Multi-CF™ UHV Vacuum Thin Flanges with 8.0", 6.0", 4.5", 2.75" and 1.33" CF Ports

APPLICATIONS:

- Enables Numerous Custom Internal Mounting Options
- Add Internal Mounting Capability (Grabber Grooves) to Existing Systems
- Use as System Spacers (nominal 0.175" and 0.400")

FEATURES / OPTIONS:

- Open or Closed Bore Options
- Annular port Grabber Grooves on all open bore 0.400" nominal thickness sealing ports (except 1.33")
- Inserted between common CF sealing surfaces flange components from almost any manufacturer

Family of Multi-CF™ Thin Flange Designs

Multi-CF™ Thin Flanges

The Thin Flange is a UHV CF flange designed for in-vacuum mounting, with the component typically inserted between two common CF style flanges from almost any manufacturer.

The Thin Flange components, with 1.33", 2.75", 4.5", 6.0" or 8.00" CF sealing surfaces are available in two different "gasket-to-gasket" nominal thicknesses (0.175" and 0.400") and have either an open bore (ID-internal diameter) or a closed bore (solid blank or membrane). The components are fabricated from 316L stainless steel, have double density clear holes, and include CF sealing surfaces on both sides.

The "gasket to gasket" nominal thickness is not the actual thickness of the flange if measured with a caliper or micrometer. The actual thicknesses are 0.155" for the nominal 0.175" flange, and 0.380" for the nominal 0.400" flange. Both nominal and actual thicknesses are provided in the tables below. For more information about "gasket to gasket" nominal thickness and the actual thickness, please see the "Gasket Crushing Allowances" inset below.

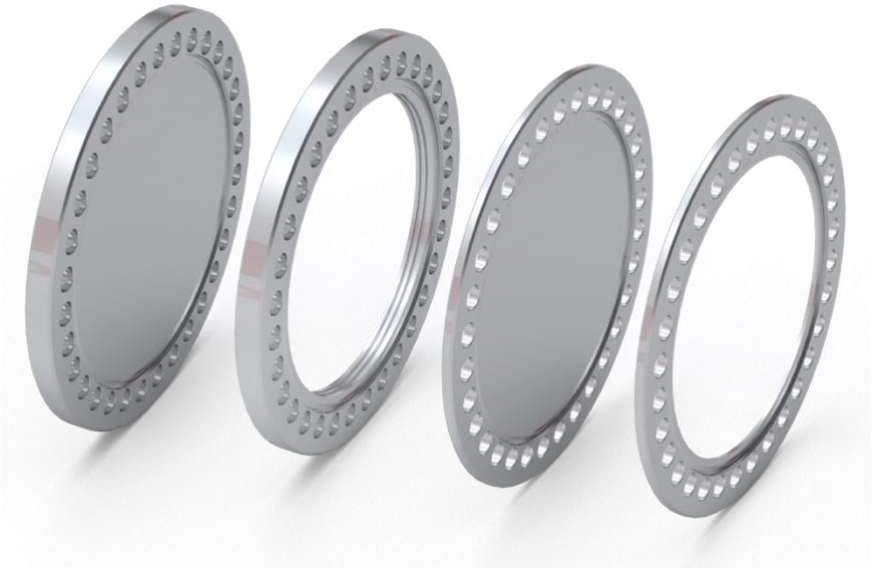
The standard flanges of the adjacent components provide the bending resistance necessary to enable a uniform crushing force of the knife-edge along the gasket perimeter. The gasket bolts pass through the clear holes of Thin Flange without putting any direct force on it. Thus, as the flange bolts are tightened with the Thin Flange interposed between the component flanges, the compression forces are symmetric without bending moments.
The open bore design is typically used as a spacer in UHV vacuum systems. It can also provide an easy method to insert a phosphor screen or similar detector adjacent to the vacuum window. The nominal 0.400" Thin Flange design has enough thickness to allow incorporation of internal mounting channels (Grabber Grooves) in components with CF sealing surfaces 2.75" or larger. This enables welcomed internal mounting flexibility with now numerous options for secure mounting of devices, apparatus, and prototyped concepts using Kimball Physics eV Parts.

