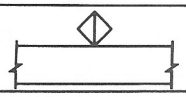
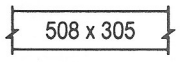
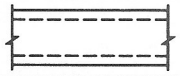
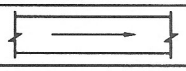
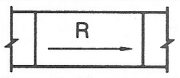
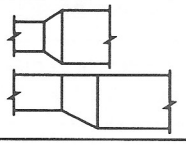
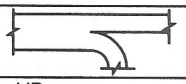
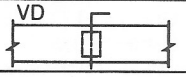
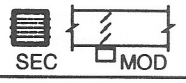
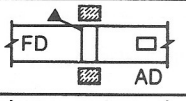
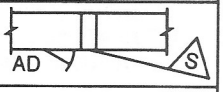
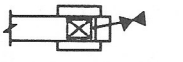
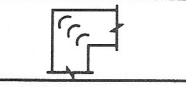
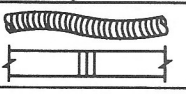
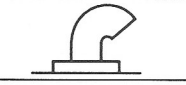
ADVANCED SHEET METAL, LLC

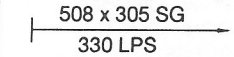
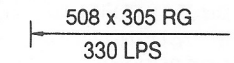
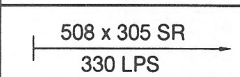
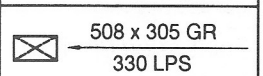
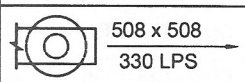
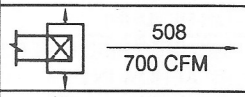
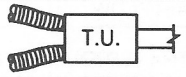
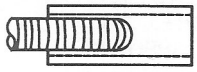
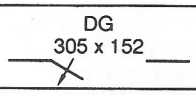
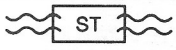
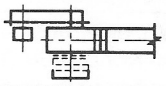
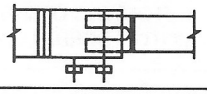
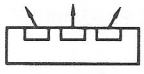
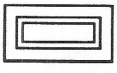
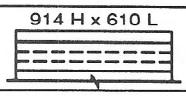
SHOP STANDARDS

SYMBOL MEANING	SYMBOL
POINT OF CHANGE IN DUCT CONSTRUCTION (BY STATIC PRESSURE CLASS)	
DUCT (1ST FIGURE, SIDE SHOWN 2ND FIGURE, SIDE NOT SHOWN)	20 x 12
ACOUSTICAL LINING DUCT DIMENSIONS FOR NET FREE AREA	
DIRECTION OF FLOW	
DUCT SECTION (SUPPLY)	S 30 x 12
DUCT SECTION (EXHAUST OR RETURN)	E OR R 20 x 12
INCLINED RISE (R) OR DROP (D) ARROW IN DIRECTION OF AIR FLOW	R
TRANSITIONS: GIVE SIZES. NOTE F.O.T. FLAT ON TOP OR F.O.B. FLAT ON BOTTOM IF APPLICABLE	
STANDARD BRANCH FOR SUPPLY & RETURN (NO SPLITTER)	S R
WYE JUNCTION	
VOLUME DAMPER MANUAL OPERATION	VD
AUTOMATIC DAMPERS MOTOR OPERATED	SEC MOD
ACCESS DOOR (AD) ACCESS PANEL (AP)	OR AD
FIRE DAMPER: SHOW ◄ VERTICAL POS. SHOW ◆ HORIZ. POS.	FD AD
SMOKE DAMPER (S)	AD S
FIRE & SMOKE DAMPER - (A) SMOKE DAMPER - (S) RADIATION DAMPER - (R)	
TURNING VANES	
FLEXIBLE DUCT FLEXIBLE CONNECTION	
GOOSENECK HOOD (COWL)	
BACK DRAFT DAMPER	BDD

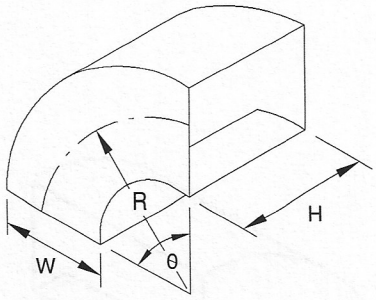
SYMBOL MEANING	SYMBOL
SUPPLY GRILLE (SG)	20 x 12 SG 700 CFM
RETURN (RG) OR EXHAUST (EG) GRILLE (NOTE AT FLR OR CLG)	20 x 12 RG 700 CFM
SUPPLY REGISTER (SR) (A GRILLE + INTEGRAL VOL. CONTROL)	20 x 12 SR 700 CFM
EXHAUST OR RETURN AIR INLET CEILING (INDICATE TYPE)	20 x 20 GR 700 CFM
SUPPLY OUTLET. CEILING, SQUARE (TYPE AS SPECIFIED) INDICATE FLOW DIRECTION	20 700 CFM
SUPPLY OUTLET. CEILING, SQUARE (TYPE AS SPECIFIED) INDICATE FLOW DIRECTION	12 x 12 700 CFM
TERMINAL UNIT. (GIVE TYPE AND OR SCHEDULE)	T.U.
COMBINATION DIFFUSER AND LIGHT FIXTURE	
DOOR GRILLE	DG 12 x 6
SOUND TRAP	ST
FAN & MOTOR WITH BELT GUARD & FLEXIBLE CONNECTIONS	
VENTILATING UNIT (TYPE AS SPECIFIED)	
UNIT HEATER (DOWNBLAST)	
UNIT HEATER (HORIZONTAL)	
UNIT HEATER (CENTRIFUGAL FAN) PLAN	
THERMOSTAT	(T)
POWER OR GRAVITY ROOF VENTILATOR - EXHAUST (ERV)	
POWER OR GRAVITY ROOF VENTILATOR - INTAKE (SRV)	
POWER OR GRAVITY ROOF VENTILATOR - LOUVERED	
LOUVERS & SCREEN	36 H x 24 L

SYMBOLS FOR VENTILATION & AIR CONDITIONING SMACNA

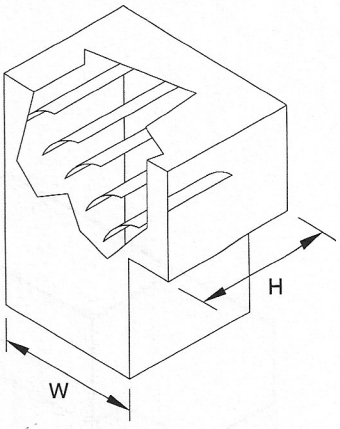
SYMBOL MEANING	SYMBOL
POINT OF CHANGE IN DUCT CONSTRUCTION (BY STATIC PRESSURE CLASS)	
DUCT (1ST FIGURE, SIDE SHOWN 2ND FIGURE, SIDE NOT SHOWN)	
ACOUSTICAL LINING DUCT DIMENSIONS FOR NET FREE AREA	
DIRECTION OF FLOW	
DUCT SECTION (SUPPLY)	
DUCT SECTION (EXHAUST OR RETURN)	
INCLINED RISE (R) OR DROP (D) ARROW IN DIRECTION OF AIR FLOW	
TRANSITIONS: GIVE SIZES. NOTE F.O.T. FLAT ON TOP OR F.O.B. FLAT ON BOTTOM IF APPLICABLE	
STANDARD BRANCH FOR SUPPLY & RETURN (NO SPLITTER)	
WYE JUNCTION	
VOLUME DAMPER MANUAL OPERATION	
AUTOMATIC DAMPERS MOTOR OPERATED	
ACCESS DOOR (AD) ACCESS PANEL (AP)	
FIRE DAMPER: SHOW ◄ VERTICAL POS. SHOW ◆ HORIZ. POS.	
SMOKE DAMPER (S)	
FIRE & SMOKE DAMPER - (A) SMOKE DAMPER - (S) RADIATION DAMPER - (R)	
TURNING VANES	
FLEXIBLE DUCT FLEXIBLE CONNECTION	
GOOSENECK HOOD (COWL)	
BACK DRAFT DAMPER	

SYMBOL MEANING	SYMBOL
SUPPLY GRILLE (SG)	
RETURN (RG) OR EXHAUST (EG) GRILLE (NOTE AT FLR OR CLG)	
SUPPLY REGISTER (SR) (A GRILLE + INTEGRAL VOL. CONTROL)	
EXHAUST OR RETURN AIR INLET CEILING (INDICATE TYPE)	
SUPPLY OUTLET. CEILING, SQUARE (TYPE AS SPECIFIED) INDICATE FLOW DIRECTION	
SUPPLY OUTLET. CEILING, SQUARE (TYPE AS SPECIFIED) INDICATE FLOW DIRECTION	
TERMINAL UNIT. (GIVE TYPE AND OR SCHEDULE)	
COMBINATION DIFFUSER AND LIGHT FIXTURE	
DOOR GRILLE	
SOUND TRAP	
FAN & MOTOR WITH BELT GUARD & FLEXIBLE CONNECTIONS	
VENTILATING UNIT (TYPE AS SPECIFIED)	
UNIT HEATER (DOWNBLAST)	
UNIT HEATER (HORIZONTAL)	
UNIT HEATER (CENTRIFUGAL FAN) PLAN	
THERMOSTAT	
POWER OR GRAVITY ROOF VENTILATOR - EXHAUST (ERV)	
POWER OR GRAVITY ROOF VENTILATOR - INTAKE (SRV)	
POWER OR GRAVITY ROOF VENTILATOR - LOUVERED	
LOUVERS & SCREEN	

SYMBOLS FOR VENTILATION & AIR CONDITIONING - METRIC **SMACNA**

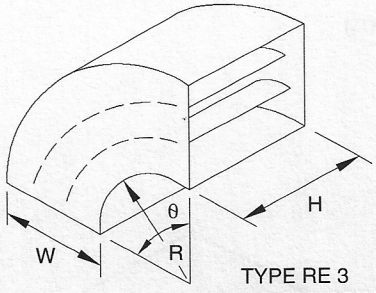


TYPE RE 1
RADIUS ELBOW



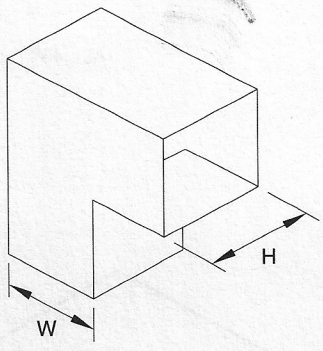
TYPE RE 2
SQUARE THROAT ELBOW
WITH VANES

CENTERLINE R = $\frac{3W}{2}$ UNLESS OTHERWISE SPECIFIED θ IS NOT RESTRICTED TO 90°.
SQUARE THROAT, $\frac{R}{W}$ = 0.5, MAY BE USED, UP TO 1000 FPM (5 mps).

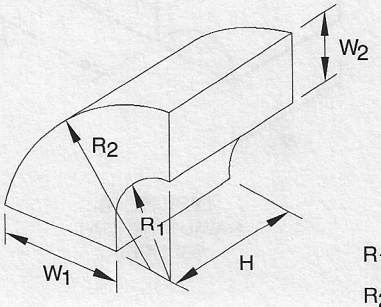


TYPE RE 3
RADIUS ELBOW
WITH VANES

NOTE: FOR RE 3 *SEE* PAGE A.41 AND CURVE RATIOS IN FIG. 5-12 IN THE SMACNA *DUCT DESIGN MANUAL*



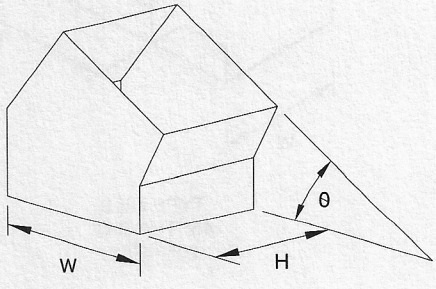
TYPE RE 4
SQUARE THROAT ELBOW
WITHOUT VANES
(1000 FPM (5 mps) MAXIMUM VELOCITY)



