

Laser Marking Machine L100

User manual

- ◆ Make sure to read the User Manual before using this machine.
- ◆ This product's appearance and specifications are subject to change without notice for performance improvement and ease of use some parts may be different the pictures shown in this Manual.



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Contents

Cautions for Use.....	2
Cautions on Laser Products	3
Product parts and installation	5
1. Parts and Accessories	5
2. Specifications.....	7
3. Descriptions.....	8
(1) Product	8
(2) Buttons	9
4. Installation.....	10
(1) Installation of Marking Machine	10
(2) Driver Installation	11
(3) Program Installation.....	12
(4) Manual Calibration	14
(5) Installation of the blower	17
(6) Auxiliary Power Device Setup (for external devices).....	18
5. Operation of Marking Machine.....	19
6. Other Devices.....	22
7. Clamp	24
Program Usage Description	34
1. Toolbar	36
2. Text object property	53
3. Rotation tool property	59
4. How to engrave for each toolpath.....	60
5. Create Toolpath.....	63
6. NC data output	66
Laser Option	69
1. Engraving Option	70
2. Options	72
3. Material.....	72
4. Rotary Engraving Option	74
5. Laser Option by Toolpath	75
MarkingProcess.....	76
Marking Process of Ring inner/outer Diameter	81
Photo Marking	92
Cutting Process	100
Curved Material Marking.....	108
Shape Distortion	111
Layout of Text in a Circle	115
Layout of Text on a Curve	117
Font Preview.....	118
Text Change	119
Template Creation.....	120
Saving as Design Sample	125
Auto Change of Serial Number	128
Loading and Editing Image.....	131
Import a File in SVG Type	136
Product Setting.....	138

Cautions for Use

Please be sure to read and follow the instructions below for safety use.

Intended use: L100 is intended for laser marking

- The instructions below are intended to prevent personal injury and property damages.
- Please read carefully and use the machine properly.



Caution

If you do not follow these instructions, injury or property damage may occur.



Warning

If you do not follow these instructions, users may be seriously injured.

■ Cautions related to power



Warning

Do not use damaged cord or loosened outlet.
➤ It may cause electric shock or fire.



Warning

Do not put multiple power plugs into one inlet simultaneously. It may cause fire due to overheated inlet.



Warning

Do not pull a plug by the cord. Do not touch a power plug with wet hands.



Caution

When the product is not in use for a long term, pull out the power plug.



Warning

If smoke comes out from the product during use, turn off the product immediately and call the sales agency or our service center.



Warning

Plug-in the provided power cable only to the grounded outlet (power mains). If the outlet (power mains) is not ground-wired, set the grounding separately.

■ Cautions related to use



Warning

Do not use this machine in a place with oil, smoke, humidity, dust or water.
➤ It may cause electric shock or fire.



Warning

Do not put a candle or cigarette butt on the product. Avoid any heating apparatus like heater when using this machine.

➤ It may cause failure or fire due to overheating.



Warning

Be sure to place the product body only on a stable level surface.



Warning

Be sure not to be caught or jammed between the paths of each axis of the product.



Caution

When temperature falls below freezing point, the product may not normally perform. In this case, please sustain the room temperature in the place where you use this product for normal operation. Please make sure the temperature in the place where you use the does not fall below the freezing point.



Warning

Do not put water or small metal materials on the product.

➤ Due to negligence or vibration of the product, the materials may fall and cause injury, fire or failure by overheating or short circuiting.
➤ If water gets into the product, it may cause electric shock or fire.



Warning

Do not disassemble or modify the product.
➤ It may cause fire, electric shock or failure. Please contact the sales agency or our service center for inspection, calibration and repair.



Warning

Be sure to keep out of the reach of toddlers and children. Their curiosity or carelessness may cause injury.



Caution

We will not be held responsible for damage caused to product by misuse or poor care.

Cautions on Laser Products

CAUTIONS



The control and operation of the laser generator (CLASS 4) in a way other than its intended purpose may result in the exposure of dangerous laser radiation. Be careful that if a body part (e.g., eyes, skin, etc.) is exposed to such laser radiation, you could suffer from serious damage.



The front part of the head has a shield (L100: 1,064nm or higher wavelength, 6 or higher optical density). Do NEVER expose yourself to laser radiation with the shield cover removed or open. Make sure that you are not exposed to the laser even through such shield. Otherwise, it may result in blindness.



Do not stare at the specular/diffuse reflection of laser. It may result in blindness.



Make sure that your body part is not in the operating range. It may result in skin damage such as burn.



Do not use the product for purposes other than those intended. Otherwise, you could be damaged by laser radiation.



Appoint a laser safety manager and have him keep monitoring a laser risk and fully understand safety measures. According to each country's laws, the safety measures for the class-4 laser system are mandatory.



If you wear a pacemaker, do not come near the product or work area. It generates electromagnetic waves and can cause malfunction to the heart rhythm device.



Do NEVER dismantle or remodel the product randomly. Otherwise, you could be exposed to laser radiation and suffer from eye/skin damage. In addition, exposure to a high-voltage part can result in an electric shock.



Make sure that you have a system which emits the dust and haze which are generated during operation. The warranty does not cover the system damage or failure resulting from corrosive haze.



During product maintenance and control, make sure that the laser radiation is stopped, and safety goggles are put on. The eye/skin exposure to laser radiation can result in serious damage.



If any defect is found, do not use the product and contact the Service Center (+82-70-7011-0905).

*** For safe operations (Laser Class 1 Safety),
Stay alert all the time when using the laser system.***

Laser generator specifications

This product uses laser generator. In accordance with IEC60825-1, JIS C6802 and FDA(CDRH) Part 1040.10, CLASS 4 was adopted.

- **CLASS 4: Approach to laser is very dangerous to the eyes and skin. An emitting laser may cause fire or explosion.**

Type	Fiber		
Class	Class 4		
Output (User Choice)	20W	Max. Output	100W
	30W		
Wavelength	1,064nm	Pulse Width	200ns
Frequency	1-400kHz	Quality of Laser Beam	<1.3M ²
Cooling System	Air Cooling (Built-in)		
Lifespan	100,000hours		
CW	NOT POSSIBLE		

In addition, it is available as a guide laser to handle the red laser 'CLASS 3R'.

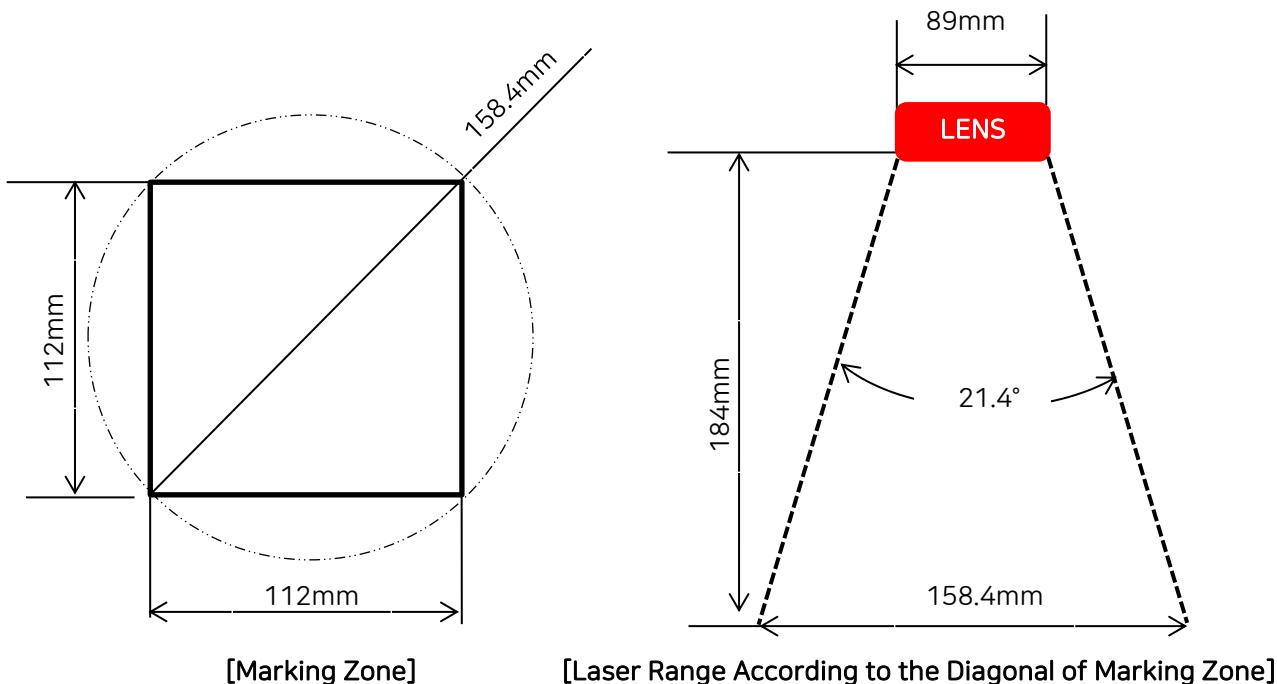
- **CLASS 3R: The approach to laser within visible spectrum (400-700nm) and 1mW or below is conditionally permitted. Exposure up to 0.25 second is okay for the eyes. However, laser approach can be dangerous.**

Class	Class 3R
Output	5mW
Wavelength	650nm

Laser Range

If a body part or flammable material comes into the range of laser radiation, it may result in eye/skin damage or fire. Cover it with a proper shield which has decent reflection and thermal properties considering the risk of such range.

(The marked distance represents the maximum width. It may differ from actual values.)














Product parts and installation

1. Parts and Accessories

The L100 provides the following accessories besides the base unit.

Their composition may differ depending on options.

Name	Picture	Quantity	Usage
Power Cable		1EA	Power supply ※ Use the power cable connected to the grounded outlet. Unless the outlet is grounded, separately ground the machine.
USB Cable		1EA	PC connection
Program CD		1EA	Design & marking software
User Manual		1EA	Operating manual
Clamp		1SET	Position support
Clamp Bolt (M5-12mm)		4EA	For holding materials in place.
L-wrench (4mm)		1EA	Tool for tightening/replacement of bolt.
L-wrench (2mm)		1EA	Tool for setting the focus pointer.
MagicArt Program Unlock USB		1EA	For running the MagicArt program.
Ruler		1EA	
Clamp Pin (6Ø)		2EA	For holding a optional clamp in place.

* Optional (Purchased separately)

Honeycomb Table Set	Honeycomb Table		1EA	For holding materials in place when cutting process.
	Honeycomb Table Tray		1EA	Tary for Honeycomb Table

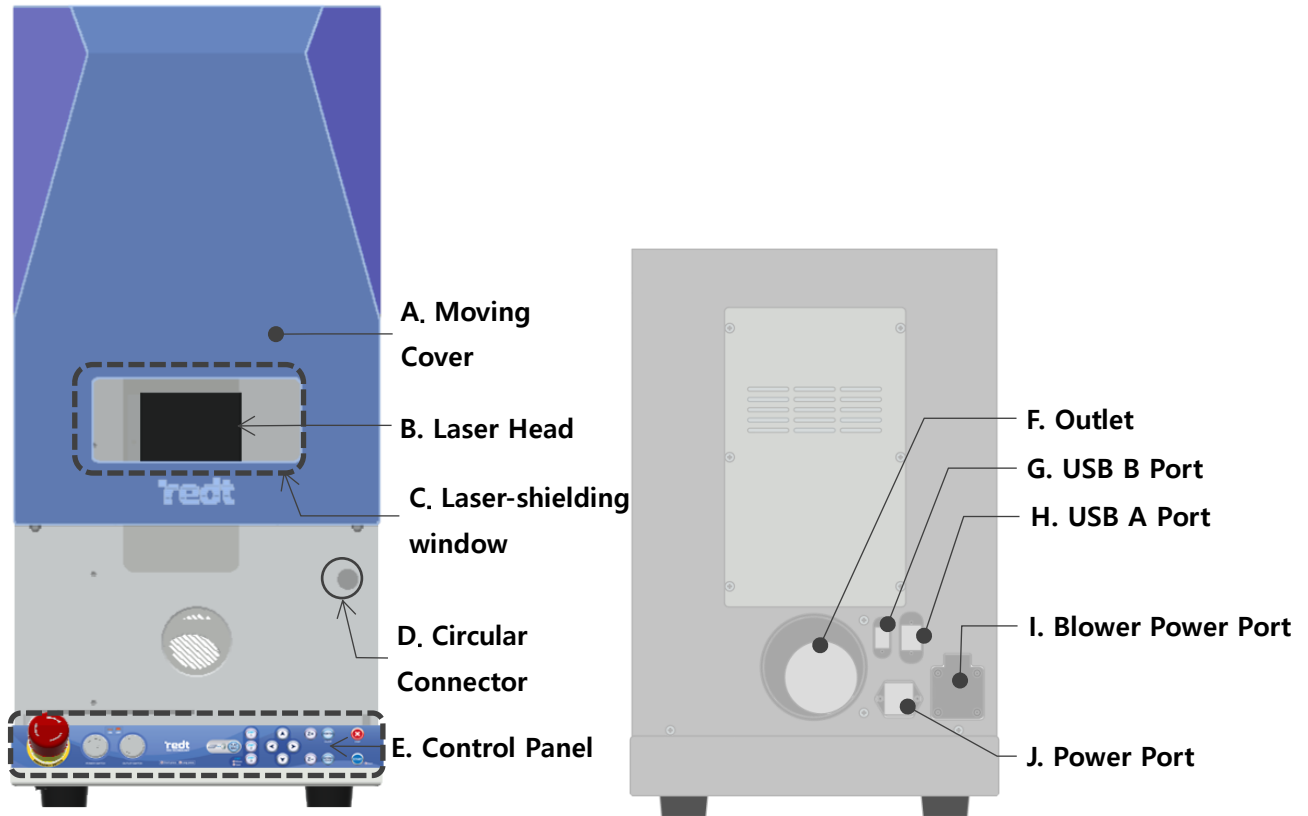
Medal Clamp Set	Medal Clamp		1EA	For holding a variety of shape of materials in place.
	Pin		6EA	For holding of irregular shaped material.
L type clamp			1EA	For holding a variety of shape of materials in place.
Blower Set	Blower		1EA	Dust & smoke discharge *There may be parts not homologous with the manual.
	Blower Hose (100Ø)		1EA	Blower connection hose (5M)
	Hose clamp (4inch)		3EA	For connect to blower and hose.
Rotary Clamp Set	Chuck Handle		2EA	Rotary clamp-tightening handle
	Chuck Finger (2mm)		3EA	For holding thin rings when marking thin ring's inner/outer diameter
	Finger Skin		1SET	For protect chuck fingers.
	Finger Spanner		1EA	Tool for tightening chuck fingers.
	Rotary Clamp		1EA	For holding ring materials in place.
Foot Switch			1EA	Other device Connect to USB A type port.
Auxiliary Power Device Set	Auxiliary Power Device		1EA	Auxiliary power device is required when using the dust collector.
	Power cable		2EA	Power supply and connect the machine.


2. Specifications

Laser safety classification	Class 1
Power consumption	AC 100~120V/ AC 200~240V
Frequency	50/60Hz
Operating voltage	< 400W
Blower power port	110~220V/2A
Dimensions	358*550*585 (W*H*D)
Weight	45Kg
Max.engraving area	Flat: 112(X)*112(Y)*115(Z)mm / Rotary: 85(A)mm
Minimum line width	0.05mm
Marking speed	3000mm/sec(X,Y) / 18mm/s(Z)
Temperature	15 - 35 C
Humidity	10 - 90 %
Purposes	Metal marking, Ring inner diameter marking, Ring outer diameter marking,.

3. Descriptions

(1) Product






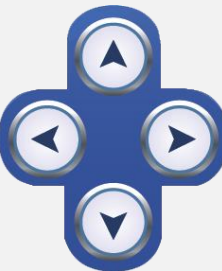







A	Moving Cover	Press [Moving Cover] to open/close the cover automatically. ※ Once the program is connected, the cover is automatically opened.
B	Head	A laser irradiation part.  Do not stare at the specular/diffuse reflection of laser. It may result in blindness.
C	Laser-shielding Display	Protects the eyes from laser radiation during laser marking. ※L100: Wavelength to protect: 1064nm/ Optical density: OD6
D	Circular Connector	Connects the power cable of the rotary clamp with the product and controls the A-axis of clamp at the use of rotary clamp.
E	Control Panel	Controls the power button and marking machine.
F	Outlet	Connects the duct hose to the outlet and removes dust generated during product processing.
G	USB Btype Port	Connects the USB cable plugged into the cable.
H	USB Atype Port	Connects the other device cable plugged into the cable.
I	Blower Power Port	Connects the blower power.<110~220V/2A>
J	Power Port	Connects the power adapter and supplies power to the marking machine. ※ Use the power cable connected to the grounded outlet. Unless the outlet is grounded, separately ground the machine.

(2) Buttons



* All buttons but POWER and EMERGENCY SWITCH **are inactive** until the program is connected. Connect the program and start the system.

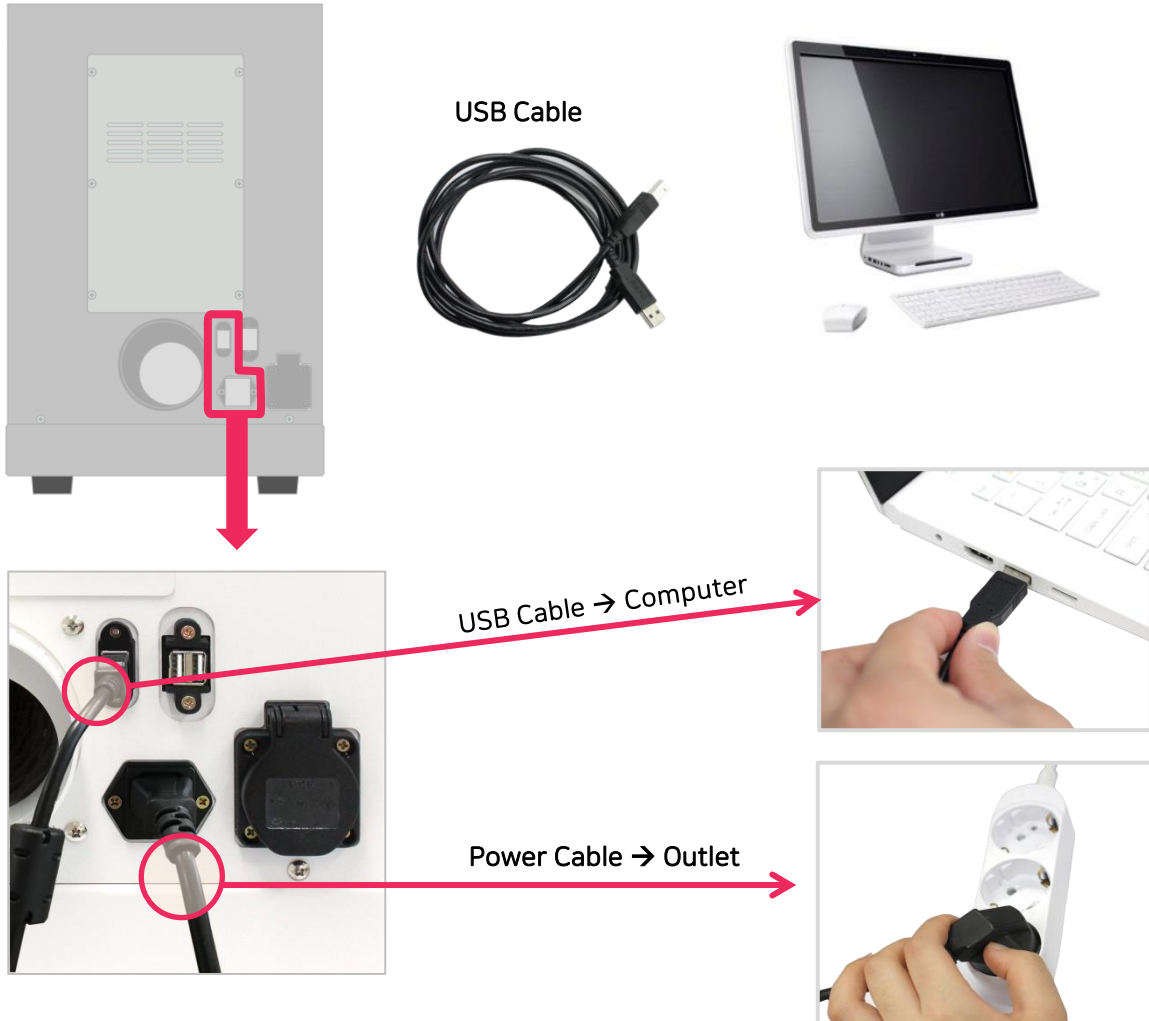
	EMERGENCY SWITCH	Emergency stop
	POWER	Product power button
	VACUUM	Vacuum dust collector power button
	MODE	Mode switch
	FOCUS	<ul style="list-style-type: none"> • If the button is pressed short (immediately released): Z-height is preset. Press the button and move the laser focus to the preset height. • If the button is pressed long (released in one second or later): Once the button is pressed long (1 second or longer) after adjusting the laser focus-moving height, the preset values are saved (linked with the height of program materials).
	DIRECTION KEY	Moves the guide laser pointer under the laser • Flat: Moves X and Y axes • Rotary: Moves A axis
	DIRECTION KEY(Z)	Moves Z-axis up and down
	FOCUS POINTER	Turns ON/OFF the guide laser pointer
	COVER	Opens/closes the front cover
	STOP	Stops marking
	START	Starts marking when pressed long

4. Installation

- ※ Please follow the instruction below in order for use the solution.
- ※ This program requires windows OS 7 or later.

(1) Installation of Marking Machine

L-100 is a desktop CNC marking system. Marking can't be done with the product only. It should be connected to the personal computer, and the program provided should be used together for marking.



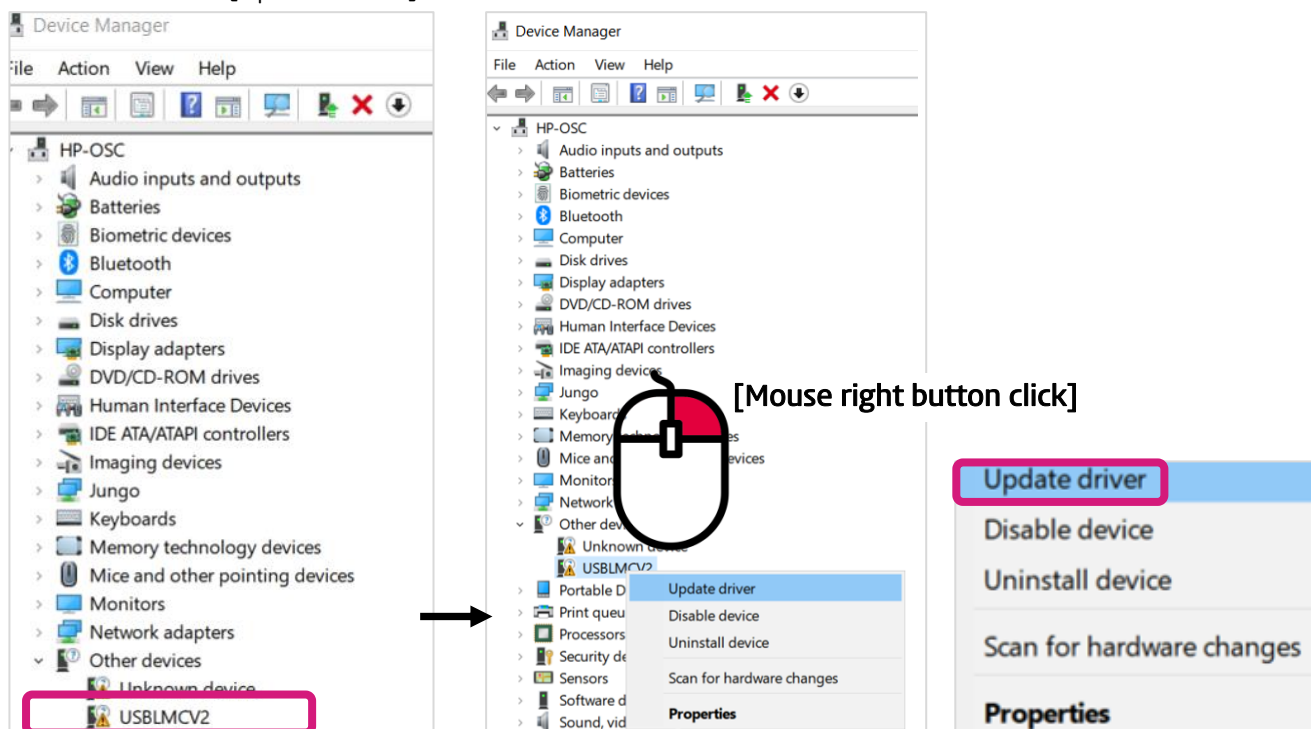
Plug the USB cable into the port on the back of the product and computer's USB port.
Plug the power cable into the outlet.

And switch on the marking machine.



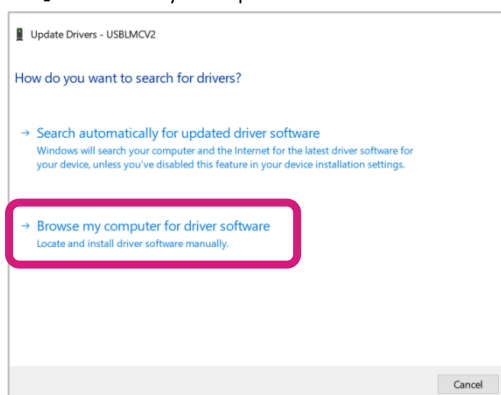
(2) Driver Installation

1. Go to **[Device Manager]**. And select the **[USBLMCV2]** using by the mouse right button. Then select the **[Update driver]**.

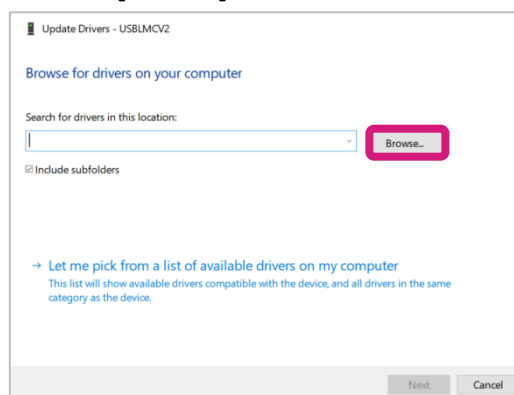


2. Follow the instructions below.

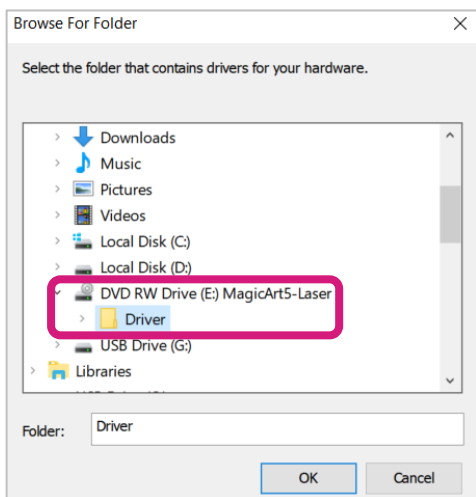
- ① Select **[Browse my computer for driver software]**.



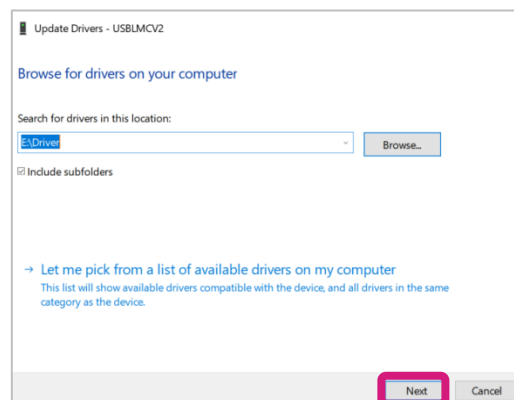
- ② Click the **[Browse]** button.



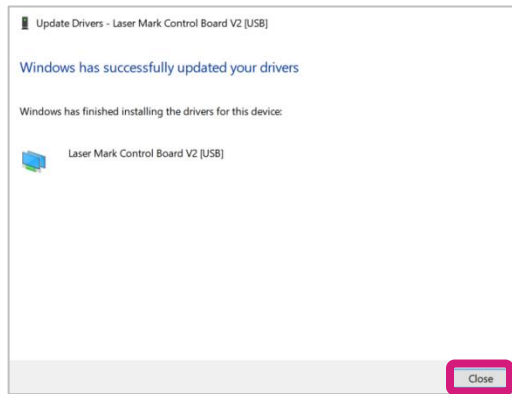
- ③ Select the **[Driver]** folder from the installation CD file.



- ④ Add the **[Driver]**, then click the **[Next]** button



5. Click "Close" button to complete program installation.



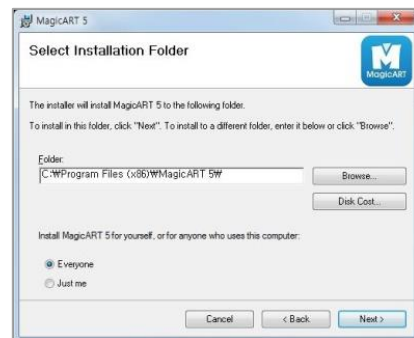
(3) Program Installation

Once the CD provided is inserted into the CD drive, the installation program is automatically being executed. Unless the program is automatically run even after the CD is inserted, start the program in "Computer - CD Drive".

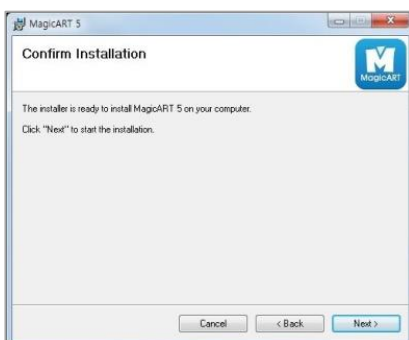
1. Setup wizard



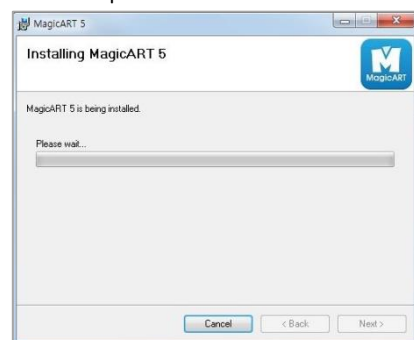
2. Select installation folder



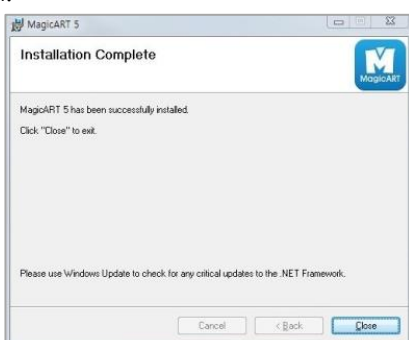
3. Confirm installation



4. The file is copied onto the hard disk.





5. Click "Close" button to complete program installation.



- Program Description

Once the installation is completed, the following icon appears on the desktop. The description on the icon is as follows:

	As a design & marking software program, it features the following functions: marking design, marking option, Toolpath setting, transfer of Toolpath data.
	As a product setting program, It features the following functions: Laser focus, Guide laser, Roatary origin, Manual calibration.

- MagicArt Program Unlock USB

The program lock should be connected to the personal computer for run the program.



- Pogram password

Only administrators can use the program by using the program password.

Please make sure that chage the default password.

Software for Engraving & Cutting

MagicART 5 - Laser

Enter the password.

- It is a device for safe use of laser marking machine.
- This step is performed once when the program is executed.
- (Default password : 0000)

Password :

Change Password

OK

Cancel

(4) Manual Calibration

Check the setting value on the product's left side.

* It has different setting value each machine.



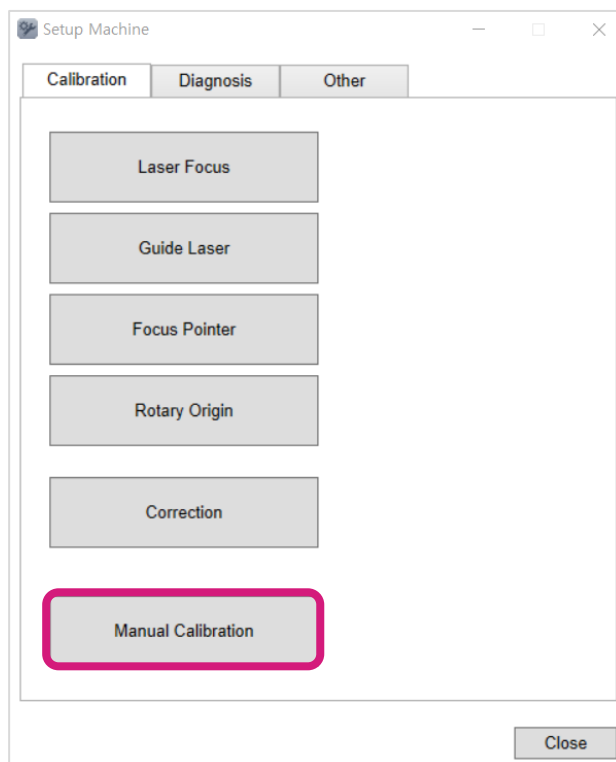
<Example>

- Manual Calibration**
1. Model: G-F-J30R-J112F163-1-2
 2. Focus Length: 1885
 3. Guide Laser X: 5000
 4. Guide Laser Y: 5002
 5. Guide Laser Width: 1015
 6. Guide Laser Height: 1023
 7. Rotary X: 2985
 8. Rotary Y: 3720
 9. Focus Pointer X: 4610
 10. Focus Pointer Y: 4920

Correction

- 1: 554, 595
- 2: 547, 597
- 3: 552, 589
- 4: 544, 591
- 5: 585, 579
- 6: 580, 570
- 7: 31191

1. Run the [machset]. And select the [Manual Calibration].



2. Click the [Edit] button.

Setup Machine

Manual Calibration Correction

Enter the laser settings directly.
If you are installing the program for the first time,
please input the setting value attached to the machine.

Model:
G - F - J30R - J70F100 - 0 - 0 - ?

Focus Length :
1885

Guide Laser X :
5003

Guide Laser Y :
5026

Guide Laser Width :
1036

Guide Laser Height :
1032

Rotary X :
2765

Rotary Y :
3469

Focus Pointer X :
4684

Focus Pointer Y :
4820

Show Edit Cancel

4. Enter the setting value, then click the [Apply] button.

Manual Calibration Correction

Enter the laser settings directly.
If you are installing the program for the first time,
please input the setting value attached to the machine.

Model:
G - F - J30R - J70F100 - 0 - 0 - ?

Focus Length :
1885

Guide Laser X :
5003

Guide Laser Y :
5026

Guide Laser Width :
1036

Guide Laser Height :
1032

Rotary X :
2765

Rotary Y :
3469

Focus Pointer X :
4684

Focus Pointer Y :
4820

Show Apply Cancel



Manual Calibration Correction

Enter the laser settings directly.
If you are installing the program for the first time,
please input the setting value attached to the machine.

