

Laser cutting service from aerobel:

The laser cutting service from aerobel is meant for ambitious model makers who want to build models themselves. The service may also be of interest to small companies which want to produce models in small series.

We do laser cutting in	1. poplar plywood	3 to 6 mm thick
	2. balsa wood	1 to 10 mm thick

If you want to use other materials, please ask. Birch plywood (air-ply) is not suitable for laser cutting since the glue between the different layers will burn at the cutting edges. Poplar plywood on the other hand is very suitable offering a number of advantages. It is cheap and light-weight.

For laser cutting we need digital drawings. If you are not familiar with CAD, you can ask us for an offer for converting your paper drawings into digital drawings.

Corel Draw (version 10-12) and Adobe Illustrator (all versions) are very suitable for CAD.

File formats

Coral Draw	.AI (Adobe Illustrao file format)
Illustrator:	.EPS (please do not send .AI data, only save as .EPS)

We cannot use other formats such as .DWG or .DXF since these contain additional information which the laser cutting machine is unable to interpret.

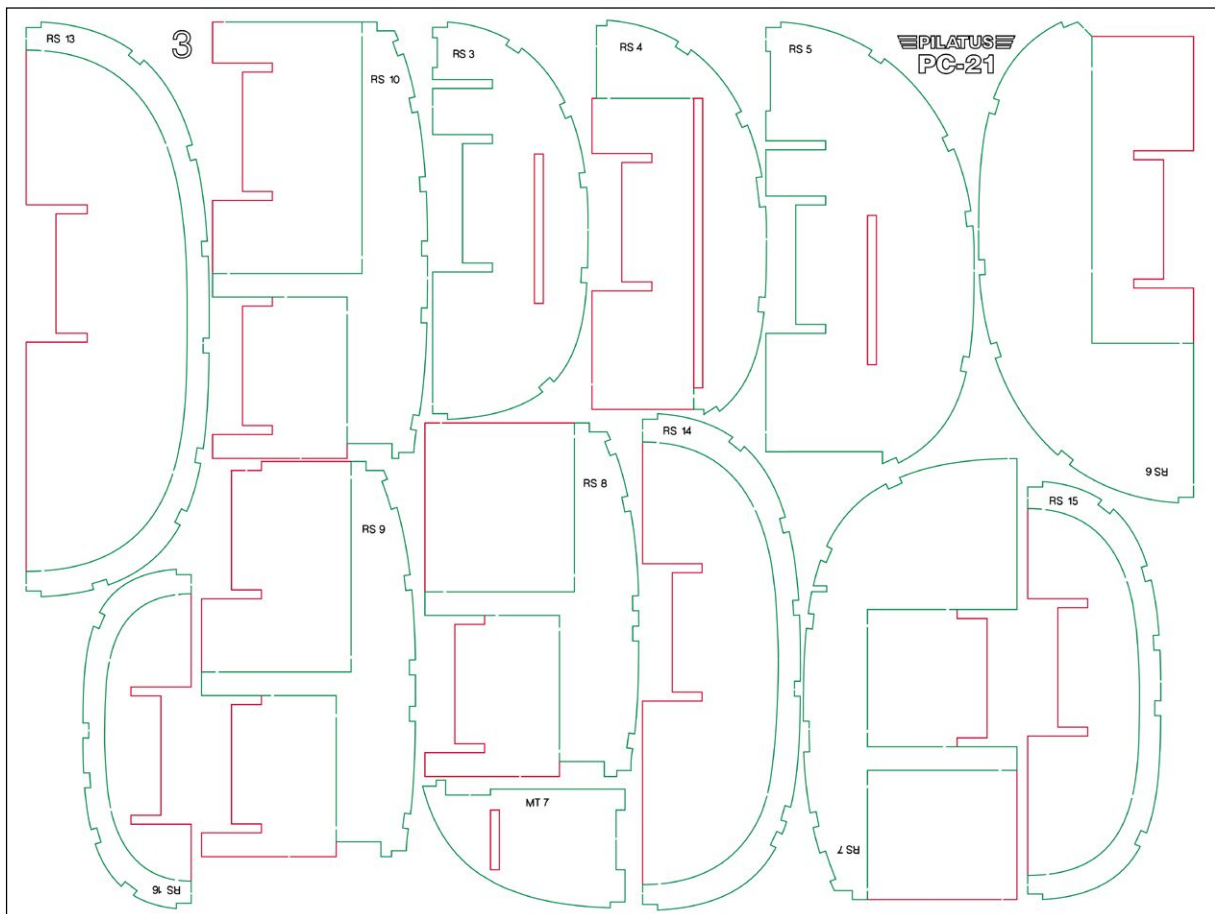
To make it more clear: A laser cutting machine works like a two dimensional plotter, therefore unable to understand a third dimension, unlike a milling machine where you can also adjust the height. In laser cutting, the different colours of the lines used to draw the shape of the parts tell the machine what it has to do. For each colour (up to 8), the intensity of the laser and the rate of feed can be defined. For example, you can define that the black line means low intensity so that the wood will be cut on the surface for engraving only.

Alignment of the parts

The different parts should be placed together as closely as possible in order that the wood may be used in the most economic way. The wood grain must be aligned horizontally.

The working surface of our laser cutting machine is 395 x 295 mm (15.55 x 11.61 inches), the size of the plywood board 405 x 305 mm (15.94 x 12.00 inches), i.e. there always remains a fringe of 5 mm (0.20 inch) on all four sides of the board.

Below you find an illustration of parts for the Pilatus PC-21 correctly aligned on the board, ready for laser-cutting.

