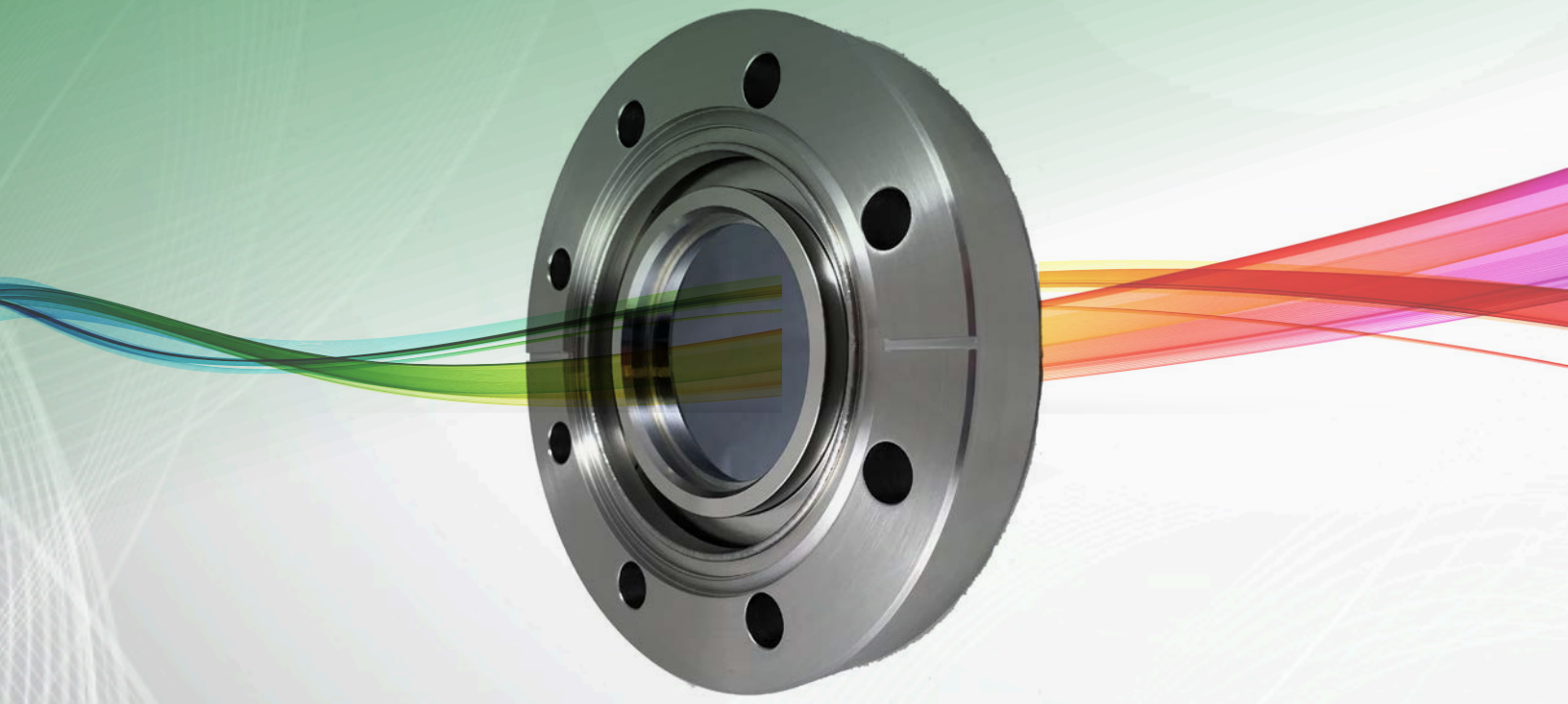
MPF

Manufacturing Precision Feedthrough Products, Inc.



Expertly Engineered Ceramic To Metal Technology for over 20 years

About MPF Products, Inc.

The Company

MPF Products, Inc. specializes in designing and manufacturing products utilizing ceramic-to-metal sealing technology. We offer a full range of electrical feedthroughs, connectors, isolators and viewports all rated for ultra-high vacuum (UHV). We are your source for Knowledge, Inventory, and Service in Hermetic, Electrical, and Optical components. Our privately held 14,000 ft^2 manufacturing facility is located in South Carolina.

Technology

MPF Products has developed and employed several different sealing strategies in creating a hermetic seal between conductive metal components and dielectrics. All three strategies can be used from -269C to 450C depending on selection of materials.

Active Metal Sealing

The active metal process takes a ceramic and a thin walled transition material and creates a hermetic seal through the application of a proprietary getter material applied to the surface of the ceramic, along with an active braze material. A hermetic bond is created during the high temperature furnace operation.