Model:
G - F - J30R - J112F163 - 1 - 2 - ?

Focus Length :
1885

Guide Laser X :
5000

Guide Laser Y :
5002

Guide Laser Width :
1015

Guide Laser Height :
1023

Rotary X :
2985

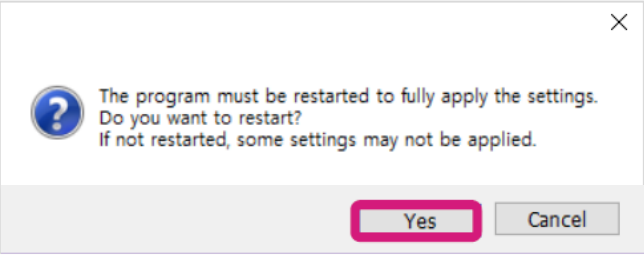
Rotary Y :
3720

Focus Pointer X :
4610

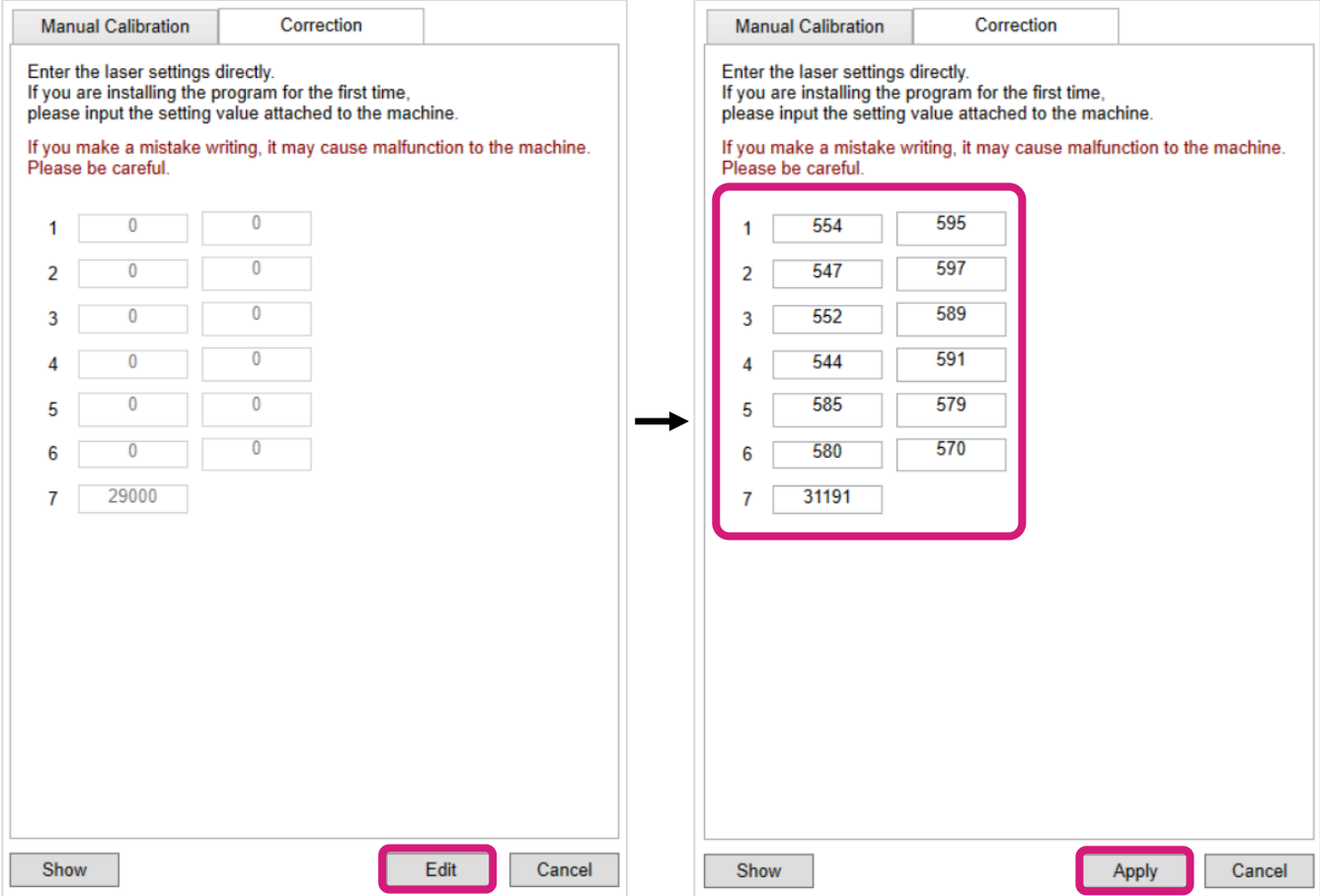
Focus Pointer Y :
4920

Show Apply Cancel

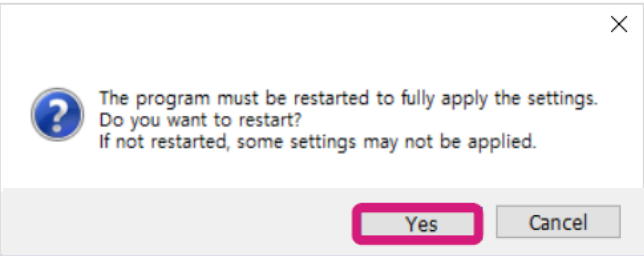
5. Click the [Yes] button, then the program will start.



6. Run the [machest]. And select the [Manual Calibration] then select the [Correction]



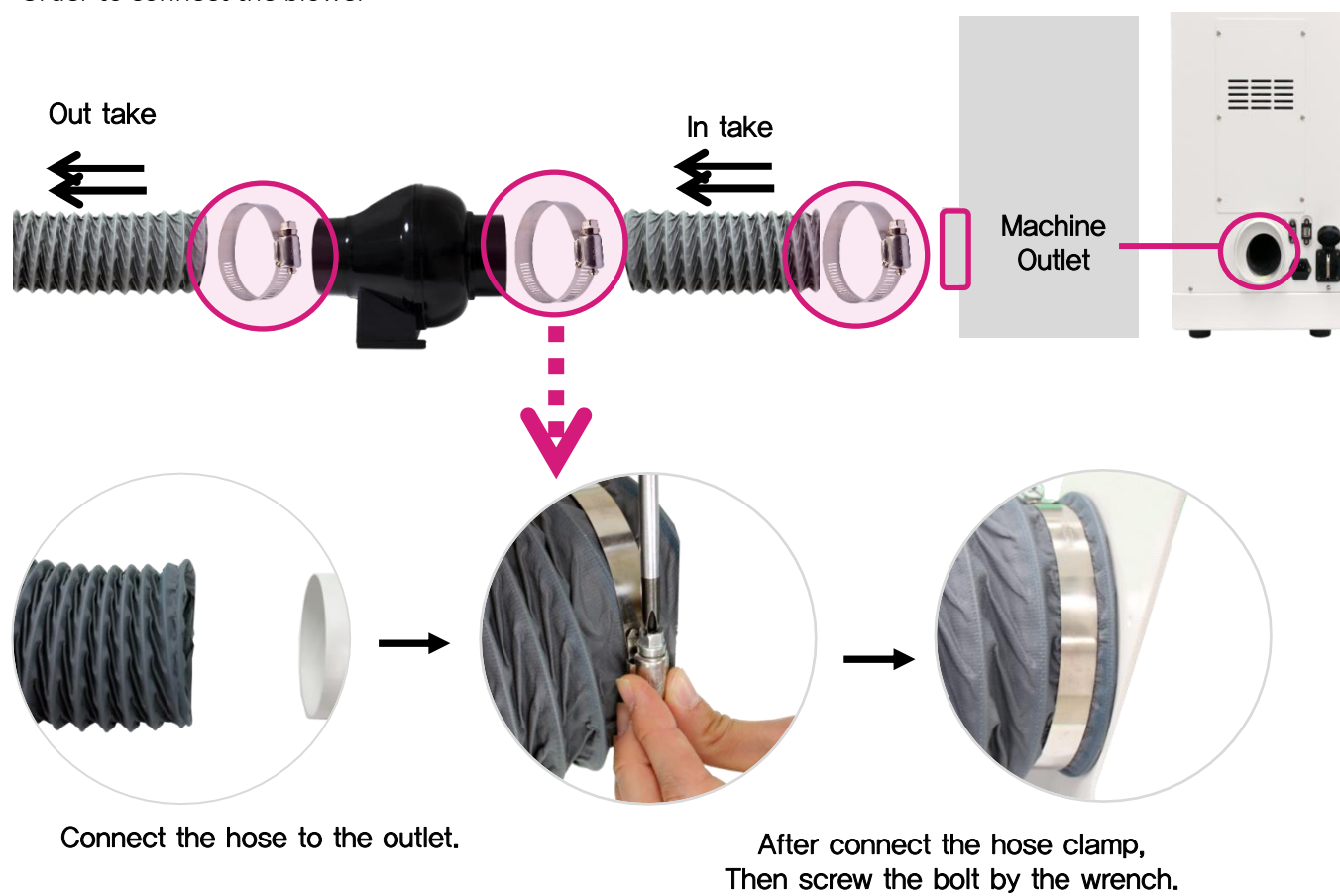
7. Click the [Yes] button, then the program will start.



(5) Installation of the blower

※Blower set is purchased separately.

-Order to connect the blower



(6) Auxiliary Power Device Setup (for external devices)

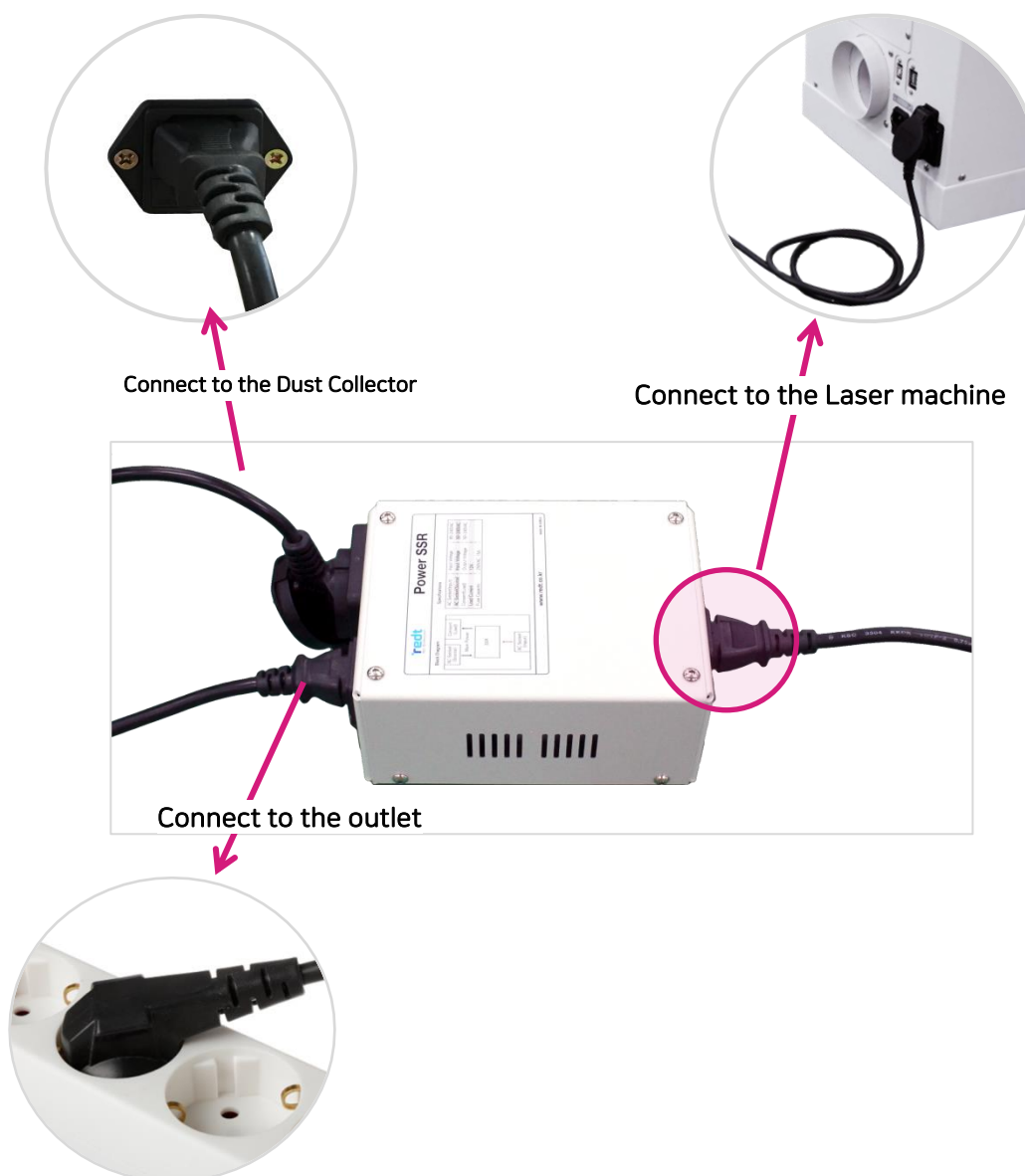
※ It is an option accessory.

Auxiliary Power Device is required when using the Dust Collector.

This device must be used if the external blowers or dust collectors have more than 2 Ampere. Otherwise, this may result in a machinal failure.



Connect the Auxiliary Power Device to the Laser machine. (Refer to the picture below)



5. Operation of Marking Machine

Switch on the product and connect the program. Then, the system performs self-examination as follows. Unless a problem is found, it goes into a standby mode with confirm sound.

(1) Self-examination procedures when the system is turned on

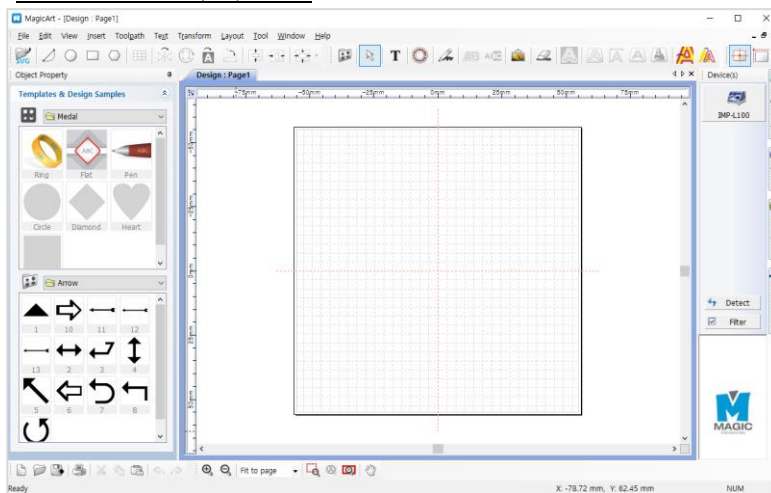
1. In case there is a sensed axis, move it out of the sensing zone.
2. Check the cover sensor.
3. Check the z-axis sensor and return back to the origin.
4. Return back to the origin.
5. Confirm sound and standby

(2) Marking procedures

- 1) Switch on the marking machine.

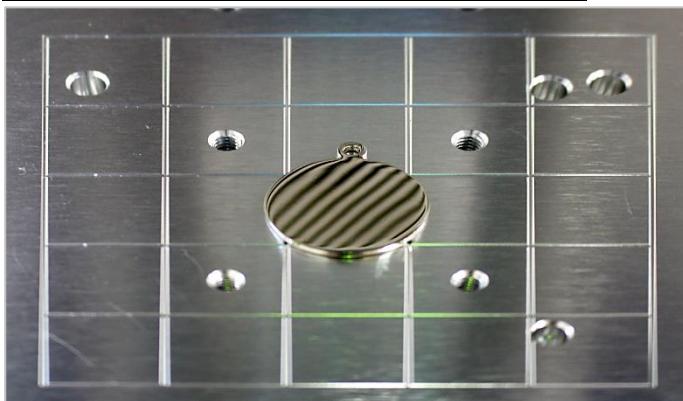


- 2) Start the program and connect it to the machine. Once connected, the system is reset, and the cover is automatically opened.

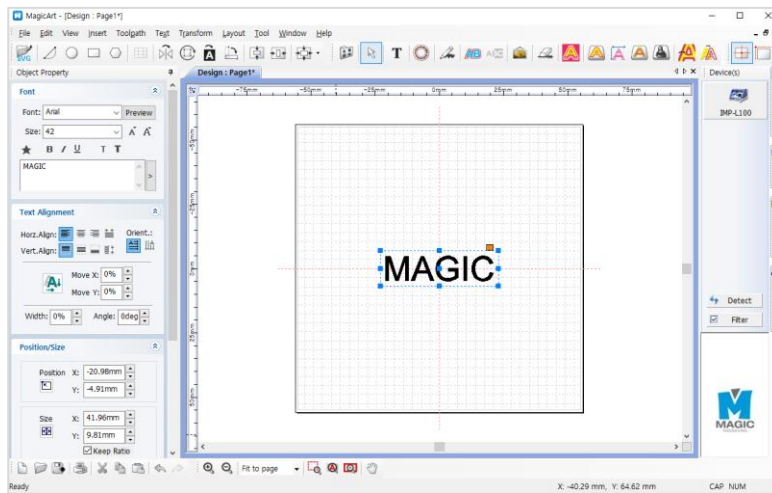


- 3) Put the material on the working area.

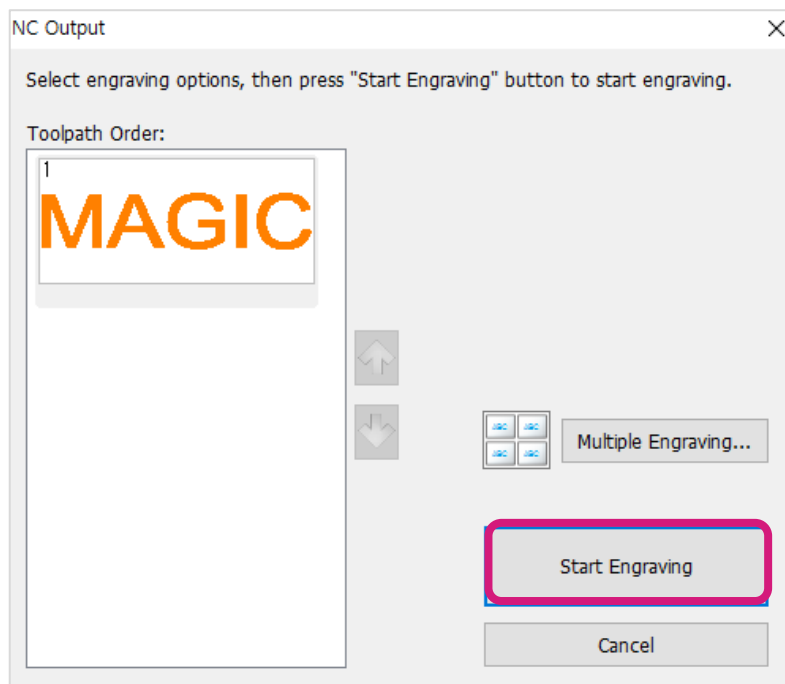
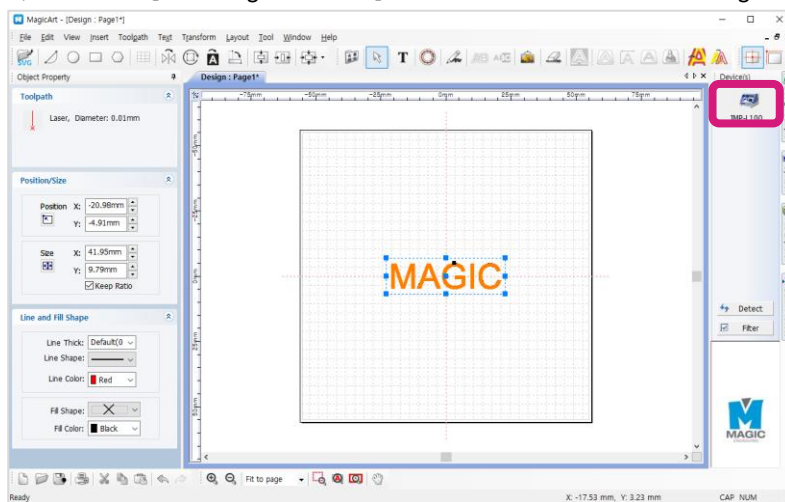
(ex: Metal medal for Fiber Laser machine L100)





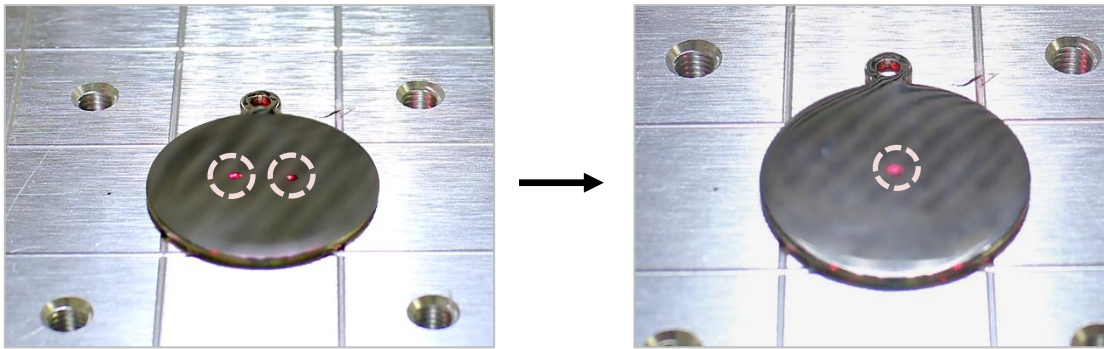
4) Prepare the design to mark.



5) Click the [Marking machine] button and send the marking data.

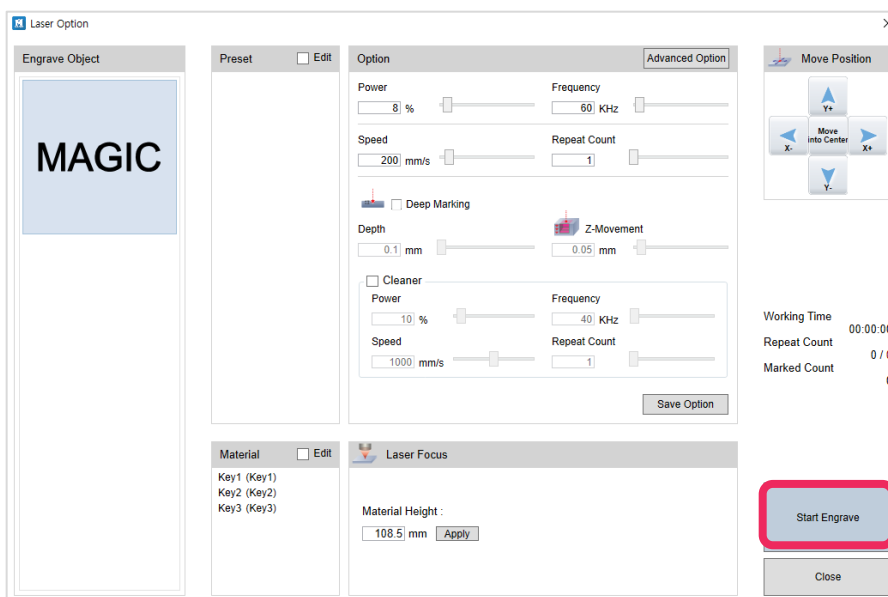



- 6) Set the laser focus, using the   buttons.
(ex: Metal medal for Fiber Laser machine L100)

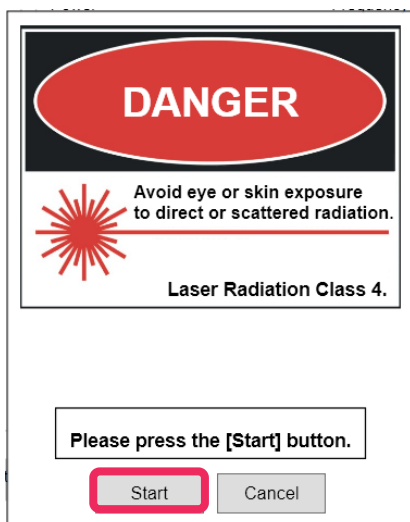


* Height is adjustable on the program [laser option-Laser Focus-Material Height].

- 7) Click [Engrave] and send data. Then, check the marking position.



- 8) Click [Start] or press  long (2 seconds or longer) to start marking.



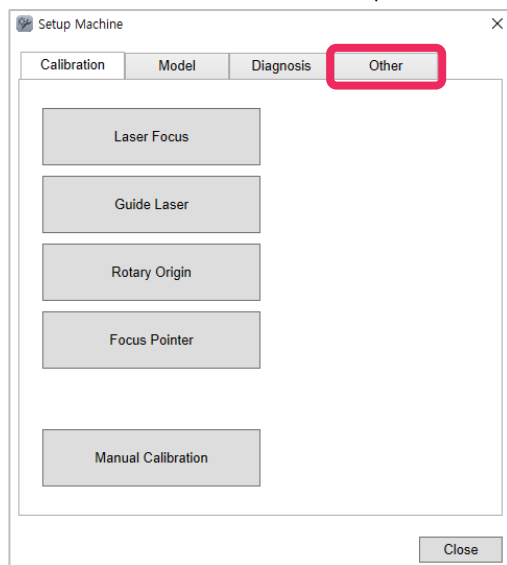
6. Other Devices

[External Device] - Blower power prot : 110~220V/2A

1. Connect the power to the back of machine.

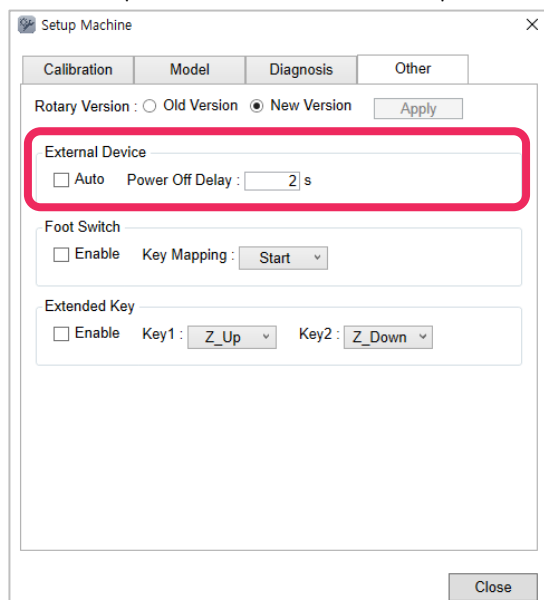


2. Click [OTHERS] in the [Setup Machine].



3. In case the AUTO checkbox is clicked in the External Device, the external device is automatically operated even though the power is switched off.

* If the power is turned ON, the system is always ON regardless the AUTO control. *



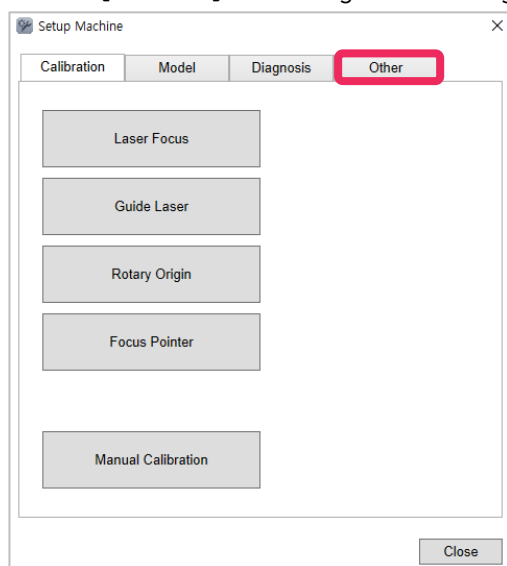
The power is automatically turned OFF after being delayed for the preset time in[Countdown before Power [OFF]].

[Foot Switch]

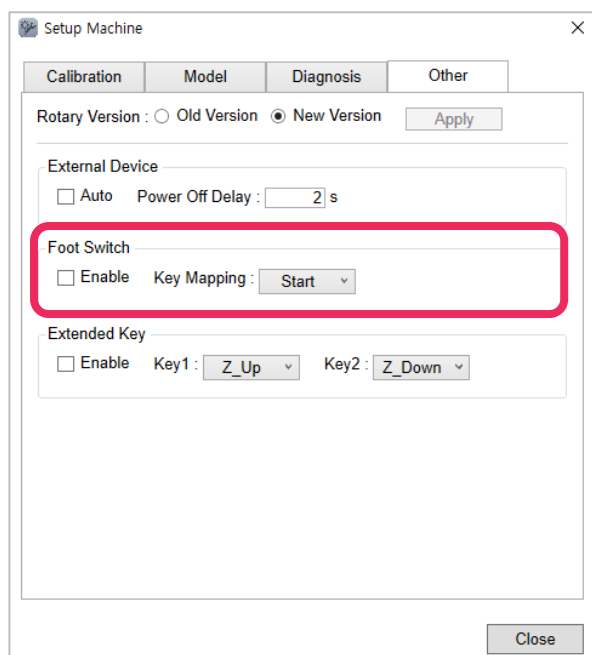
1. Connect the power cable to the back of L100.



2. Click [OTHERS] in the Engraver Settings.



3. Able to use Foot Switch for user convenience such as repetitive operation



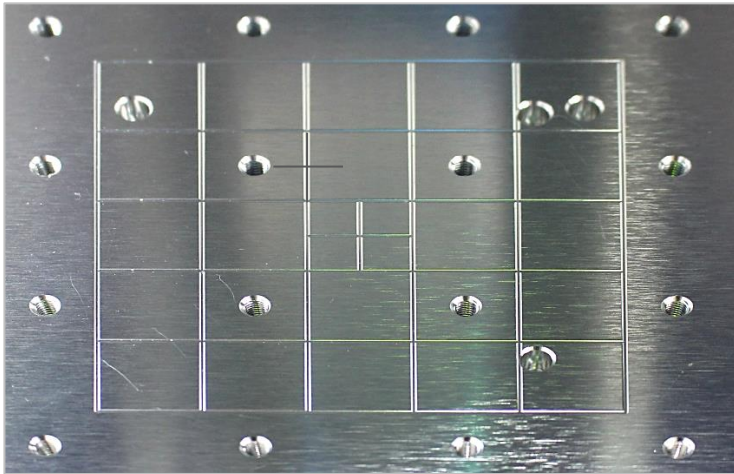
KEY Mapping

- Start: The system starts if the Foot Switch is pressed.
- Stop: The system starts if the Foot Switch is hit again.

7. Clamp

A guideline can be checked at the working area.

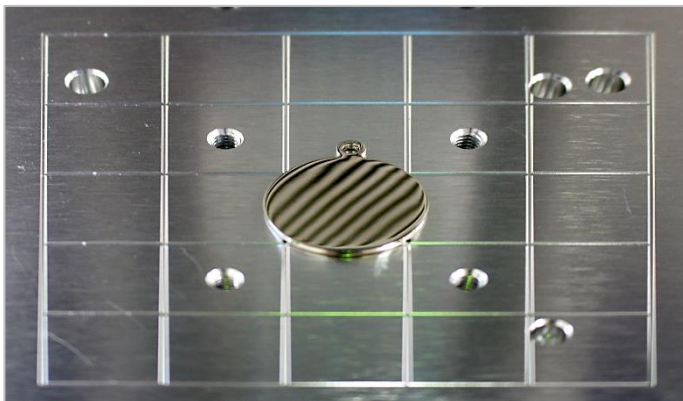
The working area of product is L100 = 112x112(mm).



Put the material on the middle of the working area.

The guideline of the working area is same with the working area of MagicArt.

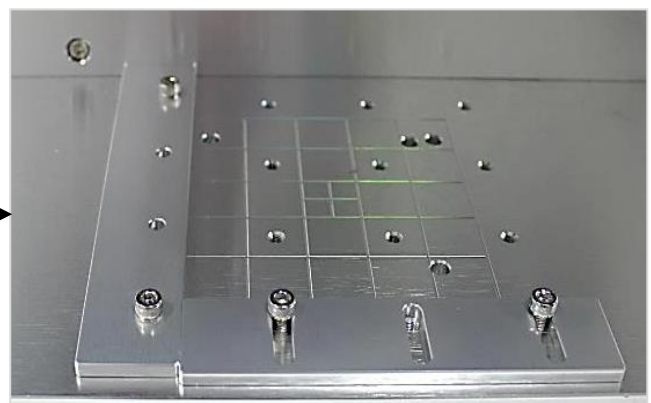
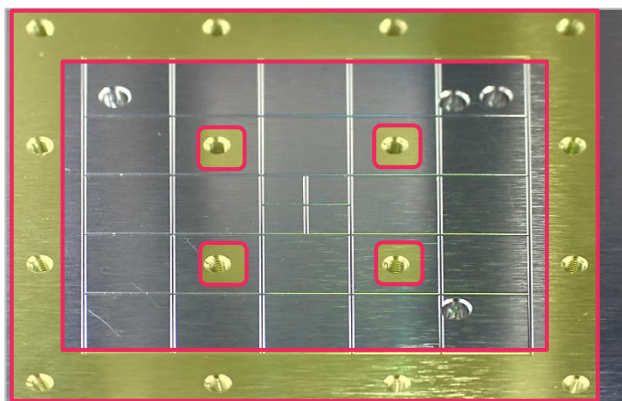
(ex: Metal medal for Fiber Laser machine L100)



<Clamp>

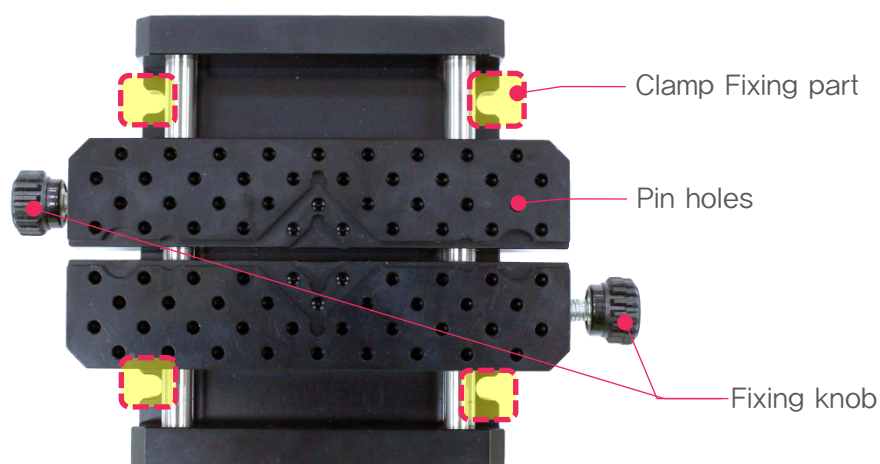
It is able to screw clamp bolts into working area holes.

Put the clamp and screw the clamp bolt.

