UHV VACUUM CHAMBERS with 1.33”, 2.75”, and 4.5” CF Ports
-Optimized Internal Spherical Workspace
-Single and Double Spherical Cube Designs

Multi-CF™ Spherical Cubes: 1.33” and 2.75” Ports

FOR USE IN:

- Compact and Miniature UHV Vacuum Chambers
- Cold Physics Experiments
- Portable low-cost UHV Systems
- High-complexity UHV subsystems
- UHV vacuum manipulator systems
- UHV specimen transfer systems

FEATURES / OPTIONS:

- Easy-access unencumbered spherical workspace
- Annular port Grabber Grooves at 2.75” CF sealing ports.
- 1.33” and 2.75” sealing surfaces cut on a hollow sphere
- Unitary stainless steel 316L construction. Titanium custom also available
- No welds, highly polished
- Precise port alignment of < 0.1 degrees

Spherical Cube MCF275-SphCube-C6

The MCF133-SphCube-A6 Spherical Cube is a six port Multi-CF™ miniature UHV vacuum chamber consisting of a hollow sphere intersected by six 1.33” CF sealing surfaces. Internal mounting channels (Grabber Grooves) are present on the 2.75” ports but are not present on 1.33” ports.

The MCF275 Spherical Cubes range from six to twelve-port Multi-CF™ miniature UHV vacuum chambers, consisting of hollow spheres intersected by four to six 2.75” CF sealing surfaces and/or zero to eight 1.33” CF sealing surfaces.

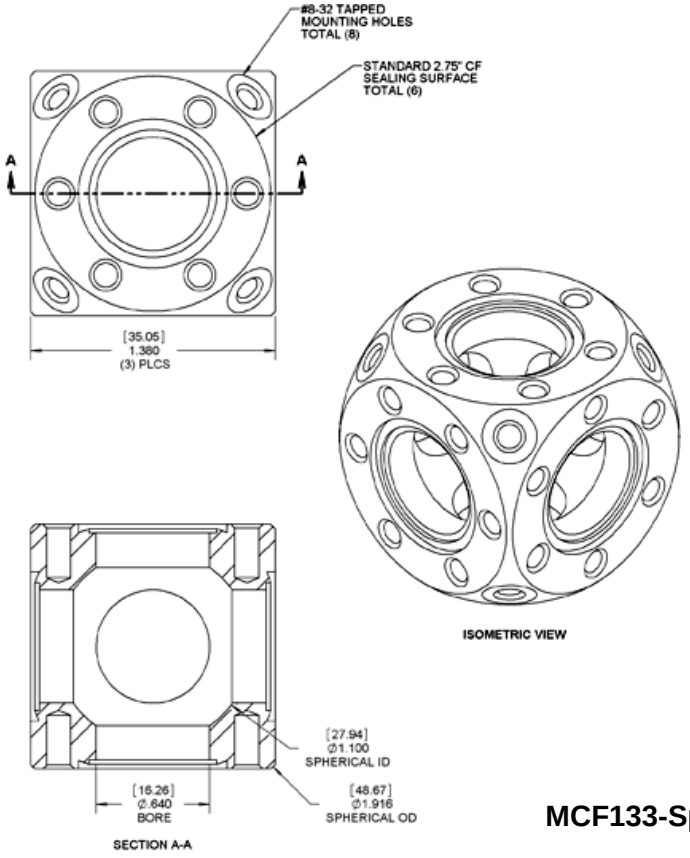
Interior space has been greatly increased over previous designs. Each 2.75” CF sealing surface has one pair of Grabber Grooves for internal mounting capability. Two to eight external tapped holes allow mounting of the MCF chamber without utilizing the gasket crushing bolts. These holes may also be used to attach small heaters for chamber bake-out.

