



Dual-Wall  
**ROUND**



# SPIRAL DUCT & FITTINGS



# Dual-Wall ROUND

## DUAL-WALL ROUND SPIRAL DUCT AND FITTINGS CONSTRUCTION STANDARDS

### Outer Shell Positive Pressure

Gauge selection for galvanized (ASTM A653), paint grip steel, and types 304 and 316 stainless steel. Fittings are spot welded or gorelocked through 40" diameter. All larger fittings are continuously welded except for PCS fittings. Check with the plant when ordering. All fittings can be provided as continuously welded if required. All galvanized and PCS spiral duct 6" and larger is corrugated unless ordered without corrugations. Smaller sizes may also be corrugated. All spiral duct from other materials will not be corrugated.

DUCT DIAMETER	2005 SMACNA 10" WG		1995 SMACNA 2" WG		1995 SMACNA 10" WG	
	SPIRAL DUCT	FITTINGS	SPIRAL DUCT	FITTINGS	SPIRAL DUCT	FITTINGS
3"-6"	26	26	26	26	26	26
7"-8"	26	26	26	26	26	26
9"-10"	26	26	26	26	26	26
11"-12"	26	26	26	26	26	24
13"-14"	26	26	26	26	26	24
15"-16"	26	26	24	24	24	22
17"-18"	26	26	24	24	24	22
19"-24"	26	24	24	24	24	22
25"-26"	24	22	24	24	24	22
27"-36"	24	22	24	22	22	20
37"-42"	24	22	22	20	22	20
43"-48"	22	20	22	20	20	20
49"-50"	22	20	22	20	20	20
51"-60"	22	20	20	18	18	18
61"-66"	22	18	18	16	18	16
67"-84"	20	18	18	16	18	16

DUCT DIAMETER	1985 SMACNA 2" WG		1985 SMACNA 10" WG		ALUMINUM 2" WG	
	SPIRAL DUCT	FITTINGS	SPIRAL DUCT	FITTINGS	SPIRAL DUCT	FITTINGS
3"-8"	26	26	26	24	0.025"	0.032"
9"-14"	26	26	26	24	0.025"	0.032"
15"-26"	24	24	24	22	0.032"	0.040"
27"-36"	24	22	22	20	0.040"	0.050"
37"-50"	22	20	20	20	0.040"	0.063"
51"-60"	20	18	18	18	0.063"	0.080"
61"-84"	18	16	18	16	0.063"	0.090"

### Inner Shell

Gauge selection for inner shell. Standard material for the inner shell of spiral duct is Spirorib perforated steel (ASTM A653), with 3/32" holes on 3/16" staggered centers for a free area of 23%. Standard material for the inner shell of fittings is solid steel. Fittings are also available with a perforated liner and spiral duct with a solid liner.

DUCT DIAMETER (inside dimensions)	SPIRORIB		SPIRAL DUCT
	DUCT	FITTINGS	
3"-26"	26	22	26
27"-60"	26	22	22
61"-84"	24	22	22

Standard insulation is 1" thick, with a thermal conductivity (ASTM C 518) @ 75° F mean temperature of 0.25 (BTU-in./hr.ft.2°F) R4 or better.

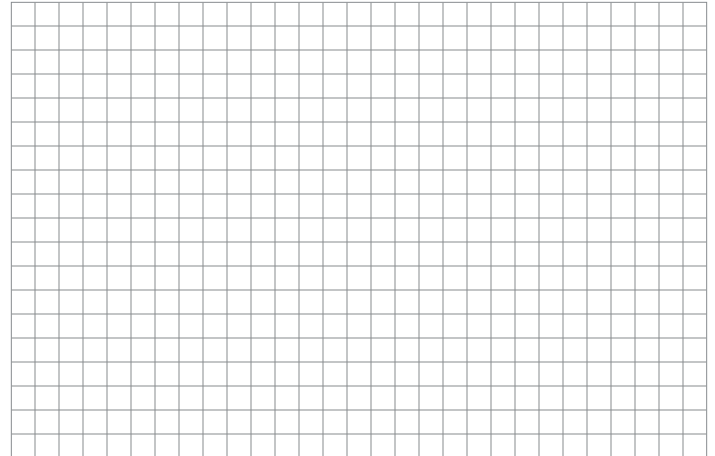
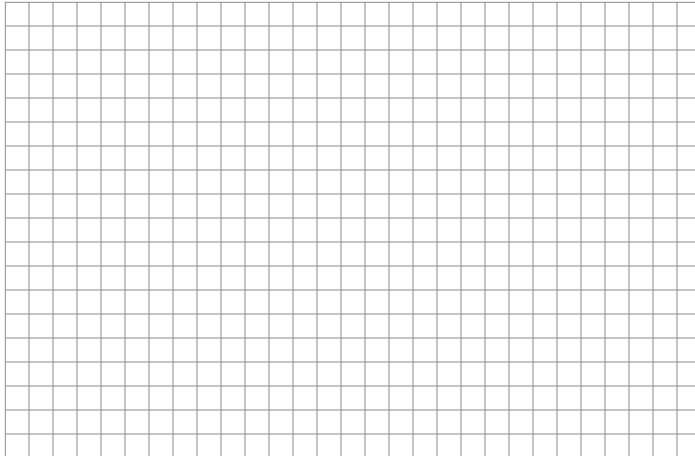
Surface burning characteristics (ASTM E 84, UL 723)  
25 flame spread  
50 smoke developed.

Sound absorption coefficients. (ASTM C 423, Type A)

Frequency, Hz						
125	250	500	1000	2000	4000	NRC
0.11	0.38	0.71	0.90	0.95	0.91	0.75

