

A Brief Introduction to PERMA-PIPE

Perma-Pipe, Inc in the Oil & Gas Industry – Thermal Insulation for Onshore and Offshore Insulated Pipelines and Subsea Equipment

Perma-Pipe Inc. is a division of **MFRI** - a public Company listed on NASDAQ stock exchange. Perma-Pipe engineers, designs, manufactures applies and sells insulation for piping systems for the oil and gas industry, specialty insulation and piping systems for district heating and cooling (DHC), and leak detection and location systems. The Company was formed in 1961 and is headquartered in Chicago, Illinois. Perma-Pipe is North America's largest manufacturer of pre-insulated piping and related products and systems.

Piping products and systems include;

- Industrial and secondary containment piping systems for transporting chemicals, hazardous fluids and petroleum products.
- Insulated and jacketed piping systems for district heating and cooling ("DHC"), for efficiency energy distribution to multiple locations from central energy plants.
- Insulation for oil and gas gathering flowlines and long lines for oil and mineral transportation for both onshore and offshore applications.
- Pre-insulated piping for cryogenic applications such as LNG, ammonia, propane and butane pipelines.
- Field and shop insulation for subsea equipment such as PLET's, PLEM's, trees, manifolds, jumpers and other applicable equipment.
- Perma-Pipe's leak detection and location systems are also sold as part of many of its piping systems or on a stand-alone basis to monitor areas where fluid intrusion may contaminate the environment, endanger personal safety, cause a fire hazard, impair essential services or damage equipment and property.

The Company's piping systems are frequently custom engineered and fabricated to specific job site dimensions and/or incorporate provisions for thermal expansion and contraction due to varying temperatures of the insulated pipe under operating conditions. This custom fabrication helps to minimize the amount of field labor required by the installation contractor thereby reducing the overall installed cost of the insulated pipeline.

Perma-Pipe now has 6 plants located throughout the world:

- **Lebanon, Tennessee.** Perma-Pipe's original plant was opened in 1969 and services the North American market for the "DHC", leak detection and pipe containment market.

- **New Iberia, Louisiana.** Established in 1997 - services the offshore market for the Gulf of Mexico, Brazil and West Africa. Products include Auto-Therm® Glass Syntactic Polyurethane insulation for deepwater applications for pipelines and subsea equipment to prevent the formation of paraffin and hydrates in the pipeline and Xtru-Therm® a low to mid density polyurethane foam insulation with an extruded PE outer jacket for offshore shallow water applications, pipe-in-pipe and onshore pipelines.
- **Fujairah, United Arab Emirates.** Established in 2006 supplying the Middle East with “DHC” and composite insulation for sulfur and other pipelines.
- **Gujarat, India.** A “grass roots” plant was established in 2008 to insulate the Cairn Energy India heavy oil pipeline with Xtru-Therm®. The original phase of this project was 625 kilometers from Barmar to Salaya in North West India. The successful execution of the original phase of this work led to additional work from Cairn Energy to insulate an additional 100+ km. lateral lines for this project. Perma-Pipe insulated over three kms. of 24” pipe per day at peak times.
- **Camrose, Alberta, Canada.** Acquired in 2009 in partnership with The Bayou Companies, provides corrosion coatings and insulation systems for the Canadian energy industry and the Western Canadian Oil Sands.
- **Dammam, Saudi Arabia.** Opening in late 2011. Established to supply the GCC countries with “DHC” and composite insulation for onshore and offshore pipelines.

Perma-Pipe currently holds four world records:

- The deepest insulated pipelines installed in the world to date -Auto-Therm® GSPU for Shell Perdido in the Gulf of Mexico, flowlines installed in water depth over 9,700 feet (~2,950 mwd).
- Xtru-Therm® a “wet insulation” mid-density spray on polyurethane foam and PE jacket insulated pipeline for the BG - NCMA3 Poinsettia Trinidad project installed by Allseas - *Solitaire* in water depth of 570’ (175 meters). An extensive testing program was jointly conducted by BG, Allseas and Perma-Pipe to prove out the viability of this product at this water depth.
- The longest continuous onshore insulated pipeline for Cairn Energy India ~190 miles (625 kilometers) using Xtru-Therm® low density polyurethane foam and high strength PE jacket.
- The highest elevation at ~ up to 8,500’ (~2,600 m.) onshore insulated pipeline for Williams American Soda ~90 miles (145 kilometers) using Xtru-Therm® low density polyurethane foam and high strength PE jacket.

Perma-Pipe has also developed a special cryogenic insulation for LNG service (-160 deg C). Perma-Pipe constructed a “test loop” at their Lebanon, TN facility to simulate the operation of an insulated LNG line. A detailed test report was written by Perma-Pipe engineering staff and is available upon request. As a result of this test program Perma-Pipe recently completed a project supplying insulation for the Gulf LNG plant being constructed in Pascagoula, Mississippi, USA, for Aker Solutions and IHI Japan.

A project experience list of major projects with the respective products that Perma-Pipe has produced is available upon request.

A brief list of major accomplishments and significant milestones that positioned Perma-Pipe as the industry leader throughout the U.S. and the world:

- 2011 Dammam, Saudi Arabia – Scheduled to open 2011
- 2010: New Iberia – Completed Insulated Piping for Gulf LNG with various pipe sizes from 3.5" TO 36" diameter and insulation thickness to 6"
- 2009: Camrose, Alberta, Canada plant acquired with JV partner –The Bayou Companies
- 2008: Gujarat, India plant opened. Successfully executed and completed the longest insulated oil pipeline in the world for Cairn Energy, India.
- 2008: Completed Auto-Therm® GSPU insulation for Shell Perdido – the deepest insulated pipeline installed in the world at ~9,600' wd.
- 2007: Applied Xtru-Therm® mid density polyurethane foam for the BG Trinidad NCMA3 Poinsettia project – the deepest installed spray on mid density polyurethane pipeline in the world at 575 feet wd.
- 2006: Developed cryogenic modified polyisocyanurate foam for – 160 Deg C
- 2006: Fujairah, UAE plant established.
- 2005: Auto-Therm® Glass Syntactic Polyurethane (GSPU) introduced for deepwater subsea pipelines.
- 2000: Xtru-THERM® is introduced to the market with a portable facility located in Parachute, Colorado for the Williams-American Soda project.
- 1998: New Iberia, LA plant opened to service the offshore market. Has since processed significant orders for pipe-in-pipe, mid density polyurethane foam and GSPU for the Gulf of Mexico and West Africa
- 1994: PERMA-PIPE became a public company, a subsidiary of MFRI, Inc. The stock is traded on the NASDAQ National Market under the symbol "MFRI". PERMA-PIPE acquired RICWIL Piping Systems. This acquisition enabled Perma-Pipe to provide a complete line of piping systems for industry needs.
- 1993: MULTI-THERM 500 is introduced to the District Heating & Cooling market.
- 1987: Perm-Alert PAL-AT Leak Detection and Location System redesigned to include microprocessor technology that was originally introduced in 1982.
- 1969: Opened manufacturing facilities in Lebanon, Tennessee. This facility located in the central USA and conveniently services the entire United States, Canada and all U.S. ports of call for export.

Additional information can be found at www.permapipe.com for pipeline insulation systems and (www.permalert.com), for heat traced and leak detection systems. July 2011