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Pre-printing Parts for Gluing

When printing big parts, you can separate your design into several parts and then glue them together to create the full assembly.

You can do this using your CAD software before the design is complete, or by using STL file manipulation software after the CAD design is already completed.

It is important to consider the following when gluing several parts together:

- Finding an easy way to connect the parts together accurately.
- Maintaining the dimensional properties of the glued parts as intended by the CAD design.

The Magics™ software cutting tool provides an easy and intuitive way to glue together multiple parts while achieving these goals.

The Magics software cutting tool as seen here has several options available. The following procedure is recommended when using this software tool:

1. Orient the part in view that coincides with the natural coordination system of the part (that is, front view, back view, left view, etc.). In this manner, you can get a clear perspective of where you draw the cutting line in relation to the part.
2. Draw the cutting line. It is recommended that you start with a point outside the part body and end with a point on the other side of the part body, thus creating a straight line across the part.
3. It is possible to choose between a triangle (most suitable to glued parts), square (most suitable to molds), jigsaw, or user-defined cut. You can also control the size and offset of the cutting type.
4. Make sure that you add a clearance between the cut parts. This leaves enough space for the glue and ensures that the final part maintains the designed dimensional properties. Note that the clearance value varies depending on the type of glue used and the recommended default value is 0.1 mm.

Two separate STL files are created when the cutting operation is complete, and they can be printed freely on the tray.

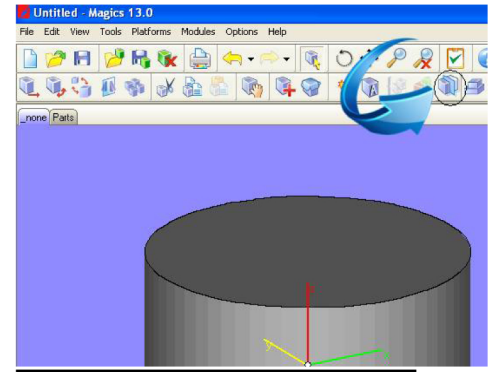


Figure 1. Cutting tool button

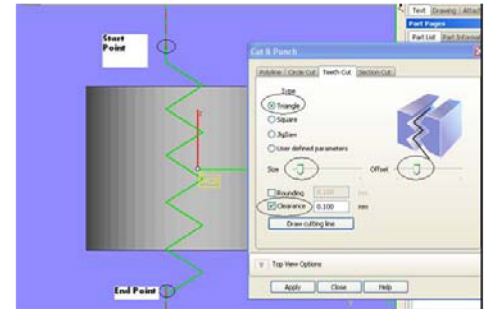


Figure 2. Cutting tool menu

Post-processing Parts for Gluing

The following process is recommended before gluing the parts:

1. After the parts are printed, use the water jet station to clean the parts.
2. Once the parts are cleaned, dip them in 2% NaOH solution diluted in water for 20 to 40 minutes. This removes all support material residues.
3. Wash again with water
4. Dry the parts in free air, or use pressured air to speed up the drying process.

Recommended Glue Types

The glue types most commonly used by Objet experts are super glues (also known as cyanoacrylate). Generally, cyanoacrylate is an acrylic resin that rapidly polymerizes in the presence of water (specifically hydroxide ions).

ALTECO- ACE –D is usually used with an activator to control the bonding time. Use of an activator spray can also be used to harden the residues as they spill onto the model. They can then be sanded off, thus preventing access glue from spreading on the parts.

To get an instant bond, the glue should be applied on the desired surface and then sprayed with the accelerator.

For more information on the glues and accelerators, access the following links:

- Glues: http://www.alteco.com.sg/industrial_gluerange_ace.shtml
- Accelerators: <http://www.hobbylinc.com/htm/hot/hotqa-6.htm>

Other Glue Types

Rigid Parts

- LOCTITE 401 – medium viscosity
- Permabond Ultra Fast 792 – ultra fast cure time, general purpose
- Al-fix – comes with activator
- Kleiberit 851.0 – with easy to use applicator cap

Flexible Parts

- Sico Met 8300 and High Speed Accelerator Spray – good for elastomers
- Permabond Black Magic 737 for flexible parts



Figure 3. Recommended glue types

Disclaimer

Objet Geometries Ltd. is not responsible for misuse of our products or their use in conjunction with unsafe or improperly maintained equipment or for uses other than intended as specified in this application note.

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