



Rhino exporting

app: Rhino 3.0 & Studio MAX 6.0
date: September 2004
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1 what up?

Rhino is a great modelling and design tool, but the data will need to be used outside of the program. The two most common uses of this data are **prototyping** and **rendering**, which will be covered separately.



2 prototyping : analyze

Before you can export to the STL (stereolithography) file format, you must verify there are no holes in your geometry. [see reminder]

Test your geometry with two simple checks:

- a Analyze** → **Mass Properties** → **Volume**
Get a number? If yes, you are done.

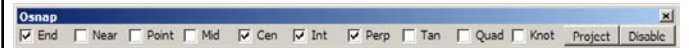
If not, you'll need to find out where the naked edges are and close them up.

- b Analyze** → **Edge Tools** → **Show Edges**
You must now find and close any and all openings.

Analyze → **Edge Tools** → **Join 2 Naked Edges**

reminder

The best way to avoid the hideous ugly "naked edge" problem is to create clean geometry in the first place!



ALWAYS use your snap settings when drawing curves.
ALWAYS use your axis or grid for symmetrical mirroring.

The rest of the process can be time-consuming and varies on a case-by-case basis.

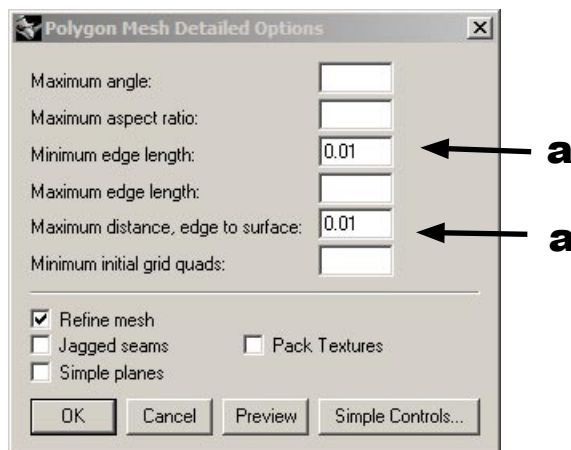
3 prototyping : convert

Select the piece (or pieces) to export
Tools → **Polygon Mesh** → **From NURBS Object**

- a** Clear out all the values except the two that are shown. The mesh resolution, or smoothness, is dependent on how much variation you will allow between the super-smooth NURBS model you created and the less-smooth angled mesh export.

This is what the setting **maximum distance, edge to surface** is really saying.

The numbers are based on your file units. For toy and product-sized objects, start with .01 mm (or .001 inch) and review the results.





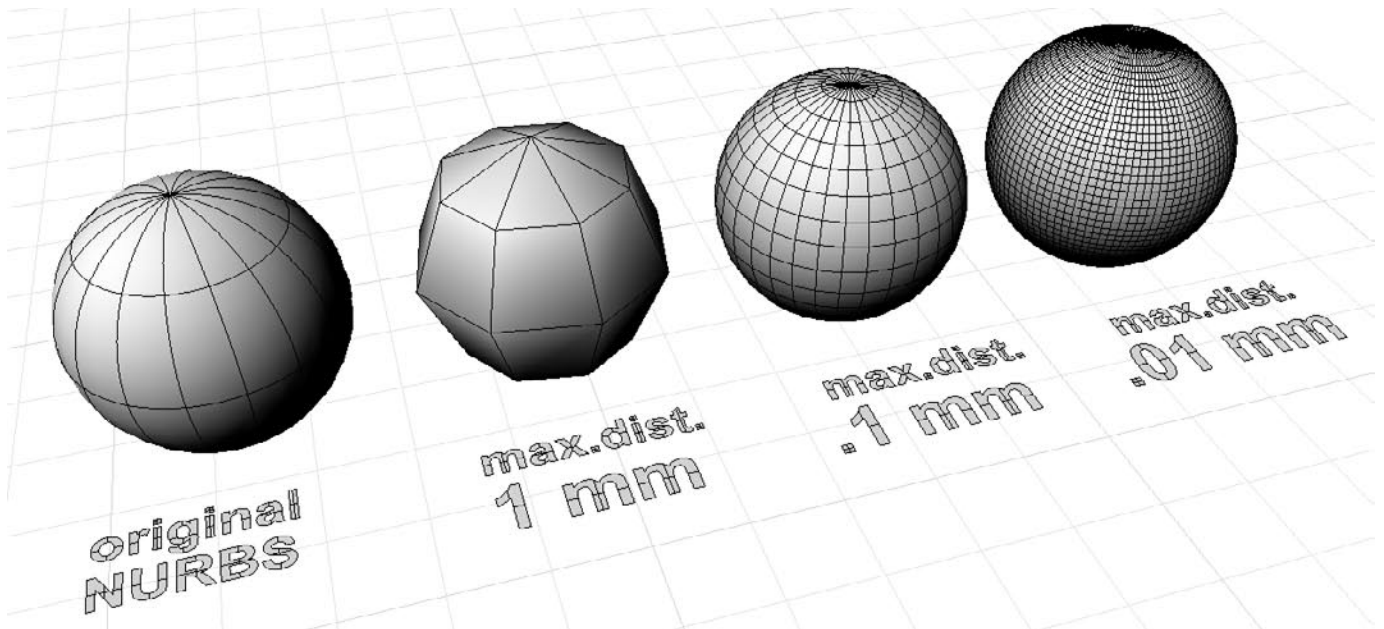
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4 prototyping : review

