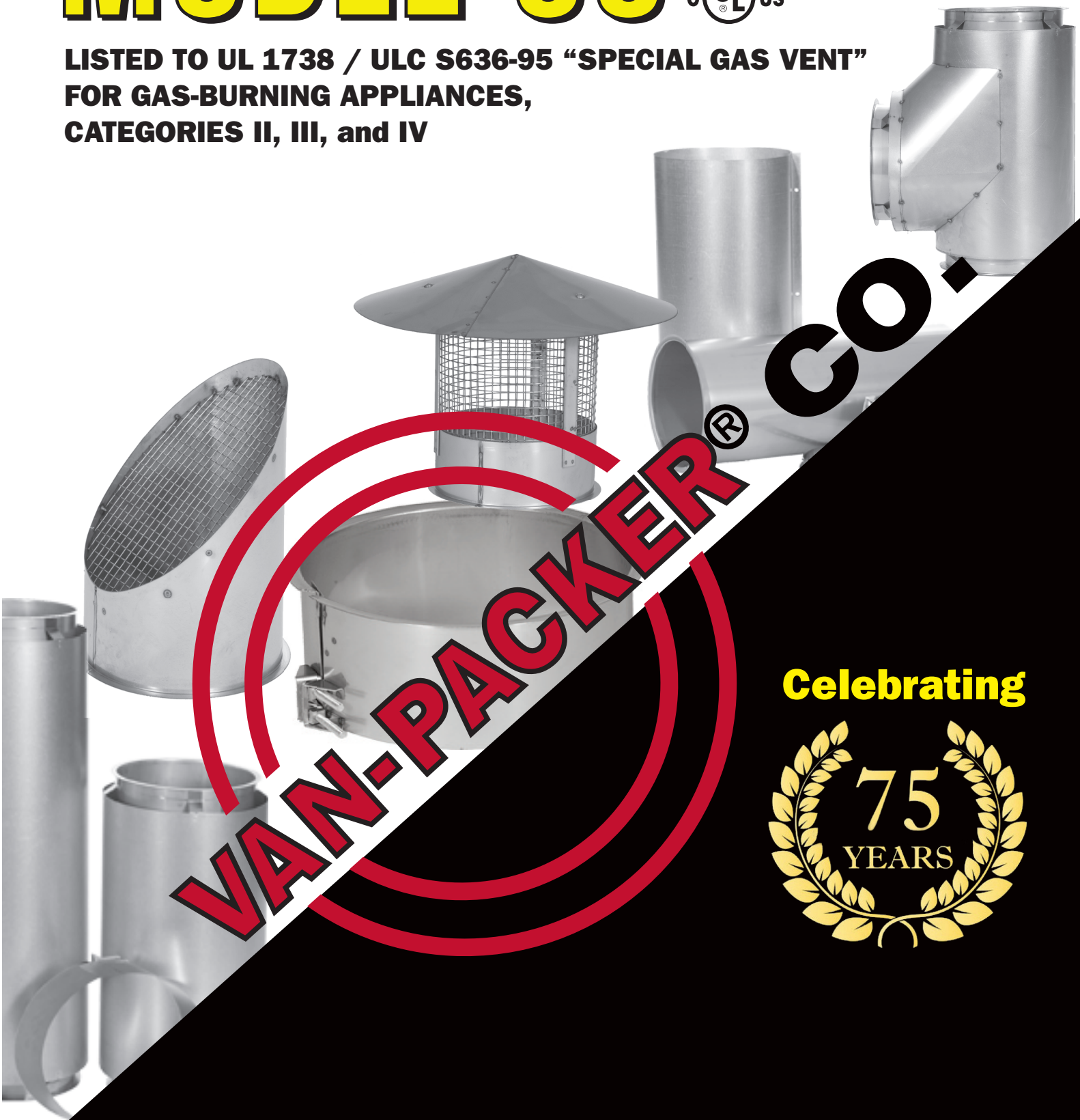
MODEL CS

c UL us

**LISTED TO UL 1738 / ULC S636-95 “SPECIAL GAS VENT”
FOR GAS-BURNING APPLIANCES,
CATEGORIES II, III, and IV**



VAN-PACKER® CO.

Celebrating

75 YEARS


BUDA
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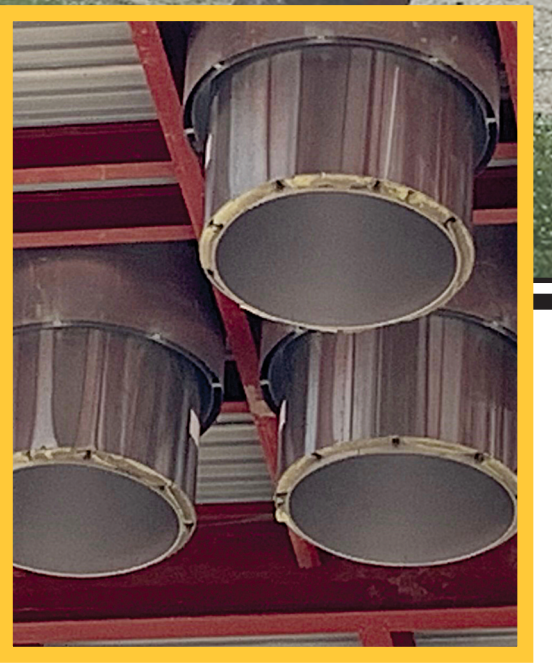
4X4



Model CS Series

Van-Packer's Model CS Series is one of the most versatile chimney flue products offered in the industry. It may be used for Category II, III, and IV applications using natural gas or propane-fired appliances where flue temperatures are 550° F or less and the vent pressure will not exceed 40 inches of water column. The Model CS Series is a complete product line that offers tees, elbows, supports, guying, transitions, and a variety of insulation options.

Model CS uses double-wall construction with three options to chose from to insulate the space between the liner and the shell. Available options are one to four inches of airgap, one to four inches of mineral wool insulation, or any combination of mineral wool and airgap up to four inches thick.

Model CS is UL Listed in sizes ranging from 4 inches to 48 inches ID. Standard liner construction uses VP1738 across several material thicknesses depending on product diameter. Model CS Series uses a 24-gauge liner on 4-inch to 24-inch ID products, a 20-gauge liner thickness is used on 26-inch to 36-inch ID Model CS products, and an 18-gauge liner is used on 38-inch to 48-inch ID products. Van-Packer can also provide VP1738A and AL29-4C liners upon request.

Model CS Series uses a 24-gauge shell on 4-inch to 36-inch ID products, and a 20-gauge shell on 38-inch to 48-inch products. Model CSplus Series uses a 24-guage shell on 4-inch to 24-inch ID products, and a 20-guage shell on 26-inch to 48-inch products.

Critical Information about Combustion Air Quality:

Consider the use of clean outside air.

Note to building owners: equipment rooms MUST NOT be used for chemical storage! It is critical to the long service life of the vent and appliance that clean combustion air be provided to the appliance. Chlorinated vapors are highly corrosive. These are some examples of products which must be avoided: cleaners containing chlorides, perchlorethylene, paints, varnishes, paint removers, de-icing chemicals, some glues, chlorine products for pools or spas, laundry room detergents, water-softening products, some refrigerants, etc.

The presence of outside/foreign chemicals in the combustion air can be cause for the Van-Packer Co. warranty to be void.

Discussion on VP1738 and VP1738A

Van-Packer has worked with metallurgists and steel manufacturers to find an economical material with better workability and weldability than the type AL29-4C. Our objective was to provide a competitive and corrosion-resistant product for near-condensing and fully-condensing chimney applications.

Van-Packer's VP1738 stainless steel achieved that objective. VP1738 is the most applicable, cost-effective solution for your condensing chimney environment.

Van-Packer's VP1738A stainless steel alloy meets a separate, more stringent objective. VP1738A has proven to be a competitive and extremely corrosion-resistant equivalent product to AL29-4C.

Both VP1738 and VP1738A are UL/ULC tested and listed in accordance with UL 1738 as a "Special Gas Vent" in the United States and ULC S636-95 as a "Gas Vent BH" in Canada.

NOTE: VP1738 and VP1738A are designations Van-Packer Co. has assigned to available alloys used in the industry. The designations are proprietary numbers used specifically for UL and their field inspectors, as a cross reference for the alloys that Van-Packer Co. has expended substantial resources to research.

One call to 1-888-VPSTACK (1-888-877-8225) is the only call you need to make. Information on all the Van-Packer Co. products and capabilities is just a phone call away!

Other Chimneys and Exhaust Systems available from Van-Packer Co.

Model DW and DW Plus double-wall positive-pressure, non-condensing chimneys
Model SW single-wall construction chimneys
Model EC engineered chimney design and fabrication
Many kitchen ventilation product models

Our Technical Service Staff can assist you in:

Complete system design
Chimney and grease duct sizing
Freestanding stack designs
SMACNA stack design
Custom stack design

Model CS Part Identification

Model CS part numbers begin with the letter C and, if the part requires the Installer-Friendly Male End, then is immediately followed by the letter M. “M” is a part option, not to be confused as a different Model all together. Next comes the Chimney ID in inches. Next is the Part Code which is typically three alpha-numeric characters. Next is the Qualifier Code; it denotes features like section lengths, tee-projection diameters, and the large-end inside diameter of an increaser. Finally comes the liner and shell material codes.

Shown below is the part number for a Model CS with Installer-Friendly Male End, 8-inch ID, 12-inch long straight section with VP1738 stainless steel liner with an aluminized steel shell.

CM08STR12BL

C = Prefix, Model CS
M = Installer-Friendly Male End (shown below)
08 = Inside diameter, 8 inches
STR = Part code, straight section
12 = Qualifier code, 12-inch long section
B = Liner, VP1738 stainless alloy
L = Shell, aluminized steel

Liner Material Codes

B = VP1738 stainless alloy (standard)
E = VP1738A stainless alloy (AL29-4C equivalent)
D = AL29-4C stainless alloy

Shell Material Codes

L = Aluminized steel (standard)
C = 430 stainless alloy (maintenance free, no painting required)

Installation Recommendations

Refer to the appliance’s instructions to understand its limitations with respect to installation and use. Some details to consider are allowable horizontal and vertical distances from the appliance and if the manufacturer has special sizing or ventilation system connection requirements.

Van-Packer recommends using Model CSplus on portions of venting systems exposed to unusually cold conditions. Model CSplus is an insulated chimney that reduces heat loss and condensation in these areas. Insulating the chimney also serves to hold flue temperatures constant, thus maintaining gas velocity, reducing condensation, and reducing shell temperatures in areas where human interaction is possible.

Van-Packer recommends sealing the draw band joints with a bead of silicone on portions of venting systems exposed to the elements. All surfaces to be sealed with silicone must first be cleaned with acetone before applying silicone sealant. Portions of aluminized steel chimney exposed to the elements must be painted in the field by the installing contractor. Follow the paint manufacturer’s recommendations for preparing and painting aluminized steel surfaces. Van-Packer recommends upgrading to a 430 stainless steel shell to eliminate this requirement.

MODEL CS (Original Design)

MODEL CS (with Male End)

MODEL CSplus (with Male End)

Installation Requirements

Installation must be made in accordance with local and national code requirements. Contact local building or fire officials about restrictions and installation inspection in your area. Consult the authority having jurisdiction to determine the need to obtain a permit.

The venting system must be installed and terminated in accordance with the requirements of CAN/CGA-B149.1, *Natural Gas Installation Code* or CAN/CGA-B149.2, *Propane Installation Code*, as applicable.

Each part of a venting system must be installed correctly. Assemble the individual venting components, accessories, and supports in strict accordance with the Model CS Installation Instructions. Improper or lack of installation of any required part may result in improper operation of the appliance being vented or the performance of the venting system.

When a chimney extends through a floor or roof from where the appliance is located, it must be in an enclosure with a fire rating equal to the floor or roof that it passes through.

Due to ice buildup and blockage, it is required that the proper sloping and location of condensate drains be employed when the vent is installed horizontally. **A minimum slope of 1/4 inch per foot (6.4mm per 304.8 mm) is required to prevent collection of condensate at any location in the assembly. Horizontal portions of a Category II venting system shall have an upward slope. Horizontal portions of a Category III or IV venting system shall have an upward or downward slope.** Follow all codes and regulations for proper draining of condensate. Condensate drains are recommended every 30 ft of horizontal vent and at the bottom of every vertical riser. Proper drain trap/loop (to be by others) must be installed to prevent exhaust from accumulating in the building.

The venting system shall not be routed into, through, or within any other vent such as an existing masonry or factory-built chimney flue.
Exception: An abandoned masonry chimney may be used as a chase to route a venting system as per UL 1738 test standard.

Any penetration of ceilings, floors, or walls must be properly fire-stopped. The venting system must be free to expand and contract.

When passing through a roof, the vent must extend a minimum of three feet above the roof penetration and also be at least a minimum of two feet higher than the highest portion of the building within a ten-foot horizontal radius, per NFPA 211.

The venting system must extend a minimum of five feet above the highest connected appliance draft hood outlet

The venting system must extend a minimum of three feet above any forced air inlet within a ten-foot horizontal radius.

Continued on next page...

Installation Requirements *(Continued from page 3)*

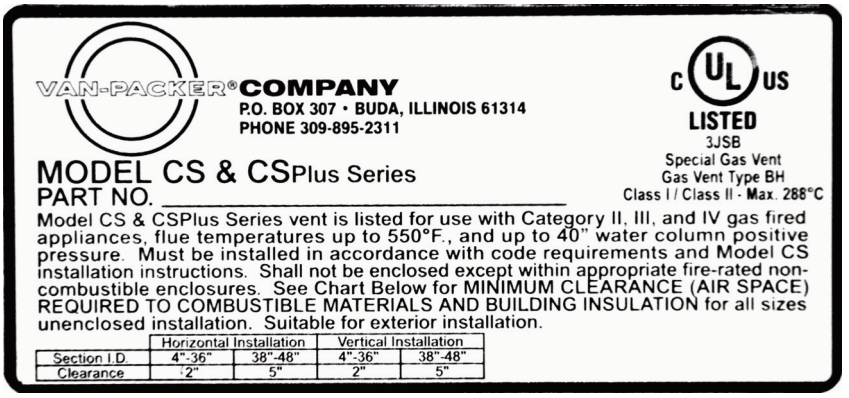
Venting systems that terminate horizontally must be at least one foot above grade, above the anticipated snow line where accumulation is expected, and at least seven feet above grade when adjacent to a public walkway.

Clearance to combustibles for sizes 4-inch ID to 36-inch ID is two inches, and for sizes 38-inch ID to 48-inch ID is five inches. Do not insulate the space surrounding the venting system. A minimum of two or five inches of air space must be maintained throughout the entire length of the venting system to allow for proper air flow and circulation. Clearance to non-combustible rated materials is zero inches.

Vertical sections require the stack to be braced within ten feet of the termination, and then at intervals of twenty feet or less. Horizontal sections require supports be placed at intervals of ten feet or less. Vertical supports are required after every transition from horizontal to vertical. Offsets may require additional supports. Additional or temporary supports may be required to avoid damaging the vent during installation. Refer to the Van-Packer Co. Installation Instructions for additional information

	Weight per Linear Foot																								
ID	4	5	6	7	8	9	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
Model CS	3	4	5	5	6	6	7	8	9	10	12	13	14	15	20	21	23	24	26	27	39	41	43	44	46	48
Model CS+1	4	5	6	6	7	8	9	10	12	13	15	16	18	19	27	29	31	34	36	38	45	47	49	51	54	56
Model CS+2	6	7	8	9	9	10	11	13	15	16	18	20	22	27	33	35	37	39	42	44	51	54	56	59	61	64
Model CS+3	8	9	10	11	12	13	14	16	18	20	22	24	30	32	38	40	43	46	48	51	58	61	64	67	69	72
Model CS+4	10	11	12	13	14	15	16	19	21	23	26	31	34	37	43	46	48	51	54	57	65	68	71	74	77	80

The weights shown are approximate installed weights per linear foot.



Silicone Sealant

Van-Packer's UL approved sealants shall be used on all joints. Proper joint assembly is essential. Follow the assembly instructions exactly as written. It is required to check the joints and seams for gas tightness when using the venting system with a Category *III* or *IV* appliance.

Part 101087A Clear Silicone
101092 Permatex Ultra Grey
101093 Permatex High Temp Red

Silicone Sealant Chart *(Estimated)*

Section ID	4"	5"	6"	7"	8"	9"	10"	12"	14"-16"	18"-20"	22"-30"	32"-38"	40"-48"
Joints per Tube	16	13	12	10	9	8	7	6	5	4	3	2	1

Vee Band and Draw Band Assembly

The Model CS is a double wall constructed venting system. The inner liner and outer shell have a one-inch airgap. The inner liner has a 7/16 inch rolled flange. The inner liners connect with a vee band. The outer shell connects with a draw band. Use a 1/4 inch bead of sealant at all vee band connections on the 7/16 inch flange.
Note: CSplus Models have insulation between the liner and shell.

1. Clean flanges with a rag and acetone (brake cleaner). THIS IS A MUST!!! One can of brake cleaner (101094) is provided with every order. Installing contractor can procure additional cleaner from any auto parts supply store.

