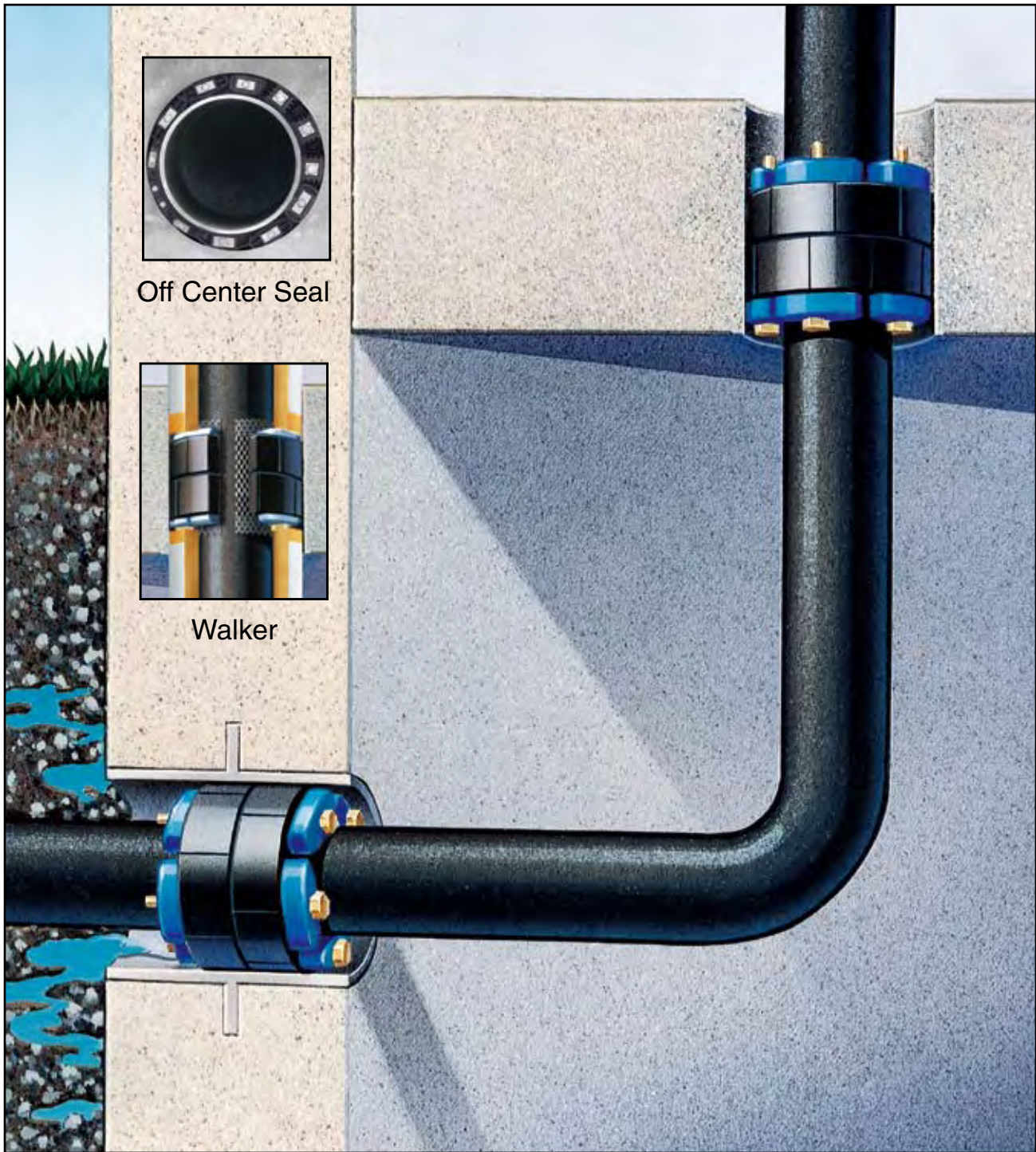


METRASEAL

PIPE WALL PENETRATION SEALS



Metraflex
for pipes in motion

2323 W. HUBBARD ST. • CHICAGO, IL 60612 • 312-738-3800 • FAX 312-738-0415 • <http://www.metraflex.com>

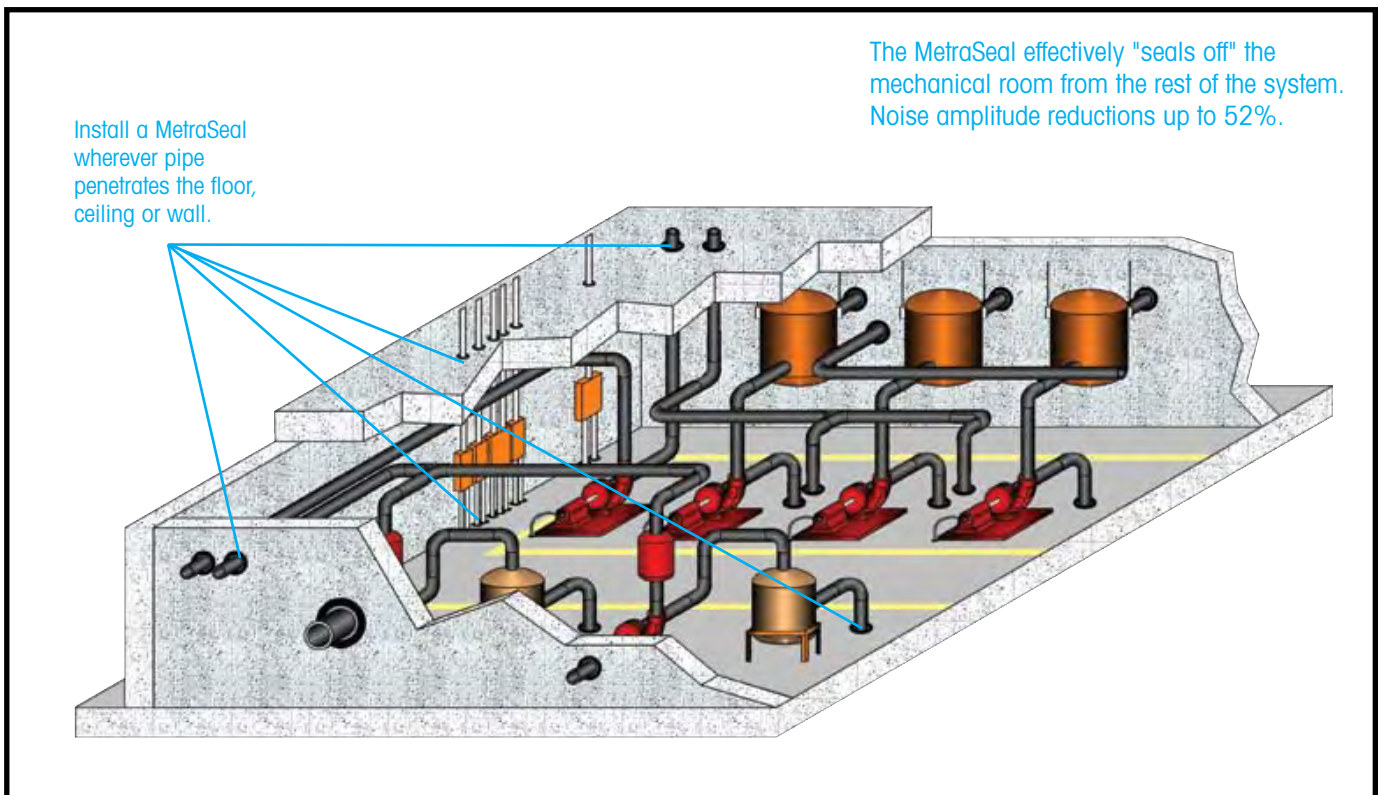
METRASeal: A WATER TIGHT MECHANICAL SEAL

- Installs around any pipe or conduit
- Hydrostatically seals the penetration to 20 psi
- Waterproof, no drying or curing time
- Heatproof, silicone option good to 400°F
- Misalignment proof, off-center seals allow eccentric installation
- Foolproof, slide it in the hole and tighten it up

The Metraflex MetraSeal quickly fills the space around any round pipe, including concrete, steel, plastic, cast iron, copper, telecommunications cable and electric conduit, with a snug, permanent seal.

