DBE MAKERSPACE | BUILDING 418
LASER CUTTING GUIDE

WORKSHOP INFO & HOURS

DBE MAKERSPACE SPACE | BUILDING 418

Technicians: Amy Hickman, Joshua Webb, Daniel McMurray & Sarah Ong
Phone: 9266 4743 or 9266 4034
Email: dbemakerspace@curtin.edu.au

Monday	8am - 6pm
Tuesday	8am - 4pm
Wednesday	8am - 4pm
Thursday	8am - 6pm
Friday	8am - 5.15pm

DIGITAL MODELING SPACE | BUILDING 202

Technician Nick Wright
Phone: 9266 4641
Email: digitalmodelling@curtin.edu.au

Monday - Friday   8am - 4pm

MATERIAL INFOMATION

Material used in the laser cutter is supplied by the workshop.
Material Variable Size Cost per sheet

Plywood - 3mm
1200 x 600 $21.14 Cost per sheet
900 x 600 $15.85
300 x 600 $5.30

Plywood 6mm
1200 x 600 $33.80 Cost per sheet
900 x 600 $25.35
300 x 600 $8.45

Strawboard 1.2mm thick
900 x 600 $5.00

Strawboard   2mm thick
900 x 600   7.00

Acrylic
We can cut up to 6mm acrylic.

We do not stock any acrylic but please
come speak to us to find the best place to
purchase it depending on your requirements.

DBE MAKERSPACE | BUILDING 418
LASER CUTTING GUIDE

1. Choose the correct laser cutter based on the material its maximum cut size.

The templates to the right have the dimensions and material.
Your job should be smaller size then then Max Material Size.

EMBLASER 2
MAKERSPACE DBE @ BUILDING 418
MAX MATERIAL SIZE = 500mm x 300mm x 3mm
Strawboard & Plywood

EMBLASER 2

TROTEC SPEEDY 400
DIGITAL MODELLING @ BUILDING 202
MAX MATERIAL = SIZE 900 x 600 x 12.7mm
Strawboard, Plywood, Acrylic, leather , other upon request

TROTEC SPEEDY

TROTEC SP500
DBE MAKERSPACE @ BUILDING 418
MAX MATERIAL SIZE = 1245 x 710 x 12.7mm
Strawboard, Plywood

TROTEC SP500
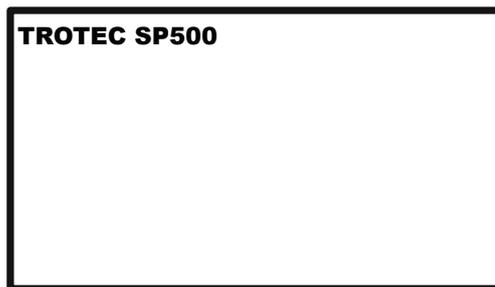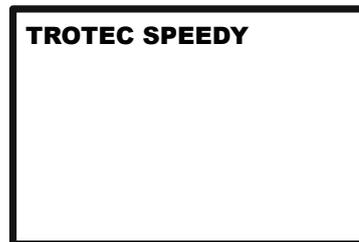
2. Ensure that your objects are at the appropriate scale.

The Laser Cutter cuts at 1:1 scale.
For example, if you need your models at 1:100,
they should be scaled down by 0.01.

Having trouble with Scale | Try a scale converter:
https://www.ginifab.com/feeds/cm_to_inch/scale_converter.html

Scale Conversion Calculator

Scale Ratio	1	:	12
Real Length	120		mm
Scale Length	10		mm

Scale Ratio 1:12

Real Length mm

Scale Length mm

AUTOCAD | LASER CUTTING GUIDE

Download: https://dbemakers.github.io/

AUTOCAD EMBLASER 2 TEMPLATE.dwg
OR
AUTOCAD TROTEC SP500 TEMPLATE.dwg

ALTERNATIVELY SET UP YOUR LAYERS FROM SCRATCH.

Click to enter
Layer Properties

TROTEC SETUP

Name your layers

Click to change
your layer's line colour

Make sure your lineweight
are all set to 0.00mm
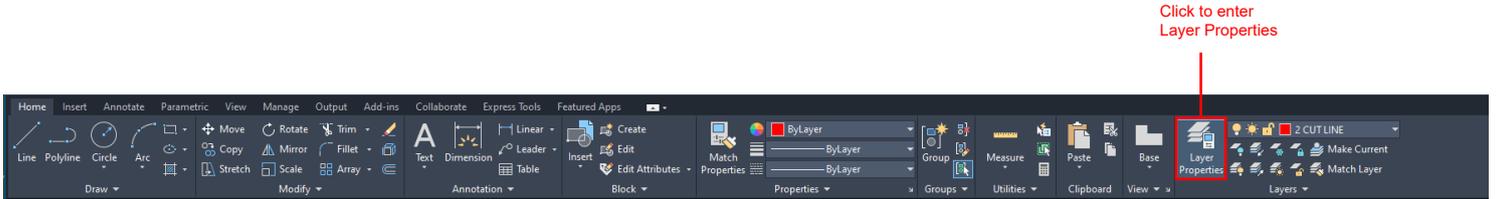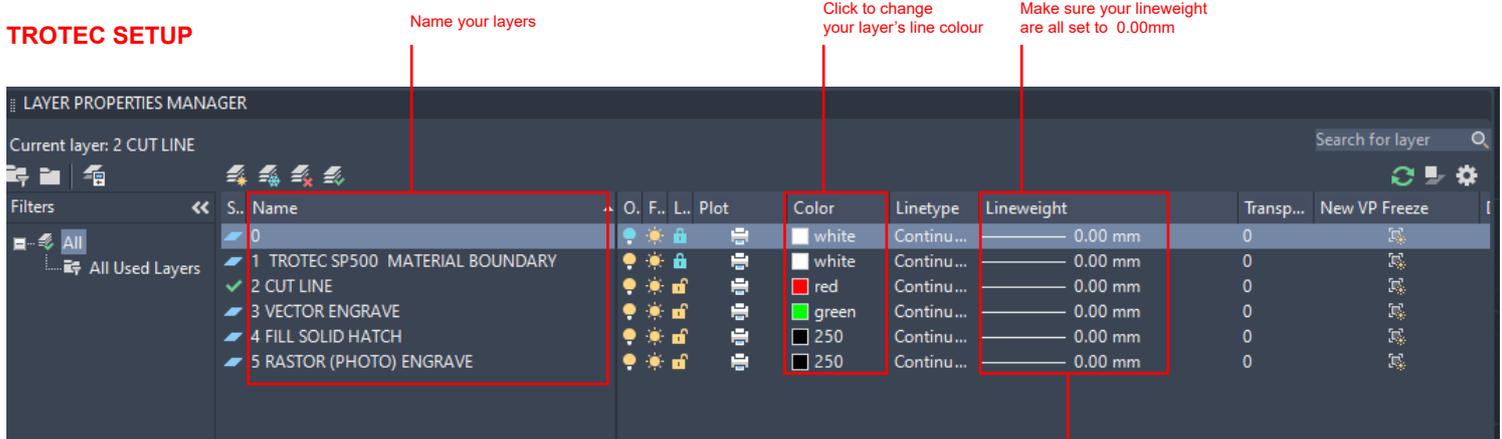
TROTEC

LAYER / COLOUR SETUP FOR

LAYER 1 = (NA)   MATERIAL BOUNDARY | (NO PRINT)

LAYER 2 = (BLACK)   RASTOR ENGRAVE | Engraving photographic type images

LAYER 3 = (GREEN)   VECTOR ENGRAVE | Engraving / scoring lines

LAYER 4 = (BLACK)   FILL / solid Hatch | Fill / solid Hatch pattern engraving

LAYER 5= (RED)   CUT | Cut lines

Colour	Red Value	Green Value	Blue Value
BLACK	0	0	0
GREEN	0	255	0
RED	255	0	0
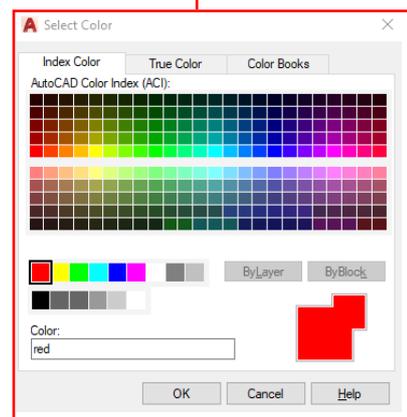
Maker sure
colours
are set to
RGB