2. Apply a continuous bead of sealant to one of the flanges to be joined, and another bead inside the inner tip (groove) of the vee band.

3. Join the two flanged ends of the chimney sections together. If you are using the CM product be sure the male end inserts into the mating section fully. Install the bolts into the two vee band halves and draw up tight. There should be no need to overtighten the bolts. Tap around the tip of the vee band with a mallet as you are tightening the bolts. For interior installations, proceed to Step 5.

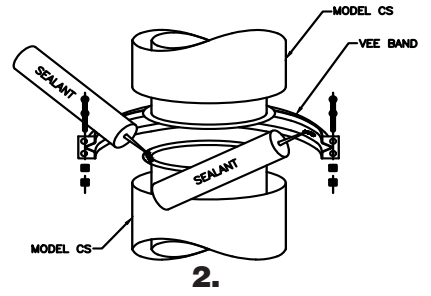
4a. For Plus Models, install the provided insulation strips into the joint area. If this is an air-insulated model, proceed to Step 5.

4b. It is recommended that silicone sealant be applied under the inside top edge of the draw band to prevent moisture or rainwater from entering between the chimney walls. This should be done on all portions of the chimney exposed to the atmosphere. The installing contractor shall supply silicone for the draw bands on exterior installations to prevent water leaching into the inner areas.

5. Secure the outer shell using the provided draw band, bolts, and nuts.

6. Refer to installation instructions for all other assembly details like sealant cure time, etc.

Brake Cleaner
(101094)
1.



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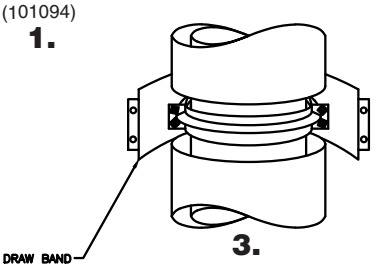

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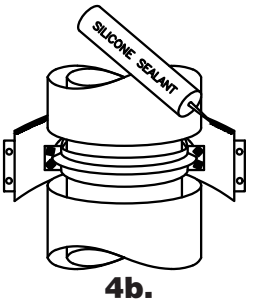
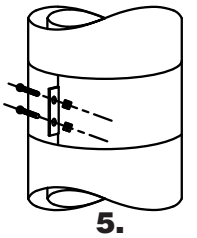


4b.


5.

Solid Vee Band

Part C_ _ SVB_

This part is used to connect Van-Packer components together. Part SVB consists of two (2) vee band halves and fasteners.

Vee Band

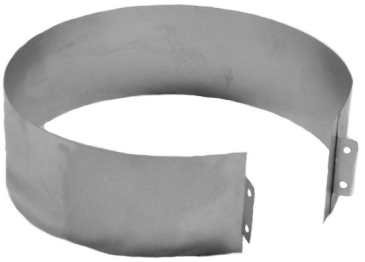
Draw Band

Part C_ _ DRW_

The Draw Band is used to seal off the gap between mated components and provide a uniform appearance. Part DRW consists of one (1) single-piece draw band and fasteners.

Model CSplus Draw Band
Part D_ _ DRW_

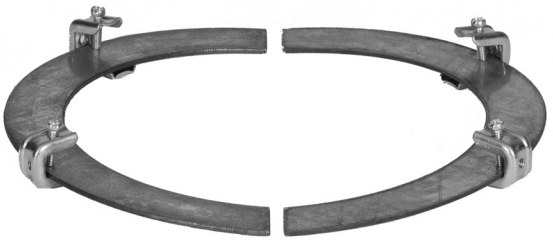
Model CS & CM Draw Band



Boiler Adapter Flange

Part C_ _ BAF_

The Boiler Adapter Flange (BAF) is used when the appliance has a blank flanged outlet. The BAF consists of one (1) two-piece ring and C-clamps.



Flangeless Outlet Adapter

Part C_ _ FOA _

The Flangeless Outlet Adapter (FOA) is used when the appliance has a smooth collar outlet. The FOA consists of one (1) flangeless outlet adapter, and two (2) vee band halves. NOTE: There is a built-in +1/4 in / –1/8 in tolerance on the diameter of this part

Male Boiler Adapter

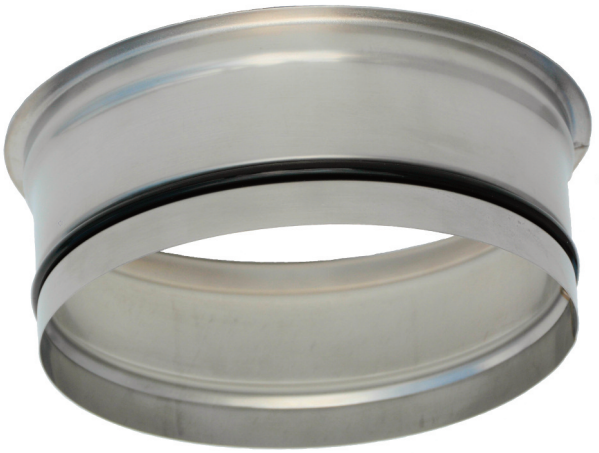
Part C_ _ MBA _

The Male Boiler Adapter (MBA) is a four-inch long single-wall adapter with a 3/16 in bead roll formed into it near the middle. It has a 7/16 in flange on the top end for a vee band connection to the first Model CS section. The adapter is designed to slide inside an exhaust outlet. The bead is designed as a stopping point and to help close any gap between the adapter and the exhaust outlet in the appliance. Often, they are odd-sized outlets. We provide a worm drive clamping ring for boilers that come with certain types of tabbed outlets around the outside of the outlet. Once the MBA is inserted into the outlet the clamp goes over the tabs and tightens down to provide a rigid connection. The MBA consists of one (1) male boiler adapter, two (2) vee band halves, and one (1) worm clamp.

Male O-Ring Adapter

Part C _ _ MOA _

The Male O-ring Adapter (MOA) is a four-inch long single-wall adapter with an acid and temperature-resistant O-ring set into a roll-formed bead. It has a mating flange on the top end for a vee band connection to the first Model CS section. The adapter is 1/8 in less than nominal size and is designed to slide inside an exhaust outlet. The gasket is designed to be a snug fit and seal any gap between the adapter and the inside of the exhaust outlet collar. Use silicone sealant to facilitate insertion of the MOA into the exhaust outlet and to ensure a proper seal. The MOA is offered in nominal sizes 4 in ID thru 12 in ID. The MOA comes with one (1) MOA adapter and two (2) vee band halves.



Butterfly Damper Section

Part C*_ _ DPR12 _ _

Part C*_ _ _ _ DPR12 _ _ (Plus Model)

* = Add M when the “Installer Friendly” Male End is required.

The Butterfly Damper Section (DPR) is a twelve-inch long manually controlled in-line type damper section used to restrict the flow of effluent. The DPR is not a 100% shut-off damper, and it is a non-UL listed component. The DPR section consists of one (1) butterfly damper section, two (2) vee band halves, and one (1) draw band. Plus Models include insulation strip.

Test Port Section

Part C*_ _ TPS12 _ _

Part C*_ _ _ _ TPS12 _ _ (Plus Models)

* = Add M when the “Installer Friendly” Male End is required.

The Test Port Section (TPS) is intended to be used to provide access to the effluent for the insertion of a thermometer or other test equipment sensors. The TPS section is 12 in long with two (2) two-inch threaded schedule 40 pipes 90° apart located 4-1/2 in from one end. The TPS consists of one (1) test port section, two (2) vee band halves, one (1) draw band, and two (2) threaded caps. Plus Models include insulation strip.

NOTE: The test port section is not intended to support the weight of test equipment. All testing equipment must be independently supported by others.

Flow resistance factor, K:
K = 0.40 L/D (for ID ≤ 18 in)
K = 0.30 L/D (for ID > 18 in)
Where L = pipe length (ft) and D = pipe diameter (in)

Straight Section

Part C*_ _ STR _ _ _ _

Part C* _ _ _ _ STR _ _ _ _ (Plus Models)

* = Add M when the “Installer Friendly” Male End is required.

Straight Section (STR) features flanges for ease of installation in both vertical and horizontal runs. The STR consists of one (1) 12-inch, 24-inch, or 36-inch long section, two (2) vee band halves, and one (1) draw band. Plus Models include insulation strip. STR is available in sizes 4 in ID through 48 in ID.

Flow resistance factor, K:
K = 0.40 L/D (for ID ≤ 18 in)
K = 0.30 L/D (for ID > 18 in)
Where L = pipe length (ft) and D = pipe diameter (in)

SECT. I.D.	MAXIMUM HEIGHT ON A STR IN FEET								
	MW	CS	C2A	C3A	C4A	C1+	C2+	C3+	C4+
4	1218	480	386	330	293	377	268	203	167
5	1022	419	348	303	273	334	241	186	153
6	937	375	318	281	256	301	222	170	143
7	828	341	295	264	242	272	205	160	135
8	747	314	271	249	227	252	191	151	126
9	683	293	256	236	217	233	179	143	121
10	632	275	243	226	208	220	169	136	116
12	556	250	222	208	194	198	155	126	107
14	513	229	206	195	183	181	144	118	100
16	470	212	194	184	174	170	135	110	95
18	436	199	182	173	164	159	127	105	90
20	410	189	174	166	129	151	121	100	77
22	388	180	166	130	124	144	115	85	74
24	375	173	132	126	120	138	97	82	72
26	246	137	110	106	102	100	84	72	64
28	238	133	107	103	100	97	82	70	62
30	229	129	104	101	97	94	79	69	61
32	224	126	101	98	95	91	77	67	59
34	217	122	99	96	93	89	76	66	58
36	212	120	97	94	92	87	74	64	57
38	160	89	85	83	81	77	67	59	53
40	160	88	85	83	81	76	66	59	53
42	159	88	84	83	81	76	66	59	53
44	159	88	84	83	81	76	66	59	53
46	158	88	84	83	81	76	66	59	53
48	158	88	84	83	81	76	66	59	53

Variable Length Section

Part C*_ _ VLS _ _

Part C*_ _ _ _ VLS _ _ (Plus Models)

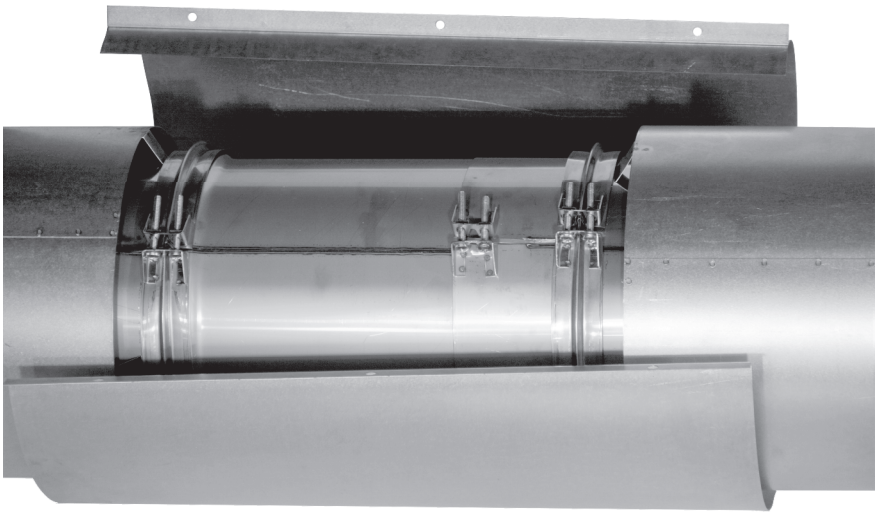
***** = Add M when the “Installer Friendly” Male End is required.

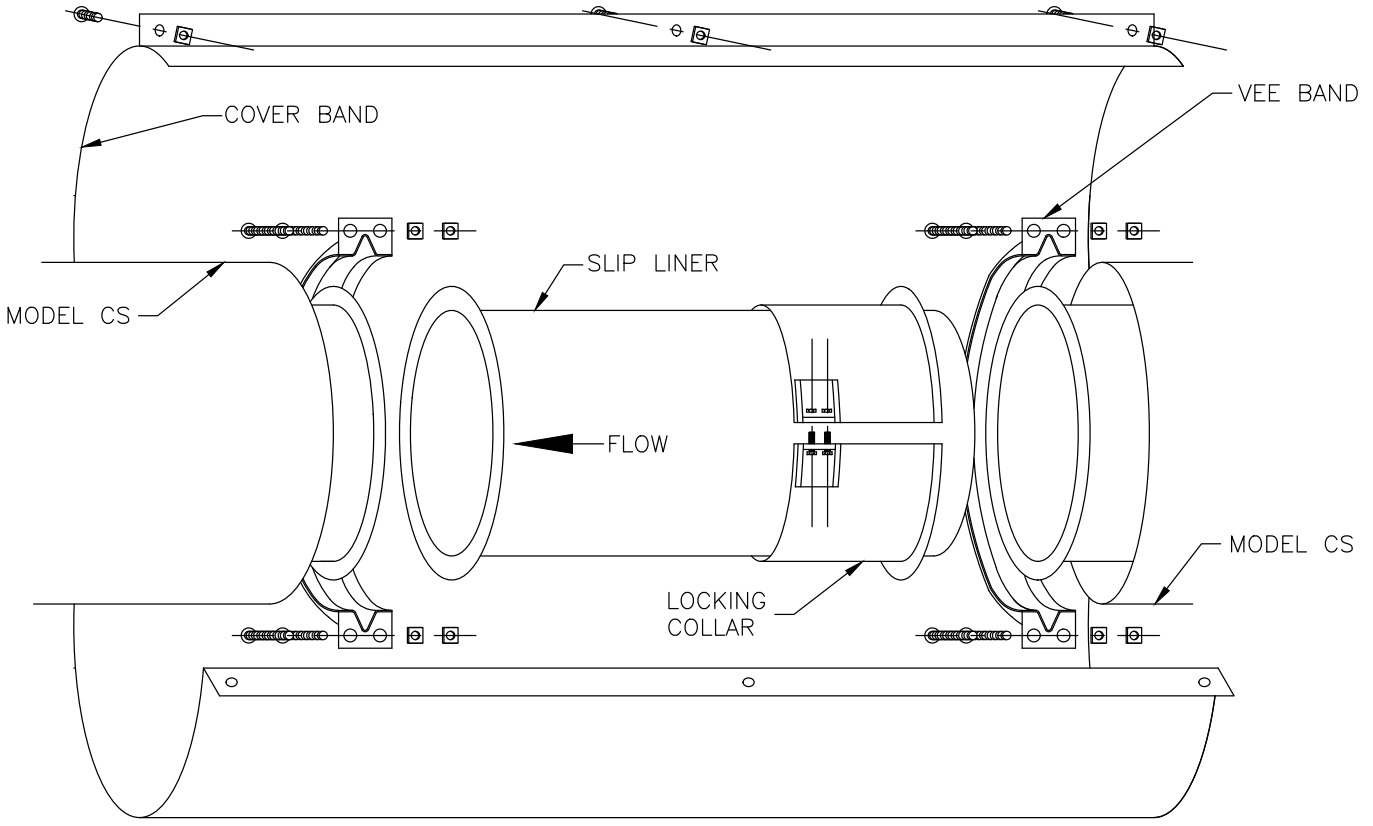
The VLS is used for custom length sections. Lengths range from 5-1/2 in to 18 in. The VLS consists of one (1) locking collar, two (2) vee band halves, one (1) slip liner, and one (1) cover band. Plus Models include insulation sheets.

Flow resistance factor, K:
K = 0.40 L/D (for ID ≤ 18 in)
K = 0.30 L/D (for ID > 18 in)
Where L = pipe length (ft) and
D = pipe diameter (in)

Variable Length Sections *(Part VLS)* are non-load bearing.

NOTE: The slip liner and cover band shown below may require field cutting for proper fit. The slip liner must protrude into the mating section. Be sure to cut longer than the measured gap length so that the slip liner extends into the mating section at least an inch.





Eccentric Increaser Section

Part C*_ _ ECC _ _ _ _

Part C*_ _ _ _ ECC _ _ _ _ (Plus Models)

***** = Add M when the “Installer Friendly” Male End is required.

The Eccentric Increaser Section (ECC) is used to increase the diameter on one side of the chimney or breeching while the other side remains the same. The ECC consists of one (1) eccentric increaser section, two (2) minor diameter vee band halves, and one (1) minor diameter draw band. Plus Models include insulation strip. Use the chart to determine the section length. Subtract the minor diameter (d) from the major diameter (D), and then match the (D-d) value with its corresponding length (L)

Eccentric and Concentric Increaser Lengths

D - d value	L
1	6-7/8"
2	8-3/4"
3	10-5/8"
4	12-1/2"
5	14-15/16"
6	16-3/16"
7	18-1/16"
8	19-15/16"
9	21-13/16"

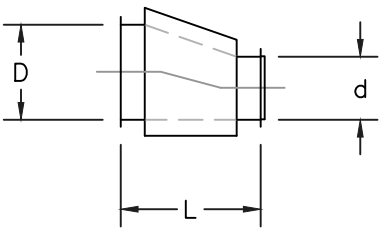
Increasers are non-load bearing parts.

