

Vacuum flanges

Several vacuum flange standards exist with differences in ultimate attainable pressure, size, and ease of attachment. These flange fittings are generally used in vacuum components in the low and medium vacuum range and can be found on a variety of laboratory, production and test equipment. These flange fittings are economical and reusable stainless steel fittings.

1. ASA-ANSI-KF/QF

These flanges are offered with choice of smooth face or O-ring groove. They are available blank or bored to fit tube sizes 1-1/2" through 12" O.D. The vacuum seal is made by compressing an O-ring between a mating pair of flanges. The pair includes a smooth face flange and an O-ring grooved flange.



1a. KF flange with O-ring groove.



1b. Elastomer O-ring on groove.



1c. Elastomer O-rings

II. ISO-KF/DN/QF/NW

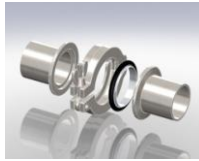
The ISO standard quick release flange is known by the names Quick Flange (QF), Klein Flange (KF) or NW, sometimes also as DN.



2a. KF flange



2b. KF O-ring with centering ring



2c. KF flange+O-ring with centering ring+Swing Clamp



2d. Adaptive centering ring

The vacuum seal between two such flanges is made by compression of an elastomer (neoprene/viton) O-ring with a centering ring. And the whole unit is tightened using an all-metal hinged swing clamp with a wing nut on it.

These type of vacuum components are available in the standard brands KF10 to KF50 depending upon the internal bore in mm. Some sizes share their flange dimensions with their respective larger neighbour and use the same clamp size. This means a DN10KF can mate to a DN16KF by using an *adaptive centering ring*. Same goes for DN20KF to DN25KF and DN32KF to DN40KF.

III. ISO-Large (ISO LF/MF)

The ISO large flange standard is known as LF, LFB, MF or sometimes just ISO flange. As in KF-flanges, the flanges are joined by a centering ring and an elastomeric o-ring. An extra spring-loaded circular clamp is often used around the large-diameter o-rings to prevent them from rolling off from the centering ring during mounting.



3. ISO-LF flange O-ring with Centering ring + claw clamp

The ISO large flanges come in two varieties depending upon the type of clamps used for tightening. The ISO-K (or ISO LF) flanges are joined with double-claw clamps, which clamp to a circular groove on the tubing side of the flange. The ISO-F (or ISO LFB) flanges have holes for attaching the two flanges with bolts. However an ISO-K flange and ISO-F flange can be joined together by clamping the ISO-K side with single-claw clamps, which are then bolted to the holes on the ISO-F side. ISO large flanges are available in sizes from 63 to 500 mm nominal tube diameter:

Brand	Int.dia.(mm)	Brand	Int.dia.(mm)	Brand	Int.dia.(mm)	Brand	Int.dia.(mm)
DN63LF	63.5	DN160LF	160	DN250LF	254	DN400LF	400
DN100LF	102	DN200LF	200	DN320LF	316	DN500LF	500

IV. Conflat fittings (CF / ISO-F)

Conflat (CF) fittings use a copper or teflon gasket and knife-edge flange to achieve an ultrahigh vacuum seal. Each face of the two mating CF flanges has a knife edge which cuts into the softer copper or teflon gasket, providing an extremely leak-tight, metal-to-metal seal.

4. Teflon & Copper gasket on flanges



Deformation of these gaskets fills the small defects in the metal flange.

Brand	Size (inches)	Brand	Size (inches)	Brand	Size (inches)	Brand	Size (inches)	Brand	Size (inches)
DN10	1	DN63	4½	DN75	4¾	DN160 (or DN150)	8		13¼
DN16	1½ ("mini")	DN40 (or DN35)	2¾	DN100	6	DN200	10		14
DN25	2¾	DN50	3¾	DN125	6¾	DN250	12		16½