

ADVANCED SHEET METAL, LLC

SHOP STANDARDS

Sample Specification for Round Medium Pressure Double Wall Spiral Pipe and Fittings

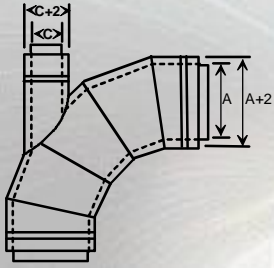
All round medium pressure double wall spiral pipe and fittings will be manufactured with the construction standards of Advanced Sheet Metal. Construction will comprise of air tight outer shell, one inch insulation layer, and a Solid inner liner that completely covers the insulation. Available connection types are raw(slip fit), Flanged and Edge gasket. The insulation will be 1 1/2 inch thick, compressed to one inch with a 3/4 pound density and will have the following Under Writer's ratings:

Flame Spread	10 - 20
Fuel Contribution	10 - 15
Smoke Developed	0 - 20

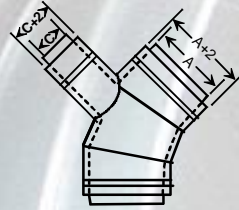
The outer shell and inner liner will be manufactured from galvanized steel which meets ASTM A-527-67 specification. Refer to the following chart for gauge specifications:

Dust Diameter	3" - 12"	13" - 24"	26" - 34"	36" - 48"
Outer Shell - Spiral Pipe	24GA.	24GA.	22GA.	20GA.
Inner Shell - Spiral Pipe	24GA.	24GA.	24GA.	24GA.
Outer Shell - Fittings	24GA.	22GA.	22GA.	20GA.
Inner Shell - Fittings	24GA.	22GA.	22GA.	22GA.

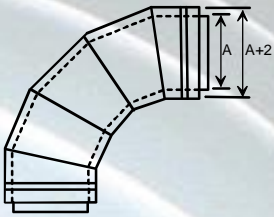
* Also available upon request, 1 1/2", 2" and 4" double wall.



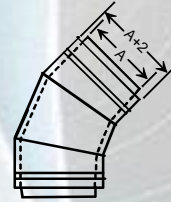
90 DEGREE 5 PIECE DW ELBOW WITH DW TAP
 When Ordering, List: A, C
 Centerline Radius = $1.5 \times (A + 2)$



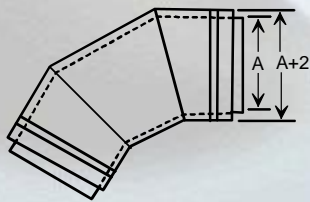
45 DEGREE 3 PIECE DW ELBOW WITH DW TAP
 When Ordering, List: A, C
 Centerline Radius = $1.5 \times (A + 2)$



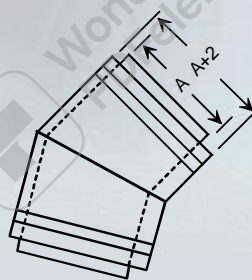
90 DEGREE 5 PIECE DW ELBOW
 When Ordering, List: A
 Centerline Radius = $1.5 \times (A + 2)$



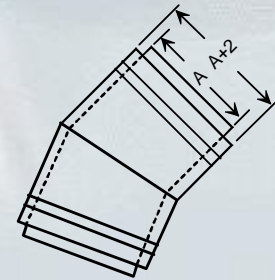
45 DEGREE 3 PIECE DW ELBOW
 When Ordering, List: A
 Centerline Radius = $1.5 \times (A + 2)$



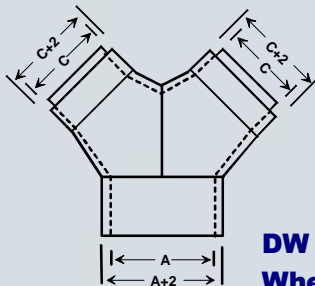
60 DEGREE 3 PIECE DW ELBOW
 When Ordering, List: A
 Centerline Radius = $1.5 \times (A + 2)$



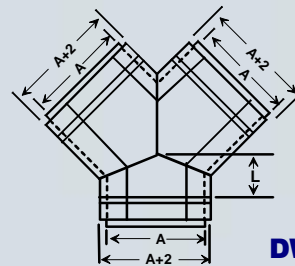
30 DEGREE 2 PIECE DW ELBOW
 When Ordering, List: A
 Centerline Radius = $1.5 \times (A + 2)$



22 1/2 DEGREE 2 PIECE DW ELBOW
 When Ordering, List: A
 Centerline Radius = $1.5 \times (A + 2)$

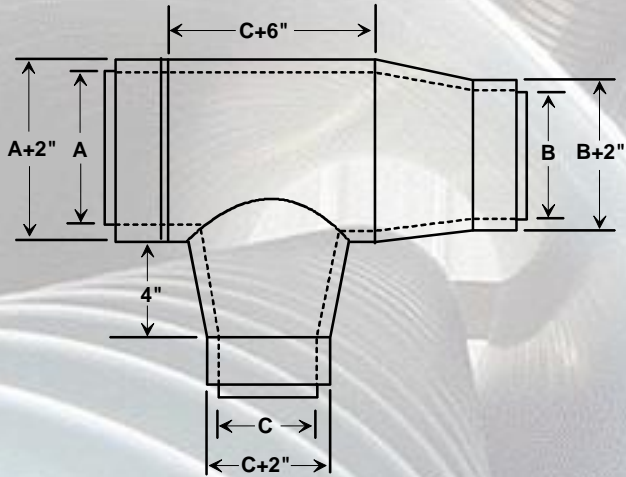


DW REDUCING 2-WAY "Y"
 When Ordering, List: A, B, C
 Crotch Height = $.75 \times A \text{ Dia.}$