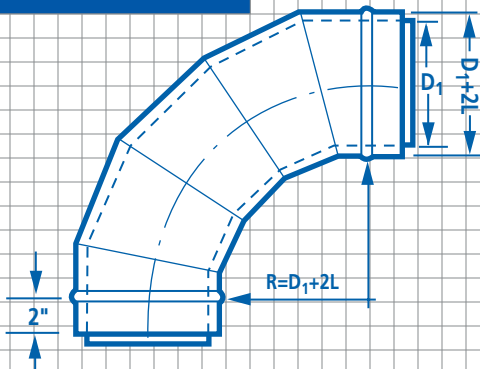
# Dual-Wall Round ELBOWS

L = Liner Thickness



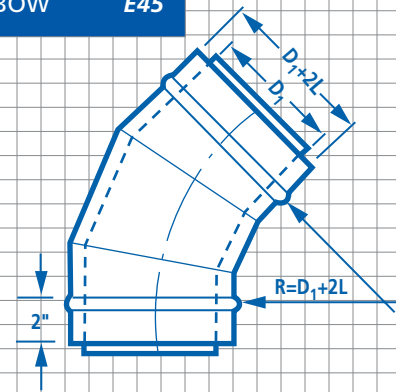
90° 5-PC. ELBOW

E90



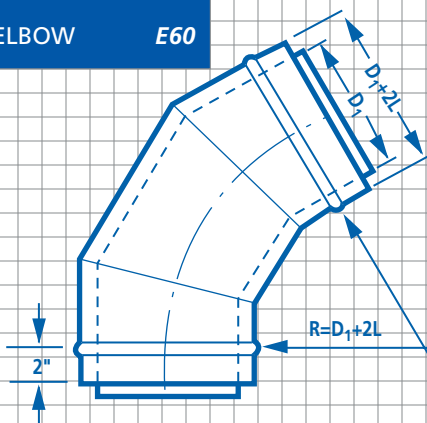
45° 3-PC. ELBOW

E45



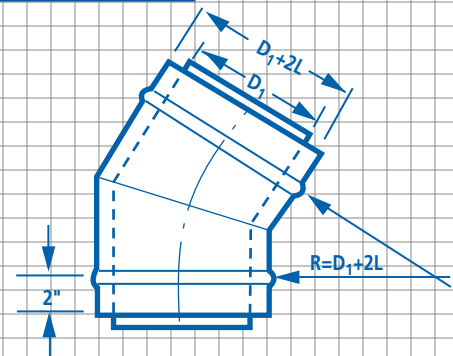
60° 3-PC. ELBOW

E60



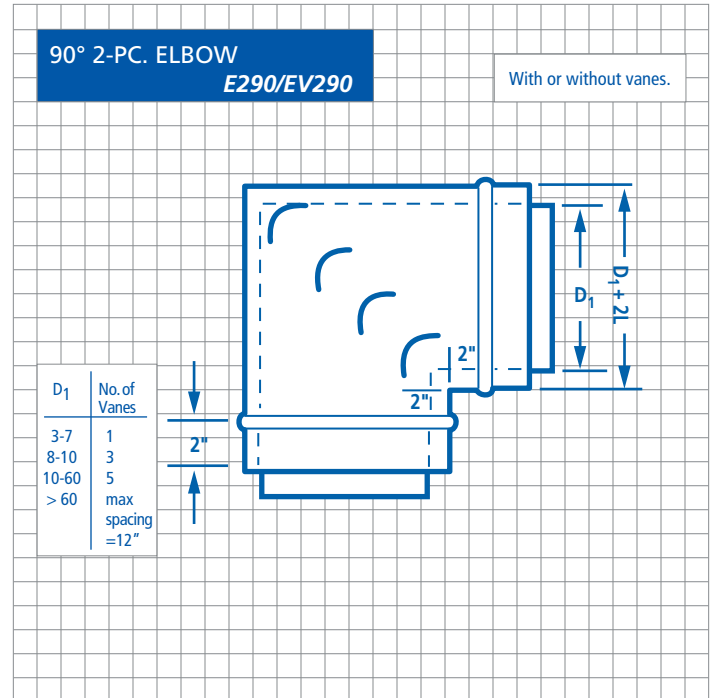
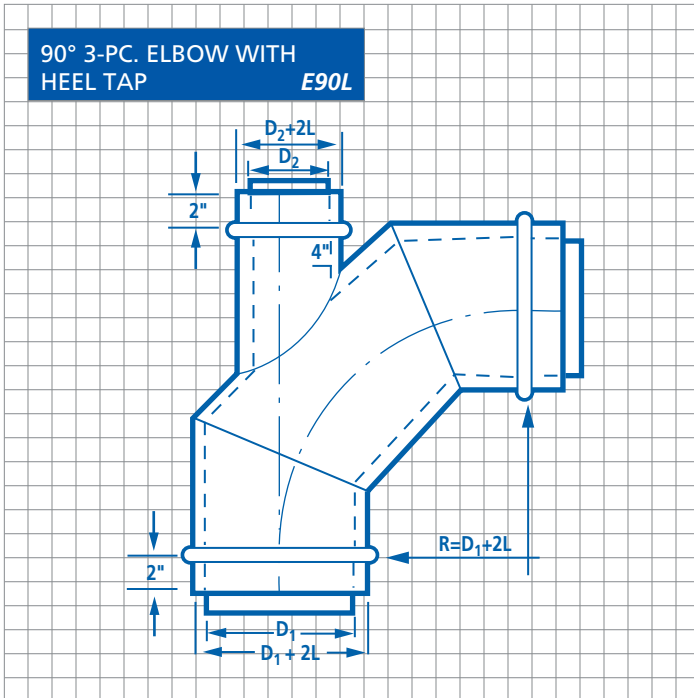
22½° AND 30° 2-PC.  
ELBOW

E22/E30



# Dual-Wall Round ELBOWS

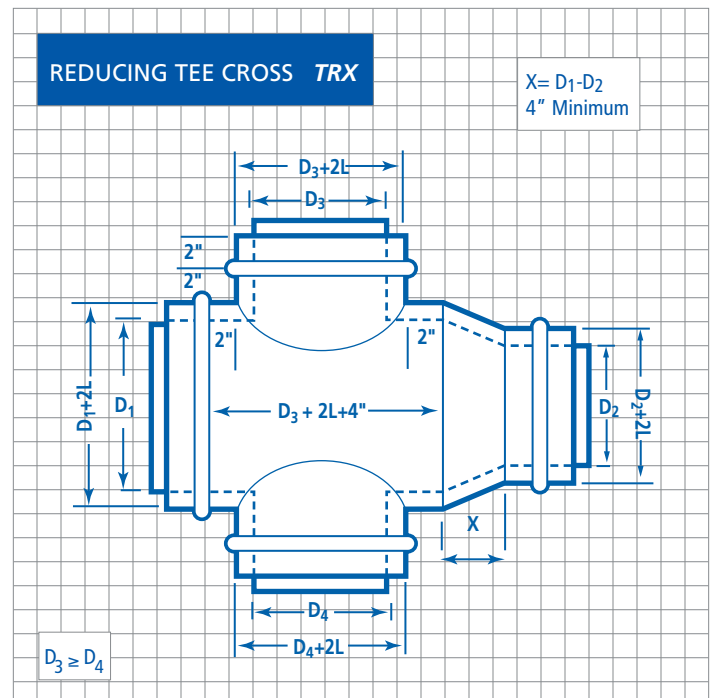
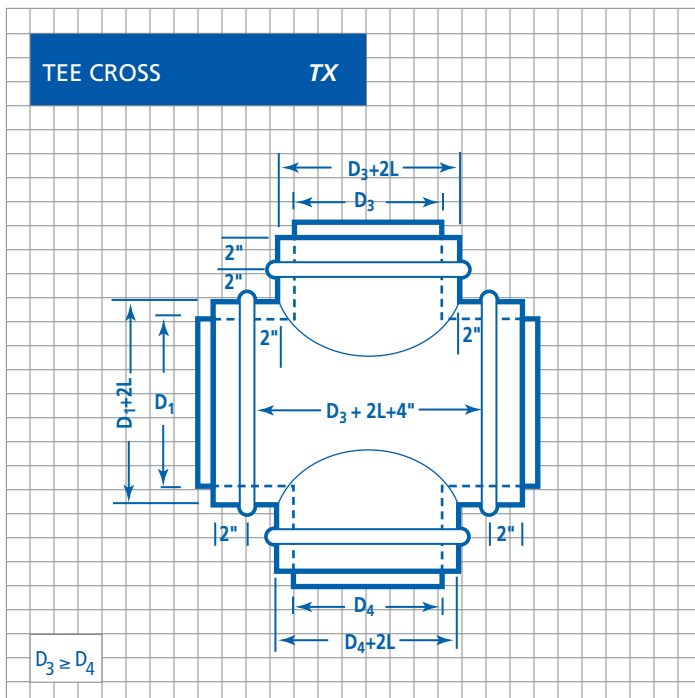
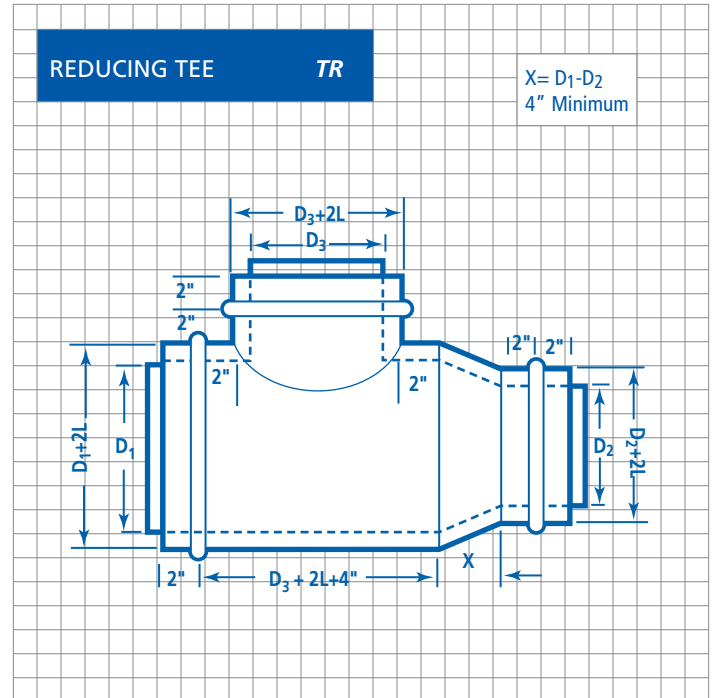
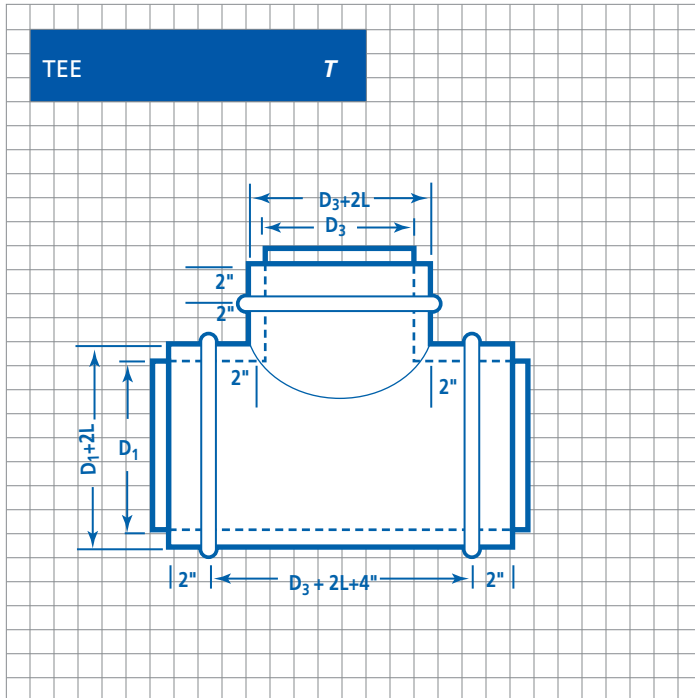
L = Liner Thickness





