

Post-Rehabilitation Operations & Maintenance

Track IV – Pressure Pipe
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Mechanical “End” or “Termination” Seals



What is the Internal Pipe Seal?



- The Internal Pipe Joint Seal is a mechanical compression seal
- Has been utilized in trenchless repairs of various types of piping for several decades

What is the Internal Pipe Seal?

- Cost effective means to eliminate joint leaks
- Mechanical remediation for joint repair
- Proven technology
- Rapid trenchless system
- NSF/ANSI 61 Certified



Features

- Requires NO hot work
- 50-year design life
- Minimal flow restriction
- Ease of installation
- Minimal equipment and manpower required
- Point repair
- Flexible



Applications

Isolation of Leaking Mechanical Joints

- Couplings
- Bell & spigot joints
- Flanged joints
- Expansion joints

Isolation of Corrosion-Prone Areas

- Welds
- Flanged joints

Isolation of Cracked Concrete Pipe Sections

- Longer sections of pipe can be isolated by interlocking multiple seals to span long lengths

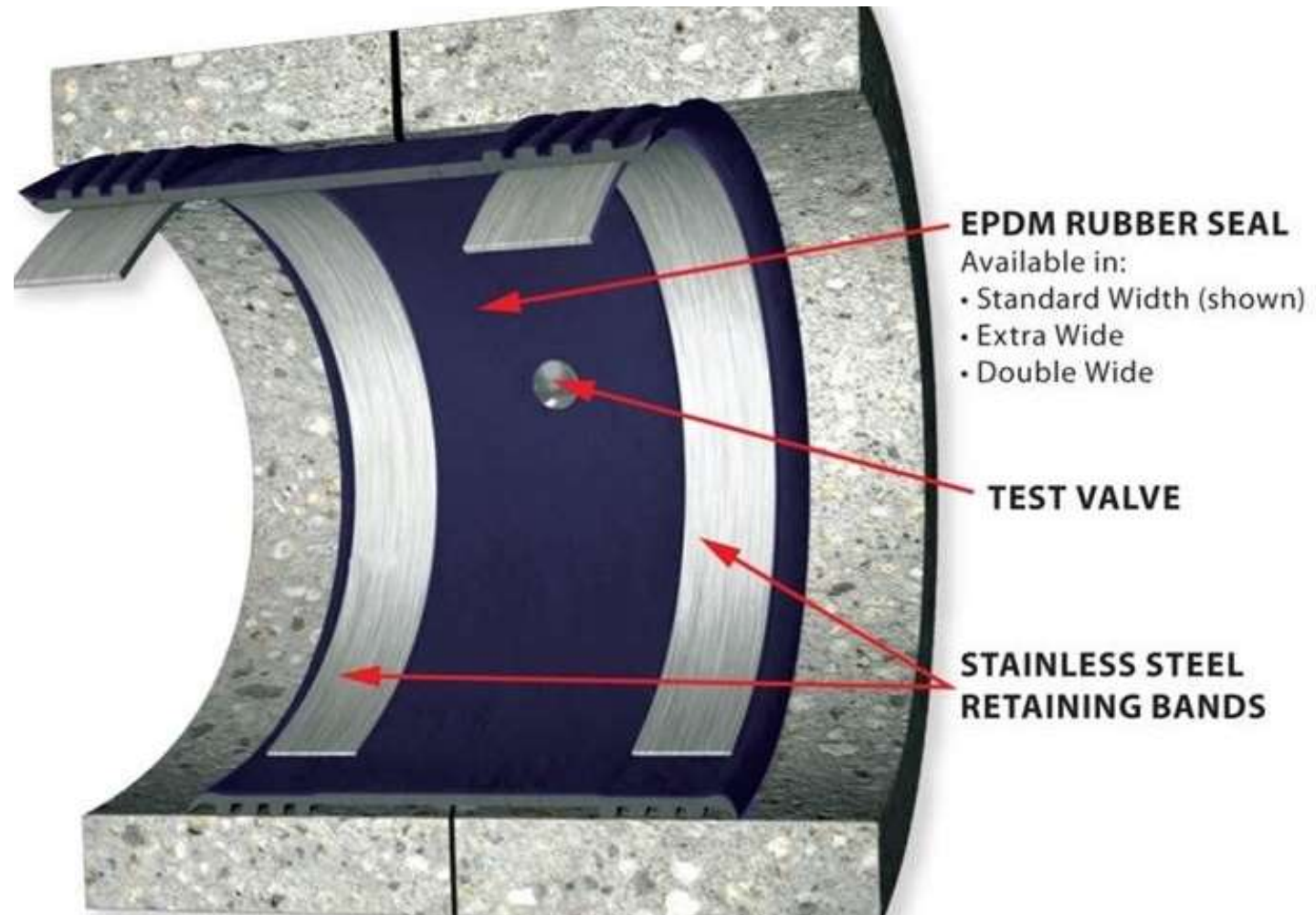
Physical Characteristics

Elastomeric Seal

- EPDM Rubber, 350% Elongation
- Grooves for retaining bands
- Pressure test valve
- Ribbed design for optimal sealing
- Three available widths

