Fire Test Report

ANSI/API Standard 607, Fifth Edition, June 2005
ISO 10497-5:2004

Performed for

Everest Valve Company

www.everestvalveusa.com

10 inch Class 150 LUG TYPE Butterfly Valve
Preferred flow direction
ASME B16.34, API609 CAT-B

Project Number: 209208
January 2010

Performed by

YARMOUTH RESEARCH AND TECHNOLOGY, LLC

434 Walnut Hill Road
North Yarmouth, ME 04097 USA
(207) 829-5359
info@yarmouthresearch.com
www.yarmouthresearch.com

Yarmouth Research and Technology, LLC

Customer:	Everest Valve Company	**Date:**	1/18/2010
Specification:	ANSI/API Standard 607, Fifth Edition, June 2005		
	ISO 10497-5:2004		
Product Description:	10 inch Class 150 Lug Type Butterfly Valve - preferred flow direction		
Project Number:	PN209208		
Comments:	ASME B16.34, API609 CAT-B		
	CS Body, Stellite Seat, 17-4 Stem		
Yarmouth Engineer:	Matthew J. Wasielewski, P.E.		
Equipment Confirmed to be in Calibration to NIST Standards:	Yes		

Burn and Cool Down Test

Burn Start Time:	**15:08:00**	
Average Pressure During Burn:	**215**	psig
Seat Leak Rate During Burn:	**11.7**	ml/min
Allowable Seat Leak Rate:	**3200**	ml/min
External Leak Rate During Burn/Cool Down:	**0.0**	ml/min
Allowable External Leak Rate:	**800**	ml/min
Amount of Time of Avg. Cal. Blocks > 650 deg. C:	**19.8**	minutes
Were Test Conditions Within Compliance?	**Yes**	
Were the Valve Leakages Below the Allowables?	**Yes**	

Post-burn Test

Average Pressure During Test:	**30**	psig
Seat Leak Rate:	**0.0**	ml/min
Allowable Seat Leak Rate:	**320**	ml/min
Was the Leakage Below the Allowable?	**Yes**	

Operational Test

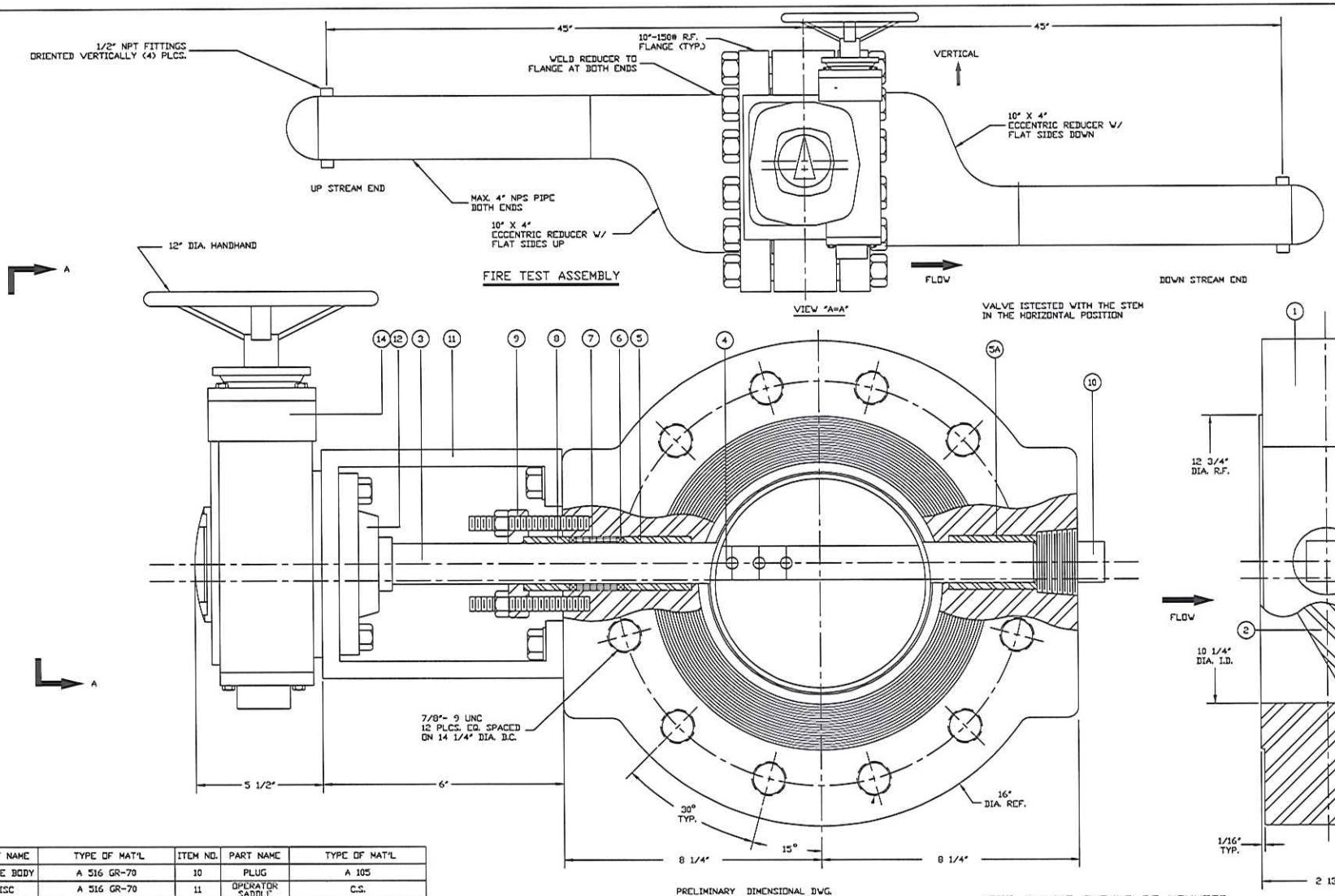
Did Valve Unseat and Open Fully?:	**Yes**	
Average Pressure During Test:	**213**	psig
External Leak Rate After Operating:	**0.0**	ml/min
Allowable External Leak Rate:	**200**	ml/min
Was the Leakage Below the Allowable?	**Yes**	

