



HIGH PRESSURE ONSHORE AND OFFSHORE PIGGING SYSTEMS



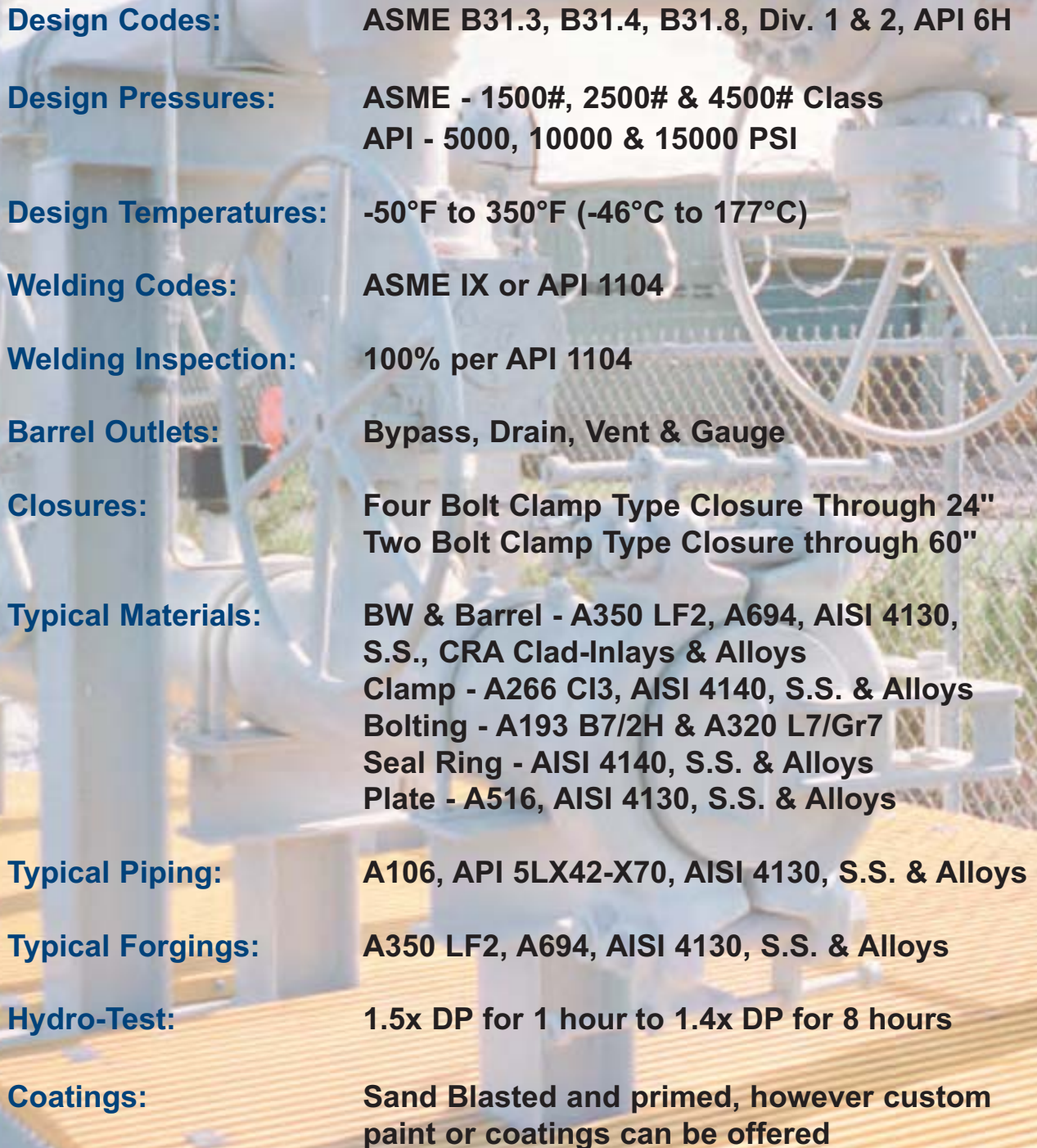
Oil and Gas Division

**ENGINEERED SOLUTIONS FOR INLINE
CLEANING AND INSPECTION**

Dedicated to Quality and Excellence

DESIGN SPECIFICATIONS

Design Options



Design Codes:	ASME B31.3, B31.4, B31.8, Div. 1 & 2, API 6H
Design Pressures:	ASME - 1500#, 2500# & 4500# Class API - 5000, 10000 & 15000 PSI
Design Temperatures:	-50°F to 350°F (-46°C to 177°C)
Welding Codes:	ASME IX or API 1104
Welding Inspection:	100% per API 1104
Barrel Outlets:	Bypass, Drain, Vent & Gauge
Closures:	Four Bolt Clamp Type Closure Through 24" Two Bolt Clamp Type Closure through 60"
Typical Materials:	BW & Barrel - A350 LF2, A694, AISI 4130, S.S., CRA Clad-Inlays & Alloys Clamp - A266 Cl3, AISI 4140, S.S. & Alloys Bolting - A193 B7/2H & A320 L7/Gr7 Seal Ring - AISI 4140, S.S. & Alloys Plate - A516, AISI 4130, S.S. & Alloys
Typical Piping:	A106, API 5LX42-X70, AISI 4130, S.S. & Alloys
Typical Forgings:	A350 LF2, A694, AISI 4130, S.S. & Alloys
Hydro-Test:	1.5x DP for 1 hour to 1.4x DP for 8 hours
Coatings:	Sand Blasted and primed, however custom paint or coatings can be offered

CUSTOM SYSTEMS

Products

LTS designs and builds custom ASME and API high pressure pig launching and receiving systems.

LTS utilizes proven high pressure metal to metal seal ring and Wireloc® connector technology, used world-wide for over 50 years in a multitude of industries and applications through 65,000 psi working pressures



One Piece 7.1/16" API 10000 psi - Four Bolt

ClampTec® Closure Types

The closures are available in four and two bolt options, in either Butt Weld or “One Piece” forged barrel construction. Both offer great advantages over standard and proprietary flanged types, and are up to **1/7 the weight**, take up **less space** and are more than **6 times quicker** to open and close. Only one operator is needed with **75% less bolt torque** required to make up the closure, and there is **no periodic re-tightening** necessary.



Fabricated 16" ANSI 1500# - Two Bolt

Systems