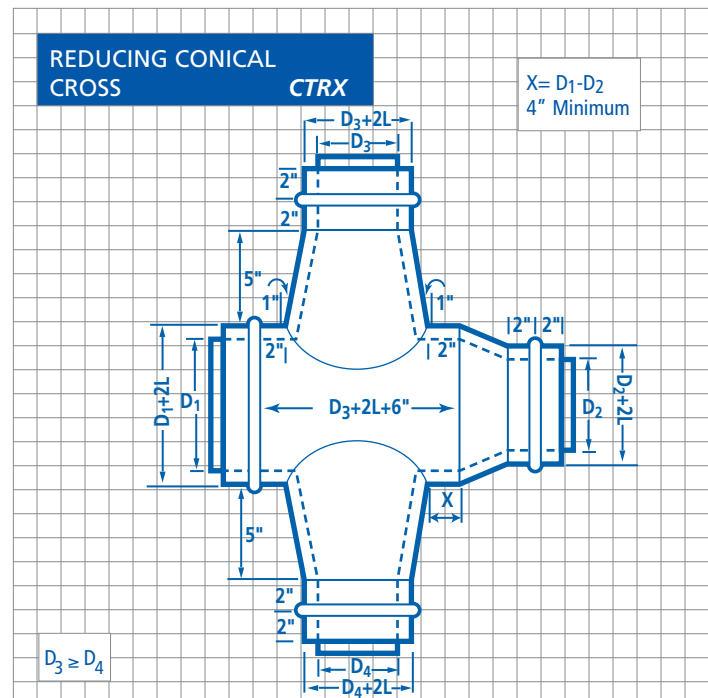
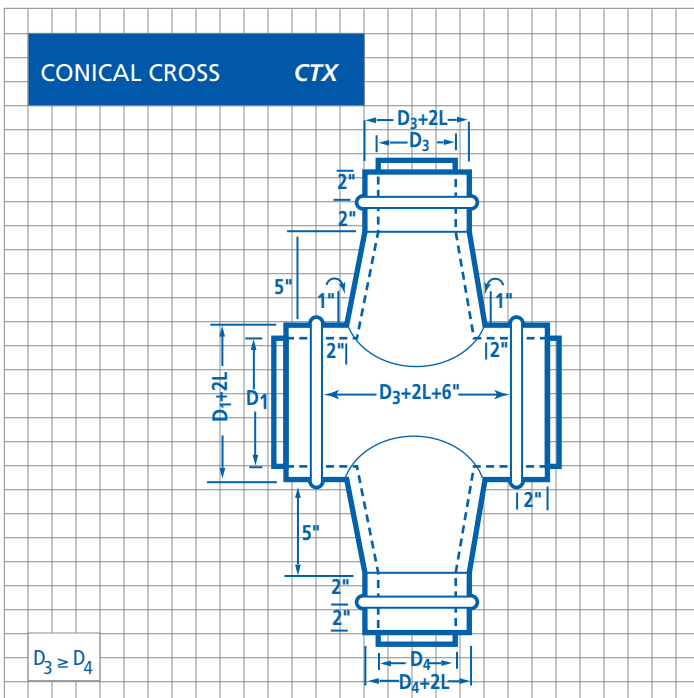
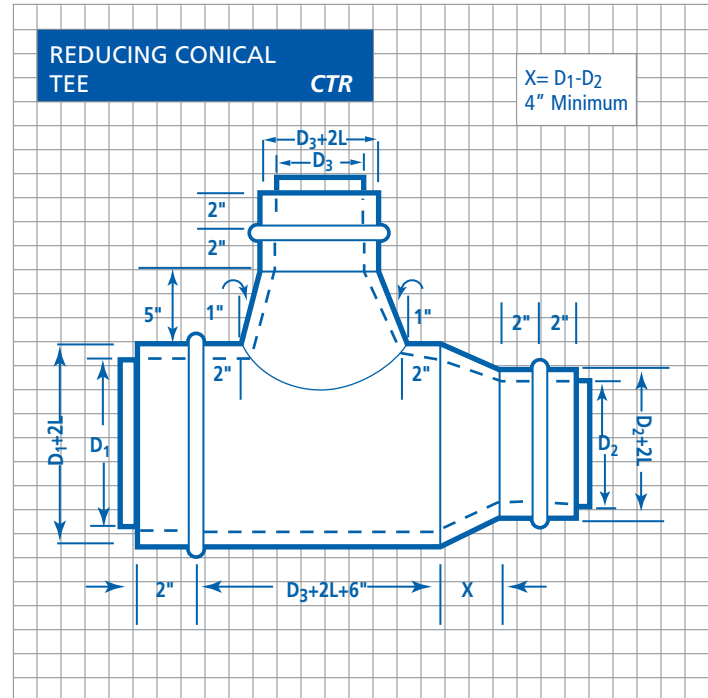
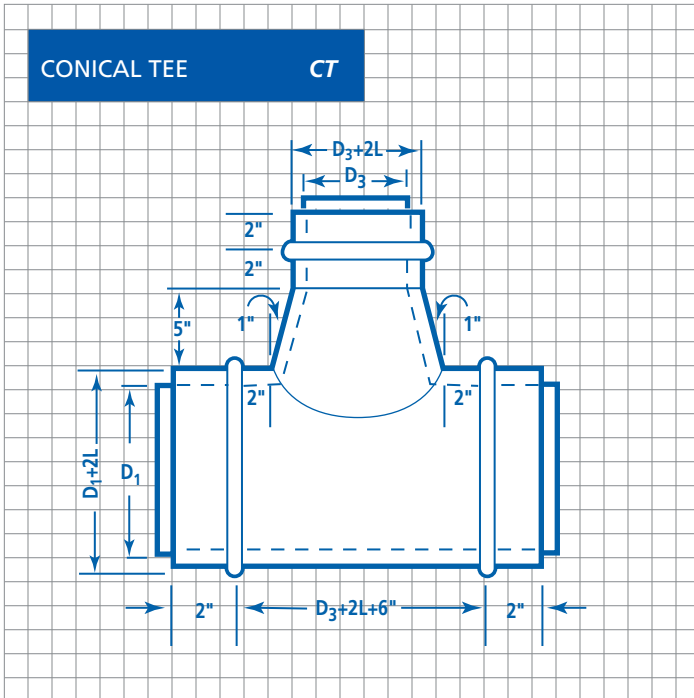
# Dual-Wall Round STRAIGHT TEES

L = Liner Thickness



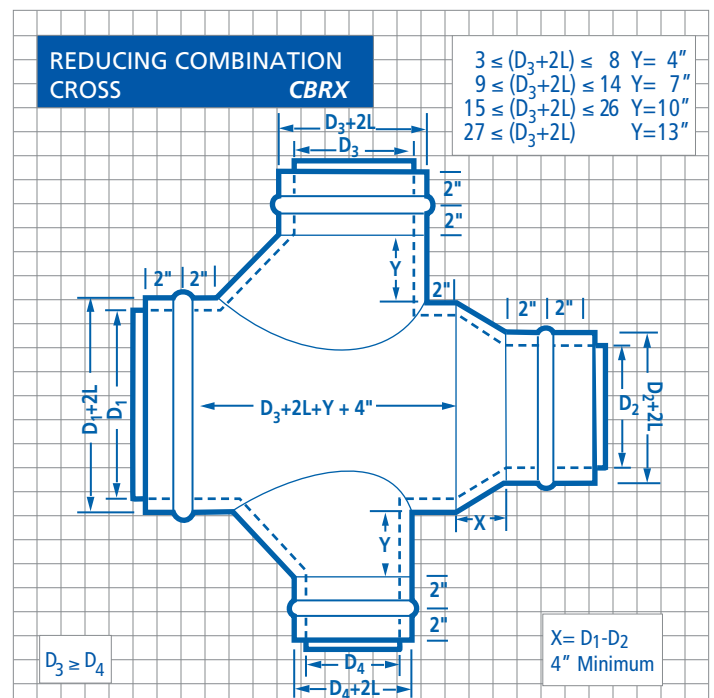
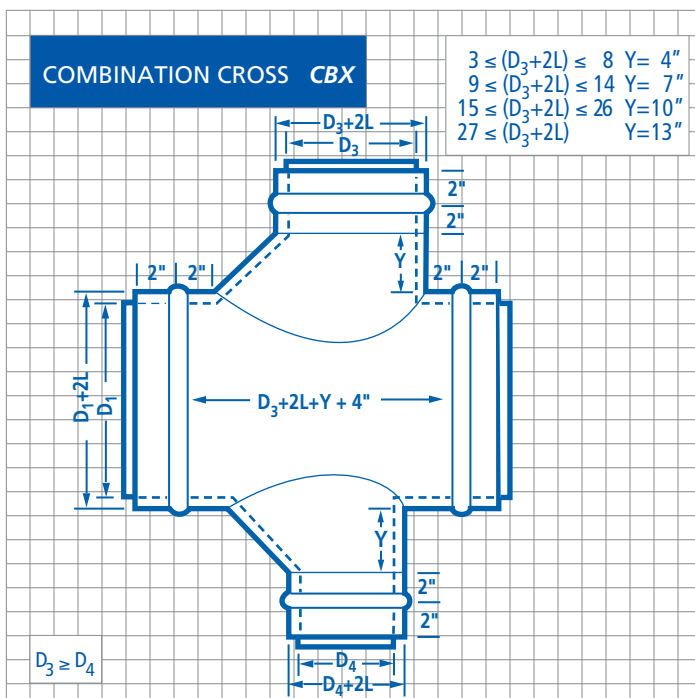
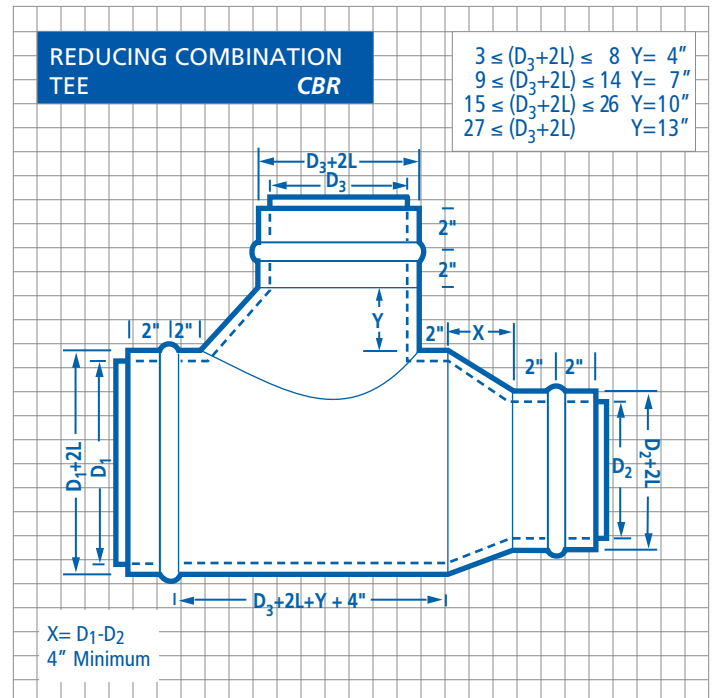
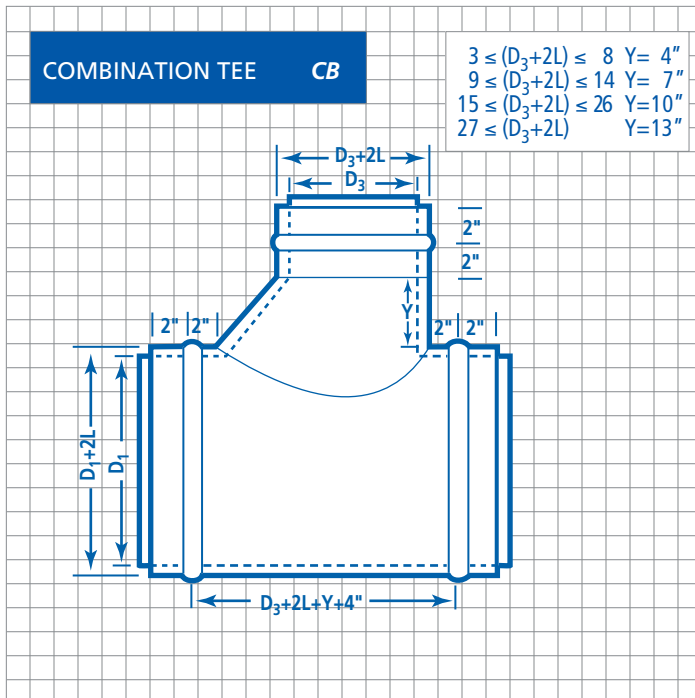
# Dual-Wall Round CONICAL TEES

