Additive Manufacturing Overview
Lack of density gradients in 3DP parts can provide more uniform flow throughout the surface of a part.

Consistent pore size distribution with 3DP parts.

Ability to print geometries that are not practical with conventional pressing or have prohibitively expensive tooling.

Print solid and porous media in one part (avoiding secondary operations such as welding, sinter-bonding, press-fitting).

Print multiple porosities in one part (i.e., 60 micron pre-filter + 2 micron diffuser).

Avoids secondary operations such as assembly, welding, press-fitting, and sinter-bonding.
BUILD FEATURES & TOLERANCES - METAL

**Build volume:** 9.7” x 9.7” x 11.0” (L x W x H)

**Build materials:** 316L Stainless Steel, Titanium, other alloys consult engineering

**Solid feature size resolution:** +/- 0.01”

**Porous feature size resolution:** +/- 0.02”

**Porosity range:** 1 to 100+ micron pore size (for custom porosity consult engineering)

**Part-part dimensional consistency:** +/- 0.001-0.002”

**Density consistency:** +/- 0.07-0.1 g/cc

**Solid printed surface finish:** 350 Ra µin

**Machined surface finish:** 5 to 32 Ra µin (same as typical hardware)
FLOW-DP PERFORMANCE

When density gradients mess up your product specs, think 3DP!

Conventional

Solid-Porous
3DP

Higher flow for 3DP media is likely the result of the lack of density gradients
Example unique designs made capable by additive manufacturing.

Example integrated filter hardware & complex porous shapes (ie spheres)

Complex solid-porous filtration structures

Example multi-dense porous used for thermal management application

Complete fully 3D printed products with unique internal fluidics for new applications (ie Integrated Valves, Mixing and Flow Reaction)
BUILD FEATURES & TOLERANCES - POLYMER

Build volume:
- Prototypes: 15.7” W x 11.8” D x 11.8” H (400mm x 300mm x 300mm)
- Production: 18.0” W x 18.0” D x 32.0” H (457mm x 457mm x 813mm)

Build materials: PEEK, PEKK, PEI, Nylon, ABS, Polyethylene, and more

Porosity range: 100 microns and larger; for custom porosity integration, consult engineering

Pore shape:
- Lattice: Rectangular, Hexagonal, Triangular
- Random: Under Development

Solid feature size resolution and dimensional consistency*:
- As Printed: +/- 0.010”
- Machined: +/- 0.002”

Part density: Up to 100% depending on polymer

Surface finish:
- As printed: 200 to 600 Ra μin
- Machined: 5 to 32 Ra μin

* Dimensions and tolerances are subject to the polymer chosen and overall part dimensions. Values presented are typical for small parts, <1” (25mm) cross section printed in PEEK with a medium resolution extrusion nozzle.
EARLY STAGE DEVELOPMENTS: POLYMERS AND CERAMICS

PEEK Static Mixer, Tooling, Filter

Alumina Flow Control Components
ABOUT US
WHO WE ARE: THE GOLD STANDARD FOR HIGH PERFORMANCE FILTRATION AND FLOW CONTROL APPLICATIONS

**60 year track record** of making products used by the most demanding customers such as NASA, Samsung, and Medtronic

**Largest installed base** of porous metal filters/fluid controls in the world across every major industry ranging from the Mars rover to implantable medical devices

**Most extensive metal alloy selection** for the toughest operating conditions such as temps from $-437^\circ F$ to $3336^\circ F$

**Customer Innovation Center (CIC)** becoming a hub for industry leader collaboration, with the latest lab equipment and new technologies like additive porous manufacturing and materials development.

*Manufacturing and CIC based in Farmington, CT.*
CAPABILITY SPANS BREADTH OF APPLICATIONS

- Large Scale Process Systems
- Point of Use Equipment
- Integrated Components
WIDE RANGE OF APPLICATION EXPERTISE

GAS & LIQUID FILTRATION
FLOW CONTROL
MIXING
DIFFUSION
HEAT EXCHANGE
WICKING & PHASE SEPARATION
FLUIDIZING
FLAME ARRESTING
SPARGING
STRUCTURAL
CONTROLLED RELEASE
SOUND DAMPENING
COLLABORATION MODEL

ANALYSIS
Mott's state-of-the-art lab performs test and analysis data
Report and explain results

PRODUCTION
Mott's prototype goes to HVM
Highest quality, best in class delivery (>99% OTOC)

OPTIMIZATION
Mott's innovative testing
Continuous improvement

PROTOTYPE
"Bird in the hand..."
Prototypes ready in days

DESIGN
Mott Consultation
Material, porosity, shape, flow rate, etc.

IDEA
Mott Application and Design Engineer Support
Optimize your idea