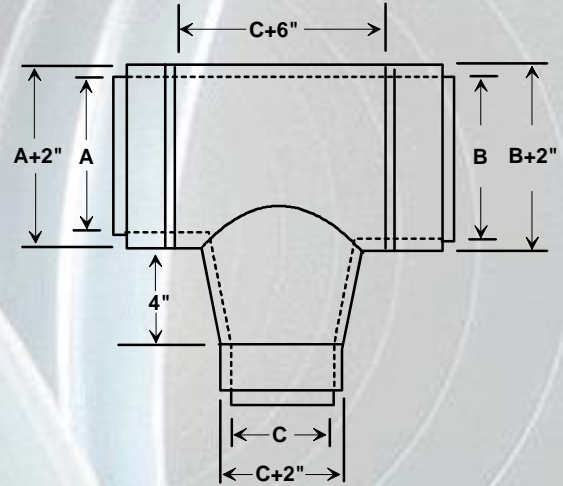


DW "Y" OF SAME DIAMETER
 When Ordering, List: A
 $L = .207 \times A + 1$

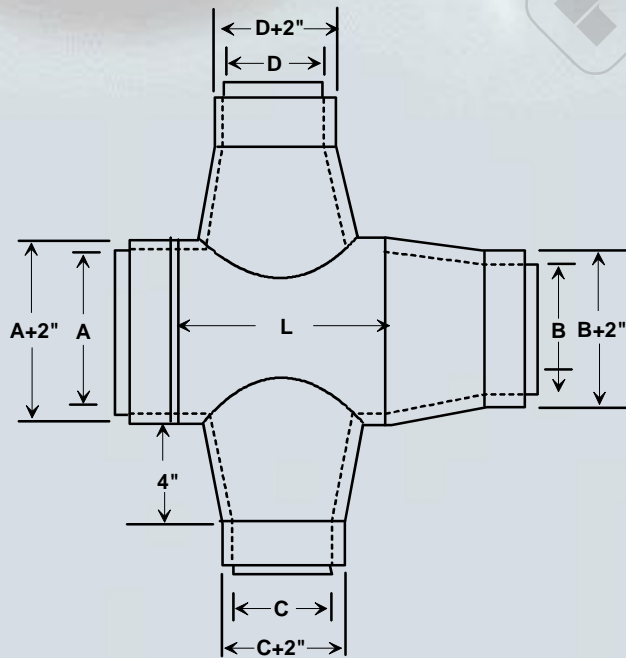
ALL ELBOWS
 23" Throat Radius + Larger
 No. "S" is Added (2" Bead is Lost From Radius)



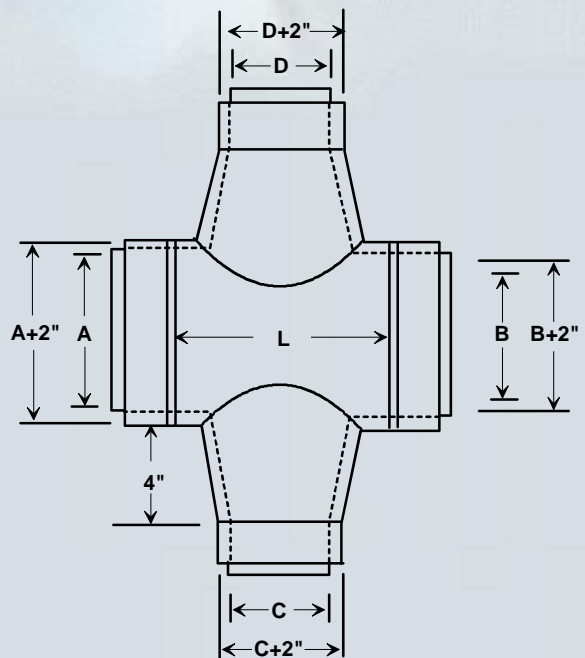
DW REDUCING CONICAL TEE
When Ordering, List: A, B, C



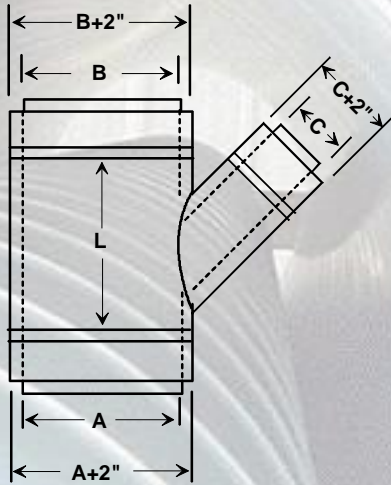
DW CONICAL TEE
When Ordering, List: A, B, C



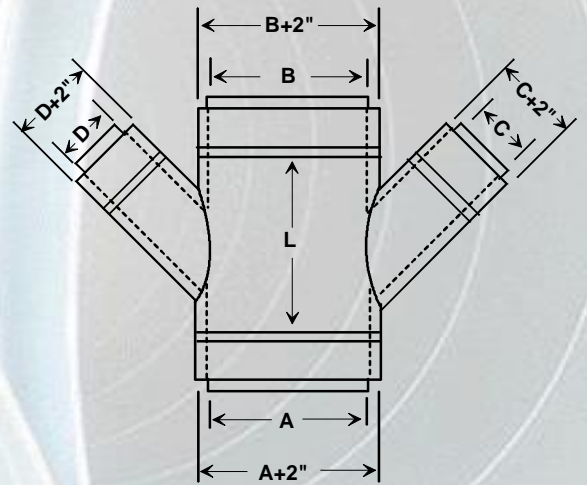
DW REDUCING CONICAL CROSS
When Ordering, List: A, B, C, D
L= Larger of C or D, + 6"



DW CONICAL CROSS
When Ordering, List: A, B, C, D, L
L= Larger of C or D, + 6"



DW LATERAL TEE
When Ordering, List: A, B, C

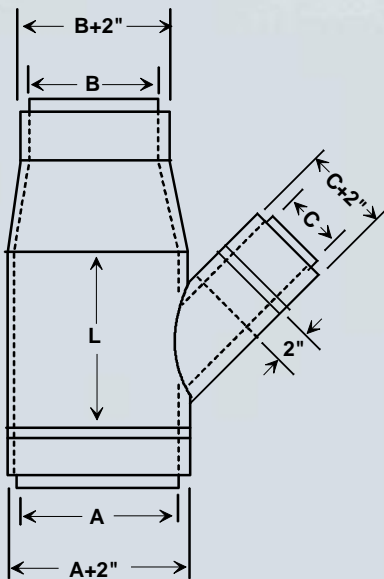


DW LATERAL CROSS TEE
When Ordering, List: A, B, C

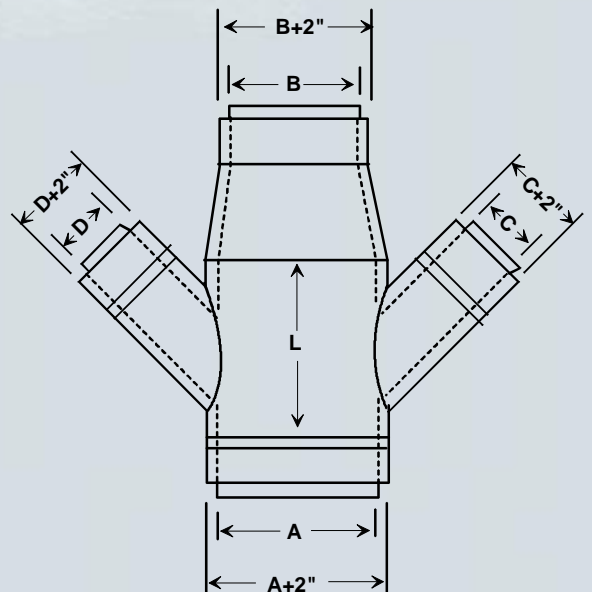
60 DEGREE LATERAL
 $L = (C \times 1.15) + 4''$