R_1 = 3/4 W_1

R_2 = R_1 + W_2

TYPE RE 5
DUAL RADIUS ELBOW



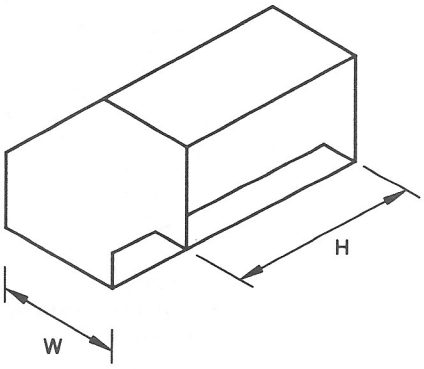
TYPE RE 6
MITERED ELBOW

BEAD, CROSSBREAK AND REINFORCE FLAT SURFACES AS IN STRAIGHT DUCT

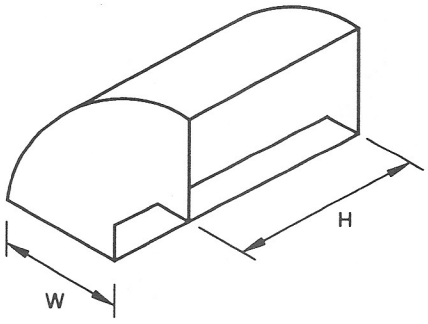
PAGE 1 OF 2

RECTANGULAR ELBOWS

FIG. 2-2

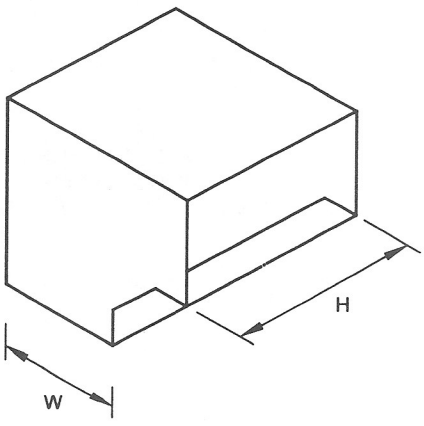


TYPE RE 7
45° THROAT
45° HEEL

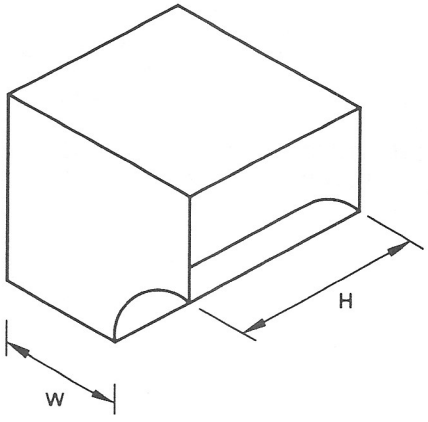


TYPE RE 8
45° THROAT
RADIUS HEEL

ALL 45° THROATS ARE 4" (100 mm) MINIMUM



TYPE RE 9
45° THROAT
90° HEEL

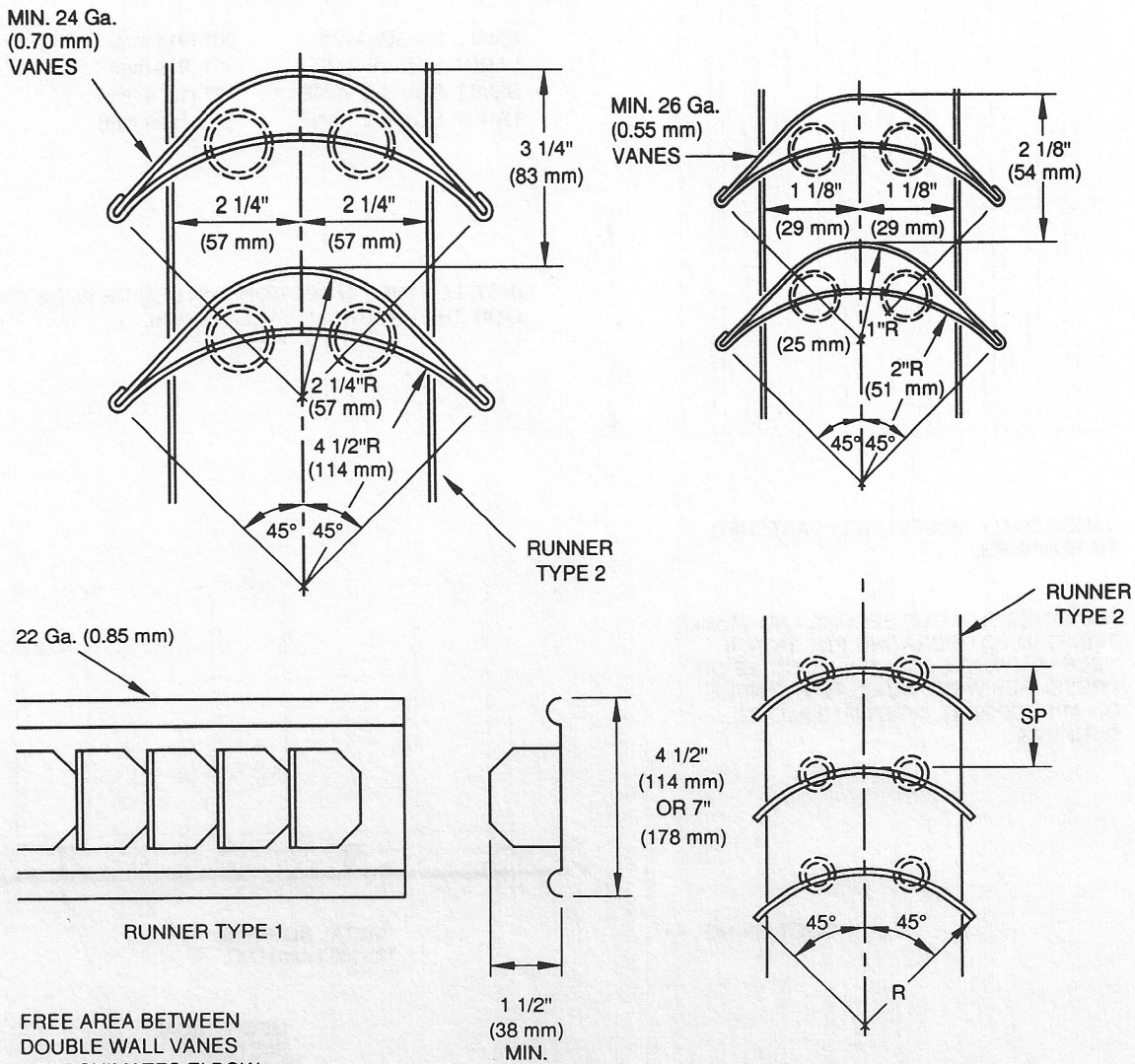


TYPE RE 10
RADIUS THROAT
90° HEEL

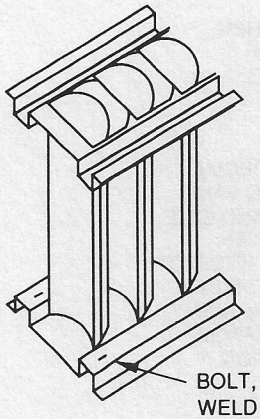
BEAD, CROSSBREAK AND REINFORCE FLAT SURFACES AS IN STRAIGHT DUCT

RECTANGULAR ELBOWS

FIG. 2-2



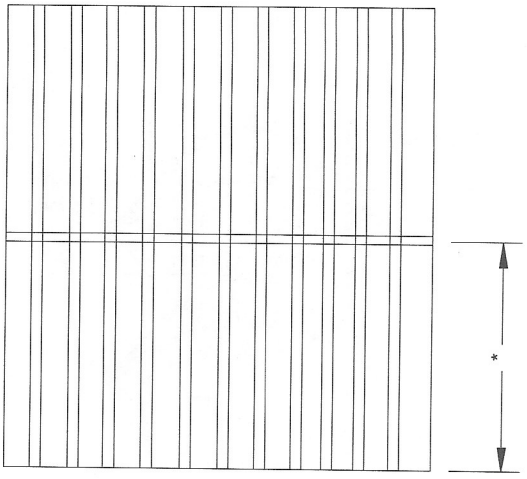
FREE AREA BETWEEN DOUBLE WALL VANES APPROXIMATES ELBOW INLET AREA.



SINGLE VANE SCHEDULE			
	R	SP	GA
SMALL	2" (51 mm)	1 1/2" (38 mm)	24 (0.70 mm)
LARGE	4 1/2" (114 mm)	3 1/4" (83 mm)	22 (0.85 mm)

SEE NOTES ON FIG. 2-4. OTHER RUNNERS MAY BE USED AS APPROPRIATE. OTHER VANE SIZES, SPACINGS OR CONFIGURATIONS ARE ACCEPTABLE ON DESIGNER APPROVAL.

VANES & VANE RUNNERS FIG. 2-3



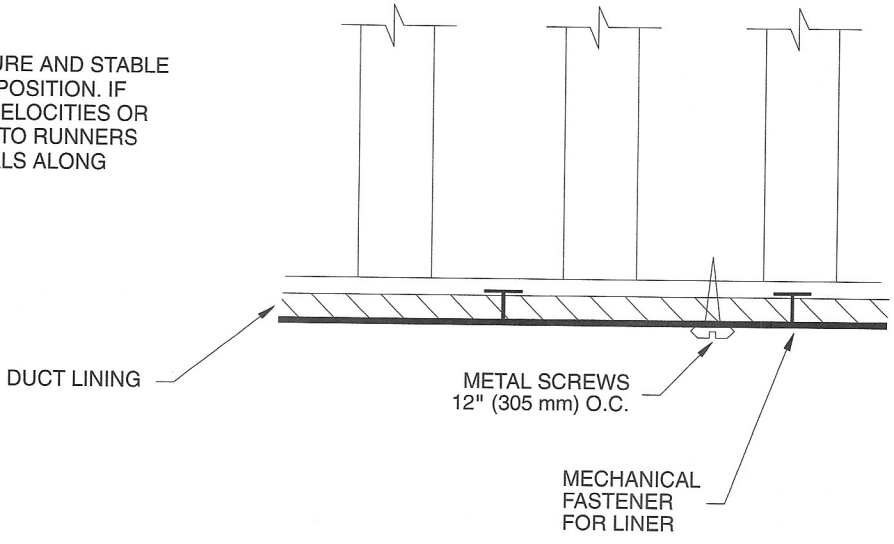
* MAXIMUM UNSUPPORTED VANE LENGTH

SMALL SINGLE VANE	36" (914 mm)
LARGE SINGLE VANE	36" (914 mm)
SMALL DOUBLE VANE	48" (1219 mm)
LARGE DOUBLE VANE	72" (1829 mm)

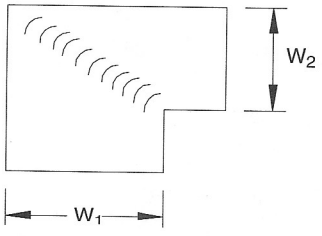
INSTALL VANES IN SECTIONS OR USE TIE RODS TO LIMIT THE UNBRACED VANE LENGTH.

VANES SHALL BE SECURELY FASTENED TO RUNNERS.

ALL VANES SHALL BE SECURE AND STABLE IN INSTALLED OPERATING POSITION. IF NECESSARY, AT CERTAIN VELOCITIES OR PRESSURES WELD VANES TO RUNNERS ON APPROPRIATE INTERVALS ALONG RUNNERS.



TO PREVENT LINER DAMAGE CARE MUST BE EXERCISED WHEN INSTALLING VANES IN LINED OR FIBROUS GLASS DUCT, SEE FIG. 2-21.

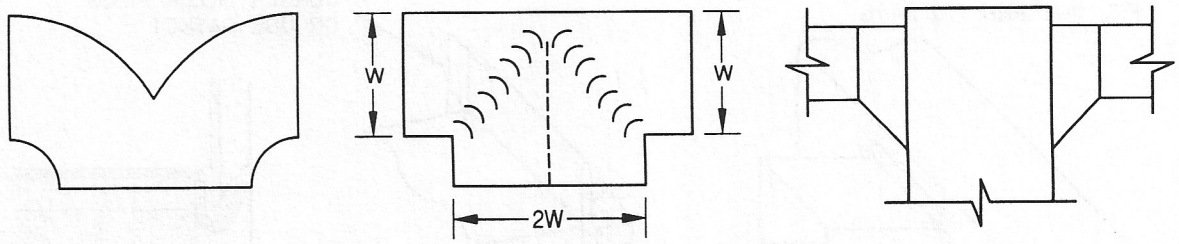


IF W_2 DOES NOT EQUAL W_1 SPECIAL PROVISIONS MUST BE MADE IN VANE SHAPE OR ANGLE OF ENTRY AND EXIT. APPLIES TO ALL TYPES OF VANES. CONSTRUCT VANE EDGES TO PROJECT TANGENTS PARALLEL TO DUCT SIDES. VANES AS USED WHEN $W_1 = W_2$ ARE NOT ACCEPTABLE ON SIZE CHANGE ELBOWS WITHOUT MODIFICATION.

SEE FIG. 2-3 FOR VANE DETAILS.

