Seminar
On
3D Printing

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What is 3D Printing?

- *For methods of applying a 2-D image on a 3-D surface*

- **Additive manufacturing** or **3D printing** is a process of making a three-dimensional solid object of virtually any shape from a digital model. 3D printing is achieved using an *additive process*, where successive layers of material are laid down in different shapes.

What is 3D Printing?

- Additive Manufacturing: The term *additive manufacturing* refers to technologies that create objects through a sequential layering process. Objects that are manufactured additively can be used anywhere throughout the product life cycle,

General Principles

- Modeling
- Printing
- Finishing

Modeling

- Additive manufacturing takes virtual blueprints from computer aided design (CAD) or animation modeling software and "slices" them into digital cross-sections for the machine to successively use as a guideline for printing.

Printing

- To perform a print, the machine reads the design and lays down successive layers of liquid, powder, or sheet material to build the model from a series of cross sections.
- These layers, which correspond to the virtual cross sections from the CAD model, are joined together or automatically fused to create the final shape.
- The primary advantage of this technique is its ability to create almost any shape or geometric feature.

Finishing

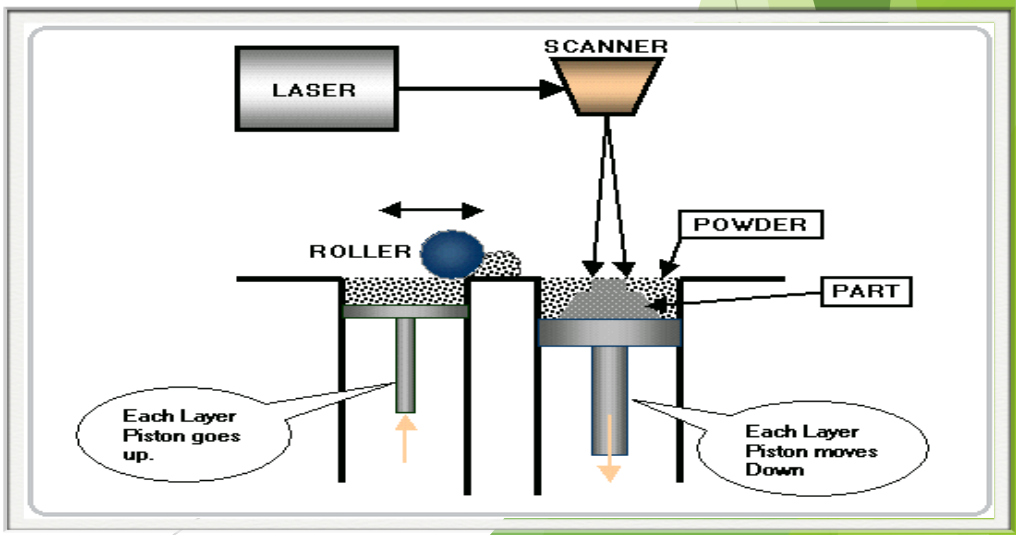
- Though the printer-produced resolution is sufficient for many applications, printing a slightly oversized version of the desired object in standard resolution, and then removing material with a higher-resolution subtractive process can achieve a higher-resolution.

Different Methods

- Selective laser sintering (SLS)
- Stereolithography
- Fused deposition modeling (FDM)
- Laminated object manufacturing

