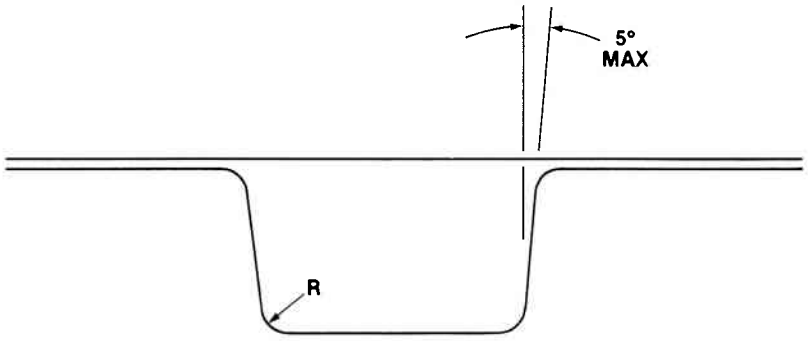
Flanges

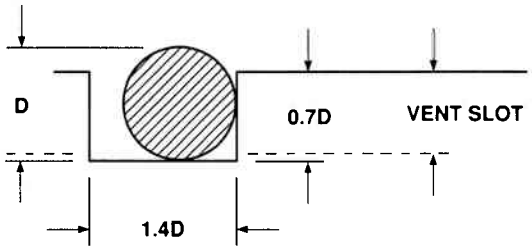
Flanges enable us to connect (join) the system parts in a reasonable and convenient manner. They also make it possible to quickly connect feedthroughs for purposes of controlling and monitoring system operation, and to maintain the system when trouble occurs.

Elastomer-Sealed Flanges

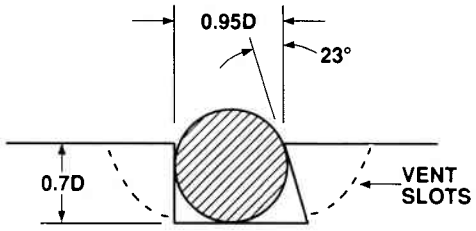
Elastomer-sealed flanges are used where there is little objection to the use of an elastomer, mostly based on temperature considerations and, perhaps, outgassing.



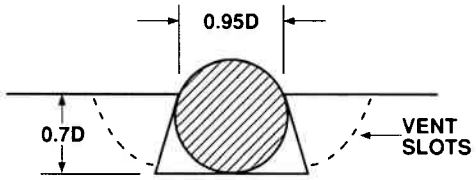
The groove in the flange for the O-ring should have sides that slope outward to a maximum of 5°. The groove should also have a radius on the inner corners equal to about two-tenths of the O-ring diameter. The surface finish of the seal area should be at least 32 microinches. The outer edges should be smooth, to avoid scratching the O-ring when making the seal.



The depth of the groove provides for deformation of the O-ring to about 70% of its unsqueezed diameter. This gives enough elastomer material to make the seal without overstressing the O-ring, but not so much as to force it out of the groove where it might be pinched or cause excessive outgassing. A vent slot is usually machined across the face of the groove to eliminate trapped volumes and for leak detection.



A. DOVETAILED O-RING GROOVE

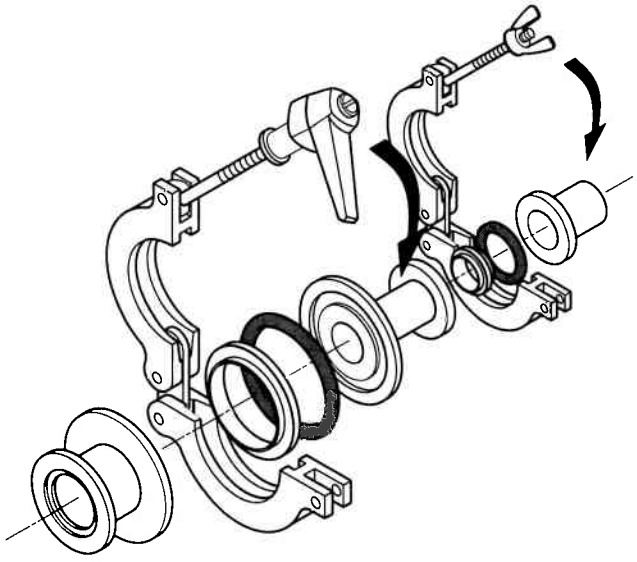


B. DOUBLE DOVETAILED O-RING GROOVE

DOVETAILING OF O-RING GROOVES

The O-ring groove can be dovetailed to help retain the O-ring. You may also see fully dovetailed O-ring grooves in cases where a gas flow process might otherwise blow the O-ring out of the groove. Dovetailing, or keystoning, is also useful for retaining the O-ring against the force of gravity. The O-ring groove must be relieved to prevent pockets of partially trapped gas from becoming sources of virtual leaks.

Another popular type of elastomer flange is the KF™ flange. As marketed by Varian, it is known as the KLAMP-FLANGE™.



KF FLANGE ASSEMBLIES

The flange is of standard ISO 2861/1 design, consisting of two symmetrical flanges, a center ring to support and position an