

BRM Lasercutter

User Guide & Maintenance Manual

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Preface

This tutorial aims at giving you the basic insights and knowledge to safely work with the BRM Laser-cutter.

Symbols



Ask the lab-manager
to supervise your
progress



Be attentive, possible
dangerous situation



Complete a task

01

Preparing a design Drawing guidelines

*Using Illustrator to check the designs before opening them in
LaserWorks*

Adjusting the design

In your CAD application (Illustrator, Inkscape, Autocad, Vectorworks,...) you will differentiate between cutting, engraving, inner and contour lines. This will be done by assigning a distinct colour to parts of your design. Each colour will then correspond in LaserWork with a specific setting and order. Pay attention that fill engraving takes a lot of time!

Your document must be set up in RGB colour-mode!

Color-codes:

- Raster engraving: **black** RGB 0,0,0 (#000000)
- Line engraving: **red** RGB 0,255,0 (#FF0000)
- Inner cut lines: **blue** RGB 0,0,255 (#0000FF)
- Contour lines: **green** RGB 0,255,0 (#00FF00)

Working-area

The dimensions of the design should be **1600x1000mm** (**PAY ATTENTION!** Always check the dimensions of the materials in stock, these differentiate from the working-area of the laser-cutter). Always keep a margin of 10 mm.

Groups and layers

Make sure that there are no groups in your file, so ungroup them. And work in one layer (also when you use different colors).

Scale

Make sure your document setup is in millimetres, this prevents scaling issues when porting designs from one application to the next.

Line width



The line width of all lines should be **0,1mm** in Illustrator!!! If the lines are thinner, LaserWork will not recognize the linecolors so there will be no distinction between cutting and engraving.

Fill colour

Make sure you use fill colours only where needed. This causes dubble lines most of the time.

Double lines



Always check your drawings for double lines! Every line drawn will be cut. Because of this there is a potential fire-hazard!!

Text

Always convert text to **outlines**. Always ungroup them.

Saving

Save your file as **DXF!!!**

LaserWork recognizes only DXF files. To export a file from Illustrator, go to *File > Export > .dxf*



When saving, make sure you know in what unit and scale your document is saved. It is wise to have a reference shape in your design in order to spot possible scaling issues. Scaling between applications is always your responsibility.

Saving your file in different CAD programs:

- Adobe Illustrator** We always use Adobe Illustrator to check your designs. If you made your designs in Illustrator, than save your designs as an DXF file (file > export > DXF)
- Autocad** When exporting designs or plans from Autocad, save them as an DFX file.
- Vectorworks** Be aware that the educational version of Vectorworks locks a PDF with a password when exporting. You can find PDF unlock applications online to address this issue.

02

Checking a design in Illustrator

Adjust a design to send to LaserWork

Open Document

Open your file in Illustrator before opening it in LaserWork.

Checklist



- Is the art-board the exact size?
- Is the document set in RGB colour mode?
- Are all lines and fills coloured correctly?
 - Raster engraving: **black** RGB 0,0,0 (#000000)
 - Line engraving: **red** RGB 0,255,0 (#FF0000)
 - Cutting lines (inside): **blue** RGB 0,0,255 (#0000FF)
 - Cutting lines (outside): **green** RGB 0,255,0 (#00FF00)
- Is the stroke width correct?
- Are there any double lines?
- Did you put all the text pieces in outlines?
- Is everything ungrouped?

Speed course Illustrator

The following pages provide you with a quick course needed to accomplish the above tasks.

Document Colour-mode

Adjusting the colour-code is done via:
File > Document color-mode > RGB Color

Check Art-board



Find the art-board tool.
Make sure the art-board measures maximum 1200 x 850 mm.
Select the selection tool to leave the art-board tool.

Adjust colours



Select the selection tool.
Select a text object (black).
Make the fill-colour active by clicking it once.
Go to *Select-> Same -> Fill-colour* to select all black elements.
Double-click the fill colour and make sure it is black (#000000)

Do the same for the other colours. Red should become RGB-red, green RGB-green etc. Take note that you will adjust stroke colours here instead of fill colours.

Adjust stroke width

Adjust in the upper menu the stroke width accordingly (0,1mm).

Position artwork

The origin of the BRM is in the **TOP RIGHT**. Move your design to the upper-right corner taking the advised **10 mm margin** into account. You can drag a frame around the artwork with the selection tool and next drag it to the correct position.

Call the supervisor



Ask the lab-manager to evaluate your progress.