L = Liner Thickness



# Dual-Wall Round COMBINATION TEES

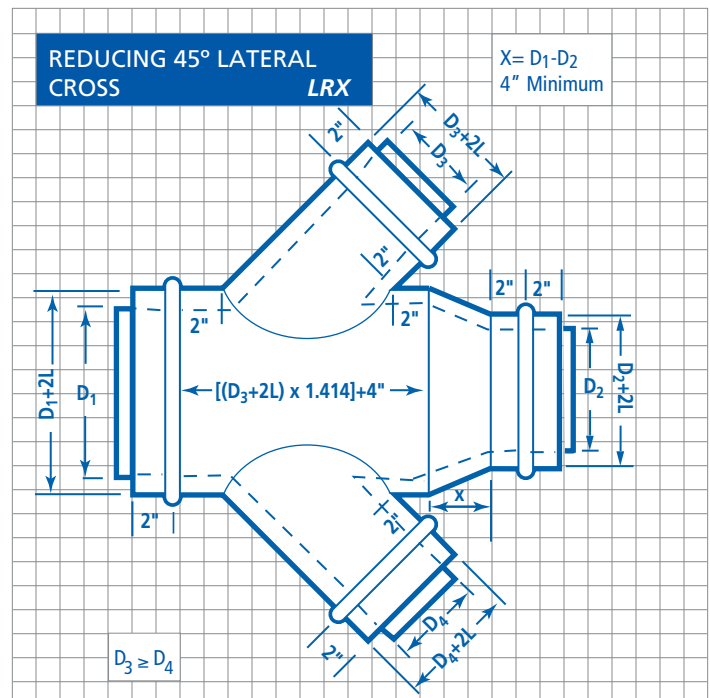
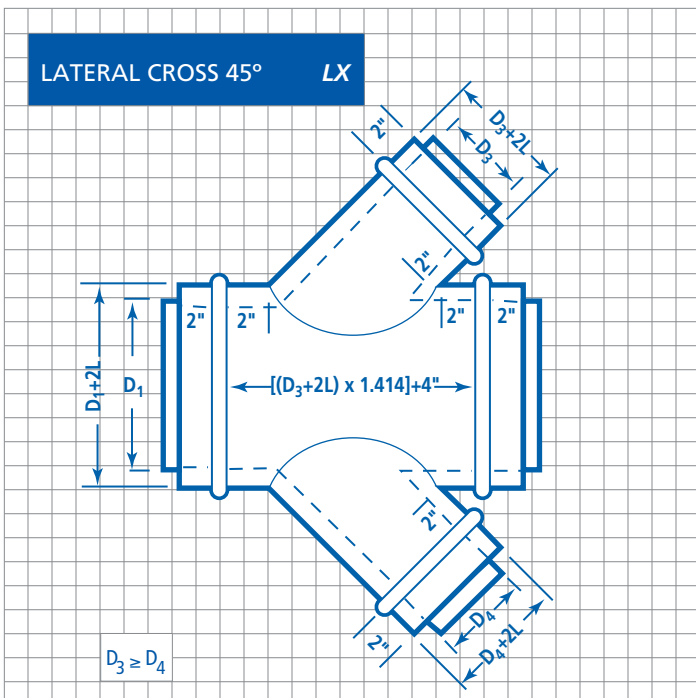
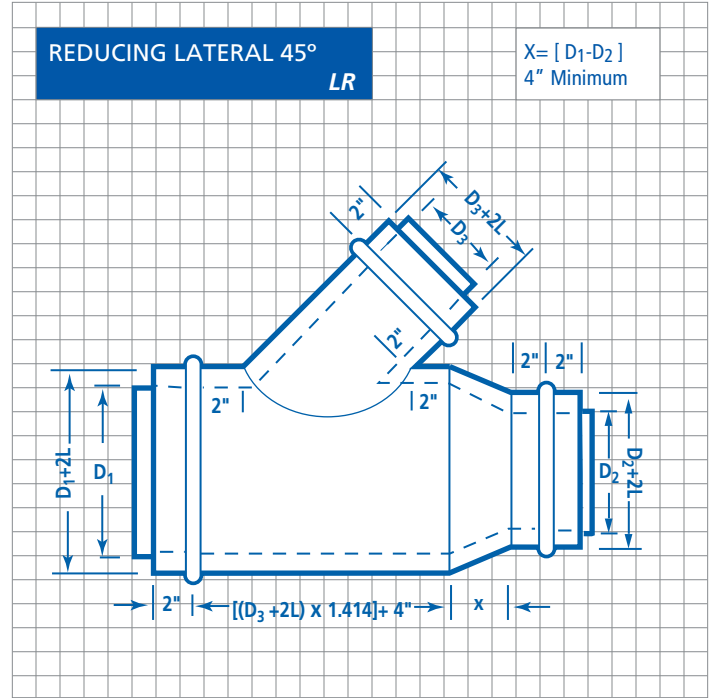
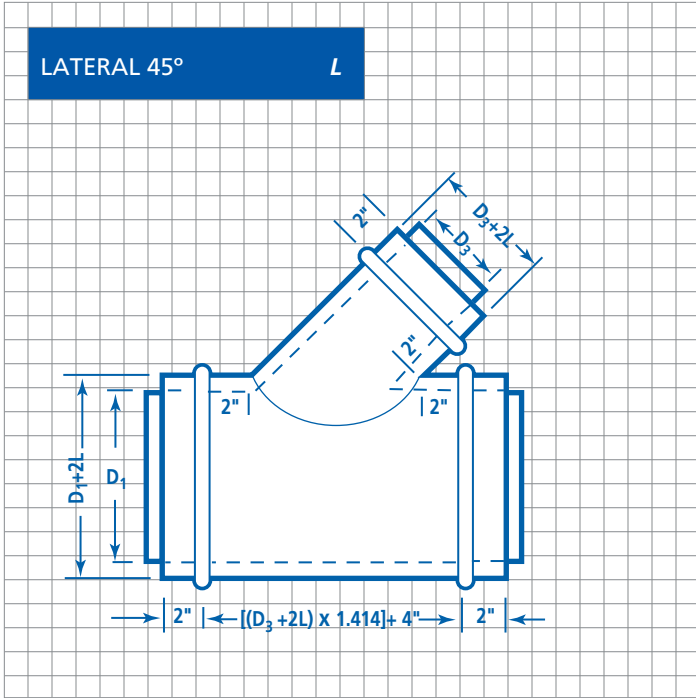
L = Liner Thickness





