-1/16	3	3-1/2	10-5/8	2-19/64	8-1/2	8	1	6-3/4	4.079	BX-154
4-1/16	4	4-1/2	12-7/16	2-49/64	10-3/16	8	1-1/8	8	5.232	BX-155
5-1/8	5	5-1/2	14-1/16	3-1/8	11-13/16	12	1-1/8	8-3/4	6.289	BX-169
7-1/16	6	6 6-5/8 7	18-7/8	4-1/16	15-7/8	12	1-1/2	11-1/4	8.600	BX-156
9	8	7-5/8 9	21-3/4	4-7/8	18-3/4	16	1-1/2	13	10.735	BX-157
11	10	9-5/8 10-3/4	25-3/4	5-9/16	22-1/4	16	1-3/4	15	12.915	BX-158
13-5/8	12	11-3/4 13-3/8	30-1/4	6-5/8	26-1/2	20	1-7/8	17-1/4	15.754	BX-159
16-3/4	26	16	34-5/16	6-5/8	30-9/16	24	1-7/8	17-1/2	18.127	BX-162
18-3/4			40-15/16	8-25/32	36-7/16	24	2-1/4	22-1/2	21.462	BX-164
21-1/4			45	9-1/2	40-1/4	24	2-1/2	24-1/2	24.134	BX-166

ALL DIMENSIONS GIVEN ABOVE ARE CITED IN INCHES.
° REQUIRED STUD LENGTH WITH TWO NUTS.
INACTIVE - SPECIAL ORDER ONLY.
* OBSOLETE BY API. OBSOLETE BY API.

BAKER OIL TOOLS
A Baker Hughes company

FLANGES WITH RING GROOVES

OBSOLETE SERIES 2900-10,000 P.S.I. WORKING PRESSURE

FLANGE SIZE NOM.	CASING SIZE O.D.	O.D. OF FLANGE	MINIMUM FLANGE THICKNESS	DIA. OF BOLT CIRCLE	BOLT			PITCH DIA. OF RING & GROOVE	API RING
					NO.	SIZE	LENGTH°		
2	2-3/8	7-3/4	2-3/8	5-3/4	8	7/8	7	3-1/8	R-85
2-1/2	2-7/8	8-7/8	2-3/4	6-5/8	8	1	8	3-9/16	R-86
3	3-1/2	10	3-1/16	7-1/2	8	1-1/8	9	3-15/16	R-87
3-1/2	4	11-1/2	3-3/8	8-1/2	8	1-1/4	9-3/4	4-1/2	R-89
4	4-3/4	12-1/2	3-5/8	9-1/2	8	1-3/8	10-1/2	4-7/8	R-88
5	5-1/2	14-1/8	4-3/16	11	8	1-5/8	12-1/2	6-1/8	R-90
6	6 6-5/8 7	NO INFORMATION AVAILABLE							
	8 7-5/8 9								
10	9-5/8 10-3/4	20-3/4	5-11/16	16-3/4	12	2	16-1/2	10-1/4	R-91
11	9-5/8 10-3/4	25-3/4	5-9/16	22-1/4	16	1-3/4	15-1/8	12.915	BX-158

ALL DIMENSIONS GIVEN ABOVE ARE CITED IN INCHES.

°REQUIRED STUD LENGTH WITH TWO NUTS.

FLANGES WITH RING GROOVES

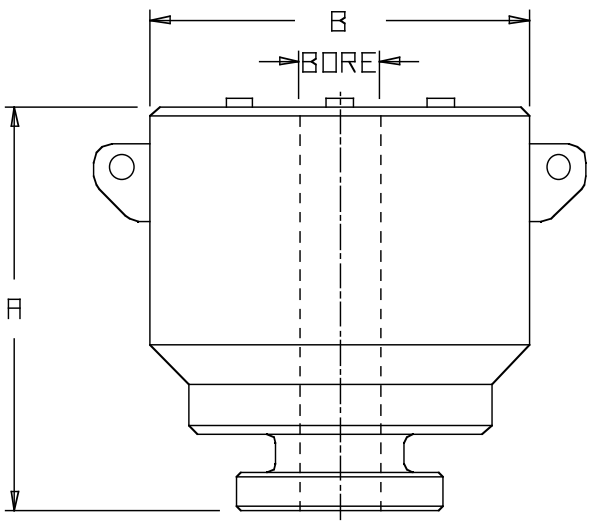
API TYPE 6BX FOR 15,000 PSI WORKING PRESSURE

FLANGE SIZE NOM.	OLD NOM SIZE OF FLANGE	CASING SIZE O.D.	O.D. OF FLANGE	MINIMUM FLANGE THICKNESS	DIA. OF BOLT CIRCLE	BOLT			PITCH DIA. OF RING & GROOVE	API RING
						NO.	SIZE	LENGTH°		
1-11/16	1-1/4	1.660	7-5/8	1-3/4	6	8	3/4	5-1/4	2.443	BX-150
1-13/16	1-1/2	1.900	8-3/16	1-25/32	6-5/16	8	7/8	5-1/2	2.596	BX-151
2-1/16	2	2-3/8	8-3/4	2	6-7/8	8	7/8	6	2.897	BX-152
2-9/16	2-1/2	2-7/8	10	2-1/4	7-7/8	8	1	6-3/4	3.492	BX-153
3-1/16	3	3-1/2	11-5/16	2-17/32	9-1/16	8	1-1/8	7-1/2	4.079	BX-154
4-1/16	4	4-1/2	14-3/16	3-3/32	11-7/16	8	1-3/8	9-1/4	5.232	BX-155
7-1/16	6	6 6-5/8 7	19-7/8	4-11/16	16-7/8	16	1-1/2	12-3/4	8.600	BX-156
9		7-5/8 8-5/8	25-1/2	5-3/4	21-3/4	16	1-7/8	15-3/4	10.735	BX-157
11		8-5/8 9-5/8	32	7-3/8	28	20	2	19-1/4	12.915	BX-158

ALL DIMENSIONS GIVEN ABOVE ARE CITED IN INCHES.

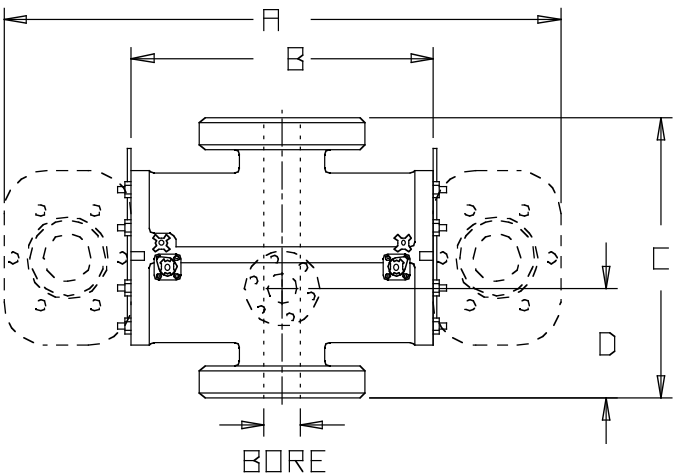
°REQUIRED STUD LENGTH WITH TWO NUTS.

INACTIVE - SPECIAL ORDER ONLY.



CAMERON TYPE "D" ANNULAR BLOWOUT PREVENTER SPECIFICATIONS

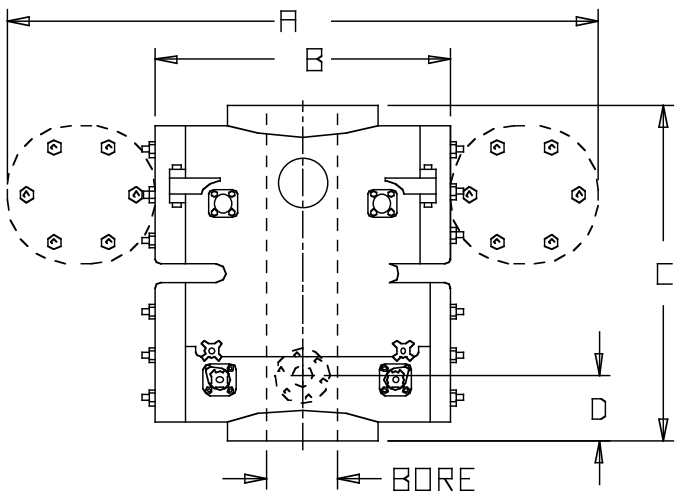
BORE SIZE (in.)	PRESSURE RATING PSI	FLANGED WEIGHT (lbs.)	FLANGED HEIGHT (in.) A	BODY DIAMETER (in.) B	GALLONS TO CLOSE	GALLONS TO OPEN
7-1/16	5,000	2,778	25-1/2	27-7/8	1.69	1.39
7-1/16	10,000	7,255	34-1/4	37-3/8	2.94	2.55
11	5,000	9,788	35-15/16	43-1/4	5.65	4.69
11	10,000	18,797	43-9/16	53	10.15	9.06
13-5/8	5,000	16,215	40-3/16	52-3/8	12.12	10.34
13-5/8	10,000	36,660	52-1/2	66-3/4	18.10	16.15



CAMERON TYPE "F" ANNULAR BLOWOUT PREVENTER

SINGLE OPEN FACE FLANGED MODELS - SPECIFICATIONS

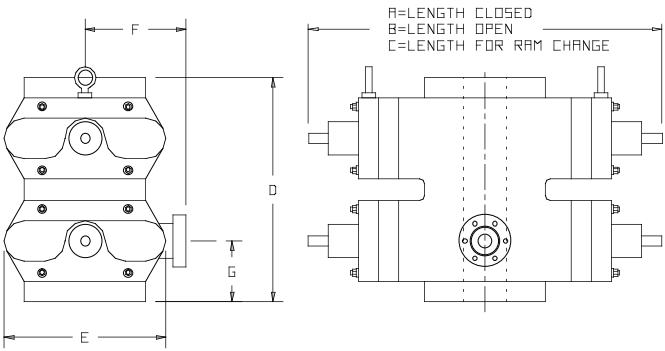
BORE SIZE (in.)	PRESSURE RATING PSI	VERTICAL BORE (in.)	OPEN A (in.)	CLOSED B (in.)	HEIGHT C (in.)	BOTTOM TO CENTER FLANGE D (in.)	APPROX. WT. (lbs.)	MAX. OUTLET UNDER OPERATOR	MAX. OUTLET OPPOSITE OPERATOR
7-1/16	3,000	7-1/16	76-5/8	44-5/8	26-3/8	10-1/4	3,500	2	4
7-1/16	5,000	7-1/16	76-5/8	44-5/8	28-5/8	11-3/8	3,700	2	4
7-1/16	10,000	7-1/16	80-3/4	46-1/2	38-1/4	13-5/8	4,600	3	4
7-1/16	15,000	7-1/16	80-3/4	46	34-5/8	11-3/4	4,300	2	3
9	3,000	9	88-3/4	48-7/8	27-7/8	10	4,900	2	4
9	5,000	9	90	50	33-5/8	12-7/8	5,300	2	4
11	3,000	11	87-3/8	48-1/4	28-3/8	10-3/8	4,800	2	4
11	5,000	11	90	50	34-7/8	13-1/2	5,200	2	4
11	10,000	11	89-1/2	51	37-3/4	12-3/8	6,000	3	5
13-5/8	3,000	13-5/8	103-1/4	54-7/8	31-5/8	11-3/4	7,400	2	6
13-5/8	5,000	13-5/8	105-5/8	57-1/8	42-1/4	14-1/8	8,250	2	6
16-3/4	2,000	16-3/4	115-3/4	64-7/8	34-1/4	12-3/8	8,500	2	6
16-3/4	3,000	16-3/4	115-3/4	64-7/8	35-1/2	13	8,850	2	6
20-1/4	2,000	20-1/4	124-1/4	64-3/4	38-1/2	11-7/8	9,500	2	6
20-1/4	3,000	20-1/4	124-1/4	66-1/4	40-1/4	12-3/4	9,850	2	6



CAMERON TYPE "F" BLOWOUT PREVENTER

DOUBLE STUDDED FLANGED MODELS - SPECIFICATIONS

BORE SIZE (in.)	PRESSURE RATING PSI	VERTICAL BORE (in.)	OPEN A (in.)	CLOSED B (in.)	HEIGHT C (in.)	BOTTOM TO CENTER FLANGE D (in.)	APPROX. WT. (lbs.)	MAX. OUTLET UNDER OPERATOR	MAX. OUTLET OPPOSITE OPERATOR
7-1/16	3,000	7-1/16	76-5/8	44-5/8	31-1/4	5	6,000	2	4
7-1/16	5,000	7-1/16	76-5/8	44-5/8	31-1/4	5	6,000	2	4
9	3,000	9	88-3/4	48-7/8	32-3/4	4-3/4	8,300	2	4
9	5,000	9	90	50	36-3/4	6	8,600	2	4
11	3,000	11	87-3/8	48-1/4	32-3/4	4-3/4	8,000	2	4
11	5,000	11	90	50	36-3/4	6	8,300	2	4
13-5/8	3,000	13-5/8	103-1/4	54-7/8	37-1/8	5-1/2	10,500	2	6
13-5/8	5,000	13-5/8	105-5/8	57-1/8	41-5/8	6-3/8	13,250	2	6
16-3/4	2,000	16-3/4	115-3/4	64-7/8	40-3/8	5-3/4	14,000	2	4
16-3/4	3,000	16-3/4	115-3/4	64-7/8	40-3/8	5-3/4	14,200	2	4
20-1/4	2,000	20-1/4	124-1/4	64-3/4	40-7/8	5-3/4	15,250	2	6



CAMERON TYPE "SS" BLOWOUT PREVENTER

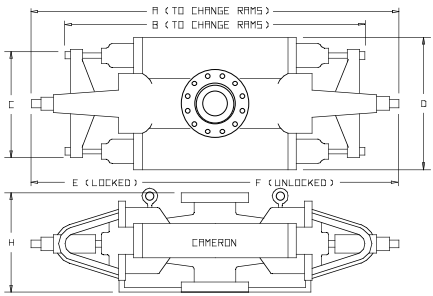
DIMENSIONAL DATA

SIZE (in.)	SERIES PSI	SIDE OUTLET SIZE	SIDE OUTLET PSI	VERT. BORE (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	G (in.)
7-1/16	5,000	2-1/16	5,000	7	41	49-1/2	61-1/2	24-1/2	19-1/4	10	4-1/2
9	3,000	3-1/8	3,000	9	53-1/2	66	82	27	21-1/2	10-3/4	5
9	5,000	3-1/8	5,000	9	53-1/2	66	82	30-1/2	23	11-1/2	5-3/4
11	3,000	3-1/8	3,000	11	53-1/2	66	82	27	21-1/2	10-3/4	5
11	5,000	3-1/8	5,000	11	53-1/2	66	82	30-1/2	23	11-1/2	5-3/4
13-5/8	3,000	4-1/16	3,000	13-5/8	66	81-1/2	101-1/2	29-1/2	26-1/2	14	6-1/4

CAMERON TYPE "SS" BLOWOUT PREVENTER

PERFORMANCE DATA

SIZE (in.)	SERIES PSI	EST. WT. (lbs.)	GAL. TO CLOSE	GAL. TO OPEN	GAL. TO CHANGE RAMS	CLOSING RATIO	OPENING RATIO	MAXIMUM RAM SIZE O.D.
7-1/16	5,000	3,400	.8	.7	2.1	3.8:1	1:1	5
9	3,000	4,800	1.5	1.3	3.8	3.9:1	1:1	7-5/8
9	5,000	5,450	1.5	1.3	3.8	3.9:1	1:1	7-5/8
11	3,000	4,750	1.5	1.3	3.8	3.9:1	1:1	7-5/8
11	5,000	5,400	1.5	1.3	3.8	3.9:1	1:1	7-5/8
13-5/8	3,000	7,600	2.9	2.5	7.7	3.7:1	1:1	9-5/8



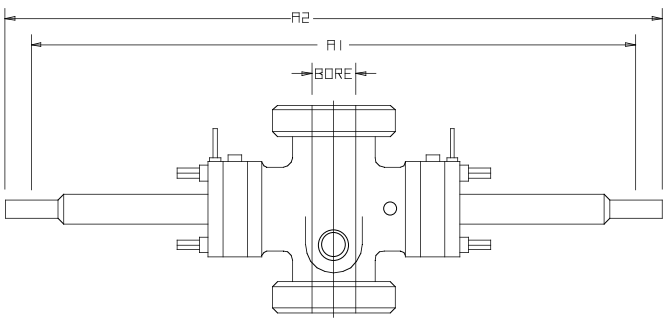
CAMERON TYPE "QRC" BLOWOUT PREVENTER

DIMENSIONAL DATA AND PERFORMANCE DATA

SIZE (in.)	SERIES PSI	VERT. BORE (in.)	RAM SIZES	TO CHANGE RAMS A (in.)	TO CHANGE RAMS B (in.)	WIDTH OF RAMS C (in.)	WIDTH D (in.)	LOCKED E (in.)	UN-LOCKED F (in.)	HEIGHT H (in.)
7-1/16	3,000	7-1/16	BLIND THRU 5 O.D.	100	83	25	31-7/8	72	81	22-3/8
7-1/16	5,000	7-1/16	BLIND THRU 5 O.D.	100	83	25	31-7/8	72	81	26-1/2
9	3,000	8-15/16	BLIND THRU 7 O.D.	126-1/2	105	32-1/4	40	89	101	25-1/2
9	5,000	8-15/16	BLIND THRU 7 O.D.	126-1/2	105	32-1/4	40	89	101	32
11	3,000	11	BLIND THRU 8-5/8 O.D.	144	117	34-3/4	42-1/2	101	114	28
11	5,000	11	BLIND THRU 8-5/8 O.D.	144	117	34-3/4	42-1/2	101	114	36
13-5/8	3,000	13-5/8	BLIND THRU 9-5/8 O.D.	161	133	39-3/4	48-7/8	111	126	34-1/2
16-3/4	2,000	16-3/4	BLIND THRU 13-3/8 O.D.	197	160	44-1/2	53-3/4	137	157	40
17-3/4	2,000	17-3/4	BLIND THRU 13-3/8 O.D.	197	160	44-1/2	53-3/4	137	157	40-1/2

ENGINEERING DATA ON CAMERON TYPE "QRC" BLOWOUT PREVENTER

SIZE (in.)	CLOSING OPENING RATIOS		FLUID REQUIRED TO OERATE PREVENTER U.S. GALLONS		
	CLOSING	OPENING	CLOSE RAMS	OPEN RAMS	CHANGE RAMS
7-1/16	7.75 to 1	1.50 to 1	.81	.95	6.4
9	9.05 to 1	1.83 to 1	2.36	2.70	18.3
11	9.05 to 1	1.21 to 1	2.77	3.18	20.8
13-5/8	8.64 to 1	1.07 to 1	4.42	5.10	33.3
16-3/4	8.64 to 1	.62 to 1	6.00	7.05	40.6
17-3/4	8.64 to 1	.62 to 1	6.00	7.05	40.6



CAMERON TYPE "U" BLOWOUT PREVENTER

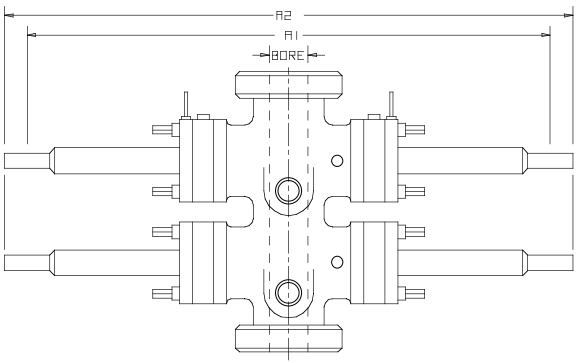
SINGLE OPEN FACE FLANGED - SPECIFICATIONS

BORE SIZE (in.)	PRESSURE RATING PSI	FLANGED WEIGHT (lbs.)	FLANGED HEIGHT (in.)	A-1° (in.)	A-2 (in.)	WIDTH (in.)	GALLONS TO CLOSE (ONE SET)	GALLONS TO OPEN (ONE SET)
7-1/16	3,000	2,600	24-1/16	74	109-1/2	20-1/4	1.33	1.28
7-1/16	5,000	2,800	27-1/2	74	109-1/2	20-1/4	1.33	1.28
7-1/16	10,000	3,550	30-9/16	74	109-1/2	20-5/8	1.33	1.28
7-1/16	15,000	3,800	31-13/16	74	109-1/2	20-5/8	1.33	1.28
11	3,000	5,300	29-1/16	96-1/4	146-7/8	25-1/8	3.36	3.20
11	5,000	5,600	34-5/16	96-1/4	146-7/8	25-1/8	3.36	3.20
11	10,000	6,400	35-11/16	96-1/4	146-7/8	25-3/4	3.36	3.20
11	15,000	10,300	44-13/16	120-7/8	180-3/16	32	3.36	3.20
13-5/8	3,000	7,200	31-5/16	112-1/8	171-1/2	29-1/4	5.80	5.45
13-5/8	5,000	7,700	33-5/16	112-1/8	171-1/2	29-1/4	5.80	5.45
13-5/8	10,000	10,300	41-3/4	114-1/8	172-3/4	30-1/4	5.80	5.45
*13-5/8	15,000	23,700	53-11/16	135-3/4	211-7/8	39-1/2	11.70	11.30
*16-3/4	3,000	13,550	40-1/16	127-1/4	199-1/16	35-3/4	10.60	9.80
*16-3/4	5,000	13,600	42-7/8	129-1/4	202-1/8	35-3/4	10.60	9.80
16-3/4	10,000	—	49-11/16	139	218-3/8	39-1/2	10.60	9.80
18-3/4	10,000	28,900	—	156-3/8	242-1/8	42-1/2	24.90	23.00
21-1/4	2,000	13,250	37-3/16	143-11/16	226-13/16	39-33/64	8.40	7.85
20-3/4	3,000	13,650	40-9/16	143-11/16	226-13/16	39-33/64	8.40	7.85
21-1/4	10,000	34,500	66	163-3/8	250-3/8	47-1/4	26.50	24.10
26-3/4	3,000	24,000	48-5/16	169-5/8	275-3/8	46-1/4	10.40	9.85

REPRINTED WITH PERMISSION FROM THE 1979 CAMERON CATALOG.

* MODEL B.

° A-1 = OVERALL LENGTH, BONNETS CLOSED, LOCKED.
A-2 = OVERALL LENGTH, RAM CHARGE, BOTH BONNETS OPENED, LOCK SCREWS UNLOCKED.



CAMERON TYPE "U" BLOWOUT PREVENTER

DOUBLE OPEN FACE FLANGED - SPECIFICATIONS

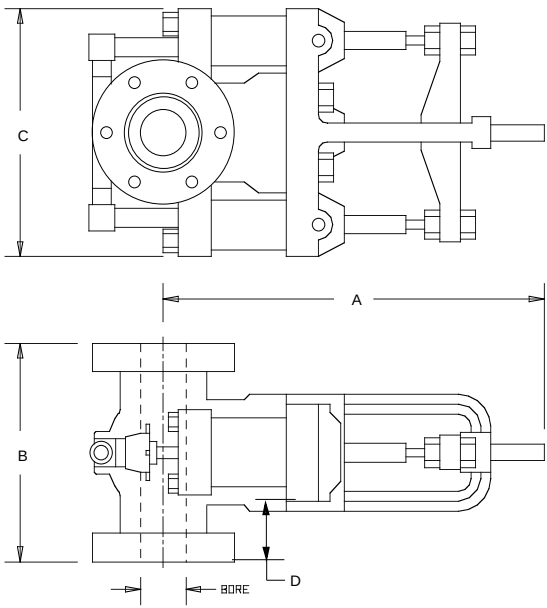
BORE SIZE (in.)	PRESSURE RATING PSI	FLANGED WEIGHT (lbs.)	FLANGED HEIGHT (in.)	A-1° (in.)	A-2 (in.)	WIDTH (in.)	GALLONS TO CLOSE (ONE SET)	GALLONS TO OPEN (ONE SET)
7-1/16	3,000	5,000	41	74	109-1/2	20-1/4	1.33	1.28
7-1/16	5,000	5,200	44-3/16	74	109-1/2	20-1/4	1.33	1.28
7-1/16	10,000	6,400	48-11/16	74	109-1/2	20-5/8	1.33	1.28
7-1/16	15,000	6,750	49-7/8	74	109-1/2	20-5/8	1.33	1.28
11	3,000	9,900	49-1/4	96-1/4	146-7/8	25-1/8	3.36	3.20
11	5,000	10,200	54-1/2	96-1/4	146-7/8	25-1/8	3.36	3.20
11	10,000	11,300	55-7/8	96-1/4	146-7/8	25-3/4	3.36	3.20
11	15,000	18,400	69-3/4	120-7/8	180-3/16	32	3.36	3.20
13-5/8	3,000	14,300	53-3/8	112-1/8	171-1/2	29-1/4	5.80	5.45
13-5/8	5,000	14,800	55-7/8	112-1/8	171-1/2	29-1/4	5.80	5.45
13-5/8	10,000	18,400	66-5/8	114-1/8	172-3/4	30-1/4	5.80	5.45
*13-5/8	15,000	43,250	81-3/4	135-3/4	211-7/8	39-1/2	11.70	11.30
*16-3/4	3,000	26,090	65-7/8	127-1/4	199-1/16	35-3/4	10.60	9.80
*16-3/4	5,000	26,140	68-11/16	129-1/4	202-1/8	35-3/4	10.60	9.80
16-3/4	10,000	—	77-3/4	139	218-3/8	39-1/2	10.60	9.80
18-3/4	10,000	54,000	—	156-3/8	242-1/8	42-1/2	24.90	23.00
21-1/4	2,000	25,150	62-3/4	143-11/16	226-13/16	39-33/64	8.40	7.85
20-3/4	3,000	25,550	66-1/8	143-11/16	226-13/16	39-33/64	8.40	7.85
21-1/4	10,000	65,500	100-1/16	163-3/8	250-3/8	47-1/4	26.50	24.10
26-3/4	3,000	44,200	78-7/8	169-5/8	275-3/8	46-1/4	10.40	9.85

REPRINTED WITH PERMISSION FROM THE 1979 CAMERON CATALOG.

* MODEL B.

° A-1 = OVERALL LENGTH, BONNETS CLOSED, LOCKED.

A-2 = OVERALL LENGTH, RAM CHARGE, BOTH BONNETS OPENED, LOCK SCREWS UNLOCKED.

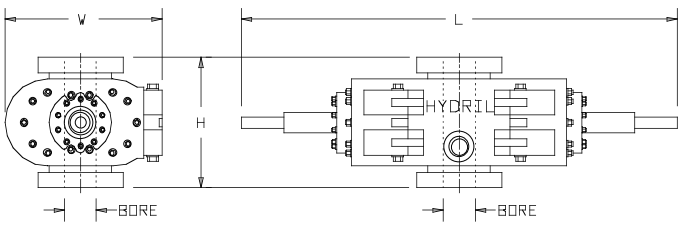


CAMERON HCR PRESSURE OPERATED GATE VALVE

DIMENSIONAL AND PERFORMANCE DATA

NOMINAL FLANGE SIZE	*4-1/16 (in.)	7-1/16 (in.)
A-LENGTH, CENTER TO END OPEN	36-1/2	56-3/8
A-LENGTH, CENTER TO END CLOSED	31-1/2	48
B-HEIGHT, FACE TO FACE	21-5/8	28-1/2
C-WIDTH	22-7/8	33-1/4
D-FLANGE FACE TO BONNET	7-1/4	9-1/2
DIAMETER VERTICAL BORE	4-1/16	7-1/16
U.S. GALLONS TO OPEN	.52	1.95
U.S. GALLONS TO CLOSE	.61	2.25
CLOSING RATIO	7.75 TO 1	9 TO 1
OPENING RATIO	4.25 TO 1	3.8 TO 1

* API 3,000 LBS. W.P. (6,000 LBS. TEST).
API 5,000 LBS. W.P. (10,000 LBS. TEST).

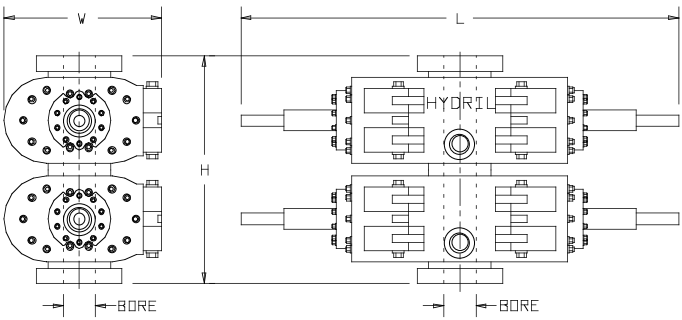


HYDRIL TYPE "V" AND TYPE "X" BLOWOUT PREVENTERS

SINGLE RAM - MANUAL LOCK - SPECIFICATIONS

BORE SIZE (in.)	PRESSURE RATING PSI	FLANGED BOTTOM APPROX. WT. (lbs.)	HUBBED BOTTOM HEIGHT H (in.)	STUDDED BOTTOM HEIGHT H (in.)	HEIGHT H (in.)	LENGTH L (in.)	WIDTH W (in.)	GALLONS TO CLOSE	GALLONS TO OPEN
7-1/16	3,000	2,800	25.375		19.000	72.50	29.000	1.2	1.3
7-1/16	5,000	2,800	27.625	23.625	19.000	72.50	29.000	1.2	1.3
9	3,000	5,200	28.187		18.125	82.50	30.875	1.9	1.9
9	5,000	5,400	31.687	23.750	18.125	82.50	30.875	1.9	1.9
11	3,000	5,600	30.250	24.250	21.500	95.00	37.875	3.3	3.2
11	5,000	6,000	35.500	25.750	21.500	95.00	37.875	3.3	3.2
11	10,000	7,000	38.250	29.875		120.75	44.250	11.8	11.8
13-5/8	3,000	8,000	33.250	30.125	22.375	116.80	40.000	5.4	4.9
13-5/8	5,000	8,600	36.250	30.125	22.375	116.80	40.000	5.4	4.9
13-5/8	10,000	11,000	41.750	31.250		124.75	50.750	11.8	11.8
16-3/4	10,000	21,000	44.875	37.625		143.00	57.375	15.0	14.1
18-3/4	10,000	29,000	56.500	45.500		150.75	64.250	16.4	15.6
21-1/4	2,000	14,000	35.250	29.250		150.75	52.250	8.1	7.2
20-3/4	3,000	14,500	38.500	28.875		130.75	52.250	8.1	7.2

DATA REPRINTED WITH PERMISSION FROM 1979 HYDRIL CATALOG.

