



SYSTEMS 3D

innovation in 3D solutions

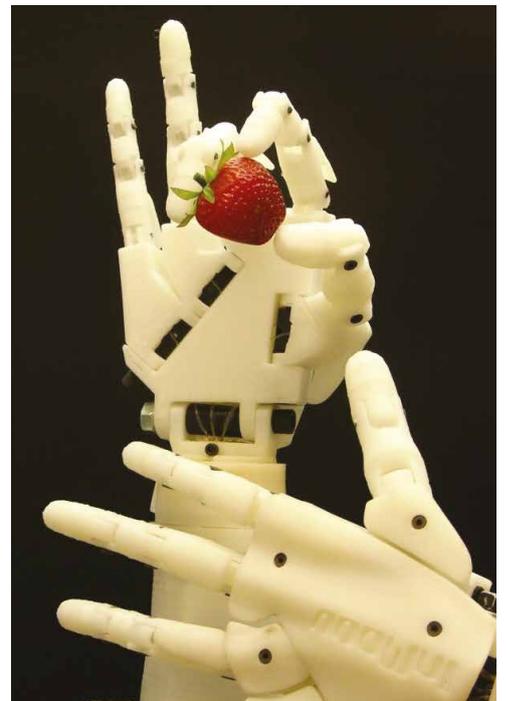
Understanding 3D Printing

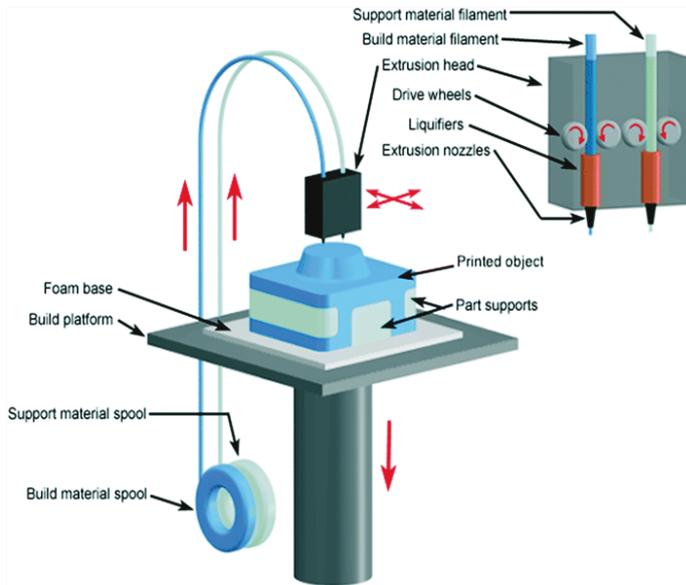


What is 3D printing?

Also known as **Additive Manufacturing** is the direct opposite process to CNC or a **Subtractive Manufacturing** process. **Additive** processes create an object by laying down successive layers of material one on top of the other, until an object is created. In contrast **Subtractive** processes start with a block of material and remove or subtract material until an object is created.

