

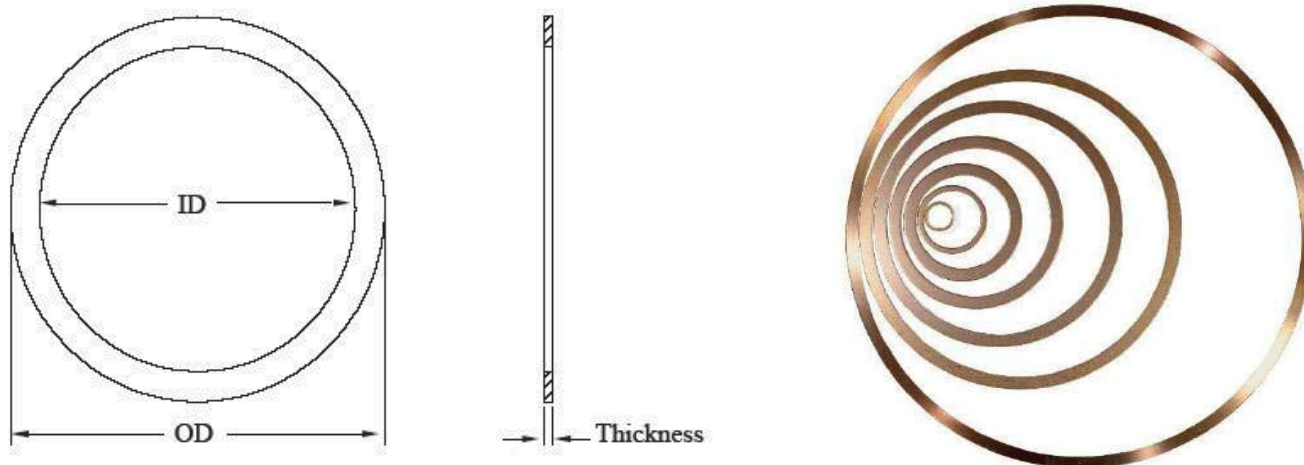


## Section 4. UHV Components and Accessories

- 4.1 OFC Gasket
- 4.2 Viton Gasket
- 4.3 Plate Nuts
- 4.4 Viewports
- 4.5 Viewport Shutters
- 4.6 Multipin Electrical Feedthroughs
- 4.7 Connectors
- 4.8 Sample Holder
- 4.9 Cubic Chambers

# Section 4. Sample Transfer Devices

## Oxygen Free Copper Gasket

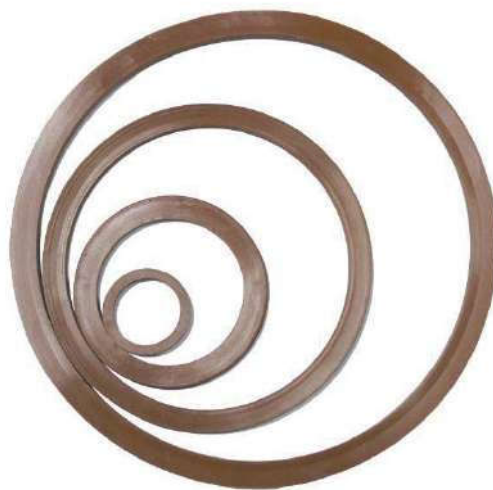
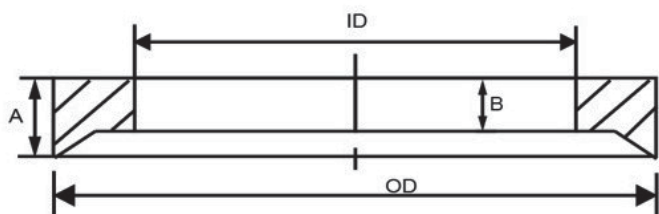