Spherical Cube MCF-133-SphCube-A6

	MCF133-SphCube-A6	MCF275-SphCube-C6	MCF275-SphCube-C5A4	MCF275-SphCube-C4A8
Multi-CF FITTING	Spherical Cube			
COMMON APPLICATION	Miniature UHV Vacuum Chamber			
CONSTRUCTION / MATERIAL	Unitary Stainless Steel 316L			
1.33" CF SEALING SURFACES	Six with (6) 8-32 tapped bolt holes per sealing surface	None	Four with (6) 8-32 tapped bolt holes per sealing surface	Eight with (6) 8-32 tapped bolt holes per sealing surface
2.75" CF SEALING SURFACES	None	Six with (6) 1/4-28 tapped bolt holes, plus one pair of Grabber Grooves per sealing surface	Five with (6) 1/4-28 tapped bolt holes, plus one pair of Grabber Grooves per sealing surface	Four with (6) 1/4-28 tapped bolt holes, plus one pair of Grabber Grooves per sealing surface
EXTERNAL MOUNTING	Eight 8-32 tapped bolt holes	Eight 1/4-28 tapped bolt holes	Five1/4-28 tapped bolt holes	Two 1/4-28 tapped bolt holes
INTERNAL WORKSPACE	1 in^3 (16 cc) 1.1 in. spherical ID	11.9 in^3 (195 cc) 2.6 in. spherical ID	12.4 in^3 (203 cc) 2.6 in. spherical ID	12.9 in^3 (211 cc) 2.6 in. spherical ID

*Spherical Cube **MCF275-SphCube-C4A8** with 4 2.75" CF ports and 8 1.33" CF ports. Four of the 1.33" ports are seen on the left of the structure. The other 4 1.33" ports are diametrically positioned. Also note the threaded hole centered in the 1.33" ports array that can be used for external mounting.*

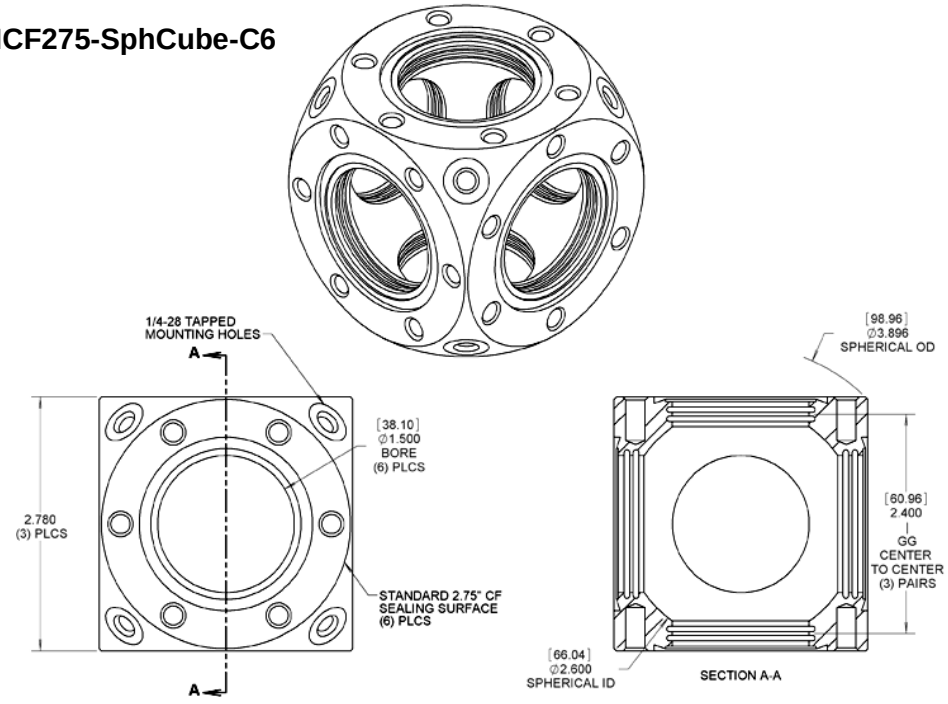
*Spherical Cube **MCF275-SphCube-C5A4** with 5 2.75" CF ports and 4 1.33" CF ports. Four of the 1.33" ports are seen on the left of the structure. A 2.75" port is diametrically positioned and can be partially seen on the back right side of the chamber Also notice the threaded hole centered in the 1.33" port array that can be used for external mounting.*



