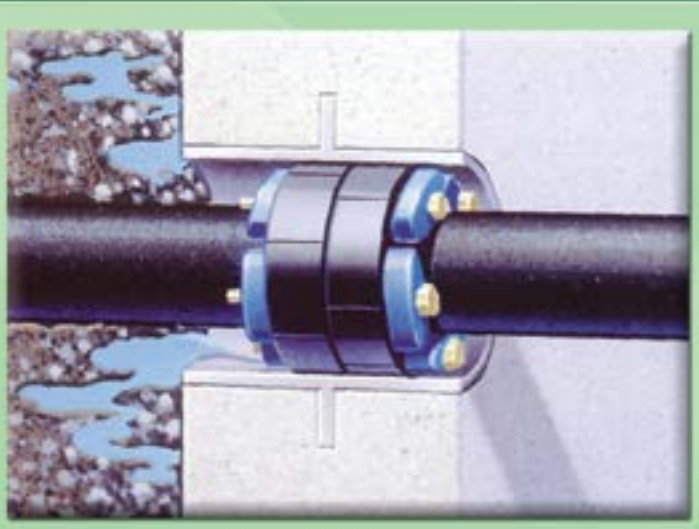
$8.00

PIPESEAL PENETRATION SEAL

APPLICATION & DESIGN GUIDE



WATER SEALS

FIRE SEALS

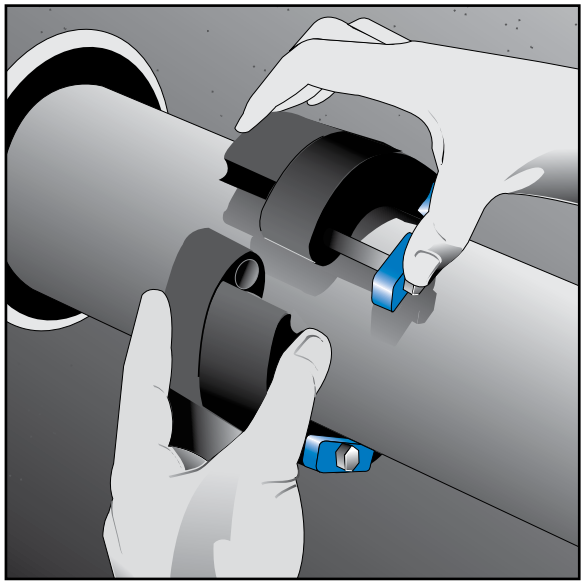
FLEXICRAFT

2315 W. HUBBARD ST. • CHICAGO, IL 60612 • 800-533-1024 • 312-738-3588 • FAX 312-421-6327

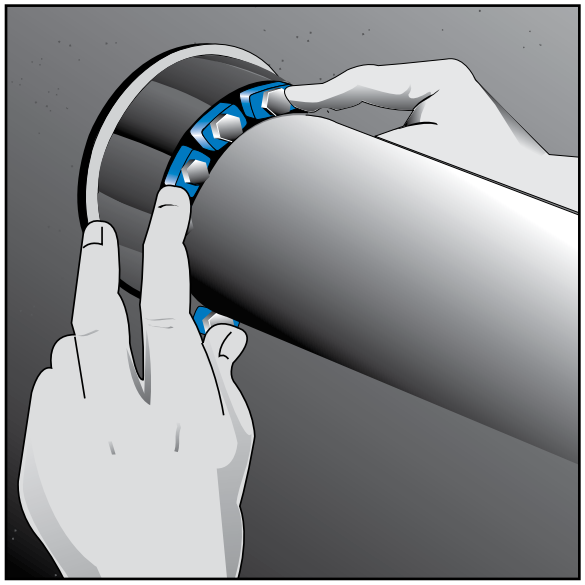
INSTALLATION

The PipeSeal forms a water-tight mechanical seal between the pipe and the hole through which it passes.

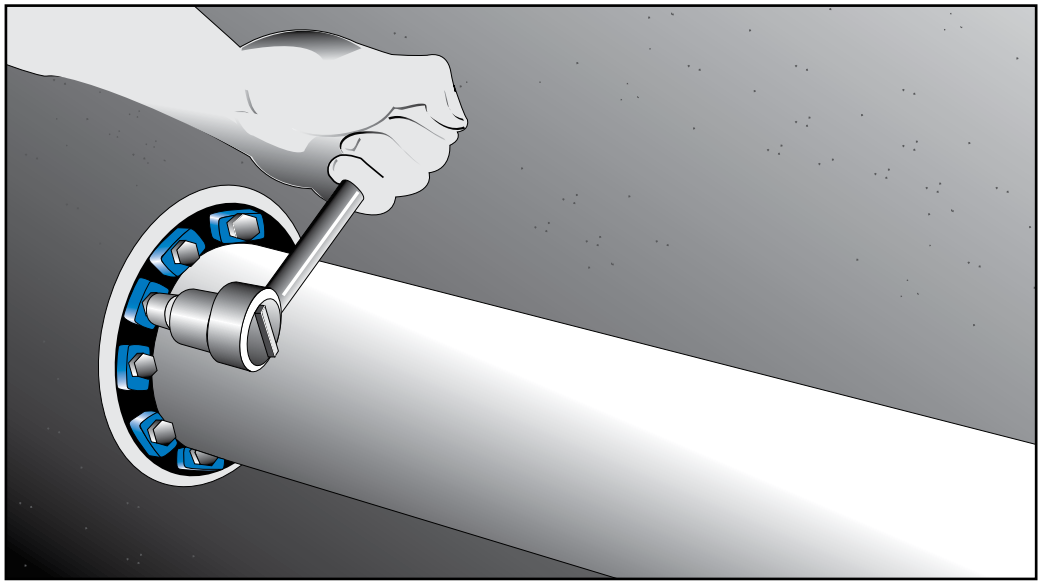
Easy as One, Two, Three



1. Wrap the belt around the pipe. Then connect the first and last links. The proper size and number of links can be found in the catalog.



2. Slide the assembly into the space between the pipe and wall.



3. Gradually and sequentially tighten the bolts. Tighten each bolt 2-3 turns making 5 to 9 passes completely around the pipe. Do not cross tighten. The PipeSeal links expand to create a gas and water tight seal.

