Tips for Users of AutoDesk® VIZ® for Creating Models for 3D Printing

Importing Geometry from AutoCAD or Architectural Desktop

Often the base geometry of a model in VIZ has been designed and imported from another AutoDesk application. These tools will result in a better and easier to manipulate polygon mesh within the file link manager.

Weld Threshold

It is important to use the weld feature within AutoCAD prior to importing the geometry into VIZ. This determines the size of the area, which vertices must be occupied to be welded. Vertices with distances equal to or less than this value are welded into a single vertex.

Weld

Turns on the Weld Vertices function. In most cases, you should leave this box turned on because unwelded objects cannot be unified or smoothed.

Unify Normals

This feature works best on 3D solids that have a thickness and ensures normals are set so that they point away from the center of an object making them visible.

Cap Closed Entities

Converts closed lines and polylines into VIZ geometry.

Remove Double Faces

Removes one of the pair wherever two faces are occupying the same location. This is highly recommended.

Exporting to .stl

The Edit Mesh modifier provides explicit editing tools for different sub-object levels of the selected object: vertex, edge, and face/polygon/element. The Edit Mesh modifier matches all the capabilities of the base Editable Mesh object. When possible, it is far more efficient and reliable to perform explicit modeling at the Editable Mesh level rather than store those edits within the Edit Mesh modifier. The Edit Mesh modifier must copy the geometry passed to it, and this storage can lead to large file sizes. The Edit Mesh modifier also establishes a topological dependency that can be adversely affected if earlier operations change the topology being sent to it.

There are, however, situations where using the Edit Mesh modifier is the preferred method.

- You want to edit a parametric object as a mesh, but want to retain the ability to modify its creation parameters after the edit.
- You want to store your edits temporarily within Edit Mesh until you are satisfied with the results before committing them permanently to an editable mesh object.
- You need to make edits across several objects at once, but do not want to convert them to a single editable mesh object.
- You have a modifier in the stack that must remain parametric, and the mesh must be edited after the modifier is applied.

VIZ has a number of tools for checking the quality of a mesh prior to exporting to .stl. These tools are located in the Modifier List drop down-down list under Mesh Editing.

.stl Check Modifier

The .stl Check modifier checks an object to see if it is correct for exporting to an .stl file format. To create a physical model, an .stl file must be a complete and closed surface. Using .stl Check to test your geometry before you export it can save time and money when the file is used to create the physical model.

Procedure

- Select the object, then on the Modify panel, choose Mesh Editing > .stl Check from the Modifier List.
- Turn on Check.
- The message in the Status group shows if errors are found. .stl Check indicates errors by selecting the problem geometry, assigning it a special material ID, or both.

Errors Group Choosing one of these options selects incorrect geometry specific to the choice, and selects it depending on the option chosen in the Selections group. Tip: While checking everything takes the longest amount of time, it is recommended if you plan to use the .stl file for generating a physical model.

- **Open Edge:** Checks for open edges (holes).
- **Double Faces:** Checks for faces that share the same 3D space.
- **Spike:** Checks for spikes, which are isolated faces that share only one edge with the object.
- **Multiple Edges:** Checks for faces that share more than one edge.
- **Everything:** Checks for all of the above.

Selections Group These options specify the level of incorrect geometry that has been selected, based on the settings in the Errors group.

- **Do Not Select:** When on, .stl Check doesn't select any part of objects in error.
- **Select Edges:** When on, .stl Check marks the edges of faces in error by selecting them. The selection of erroneous edges is visible in viewports.
- **Select Faces:** When on, .stl Check marks the faces of any object in error by selecting them. The selection of erroneous faces is visible in viewports.
- **Change Mat-ID:** When on (the default), .stl Check also marks faces in error by assigning them a unique material ID. Use the spinner to choose the value of the material ID that .stl Check uses.
- **Check:** Turn on to perform the .stl check. For complex models, expect a pause between the time you turn this on, and the time you see the reported errors in the Status group. Default=off.
- **Status:** Displays the number of errors when Check is on. This is error option dependent.
- **Tip**: If Select Edges is turned off, you can see faces in error by applying an Edit Mesh modifier and selecting by material ID at the Face sub-object level. You can also assign a Multi/Sub-Object material to the object to help you see where the errors are.

Cap Holes

Select the edges defining a hole and VIZ will cap the hole. This VIZ modifier works on planar as well as nonplanar holes.