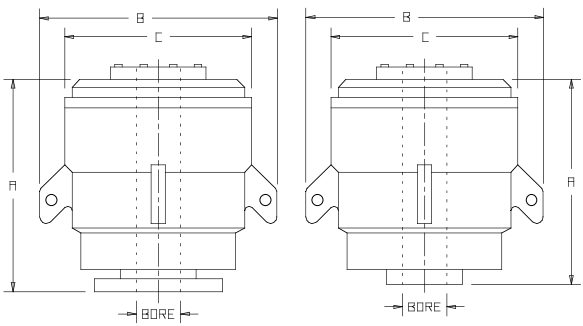


HYDRIL TYPE "V" AND TYPE "X" BLOWOUT PREVENTERS

DOUBLE RAM - MANUAL LOCK - SPECIFICATIONS

BORE SIZE (in.)	PRESSURE RATING PSI	FLANGED BOTTOM APPROX. WT. (lbs.)	HUBBED BOTTOM HEIGHT H (in.)	STUDDED BOTTOM HEIGHT H (in.)	HEIGHT H (in.)	LENGTH L (in.)	WIDTH W (in.)	GALLONS TO CLOSE	GALLONS TO OPEN
7-1/16	3,000	5,600	44.250		37.875	72.50	29.000	1.2	1.3
7-1/16	5,000	5,600	46.500	42.500	37.875	72.50	29.000	1.2	1.3
9	3,000	10,200	48.560		38.500	82.50	30.875	1.9	1.9
9	5,000	10,400	52.060	44.125	38.500	82.50	30.875	1.9	1.9
11	3,000	10,800	51.750	45.750	41.000	95.00	37.875	3.3	3.2
11	5,000	12,000	55.000	45.250	41.000	95.00	37.875	3.3	3.2
11	10,000	12,000	62.375	54.000		120.75	44.250	11.8	11.8
13-5/8	3,000	15,000	57.125	54.000	46.250	116.80	40.000	5.4	4.9
13-5/8	5,000	16,800	60.125	54.000	46.250	116.80	40.000	5.4	4.9
13-5/8	10,000	19,000	66.750	56.250		124.75	50.750	11.8	11.8
16-3/4	10,000	43,000	73.000	65.750		143.00	57.375	15.0	14.1
18-3/4	10,000	57,000	91.000	80.000		150.75	64.250	16.4	15.6
21-1/4	2,000	27,000	60.250	59.250		150.75	52.250	8.1	7.2
20-3/4	3,000	28,000	63.500	53.875		130.75	52.250	8.1	7.2

DATA REPRINTED WITH PERMISSION FROM 1979 HYDRIL CATALOG.



HYDRIL TYPE "GK" BLOWOUT PREVENTERS

DIMENSIONAL DATA

BORE SIZE (in.)	PRESSURE RATING PSI	FLANGED BOTTOM CONNECTION WT. (lbs.)	STUDDED BOTTOM CONNECTION WT. (lbs.)	FLANGED BOTTOM HEIGHT A (in.)	STUDDED BOTTOM HEIGHT A (in.)	CLEARANCE DIAMETER B (in.)	BODY DIAMETER C (in.)	U.S. GALLONS FOR FULL PISTON STROKE
4-1/16	5,000	2,015		22-3/4			25-3/4	1.78
4-1/16	10,000	2,650		25-1/4			28	1.78
7-1/16	3,000	2,620	2,500	32	27-3/4	32	26	2.85
7-1/16	5,000	3,940	3,740	36-7/8	30-3/4	35-3/4	29-1/4	3.86
7-1/16	10,000	12,000	11,800	47-5/8	41-1/4	49-1/2	43-3/4	9.42
7-1/16	15,000	14,250		53-5/8	45-7/8	61	50	11.20
7-1/16	20,000	23,000	22,000	59	48-5/8	58	55	10.90
*9	3,000	3,560	3,420	37-7/8	32-3/4	34-1/2	28	4.33
*9	5,000	6,000	5,740	41-3/4	34-3/4	41	34	6.84
9	10,000	18,200	17,800	55-3/4	48-1/2	56-3/4	50-1/2	15.90
11	3,000	5,300	5,140	39-3/4	34-1/4	40	33-3/4	7.43
11	5,000	8,250	7,800	47-3/4	40-1/4	44-1/4	37-1/2	9.81
11	10,000	25,000	24,350	63-1/2	55	62-1/4	56-1/2	25.10
13-5/8	3,000	8,784	8,522	45-1/4	39-3/8	47-1/2	40-1/2	11.36
13-5/8	5,000	13,800	13,100	54-1/8	46-1/2	52-1/4	45-1/2	17.98
13-5/8	10,000	33,525	32,851	72-1/2	63	68	61	34.53
16-3/4	2,000	11,417	11,100	49-1/2	43-3/8	53-1/4	46-1/4	17.42
16-3/4	3,000	14,868	14,470	53-7/8	47-1/4	55-1/2	48-1/2	21.02
16-3/4	5,000	20,830	20,000	61-1/4	53	59-1/2	53-1/2	28.70
17-3/4	2,000	14,000		53-1/2		55-1/2	48-1/2	21.09

DATA REPRINTED WITH PERMISSION FROM THE 1979 HYDRIL CATALOG.

ALL INFORMATION ABOVE IS FOR SCREWED TYPE BLOWOUT PREVENTER HEADS.

* OLDER MODELS MAY HAVE 8-15/16" BORE.

BAKER OIL TOOLS
A Baker Hughes company

HYDRIL TYPE "GK" BLOWOUT PREVENTERS

AVERAGE CLOSING PRESSURE (PSI)

PIPE O.D. (in.)	4-1/16 5-10M	7-1/16 3M	7-1/16 5M	7-1/16 10M	7-1/16 15M	7-1/16 20M	9 3M	9 5M	9 10M	11 3M
6-5/8										
5			400						350	450
4-1/2		350	400	350	2,100	2,200	400	450	380	450
3-1/2	450	400	450	550	2,100	2,200	450	550	570	550
2-7/8	525	400	450	750	2,100	2,200	550	650	760	650
2-3/8	675	500	500	850	2,100	2,200	650	750	860	750
1.90	800	600	600	900			750	850	950	920
1.66	875	700	700	1,000			850	950	1,000	950
*CSO	1,200	1,000	1,000	1,150			1,050	1,150	1,150	1,150

PIPE O.D. (in.)	11 5M	11 10M	13-5/8 3M	13-5/8 5M	13-5/8 10M	16-3/4 2M	16-3/4 3M	16-3/4 5M	17-3/4 2M
6-5/8			450	550		350	450		500
5	450		500	600		400	500		550
4-1/2	450	420	550	650	525	500	550	600	600
3-1/2	550	600	600	700	640	600	600	650	650
2-7/8	650	780	700	750	815	700	700	750	700
2-3/8	750	870	800	800	885	800	800	850	750
1.90	850	960	900	900	990	900	950	950	850
1.66	950	1,000	1,000	1,000	1,050	1,000	1,000	1,050	950
*CSO	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150	1,150

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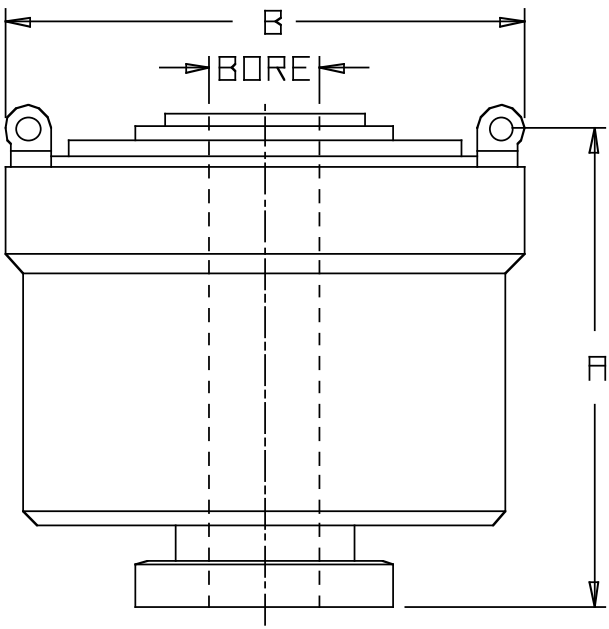
M = 1000 PSI.

* COMPLETE SHUT OFF.

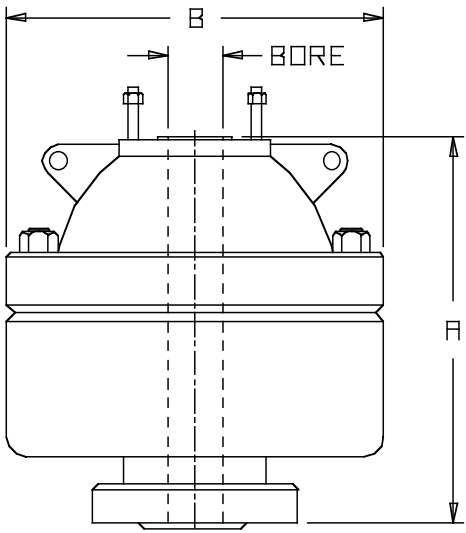


NL SHAFFER SPHERICAL BLOWOUT PREVENTERS

WEDGE COVER TYPE

BORE SIZE (in.)	PRESSURE RATING PSI	CONNECTION			FLANGED BOTTOM HEIGHT A (in.)	HUBBED BOTTOM HEIGHT A (in.)	STUDDED BOTTOM HEIGHT A (in.)	BODY DIA. B (in.)	GAL. TO CLOSE	GAL. TO OPEN
		FLANGED BOTTOM WT. (lbs.)	HUBBED BOTTOM WT. (lbs.)	STUDDED BOTTOM WT. (lbs.)						
11	10,000	23,000	22,600	22,400	53	50	45-1/2	57	30.58	24.67
13-5/8	5,000		17,400		45-9/16	43-7/16	37-3/4	54	23.58	17.41
13-5/8	10,000	32,480	31,580	31,180	58-3/8	54-1/8	50-1/8	64-1/2	40.16	32.64
16-3/4	5,000	22,900	22,400	22,000	51-15/16	49-5/16	43-5/8	60	33.26	25.61
18-3/4	5,000	36,100	35,400	34,750	60	57	51	66-1/4	48.16	37.61
21-1/4	5,000	44,500	43,300	42,500	66	63-1/2	56	71	61.37	47.76

DATA REPRINTED WITH PERMISSION FROM THE 1979 SHAFFER CATALOG.



NL SHAFFER SPHERICAL BLOWOUT PREVENTERS

BOLTED COVER TYPE

BORE SIZE (in.)	PRESSURE RATING PSI	CONNECTION			FLANGED BOTTOM HEIGHT A (in.)	HUBBED BOTTOM HEIGHT A (in.)	STUDDED BOTTOM HEIGHT A (in.)	BODY DIA. B (in.)	GAL. TO CLOSE	GAL. TO OPEN
		FLANGED BOTTOM WT. (lbs.)	HUBBED BOTTOM WT. (lbs.)	STUDDED BOTTOM WT. (lbs.)						
4-1/16	10,000	1,643	1,585	1,688	25-1/2	23	20-3/4	23	2.38	1.94
7-1/16	3,000	2,950		2,850	29-1/8		24-7/8	29	4.57	3.21
7-1/16	5,000	3,300	3,170	3,150	30-7/8	27-3/4	25-1/2	29	4.57	3.21
7-1/16	10,000	10,600	10,400	10,200	42-1/4	39	35-3/4	43	17.11	13.95
9	3,000	4,800		4,500	32-1/2		27	35-1/2	7.23	5.03
9	5,000	6,800	6,600	6,500	36-1/2	32-15/16	29-1/2	40	11.05	8.72
11	3,000	6,200	5,900	5,975	32-7/8	30-9/16	27-1/16	39-7/8	11.00	6.78
11	5,000	9,400	9,100	9,000	41-1/2	37-9/16	33-13/16	44-3/4	18.67	14.50
13-5/8	3,000	9,425	9,225	9,125	40-11/16	37-3/4	34-1/2	46-3/8	23.50	14.67
13-5/8	5,000	13,700	13,300	13,100	44-15/16	42-3/4	37-5/8	50	23.58	17.41
21-1/4	2,000	10,900	10,600	9,975	46-1/8	44-1/4	39-1/4	49	32.59	16.92

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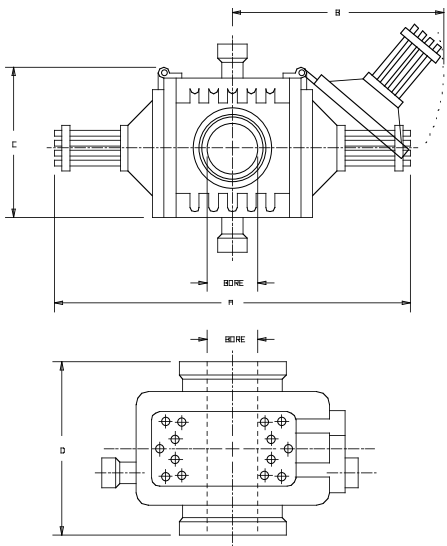

NL SHAFFER MODELS LWS AND LWP RAM-TYPE BLOWOUT PREVENTERS

SINGLE RAM MANUAL-LOCK SPECIFICATIONS

BORE SIZE (in.)	PRES-SURE RATING PSI	CONNECTION			FLANGED BOTTOM HEIGHT D (in.)	HUBBED BOTTOM HEIGHT D (in.)	STUDDED BOTTOM HEIGHT D (in.)	LENGTH		WIDTH C (in.)	GAL. TO CLOSE	GAL. TO OPEN
		FLANGED BOTTOM WT. (lbs.)	HUBBED BOTTOM WT. (lbs.)	STUDDED BOTTOM WT. (lbs.)				A (in.)	B (in.)			
4-1/16	5,000	975		830	20-3/4		15-3/4	42-1/4	23-13/16	15-11/16	.59	.52
4-1/16	10,000	975		830	20-3/4		15-3/4	42-1/4	23-13/16	15-11/16	.59	.52
*7-1/16	3,000	1,176		906	19-1/8		14-7/16	52-3/8	33-1/2	18-7/16	.55	.51
7-1/16	5,000	1,600		1,260	27-5/8		13-5/8	58	41-1/8	21-7/16	1.19	.99
7-1/16	10,000			5,450			23-3/4	74-1/2	52-1/16	31-1/2	6.35	5.89
*9	3,000	1,188		1,245			11-1/16	60-1/16	34-1/8	22-1/16	.77	.68
11	3,000		2,500	2,400		21	14-1/2	72-1/8	40-9/16	26-1/8	1.74	1.45
11	5,000	4,110		3,810	34-3/8		19-1/2	89	56-7/8	29-1/8	2.98	2.62
20-3/4	3,000	10,200		8,400	41-5/8		23-1/8	127-1/2	70	41-1/4	5.07	4.46
21-1/4	2,000	9,300	9,200	8,100	38-7/8	34-5/8	23-1/8	127-1/2	70	41-1/4	5.07	4.46

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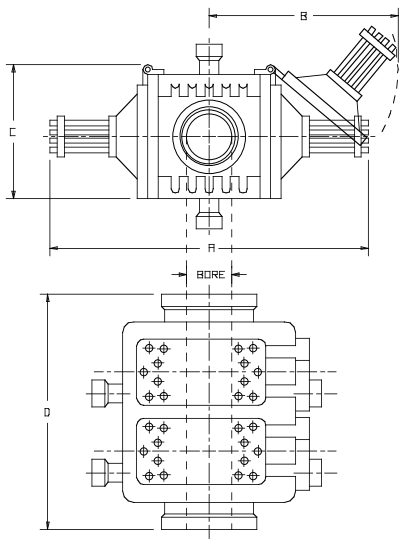
* LWP MODEL BLOWOUT PREVENTER.



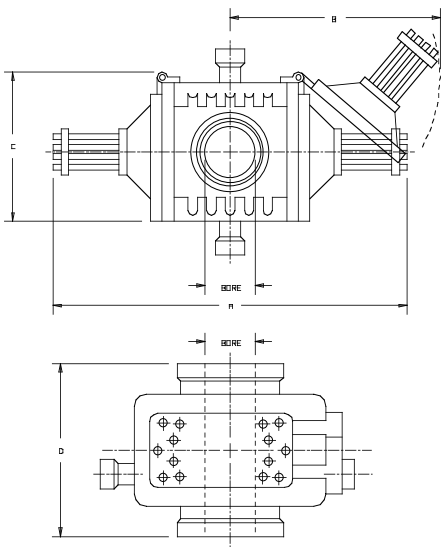
NL SHAFFER MODELS LWS AND LWP RAM-TYPE BLOWOUT PREVENTERS

DOUBLE RAM MANUAL-LOCK SPECIFICATIONS

BORE SIZE (in.)	PRES-SURE RATING PSI	CONNECTION			FLANGED BOTTOM HEIGHT	HUBBED BOTTOM HEIGHT	STUDDED BOTTOM HEIGHT	LENGTH		WIDTH	GAL.	GAL.
		FLANGED BOTTOM WT. (lbs.)	HUBBED BOTTOM WT. (lbs.)	STUDDED BOTTOM WT. (lbs.)	D (in.)	D (in.)	D (in.)	A (in.)	B (in.)	C (in.)	TO CLOSE	TO OPEN
*7-1/16	3,000	2,078		1,808	30-1/2		21-7/8	52-3/8	33-1/2	18-7/16	.55	.51
7-1/16	5,000	3,340	3,200	3,000	39-1/2	31-5/8	26-3/4	58	41-1/8	21-7/16	1.19	.99
7-1/16	10,000			11,200			43-1/2	74-1/2	52-1/16	31-1/2	6.35	5.89
9	3,000	2,278		1,950	34-3/4		23-7/8	60-1/16	34-1/8	22-1/16	.77	.68
9	5,000	5,900	5,750	5,300	45-1/8	37	29-1/2	79-1/8	46-5/16	25-3/4	2.58	2.27
11	3,000	5,380	5,180	5,080	42	36-7/8	29-3/8	72-1/8	40-9/16	26-1/8	1.74	1.45
11	5,000	8,600		7,650	50-1/2		33	89	56-7/8	29-1/8	2.98	2.62
20-3/4	3,000	18,350			67-3/4			127-1/2	70	41-1/4	5.07	4.46
21-1/4	2,000		17,000	16,320		60-3/4	49-1/4	127-1/2	70	41-1/4	5.07	4.46

DATA REPRINTED WITH PERMISSION FROM THE 1979 NL SHAFFER CATALOG.

* LWP MODEL BLOWOUT PREVENTER.



NL SHAFFER MODEL SL RAM-TYPE BLOWOUT PREVENTERS

SINGLE RAM MANUAL-LOCK SPECIFICATIONS

BORE SIZE (in.)	PRES-SURE RATING PSI	CONNECTION			FLANGED BOTTOM HEIGHT D (in.)	HUBBED BOTTOM HEIGHT D (in.)	STUDDED BOTTOM HEIGHT D (in.)	LENGTH		WIDTH C (in.)	GAL. TO CLOSE	GAL. TO OPEN
		FLANGED BOTTOM WT. (lbs.)	HUBBED BOTTOM WT. (lbs.)	STUDDED BOTTOM WT. (lbs.)				A (in.)	B (in.)			
11	10,000	11,344	10,243	9,690	42-7/8	31-3/4	23-1/2	122-7/8	65	40-3/8	8.23	7.00
13-5/8	3,000	8,690	8,540	7,235	33	25-1/2	19-1/2	130-1/4	68-1/4	40	4.35	5.30
13-5/8	5,000	8,690	8,540	7,235	33-3/8	29-1/4	17-1/4	130-3/8	68-1/8	40	4.35	5.30
13-5/8	10,000	10,400	10,100		48	38-3/4	28	128-7/8	69-11/16	43	11.56	10.52
13-5/8	15,000	29,500		25,000	59-5/8		33-1/2	144	80-1/2	55-1/8	11.56	10.52
16-3/4	5,000	15,386	14,710	13,552	42-1/4	32-3/4	25	141	75-1/2	46-3/4	13.97	12.71
16-3/4	10,000				56-7/8		34-1/2	139-3/4	79	55-3/8	14.47	12.50

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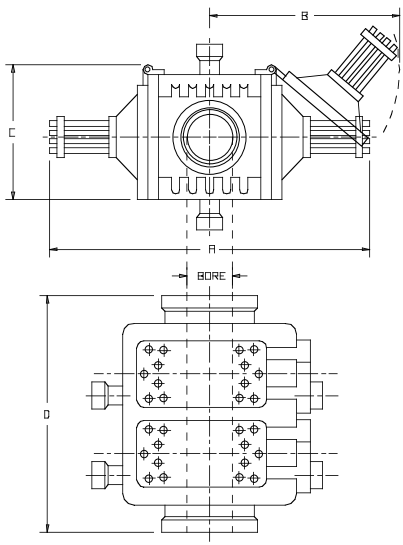

NL SHAFFER MODEL SL RAM-TYPE BLOWOUT PREVENTERS

DOUBLE RAM MANUAL-LOCK SPECIFICATIONS

BORE SIZE (in.)	PRES-SURE RATING PSI	CONNECTION			FLANGED BOTTOM HEIGHT D (in.)	HUBBED BOTTOM HEIGHT D (in.)	STUDDED BOTTOM HEIGHT D (in.)	LENGTH		WIDTH C (in.)	GAL. TO CLOSE	GAL. TO OPEN
		FLANGED BOTTOM WT. (lbs.)	HUBBED BOTTOM WT. (lbs.)	STUDDED BOTTOM WT. (lbs.)				A (in.)	B (in.)			
11	10,000	20,964	19,873	19,320	60-1/4	49-1/8	40-7/8	122-7/8	65	40-3/8	8.23	7.00
11	15,000			34,520			49-1/2	136	82-1/32	47-1/2	9.40	8.10
13-5/8	3,000	18,930	18,780	17,475	48	42	36	130-1/4	68-1/8	40	4.35	5.30
13-5/8	5,000	18,930	18,780	17,475	50-1/8	46	34	130-3/8	68-1/8	40	4.35	5.30
13-5/8	10,000	24,950	23,800	22,590	66	56-3/4	46	128-7/8	69-11/16	43	11.56	10.52
13-5/8	15,000	47,300		42,800	79-3/8		53-1/4	144	80-1/2	55-1/8	11.56	10.52
16-3/4	5,000	21,780	27,403	26,246	61-3/8	50-5/8	42-7/8	141	75-1/2	46-3/4	13.97	12.71
16-3/4	10,000		40,000	37,650	74-1/8	67-3/4	51-3/4	139-3/4	79	55-3/8	14.47	12.50

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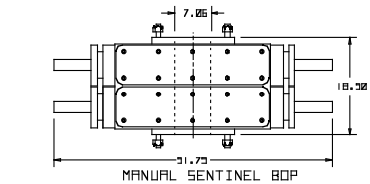
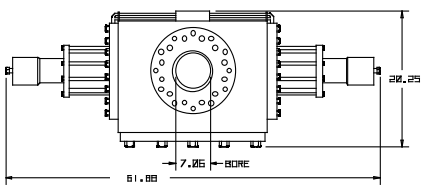


MANUAL SENTINEL BOP



HYDRAULIC SENTINEL BOP

NL SHAFFER

SENTINEL BOP SPECIFICATIONS

		HYDRAULIC	MANUAL
APPROXIMATE WEIGHT	SINGLE (lbs.)	1,152	1,272
	DOUBLE (lbs.)	2,095	2,335
OVERALL HEIGHT, LESS STUDS	SINGLE (in.)	10	10
	DOUBLE (in.)	18-1/2	18-1/2
OVERALL LENGTH (in.)		61-7/8	51-3/4
OVERALL WIDTH, LESS HANDWHEEL (in.)		20-1/4	20-1/4
OPENING THROUGH PREVENTER (in.)		7-1/16	7-1/16
WORKING PRESSURE (PSI)		3,000	3,000
TEST PRESSURE (PSI)		6,000	6,000
HANDWHEEL DIAMETER (in.)		20	20
RING JOINT GASKET API NUMBER		R-45	R-45

SENTINEL BOP HYDRAULIC CYLINDER

	TO OPEN	TO CLOSE
MAXIMUM OPERATING PRESSURE (PSI)	1,500	1,500
RATIO	2.5:1	4.0:1
VOLUME OF FLUID (U.S. gals.)	.28	.29
FLUID VOLUME PER INCH OF STROKE (cu. in.)	16.2	17.4
PISTON STROKE (in.)	4.125	4.125

SECTION 10 - General Information

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Conversion Factors

Multiply	By	To Obtain
Acre	43,560.	Square Feet
Acre	4,047.	Square Meters
Acre	160.	Square Rods
Acre	5,645.4	Square Varas (Texas)
Acre	.4047	Hectares
Acre Foot	7,758.	Barrels
Atmospheres	76.0	Cms. of Mercury
Atmospheres	760.0	Millimeters of Mercury
Atmospheres	29.92	Inches of Mercury
Atmospheres	33.90	Feet of Water
Atmospheres	1.0333	Kgs./Sq. Cm.
Atmospheres	14.70	Lbs./Sq. Inch
Atmospheres	1.058	Tons/Sq. Ft.
Barrel	5.6146	Cubic Feet
Barrel	.15897	Cubic Meters
Barrels-Oil	42.	Gallons-Oil
Barrel of Water	.1588	Metric Ton
Barrel (36° A.P.I.)	.1342	Metric Ton
Barrel per Hour	.0936	Cu. Ft. per Minute
Barrel per Hour	.700	Gallon per Minute
Barrel per Hour	2.695	Cu. In. per Second
Barrel per Day	.02917	Gallon per Minule
Bars	.9869	Atmospheres
Bars	2089	Lbs./Sq. Foot
Bars	14.50	Lbs./Sq. Inch
British Thermal Units	0.2520	Kilogram-Calories
British Thermal Units	.2928	Watt Hour
British Thermal Units	777.5	Foot-Lbs.
British Thermal Units	.0003927	Horsepower-hours
British Thermal Units	107.5	Kilogram-meters
British Thermal Unils	.0002928	Kilowatt-hours
B.T.U./min.	12.96	Foot-lbs./sec.
B.T.U./min	.02356	Horsepower
B.T.U./min.	.01757	Kilowatts
B.T.U./min.	17.57	Watts
Centares (Centaires)	1.	Square Meters
Centigrams	.01	Grams
Centiliters	.01	Liters
Centimeters	.3937	Inches
Centimeters	.01	Meters
Centimeters	10.	Millimeters
Centimeters of Mercury	.01316	Atmospheres
Centimeters of Mercury	.4461	Feet of Water
Centimeters of Mercury	136.0	Kgs./Sq. Meter
Centimeters of Mercury	27.85	Lbs./Sq. Ft.
Centimeters ot Mercury	.1934	Lbs./Sq. Inch
Centimeters/Second	1.969	Feet/Min.
Centimeters/Second	.03281	Feet/Sec.
Centimeters/Second	.036	Kilometers/Hrs.