Export

Save your file as an .DXF format. This is the only format that LaserWork can read.
File > export > .DXF

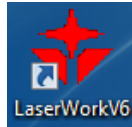
03

Send design to LaserWork
by importing .DXF file

Export file

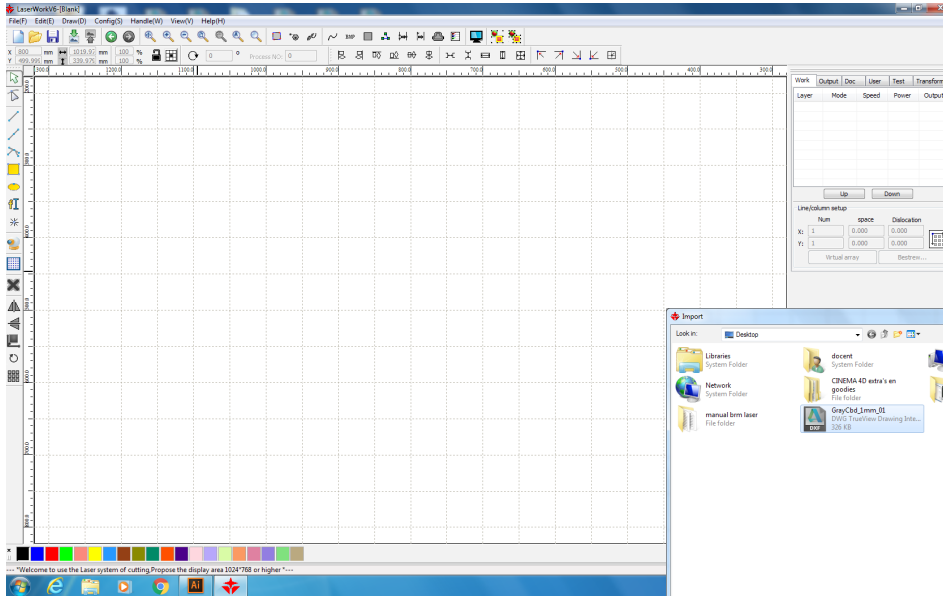


If you saved the file as an DXF, than the design is ready for the lasercutter. We use LaserWork, to send the job to the lasercutter.



When you work with your own material for which no settings are available, you will create new settings together with the lab-manager.

