

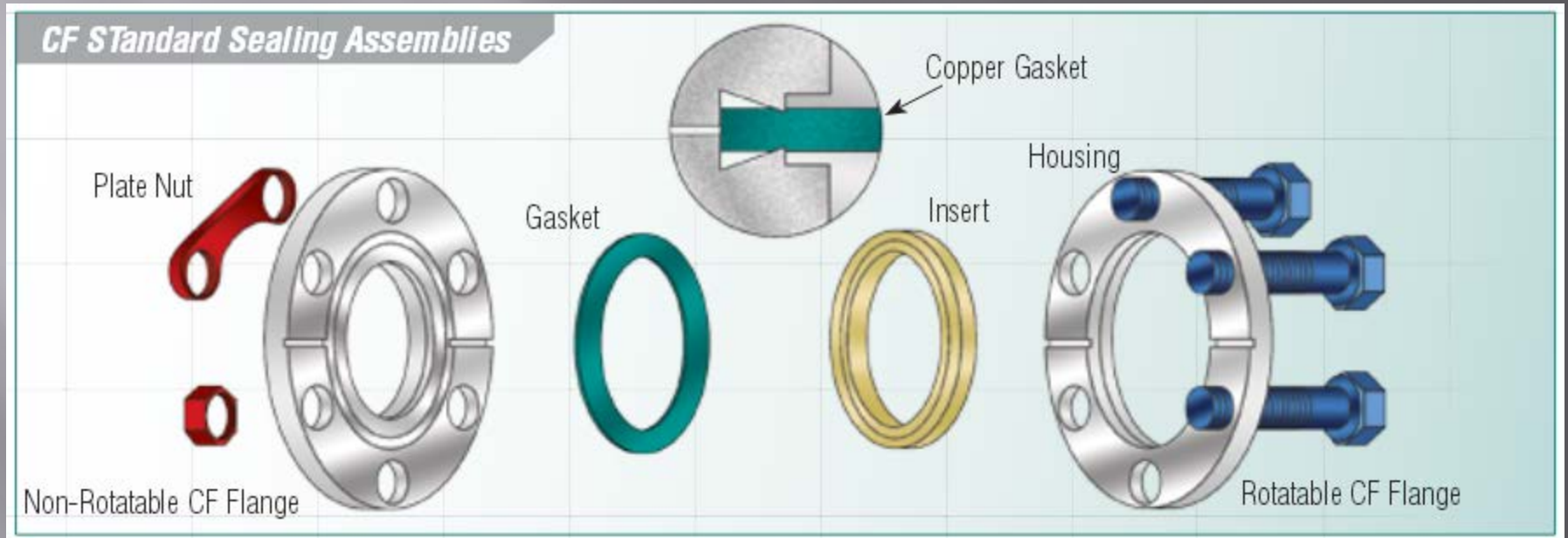
Vacuum Joints

Types and Uses

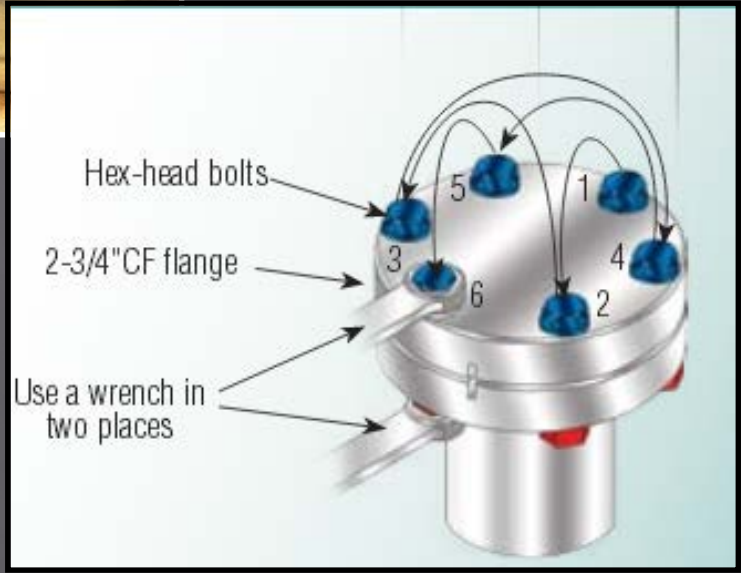
CONFLAT (CF)