See Page 9 for detailed installation instructions.

INTRODUCTION

The *PipeSeal* from Flexicraft is the fast and economical way to seal piping and conduit in wall and floor penetrations. Whether using the water seal or the fire stop seal, the benefits are clear.

Quick Installation
The PipeSeal installs in minutes compared to the other alternatives

Long Life
Designed as a permanent seal, it resists sunlight, ozone, water, and a range of chemicals.

Pressure Rated
The PipeSeal can withstand 20 psi of pressure.

Vibration and Shock Protection
Transfer of vibration and shock in a pipeline is greatly reduced by the rubber seal.

Versatile
Three types of elastomers and a choice of plated carbon steel or 316 stainless steel hardware are provided for the water seals.

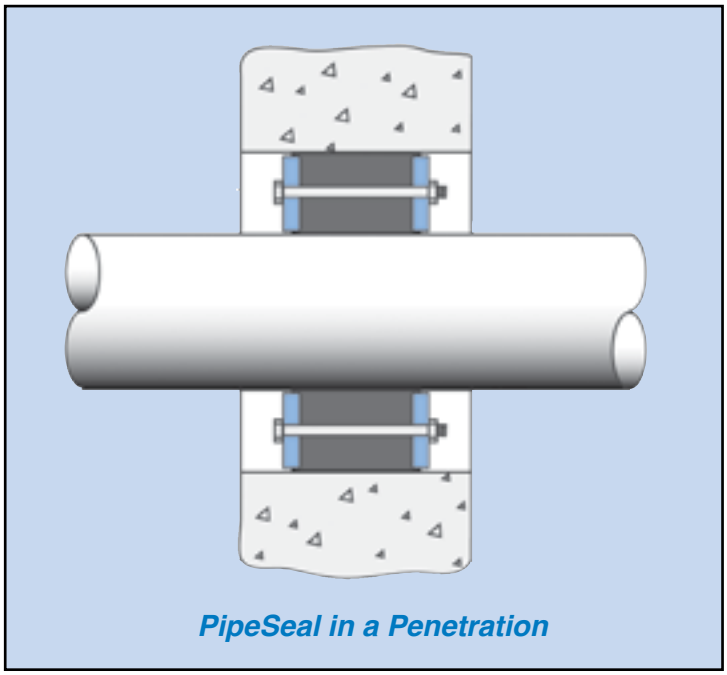
And the UL classified ***F2HR Fire Seal*** fire stop device, shown in the included submittals for various configuration systems, provides additional benefits.

2 Hour Fire Rating
Matched with the type of installation, the F2HR provides up to 2 hours of protection with an intumescent seal.

Verifiable Seal
The seal is easy to identify for inspectors, who can verify that the stop is in place at a glance.

No Curing Time or Waste
There is no 10-14 days of curing time required, as with caulks. Again unlike caulk, there is no wasted material with the F2HR PipeSeal.

PipeSeals come in a variety of model sizes. Choosing the right model and number of links for your penetration is covered in the following pages.



PipeSeal in a Penetration

SELECTION

For most applications the appropriate PipeSeal can be selected from the charts on the subsequent pages. If your pipe and wall opening dimensions do not appear on these charts, use the methods in the calculations shown later, or go to the Flexicraft web site and use the sizing calculator.

Specifically:

1. Find the chart that applies to your pipe material. Next locate your pipe size on the chart.

2. Determine your wall opening. Select either a wall sleeve or a core drilled hole, depending on which you plan to use.

3. Find your "Nominal Pipe Size", and read across to determine the appropriate PipeSeal model and number of links required.

4. Select the PipeSeal Type from the table below.

5. Order as follows for an example of a PS-475 size, 10 links, Type ES: **PS475ES10**.

SEAL TYPE CHART

TYPE	MATERIALS			TEMP RANGE (ºF)	APPLICATION
	SEAL	PRESSURE PLATES	BOLTS/ METAL		
E	EPDM	GLASS REINFORCED PLASTIC	STEEL ZINC DICHOROMATE	-40 to +250	Suitable for most applications in water, both above ground and direct burial. Provides electrical insulation where cathodic protection is required.
ES	EPDM	GLASS REINFORCED PLASTIC	316 STAINLESS STEEL	-40 to +250	Suitable for environments where the corrosion resistance of stainless steel hardware is required.
N	NITRILE	GLASS REINFORCED PLASTIC	STEEL ZINC DICHOROMATE	-40 to +210	Resistant to most hydrocarbons, oil, gas, jet fuel, and many solvents.
NS	NITRILE	GLASS REINFORCED PLASTIC	316 STAINLESS STEEL	-40 to +210	Same as above but with corrosion resistance of stainless steel hardware.
S	SILICONE	STEEL ZINC DICHOROMATE	STEEL ZINC DICHOROMATE	-40 to +400	Suitable for high temperature pipelines up to 400º F.
F	IMPREGNATED EPDM	STEEL ZINC DICHOROMATE	STEEL ZINC DICHOROMATE	-40 to +250	Suitable for an intumescent fire stop.