AUTOCAD | LASER CUTTING GUIDE

EMBLASER 2 SETUP

Name your layers

Click to change
your layer's line colour

Make sure your lineweight
are all set to 0.00mm

LAYER PROPERTIES MANAGER

Current layer: 2 CUT LAYER

Search for layer

S..	Name	O.	F..	L..	Plot	Color	Linetype	Lineweight
	0					white	Continuous	0.00 mm
	1 EMBLASER 2 MATERIAL BOUNDARY					9	Continuous	0.00 mm
✓	2 CUT LAYER					red	Continuous	0.00 mm
	3 VECTOR ENGRAVE					green	Continuous	0.00 mm
	4 FILL SOLID HATCH ENGRAVE					blue	Continuous	0.00 mm
	5 RASTOR (PHOTO) ENGRAVE					250	Continuous	0.00 mm

Filters — All — All Used Layers

Select Color

Index Color | True Color | Color Books

AutoCAD Color Index (ACI):

ByLayer | ByBlock

Color:
red

OK | Cancel | Help

Maker sure
colours
are set to
RGB

EMBLASER 2

LAYER / COLOUR SETUP FOR

LAYER 1 = (NA) MATERIAL BOUNDARY | (NO PRINT)

LAYER 2 = (BLACK) RASTOR ENGRAVE | Engraving photographic type images

LAYER 3 = (GREEN) VECTOR ENGRAVE | Engraving / scoring lines

LAYER 4 = (BLUE) FILL / solid Hatch | Fill / solid Hatch pattern engraving

LAYER 5= (RED) CUT | Cut lines

Colour	Red Value	Green Value	Blue Value
BLACK	0	0	0
GREEN	0	255	0
BLUE	0	0	255
RED	255	0	0
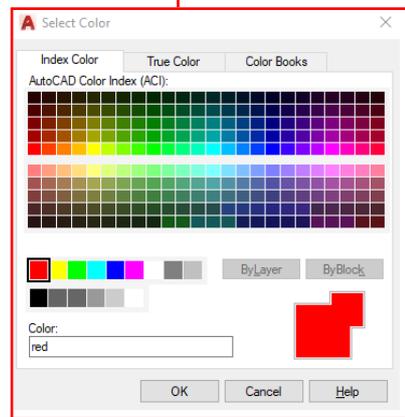
**BEFORE YOU SUBMIT, CTRL+A TO SELECT ALL AND DOUBLE CHECK THAT ALL LINES ARE
SET TO COLOUR BYLAYER AND ARE THE CORRECT LINEWEIGHTS - 0.00MM**

# FINAL STEPS | ALWAYS DO ALL 3 | EXPLODE | OVERKILL | JOIN

EXPLODE

This command breaks polylines into line or curve segments and hatches into lines segments.
In the comand line (located bottom/ middle of screen) Type EXPLODE

EXPLODE

Breaks a compound object into its component objects.

Find

Explodes a compound object when you want to modify its components separately. Objects that can be exploded include blocks, polylines, and regions, among others.
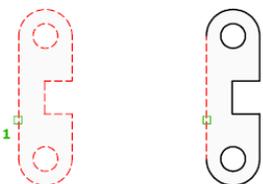
The color, linetype, and lineweight of any exploded object might change. Other results differ depending on the type of compound object you're exploding. See the following list of objects that can be exploded and the results for each.

To explode objects and change their properties at the same time, use XPLODE.

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OVERKILL

Removes duplicate or overlapping lines, arcs, and polylines. Also, combines those that are partially overlapping or contiguous.

 Find

The following changes are made to geometric objects in the drawing area or the block editor:

- Duplicate copies of objects are deleted
- Arcs drawn over portions of circles are deleted
- Lines at the same angle that partially overlap are combined into a single line
- Duplicate line or arc segments are deleted
- Overlapping and zero-length polyline segments are deleted

In the comand line (located bottom/ middle of screen) Type OVERKILL - Push Enter Key

In the command line, 'Select Objects' will appear.
Select everything in your drawing and push the Enter key and the following window will appear.
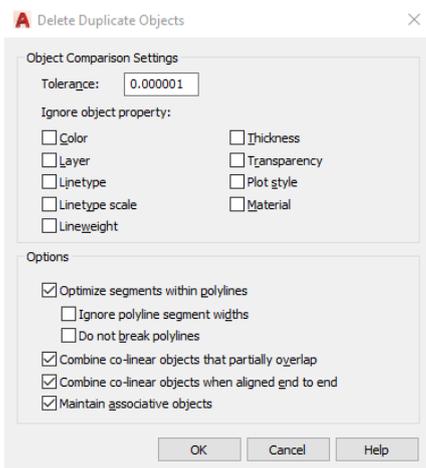
No need to change any of these setting – Just push OK

JOIN

Joins the endpoints of linear and curved objects to create a single object.

 Find

Combines a series of finite linear and open curved objects at their common endpoints to create a single 2D or 3D object. The type of object that results depends on the types of objects selected, the type of object selected first, and whether the objects are coplanar.

In the comand line (located bottom/ middle of screen) Type JOIN - Push Enter Key

PRINT SETUP

EMBLASER 2

EXAMPLE PAGE LAYOUT

MAKERSPACE DBE @ BUILDING 418
MAX MATERIAL SIZE = 500mm x 300mm x 50mm
Strawboard & Plywood

Print width = Line Weight = 0.0
**Line type = Continous**
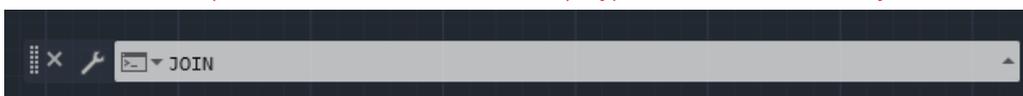
LAYER / COLOUR SETUP FOR
**ALWAYS IN RGB**

LAYER 1 = (NA)   MATERIAL BOUNDARY   (NO PRINT)

LAYER 2 = (BLACK)	RASTOR ENGRAVE	Engraving photographic type images
LAYER 3 = (GREEN)	VECTOR ENGRAVE	Engraving / scoring lines
LAYER 4 = (BLUE)	FILL / solid Hatch	Fill / solid Hatch pattern engraving
LAYER 5 = (RED)	CUT	Cut lines

Colour	Red Value	Green Value	Blue Value
BLACK	0	0	0
GREEN	0	255	0
BLUE	0	0	255
RED	255	0	0

PAGE SIZE OUTLINE
500mm x 300mm

2mm Minimun distance between parts
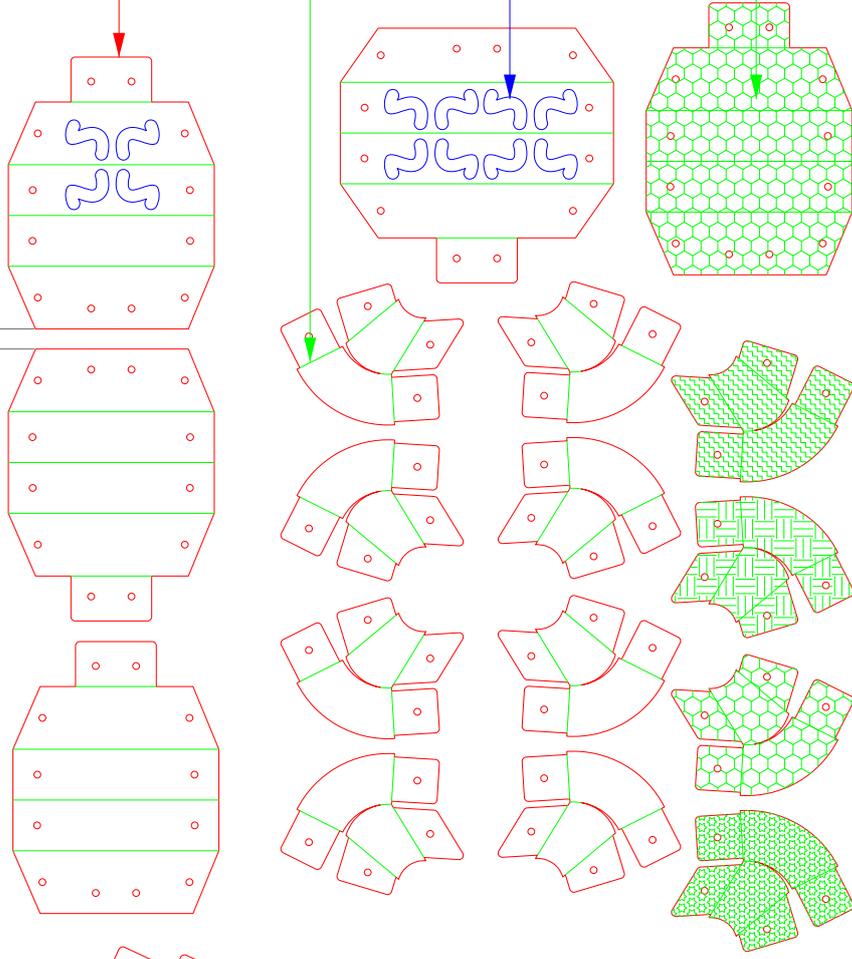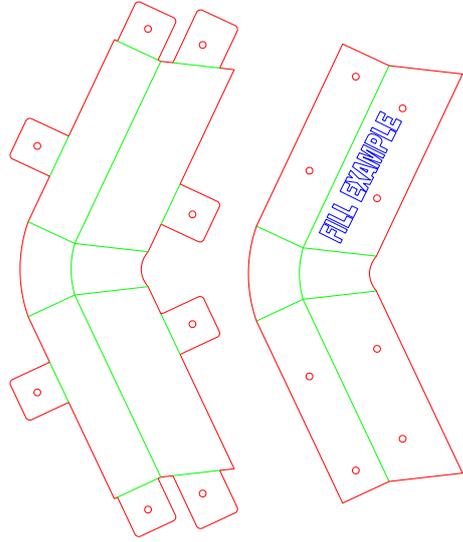
CUT LINE
Alway join line to be continuous polylines