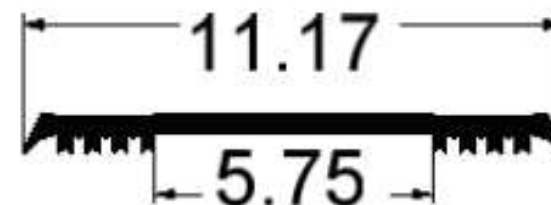
Retaining Bands

- 304 or 316 Stainless or AL6XN
- One- or multi-piece design to accommodate access through small or restricted openings

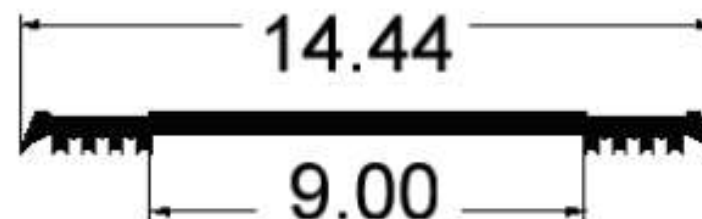


Seal Widths

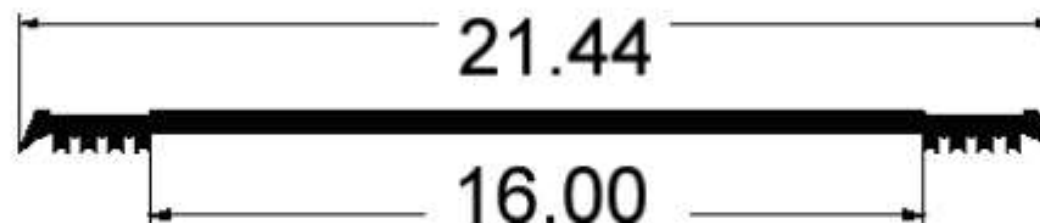
Standard Wide 11"
Joint Span 5.75"



Extra Wide 14"
Joint Span 9"



Double Wide 21"
Joint Span 16"



Design Flexibility

- Widths
- Rubber
- Steel
- Backing plate
- Interlocking
- Multi piece bands



Design Flexibility

- Designed for various pipe diameters
- Custom designed for box culverts / tunnels



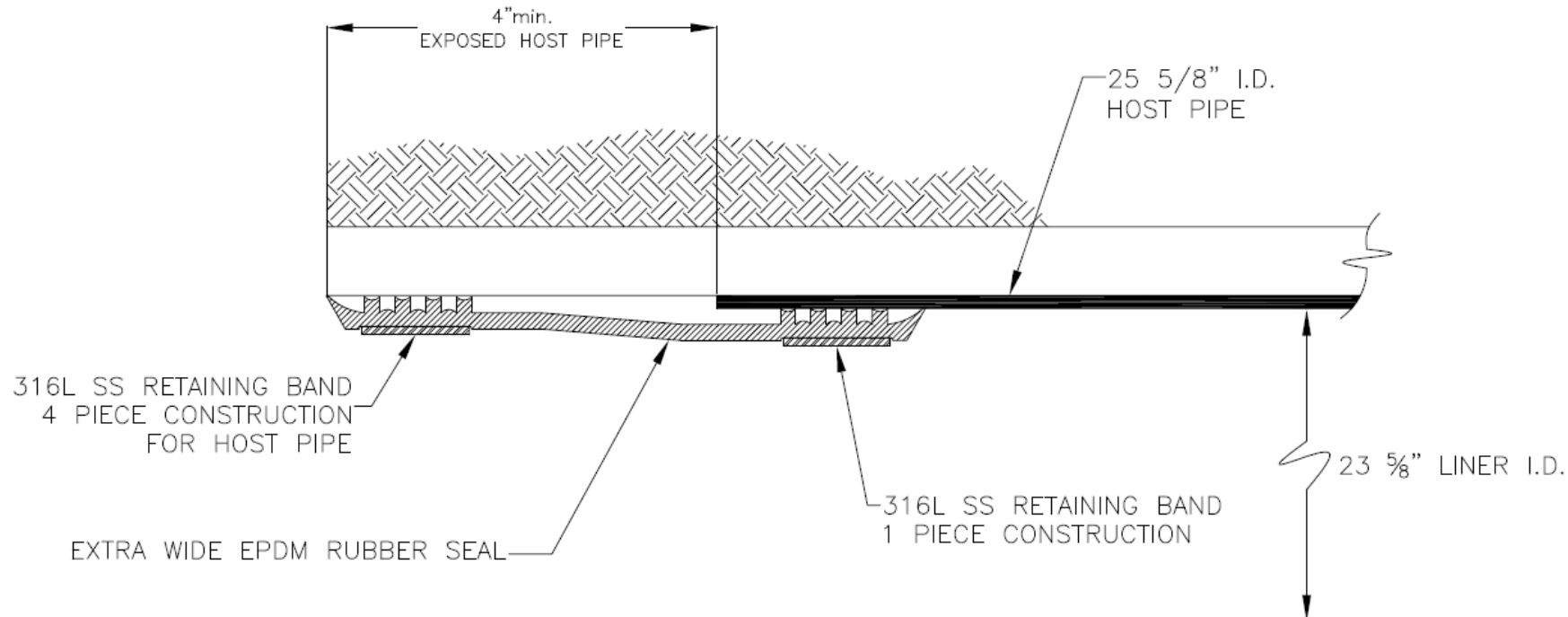
What is an “End” or “Termination” Seal?