SELECTION CHARTS

Standard Weight Steel, PVC and CPVC Pipe

NOMINAL PIPE SIZE	ACTUAL PIPE O.D	STANDARD WEIGHT STEEL PIPE SLEEVE				CORE DRILL OR CAST HOLE*		
		SLEEVE NOMINAL PIPE SIZE	SLEEVE ACTUAL I.D	PIPE SEAL MODEL NO.	NO. OF LINKS NEEDED	HOLE I.D.	PIPE SEAL MODEL NO.	NO. OF LINKS NEEDED
1/2 "	0.840 "	2"	2.067 "	PS 200	4	2.000 "	PS 200	4
3/4"	1.050 "	2-1/2"	2.469 "	PS 275	6	2.500 "	PS 275	6
1"	1.315 "	2-1/2"	2.469 "	PS 200	5	3.000 "	PS 315	4
1-1/4"	1.660 "	3"	3.068 "	PS 275	8	3.000 "	PS 275	8
1-1/2"	1.900 "	3"	3.068 "	PS 200	7	3.500 "	PS 300	5
2"	2.375 "	3-1/2"	3.548 "	PS 200	8	4.000 "	PS 300	6
2-1/2"	2.875 "	4"	4.026 "	PS 200	9	4.000 "	PS 200	9
3"	3.500 "	5"	5.047 "	PS 300	8	5.000 "	PS 300	8
3-1/2"	4.000 "	6"	6.065 "	PS 315	10	6.000 "	PS 315	10
4"	4.500 "	6"	6.065 "	PS 300	10	6.000 "	PS 300	10
5"	5.563 "	8"	7.981 "	PS 340	13	8.000 "	PS 340	13
6"	6.625 "	10"	10.020 "	PS 475	10	10.000 "	PS 475	10
8"	8.625 "	12"	12.000 "	PS 475	12	12.000 "	PS 475	12
10"	10.750 "	14"	13.250 "	PS 425	10	14.000 "	PS 475	14
12"	12.750 "	16"	15.250 "	PS 425	12	16.000 "	PS 475	17
14"	14.000 "	18"	17.250 "	PS 475	18	18.000 "	PS 575	16
16"	16.000 "	20"	19.250 "	PS 475	21	20.000 "	PS 575	18
18"	18.000 "	22"	21.250 "	PS 475	23	22.000 "	PS 575	20
20"	20.000 "	24"	23.250 "	PS 475	25	24.000 "	PS 575	22
22"	22.000 "	26"	25.250 "	PS 475	28	26.000 "	PS 575	24
24"	24.000 "	28"	27.250 "	PS 475	30	28.000 "	PS 575	26
26"	26.000 "	30"	29.250 "	PS 475	33	30.000 "	PS 575	28
28"	28.000 "	32"	31.250 "	PS 475	35	32.000 "	PS 575	30
30"	30.000 "	34"	33.250 "	PS 475	37	34.000 "	PS 575	32
32"	32.000 "	36"	35.250 "	PS 475	40	36.000 "	PS 575	34
34"	34.000 "	40"	39.250 "	PS 500	29	38.000 "	PS 575	36
36"	36.000 "	42"	41.250 "	PS 500	31	40.000 "	PS 575	38
42"	42.000 "	48"	47.250 "	PS 500	36	46.000 "	PS 575	44
48"	48.000 "	54"	53.250 "	PS 500	41	52.000 "	PS 575	50

* Min. recommended sleeve length or wall thickness is 4” for PipeSeal Model 325 and 6” for models 400 and larger.
PVC sleeves are sch. 40, and have a different I.D. at 12” and above.

SELECTION CHARTS

Cast Iron Soil Pipe (Extra Heavy)

NOMINAL PIPE SIZE	ACTUAL PIPE O.D	STANDARD WEIGHT STEEL PIPE SLEEVE				CORE DRILL OR CAST HOLE*		
		SLEEVE NOMINAL PIPE SIZE	SLEEVE ACTUAL I.D	PIPE SEAL MODEL NO.	NO. OF LINKS NEEDED	HOLE I.D.	PIPE SEAL MODEL NO.	NO. OF LINKS NEEDED
2"	2.380 "	3-1/2"	3.548 "	PS 200	8	4.000 "	PS 300	6
3"	3.500 "	5"	5.047 "	PS 300	8	5.000 "	PS 300	8
4"	4.500 "	6"	6.065 "	PS 300	10	6.000 "	PS 300	10
5"	5.500 "	8"	7.981 "	PS 340	13	8.000 "	PS 340	13
6"	6.500 "	10"	10.020 "	PS 475	9	10.000 "	PS 475	9
8"	8.620 "	12"	12.000 "	PS 475	12	12.000 "	PS 475	12
10"	10.750 "	14"	13.250 "	PS 425	10	14.000 "	PS 475	14
12"	12.750 "	16"	15.250 "	PS 425	12	16.000 "	PS 475	17
15"	15.880 "	20"	19.250 "	PS 475	21	18.000 "	PS 340	33

Cast Iron Soil Pipe (Service Weight)

NOMINAL PIPE SIZE	ACTUAL PIPE O.D	STANDARD WEIGHT STEEL PIPE SLEEVE				CORE DRILL OR CAST HOLE*		
		SLEEVE NOMINAL PIPE SIZE	SLEEVE ACTUAL I.D	PIPE SEAL MODEL NO.	NO. OF LINKS NEEDED	HOLE I.D.	PIPE SEAL MODEL NO.	NO. OF LINKS NEEDED
2"	2.300 "	4"	4.026 "	PS 315	6	4.000 "	PS 315	6
3"	3.300 "	5"	5.047 "	PS 315	9	5.000 "	PS 315	8
4"	4.300 "	6"	6.065 "	PS 315	11	6.000 "	PS 315	11
5"	5.300 "	8"	7.981 "	PS 360	10	8.000 "	PS 360	10
6"	6.300 "	8"	7.981 "	PS 315	15	8.000 "	PS 315	15
8"	8.380 "	12"	12.000 "	PS 475	12	12.000 "	PS 475	12
10"	10.500 "	14"	13.250 "	PS 360	17	14.000 "	PS 475	14
12"	12.500 "	16"	15.250 "	PS 360	20	16.000 "	PS 475	17
15"	15.620 "	20"	19.250 "	PS 475	20	18.000 "	PS 425	14

Electrical Metallic Tubing (Thin Wall)

NOMINAL PIPE SIZE	ACTUAL PIPE O.D	STANDARD WEIGHT STEEL PIPE SLEEVE				CORE DRILL OR CAST HOLE*		
		SLEEVE NOMINAL PIPE SIZE	SLEEVE ACTUAL I.D	PIPE SEAL MODEL NO.	NO. OF LINKS NEEDED	HOLE I.D.	PIPE SEAL MODEL NO.	NO. OF LINKS NEEDED
1/2 "	0.706 "	2"	2.067 "	PS 275	4	2.000 "	PS 275	4
3/4"	0.922 "	2"	2.067 "	PS 200	4	2.000 "	PS 200	4
1"	1.163 "	2-1/2"	2.469 "	PS 275	6	3.000 "	PS 315	4
1-1/4"	1.510 "	3"	3.068 "	PS 275	7	3.000 "	PS 275	7
1-1/2"	1.740 "	3-1/2"	3.548 "	PS 315	5	3.500 "	PS 315	5
2"	2.197 "	3-1/2"	3.548 "	PS 275	10	4.000 "	PS 315	6
2-1/2"	2.875 "	4"	4.026 "	PS 200	9	4.000 "	PS 200	9
3"	3.500 "	5"	5.047 "	PS 300	8	5.000 "	PS 300	8
4"	4.500 "	6"	6.065 "	PS 300	10	6.000 "	PS 300	10

* Min. recommended sleeve length or wall thickness is 4” for PipeSeal Model 325 and 6” for models 400 and larger.
PVC sleeves are sch. 40, and have a different I.D. at 12” and above.

