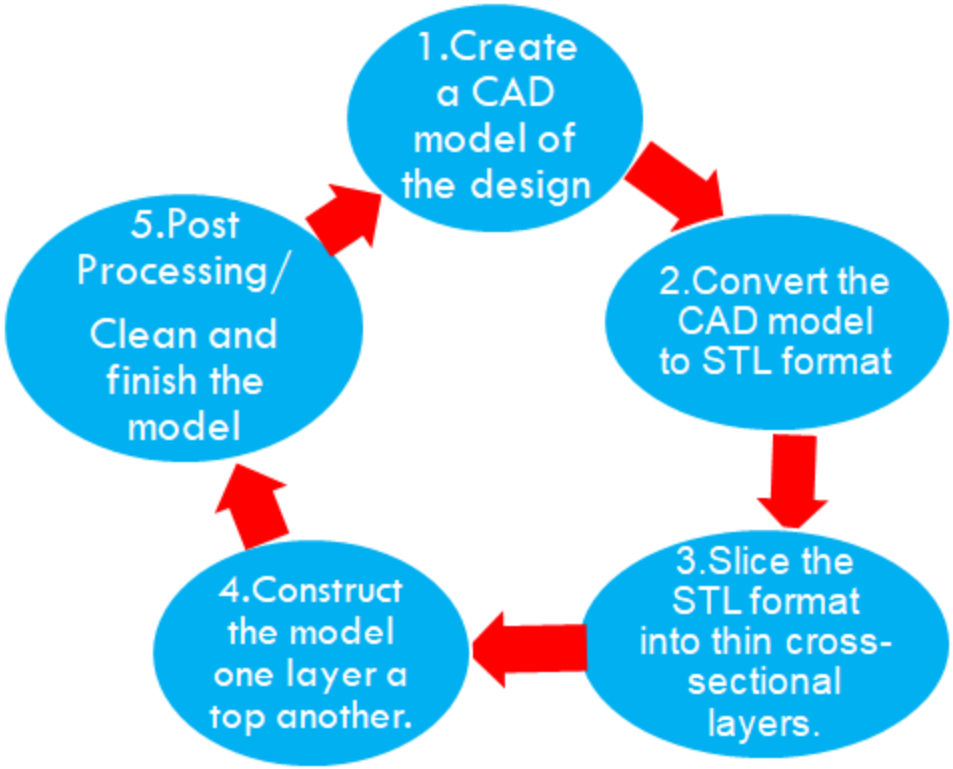
PROCESS CHAIN/BASIC STEPS IN 3D PRINTING



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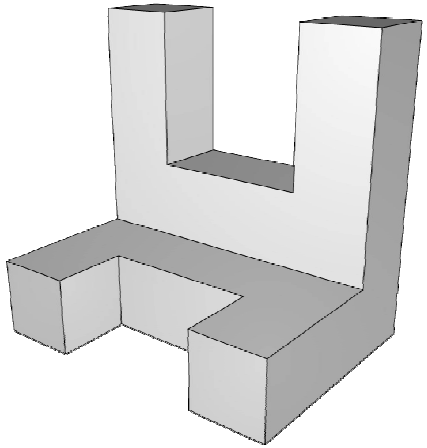
1. Create a CAD model:

- The first step is the CAD file creation. The final file or files must be in solid model format to allow for a successful prototype build.



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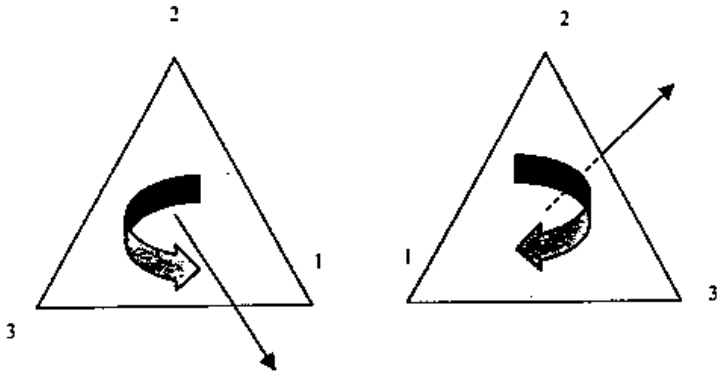
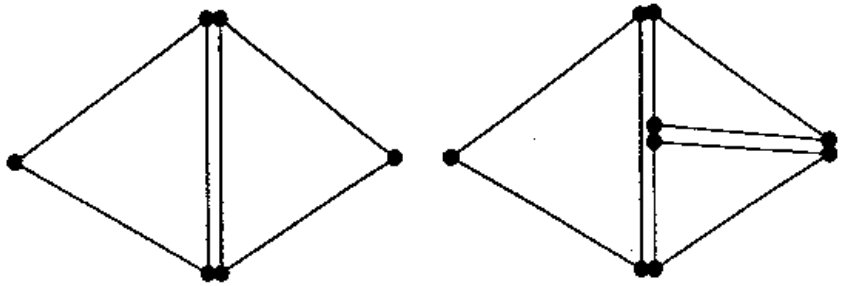
Important requirements of STL file generation:

1. **Right-hand rule:**
   - A clockwise vertex ordering defines an interior surface, and an anti-clockv.ise ordering the exterior surface.



2. Vertex-to-vertex rule

- A triangle must share exactly two common vertices with each adjacent triangle. This is known as the vertex-to-vertex rule.



3. Binary format

STL files are usually stored in binary format to conserve disk space.

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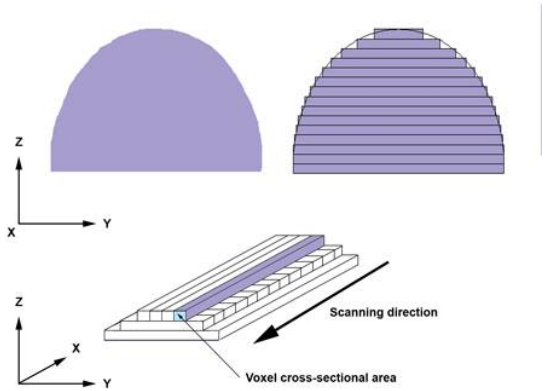
3. Slicing

- When the tessellated STL file is sent to the rapid prototype machine, the model is sliced into multiple horizontal layers.
- The pre-processing software slices the STL model into a number of layers from 0.01 mm to 0.7 mm thick, depending on the build technique.



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4. Construct the model one layer a top another.

- Once the final file formats are transferred to the RP device, the build process occurs.
- Most RP machines build parts within a few hours, but can run unattended for several days for large parts.
- The program may also generate an auxiliary structure to support the model during the build.

5. Post Processing

- Upon completion of the build process, post processing of the part must occur.
- This includes **removal of the part from the machine**, as well as any necessary support removal and finishing.
- Some photosensitive materials need to be fully **cured** before use.

EXAMPLE


CAD Model -3D Object
3D Cad Model
.STL File
Slicing Software
Layer Slices & Tool Path
3D Printer
3D Object