METAL SEAL WITH KNIFE EDGE



to $< 1 \times 10^{-13}$ Torr
-196° C to 450° C





Alternative seal material



**ISO
O-RING SEAL**

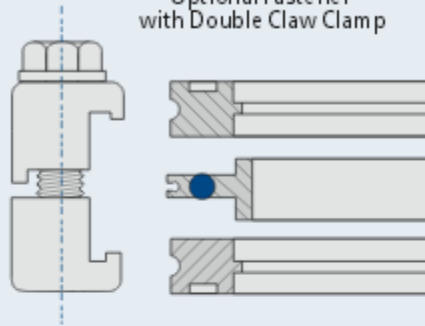
International Organization for Standardization

International Standards Organization (common, but incorrect)

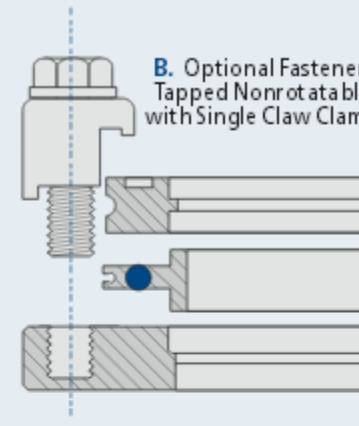
ISO Flange Assembly Instructions

Optional fastener flanges are joined around the periphery with clamps. Double claw clamps are used when a pair of OF flanges are joined (See diagram A.), or single claw clamps are used to join an OF flange to a tapped nonrotatable on a pump or gate valve. (See diagram B.) This fastening method allows the OF flange to be rotated for ease of component alignment. Additionally, a rotatable bolt ring can be used to fasten an OF flange to a nonrotatable flange using bolts. (See diagram C.) A retainer ring prevents the OF flange from slipping through the bolt ring. Nonrotatable ISO flanges are assembled with bolts. (See diagram D.) They do not allow rotation of bolt holes on mating flanges to align components.

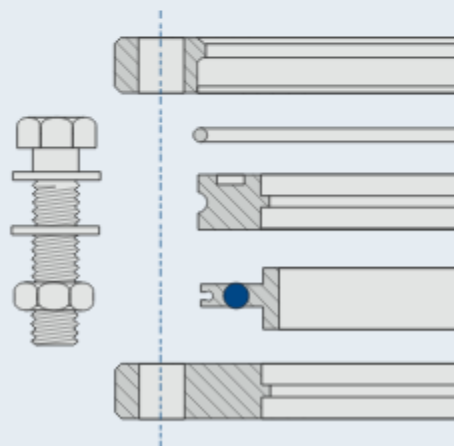
A. Optional Fastener/
Optional Fastener
with Double Claw Clamp



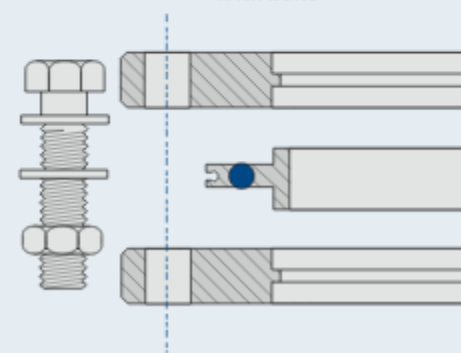
B. Optional Fastener/
Tapped Nonrotatable
with Single Claw Clamp



C. Optional Fastener/
Nonrotatable with Rotatable
Bolt Ring and Bolts



D. Nonrotatable/Nonrotatable
with bolts



to $\sim 10^{-8}$ Torr
 $\sim 0^\circ \text{C}$ and $120\text{--}180^\circ \text{C}$