VECTOR ENGRAVE LINE

FILL / SOLID HATCH
Emblaser 2 only
A single closed blue polyline.
Will result in solid black hatch:

VECTOR ENGRAVE PATTERN
Allways explode and then join line based pattern hatches

RASTOR ENGRAVE
From a photo jpg, png etc
The Laser cutter will engrave your photo

FILL EXAMPLE

TROTEC

TROTEC SPEEDY 400 | DIGITAL MODELLING @ BUILDING 202
MAX MATERIAL = SIZE 900 x 600 x 12.7mm

Strawboard, Plywood, Acrylic, leather, other upon request

Print width = Line Weight = 0.0
Line type = Continous

LAYER / COLOUR SETUP FOR

LAYER 1 = (NA)   MATERIAL BOUNDARY   (NO PRINT)

	LAYER 2 = (BLACK) RASTOR ENGRAVE	Engraving photographic type images
	LAYER 3 = (GREEN) VECTOR ENGRAVE	Engraving / scoring lines
	LAYER 4 = (BLACK) FILL / solid Hatch	Fill / solid Hatch pattern engraving
	LAYER 5= (RED) CUT	Cut lines

Colour	Red Value	Green Value	Blue Value
BLACK	0	0	0
GREEN	0	255	0
RED	255	0	0
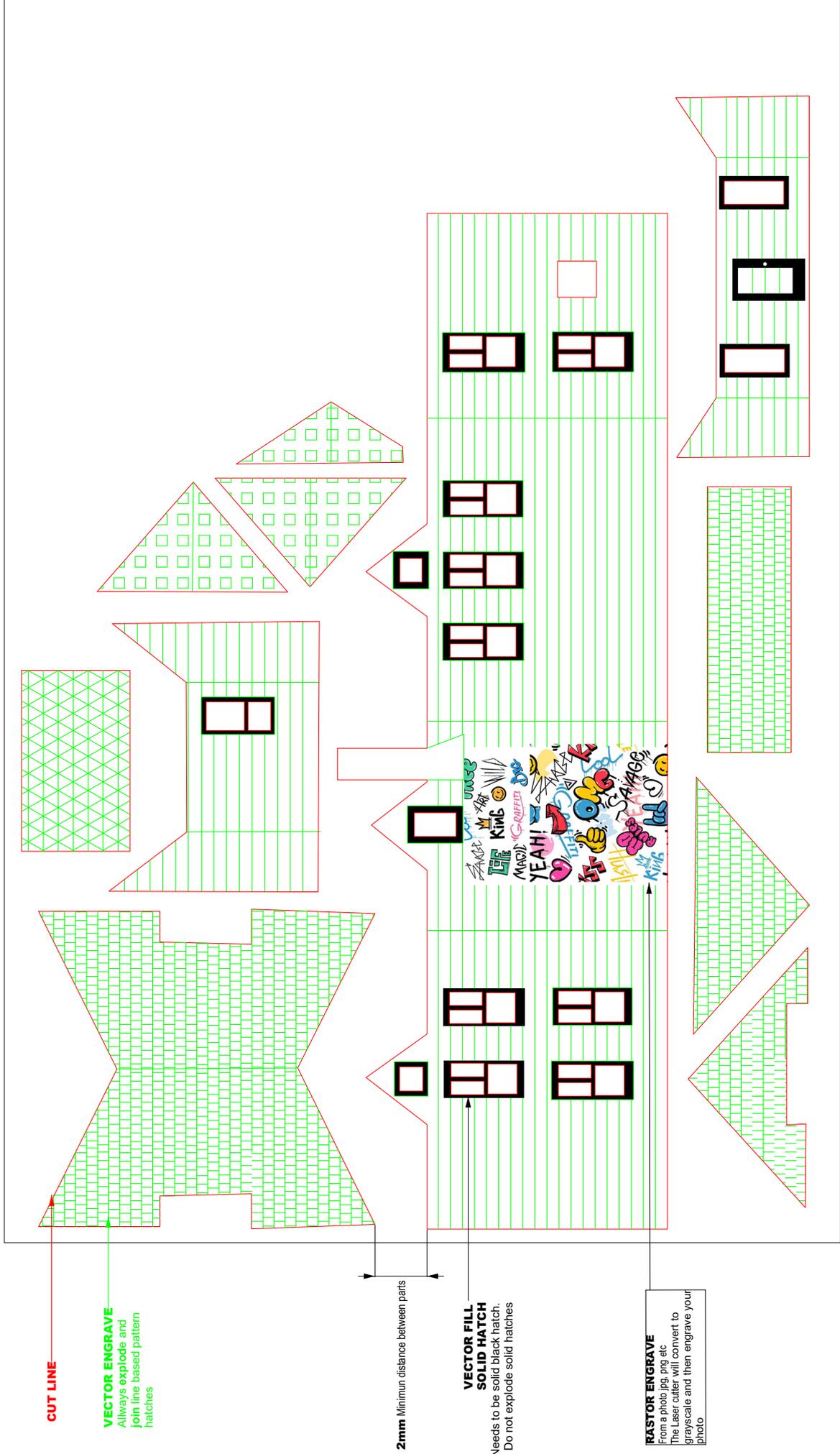
CUT LINE

VECTOR ENGRAVE
Always explode and
join line based pattern
hatches

2mm Minimun distance between parts

**VECTOR FILL
SOLID HATCH**
Needs to be solid black hatch.
Do not explode solid hatches

RASTOR ENGRAVE
From a photo jpg, png etc
The Laser cutter will convert to
grayscale and then engrave your
photo

AUTOCAD | LASER CUTTING GUIDE

EXPORT AS PDF

SUMMARY/QUICK GUIDE

Always check the following when plotting as PDF:
- Plot in **Model** page
- Printer/Plotter set to **AutoCAD PDF (High Quality Print)**
- Select or set **Custom Paper Size** to match selected material
- Make sure custom paper margin are all **set to 0**
- Select **Window** under Plot Area
- Select **Center the Plot**
- Uncheck "Fit to paper", make sure **scale is 1:1**
- Check **page orientation** is correct

AUTOCAD | LASER CUTTING GUIDE
EXPORT AS PDF (Windows)