SELECTION CHARTS

Ductile Iron Soil Pipe (AWWA Type)

NOMINAL PIPE SIZE	ACTUAL PIPE O.D	STANDARD WEIGHT STEEL PIPE SLEEVE				CORE DRILL OR CAST HOLE*		
		SLEEVE NOMINAL PIPE SIZE	SLEEVE ACTUAL I.D	PIPE SEAL MODEL NO.	NO. OF LINKS NEEDED	HOLE I.D.	PIPE SEAL MODEL NO.	NO. OF LINKS NEEDED
2"	2.500 "	3-1/2"	3.548 "	PS 200	8	4.000 "	PS 300	6
2-1/4"	2.750 "	5"	5.047 "	PS 340	7	5.000 "	PS 340	7
3"	3.960 "	6"	6.065 "	PS 315	10	6.000 "	PS 315	10
4"	4.800 "	8"	7.981 "	PS 410	7	8.000 "	PS 410	7
6"	6.900 "	10"	10.020 "	PS 410	10	10.000 "	PS 410	10
8"	9.050 "	12"	12.000 "	PS 400	9	12.000 "	PS 400	9
10"	11.100 "	14"	13.250 "	PS 340	24	14.000 "	PS 400	10
12"	13.200 "	16"	15.250 "	PS 325	14	16.000 "	PS 360	21
14"	15.300 "	18"	17.250 "	PS 325	16	18.000 "	PS 360	24
16"	17.400 "	20"	19.250 "	PS 315	39	20.000 "	PS 360	27
18"	19.500 "	24"	23.250 "	PS 475	25	24.000 "	PS 525	17
20"	21.600 "	26"	25.250 "	PS 475	28	26.000 "	PS 525	19
24"	25.800 "	30"	29.250 "	PS 475	32	29.000 "	PS 410	33
30"	32.000 "	36"	35.250 "	PS 475	40	35.000 "	PS 400	29
36"	38.300 "	42"	41.250 "	PS 400	34	41.000 "	PS 360	59
42"	44.500 "	50"	49.250 "	PS 500	38	48.000 "	PS 475	55
48"	50.800 "	54"	53.250 "	PS 425	45	54.000 "	PS 410	63

Copper Tubing

NOMINAL PIPE SIZE	ACTUAL PIPE O.D	STANDARD WEIGHT STEEL PIPE SLEEVE				CORE DRILL OR CAST HOLE*		
		SLEEVE NOMINAL PIPE SIZE	SLEEVE ACTUAL I.D	PIPE SEAL MODEL NO.	NO. OF LINKS NEEDED	HOLE I.D.	PIPE SEAL MODEL NO.	NO. OF LINKS NEEDED
1/2 "	0.625 "	2"	2.067 "	PS 275	4	2.000 "	PS 275	4
3/4"	0.875 "	2"	2.067 "	PS 200	4	2.000 "	PS 200	4
1"	1.125 "	2-1/2"	2.469 "	PS 275	6	3.000 "	PS 315	4
1-1/4"	1.375 "	2-1/2"	2.469 "	PS 200	5	3.000 "	PS 300	4
1-1/2"	1.625 "	3"	3.068 "	PS 275	8	3.000 "	PS 275	8
2"	2.125 "	3-1/2"	3.548 "	PS 300	5	3.500 "	PS 275	9
2-1/2"	2.625 "	4"	4.026 "	PS 275	11	4.000 "	PS 275	11
3"	3.125 "	5"	5.047 "	PS 315	8	5.000 "	PS 315	8
4"	4.125 "	6"	6.065 "	PS 315	10	6.000 "	PS 315	10
6"	6.125 "	8"	7.981 "	PS 315	15	8.000 "	PS 315	15
8"	8.125 "	10"	10.020 "	PS 325	9	12.000 "	PS 575	10
10"	10.125 "	14"	13.250 "	PS 410	14	14.000 "	PS 575	12
12"	12.125 "	16"	15.250 "	PS 410	16	16.000 "	PS 575	14

* Min. recommended sleeve length or wall thickness is 4" for PipeSeal Model 325 and 6" for models 400 and larger.
PVC sleeves are sch. 40, and have a different I.D. at 12" and above.

SIZING CALCULATION

Use the following calculation method if you can't find your pipe size or pipe sleeve on the preceeding selection charts.

Step 1: Calculate the Annular Space

The annular space is the gap between the outside diameter (O.D.) of the pipe and the inside diameter (I.D.) of the wall opening (sleeve or core).

$$\text{Annular Space} = \frac{\text{(Wall Opening I.D. - Pipe O.D.)}}{2}$$

Step 2: Select PipeSeal Model

The proper PipeSeal model can found in the PipeSeal dimensional chart. The annular space calculated in Step 1 must fall between the free state and expanded state thickness. Chose the seal with the free state thickness closest to, but not greater than the annular space calculated in Step 1.

Step 3: Calculate the Number of Links

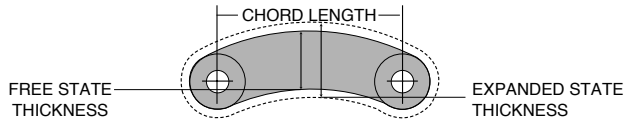
First, calculate the Bolt Circle.

$$\text{Bolt Circle} = \frac{\text{(Wall Opening I.D. + Pipe O.D.)}}{2}$$

Then determine the number of links

$$\text{No. of Links} = \frac{\text{(Bolt Circle x 3.14)}}{\text{Chord Length}}$$

Finally, if the number of links is equal to or greater than 4 and less than 10 and the decimal portion is 0.9 or greater, round up to the next whole number. Otherwise, round down to the next whole number.



