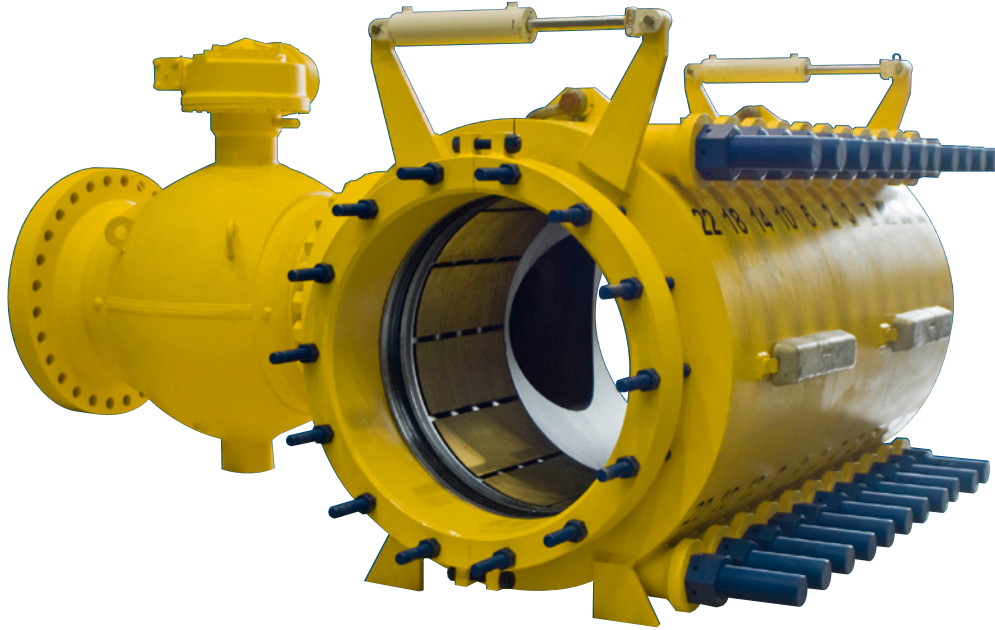


SMART TAP - HOT TAP FITTING



Oceaneering's Smart Tap is a split mechanical hot tap fitting that provides a necessary flanged branch for hot tapping an existing subsea pipeline and tying-in a new lateral pipeline. The fitting eliminates costly pipeline shut downs and expensive hyperbaric welding.

After tapping, the Smart Tap provides permanent high quality sealing integrity and structural reinforcement for the design life of the pipeline.

Smart Tap Features:

- Viton-A circumferential and longitudinal seals as standard, Buna-N (Nitrile) or other elastomeric compounds can be provided for compatibility with pipeline contents or inhibitors
- Elastomeric circumferential seals are mechanically set, permanently pressurized and fully restrained, mitigating concerns of explosive decompression effects for gas service

- Seal extrusion guards are for 12-in Nominal Pipe Size (NPS) and larger when API 5L pipe outside diameters tolerances become significant
- Port for annulus testing between the seals and pipeline prior to tapping
- Galvalum III anodes sufficient for 25-yr design life
- Externally coated with 3-part marine epoxy
- RTJ flange lateral branch is standard, specialized flanges that accommodate temporary plugs for line stopping, scarfed nipples or pigging bars can be provided.
- Hardened steel grips and bowls provide reinforcement to the pipeline by transferring axial loads from the pipeline into the body of the fitting, effectively replacing structural integrity after the branch hole is tapped
- Internal components are securely retained whether the fitting is open or closed, before or after installation



SMART TAP - HOT TAP FITTING SPECIFICATIONS



Design Parameters:

- NPS: any API Specification 5L pipe and wall thickness
- Service: Standard (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 ASME Class 2500
- Hydrostatic Test Pressure (min): 1.5 times Design Pressure Rating rounded up to nearest 25 psig
- Hydrostatic Test Duration (min): 4-hrs
- Design Temperature Range: 25°F (-4°C) to 250°F (121°C)
- Design Life: 25-yrs
- Lateral NPS \leq Trunkline NPS
- Lateral RTJ Flange \leq Design Pressure Rating
- Hydraulic Cylinder Pressure (max): 2500 psig (172 barg)

Material Specifications:

- Body: ASTM A105 forging for 12 in NPS and larger; ASTM A516 Gr. 70 pressure vessel plate for 10 in NPS and smaller
- Actuator Flanges: ASTM A105 forging or ASTM A516 Gr. 70 pressure vessel plate
- Weldolet and RTJ Flange (lateral): ASTM A105 or ASTM A694 GR. F52
- Tension Bowl and Grips: AISI 4140 (i.e. ASTM A-519 Gr. 4140, Heat Treat to 34-40 Rc, NQ&T)
- Compression Rings and Structural Attachments: ASTM A36 or ASTM A516 Gr. 70
- Seal Extrusion Guards (12 in NPS and larger): Type 316 stainless steel
- Elastomeric Circumferential and Longitudinal Seals: Viton-A, 70/80 durometer
- Studs and Nuts: ASTM A193 Gr. B7 and ASTM A194 Gr. 2H, respectively, all Xylan coated (i.e. PTFE, dark blue color)
- Anode(s): Galvalum III
- External Coating: Carboline 890 Epoxy Paint System, Safety Yellow Color

Applicable Design Codes, Standards & Specifications (latest editions):

- OIE/PRS Group Smart Tap Drawings, Bill of Materials (Controlled Copies) and Vendor Supplied Material Test Reports
- OIE ISO 9001:2000 Quality Assurance - Quality Control Procedures & PRS Operating Procedures
- ASME Boiler Pressure Vessel Code, Section V Nondestructive Examination
- ASME Boiler Pressure Vessel Code, Section VIII, Division 1 and 2
- ASME Boiler and Pressure Vessel Code, Section IX Welding and Brazing Qualifications
- ASME B16.5, Pipe Flanges and Flanged Fittings
- ASME B31.4, Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids
- ASME B31.8, Gas Transmission and Distribution Systems
- ASME B18.2.1, Square and Hex Bolts and Screws Inch Series
- API SPEC 6H, Specification on End Closures, Connectors and Swivels
- API SPEC 5L, Specification for Line Pipe
- MSS SP-44, Steel Pipeline Flanges
- NACE Standard MR0175, Sulfide Stress Cracking Resistant Metallic Materials for Oilfield Equipment
- DNV Recommended Practice RP B401, Cathodic Protection Design
- Code of Federal Regulations, Title 49, Parts 192 and 195

Certifications:

- ISO 9001:2008 - World Certification Services Ltd. - Accredited by UKAS Quality Management
- EN 10204 Section 3.1.B (DIN 50049), Inspection Documents for the Delivery of Metallic Products