LTS systems offer the most reliable and efficient high pressure pigging solution, with a standard range covering 6" (150mm) to 24" (610mm) closure sizes for ASME 1500#, 2500# and 4500# classes and up to 60" (1524mm) for specials. LTS also offers a complete range of API closures meeting API 5,000, 10,000 and 15,000 psi maximum allowable working pressures.

These system are offered in various styles such as: Butt Weld end closure units, barrels with integral closure, or skid mounted packages complete with valves and piping, tested ready for use.



9" API 10000 psi Skid Mounted Unit

CUSTOM SYSTEMS



Typical Fabricated - Four Bolt

Features

One Piece Barrel:

Solid, one piece profiled and machined from forged NACE materials with no welding required. Studded bypass and drain valve connections with tappings for vent and pressure gauge hook-ups.

Reusable Seal Ring:

Proven reusable seal ring design with over 50 years of operating experience in extreme high pressure and sour gas.

Valve and End Connections:

Standard ANSI and API valves as well as Compact ball valve "Building Block" systems. Outlet connection can be of any flange or clamp connector configuration.

Easy Maintenance:

The closure or barrel can be refurbished on-site, in-place or quickly disassembled from the skid with the minimum of effort should it ever be necessary.

Contracts

LTS can assist in turnkey project engineering, design, material selection and fabrication of your launcher and receiver systems.

LTS can also provide individual products, such as valves, fittings and end connections for flowline and manifold applications.



One Piece - 9" API 10000 psi - Two Bolt

Options

- Butt Weld or One Piece Barrel Closure
- Safety Interlock System
- Actuation for Two Bolt Clamp Design
- Double Block & Bleed Vent System
- Extension Lengths for Intelligent Pigging
- ASME Design and U Stamp
- Full Bore Cladding and Seat Inlays

FOUR BOLT CLAMP CLOSURE



Four Bolt Clamp Closure

The four bolt clamp design offers a highly reliable, proven metal to metal sealing solution to all types of high pressure closures. The clamp segments are supported on runners, and the door is hinged to allow easy access to the barrel. The all metal seal ring is retained in the door, to further simplify make-up and is reusable.

