



Design Overview LS

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22.03.2011

Building Chamber

Formiga P100

- 200 x 250 x 330 Standard
- 190 x 240 x 330 for PrimePart DC

Eosint P395

- 340 x 340 x 620 Standard
- 310 x 310 x 620 PrimePart DC
- 290 x 290 x 290 PA 2202 black

Eosint P760

- 700 x 380 x 580

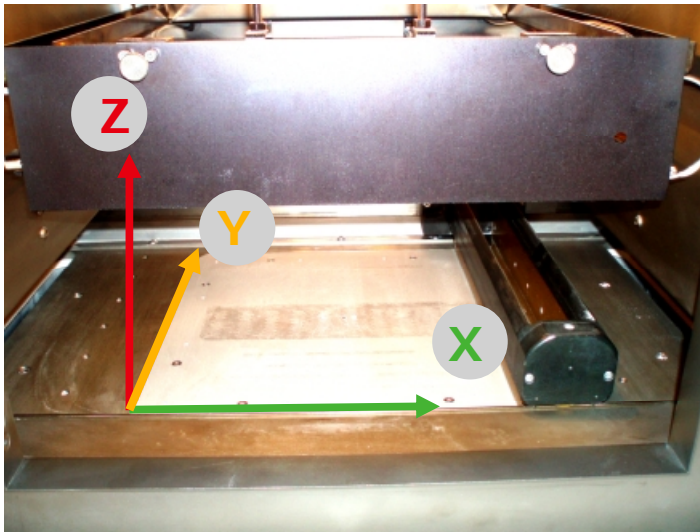
Attention: Building Chamber = Part + Scaling !!!!!

- The possible part size is depending on the scaling factor
- scaling of 3.2 means a possible part size of 329 mm in x direction
- It is not possible to build a 340 x 340 x 620 mm part for P390 !



Coordinates

- X à direction of recoater
- Z à direction of platform



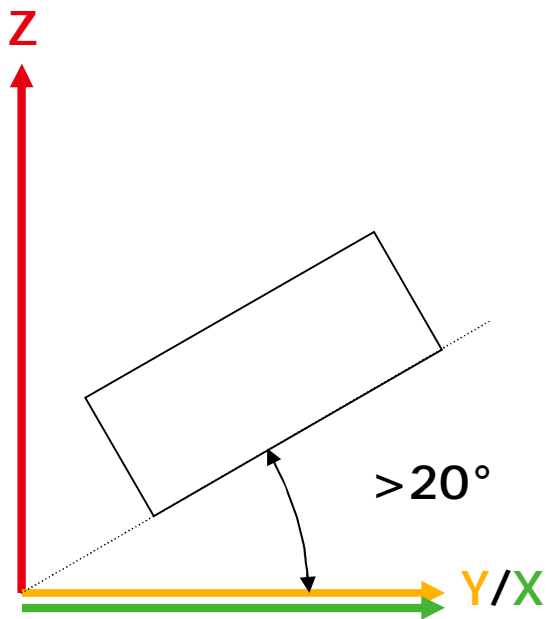
Process chamber P390



Machine P730

Steps

- Visibility and size of layer steps depend on layer thickness.
- Try to avoid flat areas with angles below 20° to XY-plane to bypass layer steps.
- Smaller angles possible but depending on the layer thickness thinner \rightarrow better