# Dual-Wall Round STRAIGHT LATERALS

L = Liner Thickness

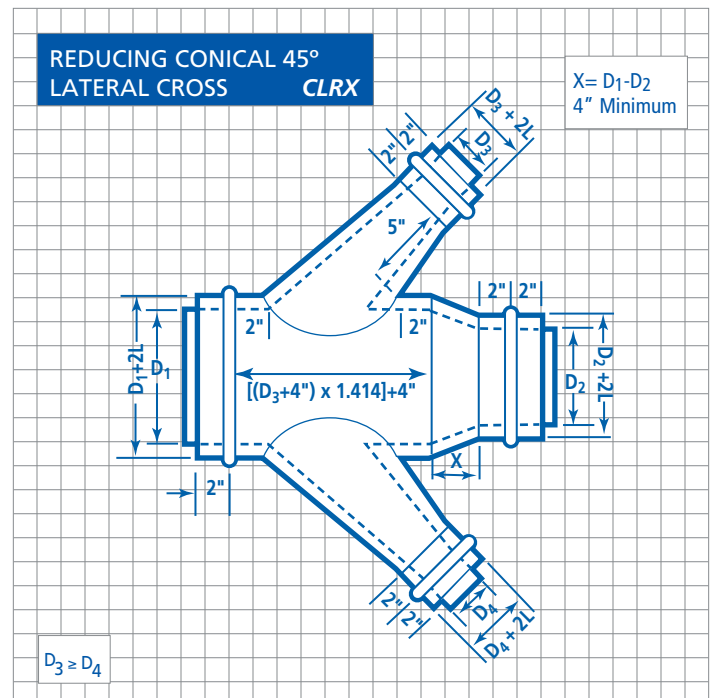
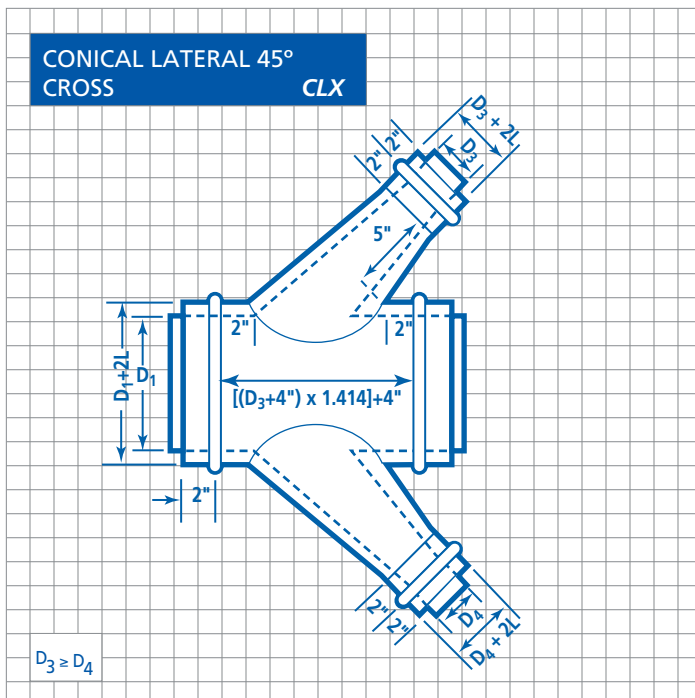
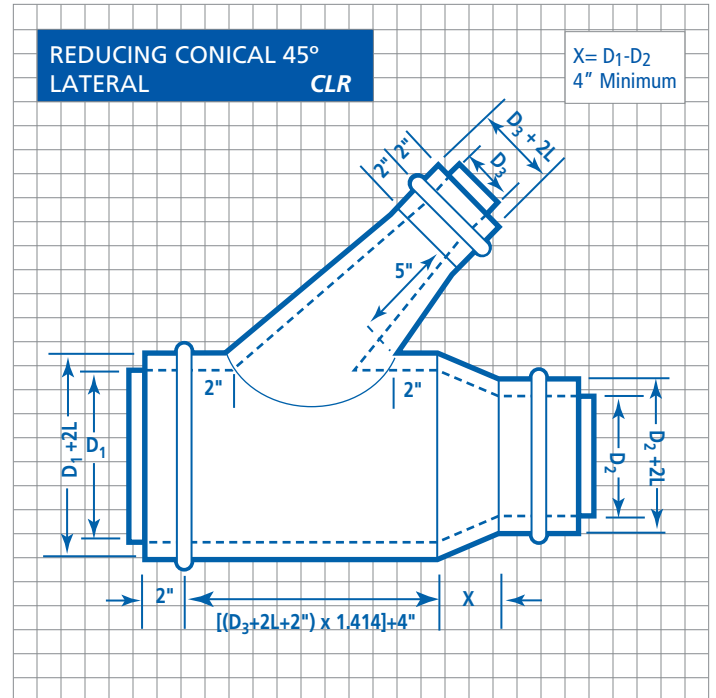
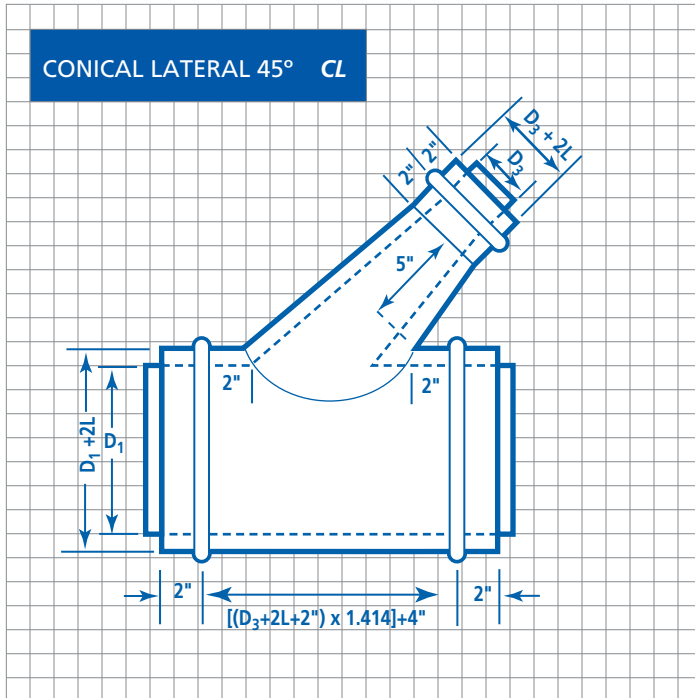






