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KLINGER SENTRY GASKET

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Metallic gaskets are used in high pressure and typically hazardous pipelines constituting a huge safety risk in the event of a failure.

For this reason leakage testing prior to pressurising the pipeline is of utmost importance. However traditional leak testing carries heavy production downtime and subsequent loss of earnings.

Traditional leakage testing

Leakage testing a newly erected or amended pipeline is carried out by filling the pipeline with pressurised water or gas to monitor any changes in pressure which indicate a defective joint. The process is carried out in sections by blanking off an area of a pipeline using shutoff valves or blinds.

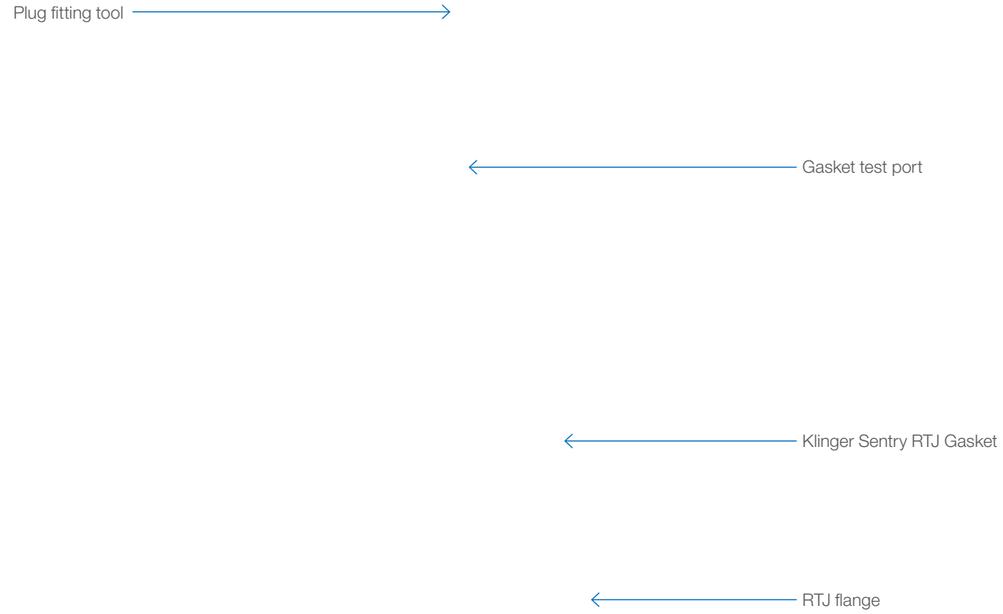
Depending on the valve location it may be a large section of pipeline that must be pressurised to test a single flange connection and in some cases it is not practicable to leak test all of the joints. Leak testing large portions of pipeline is a time consuming process, increasing production downtime and consequently induces economic loss.

Reverse Integrity Gasket leakage testing

Reverse Integrity Gaskets are designed to allow leakage testing to be carried out on individual gasketed connections to determine if tightness has been achieved before introducing internal pressure and also allows monitoring of the joint throughout its lifespan.

KLINGER SENTRY GASKET

- Allows leak testing on individual flanged joints without the need to pressurise the full system.
- Leak test both the primary and secondary sides of the seal.
- Speeds up the leakage testing reducing plant downtime.
- Significantly reduces the volume of testing media required.
- Validates individual joint integrity at installation reducing the need to re-visit the joint.
- Joints can be tested and adjusted if leakage occurs, in one visit to the flange.



KLINGER SENTRY RTJ GASKET

The Sentry can be used in both ring joint and raised face flanges. The Sentry metallic ring joint gaskets are heavy duty, high-pressure gaskets largely used in offshore petrochemical applications.

Ring Type Joints (RTJ) are precision-engineered components designed to be used in conjunction with precision-machined flanges.

The ring gasket is located within annular recesses in the opposing faces of the flanges. The ring gasket is compressed into the groove and the angled sealing faces deform to match the grooves and create a seal.

The pressure classes and geometries of the gaskets and flanges are given in the standards API 6A, ASME B16.20 and ASME B16.5.

