UHV VACUUM CHAMBERS with 1.33" 2.75", 4.5", 6.0", and 8.0" CF Ports - Maximum Number of Ports in a Cubic Symmetry (*Other Custom Port Configurations Available*)

APPLICATIONS:

- Compact UHV chamber
- Portable Low-Cost UHV Systems
- High-Complexity UHV Subsystems
- UHV Vacuum Manipulator Systems
- UHV Specimen Transfer Systems
- General UHV Vacuum Plumbing

FEATURES / OPTIONS:

- Easy access UHV chambers
- Unencumbered large diameter spherical workspace
- Maximum number of ports in a cubical symmetry cut on a hollow sphere
- Grabber Grooves on 2.75" CF, 4.5" CF and 6.0" CF sealing surfaces
- Unitary stainless steel 316L construction. Titanium available as option
- Double-density bolt holes
- No welds, highly polished
- Precise port alignment of < 0.1 deg.

Various Expanded Spherical Cubes, with 1.33", 2.75", 4.5", and 6.0" CF ports.

The Expanded Spherical Cubes are similar to our Spherical Cubes but with an expanded diameter to enable a larger number of ports to be included within the symmetric cubic geometry and provide a larger internal workspace. They consist conceptually of a hollow sphere intersected by six sealing surfaces arranged in a cubic geometry with additional optional smaller sealing surfaces on the corners and edges. Each 2.75", 4.5" and 6.0" CF sealing surface port has Grabber Grooves for internal mounting of apparatus.

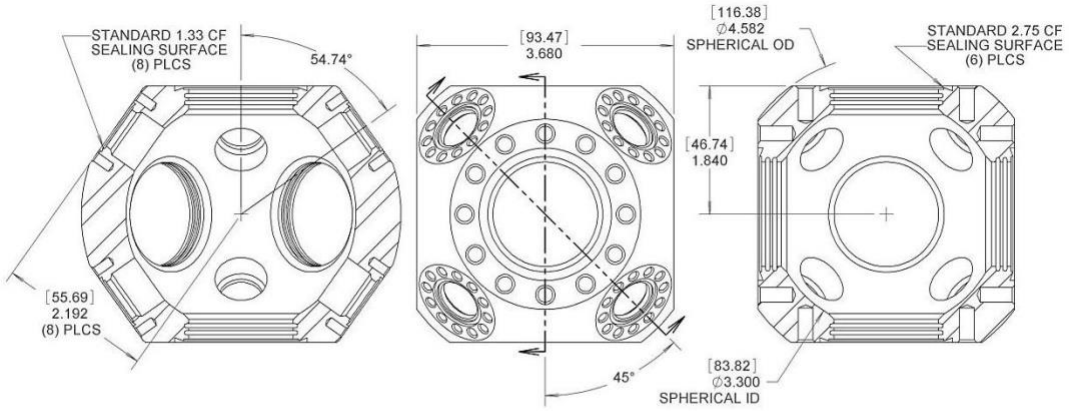
CUSTOM EXPANDED SPHERICAL CUBES with custom port configurations are available; consult Kimball Physics Engineering.

2.75" Multi-CF Expanded Spherical Cube
MCF275-ExpCube-C6A8

The 2.75" CF Expanded Spherical Cube is a small Multi-CF UHV chamber witha maximum of 14 ports integrated into a cubic symmetry. It consists of a hollow sphere intersected by six 2.75" CF sealing surfaces and eight 1.333" CF sealing surfaces on the corners. Each 2.75" CF sealing surface port has a pair of Grabber Grooves. The 2.75" Expanded Spherical Cube has a spacious 3.300" spherical inner diameter and a 4.582" outer diameter (3.680" between the 2.75" CF ports) to minimize the outside footprint.

Expanded Spherical Cube MCF275-ExpCube-C6A8
Total of 14 ports.

