

What is an STL file

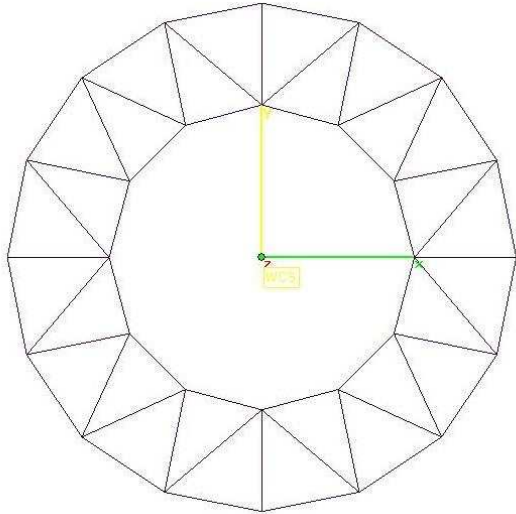
To get your model printed you will need to send us an stl file, (we can also accept stp files). The stl file is a format created to take the complexity out of a CAD model & allow easy creation of the individual slices the machine needs to print your model. An stl file is basically your CAD model with all of its surfaces represented by triangles, so a simple box shape can be made with just 12 triangles & a curve will need to be made of many triangles, effectively turning the curve into many small flats. Each triangle has 3 points which give it position in space, an outside normal & an inside normal, which describe it's orientation within the model.

If you would like a good description have a look at Wikipedia, it actually has a very good description here.

[http://en.wikipedia.org/wiki/STL_\(file_format\)](http://en.wikipedia.org/wiki/STL_(file_format))

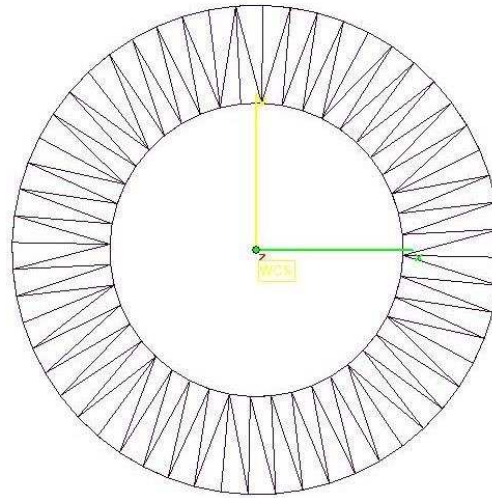


To get your model printed you will need to send us an STL file. This is a file format created to take the complexity out of a CAD model & allow easy slicing of the model for 3d printing. An STL file is basically a way of resolving complex shapes by dividing its outer surfaces up into triangles, so a simple rectangular box can be made with just 12 triangles, but a cylinder will need to be made of many triangles, effectively turning the round into many small flats. This will obviously have an effect on the look & shape of your model so here is our first set of examples.

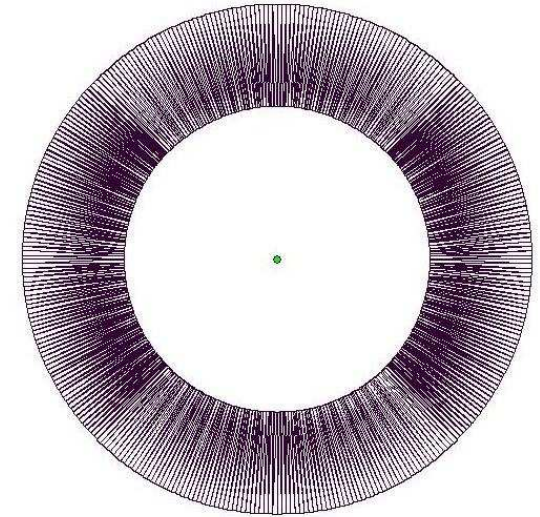


This first triangulation is very coarse & you can see distinct flats. These will appear exactly like this on your model & it would take a lot of hand finishing if you want it to be smooth & round & this finishing will also make your model less accurate as the peaks of the flats will be at the nominal size of your round feature, so you will be removing material to make it look nice. Conversely the hole in the centre will be undersize.

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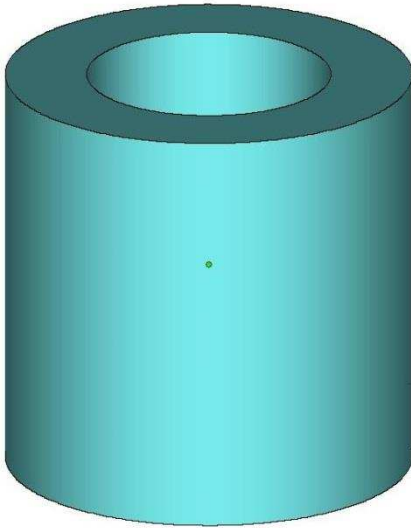


The second is of good enough quality to produce models that don't really need any finishing without making the file size too big. Although to get a perfectly round model you would need to do a little finishing, it won't take long & you will only be removing a tiny amount of material. Our Vibro finish process will be a very cost efficient way of doing this.

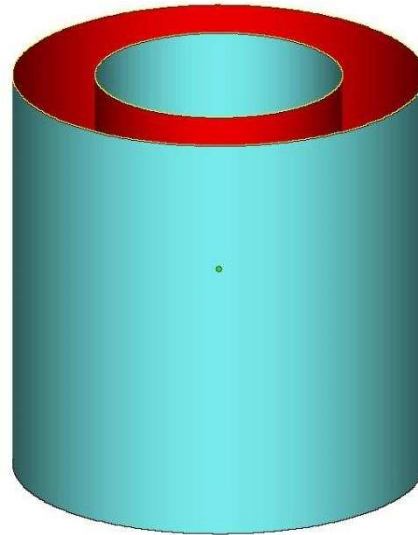


The third shows a very well defined round, but the file is much bigger & there isn't much to be gained from this for most laser sintered models unless you are after absolutely the best finish possible for your model. Vibro finish on this part will give a very smooth finish.

