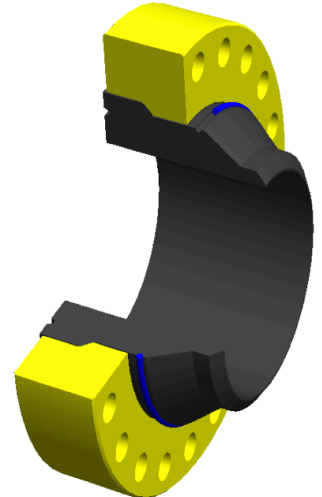


Swivel Ring Flange

Product Description:

The Titan Subsea Innovations, LLC swivel ring flanges are commonly used for flange pair makeup as they can adapt for bolt hole misalignment in the field via rotational adjustment of the bolt hole pattern on the flange ring relative to the spool- piece. This feature significantly reduces the installation time by easing the assembly process, and removes stresses that would otherwise be induced by forced rotation of the spool piece during bolt-hole alignment. The Titan swivel ring flange consists of three parts (excluding bolts); a pressure containing, sealing hub; a flange that fits over the hub, containing through holes for preload bolting; and a simple, removable method of retaining the swivel and hub together prior to bolt makeup.



Design Basis:

Titan Subsea Innovations, LLC engineered design is per ASME Boiler Pressure Vessel Code, Section VIII. Other design codes can be accommodated as appropriate per customer requirements.

The retainer ring allows for a full 360-degree rotation of the flange relative to the hub and is also removable to permit cleaning, lubrication, and inspection of the hub/flange load shoulder interface prior to installation.

Design Background:

Bolted connections are such a simple concept and are so common that the engineering required to produce a cost effective and safe product is often taken for granted. Standard weld neck flanges are specified within ANSI, MSS, and API texts, all referencing the ASME Boiler & Pressure Vessel Code for safe design. Section VIII of this design code provides for calculation of tangential, rotational, & shear moment loads on the flange, and assures the developed bolt-load pre-stress is adequately safe. This CODE provides the methodology for design of both, integral, and non-integral, hubbed flanges. Swivel Ring Flanges fall into non-integral hubbed design and will become overstressed if designed as an integral hub.

Early field failures had given companies pause with swivel ring flange design, as inadequately designed flange pairs were purchased and installed with disastrous results. These failures involved swivel ring flanges designed with integral load criteria, and would “dish” and consistently leak, or in specific cases, violently come apart with the hub stripping through the flange ring. These failures are directly attributed to inadequate flange design and misinformation concerning their installation. All of TITAN SUBSEA INNOVATIONS products are designed with the strictest compliance to the appropriate codes. Full analysis, installation instructions, and complete data packages are available for specific product serial numbers.