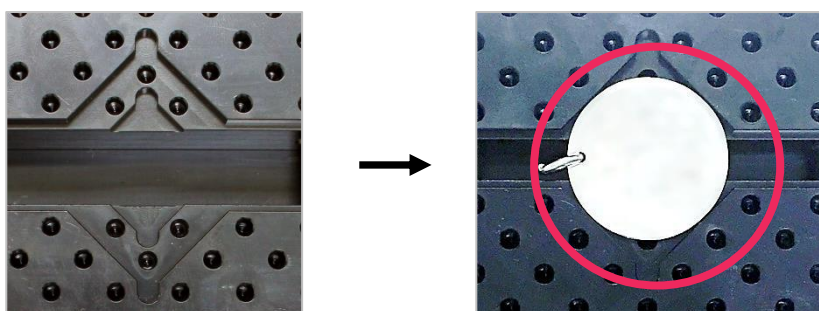


< Medal Clamp >

※Medal clamp is purchased separately.



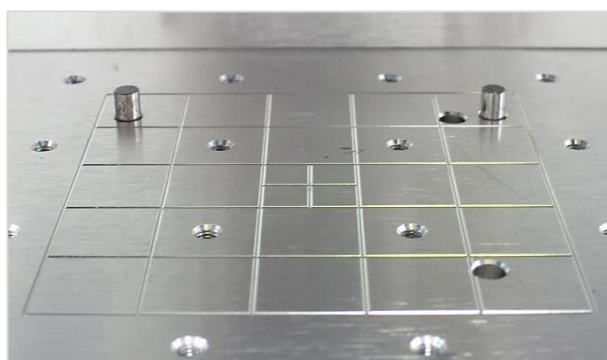
The holding part of clamp is step type, so set the clamp to the step to match the size and thickness are matched. If you move the clamp moving bar to the upside, then turn the fixing knob to the right, the clamp will be tightened.



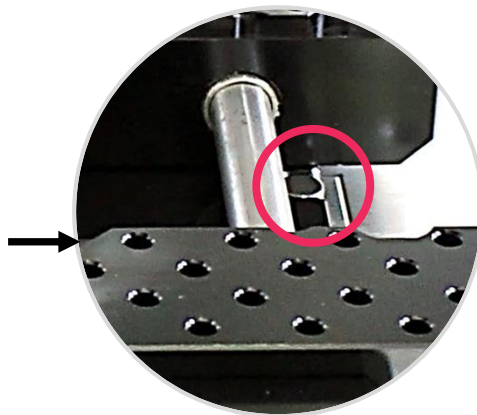
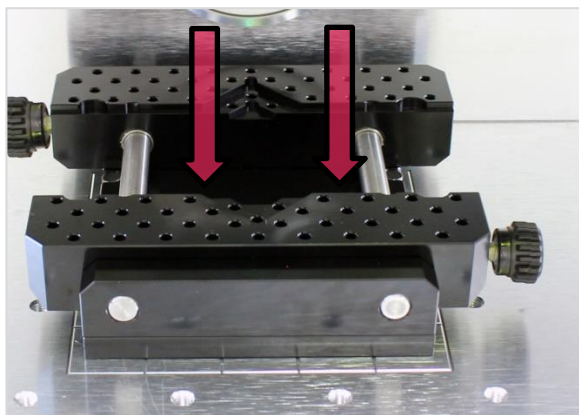
Caution

When holding the materials by turning the clamp fixing knob, a mark may be left on the materials.

1. Fix the product working area by matching the pins to the holes.

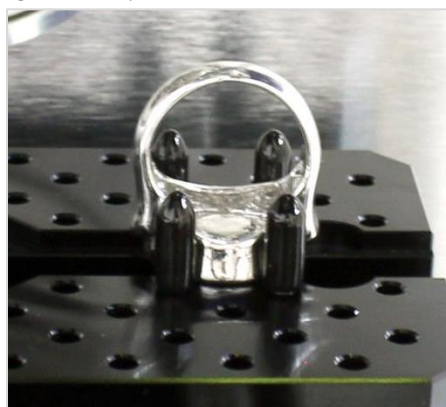
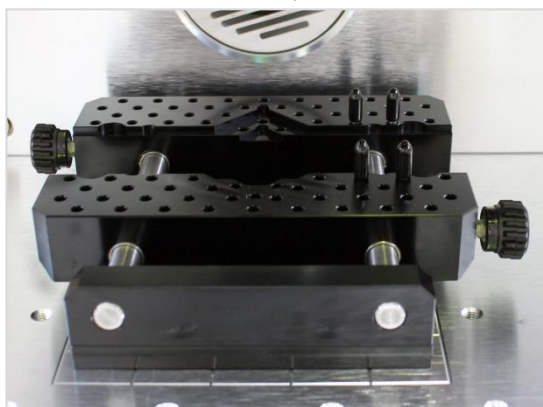


2. Connect the clamp pins to the clamp fixing unit.

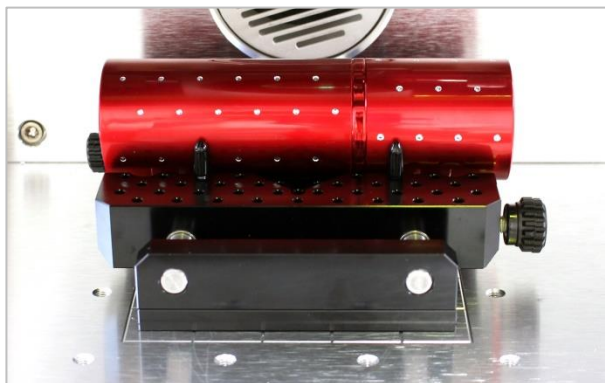


3. Fix the pin on the clamp.

Pin holes on the clamp ensures easier holding of irregular shaped material.

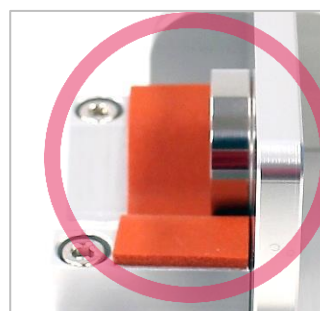
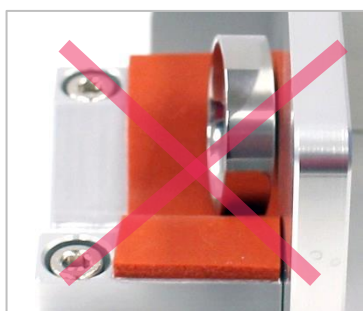
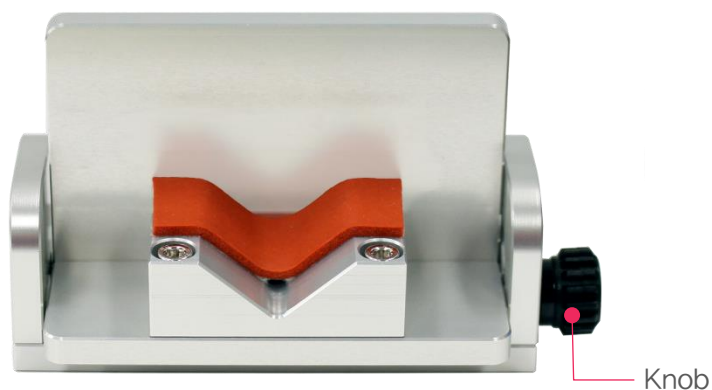


4. Fix it by turning the fixing knob.



<L Type Clamp>

※L type clamp is purchased separately.



Caution

Put the material tightly on the fixing bracket.

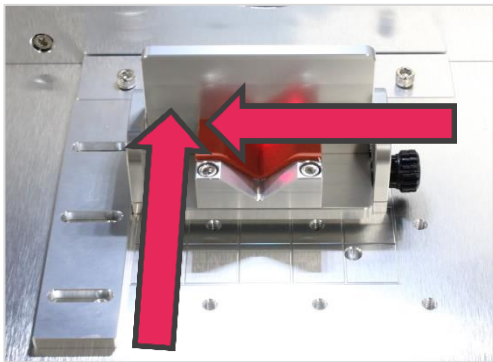
- Origin Setting

Set the L type clamp position to locate the focus at the center of the L type clamp groove. The end position is the origin of L type clamp. Once the origin is set, it is easy return L type clamp to its original position even after removal. If an x-axis flat clamp is removed, the origin should be reset.

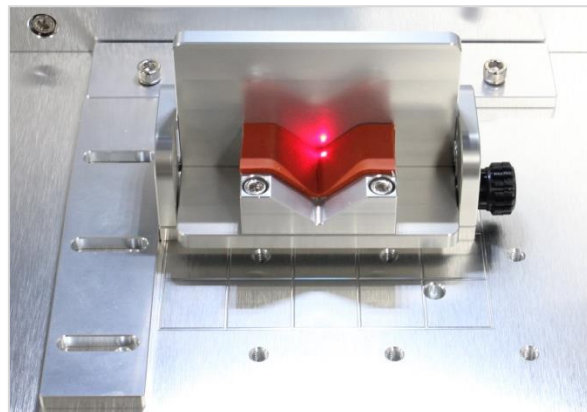
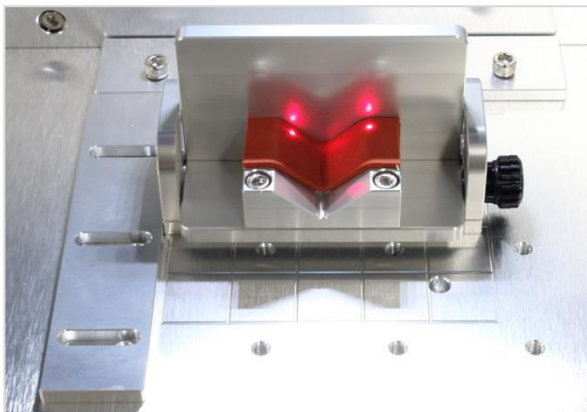
1. Fix the clamp to set the focus. Set the position of L type clamp and then fix the x-axis (vertical fixation) clamp.



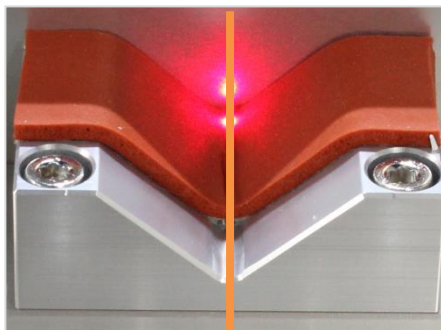
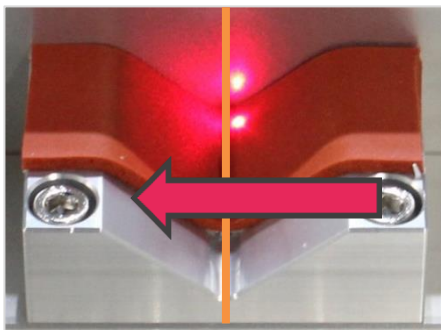
2. Put it tightly on working area with the clamp as a guide. Then, fix the position of L type clamp.



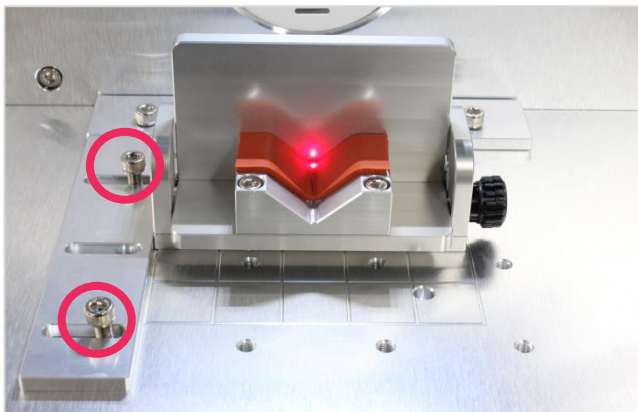
3. Set the focus, using the **Z+** **Z-** buttons.



4. Adjust the position of L type clamp to locate the origin of the focus in the middle of the L type clamp groove.

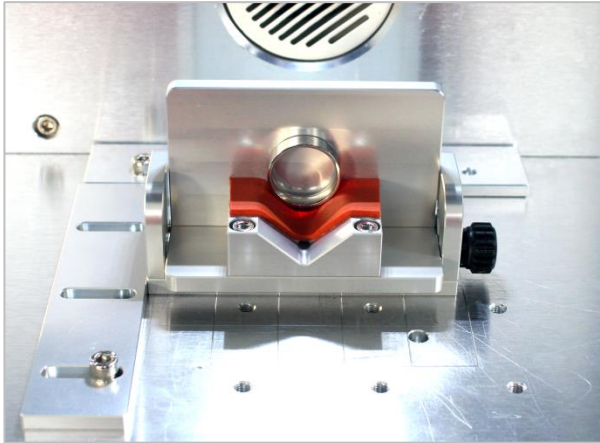




5. Fix the x-axis (vertical fixation) clamp.



-Material Focus Setting

1. Put the material on the fixing bracket.



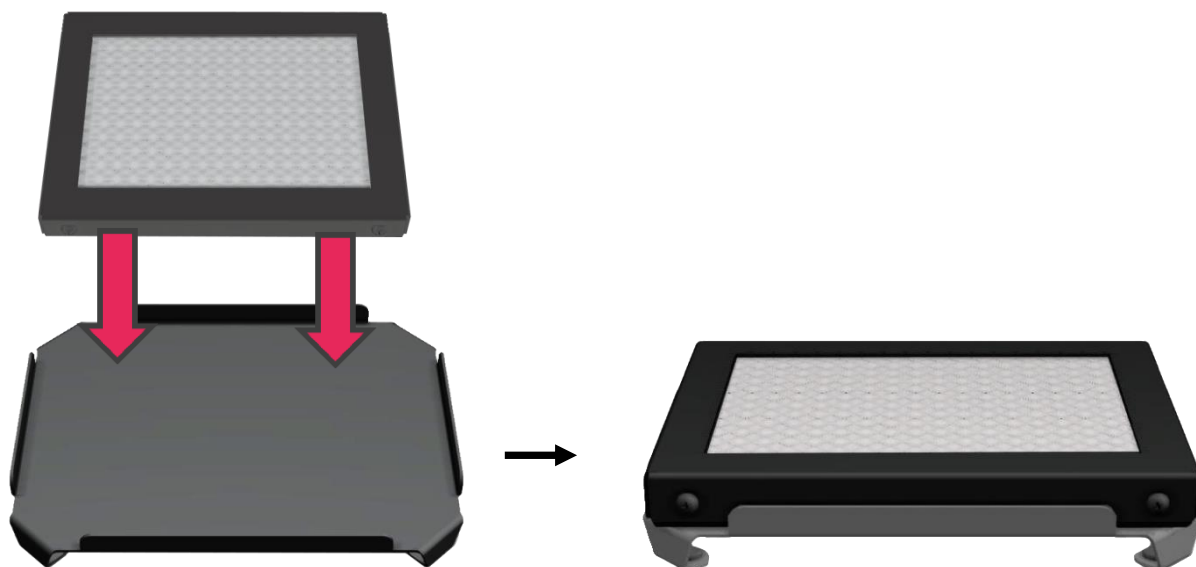
2. Set the focus, using the   buttons.



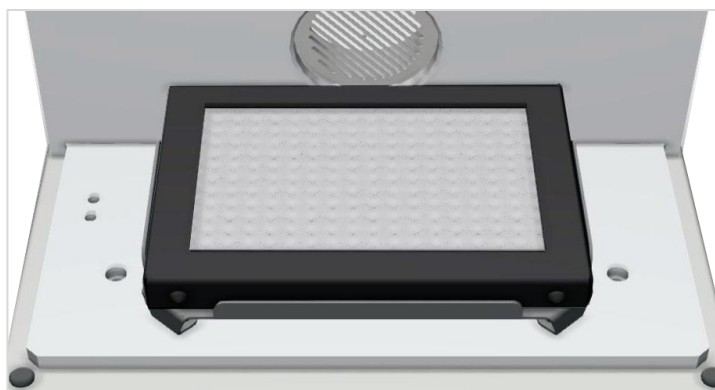
<Honeycomb Table>

※Honeycomb table is purchased separately.

1. Put the honeycomb table on the honeycomb table tray.



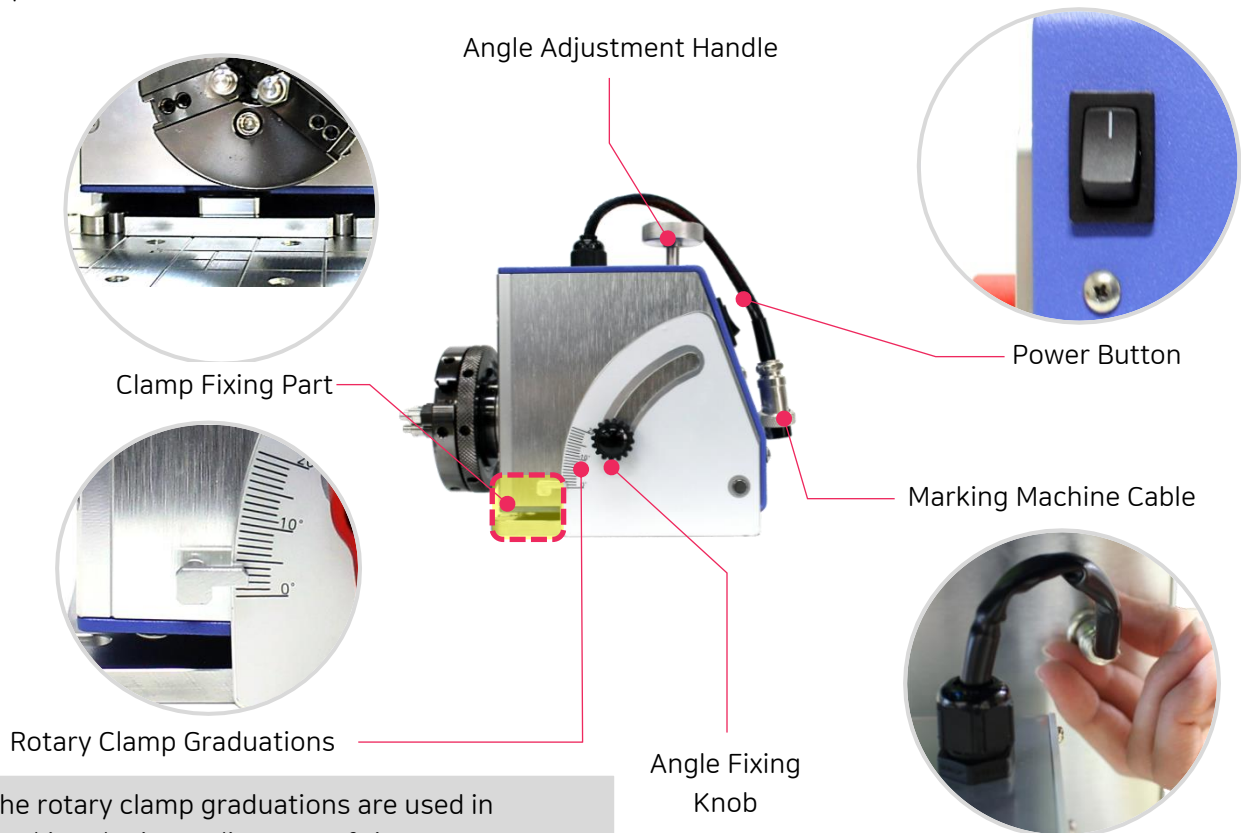
2. Set the position of honeycomb table on the machine.



<Rotary Clamp>

※Rotary clamp is purchased separately.

Connect the clamp fixing part to the working area hole. Connect the cable with the product and switch on the power.

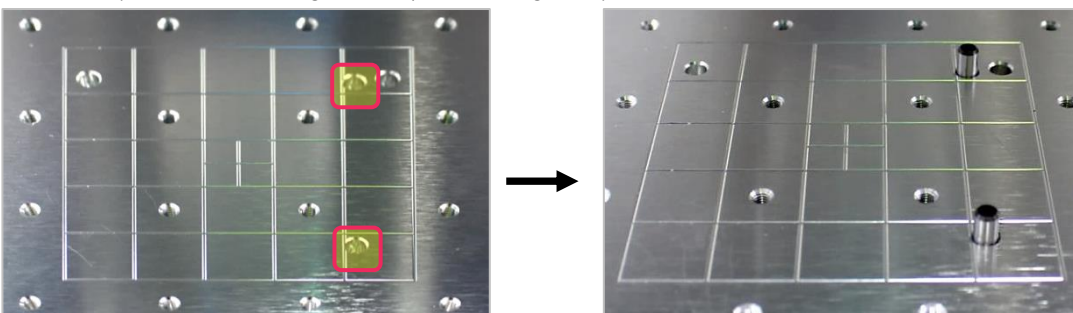


The rotary clamp graduations are used in marking the inner diameter of ring.
The recommended angle automatically appears when entering a ring size.
(for the details, refer to the processes of marking the inner and outer diameter of rings.)

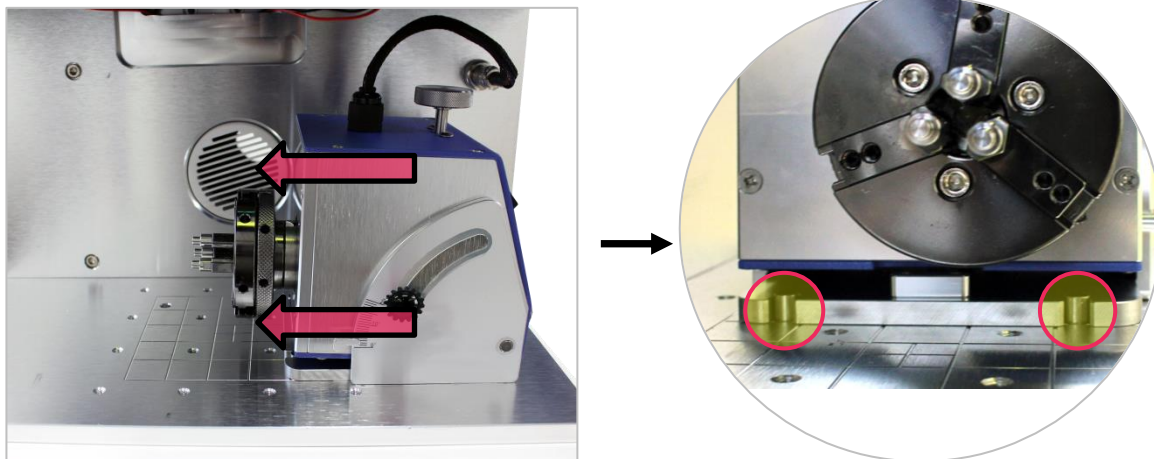
1. **Switch off the rotary clamp** power before connect to product for safety.



2. Fix the product working area by matching the pins to the holes.



3. Connect the clamp pins to the rotary clamp fixing unit.



4. Connect the product cable in the rotary clamp to the machine body.



***Please match to the groove.**

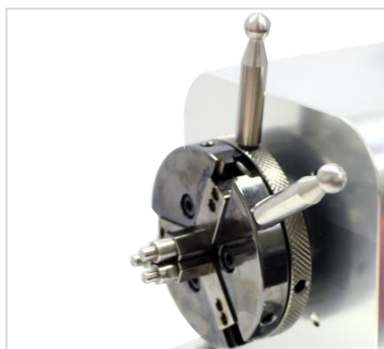
There is a risk of breakage if connected without alignment.



5. Switch on the rotary clamp.

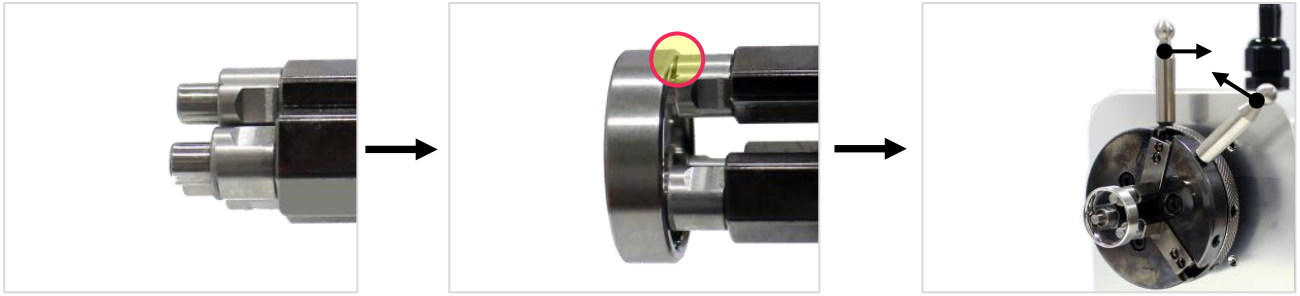


6. Close the clamp using chuck finger and fix the material.



- Holding method for outer diameter engraving

Put the ring into the chuck finger and fix it with the chuck handle.



- Holding method for inner diameter engraving

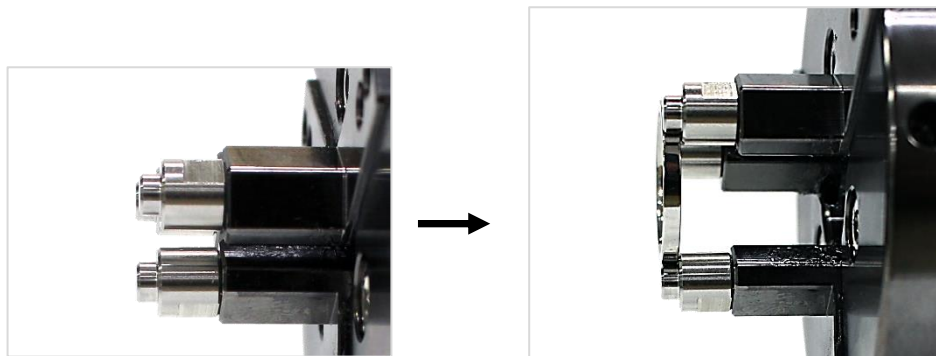
Insert the ring by widening the chuck finger of rotary clamp. Then, fix it with the chuck handle.



- Holding method for thin ring inner diameter engraving

When marking the thin rings, change to the 2mm chuckfinger by using the chuck finger spanner provided along with the product to release.

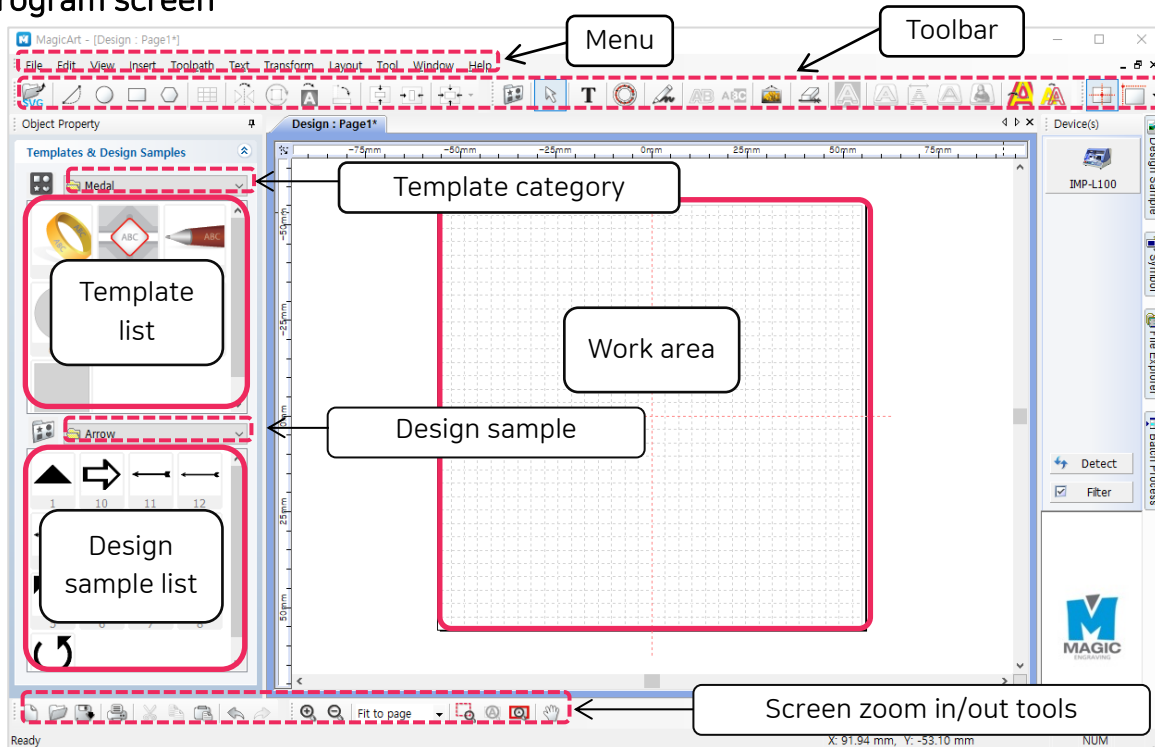
Insert the ring by widening the chuck finger of rotary clamp. Then, fix it with the chuck handle.



Program Usage Description

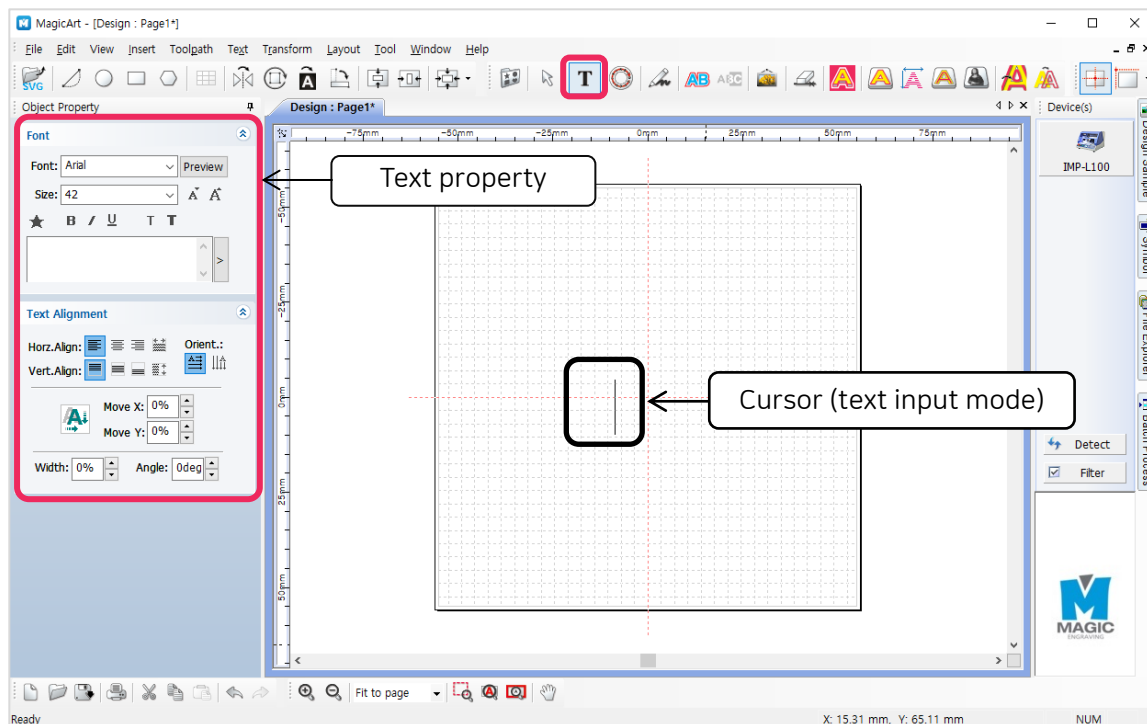
Run the program, then a window will show up as below. The program window is different in accordance with modes. The names of parts for each case are as follows.

◆ Program screen



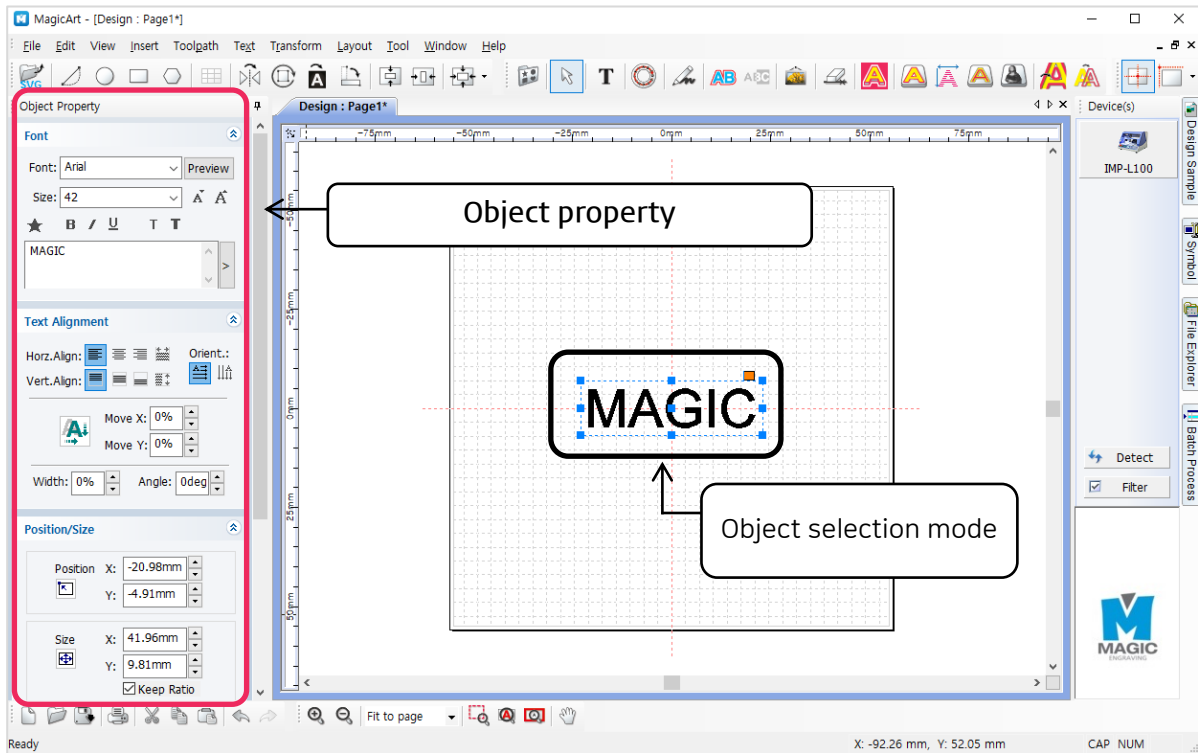
◆ Text input mode

Press **T** [Text Input] button and click the screen or double click on the selection mode to switch to text input mode.