VANE SUPPORT IN ELBOWS

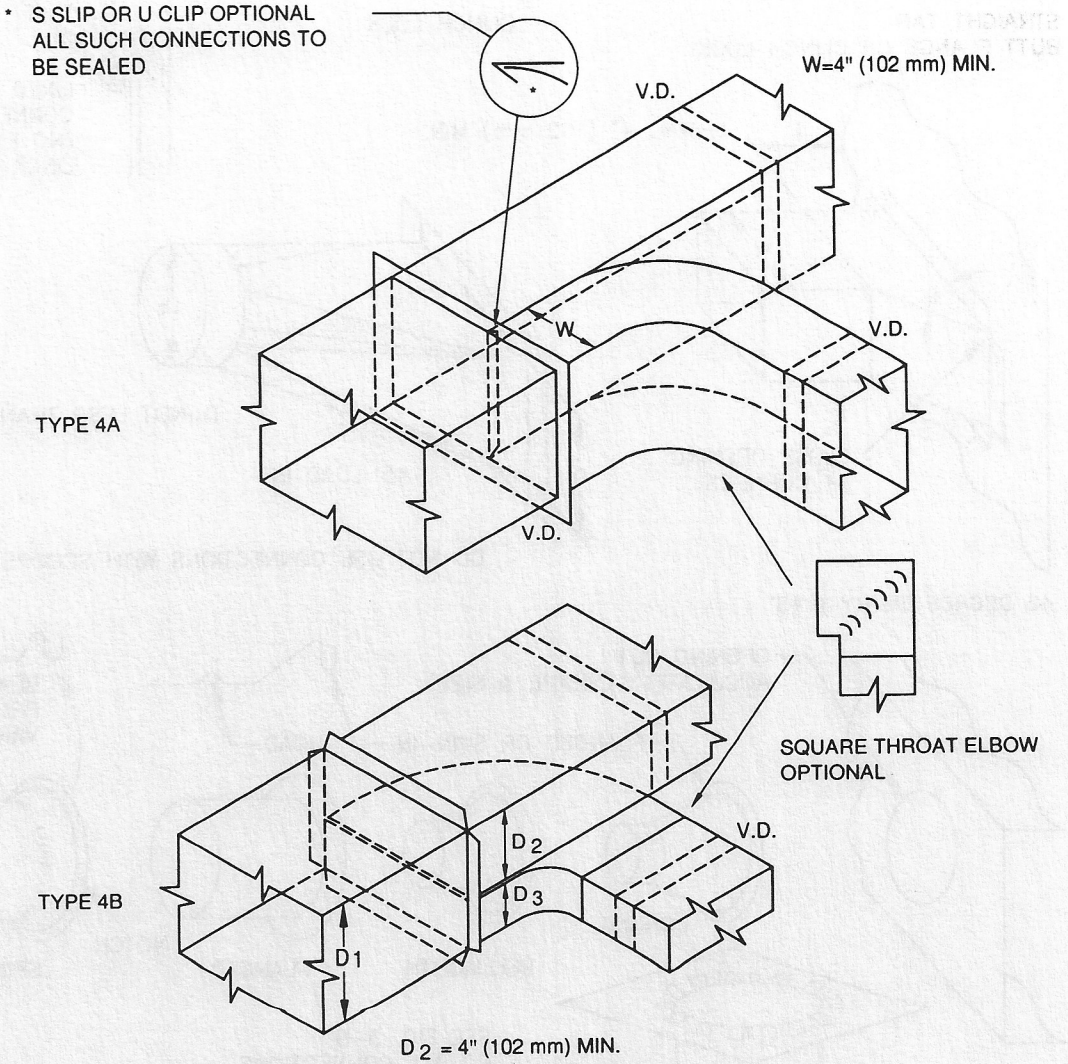
FIG. 2-4



TYPE 1

TYPE 2
STATIONARY SPLITTER
IS OPTIONAL

TYPE 3

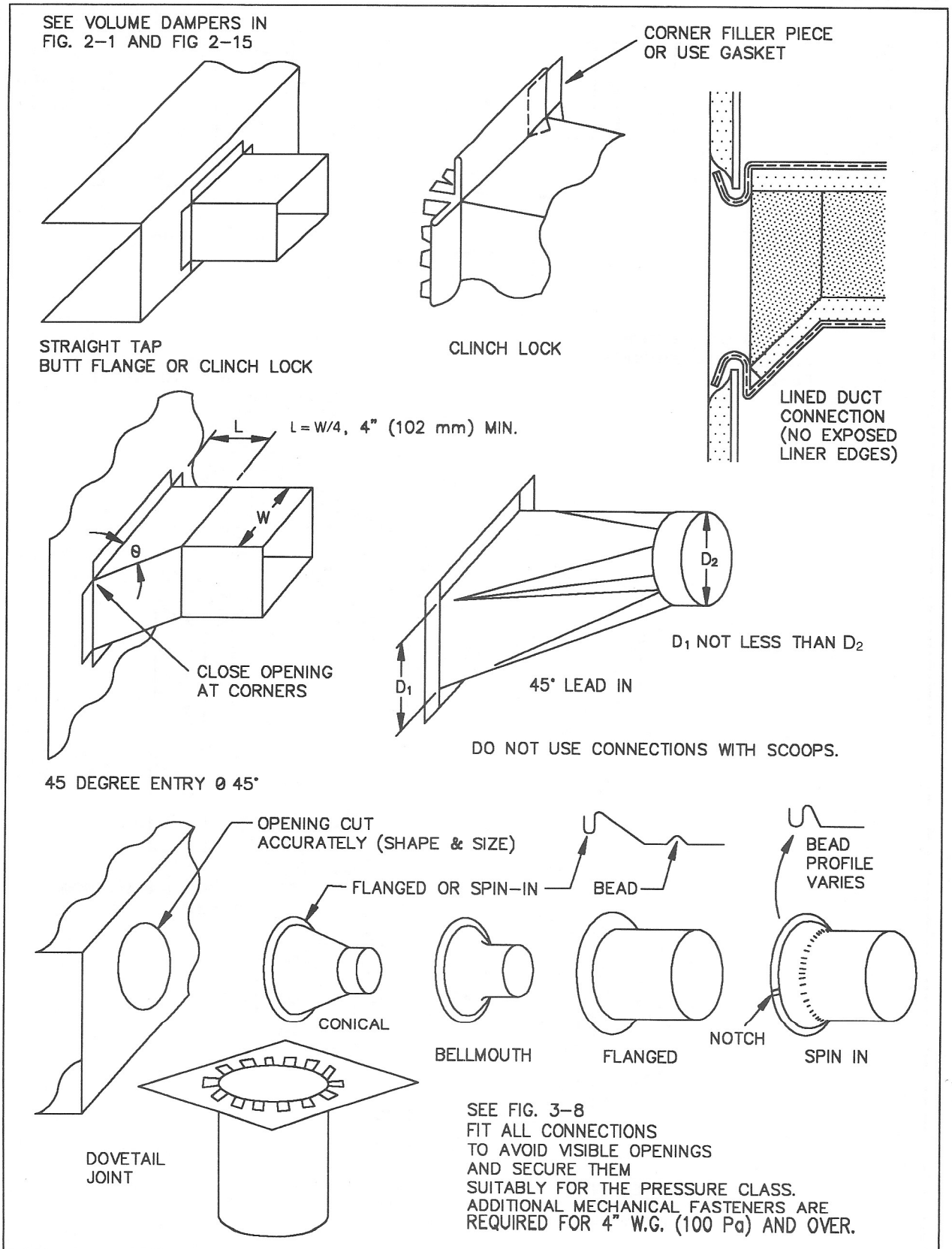


D_2 = 4" (102 mm) MIN.
D_3 = 4" (102 mm) MIN.

VOLUME CONTROL SHOULD BE BY BRANCH DAMPERS.
IF A SPLITTER IS SHOWN IN THE DESIGN ITS
LENGTH SHOULD BE 1.5 W OR 1.5 D_3.

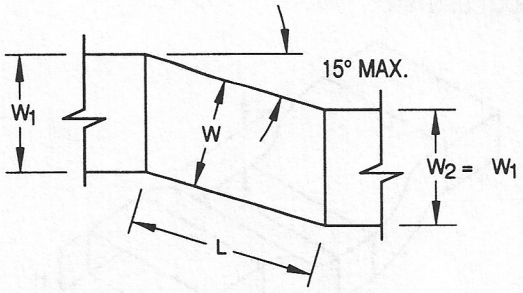
DIVIDED FLOW BRANCHES

FIG. 2-5

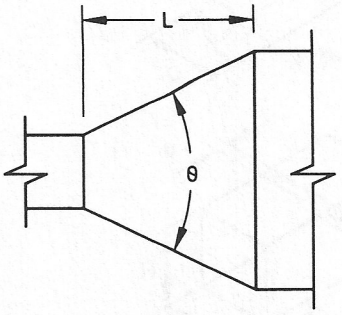


BRANCH CONNECTIONS **FIG. 2-6**

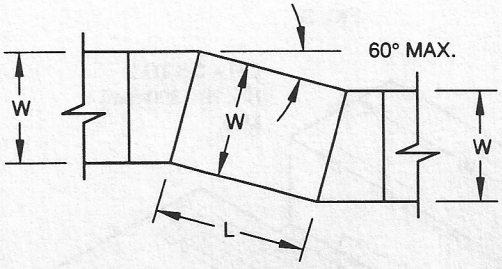
OFFSETS 2 AND 3 AND TRANSITIONS MAY HAVE EQUAL OR UNEQUAL INLET AND OUTLET AREAS. TRANSITIONS MAY CONVERT DUCT PROFILES TO ANY COMBINATION FOR RECTANGULAR, ROUND OR FLAT OVAL SHAPES.



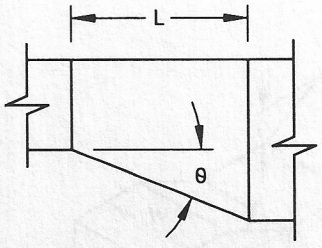
OFFSET TYPE 1
(ANGLED)



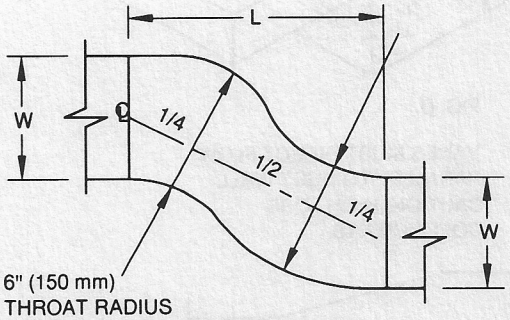
CONCENTRIC TRANSITION
θ MAX. 45° DIVERGING, 60° CONVERGING



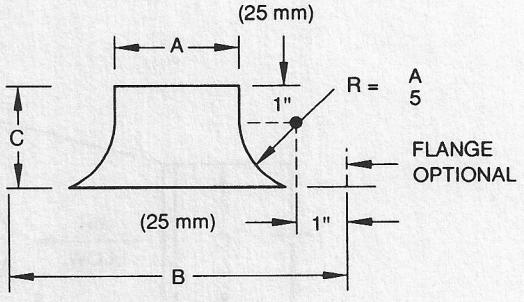
OFFSET TYPE 2
(MITERED)



ECCENTRIC TRANSITION
θ MAX. 30°
(EXCEPT 45° IS PERMITTED
AT ROUND TO FLAT OVAL)

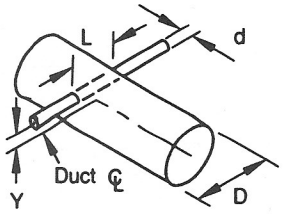


OFFSET TYPE 3
(RADIUSSED
OR OGEE)



STANDARD BELLMOUTH
(ON SHORT PATTERN BELL
C = 3" (76 mm)
B = A + 4" (102 mm))

OFFSETS AND TRANSITIONS — FIG. 2-7



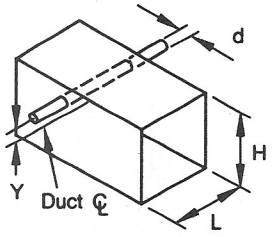


FIG. A

FIG. A IS APPLICABLE FOR UP TO 20% AREA OBSTRUCTION WITH ROUND SHAPED MEMBER AND 10% WITH FLAT PROFILE. Y IS THE DISTANCE FROM DUCT CENTER.

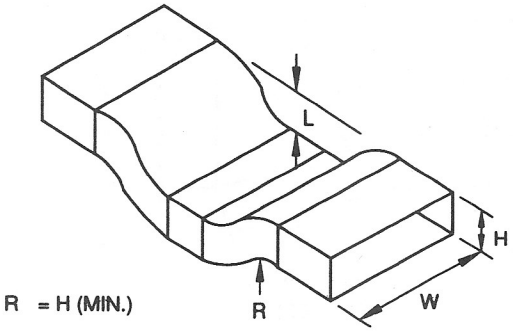


FIG. B

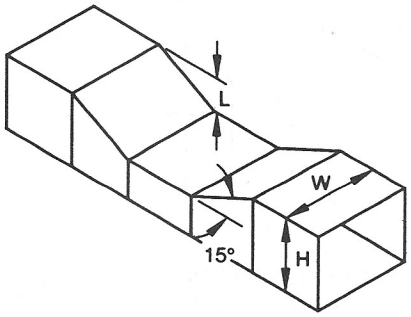


FIG. C

20% MAXIMUM AREA REDUCTION

L/H = 0.5 TO 2
B = 12" (300 mm) MIN.

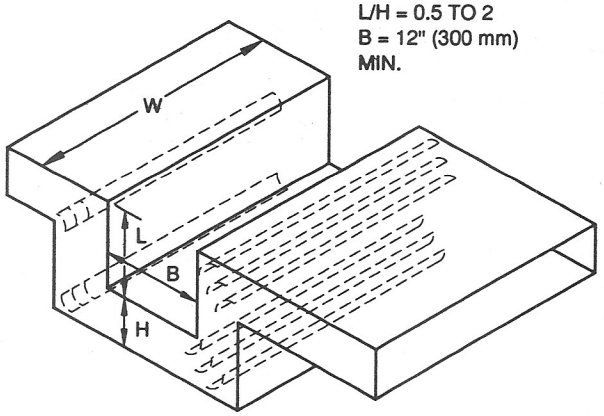
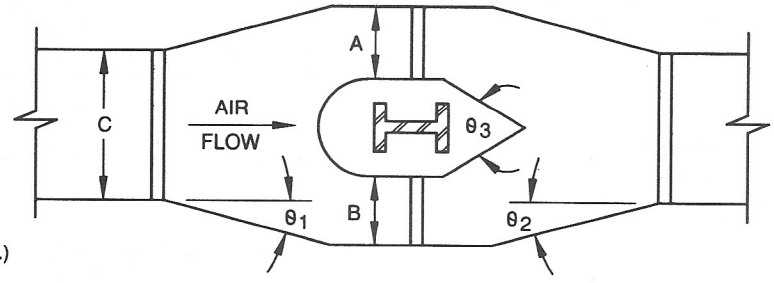


FIG. D

VANES MUST DIRECT FLOW PARALLEL TO DUCT WALL
CAUTION: HIGH LOSS COEFFICIENTS



A+B = 1.25C (MIN.) AT CONSTANT DEPTH.

FIG. E

θ_1 = 20° MAX.
θ_2 = 30° MAX.
θ_3 = 60° MAX.

(USED WHEN OBSTRUCTION EXCEEDS 20% OF SECTION AREA AND OFFSETS AROUND ARE NOT POSSIBLE).

