



FLEX RIB SEALS

Internal Rubber Seal for Manhole Chimney repair

DESCRIPTION: The FlexRib Seal is made from a premium quality rubber compound which is designed to withstand the corrosive environment present in a sanitary sewer manhole.



FlexRib Seal

The grade adjustment area of a manhole is often the first part of the structure to suffer from water infiltration since weather conditions and traffic loading can quickly degrade the grade ring seals or bricked area below the frame right down to the cone. The FlexRib Seal design allows for vertical and horizontal movement while maintaining a watertight seal.

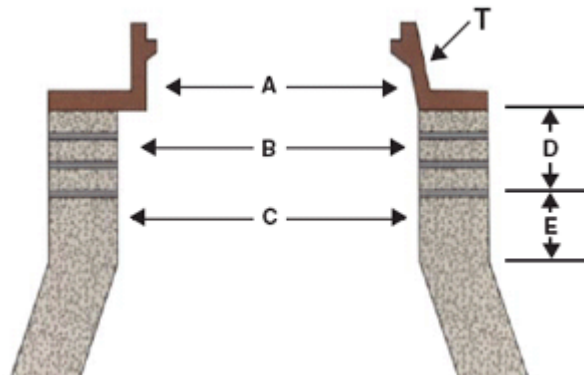
The FlexRib Seal stops infiltration by creating a watertight seal to the frame and another watertight seal to the top of the cone. These seals are created when the stainless steel expansion bands compress the rubber seal against the inside of the frame and cone with over 2,000 lbs. of force.

A single FlexRib Seal is usually all that is necessary to seal the grade adjustment area. If a greater sealing distance is required we also offer a FlexRib Extension. One end of the FlexRib Extension is designed to go under the FlexRib Seal allowing them to be overlapped to cover a greater sealing area.

ORDERING INFORMATION:

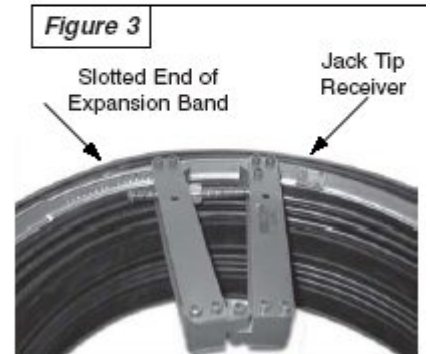
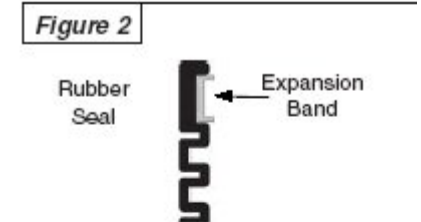
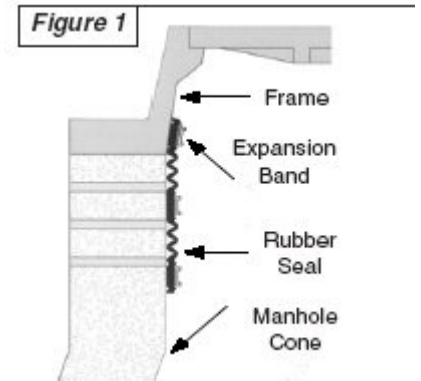
Information Needed For Ordering FlexRib Seals

- Dimension A - Inside diameter of the manhole frame
- Dimension B - Inside diameter of the grade adjustment area
- Dimension C - Inside diameter of the grade of the manhole cone
- Dimension D - Height of the grade adjustment area
(Bottom of the frame to the top of the cone)
- Dimension E - Height of vertical surface on manhole cone
- Dimension T - Degree of taper on the inside of the frame



