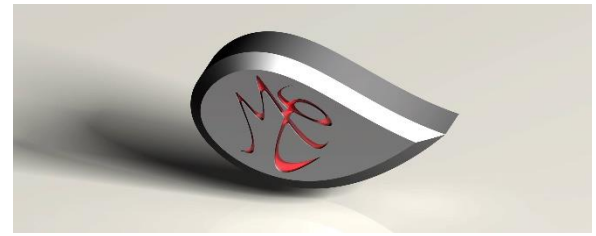# MANAGING STL FILES WITH CATIA

How to generate a STL file for more complex parts
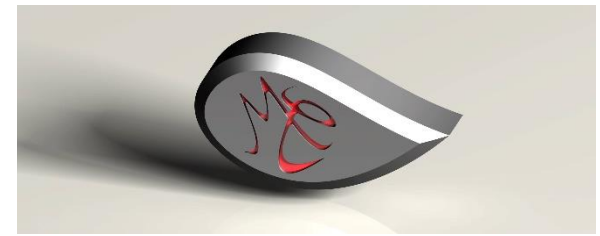
[Basics]

STL files

→ Usually STL files generated by easy-use / low-cost CAD software have poor quality

→ I found a lot of STL files on the internet and when I tried to open them they were totally distorted

→ Generating STL files with CATIA usually will result in having a good quality of the STL file, but for a optimal and personali zed quality of the STL you will have to do it manually -> this process is described in the following slides
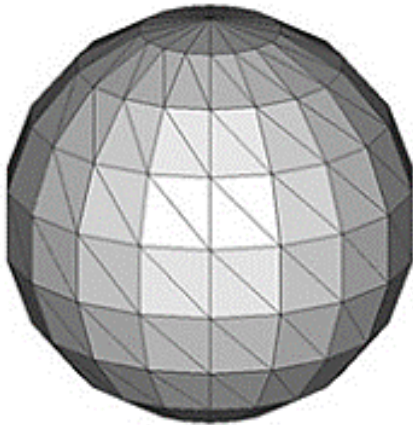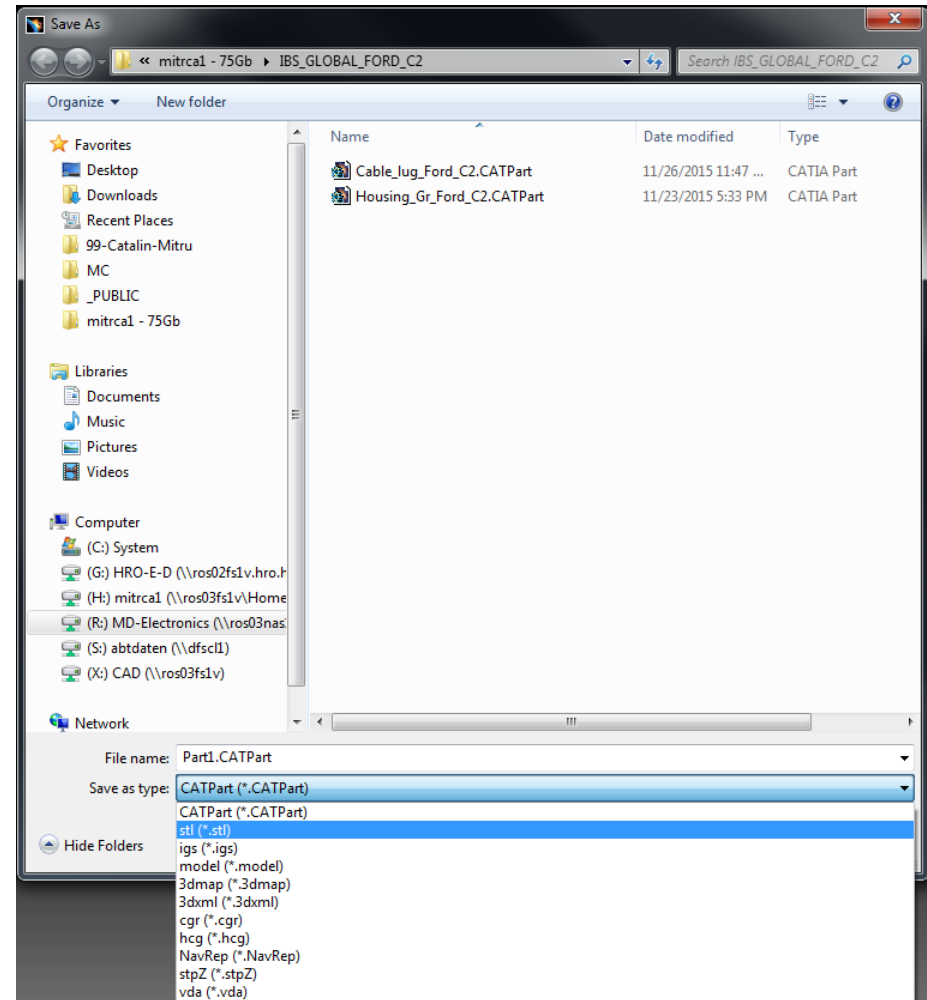
Simple method