Over the past number of years, Internal Pipe Joint Seals have been used as an end seal to prevent “backtracking” of liquid between a liner and the host pipe or fitting on trenchless repairs such as CIPP and SLP.



End Seals

The seal is mechanical and can be installed with water in the pipe which provides advantages over chemical grout and coatings. Superior quality and intricate design assures a tight, leak free seal.



GENERAL DETAIL OF HYDRATITE INSTALLATION AS END SEAL

End Seals

The end seal's flexibility accommodates shifting, vibration, ground settling and thermal expansion / contraction. The end seals are custom made for each project and match both the host pipe and liner inside diameters.



Installation Procedures

Prep Joint



Position Seal



Install Rubber Seal



Install Retaining Bands



Installation Procedures

Hydraulic Expander



Insert Wedges



Pressure Test Seal



Check for Leaks



End Seals (60" X 57")

- Once the liner has been installed and fully cured
 - Cut the liner back a minimum of 4" from the end of the host pipe or fitting



End Seals (60" X 57")

- Once the liner has been cut back:
 - Load the rubber end seal, bands and hardware into the pipe for installation



End Seals (60" X 57")

- Position the end seal so that one side is 1 inch to 2 inches from the end of the liner and the other side is on the host pipe or fitting surface.



End Seals (60" X 57")

- Assemble the expansion bands
- Use Hydraulic Expansion tool to tighten bands to recommended pressure



End Seals (60" X 57")

- Air test if required



End Seals (60" X 57")



End Seals (25.5" X 24.25")



Limitations

- Man entry required
- Operating temperatures up to 250 °F
- Flow less than 20 feet/sec
- External hydrostatic rating of 150 ft of head pressure
- Internal maximum operating pressure of 300 psi
- Piping diameters 18 inches and greater
 - Smaller diameter's can be done if termination point is at a penetration into a structure with man access capabilities
- Pipe must be structurally sound

All service saddles for 2 ½" and smaller service taps shall be epoxy coated ductile iron saddle body with a stainless steel band(s).



The service saddle shall be installed per the manufacturer's installation instructions to maintain the integrity of the lined pipe.

- Ensure the proper size saddle
- Lubricate the pipe
- Tighten the nuts to proper torque
- Use a pipe sealant on the corporation stop
- Recheck saddle torque prior to backfilling

- Keep Safety in mind and Never use an electric drill on a water line.
- Use Maximum RPM on drill as recommended by manufacturer.
- Verify manufacturer's recommendation for compressors if using a pneumatic drill.
- Always keep the shaft straight by pushing straight down on the drill.



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- When tapping a lined pipe, sizes 12" and smaller, operator should use a stainless steel tapping sleeve.
- The tapping sleeve should be installed according to the sleeve manufacturer's recommendation.
 - Care should be taken to ensure a seal on the pipe.
 - Lubricate gasket tapers to prevent the gasket ends from bunching up.
 - Tighten the bolts/nuts to the recommended torque using a torque wrench.
 - Test sleeve assembly prior to making tap. (Air tests are not advised.)
 - Always block the valve and tapping machine to maintain alignment with the tapping machine.
 - Re-Check torque on tapping sleeve bolts

Thank You

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