Valve Pass or Fail the Test Standard?	**PASS**

Witnesses

Fire Test Information Sheet

Valve Manufacturer's Name:	EVEREST VALVE COMPANY
Valve Manufacturer's Address:	6612 AVENUE U HOUSTON, TX 77011
Did valve meet all required hydrostatic, leakage and other production pressure tests?	YES
Valve Product Code:	ASME B16.34, API609 CAT-B
Valve Description Size:	10" LUG TYPE BFV
Pressure Rating:	150# RF
Pressure Rating at 100F:	285 PSIG
Type:	BUTTERFLY VALVE
Weight:	230#
Reduced or Full Bore:	FULL BORE
Body/Bonnet Material:	CARBON STEEL
Trim Material:	CARBON STEEL
Seat Material:	STELLITE HF
Stem / Body Seal Material:	17-4PHSS / LAM SS & GRF
Bolting Material:	A193GR. B7
Is valve considered "Soft-Seated"?	NO
Valve Markings	
Nameplate Information:	SEE ATTACHED
Casting Markings:	N/A
Assembly Drawing Number / Revision / Date of Issue:	EMLB-1010L 1-6-10
Assembly Drawing sent to Yarmouth:	SEE ATTACHED
If valve is fitted with gearbox, state gearbox manufacturer, model number and mechanical advantage:	AUMA GEAR #GS100.3 W/12" H.W. MECH ADV = 20
If valve is non-symmetric, state direction of flow for test:	FLOW ARROW MARKED ON THE VALVE
For double-seated valves, state maximum allowable cavity pressure:	N/A
Manufacturer's Contact Name /Date:	PHILLIP R. BLEST / 1-6-10



ITEM NO.	PART NAME	TYPE OF MAT'L	ITEM NO.	PART NAME	TYPE OF MAT'L
1	VALVE BODY	A 516 GR-70	10	PLUG	A 105
2	DISC	A 516 GR-70	11	OPERATOR SADDLE	C.S.
2A	RETAINER RING	C.S.	12	BEARING	DODGE
3	SHAFT	17-4PH S/S	13	LAMINATION	17-PH S/S W/GRFOIL
4	CONN. PIN	17-4PH S/S	14	OPERATOR	AUMA GEAR
5	POWER BUSHING	NITRONIC-60			
5A	NON POWER BUSHING	NITRONIC-60			
6	PACKING	GARLOCK-1303			
7	PACKING	GRAFOIL			
8	FOLLOWER	304 S/S			
9	GLAND	304 S/S			

SERVICE CONDITIONS:

WORKING PR.	285 PSIG.
DIFF PR.	285 PSIG.
MAX. TEMP.	375°F
OPR. TEMP.	100° F
TOTAL WT.	230 LBS.
TAG NO.	

PRELIMINARY DIMENSIONAL DWG.

CUSTOMER NAME: FIRE TEST
CUSTOMER P.O. NO.:
EVEREST APPROVAL: P.R. BLEST
END USER:
END USER P.O. NO.:
TYPE OF OPERATOR: AUMA GEAR # GS-100.3 W/ H.W.

