3D Printing Glossary

Acrylonitrile butadiene styrene / ABS

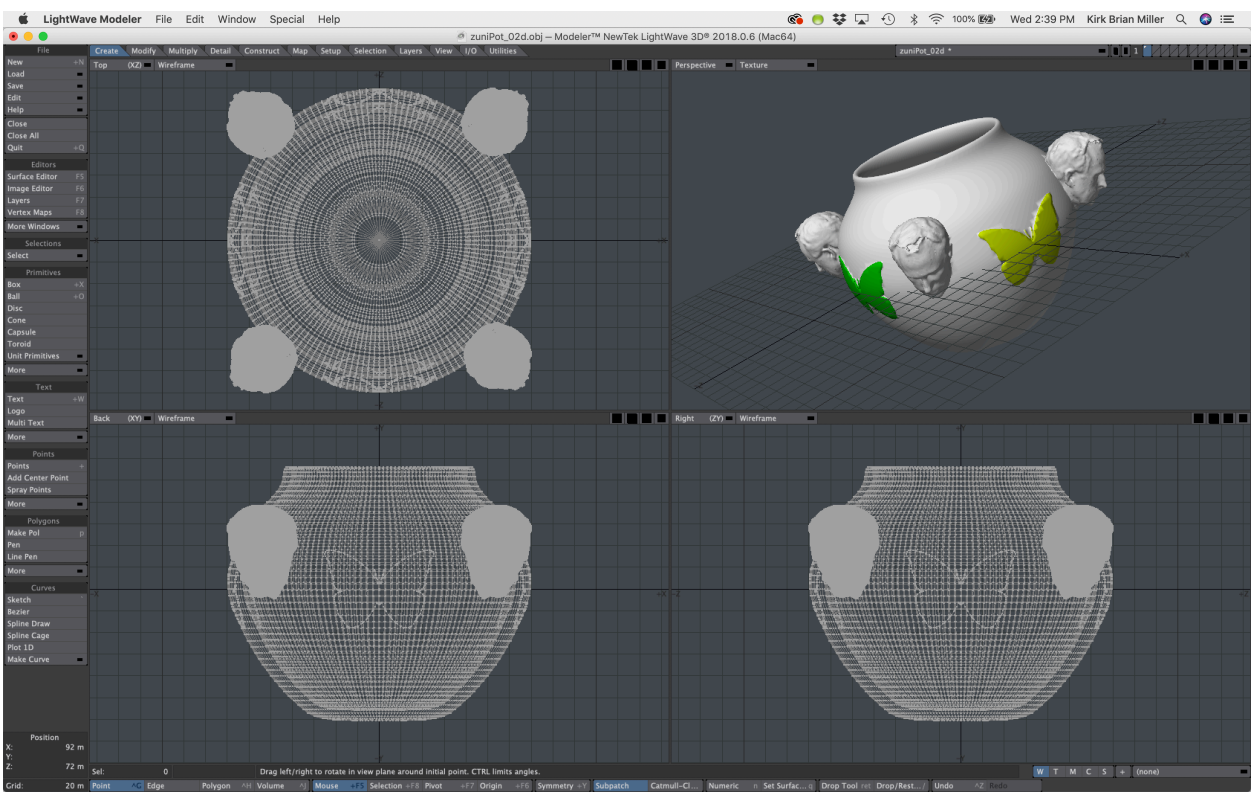
Acrylonitrile butadiene styrene otherwise known as ABS, is a thermoplastic commonly used as the build material or ‘filament’ in fused deposition modeling 3D printers It’s fairly strong, but it’s also a bit tricky to work with (and gives off nasty odors when melted)

Additive Manufacturing

Additive manufacturing is the process of building up a three-dimensional object one thin layer at a time. 3D printing is only one category of additive manufacturing though the two terms are frequently considered to mean the same thing.

3D Modeling/Animation & Computer Added Design / CAD Software

3D Modeling and Computer aided design, or CAD, is software that enables users to create models in either two or three dimensional formats. While they were initially developed for use in the architecture and manufacturing industries consumer friendly applications are now readily available for little or no cost.