MCF133-SphCube-A6

All Dimensions are in Inches.
(Metric dimensions in parentheses)

MCF275-SphCube-C6



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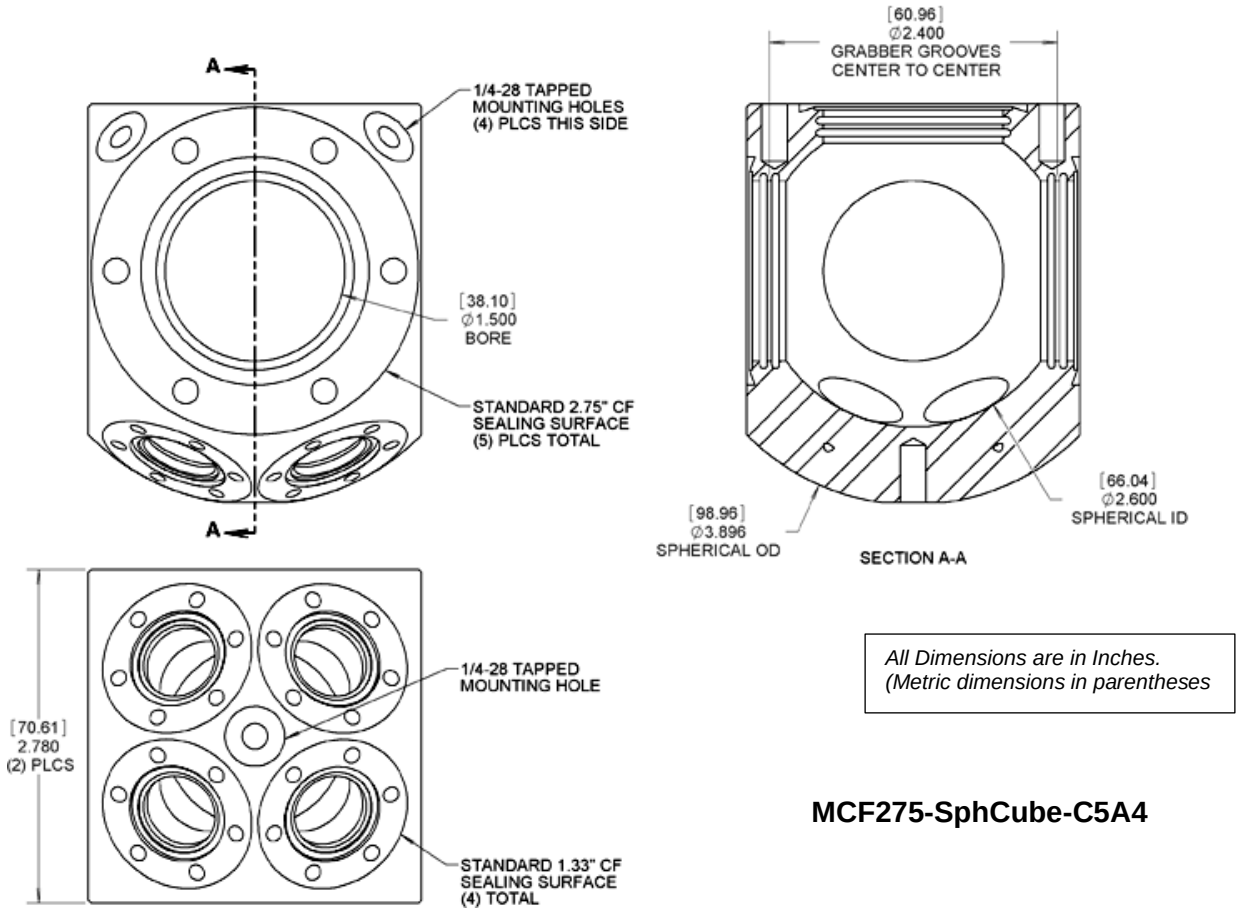
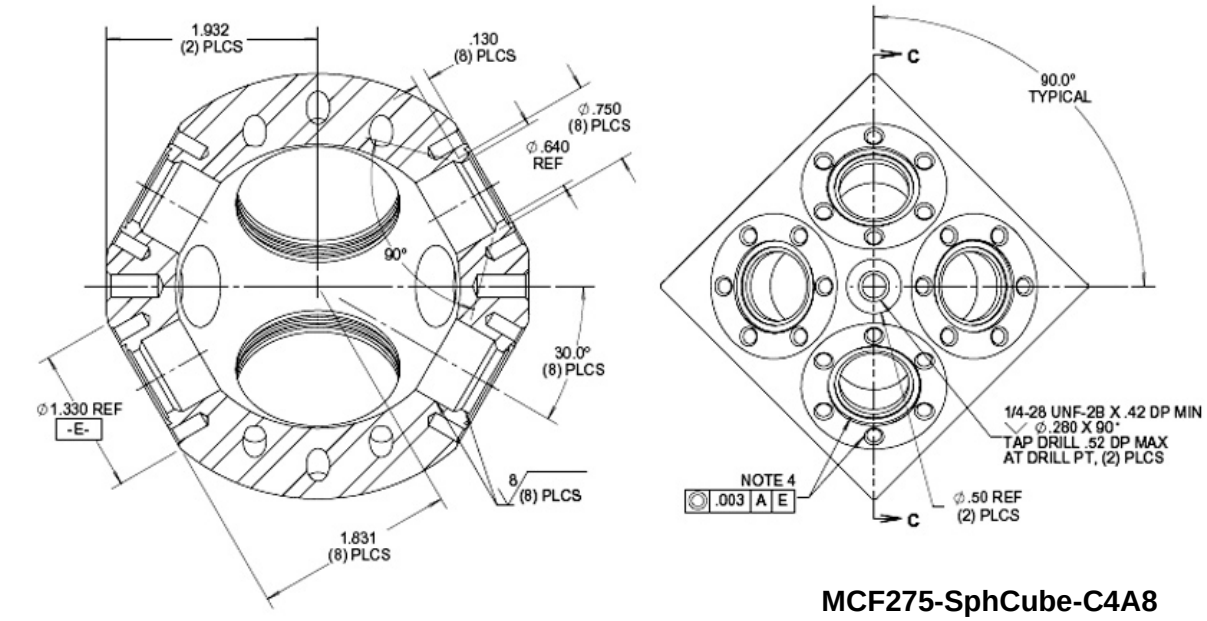