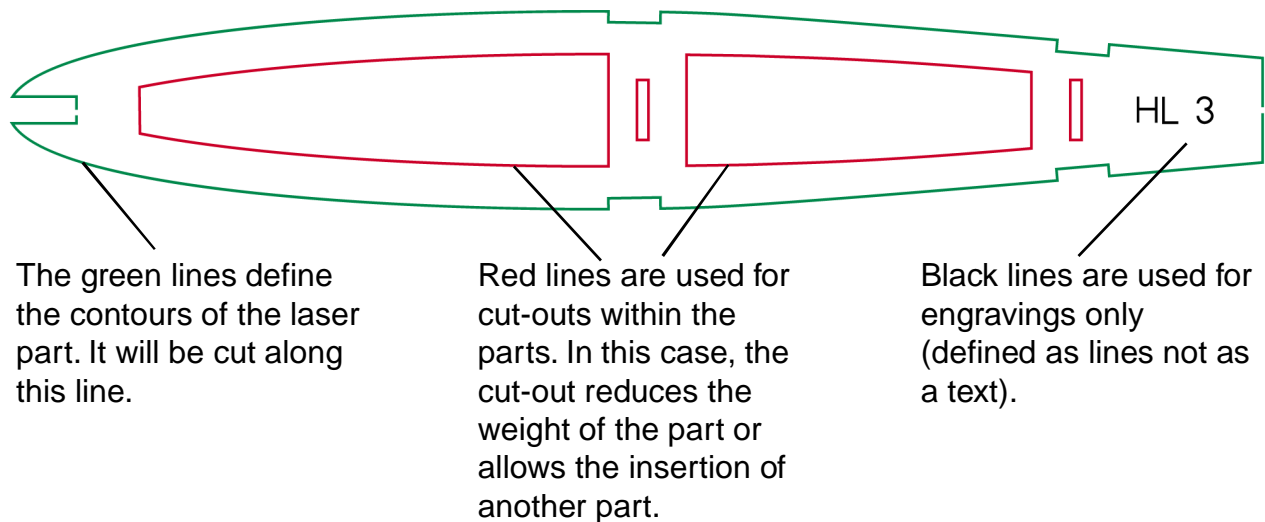


Basic requirements

The entire drawing has to consist of lines which must all have a thickness of **0.1 mm (hairline)**. Characters and numbers must also consist of lines, i.e. text must be converted into paths. The surface area must remain transparent (no coloured surfaces).

Example

Below you see a part in the way it has to be drawn and what this means to the laser cutting machine:



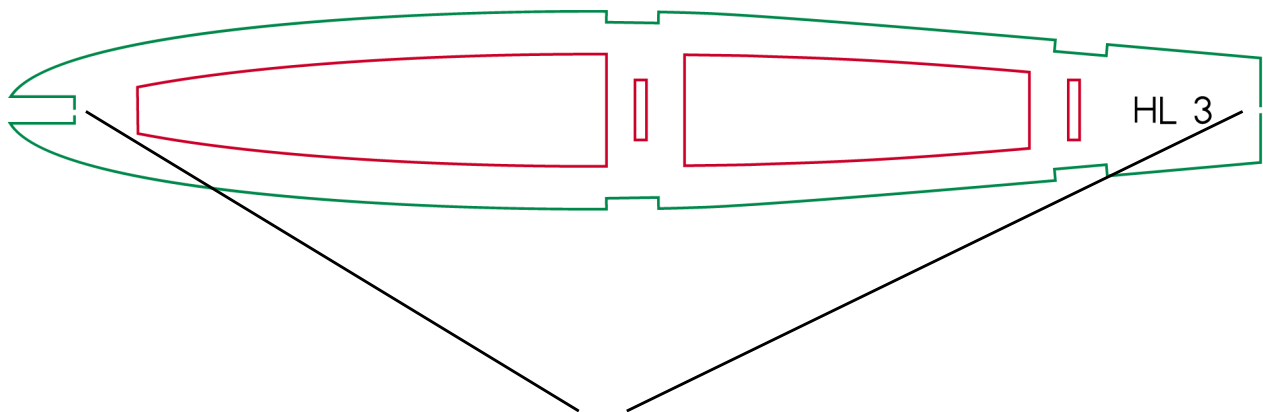
The three colours are compulsory for the functioning of the laser cutting machine. It produces the parts in the sequence black / red / green.

The reason is simple. The plywood is "free floating" and only held in place at the outer edges. If the machine started cutting along the green lines, the parts would fall off before the cut-outs and the engravings have been realized. By respecting the colours and their order, we have the guarantee that half-finished parts cannot fall off the machine.

The machine starts by engraving the still complete board. Then, it realizes the cut-outs and any drill holes. The cut-outs fall off. The last step is to laser-cut the contours. The finished parts fall down onto the machine bed. No half-finished parts will fall off.

Ultimate perfection

If more than one part have to be cut out of the same board, it is recommended that you leave bridges of 1 mm width at appropriate places as shown below. These bridges prevent the parts from falling off before the laser cutting of the entire board is complete. All the cut-out parts remain on the board which facilitates handling.



The drawing shows where the 1 mm bridges have been placed. They are sufficient to prevent the laser-cut parts from falling off the board. The bridges can be broken easily later on by exercising a small pressure only.

We know that it means considerable additional work for designing one or more bridges for every part but it is worthwhile proceeding this way, thus avoiding any piece from getting lost. Without such bridges, a finished piece may fall down onto the machine bed and be burnt on the surface by the laser cutting machine when it cuts out other parts.

It is true that the laser beam is less powerful when it is not cutting out parts but the remaining energy may be sufficient to burn parts superficially. For this reason and in order to facilitate handling, all laser-cut parts from *aerobel* are supplied with such bridges.