Rated to 20 psig, it is engineered as a permanent seal, resisting water, oil and aging for up to 25 years. The MetraSeal seals out groundwater in subgrade exterior walls, and absorbs noise and vibration in mechanical rooms. It is ideal for filling gaps in interior walls and floors where a fire rating is required.

MetraSeals can be installed in all field conditions. Operating temperatures range from -40 to 400°F. MetraSeal's unique mechanical type link construction allows installation without any moisture or drying requirements, including fully submersed locations.

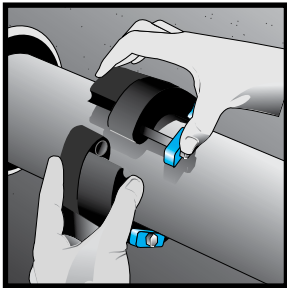


KEEP NOISE, VIBRATION OR FLOOD CONFINED TO THE MECHANICAL ROOM

INSTALLATION INSTRUCTIONS

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

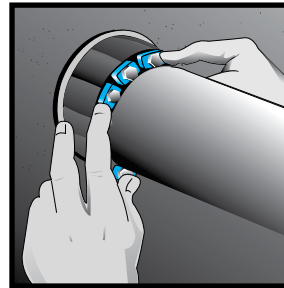
Easy as One, Two, Three



1. Wrap the belt around the pipe. Then connect the first and last links.

Asegure el cinturón alrededor del tubo. Conecte el primero y el último eslabón.

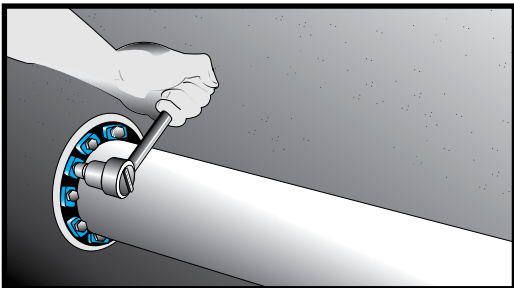
Enveloppez la ceinture autour du tuyau. Ensuite reliez les premières et dernières tiges d'assemblage.



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

Deslice el ensamblaje en el espacio entre el tubo y la pared.

Glissez l'assemblage dans l'espace entre le tuyau et le mur.

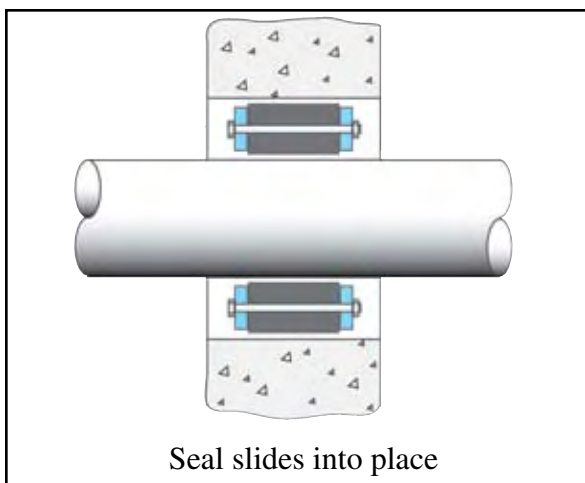


3. Gradually and sequentially tighten the bolts. Tighten each bolt 2-3 turns making 5 to 9 passes completely around the pipe. **Do not** cross tighten. The MetraSeal links expand to create a gas and water tight seal.