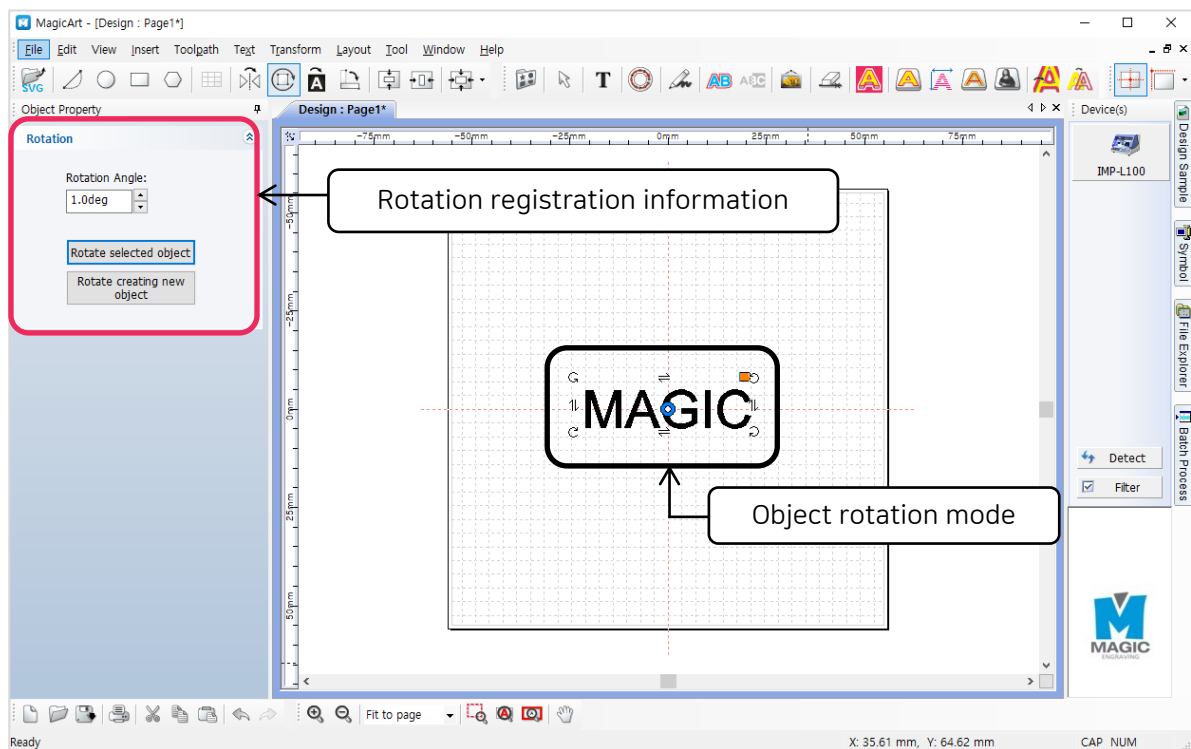
◆ Object selection mode

After entering text, click [Selection] button with a mouse or right-click the work area. Then, the entered text object is selected and it turns into selection mode. Double click the selection mode to convert it into text input mode.



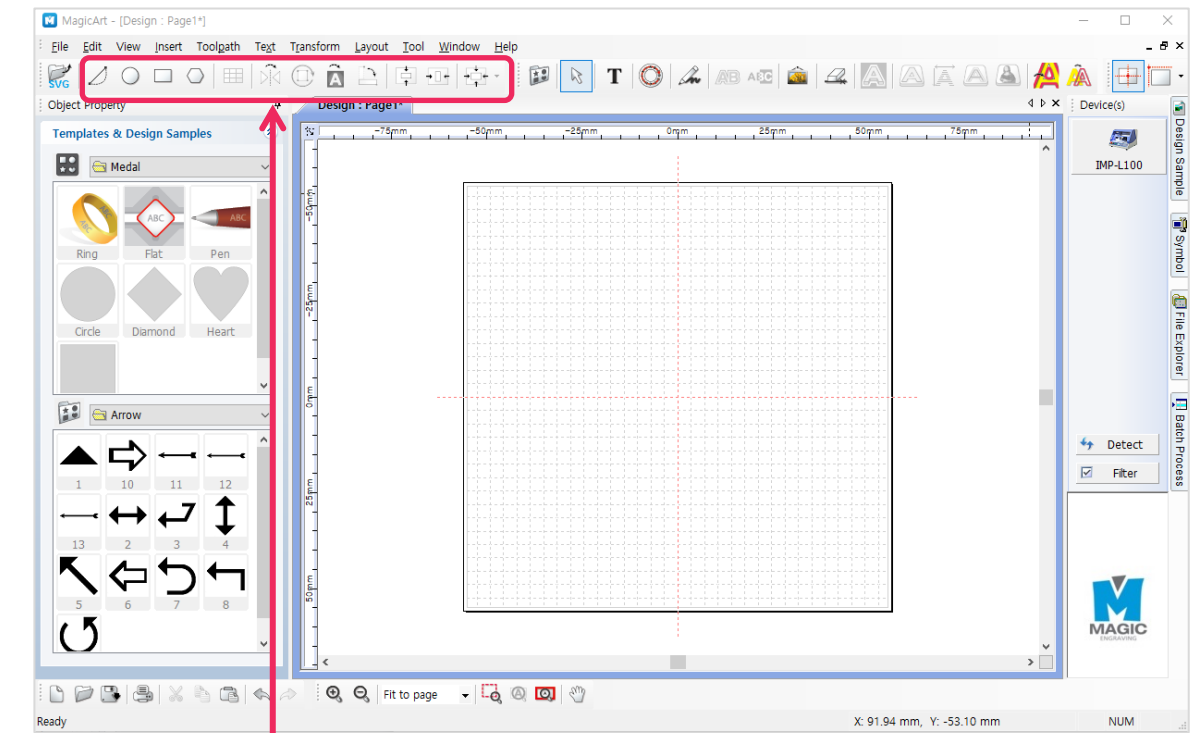
◆ Object rotation mode

If the selected object is clicked once more, the mode will be converted to the object rotation mode.



1. Toolbar

◆ Alignment tools





[Line/Curve]

	<p>Click a certain point and drag it to make a dot line appear. Designate the distance and click with the mouse and then right-click to create a straight line. At this time, press "Ctrl" key on the keyboard and move the mouse to create a horizontal line or a vertical line.</p>
	<p>Click on a certain point and designate a distance. Drag while clicking and holding the mouse to make a curve appear. Right-click to create the curve.</p>



[Circle/Ellipse/Pie]

	<p>Click and hold the work area with the mouse and drag it to designate the size of a circle. At this time, press "Shift" key and drag it to create a perfect circle.</p>
	<p>Click  button on the circle object property window to transform into an arc. The starting/ending degree can be designated and those degrees can be adjusted by dragging the starting/ending degree of the arc with the mouse. At this time, click  button to create a reversed image.</p>

Click **Pie** button on the circle object property window to transform into a pie (a filled arc). The starting/ending degree can be designated and those degrees can be adjusted by dragging the starting/ending degree of the pie with the mouse. At this time, click **CW/CCW** button to create a reversed image.

[Rectangle]

Click and hold the work area with the mouse and drag it to designate the size of a rectangle. At this time, press "Shift" key and drag it to create a square.

Determine the curvature of each edge on the rectangle object property window or drag the rectangular edge with the mouse to transform it into a rectangle with round corners.

Click **Independent Corner** button on the rectangle object property window and adjust the curvature of each corner individually.

[Polygon]

Click and hold the work area with the mouse and drag it to designate the size of a polygon.
At this time, specify the number of vertical on the polygon object property window to change it.

[Mirror]

Left/right reverse the selected object.

[Rotation]

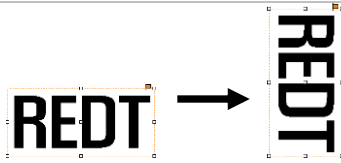
If the selected object is clicked once more with the mouse, it will convert to the object rotation mode. Then, rotate the object by dragging it with the mouse or arrow keys on the keyboard.

[Invert color]

Reverse the color of the selected object.



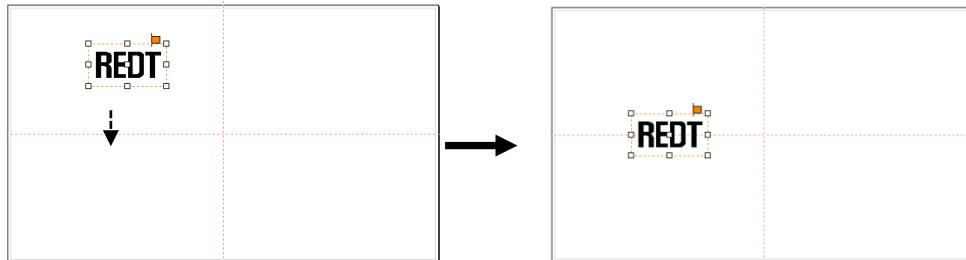
[90°CW]



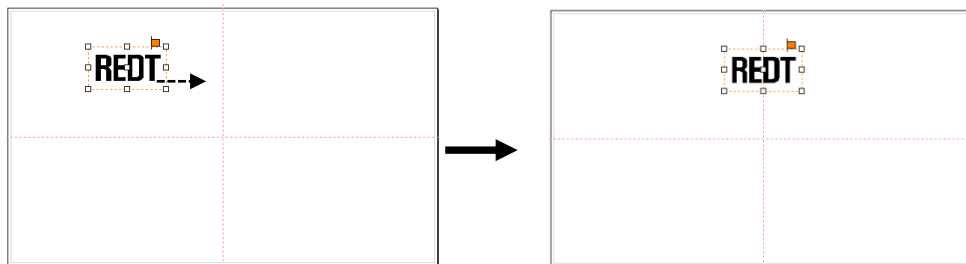
Rotate the selected object by 90°.



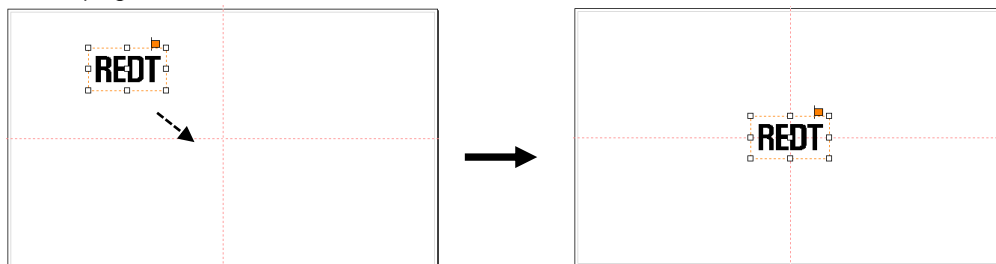
[Vertical center in page]

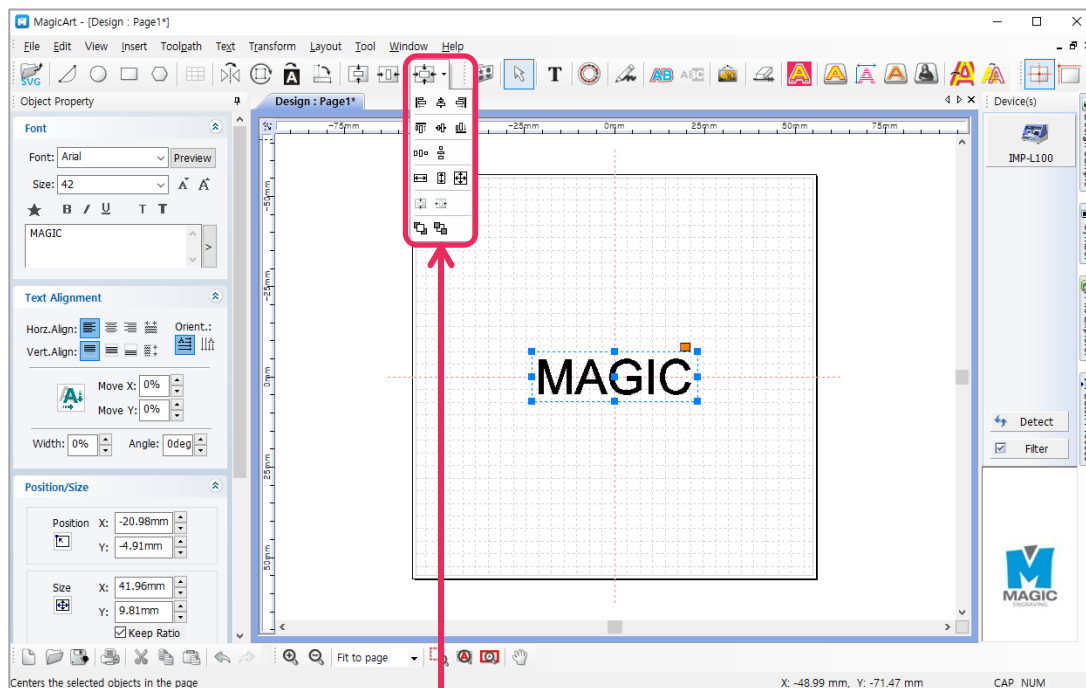















[Horizontal center in page]



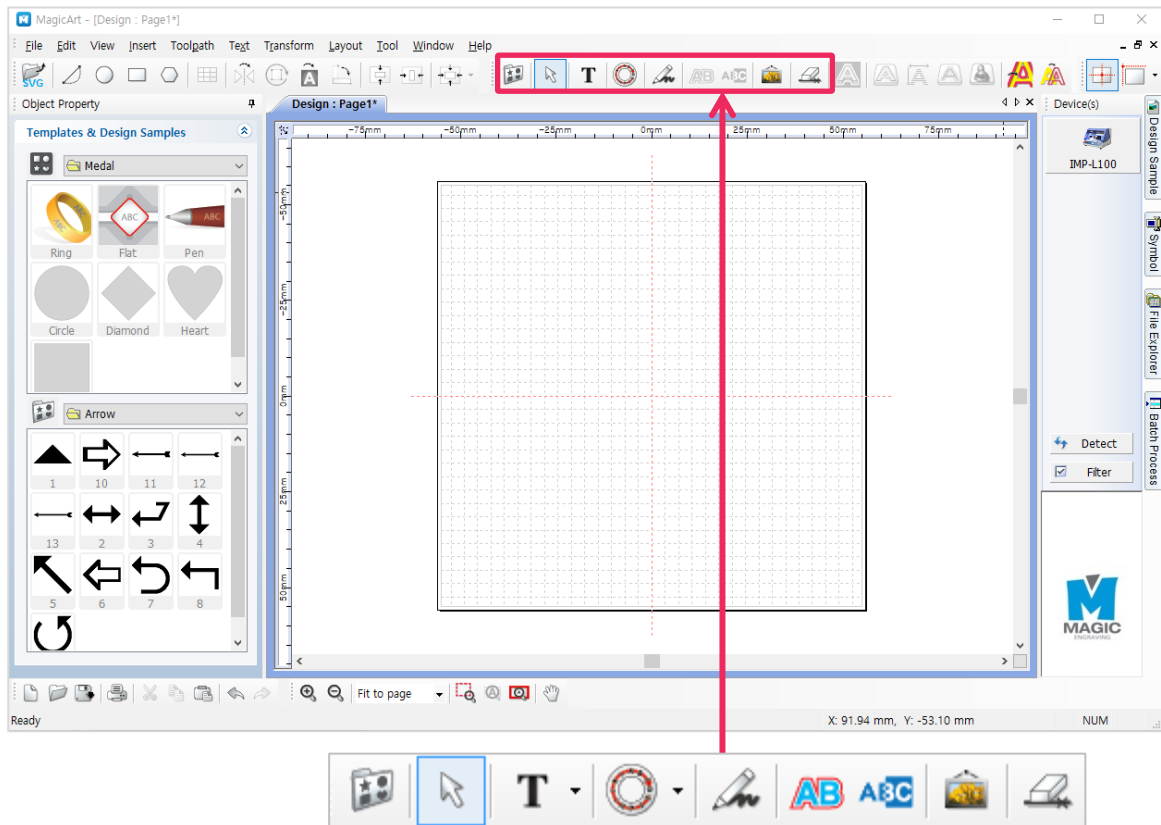
[Center in page]





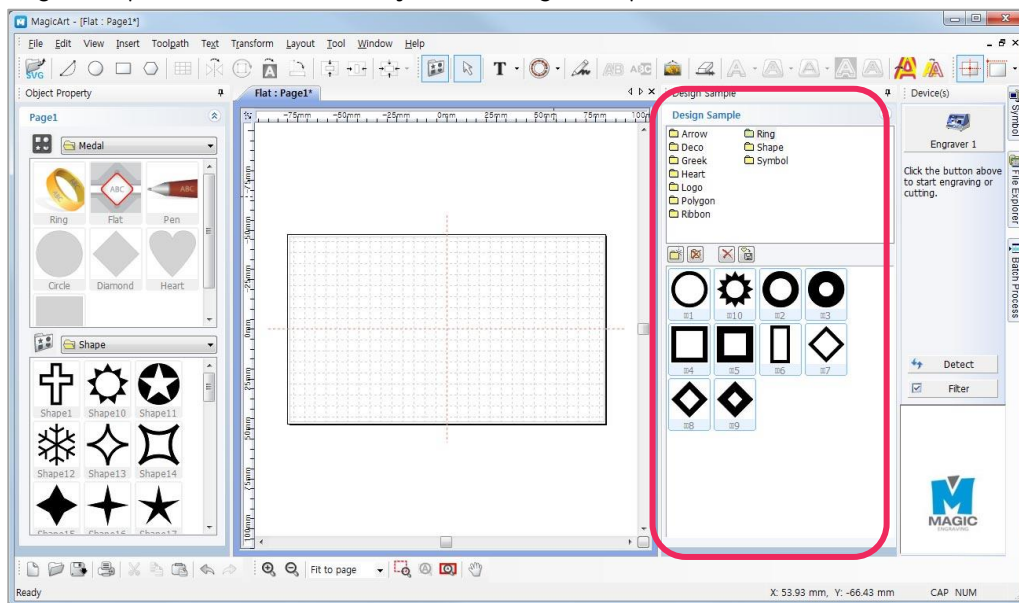
Alignment		Align to the left of base object
		Align to the center of base object
		Align to the right of base object
		Align to the top of base object
		Align to the center of base object
		Align to the bottom of base object
Adjust horizontal gap		Expand horizontal gap
Adjust vertical gap		Expand vertical gap
Same size		Make same width
		Make same height
		Make same size
Order		Bring to front
		Send to back

◆ Object tools



[Design sample]

Import design sample or save current object as design sample.



Note

What is a design sample?

It means design objects saved in the design sample library. The design sample is easily and quickly imported from the design sample library and freely edited.



[Selection]

It is available either to select the object created in the work area to adjust its size and location or to change the object's property. Only the selected objects are subject to change their options such as location, size, etc. In the text input mode, convert to selection mode easily by right-clicking the work area.



[Object selected]

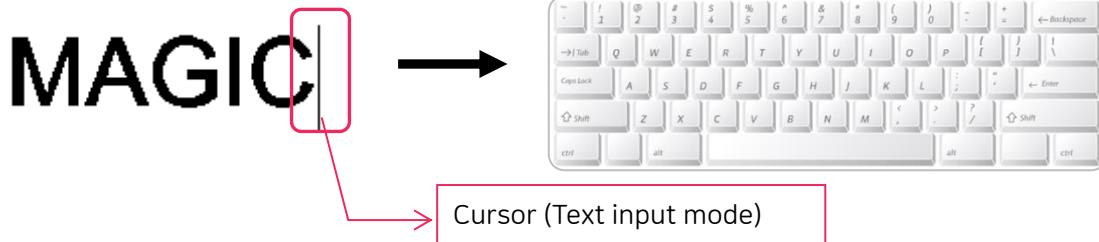
MAGIC

[No object selected]



[Text input]

If **T** button is pressed and the work area is clicked with the mouse, then characters can be entered. Double clicking in the selection mode is an easier way to convert into the text input mode.



Press **T** button and drag a character to edit with the mouse for partly selection. Then, adjust its font and size.

MAGIC

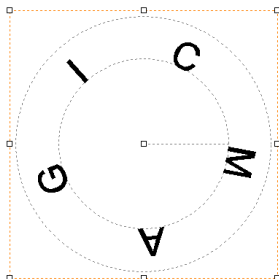


[Mouse drag]



[Circular text]

Create text objects along a circle.

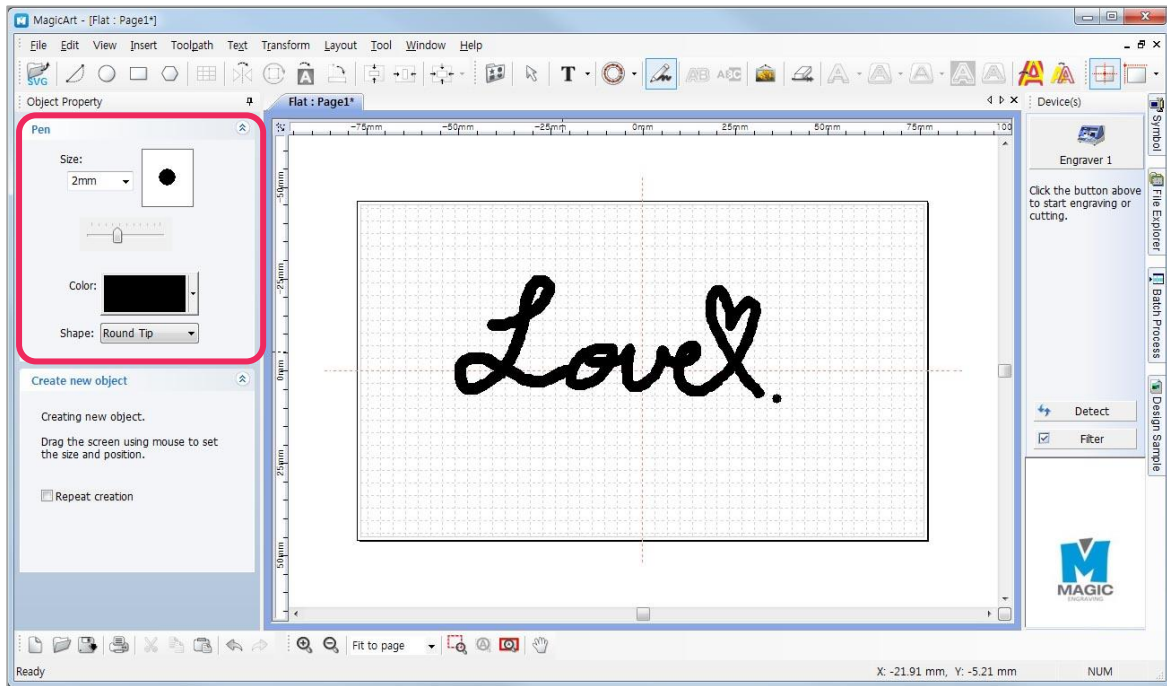




[Drawing pen]

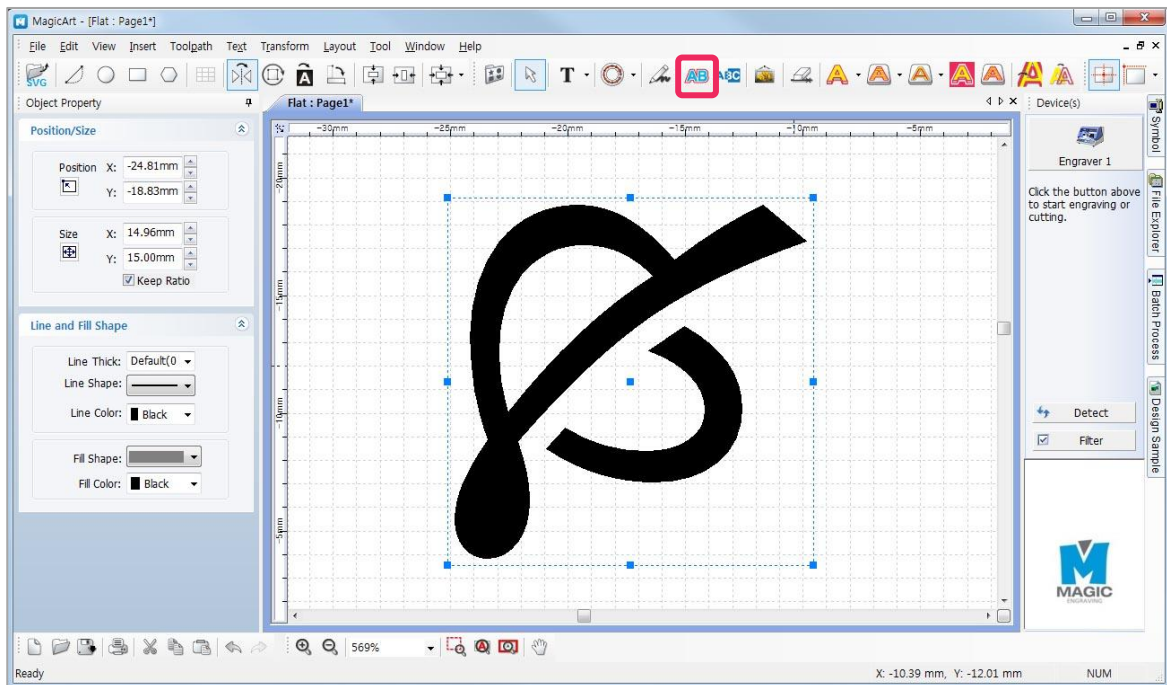
Subject can be drawn by dragging the mouse.

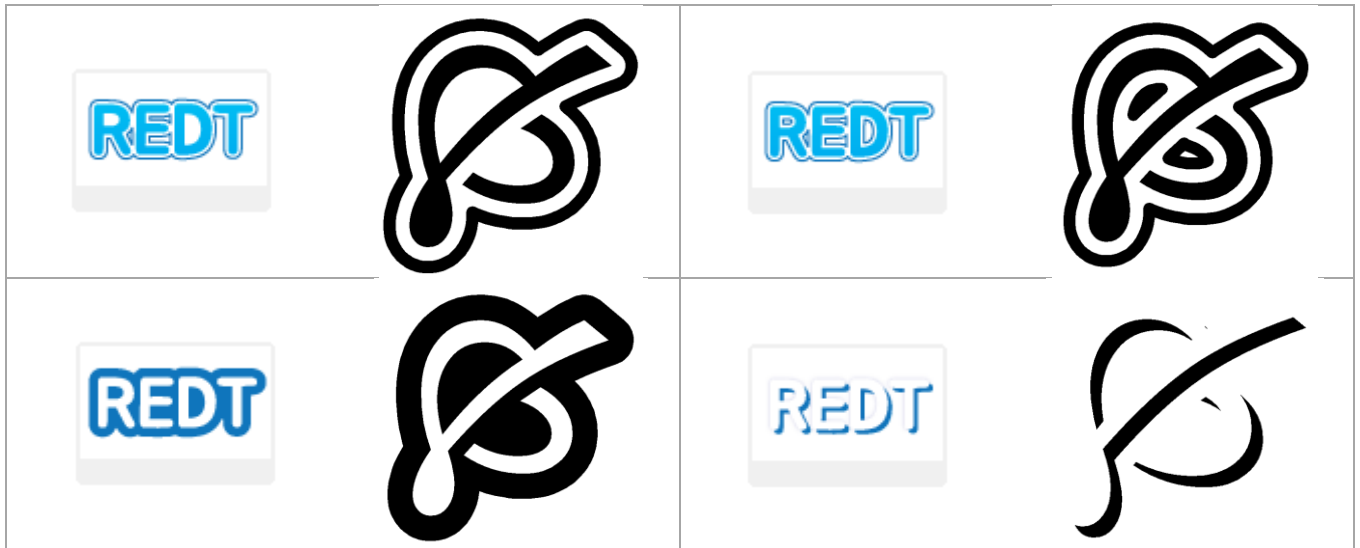
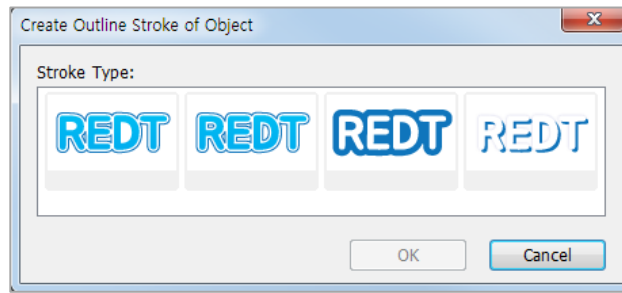
The thickness of drawing line can be adjusted in the drawing object property window.



[Outline stroke of object]

The image in a rounding box can be inserted into the target page





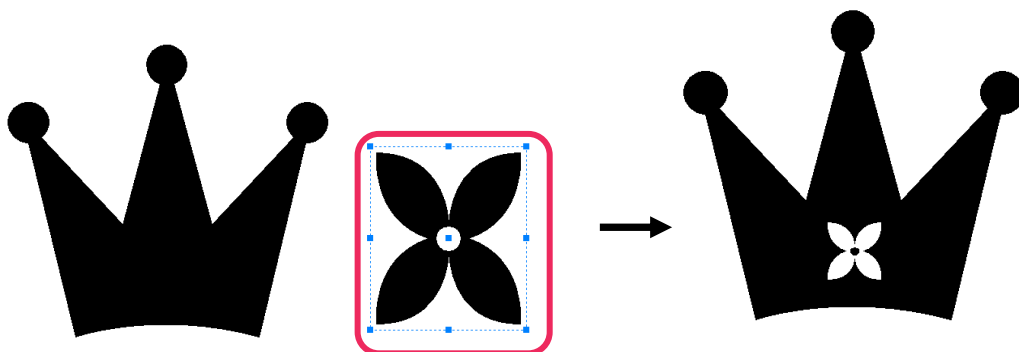
[Invert color of overlapped area]



When two or more objects are overlapped, the color in overlapped area can be inverted.

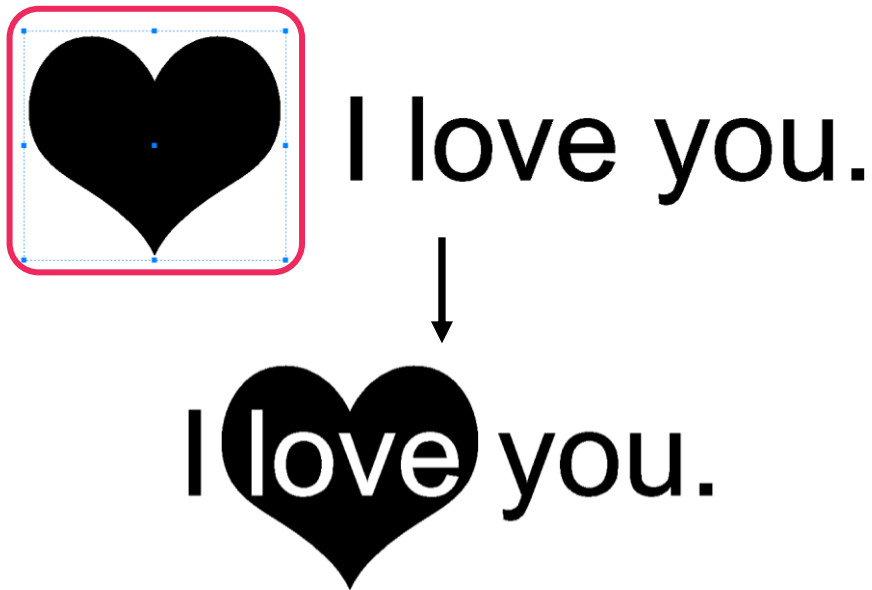


Move the target object over the first object after clicking button, then overlapped area's color will be converted.





When converting text, drag the target object over the text after clicking button.



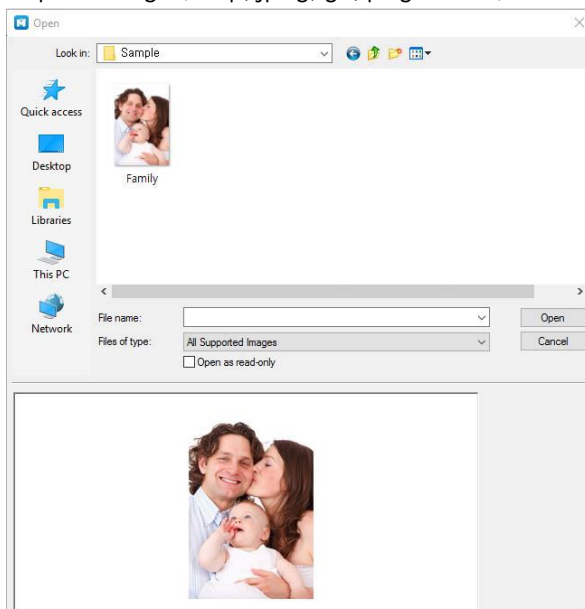
Notice

- [Invert color in overlapped area] function is only applied to straight lines, curved lines, circle, rectangle, polygon, design sample and uploaded SVG file, not texts and images.
- [Invert color in overlapped area] function inverts the color of underlaid object. If the color is not converted, select [Layout menu → Z Order → Top Most] and place the underlaid object above the other object.



[Image]

Import image (bmp, jpeg, gif, png ... etc.).

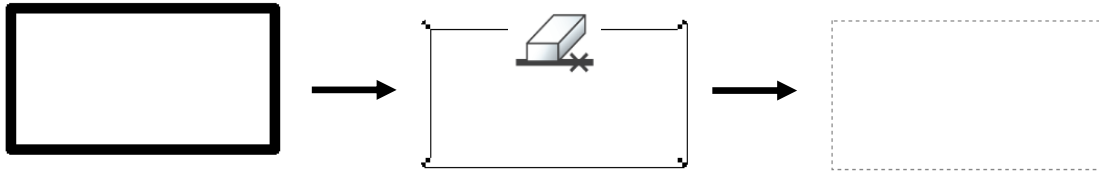




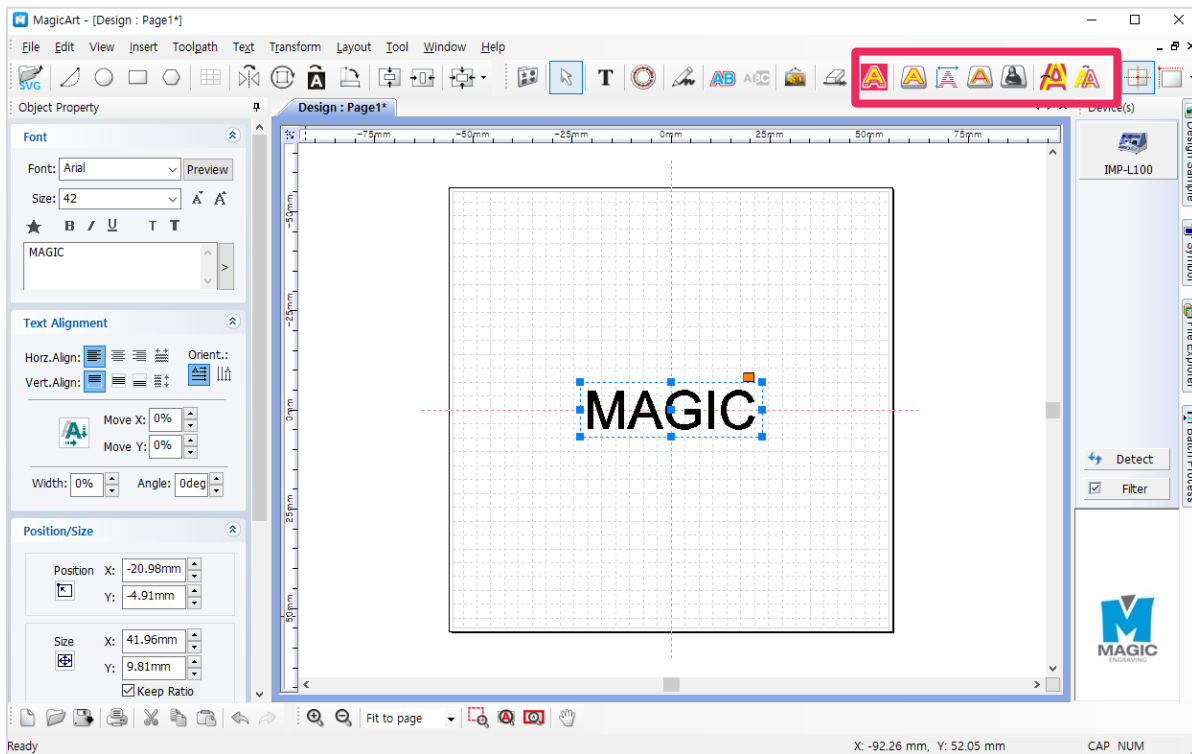
[Line eraser]

Clear the line of object.