Thick/Thin Film Metalization

During this process, a proprietary mixture of Molybdenum Manganese (MnMo) formula is applied and sintered on the alumina ceramics. Subsequent application of a nickel coating applied to the (MnMo) while introducing a complimentary braze alloy – creates a hermetic seal while being fired in a vacuum furnace.

Glass Ceramic

This sealing method is employed using an amorphous glass material that transitions between two metal surfaces. During the heat treat phase, the material becomes crystalized thus forming a UHV high pressure bond between the materials.

Mechanical Seals

MPF has created the ability to form a hermetic seal using propriety gasket material for our compressive seal designs that can be used in UHV at 200C temperature ranges. This seal would be a considered a “soft seal” in comparison to the “hard seal” molecular bond that occurs between the Active, (MnMo), and Glass Ceramic seal geometries.

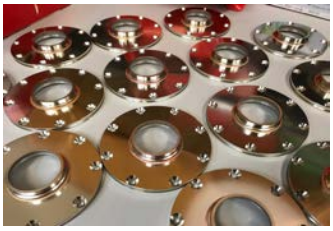
We understand and service the technical demands of our Fortune 500 customers in Aerospace, Communications, Defense, Electronics, Energy, Industrials, Life Science, Medical, Nanotechnology, Nuclear. Photonics, and Semiconductor industries. We design and manufacture products for:

Original Equipment Manufacturers	
Raytheon	Horiba
LAM	Applied Materials
3M	General Electric
Honeywell	Agilent Technologies
Veeco	Lockheed Martin
KLA Tencor	Ametek

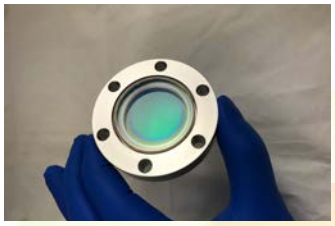
National Labs (US & International)	
Argonne	Jet Propulsion
CERN	Brookhaven
Sandia	NASA
Fermi	ITER
INFN	Canadian Light Source
TRIUMF	NIST

VIEWPORTS

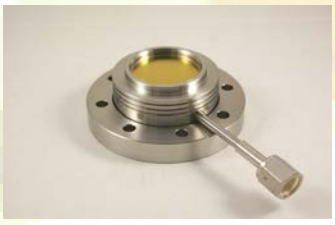
All Of Our Designs Can Employ Several Different Grades Of Stainless Steel Materials As Well As Titanium For Truly Non-Magnetic Applications.



Standard: Sapphire & Fused Silica viewports including UV, DUV, and EUV LASER grade optics.



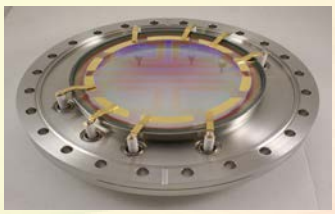
Laser Applications: We can employ our various window materials with various AR Coatings to be used in ND-YAG, ArF, KrF, XeCl, Diode, F2, and Helium Neon laser applications.



Differentially Pumped: Designed for extreme high vacuum applications where you need an access port to the window cavity pump-out.

Over Pressure: Created to handle the event of an unintentional or inadvertent pressure burst damage. Tested to withstand such pressure and can avoid catastrophic rupture in critical UHV applications.

Extended Range: These ultra-high vacuum (UHV) viewports employ window materials such as Zinc Selenide, Germanium, Magnesium Fluoride, Crystal Quartz and Calcium Fluoride.



Specialty Designs: MPF has the ability to create specialty designs with AR Coatings, different lens thickness, wedged & angled versions, with wide ranging view diameters.

Re-Entrant & Ex-Entrant: Positioning your viewport more accurately when coupling complex lens assemblies are needed.

ASK AN ENGINEER 864.876.9853

Standard Catalog Items

Visit us online at www.MPFPI.com and browse through our 1,300+ parts catalog or use the search feature to find the ceramic to metal electrical feedthroughs, connectors, isolators and viewports for your unique applications and systems.

Connectors Mil-C-5015 & Mil-C-26482

Connectors Sub-D Mil-DTL-24308 & Micro-D Mil-DTL-83513

RF Power to 13.56MHZ up to 35 KW

High Voltage and High Current Feedthroughs

Base Plate feedthroughs

Thermocouple: K, C, E, J, T, N, R, S

Coaxial: SMA, BNC, MHV, SHV, Type N Microdot, SMB, True Triax, HN 7/16, N to SMA, BSHV, BNC to Microdot

Breaks: 5 to 60 KV Non Magnetic, Weld or Braze

Specialty Designs

We are the technological leader in designing and manufacturing ceramic-to-metal hermetic electrical feedthroughs, optical viewports and related components. In addition to our standard products for UHV feedthroughs, MPF offers extensive engineering capabilities for producing custom ceramic-to-metal assemblies. Our technical experts offer responsive assistance to provide input for the design and accurate quotations of your requirements. MPF's products are manufactured by highly trained technicians utilizing the best manufacturing practices in the industry.