All Dimensions are in Inches.
(Metric dimensions in parentheses

MCF275-SphCube-C5A4



MCF275-SphCube-C4A8

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Multi-CF™ Double Spherical Cubes: 1.33” and 2.75” Ports

FOR USE IN:

- Compact and Miniature UHV Vacuum Chambers
- Cold Physics Experiments
- Portable low-cost UHV Systems
- High-complexity UHV subsystems
- UHV vacuum manipulator systems
- UHV specimen transfer systems

FEATURES / OPTIONS:

- Designed as two Spherical Cubes positioned side by side
- Annular port Grabber Grooves at 2.75” CF sealing ports.
- Unitary stainless steel 316L construction. Titanium custom also available
- No welds, highly polished
- Precise port alignment of < 0.1 degrees

Spherical Cube MCF133-DblSphCube-A10

The **MCF133-DblSphCube-A10** Double Spherical Cube is a ten port Multi-CF™ miniature UHV vacuum chamber essentially consisting of two 1.33” CF Spherical Cube structures side-by-side to provide ten (10) 1.33” CF sealing ports. Each port has six (6) #8-32 threaded holes to secure the port flanges.

The system is precision CNC manufactured from a monolithic 316L stainless steel block with sealing surfaces efficiently integrated into the structure. Fabrication from Titanium to leverage its low magnetic permeability, reduced hydrogen outgassing and lower weight is available as an option.