NOTE: VALVE SHOULD BE MOUNTED SHAFT IN HORIZONTAL POSITION

EVEREST VALVE MODEL # EMLB-1010L

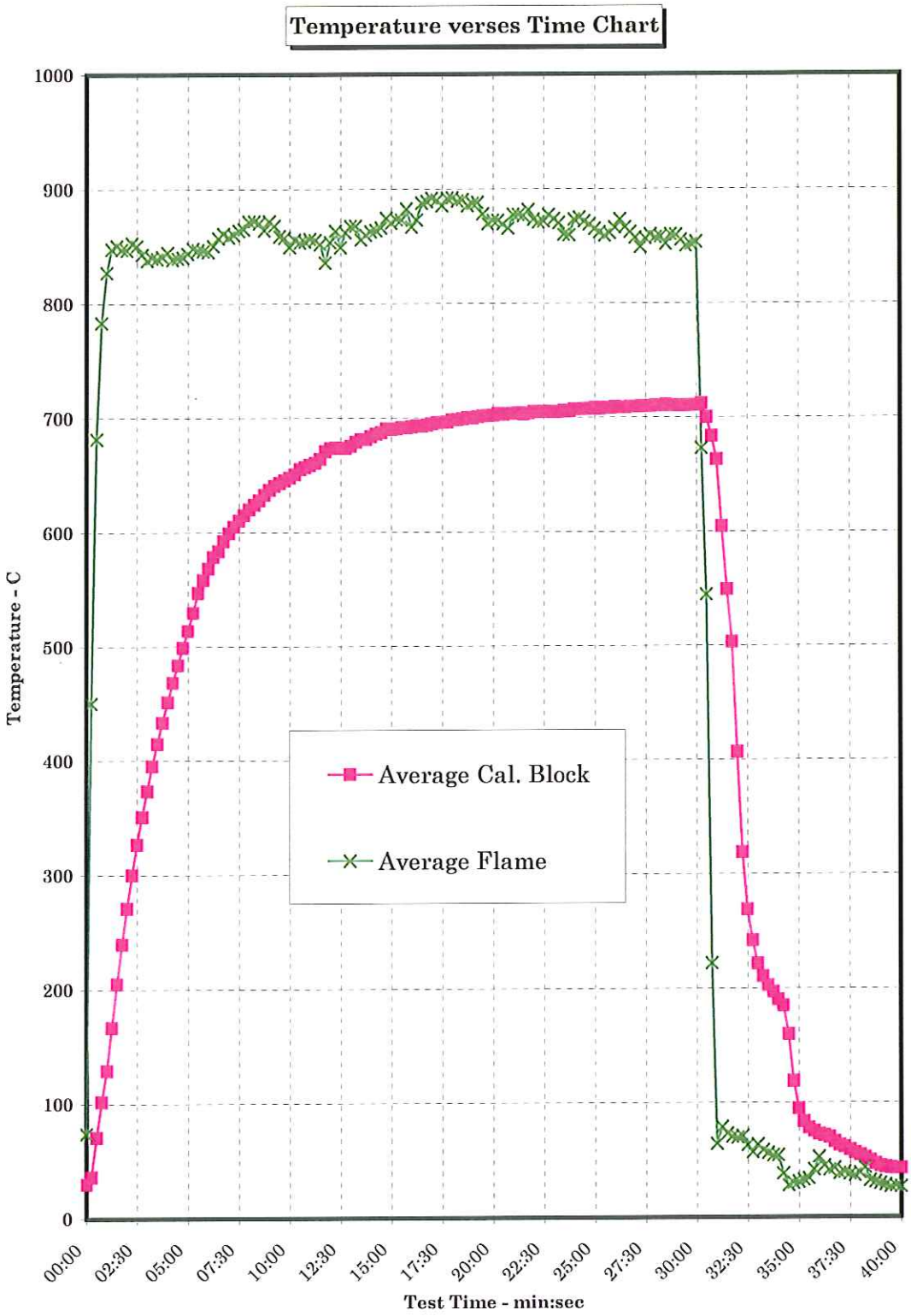
EVEREST JOB# 688