| Oxygen Free Copper Gasket |       |           |       |           |       |           |      |        |             |
|---------------------------|-------|-----------|-------|-----------|-------|-----------|------|--------|-------------|
| Flange OD                 |       | Gasket OD |       | Gasket ID |       | Thickness |      | Weight | Part Number |
| mm                        | inch  | mm        | inch  | mm        | inch  |           | inch | g      |             |
| 34                        | 1.33  | 21        | 0.83  | 16        | 0.63  | ZCUC19    | 0.08 | 2      | ZCUC19      |
| 70                        | 2.75  | 48        | 1.89  | 39        | 1.54  | ZCUC38    | 0.08 | 12     | ZCUC38      |
| 114                       | 4.50  | 82        | 3.23  | 63        | 2.48  | ZCUC64    | 0.08 | 40     | ZCUC64      |
| 152                       | 6.00  | 120       | 4.72  | 101       | 3.98  | ZCUC100   | 0.08 | 60     | ZCUC100     |
| 203                       | 8.00  | 171       | 6.73  | 152       | 5.98  | ZCUC150   | 0.08 | 89     | ZCUC150     |
| 250                       | 10.00 | 222       | 8.74  | 203       | 7.99  | ZCUC200   | 0.08 | 118    | ZCUC200     |
| 300                       | 12.00 | 272       | 10.71 | 255       | 10.04 | ZCUC250   | 0.08 | 153    | ZCUC250     |

These gaskets are designed for use in high and UHV applications where total performance is required. They are inspected, fully cleaned and then individually packed to ensure UHV compatibility. We also offered OFC gasket which is annealed, gold coated or silver coated to meet different requirement. Please call in for more information.

# Section 4. Sample Transfer Devices

## Viton Gasket



Viton Gasket

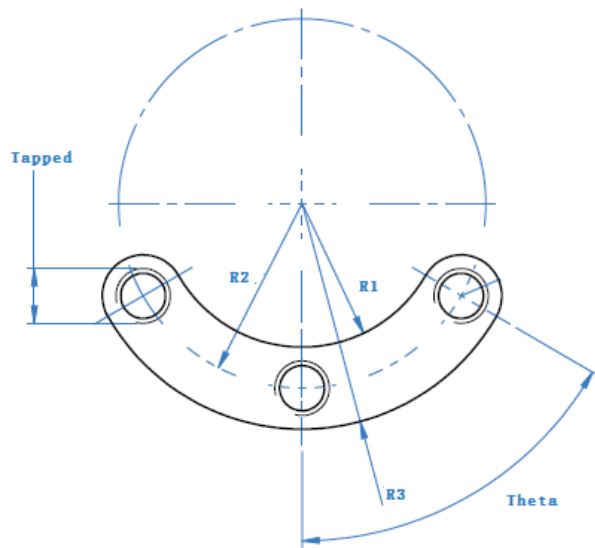
| Viton Gasket |       |           |       |           |       |             |      |             |      |        |             |
|--------------|-------|-----------|-------|-----------|-------|-------------|------|-------------|------|--------|-------------|
| Flange OD    |       | Gasket OD |       | Gasket ID |       | Thickness A |      | Thickness B |      | Weight | Part Number |
| mm           | inch  | mm        | inch  | mm        | inch  | mm          | inch | mm          | inch | g      |             |
| 34           | 1.33  | 21        | 0.83  | 16.5      | 0.65  | 3           | 0.12 | 2.2         | 0.09 | 0.69   | ZVIT19      |
| 70           | 2.75  | 48        | 1.89  | 36.4      | 1.43  | 3           | 0.12 | 2.2         | 0.09 | 3.71   | ZVIT38      |
| 114          | 4.50  | 82        | 3.23  | 70.7      | 2.78  | 3           | 0.12 | 2.2         | 0.09 | 6.48   | ZVIT64      |
| 152          | 6.00  | 121       | 4.72  | 108.8     | 4.28  | 3           | 0.12 | 2.2         | 0.09 | 11.00  | ZVIT100     |
| 203          | 8.00  | 171       | 6.73  | 159       | 6.26  | 3           | 0.12 | 2.2         | 0.09 | 16.32  | ZVIT150     |
| 250          | 10.00 | 220       | 8.66  | 209       | 8.23  | 3           | 0.12 | 2.2         | 0.09 | 21.64  | ZVIT200     |
| 300          | 12.00 | 272       | 10.71 | 255       | 10.04 | 3           | 0.12 | 2.2         | 0.09 | 28.06  | ZVIT250     |

These Viton gaskets are designed to be used with all common ConFlat flanges. They can also be easily held in place on one of the sealing flanges before engaging the seal, making them ideal for use in situations where the mounting flanges are placed vertically or out of reach. All Viton gaskets are fully inspected, cleaned, and packed ready for use.