Usually users save STL file by the most easy method:
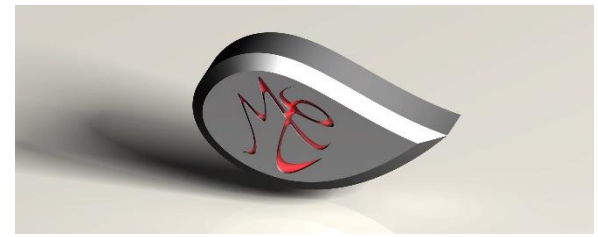File -> Save As -> STL

This method is ok for "simple" parts.

.

Picture 1

Advanced method
General description

For more complex parts (small radii, complex surfaces, smooth curves…) you need a higher density of the points.
Or if you have a simple part you don't need such a high density and you want to reduce it in order to reduce the size of the STL file. In this case you can generate a more Rough STL file
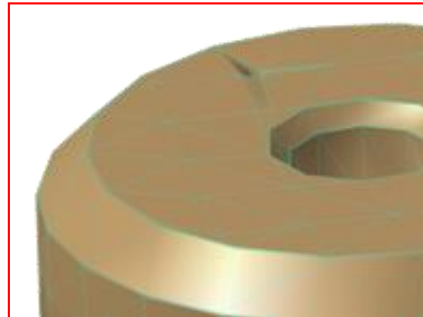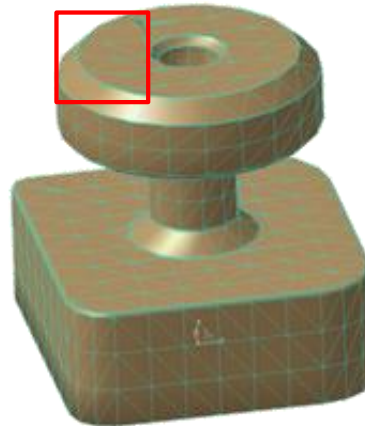
If the STL file is not "smooth" enough then that is what you should expect in the final model.

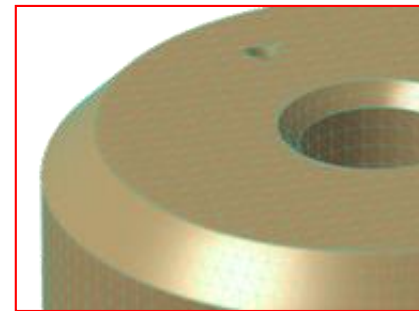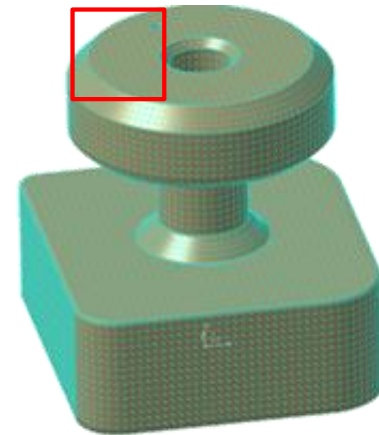**Normal** STL file generated with "simple method"
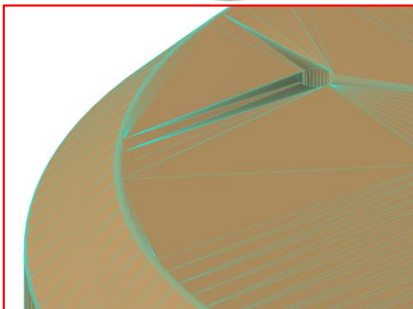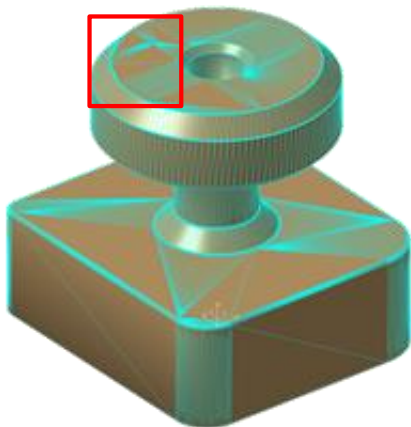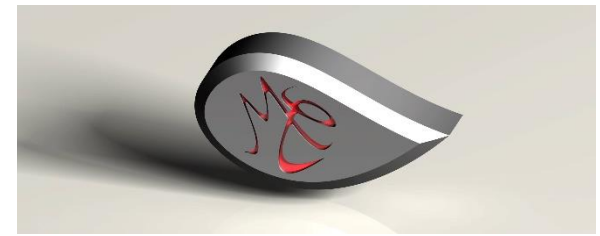
Rough STL file generated with "complex method"