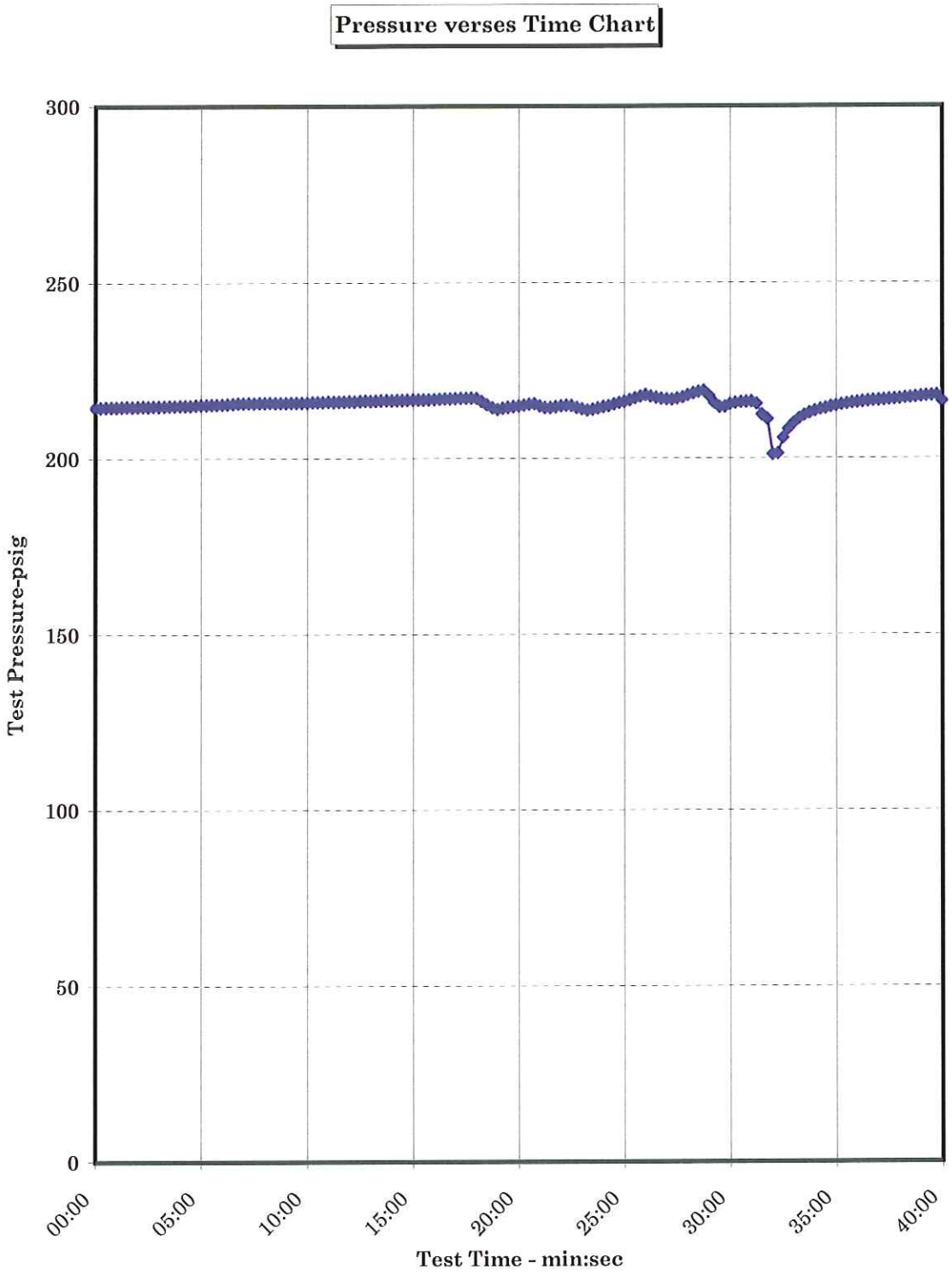
EVEREST VALVE, CO. HOUSTON, TX.

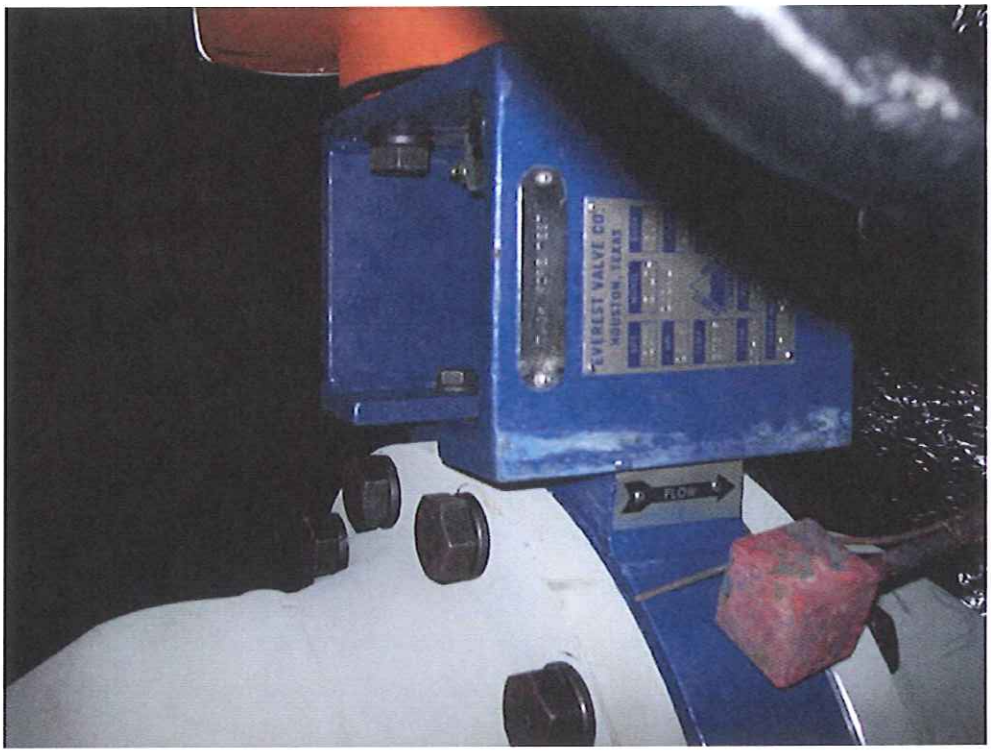
SCALE NONE	APPROVED BY: P.R. BLEST	DRAWN BY: C.S.
DATE 07/28/03		REVISED