45 DEGREE LATERAL
 $L = (C \times 1.41) + 4''$

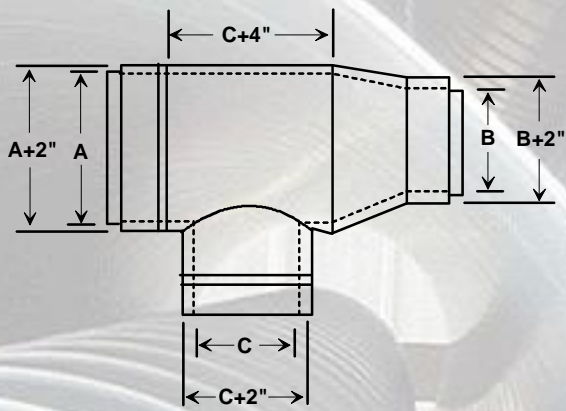
30 DEGREE LATERAL
 $L = (C \times 2) + 4''$



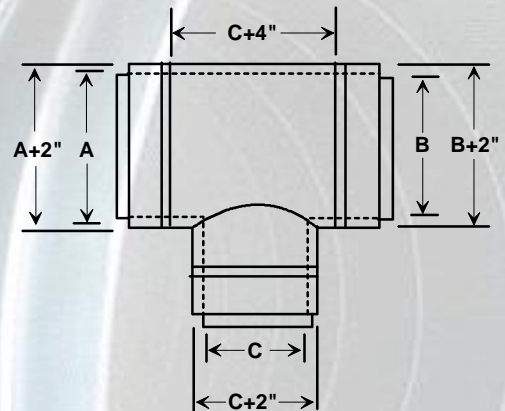
DW REDUCING LATERAL TEE
When Ordering, List: A, B, C



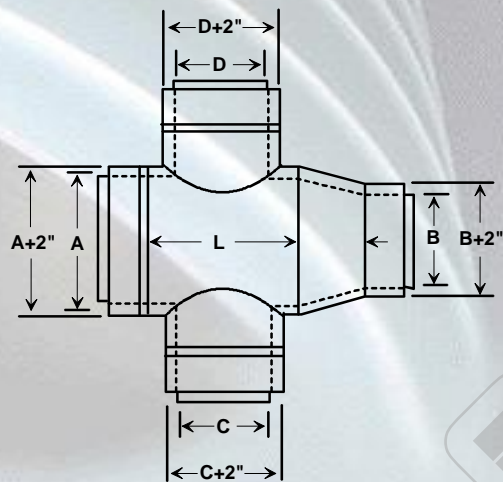
DW LATERAL REDUCING CROSS TEE
When Ordering, List: A, B, C, D



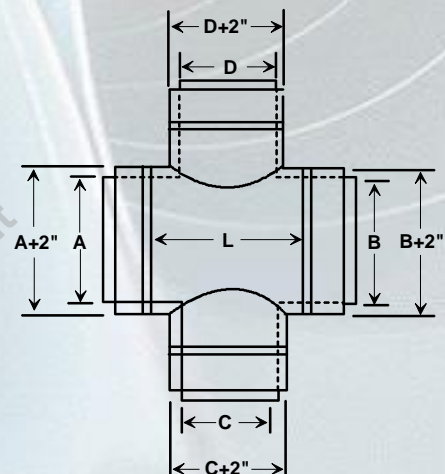
DW REDUCING STRAIGHT TEE
When Ordering, List: A, B, C



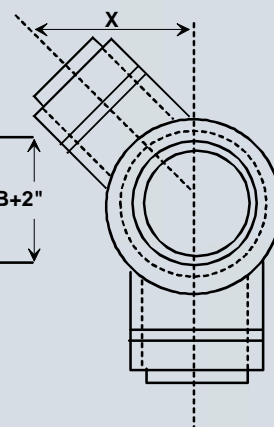
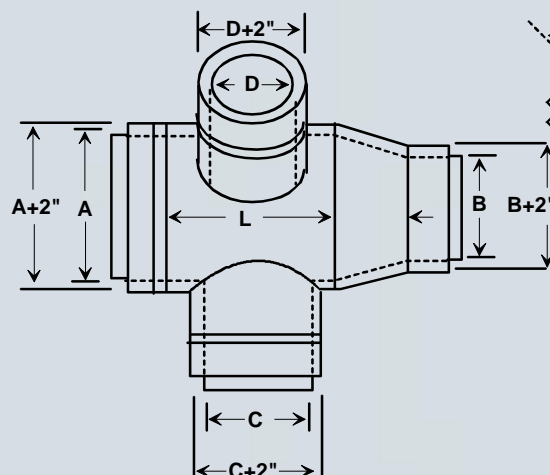
DW STRAIGHT TEE
When Ordering, List: A, B, C



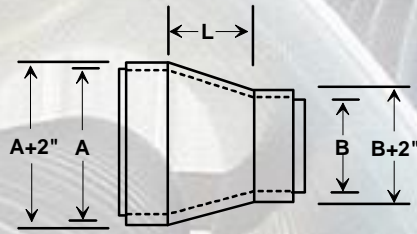
DW REDUCING STRAIGHT CROSS
When Ordering, List: A, B, C, D, L
L = Larger of C or D, + 4"



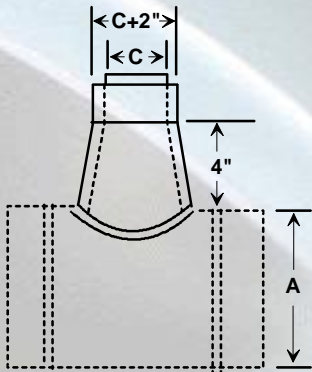
DW STRAIGHT CROSS
When Ordering, List: A, B, C, D, L
L = Larger of C or D, + 4"



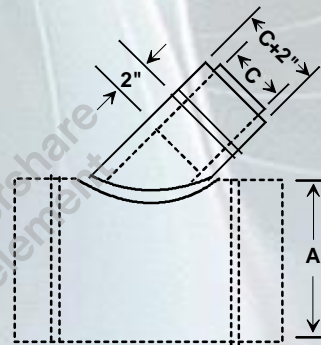
135 DEGREE DW REDUCING STRAIGHT CROSS
When Ordering, List: A, B, C, D, X⁰
L = Larger of C or D, + 4"