With these small port sizes, Grabber Grooves are not practical and therefore not present. Four external tapped holes (#8-32) allow for mounting of the MCF chamber without effecting the gasket seals. These holes may also be used to attach small heaters for chamber bake-out.

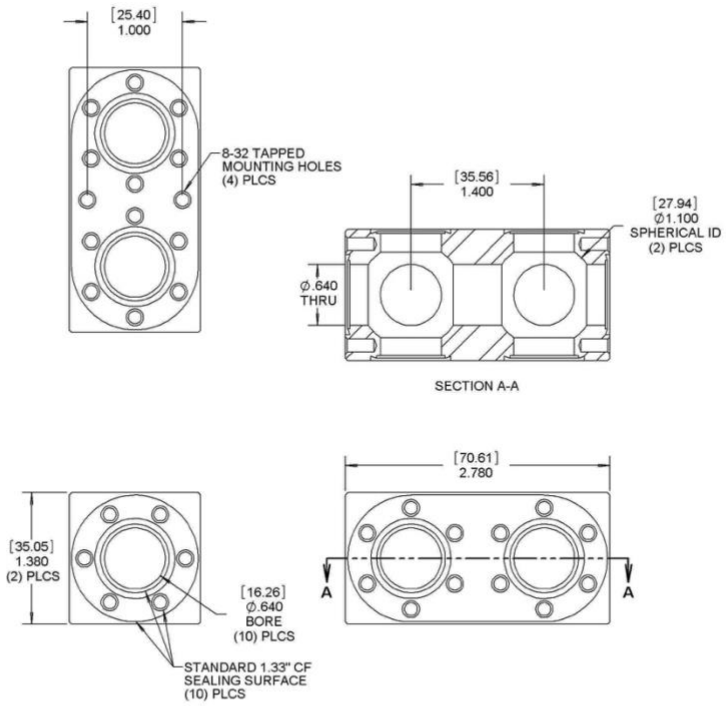
The **MCF275-DblSphCube-C10** is also a Double Spherical Cube ten port Multi-CF™ miniature UHV vacuum chamber, similar the

	MCF133-DblSphCube-A10	MCF275-DblSphCube-C10
Multi-CF™ Fitting	Double Spherical Cube	
COMMON APPLICATION	Miniature UHV Vacuum Chamber	
CONSTRUCTION / MATERIAL	Unitary Stainless Steel 316L (Titanium available as option)	
1.33” CF SEALING SURFACES	Ten (10) CF Sealing Surfaces each with (6) #8-32-28 tapped bolt holes. No Grabber Grooves available.	None
2.75” CF SEALING SURFACES	None	Ten (10) CF Sealing Surfaces each with (6) 1/4-28 tapped bolt holes, plus Grabber Grooves (internal annular grooves) per sealing surface
EXTERNAL MOUNTING	Yes, with (4) threaded bolt holes #8-32 for external mounting	Yes, with (4) threaded bolt holes 1/4-28 for external mounting.
INTERNAL WORKSPACE	Internal Volume: 1.97 in^3 (32 cc) Spherical ID: 1.10” in (27.94mm) for each half	Internal Volume: 22.3 in^3 (365.4 cc) Spherical ID: 2.60” in (66.04 mm) for each half

1.33” CF structure described above, but instead with ten (10) 2.75” CF sealing surface port ports. Each port has six (6) 1/4-28 threaded holes to secure the port flanges.

Each 2.75” CF sealing surface has one pair of Grabber Grooves for internal mounting capability. Four external tapped holes (1/4-28) allow for mounting of the MCF chamber without utilizing the gasket crushing bolts. These holes may also be used to attach small heaters for chamber bake-out.

