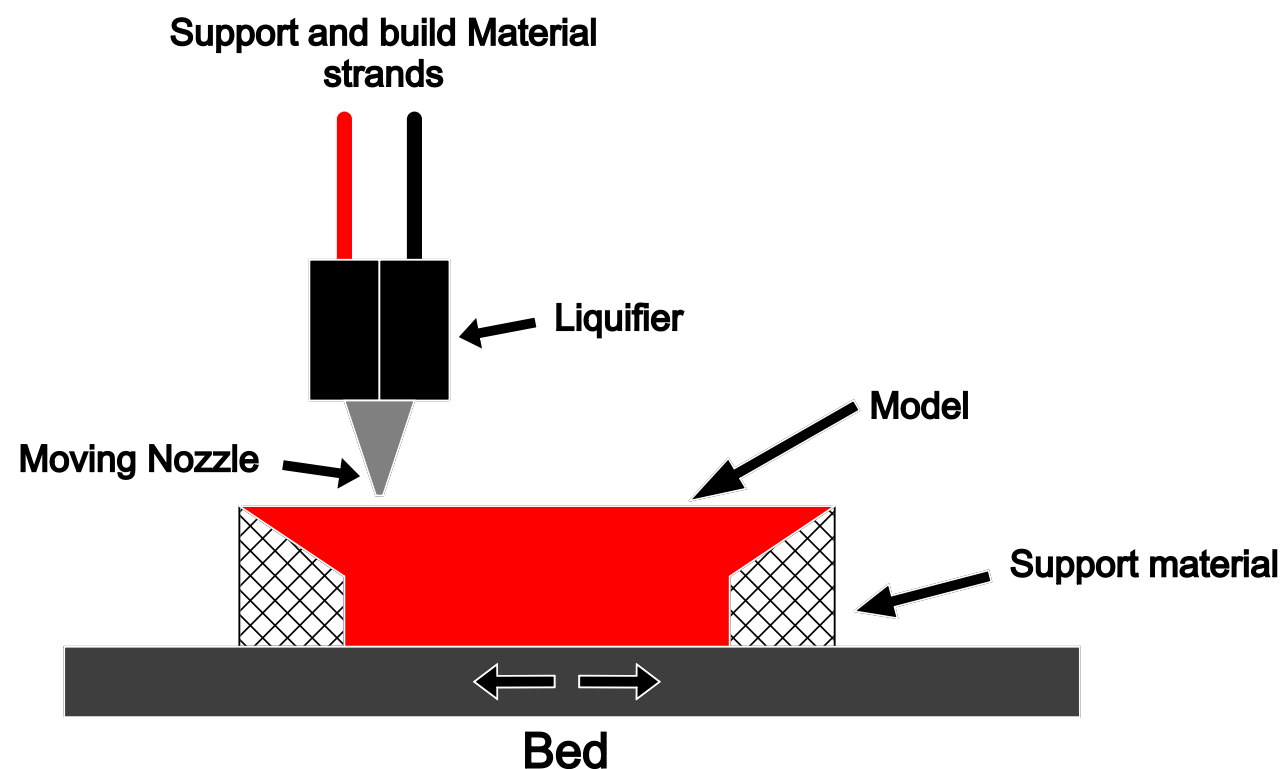


Fused Deposition Modeling (FDM)

FDM (Fused Deposition Moulding), more commonly known as 3D printing is an addition process which involved a computer controlled nozzle which moves in relation to a bed layers the building plastic in a number of different patterns or in solid layers to build up a 3 dimensional model of what the designer created on the computer.



What materials are used in FDM?

There are a number of different types of plastics used in FDM processing. The most common is ABS, a tough plastic with a variety of different versions which allow for increased impact resistance, heat resistance and toughness. Second most common type of plastic used in this type of processing is Polycarbonate (PC). This is another very tough material however it lacks the hardness of ABS, this means that it becomes prone to bending if no precautions are put in place. Where this material is required to be hard, it is usually treated with a hardened outer plastic coat. Perhaps the rarest type of plastic used in this type of processing is Ultem or PEI (polyetherimide). It comes in many different variations in varying impact resistances and heat deflection ratings. The most common types of Ultem are ULTEM 9085 and ULTEM 1010.

Time/Rate of Manufacturing

The rate at which the printer can deposit material is heavily dependent on the machine used, the type of material used and how it is being deposited. However, there are benchmark models that are used to test speed. For example the boat to the left. It is known as 3Dbenchy and has been used to test a number of different machines. The model is 6cm long, 4.8cm high and 3.1cm wide and a good printer can be expected to print it in around 2 hours.

Volume of manufacture

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Volume of manufacture

The cost to print a model using this type of process depends on the type of material used. The specialised plastic Ultem 1010 and 9085 are £50 and £60 (250g) respectively from 3DXTech. PC (polycarbonate) printing filament priced at £30 (500g) on the same site. Standard ABS filament reel (750g) has an average price of £20 - £25.

Credits

<https://all3dp.com/3d-printing-speed/-printing-speeds,dec2017->

<http://www.3dbenchy.com/download/-printerbenchmarking,dec2017->

<http://www.shutterstock.com/video/-redhandprinting,dec2017->

<https://www.3dxtech.com/-materialprices,dec2017->

3D Alchemy
-Sample Supply-
Received Dec 2017

3D Creation Lab
-Sample Supply-
-not shown-
received Nov 2017