Our Custom Design and Manufacturing Process is performed by experienced engineers, scientists and technicians. We begin by discussing your application requirements, the design features you need, major performance criteria and any other necessary information that allows us to offer valuable recommendations. MPF has a project manager involved for all parts of the design and manufacturing process to make sure your project stays on track, and is completed quickly and efficiently.

LEReC CAD Beam Position Monitor with 30mm button antenna.

4kW RF Power Coupler.

Coaxial feedthrough for transmission/detection.
Based on MPF standard SMA for reduced costs.
Precise tolerances for button antenna.

20kpsi Pressure Window, Saphire, UHV and Pressure.

Broadband transmission of RF signals into cryogenic UHV Cavity.
50 Ohm Impedance Matched.
Copper-alloy components sealed to alumina ceramic.
UHV metal-sealed flange mount.
Integrated liquid cooling.

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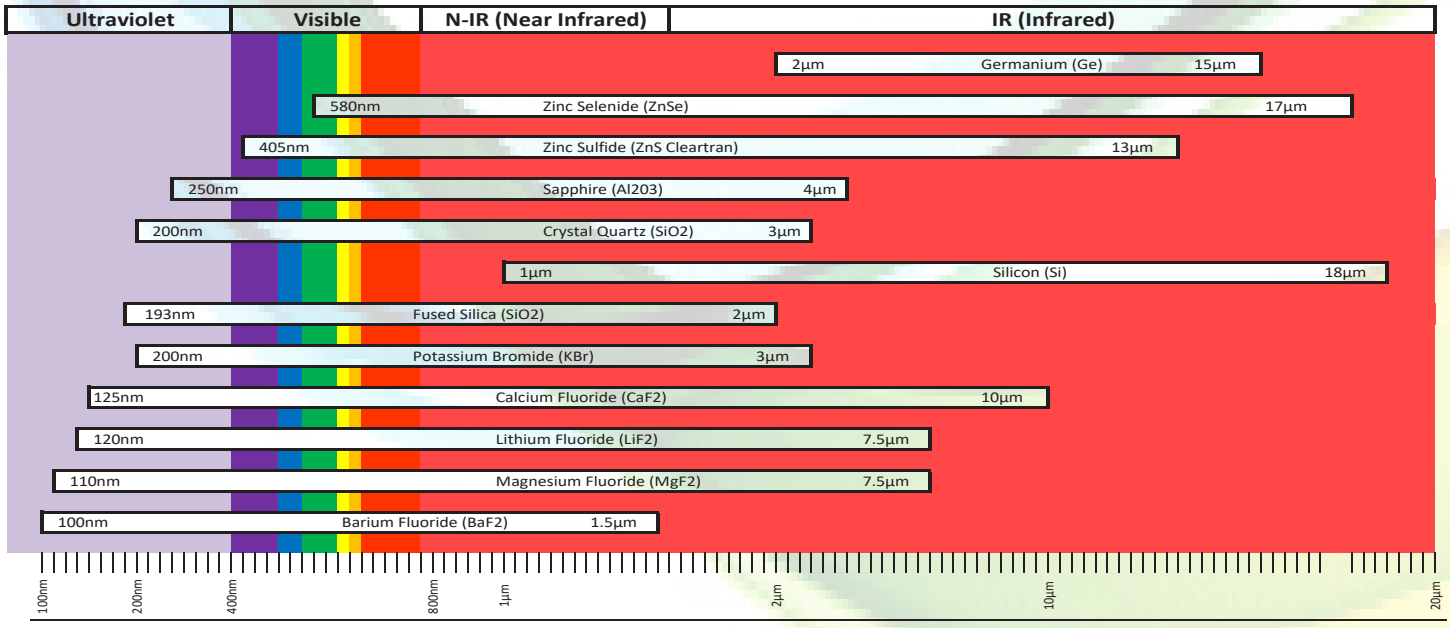
Technical Resource

MPF Coaxial Connectors Designs

	Volts	Amps	Weld OD
Microdot	500	2	.308"
SMB	375	0.5	.187"
SMA	700	1	.495"
BNC	500	3	.495"
Type N	500	3	.622"
BNC to Microdot	500	2	.528"
N to SMA	500	1	.497'
Triax	500	1	.620"
MHV	5,000	3	.495"
SHV 5	5,000	5	.495"
BSHV	7,500	3	.495"
SHV 10	10,000	5	.497"
SHV 20	20,000	15	.620"