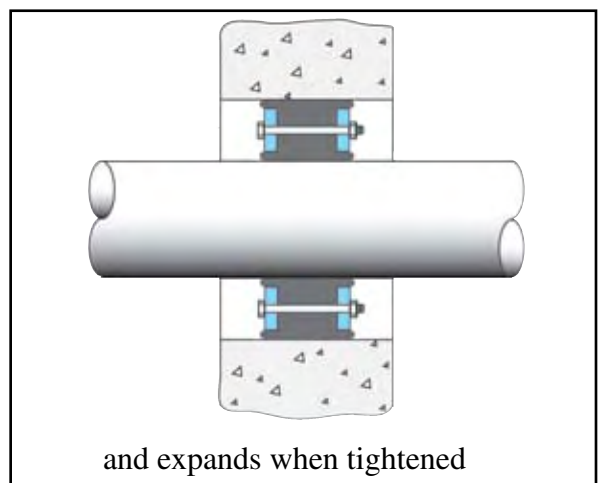
Apriete secuencialmente y gradualmente los cerrojos. Apriete cada cerrojo de 2 a 3 vueltas. Apriete consecutivamente alrededor del tubo hasta hacerlo de 5 a 9 repeticiones. ¡No cruce al apretar los cerrojos! Los eslabones se expanden creando un sello apretado de gas y agua.

Graduellement et d'une façon séquentielle serrez les boulons. Serrez chaque boulon 2 à 3 tours en tournant complètement autour du tuyau 5 à 9 fois. Ne serrez pas les boulons de manière croisée. Les tiges d'assemblage MetraSeal se dilatent pour créer une cloison étanche à l'eau et au gaz.