DW ROUND TO ROUND REDUCER
 When Ordering, List: A, B
 L= A-B (Minimum of 2" Long)

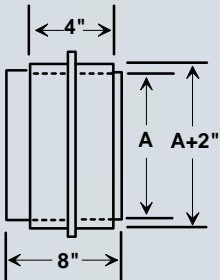


DW CONICAL TAP WITH 1/2" FLANGE
 When Ordering, List: A, C



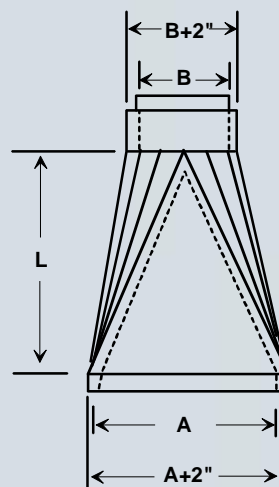
DW 45 DEGREE LATERAL TAP WITH 1/2" FLANGE
 When Ordering, List: A, C

OD Length



ID Length

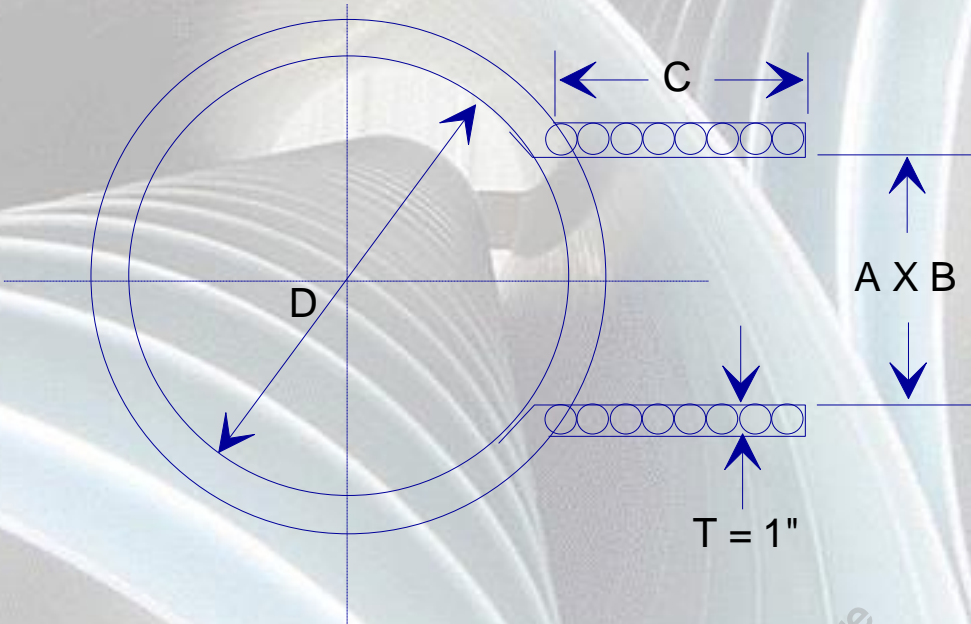
DW ROUND PIPE COUPLING
 When Ordering, List: A



DW SQUARE TO ROUND
 When Ordering, List: A, B, L
 Also specify type of connection needed after raw edge.