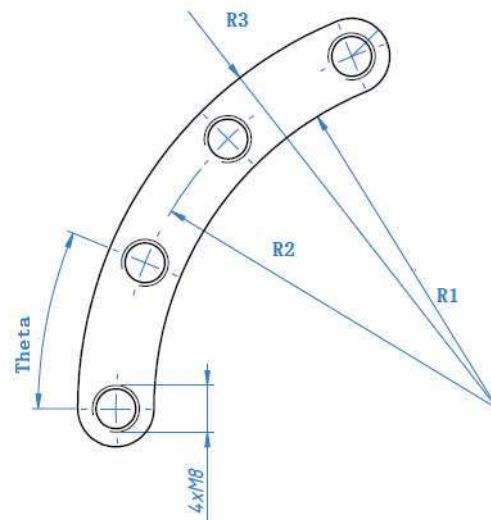
Suitable for use where high temperature (<150°C) is not necessary and base pressure above  $1 \times 10^{-9}$  mbar.

# Section 4. Sample Transfer Devices

## Nut Plate



Ref 1



Ref 2

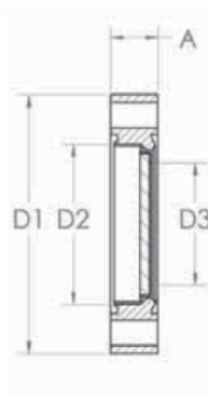
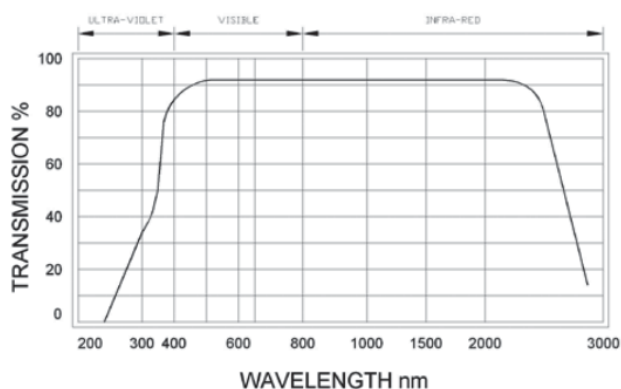
| Plate Nuts |       |       |     |       |       |       |           |           |        |             |
|------------|-------|-------|-----|-------|-------|-------|-----------|-----------|--------|-------------|
| Flange OD  |       | Screw | Ref | R1 mm | R2 mm | R3 mm | Theta (°) | Thickness | Weight | Part Number |
| mm         | inch  |       |     |       |       |       |           | mm        | g      |             |
| 34         | 1.33  | M4    | 1   | 11    | 14    | 17    | 60°       | 3.00      | 3      | ZNPS1       |
| 70         | 2.75  | M6    |     | 25    | 29    | 33    | 60°       | 5.00      | 18     | ZNPS2       |
| 114        | 4.50  | M8    | 2   | 39    | 46    | 53    | 45°       | 6.00      | 61     | ZNPS4       |
| 152        | 6.00  |       |     | 59    | 65    | 72    | 22.5°     | 6.00      | 43     | ZNPS6       |
| 203        | 8.00  |       |     | 84    | 91    | 97    | 18°       | 6.00      | 48     | ZNPS8       |
| 250        | 10.00 |       |     | 109   | 116   | 122   | 15°       | 6.00      | 51     | ZNPS10      |



Where access behind a flange is limited, or tapped flanges are required but not preferred, it is possible to use nut plate. Only one spanner is required from the top as the plates are self-locating behind the flange. Nut plate sets are available for 34 mm (1.33") to 250 mm (10") OD ConFlat flanges.

