Introduction

Notice

The information and data presented in this catalogue is intended as reference for use of PYPLOK® equipment by designers and users for proper application and installation of the product. It is not intended to be used as a substitute for competent, professional assistance for any specific application.

While every effort has been made to ensure its accuracy, Tube-Mac®, its subsidiaries and affiliated companies, make no express or implied warranty of any kind regarding the information contained in this catalogue or the material referred within.

The technical and performance information such as weights, dimensions and ratings in this catalogue supersede all previous published data. Tube-Mac® is always striving for continual product improvement and developments and therefore reserves the right to change product designs, specifications and limitations without notice.

Anyone making use of the information or material contained herein does so at their own risk and assumes any and all liability resulting from such use.

All technical data presented should always be used to design a system along with good piping practices. The pressure, temperature and other limiting factors of the PYPLOK® product must never be exceeded. For any additional technical information, it is recommended to contact Tube-Mac®.

Introduction

What is PYPLOK®

PYPLOK® is a 360° radial swage mechanically attached fitting which permanently connects pipe and tube for a leak free, cold connection. The system is fast, reliable and tamper proof ideal for use in new build and maintenance works where fire hazards exist and a clean piping connection is required. A hydraulically powered compression tool swages the fitting over pipe/tube plastically deforming the fitting in seconds. The fitting can be used in a wide variety of low to high pressure piping applications in industries such as Marine & Offshore, Navy, Oil & Gas, Petrochemical, Steel, Mining and other Industrial uses.

This technology was originally developed in 1968 by McDonnell Aircraft as a replacement to threaded and brazed joints on the F-4 Fighter Jet. Threaded and brazed joints were less reliable in applications of high stresses and loads so they developed the 360° Radial Swage technology. McDonnell Aircraft licensed a company, Deutsch Metal Components (DMC) to manufacture this new fitting technology specifically for aerospace tubing application. In 1978, DMC expanded the range of the product to Nominal Bore Pipe, OD Tube and Metric Tube for industrial applications in the Oil & Gas, Marine & Offshore, Navy and Industrial Process and Power Piping industries. As an equal or better equivalent to welding and threading it was accepted as a new alternative to connecting pipes and tubes.

In 2007, DMC decided to divest in the industrial line of Mechanically Attached Fittings and sell the product line to one of its largest users which was Tube-Mac®. Since then Tube-Mac® has integrated PYPLOK® into their large offering of non-welded piping solutions and has expanded the range to additional materials, configurations and sizes.