DOUBLE WALL REGISTER TAP

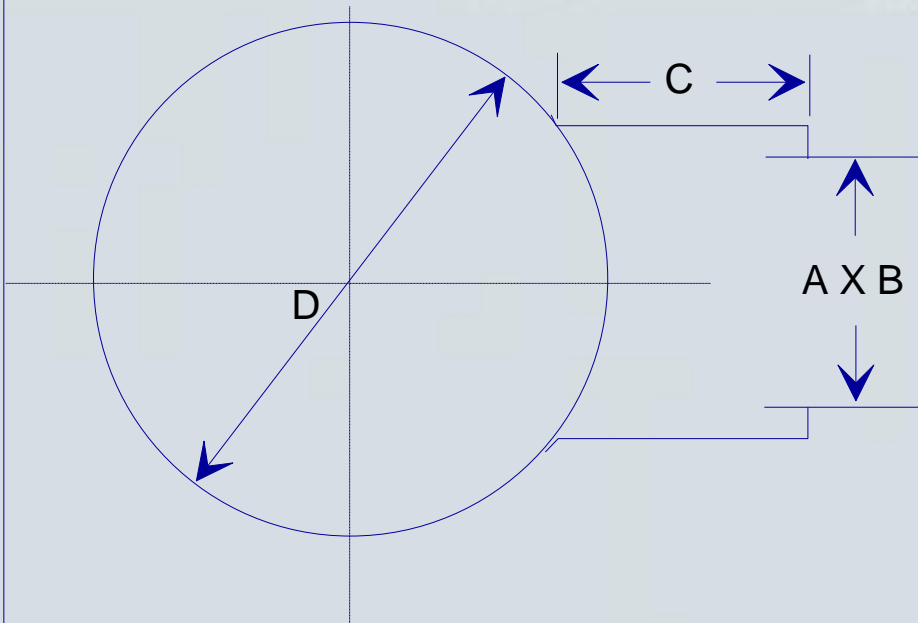
A	B	C	D



MATERIAL - OUTER _____
 MATERIAL - INNER _____

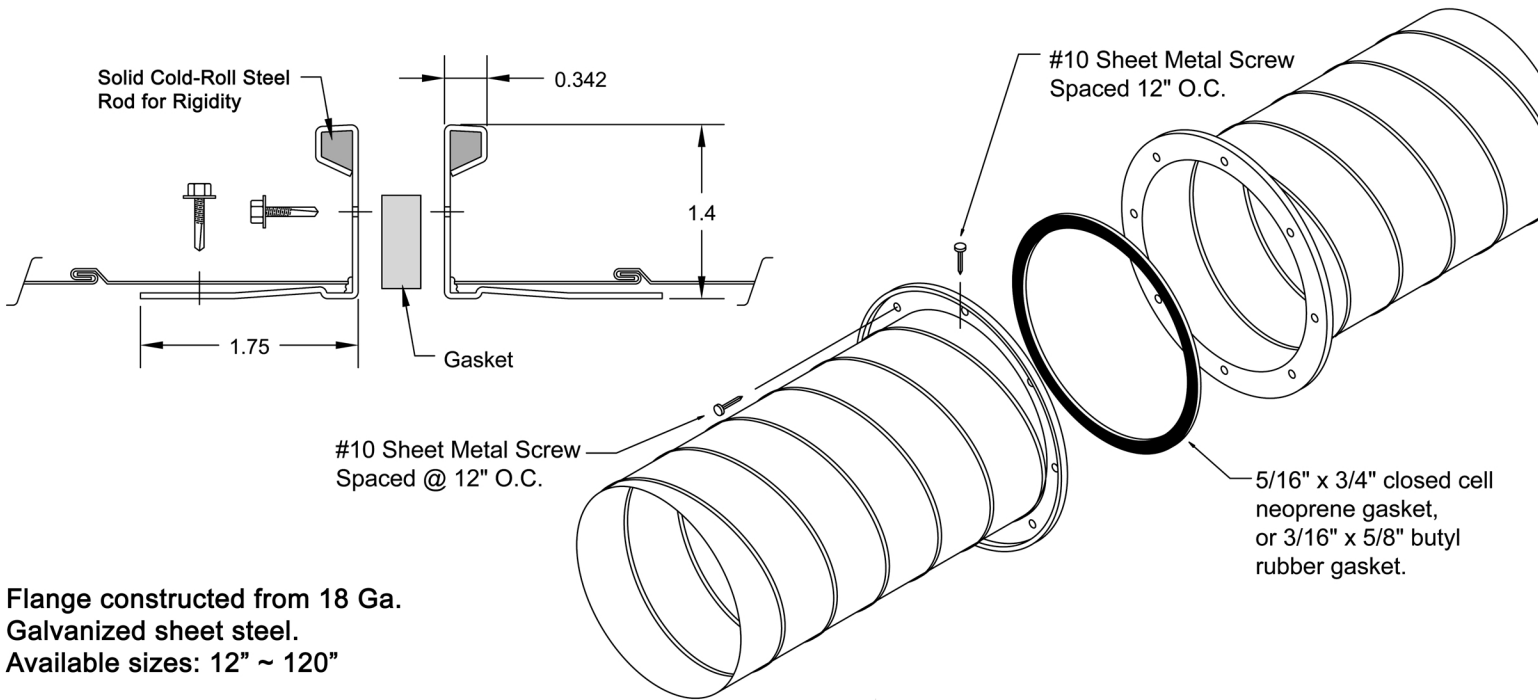
SINGLE WALL REGISTER TAP

A	B	C	D



MATERIAL _____

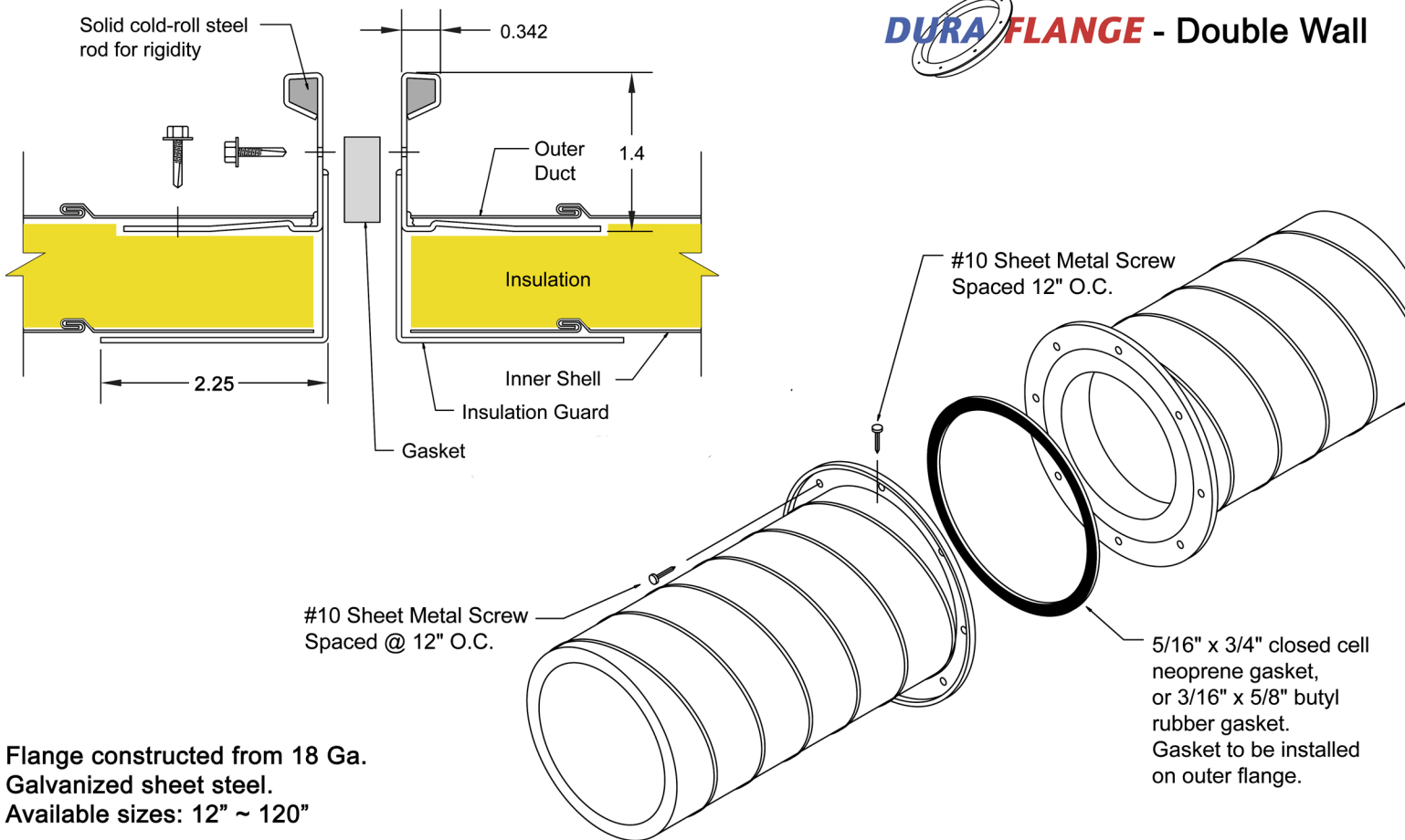
DURA FLANGE - Single Wall



Flange constructed from 18 Ga. Galvanized sheet steel.
Available sizes: 12" ~ 120"

The use of the DuraFlange connecting system, installed and sealed per manufacturer's recommendations, is suitable for use on all systems across a range of internal duct pressure classes; from positive 10" S.P.W.G. to negative 6" S.P.W.G.