Conversion Factors

Multiply	By	To Obtain
Centimeters/Second	.6	Meters/Min.
Centimeters/Second	.02237	Miles/Hrs.
Centimeters/Second	.0003728	Miles/Min.
Centimeters/Second/Second	.03281	Feet/Sec./Sec.
Chain	66.00	Feet
Chain	4.00	Rods
Cubic Centimeters	.00003531	Cubic Feet
Cubic Centimeters	.06102	Cubic Inches
Cubic Centimeters	.0000010	Cubic Meters
Cubic Centimeters	.000001308	Cubic Yards
Cubic Centimeters	.0002642	Gallons
Cubic Centimeters	.001	Liters
Cubic Centimeters	.002113	Pints (Liq.)
Cubic Centimeters	.001057	Quarts (Liq.)
Cubic Feet	.1781	Barrels
Cubic Feet	28320.	Cubic Cms.
Cubic Feet	1728.	Cubic Inches
Cubic Feet	.02832	Cubic Meters
Cubic Feet	.03704	Cubic Yards
Cubic Feet	7.48052	Gallons
Cubic Feet	28.32	Liters
Cubic Feet	59.84	Pints (Liq.)
Cubic Feet	29.92	Quarts (Liq.)
Cubic Feet/Minute	472.0	Cubic Cm./Sec.
Cubic Feet/Minute	.1247	Gallons/Sec
Cubic Feet/Minute	.4720	Liters/Sec.
Cubic Feet/Minute	62.43	Lbs. of Water/Min.
Cubic Feet/Minute	10.686	Barrels per Hour
Cubic Feet/Minute	28.800	Cubic In. per Sec.
Cubic Feet/Second	.646317	Million Gals./Day
Cubic Feet/Second	448.831	Gallons/Minute
Cubic Inches	16.39	Cubic Centimeters
Cubic Inches	.0005787	Cubic Feet
Cubic Inches	.00001639	Cubic Meters
Cubic Inches	.00002143	Cubic Yards
Cubic Inches	.004329	Gallons
Cubic Inches	.01639	Liters
Cubic Inches	.03463	Pints (Liq.)
Cubic Inches	.01732	Quarts (Liq.)
Cubic Meters	6.2905	Barrels
Cubic Meters	1,000,000.	Cubic Centimeters
Cubic Meters	35.31	Cubic Feet
Cubic Meters	61,023.	Cubic Inches
Cubic Meters	1.308	Cubic Yards
Cubic Meters	264.2	Gallons
Cubic Meters	1,000.	Liters
Cubic Meters	2,113.	Pints (Liq.)
Cubic Meters	1,057.	Quarts (Liq.)
Cubic Yards	4.8089	Barrels
Cubic Yards	764,600.	CubicCentimeters
Cubic Yards	27.	Cubic Feet
Cubic Yards	46,656.	Cubic Inches
Cubic Yards	0.7646	Cubic Meters
Cubic Yards	202.0	Gallons

Conversion Factors

Multiply	By	To Obtain
Cubic Yards	764.6	Liters
Cubic Yards	1,616.	Pinls (Liq.)
Cubic Yards	807.9	Quarts (Liq.)
Cubic Yards/Min.	.45	Cubic Feel/Sec.
Cubic Yards/Min.	3.367	Gallon/Sec.
Cubic Yards/Min.	12.74	Liters/Sec.
Decigrams	.1	Grams
Deciliters	.1	Liters
Decimeters	.1	Meters
Degrees (angle)	60.	Minutes
Degrees (angle)	.01745	Radians
Degrees (angle)	3600.	Seconds
Degrees/Sec.	.01745	Radians/Sec.
Degrees/Sec.	.1667	Revolutions/Min.
Degrees/Sec.	.002778	Revolutions/Sec.
Dekagrams	10.	Gram
Dekaliters	10.	Liters
Dekameters	10.	Meters
Drams	27.34375	Grains
Drams	.0625	Ounces
Drams	1.771845	Grams
Fathoms	6.	Feet
Feet	30.48	Centimeters
Feet	12.	Inches
Feet	.3048	Meters
Feet	.3600	Varas (Texas)
Feet	1/3	Yards
Feet of Water	.02950	Atmospheres
Feet of Water	.8826	Inches of Mercury
Feet of Water	.03048	Kgs./Sq. Cm
Feet of Water	62.43	Lbs./Sq. Ft.
Feet of Water	.4335	Lbs./Sq. In.
Feet/Min.	.5080	Centimeters/Sec.
Feet/Min.	.01667	Feet/Sec.
Feet/Min.	.01829	Kilometers/Hr.
Feet/Min.	.3048	Meters/Min.
Feet/Min.	.01136	Miles/Hr.
Feet/Sec.	.68182	Miles per hour
Feet/Sec/Sec.	30.48	Gms./Sec./Sec.
Feet/Sec/Sec.	.3048	Meters/Sec/Sec.
Foot-pounds	.001286	British Thermal Units

Conversion Factors

Multiply	By	To Obtain
Foot-pounds	.0000005050	Horsepower-hrs.
Foot-pounds	.0003241	Kilogram-calories
Foot-pounds	.1383	Kilogram-meters
Foot-pounds	.0000003766	Kilowatt-hrs
Foot-pounds/min.	.001286	British Thermal Units/ min.
Foot-pounds/min.	.01667	Foot-pounds/sec.
Foot-pounds/min.	.00003030	Horsepower
Foot-pounds/min.	.0003241	Kg.-calories/min.
Foot-pounds/min.	.00002260	Kilowatts
Foot-pounds/sec.	.07717	B.T. Units/min.
Foot-pounds/sec.	.001818	Horsepower
Foot-pounds/sec.	.01945	Kg.-calories/min.
Foot-pounds/sec.	.001356	Kilowatts
Gallons (U.S.)	.02381	Barrel
Gallons (U.S.)	.83267	Gallons (imperial)
Gallons	3,785.	Cubic Centimeters
Gallons	.1337	Cubic Feet
Gallons	231.	Cubic Inches
Gallons	.003785	Cubic Meters
Gallons	.00495	Cubic Yards
Gallons	3.785	Liters
Gallons	8.	Pints (Liq.)
Gallons	4.	Quarts (Liq.)
Gallons (imperial)	1.20095	Gallons (U.S
Gallons (imperial)	277.419	Cubic Inches
Gallons Water	8.3453	Pounds of Water
Gallons/min.	1.429	Barrels per hour
Gallons/min.	.1337	Cu. Ft. per minute
Gallons/min.	34.286	Barrels per day
Gations/min.	.06308	Liters/sec.
Gallons/min.	8.0208	Cu. Ft./hr.
Gallons/min.	.002228	Cu. Ft./sec.
Gallons of water/min	6.0086	Tons Water/24 hrs.
Grains (troy)	1.	Grains (avoir.)
Grains (troy)	.06480	Grams
Grains (troy)	.04167	Pennyweights (troy)
Grains (troy)	.0020833	Ounces (troy)
Grains/U.S. gal.	17.118	Parts/million
Grains/U.S. gal.	142.86	Lbs./million gal.
Grains/imperial gal.	14.286	Parts/million
Grams	980.7	Dynes
Grams	15.43	Grains
Grams	.001	Kilograms
Grams	1,000.	Milligrams
Grams	.03527	Ounces (Avoir.)
Grams	.03215	Ounces (troy)

Conversion Factors

Multiply	By	To Obtain
Grams/cm.	.0056	Pounds/inch
Grams/cu. cm.	62.43	Pounds/cubic foot
Grams/cu. cm.	.03613	Pounds/cubic inch
Grams/liter	58.417	Grains/gal.
Grams/liter	8.345	Pounds/1000 gals.
Grams/liter	.062427	Pounds/cubic foot
Grams/liter	1,000.	Parts/million
Hectare	2.471	Acres
Hectare	.010	Square Kilometer
Hectograms	100.	Grams
Hectoliters	100.	Liters
Hectowatts	100.	Watts
Horsepower	42.44	B.T. U./min.
Horsepower	33,000.	Foot-lbs./min.
Horsepower	550.	Foot-lbs/sec.
Horsepower	1.014	Horsepower (Metric)
Horsepower	10.70	Kg.-calories/min.
Horsepower	.7457	Kilowatts
Horsepower	745.7	Watts
Horsepower (boiler)	33,479.	B.T.U./hr.
Horsepower (boiler)	9.803	Kilowatts
Horsepower-hours	2,547.	British Thermal Units
Horsepower-hours	1,980.000	Foot-lbs.
Horsepower-hours	641.7	Kilogram-calorie
Horsepower-hours	273,700.	Kilogram-meters
Horsepower-hours	.7457	Kilowatt-hours
Inches	2.540	Centimeters
Inches	25.40	Millimeters
Inches of Mercury	.03342	Atmospheres
Inches of Mercury	1.133	Feet of Water
Inches of Mercury	.03453	Kgs./Sq. Cm.
Inches of Mercury	70.73	Lbs./Sq. Ft.
Inches of Mercury	.4912	Lbs./Sq. In.
Inches of Water	.002458	Atmospheres
Inches of Water	.07355	Inches of Mercury
Inches of Water	.002540	Kgs./Sq. Cm.
Inches of Water	.5781	Ounces/Sq. Inch
Inches of Water	5.202	Lbs./Sq. Ft.
Inches of Water	.03613	Lbs./Sq. Inch
Kilograms	980,665.	Dynes
Kilograms	2.205	Lbs.
Kilograms	.001102	Tons (short)
Kilograms	1,000.	Grams

BAKER OIL TOOLS
A Baker Hughes company

Conversion Factors

Multiply	By	To Obtain
Kilograms-meter	7.233	Ft.-Lbs.
Kilograms/meter	.6720	Lbs./Ft.
Kilograms/sq. cm.	.9678	Atmospheres
Kilograms/sq. cm.	32.81	Feet of Water
Kilograms/sq. cm.	28.96	Inches of Mercury
Kilograms/sq. cm.	2,048.	Lbs./Sq. Foot
Kilograms/sq. cm.	14.22	Lbs./Sq. Inch
Kgs./sq millimeter	1,000,000.	Kgs./sq. meter
Kiloliters	1,000.	Liters
Kilometers	100,000.	Centimeters
Kilometers	3,281.	Feet
Kilometers	1,000.	Meters
Kilometers	.6214	Miles
Kilometers	.5396	Miles (nautical)
Kilometers	1,094.	Yards
Kilomelers/hr.	27.78	Centimeters/sec.
Kilometers/hr.	54.68	Feet/min.
Kiiometers/hr.	.9113	Feet/sec.
Kilometers/hr.	.5396	Knots
Kilometers/hr.	16.67	Meters/min.
Kilometers/hr.	.6214	Miles/hr.
Kms./hr./sec.	27.78	Cms./sec./sec.
Kms./hr./sec.	.9113	Ft./sec./sec.
Kms./hr./sec.	.2778	Meters/sec./sec.
Kilowatts	56.92	British Thermal Units/ min.
Kilowatts	44,250.	Foot-lbs./min.
Kilowatts	737.6	Foot-lbs./sec.
Kilowatts	1.341	Horsepower
Kilowatts	14.34	Kg.-calories/min.
Kilowatts	1,000.	Watts
Kilowatt-hours	3,415.	British Thermal Units
Kilowatt-hours	2,655,000.	Foot-lbs.
Kilowatt-hours	1.341	Horsepower-hrs.
Kilowatt-hours	860.5	Kilogram-calories
Kilowatt-hours	367,100.	Kilogram-meters
Knot	1.	Nautical Miles per Hour
Knot	1.151	Statute Mile per Hour
Link (Surveyor's)	7.92	Inches
Liters	1,000.	Cubic Centimeters
Liters	.03531	Cubic Feet
Liters	61.02	Cubic Inches
Liters	.001	Cubic Meters
Liters	.001308	Cubic Yards
Liters	.2642	Gallons
Liters	2.113	Pints (Liq.)
Liters	1.057	Quarts (Liq.)
Liters/min.	.0005886	Cubic Ft./Sec.

Conversion Factors

Multiply	By	To Obtain
Width (in.) x thickness (in.) / 12	Length(ft.)	Board Feet
Meters	100.	Centimeters
Meters	3.281	Feet
Meters	39.37	Inches
Meters	.001	Kilometers
Meters	1,000.	Millimeters
Meters	1.094	Yards
Meters/min.	1.667	Centimeters/Sec.
Meters/min.	3.281	Feet/min.
Meters/min.	.05468	Feet/sec.
Meters/min.	.06	Kilometers/hr.
Meters/min.	.03728	Miles/hr.
Meters/sec.	196.8	Feet/min.
Meters/sec.	3.281	Feet/sec.
Meters/sec.	3.6	Kilometers/hr.
Meters/sec.	.06	Kilometers/min.
Meters/sec.	2.237	Miles/hr.
Meters/sec.	.03728	Miles/min.
Microns	.0000010	Meters
Miles	160,900.	Centimeters
Miles	5,280.	Feet
Miles	1.609	Kilometers
Miles	1,760.	Yards
Miles	1,900.8	Varas (Texas)
Mile (nautical)	6080.27	Feet
Mile (nautical)	1.15	Mile (statute)
Miles/hr.	44.70	Centimeters/sec.
Miles/hr.	88.	Feet/min.
Miles/hr.	1.467	Feet/sec
Miles/hr.	1.609	Kilometers/hrs.
Miles/hr.	.8684	Knots
Miles/hr.	26.82	Meters/min.
Miles/min.	2,682.	Centimeters/sec.
Miles/min.	88.	Feet/sec.
Miles/min.	1.609	Kilometers/min.
Miles/min.	60.	Miles/hr.
Milliers	1,000.	Kilograms
Milligrams	.0010	Grams
Milliliters	.0010	Liters
Millimeters	.1	Centimeters
Millimeters	.03937	Inches
Milligrams/liter	1.	Parts/million
Million gals./day	1.54723	Cubic feet/sec.

Conversion Factors

Multiply	By	To Obtain
Miner's inches	1.5	Cubic ft./min.
Minutes (angle)	.0002909	Radians
Ounces	16.	Drams
Ounces	437.5	Grains
Ounces	.0625	Pounds
Ounces	28.349527	Grams
Ounces	.9115	Ounces (troy)
Ounces	.0000279	Tons (long)
Ounces	.00002835	Tons (metric)
Ounces, troy	480.	Grains
Ounces, troy	20.	Pennyweights (troy)
Ounces, troy	.08333	Pounds (troy)
Ounces, troy	31.103481	Grams
Ounces, troy	1.09714	Ounces (avoir.)
Ounces (fluid)	1.805	Cubic Inches
Ounces (fluid)	.02957	Liters
Ounces/sq. inch	.0625	Lbs./sq. in
Parts/million	.0584	Grains/U.S Gal.
Parts/million	.07016	Grains/Imperial Gal.
Parts/million	8.345	Lbs./million gal.
Pennyweights (troy)	24.	Grains
Pennyweights (troy)	1.55517	Grams
Pennyweights (troy)	.05	Ounces (troy)
Pennyweights (troy)	.0041667	Pounds (troy)
Pounds	16.	Ounces
Pounds	256.	Drams
Pounds	7,000.	Grains
Pounds	.0005	Tons (short)
Pounds	453.5924	Grams
Pounds	1.21528	Pounds (troy)
Pounds	14.5833	Ounces (troy)
Pounds (troy)	5760.	Grains
Pounds (troy)	240.	Pennyweights (troy)
Pounds (troy)	12.	Ounces (troy)
Pounds (troy)	373.24177	Grams
Pounds (troy)	.822857	Pounds (avoir.)
Pounds (troy)	13.1657	Ounces (avoir.)
Pounds (troy)	.00036735	Tons (long)
Pounds (troy)	.00041143	Tons (short)
Pounds (troy)	.00037324	Tons (metric)
Pounds of water	.01602	Cubic feet
Pounds of water	27.68	Cubic inches
Pounds of water	.1198	Gallons
Pounds/cubic foot	.01602	Grams/cubic cm.
Pounds/cubic foot	16.02	Kgs./cubic meter
Pounds/cubic foot	.0005787	Lbs./cubic inch
Pounds/cubic inch	27.68	Grams/cubic cm.
Pounds/cubic inch	27,680.	Kgs./cubic meter
Pounds/cubic inch	1,728.	Lbs./cubic foot

Conversion Factors

Multiply	By	To Obtain
Pounds of water/min.	.000267	Cubic ft./sec.
Pounds/foot	1.488	Kgs./meter
Pounds/gallon	0.1199	Grams/cubic cm.
Pounds/inch	178.6	Grams/cm.
Pounds/sq. foot	.01602	Feet of water
Pounds/sq. foot	.0004883	Kgs./sq. cm.
Pounds/sq. foot	.006945	Pounds/sq. inch
Pounds/sq. inch	.06804	Atmospheres
Pounds/sq. inch	2.307	Feet of water
Pounds/sq. inch	2.36	Inches of Mercury
Pounds/sq. inch	.07031	Kgs./sq. cm.
Quarts (dry)	67.20	Cubic inches
Quarts (liquid)	57.75	Cubic inches
Quarts (liquid)	.946	Liter
Quintal	.50802	CWT (hundred weight)
Quintal (Argentine)	101.28	Pounds
Quintal (Brazil)	129.54	Pounds
Quintal (Castile, Peru)	101.43	Pounds
Quintal (Chile)	101.41	Pounds
Quintal (Mexico)	101.47	Pounds
Quintal (metric)	220.46	Pounds
Rod	16.5	Feet
Rod	25.0	Links
Square centimeter	.1550	Square inch
Square foot	.0929	Square meter
Square foot	.1296	Square vara (Texas)
Square inch	6.452	Square centimeters
Square kilometer	.3861	Square mile
Square meter	10.76	Square feet
Square mile	2.590	Square kilometers
Square vara (Texas)	7.716	Square feet
Square mile	640.	Acre
Temp. (°C.) + 273	1.	Abs. temp. (°C.)
Temp. (°C.) + 17.78	1.8	Temp. (°F.)
Temp. (°F.) + 460	1.	Abs. temp. (°F.)
Temp. (°F.) - 32	.5555	Temp. (°C.)
Tons (long)	1,016.	Kilograms
Tons (long)	2,240.	Pounds
Tons (long)	1.12000	Tons (short)
Tons (metric)	1,000.	Kilograms
Tons (metric)	2,205.	Pounds

PSI Per Barrel					
Mud Wt. API Gr. #/Gal.	**psi/Ft.**	**2-3/8 EU Tubing 4.7 #/Ft.**	**2-7/8EU Tubing 6.5 #/Ft.**	**2-7/81U Drill Pipe 10.4 #/Ft.**	**3-1/2 IU Drill Pipe 13.3 #/Ft.**
API Gr.					
60	.320	82.7	55.2	72.2	43.5
55	.329	85.0	56.8	74.2	44.7
50	.338	87.3	58.3	76.2	46.0
48	.341	88.1	58.9	76.9	46.4
46	.345	89.1	59.5	77.8	47.0
44	.349	90.2	60.2	78.7	47.5
43	.351	90.7	60.6	79.2	47.7
Diesel					
42	.354	95.1	61.1	79.8	48.1
API Gr.					
41	.355	91.7	61.3	80.1	48.3
40	.357	92.2	61.6	80.5	48.6
39	.359	92.8	62.0	81.0	48.8
38	.362	93.5	62.5	81.6	49.2
37	.364	94.1	62.8	82.1	49.5
36	.366	94.6	63.2	82.5	49.8
35	.368	95.1	63.5	83.0	50.0
34	.370	95.6	63.9	83.4	50.3
33	.373	96.4	64.4	84.1	50.7
32	.375	96.9	64.7	84.6	51.0
31	.377	97.4	65.1	85.0	51.3
30	.379	97.9	65.4	85.5	51.5
28	.384	99.2	66.3	86.6	52.2
26	.389	100.5	67.1	87.7	52.9
24	.394	101.8	68.0	88.9	53.6
22	.399	103.1	68.9	90.0	54.3
20	.405	104.7	69.9	91.3	55.1
18	.410	105.9	70.8	92.5	55.8
15	.418	108.0	72.1	94.3	56.9
12	.427	110.3	73.7	96.3	58.1
10	.433	111.9	74.8	97.6	58.9
#/Gal.					
8.34	.433	111.9	74.8	97.6	58.9
9.0	.468	120.8	80.7	105.4	63.6
9.2	.478	123.5	82.5	107.8	65.0
9.4	.488	126.1	84.3	110.1	66.4
9.6	.499	128.8	86.1	112.4	67.8
9.8	.509	131.5	87.9	114.8	69.2
10.0	.519	134.2	89,7	117.1	70.7
10.2	.530	136.9	91.4	119.5	72.1
10.4	.540	139.6	93.2	121.8	73.5
10.6	.551	142.2	95.0	124.2	74.9
10.8	.561	144.9	96.8	126.5	76.3
11.0	.571	147.6	98.6	128.8	77.7
11.2	.582	150.3	100.4	131.2	79.1
11.4	.592	153.0	102.2	133.5	80.5
11.6	.603	155.7	104.0	135.9	82.0
11.8	.613	158.3	105.8	138.2	83.4
12.0	.623	161.0	107.6	140.6	84.8
12.2	.634	163.7	109.4	142.9	86.2
12.4	.644	166.4	111.2	145.2	87.6
12.6	.655	169.1	113.0	147.6	89.0
12.8	.665	171.8	114.8	149.9	90.4
13.0	.675	174.5	116.5	152.3	91.8
13.2	.686	177.1	118.3	154.6	93.3
13.4	.696	179.8	120.1	157.0	94.7
13.6	.706	182.5	121.9	159.3	96.1
13.8	.717	185.2	123.7	161.6	97.5
14.0	.727	187.9	125.5	164.0	98.9
14.5	.753	194.6	130.0	169.8	102.4
15.0	.779	201.3	134.5	175.7	106.0
15.5	.805	208.0	139.0	181.6	109.5
16.0	.831	214.7	143.4	187.4	113.0
16.5	.857	221.4	147.9	193.3	116.6
17.0	.883	228.1	152.4	199.1	120.1
17.5	.909	234.8	156.9	205.0	123.6
18.0	.935	241.5	161.4	210.8	127.2
18.5	.961	248.3	165.8	216.7	130.7
19.0	.987	255.0	170.3	222.6	134.2
19.5	1.01	261.7	174.8	228.4	137.8
20.0	1.04	268.4	179.3	234.3	141.3

Fluid Density and Pressure
(At 60°F)

		Density			Fluid Head		
Degrees API	Specific Gravity	lb/gal	lb/cu ft	*g/cc*	psi/ft	*kg/sq cm/m*	Buoyancy Factor
60	0.738	6.160	46.08	*0,738*	0.320	*,0738*	0.905
55	0.758	6.325	47.31	*0,758*	0.328	*,0758*	0.903
50	0.779	6.499	48.62	*0,779*	0.336	*,0779*	0.900
45	0.801	6.683	49.99	*0,801*	0.347	*,0801*	0.897
40	0.825	6.878	51.45	*0,825*	0.357	*,0825*	0.894
35	0.849	7.085	53.00	*0,849*	0.368	*,0849*	0.891
30	0.876	7.304	54.64	*0,876*	0.379	*,0876*	0.888
25	0.904	7.537	56.38	*0,904*	0.391	*,0904*	0.884
20	0.933	7.786	58.24	*0,933*	0.404	*,0933*	0.880
15	0.965	8.052	60.23	*0,965*	0.418	*,0965*	0.876
10	1.000	8.337	62.36	*1,000*	0.433	*,1000*	0.872
	1.007	8.400	62.83	*1,007*	0.436	*,1007*	0.871
	1.031	8.600	64.33	*1,031*	0.446	*,1031*	0.868
	1.055	8.800	65.82	*1,055*	0.457	*,1055*	0.865
	1.079	9.000	67.32	*1,079*	0.467	*,1079*	0.862
	1.103	9.200	68.82	*1,103*	0.477	*,1103*	0.859
	1.127	9.400	70.31	*1,127*	0.488	*,1127*	0.856
	1.151	9.600	71.81	*1,151*	0.498	*,1151*	0.852
	1.175	9.800	73.30	*1,175*	0.509	*,1175*	0.849

Fluid Density and Pressure

(At 60°F)

		Density			Fluid Head		
Degrees API	Specific Gravity	lb/gal	lb/cu ft	*g/cc*	psi/ft	*kg/sq cm/m*	Buoyancy Factor*
	1.199	10.000	74.80	*1,199*	0.519	*,1199*	0.846
	1.223	10.200	76.30	*1,223*	0.529	*,1223*	0.843
	1.247	10.400	77.79	*1,247*	0.540	*,1247*	0.840
	1.271	10.600	79.29	*1,271*	0.550	*,1271*	0.837
	1.295	10.800	80.78	*1,295*	0.561	*,1295*	0.834
	1.319	11.000	82.28	*1,319*	0.571	*,1319*	0.831
	1.343	11.200	83.78	*1,343*	0.581	*,1343*	0.828
	1.367	11.400	85.27	*1,367*	0.592	*,1367*	0.825
	1.391	11.600	86.77	*1,391*	0.602	*,1391*	0.822
	1.415	11.800	88.27	*1,415*	0.612	*,1415*	0.819
	1.439	12.000	89.76	*1,439*	0.623	*,1439*	0.816
	1.463	12.200	91.26	*1,463*	0.633	*,1463*	0.813
	1.487	12.400	92.75	*1,487*	0.644	*,1487*	0.810
	1.511	12.600	94.25	*1,511*	0.654	*,1511*	0.806
	1.535	12.800	95.75	*1,535*	0.664	*,1535*	0.803
	1.569	13.000	97.24	*1,559*	0.675	*,1559*	0.800
	1.583	13.200	98.74	*1,583*	0.685	*,1583*	0.797
	1.607	13.400	100.23	*1,607*	0.696	*,1607*	0.794

Fluid Density and Pressure
(At 60°F)

		Density			Fluid Head		
Degrees API	Specific Gravity	lb/gal	lb/cu ft	*g/cc*	psi/ft	*kg/sq cm/m*	Buoyancy Factor*
	1.631	13.600	101.73	*1,631*	0.706	*,1631*	0.791
	1.655	13.800	103.23	*1,655*	0.716	*,1655*	0.788
	1.679	14.000	104.72	*1,679*	0.727	*,1679*	0.785
	1.703	14.200	106.22	*1,703*	0.737	*,1703*	0.782
	1.727	14.399	107.71	*1,727*	0.748	*,1727*	0.779
	1.751	14.600	109.21	*1,751*	0.758	*,1751*	0.776
	1.775	14.800	110.71	*1,775*	0.768	*,1775*	0.773
	1.799	15.000	112.20	*1,799*	0.779	*,1799*	0.770
	1.823	15.200	113.70	*1,823*	0.789	*,1823*	0.767
	1.847	15.400	115.20	*1,847*	0.799	*,1847*	0.764
	1.871	15.600	116.69	*1,871*	0.810	*,1871*	0.761
	1.895	15.800	118.19	*1,895*	0.820	*,1895*	0.757
	1.919	16.000	119.68	*1,919*	0.831	*,1919*	0.754
	1.943	16.200	121.18	*1,943*	0.841	*,1943*	0.751
	1.967	16.400	122.68	*1,967*	0.851	*,1967*	0.748
	1.991	16.600	124.17	*1,991*	0.862	*,1991*	0.745
	2.015	16.800	125.67	*2,015*	0.872	*,2015*	0.742
	2.039	17.000	127.16	*2,039*	0.883	*,2039*	0.739

Fluid Density and Pressure

(At 60°F)

		Density			Fluid Head		
Degrees API	Specific Gravity	lb/gal	lb/cu ft	*g/cc*	psi/ft	*kg/sq cm/m*	Buoyancy Factor*
	2.063	17.200	128.66	*2,063*	0.893	*,2063*	0.736
	2.087	17.400	130.16	*2,087*	0.903	*,2087*	0.733
	2.111	17.600	131.65	*2,111*	0.914	*,2111*	0.730
	2.135	17.800	133.15	*2,135*	0.924	*,2135*	0.727
	2.159	18.000	134.64	*2,159*	0.935	*,2159*	0.724
	2.183	18.200	136.14	*2,183*	0.945	*,2183*	0.721
	2.207	18.400	137.64	*2,207*	0.955	*,2207*	0.718
	2.231	18.600	139.13	*2,231*	0.966	*,2231*	0.715
	2.255	18.800	140.63	*2,255*	0.976	*,2255*	0.712
	2.278	19.000	142.12	*2,278*	0.987	*,2278*	0.708
	2.302	19.200	143.62	*2,302*	0.997	*,2302*	0.705
	2.326	19.400	145.12	*2,326*	1.007	*,2326*	0.702
	2.350	19.600	146.61	*2,350*	1.018	*,2350*	0.699
	2.374	19.800	148.11	*2,374*	1.028	*,2374*	0.696
	2.398	20.000	149.61	*2,398*	1.038	*,2398*	0.693

*Buoyancy factor is used to compensate for loss of weight when steel tubulars are immersed in fluid.
Applicable only when tubing or casing is completely filled with fluid.
Actual hook load = length of string (ft) x weight of string (lb/ft) x Buoyancy Factor.

Tubing Movement Formulas

Changes in temperature and pressure cause contraction or expansion of a tubing string as covered in detail in the Baker "Packer Calculation Handbook". For ready reference, the formulas for calculating the forces developed by this contraction/expansion are given below:

F_1 (piston effect) = $(A_p - A_i)\quad P_i - (A_p - A_o)\quad P_o$
F_2 (buckling effect) = usually negligible
F_3 (ballooning effect) = $.6\,(\,P_{ia}A_i - P_{oa}A_o)$
F_4 (temperature effect) = $207\,A_s\,t$

The above forces are in pounds and the equivalent tubing movement can be obtained from the stretch charts in another section of this handbook or can be calculated using the formula

$$L \text{ (stretch or contraction in feet)} = \frac{F \times L}{E \times A_s}$$

where F = force in pounds
L = tubing length in feet
E = elasticity factor of steel = 30,000,000
A_s = cross section area of tubing in sq. inches

Terms used in the force formulas are defined below:

A_s = cross section area of tubing in square inches = $A_o - A_i$
A_p = area of packer bore in square inches
A_o = area of tubing OD in square inches
A_i = area of tubing ID in square inches
P_i = change in tubing pressure at packer in pounds per square inch
P_o = change in annulus pressure at packer in pounds per square inch
P_{ia} = change in average tubing pressure in pounds per square inch

P_{oa} = change in average annulus pressure in pounds per square inch

t = change in average tubing temperature in degrees Fahrenheit

For more detailed information regarding tubing movement refer to the Baker “Packer Calculation Handbook.”