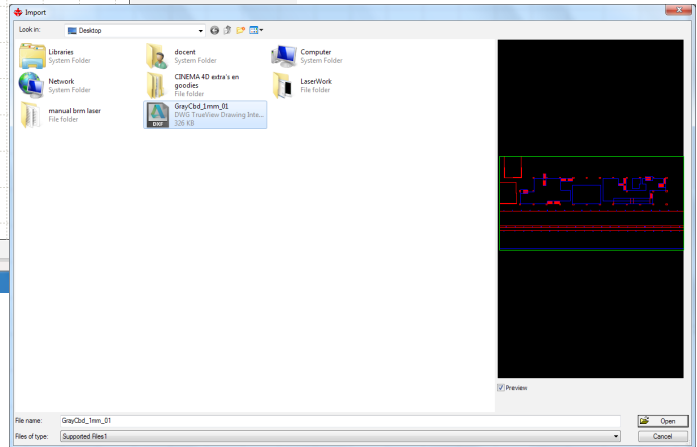
LaserWork Interface



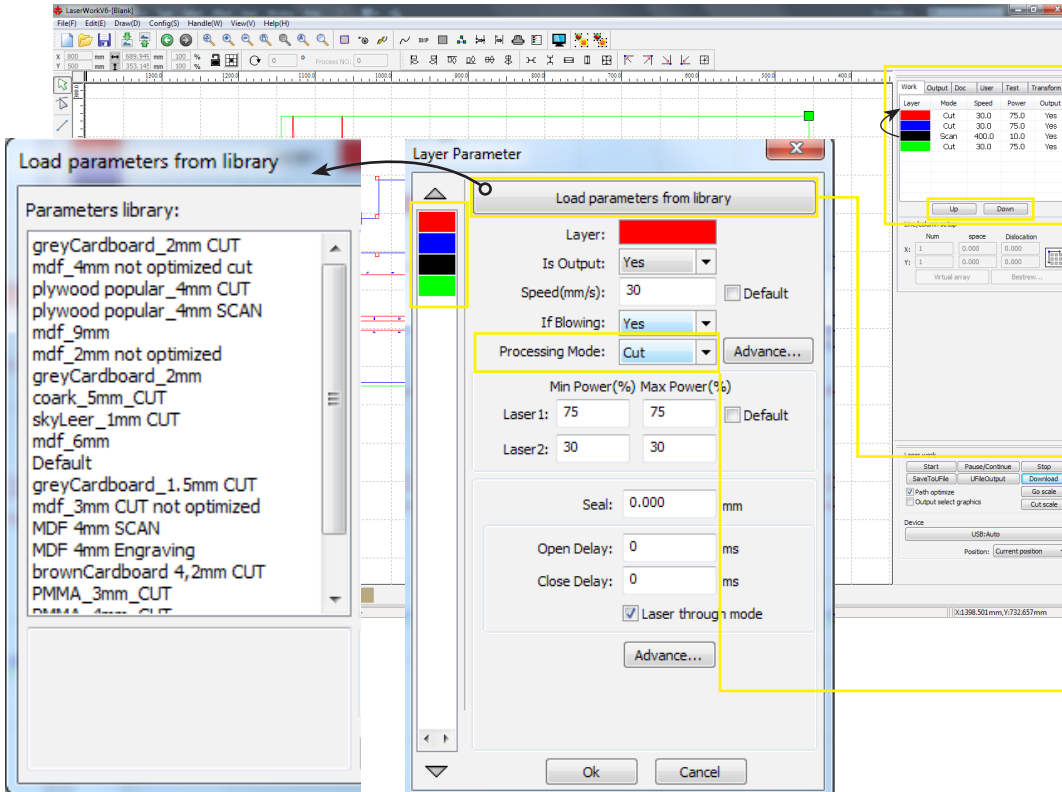
File > Import

The window (shown right below) opens. Select a file to open it in LaserWork.

If you don't see a preview and you only get a grey window than there is something wrong with your design (open your file again and go to the checklist to see if you have forgotten to adjust something).



Parameters Settings for Each Color



Make sure that the order of the colors is set correctly. If needed to be rearranged use buttons Up and Down to set it right.

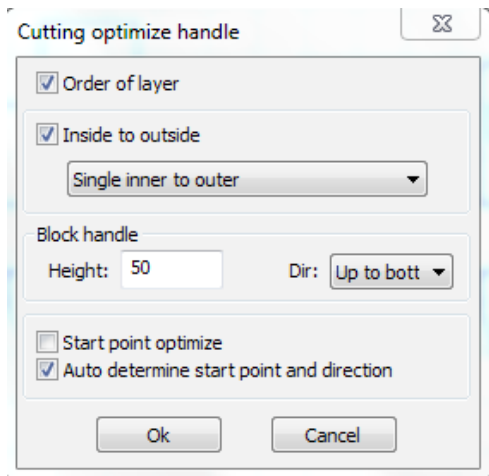


For EACH color it needs to be set cutting/engraving parameters!!! Double click on color, and *Layer Parameter* Window will open.

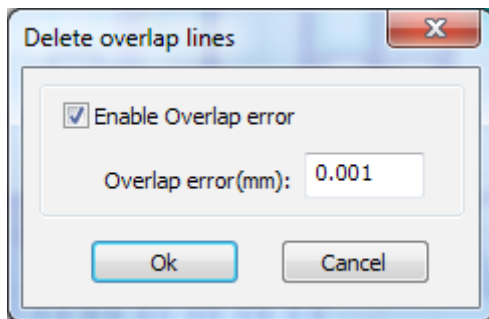


Select the color, and press *Load parameters from library*. Choose right settings from the material & thickness list (window on the left).

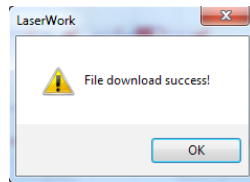
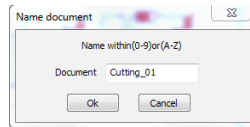
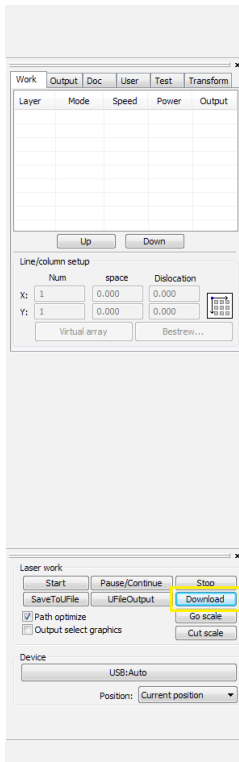
By processing mode you can choose between cut (cutting and engraving) and scan (full engraving).