Move the mouse over the line of object, then click the line. The line will be erased (Some objects cannot be erased with the Line eraser tool).



◆ Toolpath



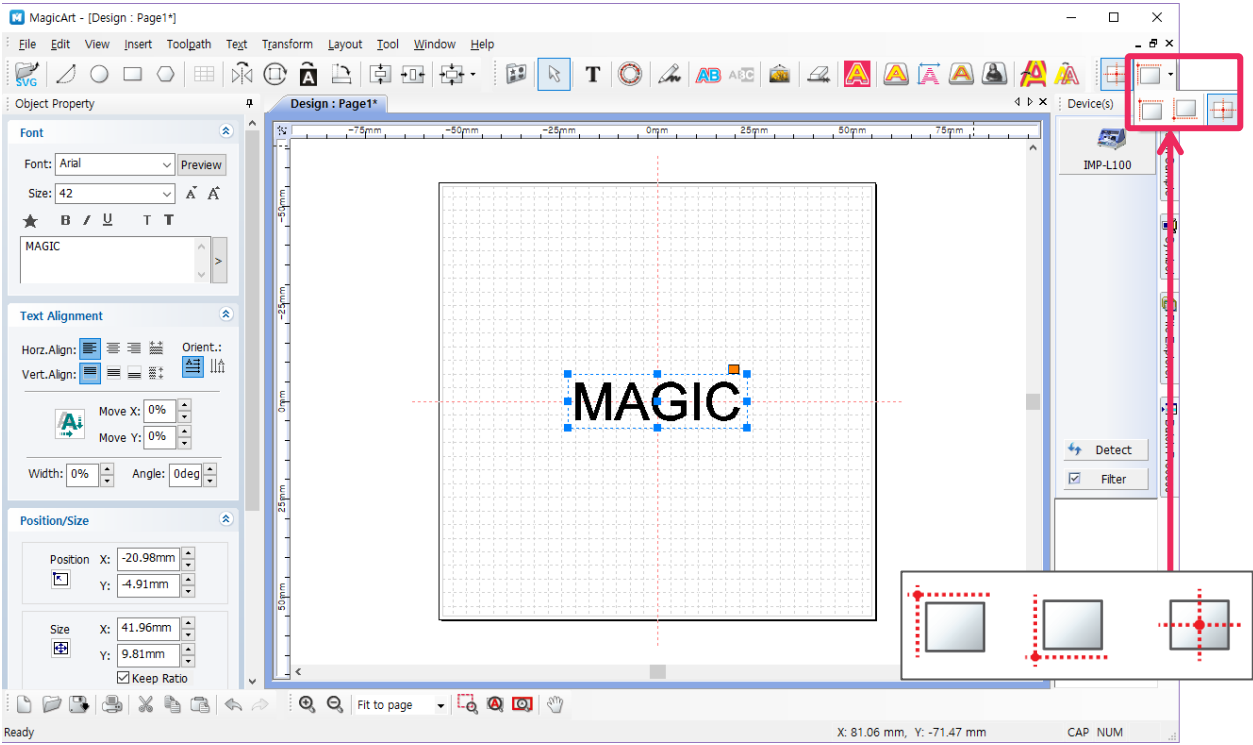
Toolpath?



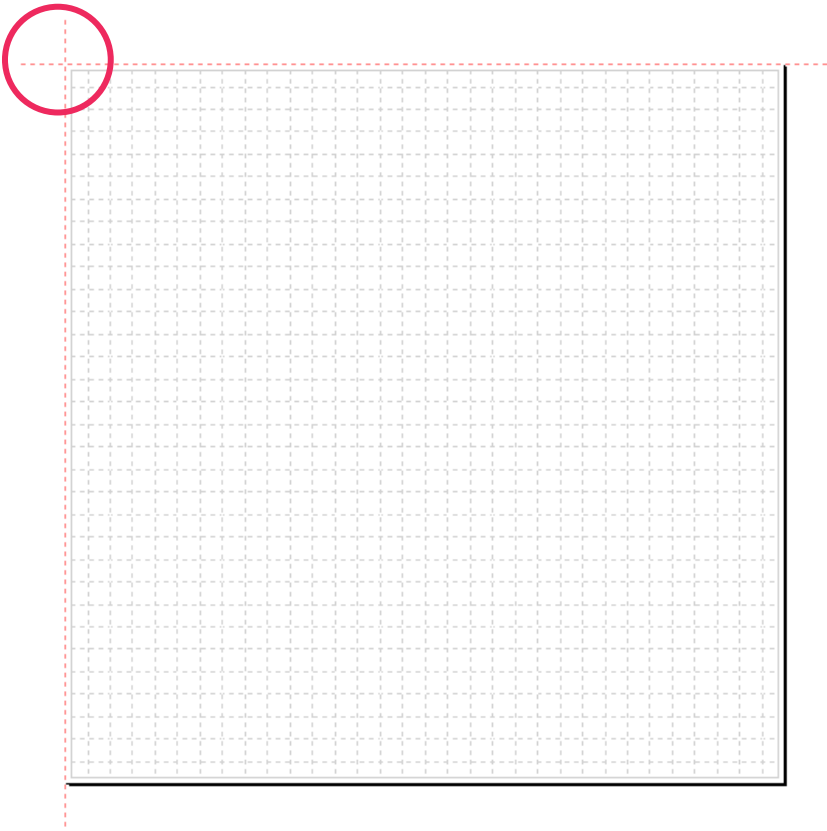
Toolpath is a pathway where tool goes by for marking.

Toolpath is usually displayed in red color and marking tool goes on the pathway as it engraves.

◆ Origin point tools

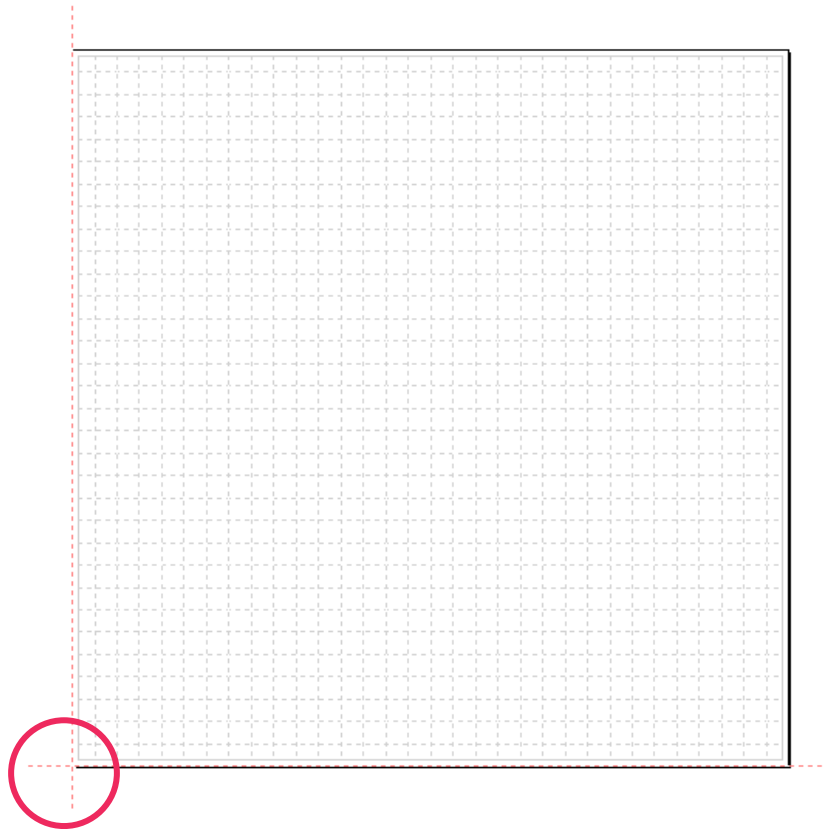


[Left top origin point]

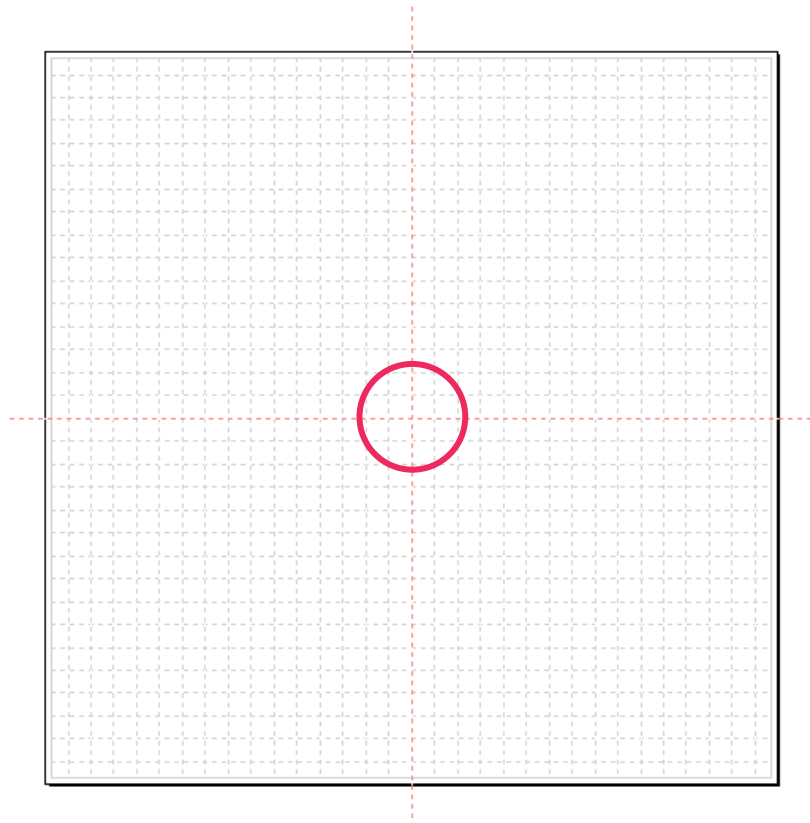




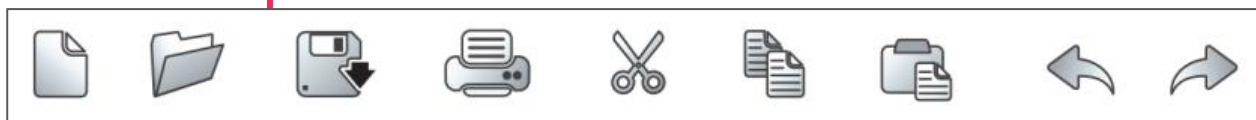
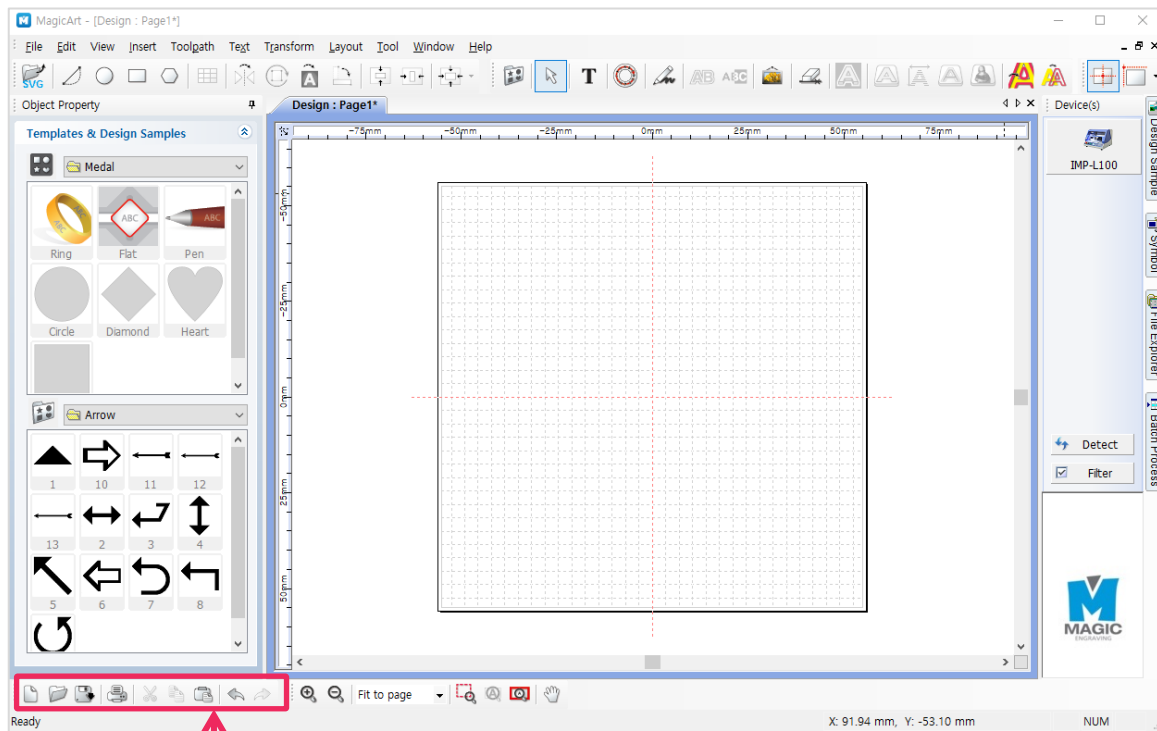
[Left bottom origin point]



[Center origin point]

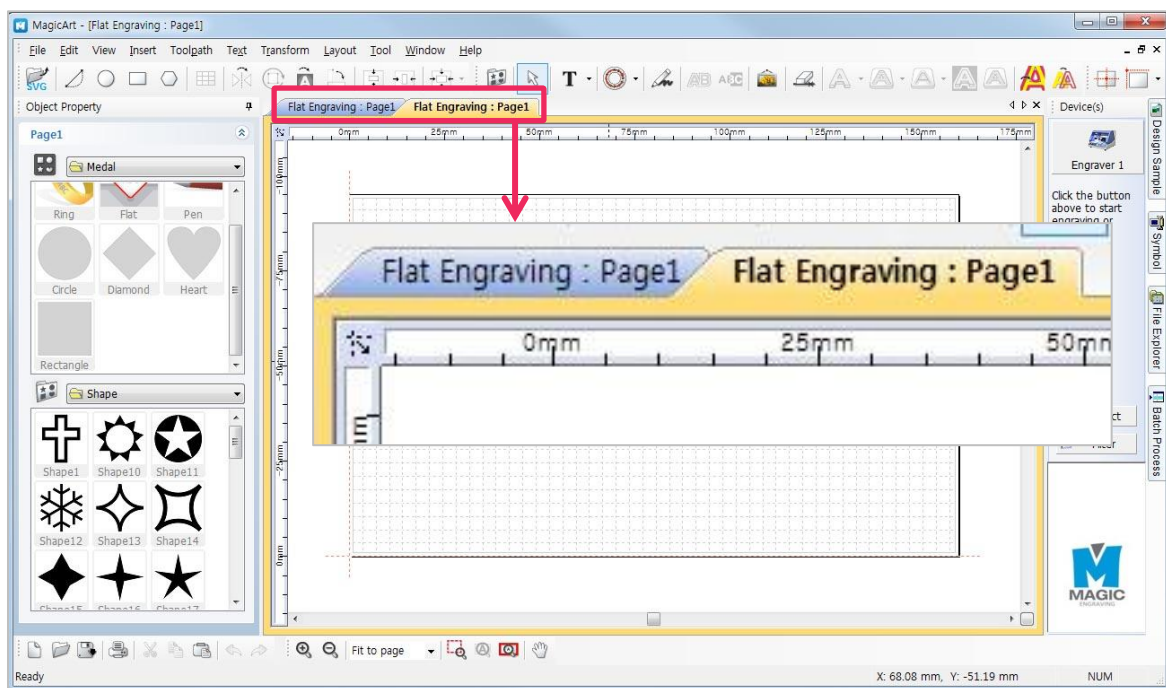


◆ Basic tools



[New document]

Open a new file.





[Open]

Open a file in "*.dgn" file format.

Select a file on the "Open" window and click "Open" button.



[Save document]

Save the design drawn on program by "*.dgn".

Choose the location(folder) in which the file will be saved and enter the file name before clicking "Save" button.



[Print]

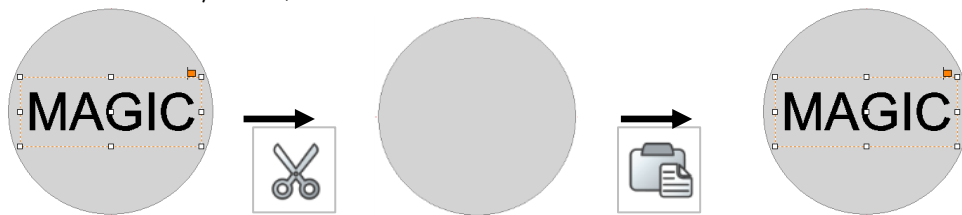
Print the design drawn on program.



[Cut]

Cut the selected object.

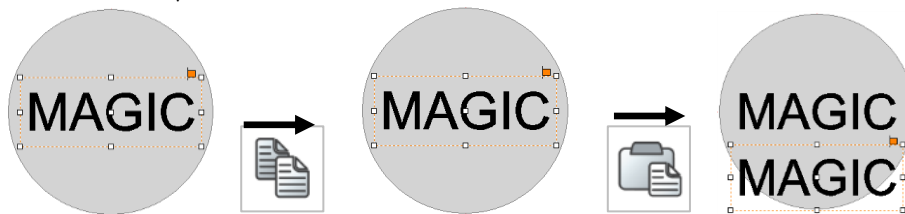
If Ctrl+X is pressed on the keyboard, the same function will be executed.



[Copy]

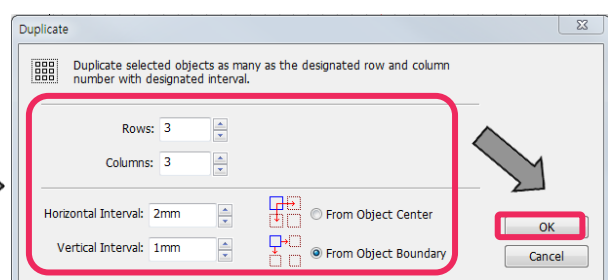
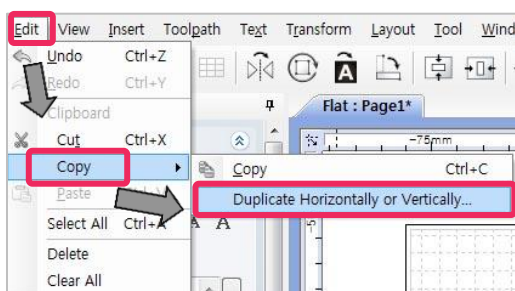
Copy the selected object.

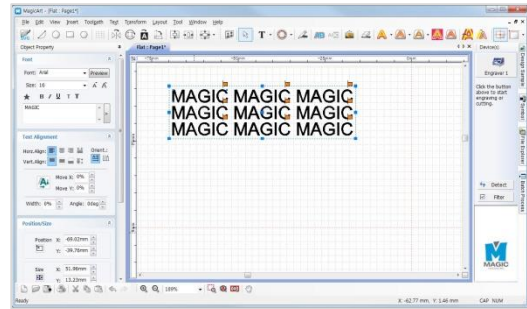
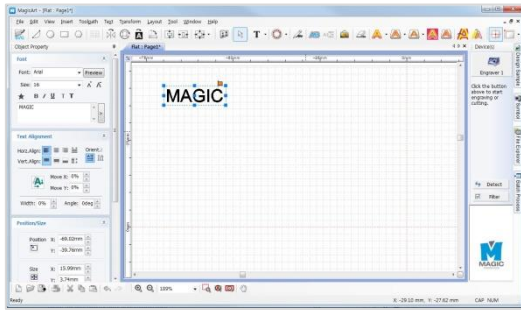
If Ctrl+C is pressed on the keyboard, the same function will be executed.



[Multiple paste]

If more than one of the same objects is needed, multi-copy the object in several constant gaps by clicking Edit menu → Copy → Multiple Paste...





[Paste]

Paste the cut or copied object.

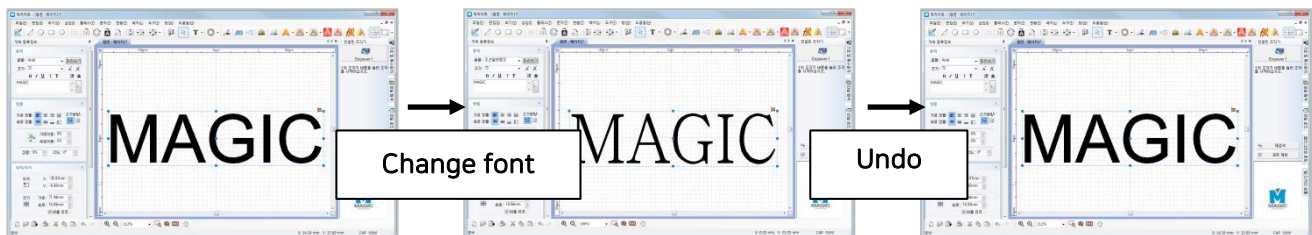
If Ctrl+V is pressed on the keyboard, the same function will be executed.



[Undo]

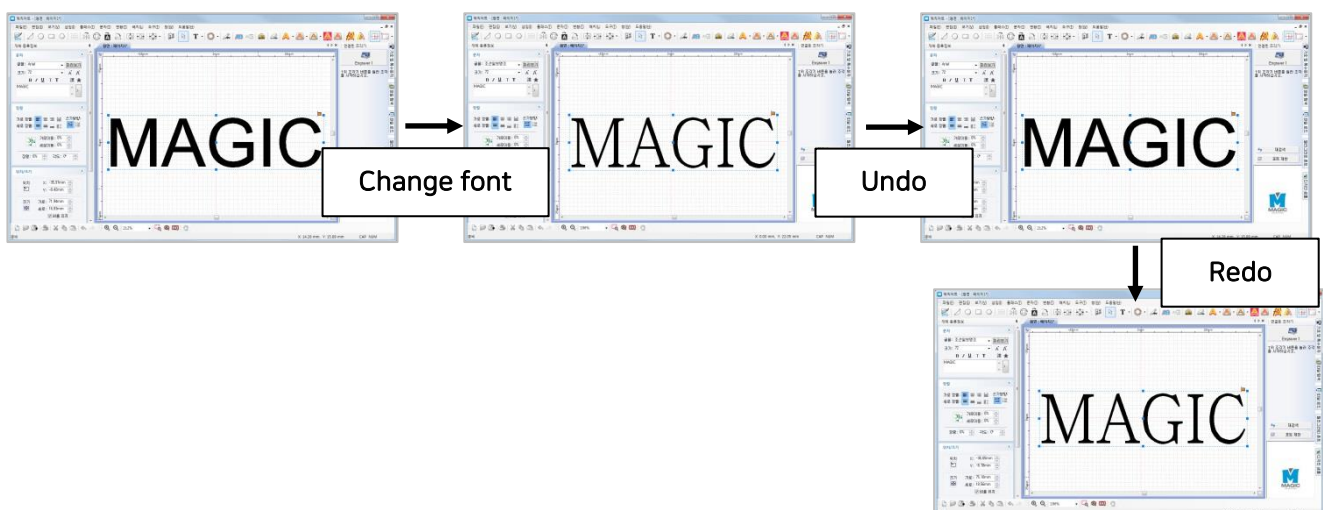
Return the work recently done to its previous state.

The number of undo stage can be adjusted with Tool menu → Option → General.

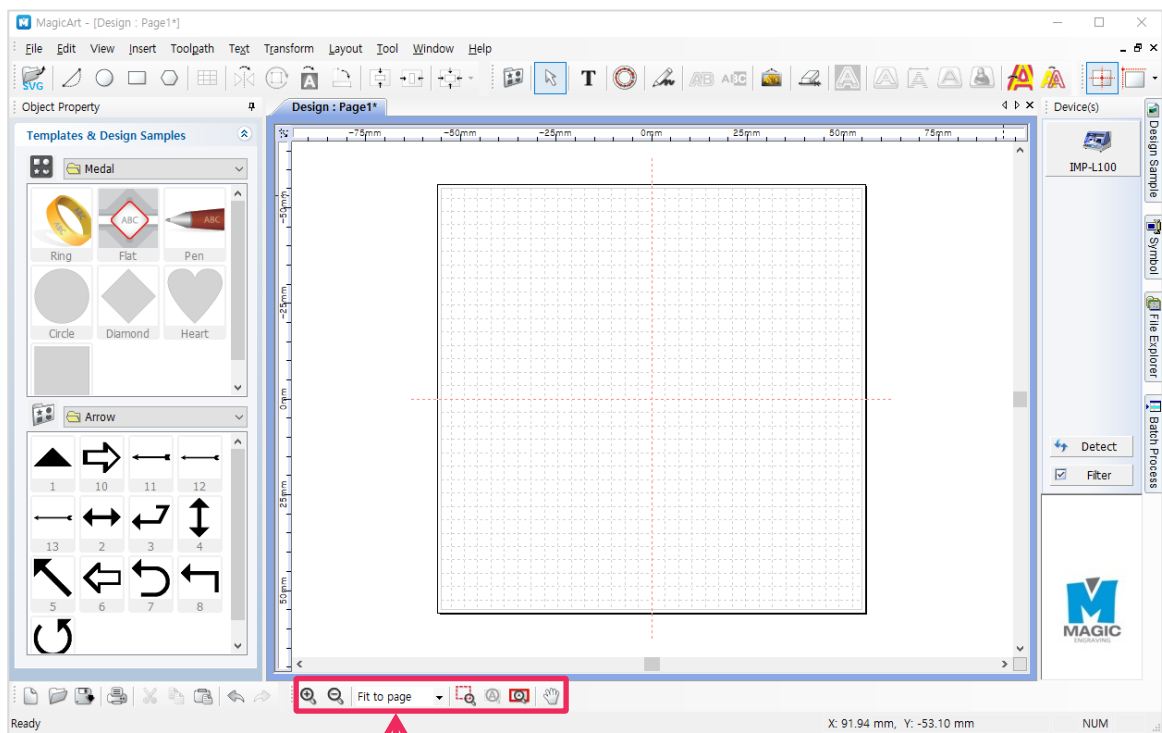


[Redo]

Re-execute the undone work.

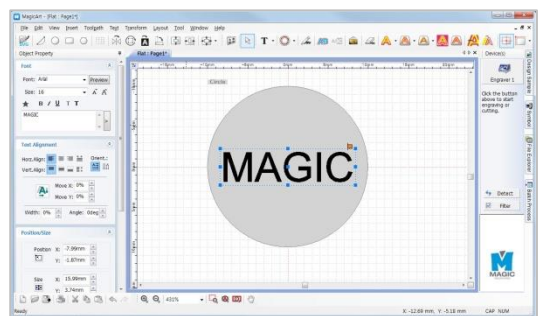
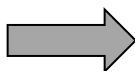
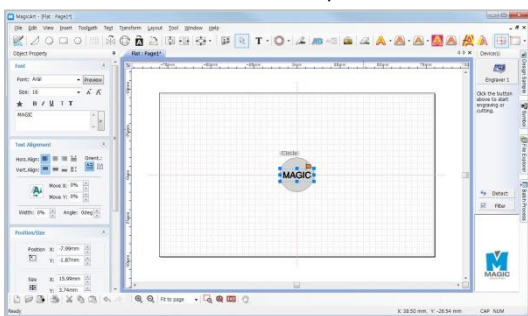


◆ Screen zoom in/out/move tools



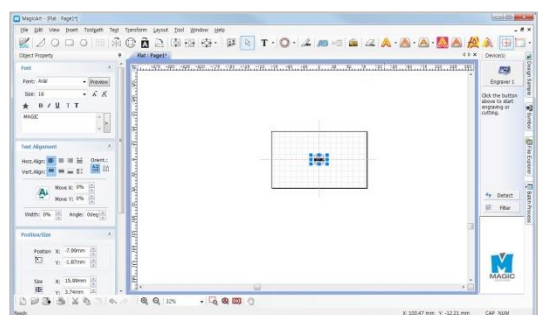
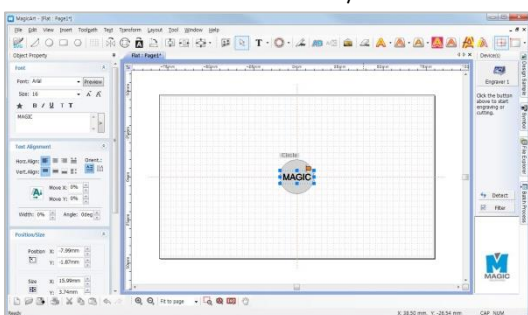
[Zoom in]

The screen is zoomed in by one level.



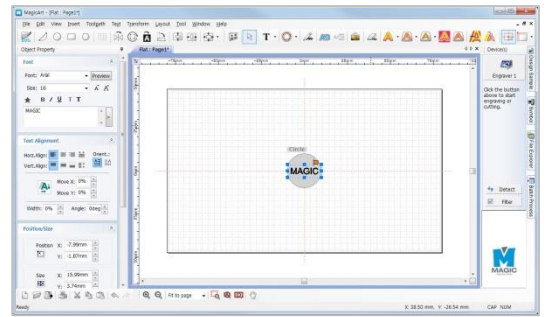
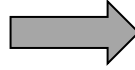
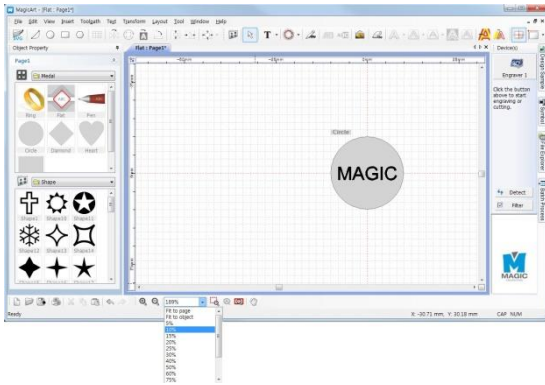
[Zoom out]

The screen is zoomed out by one level.



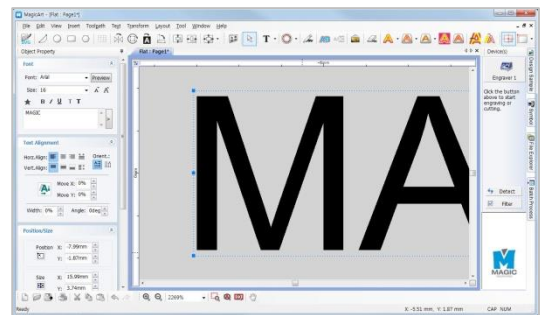
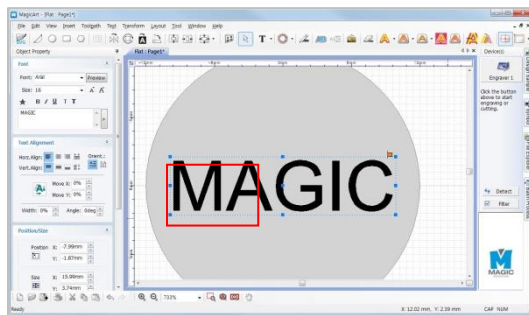
 [Zoom in/out ratio]

If any screen ratio is selected, the screen in the size of the selected ratio will be seen.



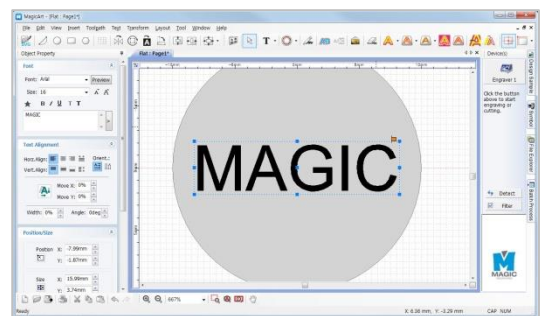
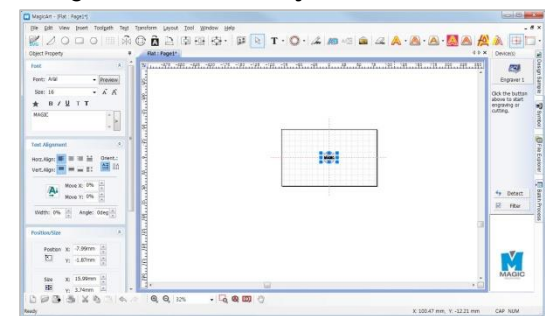
[Magnifier]

Drag a certain spot with the mouse to enlarge it.



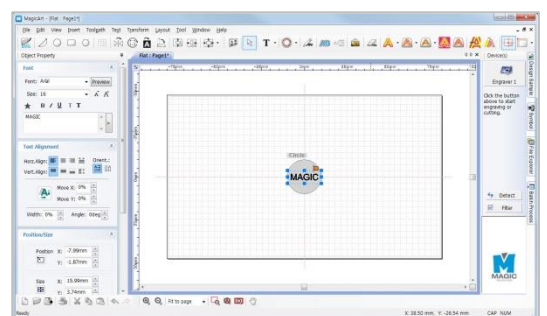
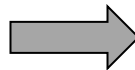
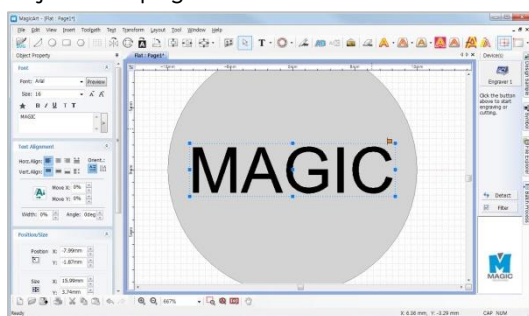
[Fit to object]

Enlarge the selected object to make it filled in the screen.