Nest all cut pieces within material template

IMPORTANT:
Make sure you are plotting in *Model* page

1) Nest all pieces to be cut within selected material template or correct sheet size
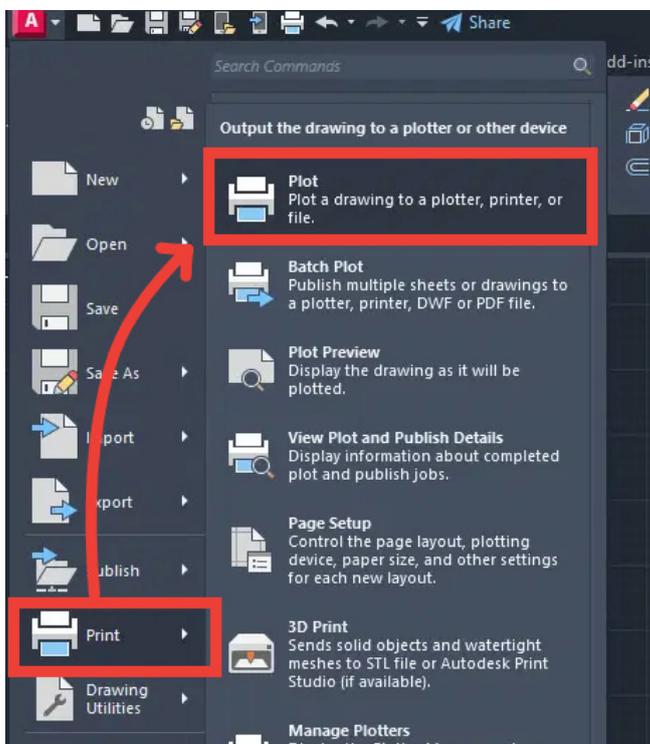
2) Go to Print and select *Plot*, or type in *Plot* into the Command Line
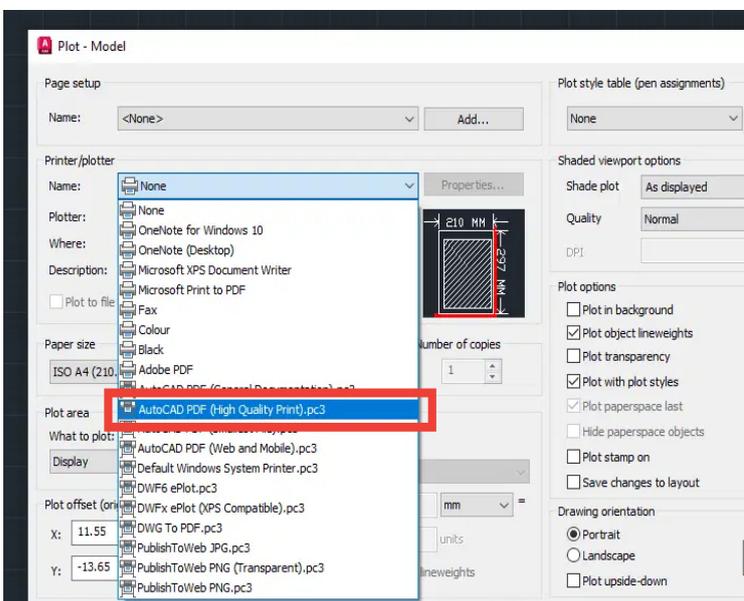
3) Under Printer/Plotter, select:
AutoCAD PDF (High Quality Print)

AUTOCAD | LASER CUTTING GUIDE
EXPORT AS PDF (Windows)
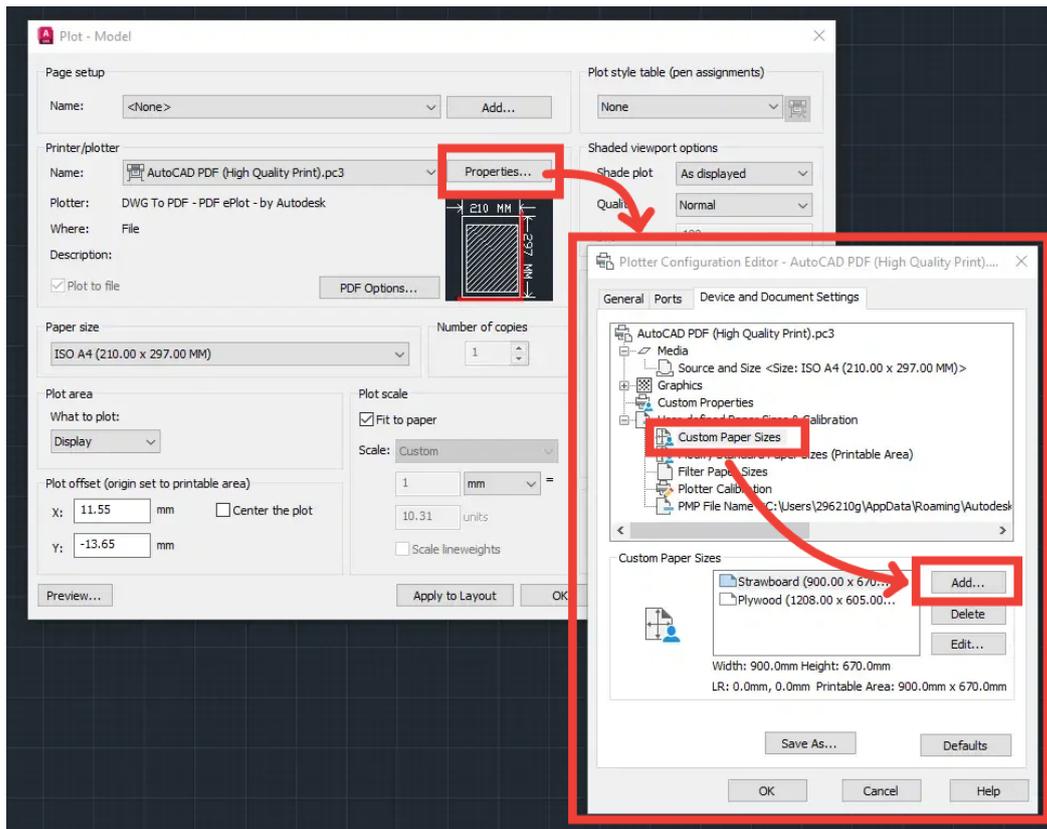
4) If plotting from AutoCAD for the first time, you will need to set up a custom paper size to match the material you are using.

- Go to *Properties*
- Select *Custom Paper Sizes*
- Click on *Add*
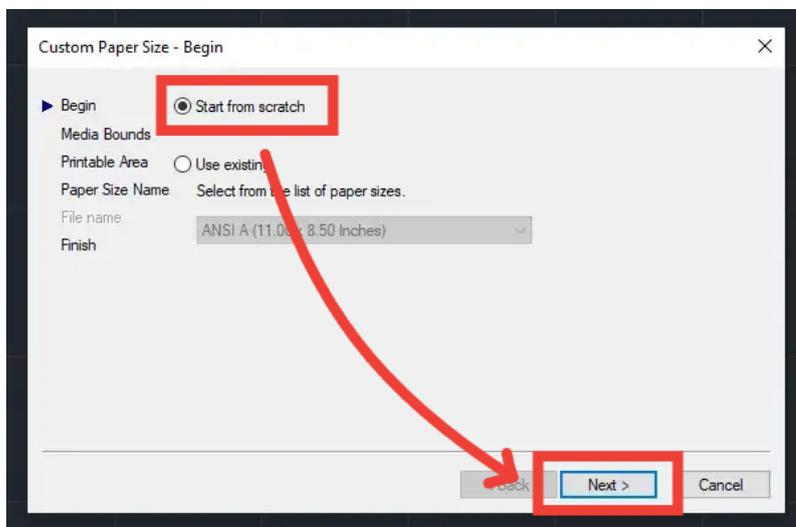
5) Select *Start from scratch*
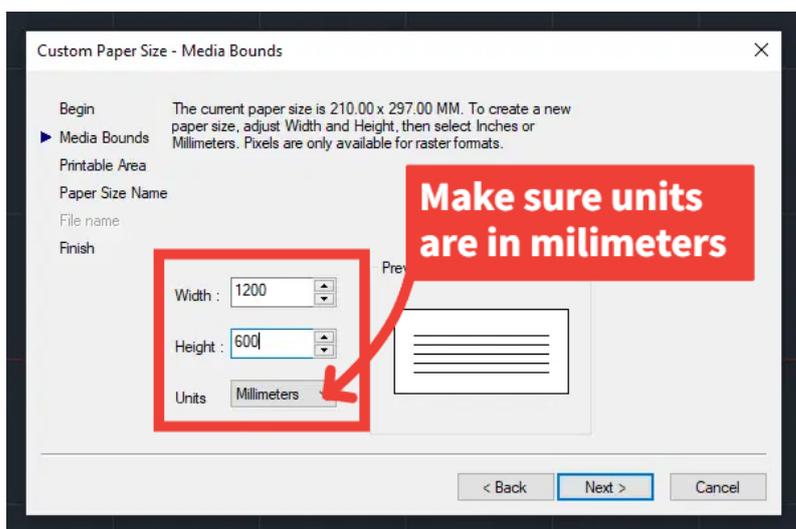
6) Set Width and Height to match selected material size
* *Make sure Units are set to Milimeters*