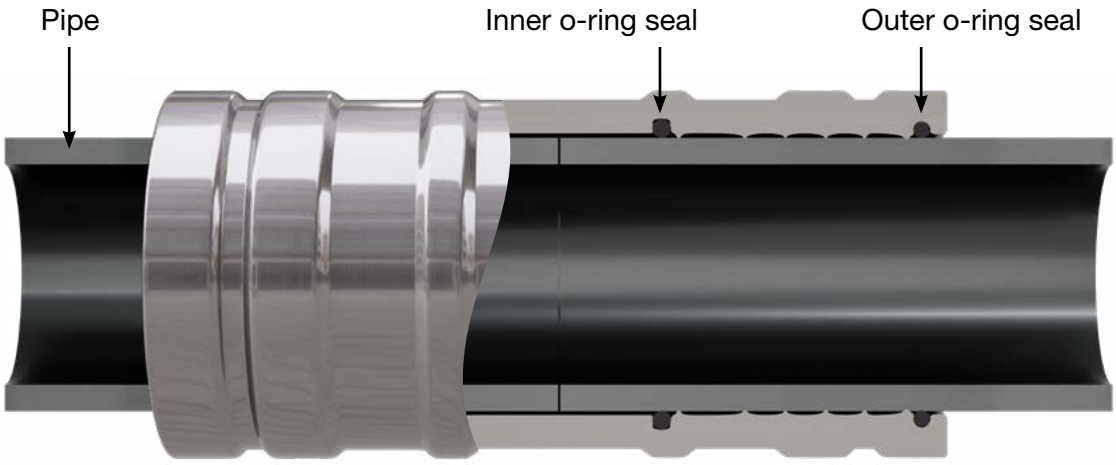
Introduction

Technology

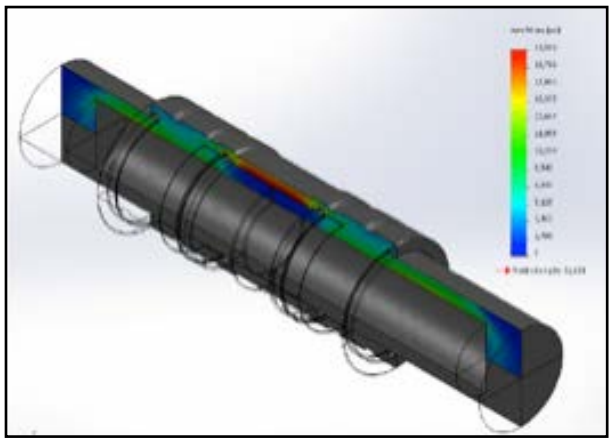
PYPLOK® Fittings incorporates a unique sealing capability by using four non-metallic O-Rings which compress against the pipe surface which produces a leak tight, permanent seal. Due to the use of O-Rings, the fitting is able to be installed on normal pipe and tube tolerances and surface conditions.

The PYPLOK® connector is a metal sleeve which slides over the pipe or tube. The outer diameter at each end of the connector is then swaged against the pipe or tube using a hand held portable hydraulic tool. The tool transfers a linear force of 360° radial force which results in a permanent leak free connection. At each swaged end there is an internal helical ridge which, when swaged, penetrates the outer surface of the pipe or tube. Axial grooves separate the ridge into teeth which resist torsional loads.

There are two O-Ring seals. The “Inner Main Seal” is the high pressure seal. The O-Ring groove which houses this main seal has an annular ridge directly beside the groove which provides additional support upon swaging assuring a fluid tight connection. At the outer end of the fitting is the second O-Ring groove which houses the “Outer Environmental Seal”. This seal prevents the ingress of fluids and/or contaminants from entering between the fitting and the tube thereby preventing internal corrosion.



PYPLOK® has been mechanically and environmentally tested according to many standards and procedures over the years. PYPLOK® has passed combined impulse and vibration tests as well as shock and fire tests. PYPLOK® was analyzed using FEA (Finite Element Analysis) to ensure compliance under ASME B31.1, 31.3, 31.4 & 31.8. Below are some of the type approvals and standards to which PYPLOK® complies:



Introduction

ASME B31.1, 31.3, 31.4 & 31.8 Qualified

CRN – Canadian Registration No. 0A12153.5

API 6FB and ISO 19921/15540 Fire Test

NAVSEA and USCG Approved

ABS, DNV, Lloyd's, CCS, RMRS & BV Type Approved

The installation and subsequent inspection of fittings is the most expensive part of joining and maintaining any piping system. Regardless of the type of piping system, there may be numerous threaded, welded and brazed fittings. These traditional types of fittings are costly to install as they are more labour intensive.

Expensive and laborious procedures may include the following:

- Obtaining permits
- Preparation time
- Fit-up time
- Inspection of joint
- Hydrostatic testing
- Purging the system
- Rework of joints that do not pass inspection
- Time for welding or brazing
- Need for a fire watch

PYPLOK® Mechanically Attached Fitting System is the best alternative to threaded, welded, or brazed joints.

Some of the many advantages of using PYPLOK® over traditional methods are:

- There is no need to purge or flush the piping system of gas or liquid because the application of PYPLOK® requires no hot work. In other words, PYPLOK® is installed cold.
- The time required to join the pipe ends together is significantly shorter because of the portable tools used to compress the fitting onto the pipe.
- Reduced inspection time through an inspection gauge, which checks for proper swaged diameter to determine satisfactory compression of the fitting. This eliminates the need for conventional NDT requirements such as X-rays etc.
- There is no need for fire watch or any special fire permit which are needed for welding or brazing, as there are no fumes or fire hazards when installing PYPLOK®.
- PYPLOK® is a safe cold work technology.