DURA FLANGE - Double Wall

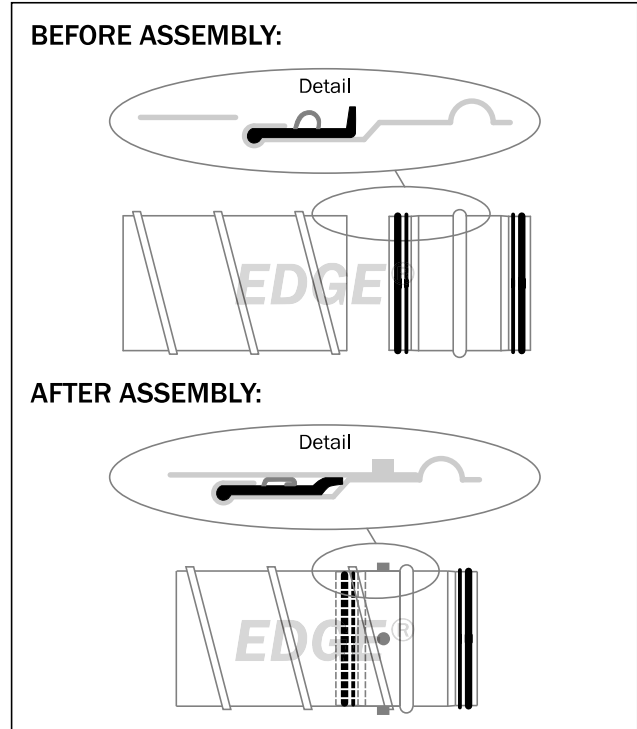


Flange constructed from 18 Ga. Galvanized sheet steel.
Available sizes: 12" ~ 120"

The **EDGE® System** will eliminate the sealing of all connections in your spiral pipe system. This system will not only provide a labor savings for the installer, it is a high efficient duct system and also great for exposed systems.

FEATURES

- All fittings will have a factory installed EPDM gasket, which has an operating temperature rating of -20°F to 212°F.
- The smoke and flame spread rating is 0/0.
- The gasket construction is of a black EPDM base with a wiper for machine application and a green EPDM hollow seal that will act as the sealing section.
- The gasket is attached to the fitting with a 180° hemmed edge that will hold the gasket in place, as shown in the diagrams to the right.
- The connections are secured with self-tapping sheet metal screws per SMACNA standards.
- **The EDGE® System** allows for substantial space for insertion of the screws, because the gasket is located on the leading EDGE of the fitting. (NOTE: The use of sheet metal screws with a rubber gasket would insure that all screw holes are sealed as well.
- **The EDGE® System** has been tested in accordance to SMACNA's Air Duct Leakage Test Manual and meets SMACNA Class 3 leakage standards.



BENEFITS

- Stronger fitting
- Eliminates sharp edge
- Consistent diameter
- Factory installed resulting in a cost savings
- **The EDGE®** gasket is treated with anti-friction coating for easy installation.

The EDGE® – Fittings & Materials

Fittings: 4" - 10" (all sizes), 12" - 60" (even sizes only)

Materials: Galvanized, Galvaneal, Stainless Steel Type 304 & 316, Aluminum.

All fittings will be fabricated, except for Galvanized Stamped Fittings® listed below:

Elbows	4" - 12" = Stamped/Stitch Welded
Reducers	4" - 24" = Spun
Bellmouths	4" - 12" = Stamped 14" - 36" = Spun
90° Tee	4" - 12" = Fabricated body with Stamped Saddle Tap
90° Tap	4" - 12" = Stamped
All Other Fittings	Any fitting can be fabricated with gasket attached. All products will be fabricated per SMACNA standards and gauges. All fabricated fittings conform to SPIDA dimensional data.

CONSTRUCTION (GAUGE):

- All duct and fittings are made per SMACNA's Duct Construction Standards (+10" W.G.).
- Stamped Fittings are all 22 or 24 gauge. Spun Fittings are all 20 gauge.
- The following table shows diameter and gauges:

Diameter	Spiral Duct	Fabricated Fittings
4"- 24"	26 ga.	24 ga.
26"- 36"	24 ga.	22 ga.
38"- 60"	22 ga.	Please Specify

Stamped Fittings®	4"	5"	6"	7"	8"	9"	10"	12"	14" - 36"
GDSE	24 ga.	22 ga.	22 ga.	22 ga.	22 ga.	22 ga.	22 ga.	22 ga.	N/A
GDSE1	24 ga.	24 ga.	24 ga.	24 ga.	24 ga.	24 ga.	24 ga.	22 ga.	N/A
GDST	24 ga.	24 ga.	24 ga.	24 ga.	24 ga.	24 ga.	24 ga.	24 ga.	N/A
GBT0 - stamped	24 ga.	24 ga.	24 ga.	24 ga.	24 ga.	24 ga.	24 ga.	24 ga.	N/A
GBT0 - spun	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20 ga.
GSPR - spun	20 ga.	20 ga.	20 ga.	20 ga.	20 ga.	20 ga.	20 ga.	20 ga.	20 ga.

CONSTRUCTION (PIPE):

- Spiral pipe
- Calibration of spiral is required by **The EDGE® System** manufacturer, Stamped Fittings Inc.

CONSTRUCTION (FITTINGS):

All **EDGE**® fittings, 4"– 60", will have a factory installed gasket that is attached to the fitting with a 180° hemmed edge for strength, rigidity and maintaining proper tolerances.

CONSTRUCTION (GASKET):

- **The EDGE**® gasket consists of a two-part EPDM rubber sealing material.
- The base EPDM (black material) is classified according to ASTM D2000-86 M3BA 810 B13 C12 F17.
- The sealing EPDM (green material) is classified according to ASTM D2000-86 M8BA 507 B13 C12.
- The operating temperature is -20°F to 212°F.
- The smoke and flame spread is in accordance to ASTM E-84-91A.

PRESSURE CLASS:

- **The EDGE**® System has been tested and meets the requirements of SMACNA's Leakage Class 3.

JOINT CONNECTIONS:

- All fittings are manufactured to slip fit into spiral duct. Any fitting to fitting connection can use a fitting coupling.



August 1st, 2014

Subject: Manson Insulation Products – fiberglass insulation made in the U.S.A

All Manson Insulation products, including Alley K™, AK Board™, AK Flex™, Akousti-Liner™ and Akousti-Liner R™ and Alley Wrap™, are produced by Knauf Insulation in Shelbyville, IN, U.S.A.

All Manson fiberglass insulation products are manufactured using a minimum of **50%** “postconsumer” recovered materials. No qualifying “post-industrial” or “pre-consumer” recovered materials are used.

If you need any further information, please do not hesitate to contact me.