[Fit to page]

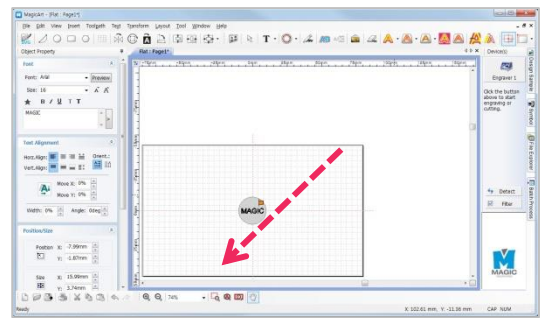
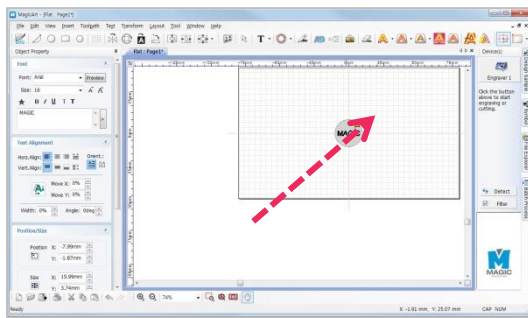
Adjust the page size to see the whole work area.





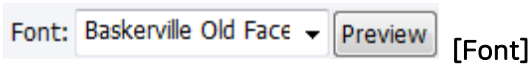
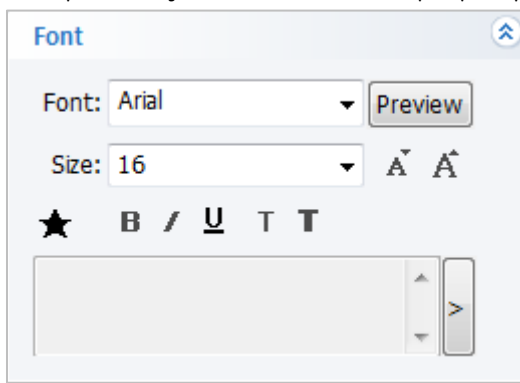
[Panning]

Drag the screen with the mouse to move it.

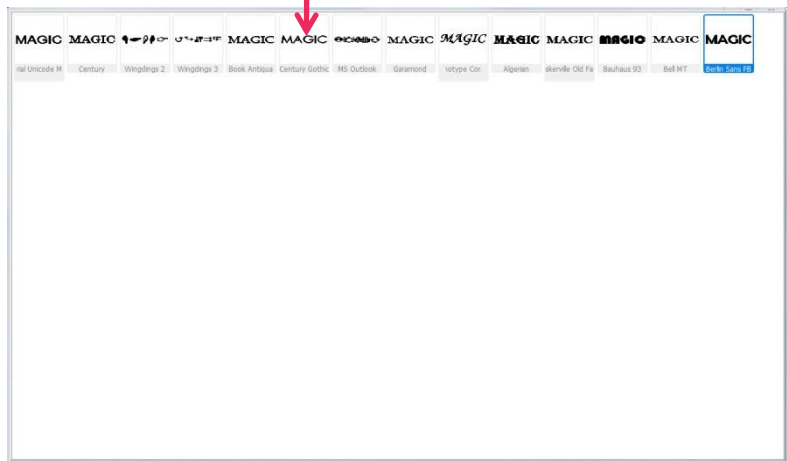


2. Text object property

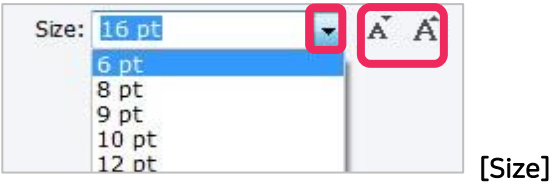
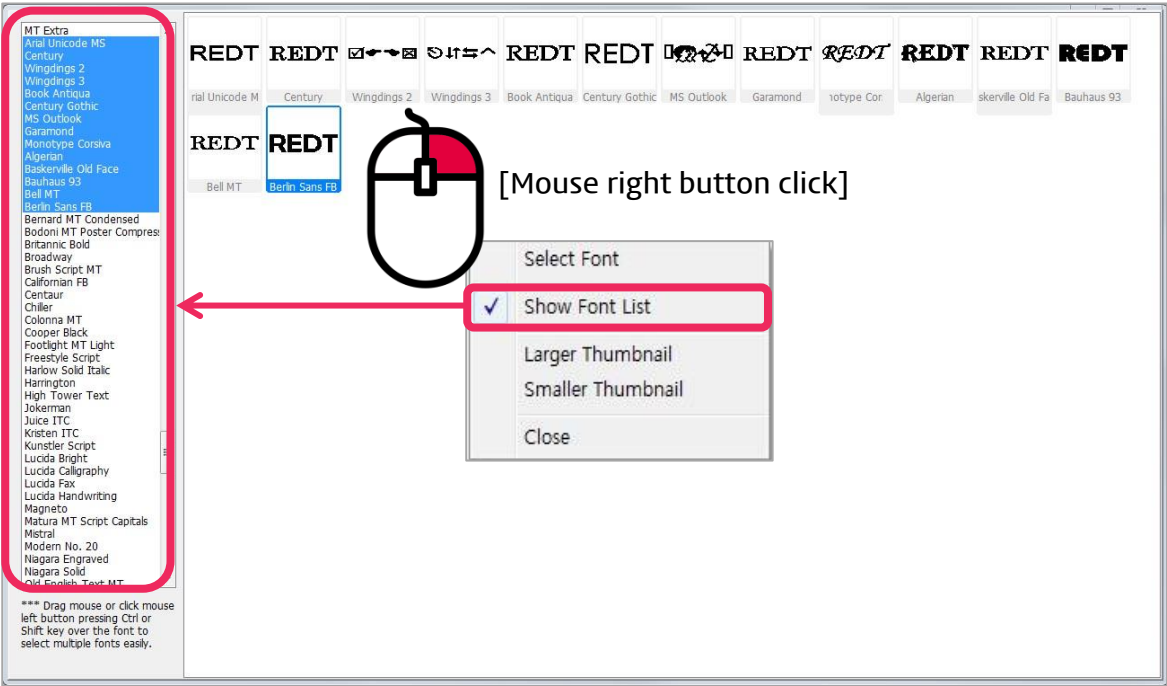
If any text object is selected, the property of the text object will appear on the left of the screen.




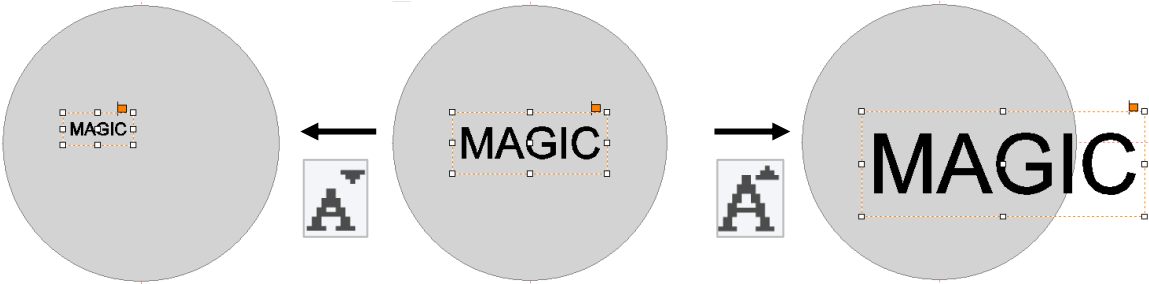
Designate font. Either click the font's arrow or click "Preview" button to designate font.



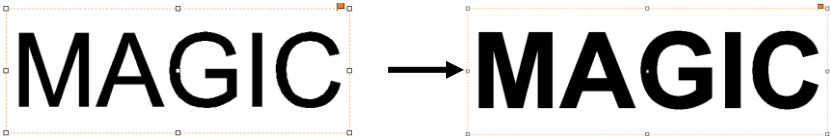
Right click to display menu on font preview window. Click “Show Font List”, then you can designate the fonts that will be used in preview.



Adjust the size of the selected text. Either press the size arrow button to select or press  [size] button to adjust the size by one level.



Change text style to bold.





[Italic]

Change the text style to italic.

MAGIC → *MAGIC*



[Reduce or increase font weight by one level]

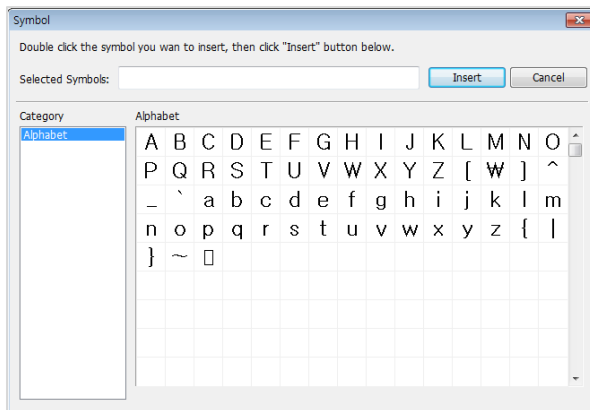
Adjust the weight of font.

MAGIC ← **MAGIC** → **MAGIC**




[Symbol]

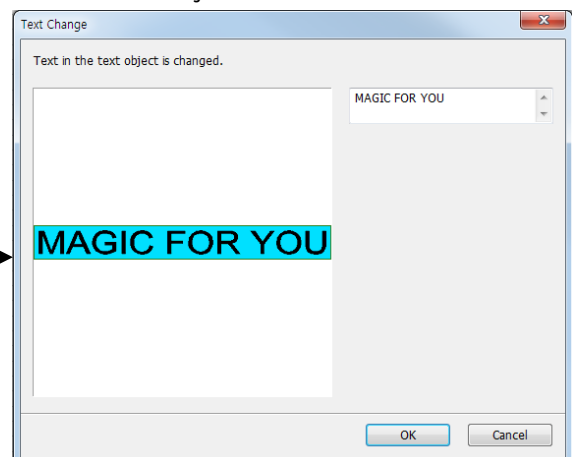
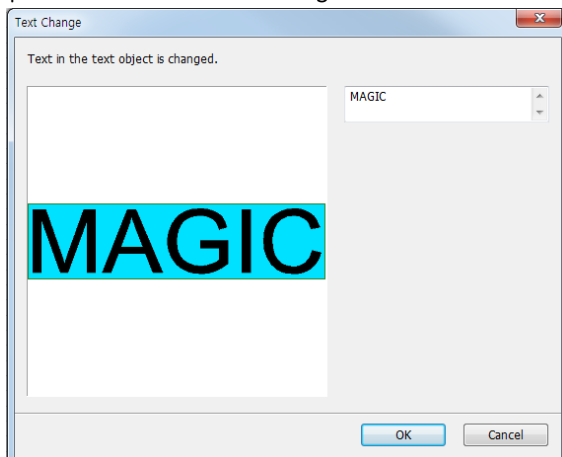
Insert symbols.



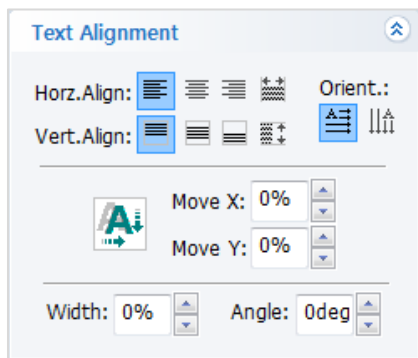
[Text change]

The entered text of the selected object can be displayed and changed. Edit the text on the text field or

press  button to change the text more easily when several text objects are selected.




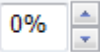

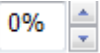






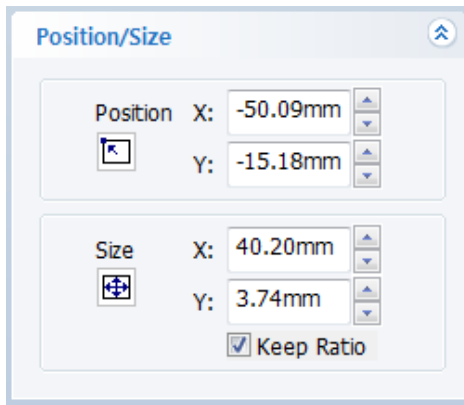
MAGIC FOR YOU



[Align]

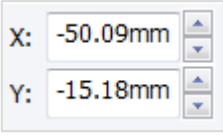
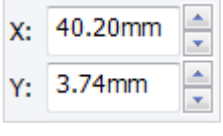
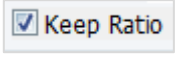
 [Align to left]	Align characters to the left in the text box. 
 [Align to center]	Align characters to the horizontal center in the text box. 
 [Align to right]	Align characters to the right in the text box. 
 [Both]	Align characters to the both direction evenly in the text box. 
 [Align to top]	Align characters to the top in the text box. 
 [Align to center]	Align characters to the vertical center in the text box. 
 [Align to bottom]	Align characters to the bottom in the text box. 

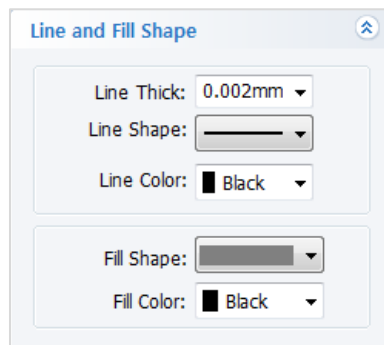
 [Horizontal text]	<p>Arrange characters horizontally.</p> 
 [Vertical text]	<p>Arrange characters vertically.</p> 
<p>Move X: 0%</p> 	<p>Move the selected character horizontally (left, right).</p> 
<p>Move Y: 0%</p> 	<p>Move the selected character vertically (up, down).</p> 
<p>Width: 0%</p> 	<p>Adjust the width of the selected character.</p> 
<p>Angle: 0deg</p> 	<p>Rotate the selected character.</p> 



The 'Position/Size' dialog box is divided into two sections. The top section, labeled 'Position', contains input fields for X and Y coordinates, both set to -50.09mm and -15.18mm respectively, with a small icon of a rectangle with an arrow. The bottom section, labeled 'Size', contains input fields for X and Y dimensions, set to 40.20mm and 3.74mm respectively, with a small icon of a rectangle with a crosshair. Below these fields is a checkbox labeled 'Keep Ratio' which is checked.

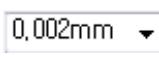
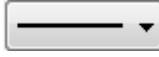
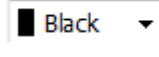

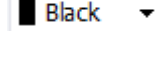
[Position/Size]

 <p>X: -50.09mm Y: -15.18mm</p>	Location of the selected object
 <p>X: 40.20mm Y: 3.74mm</p>	Size of the selected object
 <p><input checked="" type="checkbox"/> Keep Ratio</p>	<p>When "Keep Ratio" is checked, width and height of the selected object is maintained at the same rate. When "Keep Ratio" is un-checked, width and height of the selected object is adjusted separately.</p>

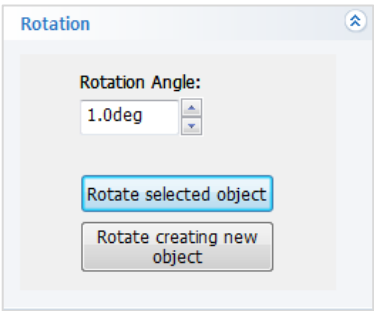


The 'Line and Fill Shape' dialog box is divided into two sections. The top section, labeled 'Line', contains dropdown menus for Line Thickness (0.002mm), Line Shape (a solid line), and Line Color (Black). The bottom section, labeled 'Fill', contains dropdown menus for Fill Shape (a solid gray rectangle) and Fill Color (Black).

[Line and Fill Shape]

 <p>0,002mm</p>	Line thickness of the selected object
 <p>—</p>	Line type of the selected object
 <p>Black</p>	Line color of the selected object
 <p>—</p>	Color filled inside of the selected object
 <p>Black</p>	Type filled inside of the selected object

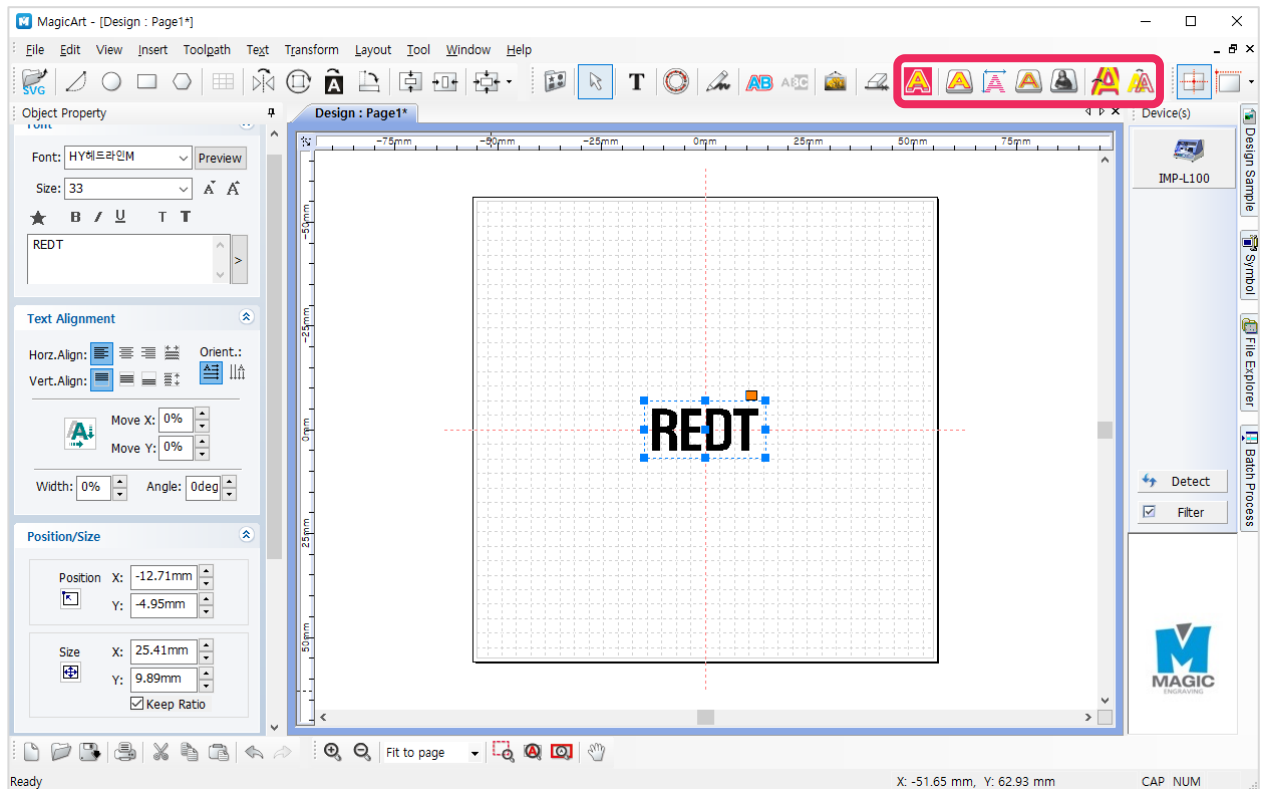
3. Rotation tool property



[Rotation]

	Rotate the selected object by designated degree. Enter the desired angle of rotation, and then press arrow button. The object is rotated by the angle entered.
	Rotate the selected object at the same degree as entered.
	Rotate and add a new object at the same degree as entered

4. How to engrave for each toolpath



Note

Toolpath?

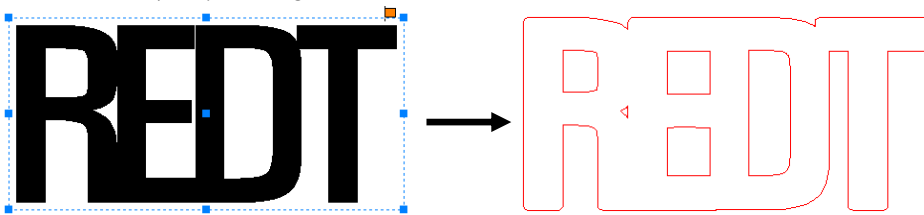
Toolpath is a pathway where tool goes by for marking.

Toolpath is usually displayed in red color and marking tool moves on the pathway as it engraves.



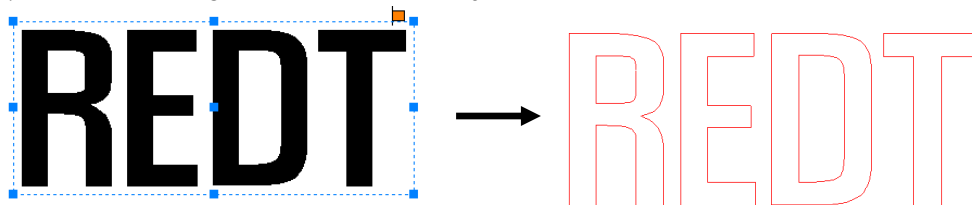
[Cut-out toolpath]

Creates a toolpath that will cut out the selected object. The toolpath boundary will be wider than the selected object's boundary depending on the diameter of tool.



[Outline toolpath]

Creates a toolpath that will engrave the selected object's border.

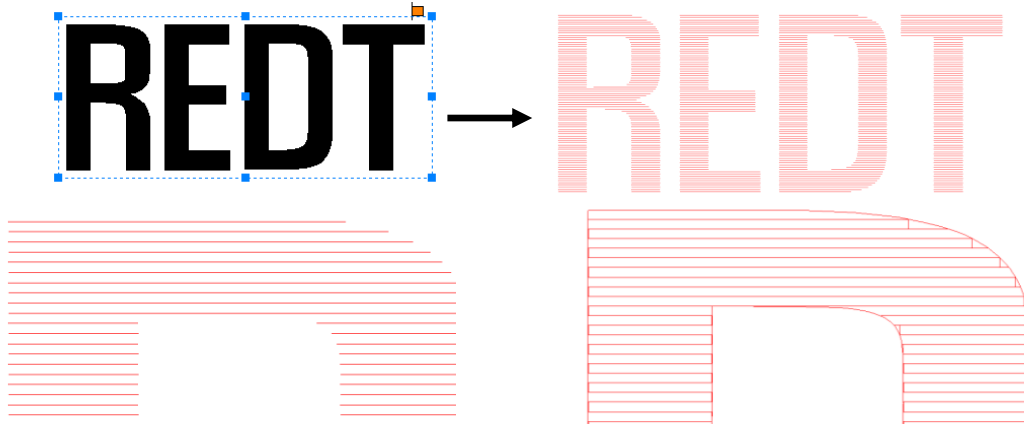




[Scan line toolpath]

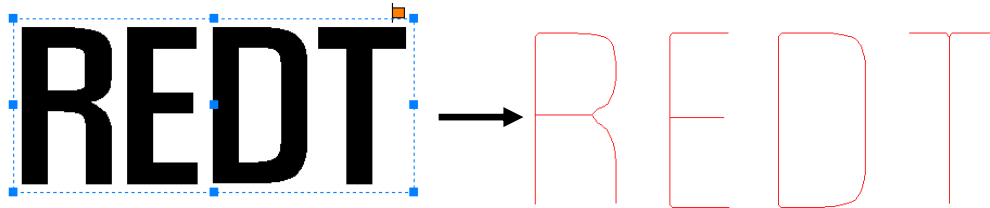
Creates toolpath that will engrave inside area of the target object's boundary.

"Scan line toolpath" might be similar to "Hatching toolpath", but it is rather used for logos, patterns or objects with larger area.



[Single line toolpath]

Creates a toolpath that will engrave the center line of the selected object.



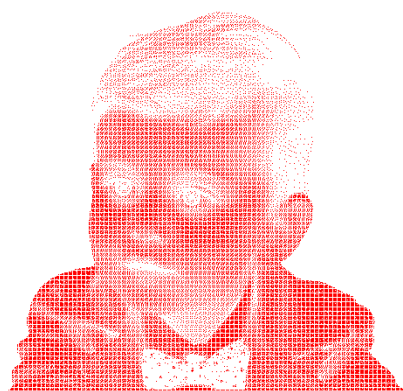
"Single line toolpath" process may cause the line deviated.

Thus, it is recommended to use thinner lined font to reduce the deviation.



[Photo impact engraving toolpath]

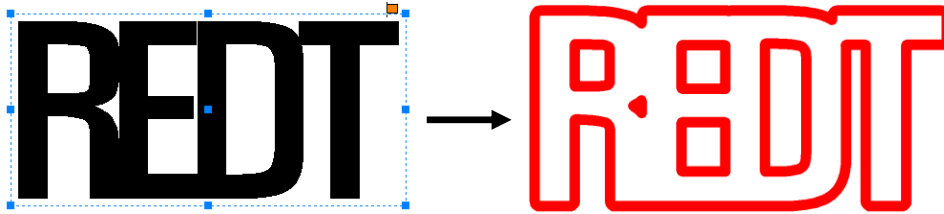
Creates a toolpath that will engrave image with dots.





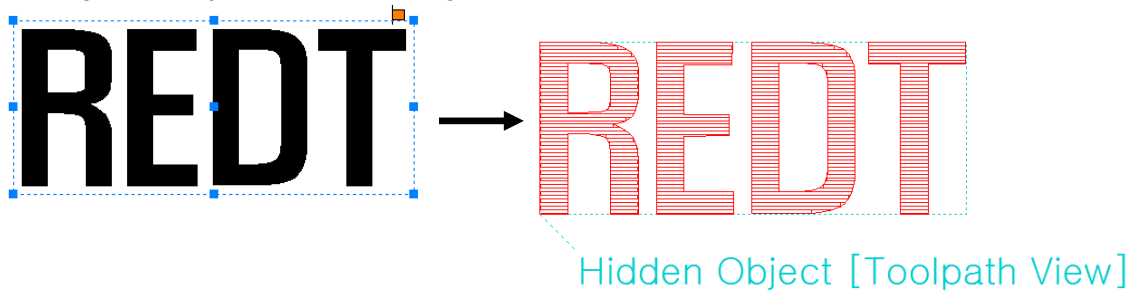
[Simulate toolpath cut]

The prospected image of the toolpath outcome processed by the selected tool is shown. The following is an example of the cutting toolpath that uses 0.6mm endmill cutter.




[Show toolpath only]

Only toolpath is shown on the screen with temporarily masking all of other objects. If this button is pressed once again, all objects will be seen again.




5. Create Toolpath



Select or input options for the desired toolpath in accordance with the tool and material characteristics to be used.

Target Objects:



Transmit...

Create Toolpath

Cancel

Laser Beam Info: ☐ Edit

Laser

Laser(Cutting)

Name: [Laser]

Laser Tip width: 0.01mm


Preset: ☐ Edit


Black Marking


Normal Marking


Ring Marking(Inside&Outside)

Option

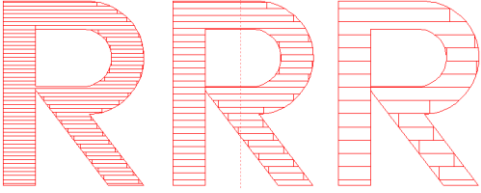

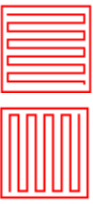
Hatching Gap:  0.01mm




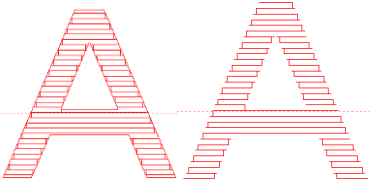
Margin:  0mm

Direction:  Angle: 0

 ☒ Engrave Outline

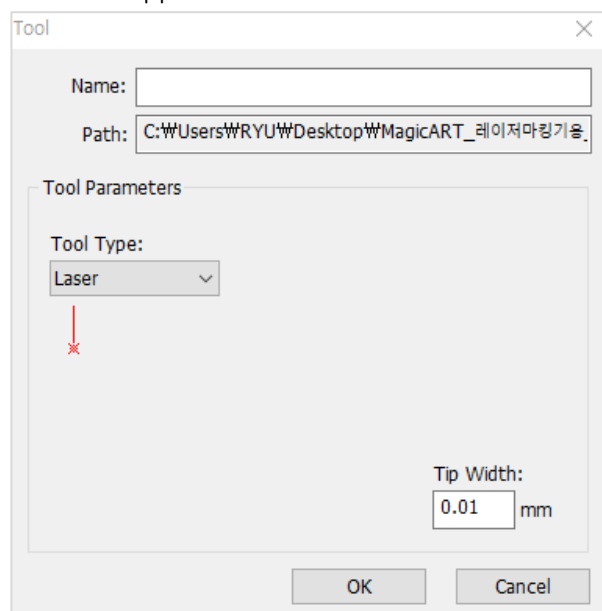
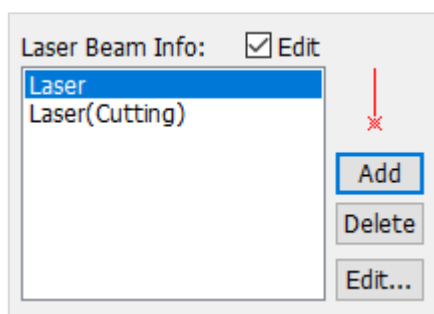
Toolpath Quality: Normal

Laser Beam Info		Select the laser beam. Each engraving option value can be changed by pressing Edit or Add button.
Preset		Hatching gap, depth, engraving speed and others are pre-set for each engraving option. Therefore, it is not necessary to designate hatching gap, depth, engraving speed and others every time and they will be automatically set with their pre-set values. Each engraving option value can be changed by pressing Edit or Add button.
Option	Hatching Gap	Designate hatching gap. 
	Margin	Designate a margin between object outline and toolpath. 
	Direction	The followings are shown only on hatching Toolpath.  <div> <p>A Toolpath is created in the horizontal direction</p> <p>A Toolpath is created in the vertical direction</p> </div>

		 A Toolpath is created in the left diagonal direction  A Toolpath is created in the right diagonal direction  A Toolpath is created in the cross hatched direction <u>※ This toolpath is not recommended due to possible damage to materials with plated surface.</u>
	Engrave outline	<p>If this option is un-checked, a toolpath for only the inside of the selected object is created.</p> 
Transmit	Toolpath output window is displayed.	
Create Toolpath	Create the toolpath.	

(1) Laser Beam Info: Add/Delete/Edit

If "Edit" button is checked, Add/Delete/Edit buttons will appear.



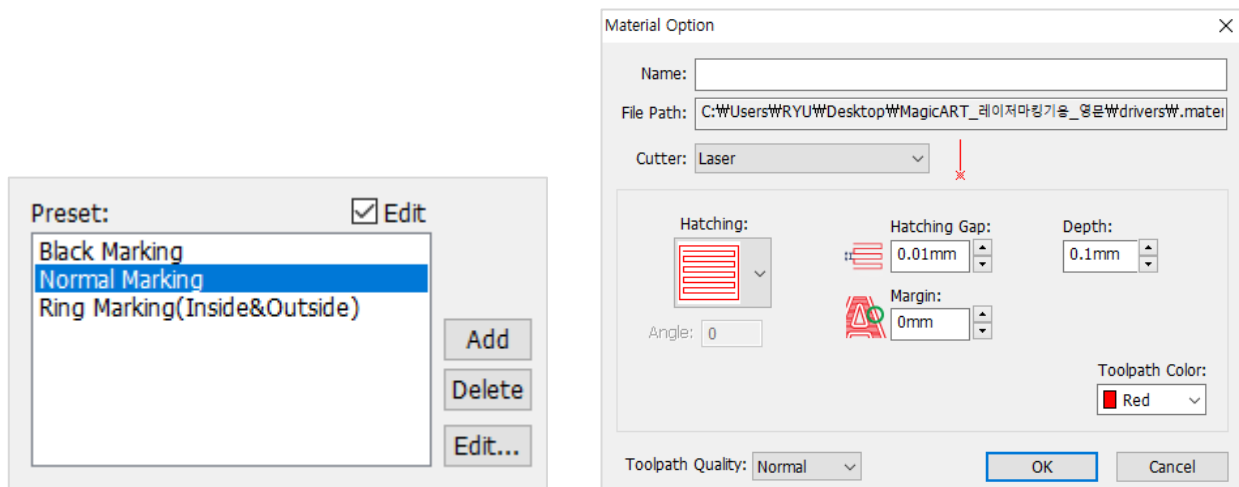
Add Designate the name of a info to be added along with its type and other options like tip width, then click "OK" button. The new info will be added to the selection list.

Delete Select a info from the list and click "Delete" button to delete the selected tool from the list.

Edit... Select a info for modifying and click "Edit" button. If "OK" button is clicked after option is modified, the modified value will be saved.

(2) Preset: Add/Delete/Edit

If "Edit" button is checked, Add/Delete/Edit buttons will appear.



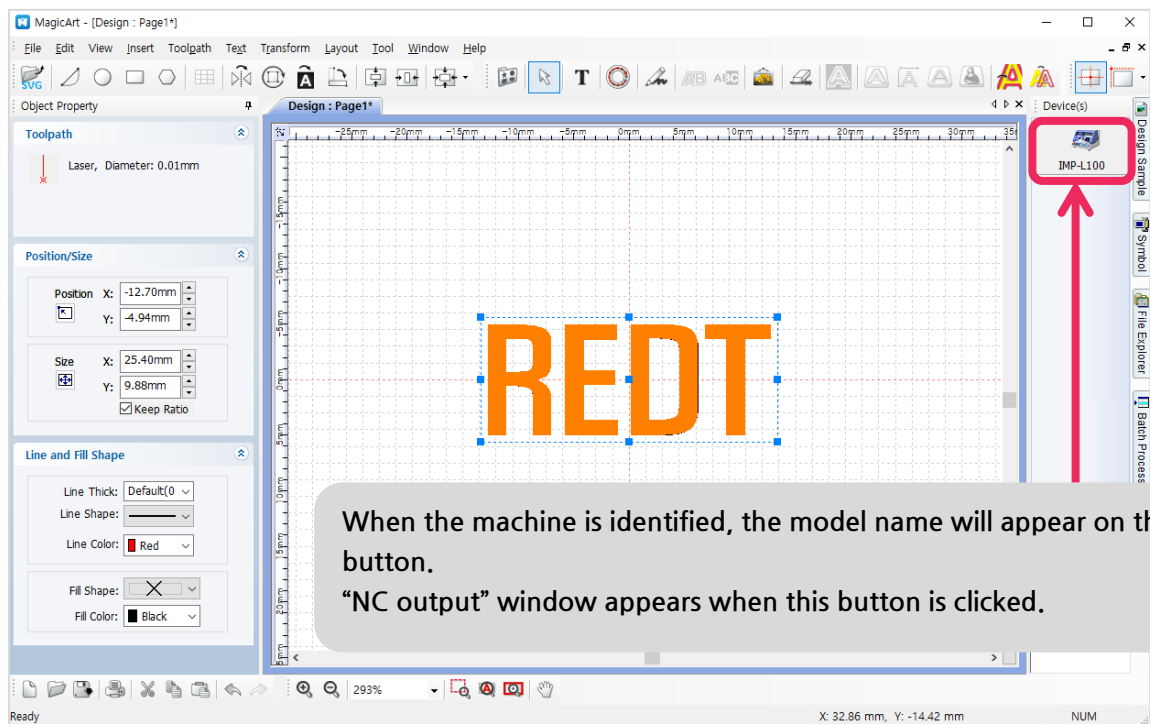
Add Enter a name to the preset option setting window and designate hatching gap, engraving depth and etc before clicking "OK" button. The option will be added to the preset option selection list.