Spherical Cube MCF275-DblSphCube-C10



MCF133-DblSphCube-A10

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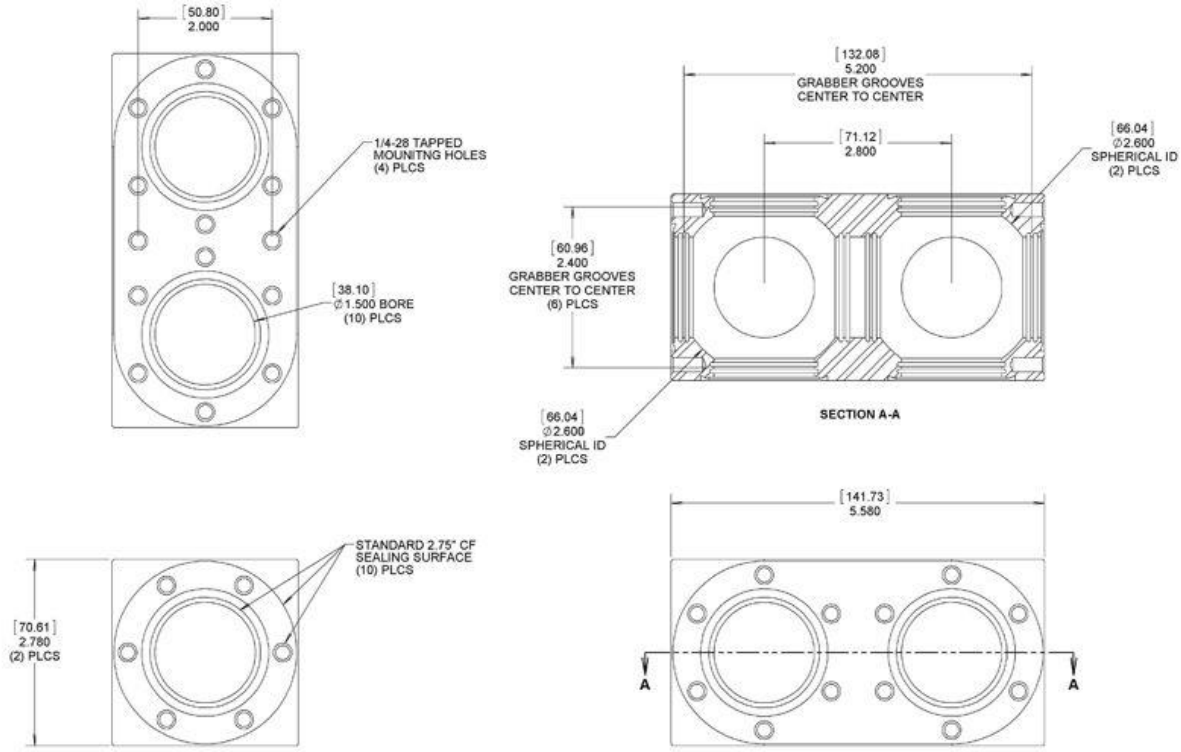

MCF275-DblSphCube-C10

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4.5” Multi-CF™ Spherical Cubes: MCF450-SphCube-E6 and MCF450-SphCube-E6A8

FEATURES / OPTIONS:

- ► Easy access small UHV vacuum chamber
- ► Unencumbered 4.800” diameter spherical workspace
- ► Grabber grooves at 4.5” CF sealing surfaces
- ► 4.5”CF and optional 1.33” CF ports cut on a hollow sphere
- ► Unitary stainless steel 316L construction
- ► No welds, highly polished
- ► Precise port alignment of <0.1 deg

The 4.5” CF Spherical Cubes are comprised of six or fourteen port small Multi™-CF UHV vacuum chambers, consisting of hollow spheres intersected by six 4.5” CF sealing surfaces and either zero or eight 1.33” CF sealing surfaces. Interior space has been greatly increased over previous designs. Each 4.5” CF sealing surface port has one triplet of internal mounting channels (Grabber Grooves).