# Section 4. Sample Transfer Devices

## Kodial Zero Length Viewport

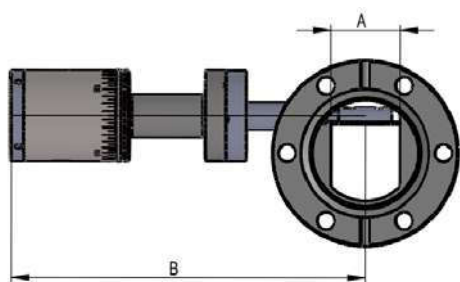


**Kodial Viewport**

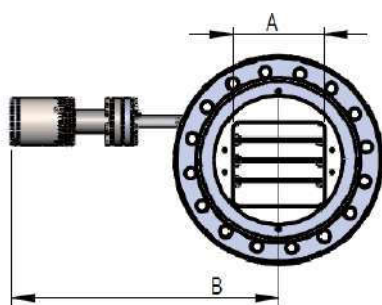
| Flange OD (D1) |      | A    |      | D3 (View Size) |      | Weight | Part Number |
|----------------|------|------|------|----------------|------|--------|-------------|
| mm             | inch | mm   | inch | mm             | inch | kg     |             |
| 34             | 1.33 | 12.7 | 0.50 | 16             | 0.63 | 0.12   | VPZ16LN     |
| 70             | 2.75 | 12.7 | 0.50 | 33             | 1.30 | 0.24   | VPZ38LN     |
| 114            | 4.50 | 17.4 | 0.69 | 63             | 2.48 | 0.82   | VPZ64LN     |
| 152            | 6.00 | 19.9 | 0.78 | 89             | 3.50 | 1.46   | VPZ100LN    |
| 203            | 8.00 | 22.3 | 0.88 | 136            | 5.35 | 2.43   | VPZ150LN    |

All our viewports are from ITL in UK whose original business was founded on expertise in the manufacture of glass to metal seals. Today, ITL manufactures glass encapsulated ionization gauge heads, viewports, glass and ceramic feedthroughs. The rare glass working expertise is available as a resource to our OEM customers. These standard viewports are UHV compatible and bakeable to 350 °C. Quartz, Magnesium Fluoride and special exotic material windows optimized for particular wavelength transmissions, plus anti-reflective coatings, can be quoted on request.

## Viewport Shutters



Swing Type



Venetian Blind Type



Viewport Shutters

| Flange OD |      | Shutter Type        | A  |      | B   |      | Weight | Part Number |
|-----------|------|---------------------|----|------|-----|------|--------|-------------|
| mm        | inch |                     | mm | inch | mm  | inch | kg     |             |
| 70        | 2.75 | Swing Type          | 26 | 1.02 | 134 | 5.24 | 0.8    | VPS2S       |
| 114       | 4.5  |                     | 45 | 1.77 | 156 | 6.14 | 1.3    | VPS4S       |
| 152       | 6    |                     | 68 | 2.68 | 195 | 7.68 | 2.3    | VPS6S       |
| 114       | 4.5  | Venetian Blind Type | 45 | 1.77 | 168 | 6.61 | 2.0    | VPS4V       |
| 152       | 6    |                     | 67 | 2.64 | 195 | 7.68 | 4.0    | VPS6V       |

Some operations inside a vacuum system can cause harm or damage to a viewport. Evaporation of metals in the UHV system can, for example, cause the viewport surface to become quickly coated, resulting in a mirror reflective surface. The viewport would then need to be removed and cleaned before it could be re-used. To overcome this problem we offer a range of viewport shutters. Both Swing Type and Venetian Blind Type Shutters are offered while Venetian Blind Type mostly on large viewports which have the advantage of being low profile when 'open'.

