

Ring Type Joint (RTJ)

The ring type joint was initially developed for use in the petroleum industry, where high pressure/temperature applications necessitated the need for a high integrity seal. They are mainly used in the oil field on drilling and completion equipment. Ring type joints are also commonly used on valves and pipework assemblies, along with some high integrity pressure vessel joints.

Style R

The Style R ring type joint is manufactured in accordance with API 6A and ASME B16.20, to suit API 6B and ASME B16.5 flanges.

Style R ring type joints are manufactured in both oval and octagonal configurations. Both styles are interchangeable on the modern flat bottom groove, however only the oval style can be used in the old type round bottom groove.

Style R ring type joints are designed to seal pressure up to 6,250 psi in accordance with ASME B16.5 pressure ratings and up to 5,000 psi in accordance with API 6A pressure ratings.

Style RX

The Style RX ring type joint is manufactured in accordance with API 6A and ASME B16.20, to suit API 6B and ASME B16.5 flanges.

The Style RX is designed to fit the modern flat bottom groove, and is interchangeable with the standard Style R ring type joint. However, since the Style RX is significantly taller than a Style R, larger flange make up distances will result.

Style RX ring type joints are designed to seal pressures up to 6,250 psi in accordance with ASME B16.5 pressure ratings, and up to 5,000 psi in accordance with API 6A pressure ratings. Selected sizes incorporate a pressure passage hole to allow for pressure equalization each side of the sealing faces.

Style BX

The Style BX ring type joint is manufactured in accordance with API 6A.

All BX ring type joints incorporate a pressure passage hole to allow for pressure equalization each side of the sealing faces. On assembly, metal to metal contact of the flange faces is achieved. The Style BX is not interchangeable with any other style, and is only suited for API 6BX flanges. Style BX ring type joints are designed to seal pressure up to 20,000 psi in accordance with API 6A pressure ratings.

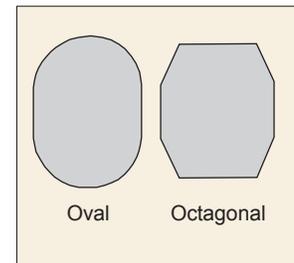
Styles SRX and SBX

Styles SRX and SBX are derived from Styles RX and BX, and are produced in line with the API Standard 17 D for use on subsea wellhead and Christmas tree equipment.

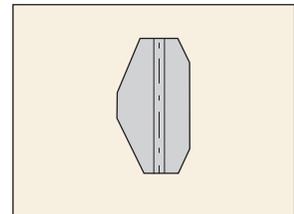
Octagonal with Grooves

This style is an octagonal ring with serrations machined on the flat corners as shown in the diagram. The serrated surface then is faced with soft conformable facing.

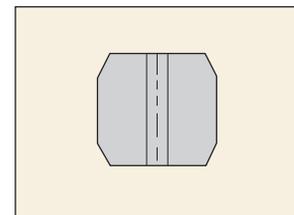
Style R



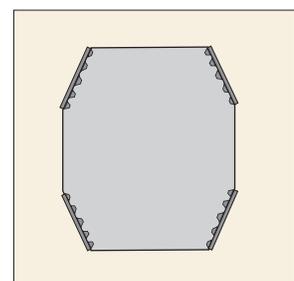
Style RX



Style BX



Octagonal with Grooves



Ring Type Joint (RTJ)

How They Work

Under axial compressive load, ring type joints plastically deform and flow into the irregularities of the flange groove. Since the load bearing area of the ring type joint is relatively small, very high surface stresses result between the sealing faces of the ring type joint and the groove. These stresses are further increased on the Style RX and BX rings which allows for very high internal pressures to be sealed.

Since ring type joints are solid metal, their recovery characteristics are poor. The seal is maintained by the action of axial load upon the gasket.

Surface Finish Requirements

With all metal to metal type seals, it is imperative that the gasket and groove sealing faces are free from indentations, score marks, tool/chatter marks and other imperfections. The surface finish of the gasket and groove sealing faces is also critical and should not exceed the following:

Style R and RX	63 microinches Ra maximum (1.6 micrometer Ra)
Style BX	32 microinches Ra maximum (0.8 micrometer Ra)

Reuse

Ring type joints are designed to have a limited amount of positive interference, which ensures that the ring type joint seats correctly into the groove on compression. Their reuse is not recommended for two reasons:

- The initial seating of the gasket will be impaired.
- When the gasket is plastically deformed, work hardening of the external metal surface occurs. This may result in permanent damage to the groove.