Delete Select an option to be deleted and click "Delete" button to delete the option from the list.

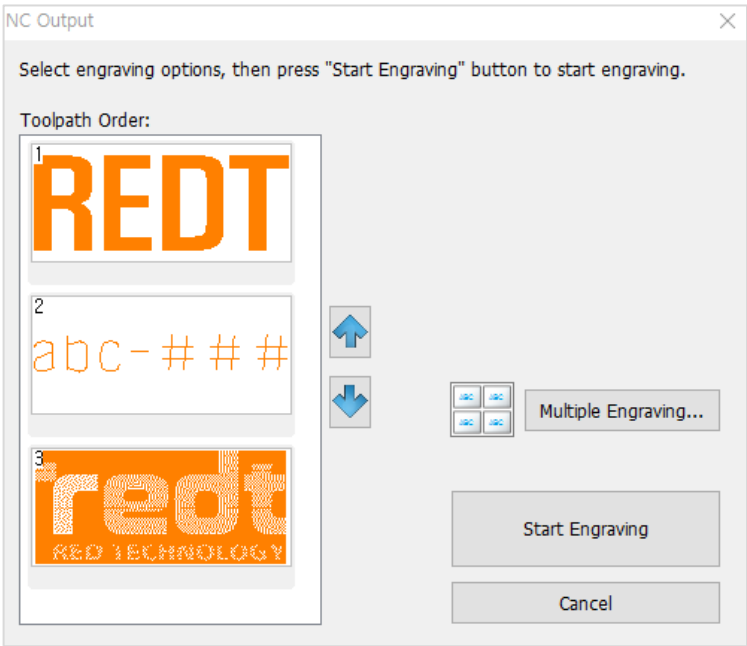
Edit... Select an option to be modified and click "Edit" button. If "OK" button is clicked after option is modified, the modified setting value will be saved.

6. NC data output

Select toolpath and click product button on the top-right of screen to transfer the selected toolpath to the product.



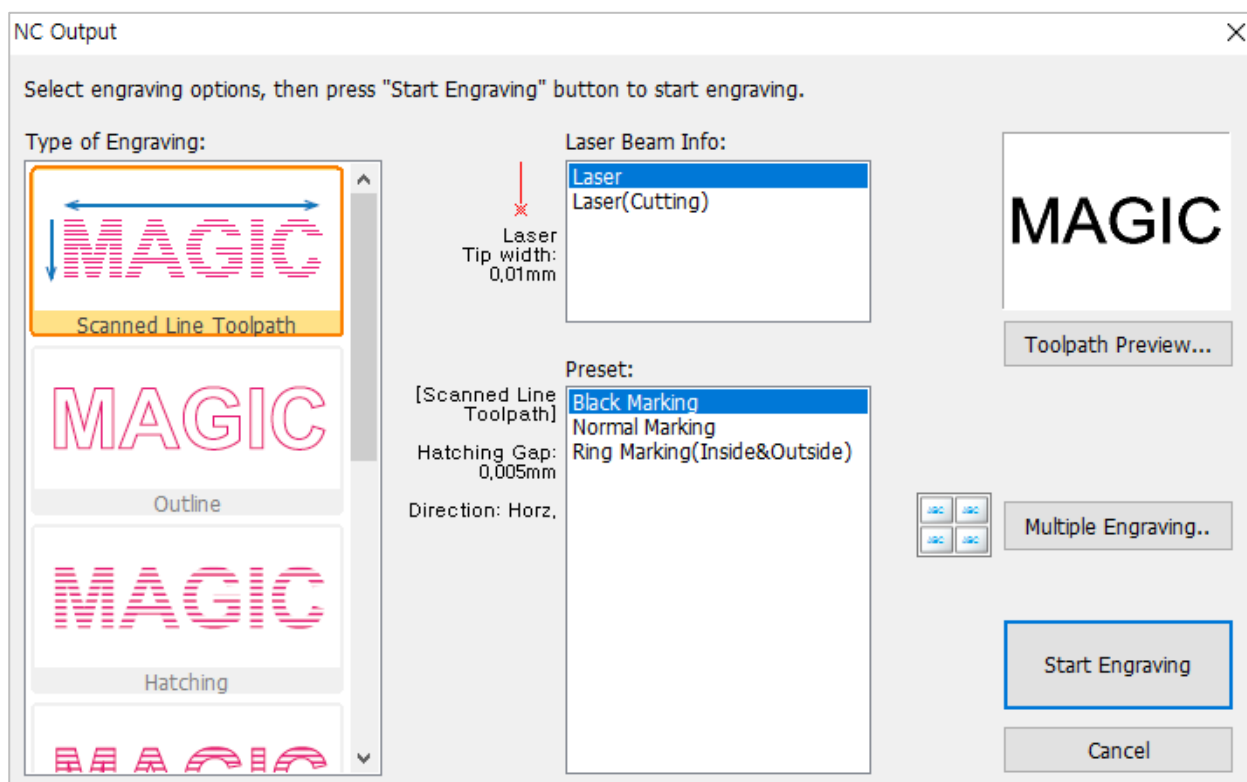
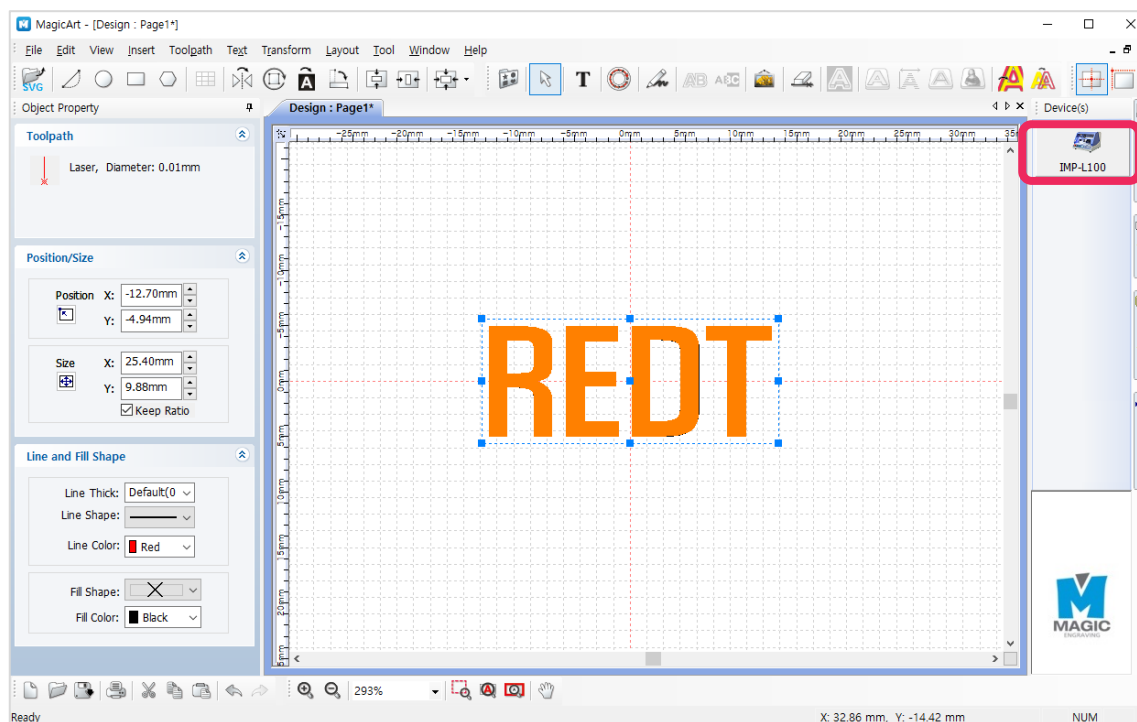
On the NC output window, select a measuring method and other options, then click "Start Engraving" button to start transferring the toolpath to the selected product.




Toolpath order	When two or more toolpaths are selected for engraving, they will be placed in order. The order can be adjusted by [Up], [Down] button on the right.
Multiple engraving	Engraves materials repeatedly in constant vertical/horizontal gap. *Usually optional clamp is used for this automatic engraving.
Start Engraving	Start engraving.

[Transfer of Tool Path Data Right after Text Entry]

Able to mark a selected object immediately without creating a tool path




Type of Engraving	Able to select a marking method such as edge and scan line A tool path is automatically generated by the selected marking method. Options can vary depending on a type of the selected tool path.
Laser Beam Info	Chooses a laser beam option

Preset	Hatching interval and direction are already set by option. Therefore, if a tool path option is chosen, the preset values are automatically set.
Toolpath Preview	<p>Displays a tool path according to the selected fragment option</p>  <p>ex> Select the scan line</p>
Multiple Engraving	<p>Able to mark a selected object repeatedly with a certain width/length interval It allows users to automatically fragment a lot of works at a time by entering clamp information and marking size.</p> <p>✳ AUTOMATIC MARKING is available with a special clamp. This special device is sold separately. To get this, contact the store.</p>

Laser Option



Click the [ (IMP-L100)] button / [Toolpath] button to send the Toolpath. Then, a laser option window pops up. Adjust the laser option and click [Engrave]. Then, the marking data are sent to the product.

Engraving object		Checks the object to engrave
Preset		Selects the engraving option * See the details at the below.
Option		Changes the laser option * See the details at the below.
	Advanced Option	Changes the advanced option <div data-bbox="738 1093 1228 1321" data-label="Form"> </div>
	Power	Adjusts the laser output
	Frequency	Adjusts the laser frequency
	Speed	Adjusts the speed
	Repeat Count	Adjusts the repetition frequency
	Depth	Adjusts marking depth at selection of Deep Marking
	Z-Movement	The depth specified at selection of Deep Marking is not marked at a time. It is adjusted by Z-axis moving unit. <u>E.g.) Deep Marking-specified depth:</u> In the event of 1.2mm/0.03mm Z-axis moving unit, 1.2mm depth is marked (0.03mm per marking, 4 times).
	Cleaner	Perform the engraving for trimming.
Relocation		Moves the laser position
Material		Selects the preset engraving height * See the details at the bottom.
Laser Focus	Material hight	Since the laser focus changes according to the height of the material, the height is adjusted accordingly.

1. Engraving Option

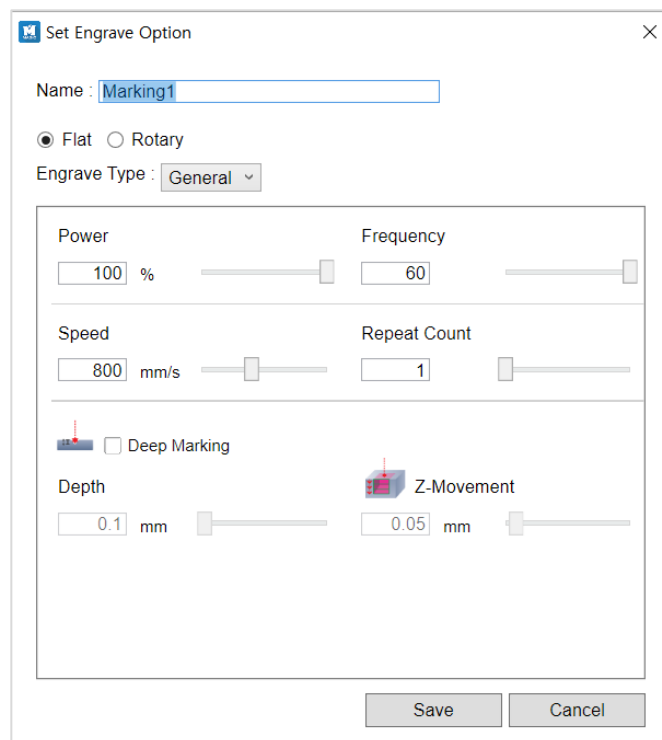
Laser options such as engraving type, power and speed can be set in advance.
Press [EDIT] and click the button at the bottom. Then, you can change options.



<Add>

This menu is used to add a new engraving option.

Set the options (e.g., name, engrave type, power, frequency, speed, etc.) and click [Save].



<Edit>

This menu is used to edit engraving options.
Edit the options and click [Save].

Set Engrave Option

Name :

☒ Flat ☐ Rotary

Engrave Type :

General

Power

%

Frequency

Speed

mm/s

Repeat Count

☐ Deep Marking

Depth

mm

Z-Movement

mm

Save

Cancel

<Delete>

Deletes engraving options

Laser Option

Engrave Object

REDT

Preset

☒ Edit

Default

Marking1

Add

Edit

Remove

Option

Advanced Option

Power

%

Frequency

KHz

Speed

mm/s

Repeat Count

☐ Deep Marking

Depth

mm

Z-Movement

mm

Save Option

Material

☐ Edit

Key1 (Key1)

Key2 (Key2)

Key3 (Key3)

Material1

Laser Focus

Material Height :

mm

Apply

Move Position

Y+

Y-

X-

X+

Move into Center

Working Time

00:00:00

Repeat Count

0 / 0

Marked Count

0

Start Engrave

Close

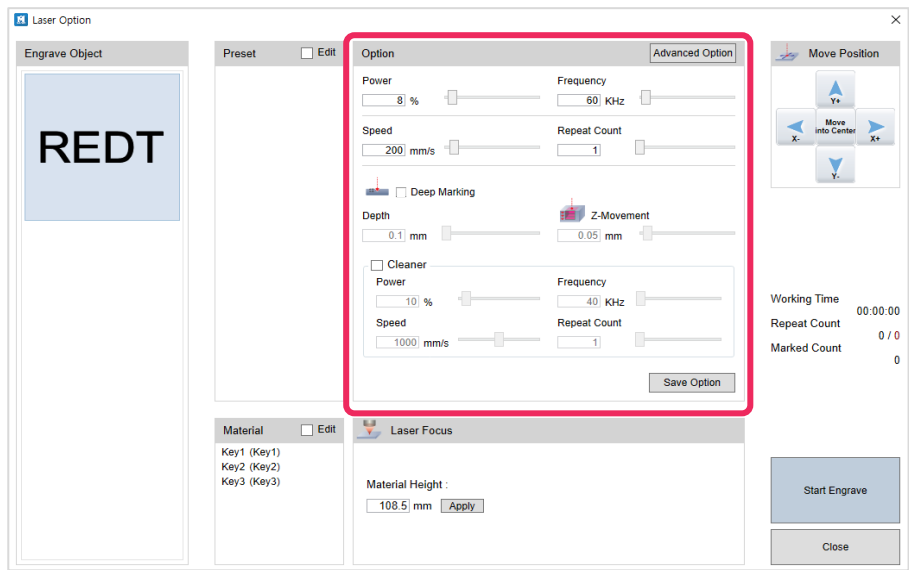
Do you want to remove the preset?

YES

Cancel

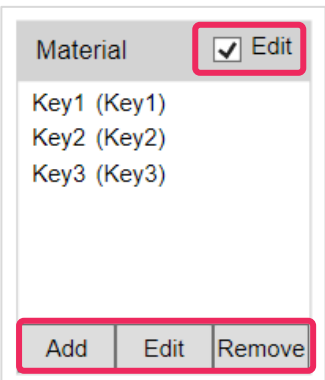
2. Options

Engraving types can be selected. Laser options change depending on an engraving type. Adjust the value and click [Save Option].



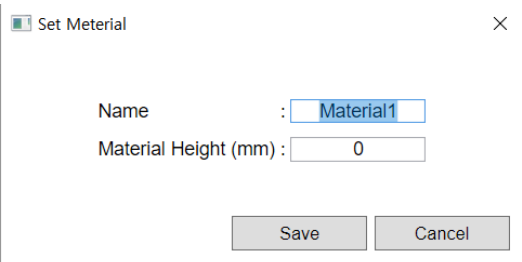
3. Material

The height of laser focus can be set by material.
Press [Edit] and click the button at the bottom to change options.



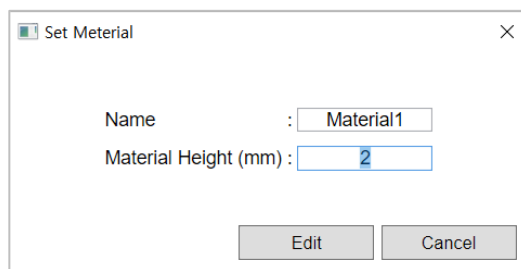
<Add>

This menu is used to add new material setting.
Set the name and material height and click [Save].



<Edit>

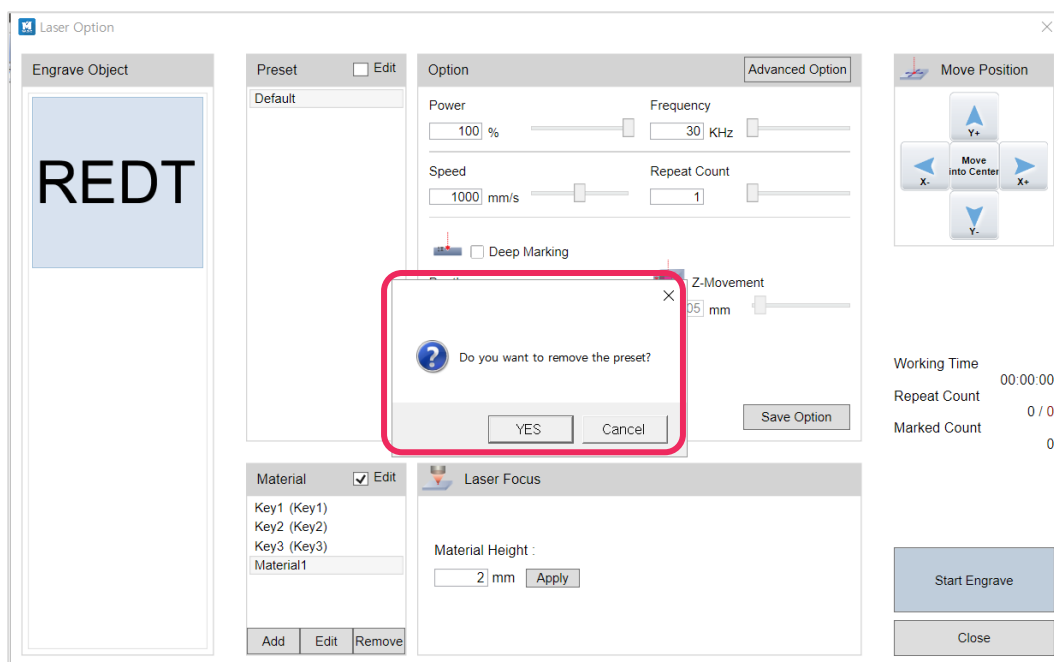
This menu is to edit material setting.
Change the option and click [Save].



A dialog box titled "Set Material" with a close button (X) in the top right corner. It contains two input fields: "Name" with the value "Material1" and "Material Height (mm)" with the value "2". At the bottom, there are two buttons: "Edit" and "Cancel".

<Delete>

Deletes the material option

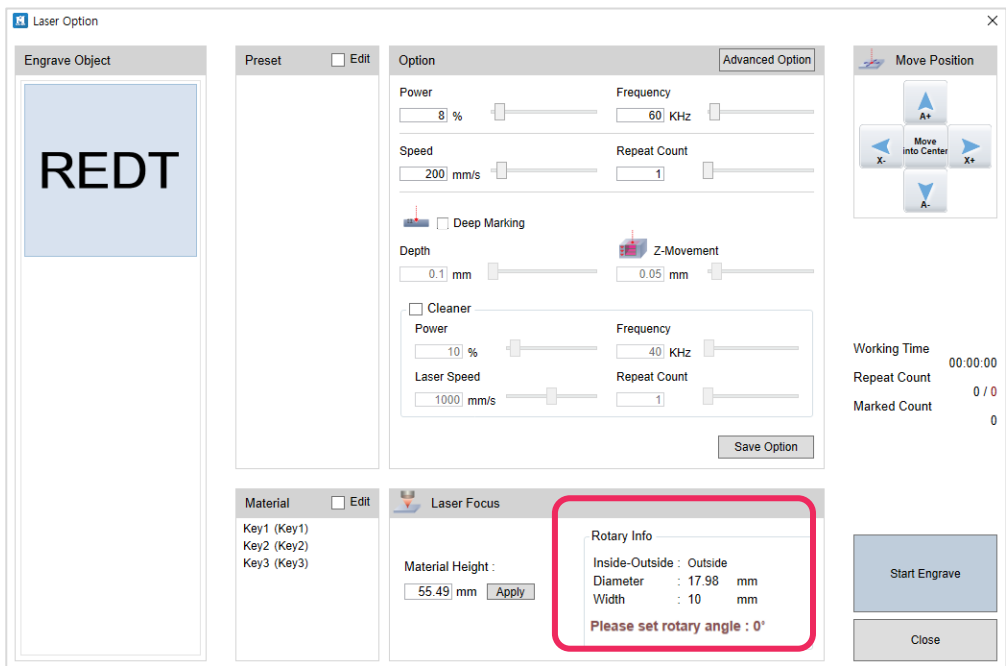


The main window of the "Laser Option" software. It features several panels: "Engrave Object" showing a blue square with the text "REDT"; "Preset" with a list containing "Default"; "Option" with sliders for Power (100%), Frequency (30 KHz), Speed (1000 mm/s), and Repeat Count (1), plus a checkbox for "Deep Marking"; "Material" with a list containing "Key1 (Key1)", "Key2 (Key2)", "Key3 (Key3)", and "Material1", and buttons "Add", "Edit", and "Remove"; "Laser Focus" with a "Material Height" input set to "2 mm" and an "Apply" button; "Move Position" with directional buttons (Y+, Y-, X+, X-, Move into Center); and a status area showing "Working Time 00:00:00", "Repeat Count 0 / 0", and "Marked Count 0". A "Start Engrave" button is at the bottom right. A red-bordered confirmation dialog is overlaid in the center, asking "Do you want to remove the preset?" with "YES" and "Cancel" buttons.

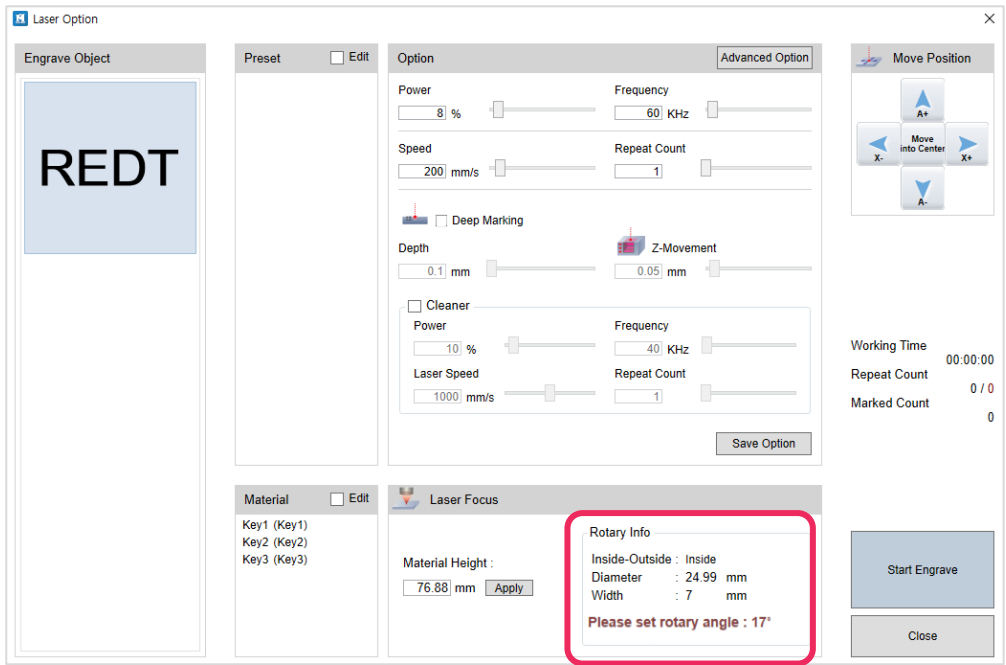
4. Rotary Engraving Option

In case of rotary engraving, the diameter and width information which were entered at design by MagicArt is reflected and stated as it is.

Then, laser focus is automatically set, using the value.



In case of inner diameter, angle is calculated and informed.

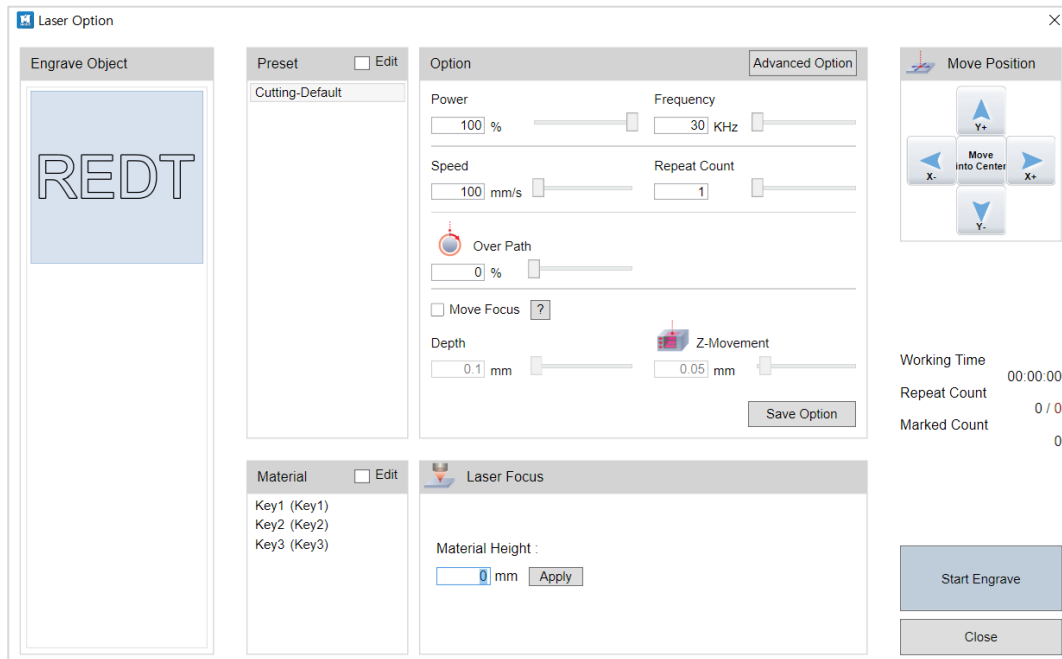


5. Laser Option by Toolpath

There are differences in laser options by Toolpath.

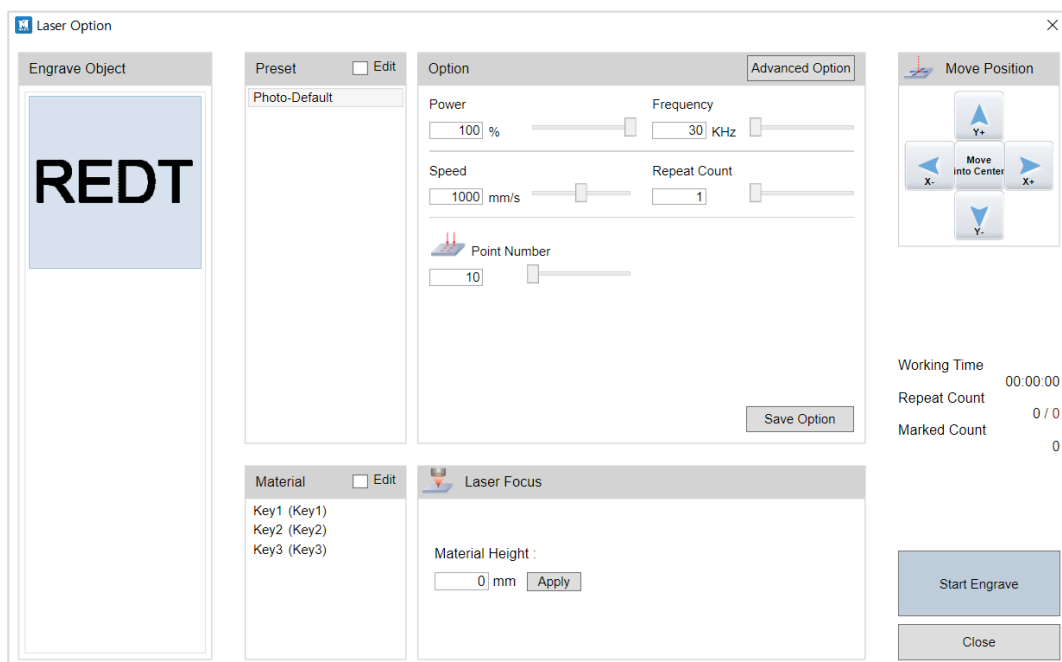
<Cutting Toolpath>

- Overpath: Improves cutting completeness by cutting from the starting point to the preset value with laser.
- Move Focus: Same with the focus depth setting. When cutting the engraving depth little by little, designate the depth.



<Image Engraving Toolpath>

- Point Number: Since an image is engraved with tiny points, the degree of image-engraving completeness can be adjusted by setting the number of points engraved at a time.

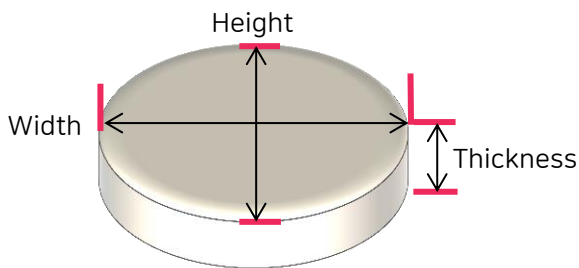




Marking Process

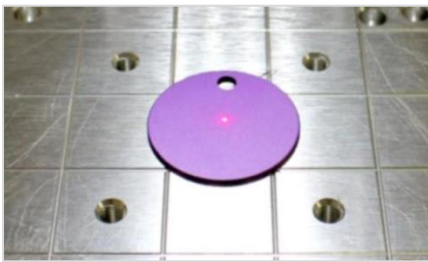


- Machine: Fiber Laser Machine L100
- Material: Aluminum pendant
- Toolpath: Scanned Line


1. Measure the size and height of a material.

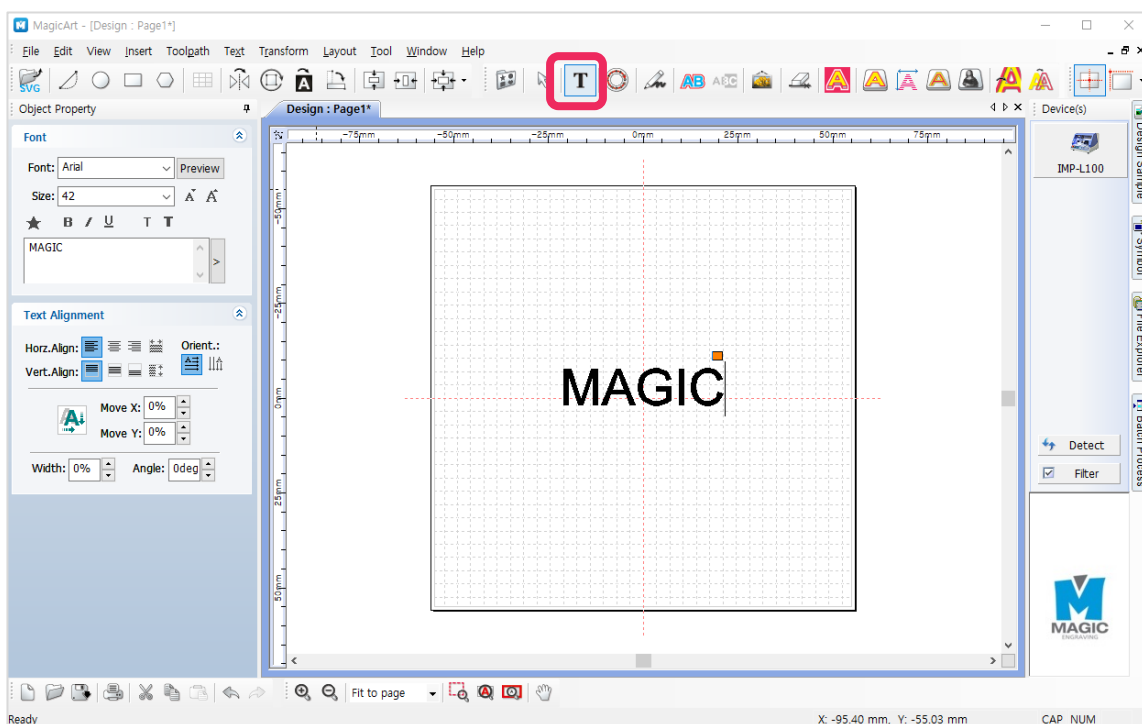




2. Place the material on the working area and set the laser focus, using   buttons.

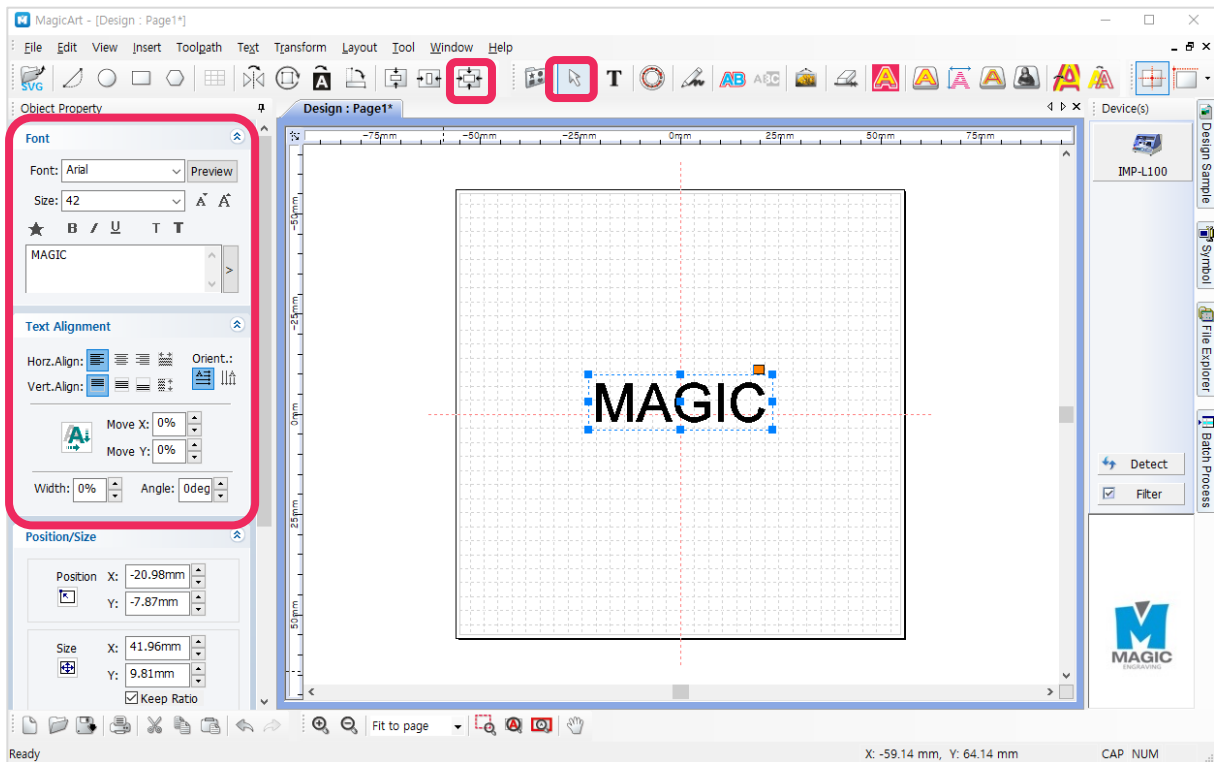



(Ex: Fiber laser machine L100/ aluminum pendant)


3. Once a template appears, click [ (Enter/edit characters)]. Move the mouse pointer to a wanted position and click it. Then, enter the characters.