MCF-450-SphCube-E6

MCF-450-SphCube-E6A8

	MCF450-SphCube-E6	MCF450-SphCube-E6A8
Multi-CF™ FITTING	Spherical Cube	
COMMON APPLICATION	Small UHV Vacuum Chamber	
CONSTRUCTION / MATERIAL	Unitary Stainless Steel 316L	
1.33”CF SEALING SURFACES	None	Eight ports with (12) 8-32 tapped boltholes per sealing surface
4.5” CF SEALING SURFACES	Six ports with (8) 5/16-24 tapped bolt holes, plus one triplet of Grabber Grooves per sealing surface	Six ports with (8) 5/16-24 tapped bolt holes, plus one triplet of Grabber Grooves per sealing surface
EXTERNAL MOUNTING	None	None
INTERNAL WORKSPACE	69.9 in^3 (1,145 cc) 4.800 in. Spherical ID	71.6 in^3 (1,174 cc) 4.800 in. Spherical ID

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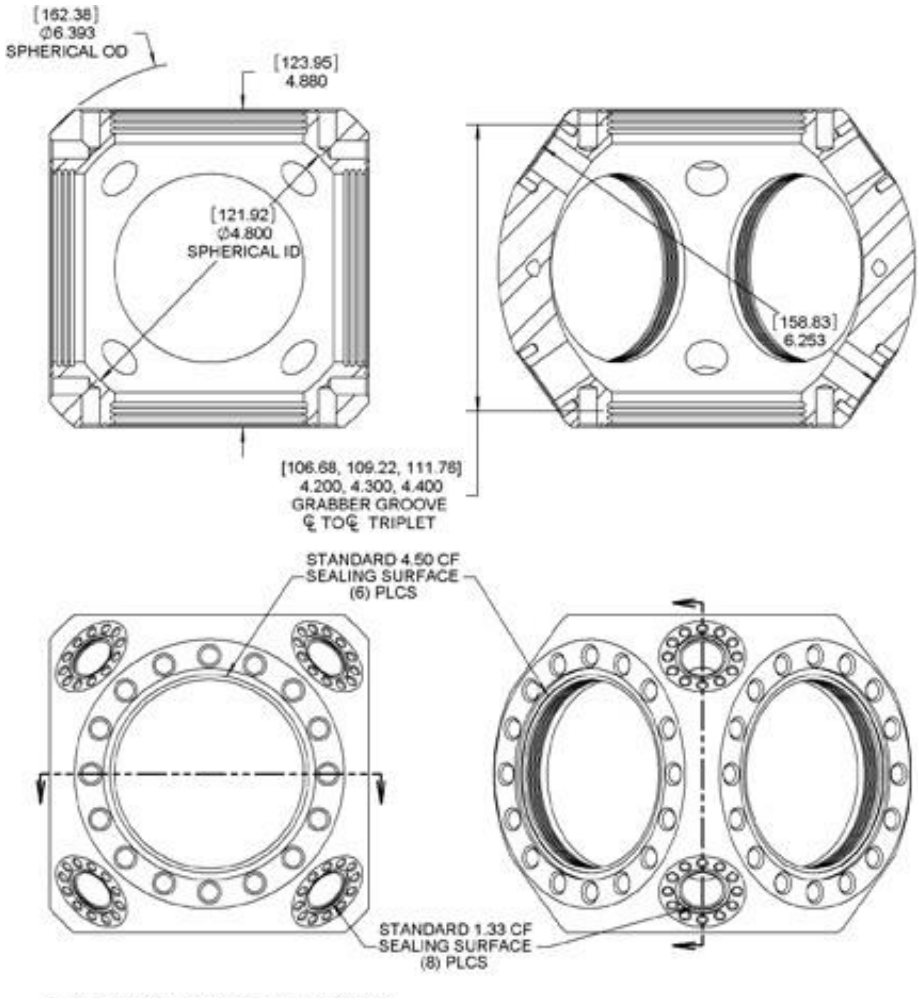