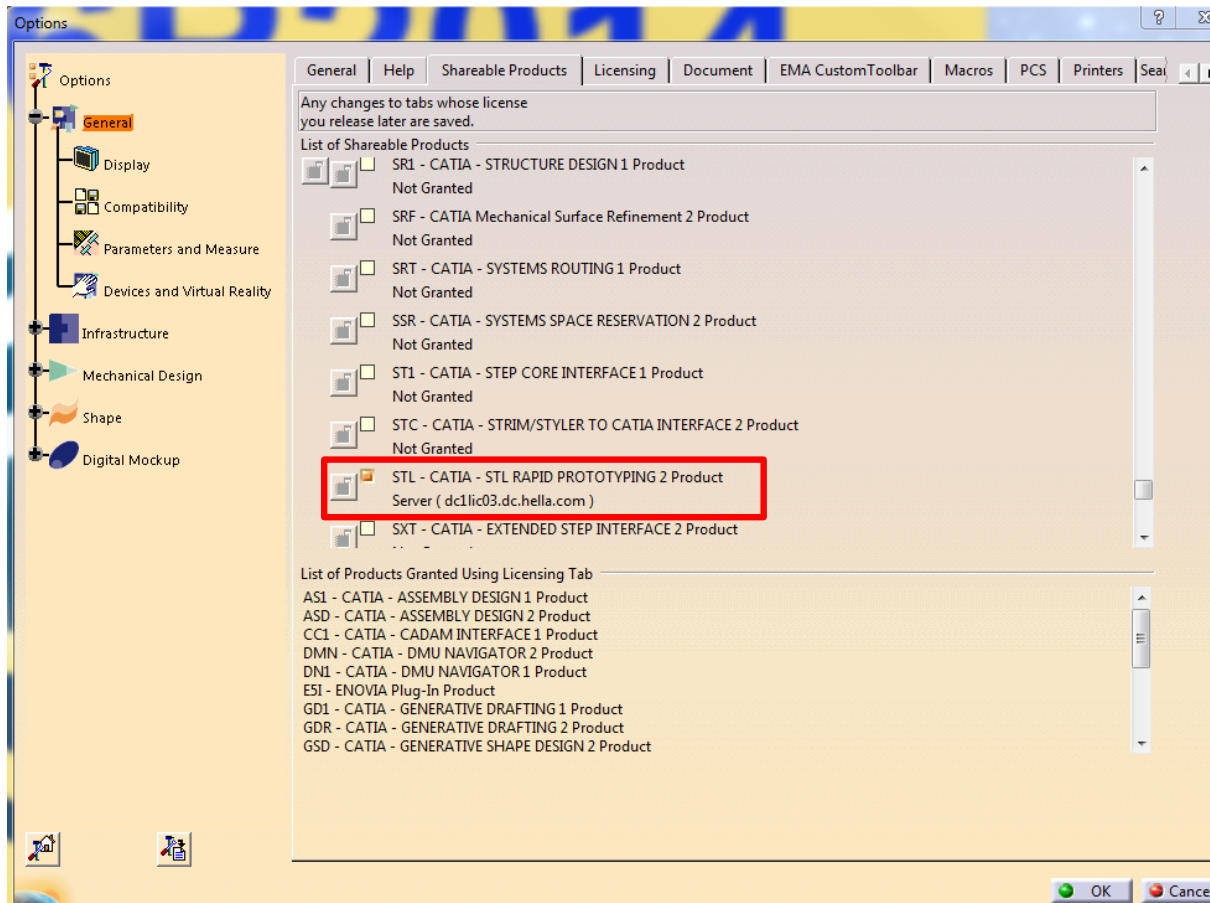**Smooth** STL file generated with "complex method"