Hinges

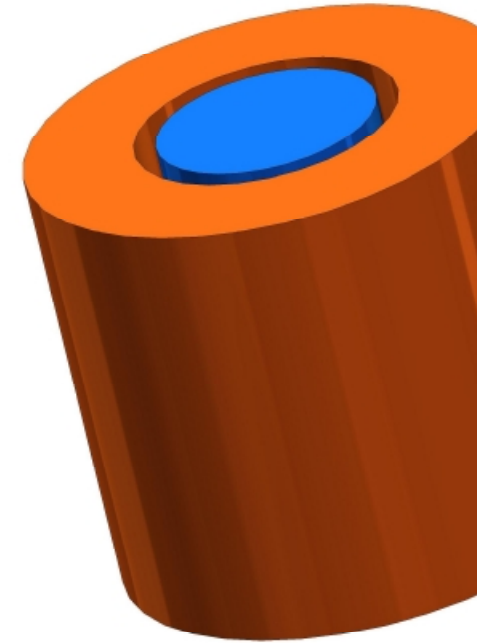
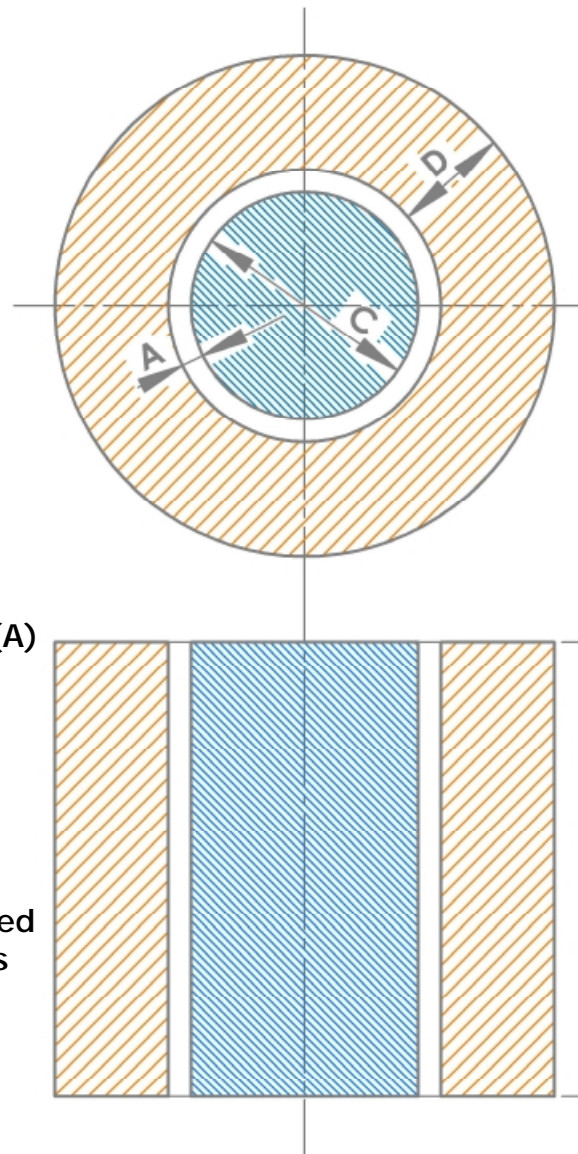
Gaps (A) for Hinges:

- x/y: 0.3 mm - 0.5 mm
- z: min 3 layers

Relevant influencing variables:

- gap between bush and bolt (A)
- length of the hinge (B)
- diameter of the bolt (C)
- thickness of the surrounding bushing (D)
- building direction