Gas Flow Through Choke

A calculation of the volume of gas flowing through a choke may be made using the formula

$$Q = \frac{C\,P}{G\,T}$$

where Q = gas flow rate in MCF per day at 60°F and atmospheric pressure
C = choke coefficient, listed in table below for various size chokes
P = absolute flowline pressure upstream of choke, gage reading plus 15 psi
G = gas specific gravity
T = absolute gas temperature upstream of choke, °F plus 460

If neither temperature nor specific gravity are known, an approximation can be made by assuming a temperature of 80°F (540°F absolute) and a specific gravity of 0.6 for the gas. In this case the formula will be

$$Q = \frac{C\,P}{540 \times .6} = \frac{C\,P}{18} = .0555\,C\,P$$

Coefficient Table

Choke Size (in.)	Coefficient (C)
1/8	6.25
3/16	14.44
1/4	26.51
5/16	43.64
3/8	61.21
7/16	85.13
1/2	112.72
5/8	179.74
3/4	260.99

Class A Cement Slurry

Slurry Weight (lb/gal.)	Mixing Water (gal./sack)	Yield (cu ft/sack)	Factor (sack/cu ft)
14.0	7.72	1.512	0.661
14.1	7.53	1.487	0.673
14.2	7.34	1.461	0.684
14.3	7.15	1.436	0.697
14.4	6.98	1.413	0.708
14.5	6.80	1.389	0.720
14.6	6.64	1.368	0.731
14.7	6.48	1.346	0.743
14.8	6.32	1.325	0.755
14.9	6.17	1.305	0.766
15.0	6.02	1.285	0.778
15.1	5.90	1.267	0.789
15.2	5.74	1.247	0.802
15.3	5.61	1.230	0.813
15.4	5.48	1.212	0.825
15.5	5.35	1.195	0.837
15.6	5.23	1.179	0.848
15.7	5.11	1.163	0.860
15.8	4.99	1.147	0.872
15.9	4.88	1.132	0.883
16.0	4.77	1.118	0.895
16.1	4.66	1.103	0.907
16.2	4.56	1.089	0.918
16.3	4.46	1.076	0.929
16.4	4.36	1.063	0.941
16.5	4.26	1.049	0.953
16.6	4.16	1.036	0.965
16.7	4.07	1.024	0.977
16.8	3.98	1.012	0.988
16.9	3.89	1.000	1.000

Bit and Casing Combinations

Casing OD	Weight (lb/ft)	Casing ID	Casing Drift	Bit Size	Standard Bit Pin Thread
4-1/2	9.5 10.5 11.6 13.5	4.090 4.052 4.000 3.920	3.965 3.927 3.875 3.795	3-7/8 3-7/8 3-7/8 3-3/4	2-3/8 API Regular
5	11.5 13.0 15.0 18.0	4.560 4.494 4.408 4.276	4.435 4.369 4.283 4.151	4-1/4 4-1/4 4-1/4 4-1/8	2-3/8 API Regular
5-1/2	13.0 14.0 15.5 17.0 20.0	5.044 5.012 4.950 4.892 4.778	4.919 4.887 4.825 4.767 4.653	4-3/4 4-3/4 4-3/4 4-3/4 4-5/8	2-7/8 API Regular
	23.0 26.0	4.670 4.548	4.545 4.423	4-1/2 4-3/8	2-3/8 API Regular
6	15.0 18.0 20.0 23.0	5.524 5.424 5.352 5.240	5.399 5.299 5.227 5.115	5-3/8 5-1/8 5-1/8 5-1/8	3-1/2 API Regular
6-5/8	17.0 20.0 24.0 28.0 32.00	6.135 6.049 5.921 5.791 5.675	6.010 5.924 5.796 5.666 5.550	6 5-7/8 5-5/8 5-5/8 5-3/8	3-1/2 API Regular
7	17.0 20.0 23.0 26.0 29.0 32.0 35.0 38.0	6.538 6.456 6.366 6.276 6.184 6.094 6.004 5.920	6.413 6.331 6.241 6.151 6.059 5.969 5.879 5.795	6-1/4 6-1/4 6-1/4 6-1/8 6 6 5-7/8 5-3/4	3-1/2 API Regular
7-5/8	20.0 24.0 26.4 29.7 33.7 39.0	7.125 7.025 6.969 6.875 6.765 6.625	7.000 6.900 6.844 6.750 6.640 6.500	6-3/4 6-3/4 6-3/4 6-3/4 6-5/8 6-1/2	3-1/2 API Regular

BAKER OIL TOOLS
A Baker Hughes company

Bit and Casing Combinations

Casing OD	Weight (lb/ft)	Casing ID	Casing Drift	Bit Size	Standard Bit Pin Thread
8-5/8	24.0 28.0 32.0 36.0 40.0	8.097 8.017 7.921 7.825 7.725	7.972 7.892 7.796 7.700 7.600	7-7/8 7-7/8 7-5/8 7-5/8 7-5/8	4-1/2 API Regular
	44.0 49.0	7.625 7.511	7.500 7.386	7-3/8 7-3/8	3-1/2 API Regular
9-5/8	29.3 32.3 36.0 40.0 43.5 47.0 53.5	9.063 9.001 8.921 8.835 8.755 8.681 8.535	8.907 8.845 8.765 8.679 8.599 8.525 8.379	8-3/4 8-3/4 8-3/4 8-5/8 8-5/8 8-1/2 8-3/8	4-1/2 API Regular
10-3/4	32.7 40.5 45.5 51.0 55.5	10.192 10.050 9.950 9.850 9.760	10.036 9.894 9.794 9.694 9.604	9-7/8 9-7/8 *9-3/4 *9-5/8 *9-5/8	6-5/8 API Regular
11-3/4	38.0 42.0 47.0 54.0 60.0	11.150 11.084 11.000 10.880 10.772	10.994 10.928 10.844 10.724 10.616	11 10-3/4 *10-3/4 *10-5/8 *10-5/8	6-5/8 API Regular
13-3/8	48.0 54.5 61.0 68.0 72.0	12.715 12.615 12.515 12.415 12.347	12.559 12.459 12.359 12.259 12.191	12-1/4 12-1/4 12-1/4 12-1/4 12	6-5/8 API Regular
16	55.0 65.0 75.0 84.0	15.375 15.250 15.125 15.010	15.188 15.062 14.938 14.822	15 15 14-3/4 14-3/4	6-5/8 API Regular
20	94.0	19.124	18.936	17-1/2	6-5/8 API Regular

*5-1/2 API Regular Thread optional

Area of Circles

D = Diameter Area = .785 D^2

Dec. Dia.	Frac. Dia.	Inches 0	1	2	3	4	5	6	7	8	Dec. Dia.	Frac. Dia.
0	0		.7854	3.1416	7.0686	12.566	19.635	28.274	38.485	50.266	0	0
.0156	1/64	.000192	.8101	3.1909	7.1424	12.665	19.753	28.422	38.656	50.462	.0156	1/64
.0312	1/32	.000767	.8352	3.2405	7.2166	12.763	19.881	28.570	38.829	50.659	.0312	1/32
.0468	3/64	.001726	.8607	3.2906	7.2912	12.863	20.005	28.718	39.002	50.856	.0468	3/64
.0625	1/16	.003068	.8866	3.3410	7.3662	12.962	20.129	28.866	39.175	51.054	.0625	1/16
.0781	5/64	.004794	.8929	3.3918	7.4415	13.062	20.253	29.015	39.348	51.252	.0781	5/64
.0937	3/32	.006903	.9306	3.4430	7.5173	13.162	20.378	29.165	39.522	51.450	.0937	3/32
.1093	7/64	.009396	.9666	3.4946	7.5934	13.263	20.503	29.315	39.696	51.649	.1093	7/64
.1250	1/8	.01227	.9940	3.5466	7.6699	13.364	20.629	29.465	39.871	51.849	.1250	1/8
.1406	9/64	.01553	1.0218	3.5989	7.7468	13.465	20.755	29.615	40.946	52.048	.1406	9/64
.1562	5/32	.01917	1.0500	3.6516	7.8241	13.567	20.881	29.766	40.222	52.248	.1562	5/32
.1718	11/64	.02370	1.0786	3.7048	7.9017	13.669	21.008	29.917	40.398	52.448	.1718	11/64
.1875	3/16	.02761	1.1075	3.7583	7.9798	13.772	21.135	30.969	40.574	52.649	.1875	3/16
.2031	13/64	.03240	1.1369	3.8121	8.0582	13.875	21.263	30.221	40.750	52.850	.2031	13/64
.2187	7132	.03758	1.1666	3.8664	8.1370	13.978	21.391	30.374	40.927	53.052	.2187	7/32
.2343	15/64	.04314	1.1967	3.9211	8.2162	14.082	21.519	30.526	41.105	53.254	.2343	15/64

Area of Circles

D = Diameter Area = .785 D^2

Dec. Dia.	Frac. Dia.	Inches									Dec. Dia.	Frac. Dia.
		9	10	11	12	13	14	15	16	17		
0	0	63.617	78.540	95.033	113.10	132.73	153.94	176.71	201.06	226.98	0	0
.0156	1/64	63.838	78.785	95.303	113.39	133.05	154.28	177.08	201.45	227.40	.0156	1/64
.0312	1/32	64.060	79.031	95.574	113.69	133.37	154.63	177.45	201.85	227.82	.0312	1/32
.0468	3/64	64.282	79.278	95.845	113.98	133.69	154.97	177.82	202.24	228.23	.0468	3/64
.0625	1/16	64.504	79.525	96.116	114.23	134.01	155.32	178.19	202.64	228.65	.0625	1/16
.0781	5/64	64.727	79.772	96.388	114.57	134.33	155.66	178.56	203.03	229.07	.0781	5/64
.0937	3/32	64.950	80.019	96.660	114.87	134.65	156.01	178.93	203.43	229.49	.0937	3/32
.1093	7/64	65.173	80.267	96.932	115.17	134.98	156.35	179.30	203.82	229.91	.1093	7/64
.1250	1/8	65.397	80.516	97.205	115.47	135.30	156.70	179.67	204.22	230.33	.1250	1/8
.1406	9/64	65.621	80.764	97.479	115.76	135.62	157.05	180.04	204.61	230.75	.1406	9/64
.1562	5/32	65.845	81.013	97.752	116.06	135.94	157.39	180.42	205.01	231.17	.1562	5/32
.1718	11/64	66.070	81.263	98.026	116.36	136.27	157.74	180.79	205.40	231.59	.1718	11/64
.1875	3/16	66.296	81.513	98.301	116.66	136.59	158.09	181.16	205.80	232.01	.1875	3/16
.2031	13/64	66.521	81.763	98.575	116.96	136.91	158.44	181.53	206.20	232.44	.2031	13/64
.2187	7/32	66.747	82.014	98.850	117.26	137.24	158.79	181.91	206.60	232.86	.2187	7/32
.2343	15/64	66.974	82.265	99.126	117.56	137.56	159.14	182.28	206.99	233.28	.2343	15/64

Area of Circles

D = Diameter Area = .785 D^2

Dec. Dia.	Frac. Dia.	Inches 0	1	2	3	4	5	6	7	8	Dec. Dia.	Frac. Dia.
.2500	1/4	.04909	1.2272	3.9761	8.2958	14.186	21.648	30.680	41.282	53.456	.2500	1/4
.2656	17/64	.05541	1.2577	4.0315	8.3757	14.291	21.777	30.833	41.461	53.659	.2656	17/64
.2812	9/32	.06213	1.2893	4.0873	8.4561	14.396	21.906	30.987	41.639	53.862	.2812	9/32
.2968	19/64	.06922	1.3209	4.1435	8.5368	14.501	22.036	31.141	41.818	54.065	.2968	19/64
.3125	5/16	.07670	1.3530	4.200	8.6179	14.607	22.166	31.296	41.997	54.269	.3125	5/16
.3281	21/64	.08456	1.3854	4.2570	8.6994	14.713	22.297	31.451	42.177	54.473	.3281	21/64
.3437	11/32	.09281	1.1482	4.3143	8.7813	14.819	22.428	31.607	42.357	54.678	.3437	11/32
.3593	23/64	.1014	1.4513	4.3720	8.8636	14.926	22.559	31.763	42.537	54.883	.3593	23/64
.3750	3/8	.1104	1.4849	4.4301	8.9462	15.033	22.691	31.919	42.718	55.088	.3750	3/8
.3906	25/64	.1198	1.5188	4.4886	9.0292	15.141	22.823	32.076	42.899	55.294	.3906	25/64
.4062	13/32	.1296	1.5532	4.5475	9.1126	15.249	22.955	32.233	43.081	55.500	.4062	13/32
.4218	27/64	.1398	1.5879	4.6067	9.1964	15.357	23.088	32.390	43.263	55.707	.4218	27/64
.4375	7/16	.1503	1.6230	4.6664	9.2806	15.466	23.221	32.548	43.445	55.914	.4375	7/16
.4531	29/64	.1613	1.6584	4.7264	9.3652	15.575	23.355	32.706	43.628	56.121	.4531	29/64
.4687	15/32	.1726	1.6943	4.7868	9.4501	15.684	23.489	32.865	43.811	56.329	.4687	15/32
.4843	31/64	.1843	1.7305	4.8476	9.5354	15.794	23.623	33.024	43.995	56.537	.4843	31/64

Area of Circles

D = Diameter Area = .785 D^2

Dec.	Frac.	Inches									Dec.	Frac.
Dia.	Dia.	9	10	11	12	13	14	15	16	17	Dia.	Dia.
.2500	1/4	67.201	82.516	99.402	117.86	137.89	159.48	182.65	207.39	233.71	.2500	1/4
.2656	17/64	67.428	82.768	99.678	118.16	138.21	159.83	183.03	207.79	234.13	.2656	17/64
.2812	9/32	67.655	83.020	99.955	118.46	138.54	160.19	183.40	209.19	234.55	.2812	9/32
.2968	19/64	67.883	83.272	100.232	118.76	138.86	160.54	183.78	208.59	234.98	.2968	19/64
.3125	5/16	68.112	83.525	100.509	119.06	139.19	160.89	84.15	208.69	235.40	.3125	5/16
.3281	21/64	68.341	83.779	100.787	119.37	139.52	161.24	184.53	209.39	235.83	.3281	21/64
.3437	11/32	68.570	84.032	101.066	119.67	139.84	161.59	194.91	209.79	236.25	.3437	11/32
.3593	23/64	68.799	84.286	101.344	119.97	140.17	161.94	185.28	210.20	236.68	.3593	23/64
.3750	3/8	69.029	84.541	101.623	120.28	140.50	162.30	185.66	210.60	237.10	.3750	3/8
.3906	25/64	69.259	84.796	101.903	120.58	140.83	162.65	186.04	211.00	237.53	.3906	25/64
.4062	13/32	69.490	85.051	102.182	120.88	141.16	153.00	186.42	211.40	237.96	.4062	13/32
.4218	27/64	69.721	85.306	102.462	121.19	141.49	163.36	186.79	211.80	238.39	.4218	27/64
.4375	7/16	69.953	85.562	102.743	121.49	141.82	163.71	187.17	212.21	238.81	.4375	7/16
.4531	29/64	70.184	85.819	103.024	121.80	142.15	164.06	187.55	212.61	239.24	.4531	29/64
.4687	15/32	70.417	86.075	103.305	122.11	142.48	164.42	187.93	213.02	239.67	.4687	15/32
.4843	31/64	70.649	86.333	103.587	122.43	142.81	164.77	188.31	213.42	240.10	.4843	31/64

Area of Circles

D = Diameter Area = .785 D^2

Dec. Dia.	Frac. Dia.	Inches 0	1	2	3	4	5	6	7	8	Dec. Dia.	Frac. Dia.
.5000	1/2	.1963	1.7671	4.9083	9.6212	15.904	23.758	33.183	44.179	56.745	.5000	1/2
.5166	33/64	.2088	1.8042	4.9703	9.7072	16.015	23.893	33.343	44.363	56.954	.5156	33/64
.5312	17/32	.2217	1.8415	5.0322	9.7937	16.126	24.029	33.503	44.548	57.163	.5312	17/32
.5468	35/64	.2349	1.8793	5.0946	9.8806	16.237	24.165	33.663	44.733	57.373	.5468	35/64
.5625	9/16	.2485	1.9175	5.1573	9.9678	16.349	24.301	33.824	44.918	57.583	.5625	9/16
.5781	37/64	.2625	1.9560	5.2203	10.0554	16.461	24.438	33.985	45.104	57.793	.5781	37/64
.5937	19/32	.2769	1.9949	5.2838	10.1435	16.574	24.575	34.147	45.290	58.004	.5937	19/32
.6093	39/64	.2916	2.0342	5.3477	10.2318	16.687	24.713	34.309	45.477	58.215	.6093	39/64
.6250	5/8	.3068	2.0739	5.4119	10.3206	16.800	24.850	34.472	45.664	58.426	.6250	5/8
.6406	41/64	.3223	2.1140	5.4765	10.4098	16.914	24.989	34.634	45.851	58.638	.6406	41/64
.6562	21/32	.3382	2.1545	5.5415	10.4994	17.028	25.127	34.798	46.039	58.850	.6562	21/32
.6718	43/64	.3545	2.1953	5.6069	10.5893	17.142	25.266	34.961	46.227	59.063	.6718	43/64
.6875	11/16	.3712	2.2365	5.6727	10.6796	17.257	25.406	35.125	46.415	59.276	.6875	11/16
.7031	45/64	.3883	2.2782	5.7388	10.7703	17.372	25.546	35.289	46.604	59.489	.7031	45/64
.7187	23/32	.4067	2.3201	5.8054	10.8614	17.488	25.686	35.454	46.793	59.703	.7187	23/32
.7343	47/64	.4236	2.3623	5.8723	10.9528	17.604	25.826	35.619	46.983	59.917	.7343	47/64

Area of Circles

D = Diameter Area = .785 D^2

Dec.	Frac.	Inches									Dec.	Frac.
Dia.	Dia.	9	10	11	12	13	14	15	16	17	Dia.	Dia.
.5000	1/2	70.882	86.590	103.869	122.72	143.14	165.13	188.69	213.82	240.53	.5000	1/2
.5156	33/64	71.116	86.848	104.151	123.03	143.47	165.49	189.07	214.23	240.96	.5156	33/64
.5312	17/32	71.349	87.106	104.434	123.33	143.80	165.84	189.45	214.64	241.39	.5312	17/32
.5468	35/64	71.583	87.365	104.717	123.64	144.13	166.20	189.83	215.04	241.82	.5468	35/64
.5625	9/16	71.818	87.624	105.001	123.95	144.47	166.56	190.22	215.45	242.25	.5625	9/16
.5781	37/64	72.053	87.883	105.285	124.26	144.80	166.91	190.60	215.85	242.68	.5781	37/64
.5937	19/32	72.288	88.143	105.569	124.57	145.13	167.27	190.98	216.26	243.11	.5937	19/32
.6093	39/64	72.524	88.404	105.804	124.88	145.47	167.63	191.36	216.67	243.54	.6093	39/64
.6250	5/8	72.760	88.664	106.139	125.19	145.80	167.99	191.75	217.08	243.98	.6250	5/8
.6406	41/64	72.996	88.925	106.425	125.50	146.14	168.35	192.13	217.48	244.41	.6406	41/64
.6562	21/32	73.233	89.186	106.711	125.81	146.47	168.71	192.52	217.89	244.84	.6562	21/32
.6718	43/64	73.470	89.448	106.997	126.12	146.81	169.07	192.90	218.30	245.28	.6718	43/64
.6875	11/16	73.708	89.710	107.284	126.43	147.14	169.43	193.28	218.71	245.71	.6875	11/16
.7031	45/64	73.946	89.973	107.571	126.74	147.48	169.79	193.67	219.12	246.14	.7031	45/64
.7187	23/32	74.184	90.236	107.858	127.05	147.82	170.15	194.06	219.53	246.58	.7187	23/32
.7343	47/64	74.423	90.499	108.146	127.36	148.15	170.51	194.44	219.94	247.01	.7343	47/64

Area of Circles

D = Diameter Area = .785 D^2

Dec. Dia.	Frac. Dia.	Inches 0	1	2	3	4	5	6	7	8	Dec. Dia.	Frac. Dia.
.7500	3/4	.4418	2.4053	5.9396	11.0447	17.721	25.967	35.785	47.173	60.132	.7500	3/4
.7666	49/64	.6404	2.4484	6.0073	11.1369	17.837	26.108	35.951	47.363	60.347	.7656	49/64
.7812	25/32	.4794	2.4929	6.0753	11.2295	17.954	26.250	36.117	47.554	60.562	.7812	25/32
.7968	51/64	.4987	2.5359	6.1438	11.3236	18.072	26.392	36.283	47.745	60.778	.7968	51/64
.8125	13/16	.5185	2.5802	6.2126	11.4159	18.190	26.535	36.450	47.937	60.994	.8125	13/16
.8281	53/64	.5386	2.6248	6.2819	11.5096	18.308	26.678	36.618	48.129	61.211	.8281	53/64
.8437	27/32	.5591	2.6699	6.3515	11.6038	18.427	26.821	36.787	48.321	61.427	.8437	27/32
.8593	55/64	.5800	2.7153	6.4215	11.6983	18.546	26.964	36.954	48.514	61.645	.8593	55/64
.8750	7/8	.6013	2.7612	6.4918	11.7933	18.665	27.109	37.122	48.707	61.862	.8750	7/8
.8906	57/64	.6230	2.8074	6.5626	11.8885	18.785	27.252	39.291	48.900	62.080	.8906	57/64
.9062	29/32	.6450	2.8540	6.6337	11.9842	18.906	27.398	37.461	49.094	62.299	.9062	29/32
.9218	59/64	.6675	2.9010	6.7052	12.0803	19.026	27.543	37.630	49.288	62.518	.9218	59/64
.9375	15/16	.6903	2.9483	6.7771	12.1768	19.147	27.688	37.800	49.483	62.737	.9375	15/16
.9531	61/64	.7135	2.9961	6.8494	12.2736	19.268	27.834	37.971	49.678	62.956	.9531	61/64
.9087	31/32	.7371	3.0442	6.9221	12.3708	19.390	27.981	38.142	49.874	63.176	.9687	31/32
.9843	63/64	.7610	3.0927	6.9952	12.4684	19.512	28.127	38.313	50.069	63.396	.9843	63/64

Area of Circles

D = Diameter Area = .785 D^2

Dec. Dia.	Frac. Dia.	Inches									Dec. Dia.	Frac. Dia.
		9	10	11	12	13	14	15	16	17		
.7500	3/4	74.662	90.763	108.434	127.68	148.49	170.87	194.83	220.35	247.45	.7500	3/4
.7656	49/64	74.901	91.027	108.723	127.99	148.83	171.24	195.21	220.76	247.89	.7656	49/64
.7812	25/32	75.141	91.291	109.012	128.30	149.17	171.60	195.60	221.18	248.32	.7812	25/32
.7968	51/64	75.382	91.556	109.301	128.62	149.50	171.96	195.99	221.59	248.76	.7968	51/64
.8125	13/16	75.622	91.821	109.591	128.93	149.84	172.32	196.38	222.00	249.20	.8125	13/16
.8281	53/64	75.863	92.087	109.881	129.25	150.18	172.69	196.77	222.41	249.63	.8281	53/64
.8437	27/32	76.105	92.353	110.171	129.56	150.52	173.05	197.15	222.83	250.07	.8437	27/32
.8593	55/64	76.346	92.619	110.462	129.88	150.86	173.42	197.54	223.24	250.51	.8593	55/64
.8750	7/8	76.589	92.886	110.753	130.19	151.20	173.78	197.93	223.65	250.95	.8750	7/8
.8906	57/64	76.831	93.153	111.045	130.51	151.54	174.15	198.32	224.07	251.39	.8906	57/64
.9062	29/32	77.074	93.420	111.337	130.82	151.88	174.51	198.71	224.48	251.83	.9062	29/32
.9218	59/64	77.317	93.688	111.630	131.14	152.22	174.88	199.10	224.90	252.26	.9218	59/64
.9375	15/16	77.561	93.956	111.922	131.46	152.57	175.25	199.49	225.31	252.70	.9375	15/16
.9531	61/64	77.805	94.225	112.215	131.78	152.91	175.61	119.89	225.73	253.15	.9531	61/64
.9687	31/32	78.050	94.494	112.509	132.09	153.25	175.98	200.28	226.15	253.59	.9687	31/32
.9843	63/64	78.295	94.763	112.803	132.41	153.59	176.35	200.67	226.56	254.03	.9843	63/64

Area of Circles

D = Diameter Area = .785 D^2

Diameter	Centimeters										Diameter
(cm)	0	1	2	3	4	5	6	7	8	9	(cm)
0	0	0,78540	3,14159	7,06858	12,5664	19,350	28,2743	38,4845	50,2655	63,6173	0
0,1	0,00785	0,95033	3,16360	7,54768	13,2025	20,282	29,2247	39,5919	51,5300	65,0388	0,1
0,2	0,03141	1,13097	3,80133	8,04248	13,8544	21,372	30,1907	40,7150	52,8102	66,4761	0,2
0,3	0,07069	1,32732	4,15476	8,55299	14,5220	22,618	31,1725	41,8539	54,1061	67,9291	0,3
0,4	0,12566	1,53938	4,52389	9,07920	15,2053	22,022	32,1699	43,0084	55,4177	69,3978	0,4
0,5	0,19635	1,76715	4,90874	9,62113	15,9043	23,583	33,1831	44,1786	56,7450	70,8822	0,5
0,6	0,28274	2,01062	5,30929	10,1788	16,6190	24,301	34,2119	45,3646	58,0880	72,3823	0,6
0,7	0,38485	2,26980	5,72555	10,7521	17,3494	25,176	35,2565	46,5663	59,4468	73,8981	0,7
0,8	0,50265	2,54469	6,15752	11,3411	18,0956	26,208	36,3168	47,7836	60,8212	75,4296	0,8
0,9	0,63617	2,83529	6,60520	11,9459	18,8574	27,397	37,3928	49,0167	60,2114	76,9769	0,9
Diameter	Centimeters										Diameter
(cm)	10	11	12	13	14	15	16	17	18	19	(cm)
1,0	78,5398	95,0332	113,097	132,732	153,938	176,715	201,062	226,980	254,469	283,529	1,0
1,1	80,1185	96,7689	114,990	134,782	156,145	179,079	203,583	229,658	257,304	286,521	1,1
1,2	81,7128	98,5203	116,899	136,848	158,368	181,458	206,120	232,352	260,155	289,529	1,2
1,3	83,3229	100,287	118,823	138,929	160,606	183,854	208,672	235,062	263,022	292,553	1,3
1,4	84,9487	102,070	120,763	141,026	162,360	186,265	211,241	237,787	265,904	295,592	1,4
1,5	86,5901	103,869	122,718	143,139	165,130	188,692	213,825	240,528	268,803	298,648	1,5
1,6	88,2473	105,683	124,690	145,267	167,415	191,134	216,424	243,285	271,716	301,719	1,6
1,7	89,9202	107,513	126,677	147,411	165,717	193,593	219,040	246,057	274,646	304,805	1,7
1,8	91,6088	109,359	128,680	149,571	167,034	196,067	221,671	248,846	277,591	307,907	1,8
1,9	193,3132	111,2201	130,698	115,747	174,366	198,557	224,318	251,649	280,552	311,026	1,9

Area of Circles

D = Diameter Area = .785 D^2

Diameter	Centimeters										Diameter
(cm)	20	21	22	23	24	25	26	27	28	29	(cm)
2,0	314,159	346,361	380,133	415,476	452,389	490,874	530,929	572,555	615,752	660,520	2,0
2,1	317,309	349,667	383,596	419,096	456,167	494,809	535,021	576,804	620,158	665,083	2,1
2,2	320,474	352,989	387,076	422,733	459,961	498,759	539,129	581,069	624,580	669,662	2,2
2,3	323,655	356,327	390,571	426,385	463,770	502,726	543,252	585,349	629,018	674,256	2,3
2,4	326,851	359,681	394,081	430,053	467,595	506,707	547,391	589,646	633,471	678,867	2,4
2,5	330,064	363,050	397,608	433,736	471,435	510,705	551,546	593,957	637,940	683,493	2,5
2,6	333,292	366,435	401,150	437,435	475,292	514,719	555,716	598,285	642,424	688,134	2,6
2,7	336,535	369,836	404,708	441,150	479,164	518,748	559,902	602,628	646,925	692,792	2,7
2,8	339,795	373,253	408,281	444,881	483,051	522,792	564,104	606,987	651,441	697,465	2,8
2,9	343,070	376,685	411,871	448,627	486,955	526,853	568,322	611,362	655,972	702,154	2,9
Diameter	Centimeters										Diameter
(cm)	30	31	32	33	34	35	36	37	38	39	(cm)
3,0	706,858	754,768	804,248	855,299	907,920	962,113	1017,88	1075,21	1134,11	1194,59	3,0
3,1	711,579	759,645	809,282	860,490	913,269	967,618	1023,54	1081,03	1140,09	1200,72	3,1
3,2	716,315	764,538	814,332	865,697	918,633	973,140	1029,22	1086,87	1146,08	1206,87	3,2
3,3	721,066	769,447	819,398	870,920	914,013	978,677	1034,91	1092,72	1152,09	1213,04	3,3
3,4	725,834	774,371	824,480	876,159	919,409	984,230	1040,62	1098,58	1158,12	1219,22	3,4
3,5	730,617	779,311	829,577	881,413	934,820	989,798	1046,35	1104,47	1164,16	1225,42	3,5
3,6	735,415	784,267	834,690	886,683	940,247	995,382	1052,09	1110,36	1170,21	1231,63	3,6
3,7	740,230	789,239	839,818	891,969	945,690	1000,98	1057,84	1116,28	1176,28	1237,86	3,7
3,8	745,060	794,226	844,963	897,270	951,149	1006,60	1063,62	1122,21	1182,37	1244,10	3,8
3,9	749,906	799,229	850,123	902,587	956,623	1012,23	1069,41	1128,15	1188,47	1250,36	3,9

BAKER OIL TOOLS
A Baker Hughes company

Area of Circles

D = Diameter Area = .785 D^2

Diameter	Centimeters										Diameter
(cm)	40	41	42	43	44	45	46	47	48	49	(cm)
4,0	1256,64	1320,25	1385,44	1452,20	1520,53	1590,43	1661,90	1734,94	1809,56	1885,74	4,0
4,1	1262,93	1326,70	1392,05	1458,96	1527,45	1597,51	1669,14	1742,34	1817,11	1893,45	4,1
4,2	1269,23	1333,17	1398,67	1465,74	1534,39	1604,60	1676,39	1749,74	1824,67	1901,17	4,2
4,3	1275,56	1339,65	1405,31	1472,54	1541,34	1611,71	1683,65	1757,16	1832,25	1908,90	4,3
4,4	1281,90	1346,14	1411,96	1479,34	1548,30	1618,83	1690,93	1764,60	1839,84	1916,65	4,4
4,5	1288,25	1352,65	1418,63	1486,17	1555,28	1625,97	1698,23	1772,05	1847,45	1924,42	4,5
4,6	1294,62	1359,18	1425,31	1493,01	1562,28	1633,13	1705,54	1779,52	1855,08	1932,21	4,6
4,7	1301,00	1365,72	1432,01	1499,87	1569,30	1640,30	1712,87	1787,01	1862,72	1940,00	4,7
4,8	1307,41	1372,28	1438,72	1506,74	1576,33	1647,48	1720,21	1794,51	1870,38	1947,82	4,8
4,9	1313,82	1378,85	1445,45	1513,63	1583,37	1654,68	1727,57	1802,03	1878,05	1955,65	4,9