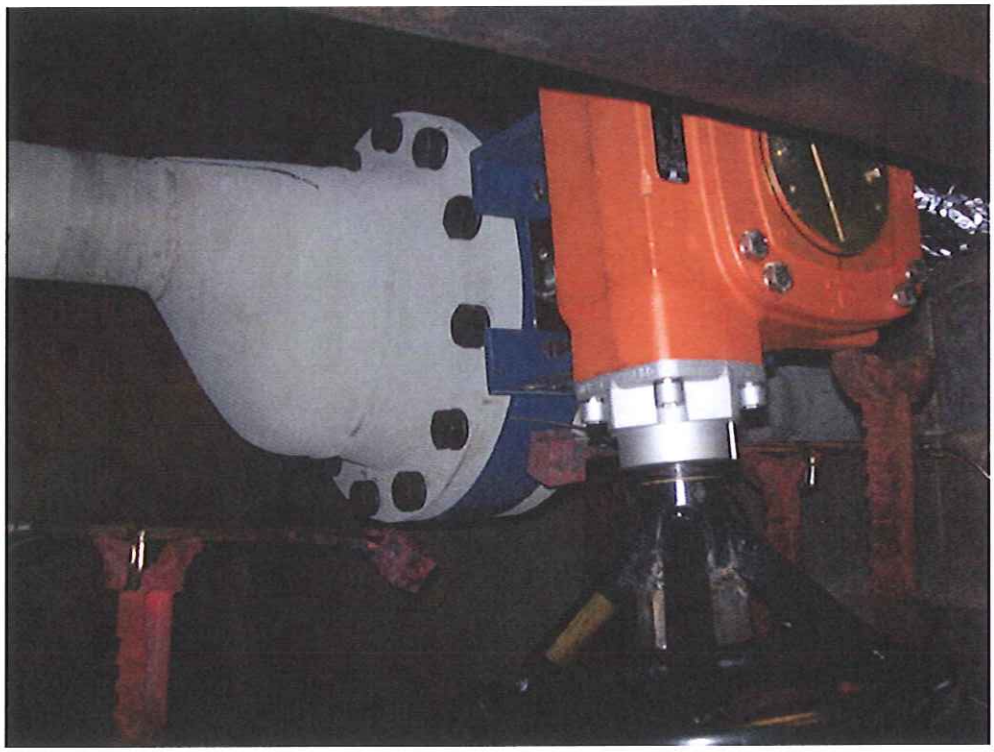
LAMINATED SEAT B.F. VALVE (LUG STYLE)

VALVE SIZE=FIRE TEST | DRAWING NUMBER EMLB-1010L


Temperature verses Time Chart
1000
900
800
700
600
500
400
300
200
100
0
Temperature - C
Average Cal. Block
Average Flame
00:00
02:30
05:00
07:30
10:00
12:30
15:00
17:30
20:00
22:30
25:00
27:30
30:00
32:30
35:00
37:30
40:00
Test Time - min:sec


Pressure verses Time Chart
300
250
200
150
100
50
0
Test Pressure-psig
00:00
05:00
10:00
15:00
20:00
25:00
30:00
35:00
40:00
Test Time - min:sec





Valve Prior to Test

Valve During Burn.

Yarmouth Research and Technology, LLC

Fire Test Information

Customer: Everest Valve Company **Date:** 1/18/2010

Product Code: 10 inch Class 150 Lug Type Butterfly Valve - preferred flow direction