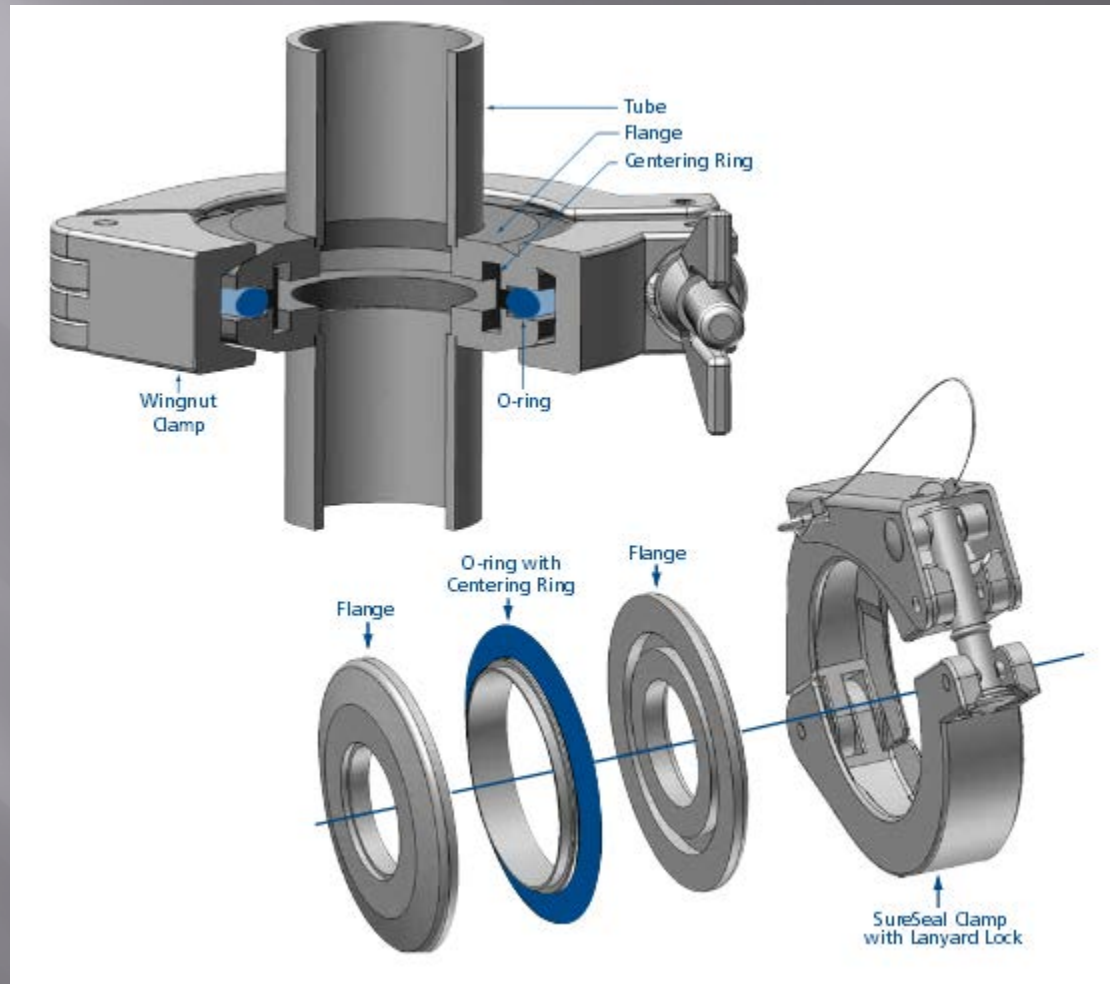
KF

(for Klein Flansche = small flange)



also called QF, NW, and occasionally, DN
Kwik flange, quick flange, ??