Filament

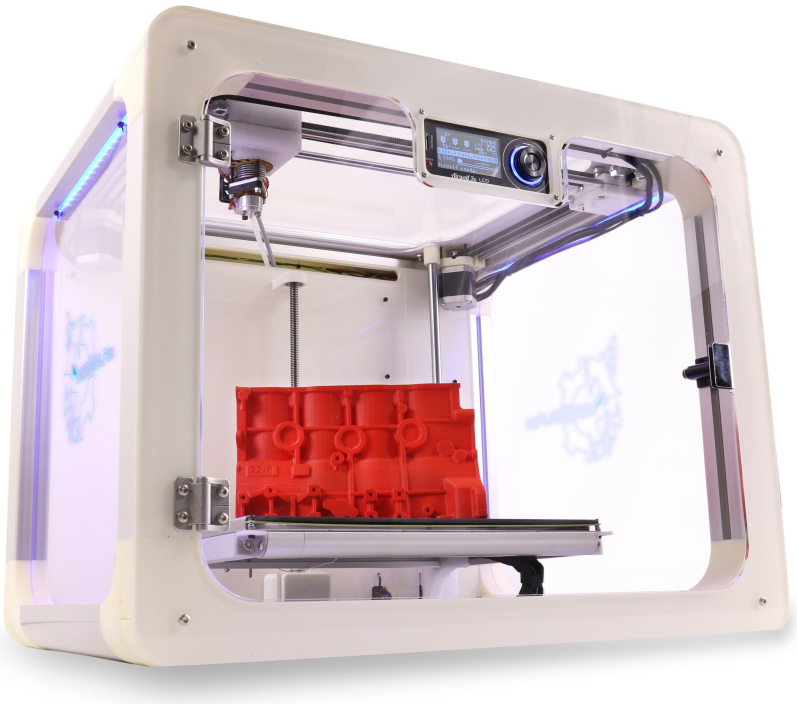
Filament is the base material that’s used to 3D print objects via fused deposition modeling. Filament is usually a thermoplastic-such as ABS or PLA-that's fed to a print head as a solid, then heated to melting point for extrusion through a small nozzle. Filament is commonly available in spools of either 1.75mm and 3 mm diameter widths.

Functional Prototype

A functional prototype is a near-final model or representation of a product created during the design process to evaluate the form fit and function of an object and its constituent parts Functional prototypes don’t necessarily have to be built from the same material as the final model (though it might help). For example, a platform jack may be 3D printed in plastic to test for fit and movement, before final production in metal.

Fused Deposition Modeling / FDM

Fused deposition modeling, otherwise known as FDM, is a 3D printing process that extrudes heated thermoplastic material through a computer-controlled print-head nozzle build parts up layers. FDM is actually a term that's been trademarked by Stratasys. This led to the RepRap open-source community to coin the term "fused filament fabrication" (FFF) for a more generalized and legal way to describe the process.



G-code

G-code is the language used to instruct your 3D printer usage this is almost exclusively generated by software, and is not written by hand. G-codes control specific actions like motion, speed, rotation, depth, and other related switches and sensors used in the operation of a machine.

Polylactic Acid

Polylactic Acid, otherwise known as PLA, is a biodegradable plastic that's used as the build material or 'filament' in fused deposition modeling 3D printers.This material is easier to work with than ABS, and the smell is not so unpleasant, but the trade-off is that PLA is structurally more brittle.

Rapid Prototyping

Rapid prototyping is a group of technologies used to quickly fabricate a scale model of a physical part or component using three-dimensional computer aided design (CAD) Construction of the part or component is usually done via 3D printing or additive manufacturing technology- More recently the term ‘real-time prototyping’ has become popular, but essentially it means the same thing.