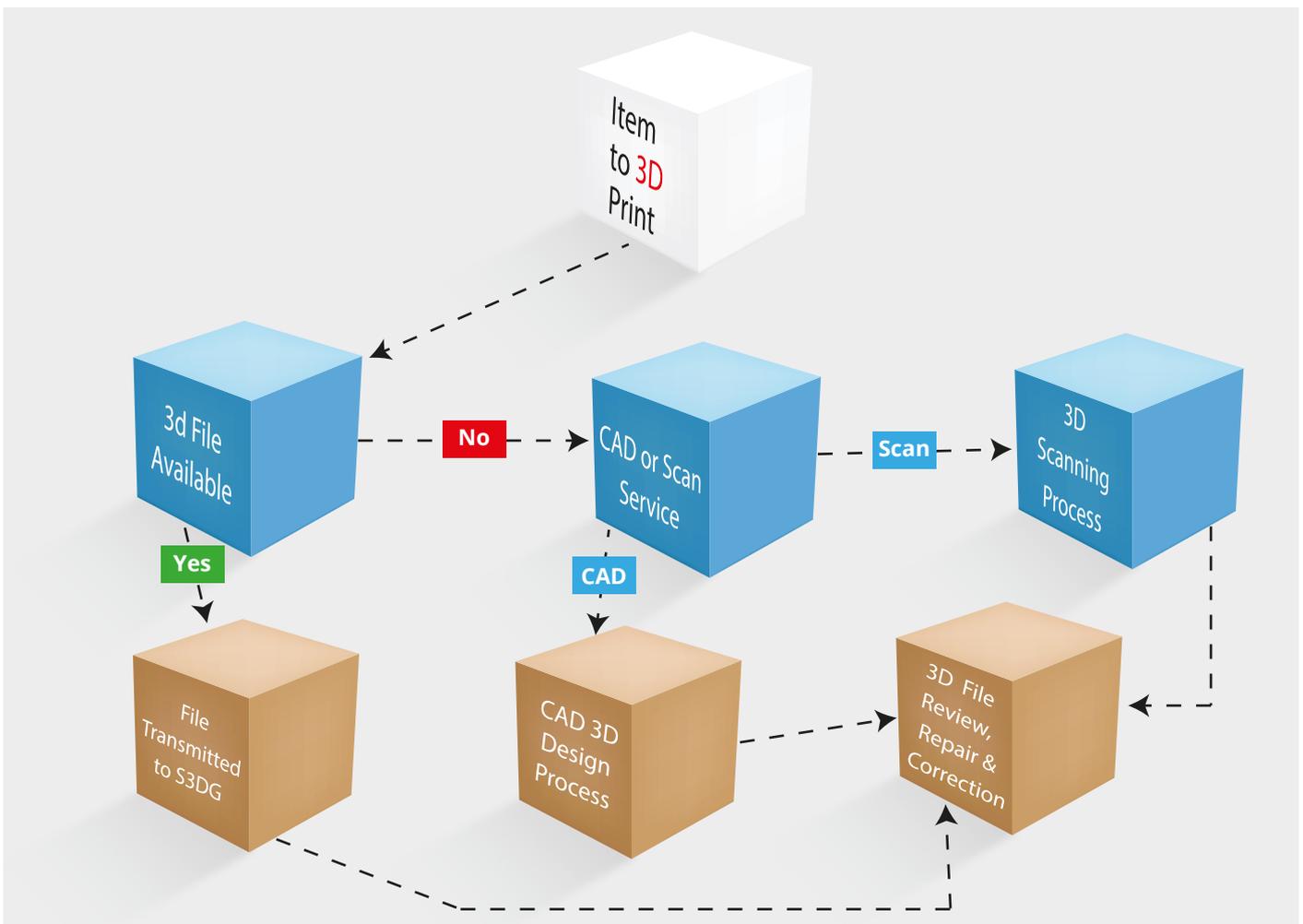
The controls and programming of 3D Printers are overall very similar to that of a CNC mill or lathe.