Flow resistance factor, K:

$K = 0.47 * [1-(d/D)^2]^2$ (for one-step increaser)

$K = 0.53 * [1-(d/D)^2]^2$ (for two-step increaser)

Where d = minor diameter (in) and D = major diameter (in)



Concentric Increaser Section

Part C*_ _ INC _ _ _

Part C*_ _ _ _ INC _ _ _ _ (Plus Models)

The Concentric Increaser Section (INC) is used to increase the chimney diameter while keeping the vertical riser aligned on its centerline. The INC consists of one (1) concentric increaser section, two (2) minor diameter vee band halves, and one (1) minor diameter draw band. Plus Models include insulation strip. Use the chart to determine the section length. Subtract the minor diameter (d) from the major diameter (D), and then match the (D-d) value with its corresponding length (L).

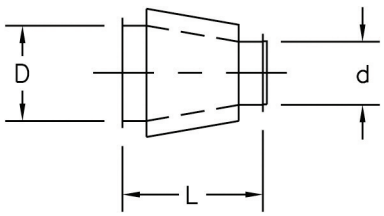
NOTE: Do not use this part in the horizontal run unless an HDS is installed directly adjacent to the INC large end.

Flow resistance factor, K:

$K = 0.47 * [1-(d/D)^2]^2$ (for one-step increaser)

$K = 0.53 * [1-(d/D)^2]^2$ (for two-step increaser)

Where d = minor diameter (in) and D = major diameter (in)



Horizontal In-Line Drain Section

Part C*_ _ HDS06 _ _

Part C*_ _ _ _ HDS06 _ _ (Plus Models)

* = Add M when the “Installer Friendly” Male End is required.

The Horizontal In-Line Drain Section (HDS) drains condensate from horizontal breeching runs. The HDS section is six inches long and has one (1) 3/4-inch threaded drain nipple. The HDS section consists of one (1) horizontal in-line drain section, two (2) vee band halves, and one (1) draw band. Plus Models include insulation strip.

Flow resistance factor, K:
K = 0.40 L/D (for ID ≤ 18 in)
K = 0.30 L/D (for ID > 18 in)
Where L = pipe length (ft) and D = pipe diameter (in)

NOTES:

1. In-house tests have proven that a 3/4" diameter nipple is large enough to flow 1028 gallons of water in one hour. An open, clear drain is sufficient for any condensing appliance in today’s market. In addition to this fact, more drains can be incorporated into the system if necessary.
2. Horizontal runs must be sloped to a drain. Refer to the emphasis on page 3.

Vertical In-Line Drain Section

Part C*_ _ D/S06 _ _

Part C*_ _ _ _ D/S06 _ _ (Plus Models)

* = Add M when the “Installer Friendly” Male End is required.

The Vertical In-Line Drain Section (D/S) drains condensate from vertical vent runs. The D/S section is six inches long and has one (1) 3/4-inch threaded drain nipple. The D/S section consists of one (1) vertical in-line drain section, two (2) vee band halves, and one (1) draw band. Plus Models include insulation strip.

Flow resistance factor: K = 0.25

15° Elbow

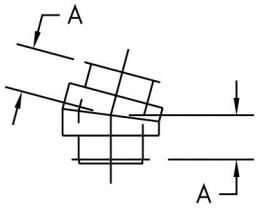
Part C*_ _ 15E _ _

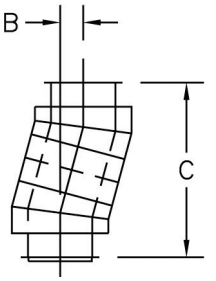
Part C*_ _ _ _ 15E _ _ (Plus Models)

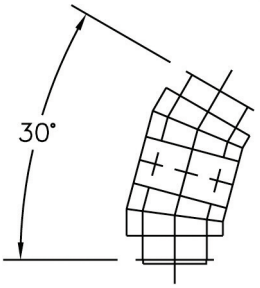
* = Add M when the “Installer Friendly” Male End is required.

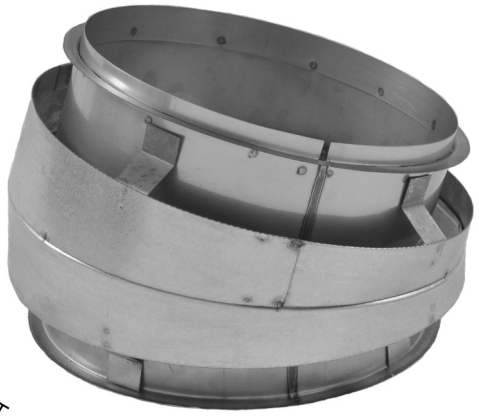
The 15° Elbow (15E) consists of one (1) 15-degree elbow, two (2) vee band halves, and one (1) draw band. Plus Models include insulation strip.

Flow resistance factor: K = 0.06









NOTE: Elbows are available in non-standard angles upon request.

15 DEGREE ELBOW & OFFSETS

CS & CS PLUS				CS PLUS 2				CS PLUS 3				CS PLUS 4			
I.D.	"A"	"B"	"C"	I.D.	"A"	"B"	"C"	I.D.	"A"	"B"	"C"	I.D.	"A"	"B"	"C"
4"	2-3/4"	1-7/16"	10-7/8"	4"	2-15/16"	1-1/2"	11-7/16"	4"	3-1/16"	1-9/16	11-15/16"	4"	3-3/16"	1-5/8"	12-7/16"
5"	2-13/16"	1-1/2"	11-3/16"	5"	3"	1-9/16"	11-11/16"	5"	3-1/8"	1-5/8"	12-3/16"	5"	2-1/4"	1-11/16"	12-11/16"
6"	2-7/8"	1-1/2"	11-7/16"	6"	3-1/16"	1-9/16"	11-15/16"	6"	2-3/16"	1-5/8"	12-7/16"	6"	3-5/16"	1-11/16"	13"
7"	2-15/16"	1-9/16"	1-11/16"	7"	3-1/8"	1-5/8"	12-3/16"	7"	3-1/4"	1-11/16"	12-11/16"	7"	3-3/8"	1-3/4"	13-1/4"
8"	3-1/16"	1-9/16"	11-15/16"	8"	3-3/16"	1-5/8"	12-7/16"	8"	3-5/16"	1-11/16"	13"	8"	3-7/16"	1-3/4"	13-1/2"
9"	3-1/8"	1-5/8"	12-3/16"	9"	3-1/4"	1-11/16"	12-13/16"	9"	3-3/8"	1-3/4"	13-1/4"	9"	3-1/2"	1-13/16"	13-3/4"
10"	3-3/16"	1-5/8"	12-7/16"	10"	3-5/16"	1-3/4"	13"	10"	3-7/16"	1-13/16"	13-1/2"	10"	3-9/16"	1-7/8"	14"
12"	3-5/16"	1-11/16"	12-15/16"	12"	3-7/16"	1-13/16"	13-1/2"	12"	3-9/16"	1-7/8"	14"	12"	3-11/16"	1-15/16"	14-1/2"
14"	3-7/16"	1-3/4"	13-1/2"	14"	3-9/16"	1-7/8"	13-1/2"	14"	3-11/16"	1-15/16"	14-1/2"	14"	3-13/16"	2"	13-1/2"
16"	3-9/16"	1-7/8"	14"	16"	3-11/16"	1-15/16"	14"	16"	3-13/16"	2"	14"	16"	3-15/16"	2-1/16"	15-1/16"
18"	3-11/16"	1-15/16"	14-9/16"	18"	3-13/16"	2"	15-1/16"	18"	3-15/16"	2-1/16"	15-9/16"	18"	4-1/16"	2-1/8"	16-1/16"
20"	3-13/16	"2"	15-1/16"	20"	3-15/16"	2-1/16"	15-9/16"	20"	4-1/16"	2-1/8"	16-1/16"	20"	4-1/4"	2-3/16"	16-9/16"
22"	3-15/16"	2-1/16"	15-9/16"	22"	4-1/16"	2-1/8"	16-1/16"	22"	4-1/4"	2-3/16"	16-9/16"	22"	4-3/8"	2-1/4"	17-1/8"
24"	4-1/16"	2-1/8"	16-1/16"	24"	4-1/4"	2-3/16"	16-5/8"	24"	4-3/8"	2-1/4"	17-1/8"	24"	4-1/2"	2-5/16"	17-5/8"
26"	4-1/4"	2-3/16"	16-5/8"	26"	4-3/8"	2-1/4"	17-1//8"	26"	4-1/2"	2-5/16"	17-5/8"	26"	4-5/8"	2-3/8"	18-1/8"
28"	4-3/8"	2-1/4"	17-1/8"	28"	4-1/2"	2-5/16"	17-5/8"	28"	4-5/8"	2-3/8"	18-1/8"	28"	4-3/4"	2-7/16"	18-5/8"
30"	4-1/2"	2-5/16"	17-5/8"	30"	4-5/8"	2-3/8"	18-1/8"	30"	4-3/4"	2-7/16"	18-5/8"	30"	4-7/8"	2-1/2"	19-3/16"
32"	4-5/8"	2-3/8"	18-1/8"	32"	4-3/4"	2-7/16"	18-5/8"	32"	4-7/8"	2-1/2"	19-3/16"	32"	5"	2-9/16"	19-11/16"
34"	4-3/4"	2-7/16"	18-5/8"	34"	4-7/8"	2-1/2"	19-3/16"	34"	5"	2-9/16"	19-11/16	34"	5-1/8"	2-11/16"	20-1/4"
36"	4-7/8"	2-1/2"	19-3/16"	36"	5"	2-9/16"	19-11/16"	36"	5-1/8"	2-11/16"	20-1/4"	36"	5-5/16"	2-3/8"	20-3/4"
38"	5"	2-9/16"	19-11/16"	38"	5-1/8"	2-11/16"	20-1/4"	38"	5-5/16"	2-3/8"	20-3/4"	38"	5-7/16"	2-13/16"	21-1/4"
40"	5-1/8"	2-11/16"	20-3/16"	40"	5-5/16"	2-3/4"	20-3/4"	40"	5-7/16"	2-13/16"	21-1/4"	40"	5-9/16"	2-7/8"	21-13/16"
42"	5-1/4"	2-3/8"	20-3/4"	42"	5-7/16"	2-13/16"	21-1/4"	42"	5-9/16"	2-7/8"	21-13/16"	42"	5-11/16"	2-15/16"	22-5/16"
44"	5-3/8"	2-13/16"	21-1/4"	44"	5-9/16"	2-7/8"	21-3/4"	44"	5-11/16"	2-15/16"	22-5/16"	44"	5-13/16"	3"	22-13/16"
46"	5-9/16"	2-7/8"	21-3/4	46"	5-11/16"	2-15/16"	22-5/16"	46"	5-13/16"	3"	21-3/4"	46"	5-15/16"	3-1/16"	21-3/4"
48"	5-11/16"	2-15/16"	22-5/16"	48"	5-13/16"	3"	22-13/16""	48"	5-15/16"	3-1/16"	23-5/16"	48"	6-1/16"	3-1/8"	23-7/8"

NOTE: Elbows are non-load bearing parts.

30° Elbow

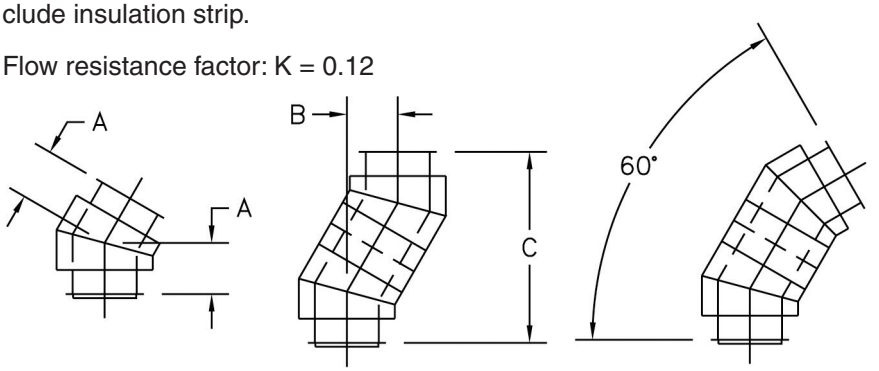
Part C*_ _ 30E _ _

Part C*_ _ _ _ 30E _ _ (Plus Models)

* = Add M when the “Installer Friendly” Male End is required.

The 30° Elbow (30E) consists of one (1) 30-degree elbow, two (2) vee band halves, and one (1) draw band. Plus Models include insulation strip.

Flow resistance factor: K = 0.12



NOTE: Elbows are available in non-standard angles upon request.

30 DEGREE ELBOW & OFFSETS

CS & CS PLUS				CS PLUS 2				CS PLUS 3				CS PLUS 4			
I.D.	“A”	“B”	“C”	I.D.	“A”	“B”	“C”	I.D.	“A”	“B”	“C”	I.D.	“A”	“B”	“C”
4"	3-3/16"	3-3/16"	11-7/8"	4"	3-7/16"	3-7/16"	12-7/8"	4"	3-11/16"	3-11/16"	13-7/8"	4"	3-11/16"	3-11/16"	13-7/8"
5"	3-5/16"	3-5/16"	12-3/8"	5"	3-9/16"	3-9/16"	13-3/8"	5"	3-7/8"	3-7/8"	14-3/8"	5"	3-7/8"	3-7/8"	14-3/8"
6"	3-7/16"	3-7/16"	12-7/8"	6"	3-11/16"	3-11/16"	13-7/8"	6"	4"	4"	14-7/8"	6"	4"	4"	14-7/8"
7"	3-9/16"	3-9/16"	13-3/8"	7"	3-7/8"	3-7/8"	14-3/8"	7"	4-1/8"	4-1/8"	15-3/8"	7"	4-1/8"	4-1/8"	15-3/8"
8"	3-11/16"	3-11/16"	13-7/8"	8"	4"	4"	14-7/8"	8"	4-1/4"	4-1/4"	15-7/8"	8"	4-1/4"	4-1/4"	15-7/8"
9"	3-7/8"	3-7/8"	14-3/8"	9"	4-1/8"	4-1/8"	15-3/8"	9"	4-3/8"	4-3/8"	16-3/8"	9"	4-3/8"	4-3/8"	16-3/8"
10"	4"	4"	14-7/8"	10"	4-1/4"	4-1/4"	15-7/8"	10"	4-1/2"	4-1/2"	16-7/8"	10"	4-1/2"	4-1/2"	16-7/8"
12"	4-1/4"	4-1/4"	15-7/8"	12"	4-1/2"	4-1/2"	16-7/8"	12"	4-13/16"	4-13/16"	17-7/8"	12"	4-13/16"	4-13/16"	17-7/8"
14"	4-1/2"	4-1/2"	16-7/8"	14"	4-13/16"	4-13/16"	17-7/8"	14"	5-1/16"	5-1/16"	18-7/8"	14"	5-1/16"	5-1/16"	18-7/8"
16"	4-13/16"	4-13/16"	17-7/8"	16"	5-1/16"	5-1/16"	18-7/8"	16"	5-5/16"	5-5/16"	19-7/8"	16"	5-5/16"	5-5/16"	19-7/8"
18"	5-1/16"	5-1/16"	18-7/8"	18"	5-5/16"	5-5/16"	19-7/8"	18"	5-9/16"	5-9/16"	20-7/8"	18"	5-9/16"	5-9/16"	20-7/8"
20"	5-5/16"	5-5/16"	19-7/8"	20"	5-9/16"	5-9/16"	20-7/8"	20"	5-7/8"	5-7/8"	21-7/8"	20"	5-7/8"	5-7/8"	21-7/8"
22"	5-9/16"	5-9/16"	20-7/8"	22"	5-7/8"	5-7/8"	21-7/8"	22"	6-1/8"	6-1/8"	22-7/8"	22"	6-1/8"	6-1/8"	22-7/8"
24"	5-7/8"	5-7/8"	21-7/8"	24"	6-1/8"	6-1/8"	22-7/8"	24"	6-3/8"	6-3/8"	23-7/8"	24"	6-3/8"	6-3/8"	23-7/8"
26"	6-1/8"	6-1/8"	22-7/8"	26"	6-3/8"	6-3/8"	23-7/8"	26"	6-11/16"	6-11/16"	24-7/8"	26"	6-11/16"	6-11/16"	24-7/8"
28"	6-7/16"	6-7/16"	23-7/8"	28"	6-11/16"	6-11/16"	24-7/8"	28"	6-15/16"	6-15/16"	25-7/8"	28"	6-15/16"	6-15/16"	25-7/8"
30"	6-11/16"	6-11/16"	24-7/8"	30"	6-15/16"	6-15/16"	25-7/8"	30"	7-3/16"	7-3/16"	26-7/8"	30"	7-3/16"	7-3/16"	26-7/8"
32"	6-15/16"	6-15/16"	25-7/8"	32"	7-3/16"	7-3/16"	26-7/8"	32"	7-7/16"	7-7/16"	27-7/8"	32"	7-7/16"	7-7/16"	27-7/8"
34"	7-3/16"	7-3/16"	26-7/8"	34"	7-7/16"	7-7/16"	27-7/8"	34"	7-3/4"	7-3/4"	28-7/8"	34"	7-3/4"	7-3/4"	28-7/8"
36"	7-7/16"	7-7/16"	27-7/8"	36"	7-3/4"	7-3/4"	28-7/8"	36"	8"	8"	29-7/8"	36"	8"	8"	29-7/8"
38"	7-3/4"	7-3/4"	28-7/8"	38"	8"	8"	29-7/8"	38"	8-1/4"	8-1/4"	30-7/8"	38"	8-1/4"	8-1/4"	30-7/8"
40"	8"	8"	29-7/8"	40"	8-1/4"	8-1/4"	30-7/8"	40"	8-9/16"	8-9/16"	31-7/8"	40"	8-9/16"	8-9/16"	31-7/8"
42"	8-1/4"	8-1/4"	30-7/8"	42"	8-9/16"	8-9/16"	31-7/8"	42"	8-13/16"	8-13/16"	32-7/8"	42"	8-13/16"	8-13/16"	32-7/8"
44"	8-9/16"	8-9/16"	31-7/8"	44"	8-13/16"	8-13/16"	32-7/8"	44"	9-1/8"	9-1/8"	33-7/8"	44"	9-1/8"	9-1/8"	33-7/8"
46"	8-13/16"	8-13/16"	32-7/8"48"	46"	9-1/8"	9-1/8"	33-7/8"	46"	9-5/16"	9-5/16"	34-7/8"	46"	9-5/16"	9-5/16"	34-7/8"
48"	9-1/8"	9-1/8"	33-7/8"	48"	9-5/16"	9-5/16"	34-7/8"	48"	9-5/8"	9-5/8"	35-7/8"	48"	9-5/8"	9-5/8"	35-7/8"

NOTE: Elbows are non-load bearing parts

45° Elbow

Part C*_ _ 45E _ _

Part C*_ _ _ _ 45E _ _ (Plus Models)

* = Add M when the “Installer Friendly” Male End is required.

