



ME3D

3D MANUFACTURING AND SERVICES

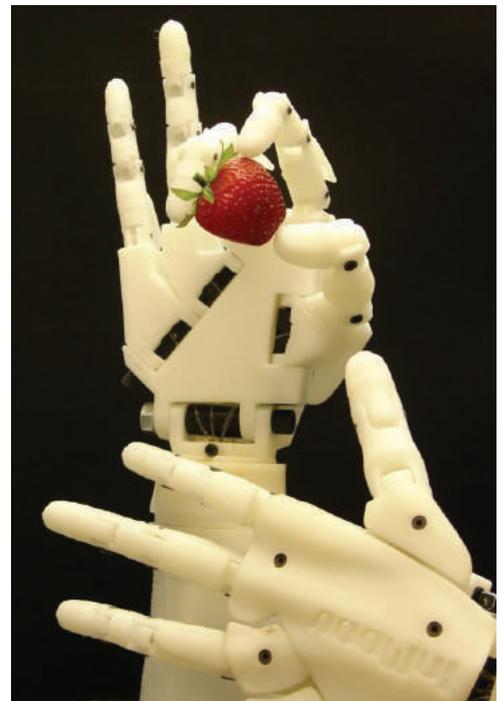
Understanding 3D Printing

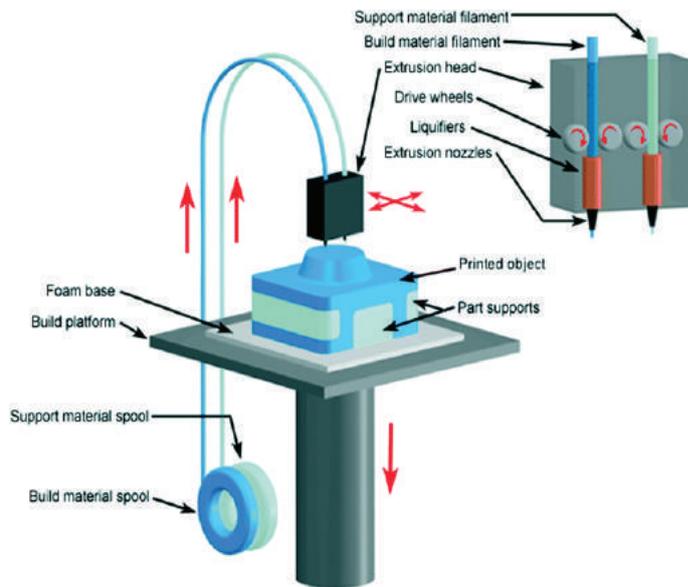


What is 3D printing?

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.