One Piece - 7.1/16" API 5000 psi - Four Bolt

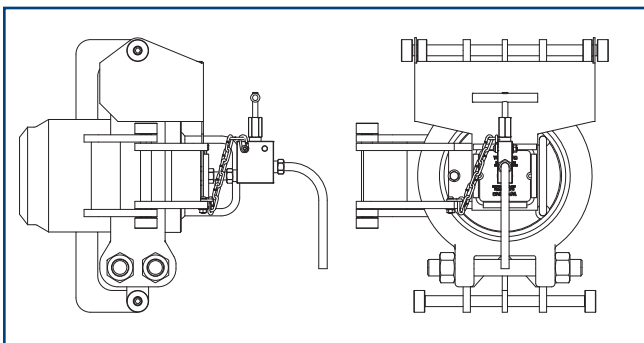
Design

The closure is designed in accordance to ASME VIII Div. 1 for pressure vessels and can be supplied with a Partial Data Report and U-Stamp upon request. For all other applications, the standard closure will comply to ASME VIII Div. 2, ASME B31.3 and API 6H.

LTS can design to any International Code and arrange for third party verification if required.



One Piece - 7.1/16" API 10000 psi - Four Bolt



Schematic of Butt Weld Four Bolt Clamp Closure

ClampTec® Range

A standard range of closures are available from 6" (150mm) through 24" (610mm). Closures can be offered with Double Block and Bleed Vent Systems as well as Pressure Relieving or Non Pressure Relieving Safety Interlock Systems as optional extras. Please refer to our Technical Data Sheets for dimensional data.

TWO BOLT CLAMP CLOSURE



One Piece - 11" API 15000 psi - Two Bolt

Two Bolt Clamp Closure

The two bolt clamp closure utilizes the same highly reliable, proven metal to metal sealing solution as the four bolt option. The clamps are supported between two plates and are actuated with bi-directional lead screws. The door is hinged to allow easy access into the barrel, and the seal ring is retained into the door as standard.

The closure can be also be supplied with a choice of electric, hydraulic or pneumatic actuation as optional extras.

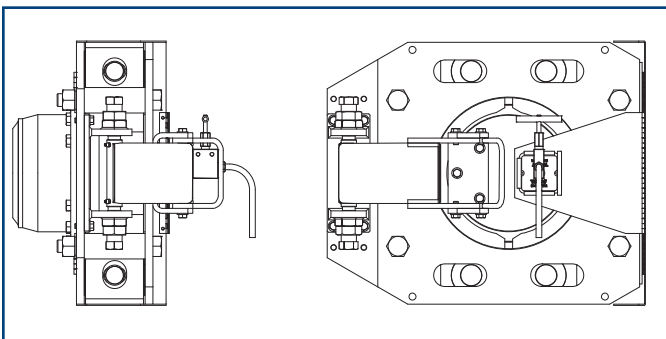
Design

The closure is designed in accordance to ASME VIII Div. 1 for pressure vessels and can be supplied with a Partial Data Report and U-Stamp upon request. For all other applications, the standard closure will comply to ASME VIII Div. 2, ASME B31.3 and API 6H.

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One Piece - 11" API 10000 psi - Two Bolt



Schematic of Butt Weld Two Bolt Clamp Closure

ClampTec® Range

A standard range of closures are available from 8" (203mm) through 60" (1524mm). Closures can be offered with Double Block and Bleed Vent Systems as well as Pressure Relieving or Non Pressure Relieving Safety Interlock Systems as optional extras. Please refer to our Technical Data Sheets for dimensional data.

CUSTOM APPLICATIONS



9" API 10000 psi Dual Block Gate

LTS offers a wide range of high pressure Oilfield products for Surface and Subsea applications, such as:

- Manifolds:** Production and Injection Manifolds
- Valves:** API 6A, 6D and ANSI Gate, Check and Ball Valves, including Compact Type
- Flowlines:** Fabricated or "One Piece" construction
- Subsea:** Poseidon® Subsea Connectors Wireloc® DSS® Clamps, FlangeTec® DSS® Flanges, Ball, Gate and Check Valves. As well as integrated PLET, PLEM and Pig Launching Systems



3.1/16" API 15000 psi Flowline



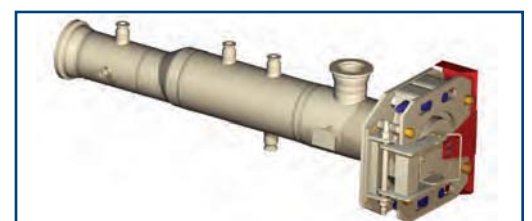
4.1/16" API 15000 psi Production Manifold



Above: Subsea Pig Launcher
 Top Right: Subsea Rock Crusher
 Bottom Right: Launcher Barrel

LTS utilizes SolidWorks 3D Design and Modeling software for all component and integrated system applications which includes, FEA and 3D animation.

This offers greater accuracy in determining application size and weights. Intelligent drawings can be emailed anywhere in the world to provide animated 3D renderings.





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