smaller gap possible with advanced geometrie → training design rules



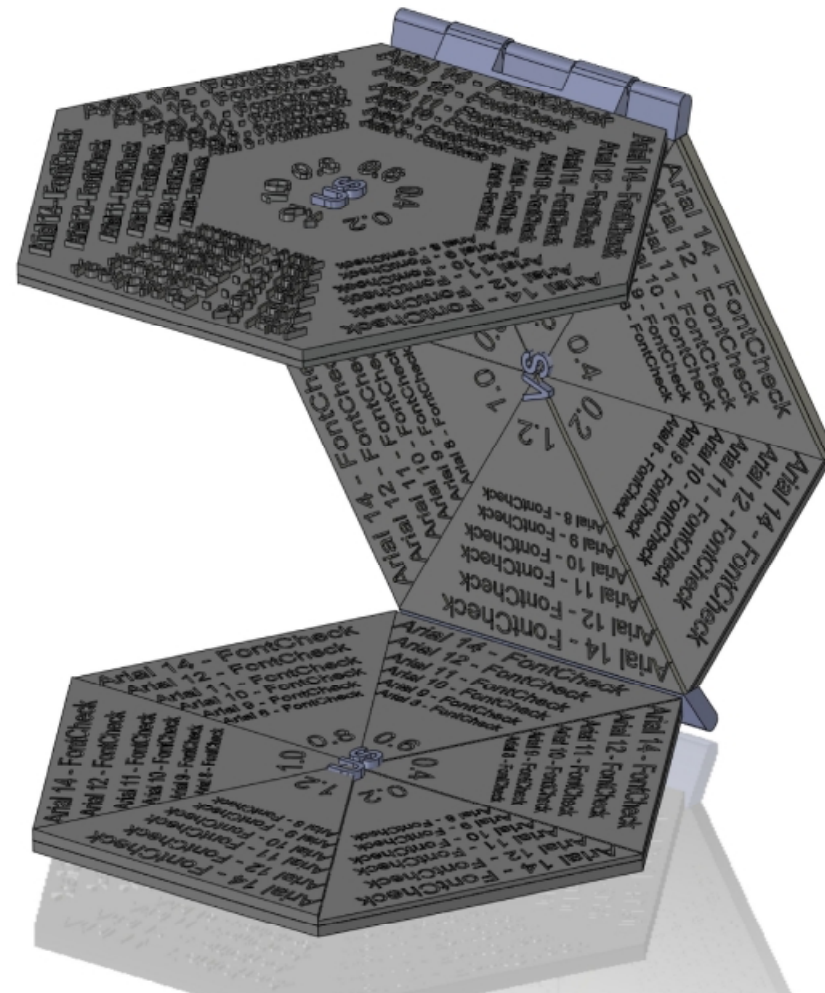
Font

Minimum font size 14
suitable for every direction

Best labeling quality on
vertical skin

Smaller fonts possible but
depending on:

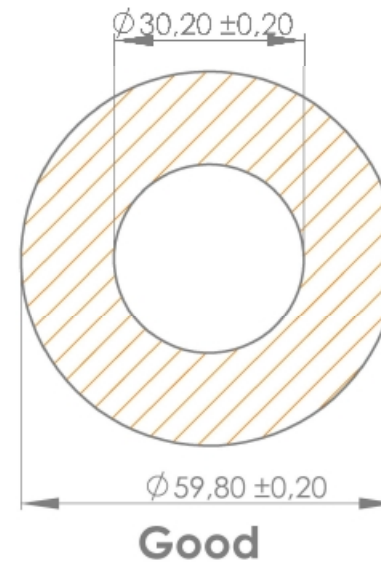
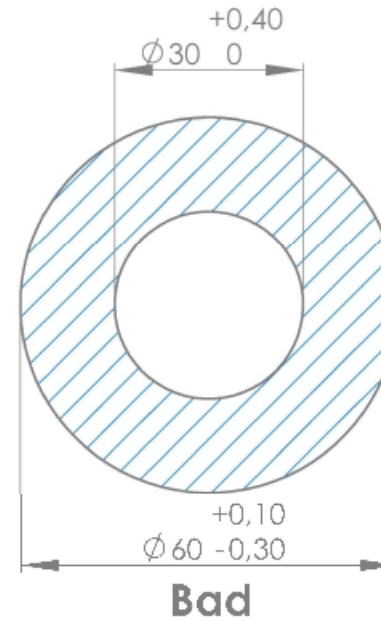
- building direction
- inside / depth of font
- outside / height of font



Test part for visibility of fonts

tolerances in parts

- Depending on the fact that the machine is building exactly the same part as in the CAD-System designed it is necessary to change the measurements to a symmetric tolerance zone.
- The bad example has an unsymmetrical tolerance zone the good one a symmetric.
- With Lasersintering it is only possible to build with symmetric tolerances.