The 45° Elbow (45E) consists of one (1) 45-degree elbow, two (2) vee-band halves, and one (1) draw band. Plus Models include insulation strip.

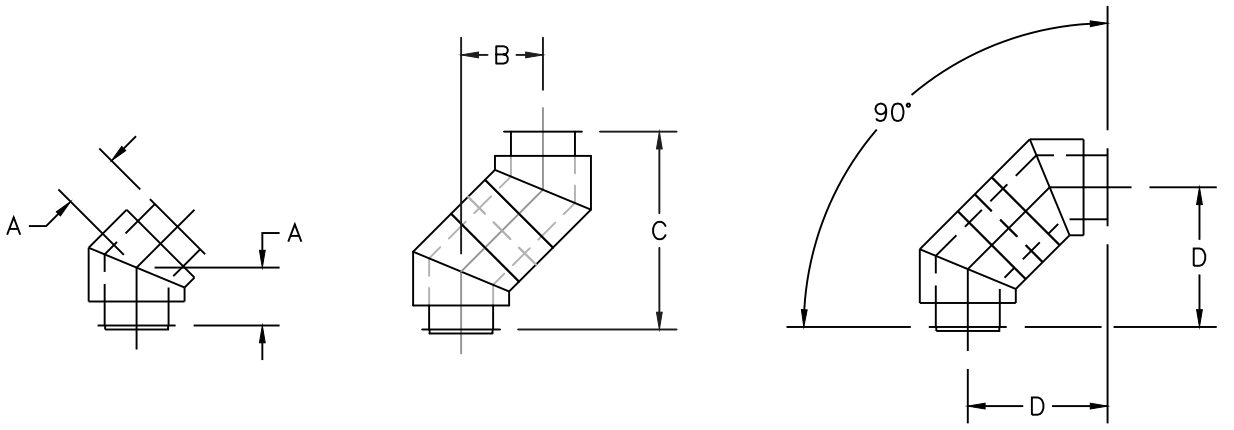
Flow resistance factor: K = 0.15

NOTE: Elbows are available in non-standard angles upon request.

45 DEGREE ELBOW & OFFSETS

CS & CS PLUS					CS PLUS 2				
I.D.	“A”	“B”	“C”	“D”	I.D.	“A”	“B”	“C”	“D”
4"	3-5/8"	5-1/8"	12-3/8"	8-3/4"	4"	4-1/16"	5-11/16"	13-3/4"	9-3/4"
5"	3-13/16"	5-7/16"	13-1/16"	9-1/4"	5"	4-1/4"	6"	14-1/2"	10-1/4"
6"	4-1/16"	5-11/16"	13-3/4"	9-3/4"	6"	4-7/16"	6-5/16"	15-3/16"	10-3/4"
7"	4-1/4"	6"	14-1/2"	10-1/4"	7"	4-5/8"	6-9/16"	15-7/8"	11-1/4"
8"	4-7/16"	6-5/16"	15-13/16"	10-3/4"	8"	4-7/8"	6-7/8"	16-9/16"	11-3/4"
9"	4-5/8"	6-9/16"	15-7/8"	11-1/4"	9"	5-1/16"	7-3/16"	17-5/16"	12-1/4"
10"	4-7/8"	6-7/8"	16-5/8"	11-3/4"	10"	5-1/4"	7-7/16"	18"	12-3/4"
12"	5-1/4"	7-7/16"	18"	12-3/4"	12"	5-11/16"	8-1/16"	19-7/16"	13-3/4"
14"	5-11/16"	8-1/16"	19-7/16"	13-3/4"	14"	6-1/8"	8-5/8"	20-13/16"	14-3/4"
16"	6-1/8"	8-5/8"	20-13/16"	14-3/4"	16"	6-1/2"	9-3/16"	22-1/4"	15-3/4"
18"	6-1/2"	9-3/16"	22-1/4"	15-3/4"	18"	6-15/16"	9-13/16"	23-11/16"	16-3/4"
20"	6-15/16"	9-13/16"	23-11/16"	16-3/4"	20"	7-3/8"	10-3/8"	25-1/16"	17-3/4"
22"	7-3/8"	10-3/8"	25-1/16"	17-3/4"	22"	7-3/4"	11"	26-1/2"	18-3/4"
24"	7-3/4"	11"	26-1/2"	18-3/4"	24"	8-3/16"	11-9/16"	27-15/16"	19-3/4"
26"	8-3/16"	11-9/16"	27-15/16"	19-3/4"	26"	8-9/16"	12-1/8"	29-5/16"	20-3/4"
28"	8-9/16"	12-1/8"	29-5/16"	20-3/4"	28"	9"	12-3/4"	30-3/4"	21-3/4"
30"	9"	12-3/4"	30-3/4"	21-3/4"	30"	9-7/16"	13-5/16"	32-1/8"	22-3/4"
32"	9-7/16"	13-5/16"	32-1/8"	22-3/4"	32"	9-13/16"	13-7/8"	33-9/16"	23-3/4"
34"	9-13/16"	13-7/8"	33-9/16"	23-3/4"	34"	10-1/4"	14-1/2"	35"	24-3/4"
36"	10-1/4"	14-1/2"	35"	24-3/4"	36"	10-11/16"	15-1/16"	36-3/8"	25-3/4"
38"	10-11/16"	15-1/16"	36-3/8"	25-3/4"	38"	11-1/16"	15-11/16"	37-13/16"	26-3/4"
40"	11-1/16"	15-11/16"	37-13/16"	26-3/4"	40"	11-1/2"	16-1/4"	39-1/4"	27-3/4"
42"	11-1/2"	16-1/4"	39-1/4"	27-3/4"	42"	11-7/8"	16-13/16"	40-5/8"	28-3/4"
44"	11-7/8"	16-13/16"	40-5/8"	28-34"	44"	12-5/16"	17-7/16"	42-1/16"	29-3/4"
46"	12-5/16"	17-7/16"	42-1/16"	29-3/4"	46"	12-3/4"	18"	43-7/16"	30-3/4"
48"	12-3/4"	18"	43-7/16"	30-3/4"	48"	13-1/8"	18-9/16"	44-7/8"	31-3/4"

NOTE: Elbows are non-load bearing parts.



45 DEGREE ELBOW & OFFSETS

CS PLUS 3					CS PLUS 4				
I.D.	"A"	"B"	"C"	"D"	I.D.	"A"	"B"	"C"	"D"
4"	4-7/16"	6-5/16"	15-3/16"	10-3/4"	4"	4-7/8"	6-7/8"	16-9/16"	11-3/4"
5"	4-5/8"	6-9/16"	15-7/8"	11-1/4"	5"	5-1/16"	7-3/16"	17-5/16"	12-1/4"
6"	4-7/8"	6-7/8"	16-9/16"	11-3/4"	6"	5-1/4"	7-7/16"	18"	12-3/4"
7"	5-1/16"	7-3/16"	17-5/16"	13-1/4"	7"	5-1/2"	7-3/4"	18-11/16"	14-1/4"
8"	5-1/4"	7-7/16"	18"	12-3/4"	8"	5-11/16"	8-1/16"	19-7/16"	13-3/4"
9"	5-1/2"	7-3/4"	18-11/16"	13-1/4"	9"	5-7/8"	8-5/16"	20-1/8"	14-1/4"
10"	5-11/16"	8-1/16"	19-7/16"	13-3/4"	10"	6-1/8"	8-5/8"	20-13/16"	14-3/4"
12"	6-1/8"	8-5/8"	20-13/16"	14-3/4"	12"	6-1/2"	9-3/16"	22-1/4"	15-3/4"
14"	6-1/2"	9-3/16"	22-1/4"	15-3/4"	14"	6-15/16"	9-13/16"	23-11/16"	16-3/4"
16"	6-15/16"	9-13/16"	23-11/16"	16-3/4"	16"	7-3/8"	10-3/8"	25-1/16"	17-3/4"
18"	7-3/8"	10-3/8"	25-1/16"	17-3/4"	18"	7-3/4"	11"	26-1/2"	18-3/4"
20"	7-3/4"	11"	26-1/2"	18-3/4"	20"	8-3/16"	11-9/16"	27-15/16"	19-3/4"
22"	8-3/16"	11-9/16"	27-15/16"	19-3/4"	22"	8-9/16"	12-1/8"	29-5/16"	20-3/4"
24"	8-9/16"	12-1/8"	29-5/16"	20-3/4"	24"	9"	12-3/4"	30-3/4"	21-3/4"
26"	9"	12-3/4"	30-3/4"	21-3/4"	26"	9-7/16"	13-5/16"	32-1/8"	22-3/4"
28"	9-7/16"	13-5/16"	32-1/8"	22-3/4"	28"	9-13/16"	13-7/8"	33-9/16"	23-3/4"
30"	9-13/16"	13-7/8"	33-9/16"	23-3/4"	30"	10-1/4"	14-1/2"	35"	23-3/4"
32"	10-1/4"	14-1/2"	35"	24-3/4"	32"	10-11/16"	15-1/16"	36-3/8"	25-3/4"
34"	10-11/16"	15-1/16"	36-3/8"	25-3/4"	34"	11-1/16"	15-11/16"	37-13/16"	26-3/4"
36"	11-1/16"	15-11/16"	37-13/16"	26-3/4"	36"	11-1/2"	16-1/4"	39-1/4"	27-3/4"
38"	11-1/2"	16-1/4"	39-1/4"	27-3/4"	38"	11-7/8"	16-13/16"	40-5/8"	28-3/4"
40"	11-7/8"	16-13/16"	40-5/8"	28-3/4"	40"	12-5/16"	17-7/16"	42-1/16"	29-3/4"
42"	12-5/16"	17-7/16"	42-1/16"	29-3/4"	42"	12-3/4"	18"	43-7/16"	30-3/4"
44"	12-3/4"	18"	43-7/16"	30-3/4"	44"	13-1/8"	18-9/16"	44-7/8"	31-3/4"
46"	13-1/8"	18-9/16"	44-7/8"	31-3/4"	46"	13-9/16"	19-3/16"	46-5/16"	32-3/4"
48"	13-9/16"	19-3/16"	46-5/16"	32-3/4"	48"	14"	19-3/4"	47-11/16"	33-1/4"

NOTE: Elbows are non-load bearing parts.

90° Elbow

Part C*_ _ 90E _ _

***** = Add M when the “Installer Friendly” Male End is required.

The 90° Elbow (90E) consists of one (1) 90-degree elbow, two (2) vee band halves, and one (1) draw band.

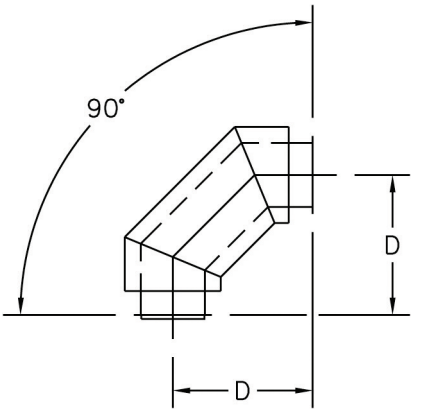
Flow resistance factor: K = 0.40

NOTES:

1. The 90E is only available in Model CS. CSplus series must use two (2) 45E assemblies.
2. Elbows are available in non-standard angles upon request.

90 DEGREE ELBOW & OFFSETS

	CS
I.D.	D
4"	8-3/4"
5"	9-1/4"
6"	9-3/4"
7"	10-1/4"
8"	10-3/4"
9"	11-1/4"
10"	11-3/4"
12"	12-3/4"
14"	13-3/4"
16"	14-3/4"
18"	15-3/4"
20"	16-3/4"
22"	17-3/4"
24"	18-3/4"
26"	19-3/4"
28"	20-3/4"
30"	21-3/4"
32"	22-3/4"
34"	23-3/4"
36"	24-3/4"
38"	25-3/4"
40"	26-3/4"
42"	27-3/4"
44"	28-3/4"
46"	29-3/4"
48"	30-3/4"



NOTE: Elbows are non-load bearing parts.

Screen Collar Termination

Part C _ _ SCT _
Part C _ _ _ _ SCT _ (Plus Models)

The Screen Collar Termination (SCT) serves as a termination when venting appliances or to cover the outdoor end of a combustion air duct. The SCT consists of one (1) screen collar termination, two (2) vee band halves, and one (1) rain skirt.

Flow resistance factor: K = 0.25

Side Discharge with Screen

Part C _ _ SDS _
Part C _ _ _ _ SDS _ (Plus Models)

This part can be used for horizontal terminations. The SDS consists of one (1) side discharge with screen, two (2) vee band halves, and one (1) rain skirt.

Flow resistance factor: K = 0.25

Barometric Damper

Part D _ _ BMD

The Barometric Damper (BMD) is an atmospheric-type draft regulator used to relieve excess draft. The BMD consists of one (1) barometric damper.

Flow resistance factor: K = 0.50

45T Section

Part C*_ _ 45T _ _ _ _

Part C*_ _ _ _ 45T_ _ _ _ (Plus Models)

* = Add M when the “Installer Friendly” Male End is required.

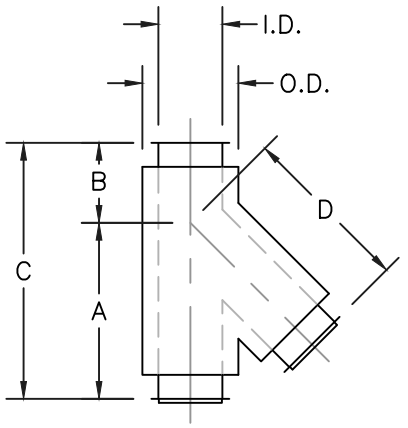
The 45T Section provides a lower flow resistance when making a change in direction. The 45T consists of one (1) 45-degree tee section, two (2) vee band halves for the body, two (2) vee band halves for the projection, one (1) draw band for the body, and one (1) draw band for the projection. Plus Models include insulation strips.

NOTES: Projection ID (dimension D) determines overall body length (dimension C). Elbows are available in non-standard angles upon request. Smaller projection diameters are available upon request.