OBSTRUCTIONS

FIG. 2-8

TABLE 3-2B
ROUND DUCT GAGE
NEGATIVE PRESSURE

MAX. DIA.	-2" w.g.		-4" w.g.		-10' w.g.	
	Spiral Seam	Long. Seam	Spiral Seam	Long. Seam	Spiral Seam	Long. Seam
6"	28	28	28	28	26	26
7"	28	28	28	28	26	26
8"	28	28	28	28	26	26
9"	28	28	28	26	26	24
10"	28	28	26	26	26	22
11"	28	26	26	24	26	22
12"	28	26	26	24	24	22
13"	28	26	26	24	24	20
14"	28	24	24	22	24	20
15"	28	24	24	22	22	20
16"	26	24	24	22	22	18
17"	26	24	24	20	22	18
18"	24	22	24	20	22	18
19"	24	22	24	20	22	18
20"	24	22	22	20	22	18
21"	24	20	22	18	22	18
22"	24	20	22	18	22	16
23"	24	20	22	18	20	16
24"	22	20	22	18	20	16
25-26"	22	20	20	18	20	18 A4
27-29"	22	18	20	16	18	16 A4
30"	22	18	20	16	18	16 B4
31-33"	20	18	20	16	18	16 B4
34"	20	18	20	20 A6	18	16 B4
35-36"	20	16	20	20 A6	18	16 B4
37-42"	20	16	18	18 B6	18 F12	
43-48"	20	18 A6	18	18 B6	18 F6	
49-60"	18	18 B4	18 F6	16 B4	18 F6	
61-72"	16		18 F6		16 F4	

An alphabet letter in the table means that reinforcement angles or their equivalent must be used at the foot interval following the letter. The angle sizes are:

A = 1" x 1" x 1/8"; B = 1-1/4" x 1-1/4" x 3/16"; C = 1-1/2" x 1-1/2" x 3/16"; D = 1-1/2" x 1-1/2" x 1/4"; E = 2" x 2" x 3/16"; F = 2" x 2" x 1/4".

If companion flange joints are used as reinforcements, those for 25" to 36" diameter shall be 1-1/2" x 1-1/2" x 3/16"; for 37" to 48" diameter 2" x 2" x 3/16"; for 40" to 60" diameter 2-1/2" x 2-1/2" x 3/16"; for 61" to 72" diameter 3" x 3" x 1/4".

English
Last Revision Date: January, 2017

Technical Data Sheet

3M™ Venture Tape™ Aluminum Foil Tape 3520CW

Product Description

3M™ Venture Tape™ Aluminum Foil Tape 3520CW is a high strength dead soft aluminum foil coated with a cold weather acrylic pressure sensitive adhesive.

Product Features

- Specifically designed to perform in temperatures from -40°F to 250°F
- Excellent for high heat and humidity conditions
- Hand tearable allows for easy installation without special tools
- UL723 Classified [10/10 Flame/Smoke Rating] (ULC File # R10984)

Technical Information Note

The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Typical Physical Properties

Property	Values	Additional Information
Backing	Aluminum Foil	
Adhesive Type	Acrylic	
Liner	Paper	
Color	Natural Aluminum	
Backing Thickness (mm)	0.05 mm	View
Test Method: ASTM D3652		
Total Tape Thickness (mil)	3.7 mil	View
Test Method: ASTM D3652		
Total Tape Thickness (mm)	0.09 mm	View

Test Method: ASTM D3652

Backing Thickness	2 mil	View

Test Method: ASTM D3652

Typical Performance Characteristics

Property	Values	Additional Information
Tensile Strength	40.3 N/cm	View

Test Method: ASTM D3759

180° Peel Adhesion	6.3 N/cm	View

Test Method: ASTM D3330

Notes: 12 in/min (300 mm/min)

180° Peel Adhesion	58 oz/in	View

Test Method: ASTM D3330

Notes: 12 in/min (300 mm/min)

Tensile Strength (lb/in)	23 lb/in	View

Test Method: ASTM D3759

Elongation at Break (%)	8.5 %	View

Test Method: ASTM D3759

Long Term Temp C	121 °C	View

Test Condition: Long Term (day, weeks)

Minimum Long Term Temperature Resistance	-40 °C	View

Test Condition: Long Term (day, weeks)

Long Term Temp F	250 °F	View

Test Condition: Long Term (day, weeks)

Minimum Long Term Temperature Resistance	-40 °F	View

Test Condition: Long Term (day, weeks)

Available Sizes

Property	Values	Additional Information
Standard Roll Length	45 m	
Standard Roll Length	50 yd	

Storage and Shelf Life

Store in a clean, dry place. Temperature of 40-80°F (4-26°C) and 40 to 50% relative humidity are recommended.
To obtain best performance, use this product within 24 months from date of manufacture.

Industry Specifications

UL 723 Classified [10/10 Flame/Smoke Rating] (File R10984)

Bottom Matter

3M
Industrial Adhesives and Tapes Division
3M Center, Building 225-3S-06
St. Paul, MN 55144-1000
800-362-3550

Trademarks

Handling/Application Information

Application Examples

- Vapor seal for fibrous and sheet metal ducts
- General purpose construction applications

References

Property	Values
3m.com Product Page	https://www.3m.com/3M/en_US/p/d/b40067932/
Safety Data Sheet SDS	https://www.3m.com/3M/en_US/company-us/SDS-search/results/?gsaAction=msdsSRA&msdsLocale=en_US&co=ptn&q=3520CW

Family Group

Link Tags:

3520CW

Products	Adhesive Type	Liner	Color	Backing Thickness (mm)	Tensile Strength	Long Term Temp C	Minimum Long Term Temperature Resistance	Long Term Temp F
3520CW	Acrylic	Paper	Natural Aluminum	0.05 mm	40.3 N/cm	121 °C	-40 °C	250 °F

ISO Statement

This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001 standards.

Information

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AIRSEAL® 22

WATER BASED DUCT SEALANT

LEED COMPLIANT

FEATURES

- *LEED EQ Credit 4.1*
- *Cures to a tough, flexible film*
- *Formulated Indoor and Outdoor use*
- *Seals High Pressure HVAC Duct Systems*
- *Exceeds all SMACNA Pressure and Sealing Classes.*
- *Has excellent mold and mildew resistance.*
- *Water Resistant*

TECHNICAL SPECIFICATIONS	
Packaging	(24) 10.5 oz. tubes, (4) 1 gal./case, 2 gal. pail, 5 gal. pail, 55/53 gal. drum
Shelf Life	18 months in unopened containers
Pressure Rating	Maximum 12" water column pressure
Coverage Rate	Approximately 80 sq. feet per gallon @ 20 mils. wet film thickness.
Solids Content	70% ± 2% by weight
Weight per gal.	10.8 lbs. ± 0.3 lbs.
Color	Gray, White
Temperature Limits	Storage and application... 35ºF to 115ºF Service..... -40ºF to 200ºF **Protect From Freezing.** If frozen, completely thaw prior to use. Passes 5 Freeze-Thaw Cycles.
Class 1 Smoke and Flame Rating LEED COMPLIANT SCAQMD Rule 1168	UNDERWRITERS LABORATORIES INC. CLASSIFIED CAULKING AND SEALANTS Applied to organic, Reinforced Cement Board. Flame Spread .....0 Smoke Developed .....0 10YF Tested in accordance with UL 723, and ASTM E-84. Satisfies the requirements of NFPA 90A, 90B, and 225.
Clean Up	Use warm soap and water

RECOMMENDED USES

AIRSEAL 22 is a UL 181 A-M & B-M listed fast drying water based duct sealant with excellent adhesion, formulated to pressure seal all types of HVAC duct systems, including sheet metal, fiberglass duct board and flexible duct.

APPLICATION INSTRUCTIONS

Apply to clean, dry surfaces, free from oils, dirt, and foreign matter. Spread at a minimum 20 mils. wet film thickness with a brush, or pump into well fitted joints. Seal all joints, seams, and penetrations in the ductwork to ensure an airtight system. Dries to touch in one (1) hour. Prior to pressure testing, allow 12 - 24 hours dry time depending on temperature, humidity and application thickness. Do not apply on outdoor surfaces within 5 hours of possibility of rain or freezing temperatures.

UL 181 A-M & B-M APPLICATION INSTRUCTIONS:
Materials must be applied in strict accordance with the following instructions in order to meet the requirements of UL 181. Allow 48 hours dry time minimum for UL 181 applications.

UL 181 A-M DUCT BOARD:

1. Fold grooved duct board to form the module, making certain that both ends are flush and the shiplaps are properly sealed.
2. Staple the duct board flap on 2" centers using outward clinching staples.
3. Spread mastic base coat onto the surface at a minimum rate of 10 mils. wet film thickness, 3" wide over stapled joint.
4. Embed fiberglass scrim tape (5 mils thick, 20 x 10 plain weave) into base coat.
5. Finish with a top coat of mastic, applied at 10 mils. minimum wet film thickness.

UL 181 B-M FLEXIBLE DUCT / METAL DUCT:

1. Coat around the collar fitting with mastic at 20 mils. wet film thickness, 3" wide.
2. Pull back jacket and insulation from the inner core. Slide 2" of the inner core over the mastic and collar. Secure with a mechanical fastener.
3. Pull the jacket and insulation back over core. Secure jacket in accordance with Flexible duct installation instructions.

Polymer Adhesives Sealant Systems Inc., is proud to be affiliated with the following organizations:

SMACNA NFPA® HARDI

UL® LISTED
UL 181A-M
UL 181B-M
10YF

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REV 11/08

SUBMITTAL RECORD_____
JOB _____
LOCATION_____
SUBMITTED TO_____
SUBMITTAL PREPARED BY_____
APPROVED BY_____
DATE_____

Submittal Form DDIF Insulation Fastener

DESCRIPTION: When liner is placed inside air conditioning or heating duct work, the movement of air could cause the insulation to delaminate. To prevent this, SMACNA Specifications call for the use of fasteners in addition to adhesive to secure the liner.
The fasteners may be of three types:
A. ADHESIVE: This fastener is bonded to the ductwork with an appropriate adhesive and allowed to set up. After sufficient drying time the liner is impaled on the pin and a washer added to retain the liner.
B. MECHANICAL: This type of fastener mechanically attaches itself to the duct work. The most popular style is a hardened nail with an attached washer. This fastener is impact driven through the liner and forms a positive mechanical grip with the metal.
C. WELD: This fastener forms a permanent bond to the duct work by becoming part of it as in any weld. Two styles are currently in use. The first fastener is a mechanical fastener which is driven through the liner and welded to the duct work underneath. The second fastener is a pin which is welded to the duct work prior to the insulation. The liner is then impaled (much like the adhesive fastener) over the pin and secured by a washer.
SPECIFICATIONS:
All Duro Dyne Insulation Fasteners are designed to meet SMACNA HVAC Duct Construction Standard for Mechanical Fasteners as per SMACNA HVAC Duct Construction Standards - Third Edition Section S2.11.
All steel used in Duro Dyne Insulation Fasteners meets ASTM-A653.
All dimensions used in pin length are from bottom of head or base of fastener.

- SPOTTER PINS -

PN Pins

Pin Diameter: 14 Gauge Galvanized

	Item#	Bulk#	Code/Bulk Code	Approx Pin Length	Use
■	26001	***26005***	PN34/***PNB34***	.75	1/2" insulation
■	26002	***26006***	PN114/***PNB114***	1.25	1" insulation
■	26004	***n/a***	PN250/***n/a***	2.5	2"- 3" insulation

- WELDED FASTENERS -

SSP Gold Seal Pins

Pin: .130 Diameter
Washer: Diameter - 1.0"
Thickness: - .015" - .017"
Acrylic PSA
Do not store at or above 110 degrees or pins may stick together.

	Item#	Bulk#	Code/Bulk Code	Nominal Length After Setting	Use
■	n/a	***26297***	n/a/***SSPB12***	.365	1/2" insulation
■	26194	***26294***	SSP34/***SSPB34***	.531	1" 1-2# density
■	26195	***26295***	SSP100/***SSPB100***	.781	1" 2-3# density
■	n/a	***26293***	n/a/***SSPB1F***	.905	1" Foam Insulation
■	n/a	***26299***	n/a/***SSPB118***	1.000	2-3# density
■	n/a	***26300***	n/a/***SSPB150***	1.365	1-1/2" insulation
■	26196	***26296***	SSP200/***SSPB200***	1.780	2" insulation
■	n/a	***26305***	n/a/***SSPB250***	2.196	2-1/2" insulation
■	26303	***n/a***	SSP300/***n/a***	2.875	3" insulation
■	26304	***n/a***	SSP400/***n/a***	3.875	4" insulation

CWFTC Cupped Washer Weld Pins

Pin: .130" Diameter
Washer: Diameter - 1.0"
Thickness: - .015" - .017"

	Item#	Pail#	Code/Pail Code	Nominal Length After Setting	Use
■	26286	***26389***	CWFTC12/***CWFTC12P***	.365	1/2" insulation
■	26287	***26390***	CWFTC34/***CWFTC34P***	.531	1" 1-2# density
■	26288	***26391***	CWFTC100/***CWFTC100P***	.781	1" 2-3# density
■	26289	***26392***	CWFTC118/***CWFTC118P***	1.000	1" 3# density
■	26290	***26393***	CWFTC150/***CWFTC150P***	1.365	1-1/2" insulation
■	26291	***26394***	CWFTC200/***CWFTC200P***	1.781	2" insulation
■	26292	***26395***	CWFTC218/***CWFTC218P***	1.780	2" HD insulation
■	n/a	***26396***	n/a/***CWFTC250***	2.196	2-1/2" insulation
■	n/a	***26397***	n/a/***CWFTC300***	2.875	3" insulation
■	n/a	***26398***	n/a/***CWFTC400***	3.875	4" insulation

CDSSP Capacitor Discharge Gold Seal Pins

Pin: .105 (+/-.005) Diameter
Washer: Diameter - 1.0"
Thickness: - .015" - .017"
Acrylic PSA
Do not store at or above 110 degrees or pins may stick together.