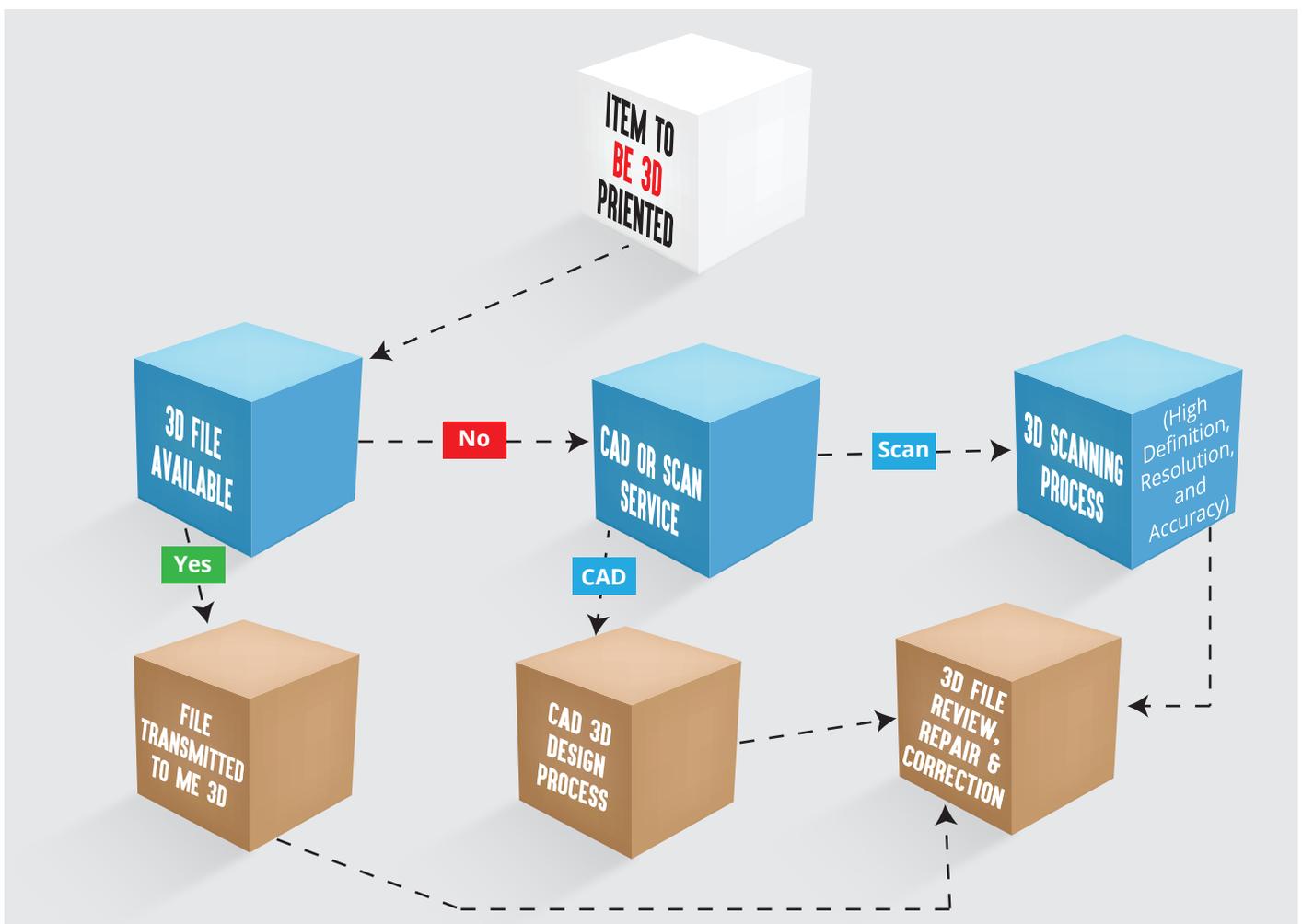
The controls and programs controlling a 3D Printer are overall very similar to that of a CNC mill or lathe.