Project Number: PN209208

Fire Test Raw Data

Time	Pressure (psig)	Water Volume (mls)	Cal. Block 1 Temp-C	Cal. Block 2 Temp-C	Cal. Block 3 Temp-C	Avg. Cal Block Temp-C	Bonnet Flame Temp-C	Body Flame Temp-C	Average Flame Temp-C
15:08:00	215	37336	27	38	25	30	44	104	74
15:08:15	215	37337	31	50	29	36	424	476	450
15:08:30	215	37334	61	103	48	71	667	697	682
15:08:45	215	37333	105	122	79	102	777	791	784
15:09:00	215	37341	128	159	101	129	820	834	827
15:09:15	215	37353	168	207	126	167	839	857	848
15:09:30	215	37372	204	251	159	205	843	858	851
15:09:45	215	37382	238	291	191	240	830	865	848
15:10:00	215	37387	267	326	220	271	825	869	847
15:10:15	215	37394	293	359	249	300	838	868	853
15:10:30	215	37402	317	389	274	327	833	868	851
15:10:45	215	37416	338	417	298	351	824	862	843
15:11:00	215	37429	358	442	321	374	818	858	838
15:11:15	215	37438	377	466	343	395	824	857	840
15:11:30	215	37455	394	488	363	415	823	856	839
15:11:45	215	37458	410	508	383	434	821	861	841
15:12:00	215	37466	427	526	401	451	829	860	845
15:12:15	215	37495	442	544	419	469	824	853	839
15:12:30	215	37522	457	559	436	484	831	849	840
15:12:45	215	37548	471	574	453	499	826	855	841
15:13:00	215	37522	483	588	471	514	823	864	844
15:13:15	215	37570	495	599	496	530	826	871	848
15:13:30	215	37554	507	609	526	547	829	864	847
15:13:45	215	37579	517	619	539	559	826	867	846
15:14:00	215	37594	527	628	551	569	828	863	845
15:14:15	216	37608	537	637	563	579	833	868	851
15:14:30	216	37629	546	644	562	584	838	876	857
15:14:45	216	37649	555	651	572	593	840	882	861
15:15:00	216	37669	563	658	577	599	834	882	858
15:15:15	216	37681	570	664	581	605	837	883	860
15:15:30	216	37693	577	669	585	610	840	887	864
15:15:45	216	37710	584	675	587	615	841	889	865
15:16:00	216	37736	591	680	590	620	850	893	872

Fire Test Data - continued

15:16:15	216	37759	597	685	591	624	852	892	872
15:16:30	216	37782	603	689	592	628	849	891	870
15:16:45	216	37800	609	693	596	633	837	891	864
15:17:00	216	37817	614	697	601	637	855	889	872
15:17:15	216	37843	619	701	602	641	851	885	868
15:17:30	216	37866	623	704	602	643	829	889	859
15:17:45	216	37881	627	707	602	645	823	892	858
15:18:00	216	37897	630	710	604	648	809	890	849
15:18:15	216	37914	632	712	607	651	821	891	856
15:18:30	216	37963	635	716	615	655	816	891	853
15:18:45	216	37988	637	718	616	657	814	894	854
15:19:00	216	38011	640	721	616	659	826	887	856
15:19:15	216	38038	643	723	617	661	824	886	855
15:19:30	216	38067	645	726	621	664	828	876	852
15:19:45	216	38085	647	729	636	671	800	872	836
15:20:00	216	38114	648	732	640	673	822	885	854
15:20:15	216	38156	651	733	638	674	835	892	863
15:20:30	216	38178	652	734	634	674	813	885	849
15:20:45	216	38213	654	736	631	674	828	896	862
15:21:00	216	38236	656	738	632	675	838	897	868
15:21:15	216	38266	658	739	639	679	841	895	868
15:21:30	216	38301	660	740	643	681	826	886	856
15:21:45	217	38326	661	741	642	681	827	893	860
15:22:00	216	38354	662	742	647	684	826	900	863
15:22:15	217	38409	663	743	652	686	823	904	864
15:22:30	217	38427	664	744	653	687	825	907	866
15:22:45	217	38426	666	745	661	691	834	915	874
15:23:00	217	38495	667	746	657	690	827	913	870
15:23:15	217	38533	668	747	657	691	832	915	873
15:23:30	217	38567	669	748	657	691	831	915	873
15:23:45	217	38583	671	748	656	691	847	918	883
15:24:00	217	38621	672	749	655	692	816	918	867
15:24:15	217	38673	672	751	656	693	823	923	873
15:24:30	217	38699	673	752	653	693	851	924	888
15:24:45	217	38752	675	752	654	694	849	928	889
15:25:00	217	38784	677	753	655	695	853	930	892
15:25:15	217	38829	678	753	656	696	848	932	890
15:25:30	217	38859	679	754	654	696	846	924	885
15:25:45	217	38910	681	756	652	696	851	932	892
15:26:00	217	38938	682	757	655	698	853	931	892
15:26:15	216	38928	684	757	654	698	844	935	889
15:26:30	215	38927	684	758	654	699	848	933	891
15:26:45	214	38944	686	759	655	700	840	931	885