	Item#	Bulk#	Code/Bulk Code	Nominal Length After Setting	Use
■	26376	***26382***	CDSSP12/***CDSSPB12***	.365	1/2" insulation
■	26377	***26383***	CDSSP34/***CDSSPB34***	.531	1" 1-2# density
■	26378	***26384***	CDSSP100/***CDSSPB100***	.781	1" 2-3# density
■	26379	***26385***	CDSSP118/***CDSSPB118***	1.000	1" 3# + density
■	26380	***26386***	CDSSP150/***CDSSPB150***	1.365	1-1/2" insulation
■	26381	***26387***	CDSSP200/***CDSSPB200***	1.781	2" insulation

CP Rib Pins®

Pin: .15" Diameter
Washer: Diameter - 1.0"
Thickness: - .015" - .017"

	Item#	Bulk#	Code/Bulk Code	Nominal Length After Setting	Use
■	26023	***26028***	CP12/***CPB12***	.365	1/2" insulation
■	26024	***26029***	CP34/***CPB34***	.531	1" 1-2# density
■	26025	***26030***	CP100/***CPB100***	.781	1" 2-3# density
■	26032	***26035***	CP118/***CPB118***	1.000	1" 3# + density
■	26026	***26031***	CP150/***CPB150***	1.365	1-1/2" insulation
■	26027	***26038***	CP200/***CPB200***	1.781	2" insulation

FTC Econo-Point Pins

Pin: .130" Diameter
Washer: Diameter - 1.0"
Thickness: - .015" - .017"

	Item#	Code	Nominal Length After Setting	Use
■	26072	FTC12	.365	1/2" insulation
■	26073	FTC34	.531	1" 1-2# density
■	26074	FTC100	.781	1" 2-3# density
■	26131	FTC118	1.000	1" 3# density
■	26226	FTC150	1.365	1-1/2" insulation
■	26227	FTC200	1.781	2" insulation

BDEP Aerodynamic Target® Washer Weld Pins

Pin: .130" Diameter
Washer: Diameter - 1.0"
Thickness: - .015" - .017"

	Item#	Bulk#	Code/Bulk Code	Nominal Length After Setting	Use
■	n/a	***26220***	n/a/***BDEP12***	.365	1/2" insulation
■	n/a	***26221***	n/a/***BDEP34***	.531	1" 1-2# density
■	n/a	***26222***	n/a/***BDEP100***	.781	1" 2-3# density
■	n/a	***26217***	n/a/***BDEP118***	1.000	1" 3# density
■	n/a	***26218***	n/a/***BDEP150***	1.365	1-1/2" insulation
■	n/a	***26219***	n/a/***BDEP200***	1.781	2" insulation
■	n/a	***26216***	n/a/***BDEP218***	2.00	2" HD insulation

CTC Sloped® Washer Weld Pins

Pin: .130" Diameter
Washer: Diameter - 1.0"
Thickness: - .015" - .017"

	Item#	Code	Nominal Length After Setting	Use
■	26228	CTC12	.365	1/2" insulation
■	26229	CTC34	.531	1" 1-2# density
■	26230	CTC100	.781	1" 2-3# density
■	26231	CTC118	1.000	1" 3# density
■	26232	CTC150	1.365	1-1/2" insulation
■	26233	CTC200	1.781	2" insulation

- MECHANICAL FASTENERS -

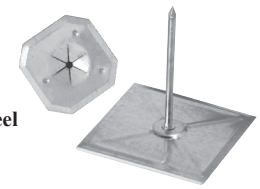
BGT Bangers®

Pin: .136" Diameter
Washer: Diameter - 1.0"
Thickness: - .015"

Item#	Bulk#	Code/Bulk Code	Approx. Length Before Setting	Approx. Length After Setting	Use
■ 26033	***26095***	BGT12/***BGB12***	.475	.375	1/2" insulation
■ 26044	***26096***	BGT100/***BGB100***	.625	.525	1" 1-2# density

- ADHESIVE FASTENERS -

SAH



Self Adhesive Hangers with Washer
Pin: min. 12 Gauge Zinc Plated
Base dimension: 2" x 2" galvanized 28 Gauge steel
Adhesive: Polyethylene double coated foam tape
Shelf Life: 2 years @ 70° and 50% humidity

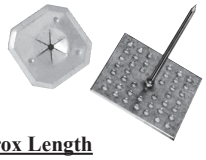
Item#	Bulk#	Code/Bulk Code	Approx Length	Use
■ 26067	***26036***	SAH34/***SAHB34***	.75	1/2" insulation
■ 26068	***26037***	SAH114/***SAHB114***	1.25	1" insulation
■ 26069	***26040***	SAH134/***SAHB134***	1.75	1-1/2"- 1-1/2# density
■ 26070	***26041***	SAH200/***SAHB200***	2.00	1-1/2"- 2# + density
■ 26071	***26047***	SAH250/***SAHB250***	2.5	2" insulation
■ n/a	***26126***	n/a/***SAHB350***	3.5	3" insulation
■ n/a	***26127***	n/a/ ***SAHB450***	4.5	4" insulation

FLIP-STIX®

Self Adhesive Hangers with Washer
Galvanized - 24 Gauge
Aluminum - .032 nominal Type 5052-H34
Stainless Steel - 24 Gauge Type 301
Adhesive: Polyethylene double coated foam tape
Shelf Life: 2 years @ 70° and 50% humidity

Item#	Code	Approx Length	Use
■ 26055	FSG-250 Galvanized	2.5	1/2" to 2" insulation
■ 26056	FSA-250 Aluminum	2.5	1/2" to 2" insulation
■ 26057	FSS-250 Stainless Steel	2.5	1/2" to 2" insulation

PBH



Perforated Base Adhesive Hangers with Washer
Pin: min. 12 Gauge Zinc Plated
Base dimension: 2" x 2" 28 Gauge Galvanized.

Item#	Bulk#	Code/Bulk Code	Approx Length	Use
■ n/a	***26097***	n/a/***PBHB34***	.75	1/2" insulation
■ n/a	***26098***	n/a/***PBHB114***	1.25	1" insulation
■ n/a	***26099***	n/a/***PBHB134***	1.75	1-1/2"- 1-1/2# density
■ n/a	***26100***	n/a/***PBHB200***	2.00	1-1/2"- 2# + density
■ 26079	***26101***	PBH250/***PBHB250***	2.5	2" insulation
■ n/a	***26128***	n/a/***PBHB350***	3.5	3" insulation
■ n/a	***26112***	n/a/***PBHB450***	4.5	4" insulation

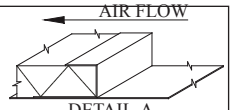
- WASHERS -

Item#	Bulk#	Code/Bulk Code	Area
■ 26017	***26019***	PC1/***PCB1*** - for use w/PN (30 gauge galvanized)	1-1/4"x 1-1/4"
■ 26115	***26093***	LPC-1/***LPC-1B*** - for use w/SAH & PBH	1-1/4"x 1-1/4"
■ 26050	***n/a***	FSW-G for use w/Flipstix (galvanized)	1-1/4"x 1-1/4"
■ 26052	***n/a***	FSW-S for use w/Flipstix (stainless)	1-1/4"x 1-1/4"

- DUCT LINER INSTALLATION-

METAL NOSING MUST BE USED WHEREVER LINER IS PRECEDED BY UNLINED METAL; OTHERWISE WHEN VELOCITY EXCEEDS 4000 FPM (20.3 MPS) USE METAL NOSING ON EVERY LEADING EDGE. NOSING MAY BE FORMED ON DUCT OR BE CHANNEL OR ZEE ATTACHED BY SCREWS, RIVETS OR WELDS.

INTERIOR WIDTH OF 8"(200 mm) AND LESS DOES NOT REQUIRE PINS

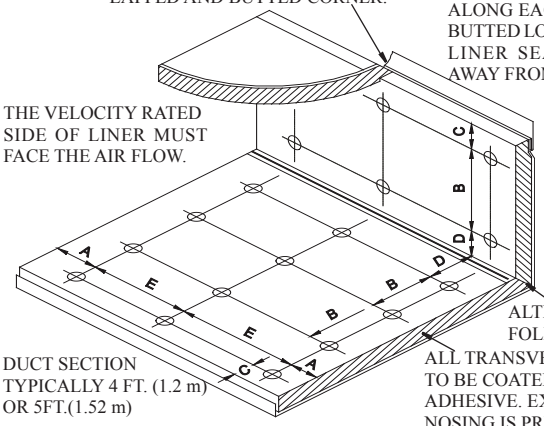


DETAIL-A
METAL NOSING
CHANNEL OR ZEE

LAPPED AND BUTTED CORNER.

PLACE PINS 3" (76 mm) ALONG EACH SIDE OF A BUTTED LONGITUDINAL LINER SEAM THAT IS AWAY FROM A CORNER

THE VELOCITY RATED SIDE OF LINER MUST FACE THE AIR FLOW.



ALTERNATE FOLDED CORNER.

DUCT SECTION TYPICALLY 4 FT. (1.2 m) OR 5FT.(1.52 m)

ALL TRANSVERSE EDGES TO BE COATED WITH ADHESIVE. EXCEPT WHEN NOSING IS PRESENT.

MAXIMUM SPACING FOR FASTENERS. ACTUAL INTERVALS ARE APPROXIMATE

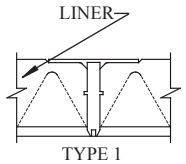
"A" PIN ROW MAY BE OMITTED WHEN METAL NOSING IS USED. "E" THEN STARTS FROM THE NOSING.

Velocity*	Dimensions				
	A	B	C	D	E
0-2500 FPM	3"	12"	4"	6"	18"
(0-12.7 MPS)	(76.2)	(305)	(102)	(152)	(457)
2501-6000 FPM	3"	6"	4"	6"	16"
(12.7-30.5 MPS)	(76.2)	(152)	(102)	(152)	(406)

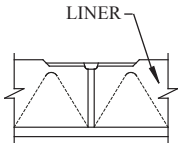
LINER ADHERED TO THE DUCT WITH 90% MIN. AREA COVERAGE OF ADHESIVE

*UNLESS A LOWER LEVEL IS SET BY MANUFACTURER OR LISTING AGENCY

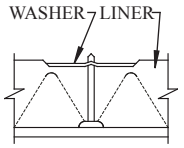
- LINER FASTENERS-



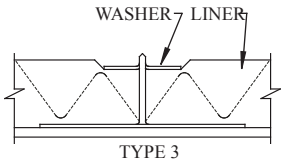
TYPE 1
CLINCHED PIN: INTEGRAL HEAD-IMPACT APPLIED BANGER ® / TRIPOD ®



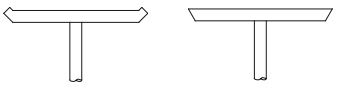
TYPE 2
WELDED PIN INTEGRAL HEAD FTC / RIB PIN ® / GOLD SEAL/TARGET PIN ®/ SLOPE PINS ®



TYPE 3
WELDED PIN PRESS-ON HEAD PN / LN



TYPE 3
ADHERED PIN PRESS-ON HEAD SAH / PBH / FLIPTIX ®



CUPPED HEAD TYPES

BEVELED

INSTALLED PINS AND WASHERS SHALL NOT COMPRESS LINER MORE THAN THE CORRECT LENGTH SPECIFIED FOR THE LINER THICKNESS USED.

Drawings and installation standards are excerts from SMACNA HVAC Duct Constructions Standards - Third Edition. Page 7.14, section S2.11:
Liners shall also be installed with mechanical fasteing devices that:
A. Are spaced in accordance with Figure 7-11,
B. When installed, are as corrosion resistant as G60 coated galvanized steel,
C. Will not adversely affect the fire resistance classification of liner and adhesives,
D. Do not damage the liner when applied as receommended by manufacturer,
E. Do not cause leakage in the duct,

SUGGESTED SPECIFICATIONS

All duct liner shall be secured to the duct work in accordance with SMACNA HVAC Duct Construction Standards. Fasteners shall be_____ (mechanical, adhesive, weld) type Fastener Code _____ as manufactured by Duro Dyne Corporation, Bay Shore, N.Y. Washers, when necessary, shall be Code _____ as manufactured by Duro Dyne Corporation, Bay Shore, N.Y.

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Duro Dyne Midwest • Duro Dyne West • Duro Dyne Canada
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DURO DYNE®

Johns Manville
A Berkshire Hathaway Company

HVAC INSULATION

LINACOUSTIC® RC

FIBERGLASS DUCT LINER WITH REINFORCED COATING SYSTEM

DATA SHEET

DESCRIPTION

Linacoustic® RC insulation is a flexible duct liner made from strong glass fibers bonded with a thermosetting resin. The airstream surface is protected with JM's exclusive Reinforced Coating system, which combines our state-of-the-art Permacote® acrylic coating with a flexible glass mat reinforcement to provide a smooth airstream surface.

FACTORY-APPLIED EDGE COATING

Edge coating is factory applied to the edges of the liner core, ensuring coverage of the leading edges per NAIMA/SMACNA requirements. Shop fabrication cuts may be coated with SuperSeal® edge treatment (refer to publication AHS-202).

USES

Linacoustic RC insulation is specifically designed for lining sheet metal ducts in air conditioning, heating and ventilating systems, providing superior acoustical and thermal performance.

STORAGE

Linacoustic RC should be kept clean and dry during storage, transport, fabrication, installation, and system operation.