Before sending the file to the laser cutter, select all elements (CTRL+A) and go to *Handle > Delete Overlap* for deleting the double lines.



Secondly, go to *Handle > Cut Optimize* for vectors to be optimally organized for cutting.

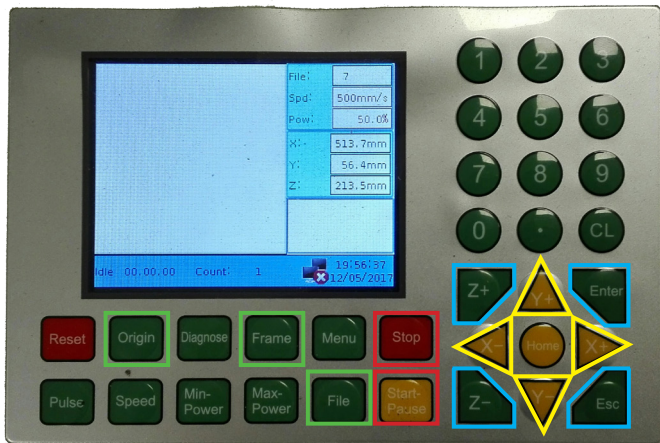


Click *Download* (lower right corner of main interface). Additional window will open and ask to enter the name of the file. When the file has been sent, it will show window with message *'File download success!'*.



04 BRM Lasercutter Machine settings

Control Board

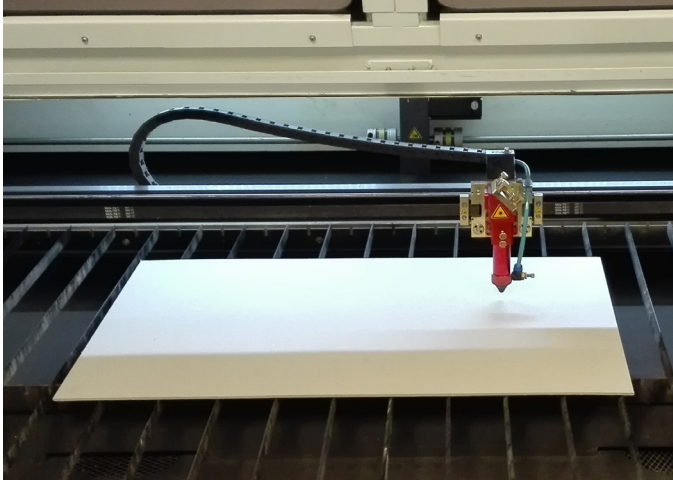


After the file has been uploaded to the machine, you proceed with settings on the BRM, as a final step before starting the laser cutter.

BUTTONS:

- Enter/Esc _ to open/exit the file
- Z+/Z- _ to move up/down the bed
- Y+/Y- _ to move the laser on the y-axis
- X+/X- _ to move the laser on the x-axis
- File _ to open the list with uploaded files
- Origin _ to set a new origin point
- Frame _ to check the size of the drawing
- Stop _ to stop the laser
- Start-Pause _ to start/pause the laser

Placing the material in the cutter



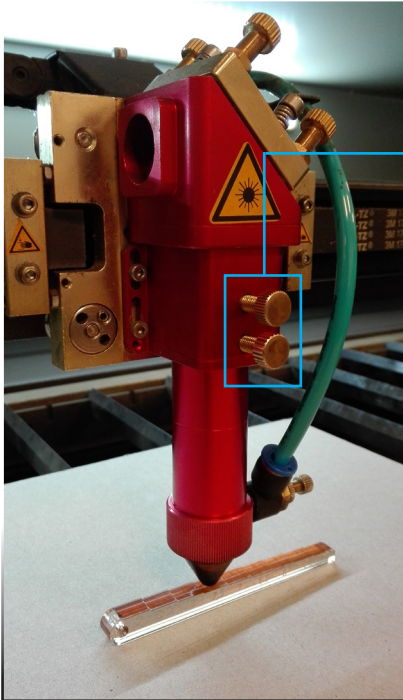
You can place the material anywhere on the laser bed, afterwards you will need to set up the origin point manually.

TIP:

Since its' main origin is in the top right corner, it is always preferable to position the material more to the left, due to necessity of the laser to achieve full speed.