The ring gaskets can be supplied in the following materials.

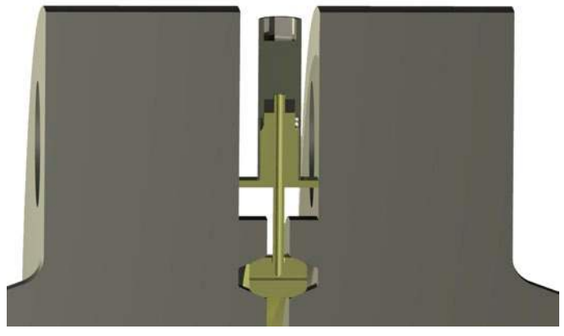
Material	Brinell Hardness
Soft Iron	90
Low Carbon Steel	120
4-6% Cr ½% Mo	130
304	160
316	160
321	160
347	160
410	170
Monel (N04400)	135
UNS N08904	180
Inconel 625	-
Incoloy 825	-
Hastelloy C-276	-
Titanium	-

*Soft iron and carbon steel gaskets are zinc plated to prevent corrosion

Sentry RTJ Gasket

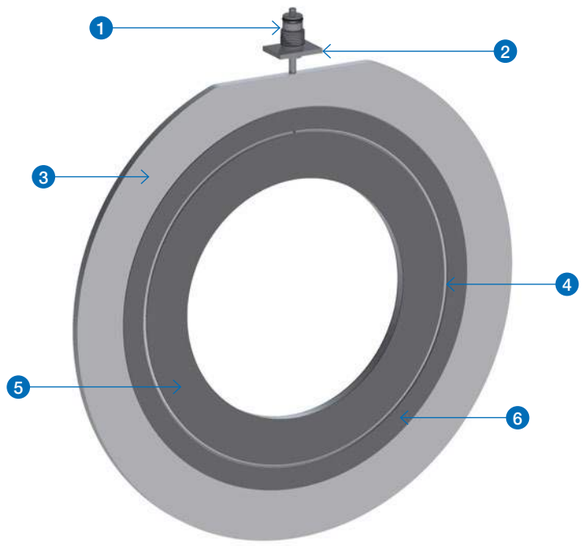


Sentry RTJ assembled with blind plug after testing



KLINGER SENTRY MAXIPROFILE

The Klinger Maxiprofile is a composite gasket, which utilises a serrated metal core with a soft facing material. The Sentry designed for use in raised face flanges is based on a Maxiprofile.



1. Test Connector with Fire-safe seal
2. Anti-Rotation Device
3. Outer Guide Ring
4. Pressurisation Groove
5. Primary Seal (Serrated Metal Core With Graphite Facing)
6. Secondary Seal (Serrated Metal Core With Graphite Facing)

The metal core is machined on each contact face with concentric serrations which provide high pressure areas, ensuring that the soft coating flows into any imperfections in the flange even at relatively low bolt loads. The result is a gasket which combines the benefits of soft, cut materials with the advantages of seal integrity associated with metallic gaskets.

Compressible Filler Material

Serrated Metal Core

Facing Materials

Expanded graphite is the most common facing material used for Maxiprofile gaskets. However, other materials can be used, such as PTFE for chemically aggressive duties or mica for high temperature duties.

Facing Material
Graphite
PTFE
Mica
KLINGERsil C-4430

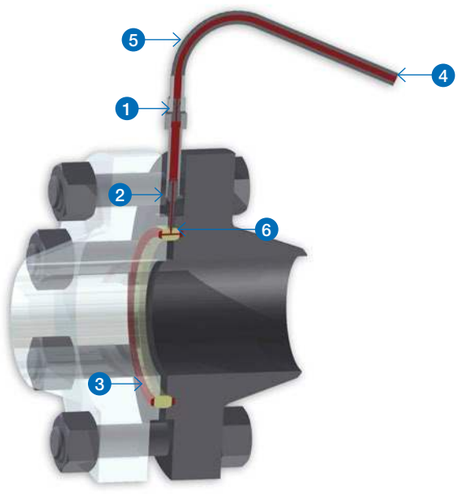
Core Materials

Maxiprofile gaskets can also be manufactured from a range of core materials according to media compatibility and temperature considerations.