GENERAL PROPERTIES

Operating temperature (max.) – ASTM C411	250°F (121°C)
Air velocity (max.) – ASTM C1071	6,000 fpm (30.5 m/sec)
Water repellency – INDA IST 80.6	≥6
Fungi resistance – ASTM C1338	Does not breed or promote
Fungi resistance – ASTM G21	No growth

STANDARD THICKNESSES AND PACKAGING

Thickness		Roll Length		Roll Widths for All Thicknesses*	
in	mm	lineal feet	lineal meters	in	mm
½	13	100, 150, 200	31, 46, 61	34 to 72	864 to 1829
1	25	50,100,150, 200	15, 31, 46, 61	34 to 72	864 to 1829
1½	38	50, 100	15, 31	34 to 72	864 to 1829
2	51	50	15	34 to 72	864 to 1829
3	76.2	50	15	55 to 60	1422 to 1524

**Available in ¼" (6.4 mm) increment.*

Contact your Regional Sales Office for stock items and availability of special sizes.

SURFACE BURNING CHARACTERISTICS

Linacoustic RC duct liner meets the Surface Burning Characteristics and Limited Combustibility of the following standards:

Standard/Test Method
- ASTM E84
- UL 723
- NFPA 255
- NFPA 90A and 90B
- NFPA 259
- CAN/ULC S102

Maximum Flame Spread Index	25
Maximum Smoke Developed Index	50

SPECIFICATION COMPLIANCE

- ASTM C1071, Type I
- ICC Compliant
- California Title 24
- MEA #353-93-M
- Conforms to ASHRAE 62
- SMACNA Application Standards for Duct Liners
- NAIMA Fibrous Glass Duct Liner Installation Standard
- Canada: CGSB 51-GP-11M and CAN/CGSB 51.11

ADVANTAGES

Improves Indoor Building Environment. Linacoustic RC duct liner improves indoor environmental quality by helping to control both temperature and sound.

Resistant to Dust and Dirt. The tough acrylic polymer Permacote coating helps guard against the incursion of dust or dirt into the substrate, minimizing the potential for biological growth.

Will Not Support Microbial Growth. Permacote coating is formulated with an immobilized EPA-registered protective agent to protect the coating from potential growth of fungi and bacteria.

Linacoustic RC duct liner meets all requirements for fungi and bacterial resistance. Tests were conducted in accordance with ASTM C1338 and ASTM G21 (fungi testing). Detailed information is available in Johns Manville fact sheet HSE-103FS.

Note: As with any type of surface, microbial growth may occur in accumulated duct system dirt, given certain conditions. This risk is minimized with proper design, filtration, maintenance and operation of the HVAC system.

Cleanability. If HVAC system cleaning is required, the Reinforced Coating airstream surface may be cleaned with industry-recognized dry methods. See the North American Insulation Manufacturers Association (NAIMA) "Cleaning Fibrous Glass Insulated Air Duct Systems."

Highly Resistant to Water. The reinforced coating surface provides superior resistance to penetration of incidental water into the fiber glass wool core.

Duct liner is UL Classified for E84
Duct Liner UL file: R3711

LINACOUSTIC® RC

FIBERGLASS DUCT LINER WITH REINFORCED COATING SYSTEM

DATA SHEET

SUSTAINABLE BUILDING CERTIFICATIONS

GREENGUARD®	Certified
GREENGUARD® GOLD	Certified

GREENGUARD® Certified products have been screened for more than 10,000 volatile organic compounds (VOCs) and meet stringent standards for low chemical emissions based on established criteria from key public health agencies

INSTALLATION

Linacoustic RC duct liner installation must be performed in accordance with the requirements of the NAIMA Fibrous Glass Duct Liner Standards or SMACNA HVAC Duct Construction Standard. All transverse edges, or any edges exposed to airflow, must be coated with an approved duct liner coating material, such as Johns Manville SuperSeal products.

Minimizes Pre-installation Damage. Linacoustic RC duct liner's Reinforced Coating System is highly resistant to damage that can occur during in-shop handling, fabrication, jobsite shipping and installation.

Easy to Fabricate. Linacoustic RC duct liner is lightweight and easy to handle. Clean, even edges can be accurately cut with regular shop tools.

THERMAL PERFORMANCE

Thickness		R-value		Conductance	
in	mm	(hr•ft²•°F)/Btu	m²•°C/W	Btu/(hr•ft²•°F)	W/m²•°C
½	13	2.2	0.39	0.46	2.61
1	25	4.2	0.74	0.24	1.36
1½	38	6.3	1.11	0.16	0.91
2	51	8.0	1.41	0.13	0.74
3	76.2	12.0	2.11	0.08	0.47

R-value and conductance are calculated from the material thermal conductivity tested in accordance with ASTM C518 at 75°F (24°C) mean temperature.

SOUND ABSORPTION COEFFICIENTS (TYPE "A" MOUNTING)

Thickness		Sound Absorption Coefficient at Frequency (Cycles per Second) of						
in	mm	125	250	500	1000	2000	4000	NRC
½	13	0.07	0.20	0.44	0.66	0.84	0.93	0.55
1	25	0.08	0.31	0.64	0.84	0.97	1.03	0.70
1½	38	0.10	0.47	0.85	1.01	1.02	0.99	0.85
2	51	0.25	0.66	1.00	1.05	1.02	1.01	0.95
3	76.2	0.47	0.96	1.17	1.10	1.02	1.05	1.05

Coefficients were tested in accordance with ASTM C423 and ASTM E795.

ISO 9001:2015 CERTIFICATION

Johns Manville mechanical insulation products are designed, manufactured and tested in our own facilities, which are certified and registered to stringent ISO 9001:2015 (ANSI/ASQC 90) series quality standards. This certification, along with regular, independent third-party auditing for compliance, is your assurance that Johns Manville products deliver consistent high quality.

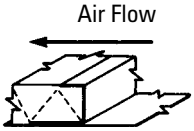
LINACOUSTIC® RC

FIBERGLASS DUCT LINER WITH REINFORCED COATING SYSTEM

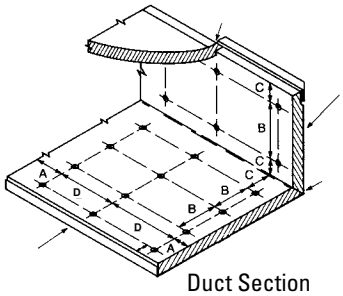
DATA SHEET

DUCT LINER INSTALLATION

When velocity exceeds 4000 fpm (20.3 m/sec), use metal nosing on every leading edge. Nosing may be formed on duct or be channel or zee attached by screws, rivets or welds. A metal nosing shall also be installed at the fan discharge and at any point where lined duct is preceded by unlined duct.



The velocity-rated side of liner must face the air flow



Duct Section
(Typically 4' or 5' [1.22 m or 1.52 m])

Lapped and Butted Corner

All Transverse Edges to be Coated with Adhesive

Alternate Folded Corner

Maximum spacing for fasteners. Actual intervals are approximate.

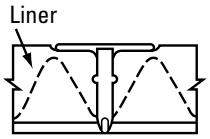
	Dimensions							
	A		B		C		D	
Velocity*	in	mm	in	mm	in	mm	in	mm
0–2500 fpm (0–12.7 m/sec)	3	76	12	305	4	102	18	457
2501–6000 fpm (12.7–30.5 m/sec)	3	76	6	152	4	102	16	406

**Unless a lower level is set by the listing agency.*

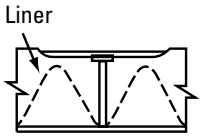
Liner adhered to the duct with 90% minimum area coverage of adhesive. Adhesive shall conform to ASTM C 916.

Shop or field cuts shall be liberally coated with SuperSeal Edge Treatment or approved adhesive.

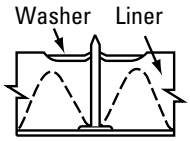
LINER FASTENERS



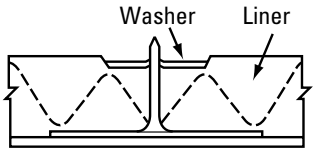
Type 1
Clinched Pin: Integral Head (Impact Applied)



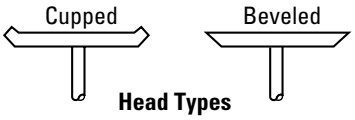
Type 2
Welded Pin: Integral Head



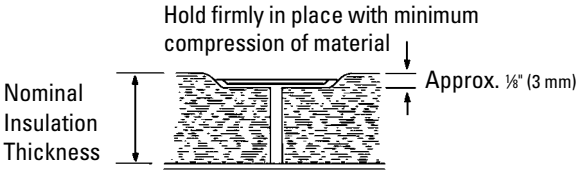
Type 3
Welded Pin: Press-on Head



Type 4
Adhered Pin: Press-on Head



Head Types



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SUBMITTAL RECORD_____
JOB _____
LOCATION_____
SUBMITTED TO_____
SUBMITTAL PREPARED BY_____
APPROVED BY _____
DATE_____

Specification Form NPAC40 Portable Adhesive Canister-Clear

DESCRIPTION

Duct liner is typically attached to duct walls by two fastening methods; one with mechanical fasteners and the other with adhesive. Mechanical fasteners are utilized to prevent delamination of the liner while adhesives bond the liner to the metal ensuring that air flow can not intrude between the two materials. The choice of an adhesive is affected by several factors some of which are; the method of application, acceptable dry time, solvent type.

Duro Dyne NPAC40 is a web type, general purpose adhesive that bonds well to a wide variety of substrates, with one side or two side application. It has a quick tack, is flexible and water proof.

FEATURES

- Wide pad nozzle
- Low VOC Organic Compound
- No Methylene Chloride (Dichloralmethane)
- High Strength
- Fast Tacking
- WaterProof

TYPICAL PROPERTIES

Color: Clear
VOC: <80 gms./ltr.
Flammability: Flammable per ASTM E-681-041
Effect of Freezing: None
Storage Life: 15 months
Application Temperature: 65° F - 95° F
Maximum Service Temperature: 150° F
Estimated Coverage: 2250-2700 Sq Ft @2.5-3 gm/Sq Ft

Method of Application: Attach spray hose and spray gun then fully open valve on canister. Hold spray gun tip 6 to 10 inches from surface to be covered, always at a 90° angle to surface. Apply even coats. Do not allow it to concentrate or puddle in one area. For best performance, use this product at room temperature.

RELATED SMACNA RECOMMENDATIONS*

7.4 Installation Standards For Rectangular Ducts Using Flexible Liner

S2.3 Each layer of duct liner shall be attached with 90 percent coverage of adhesive at the liner contact surface area.

S2.4 All transversely oriented edges of liner not receiving metal nosing shall be coated with adhesive. Liner shall be neatly butted without gaps at transverse joints and shall be coated with adhesive at such joints before butting.

S2.6 Ducts with interior widths of 8 in. (203 mm) or less do not require mechanical fasteners in addition to adhesive.

**From SMACNA HVAC Duct Construction Standards Metal and Flexible • Third Edition • 2005*

NPAC complies with the South Coast Air Quality Management (SCAQMD) Rule #1168 and VOC (Volatile Organic Compound) standards and thus can be used for **IEQ Credit 4.1: Low Emitting Materials: Adhesives & Sealants** when used for field installation on the building interior and applied on-site.

ITEM#	CODE	DESCRIPTION
5117	NPAC40	Portable Adhesive Canister-Clear

SUGGESTED SPECIFICATIONS

All metal duct shall be lined according to SMACNA HVAC Duct Construction Standards. Each layer of duct liner shall be attached with 90% coverage of adhesive at the liner contact surface area. Adhesive shall be a non-chlorinated solvent based adhesive. Adhesive shall be supplied in a Portable Adhesive Canister-Clear, code NPAC40, as supplied by Duro Dyne Corporation.

For canister disposal instructions, please visit our website at: http://www.durodyne.com/AdhInsAhes.php

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Printed in the USA 1/28/19
BC005442

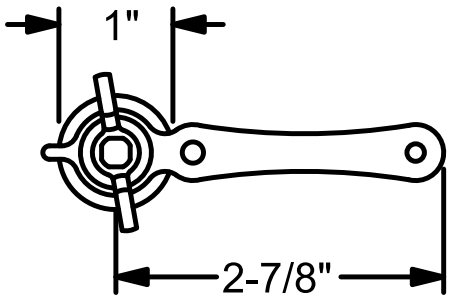
SUBMITTAL RECORD
JOB _____
LOCATION _____
SUBMITTED TO _____
SUBMITTAL PREPARED BY _____
APPROVED BY _____
DATE _____

Submittal Form KS - STAMPLINE REGULATORS

FOR CONTROLLING SMALL DAMPERS

1/4" "JIFFY" REGULATOR SETS (FOR DAMPERS UP TO 10")

These efficient, low cost, heavy gauge, plated steel regulators install in a "jiffy" by slipping the washer and handle over the threaded square end bearing. The wing nut locks the damper in position. The position of the handle indicates the position of the damper in the duct. For use on round or square ducts.