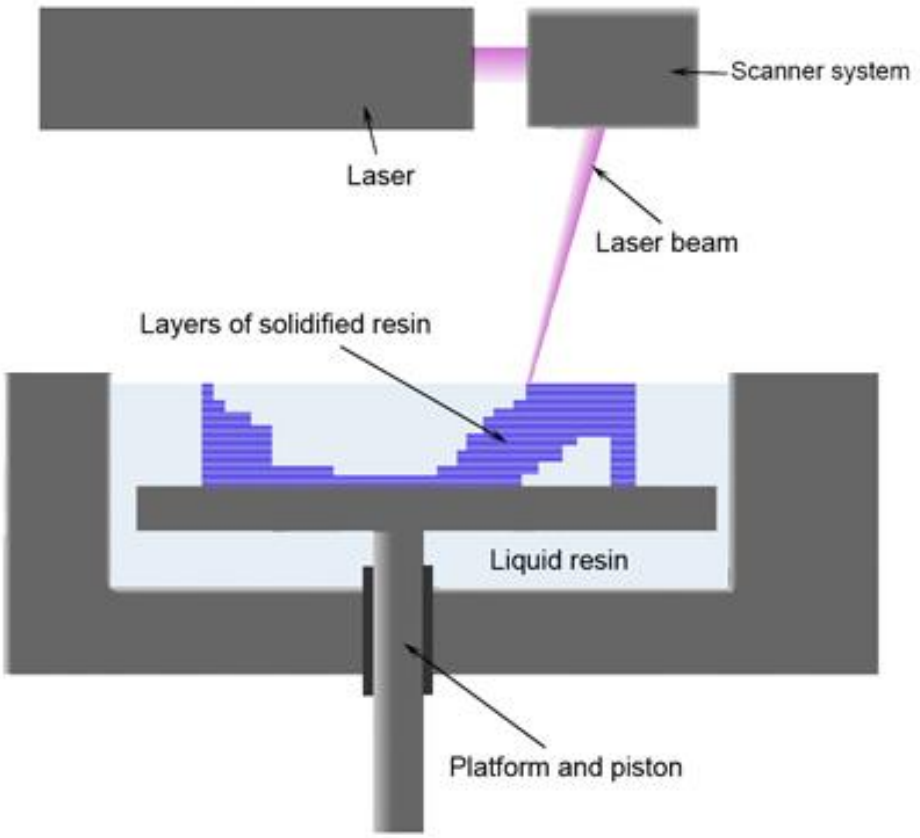
Selective laser sintering (SLS)

- Selective laser sintering (SLS) is an additive manufacturing technique that uses a high power laser (for example, a carbon dioxide laser) to fuse small particles of plastic, metal (direct metal laser sintering),ceramic or glass powders into a mass that has a desired 3-dimensional shape



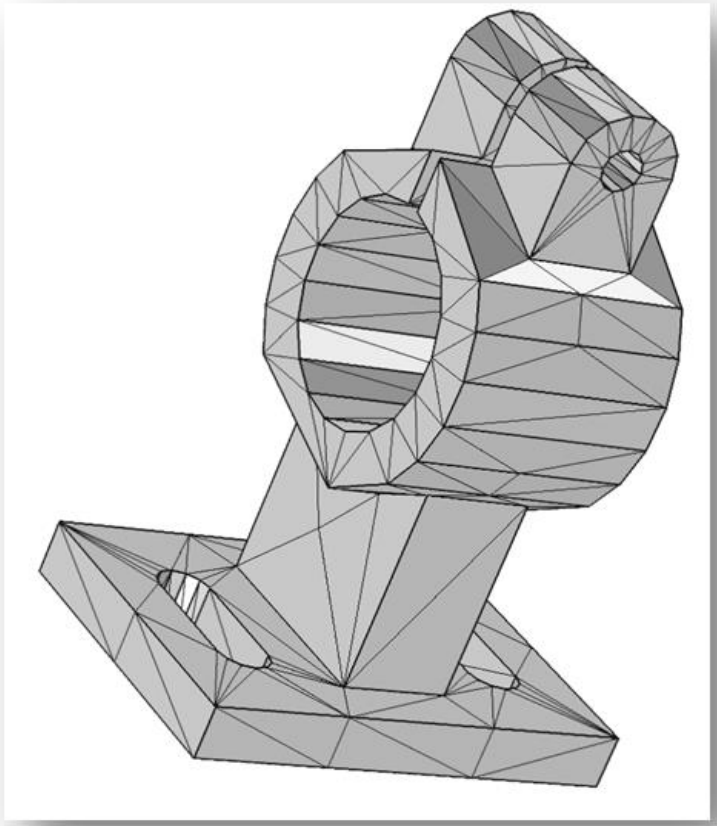
STEREOLITHOGRAPHY

- Stereolithography is an additive manufacturing process using a vat of liquid UV-curable photopolymer ”resin” and a UV laser to build parts a layer at a time.