The closed bore design, also referred to as a solid blank or membrane can be used to machine custom apertures to allow for 1) Calibration of pumping speed of a vacuum pump, 2) Determination of the out-gassing rate of a vacuum chamber, or 3) Differential pumping. The membrane blank can also provide a surface or platform to custom mount experimental apparatus directly into the vacuum space.

Gasket Crushing Allowances

In general, with copper gasket use, the copper gasket is not fully "crushed" to enable surface to surface mating of the CF flange surfaces with a zero gap (of course there are always exceptions). A typical remaining gap between the CF flange surfaces is roughly 0.20 inches. Multi-CF Fittings have been designed to provided assembled center-to-center spacings which are multiples of 0.700 inch. To maintain this 0.700 inch spatial periodicity, each CF flange face has been set back by a gasket crushing allowance of 0.010" (0.25 mm), to provide a "gasket to gasket" nominal thickness that is used for system planning and layout.

For example, a MCF450-ThnFlg-E2-400 Thin Flange fitting, with a nominal thickness of 0.400 inch between opposite gasket center planes, the actual thickness is 0.380 inch (=0.400 - (2 x 0.010)).



Example of Thin Flange Options: 6.00" CF Thin Flanges, with 0.400" nominal thickness closed and open bore flanges on the left, and 0.175" nominal thickness closed and open bore flanges on the right.

Thin Flange Model (1.33")	CF Sealing Surface	Thickness (Nominal*)	Thickness (Actual)	Holes	Notes
MCF133-ThnFlg-A2-175-ID640	1.33"	0.175"	0.155"	Double Density with (12) #8-32 Clear bolt holes	Open Bore -ID 0.640" -Use as Spacer
MCF133-ThnFlg-A2-175	1.33"	0.175"	0.155"	Double Density with (12) #8-32 Clear bolt holes	Solid Blank or Membrane -create custom apertures or mount apparatus
MCF133-ThnFlg-A2-400-ID640	1.33"	0.400"	0.380"	Double Density with (12) #8-32 Clear bolt holes	Open Bore -ID 0.640" -Use as Spacer
MCF133-ThnFlg-A2-400	1.33"	0.400"	0.380"	Double Density with (12) #8-32 Clear bolt holes	Solid Blank or Membrane -create custom apertures or mount apparatus
Notes	* Nominal Thickness is the "gasket to gasket" distance used for planning and layout purposes.				

Thin Flange Model (2.75")	CF Sealing Surface	Thickness (Nominal*)	Thickness (Actual)	Holes	Notes
MCF275-ThnFlg-C2-175-ID1500	2.75"	0.175"	0.155"	Double Density with (12) 1/4-28 Clear bolt holes	Open Bore -ID 1.500" -Use as Spacer -Mount detectors
MCF275-ThnFlg-C2-175	2.75"	0.175"	0.155"	Double Density with (12) 1/4-28 Clear bolt holes	Solid Blank or Membrane -create custom apertures or mount apparatus
MCF275-ThnFlg-C2-400-ID1500GG	2.75"	0.400"	0.380"	Double Density with (12) 1/4-28 Clear bolt holes	Open Bore -ID 1.500" -Use as Spacer -Mount detectors -Grabber Groove internal mounting channels
MCF275-ThnFlg-C2-400	2.75"	0.400"	0.380"	Double Density with (12) 1/4-28 Clear bolt holes	Solid Blank or Membrane -create custom apertures or mount apparatus
Notes	* Nominal Thickness is the "gasket to gasket" distance used for planning and layout purposes.				