Flow resistance factor: K = 0.40

45 DEGREE TEE

CS & CS PLUS					CS PLUS 2				
I.D.	“A”	“B”	“C”	“D”	I.D.	“A”	“B”	“C”	“D”
4"	11"	5"	16"	10-3/4"	4"	13-1/2"	5-1/2"	19"	13-3/16"
5"	12"	5"	17"	11-15/16"	5"	14-1/2"	5-1/2"	20"	14-3/8"
6"	13-1/2"	5-1/2"	19"	13-3/16"	6"	16"	6"	22"	15-9/16"
7"	14-1/2"	5-1/2"	20"	14-3/8"	7"	17"	6"	23"	16-3/4"
8"	16"	6"	22"	15-9/16"	8"	18"	6"	24"	18"
9"	17"	6"	23"	16-3/4"	9"	19-1/2"	6-1/2"	26"	19-3/16"
10"	18"	6"	24"	18"	10"	20-1/2"	6-1/2"	27"	20-3/8"
12"	20-1/2"	6-1/2"	27"	20-3/8"	12"	23"	7"	30"	22-13/16"
14"	23"	7"	30"	22-13/16"	14"	25-1/2"	7-1/2"	33"	25-1/4"
16"	25-1/2"	7-1/2"	33"	25-1/4"	16"	28"	8"	36"	27-5/8"
18"	28"	8"	36"	27-5/8"	18"	30-1/2"	8-1/2"	39"	30-1/16"
20"	30-1/2"	8-1/2"3	9"	30-1/16"	20"	32-1/2"	8-1/2"	41"	32-1/2"
22"	32-1/2"	8-1/2"	41"	32-1/2"	22"	35"	9"	44"	34-7/8"
24"	35"	9"	44"	34-7/8"	24"	37-1/2"	9-1/2"	47"	37-5/16"
26"	37-1/2"	9-1/2"	47"	37-5/16"	26"	40"	10"	50"	39-11/16"
28"	40"	10"	50"	39-11/16"	28"	42-1/2"	10-1/2"	53"	42-1/8"
30"	42-1/2"	10-1/2"	53"	42-1/8"	30"	45"	11"	56"	44-9/16"
32"	45"	11"	56"	44-9/16"	32"	47"	11"	58"	46-15/16"
34"	47"	11"	58"	46-15/16"	34"	49-1/2"	11-1/2"	61"	49-3/8"
36"	49-1/2"	11-1/2"	61"	49-3/8"	36"	52"	12"	64"	51-13/16"
38"	52"	12"	64"	51-13/16"	38"	54-1/2"	12-1/2"	67"	54-3/16"
40"	54-1/2"	12-1/2"	67"	54-3/16"	40"	57"	13"	70"	56-5/8"
42"	57"	13"	70"	56-5/8"	42"	59-1/2"	13-1/2"	73"	59"
44"	59-1/2"	13-1/2"	73"	59"	44"	61-1/2"	13-1/2"	75"	61-7/16"
46"	61-1/2"	13-1/2"	75"	61-7/16"	46"	64"	14"	78"	63-7/8"
48"	64"	14"	78"	63-7/8"	48"	66-1/2"	14-1/2"	81"	66-1/4"



45 DEGREE TEE

CS PLUS 3					CS PLUS 4				
I.D.	"A"	"B"	"C"	"D"	I.D.	"A"	"B"	"C"	"D"
4"	16"	6"	22"	15-9/16"	4"	18"	6"	24"	18"
5"	17"	6"	23"	16-3/4"	5"	19-1/2"	6-1/2"	26"	19-3/16"
6"	18"	6"	24"	18"	6"	20-1/2"	6-1/2"	27"	20-3/8"
7"	19-1/2"	6-1/2"	26"	19-3/16"	7"	22"	7"	29"	21-5/8"
8"	20-1/2"	6-1/2"	27"	20-3/8"	8"	23"	7"	30"	22-13/16"
9"	22"	7"	29"	21-58"	9"	24-1/2"	7-1/2"	32"	24"
10"	23"	7"	30"	22-13/16"	10"	25-1/2"	7-1/2"	33"	25-1/4"
12"	25-1/2"	7-1/2"	33"	25-1/4"	12"	28"	8"	36"	27-5/8"
14"	28"	8"	36"	27-5/8"	14"	30-1/2"	8-1/2"	39"	30-1/16"
16"	30-1/2"	8-1/2"	39"	30-1/16"	16"	32-1/2"	8-1/2"	41"	32-1/2"
18"	32-1/2"	8-1/2"	41"	32-1/2"	18"	35"	9"	44"	34-7/8"
20"	35"	9"	44"	34-7/8"	20"	37-1/2"	9-1/2"	47"	37-5/16"
22"	37-1/2"	9-1/2"	47"	37-5/16"	22"	40"	10"	50"	39-11/16"
24"	40"	10"	50"	39-11/16"	24"	42-1/2"	10-1/2"	53"	42-1/8"
26"	42-1/2"	10-1/2"	53"	42-1/8"	26"	45"	11"	56"	44-9/16"
28"	45"	11"	56"	44-9/16"	28"	47"	11"	58"	46-15/16"
30"	47"	11"	58"	46-15/16"	30"	49-1/2"	11-1/2"	61"	49-3/8"
32"	49-1/2"	11-1/2"	61"	49-3/8"	32"	52"	12"	64"	51-13/16"
34"	52"	12"	64"	51-13/16"	34"	54-1/2"	12-1/2"	67"	54-3/16"
36"	54-1/2"	12-1/2"	67"	54-3/16"	36"	57"	13"	70"	56-5/8"
38"	57"	13"	70"	56-5/8"	38"	59-1/2"	13-1/2"	73"	59"
40"	59-1/2"	13-1/2"	73"	59"	40"	61"	14"	75"	61-7/16"
42"	61"	14"	75"	61-7/16"	42"	63-1/2"	14-1/2"	78"	63-7/8"
44"	63-1/2"	14-1/2	78"	63-7/8"	44"	66"	15"	81"	66-1/4"
46"	66"	15"	81"	66-1/4"	46"	68-1/2"	15-1/2"	84"	68-3/4"
48"	68-1/2"	15-1/2"	84"	68-3/4"	48"	71"	16"	87"	71-1/8"

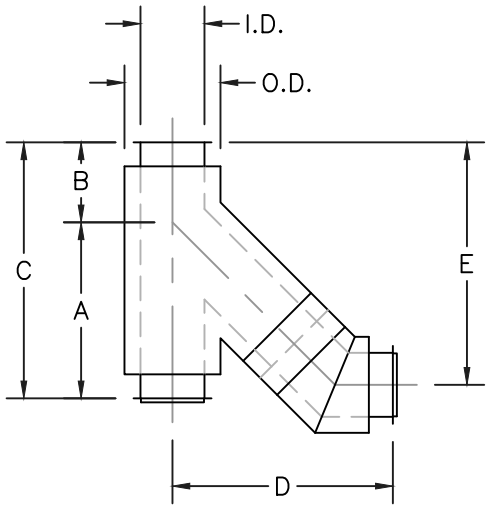
Combination 45T with 45E Data

The 45T and 45E are ordered separately, however, when combined they yield a lower flow resistance than a 90-degree tee. Their assembled dimensions are shown in the table below.

Flow resistance factor: K = 0.55

45 DEGREE TEE AND 45 DEGREE ELBOW

CS & CS PLUS						CS PLUS 2					
ID	"A"	"B"	"C"	"D"	"E"	ID	"A"	"B"	'C"	"D"	"E"
4"	11"	5"	16"	13-13/16"	15-3/16"	4"	13-1/2"	5-1/2"	19"	16-1/4"	17-11/16"
5"	12"	5"	17"	15"	16-3/16"	5"	14-1/2"	5-1/2"	20"	17-7/16"	18-11/16"
6"	13-1/2"	5-1/2"	19"	16-1/4"	17-11/16"	6"	16"	6"	22"	18-5/8"	20-3/16"
7"	14-1/2"	5-1/2"	20"	17-7/16"	18-11/16"	7"	17"	6"	23"	19-7/8"	21-3/16"
8"	16"	6"	22"	18-5/8"	20-3/16"	8"	18"	6"	24"	21-1/16"	22-3/16"
9"	17"	6"	23"	19-7/8"	21-3/16"	9"	19-1/2"	6-1/2"	26"	22-1/4"	23-11/16"
10"	18"	6"	24"	21-1/16"	22-3/16"	10"	20-1/2"	6-1/2"	27"	23-7/16"	24-11/16"
12"	20-1/2"	6-1/2"	27"	23-7/16"	24-11/16"	12"	23"	7"	30"	25-7/8"	27-3/16"
14"	23"	7"	30"	25-7/8"	27-3/16"	14"	25-1/2"	7-1/2"	33"	28-5/16"	29-11/16"
16"	25-1/2"	7-1/2"	33"	28-5/16"	29-11/16"	16"	28"	8"	36"	30-11/16"	32-3/16"
18"	28"	8"	36"	30-11/16"	32-3/16"	18"	30-1/2"	8-1/2"	39"	33-1/8"	34-11/16"
20"	10-1/2"`	8-1/2"	39"	33-1/8"	34-11/16"	20"	32-1/2"	8-1/2"	41"	35-9/16"	36-11/16"
22"	32-1/2"	8-1/2"	41"3	5-9/16"	36-11/16"	22"	35"	9"	44"	37-15/16"	39-3/16"
24"	35"	9"	44"	37-15/16"	39-3/16"	24"	37-1/2"	9-1/2"	47"	40-3/8"	41-11/16"
26"	37-1/2"	9-1/2"	47"	40-3/8"	41-11/16"	26"	40"	10"	50"	42-15/16"	44-3/16"
28"	40"	10"	50"	42-15/16"	44-3/16"	28"	42-1/2"	10-1/2"	53"	45-3/16"	46-11/16"
30"	42-1/2"	10-1/2"	53"	45-3/16"	46-11/16"	30"	45"	11"	56"	47-9/16"	49-3/16"
32"	45"	11"	56"	47-9/16"	49-3/16"	32"	47"	11"	58"	50"	51-3/16"
34"	47"	11"	58"	50"	51-3/16"	34"	49-1/2"	11-1/2"	61"	52-7/16"	53-11/16"
36"	49-1/2"	11-1/2"	61"	52-7/16"	53-11/16"	36"	52"	12"	64"	54-13/16"	56-3/16"
38"	52"	12"	64"	54-13/16"	56-3/16"	38"	54-1/2"	12-1/2"	67"	57-1/4"	58-11/16"
40"	54-1/2"	12-1/2"	67"	57-1/4"	58-11/16"	40"	57"	13"	70"	59-11/16"	61-3/16"
42"	57"	13"	70"	59-11/16"	61-3/16"	42"	59-1/2"	13-1/2"	73"	62-1/16"	63-11/16"
44"	59-1/2"	13-1/2"	73"	62-1/16"	63-11/16"	44"	61-1/2"	13-1/2"	75"	64-1/2"	65-11/16"
46"	61-1/2"	13-1/2"	75"	64-1/2"	65-11/16"	46"	64"	14"	78"	66-7/8"	68-11/16"
48"	64"	14"	78"	66-7/8"	68-11/16"	48"	66-1/2"	14-1/2"	81"	69-5/16"	71-3/16"



45 DEGREE TEE AND 45 DEGREE ELBOW

CS PLUS 3						CS PLUS 4					
ID	"A"	"B"	"C"	"D"	"E"	ID	"A"	"B"	'C"	"D"	"E"
4"	16”	6”	22”	18-5/8”	20-3/16	4"	18"	6”	24”	21-1/16”	22-3/16"
5"	17”	6”	23”	19-7/8”	21-3/16”	5"	19-1/2"	6-1/2"	26"	22-1/4"	23-11/16”
6"	18”	6”	24”	21-1/16”	22-3/16”	6”	20-1/2”	6-1/2”	27”	23-7/16”	24-11/16”
7"	19-1/2”	6-1/2”	26”	22-1/4”	23-11/16”	7”	22”	7”	29”	24-5/8”	26-3/16”
8"	20-1/2”	6-1/2”	27”	23-7/16”	24-11/16”	8”	23”	7”	30”	25-7/8”	27-3/16”
9"	22”	7”	29”	24-5/8”	26-3/16”	9”	24-1/2”	7-1/2”	32”	27-1/16”	28-3/16”
10"	23”	7”	30”	25-7/8”	27-3/16”	10”	25-1/2”	7-1/2”	33”	28-1/4”	29-11/16”
12"	25-1/2”	7-1/2”	33”	28-5/16”	29-11/16”	12”	28”	8”	36”	30-11/16”	32-3/16”
14"	28”	8”	36”	30-11/16”	32-3/16”	14”	30-1/2”	8-1/2”	39”	33-1/8”	34-11/16”
16"	30-1/2”	8-1/2”	39”	33-1/8”	34-11/16”	16”	32-1/2”	8-1/2”	41”	35-9/16”	36-11/16”
18"	2-1/2”	8-1/2”	41”	35-9/16”	36-11/16”	18”	35”	9”	44”	37-15/16”	39-3/16”
20"	35”	9”	44”	37-15/16”	39-3/16”	20”	37-1/2”	9-1/2”	47”	40-3/8”	41-11/16”
22"	37-1/2”	9-1/2”	47”	40-3/8”	41-11/16”	22”	40”	10”	50”	42-15/16”	44-3/16”
24"	40”	10”	50”	42-15/16”	44-3/16”	24”	42-1/2”	10-1/2”	53”	45-3/16”	46-11/16”
26"	42-1/2”	10-1/2”	53”	45-3/16”	46-11/16”	26”	45”	11”	56”	47-9/16”	49-3/16”
28"	45”	11”	56”	47-9/16”	49-3/16”	28”	47”	11”	58”	50”	51-3/16”
30"	47”	11”	58”	50”	51-3/16”	30”	49-1/2”	11-1/2”	61”	52-7/16”	53-11/16”
32"	49-1/2”	11-1/2”	61”	52-7/16”	53-11/16”	32”	52”	12”	64”	54-13/16”	56-3/16”
34"	52”	12”	64”	54-13/16”	56-3/16”	34”	54-1/2”	12-1/2”	67”	57-1/4”	58-11/16”
36"	54-1/2”	12-1/2”	67”	57-1/4”	58-11/16”	36”	57”	13”	70”	59-11/16”	61-3/16”
38"	57”	13”	70”	59-11/16”	61-3/16”	38”	59-1/2”	13-1/2”	73”	62-1/16”	63-11/16”
40"	59-1/2”	13-1/2”	73”	62-1/16”	63-11/16”	40”	61”	14”	75”	64-1/2”	65-11/16”
42"	61”	14”	75”	64-1/2”	65-11/16”	42”	63-1/2”	14-1/2”	78”	66-7/8”	68-11/16”
44"	63-1/2”	14-1/2	78”	66-7/8”	68-11/16”	44”	66”	15”	81”	69-5/16”	71-3/16”
46"	66”	15”	81”	69-5/16”	71-3/16”	46”	68-1/2”	15-1/2”	84”	71-3/4”	73-11/16”
48"	68-1/2”	15-1/2”	84”	71-3/4”	73-11/16”	48”	71”	16”	87”	74-1/8”	76-3/16”

Double 45T

Part C*_ _ 45T _ _ / _ _ _ _

Part C*_ _ _ _ 45T_ _ / _ _ _ _ (Plus Models)

* = Add M when the "Installer Friendly" Male End is required.

The Double 45T Section (Double 45T) is used to manifold appliances into one common breeching or chimney.

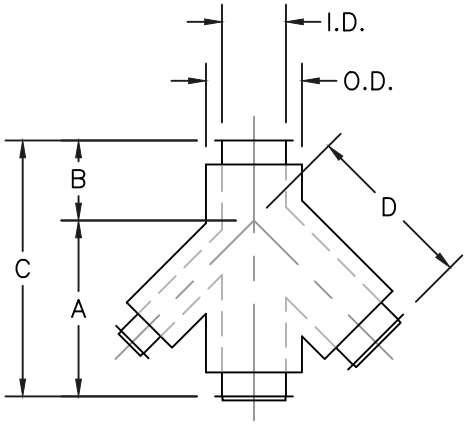
The Double 45T consists of one (1) double 45-degree tee section, two (2) vee band halves for the body, two (2) vee band halves for each projection, one (1) draw band for the body, and one (1) draw band for each projection. Plus Models include insulation strips.

NOTE: Projections must be at least one size smaller than body.

Flow resistance factor: K = 0.40

DOUBLE 45 DEGREE TEE

CS & CS PLUS					CS PLUS 2				
I.D.	"A"	"B"	"C"	"D"	I.D.	"A"	"B"	"C"	"D"
4"		N/A			4"		N/A		
5"	11"	5"	16"	10-3/4"	5"	13-1/2"	5-1/2"	19"	14-3/8"
6"	12"	5"	17"	11-15/16"	6"	14-1/2"	5-1/2"	20"	15-9/16"
7"	13-1/2"	5-1/2"	19"	13-3/16"	7"	16"	6"	22"	16-3/4"
8"	14-1/2"	5-1/2"	20"	14-3/8"	8"	17"	6"	23"	18"
9"	16"	6"	22"	15-9/16"	9"	18"	6"	24"	19-3/16"
10"	17"	6"	23"	16-3/4"	10"	19-1/2"	6-1/2"	26"	20-3/8"
12"	18"	6"	24"	18"	12"	20-1/2"	6-1/2"	27"	22-13/16"
14"	20-1/2"	6-1/2"	27"	20-3/8"	14"	23"	7"	30"	25-1/4"
16"	23"	7"	30"	22-13/16"	16"	25-1/2"	7-1/2"	33"	27-5/8"
18"	25-1/2"	7-1/2"	33"	25-1/4"	18"	28"	8"	36"	30-1/16"
20"	28"	8"	36"	27-5/8"	20"	30-1/2"	8-1/2"	39"	32-1/2"
22"	30-1/2"	8-1/2"	39"	30-1/16"	22"	32-1/2"	8-1/2"	41"	34-7/8"
24"	32-1/2"	8-1/2"	41"	32-1/2"	24"	35"	9"	44"	37-5/16"
26"	35"	9"	44"	34-7/8"	26"	37-1/2"	9-1/2"	47"	39-11/16"
28"	37-1/2"	9-1/2"	47"	37-5/16"	28"	40"	10"	50"	42-1/8"
30"	40"	10"	50"	39-11/16"	30"	42-1/2"	10-1/2"	53"	44-9/16"
32"	42-1/2"	10-1/2"	53"	42-1/8"	32"	45"	11"	56"	46-15/16"
34"	45"	11"	56"	44-9/16"	34"	47"	11"	58"	49-3/8"
36"	47"	11"	58"	46-15/16"	36"	49-1/2"	11-1/2"	61"	51-13/16"
38"	49-1/2"	11-1/2"	61"	49-3/8"	38"	52"	12"	64"	54-3/16"
40"	52"	12"	64"	51-13/16"	40"	54-1/2"	12-1/2"	67"	56-5/8"
42"	54-1/2"	12-1/2"	67"	54-3/16"	42"	57"	13"	70"	59"
44"	57"	13"	70"	56-5/8"	44"	59-1/2"	13-1/2"	73"	61-7/16"
46"	59-1/2"	13-1/2"	73"	59"	46"	61-1/2"	13-1/2"	75"	63-7/8"
48"	61-1/2"	13-1/2"	75"	61-7/16"	48"	64"	14"	78"	66-1/4"



NOTE: Dimension C will be determined by the largest projection size.

