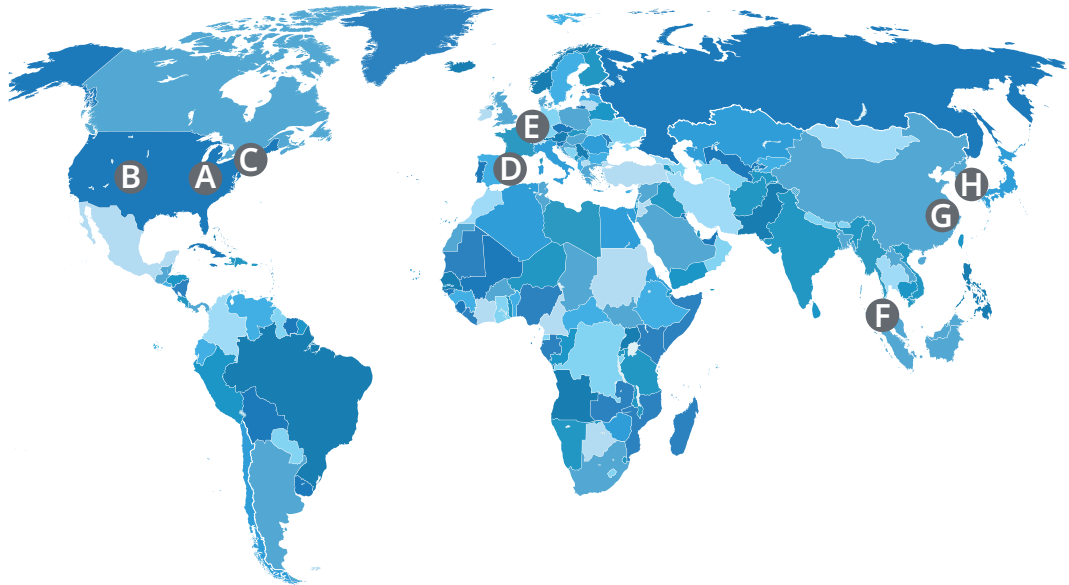


Lubrizol TPU Manufacturing Locations

- A. Cleveland, OH, USA**
 - 3DP Material Development
- B. Avid Product Development, CO, USA**
 - 3DP Design & Application Development
- C. Wilmington, MA, USA**
- D. Barcelona, Spain**
 - 3DP Material Development
- E. Oevel, Belgium**
- F. Seremban, Malaysia**
- G. Song Jiang & Shanghai, China**
 - 3DP Support APAC
- H. Bucheon, South Korea**



To learn how Lubrizol 3D Printing Solutions can meet your business needs, visit: go.lubrizol.com/3DPrinting



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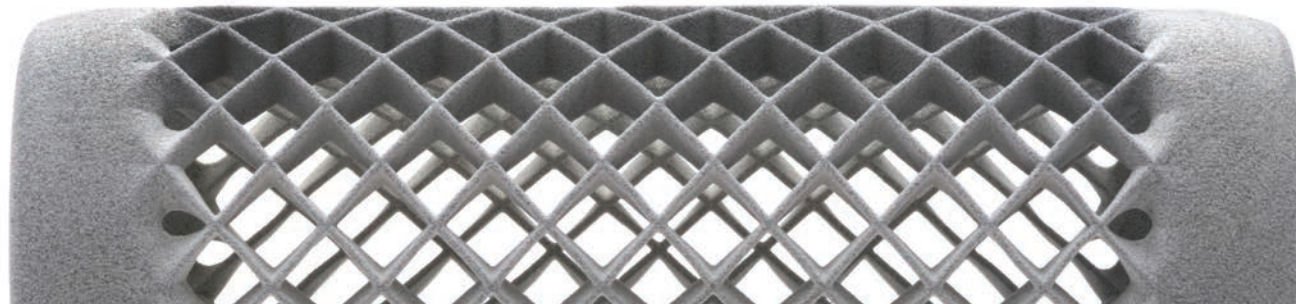
A New Dimension of Innovation



Lubrizol 3D Printing Solutions combines **comprehensive chemistry expertise, product and application testing and additive manufacturing capabilities** to transform our customers' visions into new innovations.



Since acquiring Avid Product Development in 2020, we have **expanded our expertise** and **combined capabilities** between both companies to deliver truly differentiated solutions that accelerate the growth of industries adopting 3D printing.