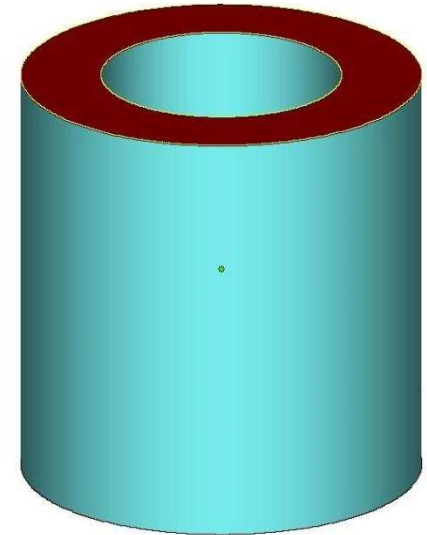
The next requirement is for the model to be a solid or watertight single entity. Our stl software, that all files will go through to be built, will show errors as shown in the following images. Generally these are problems caused during CAD modelling rather than by the translation to stl.



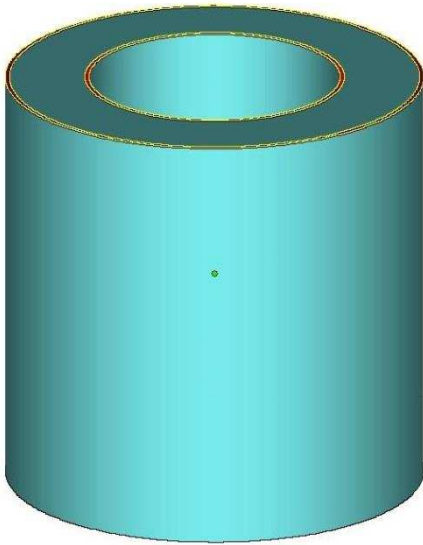
The first image shows a tube, all one colour, so we know all of the triangle 'normals' that make up the surfaces are the right way round & there are no open edges or holes. This is the quality of file we need to build from.



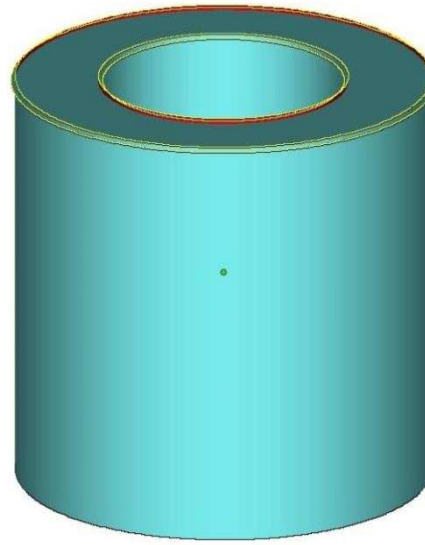
This tube has the complete top surface missing, so you can see the inside of the outer surfaces & the yellow edges telling us the model is open.



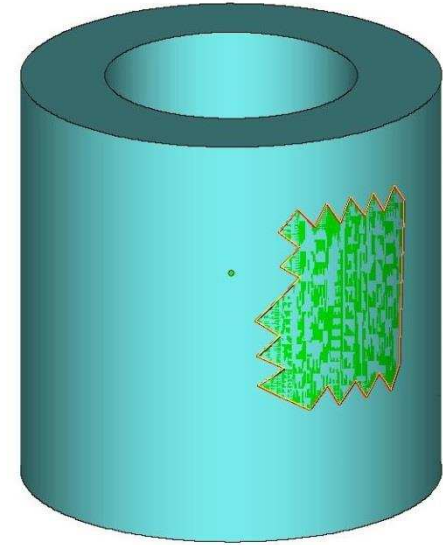
This tube has the top surface inverted, so what we see here is the red of the inside of the top surface & again the yellow lines telling us the model is open.



This tube shows gaps between the top surface & the sides. Here it looks like the top surface is too small to meet the sides & consequently you can see the red inside & yellow denoting open edges.



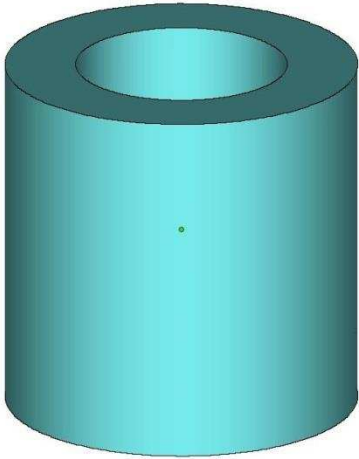
This tube shows intersecting surfaces. The top surface is literally crossing the side surfaces. You can again see red of the insides & yellow edges showing that they are open.



This final tube shows a separate overlapping surface. This sort of issue can be random as in the example or a full duplicate surface or even a duplicate of the whole model. The stl needs to be a single body or the machine will effectively draw twice on top of itself which can cause build issues.

All of these issues are fixable, but this can take some time to do, especially as your models will be much more complicated. Time, as the saying goes, is money & we are very conscious of keeping your costs down, which is why we ask you to provide good stl files.

There are further issue that can happen when your model is more complicated such as:



Coincident edges like this are not going to hold together as the contact is almost zero. There needs to be a 1mm wide attachment point or separate the 2 parts.