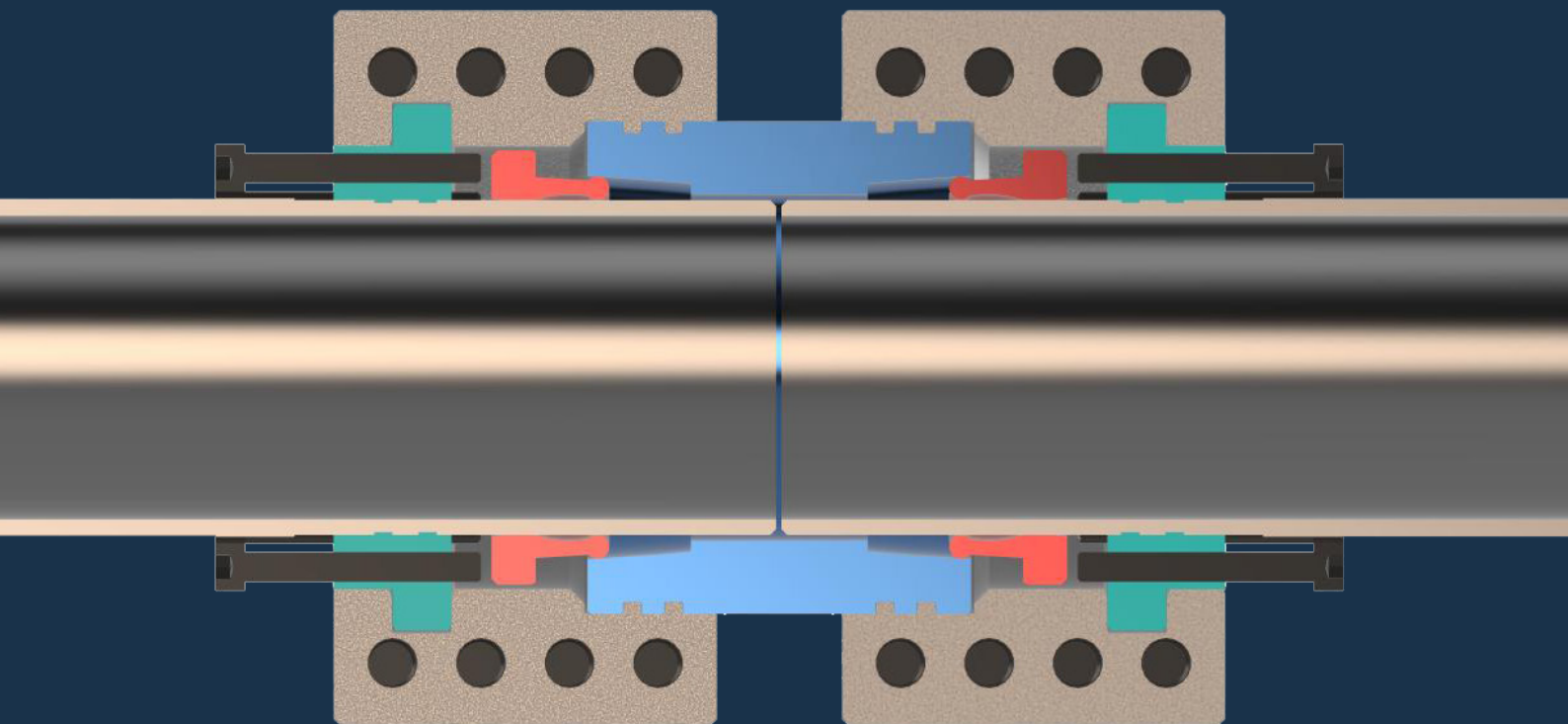


POULTON TECHNOLOGIES

CONNECT AND SEAL



PT1

CONNECT AND SEAL

Poulton Technologies was founded on the need for an unbreakable pipeline connector that can be fitted in hostile conditions, in limited space and without a need for welding or other hot work. The **PT1** connector is the result; it was developed and tested in the UK and has received type approval from Lloyd's Register (certificate number 16/00039).

The **PT1** is unique because of its novel sealing technology. It is also the most rugged pipe connector in the world because sealing is decoupled from connecting. This means that whatever external forces are applied on to the connector through the piping, these forces will not affect the seal.

Because the seal is completely metallic, the connector can maintain its excellent performance with raised external and fluid temperatures. The **PT1** has passed the API 6FB fire test at 650°C, in addition to all other tests required for Lloyd's Register Type Approval, which a flanged connection could never survive.



THE **PT1** CONNECTOR IS PROTECTED BY GLOBAL PATENTS.