AUTOCAD | LASER CUTTING GUIDE
EXPORT AS PDF (Windows)
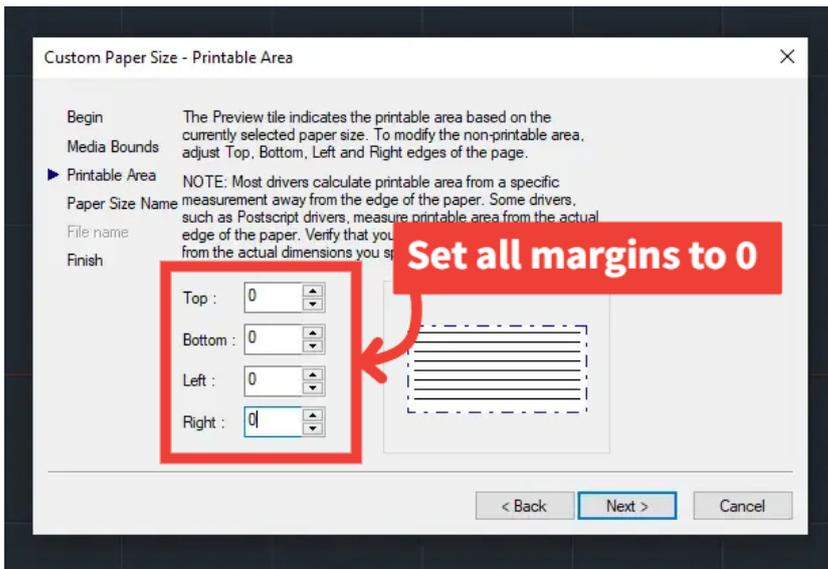
7) Set all margins to *0*
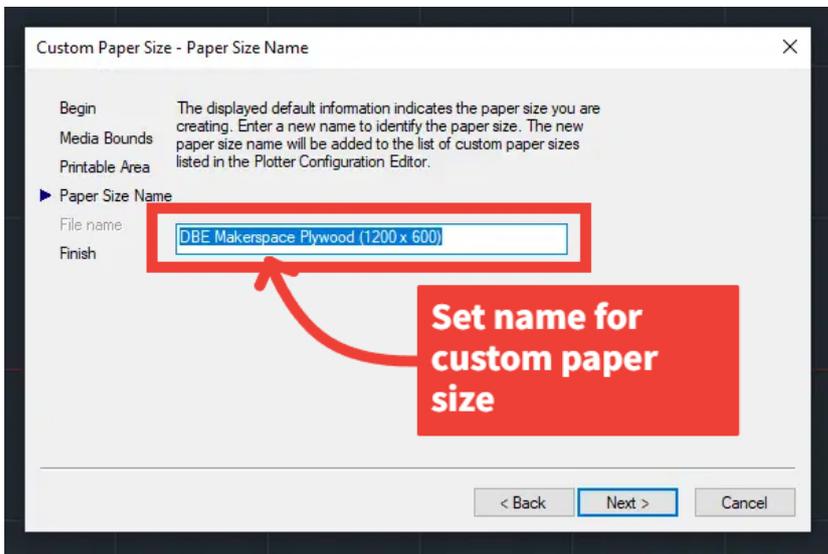

8) Set a name for the new custom paper

9) Check that new custom paper is added to the list


Tip:
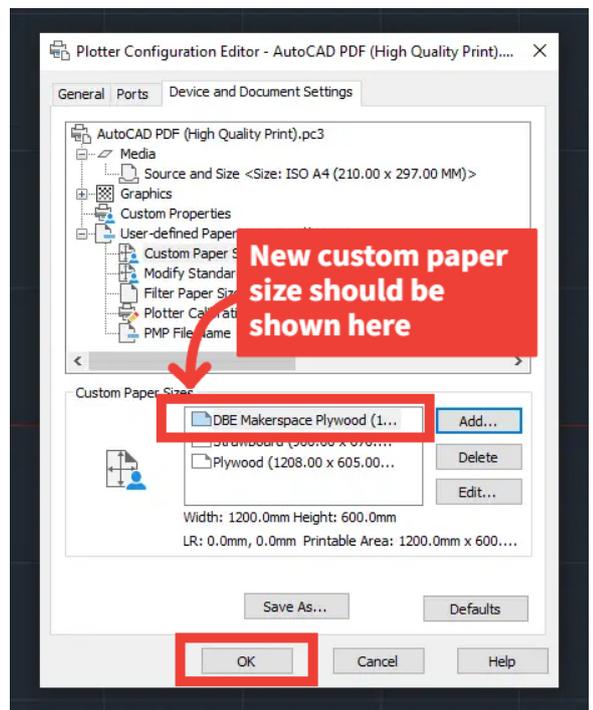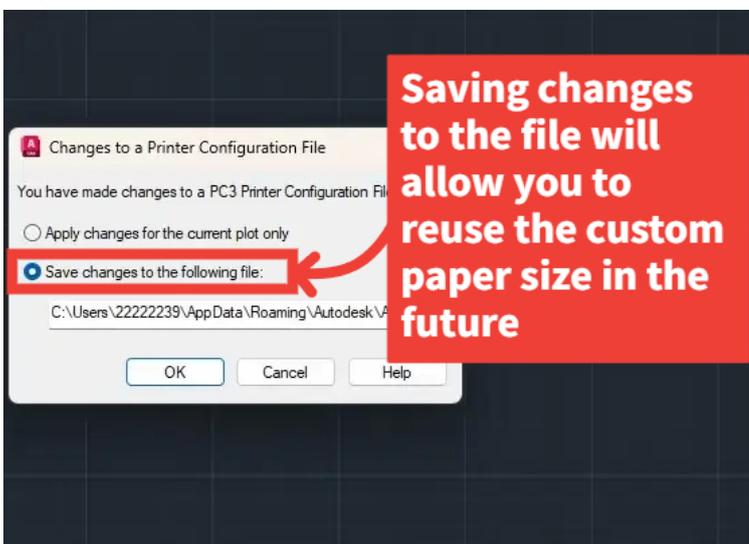
AUTOCAD | LASER CUTTING GUIDE
EXPORT AS PDF (Windows)

Search for and select newly created custom paper size

10) New custom paper should be displayed in the drop down list under *Paper Size*