Temperature Conversion of Fahrenheit to Centigrade

Fahrenheit	Centigrade	Fahrenheit	Centigrade	Fahrenheit	Centigrade
+300°	+148.89°	+180°	+82.22°	+60°	+15.56°
+295°	+146.11°	+175°	+79.44°	+55°	+12.78°
+290°	+143.33°	+170°	+76.67°	+50°	+10.00°
+285°	+140.55°	+165°	+73.89°	+45°	+7.22°
+280°	+137.78°	+160°	+71.11°	+40°	+4.44°
+275°	+135.00°	+155°	+68.33°	+35°	+1.67°
+270°	+132.22°	+150°	+65.55°	+30°	-1.11°
+265°	+129.44°	+145°	+62.78°	+25°	-3.89°
+260°	+126.67°	+140°	+60.00°	+20°	-6.67°
+255°	+123.89°	+135°	+57.22°	+15°	-9.44°
+250°	+121.11°	+130°	+54.44°	+10°	-12.22°
+245°	+118.33°	+125°	+51.67°	+5°	-15.00°
+240°	+115.55°	+120°	+48.89°	0°	-17.78°
+235°	+112.78°	+115°	+46.11°	-5°	-20.56°
+ 230°	+110.00°	+110°	+43.33°	-10°	-23.33°
+225°	+107.22°	+105°	+40.56°	-15°	-26.11°
+220°	+104.44°	+100°	+37.78°	-20°	-28.89°
+215°	+101.67°	+95°	+35.00°	-25°	-31.67°
+210°	+98.89°	+90°	+32.22°	-30°	-34.44°
+205°	+96.11°	+85°	+29.44°	-35°	-37.22°
+200°	+93.33°	+80°	+26.67°	-40°	-40.00°
+195°	+90.55°	+75°	+23.89°	-45°	-42.78°
+190°	+87.78°	+70°	+21.11°	-50°	-45.56°
+185°	+85.00°	+65°	+18.33°		

Formulas for Conversion of Fahrenheit and Centigrade Temperature Readings

$$°F = \frac{[°C \times 9]}{5} + 32$$

$$°C = \frac{[°F - 32]}{9} \times 5$$

Capacity of Vertical Cylindrical Tanks

Inside Diameter Ft.	In.	Bbl/In.	Gal/In.	Cu Ft/In.	Inside Diameter Ft.	in.	Bbl/In.	Gal/In.	Cu Ft/In.
4	0	.186	7.83	1.05	13	0	1.97	82.74	11.06
4	3	.210	8.84	1.18	13	3	2.05	85.96	11.49
4	6	.236	9.91	1.33	13	6	2.12	89.23	11.93
4	9	.263	11.05	1.48	13	9	2.20	92.57	12.37
5	0	.291	12.24	1.64	14	0	2.28	95.96	12.83
5	3	.321	13.50	1.80	14	3	2.37	99.42	13.29
5	6	.352	14.81	1.98	14	6	2.45	102.94	13.76
5	9	.385	16.19	2.16	14	9	2.54	106.52	14.24
6	0	.419	17.63	2.36	15	0	2.62	110.16	14.73
6	3	.455	19.13	2.56	15	3	2.71	113.86	15.22
6	6	.492	20.69	2.77	15	6	2.80	117.63	15.72
6	9	.531	22.31	2.98	15	9	2.89	121.45	16.24
7	0	.571	23.99	3.21	16	0	2.98	125.34	16.76
7	3	.612	25.74	3.44	16	3	3.08	129.29	17.28
7	6	.655	27.54	3.68	16	6	3.17	133.29	17.82
7	9	.700	29.41	3.93	16	9	3.27	137.36	18.36
8	0	.746	31.33	4.19	17	0	3.37	141.49	18.92
8	3	.793	33.32	4.46	17	3	3.47	145.69	19.48
8	6	.842	35.37	4.73	17	6	3.57	149.95	20.04
8	9	.892	37.49	5.01	17	9	3.67	154.26	20.62
9	0	.944	39.66	5.30	18	0	3.78	158.66	21.21
9	3	.997	41.89	5.60	18	3	3.88	163.07	21.80
9	6	1.05	44.19	5.91	18	6	3.99	167.57	22.40
9	9	1.11	46.54	6.22	18	9	4.10	172.13	23.01
10	0	1.17	48.96	6.54	19	0	4.21	176.75	23.63
10	3	1.22	51.44	6.88	19	3	4.32	181.43	24.25
10	6	1.28	53.98	7.22	19	6	4.43	186.17	24.89
10	9	1.35	56.58	7.56	19	9	4.54	190.98	25.53
11	0	1.41	59.24	7.92	20	0	4.66	195.84	26.18
11	3	1.47	61.97	8.28	20	3	4.78	200.77	26.84
11	6	1.54	64.75	8.66	20	6	4.90	205.75	27.51
11	9	1.61	67.60	9.04	20	9	5.02	210.80	28.18
12	0	1.68	70.50	9.43	21	0	5.14	215.91	28.86
12	3	1.75	73.47	9.82	21	3	5.26	221.09	29.56
12	6	1.82	76.50	10.23	21	6	5.39	226.32	30.25
12	9	1.89	79.59	10.64	21	9	5.51	231.61	30.96

Capacity of Vertical Cylindrical Tanks

Inside Diameter Ft.	In.	Bbl/In.	Gal/In.	Cu Ft/In.	Inside Diameter Ft.	in.	Bbl/In.	Gal/In.	Cu Ft/In.
22	0	5.64	236.97	31.68	26	0	7.88	330.97	44.24
22	3	5.77	242.38	32.40	26	3	8.03	337.37	45.10
22	6	5.90	247.86	33.13	26	6	8.18	343.82	45.96
22	9	6.03	253.40	33.87	26	9	8.34	350.34	46.83
23	0	6.16	259.00	34.62	27	0	8.49	356.92	47.71
23	3	6.30	264.66	35.38	27	3	8.65	363.56	48.60
23	6	6.43	270.38	36.15	27	6	8.81	370.26	49.50
23	9	6.57	276.17	36.92	27	9	8.97	377.02	50.40
24	0	6.71	282.01	37.70	27	0	9.13	83.85	51.31
24	3	6.85	287.92	38.49	28	3	9.30	390.73	52.23
24	6	6.99	293.88	39.29	28	6	9.46	397.68	53.16
24	9	7.15	300.40	40.16	28	9	9.63	404.69	54.10
25	0	7.28	306.00	40.91	29	0	9.80	411.75	55.04
25	3	7.43	312.15	41.73	29	3	9.97	418.88	56.00
25	6	7.58	318.36	42.56	29	6	10.14	426.07	56.96
25	9	7.72	324.64	43.40	29	9	10.31	433.33	57.93
					30	0	10.49	40.64	58.91

Formulas for Calculating Capacity of Vertical Cylindrical Tanks with Flat Ends

Bbl. per foot of depth of fluid	=	.1400 x D^2 (ft.)
Bbl. per inch of depth of fluid	=	.01165 x D^2 (ft.)
Gal. per foot of depth of fluid	=	5.8752 x D^2 (ft.)
Gal. per inch of depth of fluid	=	.4896 x D^2 (ft.)
Cu. Ft. per foot of depth of fluid	=	.7854 x D^2 (ft.)
Cu. Ft. per inch of depth of fluid	=	.06545 x D^2 (ft.)

D = Diameter in feet.

Formulas for Calculating Capacity of Rectangular Tanks with Flat Ends

For small or medium size rectangular tanks or pits measure the length and width in inches.

Bbl. per inch of depth of fluid	=	.0001031 x L (in) x W (in)
Gal. per inch of depth of fluid	=	.004329 x L (in) x W (in)
Cu. ft. per inch of depth of fluid	=	.005787 x L (in) x W (in)

L = Length in inches. W = Width in inches

For large tanks or pits measure length and width in feet.

Bbl. per inch of depth of fluid	=	.01484 x L (ft.) x W (ft.)
Gal. per inch of depth of fluid	=	.6234 x L (ft.) x W (ft.)
Cu. ft. per inch of depth of fluid	=	.08333 x L (ft.) x W (ft.)

Formulas for Calculating Contents of Pipe Lines

Barrels per lineal ft.	=	.0009714 x D^2
Lineal ft. per barrel	=	$\frac{1029.4}{D^2}$
Gallons per lineal ft.	=	.0408 x D^2
Lineal ft. per gallon	=	$\frac{24.51}{D^2}$
Cu. ft. per lineal ft.	=	.005454 x D^2
Lineal ft. per cu. ft.	=	$\frac{183.35}{D^2}$

D = Diameter in inches.

Formulas for Calculating Velocity and Horsepower

Feet per second	=	$\frac{\text{B.P.H. x .2859}}{(\text{Diameter in inches})^2}$
Feet per second	=	$\frac{\text{B.P.D. x .0119}}{(\text{Diameter in inches})^2}$
Feet per second	=	$\frac{\text{G.P.M. x .4085}}{(\text{Diameter in inches})^2}$
Hydraulic Horsepower	=	$\frac{\text{B.P.H. x Pressure (psi)}}{2447}$
Hydraulic Horsepower	=	B.P.H. x Pressure (psi) x .000409
Hydraulic Horsepower	=	B.P.D. x Pressure (psi) x .000017
Hydraulic Horsepower	=	B.P.M. x Pressure (psi) x .0245
Hydraulic Horsepower	=	G.P.M. x Pressure (psi) x .000584
Brake Horsepower	=	$\frac{\text{B.P.H. x Pressure (psi) x .000409}}{\text{Efficiency}}$
Brake Horsepower	=	$\frac{\text{B.P.D. x Pressure (psi) x .000017}}{\text{Efficiency}}$
Brake Horsepower	=	$\frac{\text{G.P.M. x Pressure (psi) x.000584}}{\text{Efficiency}}$

Note:

B.P.M. Barrels per minute B.P.D. = Barrels per day

B.P.H. Barrels per hour psi = Pounds per square inch

Formula for Calculating Volume and Height Between: Tubing and Hole Casing and Hole Tubing and Casing Casing and Casing

Cu. ft. per lin. ft.	=	$(D^2 - d^2)\ 0.005454$
Lin. ft. per cu. ft.	=	$\frac{183.35}{D^2 - d^2}$
Gallons per lin. ft.	=	$(D^2 - d^2)\ 0.0408$
Lin. ft. per gallon	=	$\frac{24.51}{D^2 - d^2}$
Barrels per lin. ft.	=	$(D^2 - d^2)\ 0.0009714$
Lin. ft. per barrel	=	$\frac{1029.4}{D^2 - d^2}$

Where:

For Volume and Height between Tubing and Hole
- D = Diameter of hole, inches.
- d = Outside diameter of tubing, inches.

For Volume and Height between Casing and Hole
- D = Diameter of hole, inches.
- d = Outside diameter of casing, inches.

For Volume and Height between Tubing and Casing
- D = Inside diameter of casing, inches.
- d = Outside diameter of tubing, inches.

For Volume and Height between Casings
- D = Inside diameter of outer casing, inches.
- d = Outside diameter of inner casing, inches.

Formulas for Volume and Height Between Multiple Tubing Strings and Hole (or Casing)

Cu. ft. per lin. ft.	=	$(D^2 - d^2)\ 0.005454$
Lin. ft. per cu. ft.	=	$\frac{183.35}{D^2 - d^2}$
Gallons per lin. ft.	=	$(D^2 - d^2)\ 0.0408$
Lin. ft. per gallon	=	$\frac{24.51}{D^2 - d^2}$
Barrels per lin. ft.	=	$(D^2 - d^2)\ 0.0009714$
Lin. ft. per barrel	=	$\frac{1029.4}{D^2 - d^2}$

Where:

D = Diameter of hole, inches (or ID of casing).
d = Outside diameter of tubing, inches.
n = Number of tubing strings.

Formulas for Manual Tong
(Torque in Foot Pounds)

Line Pull (Lbs.) x Tong Length in Feet = Torque in Ft./Lbs.

Example: 4000 Lbs. Line Pull with 42 in. Tongs will give 14,000 Ft./Lbs. of Torque

Decimal Equivalents of Fractions of an Inch in Inches and Millimeters

Fraction	Dec. Equiv.	*Millimeters*	Fraction	Dec. Equiv.	*Millimeters*
1/64	.015625	*0,397*	33/64	.515625	*13,097*
1/32	.03125	*0,794*	17/32	.53125	*13,494*
3/64	.046875	*1,191*	35/64	.546875	*13,891*
1/16	.0625	*1,588*	9/16	.5625	*14,288*
5/64	.078125	*1,984*	37/64	.578125	*14,684*
3/32	.09375	*2,381*	19/32	.59375	*15,081*
7/64	.109375	*2,778*	39/64	.609375	*15,478*
1/8	.1250	*3,175*	5/8	.6250	*15,875*
9/64	.140625	*3,572*	41/64	.640625	*16,272*
5/32	.15625	*3,969*	21/32	.65625	*16,669*
11/64	.171875	*4,366*	43/64	.671875	*17,066*
3/16	.1875	*4,763*	11/16	.6875	*17,463*
13/64	.203125	*5,159*	45/64	.703125	*17,859*
7/32	.21875	*5,556*	23/32	.71875	*18,256*
15/64	.234375	*5,953*	47/64	.734375	*18,653*
1/4	.2500	*6,350*	3/4	.7500	*19,050*
17/64	.265625	*6,747*	49/64	.765625	*19,447*
9/32	.28125	*7,144*	25/32	.78125	*19,844*
19/64	.296875	*7,541*	51/64	.796875	*20,241*
5/16	.3125	*7,938*	13/16	.8125	*20,638*
21/64	.328125	*8,334*	53/64	.828125	*21,034*
11/32	.34375	*8,731*	27/32	.84375	*21,431*
23/64	.359375	*9,128*	55/64	.859375	*21,828*
3/8	.3750	*9,525*	7/8	.8750	*22,225*
25/64	.390625	*9,922*	57/64	.890625	*22,622*
13/32	.40625	*10,319*	29/32	.90625	*23,019*
27/64	.421875	*10,716*	59/64	.921875	*23,416*
7/16	.4375	*11,113*	15/16	.9375	*23,813*
29/64	.453125	*11,509*	61/64	.953125	*24,209*
15/32	.46875	*11,906*	31/32	.96875	*24,606*
31/64	.484375	*12,303*	63/64	.984375	*25,003*
1/2	.5000	*12,700*	1	1.000	*25,400*

Decimal Equivalents of Inches in Feet and Millimeters

Inches	Dec. Equiv. Feet	*Millimeters*
1	.0833	*25,4*
2	.1667	*50,8*
3	.2500	*76,2*
4	.3333	*101,6*
5	.4167	*127,0*
6	.5000	*152,4*
7	.5833	*177,8*
8	.6667	*203,2*
9	.7500	*228,6*
10	.8333	*254,0*
11	.9167	*279,4*
12	1.000	*304,8*

O-RING DIMENSIONS

SIZE			ASA PART NUMBER
O.D. (in.)	I.D. (in.)	CROSS SECTION (in.)	
7/16	5/16	1/16	568-011
3/4	5/8	1/16	568-016
15/16	13/16	1/16	568-019
1-1/16	15/16	1/16	568-021
1-1/4	1-1/8	1/16	568-024
1-7/8	1-3/4	1/16	568-031
2-1/2	2-3/8	1/16	568-036
3-3/8	3-1/4	1/16	568-042
9/16	3/8	3/32	568-110
11/16	1/2	3/32	568-112
3/4	9/16	3/32	568-113
13/16	5/8	3/32	568-114
7/8	11/16	3/32	568-115
15/16	3/4	3/32	568-116
2-7/16	2-1/4	3/32	568-140
2-11/16	2-1/2	3/32	568-144
2-3/4	2-9/16	3/32	568-145
3-7/16	3-1/4	3/32	568-152
1	3/4	1/8	568-210
1-1/16	13/16	1/8	568-211
1-1/8	7/8	1/8	568-212
1-3/16	15/16	1/8	568-213
1-1/4	1	1/8	568-214
1-5/16	1-1/16	1/8	568-215
1-3/8	1-1/8	1/8	568-216
1-7/16	1-3/16	1/8	568-217
1-1/2	1-1/4	1/8	568-218
1-9/16	1-5/16	1/8	568-219
1-5/8	1-3/8	1/8	568-220
1-11/16	1-7/16	1/8	568-221
1-3/4	1-1/2	1/8	568-222
1-7/8	1-5/8	1/8	568-223
2	1-3/4	1/8	568-224
2-1/8	1-7/8	1/8	568-225
2-1/4	2	1/8	568-226

SIZE			ASA PART NUMBER
O.D. (in.)	I.D. (in.)	CROSS SECTION (in.)	
2-3/8	2-1/8	1/8	568-227
2-1/2	2-1/4	1/8	568-228
2-5/8	2-3/8	1/8	568-229
2-3/4	2-1/2	1/8	568-230
2-7/8	2-5/8	1/8	568-231
3	2-3/4	1/8	568-232
3-1/8	2-7/8	1/8	568-233
3-1/4	3	1/8	568-234
3-3/8	3-1/8	1/8	568-235
3-1/2	3-1/4	1/8	568-236
3-5/8	3-3/8	1/8	568-237
3-3/4	3-1/2	1/8	568-238
3-7/8	3-5/8	1/8	568-239
4	3-3/4	1/8	568-240
4-1/8	3-7/8	1/8	568-241
4-1/4	4	1/8	568-242
4-3/8	4-1/8	1/8	568-243
4-1/2	4-1/4	1/8	568-244
4-5/8	4-3/8	1/8	568-245
4-3/4	4-1/2	1/8	568-246
4-7/8	4-5/8	1/8	568-247
5	4-3/4	1/8	568-248
5-1/8	4-7/8	1/8	568-249
5-1/4	5	1/8	568-250
5-3/8	5-1/8	1/8	568-251
5-1/2	5-1/4	1/8	568-252
5-5/8	5-3/8	1/8	568-253
5-3/4	5-1/2	1/8	568-254
5-7/8	5-5/8	1/8	568-255
6	5-3/4	1/8	568-256
6-1/8	5-7/8	1/8	568-257
6-1/4	6	1/8	568-258
6-1/2	6-1/4	1/8	568-259
6-3/4	6-1/2	1/8	568-260
7	6-3/4	1/8	568-261

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O-RING DIMENSIONS

SIZE			ASA PART NUMBER
O.D. (in.)	I.D. (in.)	CROSS SECTION (in.)	
7-1/4	7	1/8	568-262
7-1/2	7-1/4	1/8	568-263
7-3/4	7-1/2	1/8	568-264
8	7-3/4	1/8	568-265
8-1/4	8	1/8	568-266
8-1/2	8-1/4	1/8	568-267
8-3/4	8-1/2	1/8	568-268
9	8-3/4	1/8	568-269
9-1/4	9	1/8	568-270
9-1/2	9-1/4	1/8	568-271
9-3/4	9-1/2	1/8	568-272
10	9-3/4	1/8	568-273
10-1/4	10	1/8	568-274
11-1/4	11	1/8	568-276
1-7/8	1-1/2	3/16	568-325
2	1-5/8	3/16	568-326
2-1/8	1-3/4	3/16	568-327
2-1/4	1-7/8	3/16	568-328
2-3/8	2	3/16	568-329
2-1/2	2-1/8	3/16	568-330
2-5/8	2-1/4	3/16	568-331
2-3/4	2-3/8	3/16	568-332
2-7/8	2-1/2	3/16	568-333
3	2-5/8	3/16	568-334
3-1/8	2-3/4	3/16	568-335
3-1/4	2-7/8	3/16	568-336
3-3/8	3	3/16	568-337
3-1/2	3-1/8	3/16	568-338
3-5/8	3-1/4	3/16	568-339
3-3/4	3-3/8	3/16	568-340
3-7/8	3-1/2	3/16	568-341
4	3-5/8	3/16	568-342
4-1/8	3-3/4	3/16	568-343
4-1/4	3-7/8	3/16	568-344
4-3/8	4	3/16	568-345

SIZE			ASA PART NUMBER
O.D. (in.)	I.D. (in.)	CROSS SECTION (in.)	
4-1/2	4-1/8	3/16	568-346
4-5/8	4-1/4	3/16	568-347
4-3/4	4-3/8	3/16	568-348
4-7/8	4-1/2	3/16	568-349
7-5/8	7-1/4	3/16	568-366
5	4-1/2	1/4	568-425
5-1/8	4-5/8	1/4	568-426
5-1/4	4-3/4	1/4	568-427
5-3/8	4-7/8	1/4	568-428
5-1/2	5	1/4	568-429
5-5/8	5-1/8	1/4	568-430
5-3/4	5-1/4	1/4	568-431
5-7/8	5-3/8	1/4	568-432
6	5-1/2	1/4	568-433
6-1/8	5-3/8	1/4	568-434
6-1/4	5-3/4	1/4	568-435
6-3/8	5-7/8	1/4	568-436
6-1/2	6	1/4	568-437
6-3/4	6-1/4	1/4	568-438
7	6-1/2	1/4	568-439
7-1/4	6-3/4	1/4	568-440
7-1/2	7	1/4	568-441
7-3/4	7-1/4	1/4	568-442
8	7-1/2	1/4	568-443
8-1/4	7-3/4	1/4	568-444
8-1/2	8	1/4	568-445
9	8-1/2	1/4	568-446
9-1/2	9	1/4	568-447
10	9-1/2	1/4	568-448
10-1/2	10	1/4	568-449
11	10-1/2	1/4	568-450
11-1/2	11	1/4	568-451
12	11-1/2	1/4	568-452
14-1/2	14	1/4	568-457

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CONVERSION TABLE FOR HARDNESS TESTING

(APPROXIMATE VALUES)

Brinell		Rockwell		
Impression Diameter	Hard-ness No.	C Scale	B Scale	Tensile Strength
2.45	627	60		311
2.50	601	58		298
2.55	578	57		287
2.60	555	55		276
2.65	534	53		266
2.70	514	52		256
2.75	495	50		247
2.80	477	49		238
2.85	461	47		229
2.90	444	46		220
2.95	429	45		212
3.00	415	44		204
3.05	401	42		196
3.10	388	41		189
3.15	375	40	110	182
3.20	363	38	110	176
3.25	352	37	109	170
3.30	341	36	109	165
3.35	331	35	108	160
3.40	321	34	108	155
3.45	311	33	107	150
3.50	302	32	107	146
3.55	293	31	106	142
3.60	285	30	105	138
3.65	277	29	104	134
3.70	269	28	104	131
3.75	262	26	103	128

Brinell		Rockwell		
Impression Diameter	Hard-ness No.	C Scale	B Scale	Tensile Strength
3.80	255	25	102	125
3.85	248	24	101	122
3.90	241	23	100	119
3.95	235	22	99	116
4.00	229	21	98	113
4.05	223	20	97	110
4.10	217	18	96	107
4.15	212	16	96	104
4.20	207	15	95	101
4.25	202	14	94	99
4.30	197	13	93	97
4.35	192	12	92	95
4.40	187	10	91	93
4.45	183	9	90	91
4.50	179	8	89	89
4.55	174	6	88	87
4.60	170	5	87	85
4.65	166	4	86	83
4.70	163	3	85	82
4.75	159		84	80
4.80	156		83	78
4.85	153		82	76
4.90	149		81	75
4.95	146		80	74
5.00	143		79	72
5.05	140		78	71
5.10	137		77	70

Diameter of Impression 3,000 kg. load - 10 MM. Steel Ball.
Rockwell C-Scale 150 kg. load - 120° Diamond Cone.
Rockwell B-Scale 100 kg. load - .0625 in. Steel Ball.
Tensile Strength 1000 pounds per square inch.

PRESSURE DROP ACROSS A SINGLE NOZZLE (ORIFICE)

(USING 10 LB/GAL. MUD AND A NOZZLE COEFFICIENT OF .95)

VOLUME FLOW RATE (G) IN GPM	PRESSURE DROP IN PSI ACROSS NOZZLES OF DIAMETERS SHOWN BELOW (inches)							
	1/8	9/64	5/32	11/64	3/16	13/64	7/32	15/64
10	612	382	250	171	121	88	65	49
12	881	550	361	246	174	126	94	71
14	1,199	748	491	335	237	172	128	97
16	1,566	977	641	438	309	225	167	127
18		1,237	812	554	391	284	211	160
20		1,527	1,002	684	483	351	261	198
22			1,212	828	585	424	316	239
24			1,443	985	696	505	376	285
26			1,693	1,157	817	593	441	334
28				1,341	947	688	511	388
30				1,540	1,087	789	587	445
32					1,237	898	668	507
34					1,396	1,014	754	572
36					1,566	1,137	845	641
38						1,266	942	714
40						1,403	1,043	792
42						1,547	1,150	873
44							1,262	958
46							1,380	1,047
48							1,502	1,140
50								1,237
52								1,338
54								1,443
56								1,552
58								1,664
60								1,781

FORMULA USED: $$P = \frac{G^2 D}{12{,}031\, A^2 C^2}$$

WHERE FORMULA APPLIES:

P = Pressure drop (PSI) across rock bit nozzle.
G = Volume of circulated fluid (GPM).
D = Fluid density (pounds per gallon).
A = Nozzle area in square inches.
C = The coefficient of the orifice.

PRESSURE DROP ACROSS A SINGLE NOZZLE (ORIFICE)

(USING 10 LB/GAL. MUD AND A NOZZLE COEFFICIENT OF .95)

VOLUME FLOW RATE (G) IN GPM	PRESSURE DROP IN PSI ACROSS NOZZLES OF DIAMETERS SHOWN BELOW (inches)							
	1/4	17/64	9/32	19/64	5/16	11/32	3/8	13/32
20	153	120	95	77	63	43	30	22
21	169	132	105	85	69	47	33	24
25	239	187	149	120	98	67	47	34
30	344	270	215	173	141	96	68	49
35	468	367	292	235	192	131	92	67
40	612	480	382	308	250	171	121	88
42	674	529	421	339	276	189	133	97
45	774	607	483	389	317	217	153	111
50	956	750	597	481	391	267	189	137
55	1,156	907	722	581	474	323	228	166
60	1,376	1,080	859	692	564	385	272	197
63	1,517	1,190	947	763	621	424	300	218
65	1,615	1,267	1,008	812	661	452	319	232
70		1,470	1,169	942	767	524	370	269
75		1,687	1,342	1,081	881	601	425	308
80			1,527	1,230	1,002	684	483	351
84			1,684	1,356	1,105	754	533	387
85				1,389	1,131	773	545	396
90				1,557	1,268	866	612	444
95					1,413	965	681	495
100					1,566	1,069	755	548
105					1,726	1,179	832	604
110						1,294	914	663
115						1,414	998	725
120						1,540	1,087	789
126						1,698	1,199	870
130							1,276	926
140							1,480	1,074
147							1,631	1,184
150								1,233
160								1,403
168								1,547

FORMULA USED: $$\frac{P = G^2 D}{12{,}031\, A^2 C^2}$$

WHERE FORMULA APPLIES:

P = Pressure drop (PSI) across rock bit nozzle.
G = Volume of circulated fluid (GPM).
D = Fluid density (pounds per gallon).
A = Nozzle area in square inches.
C = The coefficient of the orifice.

PRESSURE DROP ACROSS A SINGLE NOZZLE (ORIFICE)

(USING 10 LB/GAL. MUD AND A NOZZLE COEFFICIENT OF .95)

VOLUME FLOW RATE (G) IN GPM	PRESSURE DROP IN PSI ACROSS NOZZLES OF DIAMETERS SHOWN BELOW (inches)								
	7/16	15/32	1/2	9/16	5/8	11/16	3/4	13/16	7/8
30	37								
40	65								
50	102	77							
60	147	111	86						
70	200	152	117	73					
80	261	198	153	95	63	43			
90	330	250	193	121	79	54	38	28	
100	408	309	239	149	98	67	47	34	25
110	493	374	289	180	118	81	57	41	31
120	587	445	344	215	141	96	68	49	37
130	689	523	404	252	165	113	80	58	43
140	799	606	468	292	192	131	92	67	50
150	917	696	537	336	220	150	106	77	57
160	1,043	792	612	382	250	171	121	88	65
180		1,002	774	483	317	217	153	111	83
200		1,237	956	597	391	267	189	137	102
220		1,497	1,156	722	474	323	228	166	123
240			1,376	859	564	385	272	197	147
260			1,615	1,008	661	452	319	232	172
280			1,873	1,169	767	524	370	269	200
300			2,150	1,342	881	601	425	308	229
320				1,527	1,002	684	483	351	261
340				1,724	1,131	773	545	396	294
360					1,268	866	612	444	330
380					1,413	965	681	495	368
400					1,566	1,069	755	548	408
450							956	694	516
500							1,180	856	637

FORMULA USED: $$\frac{P = G^2 D}{12{,}031\ A^2\ C^2}$$

WHERE FORMULA APPLIES:

P = Pressure drop (PSI) across rock bit nozzle.
G = Volume of circulated fluid (GPM).
D = Fluid density (pounds per gallon).
A = Nozzle area in square inches.
C = The coefficient of the orifice.