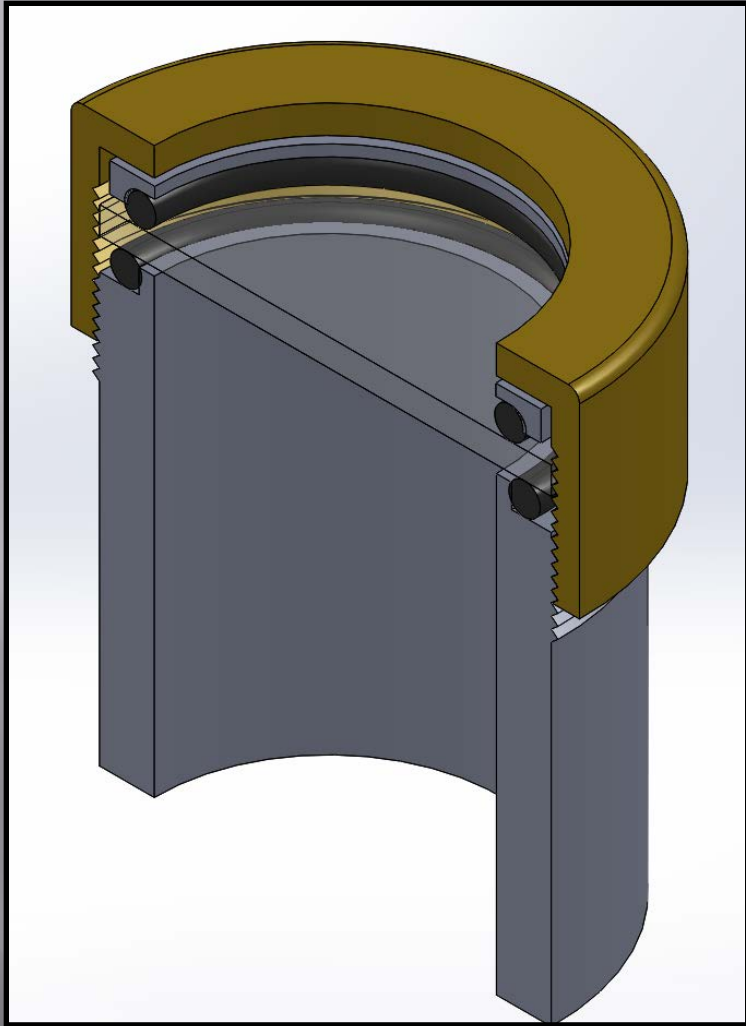
O-ring seal



KF flanges are limited (by the O-ring's properties) to applications with temperatures between $\sim 0^{\circ}\text{C}$ and $120\text{--}180^{\circ}\text{C}$, and pressure from atmosphere to $\sim 10^{-8}$ Torr or mbar.