Core Material
Stainless Steel 316L
Stainless Steel 304
Carbon Steel
Monel 400
Nickel 200
Inconel 600
Inconel 625
Incoloy 825
Hastelloy B-2/B-3
Hastelloy C-276
Titanium Gr 2
Duplex UN S31803
Stainless Steel 347
Stainless Steel 321
Zirconium
Super Duplex
254 SMO
Titanium Gr7
Hastelloy C-22
Hastelloy G-31
Alloy 20

SENTRY GASKET LEAKAGE TESTING

A Klinger Sentry gasket incorporates a leak detection system



1

High Pressure quick release test plug connector

Quick release connection between pressure equipment inlet and gasket test plug connector allow quick and easy attachment for testing.

2

Anti-Rotation Device

The duct comprises an anti-rotation device which sits within the intra-flange space. The device prevents rotation and bending of the testing duct preventing stress at the welds.

3

Pressurised Recesses

In the RTJ style the pressurisation occurs in the annular cavities above and below the gasket in the flange groove recesses. In the Maxiprofile style the pressurisation occurs in the annular space between primary and secondary seals.

4

Pressure Monitoring

Pressure changes within the sealed recess are monitored from outside the flanges via the test equipment. If the seal is sufficient, the pressure will be maintained. Conversely, in the event of a seal fault, failure to hold the pressure can provide an indication of a leak path between the gasket and the recess, indicating intervention is required in that particular joint.

5

Pressurised Fluid Inlet

Klinger hydraulic test equipment is designed to be compatible for use both on site and for subsea applications. Test Range 0-400 Bar.

6

Fluid Delivery Ducts

The tube extends from the gasket into the space between the flanges, and is accessible from the outside of the pipe when the gasket is sealed in the recess. The tube allows fluid communication with a T-shaped channel within the gasket to allow pressurisation of the cavities.

Post Leak detection

1

Blind Plug with Fire-Safe seal

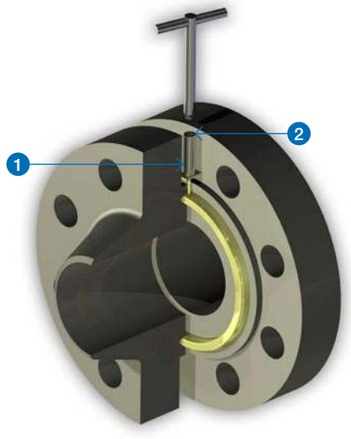
The blind cap cooperates with the connector on the duct, to close the opening to the test cavities. The cap has a sealing member in the form of an annular packer enabling the gasket to hold firesafe certification.

2

Blind Plug with Hex head for easy fitting

The Blind plug has a hexagonally-shaped recess compatible for use with torqueing tools such as an Allen key.

The Blanking cap must be applied at the end of the leakage testing procedure and can only be used once. If removed for retesting, the blanking cap must be renewed.



KLINGER SENTRY GASKET INSERTION TOOL

Klinger Gasket Insertion Tool (KGIT) allows safe and precise insertion of a Klinger Sentry RTJ (Ring Type Joint) between two flanges, allowing a safer, easier and faster fitting process with minimal need for re-visiting.

The KGIT decreases the risk of injury to divers' hands and fingers as the engineered profile is designed to locate accurately within the lower bolts of the flange, ensuring the gasket sits correctly in the groove. With well positioned holes designed to accommodate standard subsea tooling, the KGIT aids transportation and fitting. Flange alignment tools can be left in the flange as the gasket is fitted minimising movement of the flanges ensuring there is no 'bruising' or 'pinching' to the gasket.

The KGIT offers improved flange make up times and increased safety. The shape of the tool also prevents the handle from rotating in front of the studbolt holes, ensuring the gasket doesn't need to be repositioned to add the remaining bolts.

Once installation is complete, the handle of the KGIT can be easily broken off giving access to the Sentry test duct. The tag can be retained for records. After a period of time, the KGIT corrodes away due to a cathodic reaction, as a result of immersion in salt water.

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