Installation

1. Inspect the area being sealed for dirt, debris, and surface defects.
2. Remove rust and dirt from the inside of the frame casting where the seal will be installed.
3. Remove dirt, scale, and other debris from the manhole cone wall where the seal will be installed.
4. Repair any cracks and holes in the cone wall where the seal will be installed with a non-shrink filler material. It is important that the surface under the expansion bands are reasonably smooth and free from defects. The expansion bands work by compressing the rubber against the frame and the concrete to form a watertight seal. Therefore, any surface defects located under the expansion bands can prevent the rubber from being compressed against the sealing surface, and prevent a watertight seal from being achieved.
5. Place the rubber seal in the manhole following these steps:
Step 1 - Pinch seal together
Step 2 - Place seal in manhole frame
Step 3 - Push out sides of seal
6. Position the rubber seal in the frame as shown in **Figure 1** so that the expansion band track at the top of the seal is located completely inside the manhole frame.
7. Install the top expansion band by collapsing it into itself and position it in the expansion band track of the rubber seal as shown in **Figure 2**.
8. Place the installation tool into the expansion band as shown in **Figure 3** with the tips of the tool between the end of the slotted portion of the band and engaged in one of five jack tip receivers. Hold the installation tool firmly in place and expand the band until the recommended value listed below has been reached.
Manual Installation Tool - 28 foot pounds
Hydraulic Installation Tool - 5,500 psi (maximum)
Note: Index installation tool as needed to next tip receiver to cover full range of travel of band. For final tightening, place tool in closest tip receiver for best performance.
9. Loosen the installation tool and remove it from the expansion band.
10. Make sure the bottom expansion band track of the rubber seal is completely inside the manhole cone and repeat steps 7 and 8 for the bottom expansion band.
11. An optional expansion band can be installed in the center of the rubber seal to prevent the seal from ballooning inward due to external ground water pressure. The center band typically is not required.



Manual Installation Tool

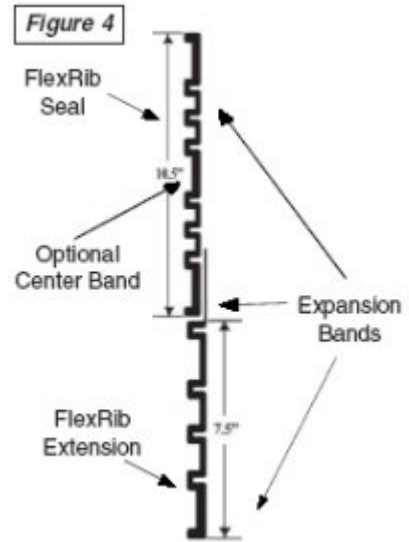


Hydraulic Installation Tool

Installing Multiple FlexRib Seals

If one FlexRib Seal is not sufficient to cover the area between the manhole frame and the manhole cone, a FlexRib Extension can be added as shown in **Figure 4**. Depending on the manhole configuration, the FlexRib extension can be used at the top or bottom of the sealing area. However, the FlexRib Seal should be used when there is a diameter change from frame to grade adjustment area.

1. Install the FlexRib Extension by following steps 5 through 9.
2. Position the bottom of this seal so that it is over a reasonably flush, smooth surface.
3. Place the FlexRib Seal over the bottom flap of the FlexRib Extension as shown in **Figure 4**. Install the expansion band as instructed in step 8 listed above.
4. Complete installation by following step 10 listed above.



FlexRib Seal- The rubber seal is made from an EPDM compound. The rubber is extruded to the required length and the ends are hot spliced together using virgin rubber compound to form a high strength vulcanized joint. Physical properties are listed in the table below.

Physical Property	ASTM Specification	Test Requirement	EPDM Performance
Chemical Resistance 1 N Sulfuric Acid 1 N Hydrochloric Acid	D543, at 22°C for 48 hours	No Weight loss No Weight loss	No Weight loss No Weight loss
Tensile Strength	D412	1200 psi	1580 psi
Elongation at Break	N/A	350% minimum	500%
Hardness	D2240 (shore A durometer)	± 5 from manufacturer's specified hardness	48 ± 5
Accelerated Aging	D573 70° for 7 days	Maximum Decrease 15% tensile 20% elongation	10.1% tensile decrease 14.0% elongation decrease
Compression Set	D395, method B, at 70°C for 22 hours	25% maximum	13%
Water Absorption	D471, immerse 0.75 by 2 inch specimen in distilled water at 70°C for 48 hours	10% weight increase maximum	0.8% weight increase
Ozone Resistance	D1149	Rating 0	Rating 0
Low temp. Brittle Point	D746	No fracture at -40°C	No fracture at -40°C
Tear Resistance	D624, method B	200 lbf/in.	Greater than 210 lbf/in

Stainless Steel Expansion Bands - The expansion bands are made from either 304 or 316 stainless steel. Physical properties are listed below.

Physical Property	304 Stainless Steel	316 Stainless Steel
Tensile Strength (minimum)	75,000 psi	75,000 psi
Yield Strength (minimum)	30,000 psi	25,000 psi
Elongation in 2 inches (minimum)	40%	40%

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