# Section 4. Sample Transfer Devices

## Multipin Electrical Feedthrough



| Multipin Electrical Feedthroughs |      |         |              |                |        |             |
|----------------------------------|------|---------|--------------|----------------|--------|-------------|
| Flange OD                        |      | Voltage | Amps Per Pin | Number of Pins | Weight | Part Number |
| mm                               | inch |         |              |                | g      |             |
| 34                               | 1.33 | 300 V   | 5 A          | 4              | 205    | F16-K-CF-04 |
| 34                               | 1.33 |         |              | 6              | 210    | F16-K-CF-06 |
| 34                               | 1.33 |         |              | 10             | 215    | F16-K-CF-10 |
| 70                               | 2.75 |         |              | 4              | 500    | F35-K-CF-04 |
| 70                               | 2.75 |         |              | 6              | 505    | F35-K-CF-06 |
| 70                               | 2.75 |         |              | 10             | 510    | F35-K-CF-10 |

Multipin Electrical Feedthroughs are commonly used for the transmission of electrical signals and/or low power applications. They are typically referred to as Instrumentation Feedthroughs, because of their use in instrumentation applications such as electron microscopy, surface analysis and semiconductor process controls.

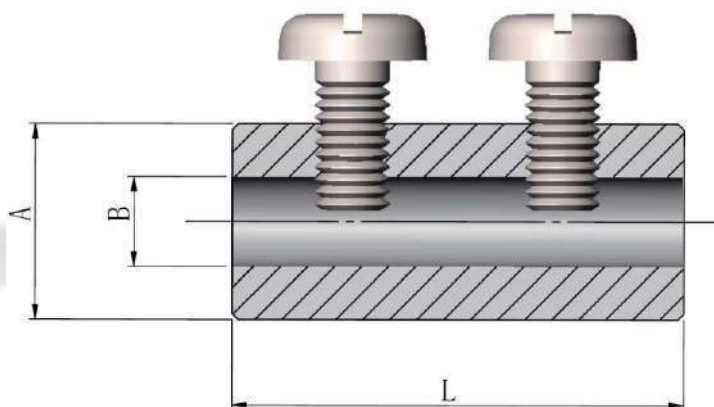
Our Multipin feedthroughs are fitted with industry standard threaded connectors, which meet MIL-C-5015 specifications. Accessories such as ceramic insulators, Kapton wires, and vacuum/air side connectors are available.

# Section 4. Sample Transfer Devices

## Connectors



BeCu



Ta

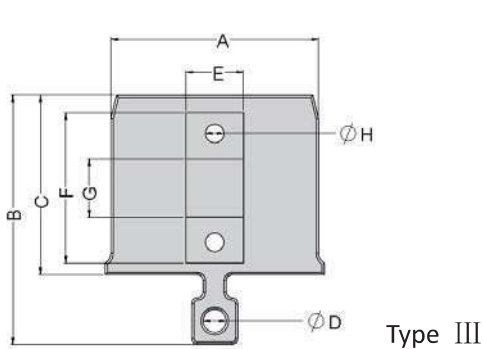
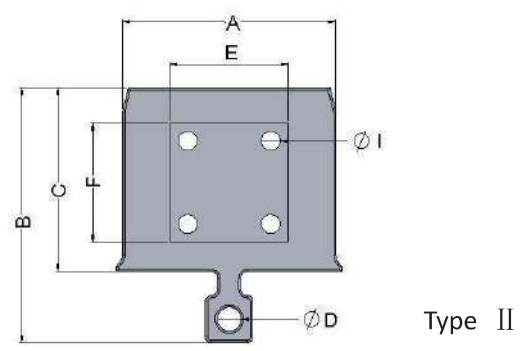
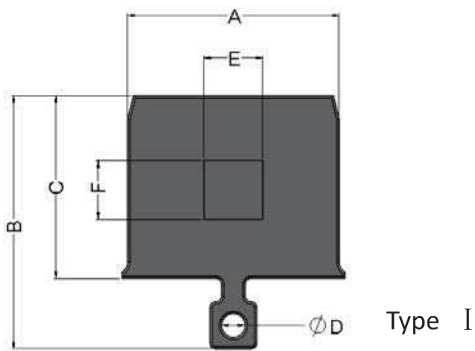
- Fully UHV Compatible Material
- Wide Temperature Range for application
- Minimum Order Unit: package (10 per pack)
- Gold Coating Optional
- Multiple sizes (can be customized)
- UHV Wire compatible Kapton wires are available