Picture 2

Picture 3

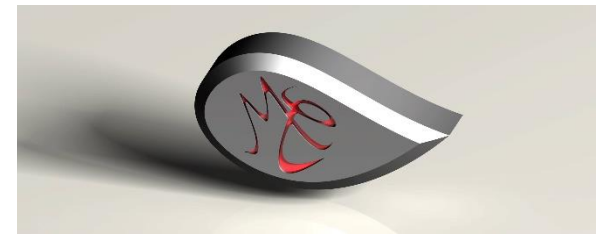Picture 4

Advanced method
How to work with this method

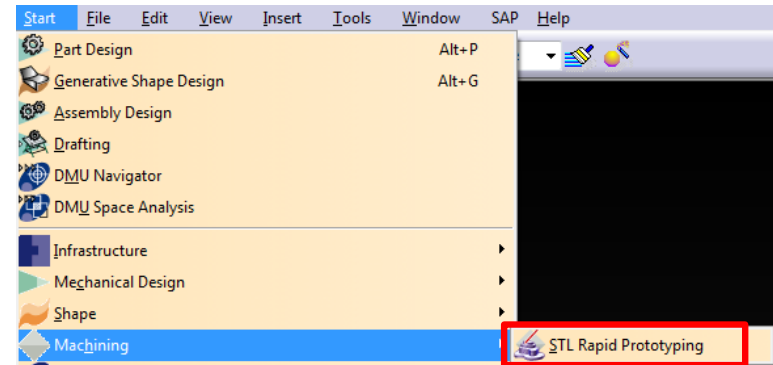→ You will need the license: STL

Picture 5

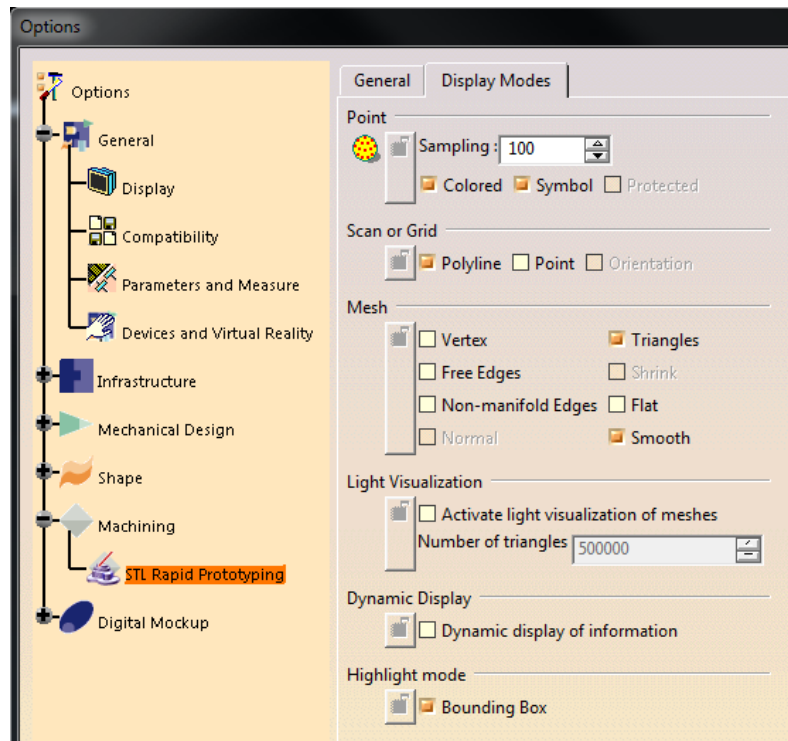# Advanced method
How to work with this method