# Dual-Wall Round CONICAL LATERALS

L = Liner Thickness



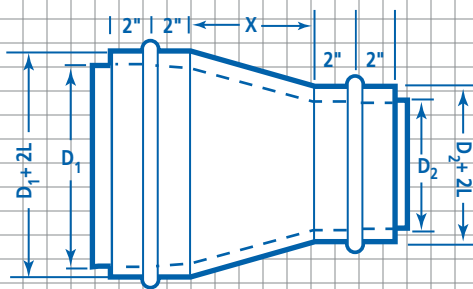
# Dual-Wall Round MISCELLANEOUS

L = Liner Thickness

**CONCENTRIC REDUCER RD**

$$X = D_1 - D_2$$

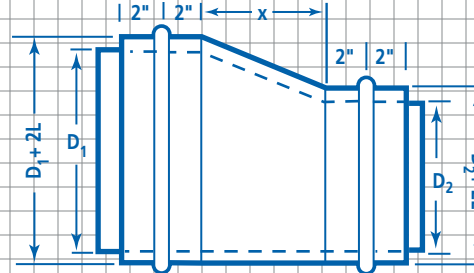
4" Minimum



**ECCENTRIC REDUCER RDE**

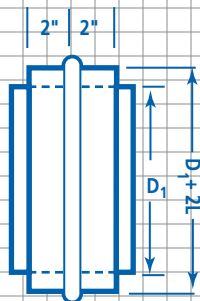
$$X = 2 [D_1 - D_2]$$

4" Minimum



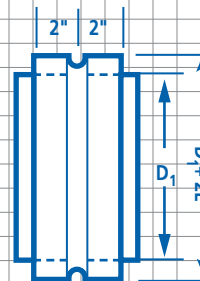
**PIPE COUPLINGS PCP**

*PCP*



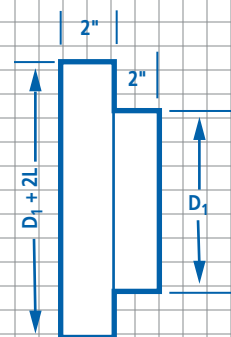
**FITTING COUPLINGS FCP**

*FCP*



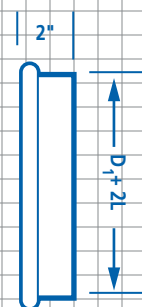
**INSULATION STOP IS**

*IS*



**END CAP EC**

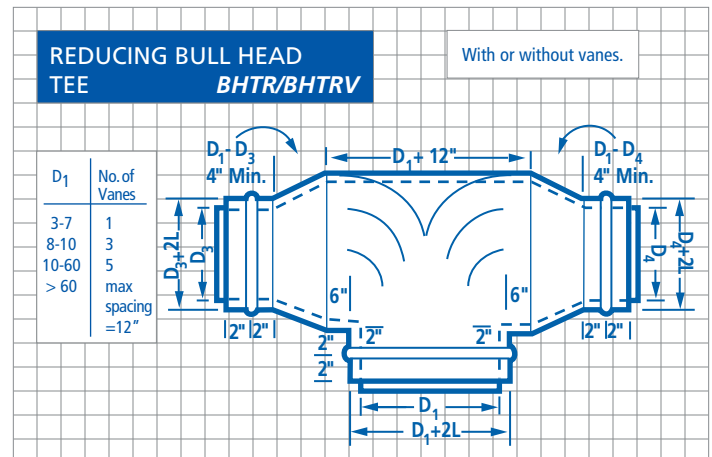
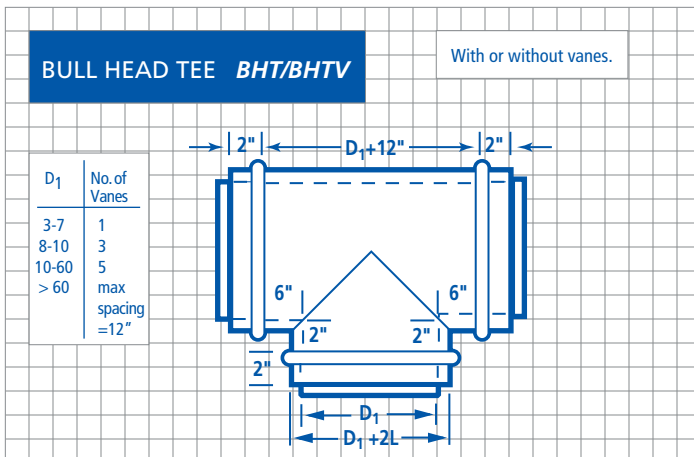
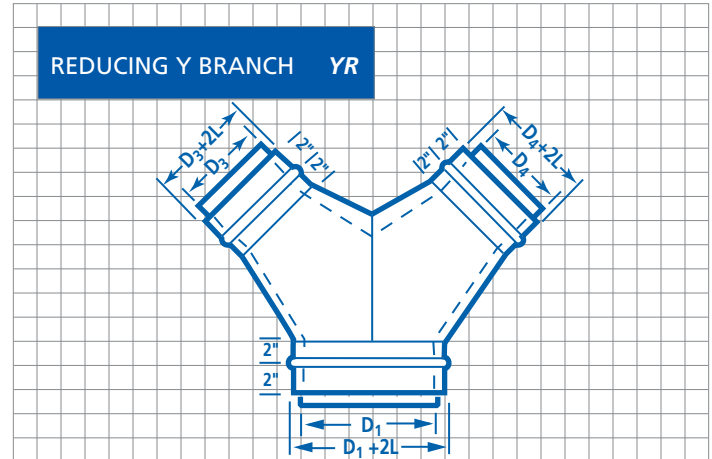
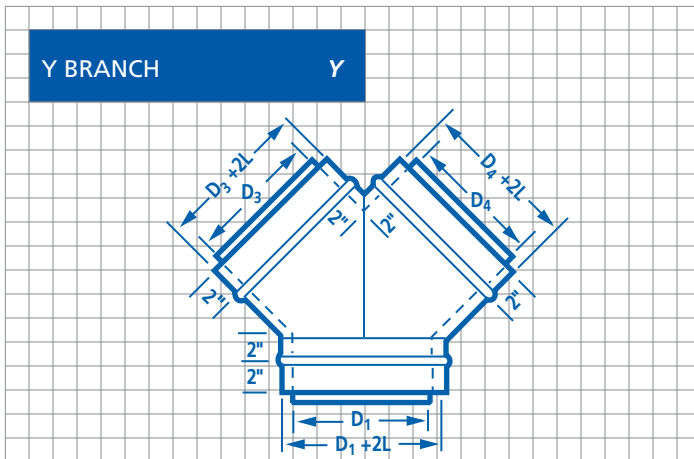
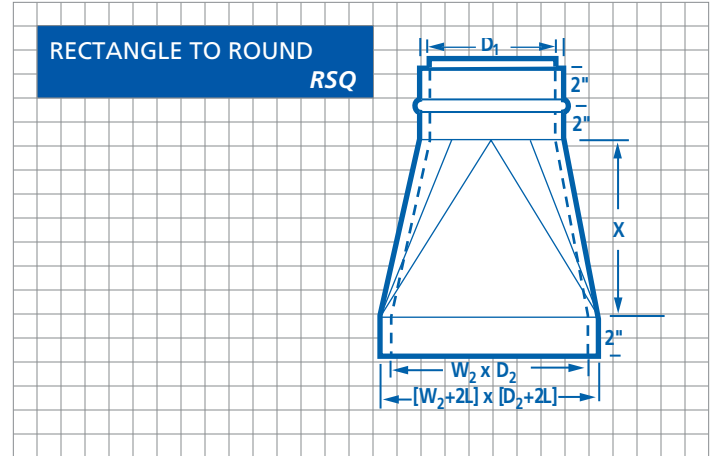
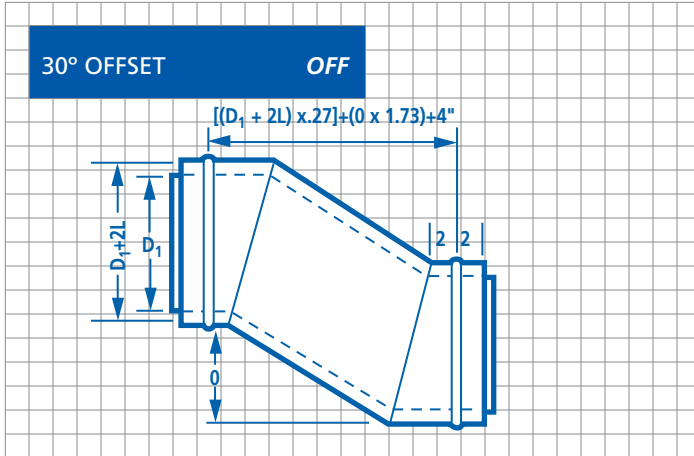
*EC*





# Dual-Wall Round MISCELLANEOUS

L = Liner Thickness





# Dual-Wall Round MISCELLANEOUS

L = Liner Thickness

**RECTANGULAR ACCESS SECTION**

**AXRT**

Also available as shop-installed SRTA or field-installed accessory FRTA.

D <sub>1</sub>	ACCESS SIZE
8" to 12"	8" x 8"
13" to 17"	12" x 12"
18" and OVER	18" x 18"

Negative and positive pressure.

**SPUN BELL MOUTH**
**SB**

**PRESSED BELL MOUTH GALVANIZED ONLY**

**PB**

D <sub>1</sub>	R
4"	.394"
5"	.472"
6"	.787"
7"	1.0"
8"	1.0"
9"	1.0"
10"	1.0"
12"	1.0"

STANDARD BELL MOUTH			
D <sub>1</sub>	D <sub>2</sub>	L	R
13"	19"	4"	3"
14"	21"	4"	3"
15"	24"	5"	4"
16"	26"	5"	4"
17"	25"	5"	4"
18"	26"	5"	4"
19"	27"	5"	4"
20"	28"	5"	4"
21"	29"	5"	4"
22"	32"	6"	5"
23"	33"	6"	5"
24"	34"	6"	5"
26"	38"	7"	6"
28"	40"	7"	6"
30"	42"	7"	6"
32"	46"	8"	7"
34"	48"	8"	7"
36"	50"	8"	7"
38"	52"	8"	7"
40"	56"	9"	8"
42"	58"	9"	8"
44"	60"	9"	8"
46"	62"	9"	8"
48"	64"	9"	8"