MCF450-SphCube-E6A8

All Dimensions are in Inches.
(Metric dimensions in parentheses

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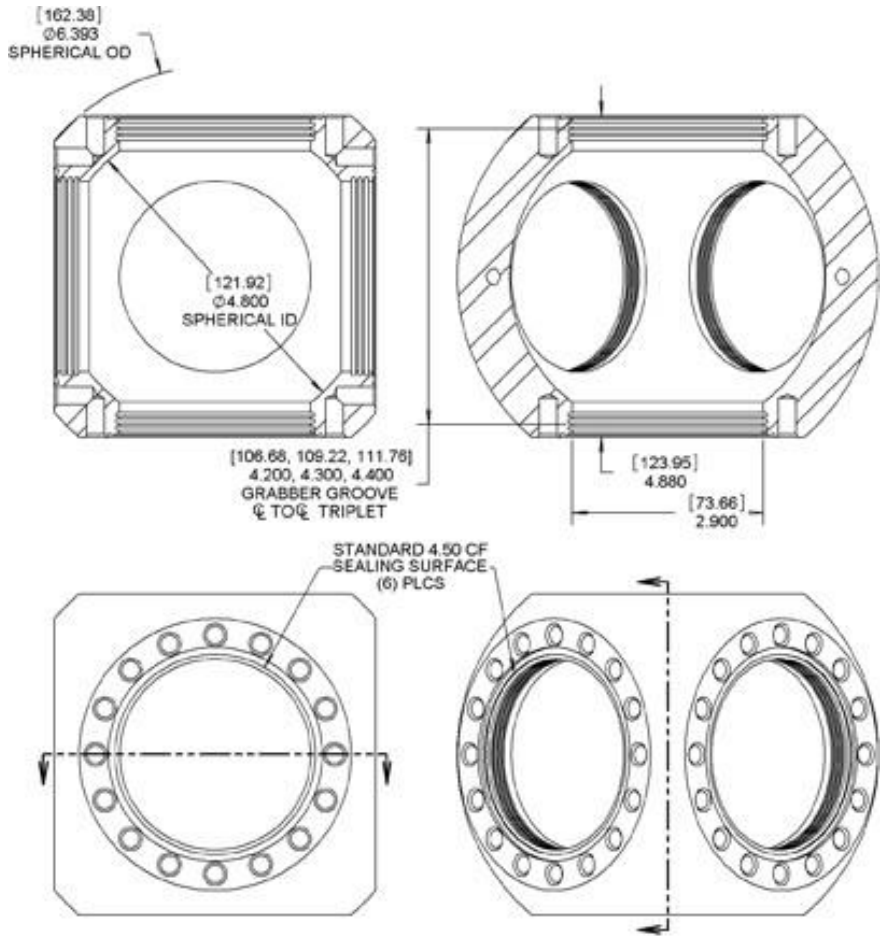

MCF450-SphCube-E6

All Dimensions are in Inches.
(Metric dimensions in parentheses

Category	Product Description	Model	Other Features	Port Code, Dimension (inches) and Number of Ports					
Spherical Cube				**A 1.33"**	**C 2.75"**	**E 4.5"**	**F 6.0"**	**G 8.0"**	**H 10.0”**
	1.33" Spherical Cube	MCF133--SphCube-A6		6					
	1.33" Spherical Cube Double	MCF133--DblSphCube-A10	Double	10					
	2.75" Spherical Cube	MCF275-SphCube-C6			6				
	2.75" Spherical Cube Alt Config 1	MCF275-SphCube-C5A4	Alt Config 1	4	5				
	2.75" Spherical Cube Alt Config 2	MCF275-SphCube-C4A8	Alt Config 2	8	4				
	2.75" Spherical Cube Double	MCF275-DblSphCube-C10-A	Double		10				
	4.5" Spherical Cube	MCF450-SphCube-E6				6			
	4.5" Spherical Cube	MCF450-SphCube-E6A8		8		6			

References

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

Other References:

MCF Vacuum Chambers Overview (Vacuum Chambers and Accessories)
Spherical Octagon- Multi-CF Hardware
Spherical Cube- Multi-CF Hardware
Spherical Cube Expanded- Multi-CF Hardware
Spherical Hexagon- Multi-CF Hardware
Thin Flange- Multi-CF Hardware
Close Coupler (non-rotatable)- Multi-CF Hardware

Notes:

1. Cautions:
   - -Silver Plated Bolts or Equivalent Lubrication must be used.
   - -Please 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. Specifications Subject to Change Without Notice.
3. DE Altobelli, DT Taylor 1/31/2023

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