MCF275-ExpCube-C6A8	
Multi-CF FITTING	Expanded Spherical Cube
COMMON APPLICATION	Miniature UHV Vacuum Chamber
CONSTRUCTION / MATERIAL	Unitary Stainless Steel 316L, various grades of Titanium available for custom fabrication.
1.33″ CF SEALING SURFACES	Eight (8) CF Sealing Surfaces with twelve (12) 8-32 tapped bolt holes per sealing surface
2.75” CF SEALING SURFACES	Six (6) CF Sealing Surfaces with (12) 1/4-28 tapped bolt holes, plus one pair of Grabber Grooves (internal annular grooves) per sealing surface
EXTERNAL MOUNTING	None
INTERNAL WORKSPACE	24.2 in^3 (397cc) 3.300 in Spherical ID
WEIGHT	Weight: 4.53 lbs. (2.05 kg)



MCF275-ExpCube-C6A8

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

4.5” Multi-CF™ Expanded Spherical:

MCF450-SphCube-E6C8, MCF450-SphCube-E6C8A12

FEATURES / OPTIONS:

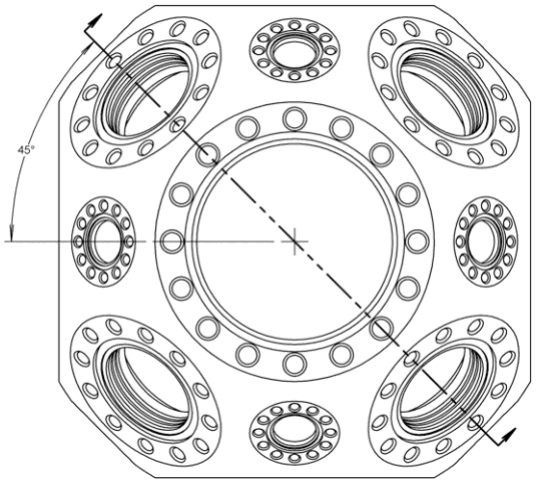
- Easy access larger UHV chambers
- Maximum of 26 ports on sphere
- Unencumbered 6.5” diameter spherical workspace
- 4.5”, 2.75” and optional 1.33” CF sealing surfaces from hollow sphere
- Internal mounting channels (Grabber Grooves) on 4.5” CF and 2.75” CF sealing surface ports
- Unitary stainless steel 316L construction
- Double-density bolt holes
- No welds, highly polished
- Precision port alignment of < 0.1 deg.

Expanded Spherical Cube MCF450-ExpCube-E6C8A12

THE 4.5” CF EXPANDED SPHERICAL CUBE

The 4.5” CF Expanded Spherical Cubes are Multi-CF™ UHV chambers with a maximum of 26 ports in a cubic symmetry. These designs conceptually begin as a hollow sphere that is then intersected by six 4.5” CF sealing surfaces, eight 2.75” CF sealing surfaces on the corners, with then either zero or twelve 1.33” CF sealing surfaces on the edges. Each 4.5” CF or 2.75” CF sealing surface port has internal mounting channels (Grabber Grooves). All 4.5” CF Spherical Cubes have a spacious 6.500” spherical inner diameter and a 8.110” inch outer diameter (6.980” inch between the 4.5” CF ports) compact exterior footprint.