Focussing the laser



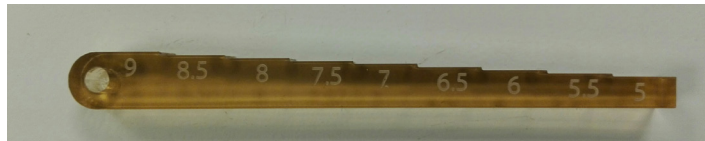
On BRM the focus is set by adjusting the distance of the laser head from material. The distance between the laserhead and the material has to be 6.5 mm.

Unscrew both screws to loosen the laser head and place the 'focus tool' (picture below).

Screw back both screws and remove the 'focus tool'.

TIP:

The bed should always be in the highest position (unless you're working with a very thick material). It is adjusted by pressing button Z+ on the control board.



Focus tool

Setting the origin and checking the frame



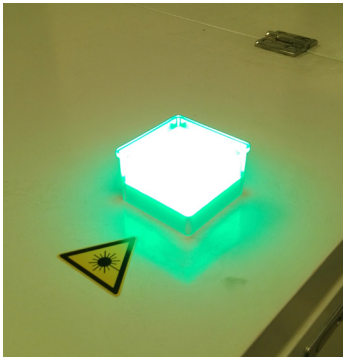
Press the *File* button to choose the uploaded file. It will take a few seconds until the file appears in the list (always at the end of the list). Press Enter to open it. ✂

Position the laser head (manually with arrows) in the corner (upper right) of the plate and press *Origin*. Then press *Frame* in order to check if the cutting surface is in the perimeter of the material. If not reposition the board, re-set the origin. ✂

Checklist



- Check if the machine is on. (Maintenance Manual)
- Raise the laser bed until it reaches the maximum.
- Position your material correctly.
- Move the laser head on top of the material using the X and Y axis buttons on the control panel.
- Place the 'focusing tool' on the material, and adjust the laser head by unscrewing two screws.
- Make sure that the air is on.
- Set origin, and check the frame.
- Close the lid of the lasercutter.
- Put the suction on



TIP:

While BRM lasercutter is working, the green lamp is on.
When it turns off, the job is done, and you can open the lid.

05 Execute design

Execute job

The only task still to execute is sending the job to the machine.



To do this, press the *Start/Pause* button, the lasercutter will start cutting. For pausing the job, press the same button. For stopping the job press button *Stop*.



Make sure you are always present when the lasercutter is operational! When the lasercutter is cutting, there should always be someone present, when hefty engraving is done you may ask the lab-manager permission to leave for a moment! You should at all times notify the manager if you intend to leave the lasercutter alone.



If you do not follow this rule, your laser rights will be revoked immediately!

After the job

When the job is finished, wait until all the smoke dissipates.



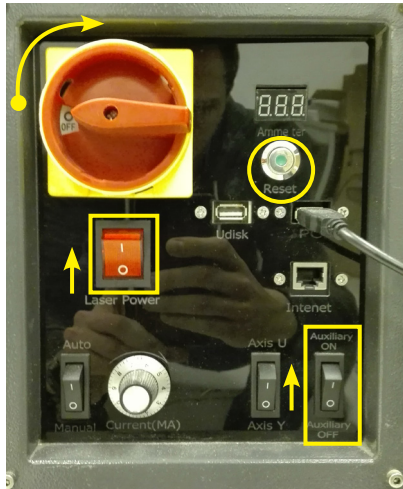
Take the material out of the lasercutter. Make sure you also remove small elements from underneath the laser bed. To do this, remove just necessary knives, so you could take out all left overs. Remove all the waste material before putting the knives in again. Make sure the knives are well placed, by pushing them additionally from top.



Delete the job in LaserWork by selecting all (ctrl + a) and delete (del). Don't forget to take your USB stick and make sure you cleaned up everything.

06 BRM Lasercutter Maintenance Manual

Turning on BRM



Rotate clockwise 90 degrees big red switch from mark OFF to ON.

Press the circular button RESET (with green dot inside).

Turn on the switch LASER POWER (it should start glowing orange).

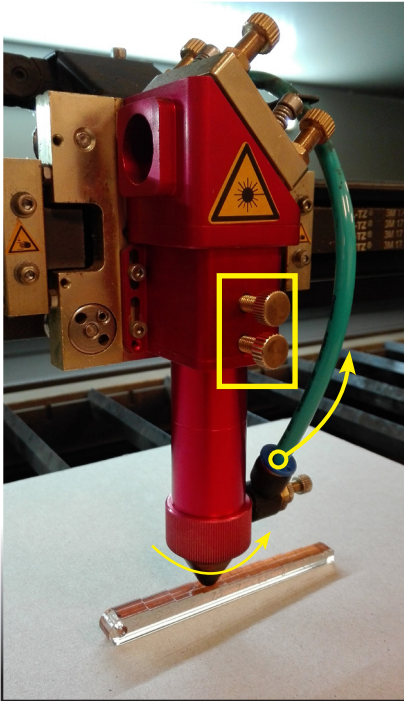
Turn on the switch AUXILIARY.