DOUBLE 45 DEGREE TEE

CS PLUS 3					CS PLUS 4				
I.D.	"A"	"B"	"C"	"D"	I.D.	"A"	"B"	"C"	"D"
4"		N/A			4"		N/A		
5"	16"	6"	22"	15-9/16"	5"	18"	6"	24"	18"
6"	17"	6"	23"	16-3/4"	6"	19-1/2"	6-1/2"	26"	19-3/16"
7"	18"	6"	24"	18"	7"	20-1/2"	6-1/2"	27"	20-3/8"
8"	19-1/2"	6-1/2"	26"	19-3/16"	8"	22"	7"	29"	21-5/8"
9"	20-1/2"	6-1/2"	27"	20-3/8"	9"	23"	7"	30"	22-13/16"
10"	22"	7"	29"	21-58"	10"	24-1/2"	7-1/2"	32"	24"
12"	23"	7"	30"	22-13/16"	12"	25-1/2"	7-1/2"	33"	25-1/4"
14"	25-1/2"	7-1/2"	33"	25-1/4"	14"	28"	8"	36"	27-5/8"
16"	28"	8"	36"	27-5/8"	16"	30-1/2"	8-1/2"	39"	30-1/16"
18"	30-1/2"	8-1/2"	39"	30-1/16"	18"	32-1/2"	8-1/2"	41"	32-1/2"
20"	32-1/2"	8-1/2"	41"	32-1/2"	20"	35"	9"	44"	34-7/8"
22"	35"	9"	44"	34-7/8"	22"	37-1/2"	9-1/2"	47"	37-5/16"
24"	37-1/2"	9-1/2"	47"	37-5/16"	24"	40"	10"	50"	39-11/16"
26"	40"	10"	50"	39-11/16"	26"	42-1/2"	10-1/2"	53"	42-1/8"
28"	42-1/2"	10-1/2"	53"	42-1/8"	28"	45"	11"	56"	44-9/16"
30"	45"	11"	56"	44-9/16"	30"	47"	11"	58"	46-15/16"
32"	47"	11"	58"	46-15/16"	32"	49-1/2"	11-1/2"	61"	49-3/8"
34"	49-1/2"	11-1/2"	61"	49-3/8"	34"	52"	12"	64"	51-13/16"
36"	52"	12"	64"	51-13/16"	36"	54-1/2"	12-1/2"	67"	54-3/16"
38"	54-1/2"	12-1/2"	67"	54-3/16"	38"	57"	13"	70"	56-5/8"
40"	57"	13"	70"	56-5/8"	40"	59-1/2"	13-1/2"	73"	59"
42"	59-1/2"	13-1/2"	73"	59"	42"	61"	14"	75"	61-7/16"
44"	61"	14"	75"	61-7/16"	44"	63-1/2"	14-1/2"	78"	63-7/8"
46"	63-1/2"	14-1/2	78"	63-7/8"	46"	66"	15"	81"	66-1/4"
48"	66"	15"	81"	66-1/4"	48"	68-1/2"	15-1/2"	84"	68-3/4"

90° Boot Tee

Part C*_ _ BTT _ _ _ _

Part C* _ _ _ _ BTT _ _ _ _ (Plus Models)

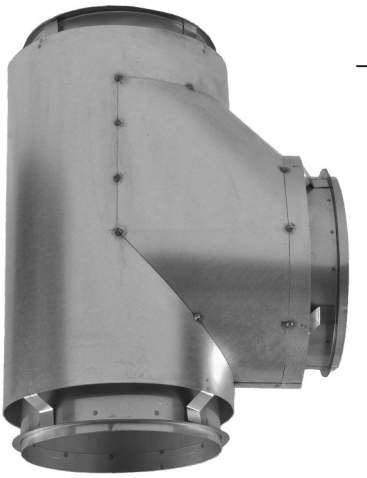
* = Add M when the "Installer Friendly" Male End is required.

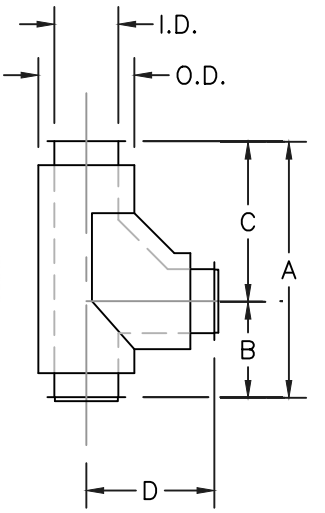
The 90° Boot Tee (BTT) is used to make low-resistance 90-degree turns. The BTT consists of one (1) 90-degree boot tee, two (2) vee band halves for the tee body), one (1) draw band for the tee body, two (2) vee band halves for the tee projection, and one (1) draw band for the tee projection. Please specify projection diameter. Plus Models include insulation strips.

Flow resistance factor: K = 0.65

Use the following to calculate 90° Boot Tee dimensions A, B, C, and D with smaller projections:

A = projection OD + 10 in C = ½ projection OD + 7 in
B = ½ projection OD + 3 in D = ½ body OD + 5 in





90 DEGREE BOOT TEES

CS & CS PLUS					CS PLUS 2					CS PLUS 3					CS PLUS 4				
I.D.	"A"	"B"	"C"	"D"	I.D.	"A"	"B"	"C"	"D"	I.D.	"A"	"B"	"C"	"D"	I.D.	"A"	"B"	"C"	"D"
4"	16"	6"	10"	8"	4"	18"	7"	11"	9"	4"	20"	8"	12"	10"	4"	22"	9"	13"	11"
5"	17"	6-1/2"	10-1/2"	8-1/2"	5"	19"	7-1/2"	11-1/2"	9-1/2"	5"	21"	8-1/2"	12-1/2"	10-1/2"	5"	23"	9-1/2"	13-1/2"	11-1/2"
6"	18"	7"	11"	9"	6"	20"	8"	12"	10"	6"	22"	9"	13"	11"	6"	24"	10"	14"	12"
7"	19"	7-1/2"	11-1/2"	9-1/2"	7"	21"	8-1/2"	12-1/2"	10-1/2"	7"	23"	9-1/2"	13-1/2"	11-1/2"	7"	25"	10-1/2"	14-1/2"	12-1/2"
8"	20"	8"	12"	10"	8"	22"	9"	13"	11"	8"	24"	10"	14"	12"	8"	26"	11"	15"	13"
9"	21"	8-1/2"	12-1/2"	10-1/2"	9"	23"	9-1/2"	13-1/2"	11-1/2"	9"	25"	10-1/2"	14-1/2"	12-1/2"	9"	27"	11-1/2"	15-1/2"	13-1/2"
10"	22"	9"	13"	11"	10"	24"	10"	14"	12"	10"	26"	11"	15"	13"	10"	28"	12"	16"	14"
12"	24"	10"	14"	12"	12"	26"	11"	15"	13"	12"	28"	12"	16"	14"	12"	30"	13"	17"	15"
14"	26"	11"	15"	13"	14"	28"	12"	16"	14"	14"	30"	13"	17"	15"	14"	32"	14"	18"	16"
16"	28"	12"	16"	14"	16"	30"	13"	17"	15"	16"	32"	14"	18"	16"	16"	34"	15"	19"	17"
18"	30"	13"	17"	15"	18"	32"	14"	18"	16"	18"	34"	15"	19"	17"	18"	36"	16"	20"	18"
20"	32"	14"	18"	16"	20"	34"	15"	19"	17"	20"	36"	16"	20"	18"	20"	38"	17"	21"	19"
22"	34"	15"	19"	17"	22"	36"	16"	20"	18"	22"	38"	17"	21"	19"	22"	40"	18"	22"	20"
24"	36"	16"	20"	18"	24"	38"	17"	21"	19"	24"	40"	18"	22"	20"	24"	42"	19"	23"	21"
26"	38"	17"	21"	19"	26"	40"	18"	22"	20"	26"	42"	19"	23"	21"	26"	44"	20"	24"	22"
28"	40"	18"	22"	20"	28"	42"	19"	23"	21"	28"	44"	20"	24"	22"	28"	46"	21"	25"	23"
30"	42"	19"	23"	21"	30"	44"	20"	24"	22"	30"	46"	21"	25"	23"	30"	48"	22"	26"	24"
32"	44"	20"	24"	22"	32"	46"	21"	25"	23"	32"	48"	22"	26"	24"	32"	50"	23"	27"	25"
34"	46"	21"	25"	23"	34"	48"	22"	26"	24"	34"	50"	23"	27"	25"	34"	52"	24"	28"	26'
36"	48"	22"	26"	24"	36"	50"	23"	27"	25"	36"	52"	24"	28"	26"	36"	54"	25"	29"	27"
38"	50"	23"	27"	25"	38"	52"	24"	28"	26"	38"	54"	25"	29"	27"	38"	56"	26"	30"	28'
40"	52"	24"	28"	26"	40"	54"	25"	29"	27"	40"	56"	26"	30"	28"	40"	58"	27"	31"	29"
42"	54"	25"	29"	27"	42"	56"	26"	30"	28"	42"	58"	27"	31"	29"	42"	60"	28"	32"	30"
44"	56"	26"	30"	28"	44"	58"	27"	31"	29"	44"	60"	28"	32"	30"	44"	62"	29"	33"	31"
46"	58"	27"	31"	29"	46"	60"	28"	32"	30"	46"	62"	29"	33"	31"	46"	64"	30"	34"	32"
48"	60"	28"	32"	30"	48"	62"	29"	33"	31"	48"	64"	30"	34"	32"	48"	66"	31"	35"	33"

90° Centered Tee

Part C*_ _ 90T_ _ _ _

Part C*_ _ _ _ 90T _ _ _ _ (Plus Models)

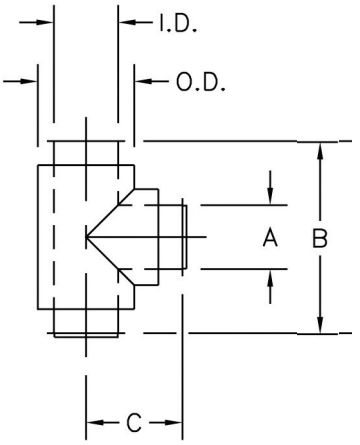
* = Add M when the “Installer Friendly” Male End is required.

The 90° Centered Tee (90T) is intended for use for the installation of barometric dampers. The 90T consists of one (1) 90-degree tee, two (2) vee band halves for the tee body, one (1) draw band for the tee body, two (2) vee band halves for the tee projection, and one (1) draw band for the tee projection. Please specify projection diameter. Plus Models include insulation strips.

Flow resistance factor: K = 1.25.

Use the following to calculate 90° Centered Tee dimensions A, B, and C with smaller projections

A = projection ID
B = projection OD + 6 in
C = ½ body OD + 3 in



NOTE: Tees are available in non-standard angles upon request.

90 DEGREE CENTERED TEE

CS & CS PLUS				CS PLUS 2				CS PLUS 3				CS PLUS 4			
I.D.	“A”	“B”	“C”	I.D.	“A”	“B”	“C”	I.D.	“A”	“B”	“C”	I.D.	“A”	“B”	“C”
4”	4”	12”	6”	4”	4”	14”	7”	4”	4”	16”	8”	4”	4”	18”	9”
5”	5”	13”	6-1/2”	5”	5”	15”	7-1/2”	5”	5”	17”	8-1/2”	5”	5”	19”	9-1/2”
6”	6”	14”	7”	6”	6”	16”	8”	6”	6”	18”	9”	6”	6”	20”	10”
7”	7”	15”	7-1/2”	7”	7”	17”	8-1/2”	7”	7”	19”	9-1/2”	7”	7”	21”	10-1/2”
8”	8”	16”	8”	8”	8”	18”	9”	8”	8”	20”	10”	8”	8”	22”	11”
9”	9”	17”	8-1/2”	9”	9”	19”	9-1/2”	9”	9”	21”	10-1/2”	9”	9”	23”	11-1/2”
10”	10”	18”	9”	10”	10”	20”	10”	10”	10”	22”	11”	10”	10”	24”	12”
12”	12”	20”	10”	12”	12”	22”	11”	12”	12”	24”	12”	12”	12”	26”	13”
14”	14”	22”	11”	14”	14”	24”	12”	14”	14”	26”	13”	14”	14”	28”	14”
16”	16”	24”	12”	16”	16”	26”	13”	16”	16”	28”	14”	16”	16”	30”	15”
18”	18”	26”	13”	18”	18”	28”	14”	18”	18”	30”	15”	18”	18”	32”	16”
20”	20”	28”	14”	20”	20”	30”	15”	20”	20”	32”	16”	20”	20”	34”	17”
22”	22”	30”	15”	22”	22”	32”	16”	22”	22”	34”	17”	22”	22”	36”	18”
24”	24”	32”	16”	24”	24”	34”	17”	24”	24”	36”	18”	24”	24”	38”	19”
26”	26”	34”	17”	26”	26”	36”	18”	26”	26”	38”	19”	26”	26”	40”	20”
28”	28”	36”	18”	28”	28”	38”	19”	28”	28”	40”	20”	28”	28”	42”	21”
30”	30”	38”	19”	30”	30”	40”	20”	30”	30”	42”	21”	30”	30”	44”	22”
32”	32”	40”	20”	32”	32”	42”	21”	32”	32”	44”	22”	32”	32”	46”	23”
34”	34”	42”	21”	34”	34”	44”	22”	34”	34”	46”	23”	34”	34”	48”	24”
36”	36”	44”	22”	36”	36”	46”	23”	36”	36”	48”	24”	36”	36”	50”	25”
38”	38”	46”	23”	38”	38”	48”	24”	38”	38”	50”	25”	38”	38”	52”	26”
40”	40”	48”	24”	40”	40”	50”	25”	40”	40”	52”	26”	40”	40”	54”	27”
42”	42”	50”	25”	42”	42”	52”	26”	42”	42”	54”	27”	42”	42”	56”	28”
44”	44”	52”	26”	44”	44”	54”	27”	44”	44”	56”	28”	44”	44”	58”	29”
46”	46”	54”	27”	46”	46”	56”	28”	46”	46”	58”	29”	46”	46”	60”	30”
48”	48”	56”	28”	48”	48”	58”	29”	48”	48”	60”	30	48”	48”	62”	31”

BTT

90T

45T

Double 45T

ALLOWABLE MAXIMUM HEIGHT ON A 90T, 45T, BTT, & DOUBLE 45T IN FEET

I.D.	MW	CS	C2A	C3A	C4A	C1+	C2+	C3+	C4+
4	346	136	110	94	83	107	76	58	47
5	316	130	108	94	84	103	74	58	47
6	313	125	106	94	85	100	74	57	48
7	295	121	105	94	86	97	73	57	48
8	281	118	102	94	85	95	72	57	48
9	271	116	102	94	86	93	71	57	48
10	263	114	101	94	87	92	70	57	48
12	250	113	100	94	87	89	70	57	48
14	247	110	99	94	88	87	69	57	48
16	239	108	99	94	89	87	69	56	48
18	208	95	87	82	78	76	60	50	43
20	182	84	77	74	58	67	54	45	34
22	162	75	69	54	52	60	48	35	31
24	147	68	52	49	47	54	38	32	28
26	83	46	37	36	35	34	28	24	22
28	69	39	31	30	29	28	24	20	18
30	56	31	25	25	24	23	19	17	15
32	45	25	20	20	19	18	16	14	12
34	35	20	16	16	15	14	12	11	9
36	27	15	12	12	12	11	9	8	7
38	20	11	11	10	10	10	8	7	7
40	20	11	11	10	10	10	8	7	7
42	20	11	11	10	10	10	8	7	7
44	20	11	11	10	10	9	8	7	7
46	20	11	10	10	10	9	8	7	7
48	20	11	10	10	10	9	8	7	7

WYE Section

Part C*_ _ WYE _ _ _ _

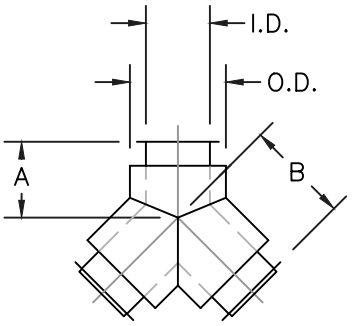
Part C*_ _ _ _ WYE _ _ _ _ (Plus Models)

***** = Add M when the "Installer Friendly" Male End is required.

The WYE Section (WYE) is used to manifold appliances into one common breeching or chimney. The WYE consists of one (1) wye section, four (4) vee band halves, and two (2) draw bands.