| Pin    |        |       |          |        |        |               |             |
|--------|--------|-------|----------|--------|--------|---------------|-------------|
| A (OD) | B (ID) | L     | Material | Gender | Weight | Threaded Hole | Part Number |
| mm     |        |       |          |        | g      |               |             |
| 6.50   | 3.20   | 15.00 | BeCu     | Female | 3      | M2            | FPIN1-Cu    |
| 5.00   | 2.00   | 12.00 |          |        | 2      | M2            | FPIN2-Cu    |
| 6.50   | 3.20   | 15.00 | Ta       | Female | 6      | M2            | FPIN1-Ta    |
| 5.00   | 2.00   | 12.00 |          |        | 3      | M2            | FPIN2-Ta    |



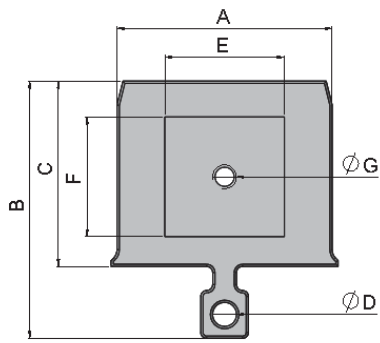
# Section 4. Sample Transfer Devices

## Sample Holder



| Thin Film Sample Holder |    |      |      |    |    |  |             |
|-------------------------|----|------|------|----|----|--|-------------|
| Type                    | A  | B    | C    | E  | F  | Material                               | Part Number |
|                         | mm |      |      |    |    |  |             |
| I                       | 18 | 21.5 | 15.5 | 3  | 3  | Ta, Mu, Inconel,<br>Oxygen-Free Copper | SH1001      |
| I                       |    |      |      | 3  | 5  |  | SH1002      |
| I                       |    |      |      | 3  | 7  |  | SH1003      |
| I                       |    |      |      | 3  | 10 |  | SH1004      |
| I                       |    |      |      | 0  | 0  |  | SH1005      |
| II                      |    |      |      | 10 | 10 |  | SH1011      |
| III                     |    |      |      | 5  | 13 |  | SH1021      |

# Section 4. Sample Transfer Devices



**Single Crystal Holder**

| A  | B    | C    | E  | F  | Material           | Weight (g) | Part Number |
|----|------|------|----|----|--------------------|------------|-------------|
| mm |      |      |    |    |                    |            |             |
| 18 | 21.5 | 15.5 | 10 | 10 | Ta                 | 4.30       | SH2001      |
|    |      |      |    |    | Mu                 | 4.08       | SH2002      |
|    |      |      |    |    | Inconel            | 3.18       | SH2003      |
|    |      |      |    |    | Oxygen-Free Copper | 3.63       | SH2004      |