PUMP OUTPUT TABLES
SINGLE ACTING TRIPLEX PUMP

STROKE (in.)	BORE (in.)	100% EFFICIENCY		90% EFFICIENCY	
		(cu. ft.)	(bbl.)	(cu. ft.)	(bbl.)
4	3.00	.0491	.0087	.0442	.0078
4	3.25	.0576	.0103	.0518	.0093
4	3.50	.0668	.0119	.0601	.0107
4	3.75	.0767	.0137	.0690	.0123
4	4.00	.0873	.0155	.0786	.0140
4	4.50	.1104	.0197	.0994	.0177
4	5.00	.1364	.0243	.1228	.0219
4	6.00	.1963	.0350	.1767	.0315
4	8.00	.3491	.0622	.3142	.0560
6	3.00	.0737	.0131	.0663	.0117
6	3.25	.0864	.0155	.0777	.0140
6	3.50	.1002	.0179	.0902	.0161
6	3.75	.1151	.0206	.1035	.0185
6	4.00	.1310	.0233	.1179	.0210
6	4.50	.1656	.0296	.1491	.0266
6	5.00	.2046	.0365	.1842	.0329
6	6.00	.2945	.0525	.2651	.0473
6	8.00	.5237	.0933	.4713	.0840
8	3.00	.0982	.0174	.0884	.0156
8	3.25	.1152	.0206	.1036	.0186
8	3.50	.1336	.0238	.1202	.0214
8	3.75	.1534	.0274	.1380	.0246
8	4.00	.1746	.0310	.1572	.0280
8	4.50	.2208	.0394	.1988	.0354
8	5.00	.2728	.0486	.2456	.0438
8	6.00	.3926	.0700	.3534	.0630
8	8.00	.6982	.1244	.6284	.1120
10	3.00	.1228	.0218	.1105	.0195
10	3.25	.1440	.0256	.1295	.0233
10	3.50	.1670	.0298	.1503	.0268
10	3.75	.1918	.0343	.1725	.0308
10	4.00	.2183	.0388	.1965	.0350
10	4.50	.2760	.0493	.2486	.0443
10	5.00	.3410	.0608	.3070	.0548
10	6.00	.4908	.0875	.4418	.0788
10	8.00	.8728	.1555	.7855	.1400

PUMP OUTPUT TABLES
DOUBLE ACTING TRIPLEX PUMP

STROKE (in.)	BORE (in.)	ROD D. (in.)	100% EFFICIENCY		90% EFFICIENCY	
			(cu. ft.)	(bbl.)	(cu. ft.)	(bbl.)
6	4.00	1.5	0.1623	0.0289	0.1460	0.0260
8	4.00	1.5	0.2163	0.0385	0.1947	0.0347
8	4.50	1.5	0.2782	0.0495	0.2503	0.0446
8	5.00	1.5	0.3472	0.0618	0.3125	0.0557
10	4.00	1.5	0.2704	0.0482	0.2434	0.0433
10	4.50	1.5	0.3477	0.0619	0.3129	0.0557
10	5.00	2.0	0.4182	0.0745	0.3763	0.0670
12	4.00	1.5	0.3245	0.0578	0.2921	0.0520
12	4.50	1.5	0.4172	0.0743	0.3755	0.0669
12	5.00	2.0	0.5018	0.0894	0.4516	0.0804
12	5.50	2.0	0.6163	0.1098	0.5547	0.0988
14	4.50	1.5	0.4868	0.0867	0.4381	0.0780
14	5.00	2.0	0.5854	0.1043	0.5269	0.0938
14	5.50	2.0	0.7190	0.1281	0.6471	0.1153
14	6.00	2.0	0.8654	0.1541	0.7789	0.1387
14	6.25	2.0	0.9433	0.1680	0.8490	0.1512
14	6.50	2.0	1.0245	0.1825	0.9220	0.1642
14	6.75	2.0	1.1088	0.1975	O.9979	0.1777
14	7.00	2.0	1.1963	0.2131	1.0766	0.1918
14	7.25	2.5	1.2583	0.2241	1.1325	0.2017
14	7.50	2.5	1.3522	0.2408	1.2170	0.2167
14	7.75	2.5	1.4492	0.2581	1.3043	0.2323
16	5.00	2.5	0.6363	0.1133	0.5727	0.1020
16	5.50	2.5	0.7890	0.1405	0.7101	0.1265
16	6.00	2.5	0.9563	0.1703	0.8607	0.1533
16	6.25	2.5	1.0454	0.1862	0.9408	0.1676
16	6.50	2.5	1.1381	0.2027	1.0245	0.1824
16	6.75	2.5	1.2345	0.2199	1.1110	0.1979
16	7.00	2.5	1.3344	0.2377	1.2010	0.2139
16	7.25	2.5	1.4381	0.2561	1.2943	0.2305
16	7.50	2.5	1.5453	0.2752	1.3908	0.2477
16	7.75	2.5	1.6562	0.2950	1.4906	0.2655
18	5.00	2.5	0.7159	0.1275	0.6443	0.1147
18	5.50	2.5	0.8877	0.1581	0.7989	0.1423
18	6.00	2.5	1.0758	0.1916	0.9682	0.1725
18	6.25	2.5	1.1761	0.2095	1.0584	0.1885
18	6.50	2.5	1.2804	0.2280	1.1523	0.2052
18	6.75	2.5	1.3888	0.2473	1.2499	0.2226
18	7.00	2.5	1.5013	0.2674	1.3511	0.2406
18	7.25	2.5	1.6178	0.2881	1.4561	0.2593
18	7.50	2.5	1.7385	0.3096	1.5647	0.2787
18	7.75	2.5	1.8633	0.3319	1.6769	0.2987
20	6.50	2.5	1.4226	0.2534	1.2804	0.2280
20	6.75	2.5	1.5431	0.2748	1.3888	0.2473
20	7.00	2.5	1.6681	0.2971	1.5013	0.2674
20	7.25	2.5	1.7976	0.3202	1.6178	0.2881
20	7.50	2.5	1.9317	0.3440	1.7385	0.3096
20	7.75	2.5	2.0703	0.3687	1.8633	0.3319
20	8.00	2.5	2.2135	0.3942	1.9921	0.3548

NOTES: 1. Volumes shown are for one complete cycle or revolution.
2. To get output in volume/minute, mutiply output/cycle by pump RPM.
3. For triplex double acting pump, multiply output by 1.5.

WIRELINE CABLE TABLE

NOMINAL DIAMETER (in.)	3/16	7/32	5/16	5/16	3/8	3/8	7/16	7/16	15/32	17/32
NO. OF CONDUCTOR WIRES	1	1	1	7	1	7	1	7	7	7
BREAKING LOAD (lbs.)	3,600	5,000	10,400	9,500	14,500	12,000	17,500	16,000	17,000	25,500
WEIGHT (lbs./1000 ft.)	65	95	189	184	262	246	317	324	344	476

COURTESY: ATLAS WIRELINE SERVICES DIVISION OF WESTERN ATLAS INTERNATIONAL, INC.

STRENGTH OF J-TYPE SAFETY JOINT

SIZE (in.)	JOINT PART NO.	TORSIONAL STRENGTH (ft.-lbs.)	TENSILE STRENGTH (lbs.)	MAKE-UP TORQUE (ft.-lbs.)
2-3/8 EUE	1-1535	5,000	225,000	1,800
2-3/8 API-I.F.	1-1595	10,000	300,000	3,000
2-7/8 API-I.F.	1-1530	12,000	300,000	5,000
3-1/2 API-I.F.	1-1538	14,000	375,000	6,500
4 API-F.H.	1-1904	22,000	550,000	8,500
4-1/2 API-F.H.	1-1518	30,000	600,000	11,500
4-1/2 API-I.F.	1-2345	39,000	800,000	12,500
4-1/2 X-HOLE	1-1653	*35,500	800,000	12,000
5-1/2 API-REG.	1-1520	*64,000	**800,000	20,500
6-5/8 API-REG.	1-1356	*87,000	**1,300,000	27,000

* JOINT STRENGTH.

** SHEAR ON LUGS.

STRENGTH DATA BASED ON:

125,000 PSI MINIMUM TENSILE YIELD STRENGTH.

62,500 PSI MINIMUM TORSIONAL YIELD STRENGTH.

ALL CALCULATIONS ARE THEORETICAL AND DO NOT CONSTITUTE OR IMPLY A GUARANTEE OF STRENGTH.

ROCK BIT DESIGNATIONS

SERIES		FORMATIONS	TYPE	1 STANDARD ROLLER BEARING					2 ROLLER BEARING AIR COOLED					3 ROLLER BEARING GAGE PROTECTED					4 SEALED ROLLER BEARING				
				HC	RTC	SEC	SM	VAR	HC	RTC	SEC	SM	VAR	HC	RTC	SEC	SM	VAR	HC	RTC	SEC	SM	VAR
MILLED TOOTH BITS	1	SOFT	1	R1	Y11	S3SJ S3SJD 2S3SJD	DSJ	L111											ATX-1 X3A	S11	S33S MS33S SS33S	SDS	L114
			2	R2	Y12	S3J S3TJ	DTJ	L121									DTT				S33	SDT	L124
			3	R3		S4J S4TJ S4T	DGJ	L131									DGT		ATX-3		S44		L134
			4																				
	2	MED.	1	R4		M4NJ	V2J	L211									V2H				M44N		L214
			2			M4																	
			3					L231									T2H						L234
			4																				
	3	HARD	1			H7J H7		L311									L4H				H77		L314
			2	R7				L321															
			3																				
			4																				

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ROCK BIT DESIGNATIONS

SERIES		FORMATIONS	TYPE	5 SEALED ROLLER BEARING GAGE PROTECTED						6 SEALED FRICTION BEARING						7 SEALED FRICTION BEARING GAGE PROTECTED					
				HC		RTC	SEC	SM	VAR	HC		RTC	SEC	SM	VAR	HC		RTC	SEC	SM	VAR
					METAL						METAL						METAL				
MILLED TOOTH BITS	1	SOFT	1	ATX-G1	MAX-G1		S33SG SS33SG	MSDSH	L115	ATJ-1 ATJ-1S	ATM-1 ATM-1S	HP11	S33SF	FDS FDS-1	L116		ATM-G1 ATM-G1S		S33SGF	MFDSH	
			2				S33G SS33G		L125	ATJ-2 J2,J2T		HP12	S33F	FDT	L126	JG2			S33TGF		L127
			3	ATX-G3 XGG	MAX-G3	S13G	S44G SS44G	SDGH MSDGH	L135				S44F		L136	JG3	ATM-G3	HP13G	S44GF	FDGH MFDGH	L137
			4			S21G	M44NG	SVH	L215				M44NF		L216	JG4		HP21G	M44NGF	FVH	
	2	MED.	1				MM44NG														
			2				DMM		L235						L236						
			3																		
			4			S31G			L315				H77F		L316	JG7		HP31G			
	3	HARD	1																		
			2				H77SG						H77SGF								
			3													JG8					
			4																		

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ROCK BIT DESIGNATIONS

SERIES		FORMATIONS	TYPE	2 ROLLER BEARING AIR COOLED					5 SEALED ROLLER BEARING GAGE PROTECTED						7 SEALED FRICTION BEARING GAGE PROTECTED					
				HC	RTC	SEC	SM	VAR	HC		RTC	SEC	SM	VAR	HC		RTC	SEC	SM	VAR
										METAL						METAL				
INSERT BITS	4	SOFT	1						ATX-05	MAX-05					ATJ-05	ATM-05				
			2												ATJ-05C					
			3						ATX-11 ATX-11H	MAX-11H	S43A	S82 SS82	M1S	V435	ATJ-11 ATJ-11S ATJ-11H	ATM-11 ATM-11H	HP43A	S82F S82CF	F1	V437 V437Y
			4						ATX-11C				15JS M15S M15SD		ATJ-11C	ATM-11C ATM-11CG			F15,F17 MF15 MF15D	
	5	SOFT TO MED.	1						ATX-22		S51A	2SS82 S84 SS84	2JS M2S M2SD	V515	ATJ-22 ATJ-22S	ATM-22 ATM-22G	HP51 HP51A HP51X HP51H	S84F S84CF DS84F	F2,F2H F25,F15H MF2D,A1 MF2HD	V517 V517Y
			2								S52A			V525	ATJ-22C	ATM-22C	HP52A HP52X	S85F S85CF	F27 MF27D	V527 V527Y
			3					DW532 DW533			S53A	S86 SS86	3JS	V535	ATJ-33 ATJ-33S ATJ-33A	ATM-33	HP53 HP53A	S86F S86CF	F3,F3H MF3H MF3D	V537 V537Y
			4			S8JA						S88 GS88			ATJ-33C ATJ-35C	ATM-33C	HP54	S88F S88CF S88FA	F37 F37D	V547

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ROCK BIT DESIGNATIONS

SERIES		FORMATIONS	TYPE	2 ROLLER BEARING AIR COOLED					5 SEALED ROLLER BEARING GAGE PROTECTED						7 SEALED FRICTION BEARING GAGE PROTECTED					
				HC	RTC	SEC	SM	VAR	HC		RTC	SEC	SM	VAR	HC		RTC	SEC	SM	VAR
										METAL						METAL				
INSERT BITS	6	MED.	1	G44				DW612 DW613				M84	4JS	V615	ATJ-44 ATJ-44A		HP61 HP61A	M84F M84FA M84CF M85F	F4,F4A F45A F4H F45H	V617 V617Y
			2		Y62JA	M8JA	47JA 5GA	DW622 DW623			S62A	M89T M88 GM88		V625	ATJ-44C		HP62 HP62A	M89TF M88F M88FA	F47 F47H F5	V627
			3	G55	Y63JA			DW632 DW633							ATJ-55R ATJ-55 ATJ-55A		HP63	M89F	F57 F57A F57D	V637
			4															M90F		
	7	HARD	1																	
			2																	V727
			3	G77	Y73JA		7JA	DW732 DW733						V735	ATJ-77		HP73	H87F	F7	V737
			4			H8JA						H88						H88F		
	8	EXTRA HARD	1			H9JA												H99F		
			2																	
			3	G99	Y83JA	H10JA	9JA					H100			ATJ-99 ATJ-99A		HP83	H100F	F9	

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BOWEN RELEASING & CIRCULATING OVERSHOTS SERIES "150"

BOWL NO.	MAXIMUM CATCH SIZE (w/spiral grapple)	O.D. (in.)	LOAD CAPACITY @ YIELD PT. (lbs.) SPIRAL GRAPPLE	BASKET GRAPPLE W/O STOP	BASKET GRAPPLE WITH STOP	BOWL NO.	MAXIMUM CATCH SIZE (w/spiral grapple)	O.D. (in.)	LOAD CAPACITY @ YIELD PT. (lbs.) SPIRAL GRAPPLE	BASKET GRAPPLE W/O STOP	BASKET GRAPPLE WITH STOP
249	6	7-5/8	670,000	580,000	442,000	B-4516	7-1/2	9-1/8	637,000	574,300	462,000
266	8	9-5/8	602,700	510,750	422,000	B-4519	5-1/4	6-7/8	637,000	574,300	462,000
M-266	8	9-5/8	625,000	537,800	406,600	B-4563	3-1/2	5-1/8	625,000	526,000	330,000
277	6-3/4	8-3/4	637,000	542,250	408,250	B-4621	3-1/2	4-3/8	267,400	220,700	144,300
905	4-7/8	6-1/8	405,000	367,000	298,000	B-4688	3-3/4	5-1/8	489,000	447,000	354,000
M-1026-1	7-1/4	8-7/8	586,900	515,600	426,500	B-4693	6-1/4	7-3/8	414,100	373,100	283,600
B-1231	8-3/8	10-1/16	637,500	574,300	462,000	4717	4-1/4	5-1/4	312,500	264,000	196,000
1248	3-1/2	4-5/8	241,000	256,000	177,000	B-4734	3-1/2	4-13/16	456,000	396,000	286,000
1283	7-3/4	9-3/8	637,000	542,250	408,250	B-4738	2-7/8	4	304,000	221,500	199,000
1446	2-3/8	4-1/8	355,000	304,000	260,000	B-4743	2-3/8	3-1/2	309,000	265,500	167,000
B-1501	7-3/4	9-3/8	592,000	520,000	340,000	B-4816	4-1/2	5-13/16	439,200	396,000	286,000
1619	6-5/8	8-1/8	590,000	500,000	403,000	B-4821	4-1/4	5-9/16	439,200	396,000	286,000
1641	6-1/4	7-5/8	486,900	431,100	348,000	B-4824	3-1/8	4-1/4	291,800	263,000	118,200
M-1641	6-1/4	7-5/8	542,468	479,044	364,490	B-4827	5	6-5/8	637,000	574,300	462,000
1657	6-1/4	7-7/8	655,000	570,000	428,000	B-4831	4-3/4	6-1/16	431,000	381,000	275,500
M-1657	6-1/4	7-7/8	645,300	564,000	482,000	B-4846	4-5/8	5-15/16	439,200	395,800	285,800
B-1828	2-7/8	3-3/4	214,000	192,800	121,400	B-4971	4-5/8	5-1/2	297,000	258,000	186,200
B-1836	3-1/8	3-7/8	154,100	138,800	77,100	B-5074	2-3/8	3-1/4	211,500	190,000	119,800
B-1871	8-7/8	11-1/4	1,605,000	1,580,000	1,395,000	B-5082	2-1/2	3-5/8	291,800	263,000	118,200
1875	6-1/4	7-5/8	542,468	479,044	364,490	B-5088	2-1/2	3-3/8	218,000	196,500	123,700
B-1881	10-1/8	12-1/2	1,364,000	1,207,000	941,700	B-5100	3-1/16	4-3/16	291,800	263,000	118,200
B-2109	6-1/4	7-7/8	586,800	515,600	413,700	B-5103	3-1/16	3-15/16	265,400	219,000	160,100
C-2205	6-1/4	7-7/8	640,000	560,000	468,000	B-5106	3-1/8	4	262,900	217,000	125,100
2382	6-1/2	8-1/4	760,000	650,000	552,000	B-5114	3-1/4	4-3/8	254,000	234,200	147,500
B-2716	8	9-5/8	601,000	541,500	435,600	B-5117	3-1/4	4-1/8	225,000	202,000	127,500
B-2791	5-1/2	7-1/8	637,500	574,300	462,000	B-5125	3-3/8	4-1/2	320,000	280,000	176,000
B-3034	6-5/8	8-1/4	637,500	574,300	462,000	B-5128	3-3/8	4-1/4	225,000	202,000	127,500
3075	4-7/8	6-3/8	558,000	510,000	369,000	B-5131	3-3/4	4-5/8	220,000	198,000	126,000
B-3264	7	8-1/8	439,200	395,800	318,400	B-5138	3-7/8	5-3/16	391,000	352,500	254,500
B-3366	6	7-5/8	637,500	574,300	462,000	B-5141	3-7/8	4-3/4	370,000	232,000	160,000
B-3522	5-3/4	7-3/8	637,500	574,300	462,000	B-5144	4	5-5/16	402,000	351,000	273,000
B-3711	6-1/2	8-1/8	586,500	515,500	413,500	B-5150	3-21/32	5	394,000	338,000	210,000
A-3795	3-1/2	4-1/2	271,000	226,000	146,500	B-5153	3-21/32	4-9/16	276,400	228,100	157,900
B-3798	4-1/2	5-5/8	268,000	320,000	211,000	5156	4	4-7/8	306,200	222,000	126,000
B-3812	5-9/16	7-1/4	675,200	608,400	489,400	B-5156	4	4-7/8	306,200	222,000	126,000
B-3816	6-3/4	8-3/8	637,000	574,300	462,000	B-5164	4-1/4	5-1/8	356,800	301,000	232,200
B-3819	7	8-5/8	637,000	574,300	462,000	B-5167	4-1/2	5-3/8	297,000	258,000	186,200
B-4218	6-1/8	7-3/4	637,000	574,300	462,000	B-5170	4-3/4	5-5/8	360,400	308,400	234,500
4392	2-7/8	4-1/8	349,000	264,000	176,000	B-5173	5	5-7/8	323,500	238,500	218,500
4503	5-1/4	6-3/8	403,000	356,000	256,000	B-5179	5-1/2	6-5/8	435,000	392,000	298,000
M-4503	5-1/4	6-3/8	397,400	358,400	278,500	B-5187	5-9/16	6-11/16	420,000	369,000	296,000

BOWEN RELEASING & CIRCULATING OVERSHOTS
SERIES "150" (Continued)

BOWL NO.	MAXIMUM CATCH SIZE (w/spiral grapple)	O.D. (in.)	LOAD CAPACITY @ YIELD PT. (lbs.)			BOWL NO.	MAXIMUM CATCH SIZE (w/spiral grapple)	O.D. (in.)	LOAD CAPACITY @ YIELD PT. (lbs.)		
				BASKET GRAPPLE						BASKET GRAPPLE	
			SPIRAL GRAPPLE	W/O STOP	WITH STOP				SPIRAL GRAPPLE	W/O STOP	WITH STOP
B-5195	5-3/4	6-7/8	435,000	395,000	298,000	7801	7	8-5/8	637,000	542,250	408,250
B-5198	6	7-1/8	435,000	392,000	298,000	7806	7-1/4	8-7/8	637,000	542,250	408,250
B-5208	6-1/8	7-1/4	435,000	392,000	298,000	7811	7-3/4	9-3/8	540,000	475,000	359,000
B-5216	6-5/8	7-3/4	350,000	306,000	246,000	7831	7-1/4	8-7/8	637,300	564,000	427,700
B-5224	6-3/4	7-7/8	531,900	467,300	375,000	8223	3-1/8	4-1/8	310,200	255,000	170,000
B-5232	7-3/8	9	637,000	574,300	462,000	8617	5-1/2	6-5/8	386,000	325,000	232,000
B-5235	7-3/8	8-1/2	416,000	365,000	292,000	B-8921	2	2-5/16	68,000	47,000	30,000
B-5243	7-5/8	9-1/4	657,000	578,000	465,000	8942	4-3/4	6	422,000	354,000	253,000
B-5251	7-5/8	8-3/4	430,000	385,000	295,000	8962	8-1/2	10-1/8	602,700	492,000	391,000
5259	7-3/4	8-7/8	416,000	345,000	276,000	M-8962	8-1/2	10-1/8	624,300	576,700	445,500
B-5259	7-3/4	8-7/8	430,000	385,000	295,000	8965	8-3/4	10-1/2	296,000	251,000	200,000
B-5267	8	9-1/8	396,000	347,500	236,000	8971	10	11-7/8	828,300	744,000	558,800
B-5283	8-1/2	10-1/8	637,000	574,300	462,000	8977	4-3/4	5-7/8	432,900	411,600	303,275
B-5286	8-1/2	9-5/8	419,500	376,000	341,000	M-8977	4-3/4	5-3/4	485,286	461,154	340,515
B-5294	8-5/8	11	1,308,000	1,240,000	1,130,000	8980	5-3/4	6-7/8	367,000	332,000	253,000
B-5299	8-5/8	10-1/4	657,000	578,000	465,000	8997	6-7/8	8	443,000	410,000	318,000
B-5307	8-7/8	10-1/2	586,600	515,400	413,600	M-8997	6-7/8	8	481,600	433,900	335,000
B-5315	9	11-3/8	1,364,000	1,207,000	942,000	9011	6-3/8	7-1/2	479,000	454,000	339,000
5323	9	10-5/8	660,000	556,000	445,000	M-9011	6-3/8	7-1/2	459,600	435,300	323,700
B-5323	9	10-5/8	586,800	515,600	426,500	9028	4-7/8	6	405,000	343,000	284,000
5331	10-1/8	11-3/4	616,000	528,000	435,000	9040	5-5/8	6-3/4	405,000	347,000	289,000
B-5331	10-1/8	11-3/4	660,000	580,000	468,000	9062	8-3/8	9-1/2	422,000	402,000	309,000
B-5346	6-1/2	7-5/8	430,000	385,000	295,000	9098	8-5/8	9-3/4	458,000	435,000	333,000
B-5356	7-1/4	8-3/8	430,000	385,000	295,000	9107	3-1/8	4-1/8	310,200	255,000	170,000
B-5427	4-1/8	5-7/16	547,600	435,500	277,100	M-9107	3-1/8	4-1/8	255,000	210,600	140,000
B-5430	4-1/8	5	296,500	258,500	201,000	9111	3-21/32	4-11/16	332,000	279,000	199,500
5700	4-5/8	5-5/8	420,000	378,500	273,000	M-9111	3-21/32	4-11/16	366,098	314,021	212,870
M-5700	4-5/8	5-5/8	349,600	315,000	227,000	9121	3-3/4	4-11/16	261,300	233,000	138,000
5735	4-5/8	5-15/16	543,375	408,000	317,000	M-9121	3-3/4	4-11/16	291,800	261,500	166,400
5735-PT	—	—	612,700	509,200	361,300	9134	6-5/8	7-3/4	422,000	400,000	318,000
5898	4-1/4	5-9/16	526,600	494,300	362,500	M-9134	6-5/8	7-3/4	345,000	315,000	227,000
6152	5-3/4	7-3/8	637,000	542,250	421,750	9164	6-3/8	7-3/4	523,500	456,000	346,500
M-6152	5-3/4	7-3/8	656,800	564,000	372,700	9205	5-3/8	6-1/2	350,000	294,000	210,000
B-6232	3-7/8	4-5/8	204,300	190,500	160,000	9211	5-1/2	6-5/8	444,000	379,000	293,000
B-7095	4-7/8	6-3/16	404,500	341,200	282,700	9219	7	8-1/8	434,300	412,000	316,100
B-7098	4-7/8	5-3/4	273,500	230,700	178,000	9233	7-3/8	8-1/2	422,000	400,000	309,000
B-7103	7-1/2	8-5/8	436,000	385,000	309,000	9239	7-5/8	8-3/4	458,000	435,000	333,000
B-7499	3-13/16	5-1/8	431,000	381,000	275,000	A-9239	3	3-5/8	129,184	107,435	55,313
7574	6	7-5/8	611,300	532,600	404,300	9245	7-7/8	9	422,000	400,000	309,000
7788	5	6-1/8	468,000	440,000	322,000	9271	2-7/8	3-5/8	193,500	157,400	78,700
7797	6-1/2	8-1/4	760,000	650,000	552,000	M-9271	2-7/8	3-5/8	229,100	195,900	102,500

BOWEN RELEASING & CIRCULATING OVERSHOTS SERIES "150" (Continued)

BOWL NO.	MAXIMUM CATCH SIZE (w/spiral grapple)	O.D. (in.)	LOAD CAPACITY @ YIELD PT. (lbs.)			BOWL NO.	MAXIMUM CATCH SIZE (w/spiral grapple)	O.D. (in.)	LOAD CAPACITY @ YIELD PT. (lbs.)		
			SPIRAL GRAPPLE	BASKET GRAPPLE W/O STOP	BASKET GRAPPLE WITH STOP				SPIRAL GRAPPLE	BASKET GRAPPLE W/O STOP	BASKET GRAPPLE WITH STOP
9291	7-1/2	9-1/8	660,200	547,500	409,000	B-14142	6-1/8	7-1/4	435,000	392,000	298,000
B-9298	3-13/16	4-11/16	265,000	214,000	106,000	14762	6-3/4	7-7/8	425,000	381,000	288,000
9306	2-3/8	3-1/8	193,500	173,200	118,000	15252	9-1/2	11-3/4	966,500	852,000	635,000
M-9306	2-3/8	3-1/8	215,526	184,312	122,700	15802	11-1/4	12-3/4	605,000	562,250	444,000
9337	6-5/8	8-1/8	590,000	500,000	403,000	16397	2-1/8	2-7/8	193,500	173,200	110,200
M-9337	6-5/8	8-1/8	587,000	505,500	382,500	16502	6-3/4	7-7/8	413,000	362,500	246,000
9517	3-7/8	5-1/4	451,000	389,500	276,500	17203	3-21/32	4-17/32	260,400	233,400	170,500
9571	7-1/8	8-1/4	422,000	400,000	307,000	17209	7	8-3/8	616,000	580,000	449,000
9637	3-3/8	4-3/8	301,000	267,000	180,000	17422	3-21/32	4-1/2	343,600	316,500	249,000
M-9637	3-3/8	4-3/8	248,700	224,000	152,900	18439	5-1/4	6-3/8	403,000	356,000	256,000
9694	6-1/4	7-3/8	471,000	448,000	283,000	19092	6-1/4	7-5/8	542,500	479,000	364,500
M-9694	6-1/4	7-3/8	467,600	444,000	340,400	19477	3-1/16	3-5/8	169,300	178,500	97,600
9727	3-3/4	5	513,000	450,000	321,000	19841	3-21/32	4-11/16	355,000	300,000	213,000
9747	6-3/8	7-1/2	479,000	454,000	339,000	20167	8-1/2	10-1/8	600,000	492,,000	391,000
9748	6-1/2	8-1/8	420,000	400,000	325,000	21302	3-3/8	3-7/8	102,500	97,500	66,500
9749	6-1/4	7-7/8	655,000	570,000	428,000	21381	4-3/4	5-3/4	449,000	420,000	308,000
B-9775	3-13/16	4-7/16	137,500	118,000	44,800	22991	4-3/4	5-3/4	428,000	410,000	303,000
9817	7	8-1/8	422,000	400,000	309,000	26352	4-3/4	5-3/4	449,000	420,000	308,000
9852	7-3/4	8-7/8	458,000	435,000	333,000	27901	6	7-5/8	670,000	580,000	442,000
9862	6-1/2	7-5/8	418,200	396,700	322,900	28072	22	24-3/4	1,270,000	1,253,800	1,076,250
M-9862	6-1/2	7-5/8	448,900	425,100	352,459	28332	2-1/16	2-3/8	68,000	48,900	32,900
9984	6-1/4	7-7/8	655,000	570,000	428,000	28500	2	2-5/16	96,000	90,600	71,500
9998	6	7-1/2	590,000	512,000	390,000	30082	3-1/16	4-1/8	347,200	347,200	190,400
B-10201	2-1/8	2-5/8	113,226	103,272	57,373	31655	16-3/4	20-1/4	NA	1,479,060	1,344,600
B-11323	6-5/8	7-3/4	345,000	315,000	227,000	31765	4-3/4	5-3/4	432,900	411,600	303,275
B-11825	5-1/8	5-3/4	135,000	115,000	71,500	32775	2-5/32	3-7/32	185,700	166,100	81,200
12277	3-21/32	4-11/16	332,000	279,000	199,500	33008	11-7/8	13-3/4	1,022,314	745,564	—
12566	6-1/4	7-3/8	471,000	448,000	283,000	64555	14-3/4	16-3/4	1,197,674	1,226,777	—
12568	6-1/4	7-3/8	471,000	448,000	283,000	36537	9-1/4	11	707,400	644,200	520,000
12694	7-1/2	8-5/8	458,000	414,400	313,400	37587	3-1/16	3-3/4	217,700	221,200	179,700
B-12824	9-5/8	11-1/4	536,800	515,600	413,700	47475	3-7/8	5-1/4	451,000	389,500	276,500
B-13681	2-7/8	3-3/4	214,000	192,800	121,400	68030	14	16	1,226,777	—	—
B-13722	4-3/4	6-1/16	431,000	381,000	275,500						

ITCO TYPE
BOWEN RELEASING SPEARS

SPEAR ASSY. NO.	GRAPPLE NO.	BODY YIELD STRENGTH (lbs)
530	532	530,000
1227	1230	270,000
1332	1334	920,000
1344	1348	132,000
9266	9268	972,000
9281	9283	2,700,000
9380	9382	1,946,000
9410	9412	357,000
9485	9487	530,000
9572	9574	1,800,000
9645	9647	116,400
9680	9682	920,000
9715	9717	1,175,000
9915	9917	62,000
9945	9947	357,000
11195	11197	43,600
13200	13202	725,000
16455	16457	20,800
17228	17230	132000
17231	17233	270,000
17234	17236	1,175,000
17237	17239	972,000

SPEAR ASSY. NO.	GRAPPLE NO.	BODY YIELD STRENGTH (lbs)
17240	17242	NA
17243	17245	1,946,000
17246	17248	2,700,000
17470	17472	NA
17475	17477	725,000
18270	18272	920,000
18820	18822	NA
19350	19352	29,400
20115	20119	NA
20120	20122	270,000
20890	20892	NA
20895	20897	NA
27780	27782	5,600,000
35841	35843	436,00
42069	42071	132,000
58292	58294	1,175,000
62198	49888	270,000
62242	1230	270,000
74509	74555	116,400
81470	9283	2,700,000
195015	145017	270,000

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DATA COMPILED FROM BOWEN MANUAL NO. 5/2300, JAN. 1991.