Plus Models include insulation strips.

Flow resistance factor: K = 0.60

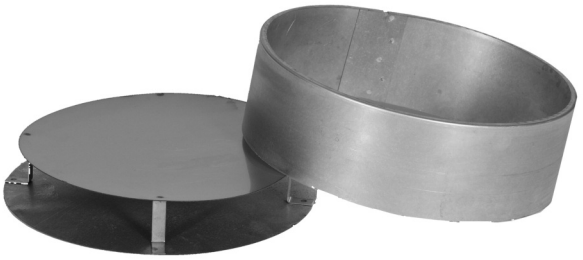


CS & CS PLUS			CS PLUS 2			CS PLUS 3			CS PLUS 4		
I.D.	"A"	"B"	I.D.	"A"	"B"	I.D.	"A"	"B"	I.D.	"A"	"B"
4"	4-3/4"	6-1/2"	4"	5-3/16"	7-1/2"	4"	5-9/16"	8-1/2"	4"	6"	9-1/2"
5"	4-15/16"	7"	5"	5-3/8	8"	5"	5-3/4"	9"	5"	6-3/16	10"
6"	5-3/16"	7-1/2"	6"	5-9/16"	8-1/2"	6"	6"	9-1/2"	6"	6-3/8"	10-1/2"
7"	5-3/8"	8"	7"	5-3/4"	9"	7"	6-3/16"	10"	7"	6-5/8"	11"
8"	5-9/16"	8-1/2"	8"	6"	9-1/2"	8"	6-7/16"	10-1/2"	8"	6-13/16"	11-1/2"
9"	5-3/4"	9"	9"	6-3/16"	10"	9"	6-5/8"	11"	9"	7"	12"
10"	6"	9-1/2"	10"	6-7/16"	10-1/2"	10"	6-13/16"	11-1/2"	10"	7-1/4"	12-1/2"
12"	6-7/16"	10-1/2"	12"	6-13/16"	11-1/2"	12"	7-1/4"	12-1/2"	12"	7-5/8"	13-1/2"
14"	6-13/16"	11-1/2"	14"	7-1/4"	12-1/2"	14"	7-5/8"	13-1/2"	14"	8-1/16"	14-1/2"
16"	7-1/4"	12-1/2"	16"	7-5/8"	13-1/2"	16"	8-1/16"	14-1/2"	16"	8-1/2"	15-1/2"
18"	7-5/8"	13-1/2"	18"	8-1/16"	14-1/2"	18"	8-1/2"	15-1/2"	18"	8-7/8"	16-1/2"
20"	8-1/16"	14-1/2"	20"	8-1/2"	15-1/2"	20"	8-7/8"	16-1/2"	20"	9-5/16"	17-1/2"
22"	8-1/2"	15-1/2"	22"	8-7/8"	16-1/2"	22"	9-5/16"	17-1/2"	22"	9-3/4"	18-1/2"
24"	8-7/8"	16-1/2"	24"	9-5/16"	17-1/2"	24"	9-3/4"	18-1/2"	24"	10-1/8"	19-1/2"
26"	9-5/16"	17-1/2"	26"	9-3/4"	18-1/2"	26"	10-1/8"	19-1/2"	26"	10-9/16"	20-1/2"
28"	9-3/4"	18-1/2"	28"	10-1/8"	19-1/2"	28"	10-9/16"	20-1/2"	28"	10-15/16"	21-1/2"
30"	10-1/8"	19-1/2"	30"	10-9/16"	20-1/2"	30"	10-15/16"	21-1/2"	30"	11-3/8"	22-1/2"
32"	10-9/16"	20-1/2"	32"	10-15/16"	21-1/2"	32"	11-3/8"	22-1/2"	32"	11-13/16"	23-1/2"
34"	10-15/16"	21-1/2"	34"	11-3/8"	22-1/2"	34"	11-13/16"	23-1/2"	34"	12-3/16"	24-1/2"
36"	11-3/8"	22-1/2"	36"	11-13/16"	23-1/2"	36"	12-3/16"	24-1/2"	36"	12-5/8"	25-1/2"
38"	11-13/16"	23-1/2"	38"	12-3/16"	24-1/2"	38"	12-5/8"	25-1/2"	38"	13-1/16"	26-1/2"
40"	12-3/16"	24-1/2"	40"	12-5/8"	25-1/2"	40"	13-1/16"	26-1/2"	40"	13-7/16"	27-1/2"
42"	12-5/8"	25-1/2"	42"	13-1/16"	26-1/2"	42"	13-7/16"	27-1/2"	42"	13-7/8"	28-1/2"
44"	13-1/16"	26-1/2"	44"	13-7/16"	27-1/2"	44"	13-7/8"	28-1/2"	44"	14-1/4"	29-1/2"
46"	13-7/16"	27-1/2"	46"	13-7/8"	28-1/2"	46"	14-1/4"	29-1/2"	46"	14-11/16"	30-1/2"
48"	13-7/8"	28-1/2"	48"	14-1/4"	29-1/2"	48"	14-11/16"	30-1/2	48"	15-1/8"	31-1/2"

CS End Cap

Part C_ _ CAP_ _

The CS End Cap (CAP) is used to close a system and provide an access or clean out and inspection cover. The CAP consists of one (1) end cap, two (2) vee band halves, and one (1) end cap cover band. This cap is used for the original design Model CS



CS End Cap with Drain

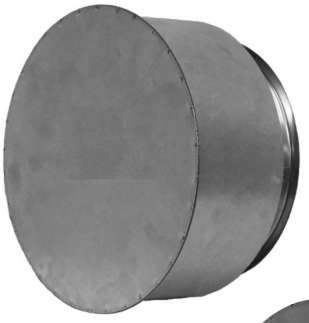
Part C_ _ C/D_ _

The CS End Cap with Drain (C/D) serves as a drain at the base of vertical tee sections. The C/D has one (1) 3/4-inch threaded drain nipple, and it consists of one (1) end cap with drain, two (2) vee band halves, and one (1) end cap cover band. This cap is used for the original design Model CS.

CM End Cap

Part CM_ _ CAP_ _

The CM End Cap (CAP) accommodates the Male End when ordering Van Packer's installer-friendly Model CS Series with Male End. CAP is used to close a system and provide an access or clean out and inspection cover. CAP consists of one (1) end cap, two (2) vee band halves, and one (1) end cap draw band.



CM End Cap with Drain

Part CM ._ _ C/D_ _

The CM End Cap with Drain (C/D) accommodates the Male End when ordering Van Packer's installer-friendly Model CS Series with Male End. C/D has one (1) 3/4-inch threaded drain nipple. The C/D consists of one (1) end cap with drain, two (2) vee band halves, and one (1) draw band.

CSplus End Cap

Part C*_ _ _ _ CAP_ _

The CSplus End Cap (CAP) is used to close a system and provide an access or clean out and inspection cover. The CAP consists of one (1) end cap, two (2) vee band halves, one (1) draw band, and insulation strip. This part is used for the Model CSplus or CSplus with male end.

CSplus End Cap with Drain

Part C*_ _ _ _ C/D_ _

The CSplus End Cap with Drain (C/D) has one (1) 3/4-inch threaded drain nipple. The C/D consists of one (1) end cap with drain, two (2) vee band halves, one (1) draw band, and insulation strip. This part is used for the Model CSplus or CSplus with male end,

Plate Support Assembly

Part C _ _ PLS _

The Plate Support Assembly (PLS) consists of one (1) two-piece square support plate, one (1) two-piece round clamp flange, two (2) half draw bands, and 3/8-inch diameter nuts and bolts. The PLS is used in conjunction with field-fabricated support members to provide structural vertical support for the chimney. Plus Models include insulation strips.

MAXIMUM HEIGHT ON A PLS IN FEET

I.D.	MW	CS	C2A	C3A	C4A	C1+	C2+	C3+	C4+
4	1269	500	402	344	306	393	280	212	174
5	1060	435	361	314	283	346	249	193	158
6	967	387	328	290	264	311	229	176	148
7	851	350	303	271	248	279	210	164	138
8	763	321	278	254	232	258	195	154	129
9	695	298	261	241	221	238	182	146	123
10	641	279	247	229	211	224	172	138	117
12	547	246	219	205	191	195	153	124	105
14	500	223	201	190	178	177	140	115	98
16	454	205	187	178	168	164	130	107	92
18	418	191	174	165	157	153	122	100	86
20	389	179	165	157	123	144	115	95	73
22	366	170	156	123	117	136	109	80	70
24	351	162	124	118	113	129	91	77	67
26	243	135	109	104	101	99	83	71	63
28	246	137	110	106	103	100	84	73	64
30	247	138	112	108	104	101	85	74	65
32	249	140	113	109	106	101	86	74	66
34	250	141	114	110	107	102	87	75	67
36	252	142	115	112	108	103	88	76	68
38	174	96	92	90	88	83	72	64	57
40	159	88	84	82	81	76	66	59	53
42	146	81	77	76	74	70	61	54	48
44	133	74	71	69	68	64	56	49	44
46	122	68	65	64	62	59	51	45	41
48	112	62	60	59	57	54	47	42	38

Wall Support Assembly

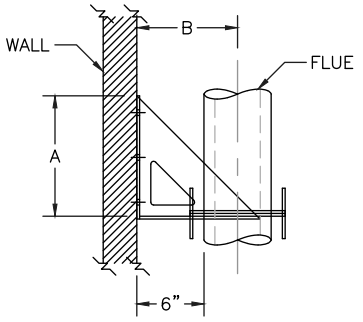
Part C _ _ WSA _

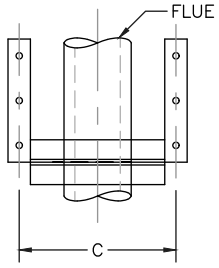
Part C _ _ _ _ WSA _ (Plus Models)

The Wall Support Assembly (WSA) supports vertical lengths of chimney along a wall or chase. The WSA consists of two (2) wall brackets, one (1) two-piece bottom support plate, one (1) two-piece top support plate, two (2) half draw bands, and 3/8-inch diameter nuts and bolts. Plus Models include insulation strips. Installing contractor to supply 1/2-inch hardware to securely fasten WSA to the wall.

WSA ALLOWABLE HEIGHT IN FEET

I.D.	MW	CS	C2A	C3A	C4A	C1+	C2+	C3+	C4+
4"	1009	398	320	273	243	312	222	168	138
5"	820	336	279	243	219	268	193	149	123
6"	729	292	248	219	199	234	173	133	111
7"	625	257	222	199	182	205	154	120	102
8"	547	230	199	182	166	185	140	110	92
9"	486	208	182	168	154	166	127	102	86
10"	437	190	168	156	144	153	117	94	80
12"	364	164	146	137	127	130	102	83	70
14"	320	143	129	121	114	113	90	73	62
16"	279	126	115	109	103	101	80	66	56
18"	248	113	103	98	93	90	72	59	51
20"	222	103	94	90	70	82	66	54	42
22"	202	94	86	68	64	75	60	44	38
24"	187	86	66	63	60	69	49	41	36
26"	118	66	53	51	49	48	40	35	31
28"	110	62	50	48	46	45	38	33	29
30"	103	58	47	45	43	42	35	31	27
32"	96	54	44	42	41	39	33	29	26
34"	87	49	40	38	37	36	30	26	23
36"	79	45	36	35	34	32	28	24	21
38"	54	30	29	28	27	26	23	20	18
40"	49	27	26	26	25	24	21	18	16
42"	45	25	24	23	23	22	19	17	15
44"	41	23	22	21	21	20	17	15	14
46"	37	21	20	19	19	18	16	14	12
48"	34	19	18	18	17	16	14	13	11





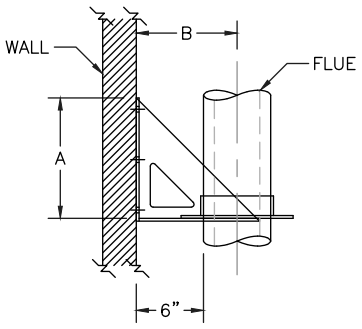
WALL SUPPORT ASSEMBLY DIMENSIONAL DATA

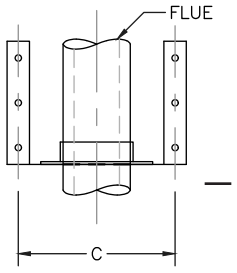
CS & CS PLUS				CS PLUS 2				CS PLUS 3				CS PLUS 4			
I.D.	"A"	"B"	"C"	I.D.	"A"	"B"	"C"	I.D.	"A"	"B"	"C"	I.D.	"A"	"B"	"C"
4"	14"	9"	15-1/2"	4"	15"	10"	15-1/2"	4"	16"	11"	15-1/2"	4"	17"	12"	15-1/2"
5"	14"	9-1/2"	16-1/2"	5"	15"	10-1/2"	16-1/2"	5"	16"	11-1/2"	16-1/2"	5"	17"	12-1/2"	16-1/2"
6"	15"	10"	17-1/2"	6"	16"	11"	17-1/2"	6"	17"	12"	17-1/2"	6"	18"	13"	17-1/2"
7"	15"	10-1/2"	18-1/2"	7"	16"	11-1/2"	18-1/2"	7"	17"	12-1/2"	18-1/2"	7"	18"	13-1/2"	18-1/2"
8"	16"	11"	19-1/2"	8"	17"	12"	19-1/2"	8"	18"	13"	19-1/2"	8"	19"	14"	19-1/2"
9"	16"	11-1/2"	20-1/2"	9"	17"	12-1/2"	20-1/2"	9"	18"	13-1/2"	20-1/2"	9"	19"	14-1/2"	20-1/2"
10"	17"	12"	21-1/2'	10"	18"	13"	21-1/2'	10"	19"	14"	21-1/2'	10"	20"	15"	21-1/2"
12"	18"	13"	22-1/2"	12"	19"	14"	22-1/2"	12"	20"	15"	22-1/2"	12"	25"	16"	22-1/2"
14"	19"	14"	23-1/2"	14"	20"	15"	23-1/2"	14"	25"	16"	23-1/2"	14"	26"	17"	23-1/2"
16"	20"	15"	24-1/2"	16"	25"	16"	24-1/2"	16"	26"	17"	24-1/2"	16"	28"	18"	24-1/2"
18"	25"	16"	29"	18"	26"	17"	29"	18"	28"	18"	29"	18"	29"	19"	29"
20"	26"	17"	31"	20"	28"	18"	31"	20"	29"	19"	31"	20"	31"	20"	31"
22"	28"	18"	33"	22"	29"	19"	33"	22"	31"	20"	33"	22"	32"	21"	33"
24"	29"	19"	35"	24"	31"	20"	35"	24"	32"	21"	35"	24"	34"	22"	35"
26"	31"	20"	37"	26"	32"	21"	37"	26"	34"	22"	37"	26"	35"	23"	37"
28"	32"	21"	39"	28"	34"	22"	39"	28"	35"	23"	39"	28"	37"	24"	39"
30"	34"	22"	41"	30"	35"	23"	41"	30"	37"	24"	41"	30"	38"	25"	41"
32"	35"	23"	43"	32"	37"	24"	43"	32"	38"	25"	43"	32"	40"	26"	43"
34"	37"	24"	45"	34"	38"	25"	45"	34"	40"	26"	45"	34"	41"	27"	45"
36"	38"	25"	47"	36"	40"	26"	47"	36"	41"	27"	47"	36"	43"	28"	47"
38"	40"	26"	49"	38"	41"	27"	49"	38"	43"	28"	49"	38"	44"	29"	49"
40"	41"	27"	51"	40"	43"	28"	51"	40"	44"	29"	51"	40"	46"	30"	51"
42"	43"	28"	53"	42"	44"	29"	53"	42"	46"	30"	53"	42"	47"	31"	53"
44"	44"	29"	55"	44"	46"	30"	55"	44"	47"	31"	55"	44"	49"	32"	55"
46"	46"	30"	57"	46"	47"	31"	57"	46"	49"	32"	57"	46"	50"	33"	57"
48"	47"	31"	59"	48"	49"	32"	59"	48"	50"	33"	59"	48"	52"	34"	59"

Wall Guide Assembly

Part C _ _ WGA _

The Wall Guide Assembly (WGA) laterally supports vertical lengths of chimney along a wall or chase. The WGA consists of two (2) wall brackets, two (2) half angle rings, and 3/8-inch hardware. Installing contractor to supply 1/2-inch hardware to fasten WGA to the wall.





* C02WGA is designated for 4 in diameter Model MW (single wall) chimney.
** C03WGA is designated for 5 in diameter Model MW (single wall) chimney..

