

Process (ASTM)	Notes	Description	Materials	Companies	Pros	Cons	Machine price range
Material extrusion	Commonly referred to as FDM. This is what the Dimension is.	Material extruded through nozzle	ABS, PC, PLA, ULTEM	Stratasys, 3D Systems, EnvisionTEC, MakerBot Industries	Parts are relatively strong and can be good for some functional testing. Can make complex geometries.	Poorer surface finish than SLA and SLS	\$500 - \$500,000
Material Jetting	This is what the Objet is.	Droplets of material deposited	Acrylic-based photopolymers, elastomeric photopolymers, wax-like materials, "digital" materials	3D Systems, Stratasys/Objet, Solidscape	Yields best surface finish of additive processes and is the best choice for complex parts with undercuts.	Poor strength compared to SLA	\$20,000 - \$600,000
Binder Jetting		Liquid bonding agent is deposited to join powder materials	Plaster, metal, sand	3D Systems, ExOne, VoxelJet	Fastest time of any additive process. Can print in multiple color combinations and is one of the least expensive options for prototyping.	Parts are rough and less durable.	\$16,500 - \$1,400,000
Sheet Lamination		Sheets of material are bonded and cut	Plastic, metal, paper	Mcor, Fabrisonic	Inexpensive, full color prints using paper. Strong metal parts with composite materials.	Paper models are not durable. Few ultrasonic machines.	\$36,000 - \$47,000 (no prices for fabrisonic machines but estimate high 100Ks to Ms)
Vat Photopolymerization	Commonly referred to as SLA or DLP	Liquid photopolymer in a vat is cured by light-activated polymerization	Photopolymers	3D Systems, EnvisionTEC, DWS, Carima, FormLabs	Can produce parts with complex geometries and excellent surface finishes compared to other additive processes.	Parts are weaker than those made from engineering grade resins; typically unsuitable for functional testing.	\$3,300 - \$460,000
Powder Bed Fusion	Commonly referred to as laser sintering, DMLS, ...	Thermal energy fuses regions of a powder bed	Metal, plastic	3D Systems, EOS, SLM Solutions, Arcam, Concept Lasers, AMT Phenix	Fully dense (~99.5%). Extremely durable. No post thermal treatment required. Strong parts. Most are fully functional.	Poor surface finish combined with expensive materials.	\$170,000 - \$1,900,000
Directed Energy Deposition		focused thermal energy fuses and melts material as it is being deposited	Metal	Optomec, Honeywell Aerospace, Irepa Laser	Ideal for adding material to existing parts for repair or hybrid manufacturing.	Worst surface finish of all additive processes. Usually requires post-operations.	\$350,000 - \$1,500,000

Data compiled by Aedhan Loomis 2013