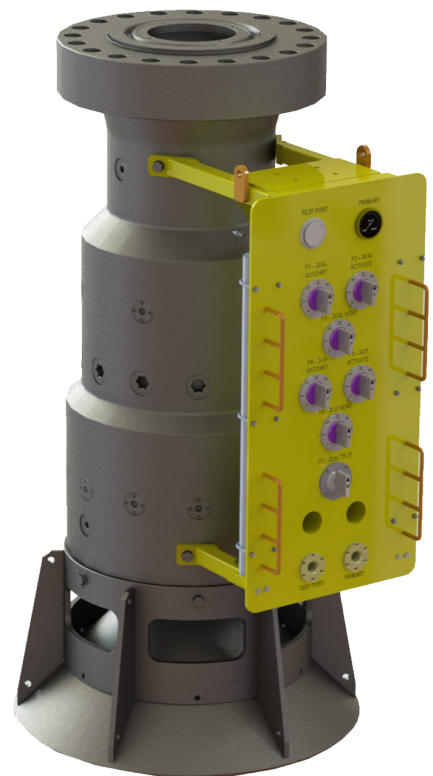


Capping Stack Grip and Seal Connectors

9 to 16 inch API 5CT Casing

Capping stack grip and seal connectors are installed on and grip API 5CT casings. The connectors seal to a maximum operating pressure of 15 kpsi on casing sizes up to 14 in and 10 kpsi on casings up to 16 in. All operations of the connector are controlled from an ROV panel and operated via a 5,000 psi hydraulic hot stab. From the ROV panel, the connector can be cycled through grip actuation, seal actuation, seal integrity testing, seal release, and grip release.



FEATURES

API Spec 6A 18 3/4 in - 15 kpsi BX top flange

Stabs over free-flowing API 5CT casing

Redundant elastomeric seal packs

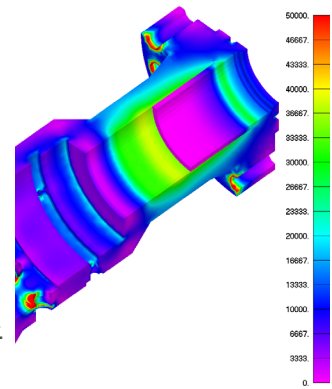
Engineering

We combine industry experience and subject matter expertise in mechanical design and analysis, seal materials, pipeline connection and repair systems, and ROV operations to deliver an integrated, robust connector solution for capping and containment operations of deepwater wells.



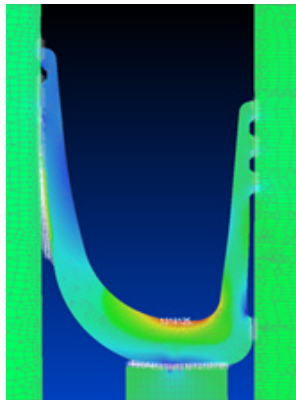
Stress Analysis

Finite element analysis is also used to verify structural integrity of the connector housing and all internal load bearing elements. This image shows the Von Mises stress contour plot for the housing of a 14 in, 15 kpsi connector.



Seal Analysis

Rigorous analysis of the seals at worst case conditions requires more than 500 hours running 3D non-linear finite element analysis (FEA) solvers. Through this analysis, the micro-stresses in the seal packer caps have been determined to be within acceptable limits.



Production

We maintain a mature supply chain for production of large diameter, high pressure grip and seal connectors and a 120,000 square foot ISO 9001:2008 certified facility for assembly and testing operations.

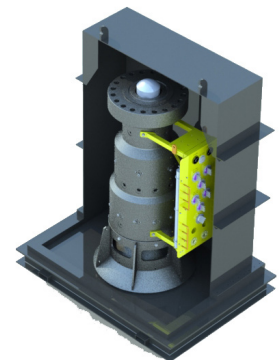
Seal Testing

Each new seal design is tested at pressure and temperature extremes to verify seal performance. This rigorous analysis and testing ensures we deliver connectors and seals that perform even in the most challenging conditions.



Storage Solutions

For long term storage, we offer sealed container solutions with inert gas environments that reduce the cost of maintenance for our customers over the 30 year storage life of the connector.



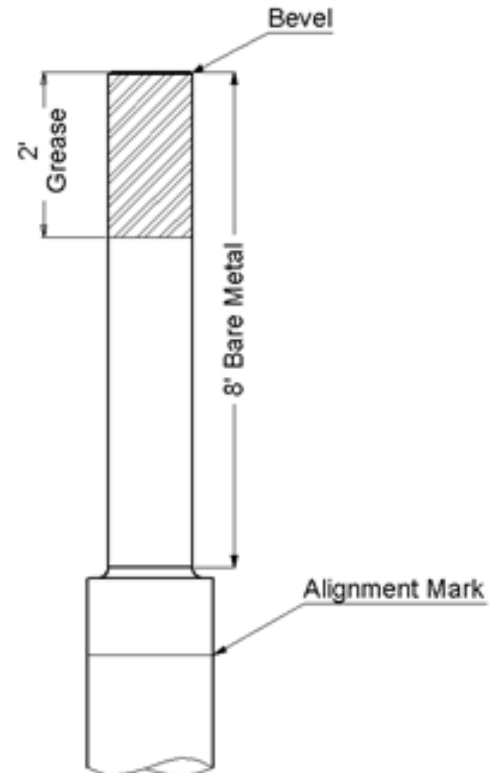
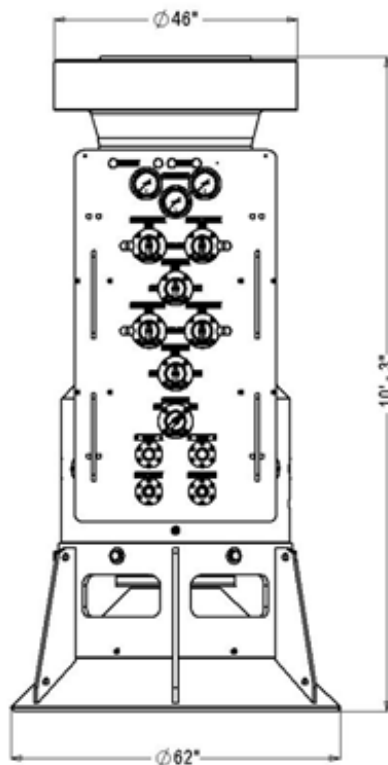
Specifications

Water depth	Up to 10,000 ft / 3.048 m
Maximum working pressure	15 kpsi (up to 14 in diameter) 10 kpsi (up to 16 in diameter)
Hydraulic actuation pressure	Equivalent to max kpsi
Service temperature	32 to 195 °F 0 to 90.5 °C

Casing	API 5CT, +1.5% to -0.5% OD
Service life	1 year (installed on a capped well)
Shelf life	30 years (with maintenance)
Seal elements	Single use

Installation

1. Clean 9 ft of casing surface to bare metal
2. Cut the riser roughly 100 ft above mudline
3. Bevel edge of casing and deburr inside edge
4. Mark the casing for installation reference
5. Grease top 2 ft of casing surface
6. Lower capping stack over riser
7. Confirm connector alignment via casing marks
8. Install hydraulic hot stab into ROV panel
9. Set valves to pressurize connector slip segments
10. Pressurize slips to set on casing
11. Set valves to pressure connector seal elements
12. Pressurize seals to set on casing
13. Install hydraulic hot stab into seal test port
14. Set valves for seal integrity pressure test
15. Pressurize test port to test seal integrity
16. Bleed test pressure
17. Close all valves
18. Remove hydraulic hot stab





oceaneering.com