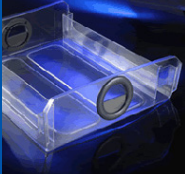
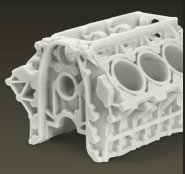
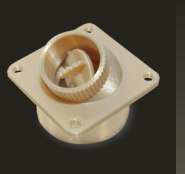
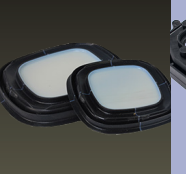


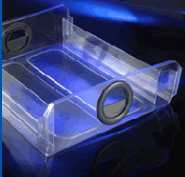
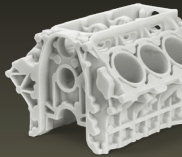

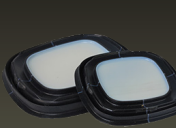




## Standard Plastic Additive Processes and Material Availability

	<u>Stereolithography (SLA)</u>	<u>Laser Sintering (SLS)</u>	<u>Fuse Deposition Modeling (FDM)</u>	<u>Polyjet/Objet</u>	<u>CLIP Digital Light Synthesis (DLS)</u>	<u>HP Multi Jet Fusion (MJF)</u>
<b>Material Equivalents Available</b>						
	SLA builds a 3D model of a component using a vat of liquid ultraviolet-curable photopolymer resin and an ultraviolet laser to form one thin layer at a time.	SLS builds parts using a high power laser to fuse small particles of powdered material into a desired three-dimensional shape.	FDM is an additive manufacturing technique, also known as direct digital manufacturing (DDM) or 3D printing, that builds parts by depositing production-grade thermoplastic material layer by layer.	PolyJet or Objet 3D printers work like an inkjet printer. Instead of jetting drops of ink, the printer jets drops of photopolymer that solidify when exposed to UV light. These layers accumulate on the build tray until the part is complete.	DLS process using CLIP technology works by projecting UV images, generated by a digital light projector, through an oxygen-permeable window into a reservoir of UV curable resin. The UV images when projected are solidified as the build platform rises.	MJF is a powder-based technology but does not use lasers. The powder bed is heated uniformly at the outset. A fusing agent is jetted where particles need to be selectively molten, and a detailing agent is jetted around the contours to improve part resolution.
<b>Acrylonitrile Butadiene Styrene (ABS)</b> General use thermoplastic with strong resistance to corrosive chemicals and physical impact. It is used for enclosures and housings.	■		■	■	■	
<b>Polycarbonate (PC)</b> A high impact strength engineering thermoplastic with good heat resistance that can be opaque or transparent in color. PC is often used in medical devices, automotive components and protective equipment.	■		■		■	
<b>Polypropylene (PP)</b> A thermoplastic that is elastic, tough, chemically resistant, and fatigue resistant. It is commonly used in packaging for consumer products, automotive and textiles. It is best known for being used to make living hinges.	■	■			■	
<b>PC/ABS</b> A very common industrial thermoplastic that offers the best of PC for strength and heat resistance tied with the flexibility of ABS. Automotive, electronics and telecommunications are the most widely used applications.			■		■	
<b>Thermoplastic Polyurethane (TPU)</b> A mixture of hard plastic and soft silicone. Typically these parts are soft durometer parts that are elastic and resistant to oil, grease and abrasion. It can be found in caster wheels, medical devices, power tools and footwear.		■		■	■	

## Standard Plastic Additive Processes and Material Availability (continued)

	<u>Stereolithography (SLA)</u>	<u>Laser Sintering (SLS)</u>	<u>Fuse Deposition Modeling (FDM)</u>	<u>Polyjet/Objet</u>	<u>CLIP Digital Light Synthesis (DLS)</u>	<u>HP Multi Jet Fusion (MJF)</u>
<b>Material Equivalents Available</b>						
	SLA builds a 3D model of a component using a vat of liquid ultraviolet-curable photopolymer resin and an ultraviolet laser to form one thin layer at a time.	SLS builds parts using a high power laser to fuse small particles of powdered material into a desired three-dimensional shape.	FDM is an additive manufacturing technique, also known as direct digital manufacturing (DDM) or 3D printing, that builds parts by depositing production-grade thermoplastic material layer by layer.	PolyJet or Objet 3D printers work like an inkjet printer. Instead of jetting drops of ink, the printer jets drops of photopolymer that solidify when exposed to UV light. These layers accumulate on the build tray until the part is complete.	DLS process using CLIP technology works by projecting UV images, generated by a digital light projector, through an oxygen-permeable window into a reservoir of UV curable resin. The UV images when projected are solidified as the build platform rises.	MJF is a powder-based technology but does not use lasers. The powder bed is heated uniformly at the outset. A fusing agent is jetted where particles need to be selectively molten, and a detailing agent is jetted around the contours to improve part resolution.
<b>Glass-Filled Nylon</b> Nylon with glass fiber added to increase the strength of the component. The glass fibers also reduce the bending resulting in a more brittle break. It is used in industrial applications for strong and rigid parts.		■			■	
<b>Ultem</b> Ultem (part of the PEI family) is a thermoplastic with high heat solvent and flame resistance. It is used in medical, aerospace and industrial applications.			■			
<b>Polyether Ether Ketone (PEEK)</b> An organic thermoplastic with excellent mechanical and chemical resistance properties with high heat applications. It is known for its uses in medical implants and devices.		■				
<b>Acetal</b> Also known as Polyoxymethylene (POM) or Delrin, is a thermoplastic that is stable, slippery, low friction, and resistant to abrasion, heat, water and organic chemicals. It is used for gears, consumer electronics and medical devices.					■	
<b>Nylon</b> Nylon (PA 6 or PA 6/66) is a thermoplastic that is known for its strength, elasticity, life, and resistance to abrasions, moisture and heat. It is used to replace low strength metals and can be found in most vehicles and mechanical equipment.		■	■		■	■