How it works

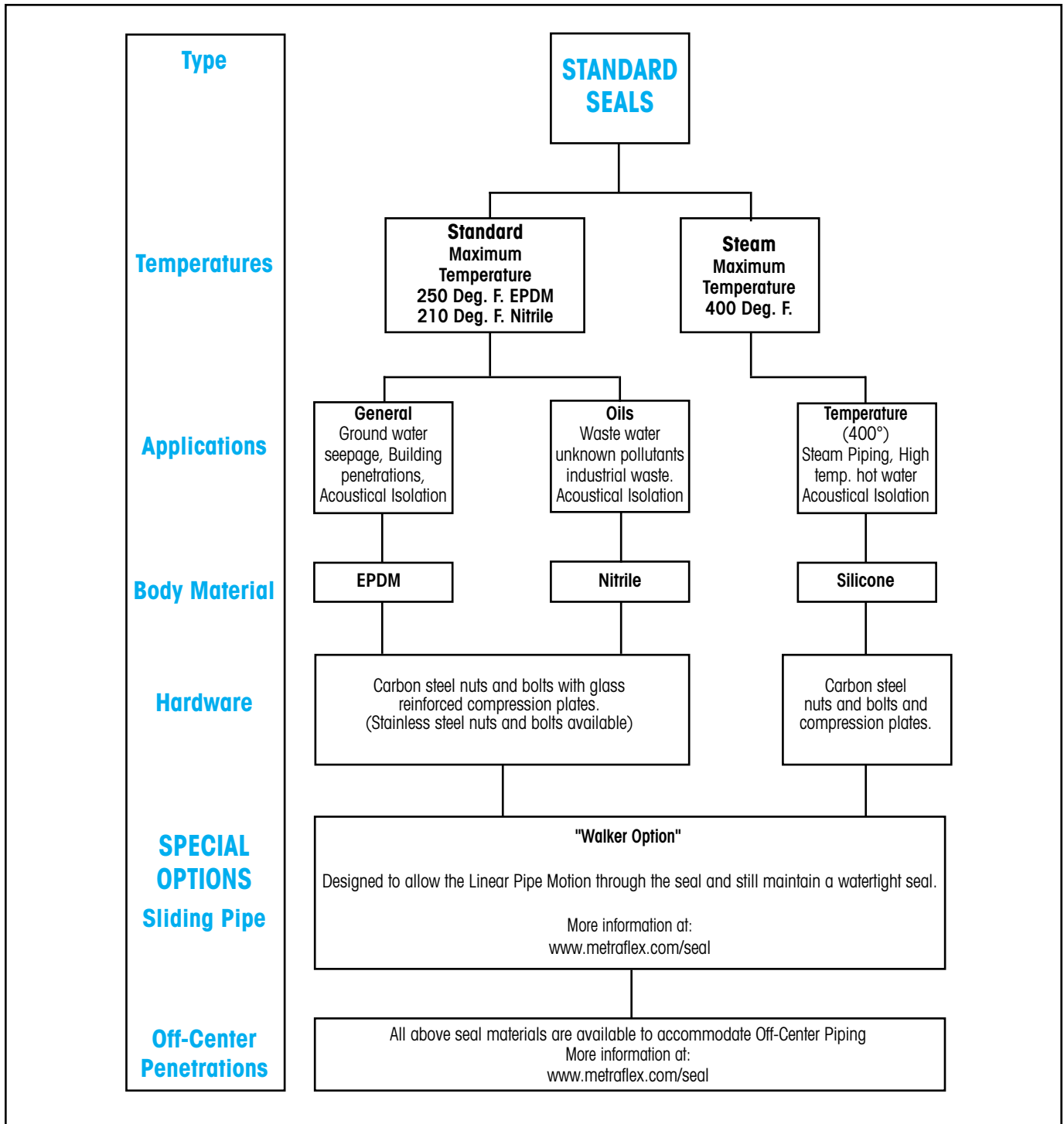


Seal slides into place



and expands when tightened

METRASEAL SELECTION FLOW CHART

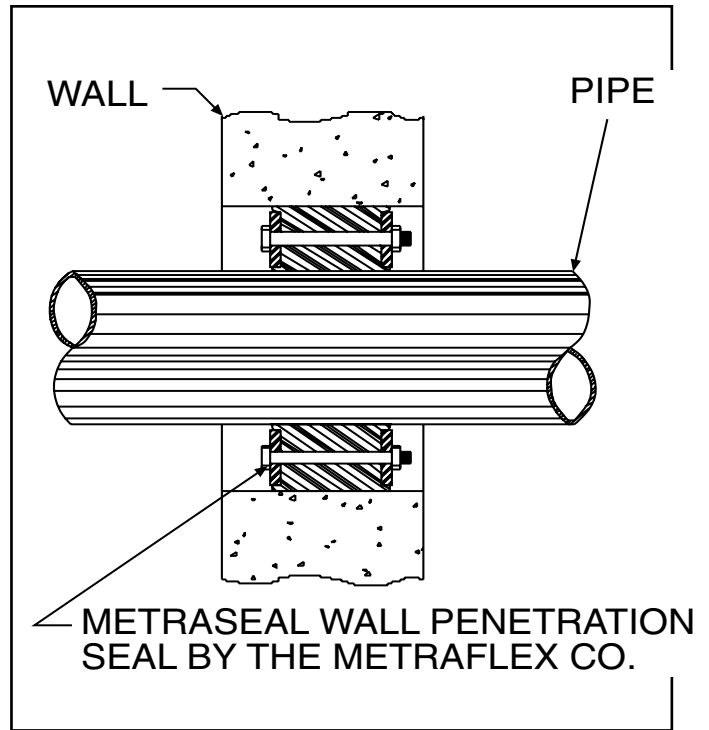


METRASEAL SELECTION GUIDE

For most applications, the appropriate MetraSeal can be selected from the charts on pages 6, 7, 8 and 9. If your pipe and wall opening dimensions do not appear on these charts, use the methods on page 10.

1. Find the chart that applies to your pipe material. Next, locate your pipe size.
2. Determine your wall opening. Select either the standard weight steel or PVC wall sleeve that was used or the diameter of the core bit drilled hole.
3. Find your "Nominal Pipe Size". Then read across to the sizing section for wall sleeves or core bit drilled holes. The first column identifies either the nominal wall sleeve size, or the hole I.D. The appropriate MetraSeal model and number of links required is shown to the right.
4. Select the MetraSeal type from the table below.
5. To order, designate the number of links required, followed by the combination of the MetraSeal model and type. For example:

A 6" schedule 40 pipe in a 10" wall sleeve would be ordered as a 1 0 M S 4 7 5 E.