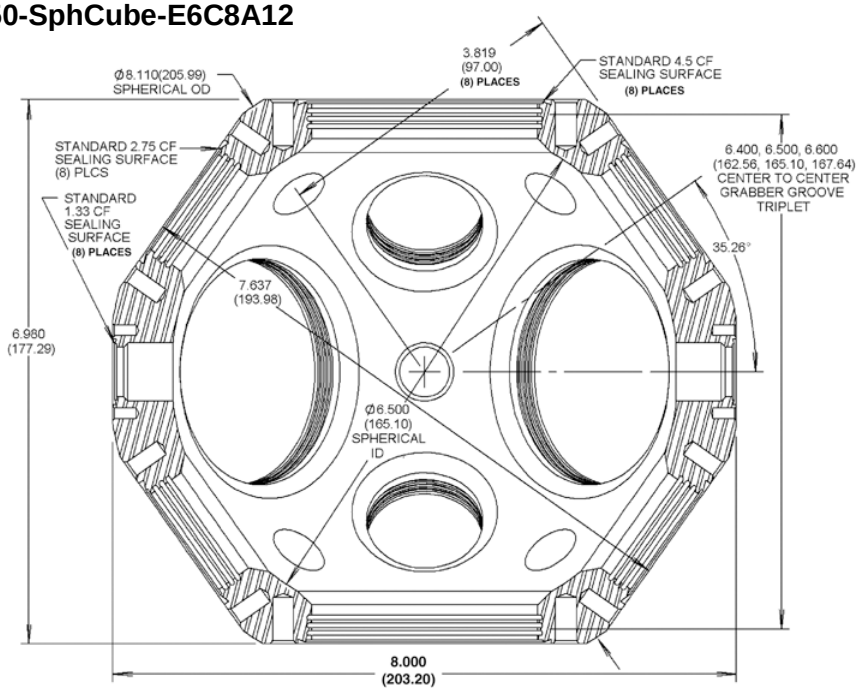
	MCF450-SphCube-E6C8	MCF450-SphCube-E6C8A12
Multi-CF FITTING	Expanded Spherical Cube	
COMMON APPLICATION	UHV Vacuum Chamber	
CONSTRUCTION / MATERIAL	Unitary Stainless Steel 316L, various grades of Titanium available for custom fabrication.	
1.33″ CF SEALING SURFACES	None	Twelve (12) CF Sealing Surfaces with twelve (12) 8-32 tapped bolt holes per sealing surface
2.75” CF SEALING SURFACES	Eight (8) CF Sealing Surfaces with (12) 1/4-28 tapped bolt holes, plus one triplet of Grabber Grooves (internal annular grooves) per sealing surface	Eight (8) CF Sealing Surfaces with (12) 1/4-28 tapped bolt holes, plus one triplet of Grabber Grooves (internal annular grooves) per sealing surface
4.5”CF SEALING SURFACES	Six (6) CF Sealing Surfaces with (16) 5/16-24 tapped bolt holes, plus one triplet of Grabber Grooves (internal annular grooves) per sealing surface	Six (6) CF Sealing Surfaces with (16) 5/16-24 tapped bolt holes, plus one triplet of Grabber Grooves (internal annular grooves) per sealing surface
EXTERNAL MOUNTING	None	None
INTERNAL WORKSPACE	169.3 in^3 (2,774 cc) 6.500 in Spherical ID	173.2 in^3 (2,838 cc) 6.500 in Spherical ID
WEIGHT	21.4 lbs. (9.76 kg)	19.9 lbs. (9.01 kg)



MCF450-SphCube-E6C8A12

www.kimballphysics.com **Email:** info@kimphys.com **Tel:** +1 603 878 1616

MCF450-SphCube-E6C8A12



Multi-CF™ Expanded Spherical Cubes

MCF600-SphCube-F6, MCF600-SphCube-F6C8, MCF600-SphCube-F6C8A24

FEATURES / OPTIONS:

- Easy access larger UHV chambers
- Max 38 ports on sphere
- Unencumbered 8.4” inch diameter spherical workspace
- 6.0” CF sealing surfaces, with optional 2.75” CF and 1.33” CF ports cut on a hollow sphere
- Grabber Grooves on 6.0” CF and 2.75” CF sealing surfaces
- Unitary stainless steel 316L or custom titanium construction
- Double-density bolt holes

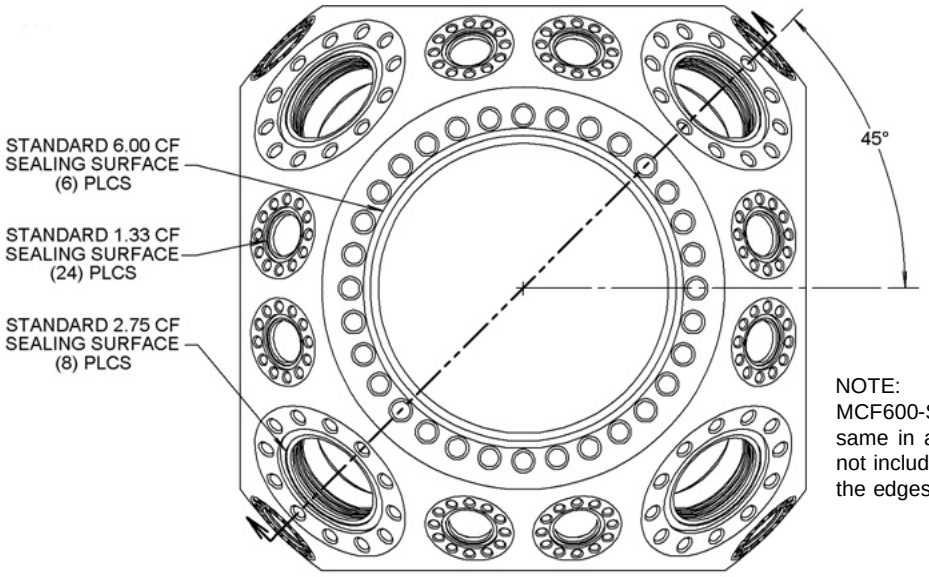
The 6.0” CF Expanded Spherical Cubes are Multi-CF™ UHV chambers with a up to 38 ports positioned in a symmetric cubic geometry. The design conceptually starts as a hollow sphere that is then intersected by six primary 6.0” CF sealing surfaces in a cubic geometry, with zero or eight 2.75” CF secondary sealing surfaces on the corners, and then with zero or up to twenty-four 1.33” tertiary CF sealing surfaces on the edges. Each of the 6.0” CF and 2.75” CF sealing surface ports has internal mounting channels (Grabber Grooves). All 6.0” CF Spherical Cubes have a spacious 8.400” inch spherical inner diameter and a 10.290” inch outer diameter (8.380” inch between the 6 CF ports).