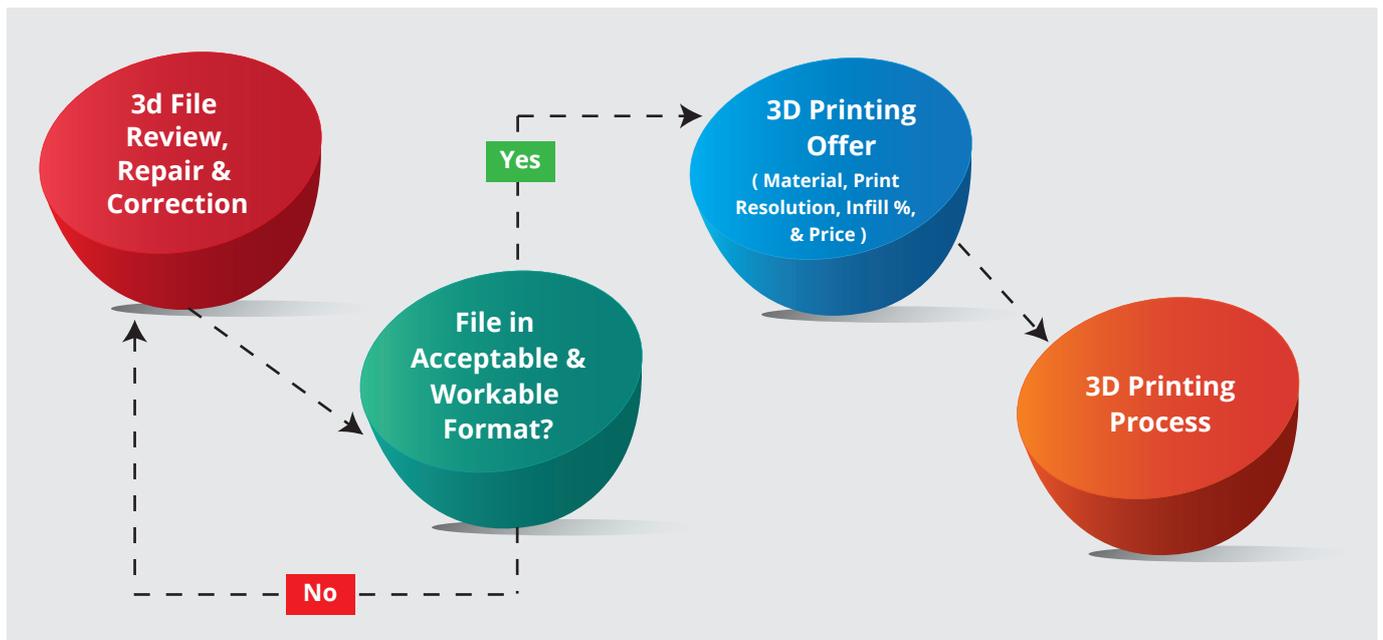
How do you take an idea and print it in **three dimensions**?

!! You Need a Digital 3D File !!



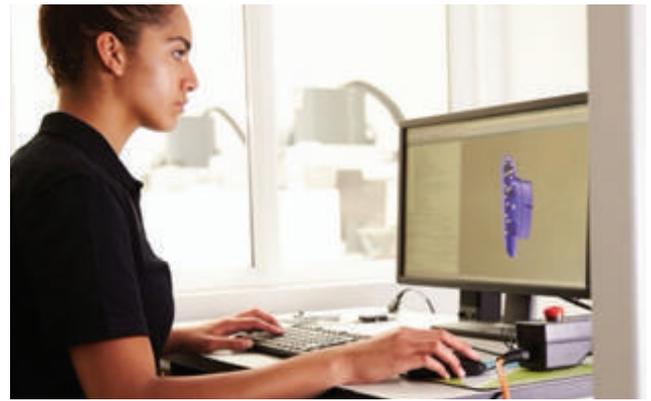
Once you know what you would like to print, you will need a 3D file, if you have one, great, you are off to a great start! Please send it to ME 3D to be reviewed, potentially repaired or corrected, and then quoted.

If you don't have a 3D file ME 3D can scan the item with our **High-Resolution Scanner** to produce a data cluster to work from. Once shape data of the item is acquired a printable 3D file will need to be created from the acquired shape data. ME 3D uses highly-intuitive Computer Aided Design (CAD) software to create a solid model to do the manufacturing from.



If you already have a file and it is in an acceptable format we can go directly to the decision-making process for deciding printing parameters:

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



All 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 of these factors can be adjusted to suit the required application and many times a predefined budget.

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



From there all that is to be done is to let the machine do its thing; the build process is mostly automatic. Each layer is usually about 0.1 mm thick, though it can be much thinner or thicker. Depending on the object's size, the machine and the materials used, this process could take hours or even days to complete. The machine is periodically checked to make sure there are no errors.

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

Due to the way 3D Printed models are manufactured, no matter what technology, striations will be visible on the model. This 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. Often times basic functionality outweighs a "pretty model".

Another way to reduce or eliminate the visibility of the striations is 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**