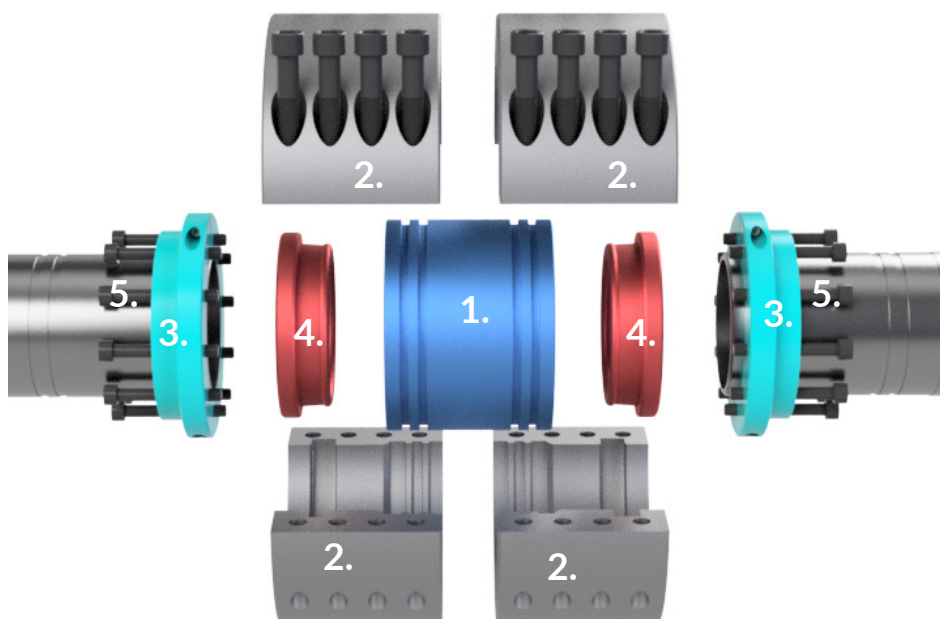
Patented in multiple countries, including under US patent number 14/432,955, Russia patent number 2016108966 and European patent number 14766785.1

EASY-FIT TECHNOLOGY

The key to the simplicity of the PT1

This image shows an exploded view of the **PT1**. The parts are:

1. **JOINING STOCK** A pipe sleeve over the pipe ends which are being connected.
2. **CLAMSHELLS** A pair of clamps which connect the two ends of the Joining Stock with the two Pipe Ends
3. **SPIGOT RINGS** Two half rings which are fitted onto the Pipe Ends, spigots in the grooves, and the outside shoulders sit in the Clamps.
4. **RADIAL WEDGE SEALS** Steelrings with a wedge shape and round end on one side, which are forced by the Energisation Screws (5) into the tapered gap between the Pipe End and the Joining Stock.



ATTRIBUTES

METAL SEALS

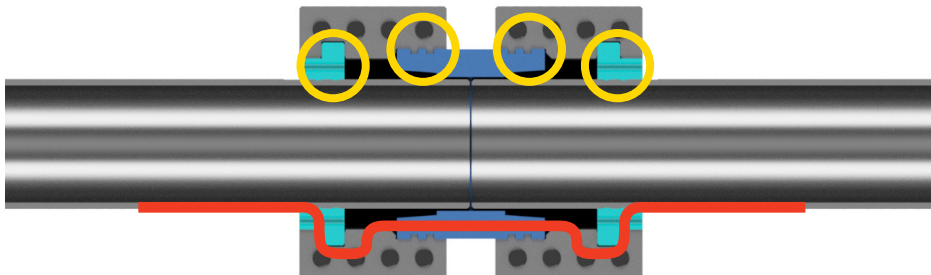
The **PT1** performs better than any other mechanical connector in the world:

- Pressure capabilities - the **PT1** has been hydrostatically tested to 24,000 psi (>1,600 Bar).
- Outstanding sealing performance - the **PT1** is proven to seal helium to 3×10^{-10} mbar.litres/second, equivalent to the loss of 1 cc of helium 105 years.
- Fire resistance - the **PT1** has been tested to 650°C in the API 6FB fire test.

RUGGED

Because the **PT1** separates connecting from sealing:

- External forces introduced into the connector through the pipes do not compromise the sealing performance. In the adjacent image, the yellow hoops show the connection points and the red line shows the flow of stress through the **PT1**, away from the sealing.



- With flanged connections, where the flange bolts are responsible for both the sealing and connection forces, any external forces (bending, twisting, tension and vibration), interfere with the sealing pressure applied to the gasket. The **PT1** is immune to such forces.
- All the sealing forces are generated by bolts under compression. Which means that Yielding bolts, like in flanged connections do not exist. This unique feature has allowed the **PT1** to survive the harshest vibration test possible. (In accordance with IACS P2, 3 million cycles with a frequency of 10Hz and an amplitude of 1.5mm).

