

"We can make that!"

*Expertly Engineered
Ceramic To Metal
Technology
for over 25 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 21,000 ft² 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 a proprietary gasket material for our compressive seal designs that can be used in UHV at 200C temperature ranges. This seal would be 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	General Electric
LAM	Agilent
3M	Lockheed Martin
Honeywell	Ametek
Veeco	ASML
KLA Tencor	
Horiba	
Applied Materials	

National Labs (US & International)

Europe:

CERN
DESY
Diamond Light Source
ITER
INFN

United States:

Sandia
Brookhaven
Argonne
Pacific Northwest
Idaho National
Fermi
Jet Propulsion Lab
NIST
NASA

Canada:

TRIUMF
Canadial Light Source

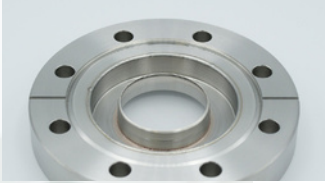
Asia:

Taiwan Light Source
Pohang Light Source II
Singapore Synchrotron
Australian Synchrotron



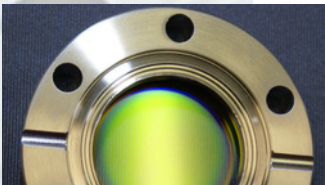
VIEWPORTS

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



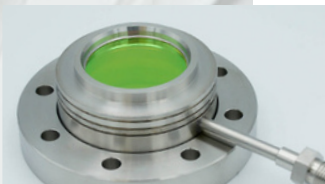
Standard

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



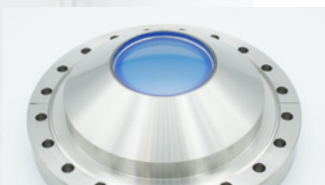
Laser Applications

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.



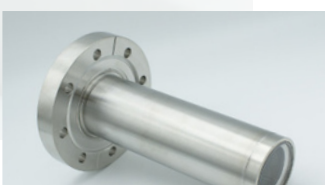
Extended Range

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

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

STANDARD CATALOG ITEMS



Visit us online at www.MPFPI.com and browse through our 2,200+ 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



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



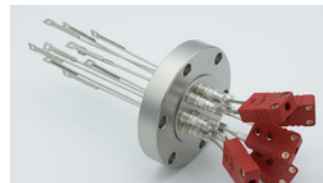
RF Power to 13.56MHZ up to 35 KW



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



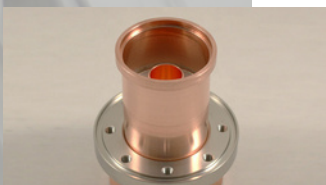
SPECIALTY DESIGNS

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



20Kpsi Pressure Window, Sapphire, UHV and Pressure.



Coaxial feedthrough for transmission/detection. Based on MPF standard SMA for reduced costs. Precise tolerances for Beam Position Monitor Feedthroughs.



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.

Visit
MPFPI.com
for More
Custom
Examples!