TYPE	SEAL MATERIAL	PRESSURE PLATES	BOLTS & NUTS	TEMPERATURE RANGE (°F)	APPLICATIONS*
E	EPDM Black	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 Black	GLASS REINFORCED PLASTIC	STAINLESS STEEL (18-8)	-40 to +250	Suitable for environments where the corrosion resistance of stainless steel hardware is required.
P	NITRILE	GLASS REINFORCED PLASTIC	STEEL zinc dichoromate	-40 to +210	Resistant to most hydrocarbons, oil, gas, jet fuel, and many solvents.
PS	NITRILE	GLASS REINFORCED PLASTIC	STAINLESS STEEL (18-8)	-40 to +210	Same as above but with corrosion resistance of stainless steel hardware.
HT	Silicone	STEEL ZINC DICHOROMATE	STEEL zinc dichoromate	-40 to +400	High temperature applications.

*For more details and complete chemical compatibility contact factory.

METRASeal SIZING CALCULATION

Use the following calculation method if you cannot find your pipe size or wall sleeve in the charts on pages 6, 7, 8 and 9.

Step 1 - Calculate the Annular Space

The Annular Space is the space between the Outside Diameter of the pipe, and the Inside Diameter of the wall sleeve or wall opening. It is calculated using the following formula:

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

Step 2 - Select MetraSeal Model

Select the proper MetraSeal Model from the MetraSeal Dimensional Chart (shown below) by comparing the Annular Space to the Free State and Expanded State Thicknesses. The Annular Space calculated must fall between the Free State and Expanded State Thicknesses.

Step 3 - Calculate Number of Links

First, calculate the Bolt Circle.

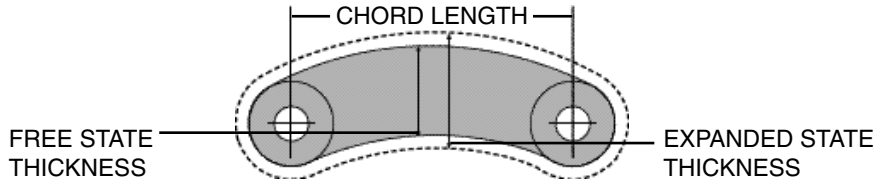
$$\text{Bolt Circle} = \frac{\text{Wall Opening I.D.} + \text{Pipe O.D.}}{2}$$

Then, determine the number of links required by using the following formula. Chord Length is found in MetraSeal Dimensional Chart below.

$$\text{Number of Links} = \frac{\text{Bolt Circle} \times 3.14}{\text{Chord Length}}$$

Finally, the number of links determined must be rounded down to the next whole number.

MetraSeal Dimensional Chart



SIZE	SEALING RANGE		CHORD LENGTH
	FREE STATE THICKNESS	EXPANDED STATE THICKNESS	
MS-200	.50"	.62"	1.125"
MS-275	.62"	.78"	0.910"
MS-300	.71"	.88"	1.510"
MS-315	.82"	1.03"	1.470"
MS-325	.94"	1.18"	3.100"
MS-400	1.43"	1.81"	3.625"
MS-410	1.48"	1.91"	2.598"
MS-425	1.13"	1.45"	3.625"
MS-475	1.62"	1.90"	2.625"
MS-500	2.37"	2.81"	3.860"
MS-525	2.18"	2.50"	3.860"
MS-575	1.81"	2.35"	3.100"
MS-600	3.20"	4.00"	6.000"

Or use the web seal calculator at www.metroflex.com/wall-select2.php

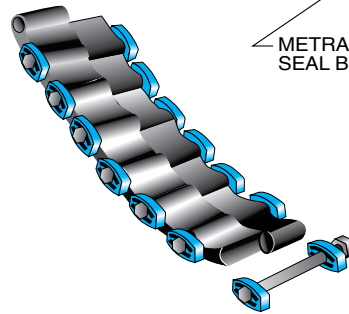
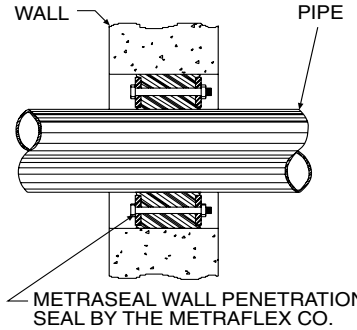
METRASEAL

MetraSeal forms a mechanical rubber seal between pipes going through walls, floors, vaults, tanks, and pipeline casings. MetraSeal makes a watertight seal and fire stop seal if UL seals are used. 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.