Select "Window" for Plot area

11) Under *Plot Area*, select *Window*

Select the sheet to plot

12) Select the material sheet to specify the area to plot
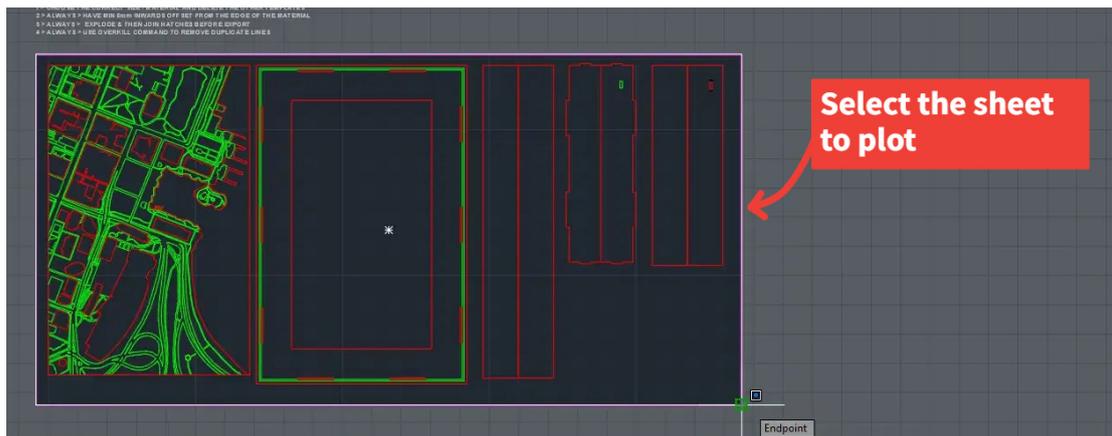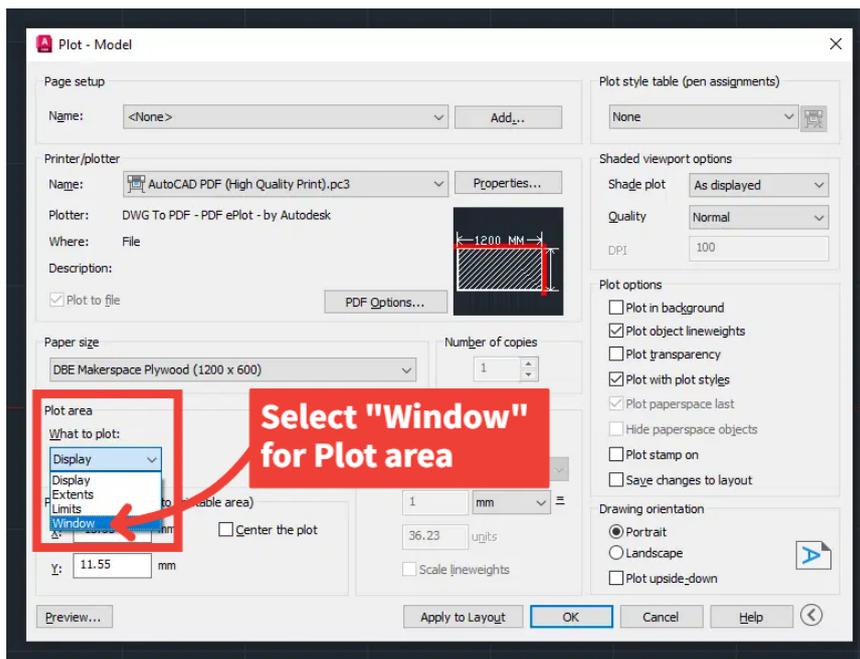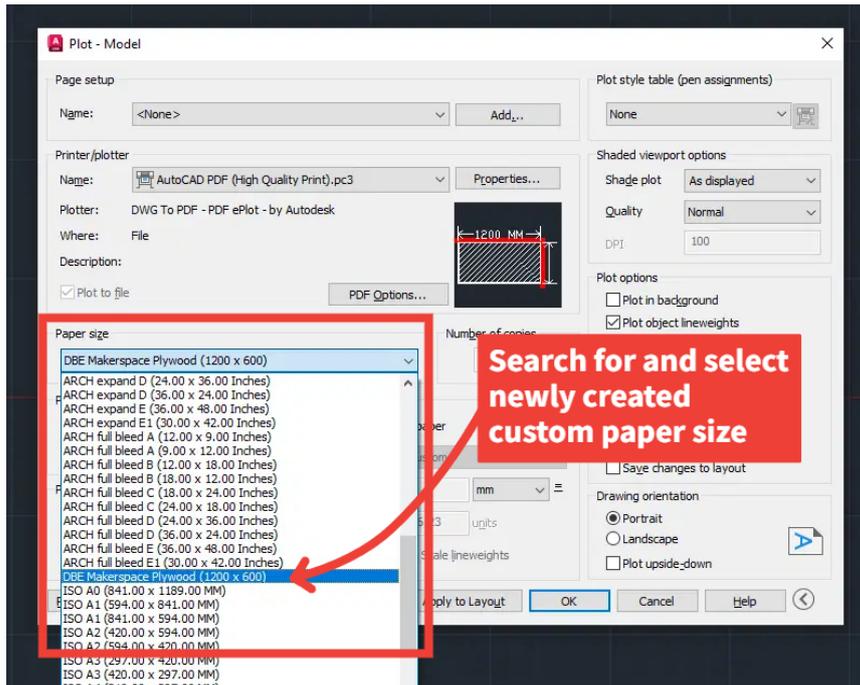
AUTOCAD | LASER CUTTING GUIDE

EXPORT AS PDF (Windows)
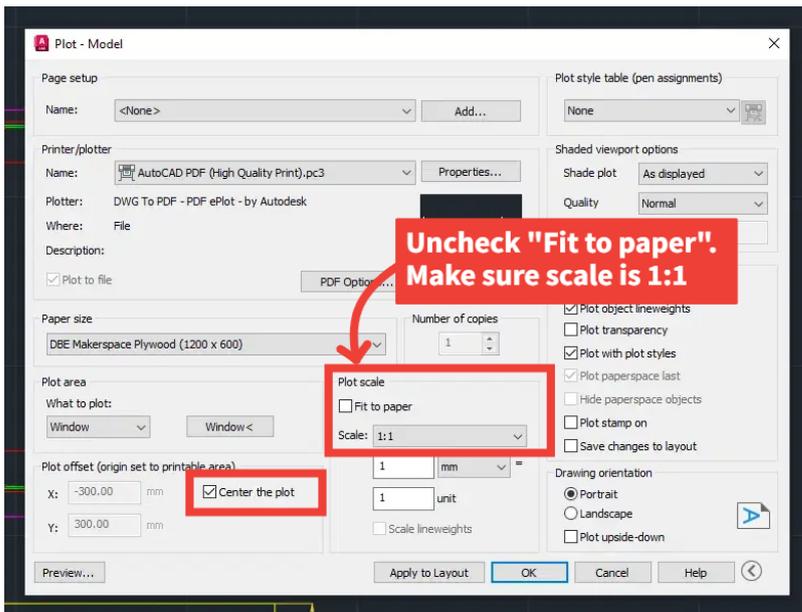
13) Select *Center the plot*

IMPORTANT: Make sure scale is *1:1*
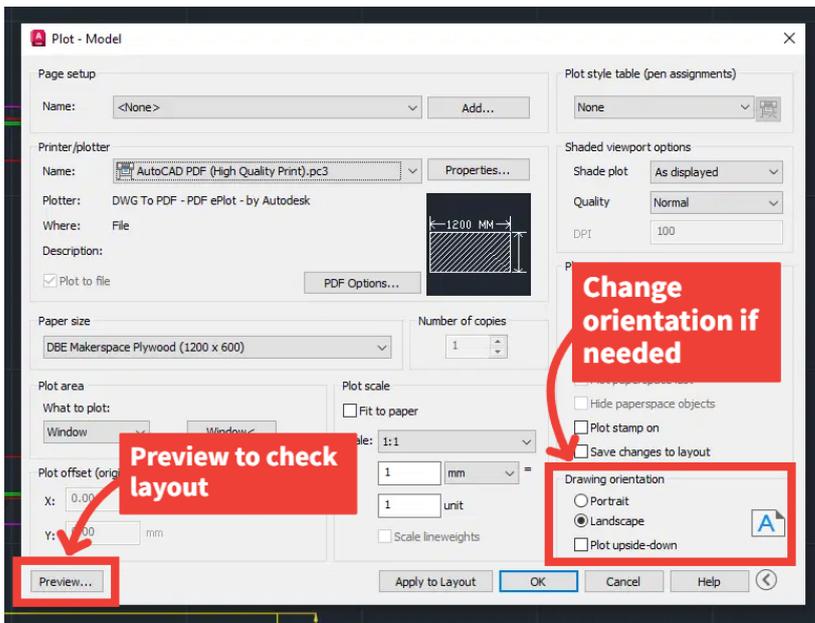
14) Click on *Preview* to check layout and pen colour

- Change page orientation if needed
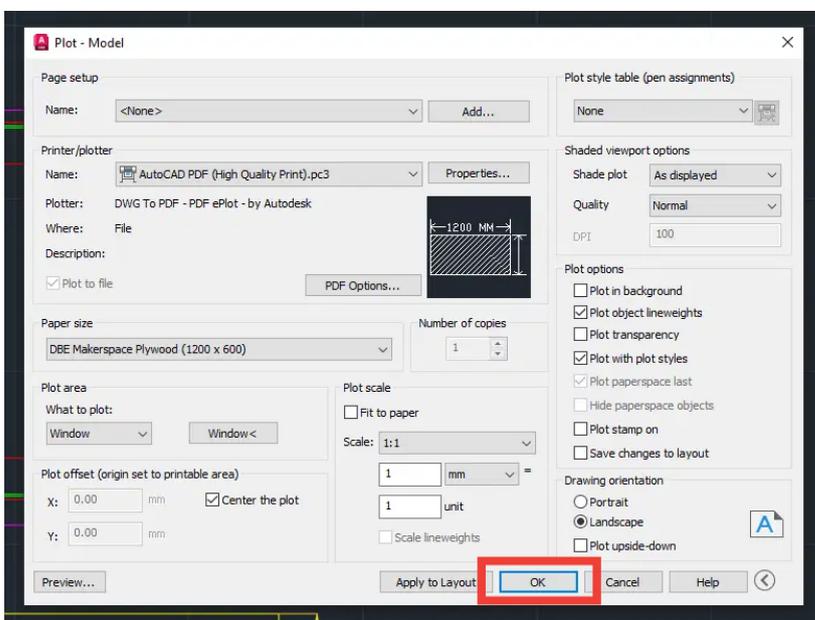

15) Click on *OK* to plot

AUTOCAD | LASER CUTTING GUIDE
EXPORT AS PDF (Mac)