SCAN WITH YOUR PHONE

TECHNICAL RESOURCE



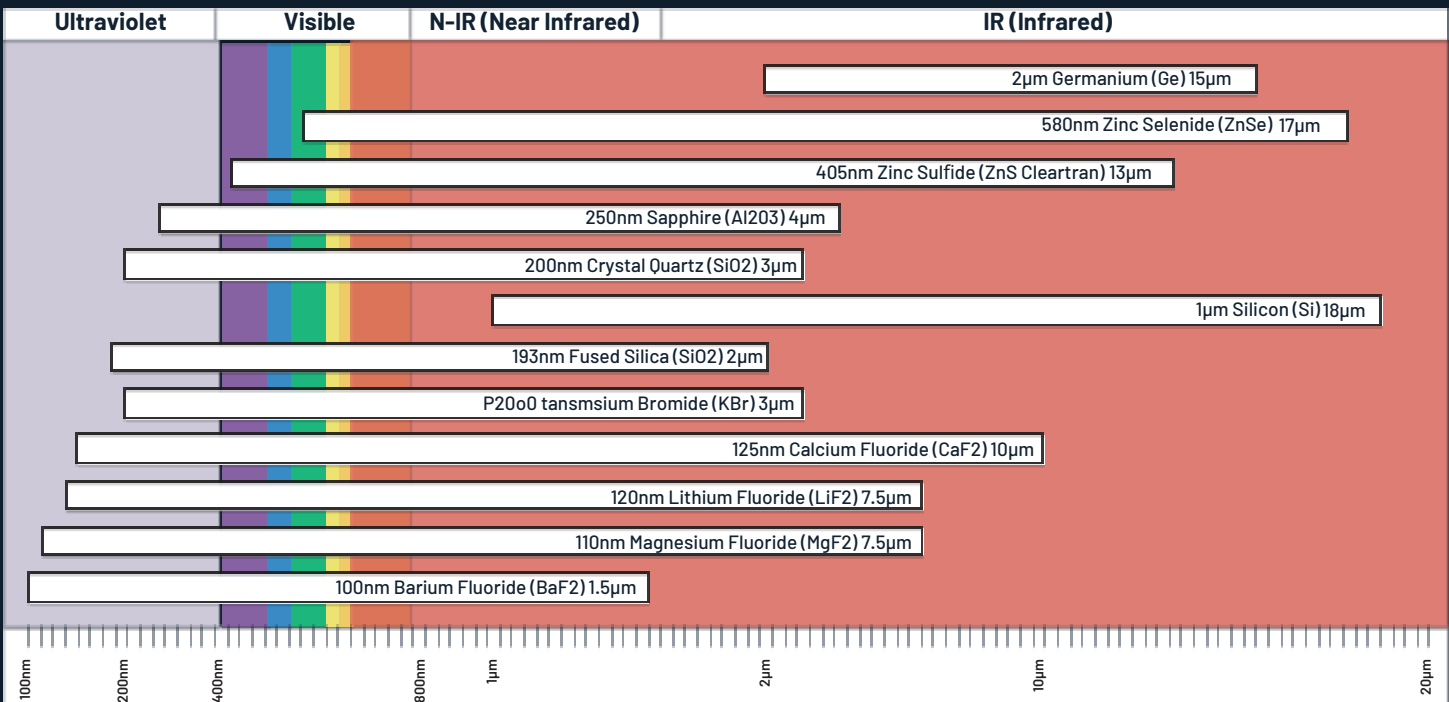
MPF Coaxial Connectors Designs

	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
- Cryogenic Testing to -196C
- Micro Amp Leakage Current Testing
- Helium Leak Testing to 1x10⁻⁹ Atm cc/sec (He)
- Pressure Test to 30,000 PSI
- Over 2,000 Standard Catalog Items
- Engineering Software: SOLID WORKS
- Company began operations in 1994
- Over 14,000 ft Manufacturing Facility located in SC; privately held Customer Base: Fortune 500
- Companies; World renowned research facilities

Window Material Transmission Chart



TECHNICAL RESOURCE

MPF Thermocouple Type Designs

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

Dielectric Materials & Metals

Insulating Materials

Alumina (Al₂O₃)
Sapphire (Al₂O₃)
Fused Silica (amorphous SiO₂)
Zirconia Toughened Alumina
(ZrO₂-Al₂O₃)
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, Palladium, Gold, Silver
Chromel, Constantan
Niobium



"We can make that!"

- 21,000 sq ft Campus (with room to grow)
- Brazing, Welding, Assembly, Manufacturing, & more
- Leak testing, HV testing, Cryogenic Testing, & more



"Engineering Light"

- 40,000 sq ft Campus (with room to grow)
- Newly invested, Class 5 ISO Clean Room
- AR Coatings, Fabricated Optics, Performance Interferometry, Optics Measurements, & more



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MPFPI.com

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MPF & BRO are owned by the private equity firm Fulham & Co