MetraSeal is designed to make a hydrostatic seal of up to 20 psig and up to 40 feet of head. The MetraSeal, in addition to its 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.

IPS = Schd. 40 or Std. Weight Pipe Size Plastic Pipe Size API Pipe Size Electrical Conduit Size Or any pipe with same O.D.	IMC = Intermediate Metal Conduit RSC = Rigid Steel Conduit DI = Ductile Iron Pipe Size Plastic Pipe Size Or any pipe with same O.D.
CT = Copper Tubing Or any pipe with same O.D.	CI (EH) = Cast Iron (Extra Heavy) CI (SW) = Cast Iron (Service Weight)
EMT = Electrical Metallic Tubing	

TYPE	SEAL MATERIAL	PRESSURE PLATES	BOLTS & NUTS	TEMPERATURE RANGE (F°)	APPLICATIONS*
E	EPDM Black	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 Black	Glass reinforced plastic	STAINLESS STEEL (316)	-40 to +250	Suitable for environments where the corrosion resistance of stainless steel hardware is required.
P	NITRILE	Glass reinforced plastic	STEEL zinc dichoromate	-40 to +210	Resistant to moss hydrocarbons, oil, gas, jet fuel, and many solvents.
PS	NITRILE	Glass reinforced plastic	STAINLESS STEEL (316)	-40 to +210	Same as above but with corrosion resistance of stainless steel hardware.
HT	Silicone	Steel zinc dichoromate	Steel zinc dichoromate	-40 to +400	High temperature applications.



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./Type	Qty. of Links	Sleeve I.D.	Model No./Type	Qty. of Links	

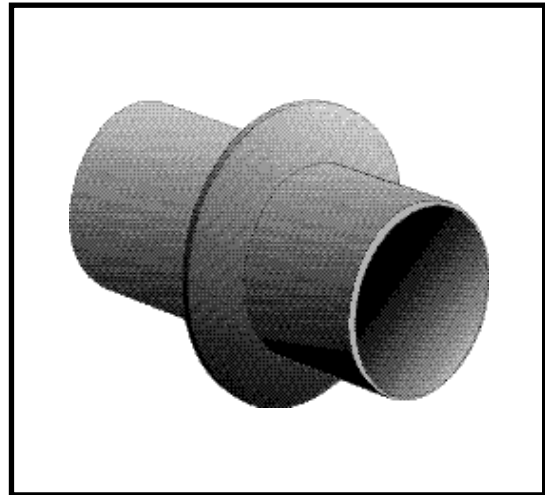
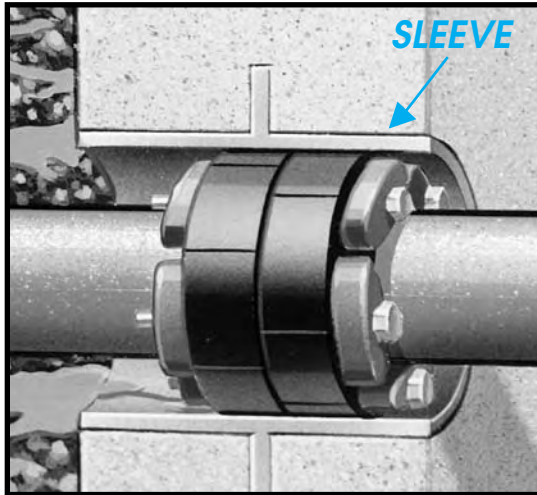
CUSTOMER _____
 PROJECT _____
 ENGINEER _____
 ARCHITECT _____
 PRO OR P.O. NO. _____



DESCRIPTION:
METRA SEAL

DRAWN BY: **ZB** DATE: **07/02** DRAWING: **SEAL(A)**

WALL SLEEVES



Wall Sleeves must be positioned in the wall before the concrete is poured.

Standard Weight steel or PVC pipe sleeve			
Sleeve Nominal Pipe Size	Sleeve Actual I.D.	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"

*Optional lengths and heights available. Please contact your Metraflex representatives.