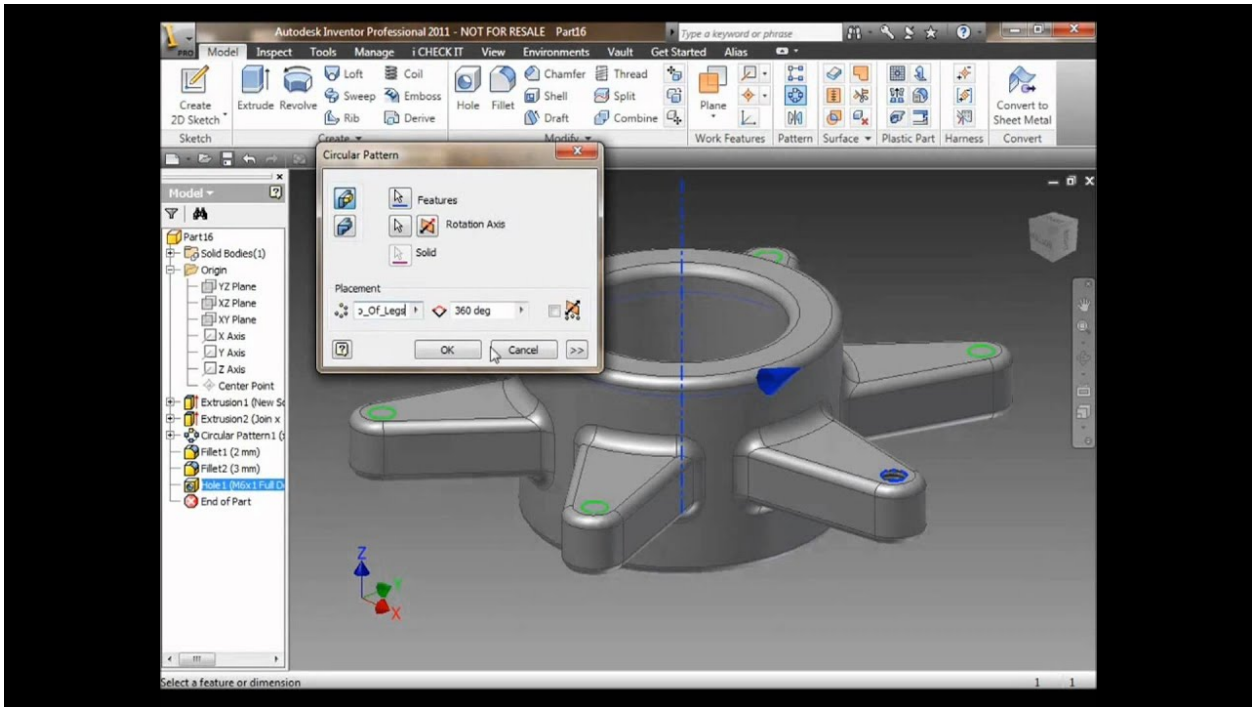
COMPUTER AIDED MANUFACTURING.

Computer aided manufacturing(CAM) is the use of software and computer-controlled machines to automate the machining process.
Machining is the process by which a material is cut into its final desired shape through a controlled process.

CAM allows us to bring our designs into life in the real world.
As such computer aided design (CAD) works hand in hand with CAM.

CAD focuses on the design of a part. This is how the product will look and function.



A CAD is either a 2D or 3D drawing and is the beginning of any design process. The design contains physical properties that are used by the CAM system. A design that cannot be used by a CAM system, however appealing is basically useless.

CAM system components.

1. Software - Tells the machine how to make a part and generates toolpaths.
2. Machinery - Does the actual machining ie turns raw material into finished product.

3. Post processing - Converts the toolpaths into a language the machine can understand

Any design from CAD is called a model. Once complete this model is loaded to a CAM system. This is done by exporting the CAD file and then importing it into the CAM software.

A CAM software prepares the model for machining by:

- Checking for geometry errors
- Creating a toolpath for the model
- Setting required machine parameters; cutting-speed, feed rate
- Decide the best orientation for a part to maximize machining efficiency. (Nesting)

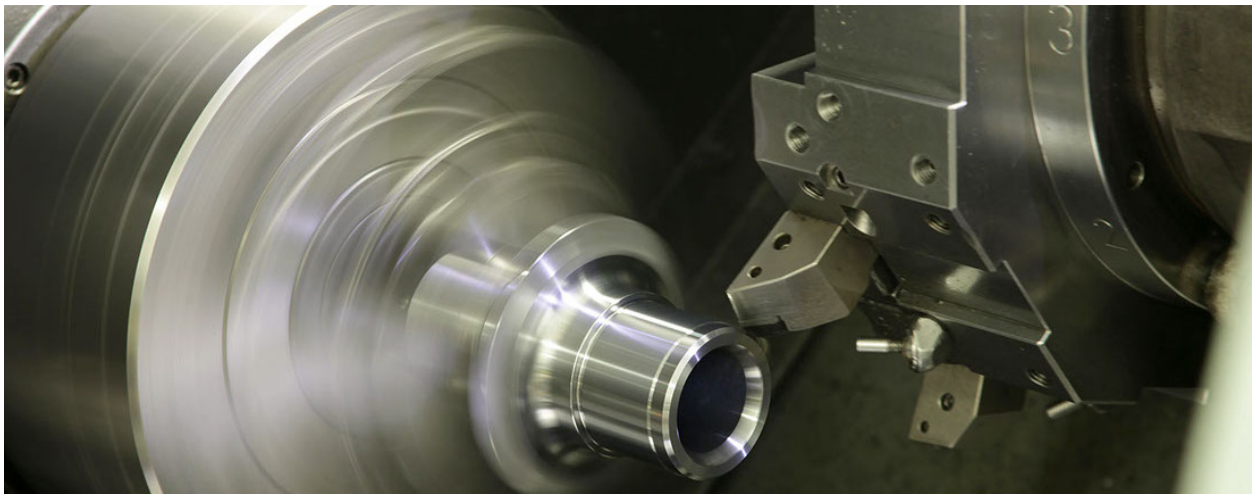
The software then sends the info to the machine to be produced physically.
This info is sent in the form of G-codes. This set of instructions controls the machine's actions in the form of : speed, feed rate, coolants etc
G01 X1 Y1 F20 T01 S500

G01 - Type of motion to coordinates x1,y1 ; Linear motion
F20 - Feed rate, distance travelled by the tool in one spindle revolution.
T01 - Tool select.
S500 - Spindle speed in rpm

CNC MILLING

Removes mass from a raw block of material

CNC LATHE



WIRE EDM

Used to cut any material that is electrically conductive.