Fire Test Data - continued

15:27:00	214	38991	686	760	653	700	841	933	887
15:27:15	214	39074	687	762	654	701	842	934	888
15:27:30	215	39161	688	763	654	701	826	931	878
15:27:45	215	39225	687	763	655	702	812	927	870
15:28:00	215	39285	687	764	655	702	822	923	873
15:28:15	215	39349	687	766	657	704	816	929	873
15:28:30	215	39416	687	767	654	703	813	925	869
15:28:45	216	39478	687	768	655	703	809	922	866
15:29:00	215	39484	687	769	655	704	827	929	878
15:29:15	214	39548	687	771	654	704	821	934	878
15:29:30	214	39642	688	772	649	703	819	934	877
15:29:45	215	39705	688	774	649	704	827	936	882
15:30:00	215	39802	688	775	652	705	812	935	873
15:30:15	215	39877	689	777	649	705	812	930	871
15:30:30	215	39982	689	778	648	705	809	934	872
15:30:45	214	39954	688	779	647	705	821	934	878
15:31:00	214	40068	688	781	645	705	810	938	874
15:31:15	214	40167	688	782	645	705	803	937	870
15:31:30	214	40302	688	783	648	706	792	928	860
15:31:45	214	40413	688	784	645	706	793	927	860
15:32:00	215	40540	687	786	648	707	814	932	873
15:32:15	215	40652	687	787	647	707	814	936	875
15:32:30	215	40773	687	788	647	707	807	937	872
15:32:45	216	40918	688	789	646	708	803	935	869
15:33:00	216	41062	687	791	647	708	796	934	865
15:33:15	217	41227	687	792	645	708	787	937	862
15:33:30	217	41414	686	793	646	709	779	939	859
15:33:45	218	41613	686	795	645	709	787	936	861
15:34:00	218	41805	685	796	646	709	796	937	866
15:34:15	218	41984	685	797	644	709	807	940	873
15:34:30	217	42223	684	798	643	709	788	944	866
15:34:45	217	42495	684	800	644	709	787	937	862
15:35:00	217	42829	684	801	643	709	775	939	857
15:35:15	217	43088	683	802	643	710	764	934	849
15:35:30	217	43553	682	803	644	710	779	934	857
15:35:45	217	44002	682	804	643	710	783	937	860
15:36:00	218	44564	681	805	644	710	781	934	858
15:36:15	219	45208	681	806	644	710	776	941	858
15:36:30	219	46039	681	807	645	711	761	943	852
15:36:45	219	47223	680	808	642	710	783	937	860
15:37:00	218	49179	680	809	642	710	781	938	859
15:37:15	216	48441	679	811	640	710	771	939	855
15:37:30	215	48808	679	812	639	710	758	942	850

Fire Test Data - continued

15:37:45	215	48791	679	812	640	711	765	938	851
15:38:00	215	49525	679	813	639	711	770	937	854
15:38:15	216	50019	677	813	646	712	618	728	673
15:38:30	216	50027	668	805	626	700	509	581	545
15:38:45	216	50125	654	786	611	684	359	85	222
15:39:00	216	50302	634	724	631	663	70	58	64
15:39:15	216	50291	603	610	601	605	78	80	79
15:39:30	212	49221	584	552	513	549	72	75	73
15:39:45	211	48169	568	491	451	503	59	82	71
15:40:00	201	12005	551	316	353	407	66	73	69
15:40:15	201	37784	534	163	260	319	66	76	71
15:40:30	206	37700	519	98	189	269	62	64	63
15:40:45	208	37641	506	78	141	242	53	61	57
15:41:00	210	37602	493	64	108	222	54	73	64
15:41:15	211	37562	481	62	88	210	53	64	59
15:41:30	212	37531	470	61	77	202	52	60	56
15:41:45	213	37509	458	61	71	197	53	56	54
15:42:00	213	37495	447	57	66	190	53	56	54
15:42:15	214	37475	437	56	62	185	36	41	38
15:42:30	214	37467	377	48	53	159	29	27	28
15:42:45	215	37457	282	33	41	119	33	27	30
15:43:00	215	37443	222	29	33	95	31	31	31
15:43:15	215	37453	192	28	31	84	33	32	33
15:43:30	216	37420	177	28	29	78	33	34	34
15:43:45	216	37419	168	28	29	75	37	46	42
15:44:00	216	37402	158	29	30	73	49	56	53
15:44:15	216	37391	150	31	33	71	46	44	45
15:44:30	216	37370	142	31	36	70	34	48	41
15:44:45	216	37322	129	31	38	66	36	49	43
15:45:00	216	37148	119	31	39	63	37	39	38
15:45:15	217	37138	111	31	42	61	34	45	39
15:45:30	217	37110	103	32	41	59	33	42	38
15:45:45	217	37046	96	32	41	56	32	42	37
15:46:00	217	37112	89	33	41	54	38	39	39
15:46:15	217	37025	83	33	39	52	36	52	44
15:46:30	217	37026	77	32	39	49	31	33	32
15:46:45	217	37020	68	32	39	46	27	34	31
15:47:00	218	37009	63	32	39	45	27	32	29
15:47:15	218	37005	61	32	38	44	26	30	28
15:47:30	218	37000	58	33	38	43	24	28	26
15:47:45	218	36996	58	32	38	43	27	28	27
15:48:00	216	36989	57	33	38	43	26	27	26

Leakage Summary for Burn and Cool Down Periods

All pressure transducers and thermocouples are in calibration per YRT's QA program
Seat leakages were collected manually. External leakage was collected electronically.

