3D Contents / 3D Printer: make file

Some 3D printers cannot print data which has plural objects. Or cavity in the object results in unremovable supports inside and may cause bad appearance of the product. To resolve these problems, edit 3D data by "Voxel Process" or "Voxel division".

"Polygon Reduction" is also useful to avoid limits of 3D printer's maximum number of handling polygon. Processed data can be exported as a STL or a OBJ format, standard 3D printer file.

Remove needless objects

Change to "Surface Rendering" and check whether needless objects exist.



■ 🕞 🍇 Volume Rendering < Many noise exist besides fish object.

Show All Units Hide All Units									
1	Disp	Name		Туре	Rendering	Color			
E	\checkmark	SurfaceR		Voxel Surface	A				
n	ame [SurfaceR			f all units				
re	enderir	ng type 🗛 🔻 color		Back	ve Loa	ad			
		unit	_						
		Preference		New	Delete				
(М	easurement		Nonius	Solid Measure	ement			
	V	oxel Process	Vo	xel Division	Voxel Filt	er			
Polygon Reduction Polygon Clipping									
[Section Analysis Particle / Cavity Analysis Fiber Analysis								
[Voxel Rotational Trim Voxel Trim								
		export file							
	Voxel Polygon								

Open "Voxel Process" dialog from "Main Control".

Select "selected".



Select necessary object by click.



Press "Delete Non-selected" button.

Voxel Process
start point of process: x = 289, y = 296, z = 78, value = 20
designate center by click
target dipping plane
shape: sphere v of 20 voxel
fluctuate voxel value behavior: decrease by value
smoothing
🔘 contrast
 level off (assuming removal of void or inner particle)
✓ variation is gradually reduced from center to edge, finally 0
select / deselect continuous object by click Select All Operation
Delete Delete Non-selected
Export by Images Copy Polygon
all Invert Voxel and Border Values Fill Cavity
Back
Save Temporary Load the Temporary Data

Non-selected, needless objects are removed.



Close "Voxel Process" dialog.

Divide space

If cavity of the objects is connected with exterior space even a little, cavity is considered as a part of exterior space and function of filling cavity is no more effective. To resolve this problem, make wall at the connecting space to isolate cavity.

Show section of the objects and check if cavity is connected with exterior space.



Open "Voxel Division" dialog from "Main Control". Check "divide only connected with exterior space" and press "Apply" button.

Disp	Name		Туре	Rendering	Color		
\checkmark	SurfaceR		Voxel Surface	A			
name	SurfaceR		color	of all units			
rendering type A color Back Load							
render	ing type 🗛 🔻 co	lor	Back	Save Lo	ad		
render	unit		Back	Save Loi	ad		
render			Back New	Save Los Delete	ad		
	unit		Back				
	unit Preference		New (Delete	ement		
	unit Preference Measurement		New Nonius	Delete Solid Measur	ement		
Pol	Unit Preference Measurement Voxel Process		New Nonius	Delete Solid Measur	ement :er		

Voxel Division
target © space © object
parameters allowable rate (%) 5
V divide only connected with exterior space
minimum distance from divide plane's center to edge ginore 50 or more unit: number of voxels ginore 5 or less
Apply Back Image: show original rendering type Image: show original Image: show opacity (%)
select result select / deselect by click Select All Deselect All Deselect edge-connected
Update by Result Copy Result

The original objects (green) and selectable results (white) are drawn.



Press "Select All" button. All results are selected.

Voxel Division
target space o object
parameters allowable rate (%) 5
divide only connected with exterior space divide also exterior space
minimum distance from divide plane's center to edge ignore 50 or more unit: number of voxels
Apply Back
✓ show original rendering type B opacity (%) 100
select result select / <u>deselect</u> by dick
Select All Deselect All Deselect edge-connected
Update by Result
Copy Result



Press "Update by Result" button. Wall is generated and cavity isolated (red arrow).



Close "Voxel Division" dialog.

Fill Cavity

Open "Voxel Process" dialog from "Main Control", select "all" and press "Fill Cavity" button.

	Name	Туре	Rendering	Color			
	SurfaceR	Voxel Surface	A				
name render	SurfaceR Ing type A color unit Preference		of all units	ad			
	Measurement	Nonius	Solid Measure	ement			
	/oxel Process	Voxel Division	Voxel Filt	er			
	ygon Reduction	Polygon Clipping					
Pol	Section Analysis Particle / Cavity Analysis Fiber Analysis						
	ection Analysis	Particle / Cavity Analysis		y 313			

Voxel Process	
start point of process:	
🔘 screen	
designate center by click	
target dipping plane	
shape: sphere v of 20 voxel	
fluctuate voxel value behavior: decrease by value	
moothing	
🔘 contrast	
level off (assuming removal of void or inner particle)	
✓ variation is gradually reduced from center to edge, finally 0	
© selected	
selected select / deselect continuous object by click	
Select All Deselect All	
operation	
Delete Non-selected	
Export by Images Copy Polygon	
Invert Voxel and Border Values Fill Cavity	
Back	
Save Temporary Load the Temporary Data	

Cavity is filled.