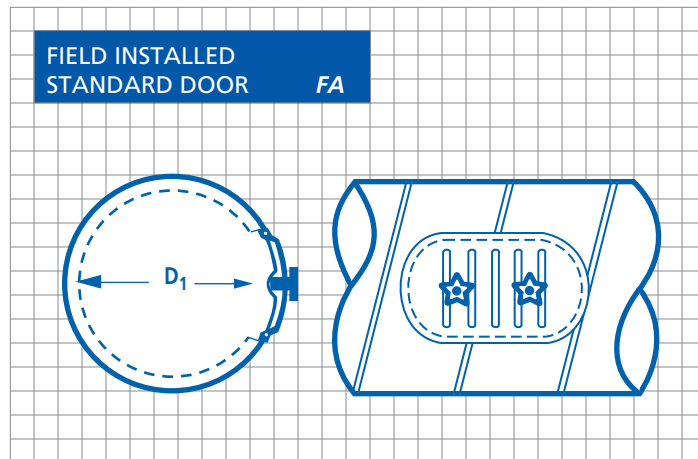
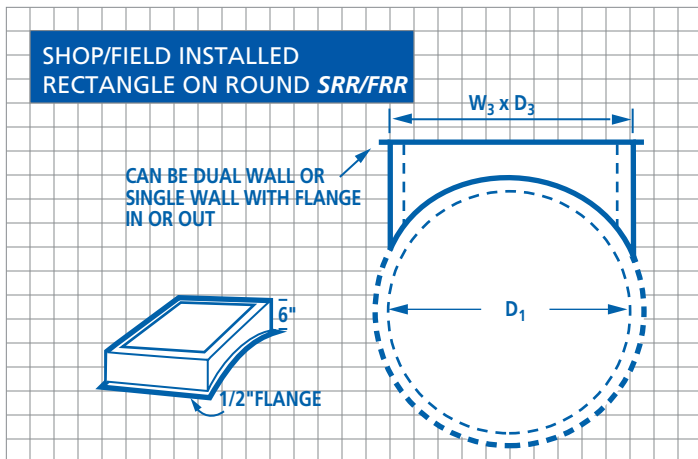
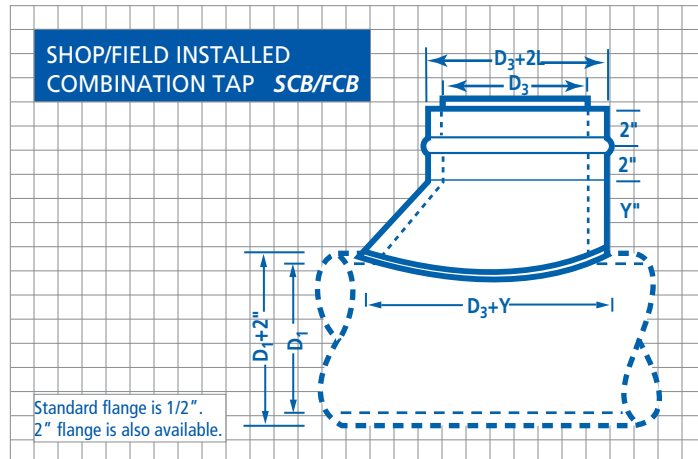
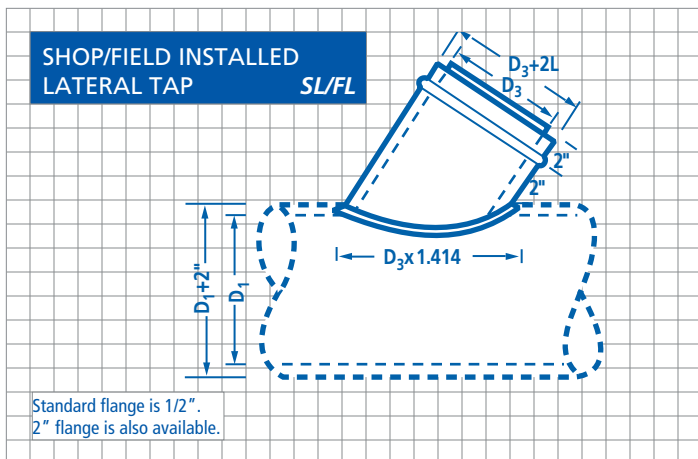
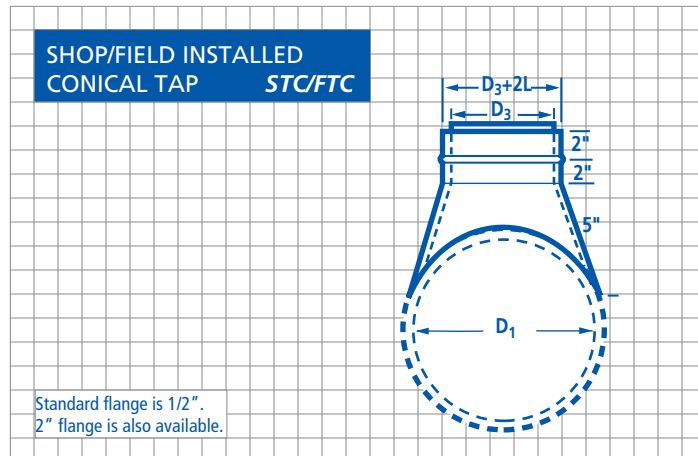
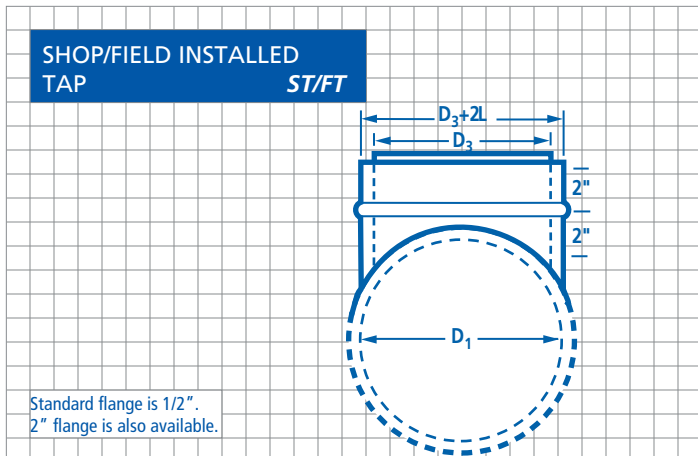
SHORT RADIUS BELL MOUTH		
D <sub>1</sub>	D <sub>2</sub>	L
13"	15"	3 1/2"
14"	16"	3 1/2"
15"	17"	3 1/2"
16"	18"	3 1/2"
17"	19"	3 1/2"
18"	20"	3 1/2"
19"	21"	3 1/2"
20"	22"	3 1/2"
21"	23"	3 1/2"
22"	24"	3 1/2"
23"	25"	3 1/2"
24"	26"	3 1/2"
26"	28"	3 1/2"
28"	30"	3 1/2"
30"	32"	3 1/2"
32"	34"	3 1/2"
34"	36"	3 1/2"
36"	38"	3 1/2"
38"	40"	3 1/2"
40"	42"	3 1/2"
42"	44"	3 1/2"
44"	46"	3 1/2"
46"	48"	3 1/2"
48"	50"	3 1/2"
50"	52"	3 1/2"
52"	54"	3 1/2"
54"	56"	3 1/2"
56"	58"	3 1/2"
56"	60"	3 1/2"
60"	62"	3 1/2"



# Dual-Wall Round ACCESSORIES

SHOP INSTALLED/ FIELD INSTALLED

L = Liner Thickness





# Dual-Wall Round INSTALLATION

## DUAL-WALL SLIP FIT

The inner and outer collars of Eastern Sheet Metal fittings are sized to slip into, and should be used with, Eastern Sheet Metal spiral duct. The inner collar projects beyond the outer collar. This permits the inner collar to be started into the inner liner of the spiral duct in a manner similar to the single wall technique. A tight fit is necessary to minimize friction loss and to promote proper sealing. Care should be taken during the handling and installation to avoid dents and distortions that can cause improper fit or difficult installation.

1. Bring the bottom of the inner fitting collar into the inner spiral duct at a slight angle.
2. Work the rest of the inner collar into the spiral duct.
3. When the inner collar is fully inserted, start the outer collar in the same manner.
4. Carefully work the rest of the collar into the spiral duct until approximately one inch of the collar remains exposed between the end of the spiral duct and the stop bead of the fitting collar. Do not use a screwdriver or knife to help make the connection. Apply pressure with the heel of your hand or with your fist to help slip the fitting into the duct.
5. Apply duct sealer to this exposed area. Skip this step if installing Eastern Tight fittings.
6. Push the fitting into the spiral duct until the stop bead meets the edge of the spiral duct.
7. Fasten the fitting into the spiral duct with screws per the chart at right. The screws should be evenly spaced around the perimeter of the connection and approximately 1/2" back from the stop bead. Placement of the outer shell screws should be opposite of each other as demonstrated in the diagram.

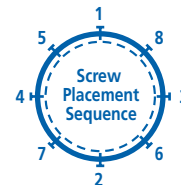
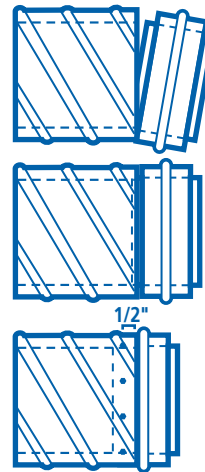
## DUAL-WALL EASTERN FLANGE

Eastern Flanges come factory-mounted on fittings and spiral duct. Eastern Flanges are standard for all duct with outer shell walls over 61" in diameter, but are available on smaller sizes. Dual-wall Eastern Flanges attach to both the outer wall and the inner wall of the duct, eliminating the need to make an inner connection. Stainless steel Eastern Flanges are only available for round outer wall diameters of 16" or larger.

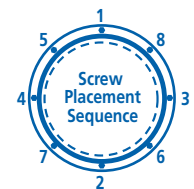
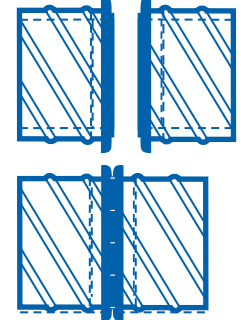
1. Place closed cell neoprene gasket on the face of one of the mating outer flanges.
2. Push the flanges together keeping the edges of the flanges aligned.
3. Clamp the flanges to help hold them in place.
4. Screw the flanges together with self-tapping screws per the chart at right. The screws should be evenly spaced around the perimeter of the connection. Placement of the screws should be opposite of each other as demonstrated in the diagram.