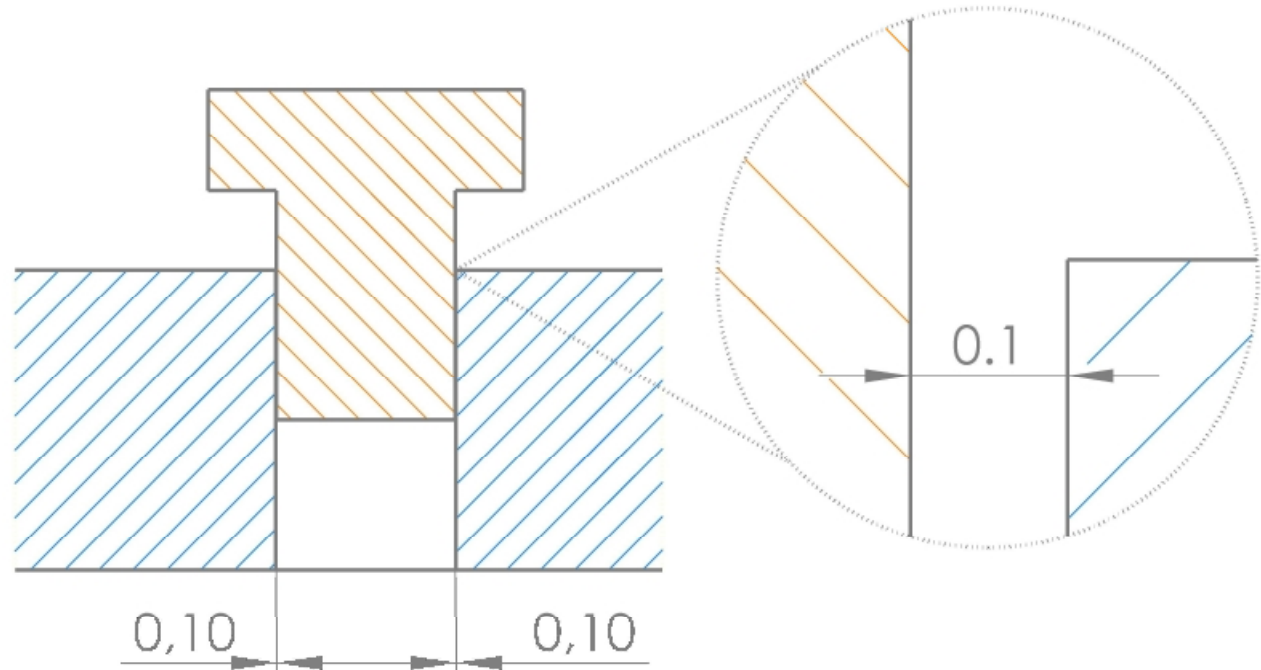


lose connection

Only for parts not built together!
Else see hinges.

Use 0.1 mm distance for lose connection.

A male and female part without a gap has a press fit.



walls / pins

walls

X/Y

- min possible wall thickness = 0.7 mm for P395 /P760
- min possible wall thickness = 0.45 mm for P100
- min wall thickness for reproducible measurements and mechanical properties = 1.5 mm

Z

- min possible wall thickness = one Layer; typical 0.15 for P390 and 0.10 for Formiga

pins

min pin thickness = 0.8 mm

min pin thickness for reproducible measurement and mechanical properties = 1.8 mm

gap

the min size of a gap is depending on the wall thickness of the part

Gap width [mm]:

0.5

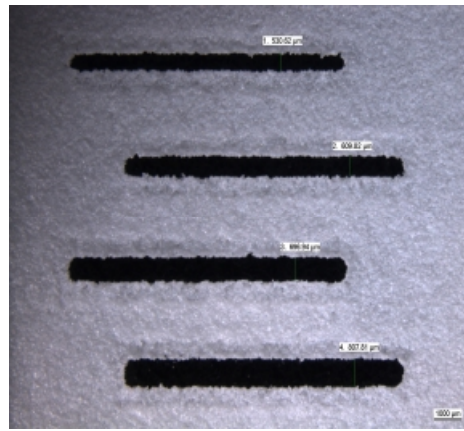
0.6

0.7

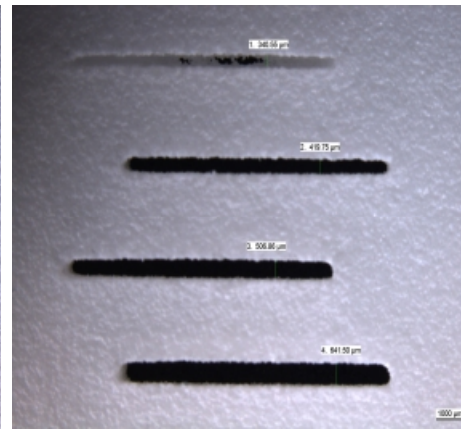
0.8

y

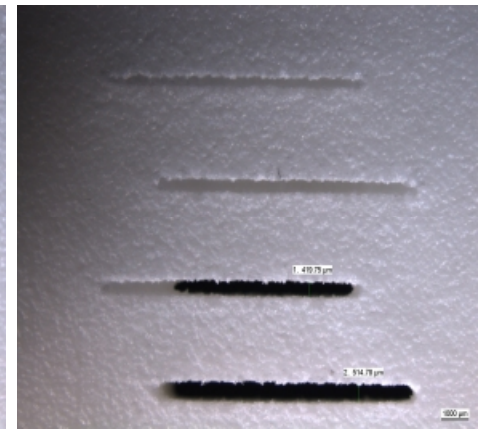
x



Wall thickness: 0.30mm



3.00mm



6.00mm

hole

possible min hole diameter is depending on the thickness of wall

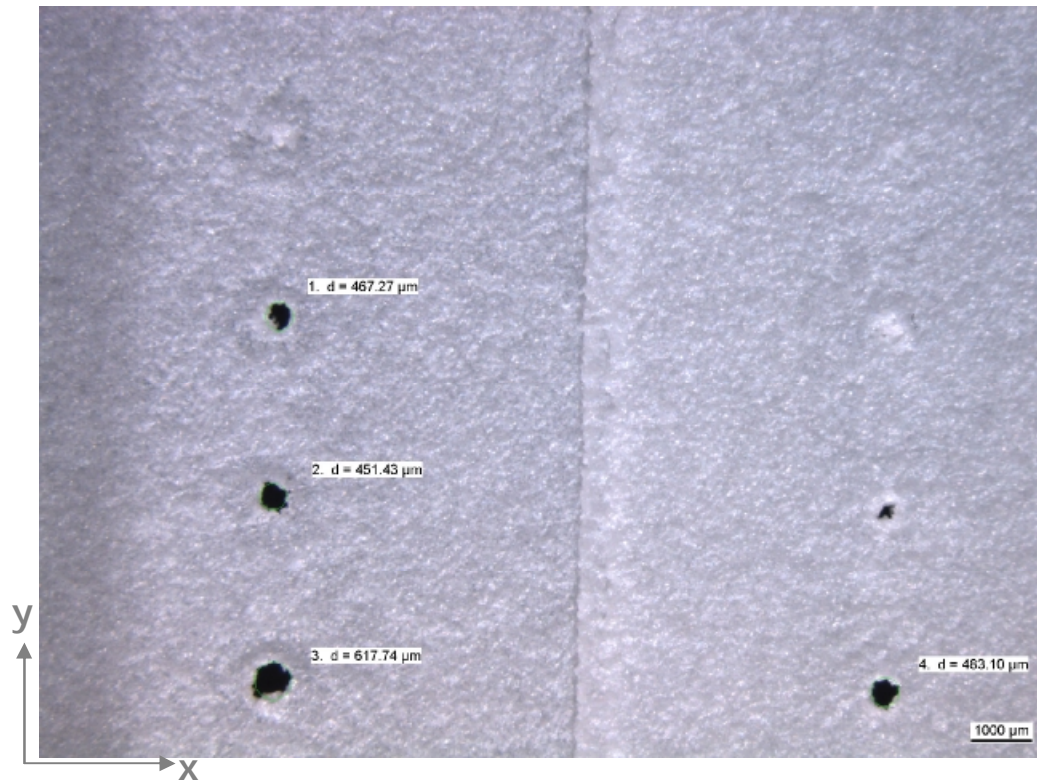
Hole diameter:

0.5mm

0.6mm

0.7mm

0.8mm



Wall thickness: 0.30mm

0.60mm

costs

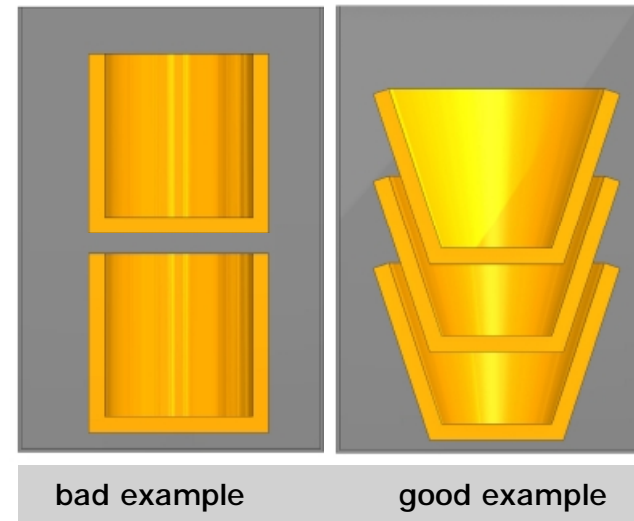
— costs depending on z- height (machine hours) and (powder)

— reducing z-height

- design parts as low as possible in Z
- stackable => increase filling rate

— reducing part volume

- integrated design
- lightweight design
- force flow optimized design



powder removable design

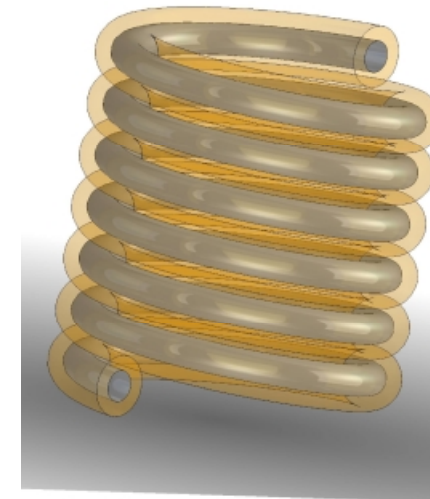
— powder must be removable

- problems in small long pipes
- very complex parts with inside structure
- the example is easy to produce but in the long hollow pipe inside it is impossible to remove the whole powder (pic2 grey). With compressed air is it possible to clean one or two windings but the rest remains inside.