→ Open your CATPart and go to **STL Rapid Prototyping**

→ If you have an Assembly you will need to generate a CATPart from it because this module **does not work with CATProducts**
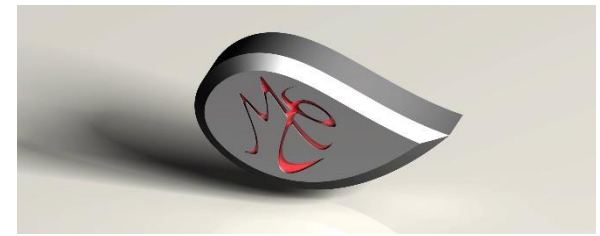
Picture 6

Picture 7

→ In order to see the points and triangles you will have to update your settings for STL Rapid Prototyping:

Tools -> Options -> *see Picture 7*

Advanced method
How to work with this method

Usually used functions

STL Import

STL Export

Tessellation
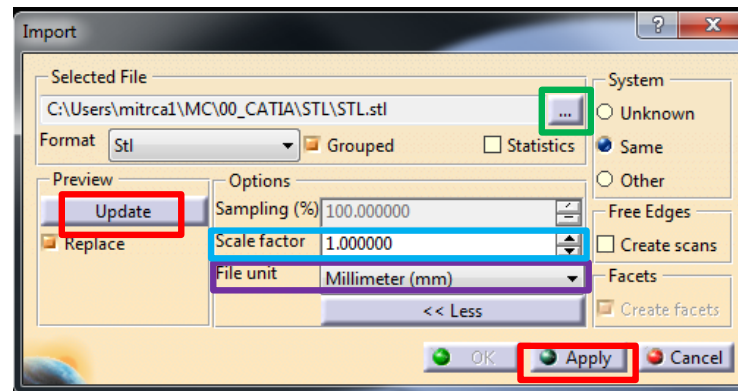
Interactive Triangle Creation

Information

Picture 8

→ In this tool you can import/export, repair etc. a STL fie

▪ STL Import:

Picture 9

Select your STL File, and the measurement Unit in which the file was created.

You can always **Scale** your STL.

To Preview you file, click **Update** (under preview) or **Apply**

After you click OK, if you want to change the initial parameters again you will have to import the file again.

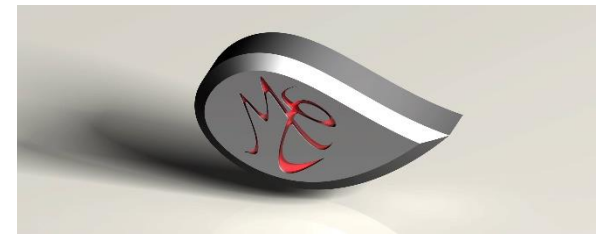The imported file will appear under the Geometrical set that is *Defined in work object*
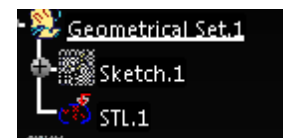
Picture 10

Advanced method
## How to work with this method

- Tessellation

For users with FEA experience, the tessellation works in a similar way like the Mesh.

Click on Tessellation icon –> The windows from Picture 1 will appear.

*Select the ❄ *Body* / 🌼 *Geometrical Set* that you want to tessellate, then click Apply. The default generated tessellation is the one that is generated with *File -> Save As -> STL* command.

*The Body / Geometrical Set selected must be <u>Shown</u> during selection.

* You can select two or more different bodies, or if you have surfaces, you can select as many as you want, even from different Geometrical Sets, but you have to select the individually, you can't select two different Geometrical Sets
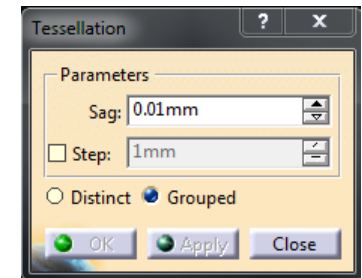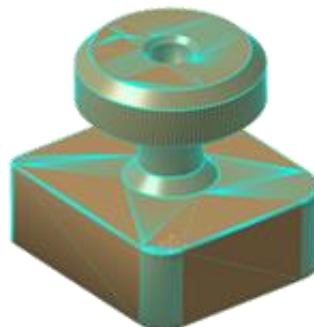
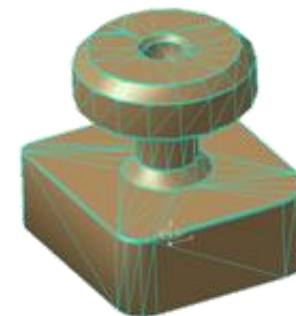Now you can "play" with the Parameters until you get the desired tessellation:

➢ **<u>Sag</u>** - that is the maximum distance between the geometry and the triangles

Tessellation

Parameters

Sag: 0.01mm

☐ Step: 1mm

○ Distinct ● Grouped

OK Apply Close

Picture 11

Picture 12
Sag 0.05mm
(Step 8.5 mm)
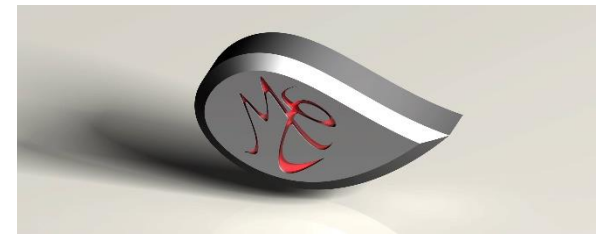
Picture 13
Sag 0.01mm (Default)
(Step 8.5 mm)
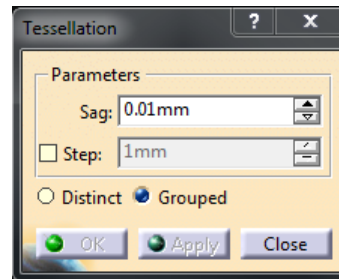
Picture 14
Sag 0.5mm
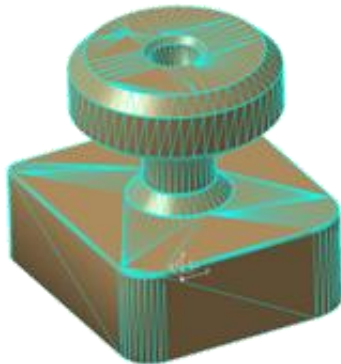(Step 8.5 mm)

Advanced method
How to work with this method

➢ **Step** – controls the length of the triangles
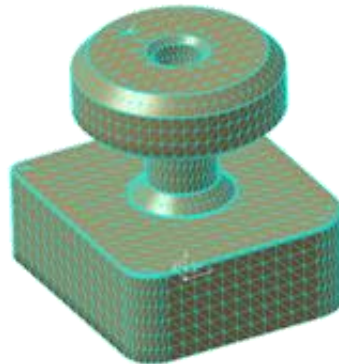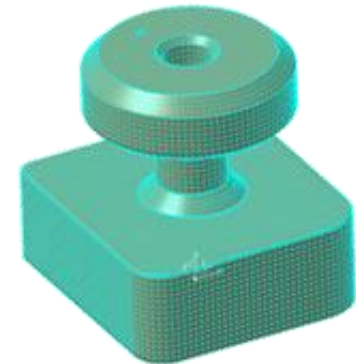
Check the Step box and set the value

Picture 11

Picture 15
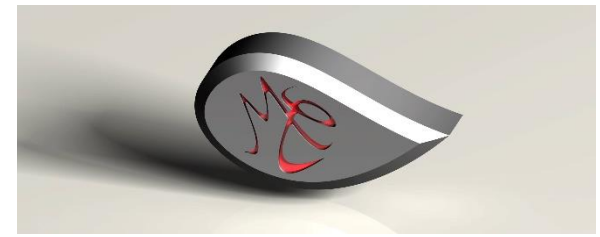Step Default
(Sag 0.05mm)

Picture 16
Step 5 mm
(Sag 0.05mm)

Picture 17
Step 2 mm
(Sag 0.05mm)