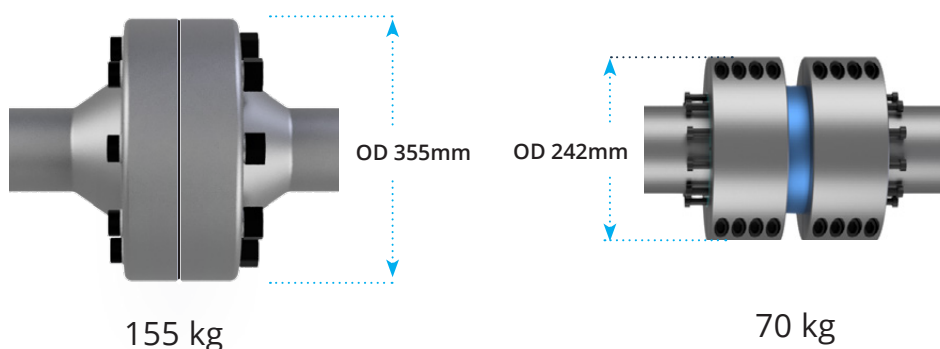
NO WELDING

- No requirement for hot work permits.
- No metallurgical weakening of the pipe in the most critical locations, i.e. adjacent to flange joints.
- No thermal damage to pipe linings which protect pipes from sour service attack.
- No requirement for certified welders, or non-destructive testing.

ATTRIBUTES

SMALLER SIZE, LOWER MASS

- Pressure for pressure, the **PT1** is much smaller and lighter than any flange connection.



- The images above show a 4-inch ANSI 2500-rated flange connection in the same scale as the **PT1**
- As pipe sizes increase, the size and mass difference between **PT1** and ANSI flanges increase. For example, a fully-bolted 8-inch ANSI2500# flange has a mass of 650 kg and diameter of over 533mm. The equivalent **PT1** weighs just 150 kg with a diameter of 364mm.

FLEXIBILITY / WIDE RANGE OF SIZES

- The **PT1** is type approved for pressure ratings up to ANSI 2500, for all sizes up to 16-inches nominal bore.

FAST AND STRAIGHTFORWARD INSTALLATION

Once pipes have been prepared with a clamp-on lathe, assembly requires only hand tools:

- No hydraulic bolting.
- Short installation timescales.
- Swift return to service.
- No welding

APPLICATIONS

SAFETY CAN BE COST-EFFECTIVE

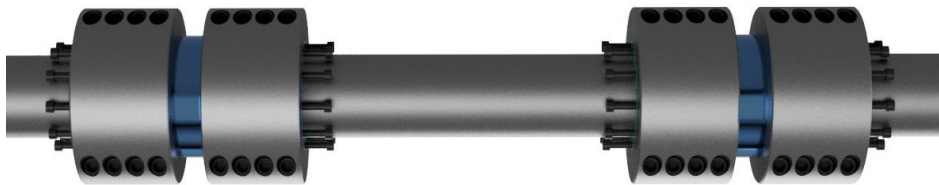
Pipe leakages and repairs can create serious safety concerns. The straight forward installation of the **PT1**, without the need for hot work and scarce welding skills, will provide large cost savings when pipe repairs are required.

The **PT1** is not only a quick fix, but a permanent solution for subsea, the weightconscious topside, the frozen arctic or the blistering desert.

These attributes of the **PT1** make it ideal for use within **hazardous areas**, and especially where other alternatives cannot meet the **size requirements**.

VOC Emissions have become a significant concern to the industry. As the **PT1** has been emphatically-proven to even seal helium to an exceptional degree, its use will prevent VOC emissions from occurring.

The benefits of using the **PT1** for individual repairs is self-evident, however, its use in replacing complete subsystems also has significant advantages. As the **PT1** is reusable, complete networks can be designed, built and factory-tested before dismantling for simple rebuilding on site.



Without further dismantling of the pipe network, the **PT1** can be used for in situ repairs and pipe replacements.

VALIDATION

The Lloyd's Register type approval provides assurance that the repair will last the lifetime of the pipe.

THE **PT1**
IS BETTER

It is stronger and longer-lasting, safer and more reliable, much cheaper to install, and offering through-life costs much lower than a flange.

No other connector - or flange - is capable of the same performance as the **PT1**, in terms of:



PRESSURE



TEMPERATURE



STRENGTH



RELIABILITY

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