# Section 4. Sample Transfer Devices

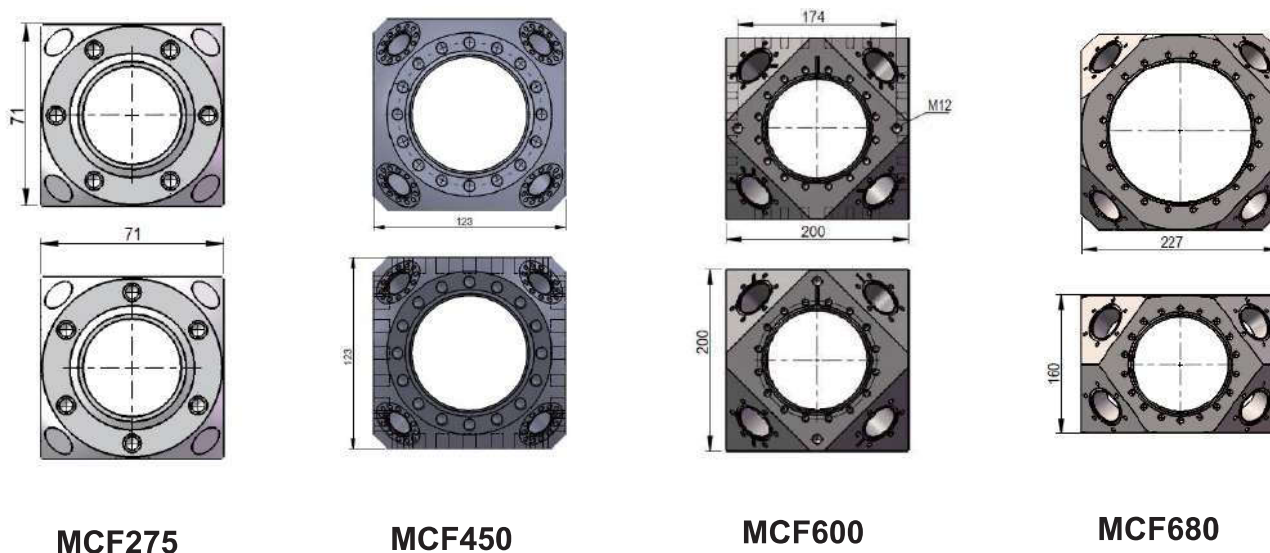
## Cubic Chambers

Fermi Instruments offers Cubic Chambers to where there are spatial/weight constraints or where a high density of experimental apparatus is required. With chamber manufactured from one piece of metal, cubic chambers improve UHV performance with highly polished surfaces, contoured interiors and minimal welds.

|                         | MCF275                       | MCF450 | MCF600 | MCF680 |
|-------------------------|------------------------------|--------|--------|--------|
| Material                | SS304,SS316,SS316L, Ti Alloy |        |        |        |
| Ultimate Vacuum         | 1x 10 <sup>-13</sup> mbar    |        |        |        |
| Max Bakeout Temperature | 250 °C                       |        |        |        |
| 34mm (1.33") CF Flange  |                              | *8     |        |        |
| 70mm (2.75") CF Flange  | *6                           |        | *8     | *8     |
| 114mm (4.50") CF Flange |                              | *6     |        |        |
| 150mm (6.00") CF Flange |                              |        | *6     | *4     |
| 200mm (8.00") CF Flange |                              |        |        | *2     |

\*Standard Chambers are all with metric tapped flanges;

\*\*Different Size and Material Cubic Chambers are on request, please call for more information;



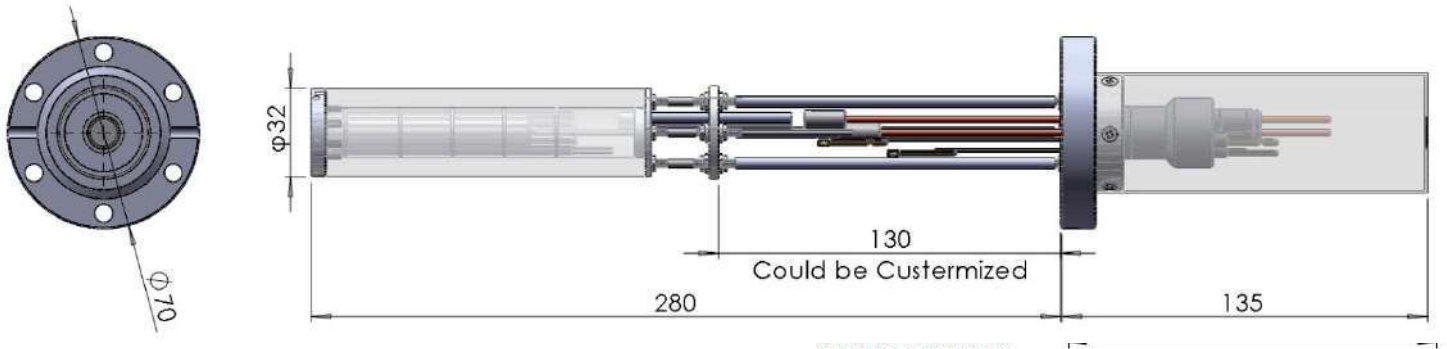


## Section 5. Evaporators

- 5.1 Standard Effusion Cell
- 5.2 Cold Lip Effusion Cell
- 5.3 Near Ambient Effusion Cell
- 5.4 High Temperature Effusion Cell
- 5.5 High Capacity Effusion Cell
- 5.6 E-Beam Evaporators
- 5.7 Gas Cracker (Hydrogen/Oxygen)
- 5.8 Compact Evaporator
- 5.9 Alkaline Metal Evaporator
- 5.10 Accessories

