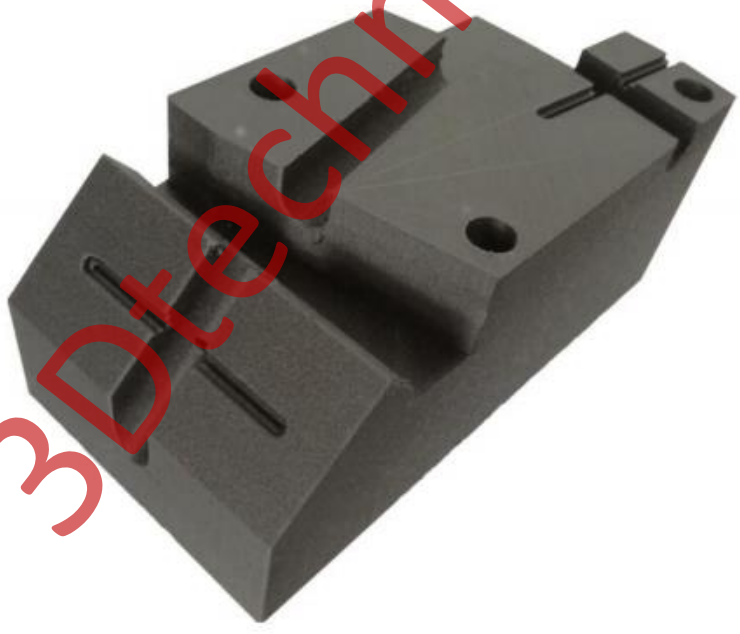
FUSED DEPOSITION MODELLING

What Is Fused Deposition Modelling?

Fused deposition modelling (FDM) is one of the most widely used additive manufacturing processes for fabricating prototypes and functional parts in common engineering plastics. The simplicity, reliability, and affordability of the FDM process have made the additive manufacturing technology widely recognized and adopted by industry, academia, and consumers.

Many businesses use FDM 3D printing service as it allows the creation of detailed and intricate objects. Therefore, engineers are using it to allow them to test parts for fit and form. It is a technology that is now assisting the creation of small parts and specialized tools that would once take a lot longer to produce.

The FDM process uses a digital design (G-code) that is uploaded to the 3D printer. The filaments are melted and fed onto the build plate, as the nozzle moves across the plate, the plastic cools and becomes solid, forming a hard bond with the previous layer, layer by layer until the object is finished.



Jigs & fixtures
PA + Carbon fiber
FDM

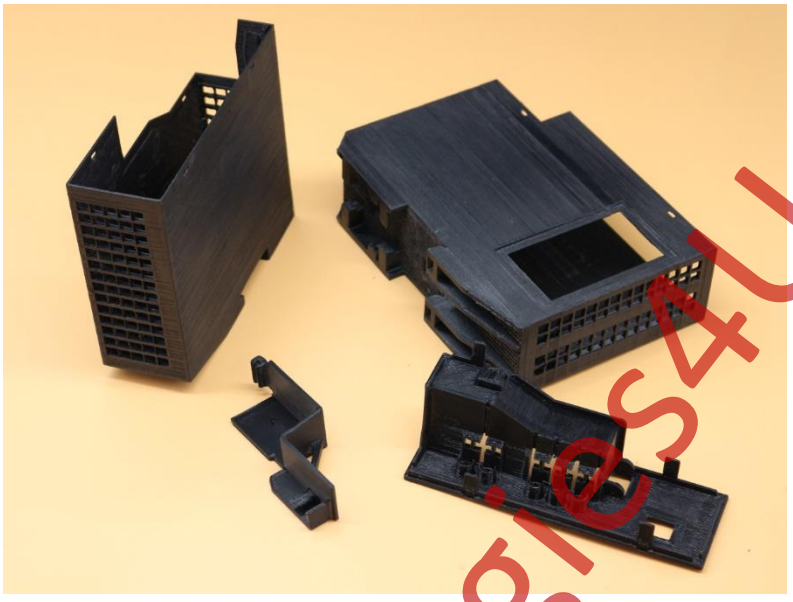
How does FDM 3D printing work?

The process uses a digital design that is uploaded to the 3D printer. There are a lot of different polymers used, such as ABS, PETG, PA+CF, PEI, PPSF, and PEEK.

These take the shape of plastic threads that are fed from a coil and through a nozzle. The filaments are melted and fed onto the base, known as a build platform, both of the plate ad nozzle which are controlled by a computer. The computer works by translating the object and its dimension into co-ordinates that make it possible for the nozzle and base to follow.

Available materials in 3Dtechnologies4U:

Material	Applications
ABS	General purpose applications, housing and cases, electronics and low-cost prototyping
ASA	Outdoor products
ABS-ESD	Electronics, housing and cases, jigs and fixtures
ABS M30i	Medical e.g. surgical medical equipment
PA+CF & PA+GF	Automotive, bike, shipping, robotics, drones, jigs and fixtures, tooling
PETG	Outdoor products, waterproof products, housing and casings, consumer products
PC	Transportation, automotive, bikes and shipping, jogs and fixtures, housings and casings, tooling
PPS	Automotive, bike, shipping, electronics, flame retardant products, connectors, military
PEI	Aerospace, automotive, medical, oil and gas, functional products, jigs and fixtures
PPSF	Medical, aerospace, automotive
PEEK	Aerospace, automotive, safety guards, electronics, military, oil and gas, functional and end-use parts, high strength with lightweight applications, chemical resistance applications
TPU	Automotive, medical, robotics, hoses, seals, footwear, helmet interiors, toy tires



FDM Flame Retardant- PC - electrical application

General guides

- If a bridge (print between 2 supports) is bigger than 5mm, sagging or marks from support material can occur. Splitting the design or post-processing is recommended to eliminate the problem.
- As FDM usually prints vertical holes smaller than it's been designed drilling after 3d printing is recommended to achieve accurate results.
- For overhanged features or geometries greater than 45 degrees, supports will be required.
- It is recommended all edges of an FDM component that are in contact with the build plate to have 45 degrees chamfer or radius.
- In instances where small vertical pins included in the geometry, small fillet areas at the base of them required to allow 3d printers produce the required geometry
- Splitting a model, re-orientating holes when required, and specifying manufacturing direction are all important factors to be considered that can reduce the cost, speed up the printing process, and improve the strength and quality of a geometry.