Protected by the following U.S. Patents: 7,287,407; D518,885; D517,679; D516,698; D516,697.

Installation of  
Slip Joint Connector



Installation of  
Eastern Flange Connector



DUCT OUTER WALL DIAMETER	#OF SCREWS	
	SLIP FIT	EASTERN FLANGE
4"-9"	3	NA
10"	3	4
11"-16"	3	6
17"-21"	4	8
22"-26"	5	10
27"-30"	6	12
32"-36"	7	14
38"-42"	8	16
44"-46"	9	18
48"-52"	10	20
54"-56"	11	22
58"-60"	12	24
62"-66"	NA	26
68"-72"	NA	28
74"-76"	NA	30
78"-84"	NA	32



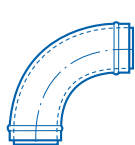
# Dual-Wall Round SOUND DATA

## INSERTION LOSS TESTING

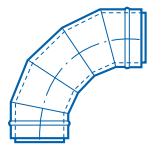
Insertion loss testing for ESM Dual-Wall Spiral Duct was conducted by the Center for Mechanical System Technology at the University of Nevada Las Vegas. Test results for 1" liner and 2" liner are shown below.

*Insertion Loss = dB/ft*

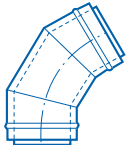
Diameter in.	Liner Thickness = 1"								Liner Thickness = 2"							
	Octave Band Center Frequency - Hz								Octave Band Center Frequency - Hz							
	63	125	250	500	1000	2000	4000	8000	63	125	250	500	1000	2000	4000	8000
12	0.07	0.34	1.01	1.75	3.83	3.04	2.06	1.62	0.15	0.52	1.58	2.75	3.83	3.04	2.06	1.62
14	0.07	0.30	0.92	1.67	3.57	2.80	1.99	1.62	0.15	0.47	1.49	2.68	3.57	2.80	1.99	1.62
16	0.06	0.26	0.84	1.61	3.34	2.59	1.93	1.60	0.14	0.43	1.41	2.61	3.34	2.59	1.93	1.60
18	0.06	0.22	0.77	1.54	3.12	2.40	1.87	1.59	0.14	0.40	1.34	2.55	3.12	2.40	1.87	1.59
20	0.05	0.19	0.70	1.48	2.91	2.24	1.82	1.57	0.13	0.37	1.27	2.48	2.91	2.24	1.82	1.57
22	0.05	0.16	0.64	1.42	2.72	2.10	1.78	1.55	0.12	0.34	1.21	2.43	2.72	2.10	1.78	1.55
24	0.04	0.14	0.58	1.37	2.55	1.98	1.74	1.52	0.12	0.31	1.15	2.37	2.55	1.98	1.74	1.52
26	0.04	0.11	0.53	1.31	2.39	1.88	1.70	1.49	0.11	0.29	1.10	2.32	2.39	1.88	1.70	1.49
28	0.03	0.10	0.48	1.26	2.25	1.80	1.66	1.46	0.11	0.27	1.05	2.27	2.25	1.80	1.66	1.46
30	0.03	0.08	0.44	1.21	2.11	1.73	1.63	1.42	0.11	0.25	1.01	2.22	2.11	1.73	1.63	1.42
32	0.02	0.07	0.40	1.17	1.99	1.67	1.60	1.39	0.10	0.24	0.97	2.17	1.99	1.67	1.60	1.39
34	0.02	0.05	0.36	1.12	1.88	1.63	1.58	1.35	0.10	0.23	0.93	2.12	1.88	1.63	1.58	1.35
36	0.01	0.04	0.33	1.07	1.78	1.59	1.55	1.31	0.09	0.22	0.90	2.08	1.78	1.59	1.55	1.31
38	0.01	0.04	0.30	1.03	1.69	1.57	1.53	1.26	0.09	0.21	0.87	2.03	1.69	1.57	1.53	1.26
40	0.01	0.03	0.28	0.99	1.60	1.55	1.50	1.22	0.09	0.20	0.85	1.99	1.60	1.55	1.50	1.22
42	0.00	0.02	0.25	0.94	1.53	1.53	1.48	1.17	0.08	0.20	0.83	1.95	1.53	1.53	1.48	1.17
44	0.00	0.02	0.23	0.90	1.46	1.52	1.45	1.12	0.08	0.19	0.80	1.90	1.46	1.52	1.45	1.12
46	0.00	0.02	0.21	0.85	1.39	1.52	1.43	1.07	0.08	0.19	0.79	1.85	1.39	1.52	1.43	1.07
48	0.00	0.01	0.20	0.80	1.33	1.51	1.40	1.02	0.08	0.19	0.77	1.81	1.33	1.51	1.40	1.02
50	0.00	0.01	0.18	0.75	1.27	1.50	1.38	0.97	0.07	0.19	0.75	1.76	1.27	1.50	1.38	0.97
52	0.00	0.01	0.16	0.71	1.22	1.48	1.35	0.92	0.07	0.19	0.73	1.71	1.22	1.48	1.35	0.92
54	0.00	0.01	0.15	0.65	1.17	1.46	1.31	0.87	0.07	0.18	0.72	1.66	1.17	1.46	1.31	0.87
56	0.00	0.01	0.13	0.60	1.12	1.44	1.28	0.81	0.07	0.18	0.70	1.60	1.12	1.44	1.28	0.81
58	0.00	0.00	0.12	0.54	1.07	1.40	1.24	0.76	0.07	0.18	0.69	1.55	1.07	1.40	1.24	0.76
60	0.00	0.00	0.10	0.48	1.02	1.36	1.20	0.71	0.06	0.18	0.67	1.49	1.02	1.36	1.20	0.71
62	0.00	0.00	0.08	0.42	0.97	1.30	1.15	0.66	0.06	0.17	0.66	1.43	0.97	1.30	1.15	0.66
64	0.00	0.00	0.06	0.36	0.91	1.23	1.10	0.61	0.06	0.17	0.64	1.36	0.91	1.23	1.10	0.61
66	0.00	0.00	0.05	0.29	0.86	1.15	1.04	0.56	0.06	0.16	0.62	1.29	0.86	1.15	1.04	0.56
68	0.00	0.00	0.02	0.21	0.79	1.04	0.97	0.51	0.06	0.15	0.60	1.22	0.79	1.04	0.97	0.51
70	0.00	0.00	0.00	0.13	0.73	0.92	0.90	0.46	0.06	0.14	0.57	1.14	0.73	0.92	0.90	0.46
72	0.00	0.00	0.00	0.05	0.66	0.78	0.83	0.41	0.06	0.13	0.55	1.06	0.66	0.78	0.83	0.41



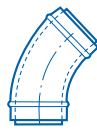
*PE90*



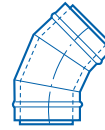
*E90*



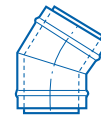
*E60*



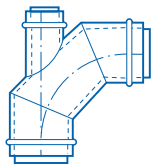
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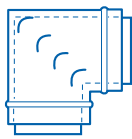
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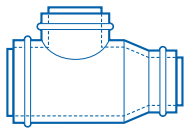
*E22/E30*



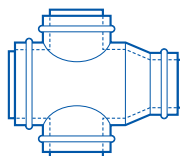
*E90L*



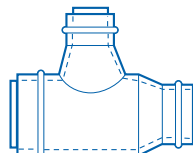
*E290/EV290*



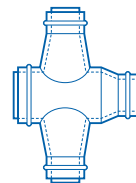
*TR*



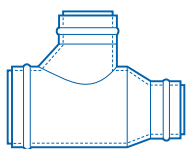
*TRX*



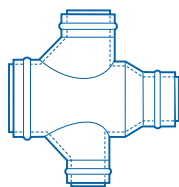
*CTR*



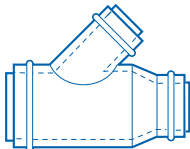
*CTRX*



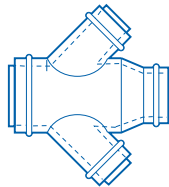
*CBR*



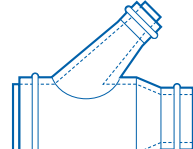
*CBRX*



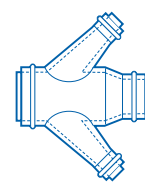
*LR*



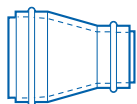
*LRX*



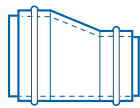
*CLR*



*CLRX*



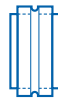
*RD*



*RDE*



*PCP*



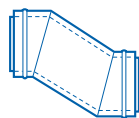
*FCP*



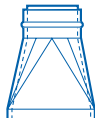
*IS*



*EC*



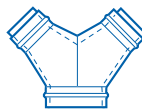
*OFF*



*RSQ*



*Y*



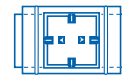
*YR*



*BHTR/BHTRV*



*AXRT*



*PB*



*SB*



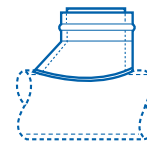
*ST/FT*



*STC/FTC*



*SL/FL*



*SCB/FCB*



*SRR/FRR*



*FA*