— if the powder is removable very simple your post processing time is shorter

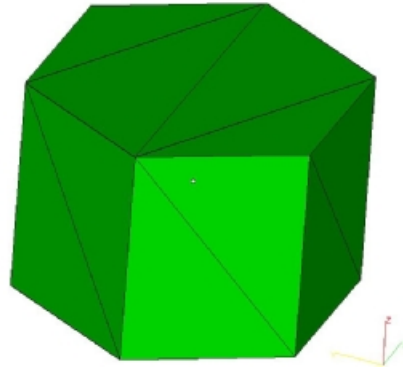


example part

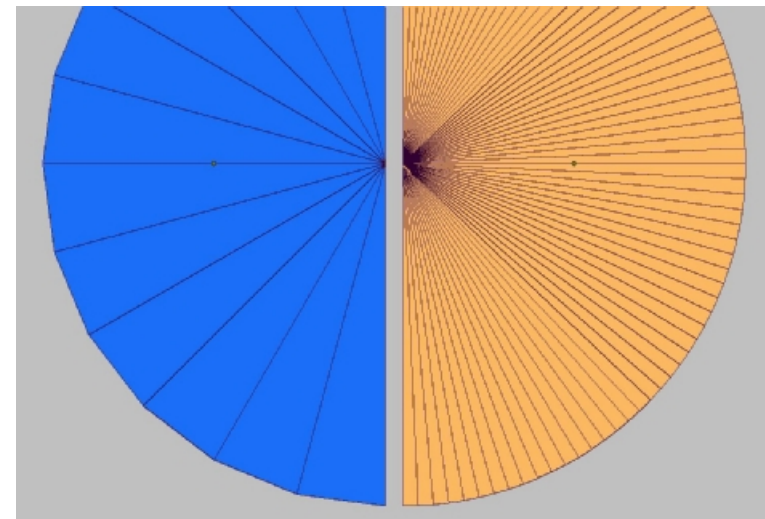
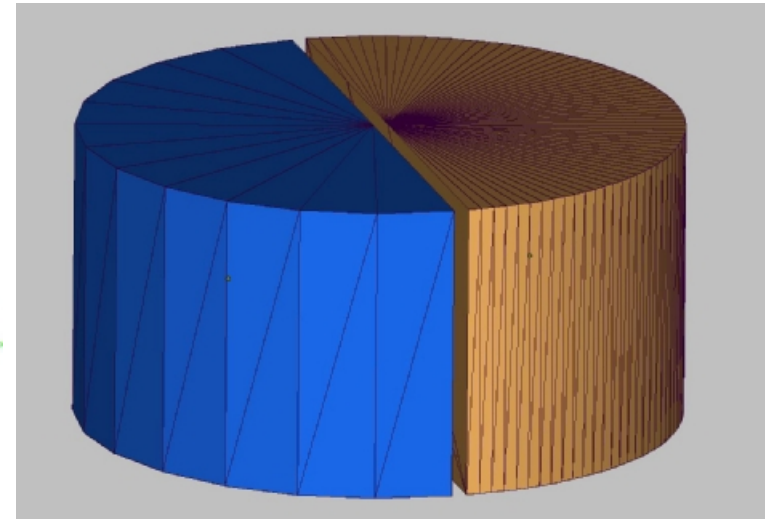


example transparent

Data format

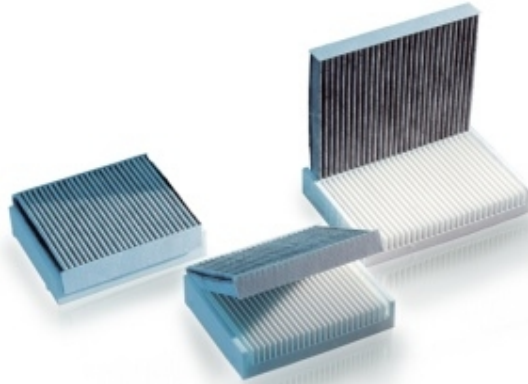


- the interchange format for RP technologies is **STL**
- the file describe a surface by triangles
- the file size and detail resolution is depending on the number of triangles
- square-cut surfaces are easy to describe exact pic1. For freeform or round shaped parts you need a lot of triangles pic 2+3
- a guide value for plastic parts is:
 - deviation tolerance: 0.01 mm
 - angle tolerance: 2 deg



rough triangulation

fine triangulation



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