Thin Flange Model (4.5")	CF Sealing Surface	Thickness (Nominal*)	Thickness (Actual)	Holes	Notes
MCF450-ThnFlg-E2-175-ID2900	4.50"	0.175"	0.155"	Double Density with (16) 5/16-24 Clear bolt holes	Open Bore -ID 2.900" -Use as Spacer -Mount detectors
MCF450-ThnFlg-E2-175	4.50"	0.175"	0.155"	Double Density with (16) 5/16-24 Clear bolt holes	Solid Blank or Membrane -create custom apertures or mount apparatus
MCF450-ThnFlg-E2-400-ID2900GG	4.50"	0.400"	0.380"	Double Density with (16) 5/16-24 Clear bolt holes	Open Bore -ID 2.900" -Use as Spacer -Mount detectors -Grabber Groove internal mounting channels
MCF450-ThnFlg-E2-400	4.50"	0.400"	0.380"	Double Density with (16) 5/16-24 Clear bolt holes	Solid Blank or Membrane -create custom apertures or mount apparatus
Notes	* Nominal Thickness is the "gasket to gasket" distance used for planning and layout purposes.				

Thin Flange Model (6.0")	CF Sealing Surface	Thickness (Nominal*)	Thickness (Actual)	Holes	Notes
MCF600-ThnFlg-F2-175-ID4300	6.00"	0.175	0.155"	Double Density with (32) 5/16-24 Clear bolt holes	Open Bore -ID 4.300" -Use as Spacer -Mount detectors
MCF600-ThnFlg-F2-175	6.00"	0.175"	0.155"	Double Density with (32) 5/16-24 Clear bolt holes	Solid Blank or Membrane -create custom apertures or mount apparatus
MCF600-ThnFlg-F2-400-ID4300GG	6.00"	0.400"	0.380"	Double Density with (32) 5/16-24 Clear bolt holes	Open Bore -ID 4.300" -Use as Spacer -Mount detectors -Grabber Groove internal mounting channels
MCF600-ThnFlg-F2-400	6.00"	0.400"	0.380"	Double Density with (32) 5/16-24 Clear bolt holes	Solid Blank or Membrane -create custom apertures or mount apparatus
Notes	* Nominal Thickness is the "gasket to gasket" distance used for planning and layout purposes.				

Thin Flange Model (8.0")	CF Sealing Surface	Thickness (Nominal*)	Thickness (Actual)	Holes	Notes
MCF800-ThnFlg-G2-400-ID6300GG	8.00"	0.400"	0.380"	Double Density with (40) 5/16-24 Clear bolt holes	Open Bore -ID 6.300" -Use as Spacer -Grabber Groove internal mounting channels
MCF800-ThnFlg-G2-400	8.00"	0.400"	0.380"	Double Density with (40) 5/16-24 Clear bolt holes	Solid Blank or Membrane -create custom apertures or mount apparatus
Notes	* Nominal Thickness is the "gasket to gasket" distance used for planning and layout purposes.				

References

For more information about Multi-Port CF (MCF™) Vacuum Chambers and Accessories, visit our website at: Multi-CF Hardware

Other References

Website

Multi-CF Flanges
- Multi-CF Thin Flanges
- Multi-CF Flanges Adapters
- Multi-CF Thin Mounting Flanges
- Multi-CF Perimeter Weld Flanges
- Multi-CF Tilt Adapter Flanges

PDF Documents
- Multi-CF (MCF) Vacuum Hardware Overview

Notes:

1. Cautions:
   - -Silver Plated Bolts or Equivalent Lubrication must be used.
   - -Please carefully measure the hole depth and other flange / copper ring /part thicknesses
   - -Choose a correct bolt length such that the bolt doesn't bottom in the tapped hole prior to tightening the structure.
2. 3D Solid Models of all parts shown are available as STEP files. They can be downloaded from Kimball Physics Website for interactive visualization and measurements in your CAD software environment.
3. Specifications Subject to Change Without Notice.
4. Images are not to scale
5. DE Altobelli, DT Taylor 4/25/2024

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