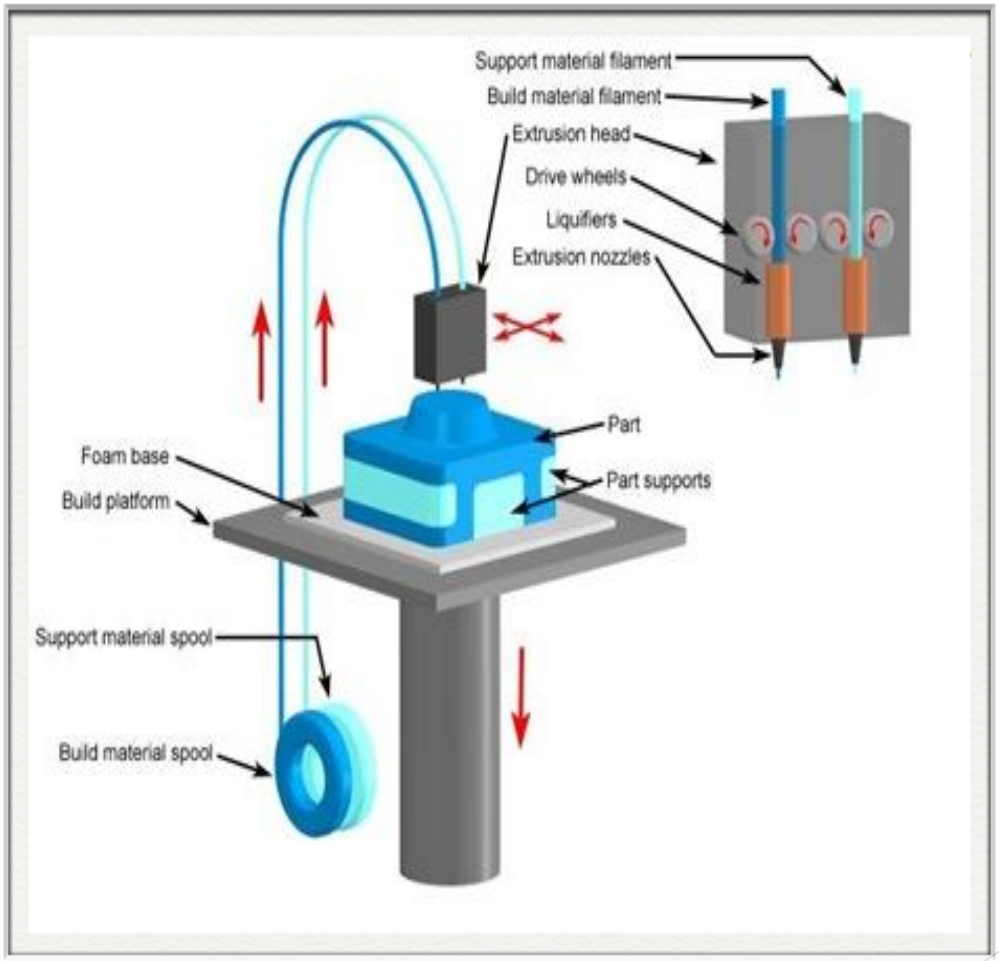


STEREOLITHOGRAPHY (Cont…)

- CAD (Computer Assisted Design) Programs help users create STL Files for the 3D Printers to read.
- STL (STereoLithography) file format – a file format which uses many little triangles to make a 3 dimensional plot of the objects intended surface.