# Section 5. Evaporators

## Standard Effusion Cell



All dimensions in mm

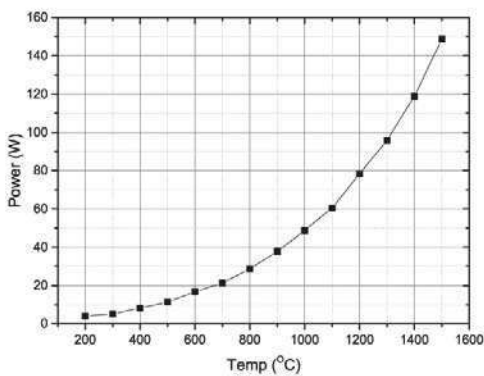
| Mounting Flange         | Crucible Size (cc) | Working Temperature (°C) | Degas Temperature (°C) | Thermocouple | Stability (°C) | Part Number |
|-------------------------|--------------------|--------------------------|------------------------|--------------|----------------|-------------|
| NW38CF<br>( 2.75 inch ) | 10                 | 100~1100                 | 1200                   | K            | 0.1            | EC2LT       |
|                         |                    | 300~1400                 | 1500                   | C            | 0.1            | EC2MT       |

\*Test with Heat Pro-II PID Power Supply

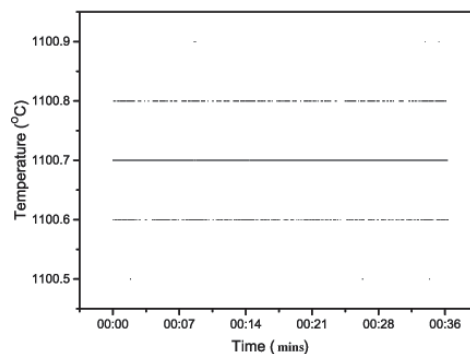
The Standard Effusion Cell is designed for evaporation or sublimation of a variety of elements and compounds in the temperature range from 100°C up to 1500°C.

The heating element is constructed from alloy filament supported by PBN ring which provides for excellent temperature uniformity within the crucible, high heating efficiency even at the crucible lip, and easy replacement of different crucibles.

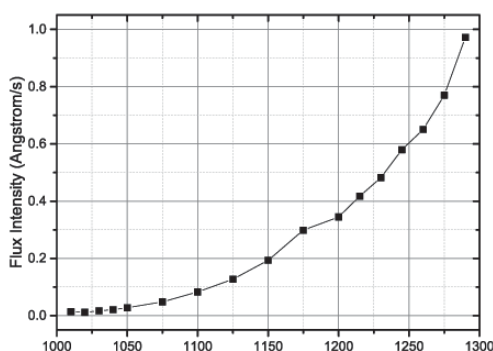
All evaporators are tested and degassed before shipment with factory test report.



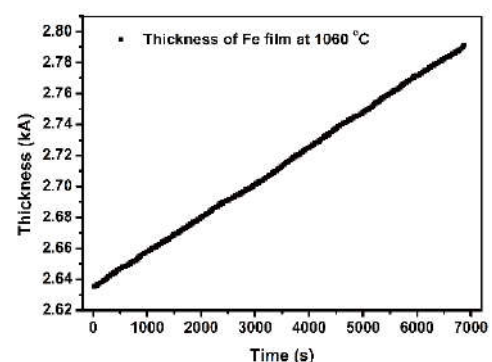
Power Test



Temperature Stability



Flux Test (MgF<sub>2</sub>)



Flux Stability Test