PipeSeal Dimensional Chart

SIZE	SEALING RANGE		CHORD LENGTH
	FREE STATE THICKNESS	EXPANDED STATE THICKNESS	
PS-200	0.500"	0.640"	1.125"
PS-275	0.620"	0.800"	0.910"
PS-300	0.710"	0.920"	1.510"
PS-315	0.820"	1.100"	1.470"
PS-325	0.940"	1.140"	3.100"
PS-340	1.050"	1.330"	1.570"
PS-360	1.290"	1.650"	2.106"
PS-400	1.430"	1.870"	3.625"
PS-410	1.480"	1.910"	2.600"
PS-425	1.130"	1.430"	3.625"
PS-475	1.620"	2.080"	2.625"
PS-500	2.370"	2.810"	3.860"
PS-525	2.180"	2.580"	3.860"
PS-575	1.880"	2.350"	3.100"
PS-600	3.200"	4.000"	6.000"

Examples:

5.92 → round up to 6

5.75 → round down to 5

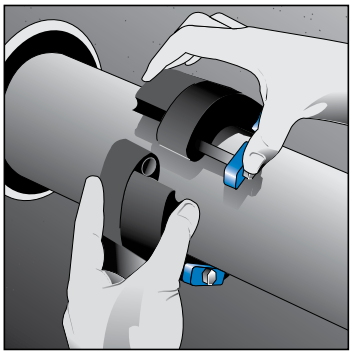
15.92 → round down to 15

A sizing spreadsheet can also be found on our website at:
www.flexicraft.com/pipeseals/main/

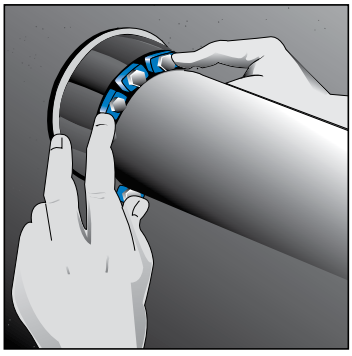
INSTALLATION

PipeSeal installation can be just as important as PipeSeal selection. Follow these easy steps to ensure a good seal.

1. Make sure pipe is centered though out the sleeve or core opening. Plan on supporting the pipe at both ends as PipeSeals are not meant to act as supports and you should be able to adjust the pipe during seal installation.
2. Wrap the belt over the pipe as you begin installation. Make sure the bolt heads are facing the installer.
3. Connect the ends by passing the last bolt through the seal holes. Thread the bolt into the last pressure plate and tighten bolt head until snug.

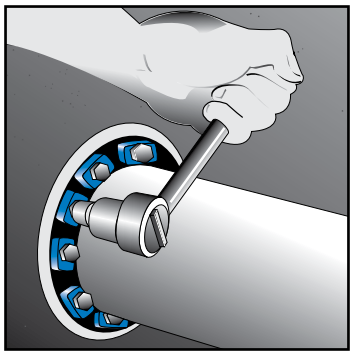


4. For larger sizes, begin inserting the assembly at the 6 O'clock position and push the remaining seal in on both sides as you move up towards the 12 O'clock position.



Use a light solution of soapy water as lubricant if needed.

5. Using a ratchet wrench, tighten each bolt moving about the belt in a clock-wise direction. Starting at the 12 o'clock position, tighten each bolt no more than 4 turns at a time until you start to see a slight bulge between each pressure plate. Expect to repeat this at least 3 times around the seal.



6. If the seal doesn't appear to be installed properly, contact Flexicraft.

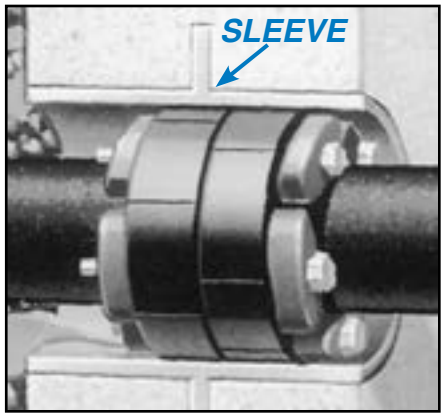
MODEL	MIN. REQUIRED SEATING WIDTH
200	2.25
275	2.25
300	3
315	3
325	4
340	4
360	4
400	5
410	5
425	5
475	5
500	5
525	5
600	6

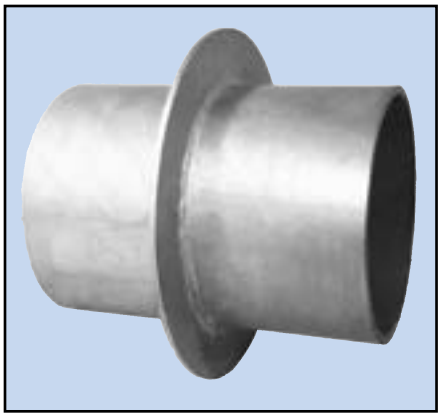
ATTENTION

- **Always make sure the pipe and opening are clean and free of any irregularities.**
- **Using high speed power tools can lead to over torqueing.**

WALL SLEEVES

Wall Sleeves are provided by Flexicraft, in both galvanized steel and PVC materials.





