



RISER & DRILLING SYSTEMS

Merlin™ R Connector

Introduction

Oil States Industries is a world leader in the design and manufacture of advanced connection systems for offshore applications. Our connectors provide fast make-up and high performance ideal for Risers, SCRs, TLPs, tethers, conductors, casing, new and replacement caissons, HP risers, pipelines and jacket piles. Oil States is a proven provider of riser components for deep water, production, drilling and completion risers. We also offer comprehensive riser system design services for completion, drilling, subsea and surface equipment to complement our field-proven connector technologies.

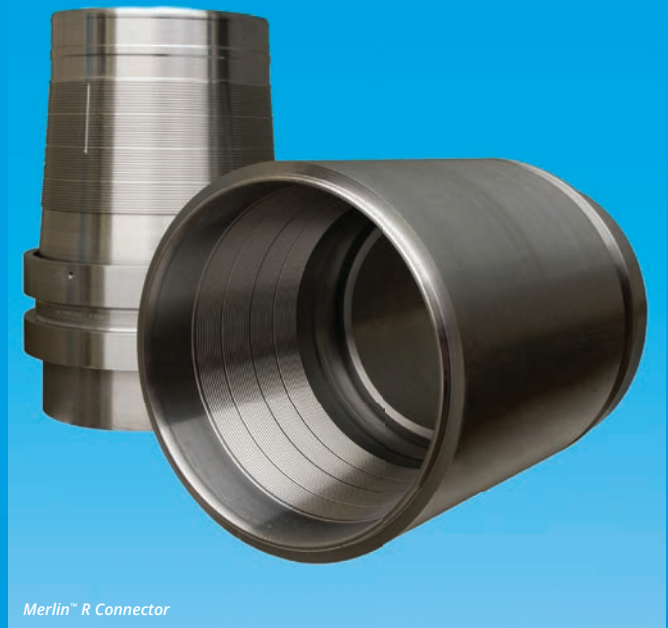
Merlin™ R connectors consist of male and female couplings at either end of the pipe. These unique connectors permit pre-welded pipe segments, 30 - 90 meters long, to be safely assembled offshore without welding. Merlin™ R connectors include a preload against operating tension, thereby minimising stress concentrations to extend the service. The connectors' unique grooved thread profile provides clear evidence of proper mating and prevents connector back-off under fatigue loadings.

Complete Handling Package

Oil States has designed and tested handling tools for installation of the Merlin™ R. Tools include assembly clamps, stabbing guides, hydraulically operated spider units to support the full weight of the riser during assembly and pick-up tools to lift the riser string into position prior to assembly. Tools are operated by in-house offshore technicians ensuring a smooth installation service.

Design

The Merlin™ R connection system has been designed and manufactured to meet a range of static, fatigue and pressure loads (up to 15,000 psi). Sizes range from 6 5/8" to 24". As with all Merlin™ connectors, the high pressure riser Merlin™ incorporates non-helical interlocking teeth which, because of the design geometry, ensure that the connector pin and box can only be mated in one precise configuration. The connection is assembled in a maximum time of 5 minutes using an Oil States supplied hydraulic clamp and air operated power pack.



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Field Proven

Since their inception in 1981, Merlin™ R Connectors have consistently proven to be at the forefront of connector technology worldwide with over 60 systems run in the last 20 years.

Features

- Non helical tooth profiler
- Non rotation make-up
- Multiple seals
- Pre-loaded abutment face
- Full bore smooth profile
- High yield material



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Benefits

- No back off possible due to cyclic tension loading
- Fast, repeatable and reliable assembly in under 5 minutes
- High internal and external pressure integrity
- Allows retention of corrosion inhibitor in the tooth area to increase corrosion resistance
- High fatigue capacity
- Tool running is simple
- Slimline low cost designs
- High strength

After stabbing, the clamp is fitted around the connector, and hydraulic fluid is injected between the pin and the box. As pressure elastically expands the box and compresses the pin and the clamp is activated axially to pull the two halves of the connector together. When pressure is released, the box shrinks onto the pin and the pin expands into the box. The wedging action of the teeth converts radial preload into a high axial preload thus maintaining connector stiffness and providing enhanced fatigue characteristics.

As a result of the make-up process which requires fluid at high pressure to be injected into the tooth cavity between the two sealing areas, seal integrity is automatically confirmed. Make-up is visually confirmed by inspecting the external abutment face. Additional gas tests can be carried out externally at the bleed ports, which have direct access to the inner and outer metal to metal sealing areas. It is also possible to apply the clamp load in the reverse direction to ensure mechanical integrity has been achieved.

Merlin™ R Connectors for Workover Risers

Merlin™ R workover riser connectors are designed to meet a range of static and fatigue stresses compatible with ISO 13628-7. All the design features of the TLE connectors are present, together with a number of additional capabilities; the connector can be machined directly onto upset riser pipe, with the facility to perform “re-cuts” of the connector, should damage occur in service. The interface profile between pin and box has been improved to allow the full combined pin/ box thickness to be mobilised when resisting riser internal pressure.

Testing

Extensive testing has been carried out on the Merlin™ to include internal gas pressure, external water pressure, tension, axial fatigue, bending fatigue, corrosion simulation, crevice corrosion and a variety of load combinations that simulate operating conditions.



Merlin™ R Connector run pin up, box down



Connection made-up, hydraulic clamp assembly up, box down



Made-up connection is preloaded both radially and axially

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