- a** After the NURBS is copied / converted to a mesh, move it away from the original NURBS to review it clearly. By default, it will be right on top!

After one or two tests, you should have a good idea what will be a good setting. Don't forget to factor in the resolution of the output device. You don't want the mesh to have 100 times more detail than the 3D printer or SLA can show!



- b** File → Export Selected →

Select the object to be exported, hit return, and choose file type:

- c** Stereolithography (*.stl)

You are done!



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5 rendering : overview

Rendering (and animating) are much less demanding than prototyping. In fact, we don't care the least about volume, naked edges, or wall thickness!


The trick with exporting for rendering is to "break" the model into as many pieces as you will need for different material assignments.

If you're not sure, go ahead and break it!


You can always make two adjacent pieces appear as one continuous piece -- as long as they are the exact same material.

6 rendering : split & break

There are three basic ways to "break" your geometry. It all depends on your model's complexity and the number of materials you plan to use for rendering. You can also use any combination of the approaches.

a Edit → Explode 

This method will break apart every single surface and leave them as separate entities. Best used when your model is fairly simple.

b Edit → Split 

This method requires you to create cutting planes or curves and manually separate. It can be hard if you need a complex edge shape.

c Solid → Extract Surface 

This method allows the most control, especially if you simply want to break stuff at intersection of surfaces.

Once separated, we use an export procedure similar to the prototyping method

File → Export Selected →

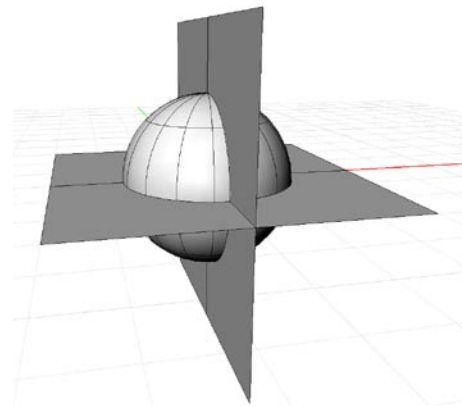
Select the object to be exported, hit return, and choose file type:

3D Studio (*.3ds) And you are done!

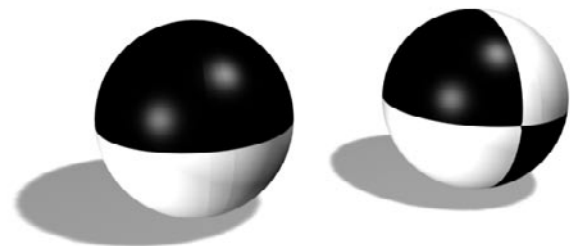
insider tip

It is not necessary to go through the meshing steps outlined here if you have a cool plug-in called **Rhino2MAX**. Made by NPowerSoftware, it allows you to directly import clean and fresh NURBS -- from Rhino into Studio MAX -- without any additional work!

The only drawback is that you must have this plug-in on any computer that will need to later open the Studio MAX file.



In Rhino, planes were used for splitting. The result is four pieces.



In Studio MAX, the four pieces were assigned two materials. Note how the left ball reads as only two pieces.