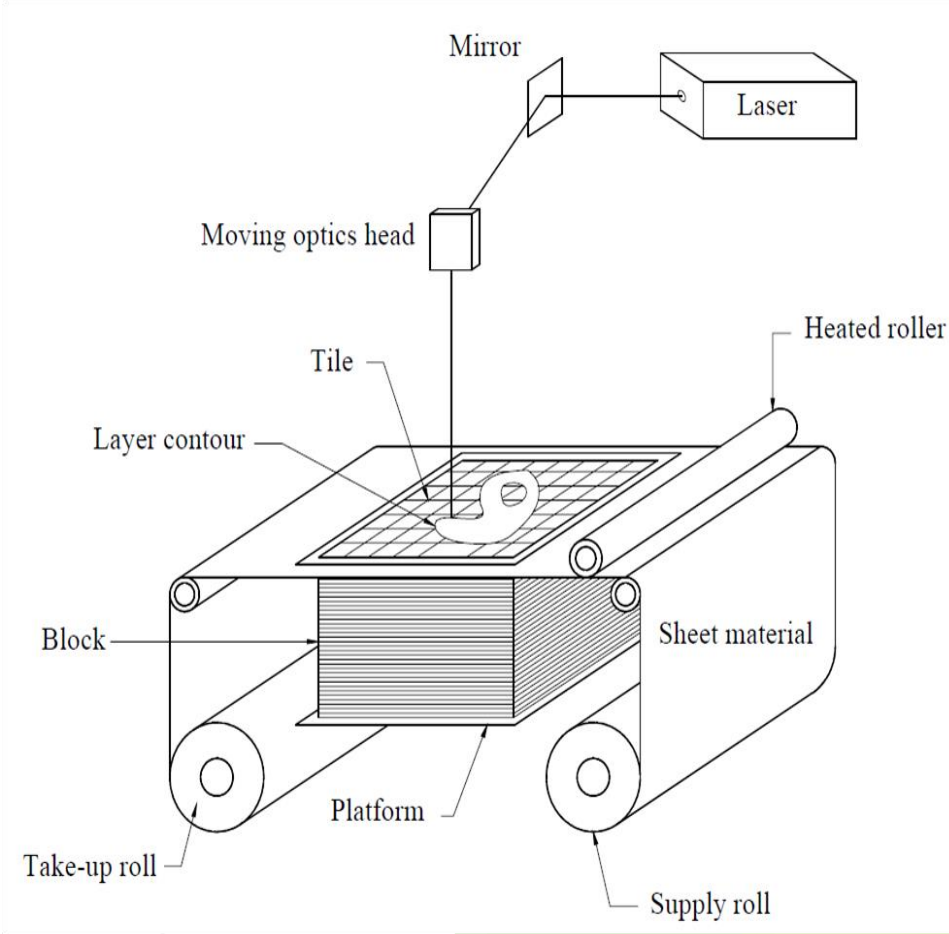
FDM



Fused deposition modeling (FDM) is an additive manufacturing technology commonly used for modeling, prototyping, and production applications

Laminated object manufacturing

- **Laminated object manufacturing (LOM)** is a rapid prototyping system developed by Helisys Inc. In it, layers of adhesive-coated paper, plastic or metal laminates are successively glued together and cut to shape with a knife or laser cutter.



Applications

- Prototyping
- Modeling
- Custom parts
- Design
- Research

Challenges Facing 3D Printing

- Intellectual property rights of the 3D Printer users.
- Nearly anything can be printed by 3D Printers and this is a troubling prospect if criminals use 3D Printers to create illegal products.

Conclusion

- Nothing communicates ideas faster than a three-dimensional part or model. With a 3D printer you can bring CAD files and design ideas to life – right from your desktop.
- Test form, fit and function – and as many design variations as you like – with functional parts.

Reference

- www.google.com
- www.wikipedia.com
- www.studybindas.com

Thanks