Nest all cut pieces within material sheet size

IMPORTANT:
Make sure you are plotting in *Model* page

1) Nest all pieces to be cut within selected material template or a rectangle that is drwan to the correct-correct sheet size
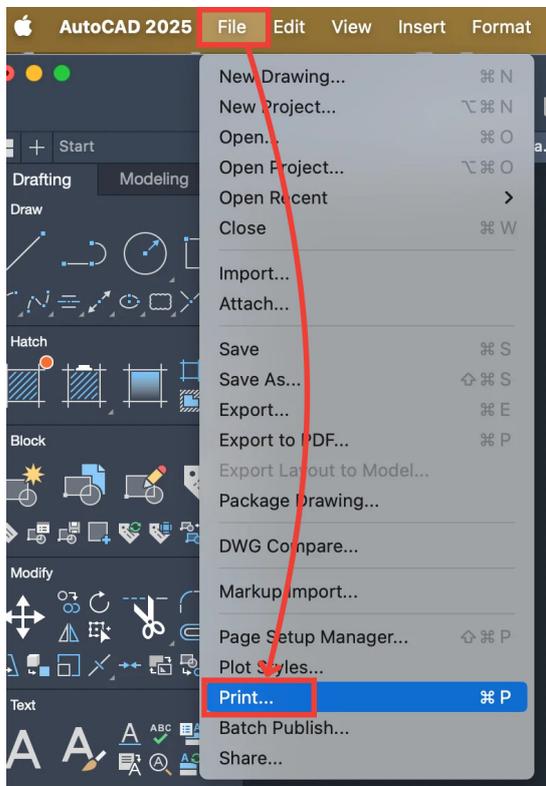
2) Go to File and select *Print* or type in *Print* into the Command Line
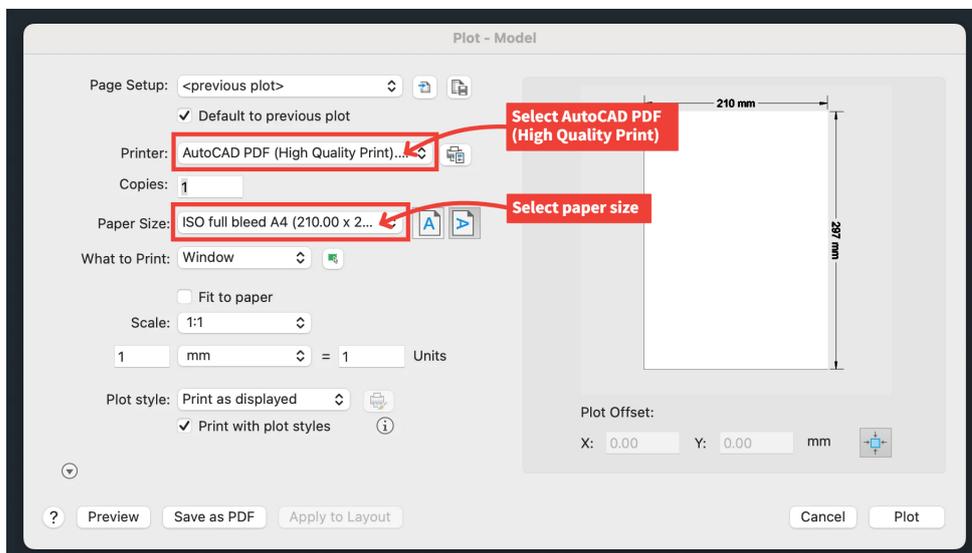
3) Under Printer, select:
*AutoCAD PDF (High Quality Print)*

4) Select Paper Size

AUTOCAD | LASER CUTTING GUIDE
EXPORT AS PDF (Mac)
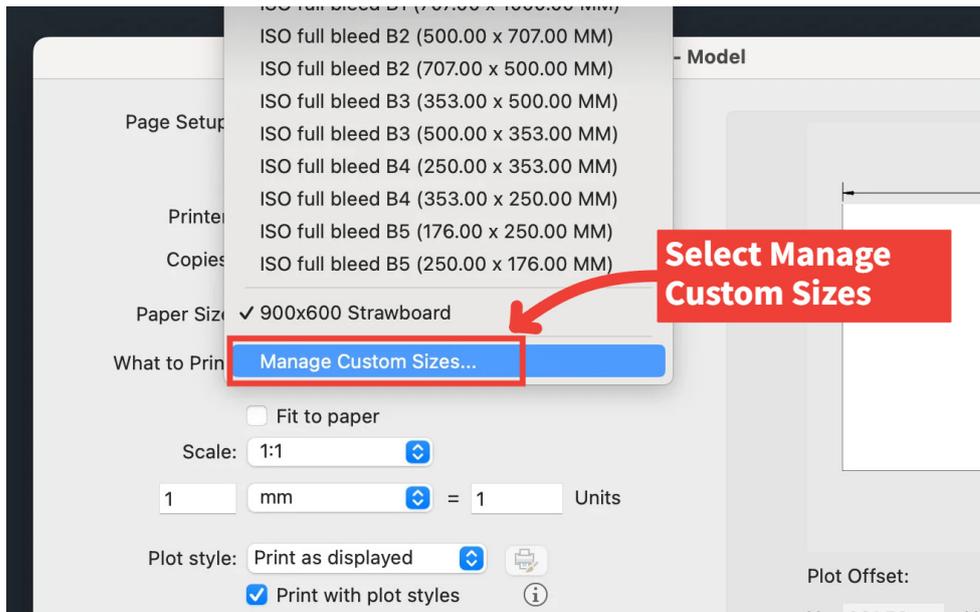
ISO full bleed B1 (707.00 x 1000.00 MM)
ISO full bleed B2 (500.00 x 707.00 MM)
ISO full bleed B2 (707.00 x 500.00 MM)
ISO full bleed B3 (353.00 x 500.00 MM)
ISO full bleed B3 (500.00 x 353.00 MM)
ISO full bleed B4 (250.00 x 353.00 MM)
ISO full bleed B4 (353.00 x 250.00 MM)
ISO full bleed B5 (176.00 x 250.00 MM)
ISO full bleed B5 (250.00 x 176.00 MM)

✓ 900x600 Strawboard

Manage Custom Sizes...

Select Manage Custom Sizes

4) If plotting from AutoCAD for the first time, you will need to set up a custom paper size to match the material you are using.

- Select **Manage Custom Sizes**

Custom Paper Sizes

900x600 Strawboard

Paper Size: 90.00 cm (Width) 67.00 cm (Height)

Non-Printable Area: User Defined

0.00 cm Top
0.00 cm Left   0.00 cm Right
0.00 cm Bottom

+ — Duplicate

? Cancel OK
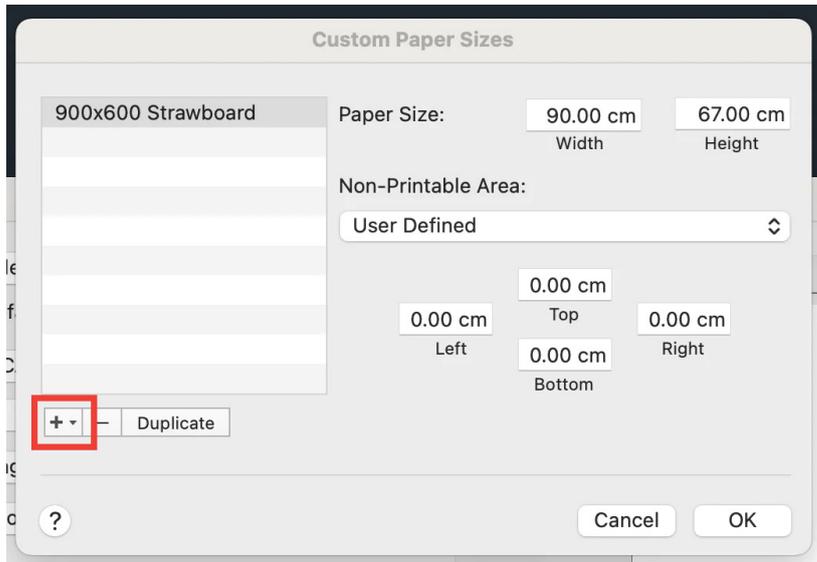
5) Click on the **"+"** sign to create a new page size

Custom Paper Sizes

900x600 Strawboard

Paper Size: 90.00 cm (Width) 67.00 cm (Height)

Non-Printable Area: User Defined

0.00 cm Top
0.00 cm Left   0.00 cm Right
0.00 cm Bottom

+ — Duplicate
New Paper Size
Select From List...

