

CUSTOM POROUS CERAMICS FOR SPACEFLIGHT ENVIRONMENTS



DESIGNED FOR EXTREME TEMPERATURES. PROVEN IN EXTREME ENVIRONMENTS.

Mott's novel, patented porous ceramic flow components are engineered specifically for the demands of space. Each component is custom-made with tunable porosity, extremely low part-to-part variability, and high-purity ceramic formulations to deliver reliable thermal performance, stable fluid flow, and consistent behavior across extreme temperature ranges.

Our advanced manufacturing capabilities - including precision 3D-printed ceramics - enable complex geometries, tight tolerances, and repeatable production. If your mission requires a specialized ceramic material or a unique structural configuration, our engineering team can help turn your concept into flight-ready hardware.

KEY BENEFITS

- » Tailored pore size, permeability, and geometry
- » Microgravity-friendly phase separation
- » High-temperature electronics cooling
- » Cryogenic and high-heat fluid management
- » Superior cleanliness with high-purity materials

DIMENSIONS

Mott leverages both conventional and 3D printing methods to satisfy customer requirements on part geometry and dimensions

Part Size Ranges

- » Diameter: 0.5mm-55mm
- » Length: 0.5mm-100mm

Achievable Tolerances

- » Diameter: +/- .05mm
- » Length: +/- .05mm
- » Chamfers: +/- .127mm
- » Radii: +/- .127mm

SPECIFICATIONS

Dielectric Strength Ranges	0.5 - 2.0 kV/mm
Material Purity	Up to 99.999% (5N) Available
Porosity Ranges	10% - 65%
Flow Range	0.5 SCCM - 40 SLPM
Flux Range	0.010 - 500 SLPM/cm ²
Cleanliness & Particle Shedding	Testing Available



3D-Printing Parameter Matrix Build Designs



Conventional & 3D Printed Designs

Porous alumina provides high-temperature stability, oxidation resistance, and tunable permeability, making it ideal for lightweight thermal barriers, filtration elements, and dielectric structures that require controlled gas flow. Its combination of mechanical robustness and electrical insulation allows it to function reliably in harsh aerospace environments while reducing mass.

Porous aluminum nitride offers high intrinsic thermal conductivity even at reduced density, enabling lightweight heat-spreading and thermal-management components for avionics and satellite electronics. Its silicon-matched CTE and low dielectric loss make it well suited for high-power electronic assemblies where thermal efficiency, dimensional stability, and electrical insulation are critical.

Contact us if you have a need for porous ceramic components for your spacecraft, such as electronics, cooling, fluid management, thermal protection, or electrical insulation.