3D Printing Solutions

We are committed to being the partner that helps our customers solve 3D printing challenges. As an end-to-end solutions provider, our expertise includes, but is not limited to:

- Polymer Material Development and Application Testing
- Design for Additive Manufacturing (DfAM)
- Prototyping
- Bridge Manufacturing
- On-Demand Production
- Post-Processing

Unlock The Benefits of 3D Printing

From prototyping to mass production, Lubrizol 3D Printing Solutions is equipped to be the collaborative partner your business needs. Featuring an extensive portfolio of materials for 3D printing, including our portfolio of ESTANE® 3D TPU which can be used in powder bed fusion or fused filament fabrication 3D technologies.



DfAM

The freedom to create innovative products and parts provides the ability to create complex parts with intricate geometries. ESTANE® 3D TPUs in lattice structures can reduce the weight of the part without compromising structural integrity and allows for precise control of stiffness within specific regions.

Bridge Manufacturing

Bridging the gap between prototype and mass production, bridge manufacturing allows companies of any size to complete market testing and short-run production in a fast, cost-effective way. Services include rapid design iteration and production agility.

Post-Processing

Our full suite of post-processing services will transform your 3D printed parts made with ESTANE 3D M88A and M95A TPU into fully finished end-use products, from beautiful aesthetics to enhanced mechanical properties. And we also provide custom finishes, including surface smoothing and coloring, as well as full assembly support.

Lubrizol 3D Printing Solutions for Powder Bed Fusion

ESTANE® 3D TPU M88A and ESTANE® 3D TPU M95A are specially formulated for additive manufacturing and HP's Jet Fusion 5200 and 4200 series 3D printing solutions, respectively, thus offering a broad range of production possibilities that require elasticity, increased elongation at break, abrasion resistance, compression and skin contact approval. These benefits make it a valuable material in industries from [automotive](#) and [footwear](#) to [consumer goods](#).

Lubrizol ESTANE® 3D TPU Solutions for Powder Bed Fusion Applications:

Product Name

Shore Hardness

ESTANE® 3D TPU M88A-565 OR UV PW

Unique flexible and durable material for the use on HP's Jet Fusion 5200 series, with easy unpacking at room temperature, ability to dye parts for bright colors and skin contact certification. Ideal solution for complex lattice design.

88A

ESTANE 3D TPU M95A-545 OR UV PW

Unique flexible and durable material for the use on HP's Jet Fusion 4200 series. Powder TPU offering a PA12-like process, wide range of working temperatures, excellent chemical, hydrolysis and abrasion resistance.

95A



Lubrizol ESTANE® 3D TPU Solutions for Fused Filament Fabrication

Lubrizol 3D Printing Solutions offers an expansive portfolio of ESTANE® 3D thermoplastic polyurethane (TPU) for use in fused filament fabrication (FFF) 3D printers. Engineered to meet high-performance demands, our TPU can be used across a variety of applications, including everything from [footwear](#) to [industrial](#) and [healthcare](#) products.

Lubrizol solutions range from 72 shore A to 75 Shore D hardness for FFF and FGF. ESTANE 3D TPU F98A-030CR HC PL (with 98 shore A hardness) stands out due to its excellent mechanical properties, transparency, low warpage and shrinkage.



colorFabb's VarioShore™ TPU

ColorFabb's varioShoreTPU has a few main distinctive features: its variable shore hardness, reduced weight and density and soft touch. VarioShore TPU allows users to vary the density of the material by adjusting print temperature and material throughput. At temperatures between 200 and 250°C, the materials will start to expand to roughly 1.4 to 1.6 times its original volume, which reduces the density to 0.7 to 0.9 g/cm³. This means the material can be printed at low flow rates (60-70%) to compensate the active foaming, which in return gives very soft printed parts. VarioShore TPU is a 3D printing filament ideally suited for printing orthotics and prosthetics, among other 3D printed parts.

Post Processing

Post-processing is a key element in Additive Manufacturing offering a turnkey solution for both prototyping and mass production applications. Final printed parts will go through different physical and chemical processes (cleaning, surface smoothing and coloring) providing ready-to-market 3D printed parts across different market segments: orthotics and prosthetics, consumer goods, automotive, etc.

Lubrizol 3D Printing Solutions is well-equipped with a broad range of inhouse post-processing technologies with the commitment and aim to deliver an end-to-end solution.