Standard Weight Steel, PVC and CPVC Pipe

SLEEVE NOMINAL PIPE SIZE	SLEEVE ACTUAL I.D. (STANDARD WT)*	STANDARD SLEEVE LENGTH**	STANDARD WATER-STOP HEIGHT**
2"	2.067"	12"	2"
2.5"	2.469"	12"	2"
3"	3.068"	12"	2"
3.5"	3.548"	12"	2"
4"	4.026"	12"	2"
5"	5.047"	12"	2"
6"	6.065"	12"	2"
8"	7.981"	12"	2"
10"	10.02"	12"	2"
12"	12.00"	12"	2"
14"	13.25"	12"	2"
16"	15.25"	12"	2"
18"	17.25"	12"	2"
20"	19.25"	12"	2"
22"	21.25"	12"	2"
24"	23.25"	12"	2"
26"	25.25"	12"	2"
28"	27.25"	12"	2"
30"	29.25"	12"	2"
32"	31.25"	12"	2"
34"	33.25"	12"	2"
36"	35.25"	12"	2"
38"	37.25"	12"	2"
40"	39.25"	12"	2"
42"	41.25"	12"	2"
44"	43.25"	12"	2"
46"	45.25"	12"	2"
48"	47.25"	12"	2"
50"	49.25"	12"	2"
52"	51.25"	12"	2"
54"	53.25"	12"	2"

*PVC sleeves are schedule 40 and have a slightly different I.D.for 12" and above.
**Optional lengths and height are available. Please contact Flexicraft.

PIPESEAL - WATERSEAL

PipeSeal forms a mechanical rubber seal between pipes going through walls, floors, vaults, tanks, and pipeline casings. PipeSeal makes a watertight seal between a pipe and a wall hole. It can also seal the gap between an inner pipe and an outer pipe sleeve or pipeline casing. It seals the gap between electrical conduit and the outer conduit, or between electrical conduit and the wall hole it passes through.

PipeSeal is designed to make a hydrostatic seal of up to 20 psig and up to 40 feet of head. The PipeSeal, in addition to it's sealing properties, helps absorb vibrations, shocks, and sound waves. It also insulates the inner pipe from all other outer structures, including outer pipe sleeves, pipeline casings, walls and tanks.

PipeSeals are made from synthetic rubber with heavy-duty plastic or steel pressure plates, which are resistant to sunlight and ozone. All bolts and nuts are plated with an anti-corrosive coating. 316 Stainless steel bolts and nuts are also available.

IPS = Schd. 40 or Std.
Weight Pipe Size
Plastic Pipe Size
API Pipe Size
Electrical Conduit Size
Or any pipe with same O.D.

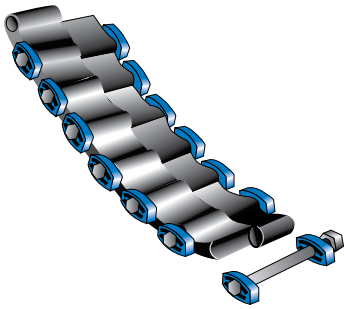
CI (SW) = Cast Iron (Service Weight)
CI (EH) = Cast Iron (Extra Heavy)

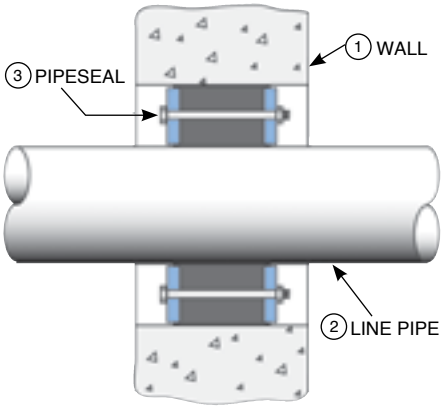
EMT = Electrical Metalic Tubing

CT = Copper Tubing
Or any pipe with same O.D.

LP = Pipeline Pipe with coating of 50 mils approximately

DI = Ductile Iron Pipe Size
Plastic Pipe Size
Or any pipe with same O.D.





Qty.	Nominal Pipe Size & Type of Pipe	Pipe O.D.	Inner Pipe Through a Core Drilled Hole			Inner Pipe Through a Wall Sleeve			Notes
			Hole Dia.	Model No.	Qty. of Links	Sleeve I.D.	Model No.	Qty. of Links	

CUSTOMER _____

PROJECT _____

ENGINEER _____

ARCHITECT _____

PRO. OR P.O. NO_____

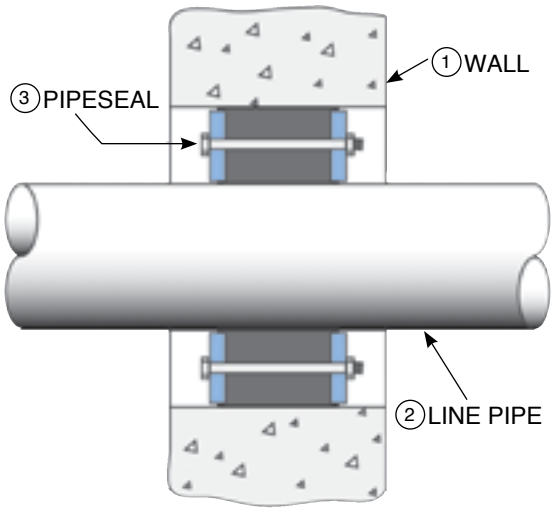
FLEXICRAFT

"Flexible Piping Solutions"

DESCRIPTION:

PIPESEAL

DRAWN BY:	DATE:	DRAWING NO:
P.B.	**1-1-02**	**SEAL**



Metallic Pipe and Copper Tubing, Core Drilled Hole

SYSTEM C-AJ-1423 FIRE SEAL

Additional Systems
C-AJ-1424 Sleeved

C-AJ-2369 PVC, CPVC, Rigid Non-Metallic Conduit

1. Floor or Wall Assembly - Minimum 4-1/2" thick reinforced lightweight or normal weight (100-150 pcf) concrete, maximum hole diameter 26 inches.

2. Through Penetrants - One metallic pipe, conduit or tubing to be centered within the firestop system. The nominal annular space between the pipe, conduit or tubing and the periphery of the opening shall be min. 1/2 in. to a max 2-7/16 in. Pipe, conduit or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:

A. Steel Pipe - Nominal 24 in. diameter (or smaller) Schedule 10 (or heavier) steel pipe.

B. Iron Pipe - Nominal 24 in. diameter (or smaller) cast or ductile iron pipe.

C. Conduit - Nominal 4 in. diameter (or smaller) steel electrical metallic tubing or nominal 6 in. diameter (or smaller) rigid steel conduit.