Capabilities Include:

- Partial Pressure Vacuum Ovens
- Vacuum Brazing & TIG Welding
- Machining & Turning Centers
- High Pot Test to 40KV
- Helium Leak Testing to $1x10^{-9}$ std./cc He
- Pressure Test to 30,000 PSI
- Over 2000 Catalog Items
- Engineering Software: SOLID WORKS
- Company began operations in 1994
- Over 14,000 ft^2 Manufacturing Facility located in SC; privately held
- Customer Base: Fortune 500 Companies; World renowned research facilities



Technical Resource

Thermocouple Reference Table

Type	Thermocouple Material	Polarity	Operating Temperature Range
K	Chromel	+	-184 to 1260°C
	Alumel	-	
C	Tungsten 5% Rhenium	+	0 to 2760°C
	Tungsen 26% Rhenium	-	
E	Chromel	+	-184 to 900°C
	Constantan	-	
J	Iron	+	0 to 750°C
	Constantan	-	
T	Copper	+	-184 to 400°C
	Constantan	-	
N	NiCrSi	+	-270 to 1300°C
	NiSiMg	-	
R	Platinum 13% Rhodium	+	0 to 1540°C
	Platinum	-	
S	Pllatinum 10% Rhodium	+	0 to 1540°C
	Platinum	-	

Dielectric Materials & Metals:

Insulating Materials

- Alumina (Al_2O_3)
- Sapphire (Al_2O_3)
- Fused Silica (amorphous SiO_2)
- Zirconia Toughened Alumina ($ZrO2$-Al_2O_3)
- Zinc Selenide
- Zinc Sulfide
- Cleartran
- Calcium Fluoride
- Magnesium Fluoride
- Crystal Quartz

Conductive Materials

- Titanium
- 304, 304L, 316, 316L, 316LN
- Copper OFHC (CDA 101)
- Molybdenum
- Nickel 200
- CuNi (70/30)
- NiFe (52%), NiFe (42%)
- Kovar, Inconel
- Platinum, Paladium, Gold, Silver
- Chromel, Constantan
- Niobium

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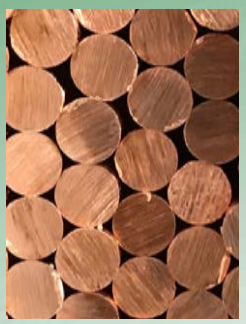
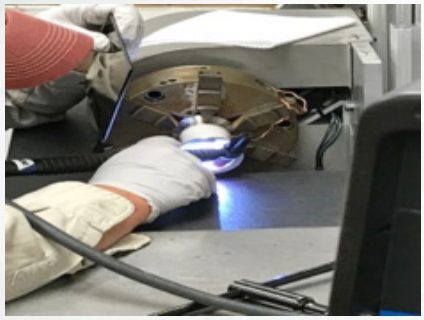
Manufacturing Precision Feedthrough Products, Inc.

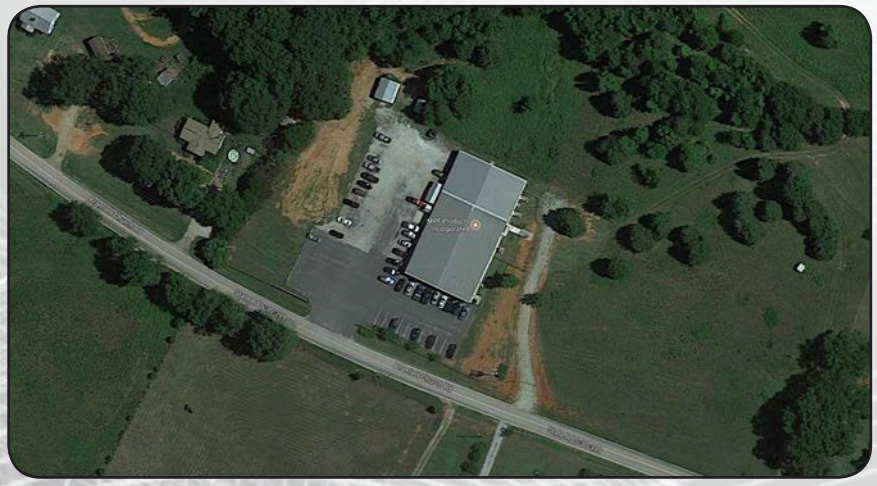
MPF streamlines the custom design and manufacturing process so you get the part you need, when you need it.









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