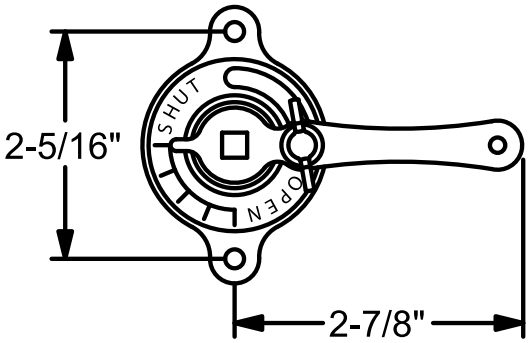


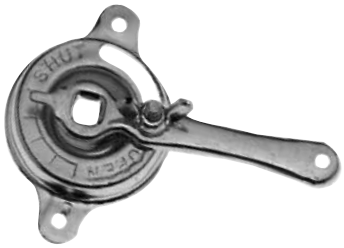
Stands Off Duct 3/4"

1/4'' "JIFFY" REGULATOR SETS			
ITEM#/***BULK#***	CODE/***BULK CODE***	SET CONSISTS OF	QTY/***BULK QTY***
8039 / ***8374***	KS7 / ***KS7B***	KP5 1/4" threaded bearing, handle; KP-6 spring loc bearing, bevelled wingnut & washer	10 Per Ctn-10 Cts Per Box / ***500 Per Ctn***
8046 / ***8246***	KS7L / ***KS7LB***	KP5L 1/4" long threaded bearing, handle; KP-6L long spring loc bearing, bevelled wingnut & washer	10 Per Ctn-10 Cts Per Box / ***500 Per Ctn***
8102 / ***8339***	JB1 / ***JB1B***	KP5 1/4" threaded bearing, handle; wingnut & washer	100 Per Ctn / ***500 Per Ctn***
8220	JB1L	KP5L 1/4" long threaded bearing, handle; wingnut & washer	100 Per Ctn
8295	JB1XL	KP5XL 1/4" extra long threaded bearing, handle; wingnut & washer	100 Per Ctn

1/4" DIAL REGULATOR SETS AND BEARINGS (FOR DAMPERS UP TO 10")

These heavy gauge plated steel regulators are among the most popular on the market. They minimize air leakage and reduce rattle. A wing nut locks the damper in position, yet permits quick readjustment. The dial shows the damper position at a glance. The regulator mounts easily on round or square ducts.





1/4" DIAL REGULATOR SETS			
ITEM#/***BULK#***	CODE/***BULK CODE***	SET CONSISTS OF	QTY/***BULK QTY***
8040	KS14	K-2 regulator; KP-8S square end bearing; KP-8R round end bearing	10 Per Ctn-10 Cts Per Box
8041 / ***8142***	KS145 / ***KS145B***	K-2 regulator; KP-6 spring loc bearing; KP-8S square end bearing	10 Per Ctn-10 Cts Per Box / ***500 Per Ctn***
8047 / ***8143***	KS145L / ***KS145LB***	K-2 regulator; KP-6L long spring loc bearing; KP-8L long square end bearing	10 Per Ctn-10 Cts Per Box / ***500 Per Ctn***
7384	KS145XLS	K-2 regulator; KP-6 spring loc bearing; KP-8XL extra long square end bearing	10 Per Ctn-10 Cts Per Box
8056 / ***8350***	K2 / ***K2B***	1/4" regulator only	100 Per Ctn / ***500 Per Ctn***

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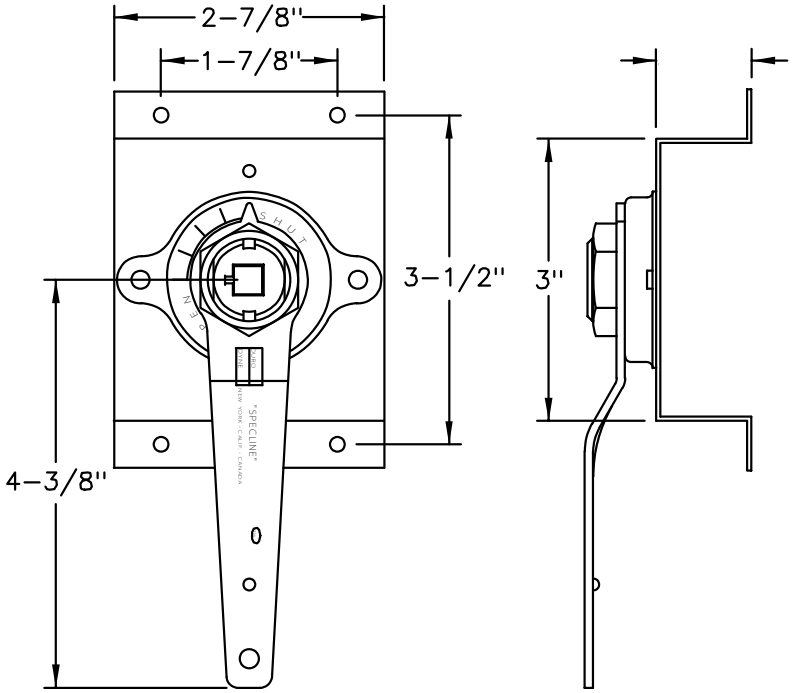
BO008432

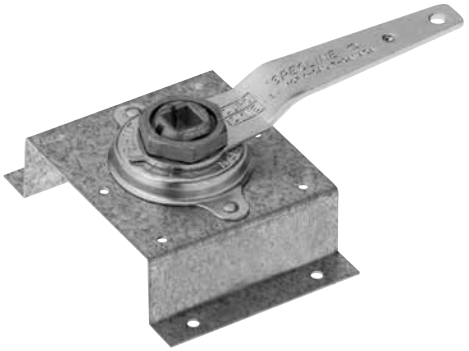
SUBMITTAL RECORD
JOB _____
LOCATION _____
SUBMITTED TO _____
SUBMITTAL PREPARED BY _____
APPROVED BY _____
DATE _____

Submittal Form SRST - Standoff with Stampline Regulator for Square Duct

STANDOFF WITH *STAMPLINE* REGULATOR - SQUARE

- 14 GAUGE (.072 MIN) ZINC PLATED





SRST SERIES FOR SQUARE DUCT				
ITEM#	CODE	SHAFT SIZE	STAND HEIGHT	QUANTITY
8184	SRST 1-148 w/SRHS-148	1/4" sq.	1"	10 Per Ctn
8318	SRST 1-1/2-148 w/SRHS-148	1/4" sq.	1-1/2"	10 Per Ctn
8196	SRST 2-148 w/SRHS-148	1/4" sq.	2"	10 Per Ctn
8019	SRST 1-388 w/SRHS-388	3/8" sq.	1"	10 Per Ctn
8020	SRST 1-1/2-388 w/SRHS-388	3/8" sq.	1-1/2"	10 Per Ctn
8021	SRST 2-388 w/SRHS-388	3/8" sq.	2"	10 Per Ctn
8208	SRST 1-128 w/SRHS-128	1/2" sq.	1"	10 Per Ctn
8384	SRST 1-1/2-128 w/SRHS-128	1/2" sq.	1-1/2"	10 Per Ctn
8177	SRST 2-128 w/SRHS-128	1/2" sq.	2"	10 Per Ctn

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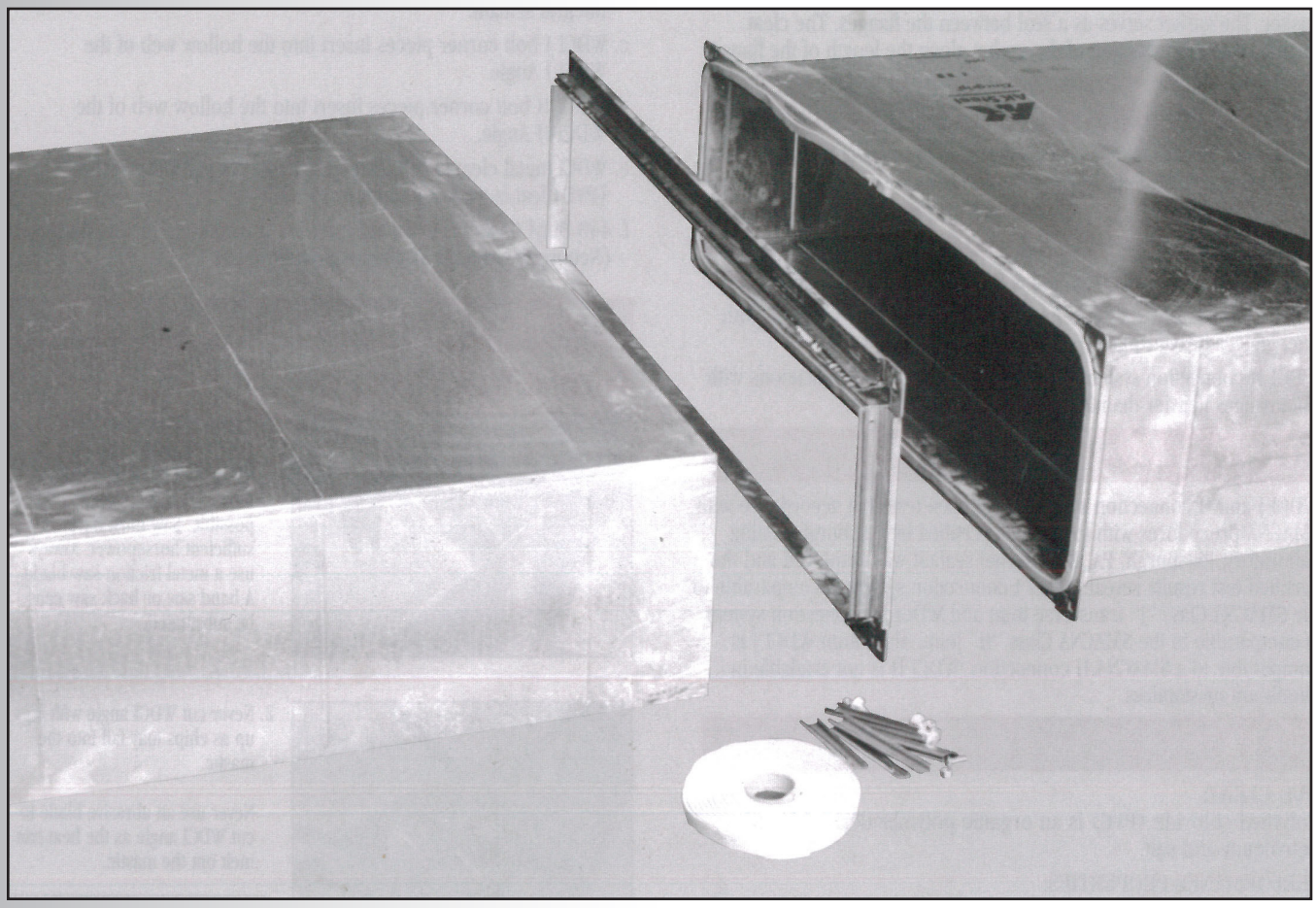
D U C T M A T E

WDCI J & H



Rectangular Duct Connection System

Strong and Virtually Leak-Free

- Simple to install
- No additional sealing required
- Available in specialty metals
- Consistent connections

DUCTMATE® Industries, Inc.

WDCI J and H

Rectangular Duct Connection System

DESCRIPTION

WDCI J and H connection systems consist of roll-formed flanges, corner pieces, gasket, bolts, nuts and cleat. The flanges attach to the duct wall and have an integral mastic which allows the flange to seal itself to the duct. Corner pieces are used to add rigidity to the flange; hold the ductwork together and provide a sealing surface for the gasket. The gasket serves as a seal between the flanges. The cleat insures even compression of the gasket along the length of the flange.

BASIC USE

WDCI J and H connection systems are used to connect rectangular ducts when a rigid, leak-free connection is required.

SPECIAL CHARACTERISTICS

Sealing materials meet NFPA 90A & 90B Class 1 requirements.

WDCI J connections systems is not recommended for application with duct gauges heavier than 16 GA, or lighter than 26 GA.

WDCI H connection system is not recommend for applications with duct gauges heavier than 20 GA or lighter than 26 GA.

TECHNICAL INFORMATION

WDCI J and H connection systems have been tested in accordance with SMACNA procedures with test results certified by Pittsburgh Testing Laboratory, Pittsburgh PA. No external sealant was employed and the certified test results reveal: WDCI J connection system is comparable to the SMACNA Class "J" transverse joint and WDCI H connection system is comparable to the SMACNA Class "H" joint. Aluminum WDCI J is comparable to a SMACNA H connections. WDCI H is not available in aluminum or stainless.

CLEAT

PVC CLEAT:
Polyvinyl chloride (PVC) is an organic polymer derived from petroleum and salt.

PERFORMANCE PROPERTIES:

Relative high ignition resistance	flash ignition 391°C/735°F self ignition 454°C/850°F
Low fuel contribution	
Lack of flaming drips	
High external heat necessary to maintain combustion	
UL723 (ASTM E-84) Test Data:	Flame Spread: 10 Fuel Contribution: 0 Smoke Density: 10
Service Temp:	+32°F to +150°F

METAL CLEAT:
WDCI Metal Cleat is roll-formed from 22 GA galvanized steel for application around perimeter of transverse joint.

PACKAGING INFORMATION

WDCI connection systems consists of the following components:

a. WDCI J flange is roll-formed from 20 GA galvanized steel, with an integral sealant.

b. WDCI H flange is roll-formed from 22 GA galvanized steel, with and integral sealant.

c. WDCI J bold corner pieces insert into the hollow web of the WDCI J Angle.

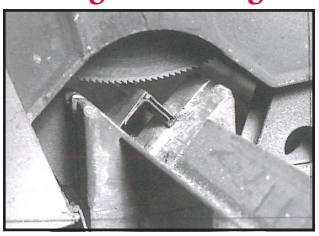
d. WDCI H bold corner pieces insert into the hollow web of the WDCI H Angle.

e. WDCI metal cleat is roll-formed from 22 GA galvanized steel (PVC Cleat is available upon request).

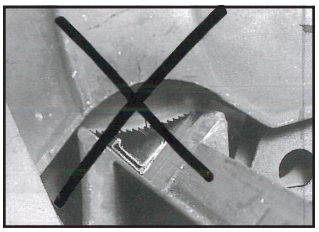
f. 440 Butyl Gasket is extruded butyl for used between mating flanges (Neoprene gasket is available upon request).

INSTALLATION INSTRUCTIONS

Cutting WDCI Angle

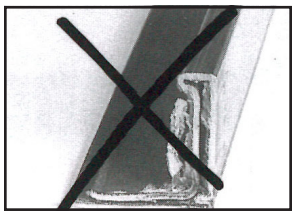


1. Always cut WDCI angle 1⅝" shorter than duct dimensions. Slam the blade through the Angle as quickly as possible. Saw must have sufficient horsepower. Always use a metal friction saw blade. A band saw or hack saw can be substituted.