Total Through Seat Leakage Collected Over 30 Minute Duration:	350	mls
Average Leak Rate Over 30 Minute Duration:	11.7	ml/min
Allowable Leak Rate:	3200	ml/min
Total Through Seat Leakage Collected Over 10 Minute Cool Down:	0	mls
Total Water Volume Lost Over 40 Minute Burn and Cool Down:	347	mls
Water Collected in System Relief Valve:	0	mls
Calculated External Leakage During 40 Minute Duration:	-3	mls
Average Leak Rate Over 40 Minute Duration:	0.0	ml/min
Allowable Leak Rate:	800	ml/min
Were the Valve Leakages Below the Allowables?	**Yes**	

Yarmouth Research and Technology, LLC

Summary of Test Parameters During Burn and Cool Down Periods

Amount of Time Pressure Dropped Below 50%:	0.0	minutes
Maximum Allowable Low Pressure Time:	2.0	minutes
Maximum Pressure During Burn/Cool Down:	219.2	psig
Average Pressure During Burn/Cool Down:	215.4	psig
Minimum Pressure During Burn/Cool Down:	201.2	psig
Amount of Time of Avg. Cal Block > 650 deg.C:	19.8	minutes
Minimum Allowable Time at Temperature:	15.0	minutes
Maximum Avg Cal Block Temperature:	712.0	deg. C
Average Cal Block Temperature:	512.2	deg. C
Lowest Avg Cal. Block Temperature:	30.0	deg. C
Maximum Body Flame Temperature During Burn:	944.4	deg. C
Average Body Flame Temperature During Burn:	896.1	deg. C
Maximum Bonnet Flame Temperature During Burn:	855.0	deg. C
Average Bonnet Flame Temperature During Burn:	810.3	deg. C
Average of Both Flame Temperatures During Burn:	853.2	deg. C

Notes

Were Test Conditions Within Compliance?	**Yes**

Yarmouth Research and Technology, LLC

Post-Burn Seat Test Information

Customer: Everest Valve Company **Date:** 1/18/2010

Product Code: 10 inch Class 150 Lug Type Butterfly Valve - preferred flow direction

Project Number: PN209208

Test Data

Time	Pressure (psig)	Cal Block Temp - C
15:52:58	30	13
15:53:13	30	13
15:53:28	30	13
15:53:43	30	13
15:53:58	30	13
15:54:13	30	14
15:54:28	30	14
15:54:43	30	14
15:54:58	30	14
15:55:13	30	14
15:55:28	30	15
15:55:43	30	15
15:55:58	30	15
15:56:13	30	15
15:56:28	30	15
15:56:43	30	16
15:56:58	30	16
15:57:13	30	16
15:57:28	30	16
15:57:43	30	16
15:57:58	30	16

Leakages were collected manually.

Total Seat Leakage Collected Over 5 Minute Duration:	0.0	mls
Average Leak Rate Over 5 Minute Duration:	0.0	ml/min
Allowable Leak Rate:	320	ml/min

Was the Valve Leakage Below the Allowable?	**Yes**

Yarmouth Research and Technology, LLC

Operational Test Information

Customer: Everest Valve Company **Date:** 1/18/2010

Product Code: 10 inch Class 150 Lug Type Butterfly Valve - preferred flow direction

Project Number: PN209208

Test Data

Time	Pressure (psig)	Cal Block Temp - C
16:00:32	213	17
16:00:47	213	17
16:01:02	213	17
16:01:17	213	17
16:01:32	213	17
16:01:47	213	17
16:02:02	213	17
16:02:17	213	17
16:02:32	213	17
16:02:47	213	17
16:03:02	213	17
16:03:17	213	17
16:03:32	213	17
16:03:47	213	17
16:04:02	213	17
16:04:17	213	17
16:04:32	213	17
16:04:47	213	17
16:05:02	213	17
16:05:17	213	17
16:05:32	213	17

Leakages were collected manually.

Total External Leakage Collected Over 5 Minute Duration:	0	mls
Average Leak Rate Over 5 Minute Duration:	0.0	ml/min
Allowable Leak Rate:	200	ml/min

Was the Valve Leakage Below the Allowable?	**Yes**