OBJET 3D Printing Overview

ELEC391

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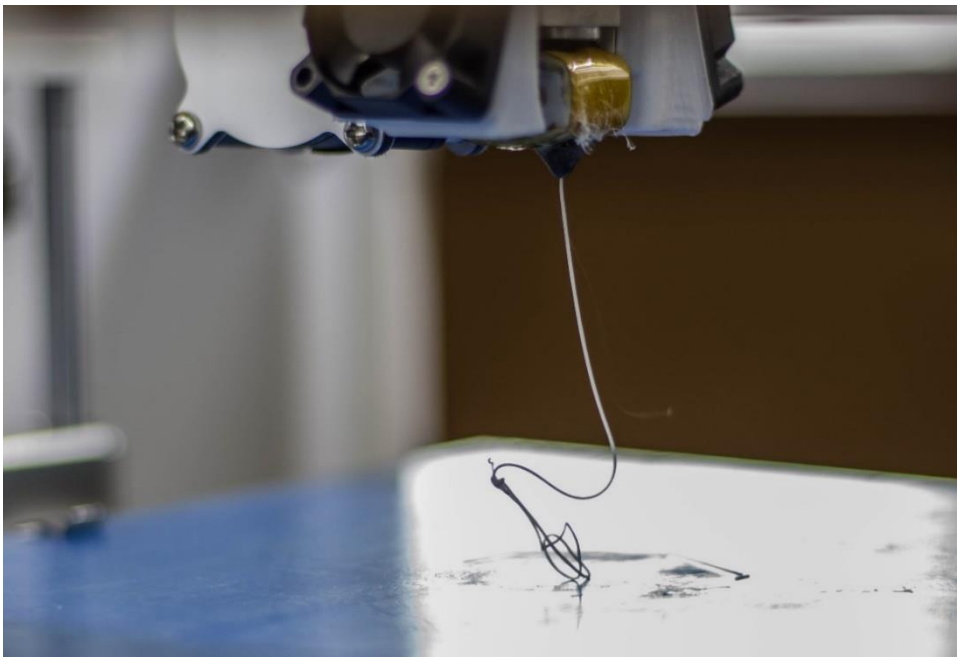
FDM vs PolyJet (SLA)

The OBJET printers are different than the Tinkerine printers several different ways. They both use different 3D printing technology, and vary in price and functionality.

FDM (Fused Deposition Modelling)

SLA (Stereolithography)

The Tinkerine DITTO PRO 3D printers use FDM (fused deposition modeling) technology. FDM technology works by depositing material layer-by-layer to create a 3D object. Usually the material is a PLA plastic that is melted by the printing head, extruded as a thin stream of melted material, and then dried to form a solid layer. These layers are deposited one-by-one until a full 3-dimensional solid shape is formed.



The Objet printers use PolyJet technology, which is a type of SLA (stereolithography) technology. This type of 3D printing technology utilizes the same principles as an inkjet printer. The PolyJet printing head is made up of many tiny holes, which deposit liquid photopolymer in layers. Once a layer of the liquid photopolymer is deposited, a UV light is passed over the liquid layer, immediately curing the liquid into a solid layer. The process is repeated, a layer is deposited, then cured, over and over again until a solid object is formed. This process takes place entirely inside the housing of the printer. Unlike the Tinkerine printers, the printing happens in a closed environment.

These are two 3D printing technologies are fundamentally different and as such, they are both different in terms of material used, cost, functionality, etc. The Tinkerine DITTO PRO 3D printer has a lower absolute resolution, is much cheaper (both the cost of the printer and the build material), and can print parts much quicker. The Objet printers are able to achieve much higher precision and resolution, but cost considerably more and are also much slower in printing parts.

TINKERINE DITTO PRO	OBJET24/OBJET30
- FDM technology - Lower resolution - Lower cost - Faster print times - Economical - For general purpose/prototyping/hobbyist use	- PolyJet SLA technology - Higher resolution - Higher cost - Larger footprint - Slower print times - For industrial/research applications

In general, the Tinkerine printers are more appropriate for undergraduate projects, basic prototyping and for hobbyist/enthusiast use. The Objet printers, on the other hand, are more appropriate for graduate research work and industrial applications.

For most students in ELEC 391, the Tinkerine DITTO PRO 3D printers make more economical sense. However, there may be some situations where students would like to print parts that are less feasible using FDM technology and better suited for PolyJet printers. In these cases, students can submit a job to be printed by the Lightning Lab.