With all the advantages listed above, PYPLOK® is certainly the most economical and efficient way of joining pipes. It dramatically reduces costs, greatly enhances quality and significantly improves safety conditions and reliability of the completed joint.

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PYPLOK® fittings come in all standard configurations (straights, 45° & 90° elbows, adapter, tees, reducers and flanged ends).

PYPLOK® configurations provide permanent ends or a combination of permanent and separable ends. Separable ends include ANSI, SAE and ISO Flanged as well as JIC 37°, ORFS, NPT, BSPP and DIN 24° fittings.

PYPLOK® fittings are available in Carbon Steel, Stainless Steel and Copper Nickel (CuNi), Duplex and Super Duplex.

PYPLOK® is suitable for NPS pipes, OD tubes and Metric tubes.

PYPLOK® System Benefits

PYPLOK® system assists you and your team with safe and cost effective work practices

Most cost effective on-site pipe work fabrication and repairs

- Reduces on-site time and labour; PYPLOK® fittings are swaged on cold, hot work permits are no longer required. PYPLOK® tooling is hydraulically actuated removing the need for special site services.
- PYPLOK® system prevents the need for Gas Freeing, System Flushing, NDT, and Fire Watch; designed as a one person operation.
- Swaged fittings are verified with an inspection gauge - much quicker than NDT.

Provides an improved safety environment

- The PYPLOK® system, developed to reduce hot work, is in itself a safe system. There are no torches, open flames or sparks are associated with the installation or maintenance.

PYPLOK® system on EVERY installation achieves

- Improved productivity; many tasks carried out in only one-shift with minimum disruption to production.
- Installed cost reduction of up to 60%.

PYPLOK® system on EVERY installation offers

- High tensile and high torque hold.
- Minimum pipe preparation.

Requires very little specialized skill and training

- PYPLOK® system provides a range of fittings and hand-held tooling that requires a minimum of specialized skills to install - easy and user friendly.
- Training takes less than 30-minutes to complete.
- Fully detailed, simple to follow documentation (Installation and Preventative Maintenance Manuals including Inspection Criteria Instructions) are provided with each purchased kit.

How much does it cost - rent or buy?

- Clients have recuperated tooling and fitting costs in one system installation.
- Tooling Rental Program and or Purchase Programs Available.

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Industries and Applications

PYPLOK® has been used in numerous industries worldwide including but not limited to:

- Ship Building and Repair (Commercial and Navy)
- Refinery, Chemical, Pharmaceuticals, Food/Beverage
- Marine, Offshore and Sub Sea
- Land Based Drilling Rigs, Mobile Equipment
- Sugar, Steel/Metal Production, Testing Equipment, Fire Suppression
- Mining, Pulp and Paper, Nuclear/Power Generation, Automotive

PYPLOK® Applications Include:

- CNG – Compressed Natural Gas
- CO2 Cofferdam Inerting
- Condensate Piping
- Deluge Systems
- Down Well Coiled Tubing
- Drains and Plumbing Vent
- Ethylene Glycol/Water
- Fuel and Fuel Heating Lines
- Heating Coils
- Utility Piping Systems
- High Pressure Fire Suppression Systems
- Mobile Equipment Tubing/Piping
- High Pressure Hydraulics Systems
- Low Temperature Steam (<200°C)
- LPG – Liquefied Petroleum Gas
- Lubrication & Grease
- Natural Gas Distribution
- Plant, Instrumentation and Utility Air
- Waste Systems
- Solvents and Water Based Paints
- Subsea/BOP Piping
- Steam Tracer Lines
- Waste Water
- Paint, Brake Fluid and Sealer Lines

Notes