BAKER OIL TOOLS PACKER RETRIEVER SPEAR DRESSING CHART

T.S. SERIES	CATCH SIZE I.D. (in.)	GRAPPLE PART NUMBER	WEIGHT (lbs.)
100	1.968	02135004	2
	2.000	02135006	2
	2.250	02135003	2
	2.313	02135011	2
	2.370	02135005	2
	2.441	02135014	2
	2.500	02135007	2
	2.750	02135012	3
200	2.468	02135107	4
	2.500	02135108	4
	2.625	02135106	5
	2.688	02135105	5
	2.750	02135104	5
	2.811	02135103	5
	2.875	02135112	6
	3.000	02135113	6
	3.250	02135109	7

T.S. SERIES	CATCH SIZE I.D. (in.)	GRAPPLE PART NUMBER	WEIGHT (lbs.)
300	3.000	02135206	5
	3.250	02135205	6
	3.375	02135214	7
	3.500	02135204	8
	3.740	02135207	8
	3.875	02135220	10
	4.000	02135203	11
400	4.000	02138104	12
	4.250	02138112	12
	4.400	02138106	12
	4.500	02138105	13
	4.750	02138103	15
	5.000	02138107	17
500	4.750	02192503	23
	5.000	02192504	24
	6.000	02192505	25

"TYPE Z" BOWEN OIL JARS

JAR ASSY. NO.	JAR TYPE	O.D. (in.)	I.D. (in.)	REC. MAX. JARRING LOAD* (lbs.)	LIFT LOAD AFTER JARRING AT YIELD (lbs.)	TORQUE TO FAILURE (ft.- lbs.)	REC. WT. OF COLLARS ABOVE JAR** (lbs.)
70822	SUB TYPE	1-5/8	1/4	15,400	46,300	420	1,100 - 1,450
74723	SUB TYPE	1-13/16	5/16	18,000	59,400	640	1,360 - 1,800
54020	INTEGRAL MANDREL	2-1/4	3/8	21,000	118,500	2,200	1,560 - 2,100
68010	SUB TYPE	2-29/32	1	35,400	194,800	5,200	2,200 - 3,000
55670	SUB TYPE	3-1/16	1-1/2	31,300	160,200	5,900	2,300 - 3,100
52504	INTEGRAL MANDREL	3-1/8	1	32,400	229,200	7,600	2,400 - 3,300
52506	INTEGRAL MANDREL	3-3/4	1-1/4	56,500	345,000	13,500	4,200 - 5,700
52528	SUB TYPE	3-3/4	1-1/2	46,000	299,700	13,000	3,400 - 4,600
52497	SUB TYPE	3-3/4	1-7/8	46,500	179,500	8,200	3,500 - 4,700
52502	INTEGRAL MANDREL	4-1/4	1-15/16	46,700	430,300	24,500	3,500 - 4,700
52653	INTEGRAL MANDREL	4-1/2	2-3/8	49,000	375,000	25,900	3,600 - 4,900
52530	INTEGRAL MANDREL	4-3/4	1-1/2	85,000	591,900	27,600	6,300 - 8,500
52500	INTEGRAL MANDREL	4-3/4	2	74,500	468,800	27,100	5,600 - 7,500
52498	INTEGRAL MANDREL	6	2	136,400	937,000	52,600	10,200 - 13,800
52544	INTEGRAL MANDREL	6-1/4	2-1/4	159,000	917,400	56,900	11,800 - 16,000
52680	INTEGRAL MANDREL	6-3/4	2-3/8	172,800	1,013,800	74,200	13,000 - 17,500
52711	INTEGRAL MANDREL	7-3/4	3-1/16	149,000	1,587,900	145,300	11,000 - 15,000
66346	INTEGRAL MANDREL	9	3-3/4	215,000	1,621,000	224,700	14,300 - 19,600

* BASED ON 80% OF CALCULATED LOAD AT YIELD POINT.

** OPTIMUM WEIGHTS CAN BE DETERMINED ONLY BY CALCULATION AND ONLY IF SUFFICIENT WELL DATA IS AVAILABLE.

THESE FIGURES DO NOT CONSTITUTE A GUARANTEE, ACTUAL OR IMPLIED; THEY ARE MEANT TO SERVE AS A GUIDE ONLY, AND APPROPRIATE ALLOWANCE MUST BE MADE IN USE, AS A SAFETY FACTOR.

DATA OBTAINED FROM BOWEN MANUAL NO. 5/4065, NOV. 1991.

"TYPE Z" IS A TRADEMARK OF BOWEN TOOLS, INC.

BOWEN SUPER FISHING JAR

JAR ASSY. NO.	JAR SIZE			MAX. REC. JARRING LOAD IN HOLE* (lbs.)	TENSILE @ YIELD AFTER JARRING (lbs.)	TORQUE AT YIELD (ft.-lbs.)
	CONNECTION	O.D. (in.)	I.D. (in.)			
72888	2-3/8 REG.	3-1/8	1	59,000	257,000	7,000
145737	2-7/8 REG.	3-3/4	1-1/4	78,000	324,000	11,000
146544	2-3/8 I.F.	3-3/4	1-1/2	66,000	333,000	12,000
147902	2-3/8 E.U.E.	3-3/4	1-7/8	48,000	258,000	9,600
80468	2-7/8 I.F.	4-1/4	2	62,000	374,000	18,000
79789	3-1/2 F.H. 3-1/2 I.F.	4-3/4	2	98,000	575,000	28,000
145484	4-1/2 F.H.	6	2	196,000	913,000	46,000
79691	4-1/2 I.F.	6-1/4	2-1/4	200,000	1.1 million	66,000
145440	5-1/2 REG.	6-3/4	2-3/8	250,000	1.2 million	78,000
72978	6-5/8 REG.	7-3/4	3-1/16	265,000	1.7 million	130,000

* LOADS SHOWN ARE MAXIMUM RECOMMENED PULL LOADS. PULLING ABOVE THE VALUE SHOWN CAN DAMAGE THE TOOLS.

ALL JARRING AND PULLING LOADS SHOWN ASSUME THAT THE FORCE IS ACTING ALONE AND IS ESSENTIALLY ALONG WITH MAJOR AXIS OF THE TOOL. IF TORQUE AND TENSION OR BENDING AND TENSION ARE USED TOGETHER, THE RESULTING COMBINED STRESSES MAY LEAD TO FAILURE AT SUBSTANTIALLY LESS THAN RATED LOADS. ROTATION AND BENDING TOGETHER CAN LEAD TO FATIGUE.

DATA OBTAINED FROM BOWEN MANUAL NO. 5/4100, FEB. 1992.

BAKER OIL TOOLS
A Baker Hughes company

BOWEN JAR INTENSIFIERS

INTENSIFIER ASSY.	O.D. (in.)	I.D. (in.)	REC. DRILL COLLAR WT. RANGE (lbs.)	PULL LOAD TO OPEN (lbs.)	MIN. PULL TO OBTAIN EFF. BLOW (ABOVE STRING & COLLAR WT.) (lbs.)	TENSILE AT YIELD * (lbs.)	TORQUE REC. (ft.-lbs.)	TORQUE YIELD (ft.-lbs.)	USED WITH JAR NO.	USED WITH SUPER FISHING JAR NO.
70957	1-5/8	1/4	1,100-1,400	14,000	8,400	43,200 46,300	200	420	70822	—
64460	1-13/16	5/16	1,360-1,800	18,100	10,800	59,400	370	640	74223 21150 78074	—
50640	2-1/4	3/8	1,560-2,100	20,700	13,800	118,500	1,700	2,200	18775 54020	—
68262	2-29/32	1	2,200-3,000	37,000	24,600	194,800	1,600	5,200	68010	—
55867	3-1/8	1	2,400-3,300	30,000	21,000	229,200	3,500	7,600	42736 52504	72888
55895	3-3/4	1-1/4	4,200-5,700	52,000	36,000	345,000	3,800	13,500	38040 13255 52506	145737
55747	3-3/4	1-1/2	3,400-4,600	43,500	30,000	299,700	3,800	13,000	37406 52528	—
50660	3-3/4	1-7/8	3,500-4,700	43,000	30,000	179,500	2,500	8,200	41355 20150 52497	—
55664	4-1/4	1-15/16	3,500-4,700	43,000	30,000	430,300	6,600	24,500	44483 13640 52502	80468
50708	4-1/2	2-3/8	3,600-4,900	49,000	32,000	375,000	4,000	25,900	35849 52653	—
50700	4-3/4	1-1/2	6,300-8,500	78,000	54,000	591,900	9,500	27,600	25960 52530	—
55812	4-3/4	2	5,600-7,500	63,000	43,000	468,800	9,500	27,100	38110 52500	79789
55860	6	2	10,200-13,800	128,500	77,000	937,000	17,000	52,600	14710 52498	145484
55905	6-1/4	2-1/4	11,800-16,000	147,000	102,000	917,400	21,000	56,900	12370 52544	79691
50720	6-3/4	2-3/8	13,000-17,500	172,900	102,000	1,013,800	24,000	74,200	11130 52680	145400
55910	7-3/4	3-1/16	11,000-15,000	126,000	88,000	1,587,900	45,000	145,300	15160 52711	—
78964	7-3/4	3-1/16	12,100-20,500	220,000	123,000	1,600,000	45,500	130,000	—	72978
66372	9	3-3/4	12,000-16,000	200,000	100,000	1,621,000	70,000	224,700	66346	—

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DATA OBTAINED FROM BOWEN MANUAL NO. 5/4019, MAY 1992.

BOWEN BALANCED BUMPER SUB

SYMBOL NO.	O.D. (in.)	I.D. (in.)	CONNECTION	TENSILE STRENGTH (YIELD) (lbs.)	TORQUE	
					BUMPER SUB (ft.- lbs.)	DRILL PIPE (SPANG DATA) (ft.- lbs.)
36741	1-13/16	3/8	1-13/16 WILSON F.J.	75,400	791	—
39975	6-3/4	2-3/4	5-1/2 REG.	1,130,400	91,096	68,630
41228	4-5/8	2	3-1/2 F.H.	484,650	25,495	25,580
42034	4-1/4	1-1/2	2-7/8 I.F.	393,240	17,642	14,020
42042	6-1/4	3-1/8	4-1/2 I.F.	777,150	74,994	44,770
42091	2-1/4	3/8	1-1/4 REG.	116,415	1,846	—
42118	7	3-1/4	5-1/2 F.H.	1,146,750	97,040	68,630
42126	7-3/4	3-1/2	6-5/8 REG.	1,276,950	149,303	85,630
42175	3-3/8	7/8	2-3/8 I.F.	323,835	9,458	7,580
43363	6-1/4	3-1/8	4-1/2 I.F.	777,150	74,994	44,770
43370	7-3/4	3-1/2	6-5/8 REG.	1,276,950	149,303	85,630
43478	6-1/4	3-1/8	4 I.F.	777,150	74,994	44,770
44202	3-1/8	1	2-3/8 REG.	239,070	6,970	7,580
44212	3-3/4	1-1/4	2-7/8 REG.	363,780	12,646	14,020
44222	3-3/4	1-1/2	2-3/8 I.F.	300,750	12,720	7,580
44232	3-3/4	1-7/8	2-3/8 E.U.E.	291,735	14,342	4,440
44242	4-1/4	2	2-7/8 E.U.E.	358,000	22,300	14,020
44252	4-1/4	1-15/16	2-7/8 I.F.	397,650	22,984	14,020
44262	4-1/2	2-3/8	2-7/8 E.U.E.	388,650	30,000	7,450
44293	4-5/8	2	3-1/2 F.H.	484,650	25,495	25,580
46252	4—5/8	2	3-1/2 F.H.	484,650	25,495	25,580
46259	4-5/8	2	3-1/2 F.H.	484,650	25,495	25,580
46268	7-3/4	3-1/2	6-5/8 REG.	1,276,950	149,303	85,630
46608	4-5/8	2	3-1/2 F.H.	484,650	25,495	25,580
47673	4-1/4	2	2-7/8 I.F.	358,000	22,300	14,020
49327	6-3/4	2-3/4	4-1/2 REG.	1,130,400	91,096	44,770
51596	7-1/2	3-3/4	6-5/8 REG.	1,290,300	124,797	85,630
51597	6	3	4-1/2 I.F.	711,150	70,116	44,770
52237	6-1/4	3-1/8	4-1/2 I.F.	777,150	74,994	44,770
52245	7	3-1/4	5-1/2 F.H	1,146,750	97,040	68,630
52252	7	3-1/4	5-1/2 F.H.	1,146,750	97,000	68,630
52260	7-3/4	3-1/2	6-5/8 REG.	1,276,950	149,303	85,630
52448	5-3/4	2-13/16	4-1/2 F.H.	622,295	57,533	44,770

THE STRENGTHS SHOWN ARE THEORETICAL CALCULATIONS BASED ON YIELD STRENGTH OF THE MATERIAL USED IN EACH CASE. THE STRENGTHS SHOWN ARE THEREFORE ACCURATE, PLUS OR MINUS 20% OF THE FIGURES SHOWN ONLY.

THESE FIGURES DO NOT CONSTITUTE A GUARANTEE, ACTUAL OR IMPLIED; THEY ARE MEANT TO SERVE AS A GUIDE ONLY, AND APPROPRIATE ALLOWANCE MUST BE MADE IN USE, AS A SAFETY FACTOR.

DATA OBTAINED FROM BOWEN MANUAL NO. 5/4455, OCT. 1972.

ANADRILL HYDRAULIC JARS
TR, DC AND FB

JAR O.D. (in.)	I.D. (in.)	TYPE*	STD. CONN. (lbs.)	MAX. REC. JARRING PULL (lbs.)	MAX. JARRING PULL @ YIELD (lbs.)	STRENGTH AFTER LIFTING	
						MAX. PULL (ft.- lbs.)	MAX. TORQUE
1-13/16	3/8	—	1-13/16 WILSON	20,000	30,000	100,000	1,200
2-1/4	1/2	—	1-1/4 REG.	33,500	50,000	135,000	2,200
2-1/4	1/2	L H	1-1/4 REG. L H*	33,500	50,000	135,000	2,200
3-1/16	1	F B	2-3/8 REG.	20,000	30,000	160,000	7,600
3-1/16	1-1/2	F B	2-3/8 EUE	20,000	30,000	160,000	7,600
3-5/8	1-15/16	F B	2-3/8 EUE	33,000	52,000	232,000	8,350
4-1/2	2-3/8	F B	2-7/8 EUE	54,000	83,800	318,000	17,750
3-3/4	1-1/2	T R	2-3/8 I.F.	50,000	78,000	248,000	12,580
4-1/8	1-1/2	T R	2-7/8 I.F.	70,000	107,000	331,000	15,900
4-1/8	1-1/2	D C	2-7/8 I.F.	70,000	107,000	331,000	15,900
4-1/8	2	T R	2-7/8 I.F.	45,500	70,000	320,000	14,000
4-3/4	1-7/8	T R	3-1/2 F.H.	80,000	125,000	379,000	29,200
4-3/4	1-7/8	D C	3-1/2 F.H.	80,000	125,000	379,000	29,200
4-3/4	2	D C	3-1/2 I.H.	67,000	103,000	364,000	20,000
5-3/4	2	T R	4-1/2 F.H.	131,000	219,000	651,000	34,200
5-3/4	2	D C	4-1/2 F.H.	131,000	219,000	651,000	34,200
6-1/4	2	T R	4-1/2 I.F.	190,000	292,000	726,000	57,300
6-1/4	2	D C	4-1/2 I.F.	190,000	292,000	726,000	57,300
6-3/8	2	T R	4 I.F.	197,000	311,000	726,000	57,300
6-1/2	2-1/2	T R	4-1/2 I.F.	160,000	250,000	975,000	89,500
6-3/4	2-1/2	T R	5-1/2 REG.	190,000	292,000	975,000	89,500
6-3/4	2-1/2	D C	5-1/2 REG.	190,000	292,000	975,000	89,500
7	2-1/2	T R	4-1/2 I.F.	210,000	332,000	975,000	89,500
7-1/4	2-1/2	D C	4-1/2 I.F.	235,000	372,000	975,000	89,500
7-3/4	3	T R	6-5/8 REG.	208,000	317,000	1,390,000	136,000
7-3/4	3	D C	6-5/8 REG.	208,000	317,000	1,390,000	136,000
8-1/4	3	D C	API-61	244,000	386,000	1,390,000	136,000
9	3	D C	6-5/8 H90	300,000	474,000	1,390,000	136,000

*L.H. - LEFT HAND; TR - TIME REGULATED; FB - FULL BORE; DC - DRILLING & CORING.
DATA OBTAINED FROM ANADRIL.

ANADRILL HYDRAULIC BUMPER SUBS

SIZE		TOOL JOINT	MAXIMUM	MAXIMUM
O.D. (in.)	I.D. (in.)	CONNECTION	PULL (lbs.)	TORQUE (ft.- lbs.)
3-3/4	1-1/2	2-3/8 I.F.	283,000	12,900
4-1/8	2	2-7/8 I.F.	367,000	17,500
4-3/4	1-7/8	3-1/2 F.H.	480,000	25,700
5-3/4	2	4-1/2 F.H.	789,000	39,600
6-1/4	2	4-1/2 F.H.	942,000	49,300
6-3/4	2-1/2	5-1/2 REG	968,000	89,000
3-1/16	1-1/2	2 EUE	185,000	6,400
3-5/8	1-15/16	2 EUE	175,000	8,600
4-1/2	2-3/8	2-1/2 EUE	242,000	18,700
7-3/4	3	6-5/8 REG	1,630,000	125,000
3-1/16	1	2-3/8 REG	244,000	7,600

ANADRILL JAR BOOSTERS

SIZE O.D. X I.D. (in.)	TOOL JOINT	PRE-CHARGE PRESSURE (PSI)	MAX. LOAD (FULL STROKE) (lbs.)	STROKE (in.)	TENSILE STRENGTH (lbs.)	TORSIONAL STRENGTH (ft.- lbs.)
2-1/4 X 1/2	1-1/4 REG	2,000	26,000	11-1/2	135,000	2,200
3-1/16 X 1	2-3/8 REG	1,800	40,000	11	190,000	7,600
3-5/8 X 1-15/16	2 EUE	1,800	35,000	11-1/2	238,000	8,750
3-3/4 X 1-1/2	2-3/8 I.F.	2,000	45,000	13-1/2	268,000	12,600
4-1/8 X 2	2-7/8 I.F.	2,000	45,000	11-1/2	342,000	16,000
4-3/4 X 1-7/8	3-1/2 F.H.	2,000	60,000	11-1/2	475,000	29,000
5-3/4 X 2	4-1/2 F.H.	2,000	100,000	9-1/*2	650,000	36,000
6-1/4 X 2	4-1/2 F.H. 4-1/2 I.F.	2,000	140,000	9-1/2	1,160,000	62,500
6-3/4 X 2-1/2	5-1/2 REG	2,000	170,000	9-1/2	1,270,000	97,400
7-3/4 X 3	6-5/8 REG	2,000	145,000	9-1/2	1,390,000	136,000

RECOMMENDED NO. OF COLLARS TO RUN BETWEEN JAR AND BOOSTER FOR OPTIMUM HITTING EFFICIENCY

JAR/BOOSTER SIZE O.D. X I.D. (in.)	DRILL COLLAR O.D. X I.D. (in.)	@ 1/2 MAX. REC. PULL		MAX. REC. PULL	
		PULL (lbs.)	NO. OF COLLARS	PULL (lbs.)	NO. OF COLLARS
2-1/4 X 1/2	2-1/4 X 1	15,000	11	25,000	14
3-1/16 X 1	3-1/8 X 1	22,000	8	45,000	11
3-5/8 X 1-15/16	3-3/4 X 1-1/2	20,000	5	35,000	7
3-3/4 X 1-1/2	3-3/4 X 1-1/2	25,000	7	47,000	10
4-1/8 X 2	4-1/8 X 2	30,000	6	60,000	9
5-3/4 X 2	5-3/4 X 2	60,000	6	120,000	8-9
6-1/4 X 2	6-1/4 X 2	60,000	6	135,000	8-9
6-3/4 X 2-1/2	6-3/4 X 2-1/2	90,000	7	180,000	10
7-3/4 X 3	7-3/4 X 3	75,000	5	150,000	6-7

DATA OBTAINED FROM ANADRILL.

HOUSTON ENGINEERS, INC
H-E HYDRA JAR
DOUBLE ACTING HYDRAULIC DRILLING JAR

TOOL O.D.	4-1/4	4-3/4	6-1/4	6-1/2	7-3/4	8
TOOL I.D.	2	2-1/4	2-3/4	2-3/4	3	3
TOOL JOINT	2-7/8	3-1/2	4-1/2	4-1/2	6-5/8	6-5/8
CONNECTIONS	API IF	API IF	XH	API IF	API REG	API REG
OVERALL LENGTH (EXTENDED) (ft.)	29'10"	29'10"	31'2"	31'2"	32'6"	32'6"
MAX. DETENT WKG. LOAD	65,000	80,000	165,000	165,000	250,000	300,000
TENSILE YIELD STRENGTH	319,000	440,000	640,000	889,000	1,200,000	1,600,000
TORSIONAL YIELD STRENGTH (ft.-lbs.)	15,000	20,000	50,000	65,000	115,000	115,000
UP STROKE (in.)	6	7	8	8	8	8
DOWN STROKE (in.)	5	5	6	6	6	6
TOTAL STROKE (in.)	25	25	25	25	25	25

DATA OBTAINED FROM HYDRA-JAR OOPERATION MANUAL NO. 6-80, 1992.

HOUSTON ENGINEERS, INC.
H-E MAGNUM DRILLING ACCELERATOR

TOOL O.D.	4-1/4	4-3/4	6-1/4	6-1/2	7-3/4	8
TOOL I.D.	2	2-1/4	2-3/4	2-3/4	3	3
TOOL JOINT	2-7/8	3-1/2	4-1/2	4-1/2	6-5/8	6-5/8
CONNECTIONS	API IF	API IF	XH	API IF	API REG	API REG
OVERALL LENGTH (CLOSED) (ft.)	17'5"	17'9"	18'3"	18'3"	19'	19'
TOTAL STROKE (in.)	17	17	17	17	17	17
REC. MAX. WKG. LOAD - (lbs.)	65,000	80,000	165,000	165,000	250,000	300,000
MIN. OVERPULL REQUIREMENT W/JAR & ACCEL.	21,000	29,000	*56,000	*56,000	*65,000	*65,000
ASSEMBLY NO.	15579	15549	15399	15688	15576	15689

* BASED ON 150,000 MAXIMUM EFFECTIVE ACCELERATOR LOAD.

DATA OBTAINED FROM HOUSTON ENGINEERS, INC. 1992-93 GENERAL CATALOG.

HOUSTON ENGINEERS, INC.
H-E LONG STROKE DRILLING BUMPER SUBS

TYPE*	AEBLP		AEBLP	AEBB	AEBLP	AEBB	AEBLP	AEBB
Description	Partial Balance	Partial Balance	Partial Balance	Fully Balance	Partial Balance	Fully Balance	Partial Balance	Fully Balance
Std. O.D. (in.)	4-1/2	4-3/4	6-1/2	6-1/2	8	8	8-1/4	8-1/4
Std. I.D. (in.)	2	2	2-3/4	2-3/4	3	3	3-1/2	3-1/2
Stroke (in.)	48	72	72	72	72	72	72	72
Closed Length (ft.-in.)	18'0"	22'0"	24'2"	32'8"	26'8"	36'2"	26'8"	36'2"
Approx. Weight (lbs.)	650	850	2,300	3,200	2,910	3,340	3,510	3,760
Tensile Yield (lbs.)	375,000	636,000	800,000	800,000	1,900,000	1,900,000	1,580,000	1,580,000
Torsional Yield (ft.-lbs.)	15,000	25,400	75,000	75,000	150,000	150,000	200,000	200,000

* TYPE AEBB IS A FULLY BALANCED BUMPER SUB.
TYPE AEBLP IS A PARTIAL BALANCED BUMPER SUB.
DATA OBTAINED FROM HOUSTON ENGINEERS, INC. 1992-93 GENERAL CATALOG.

HOUSTON ENGINEERS, INC.
FISHING BUMPER SUBS

TYPE*	EBD	EBD	EBD	EBD	EBD	EBL	EBD	AEBL	EBD	AEBL	EBD	EBL	EBD	EBD
	1-13/16	2-3/8	2-3/8	2-7/8	2-7/8	2-7/8	3-1/2	3-1/2	4-1/2	4-1/2	4-1/2	4-1/2	5-1/2	6-5/8
Nominal Size	Wilson FJ	API REG	API IF	API REG	API IF	API IF	API FH-IF	API IF	API FH	API FH	API IF	API IF	API REG	API REG
Outside Dia.(in.)	1-13/16	3-1/8	3-3/4	3-3-/4	4-1/4	4-1/4	4-3/4	4-3/4	5-3/4	5-3/4	6-1/4	6-1/4	6-3/4	7-3/4
Inside Dia.(in.)	1/4	5/8	1-1/2	1-1/16	2	2	2	2-1/4	2	2-3/4	2	2-3/4	2-1/2	3-1/2
Total Travel (in.)	10	16	16	16	16	16-	16	18	18	18	18	18	18	18
Max. Torque Yield (ft.-lbs.)	1,000	8,000	13,500	15,000	15,000	20,000	18,000	25,000	35,000	50,000	40,000	75,000	50,000	62,000

* TYPE EBD IS A NON-LUBRICATED BUMPER SUB.
TYPE EBL IS A LUBRICATED BUMPER SUB.
DATA OBTAINED FROM HOUSTON ENGINEERS, INC. 1992-93 GENERAL CATALOG.

HOUSTON ENGINEERS, INC.
"TMC" HYDRAULIC JAR

TOOL O.D.		3-1/8	3-3/4	3-3/4	4-1/4	4-1/4	4-3/4	5-3/4	6-1/4	7-3/4
TOOL I.D.		1	1-1/2	2	2	2-7/16	2	2	2-1/4	3-1/2
TOOL JOINT CONNECTIONS		2-3/8 API REG	2-3/8 API IF	2-3/8 EUE	2-7/8 API IF	2-7/8 EUE	3-1/2 APIFH	4-1/2 API FH	4-1/2 API IF	6-5/8 API REG
REC. MAX. WKG. LOAD / RESTRICTED TRAVEL(lbs.)		55,000	59,000	38,000	73,000	39,000	90,000	180,000	180,000	300,000
TOTAL TRAVEL (in.)		16	16	16	16	16	16	18	18	18
Max. Strength After Restricted Travel	Max. Pull Yield (lbs.)	192,000	257,000	233,000	348,000	320,000	422,000	809,000	900,000	1,304,000
	Max. Torque Yield	7,600	12,000	10,000	19,000	15,000	29,000	55,000	79,000	151,000

DATA OBTAINED FROM HOUSTON ENGINEERS, INC. 1992-93 GENERAL CATALOG.

"TM" HYDRAULIC JAR

TOOL O.D.		1-13/16	2-1/4	3-1/8	3-3/4	3-3/4	4-1/4	4-1/4	4-3/4	5-3/4	6-1/4	7-3/4
TOOL I.D.		3/8	1/2	1	1-1/2	2	2	2-7/16	2	2	2	3-1/3
TOOL JOINT CONNECTIONS		1-13/16 WFJ	1-1/4 REG	2-3/8 API REG	2-3/8 APE IF	2-3/8 EUE	2-7/8 API IF	2-7/8 EUE	3-1/2 API FH	4-1/2 API FH	4-1/2 API IF	6-5/8 API REG
REC. MAX. WKG. LOAD / RESTRICTED TRAVEL(lbs.)		19,000	22,000	55,000	59,000	38,000	73,000	39,000	90,000	180,000	230,000	300,000
TOTAL TRAVEL (in.)		10	12	16	16	16	16	16	16	18	18	18
Max. Strength After Restricted Travel	Max. Pull Yield (lbs.)	56,000	130,000	192,000	257,000	233,000	348,000	320,000	422,000	809,000	949,000	1,304,000
	Max. Torque Yield	1,300	3,500	7,600	12,000	10,000	19,000	15,000	29,000	55,000	77,000	151,000

DATA OBTAINED FROM "TM" MAGNA-JAR OPERATION MANUAL NO. 2-45.

HOUSTON ENGINEERS, INC.
"ACCD" ACCELERATOR

TOOL SIZES (in.)		# TOTAL TRAVEL WITH STOP SLEEVE (in.)	RACK TEST INCHES @ LBS. PULL	OIL (ounces)	***DOWNHOLE @ 240° JAR AND ACCELERATOR COMBO LOADS	
O.D.	I.D.				*MINIMUM (lbs. overpull)	MAXIMUM (lbs. overpull)
1-13/16	1/4	8	6-1/2" @ 6,600	2	4,800	15,000
3-1/8	5/8	12	10-1/2" @ 27,000	3	20,000	60,000
3-3/4	1-1/2	11-3/8	9-7/8" @ 22,000	3	16,000	45,000
3-3/4	1-1/16	12	10-5/8" @ 25,000	3	17,000	60,000
4-1/4	2	11-1/4	9-1/2" @ 26,500	4	20,000	60,000
4-3/4	2	10-3/8	8" @ 35,000	8	38,000	85,000
5-3/4	2	11-3/4	7-3/8" @ 47,000	10	57,500	100,000**
6-1/4	2	10-3/4	8-3/4" @ 54,000	12	68,000	100,000**
7-3/4	3-1/2	12	10" @ 72,000	12	84,000	150,000**

"ACCM" ACCELERATOR

TOOL SIZES (in.)		# TOTAL TRAVEL WITH STOP SLEEVE (in.)	RACK TEST INCHES @ LBS. PULL	OIL (ounces)	***DOWNHOLE @ 240° JAR AND ACCELERATOR COMBO LOADS	
O.D.	I.D.				*MINIMUM (lbs. overpull)	MAXIMUM (lbs. overpull)
1-13/16	3/8	8	6-3/4" @ 6,000	2	7,500	19,000
3-1/8	1	12	11" @ 29,000	3	19,000	50,000
3-3/4	1-1/2	11-3/8	10" @ 31,000	3	22,000	59,000
3-3/4	2	12	10-1/8" @ 16,000	3	15,000	38,000
4-1/4	2	11-1/4	9-5/8" @ 32,000	4	32,000	73,000
4-1/4	2-7/16	12	10-7/8" @ 19,000	3	15,000	39,000
4-3/4	2	10-3/8	8" @ 35,000	8	54,000	85,000
5-3/4	2	11-3/4	7-3/8" @ 47,000	10	64,000	100,000**
6-1/4	2	12	8-3/4" @ 54,000	12	77,000	124,000**
7-3/4	3-1/2	12	10" @ 72,000	12	84,000	150,000**

* MINIMUM OVERPULL REQUIREMENT FOR JAR-ACCELERATOR COMBINATION TO OBTAIN AN EFFICIENT ACCELERATOR TOOL.