RepRaP

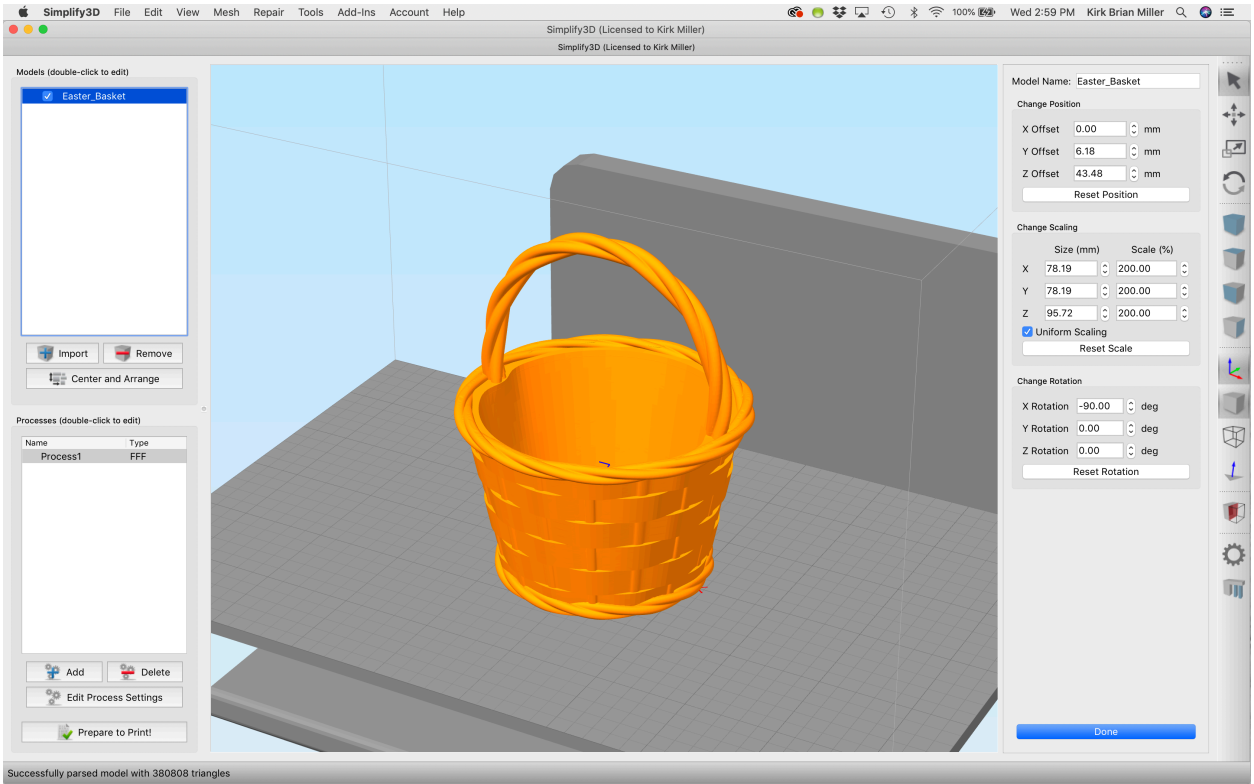
RepRap is shorthand for “replicating rapid prototypers”, machines which are open-source 3D printers utilizing the fused filament fabrication process One of the defining characteristics of a RepRap machine is that it should be capable of printing out its own parts (but not necessarily al I of them). Various RepRap designs and build instructions are freely downloadable from reprap.org, where they proudly describe their printers as “humanity’s first general-purpose self-replicating manufacturing machines”.

Selective Laser Sintering / SLS

Selective Laser Sintering or SLS for short, is a technology commonly employed by printing services for metallic objects. SLS is a powder bed fusion 3D printing technique that uses a laser to selectively fuse-or sinter-together the granules of successive layers of powder.

Slicer

As we’ve established additive manufacturing works by building an object layer by layer, k slicer is the software package used to divide a 3D model into flat layers which are then printed one at a time. The output of a slicer is G-code that controls the path speed, and temperature of the printer Slicer software packages are available in both open-source and proprietary programs and they’re an essential tool for successful 3D printing.



Stereolithographic Apparatus / SLA

Stereolithography is a 3D printing technology that works via a process called vat photopolymerization. Objects are built in layers using a Stereolithographic Apparatus, or SLA for short. This works using a laser beam to trace out and solidify each successive layer of an object on the surface (or base) of a vat of liquid photopolymer.

STL

STL is the most popular file format for 3D printing. The STL file format represents a 3D Obiect by describing the surface as a series of triangles, strangely enough information about what the letters STL actually stand for has been lost to the mists of time. Backronyms posited as an answer include ‘standard tessellation language’ and ‘standard triangle language’.