➢ **Grouped / Distinct** – If you select two or more Bodies / Surfaces then the tessellation generated can be just one **(Grouped)** or you can have as many tessellations as the Bodies / Surfaces selected **(Distinct)**
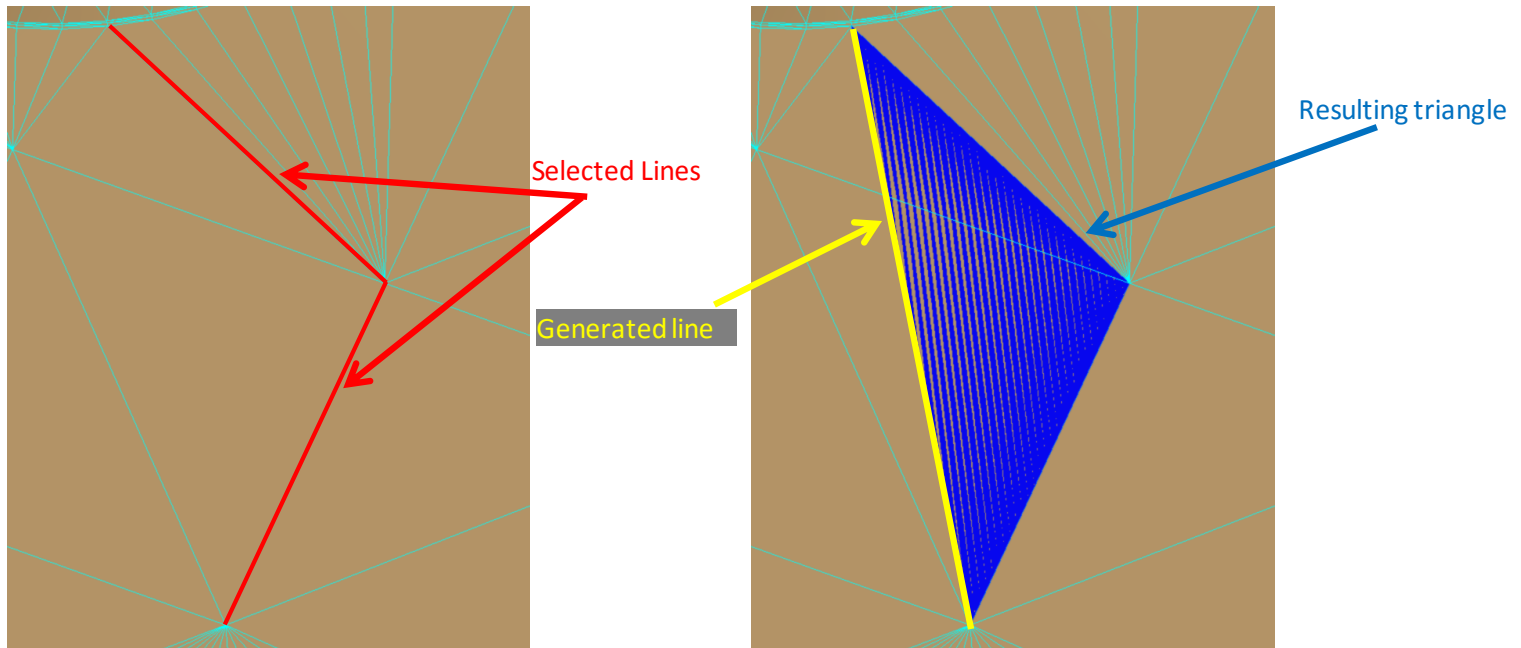
Advanced method
How to work with this method

▪ Interactive Triangle Creation - create user defined triangles on the Tessellation already created.

If you want to add more triangle on a specific surface because it's more delicate then you should use this function.

Click on the Interactive Triangle Creation icon and then select two intersecting lines.
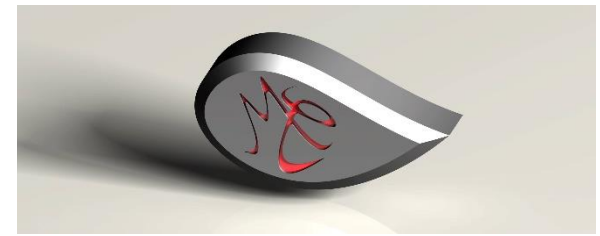
A third line from the open points of the initially selected lines will be generated.