** MAXIMUM OVERPULL CAN BE INCREASED IN SHOP, SEE OPTIONAL GRAPHS - AS MAXIMUM INCREASES, MINIMUM INCREASES.

*** STOCK ACCELERATOR TOOLS ARE GAS-FILLED FOR A NORMAL 240oF BOTTOM HOLE TEMPERATURE. OPERATIONAL CHARACTERISTICS WILL CHANGE AT OTHER TEMPERATURES. ACCELERATOR TOOL CAN BE GAS-FILLED TO OPTIMIZE ITS PERFORMANCE AT SPECIFIED BOTTOM HOLE TEMPERATURES. PLEASE CONSULT WITH HOUSTON ENGINEERS, INC.

CHECK STROKE BEFORE LOADING THE ACCELERATOR TOOL. IF STROKES VARY, STOP SLEEVES MUST BE MODIFIED TO OBTAIN STROKE AS LISTED.

DATA OBTAINED FROM "ACCD" & "ACCM" ACCELERATORS OPERATION MANUAL NO. 2-25, JUNE 1988.

HOUSTON ENGINEERS, INC.
HYDRAULIC JAR AND ACCELERATOR WEIGHT TABLE

JAR AND ACCEL. LOAD	1-13/16 WFJ 1-13/16 OD	1-1/4 REG 2-1/4 OD	2-3/8 WFJ 2-1/2	2-3/8 API REG 3-1/8 OD	2-3/8 API IF MOD 3-3/4 OD	2-3/8 EUE 3-3/4	2-7/8 API IF MOD 4-1/4 OD	2-7/8 EUE 4-1/4	3-1/2 API FH-IF 4-3/4 OD	4-1/*2 API FH 5-3/4 OD	4-1/2 API IF MOD 6-1/4 OD	5-1/2 API REG 6-3/4 OD	6-5/8 API REG 7-3/4 OD	7-5/8 API REG 9-1/2 OD
500														
1,000														
2,000														
10,000	1000 5 2500 11	1000 3 1500 5	2000 5											
20,000	3000 11	2000 6 2500 8	2500 6 3000 7	2000 3 3000 4	3000 3 4000 4	3000 4 3500 4	4000 4	4000 3						
30,000			3500 8	4000 6 5600 7 6000 8	6000 6 7000 7 8000 8	4000 5	5200 5 6000 6 8000 8	4500 4 5000 5 5500 5						
50,000				7000 10 7500 11 8000 12	13000 11 14000 12		10000 10 14000 14	6500 6	10000 9 15000 10 20000 12	10000 4 15000 6 25000 11 30000 12	10000 4 15000 5 20000 7 25000 8	10000 3 15000 4 20000 5 30000 10	25000 6	
100,000														
150,000										30000 12 35000 13	30000 10 35000 11	30000 10 35000 11	30000 7 35000 8	30000 5 35000 6
200,000											40000 12 45000 13	40000 12 45000 13	40000 10 50000 12	40000 7 50000 9
250,000 Drill Collar Size	1-13/16 OD 3/4" ID	2-1/4 OD 1" ID	2-1/2 OD 1" ID	3-1/8 OD 1" ID	3-3/4 OD 1-1/2" ID	3-3/4 OD 2" ID	4-1/4 OD 2-1/4" ID	4-3/4 OD 2-1/2" ID	4-3/4 OD 2" ID	5-3/4 OD 2" ID	6-1/4 OD 2" ID	50000 14 6-3/4 OD 2-1/2" ID	60000 14 7-3/4 OD 3" ID	60000 11 70000 12 9-1/2 OD 3" ID
WT/30'	215 LB.	300 LB.	450 LB.	702 LB.	948 LB.	8500 LB.	1041 LB.	1304 LB.	1488 LB.	2328 LB.	2794 LB.	3159 LB.	4080 LB.	5758 LB.
LBS. FORCE IMPACT BLOW	70	150	350	300	350	400	350	650	500	800	1,600	1,200	1,600	2,500
X 1000	60	100	200	200	300	300	250	400	375	750	1,000	1,150	1,150	1,500

INSUFFICIENT DRILL COLLAR WTS. WILL CAUSE EXCESSIVE HIGH IMPACT LOADS ON JAR AND FINISHING TOOLS.

EXCESSIVE DRILL COLLAR WTS. DIMINISH EFFICIENCY OF JAR ACCELERATION EFFORT.

EXAMPLE: SELECT JAR SIZE 1 9-1/2 O.D. SEE 2 FOR LOAD CAPACITY (150,000 TO 250,000 LBS.) 3 READ OPTIMUM WEIGHT RANGE (30,000 TO 60,000). SEE 1,500,000 FOR HEAVY WEIGHT OR 2,500,000 LBS. FOR LIGHT WEIGHT. IMPACT BLOW 4 IS BASED ON USE OF OPTIMUM WEIGHT 3 = BETWEEN JAR AND ACCELERATOR. E = ENERGY DELIVERED BY ACCELERATOR. L = FREESTROKE OF JAR.

RULE OF THUMB FOR ESTIMATING OPTIMUM WEIGHT W: SELECT APPROXIMATELY 20% OF NOMINAL JAR LOAD IN DRILL COLLARS AND INSERT THIS WEIGHT BETWEEN JAR AND ACCELERATOR. IMPACT BLOW WILL THEN BE TEN TIMES GREATER THAN JAR LOAD.

NOTE: WEIGHTS SHOWN IN THE TABLE MUST HAVE THE BUOYANCY FACTOR APPLIED FOR USE DOWNHOLE.

DATA OBTAINED FROM "TM" MAGNA-JAR OPERATION MANUAL NO. 2-45.

BAKER OIL TOOLS PACKER RETRIEVER SPEAR

TO ORDER, SPECIFY PRODUCT NUMBER, TOP CONNECTION IF OTHER THAN STANDARD, NUMBER OF EXTENSIONS AND GRAPPLE SERIES, SIZE AND PART NUMBER.

T.S. SERIES	100	200	300	300	400	500
TOP CONNECTION	1-13/16 TS PRT	2-1/4 TS PRT	2-1/4 TS PRT	3-1/8 TS PRT	3-1/8 TS PRT	3-1/4 6P ACME
O.D. OF TOOL	1-3/4	2-3/8	2-3/4	3-1/8	3-1/2	4-1/4
I.D. OF TOOL	3/8	3/8	5/8	5/8	3/4	2
APPROXIMATE WEIGHT (lbs.)	11	30	46	49	73	112
MAX PULL (lbs.)	45,850	91,700	165,000	165,000	206,300	366,800
PRODUCT NUMBER	14032100	14032110	14032140	14032120	14032130	14032150

NOTE: ALL STRENGTHS ARE THEORETICAL AND DO NOT CONSTITUTE OR IMPLY A GUARANTEE OF STRENGTH.

BAKER OIL TOOLS TYPE “B” PACKER RETRIEVER

TO ORDER, SPECIFY TOOL PRODUCT NUMBER AND TOP CONNECTION IF OTHER THAN SHOWN BELOW.

TOP CONNECTION	3-13/16 TSWP	4 TSWP	4-3/8 TSWP	4-3/8 TSWP	4-1/2 TSWP
BOTTOM CONNECTION (J-SUB)	2-1/4 PRT	2-3/8 FJ	2-3/8 EUE	2-1/4 PRT	2-3/8 EUE
O.D. OF BODY	3-13/16	4	4-3/8	4-3/8	4-1/2
I.D. OF BODY	2-9/16	2-11/16	3-3/16	3-5/16	3-3/16
PRODUCT NUMBER	14132390	14132400	14132200	14132210	14132290

TOP CONNECTION	5 TSWP	5 X-LINE	5-1/2 TSWP	5-3/4 TSS	7-3/8 TSWP
BOTTOM CONNECTION (J-SUB)	2-3/8 EUE	2-7/8 EUE	2-3/8 REG	2-7/8 EUE	3-1/2 I.F.
O.D. OF BODY	5	5-3/8	5-1/2	5-3/4	7-3/8
I.D. OF BODY	3-5/8	3-3/4	4-1/16	4-1/4	5-7/8
PRODUCT NUMBER	14132430	14132420	14132410	14132170	14132460

BAKER OIL TOOLS CUT AND PULL CASING SPEAR

TO ORDER, SPECIFY PRODUCT NUMBER OF TOOL, CASING SIZE AND WEIGHT.

CASING SIZE	9-5/8"	13-3/8" - 30"
SPEAR I.D.	1-1/2	2-1/4
TOP CONNECTION	4-1/2 I.F. BOX	6-5/8 REG. BOX
BOTTOM CONNECTION	4-1/2 I.F. PIN	6-5/8 REG. PIN
APPROXIMATE WEIGHT (lbs.)	1,750	3,200
BEARING DYNAMIC LOAD (lbs.)	113,000	173,102
BEARING STATIC LOAD (lbs.)	231,000	595,743
PRODUCT NUMBER	12209610	12209620

BAKER OIL TOOLS TYPE "D" CASING SPEAR

TO ORDER, SPECIFY PRODUCT NUMBER,
AND SIZE AND WEIGHT OF CASING TO BE CAUGHT.

SIZE	4-1/2" - 5"	5-1/2" - 6-5/8"	7" - 8-1/8"	8-1/8" - 9"
TOP CONNECTION	2-3/8" API REG.	2-7/8" API REG.	3-1/2" API REG.	5-1/2" API REG.
O.D. OF TOOL	3-5/8"	4-1/2"	5-3/4"	6-7/8"
I.D. OF TOOL	3/4"	3/4"	1-3/4"	3"
APPROXIMATE WEIGHT (lbs.)	185	345	515	785
PRODUCT NUMBER	12009520	12009530	12009540	12009560
MAXIMUM PULL (lbs.)	347,000	391,000*	727,400*	1,167,700

SIZE	9-5/8" - 11-3/4"	11-3/4" - 13-3/8"	16" - 20"	24" - 30"
TOP CONNECTION	5-1/2" API REG.	6-5/8" API REG.	6-5/8" API REG.	6-5/8" API REG.
O.D. OF TOOL	8-1/4"	10-1/2"	14"	20-3/4"
I.D. OF TOOL	3"	3-1/2"	3-1/2"	3-1/2"
APPROXIMATE WEIGHT (lbs.)	1,255	1,865	4,500	6,700
PRODUCT NUMBER	12009580	12009570	12009590	12009480
MAXIMUM PULL (lbs.)	1,045,800	1,867,000*	1,867,000*	1,867,000*

* PULL LIMITED BY CONNECTION.

BAKER OIL TOOLS CASING BACKOFF TOOL

TO ORDER, SPECIFY REQUIRED TOOL O.D., PRODUCT NUMBER,
AND CASING SIZE AND WEIGHT TO BE BACKED OFF.

O.D. OF TOOL (in.)	4-1/2	5-5/8	8	
TOP CONNECTION	3-1/2 API REG.	3-1/2 API I.F.	6-5/8 API REG.	
CASING SIZE AND WEIGHT	5-1/2	7	9-5/8	11-3/4
THAT TOOL IS DESIGNED	14# - 23#	17# - 38#	32# - 53.5#	42# - 60#
TO BACK OFF		7-5/8	10-3/4	13-3/8
		24# - 47.1#	32.75# - 65.7#	48# - 72#
LENGTH OF TOOL (ft.)	28	28	34	
WEIGHT (lbs.)	1,500	2,200	4,700	
PRODUCT NUMBER	14210100	14210130	14110240	
MAXIMUM TORQUE (ft.-lbs.) AT MAXIMUM PRESSURE OF 5000 PSI	15,000	25,000	50,000	

ALL STRENGTHS ARE THEORETICAL AND DO NOT CONSTITUTE OR IMPLY A GUARANTEE OFSTRENGTH.

BAKER OIL TOOLS T-DOG OVERSHOT

TO ORDER, SPECIFY PRODUCT NUMBER, TOP CONNECTION OF TOOL,
AND TYPE OF CAGE ASSEMBLY REQUIRED.

TOP CONNECTION	3-13/16 TWSP	4 TWSP	4-1/2 TWSP	4-1/2 TWSP
OVERSHOT O.D.	3-7/8	4-1/16	4-1/2	4-11/16
OVERSHOT I.D.	3-1/8	3-3/16	3-1/4	3-3/4
APPROXIMATE WEIGHT (lbs.)	25	40	45	43
PRODUCT NUMBER	11407100	11407340	11407120	11407130
MAXIMUM PULL STRENGTH (lbs.)*	145,778	161,798	177,146	177,146

TOP CONNECTION	5 X-LINE	5-1/2 TWSP	5-1/2 TWSP	5-1/2 X-LINE
OVERSHOT O.D.	5-1/2	5-1/2	5-5/8	5-7/8
OVERSHOT I.D.	3-27/32	3-13/16	4-1/4	4-1/4
APPROXIMATE WEIGHT (lbs.)	85	85	75	111
PRODUCT NUMBER	11407140	11407230	11407150	11407160
MAXIMUM PULL STRENGTH (lbs.)*	475,914	200,383	200,383	530,145

TOP CONNECTION	5-3/4 TSS	7 X-LINE	7-5/8 TWSP	7-5/8 X-LINE
OVERSHOT O.D.	5-7/8	7-1/2	7-3/4	8
OVERSHOT I.D.	4-5/8	6-3/16	6-1/8	6-3/16
APPROXIMATE WEIGHT (lbs.)	88	104	157	122
PRODUCT NUMBER	11407170	11407190	11407210	11407200
MAXIMUM PULL STRENGTH (lbs.)*	478,228	404,770	396,785	555,108

* UNLESS OTHERWISE INDICATED, ALL THE STRENGTH FIGURES SHOWN ARE THE RESULT OF CALCULATIONS BASED ON THE YIELD STRENGTH OF THE MATERIAL USED IN THE MANUFACTURE OF THE PARTICULAR ITEM. THESE STRENGTH CALCULATIONS ARE INTENDED ONLY AS A GUIDE. THEY DO NOT CONSTITUTE A GUARANTEE, ACTUAL OR IMPLIED. IN USE, APPROPRIATE ALLOWANCE SHOULD BE MADE AS A SAFETY FACTOR.

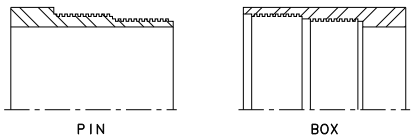
BAKER OIL TOOLS HIGH PRESSURE PACKOFF ASSEMBLY

TO ORDER, SPECIFY THE PACKOFF ASSEMBLY PRODUCT NUMBER AND O.D. OF PIPE TO PACKOFF ON.

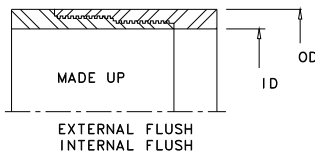
PRODUCT NO.	BOWL NO.	OVER-SHOT SIZE	SIZE TO PACKOFF ON	BURST PRESSURE FOR BODY PSI
11059410	9271	3-5/8	1-1/4	7,200
11059430	9271	3-5/8	1.660	7,200
11059100	9271	3-5/8	2	7,200
11059110	9271	3-5/8	2-1/16	7,200
11059120	9271	3-5/8	2-3/8	7,200
11059480	B5103	3-7/8	2-3/8	7,100
11059130	B5103	3-7/8	2-7/8	7,100
11059390	B1836	3-7/8	2-7/8	9,050
11059140	9107	4-1/8	1.900	9,000
11059150	9107	4-1/8	2-3/8	9,000
11059520	8223	4-1/8	2-3/8	8,000
11059600	B5117	4-1/8	2-7/8	9,000
11059160	9107	4-1/8	2-7/8	9,000
11059530	8223	4-1/8	2-7/8	8,000
11059170	9107	4-1/8	3-1/16	9,000
11059380	B4621	4-3/8	2-7/8	5,800
11059180	9111	4-11/16	2-1/16	8,400
11059190	9111	4-11/16	2-3/8	8,400
11059200	9111	4-11/16	2-7/8	8,400
11059540	B4717	5-1/4	3-1/2	6,500
11059550	5898	5-9/16	2-3/8	8,600
11059210	8977	5-3/4	2-3/8	8,600
11059220	8977	5-3/4	2-7/8	8,600
11059230	8977	5-3/4	3-1/16	8,600

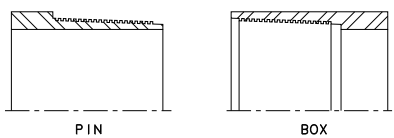
PRODUCT NO.	BOWL NO.	OVER-SHOT SIZE	SIZE TO PACKOFF ON	BURST PRESSURE FOR BODY PSI
11059570	8977	5-3/4	4	8,600
11059240	8977	5-3/4	3-1/2	8,600
11059250	8977	5-3/4	4-1/8	8,600
11059260	8977	5-3/4	4-1/2	8,600
11059400	7788	6-1/8	3-1/2	5,600
11059440	6152	7-3/8	4	8,000
11059270	9694	7-3/8	4	5,500
11059460	B3522	7-3/8	4	7,000
11059280	9694	7-3/8	4-1/2	5,500
11059290	7574	7-5/8	3-1/2	7,500
11059490	7574	7-5/8	4	7,500
11059300	9134	7-3/4	4-1/2	5,100
11059310	9134	7-3/4	5	5,100
11059470	1657	7-7/8	4-1/2	5,500
11059590	1657	7-7/8	5-1/2	5,500
11059510	9134	8	4-1/2	7,100
11059500	9134	8	5	7,100
11059340	9219	8-1/8	4-1/2	4,800
11059350	9219	8-1/8	5	4,800
11059330	9219	8-1/8	5-1/2	4,800
11059420	B3711	8-1/8	6-1/4	5,500
11059360	7801	8-5/8	4-1/2	6,000
11059370	15802	12-3/4	10-3/4	3,400

ALL STRENGTHS ARE THEORETICAL AND DO NOT CONSTITUTE OR IMPLY A GUARANTEE OF STRENGTH.

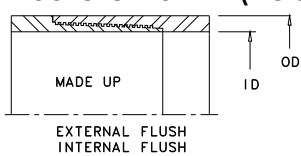


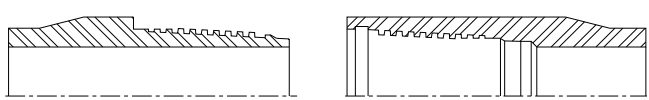
BAKER OIL TOOLS WASHPIPE (T.S.W.P.)



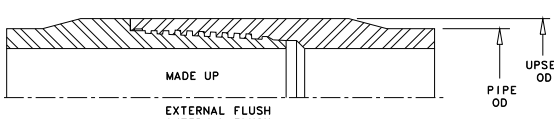


BAKER OIL TOOLS SPECIAL (T.S.S.)





BAKER OIL TOOLS X-LINE WASHPIPE (X-LINE)



BAKER OIL TOOLS WASHOVER PIPE STRENGTH CHART

SIZE AND CONNECTION	GAGE NO.	WEIGHT PLAIN END (lbs./ft.)	INSIDE DIA. (in.)	WALL THICK. (in.)	UPSET DIA. (in.)	DRIFT DIA. (in.)	MAKE-UP TORQUE (ft/lbs)+		JOINT TENSILE YIELD STRENGTH (lbs.)+	§JOINT EFFICIENCY %	WASHOVER SIZE	
							REC.¶	MAX.			REC.	MAX.
3-3/8 TSWP	318	10.02	2.764	0.305		2.639	1,000	4,000	111,500	47	2-1/2	2-5/8
3-1/2 TSWP	127	12.31	2.764	0.368		2.639	1,100	4,500	160,000	54	2-1/2	2-5/8
3-1/2 TSWP	422	8.81	2.992	0.254		2.867	850	3,400	97,400	47	2-11/16	2-7/8
3-5/8 TSWP	674	7.06	3.240	0.192		3.115	630	2,550	74,000	45	3	3-1/8
3-3/4 TSWP	675	9.55	3.238	0.256		3.113	980	3,950	108,700	45	3	3-1/8
3-3/4 TSWP	196	10.46	3.185	0.283		3.060	1,115	4,470	123,100	50	3	3-1/8
3-13/16 TSWP	75	11.70	3.187	0.313		3.062	1,225	5,050	138,500	50	3	3-1/8
4 TSWP°	58	12.93	3.340	0.330		3.215	1,370	5,600	153,670	51	3-1/16	3-1/4
4-3/8 TSWP	91	12.02	3.826	0.275		3.701	1,400	5,600	134,000	47	3-1/2	3-3/4
4-3/8 TSWP	91	13.58	3.749	0.313		3.624	1,660	6,650	158,700	50	3-1/2	3-5/8
4-1/2 TSS	117	11.35	4.000	0.250		3.875	1,200	4,800	99,250	37	3-3/4	3-7/8
4-1/2 TSWP°	148	13.04	3.920	0.290		3.795	1,460	5,860	160,800	52	3-5/8	3-3/4
4-1/2 TSWP°	59	14.98	3.826	0.337		3.701	1,800	7,220	181,200	51	3-1/2	3-11/16
4-3/4 TSS	92	17.52	4.000	0.375		3.875	2,390	9,590	181,400	44	3-3/4	3-7/8
4-7/8 TSWP	105	11.57	4.408	0.233		4.283	1,380	5,540	134,600	49	4	4-1/8
5 TSWP	50	14.87	4.408	0.296		4.283	1,870	7,500	178,900	51	4	4-1/8
5 TSWP°	57	14.87	4.408	0.296		4.283	1,870	7,500	184,600	53	4	4-1/8
5 X-LINE	73	15.00	*4.375	0.296	5.360	4.283	2,700	9,550	282,640	80	4	4-1/4
5 X-LINE	73	18.00	*4.250	0.362	5.360	4.151	2,700	9,550	350,400	83	4	4-1/8
5 TSWP°	158	17.93	4.276	0.362		4.151	2,460	9,850	218,500	52	4	4-1/8
5-3/8 TSS	53	20.02	4.625	0.375		4.500	2,900	11,600	222,800	47	4-1/4	4-1/2
5-1/2 TSWP°	56	16.87	4.892	0.304		4.767	2,370	9,480	209,700	52	4-5/8	4-3/4
5-1/2 X-LINE	74	17.00	*4.875	0.304	5.860	4.767	2,700	11,800	316,640	80	4-5/8	4-3/4
5-1/2 TSWP	164	19.81	4.778	0.361		4.653	2,970	11,900	237,200	51	4-1/2	4-5/8
5-3/4 TSWP°	133	18.18	5.124	0.313		4.999	2,700	10,800	222,800	52	4-7/8	5
5-3/4 TSS	77	21.53	5.000	0.375		4.875	3,400	13,580	246,500	49	4-3/4	4-7/8
6 TSS	78	15.35	5.500	0.250		5.375	2,500	10,000	147,450	41	5-1/4	5-3/8
6 TSWP°	428	19.64	5.352	0.324		5.227	3,170	12,700	238,800	52	5-1/8	5-1/4
6 TSWP°	79	22.81	5.240	0.380		5.115	3,870	15,500	276,300	49	5	5-1/8
6-3/8 TSWP°	129	24.03	5.625	0.375		5.500	4,250	17,000	288,300	51	5-3/8	5-1/2
6-5/8 TSWP	93	23.58	5.921	0.352		5.796	4,400	17,590	251,600	45	5-5/8	5-3/4
6-5/8 X-LINE	70	24.00	5.921	0.352	7.00	5.796	3,900	15,700	420,720	76	5-5/8	5-3/4
7 TSWP°	96	25.66	6.276	0.362		6.151	4,970	19,880	315,200	52	6	6-1/8
7 X-LINE	71	26.00	*6.276	0.362	7.39	6.151	4,500	20,900	482,640	80	6	6-1/8
7-1/4 TSWP	128	23.19	6.624	0.313	7.5	6.499	6,330	25,300	437,900	56	6-3/8	6-1/2

BAKER OIL TOOLS WASHOVER PIPE STRENGTH CHART

SIZE AND CONNECTION	GAGE NO.	WEIGHT PLAIN END (lbs./ft.)	INSIDE DIA. (in.)	WALL THICK. (in.)	UPSET DIA. (in.)	DRIFT DIA. (in.)	MAKE-UP TORQUE (ft/lbs)+		JOINT TENSILE YIELD STRENGTH (lbs.)+	§JOINT EFFICIENCY %	WASHOVER SIZE	
							REC.¶	MAX.			REC.	MAX.
7-3/8 TSWP°	94	28.04	6.625	0.375		6.500	5,700	22,800	343,000	52	6-3/8	6-1/2
7-3/8 TSWP°	109	28.04	6.625	0.375		6.500	5,725	22,900	341,300	52	6-3/8	6-1/2
7-5/8 TSWP°	166	25.56	6.969	0.328		6.844	5,080	20,300	309,300	51	6-3/4	6-7/8
7-5/8 TSWP°	122	29.04	6.875	0.375		6.750	5,650	22,600	378,500	55	6-5/8	6-3/4
7-5/8 TSWP	80	29.04	6.875	0.375		6.750	6,120	24,500	355,000	52	6-5/8	6-3/4
7-5/8 TSWP°	81	33.04	6.765	0.430		6.640	7,520	30,100	398,900	51	6-1/2	6-5/8
7-5/8 X-LINE	87	29.70	*6.843	0.375	8.010	6.750	5,000	25,300	531,200	78	6-9/16	6-11/16
8 TSWP°	121	30.54	7.250	0.375		7.125	6,600	26,400	362,900	51	7	7-1/8
8-1/8 TSWP°	153	31.04	7.375	0.375		7.250	6,820	27,300	373,900	51	7-1/8	7-1/4
8-1/8 TSWP°	97	35.92	7.250	0.437		7.125	8,370	33,500	398,500	47	7	7-1/8
8-1/8 TSWP°	97	38.42	7.185	0.470		7.060	9,150	36,600	457,500	51	6-15/16	7-1/16
8-3/8 TSWP	163	33.95	7.578	0.399		7.453	7,500	30,000	404,900	51	7-1/4	7-3/8
8-3/8 TSS	106	37.09	7.500	0.437		7.375	7,000	28,100	441,000	55	7-1/4	7-3/8
8-5/8 TSWP°	151	31.10	7.921	0.352		7.796	6,700	27,100	335,300	41	7-9/16	7-11/16
8-5/8 X-LINE	103	36.00	*7.813	0.400	9.120	7.700	5,500	37,100	652,000	79	7-1/2	7-5/8
8-5/8 TSWP°	110	39.29	7.725	0.450		7.600	9,950	39,800	475,200	51	7-1/2	7-11/16
9 TSWP°	139	38.92	8.150	0.425		7.994	9,920	39,700	458,400	50	7-7/8	8
9-5/8 TSWP°	152	38.94	8.835	0.395		8.679	10,450	41,800	463,400	51	8-1/2	8-3/4
9-5/8 TSWP°	140	42.70	8.755	0.435		8.599	11,750	47,000	507,800	51	8-1/4	8-1/2
9-5/8 X-LINE	114	43.50	8.665	0.435	10.100	8.599	6,000	48,500	836,960	83	8-1/4	8-1/2
9-5/8 TSWP	170	46.14	8.681	0.472		8.525	13,000	52,100	543,800	50	8-1/4	8-1/2
10-3/4 TSWP°	155	44.22	9.950	0.400		9.794	13,150	52,600	531,000	51	9-1/2	9-3/4
10-3/4 TSWP°	154	49.50	9.850	0.450		9.694	15,600	62,400	595,600	51	9-3/8	9-5/8
10-3/4 TSWP	124	49.50	9.850	0.450		9.694	14,250	57,000	606,000	52	9-3/8	9-5/8
10-3/4 TSWP°	147	54.21	9.760	0.495		9.604	17,550	70,200	641,800	50	9-1/4	9-1/2
11-3/4 TSWP°	156	52.57	10.880	0.435		10.724	12,130	48,500	++377,400	44	10-1/8	10-5/8
11-3/4 TSWP	125	58.81	10.772	0.489		10.616	13,230	52,900	++470,400	49	10	10-1/2
12-3/4 TSWP	150	49.56	12.000	0.375	13.500	11.844	28,500	114,100	++807,300	49	11	11-1/2
13-3/8 TSWP	134	66.11	12.415	0.480	13.750	12.259	25,000	100,300	++788,900	52	11-1/2	12
16 TSWP	426	81.97	15.010	0.495	16.750	14.823	43,000	172,000	++1,231,700	52	14-1/4	14-3/4

ALL STRENGTHS MAXIMUM VALUE-APPLY SAFETY FACTOR OF 2 TO THE JOINT TENSILE YIELD STRENGTH.

¶ RECOMMENDED MAKE-UP TORQUE = 25% OF MAXIMUM MAKE-UP TORQUE-DOES NOT APPLY TO X-LINE CONNECTIONS.

§ RATIO OF THE JOINT TENSILE YIELD STRENGTH TO THE PIPE TENSILE YIELD STRENGTH.

* THE INTERNAL UPSET HAS BEEN REDUCED. + N-80 PIPE.

° INTERCHANGEABLE WITH HYDRIL THREADS. ++ J-55 MATERIAL.