Expanded Spherical Cube MCF600-SphCube-F6C8A24
Total of 38 ports (models with fewer ports or custom configurations available)

	MCF600-SphCube-F6	MCF600-SphCube-F6C8	MCF600-SphCube-F6C8A24
Multi-CF FITTING	Expanded Spherical Cube		
COMMON APPLICATION	UHV Vacuum Chamber		
CONSTRUCTION / MATERIAL	Unitary Stainless Steel 316L, various grades of Titanium available for custom fabrication.		
1.33″ CF SEALING SURFACES	None	None	Twenty-four (24) CF Sealing Surfaces with twelve(12) 8-32 tapped bolt holes per sealing surface
2.75” CF SEALING SURFACES	None	Eight (8) CF Sealing Surfaces with (12) 1/4-28 tapped bolt holes, plus one triplet of Grabber Grooves (internal annular grooves) per sealing surface	Eight (8) CF Sealing Surfaces with (12) 1/4-28 tapped bolt holes, plus one triplet of Grabber Grooves (internal annular grooves) per sealing surface
6.0””CF SEALING SURFACES	Six (6) CF Sealing Surfaces with (32) 5/16-24 tapped bolt holes, plus one triplet of Grabber Grooves (internal annular grooves) per sealing surface	Six (6) CF Sealing Surfaces with (32) 5/16-24 tapped bolt holes, plus one triplet of Grabber Grooves (internal annular grooves) per sealing surface	Six (6) CF Sealing Surfaces with (32) 5/16-24 tapped bolt holes, plus one triplet of Grabber Grooves (internal annular grooves) per sealing surface
EXTERNAL MOUNTING	None	None	None
INTERNAL WORKSPACE	336.4 in^3 (5512 cc) 8.400 in Spherical ID	348.7 in^3 (2,838 cc) 8.400 in Spherical ID	360.2 in^3 (5,902 cc) 8.400 in Spherical ID
WEIGHT	41.8 lbs. (19.0 kg)	36.5 lbs. (16.5 kg)	33.1 lbs. (15.0 kg)