Selected Lines
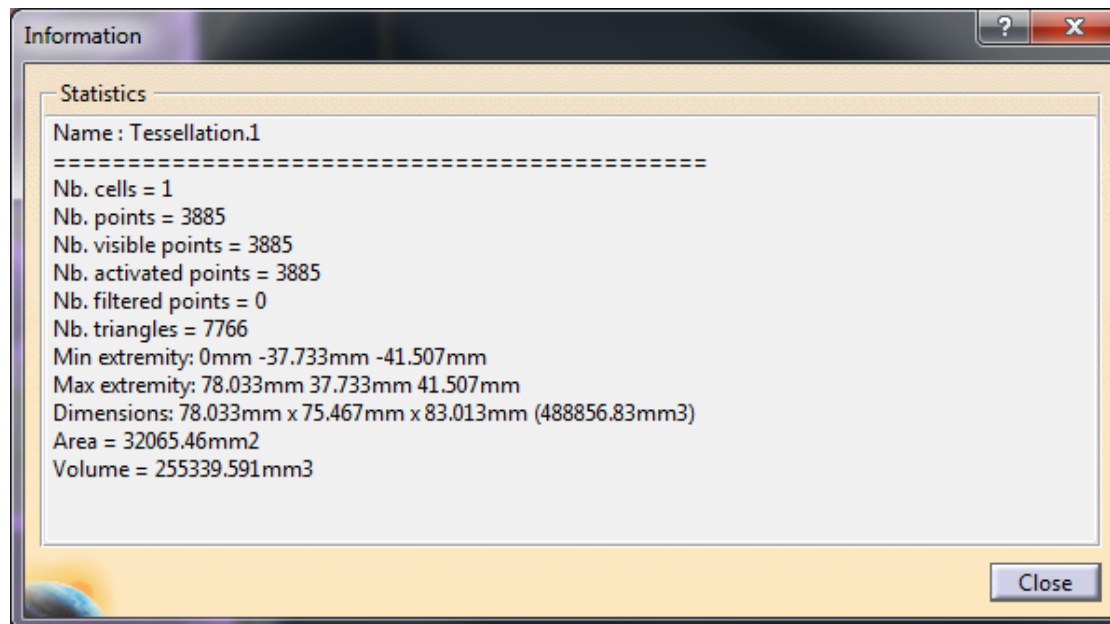
Generated line

Resulting triangle

Picture 18

Advanced method
How to work with this method

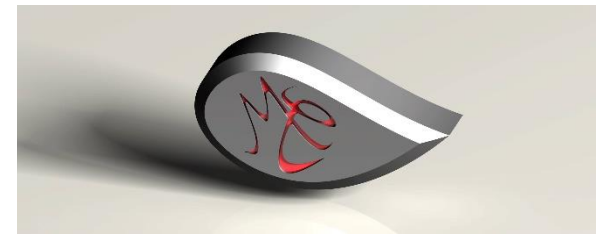- Information ⬚ - provides information regarding the cloud of points

Click on Information Icon and then select the Tessellation ⬚

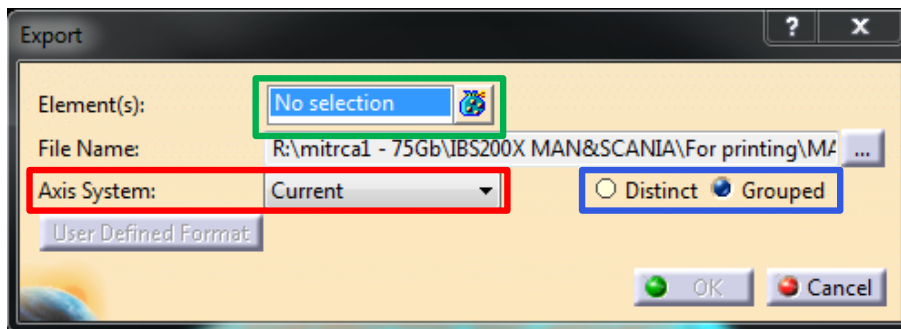Picture 20

Advanced method
How to work with this method

- STL Export

After generating the Tessellation that you desire, click on the STL Export Icon to Save it as an STL

Picture 21

If you have one or more Tessellations generated then just select them all.

You can chose to have your STL file Grouped or Distinct (as described in the Tessellation slide) if you have one or more Tessellations.

You can chose the Axis System of the exported STL file.

For more detail information about the STL Rapid Prototyping functions you can check the CATIA Help.

MANAGING STL FILES WITH CATIA

How to generate a STL file for more complex parts

[Basics]

Tutorial done by **Cătălin Mitru**

https://www.facebook.com/**MC3dprint**/