Sincerely,

MANSON INSULATION

A handwritten signature in black ink, appearing to read "Joe Hudock", is positioned above the printed name.

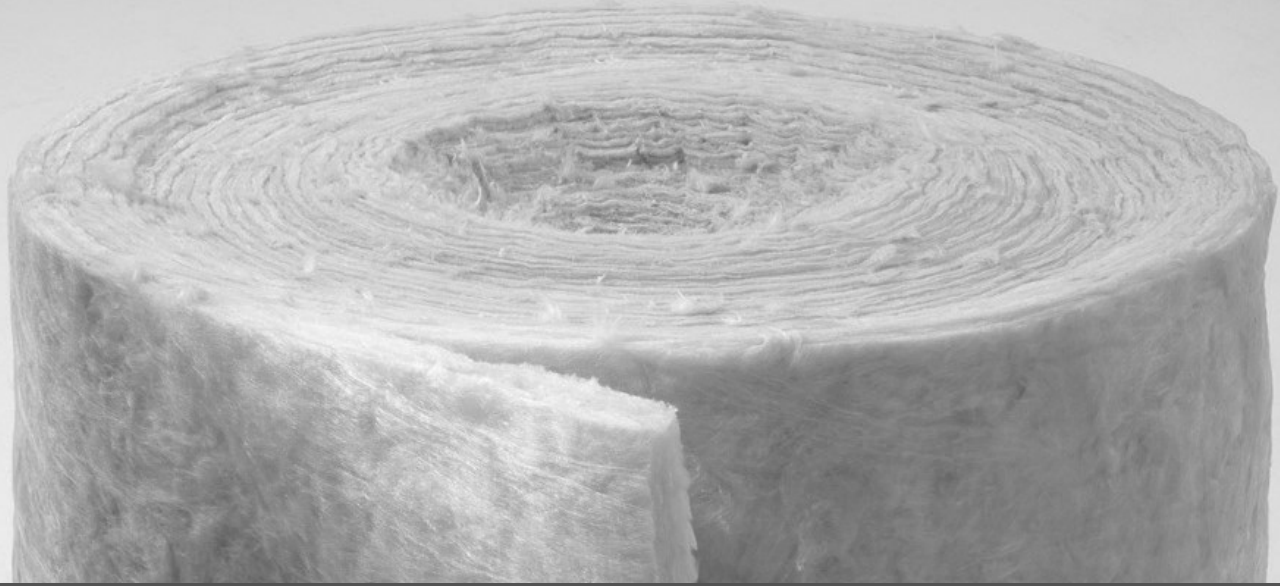
Joe Hudock
Director of Sales – North America



Corporate Office: One Knauf Drive | Shelbyville IN 46176

Tel : 1-800-626-7661 - Fax : 1-800-811-4715

www.imanson.com



AK BLANKET™

Temperature Limit: 650°F (343°C)

DESCRIPTION

AK Blanket is an amber blanket of glass fibers bonded with a thermosetting resin.

APPLICATION

AK Blanket products are used as thermal and/or acoustical insulation in the appliance, equipment, industrial, commercial and marine markets.

PACKAGING

AK Blanket products are rolled using a tight wound single compression method and wrapped in poly sheets and unitized in bundles of 4 rolls.

GLASS MINERAL WOOL AND MOLD

Glass mineral wool insulation will not sustain mold growth. However, mold can grow on almost any material when it becomes wet and contaminated. Carefully inspect any insulation that has been exposed to water. If it shows any sign of mold, it must be discarded. If the material is wet but shows no evidence of mold, it should be dried rapidly and thoroughly. If it shows signs of facing degradation from wetting, it should be replaced.

SPECIFICATION COMPLIANCE

ASTM C553

- Standard specification for mineral fiber board insulation
- Type I
- Type II

PRODUCT FEATURES

Greenguard Certification

- Over 50% post-consumer recycled glass

EUCEB

- This product is tested and certified to meet EUCEB requirements.

Water Vapor Sorption (ASTM C1104)

- Less than 3% by weight when exposed to air at 120°F (49°C) and 95% humidity for 96 hours

Microbial Growth (ASTM C1338)

- Does not promote or support the growth of fungi or bacteria

Surface Burning Characteristics

- UL/ULC Classified
- Does not exceed 25 Flame Spread, 50 smoke
- Developed when tested in accordance with UL 723, ASTM E84

Odor (ASTM C1304)

- Not objectionable

Maximum Service Temperature (ASTM C411)

- Unfaced, up to 350°F (177°C)

NOTES

The chemical and physical properties of AK Blanket represent average values determined in accordance with accepted test methods. The data is subject to normal variations. The data is supplied as a technical service and is subject to change without notice. References to numerical flame spread ratings are not intended to reflect hazards presented by these, or any other material under actual fire conditions.

Check with your Manson Insulation Area Manager to assure information is current.

SOUND ABSORPTION COEFFICIENTS ASTM C423, TYPE A MOUNTING								
		1/3 OCTAVE BAND CENTER FREQUENCY (CYCLES/SEC.)						
TYPE	THICKNESS	125	250	500	1000	2000	4000	NRC
1.5 PCF (24 kg/m ³)	1" (25 mm)	0.03	0.28	0.56	0.82	0.90	0.94	0.65
	2" (51 mm)	0.38	0.89	1.08	1.14	1.11	1.08	1.05

THERMAL CONDUCTIVITY ASTM C518 @ 75°F MEAN TEMPERATURE		
DENSITY	THERMAL CONDUCTIVITY	
	BTU-IN. FT ³ F	M ² . °C/W
1.5 PCF (24 kg/m ³)	0.24	0.035



CONTRACTOR _____

JOB NAME _____

DATE _____



AKOUSTI-LINER™

Temperature Limit: 250°F (121°C)

DESCRIPTION

Akousti-Liner insulation is a flexible duct liner providing both thermal and acoustical insulation. It is manufactured from inorganic glass fibers bonded by a thermosetting binder. The airstream surface is faced with a black mat bonded to the black glass mineral wool substrate. Akousti-Liner insulation is offered with or without edge coating to seal fibers.

APPLICATION

Manson Insulation Akousti-Liner insulation is a durable, flexible liner used extensively in flat and irregular shaped ductwork.

INSTALLATION

All duct liner shall be installed in accordance with the requirement of the NAIMA Fibrous Glass Duct Liner Standard or SMACNA HVAC Duct Construction Standard and the project specification. Liner shall be adhered with adhesive (complying with ASTM C916) and mechanical fasteners.

LIMITATION

Duct liner should be kept clean and dry during shipping, storage, installation and system operation. When condensation is permitted to occur between nested liner and galvanized steel panels, discoloration of the metal may occur.