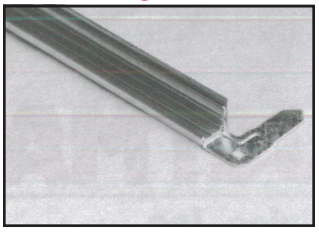


2. Never cut WDCI angle with legs up as chips may fall into the mastic.

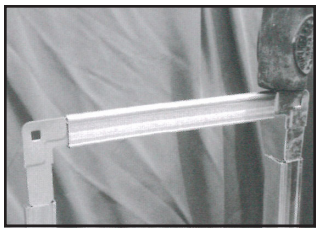
   Never use abrasive blade to cut WDCI angle as the heat can melt out the mastic



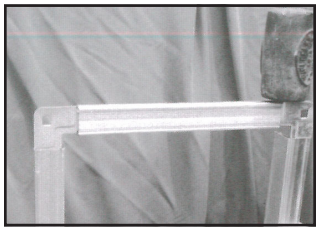
Assembling WDCI Frame



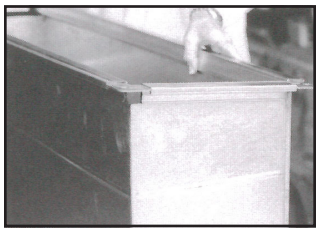
3. Insert a WDCI corner piece into each end of the two shortest frame angle pieces.



4. Slide two longer angle pieces onto corner pieces already inserted into shorter pieces, then add the second short piece to complete the frame.

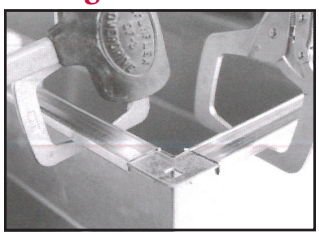


5. Now complete the frame by seating the corner pieces into the WDCI angle.

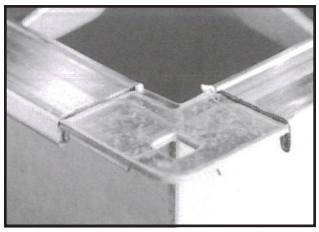


6. Start, completed WDCI frame at corner of duct.

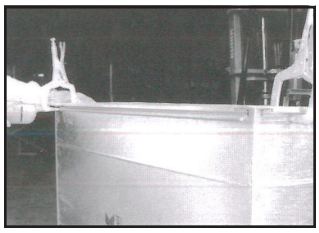
Seating WDCI Frame



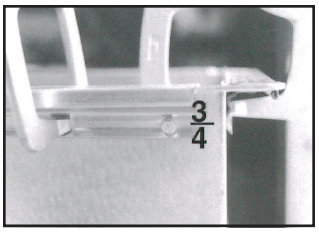
7. Use a mallet to seat the frame onto the duct. *Establish metal to metal contact along the length of the angle.*



8. The duct must be seated all the way into the WDCI angle in order to penetrate the integral mastic sealant and avoid leakage.



9. Work in one direction around duct when seating the frame. Fasten in sequence as you go. Do not fasten angle at corners first, it can cause seating problems.



10. It is essential that the frame angle is fastened to the duct within ¾" of the end of the angle at each corner.

    When the table below requires a second screw at each corner it must be placed within 2"-3" of the end of the WDCI angle.

WDCI angle may be fastened to the duct with self drilling screws or spotwelds.

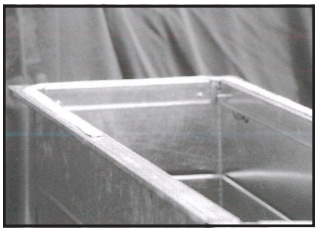
Spot welding is recommended, especially on ductwork where static pressure is above 3" and the leakage is specified to be less than 1%.

Due to their superior strength, spotwelds may be substituted for screws in the table below. Table also shows minimum fastening requirements. Job conditions (handling, etc.) may require additional fastening.

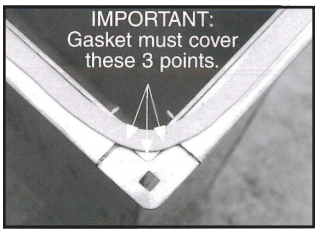
Fasten at intervals as in table below:

Duct Wall Size	0-4" W.G.	6" W.G.
0-24"	1 screw each corner	1 screw each corner
25"-48"	1 screw each corner	2 screws each corner
49" and over	1 screw each corner plus 1 screw each 24"	2 screws each corner plus 1 screw each 24"

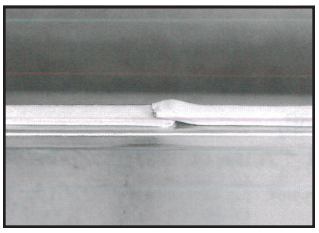
Applying Ductmate 440 Gasket Tape



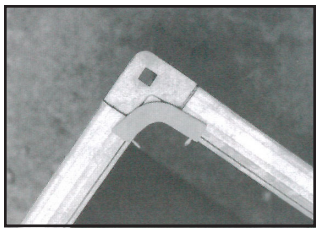
11. Start approximately in the middle of one side, place a single strip of gasket tape completely around the inside edge of the angle frame. At the corners, the gasket must cover the exposed edge of the duct section and the gap between the duct wall and the WDCI corners.



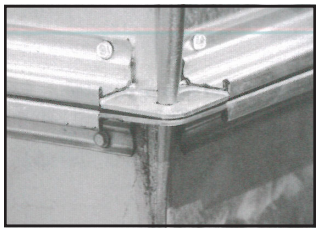
12. Position 440 Gasket in an arc so that is covers the three points in the duct corner. Gasket must cover all three points. Some gasket will protrude into the airstream. Press firmly into contact with the raw edge of the duct corner and WDCI corner assembly. In steps 11, 12, 13, and 14 Ductmate 440 is the preferred gasket. Ductmate Neoprene Gasket may be used where a section must be disassembled.



13. Apply 440 gasket completely around WDCI frame to the beginning point. Where the gasket meets overlay about ⅜".

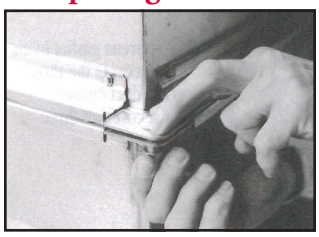


14. On the mating WDCI frame apply 440 gasket only to the corners as in photo (approximately 3" per corner). The same 3 point application requirements apply as in photo 12.



15. Carefully align mating frames before they touch. Ductmate 440 adheres on contact. A drift pin can be used to correct any misalignment.

Completing WDCI Connection

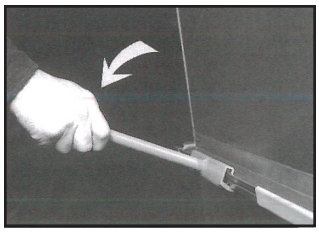


16. Insert ⅜" x 1" nut and bolt for WDCI J Connection System.

    Insert a ¼" x 1" nut and bolt for WDCI H Connection Systems.

    It is not necessary to over torque the nuts and bolts.

Cleat Installation



With DM440 Gasket
For all low, medium and high pressure applications, use 6" cleat 24" O.C.

With Neoprene Gasket
For ½" - 2" WG/SP use 6" cleat, 24" O.C.

For 3" - 4" WG/SP use 6" cleat, 18" O.C.

For 6" - 10" WG/SP use 6" cleat, 12" O.C.

17. WDCI cleat can be snapped-on with the Snapper1 Tool.

    Insert cleat in tool, hook onto mated frames near corner, apply pressure to handle so the Snapper tool compresses frames and cleat snaps on. Work toward center of duct using the schedule at left.

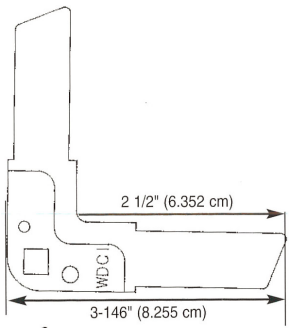
    For weather-proof duct connections, install full-length, one-piece cleat to top duct flange joint to prevent water from collecting on gasket.

    If corner cannot be bolted due to inaccessibility, cleat can be driven onto the mating flanges to complete the WDCI connection.

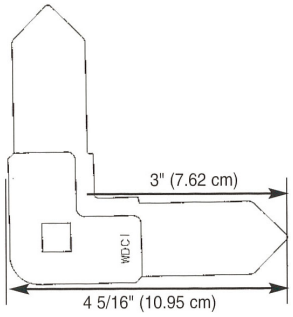
SNAPPER1
Ideal tool to attach cleat to WDCI flange joint.

DUCTMATE WDCI COMPONENTS

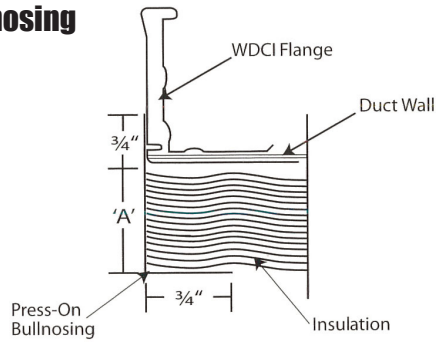
WDCI H Corner Piece



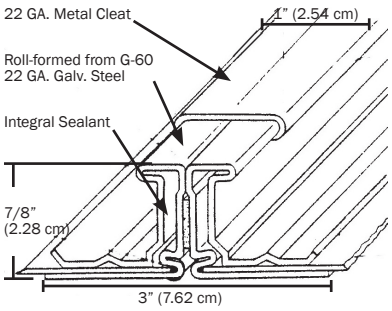
WDCI J Corner Piece



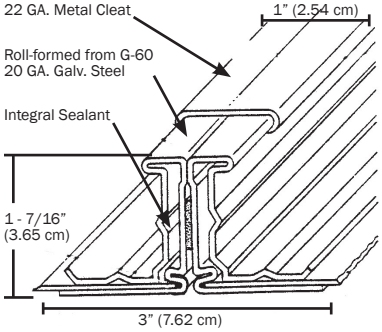
Press-On Bullnosing



WDCI H

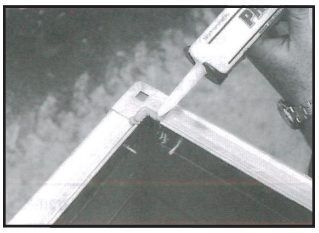


WDCI J

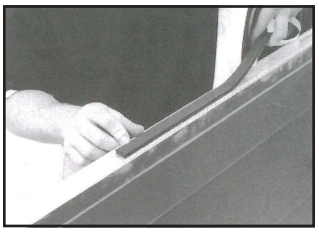


ADDITIONAL INSTRUCTION FOR APPLICATION REQUIRING NEOPRENE GASKET

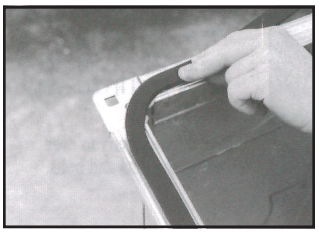
When using Neoprene gasket with WDCI J & H connection system, sealant is required in the corners. Unlike the Butyl gasket the Neoprene gasket alone is unable to properly seal the corners. It is necessary to apply a small amount of duct sealant (preferably sealant from a tube) in all eight corners to form a flawless connection. Ideally the sealant should be allowed to cure before the gasketing is applied. However, if reasonable care is taken, the gasket may be applied before the sealant is cured. When applying the gasket, care must still be taken at the corners. As with the 440 Butyl gasket, the three points at the corners should be covered. The joint is then completed in the standard manner. This sealing technique is especially useful when making connections at fire dampers where the Neoprene must be used.



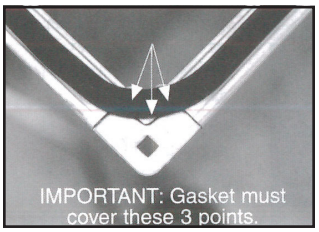
1. Apply a liberal amount of PROseal sealant in each of the eight corners. The sealant must cover the three points in the duct corner.

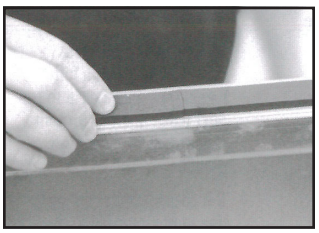


2. Start applying Ductmate Neoprene gasket about halfway between corners. Position gasket in center of WDCI angle as in photo.



3. Position Neoprene gasket in an arc so that it covers the three points in the duct corner. Gasket must cover all three points.





4. Apply Neoprene gasket completely around WDCI frame to the beginning point. Butt the two ends of the gasket up against each other. Do not overlap the two ends.

Frequently a contractor installing a high velocity duct system will employ a duct joint which either he or his work force have no experience. In such a case, it is strongly recommended that the contractor promptly test the initial 100 to 300 feet of duct before installing any more duct. This test will quickly reveal whether or not the workmen can make this joint ait-tight in an economical manner.

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Ductmate warrants that WDCI J and H Connection Systems, when properly installed and maintained, will be free from defects in material and workmanship, and will comply with all written specifications made by Ductmate at the time of sale. Ductmate's warranty shall run for a period of one year from the date of manufacture.

Warranty Limitation
The warranty stated above is in lieu of all other warranties, express or implied, including but not limited to the implied warranties of MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Although Ductmate may have suggested the product, or provided written or oral advice to the Purchaser, it is the Purchaser's responsibility to test and determine the suitability of WDCI J and H Connection Systems, for the intended use and purpose, and Purchaser and/or its customer assumes all risk and liability whatsoever regarding such suitability.

Limitation of Liability
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