Horizontal Diverless Connection System

Enabling fast and reliable diverless pipeline and flowline tie-ins

Our ROV-operated clamp connector engages a patented Oceaneering® Grayloc® metal seal between male and female hubs to provide a robust, field-proven connection solution. The system enables a fast and reliable connection between pipelines and flowlines to new production fields or field expansions.

FEATURES

- Single drive screw adaptable for ROV operations
- Field-proven Grayloc® metal-to-metal seal
- Engaged using an industry-standard ROV torque tool
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The horizontal connection system includes a Grayloc® remote clamp connector with a single drive screw and standard API torque bucket. The clamp connector is engaged by using an industry-standard ROV torque tool.

The remote clamp connector is mounted to the female hub assembly, which is located on the infield jumper. Upon full makeup of the clamp connector, an annulus test port is positioned on the backing plate of the connector to enable verification of the clamp’s sealing integrity.

The connector is designed to be installed with a non-integral pull-in system.

Oceaneering offers a complete turnkey solution for subsea flowline connection systems starting from the seal, connector, jumper metrology, jumper design, engineering, testing installation, fabrication, load-out, ROV tools, and installation. We have installed more than 420 jumpers worldwide.

### Design Parameters

Nominal Pipe Size (NPS): any API Specification 5L pipe, wall thickness, and grade

Service: Sweet [i.e. crude oil, natural gas, hydrocarbons, water, or chemical injection, etc.] and Sour [i.e. hydrogen sulfide, carbon dioxide, etc.]

Design Pressure Rating: Up to 15 ksi. Higher design pressures may be offered upon further evaluation

Design Temperature Range: -20°F to 300°F / -29°C to 149°C

Design Life: 30+ Years

Design Water Depth: 12,500 ft / 3810 m

Make and Break Cycles: 25

### Material Specifications

| Hubs | ASTM A695 F65 with Inconel 625 inlay on sealing surfaces. HH trim may be offered upon request |
| Clamp | 4140 Alloy Steel |
| Grayloc® Seal | Inconel 718, silver plated |
| Body | ASTM A572 Gr50 |
| Frame | ASTM A572 Gr502 |
| Pins/Receptacles | 4140 alloy steel |

Studs and nuts

| Studs and nuts | ASTM A193 Gr. B7 studs and ASTM A194 Gr. 2H heavy hex nuts, all Xylan coated [i.e. PTFE, dark blue] |

External coating

| External coating | 3-Part Epoxy and Xylan PTFE |

### Applicable Design Codes, Standards, and Specifications (latest editions)

ISO 9001:2015 Quality Assurance – Quality Control Procedures and PCRS Operating Procedures

Oceaneering Subsea Coating Specification

ASME Boiler and Pressure Vessel Code, Section VIII, Division 1 and 2

ASME B31.4, Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids

ASME B31.8, Gas Transmission and Distribution Piping Systems

API 5L, Specification for Line Pipe

API 6A, Specification for Wellhead and Christmas Tree Equipment

API 17D, Specification for Subsea Wellhead and Christmas Tree Equipment

API 17N, Recommended Practice for Subsea Reliability and Technical Risk Management

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