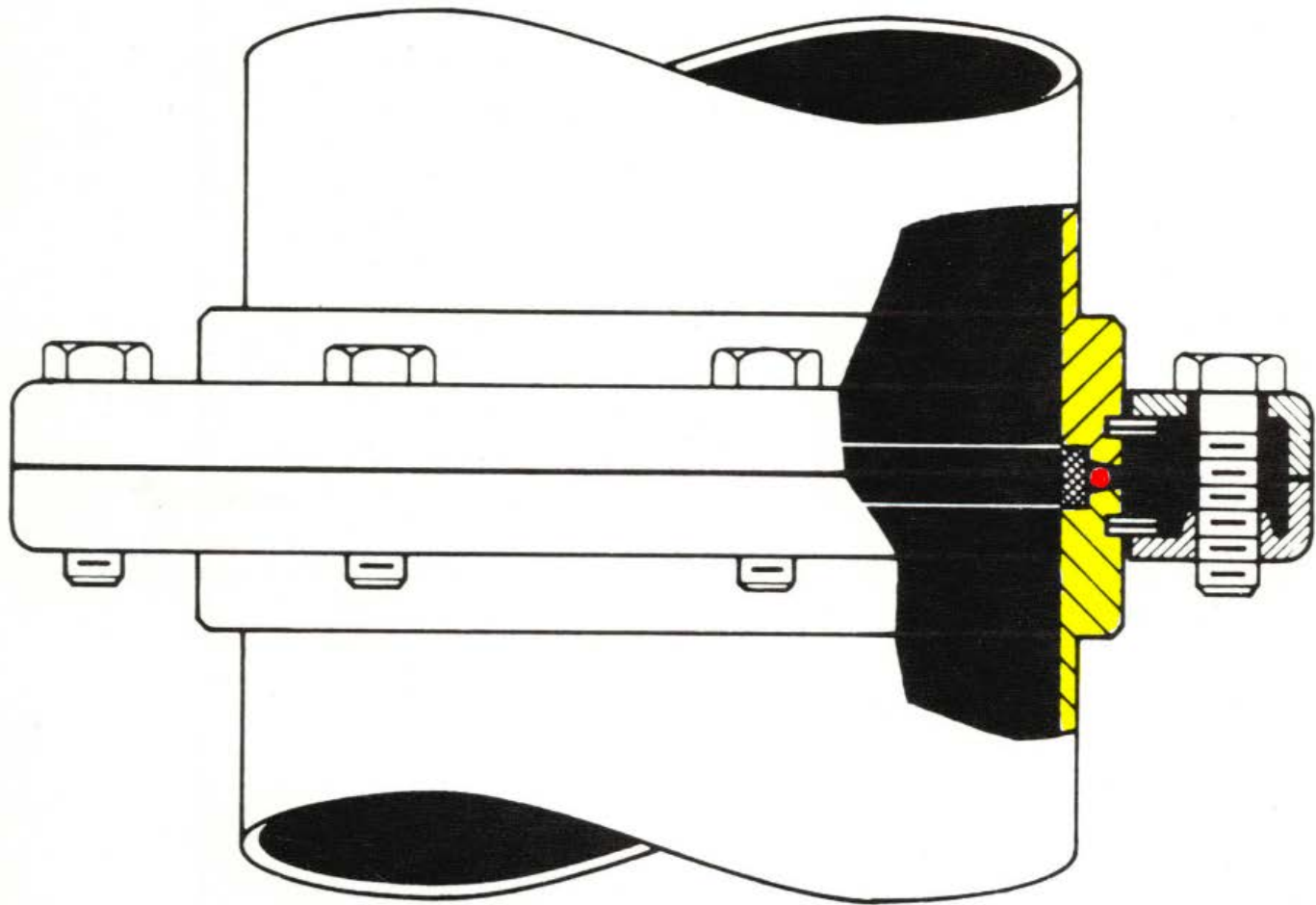
**A&N
QUICK CONNECT
CAJON**





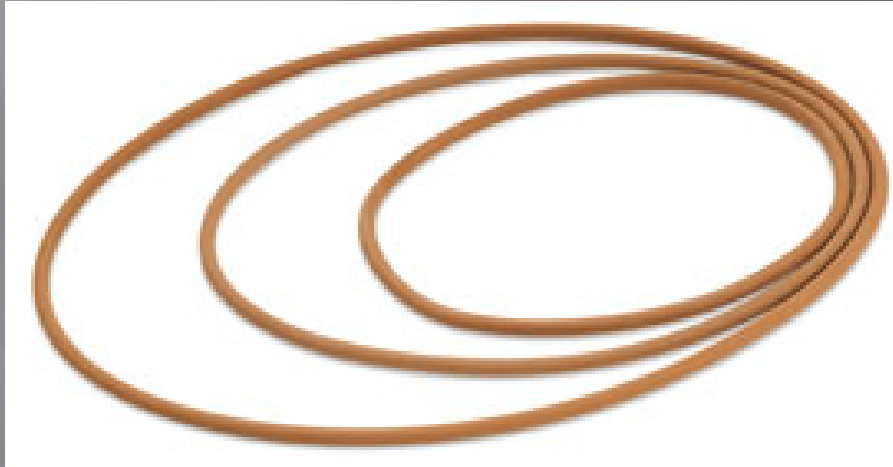
DEPENDEX





O-rings

Elastomeric gaskets, often O-rings of circular cross-section, are convenient, easy-to-use vacuum seals. With flange surface finishes of 32 rms or better, compressing the O-ring by 25% to 35% will form a vacuum seal that should be easily compatible with 10^{-7} Torr or mbar and, with better design/preparation, perhaps 10^{-9} Torr or mbar.



Nitrile (Buna-N, NBR)
-40°C to 120°C

Viton (Fluorocarbon, FKM)
-26°C to 200°C

Torr Seal[®]

Low Vapor Pressure Epoxy
pressures of 10^{-9} torr



TIG WELDING FABRICATION

Tungsten
Inert
Gas