Select "selected", click necessary objects on the screen and press "Delete Non-selected" button. Selected objects are drawn yellow.



Reselect necessary objects and press "Copy polygon" button to copy selected polygon data to "Main Control". Close "Voxel Process" dialog.

To export a file for 3D printer at this time, press "Polygon" button of "export file" box selecting copied unit and designate file format.

Voxel Process				
start point of process: x = 289, y = 296, z = 78, value = 20	Show A	l Units Hide All Ur	nits	
🔘 screen	(
designate center by click		Name	Type	Rendering Color
target dipping plane	V	ProcPoly_0	Surface	A
shape: sphere voxel		SurfaceR	Voxel Surface	A
fluctuate voxel value behavior: decrease by value				
smoothing				
🔘 contrast				
\bigcirc level off (assuming removal of void or inner particle)	0.0000	ProcPoly_0	color c	of all units
√ variation is gradually reduced from center to edge, finally 0		ng type A 🔻 col	lor Back	ave Load
selected select / deselect continuous object by click Select All Deselect All		unit Preference	New	Delete
operation	N	leasurement	Nonius	Solid Measurement
Delete Delete Non-selected	V	oxel Process	Voxel Division	Voxel Filter
Export by Images Copy Polygon	Poly	gon Reduction	Polygon Clipping	
	Se	ction Analysis	Particle / Cavity Analysis	Fiber Analysis
Invert Voxel and	Voxe	Rotational Trim	Voxel Trim	
Border Values Fill Cavity		export f	file	
Back			Voxel Polygon	\supset
Save Temporary Load the Temporary Data				

Reduce Polygon

Tremendous polygon data may exceeds 3D printer's maximum number of handling polygon. You can reduce polygons by "Polygon Reduction".

Select objective unit on "Main Control" and press "Polygon Reduction" button. Settle "target rate" to reach "target number of polygons" and press "Apply" button.

	Polygon Reduction
Show All Units Hide All Units	original
Disp Name Type Repdering Color	number of polygons 3499192
ProcPoly_0 Surface A Surface A	parameters maximum changeable angle of plane 15 threshold angle of keen point 20 target rate (1-99%) 10
name ProcPoly_0 color of all units rendering type A ▼ color Back Save Load unit Preference New Delete	target number of polygons 349919 Correct intersection check error (low speed)
Measurement Nonius Solid Measurement Voxel Process Voxel Division Voxel Filter Polygon Reduction Polygon Clipping Section Analysis Particle / Cavity Analysis Fiber Analysis	current number of polygons 3499192(100.00%)
Voxel Rotational Trim Voxel Trim export file Voxel Polygon	rendering type A v opacity (%) 100 v

Uncheck "show original" to show reduced polygons only. Now number of polygons is reduced to 6.60% of the original. If "intersect error" occurred, reduction with "correct intersection check error (low speed)" checked may effect.



Press "Copy Result" button to copy reduced polygon data to "Main Control". After closing "Polygon Reduction" dialog, press "Polygon" button of "export file" box selecting copied unit and designate file format.

Polygon Reduction		-		
original	Show	All Units Hide All Un	nits	
number of polygons 3499192	Disp	Name	Туре	Pendering Color
parameters		ReductPoly_0	Surface	D D
maximum changeable angle of plane 15 🔹		SurfaceR	Voxel Surface	Α
threshold angle of keen point 20 💌				
target rate (1-99%) 6				
target number of polygons 209951		ReductPoly_0		of all units ave Load
✓ correct intersection check error (low speed)	rende	ering type D ▼ col	or Back	
Apply Back		Preference	New	Delete
current		Measurement	Nonius	Solid Measurement
number of polygons 230878 (6.60%)		Voxel Process	Voxel Division	Voxel Filter
show original	P	olygon Reduction	Polygon Clipping	
rendering type A 🔹 opacity (%) 100 📩		Section Analysis	Particle / Cavity Analysis	Fiber Analysis
▼ show result	Vo	xel Rotational Trim	Voxel Trim	
Copy Result		export f	ile Voxel Polygon	>