

The Benefits of Selective Laser Sintering

Selective Laser Sintering (SLS[®]) may be one of the most challenging additive fabrication (AF) technologies to master but the benefits it offers customers are worth the effort. SLS offers the freedom to quickly build complex parts that are more durable and provide better functionality over other rapid prototyping technologies. Customers that leverage the SLS process see a real benefit in that it allows them to test those parts in real world environments.

When you compare SLS technology to Stereolithography (SLA[®]), SLS differs in that the material is a powder rather than a photo curable liquid resin cured by UV light. This means your SLS parts will remain stable over time instead of degrading and becoming brittle from light absorption as SLA parts do. Since the material is a powder and the part being built is completely trapped in un-sintered powder there are no support structures required. This means complex parts with interior components, channels, and other features can be built without trapping material inside and altering the surface from support removal. Conversely, SLA parts are built in a vat of liquid and parts do require a support structure to facilitate the build. Internal features are often hard to build and post process as the support structures must be removed.

When SLS is compared to Fused Deposition Modeling (FDM[™]), they both have good durability and can work very well as functional prototypes or end-use parts. However, the FDM process has its limitations of strength in certain build directions as fused “walls” can be strong in one direction but extremely brittle in another. Additionally, the SLS process is faster, more affordable and can build smaller features that are crisper and more accurate than FDM.

SLS materials have evolved over the years and we are now able to offer a diverse selection for many different applications. If strength, durability and functionality are required, we can offer black or white Duraform[™] EX, Duraform PA and GF. These three materials are the majority of the SLS business for APP and provide an excellent solution for many applications including aerospace, automotive, and consumer products. Duraform EX has proven to be the best direct AF material to produce snap-fits and living hinges – that actually work for many cycles! If a customer has the need to build a part that requires a low durometer to simulate rubber hoses, gaskets or seals, then Duraform Flex is a perfect fit. SLS CastForm Wax allows for the production of investment casting patterns direct from 3D CAD data without tooling.

SLS continues to be one of my favorite AF technologies because of the diverse materials offered and wide array of applications. It is a challenging technology that continues to deliver strong, functional parts from production like materials for a wide array of customers.