

SOLUTIONS

WINNING THE FIGHT AGAINST
CORROSION UNDER INSULATION



PARTNERS IN EXCELLENCE



PREVENTION MATTERS

Corrosion Under Insulation (CUI) is a severe form of localized, external corrosion that commonly occurs on insulated carbon steel piping systems that operates between 25° F (-4° C) and 300° F (149° C). The cause of CUI is widely known and it is important to understand the most common contributors to CUI:

- Moisture, or water in all forms, is the greatest contributor to corrosion
- Operating temperature
- Chemical exposure

Prevention lies in controlling these contributors to CUI through proper system design and material specification, installation, and maintenance.

SYSTEM DESIGN & MATERIAL SPECIFICATION EXCELLENCE

Prevention starts with the proper design of the piping system and selection of materials. PERMA-PIPE is available to support from start to finish with:

- Design of the piping system to meet project requirements.
- Optional wind-down end seal to prevent water ingress at the cutbacks.
- Optional PERMA-BOND™ anti-corrosion coatings are available according to operating temperature and environmental conditions.
- Selecting the proper insulation and jacket materials to prevent moisture ingress and chemical exposure.
 - » XTRU-THERM® utilizes high-density polyethylene (HDPE) as the durable, waterproof jacket material.
 - » POLY-THERM® utilizes fiber-reinforced polymers (FRP) for applications requiring high impact resistance.

- Engineering of insulation density, thickness, and thermal conductivity to meet project requirements, to withstand project operating temperatures, and prevent damage during installation, operation, and maintenance.
 - » Void-free, fully bonded, polyurethane foam for optimum performance, CUI mitigation, and longer service life.
 - » For temperatures above 250° F (121° C), a composite insulation system with an inner layer of high-temperature insulation with void-free foam as the outer insulation layer.
- An optional aluminum diffusion barrier maintains thermal conductivity over time and ensures a complete bond between jacket and polyurethane insulation.

EASY INSTALLATION

Commonly used insulation systems are vulnerable to poor installation and require a high level of craftsmanship. PERMA-PIPE's pre-insulated piping systems are:

- Manufactured in an ISO certified, quality-controlled, factory environment ensuring the highest quality and repeatability.
- Custom designed in modular sections of pipe which ship from our plant to the project site where it is easily assembled.
 - » Exposed sections of pipe are coated, insulated, and jacketed on-site with identical or compatible materials creating a watertight end to end system.



PERMA-PIPE'S SOLUTIONS

PERMA-PIPE provides industry-leading solutions addressing CUI problems. XTRU-THERM (HDPE jacket) or POLY-THERM (FRP jacket) systems avoid premature failure of the piping system due to corrosion and resulting in production downtime, costly maintenance & repair, and health & safety risks. Furthermore, these systems not only increase overall value by reducing installation and field labor costs, but also extending the life of the piping system.

MAINTENANCE-FREE

If system design, material specification or installation do not lead to CUI, maintenance can. PERMA-PIPE's pre-insulated systems are virtually maintenance-free.

- PermAlert™ leak detection systems detect small amounts of moisture on the pipe or in the insulation, providing an early warning of potential problems.
- XTRU-THERM and POLY-THERM can be designed to include inspection ports.
- Polyurethane insulation is fully bonded to the pipe and it is a closed-cell foam preventing water migration where inspection ports are used.



PARTNER WITH PERMA-PIPE

PERMA-PIPE International Holdings, Inc. (NASDAQ:PPIH) is a global engineered pipe services company offering core competencies in anti-corrosion coatings, insulation solutions, containment systems, leak detection systems, engineering support, field service, and custom fabrication.

When you do business with PERMA-PIPE, you are partnering with a company that has served the industry for over 100 years and has vast experience in all the markets we serve. You are not just buying a long-lasting, reliable piping system; you are also investing in a partnership with a company that stands behind its products and services while providing lasting peace of mind.

SYSTEMS THAT YOU CAN TRUST

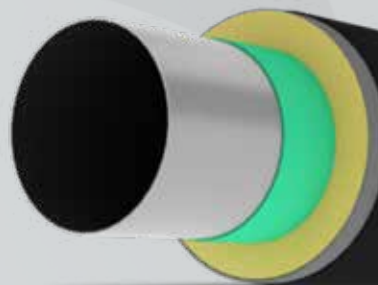
PERMA-BOND™

Anti-Corrosion Pipe Coatings



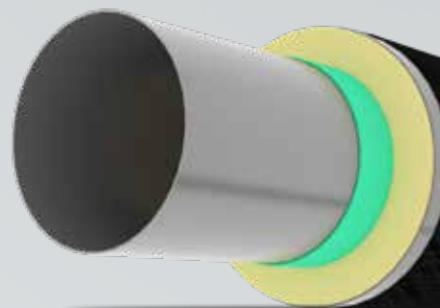
XTRU-THERM™

Pre-Insulated Pipe System



POLY-THERM™

Pre-Insulated Pipe System





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