TIP: If the lasercutting is not working properly, check if all of these buttons are switched correctly.

Turning off BRM



Cleaning the lens



Remove hose (air-pressure) from the laser head, by holding firmly the blue ring and pull upwards the hose.

Loosen both screws on the laser head in order to take it out of the entire head.

Unscrew the conical top of the laser head.

With a small screw driver, unscrew the ring that is holding the lens (picture on the right).



Q-tip

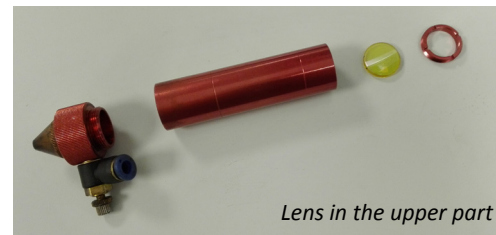
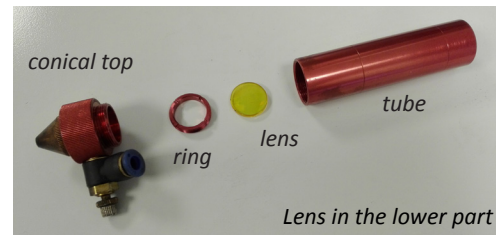
Put on some gloves! Carefully take the lens out of the tube.

First clean with a dry tissue both sides of the lens.

Afterwards, use special wet tissue or a Q-tip soaked in special alcohol (small white bottle).

ATTENTION:

Always pay attention to the position of the lens in the tube. Depending on the type of the lens it could be screwed in the lower or upper part!!!



07

Difference between
Trotec and BRM

BRM

Adjusting the design

Color-codes:

- Raster engraving: **black** RGB 0,0,0 (#000000)
- Line engraving: **red** RGB 0,255,0 (#FF0000)
- Inner cut lines: **blue** RGB 0,0,255 (#0000FF)
- Contour lines: **green** RGB 0,255,0 (#00FF00)

Working-area

The dimensions of the design should be **1600x1000mm** (**PAY ATTENTION!** Always check the dimensions of the materials in stock, these differentiate from the working-area of the laser-cutter). Always keep a margin of 10 mm.

TROTEC

Colour-codes Trotec Speedy 300

- Raster engraving: black #000000
- Line engraving: **red** #FF0000
- Cutting lines in order:
 - **Blue** #0000FF
 - **Petrol** #336699
 - **Cyan** #00FFFF
 - **Green** #00FF00
 - **Magenta** #FF00FF
 - **yellow** #FFFF00

(JobControl has an extended list of colours you can use. In general the colours listed here suffice. A complete list can be found in the appropriate template on the website)

The dimensions of the design should be 700x400mm (these are the dimensions of the materials in stock and approximately the working area of the lasercutter). It is wise to keep a margin of 5mm.

BRM

Groups and layers

Make sure that there are no groups in your file, so ungroup them. And work in one layer (also when you use different colors).

Scale

Make sure your document setup is in millimetres, this prevents scaling issues when porting designs from one application to the next.

Line width

The line width of all lines should be **0,1mm** in Illustrator!!! If the lines are thinner, LaserWork will not recognize the linecolors so there will be no distinction between cutting and engraving.

Fill color

Make sure you use fill colours only where needed. This causes double lines most of the time.

TROTEC

Line width should be 0, in Illustrator you should type in **0,001mm**.

BRM

Double lines

Always check your drawings for double lines! Every line drawn will be cut. Because of this there is a potential fire-hazard!!

Text

Always convert text to **outlines**. Always ungroup them.

Saving

Save your file as **DXF!!!**

LaserWork recognizes only DXF files. To export a file from Illustrator, go to *File > Export > .dxf*

When saving, make sure you know in what unit and scale your document is saved. It is wise to have a reference shape in your design in order to spot possible scaling issues. Scaling between applications is always your responsibility.

TROTEC

Save your file as **AI** or **PDF**.

When saving, make sure you know in what unit and scale your document is saved. It is wise to have a reference shape in your design in order to spot possible scaling issues. Scaling between applications is always your responsibility.