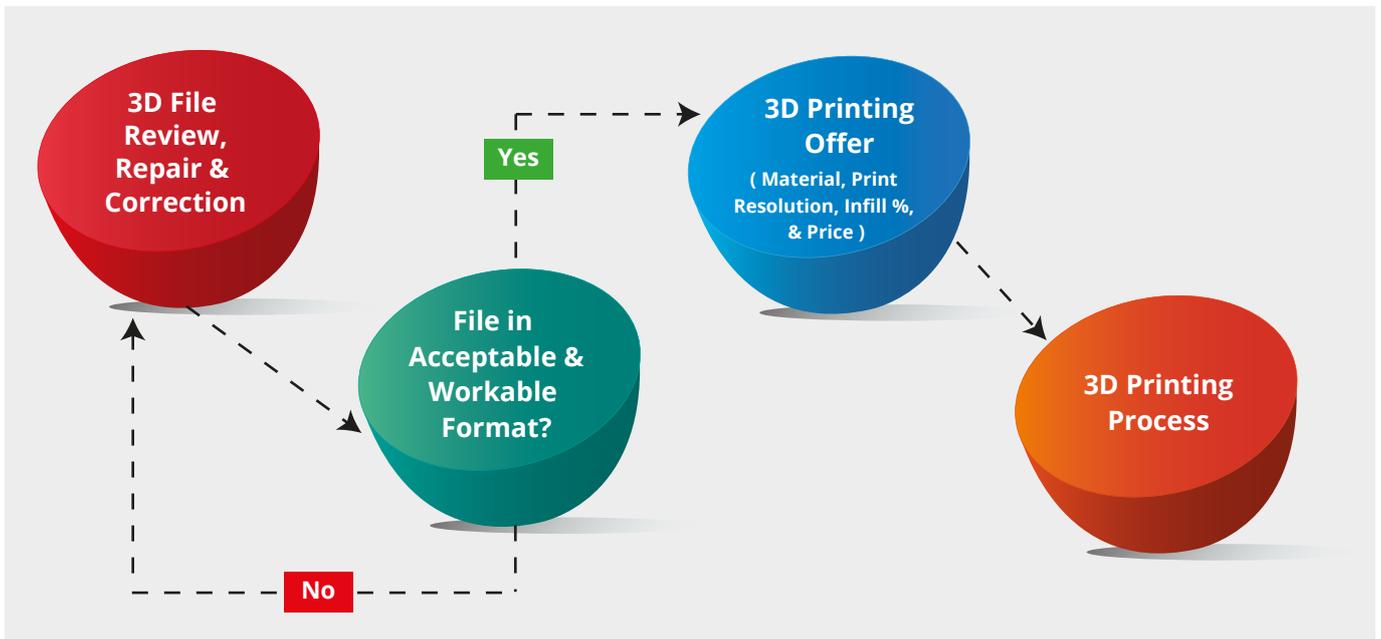
How do you take an idea and print it in **three dimensions**?

!! You Need a 3D Digital File !!



Once you know what you would like to print, you will need a 3D file. If you have one, great, you are off to a great start! Please send it to Systems 3D Group to be reviewed, potentially repaired or corrected, and then quoted.

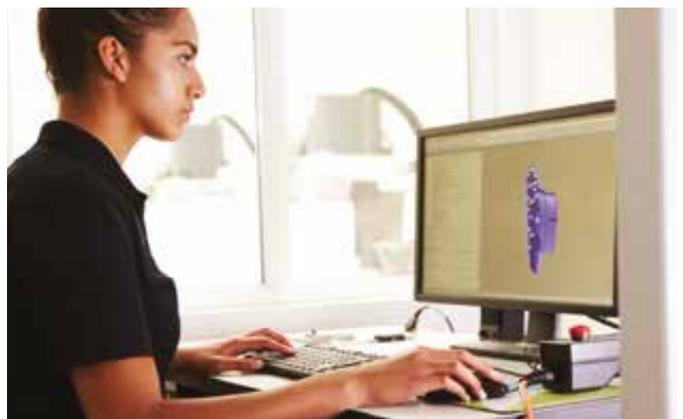
If you don't have a 3D file Systems 3D Group can scan your item with our **High-Resolution Scanner** to produce a 3D File to use. Once shape data of the item is acquired a printable 3D file will need to be created from the acquired scan data. ME 3D uses highly-intuitive Computer-Aided Design (CAD) software to create a solid model to do the 3D Printing. The produced 3D files are useable for a wide variety of manufacturing and design processes besides 3D Printing.