WALL GUIDE ASSEMBLY

CS			
I.D.	"A"	"B"	"C"
2" *	12"	8"	10-15/16"
3" **	12"	8-1/2"	11-15/16"
4"	14"	9"	12-7/8"
5"	14"	9-1/2"	13-7/8"
6"	15"	10"	14-7/8"
7"	15"	10-1/2"	16"
8"	16"	11"	17"
9"	16"	11-1/2"	18"
10"	17"	12"	18-7/8"
12"	18"	13"	20-7/8"
14"	19"	14"	22-7/8"
16"	20"	15"	24-7/8"
18"	25"	16"	26-7/8"
20"	26"	17"	29"
22"	28"	18"	31"
24"	29"	19"	33-1/16"
26"	31"	20"	35-1/16"
28"	32"	21"	37-1/16"
30"	34"	22"	39-1/16"
32"	35"	23"	41-1/16"
34"	37"	24"	43-1/16"
36"	38"	25"	45-1/16"
38"	40"	26"	47-1/16"
40"	41"	27"	49-1/16"
42"	43"	28"	51-1/16"
44"	44"	29"	53-1/16"
46"	46"	30"	55-1/16"
48"	47"	31"	57-1/16"
50"	49"	32"	59-1/16"
52"	50"	33"	61-1/16"
54"	52"	34"	63-1/16

Refer to the following guidelines to determine the appropriate size:

Product Configuration:	**12 in ID Flue**
CS / C1+ → Same as ID	(C12WGA)
C2+ → One size larger than ID	(C14WGA)
C3+ → Two sizes larger than ID	(C16WGA)
C4+ → Three sizes larger than ID	(C18WGA)

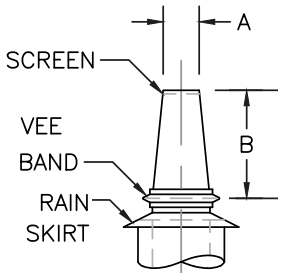
Velocity Cone with Screen

Part C _ _ VCS

Part C _ _ _ _ VCS _ _ (Plus Models)

The Velocity Cone with Screen (VCS) is designed to increase the exit velocity approximately 1-1/2 times. It includes a screen in the top to prevent birds from entering the chimney. The VCS section consists of one (1) velocity cone screen section, two (2) vee band halves, and one (1) rain skirt.

Flow resistance factor: K = 1.50



CS, CS PLUS,1,2,3,4		
I.D.	"A"	"B"
4"	CONSULT FACTORY	
5"	CONSULT FACTORY	
6"	4-1/2"	7-1/2"
7"	5-11/16"	7-1/2"
8"	6-1/2"	7-1/2"
9"	7-5/16"	7-1/2"
10"	8"	7-1/2"
12"	10"	7-1/2"
14"	11-1/2"	7-1/2"
16"	13"	7-1/2"
18"	14-1/2"	7-1/2"
20"	16"	7-1/2"
22"	18"	7-1/2"
24"	19-1/2"	8-3/8"
26"	21-1/4"	8-7/8"
28"	22-1/2"	22-1/2"
30"	24-1/2"	10-1/4"
32"	26"	11-1/4"
34"	27-1/2"	12-1/8"
36"	29-1/2"	12-1/8"
38"	31"	13"
40"	32-1/2"	14"
42"	34-1/4"	14-1/2"
44"	36"	14-7/8"
46"	37-1/2"	15-7/8"
48"	39-1/4"	16-3/8"

Breeching Hanger Band

Part C _ _ BHB _

The Breeching Hanger Band (BHB) supports horizontal lengths of breeching in sizes 4 in ID to 24 in ID and for Models CS and CS+1. Do not use on exterior portions of horizontal breechings. The BHB consists of one (1) half breeching hanger band. Installing contractor to supply 1/2-inch diameter threaded rod supports.

Half Angle Ring

Part C _ _ HAR _

The Half Angle Ring (HAR) supports horizontal lengths of breeching in sizes 4 in ID to 24 in ID for Models CSplus 2, 3, and 4 Series. Do not use on exterior portions of horizontal breechings. The HAR consists of one (1) half angle ring. Installing contractor to supply 1/2-inch diameter threaded rod supports.

Full Angle Ring

Part C _ _ FAR _

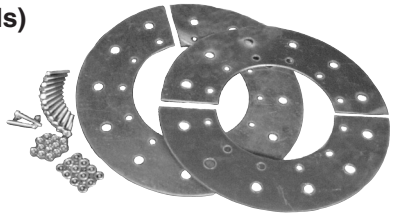
The Full Angle Ring (FAR) laterally supports vertical chimneys and horizontal lengths of breeching in any size and model. Recommended on sizes 26 in ID through 48 in ID and all sizes of Plus 2, 3, and 4 Series. The FAR consists of two (2) half angle rings, and 1/2-inch nuts and bolts. Use the Full Angle Ring support on all models being used on exterior installations. Installing contractor to supply 1/2-inch diameter threaded rod supports.

Guy Attachment Ring

Part C _ _ GAR _

Part C _ _ _ _ GAR _ (Plus Models)

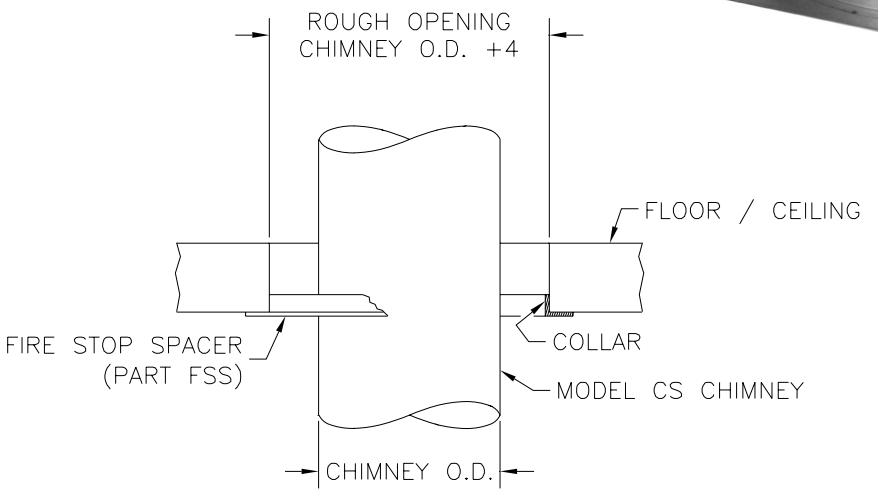
The Guy Attachment Ring (GAR) is used for lateral support. The GAR consists of four (4) half clamp rings, two (2) half draw bands, and 3/8-inch nuts and bolts. Plus Models include insulation strips.



Fire Stop Spacer

Part C _ _ FSS _
Part C _ _ _ _ FSS _ (Plus Models)

The Fire Stop Spacer (FSS) is for use when penetrating a floor, ceiling, or interior side of a roof. The FSS consists of one (1) fire stop spacer.

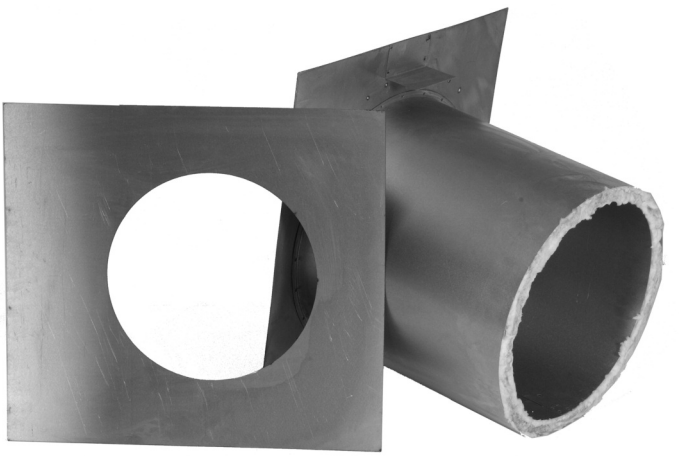


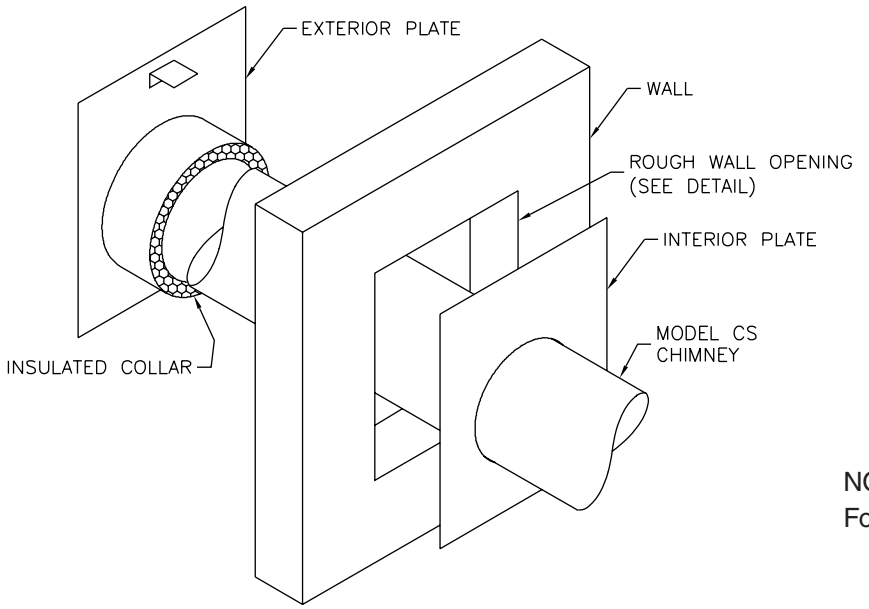
Exterior Wall Penetration

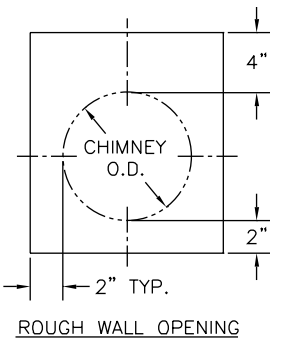
Part C _ _ EWP _
Part C _ _ _ _ EWP _ (Plus Models)

The Exterior Wall Penetration (EWP) is used to penetrate walls of either combustible or non-combustible construction. The EWP consists of one (1) interior plate and one (1) exterior plate with insulated wall sleeve.

NOTES:
1. Maximum allowable wall thickness is 14 inches
2. Insulated collar may require field cutting for proper installation
3. Dimensions based on 4 in ID to 36 in ID
4. Contact factory for larger sizes





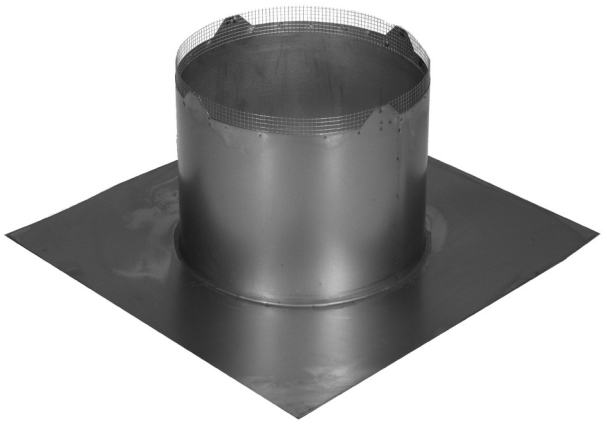


NOTE: Dimensions based on 4" to 36" I.D.
For larger sizes contact factory.

Flashing

Part C _ _ FLS _

Flashing (FLS) is installed when the exhaust system is penetrating a roof structure. The FLS consists of one (1) flashing. This part is designed for use on a flat roof or on top of a roof curb. For sloped roofs please consult with a Van-Packer factory representative.



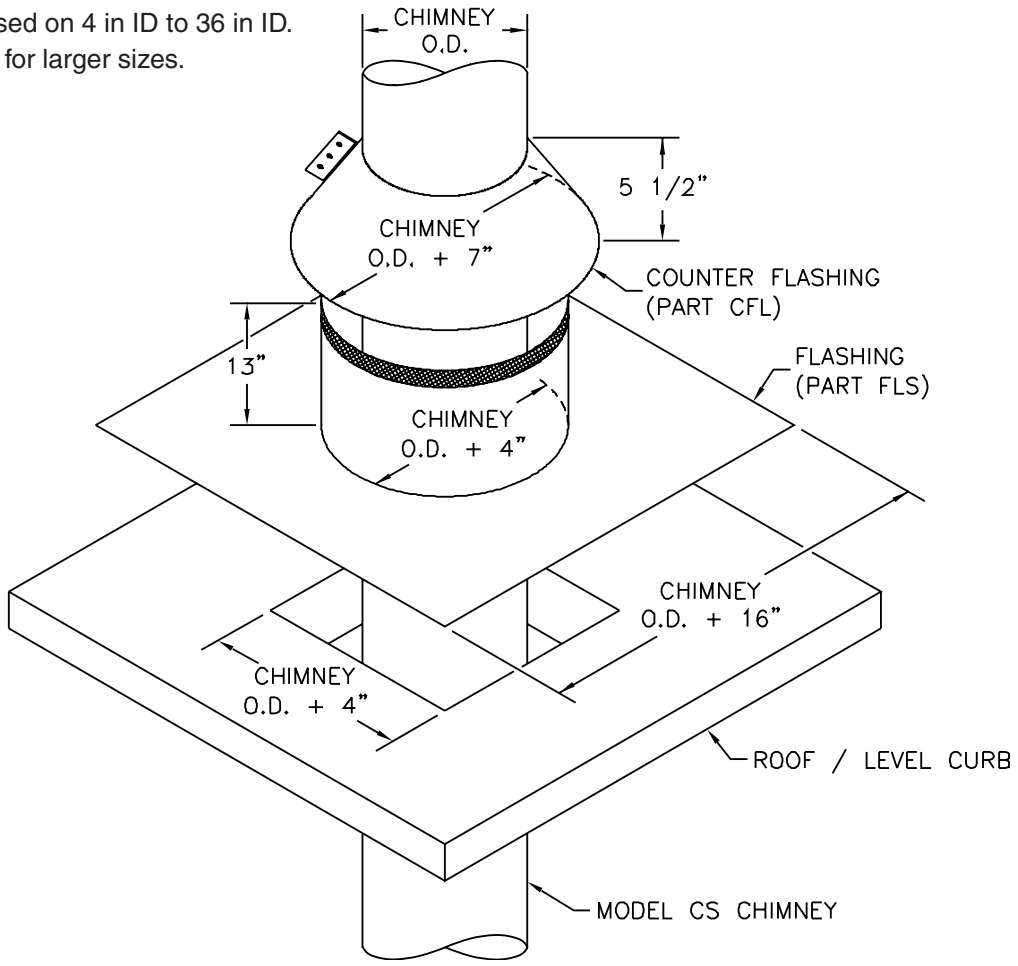
Counter Flashing

Part C _ _ CFL _

This part is installed above the flashing to provide rain protection. Sealant should be applied to form a weather tight seal. The CFL consists of one (1) counter flashing, and hardware.

NOTES:

1. Dimensions based on 4 in ID to 36 in ID.
2. Contact factory for larger sizes.

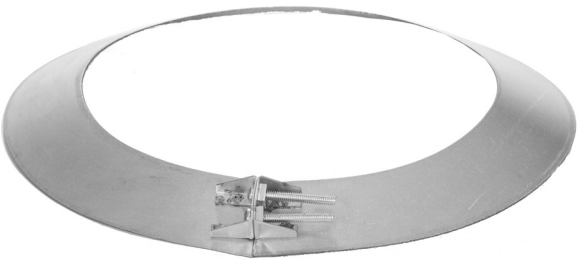


Rain Skirt

Part C _ _ RSK _

Part C _ _ _ _ RSK _ (Plus Models)

The Rain Skirt (RSK) protects the space between the liner and the shell from the elements by closing off the gap between the liner and shell. The RSK consists of one (1) rain skirt, nuts and bolts.



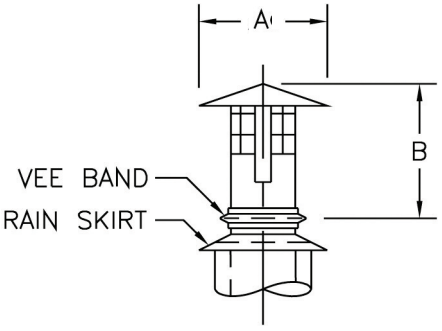
Rain Cap with Screen

Part C _ _ _ SCS _

Part C _ _ _ SC _ (Plus Models)

The Rain Cap with Screen (SCS) used for vertical terminations. The SCS consists of one (1) rain cap with screen, two (2) vee band halves, and one (1) rain skirt.

Flow resistance factor: K = 1.25



Rain Cap with Screen		
I.D.	**A**	**B**
4"	**8"**	**8-3/8"**
5"	**10"**	**9-7/16"**
6"	**12"**	**10-1/2"**
7"	**14"**	**11-5/8"**
8"	**16"**	**12-11/16"**
9"	**18"**	**13-3/4"**
10"	**20"**	**14-7/8"**
12"	**24"**	**17"**
14"	**28"**	**19-3/16"**
16"	**32"**	**21-3/8"**
18"	**36"**	**23-1/2"**
20"	**40"**	**25-11/16"**
22"	**44"**	**27-7/8"**
24"	**48"**	**30"**
26"	**52"**	**31-9/16"**
28"	**56"**	**33-11/16"**
30"	**60"**	**35-7/8"**

32"		
34"		
36"		
38"	Sizes 32"- 48" are considered custom. You must consult the factory.	
40"		
42"		
44"		
46"		
48"		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