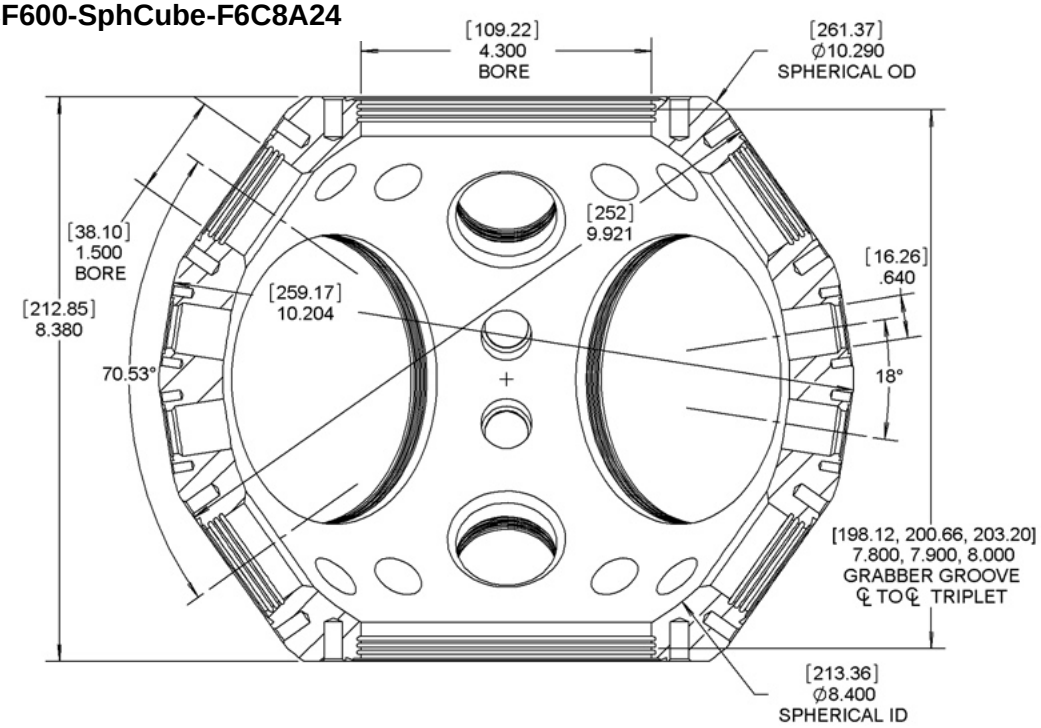
*Spherical Cube **MCF600-SphCube-F6** with (6) 6.0” CF ports.*

*Spherical Cube **MCF600-SphCube-F6C8** with (6) 6.0” CF ports and 8 2.75” CF ports.*



NOTE:
MCF600-SphCube-F6C8 is the same in all dimensions but does not include the 1.33" CF ports on the edges.

MCF600-SphCube-F6C8A24



All Dimensions are in inches.
(Millimeters are in parentheses)

Multi-CF™ Expanded Spherical Cubes

MCF800-SphCube-G6C8

FEATURES / OPTIONS:

- Easy access larger UHV chambers
- Unencumbered 10.2” inch diameter spherical workspace
- 8.0” Primary CF sealing surfaces (6), with eight (8) secondary 2.75” CF surfaces
- Internal mounting channels (Grabber Grooves) on 8.0” CF and 2.75” CF ports
- Unitary stainless steel 316L or custom titanium construction
- Double-density bolt holes

*Spherical Cube **MCF600-SphCube-G6C8** with (6) 8.0” CF ports and (8) 2.75”” CF ports.*

The 8.0” CF Expanded Spherical Cube is a Multi-CF™ UHV chamber design that conceptually begins as a hollow sphere, with then six (6) primary 8.0” sealing surfaces positioned in a cubic geometry arrangement, and with an additional eight (8) 2.75” sealing surface positioned at the “corners” of the cube. Each of the 8.0” CF and 2.75” CF sealing surface ports has internal mounting channels (Grabber Grooves). The spacious internal chamber has an inside diameter of 10.20” (259.08 mm) and an internal volume of 552.7 in^3 ((9057 cc), with a weight of 31.76 lbs. for the 316L stainless steel version. All ports have double density bolt holes to allow redundancy in bolt connections and enable use of Kimball Physics Close Couplers to allow connection of components in close proximity and allow rotational adjustment. Titanium and metric hole dimensions are available as options.

Category	Product Description	Model	Other Features	Port Code, Dimension (inches) and Number of Ports					
Spherical Cube	**Expanded**			**A 1.33"**	**C 2.75"**	**E 4.5"**	**F 6.0"**	**G 8.0"**	**H 10.0”**
	2.75" Spherical Cube Expanded	MCF275-ExpCube_C6A8	Expanded	8	6				
	4.5" Spherical Cube Expanded	MCF450-SphCube-E6C8	Expanded		8	6			
	4.5" Spherical Cube Expanded	MCF450-SphCube-E6C8A12	Expanded	12	8	6			
	6.0" Spherical Cube Expanded	MCF600-SphCube-F6	Expanded				6		
	6.0" Spherical Cube Expanded	MCF600-SphCube-F6C8	Expanded		8		6		
	6.0" Spherical Cube Expanded	MCF600-SphCube-F6C8A24	Expanded	24	8		6		
	8.0" Spherical Cube Expanded	MCF800-SphCube-G6C8	Expanded		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 11/1/2023

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