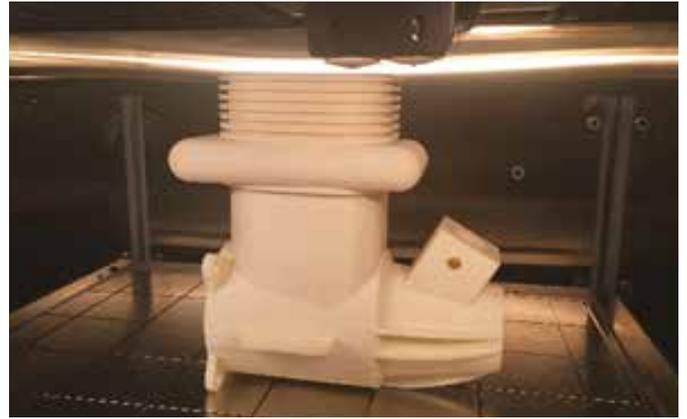
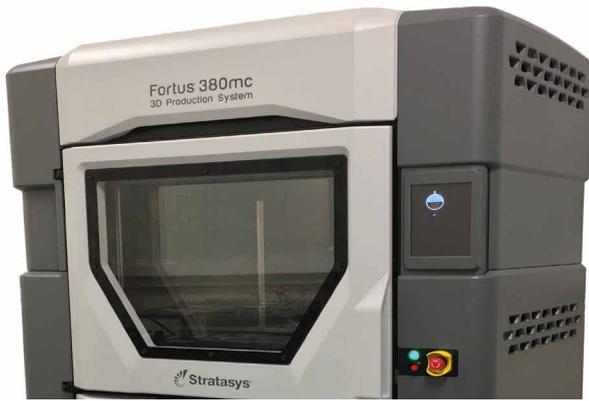


If you already have a file and it is in good form, we will have a discussion on what the end use of the product will be as this will determine what **3D Printing Parameters** are needed.

The parameters are:

- Material Type
- Layer Resolution
- Desired surface finish
- Infill Density
- Infill Pattern





These factors are influenced by the intended end use of the model and will have an impact on the cost of the component and finished appearance of the model. All factors can be adjusted to suit the required application and many times the customer's budget.

Once you have chosen your material, resolution, and infill % your file is ready for print.



Systems 3D Group offers a wide variety of materials for 3D printing. Please check our website for the most current listing. Layer resolution can vary from around 0.1 mm (100 Microns) up to 0.3 mm (300 Microns). Also there are a wide variety of infill densities and patterns available. The best one will be determined during consultation and based on what the end use of the component will be. Printing time varies greatly by model and chosen parameters but some prints can last of up to several days.

3D printers on average can only print up to a 45-degree angle so support structures are implemented to support overhanging and included surfaces. When the printing process is complete support structures are removed from the model either manually or through a washing process.

Due to the layered process of the 3D printing process, **ALL** 3D Printed Models will have layer striations to some to degree. The striations will vary based on the technology used to 3D print the model and will be visible on the model to one degree or the other. The appearance of striations also varies greatly based on the layer height and resolution used during the build process. A model can be printed at a very fine resolution to reduce the visibility of the striations, but this will impact the cost of the finished model. Very often attaining a sound model with ultimate functionality outweighs the need for a really “pretty model”.

When a 3D Printed model is to be used for aesthetic purposes or will be highly visible the model can be post-processed to reduce or eliminate the visibility of the striations, and this accomplished through post-processing processes such as:

- **Sanding**
- **Grinding**
- **Shot blasting**
- **Vapour smoothing**
- **Vibratory finishing**

After the surface is smoothed or flattened-out the object is ready for finishing processes such as:

- **Spray painting**
- **Wet Painting (Automotive style)**
- **Power Painting**
- **Metalizing**
- **Plating**
- **Chroming**

Very good examples where these post processes are used is in the auto industry, both on prototype vehicles and with restorations, and then with product prototypes.

Please do not hesitate to contact us with any questions you may have regarding 3D Printing or any of the post-processes available.



Systems 3D Group Limited
Unit F3, Holly Farm Business Park
Honiley
Kenilworth
Warwickshire
CV8 1NP
United Kingdom

Phone: +44 (0)1926 800 777

Email: info@systems3d.co.uk

Web: www.systems3d.co.uk