Cancel OK
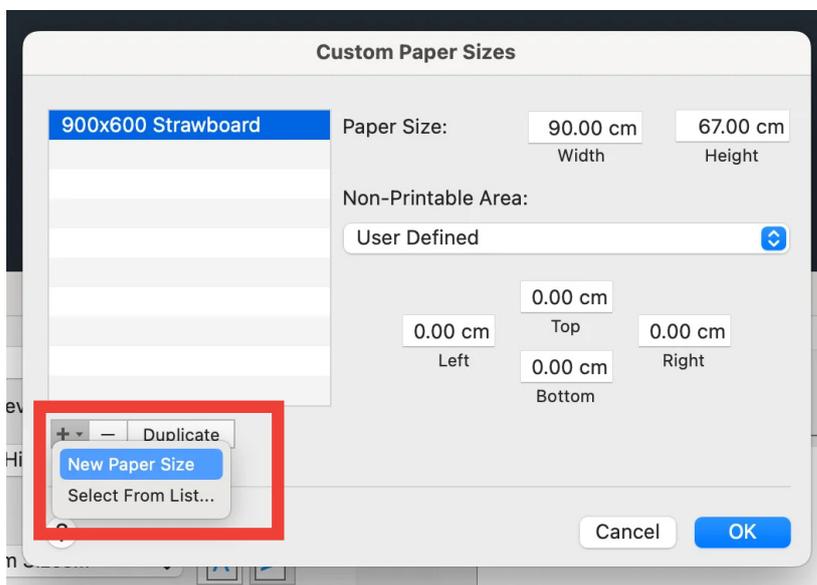
6) Select **New Paper Size** to create a new custom paper size

AUTOCAD | LASER CUTTING GUIDE
EXPORT AS PDF (Mac)
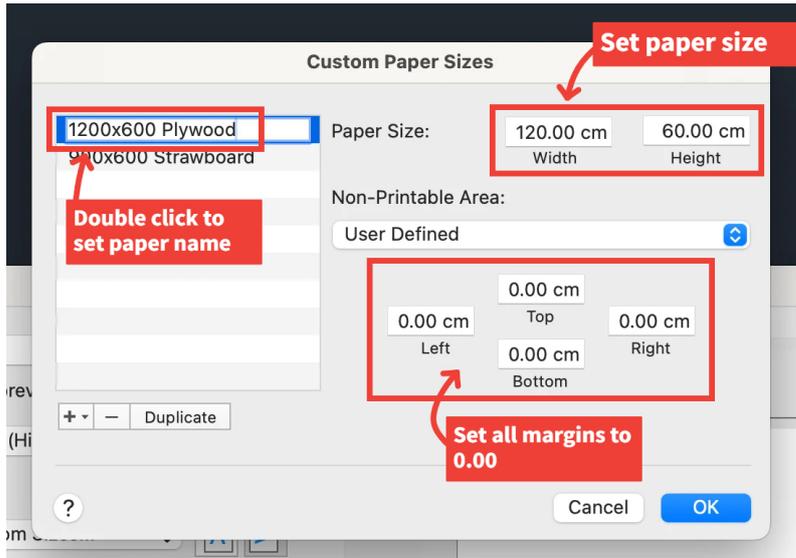
7) Within the Custom Paper Size window:

- Set *paper size* to match the material size that has been set up (***note:*** dimensions are in cm)

- Set all *margins to 0.00*

- Double click *Untitled* new paper to set a name for the new custom paper size to save for future use

- Click on *'OK'* to finish setting up custom paper
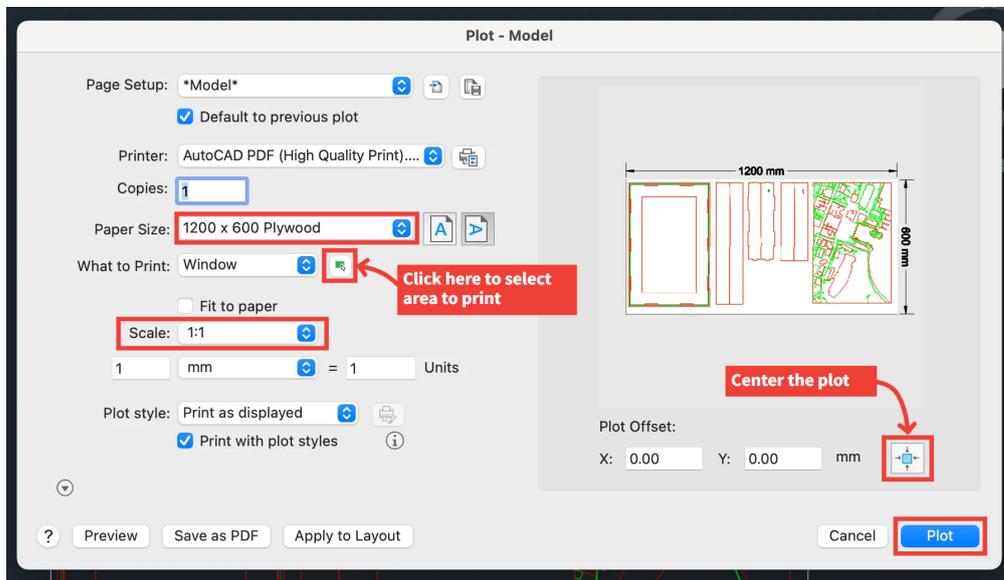
8) Back in the Plot window:
- Ensure correct paper size is selected

- Under "What to Print", select *Window* and *click on the icon* to select the area to print

- Ensure *scale is set to 1:1*

- *Center the plot* if needed

- Click on *Plot* to finish and save PDF
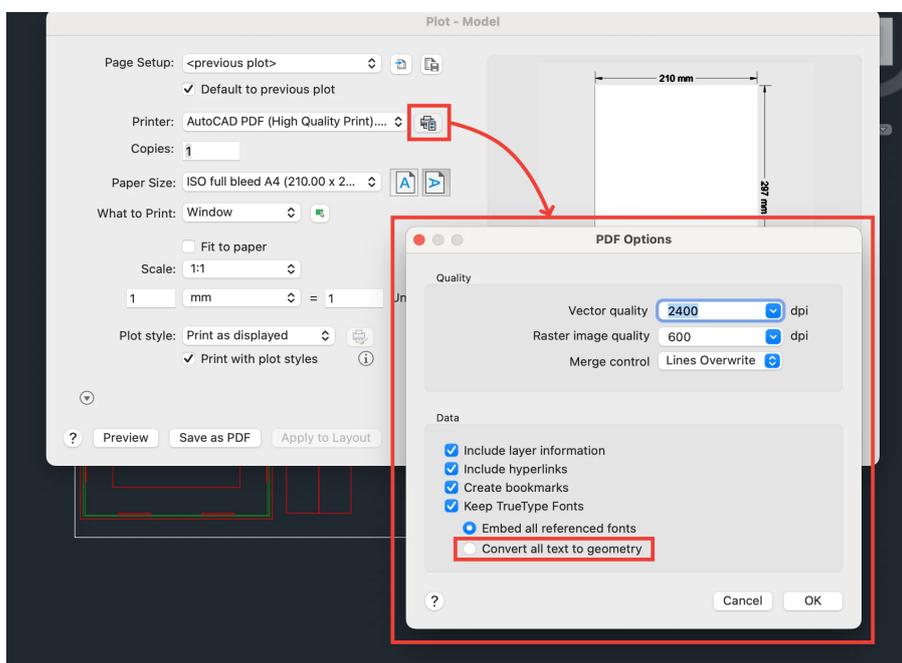
Tip:
If cut file contains texts

If the cut file contains texts that needs to be etched or engraved, click on the *icon* next to the Printer selection and make sure that *Convert all text to geometry is selected*