D. Copper Tubing - Nominal 6 in. diameter (or smaller) Type L (or heavier) copper tubing.

E. Copper Pipe - Nominal 6 in. diameter (or smaller) regular (or heavier) copper pipe.

The F Rating of the firestop system is dependent upon the nominal annular space within the firestop system. If the annular space within the firestop system is 1-3/16 in. or less, the F Rating is 2 hr. If the annular space within the firestop system is greater than 1-3/16 in., the F Rating is 1-1/2 hr.

3. Firestop Device/Specification* - The firestop device consists of intumescent rubber plugs, steel plates and steel bolts sized to within the nominal annular space of the firestop system. The device to be wrapped around the outer circumference of the penetrant and installed to completely seal the annular space within the firestop system in accordance with the accompanying installation instructions. In floors, device to be installed within opening in such a manner that the device to be recessed a 1/2 in. from the bottom surface of the floor. For walls, one device to be centered within the wall.

4. Wire Mesh - (Not Shown, Optional) - Prior to the installation of the firestop device, nominal 0.028 in. thick Type 304 stainless wire mesh supplied with the product may be wrapped around the outer circumference of the through penetrant with seams butted together. Wire mesh shall extend a min. 3/8 in. beyond both sides of the rubber links within the firestop device.

*Bearing the UL Classification marking.

CUSTOMER _____

PROJECT _____

ENGINEER _____

ARCHITECT _____

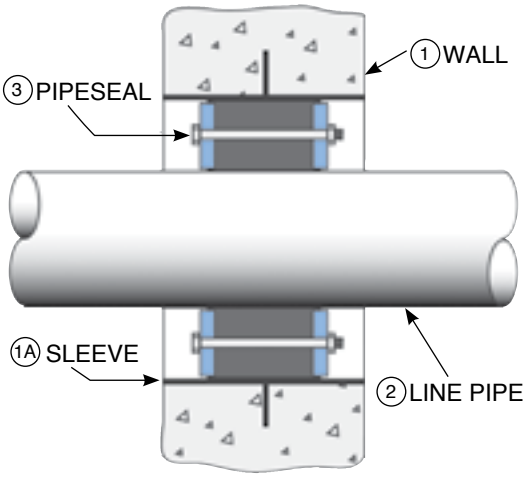
PRO. OR P.O. NO_____

FLEXICRAFT

"Flexible Piping Solutions"

DESCRIPTION: **PIPESEAL F2HR**
STEEL PIPE **COPPER TUBING**

F-RATING: 2 HRS. & 1-1/2 HRS.	T-RATING: 0 HRS.	
DRAWN BY: **P.B.**	DATE: **1-1-02**	DRAWING NO: **C-AJ-1423**



Metallic Pipe and Copper Tubing, Sleeved Hole

SYSTEM C-AJ-1424 FIRE SEAL

Additional Systems
C-AJ-1423 Core Drilled

C-AJ-2369 PVC, CPVC, Rigid Non-Metallic Conduit

1. Floor or Wall Assembly - Minimum 4-1/2" thick reinforced lightweight or normal weight (100-150 pcf) concrete, maximum hole diameter is 11 in.

See Concrete Block (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. Metallic Sleeve - (Optional) Nominal 11 in. diameter (or smaller) min .060 in. (or heavier) steel sleeve cast or grouted into floor or wall assembly, flush with floor or wall surfaces. If the firestop device (Item 4) is installed in a concrete block wall, the steel sleeve is required.

3. Through Penetrants - One metallic pipe, conduit or tubing to be centered within the firestop system. The nominal annular space between the pipe, conduit or tubing and the periphery of the opening shall be min 1/2 in. to a max 2-7/16 in. Pipe, conduit or tubing to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:

- **A. Steel Pipe** - Nominal 6 in. diameter (or smaller) Schedule 10 (or heavier) steel pipe.
- **B. Iron Pipe** - Nominal 6 in. diameter (or smaller) cast or ductile iron pipe.
- **C. Conduit** - Nominal 4 in. diameter (or smaller) steel electrical metallic tubing or nominal 6 in. diam rigid steel conduit.
- **D. Copper Tubing** - Nominal 6 in. diameter (or smaller) Type L (or heavier) copper tubing.
- **E. Copper Pipe** - Nominal 6 in. diameter (or smaller) regular (or heavier) copper pipe.

The F Rating of the firestop system is dependent upon the annular space within the firestop system. If the annular space within the firestop system is 1-3/16 in. or less, the F Rating is 2 hr. If the annular space within the firestop system is greater than 1-3/16 in., the F Rating is 1-1/2 hr.

4. Firestop Device/Specification* - The firestop device consists of intumescent rubber plugs, steel plates and steel bolts sized to within the nominal annular space of the firestop system. The device to be wrapped around the outer circumference of the penetrant and installed to completely seal the annular space within the firestop system in accordance with the accompanying installation instructions. In floors, device to be installed within opening in such a manner that the device to be recessed a 1/2 in. from the bottom surface of the floor. For walls, one device to be centered within the wall.

5. Wire Mesh - (Not Shown, Optional) - Prior to the installation of the firestop device, nominal 0.028 in. thick Type 304 stainless wire mesh supplied with the product may be wrapped around the outer circumference of the through penetrant with seams butted together. Wire mesh shall extend a min. 3/8 in. beyond both sides of the rubber links within the firestop device.

*Bearing the UL Classification marking.

CUSTOMER _____

PROJECT _____

ENGINEER _____

ARCHITECT _____

PRO. OR P.O. NO_____

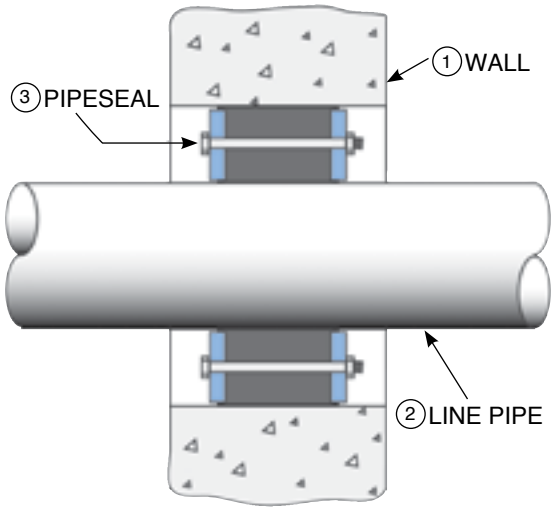
FLEXICRAFT

"Flexible Piping Solutions"