Hardness of Materials

On compression of the flange assembly, it is imperative that the ring type joint be significantly softer than the flange groove so that the gasket plastically deforms and not the groove. The use of harder ring type joints can result in flange groove damage. For this reason, ring type joints are supplied with the following maximum hardness values:

Material	Werkstoff Number	Maximum Hardness		Identification
		Brinell*	Rockwell B†	
Soft Iron		90	56	D
Low Carbon Steel		120	68	S
4 - 6% Chrome 1/2% Moly.		130	72	F5
Type 304 Stainless Steel	1.4301	160	83	S304
Type 316 Stainless Steel	1.4401	160	83	S316
Type 347 Stainless Steel	1.4550	160	83	S347
Type 410 Stainless Steel	1.4006	170	86	S410

* Measured with 3000Kg load except soft iron which is measured with 500Kg load

† Measured with 100 Kg load and 1/16" diameter ball.

Some materials can be supplied with NACE certification on request.

Protective Coating

In accordance with API Specifications, soft iron, low carbon steel, and other ferrous materials ring type joints are protected from corrosion with electroplated zinc to a maximum thickness of 0.0005". Alternative material coatings can be supplied on request.

Specialized Ring Type Joint

For critical and non standard applications, where ring type joints are unsuitable in their standard form, Flexitallic offers a range of specialized ring type joint gaskets to suit the needs of the petrochemical industry.

Style R Ring Type Joints with PTFE Inserts

Oval and octagonal ring type joints can be supplied with a PTFE insert which is located in a machined recess in the bore of the gasket. The insert reduces turbulent flow across adjoining flanges and also eliminates flange/gasket erosion which can occur with high velocity fluids.

Style RX Ring Type Joints with PTFE Inserts

Style RX ring type joints can also be supplied with PTFE inserts, in order to reduce turbulent flow and eliminate gasket/flange erosion. The insert is specially designed with radially drilled pressure passage holes so that the self sealing performance of the RX Ring Joint is not impaired.

Rubber Coated Ring Type Joints

This is an oval ring type joint which is totally enclosed in a nitrile rubber coating. The ring type joint material is usually soft iron or low carbon steel. This type of gasket has three main functions:

- It is used in pressure testing to minimize damage to flanges.
- The rubber contact points provide additional seals while protecting the flange surfaces.
- It provides increased assurance against corrosion, which can occur between conventional ring type joints and the engaged surfaces of the groove.

Transition Ring Type Joints

These are combination rings which consist of two different sizes having the same pitch circle diameter. They are used for sealing ring type joint flanges where the mating flanges have different ring groove diameters. Transition ring type joints are available with either oval or octagonal facings.

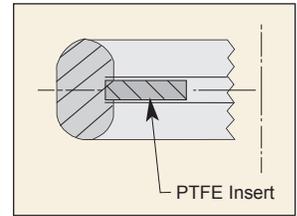
Blind Ring Type Joints

Special ring type joints can be manufactured to blank off flanges and pipework. They consist of standard ring type joints with integral solid metallic centers.

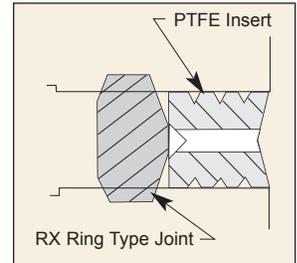
Flange Guards

Flange guards are supplied to suit all API, ASME, BS and MSS SP44 ring type joint flanges. Flange guards are manufactured from closed cell neoprene foam, which compresses readily under load. Once assembled, they protect the outside diameter of the ring type joint in corrosive environments e.g. salt spray.

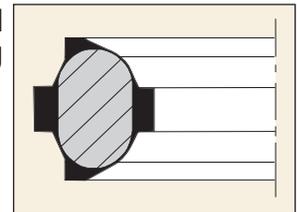
Style R with PTFE Inserts



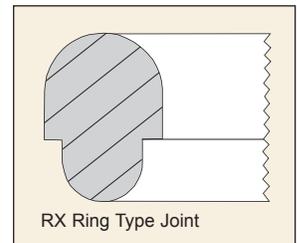
Style RX with PTFE Inserts



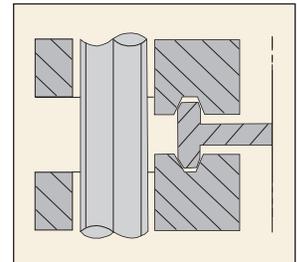
Rubber Coated RTJ



Transition RTJ



Blind RTJ



Flange Guards





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-RINGS