SPECIFICATION COMPLIANCE

ASTM C1071 Type I

- Standard specification for Thermal and Acoustical Insulation (Glass, Fiber, Duct Lining Material)

NFPA 90A

- Standard for the Installation of Air-Conditioning and Ventilating Systems

NFPA 90B

- Standard for the Installation of Warm Air Heating and Air-Conditioning Systems

City of New York MEA 323-83-M

California Title 24

CAN/CGSB 51.11-92

PRODUCT FEATURES

Sustainability

- Over 50% post-consumer recycled glass
- Greenguard GOLD certified for superior indoor air quality performance
- EUCEB
- No added formaldehyde

Surface Burning Characteristics

- UL/ULC Listed
- Does not exceed 25 Flame Spread, 50 Smoke Developed when tested in accordance with ASTM E 84, CAN/ULC S102-M88, NFPA 255 and UL 723

Air Flow Characteristics (ASTM C1071)

- Air velocity rating 6,000 ft/min (30.5 m/s)

Water Vapor Sorption (ASTM C1104)

- Less than 3% by weight

Corrosiveness (ASTM C665)

- Will not accelerate corrosion

Bacteria Resistance (ASTM G22)

- Does not breed or promote growth

Fungi Resistance (ASTM C1338, ASTM G21)

- Airstream surface is coated with an EPA-registered anti-microbial agent; does not breed or promote growth

Hot Surface Performance (ASTM C411)

- Operating temperature limit: Max. 250°F (120°C)

DecaBDE Free

- Does not contain polybrominated diphenyl ethers (PBDE) such as: Penta – BDE, Octa – BDE or Deca – BDE

ACOUSTICAL PERFORMANCE
ASTM C423, TYPE A MOUNTING

DENSITY	THICKNESS	FREQUENCY						
		125	250	500	1000	2000	4000	NRC
2.0 PCF (32 kg/m ³)	½" (13 mm)	0.09	0.14	0.40	0.60	0.73	0.82	0.45
	1" (25 mm)	0.25	0.35	0.69	0.89	0.96	1.01	0.70
1.5 PCF (24 kg/m ³)	1" (25 mm)	0.18	0.36	0.59	0.86	0.95	0.90	0.70
	1½" (38 mm)	0.35	0.51	0.83	0.93	0.97	0.96	0.80
	2" (51 mm)	0.34	0.64	0.96	1.03	1.00	1.03	0.90

THERMAL PERFORMANCE
ASTM C177 - 75°F (24°C) MEAN TEMPERATURE

DENSITY	THICKNESS	C-VALUE		R-VALUE	
		BTU/ FT ² .HR.°F	W/M ² .°C	FT ² .HR.°F/ BTU	M ² .°C/W
2.0 PCF (32 kg/m ³)	½" (13 mm)	0.48	2.73	2.1	0.37
	1" (25 mm)	0.24	1.36	4.2	0.74
1.5 PCF (24 kg/m ³)	1" (25 mm)	0.24	1.42	4.2	0.74
	1½" (38 mm)	0.17	0.97	6.0	1.06
	2" (51 mm)	0.13	0.74	8.0	1.41

GLASS MINERAL WOOL AND MOLD

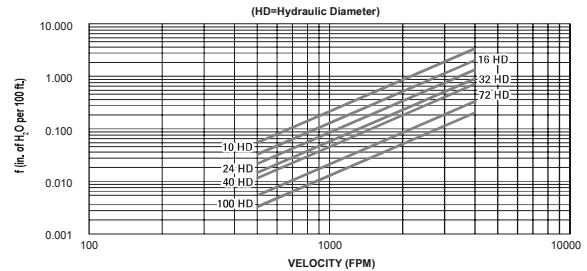
Glass mineral wool insulation will not sustain mold growth. However, mold can grow on almost any material when it becomes wet and contaminated. Carefully inspect any insulation that has been exposed to water. If it shows any sign of mold, it must be discarded. If the material is wet but shows no evidence of mold, it should be dried rapidly and thoroughly. If it shows signs of facing degradation from wetting, it should be replaced. Air handling insulation used in the air stream must be discarded if exposed to water.

NOTES

The chemical and physical properties of Manson Insulation Akousti-Liner insulation represent average values determined in accordance with accepted test methods. The data is subject to normal manufacturing and testing variations. The data is supplied as a technical service and is subject to change without notice. References to numerical flame spread ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions.

Check with your Manson Insulation Area Manager to assure information is current.

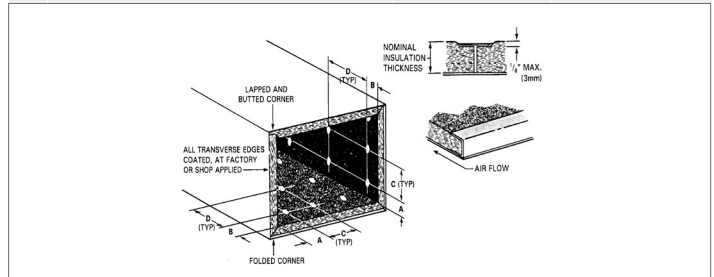
FRICITION LOSS (INCHES OF WATER PER 100')



FPM	HYDRAULIC DIAMETER						
VELOCITY	10"	16"	24"	32"	40"	72"	100"
500	0.054	0.030	0.018	0.012	0.009	0.005	0.003
600	0.077	0.042	0.025	0.018	0.013	0.007	0.004
700	0.104	0.057	0.034	0.024	0.018	0.009	0.006
800	0.134	0.074	0.044	0.031	0.023	0.011	0.008
900	0.169	0.093	0.056	0.039	0.029	0.014	0.010
1000	0.207	0.114	0.068	0.048	0.036	0.018	0.012
2000	0.806	0.443	0.266	0.186	0.141	0.069	0.046
3000	1.797	0.988	0.594	0.415	0.315	0.153	0.103
4000	3.179	1.748	1.050	0.734	0.557	0.271	0.181
5000	4.952	2.724	1.636	1.143	0.867	0.422	0.283

MECHANICAL FASTENER LOCATION

	VELOCITY/FPM (METERS/SECOND)	0-255 (0-12.7)	2501-5000 (12.7-25.4)
A	From corners of duct	4" (102 mm)	4" (102 mm)
B	From transverse of duct	3" (76 mm)	3" (76 mm)
C	Across width of duct, on centers (min. 1/side)	12" (305 mm)	6" (152 mm)
D	Across length of duct, on centers (min. 1/side)	18" (457 mm)	16" (406 mm)



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