DESCRIPTION: **PIPESEAL F2HR**

STEEL PIPE **COPPER TUBING**

F-RATING: 2 HRS. & 1-1/2 HRS.	T-RATING: 0 HRS.	
DRAWN BY: **P.B.**	DATE: **1-1-02**	DRAWING NO: **C-AJ-1424**



PVC, CPVC, Rigid Non-Metallic Conduit, Core Drilled & Sleeved Hole

SYSTEM C-AJ-2369 FIRE SEAL

Additional Systems
C-AJ-1424 Metallic Pipe & Copper Tubing Sleeved Hole

C-AJ-1423 Metallic Pipe & Copper Tubing Core Drilled Hole

1. Floor or Wall Assembly - Minimum 4-1/2" thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diameter of opening is 4 in.

See Concrete Block (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. Metallic Sleeve - (Optional) Nominal 4 in. diameter (or smaller) min .060 in. (or heavier) steel sleeve cast or grouted into floor or wall assembly, flush with floor or wall surfaces. If the firestop device (Item 4) is installed in a concrete block wall, the steel sleeve is required.

3. Through Penetrants - One nonmetallic pipe or conduit to be centered within the firestop system. The nominal annular space between the pipe, conduit or tubing and the periphery of the opening shall be minimum 5/8 in. to a max 13/16 in. The pipe or conduit to be rigidly supported on both sides of floor or wall. The following types and sizes of pipes or conduits may be used:

A. Polyvinyl Chloride (PVC) Pipe - Nominal 2 in. diameter (or smaller) Schedule 40 solid core PVC pipe for use in closed (process or supply) or vented (drain, waste, or vent) piping systems.

B. Chlorinated Polyvinyl Chloride (CPVC) Pipe - Nominal 2 in. diameter (or smaller) SDR 13.5 CPVC pipe for use in closed (process or supply) piping systems.

C. Rigid NonMetallic Conduit + - Nominal 2 in. diameter (or smaller) Schedule 40 PVC conduit installed in accordance with Article 347 of the National Electrical Code, (NFPA No. 70).

The F Rating of the firestop system is dependent upon the nominal diameter of the penetrant within the firestop system. If the nominal diameter of the penetrant within the firestop system is a nominal 1-1/4 in. or less, the F Rating is 2 hr. If the nominal diameter of the penetrant within the firestop system is greater than 1-1/4 in., the F Rating is 1 hr.

4. Firestop Device - The firestop device consists of rubber plugs, steel plates and steel bolts sized to fit within the annular space of the firestop system. The device to be wrapped around the outer circumference of the penetrant and installed to completely seal the annular space within the firestop system in accordance with the installation instructions. In floors, device to be installed within opening in such a manner that the device to be recessed a nominal 1/2 in. from the bottom surface of the floor. For walls having a nominal thickness of 8 in. or less, the device to be installed within the opening in such a manner that the device shall be recessed at minimum 1/2 in. to a max 1-1/2 in. from either surface. For walls having a nominal thickness greater than 8 in., a device to be installed on each side of the wall.

* Bearing the UL Classification Marking + Bearing the UL Listing Mark

CUSTOMER _____

PROJECT _____

ENGINEER _____

ARCHITECT _____

PRO. OR P.O. NO _____

FLEXICRAFT

"Flexible Piping Solutions"

DESCRIPTION: **PIPESEAL F2HR**
PVC, CPVC, RIGID NON-METALLIC CONDUIT

F-RATING: 2 HRS. & 1-1/2 HRS.	T-RATING: 0 HRS.	
DRAWN BY: **P.B.**	DATE: **1-1-02**	DRAWING NO: **C-AJ-2369**

Terms and Conditions

1. All quotations are subject to approval, acceptance and correction at the home office Any errors in quotations resulting in orders will be corrected and re-submitted to the customer for their acceptance or refusal.

No prices may be made up from information other than that shown in the tables.

2. All prices are F.O.B. factory, Chicago, Illinois, are are quoted exclusive of any taxes.

Shipments boxed for trans-ocean export add 10% to total trade price.

Terms: Net 30 days from date of invoice.

3. Cancellation or alteration of an order or return of any product by Buyer may not be made without advance written consent of manufacturer and shall be subjected to a cancellation charge.

A 35% minimum restocking charge shall be placed on any returned goods of stocked items. Fabricated items are not returnable.

4. We will not be responsible for delays in shipping due to conditions beyond our control such as strikes, fires, or accidents.

5. Any claims for shortages or damaged products must be made in writing within 10 days after receipt of shipment.

6. Prices subject to change without notice.

Design and Dimensional Specifications

The products illustrated reflect the design characteristics at time of printing.

Flexicraft reserves the right to change dimensions, materials, or methods of construction without notice. Please contact the factory for certified prints (exact dimensions) when necessary.

Limited Warranty

All products are warranted to be free of defects in material and workmanship for a period of one year from the date of shipment, subject to the limitations below.

If the purchaser believes a product is defective the purchaser shall: (a) Notify the manufacturer, state the alleged defect and request permission to return the product. (b) If permission given, return the product with transportation prepaid. If the product is accepted for return and found to be defective, the manufacturer will, at its discretion, either repair or replace the product F.O.B. factory, within 60 days of receipt, or refund the purchase price. Other than to repair, replace or refund as described above, purchaser agrees that manufacturer shall not be liable for any loss, costs, expenses or damages of any kind arising out of the product, its use, installation or replacement, labeling, instructions, information or technical data of any kind, description of product or use, sample or model, warnings or lack of any of the foregoing. NO OTHER WARRANTIES, WRITTEN OR ORAL, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY, ARE MADE OR AUTHORIZED. NO AFFIRMATION OF FACT, PROMISE, DESCRIPTION OF PRODUCT OF USE OR SAMPLE OR MODEL SHALL CREATE ANY WARRANTY FROM THE MANUFACTURER, UNLESS SIGNED BY THE PRESIDENT OF MANUFACTURER. These products are not manufactured, sold or intended for personal, family or household purposes.

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