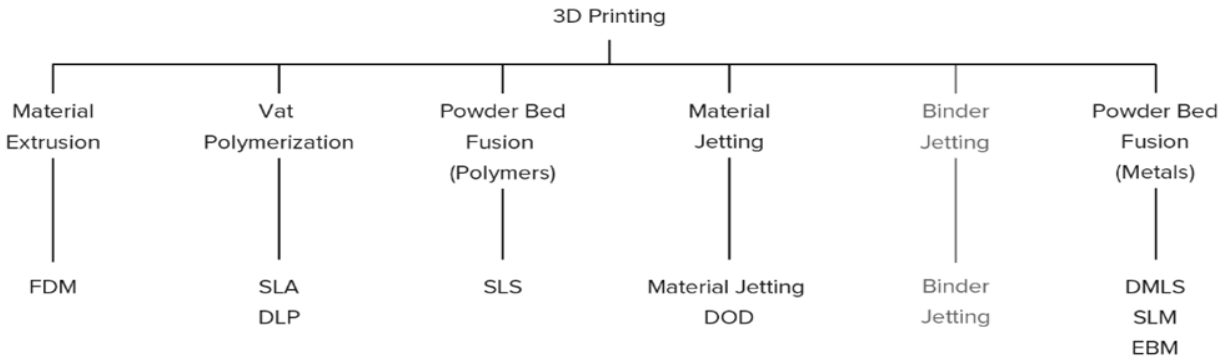
Terminology - Glossary

As 3D printing is still such a new field, the terminology of the industry can sometimes be confusing and even contradictory. Below is a relatively short list of terminology that can help you get started. The list is nowhere near complete, but great online sources exist should run into terms that you are not familiar with.



3d printing technologies

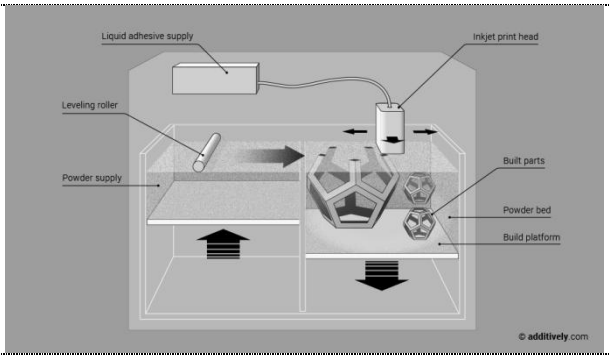
- **Rapid Prototyping**: a vat of photopolymer material is exposed to a UV light that hardens the part and builds up the model in layers.

- **Stereolithography**: **SLA** or SL; also known as stereolithography apparatus, optical fabrication, photo-solidification, or resin printing) is a form of 3D printing technology used for creating models, prototypes, patterns, and production parts in a layer by layer fashion using photochemical processes by which light causes chemical monomers to link together to form polymers.[1] Those polymers then make up the body of a three-dimensional solid.

- **Selective Layer Sintering**: Selective laser sintering (SLS) is an additive manufacturing (AM) technique that uses a laser as the power source to sinter powdered material (typically nylon or polyamide), aiming the laser automatically at points in space defined by a 3D model, binding the material together to create a solid structure.

- **Fused Deposition Modeling or Fused filament fabrication (*FFF)*:** FDM printers use a thermoplastic filament, which is heated to its melting point and then extruded, layer by layer, to create a three dimensional object.

- **Binder jetting**: a binder is selectively deposited onto the powder bed, bonding these areas together to form a solid part one layer at a time. The materials commonly used in Binder Jetting are metals, sand, and ceramics that come in a granular form.



General

- **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.

- **Computer Aided Design (CAD)**

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

- **Fused filament fabrication (FFF)**

An additive manufacturing technology that is based on the principle of laying down material in layers. It has similarities to the term FDM (fused deposition modeling), however, FDM is a trademark term. Therefore FFF will be used from this point.

- **Filament**

The material that is used for 3D printing. It has the shape of a wire and is usually coiled on a spool. Usually consisting of different plastic materials.

- **Polylactic acid (PLA)**

A hard, odorless bioplastic that has a low environmental impact. It is derived from renewable, starch-based resources. PLA has a very low shrinkage, which is ideal for 3D models and prototyping at home.

- **Layer resolution**

The layer resolution (or layer height) describes the thickness of one layer of the 3D print.

- **Slicing**

The process of converting a 3D model, such as an STL file, into a printable file, such as a G-code or F-code. It will divide the model into “slices” so that the 3D printer can build it up layer by layer. Examples of slicers are: Cura, Slic3r, Simplify 3D

File formats

- **STL**

A widely used file format for 3D models when 3D printing.

- **G-code**

A file format that is used for 3D printing models (after it has been sliced).

3D printer

- **Extruder**

A common name for the parts that control the extrusion of the filament.

- **Print Head**

oThe part of a 3D printer where material is extruded/jetted from. It is an assembly of multiple components including the nozzle in the case of FFF.

- **Nozzle**

The part of a 3D printer where the build material is extruded from.

- **Print Bed / build plate**

The print bed or build plate are sometimes used interchangeably. This is a flat surface, that the object is built upon.

- **Bed leveling**

Leveling the print bed (sometimes referred to as calibrating) is the process of making sure that the print bed has just the right distance from the nozzle to assure that the object will stick to the bed. Depending on the printer model, this can be more or less automatic.

- **XYZ axis**

The 3D printing is in most cases viewed as a Cartesian coordinate system, with the X and Y being the plane on which each layer is built, and the Z-axis the height. Exceptions are the Delta and the Bipolar system.

- **Stepper motors**

The motors most commonly used to control a 3D printer. A 3D printer will mostly consist of at least four stepper motors, one each axis and one or more used to feed the filament.

- **Controller**

A PCB containing controller software and hardware is necessary to run the printer.