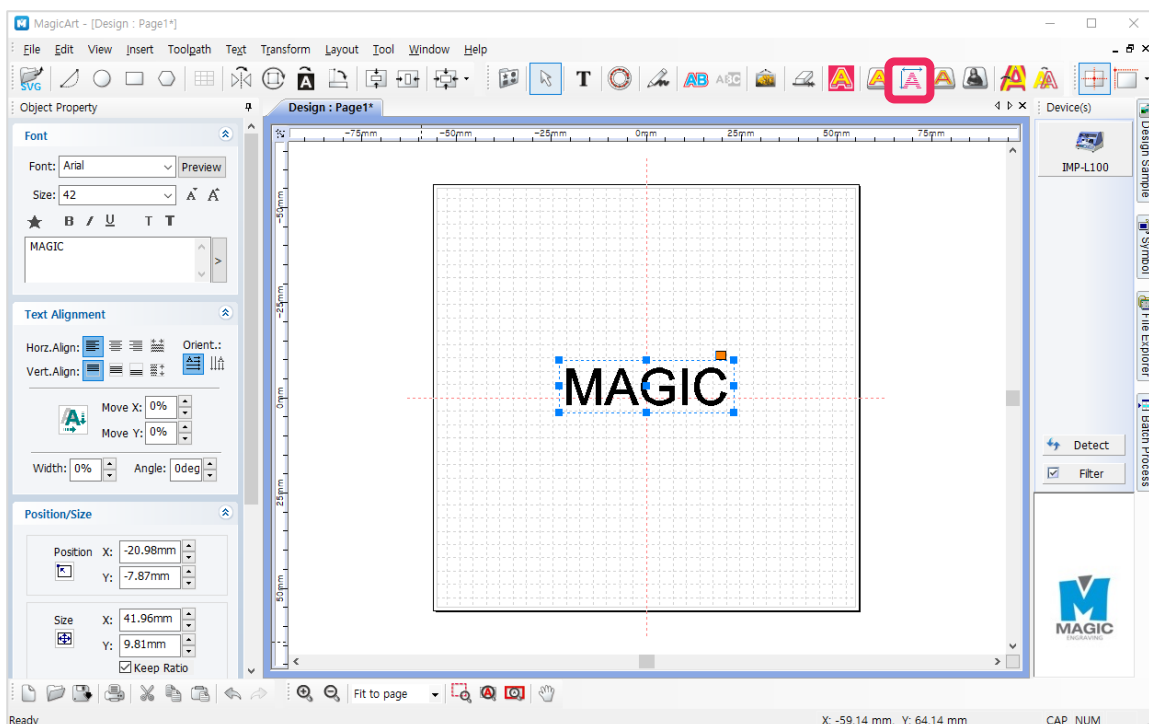


4. Once characters are entered, click [ (Select)] on the toolbar and open the Select Object mode. Then, select the entered character and edit **its size, font and boldness**. To put the object in the middle of the work area, click [ (alignment in the middle of a work area)].

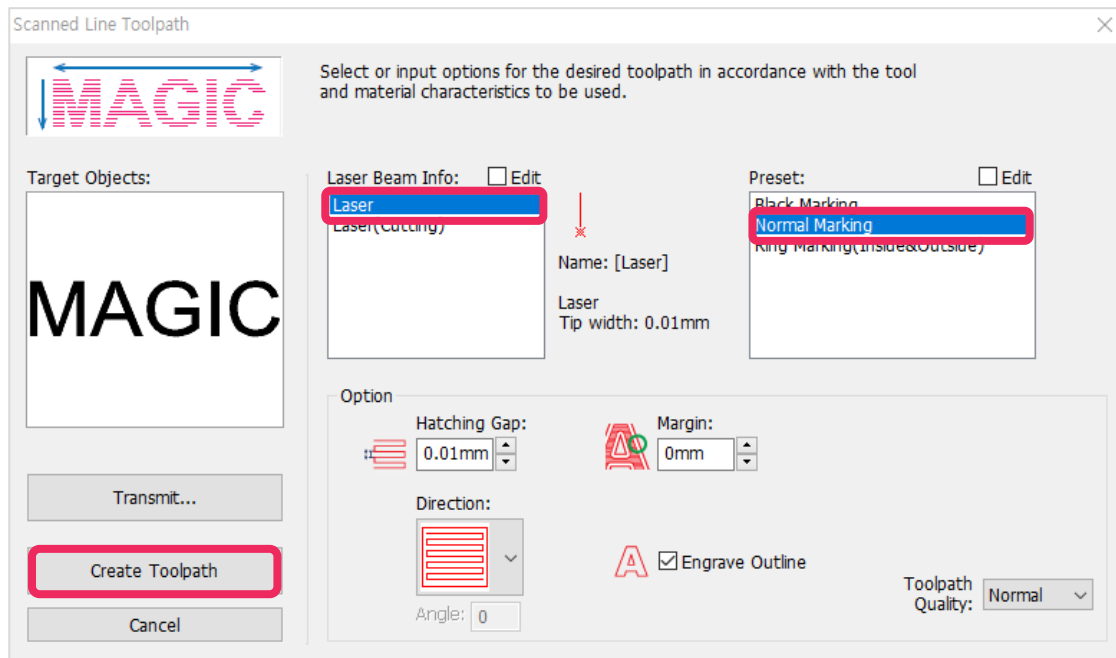


5. Once the design is completed, click [ (Scanned line Toolpath)]. A Toolpath refers to a path way of tools.

* Click [ (IMP-L100)] on the right top without creating a Toolpath for immediate Marking.



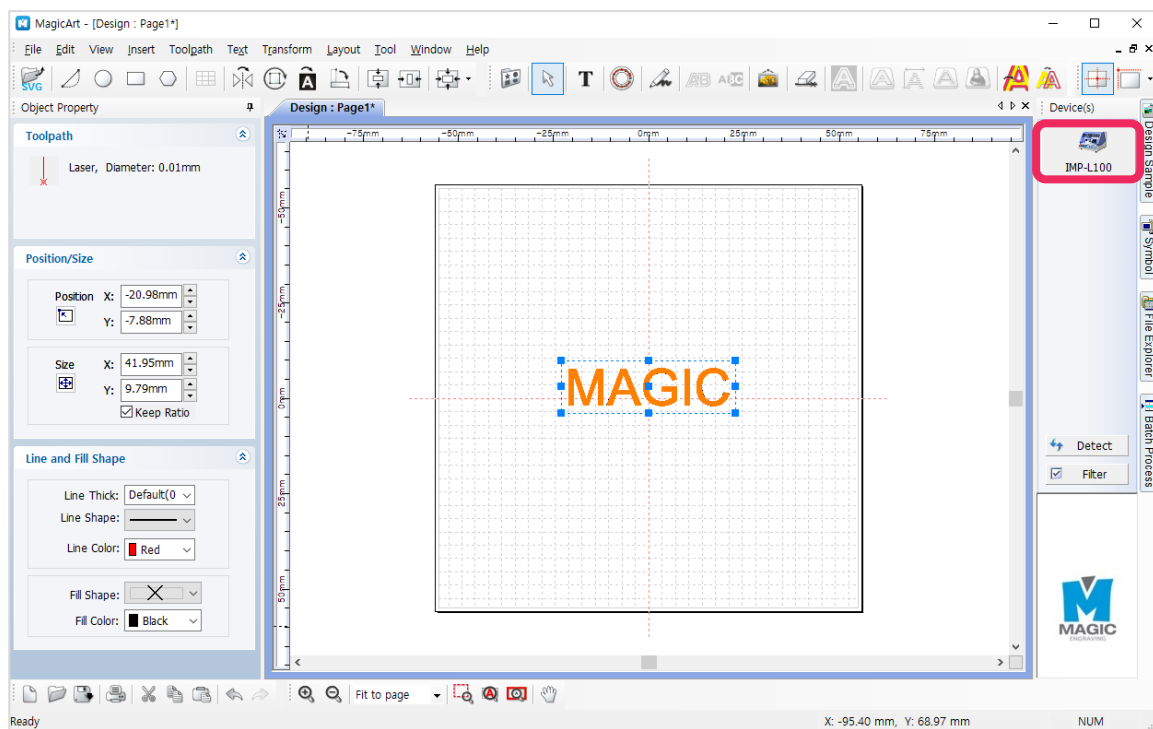
6. Select an option on the Toolpath page. If necessary, set the hatching interval and click [Create Toolpath].



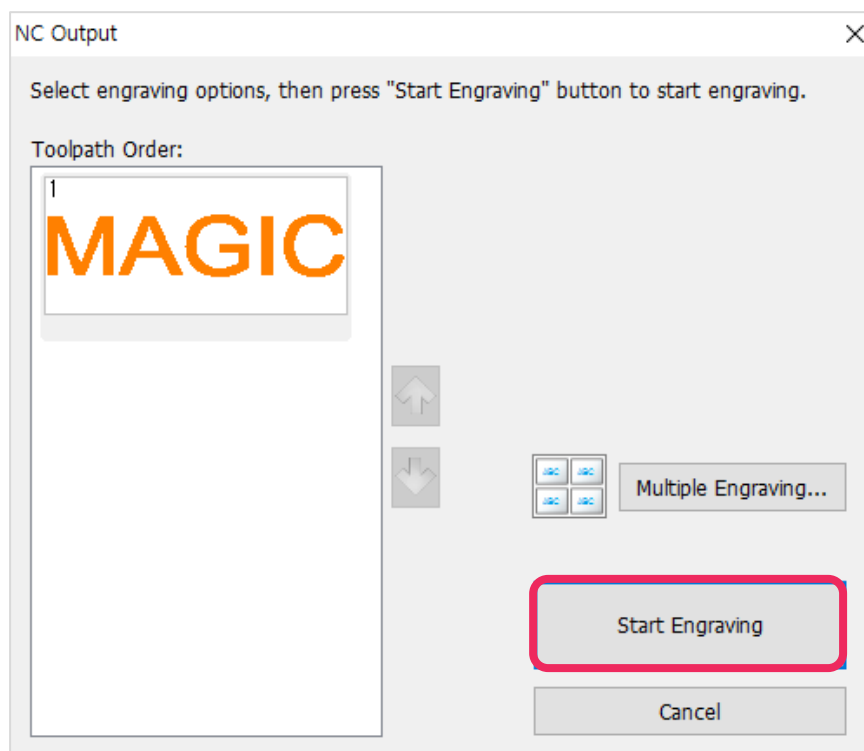
7. A Toolpath object is being created.



Click [IMP-L100] on the right top.

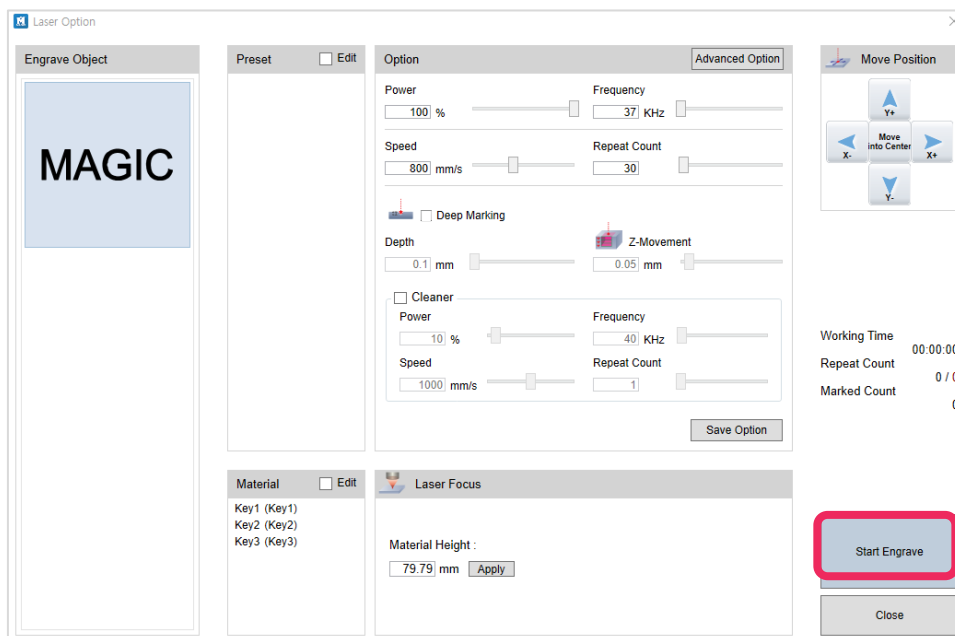


8. If the NC Output window appears, click [Start Engraving].



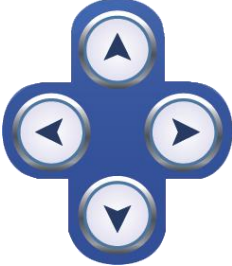
9. A laser option window pops up. Select the Laser Option and click [Engrave]. Then, a Start page appears with a warning message. Click [Start].

(If the laser focus is set in advance when a material is placed, it is unnecessary to enter height at a laser option.)




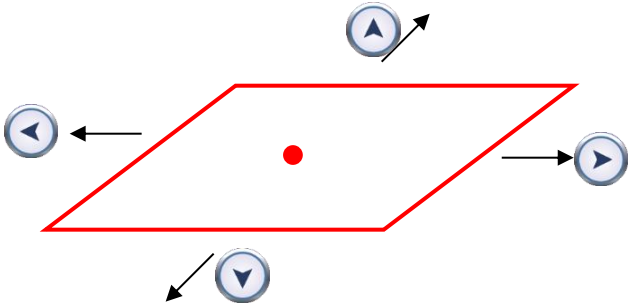
10. Once a red laser pointer on the material is turned on, check and adjust the position of the pointer, using the direction keys.


The area pointed by the red rectangular laser pointer refers to an actual marking zone. The round laser pointer in the middle represents the origin of the height of laser focus.



Whenever the direction key is pressed, the laser pointer moves up/down/left/right, showing an marking area. Check if the marking zone is matched with the area on the material to be actually engraved. If unmatched, adjust the position, using the direction keys.

Once the direction key is pressed, the laser pointer moves up/down/left/right in the marking zone. In other words, if a laser pointer is situated on the left side, press [] to move the marking zone to the left.



11. Once the marking position setting is done, click the program Start button or [] on the product long (2 seconds or longer). Then, the cover is automatically closed, and marking begins.



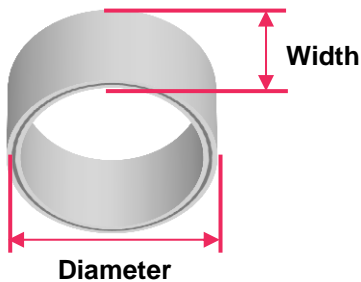
Marking Process of Ring inner/outer Diameter



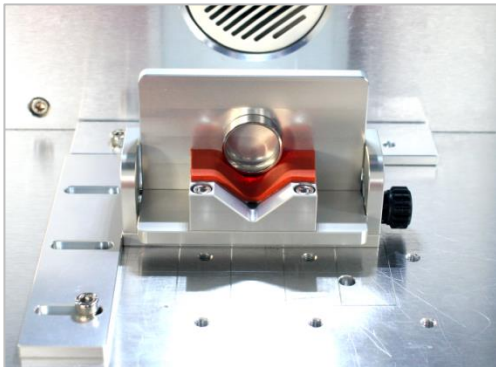
- Machine: Fiber Laser Machine L100
- Clamp: L type clamp or Rotary clamp (Optional)
- Material: Metal ring
- Toolpath: Scanned Line

◆ Preparation

1. Measure the width and diameter of a ring to be engraved.

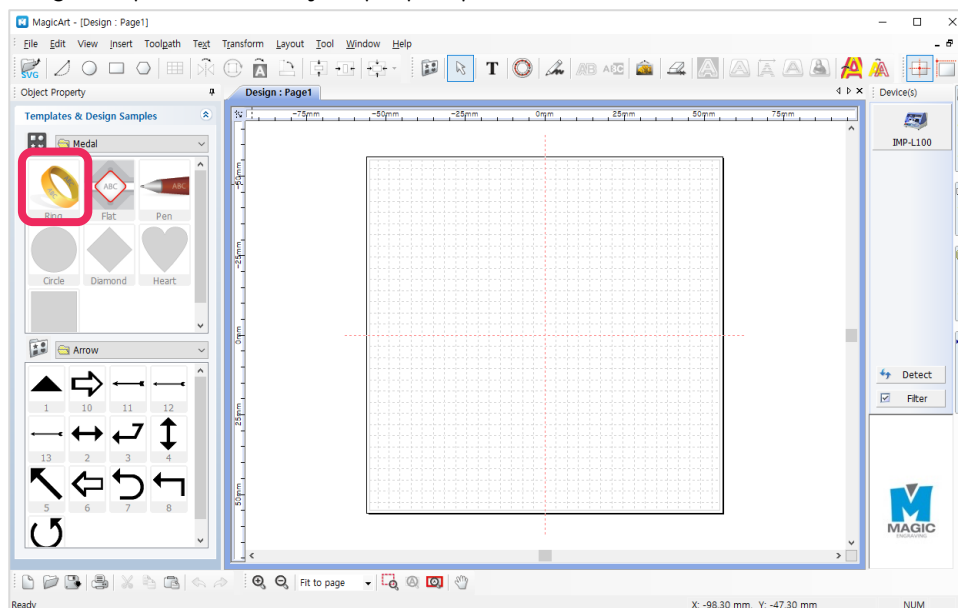


2. Insert the ring into the chuck finger as below, and tighten the L type clamp to set it.

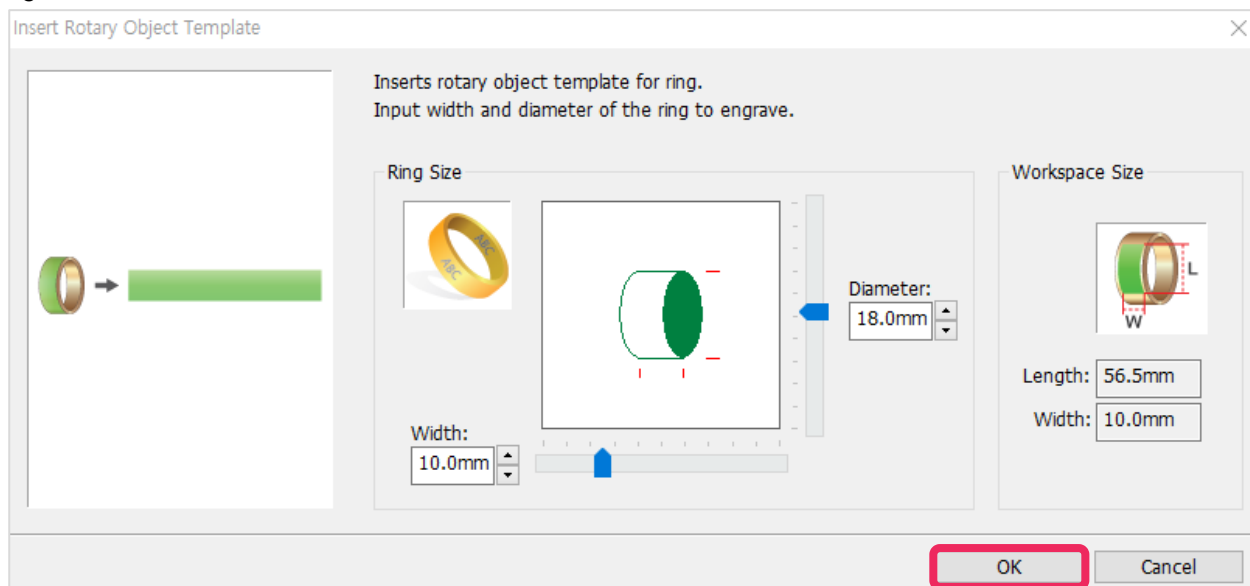


◆ Program Process

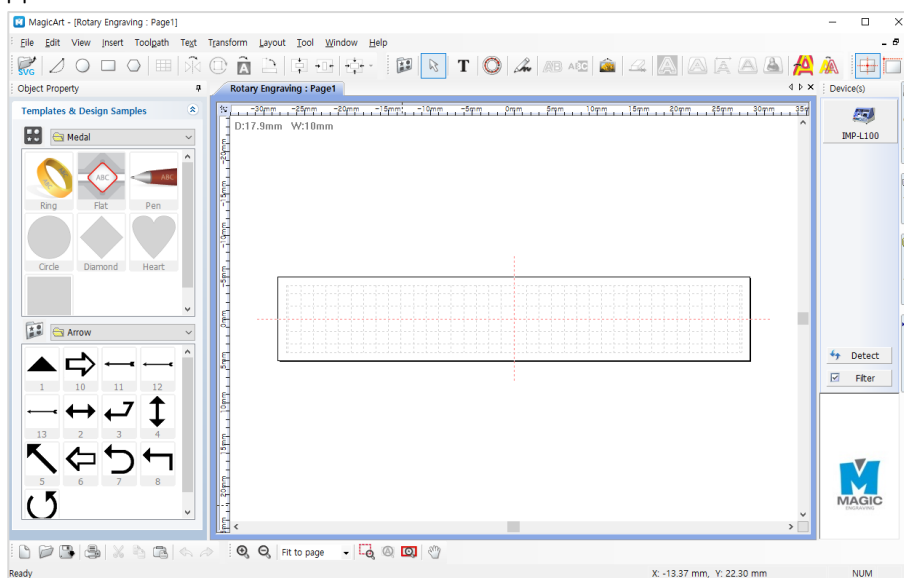
1. Double click "Ring" template in the object property window.



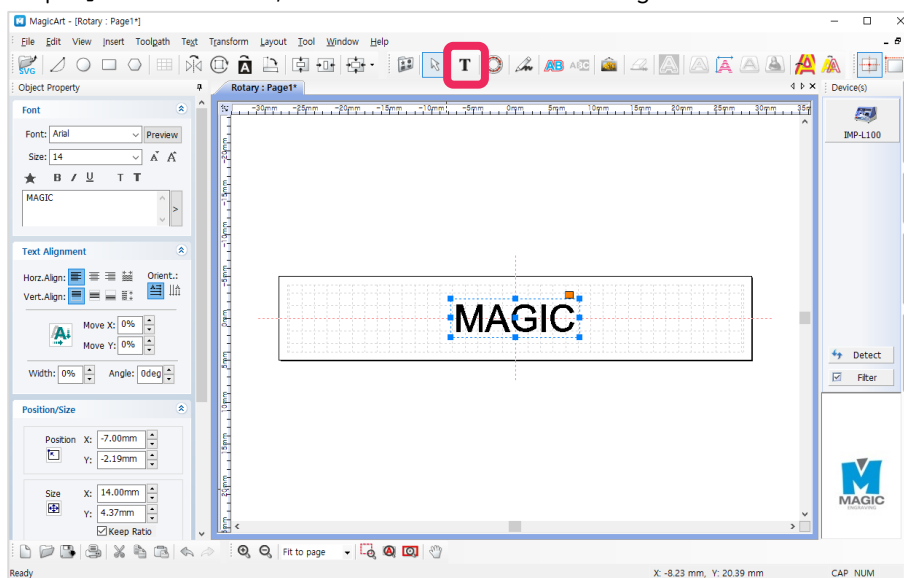
2. When "Insert Rotary Object Template" window appears, enter the measured width and diameter of the ring and click "OK."





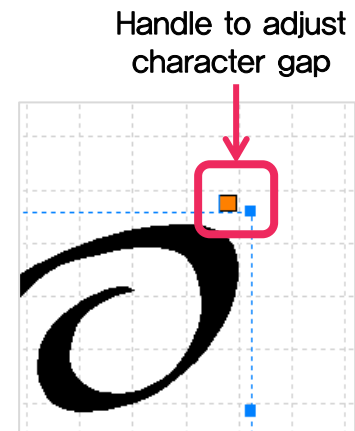
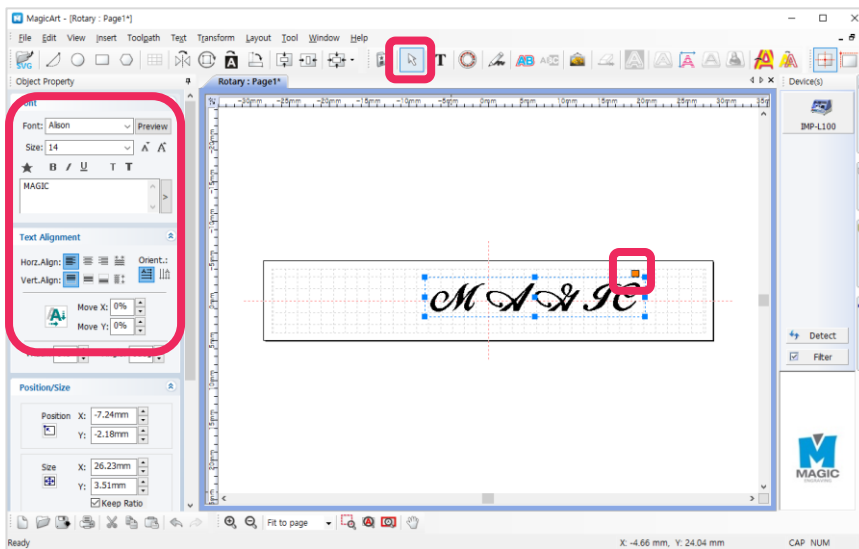
3. The template appears at the center of the screen.



4. Select **T** [Text Input] on the toolbar, and click the work area using mouse and enter text to be engraved.



5. After entering text, press  [Selection] on the toolbar to enter the object selection mode. Select the text, and edit the size and font of the object. To place the object at the center of the work area, click  [Center in Page] button.

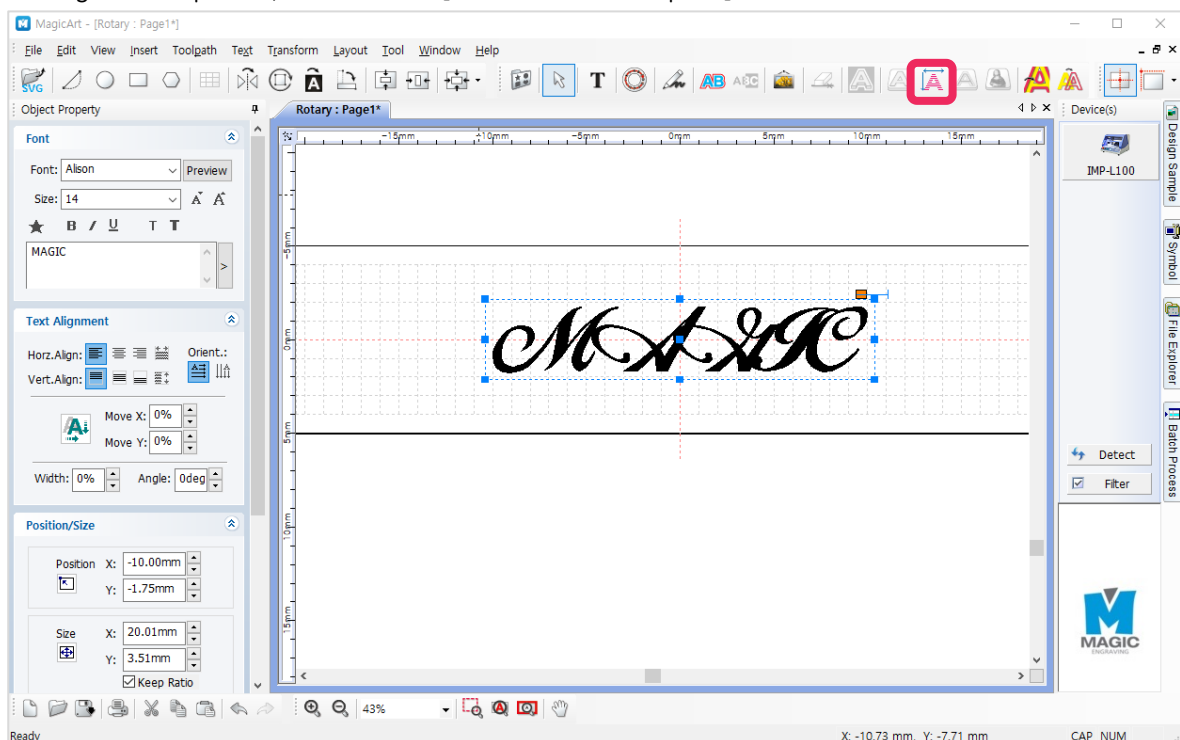


Note

Handle adjusting gaps between characters?

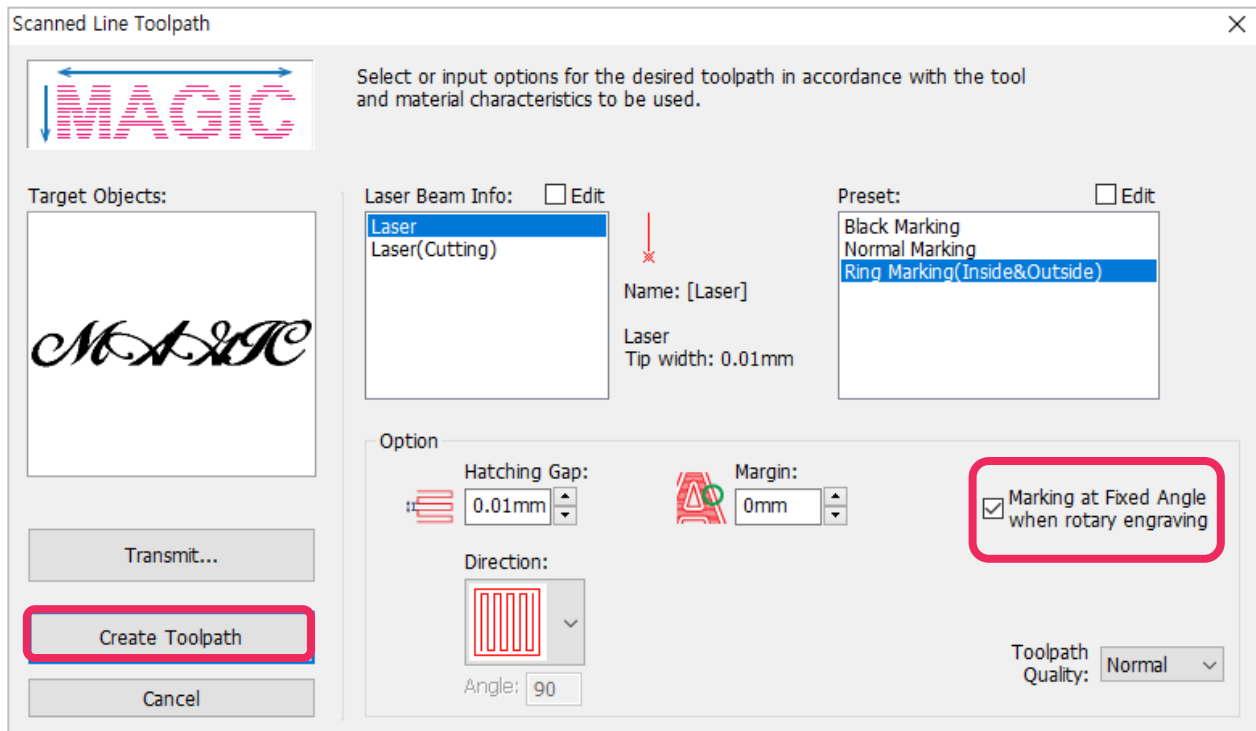
A function adjusting gaps between characters by dragging characters to target positions.

6. Once design is completed, click  [Scanned line Toolpath] button.

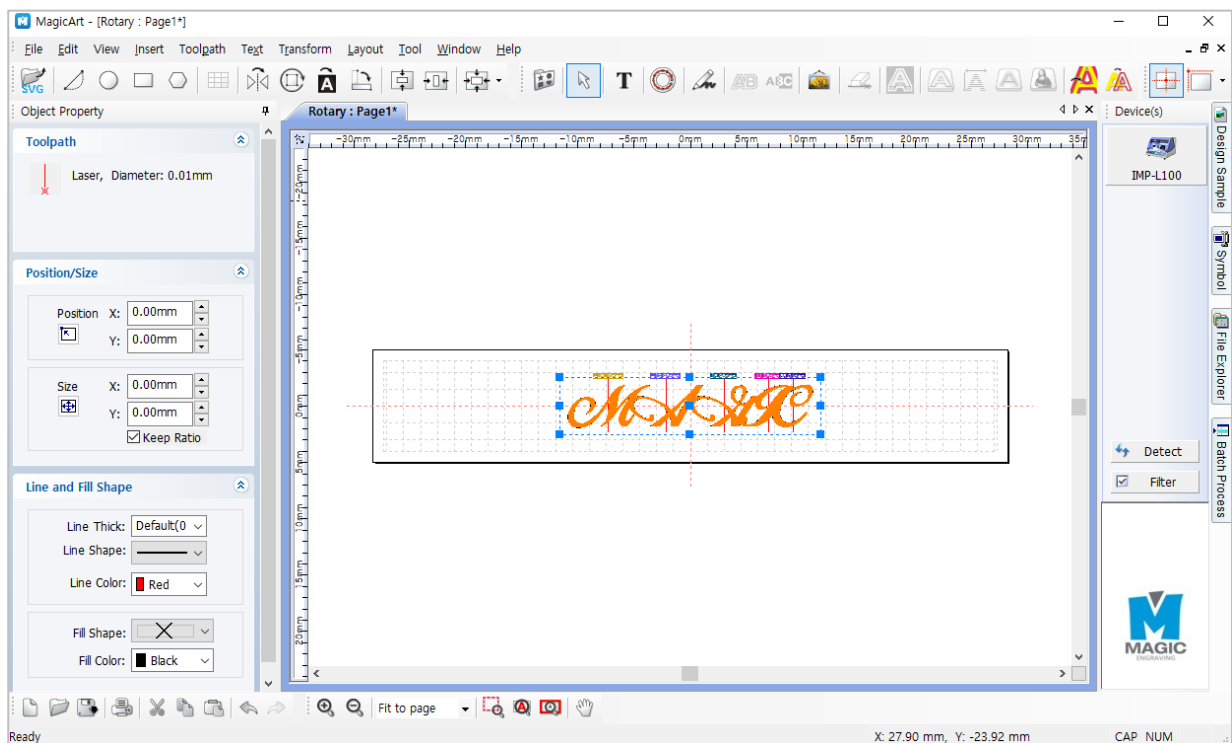


7. Once "Hatching Toolpath" window appears as shown in the picture below, select tool, toolpath gap and depth, and click "Create Toolpath" button.

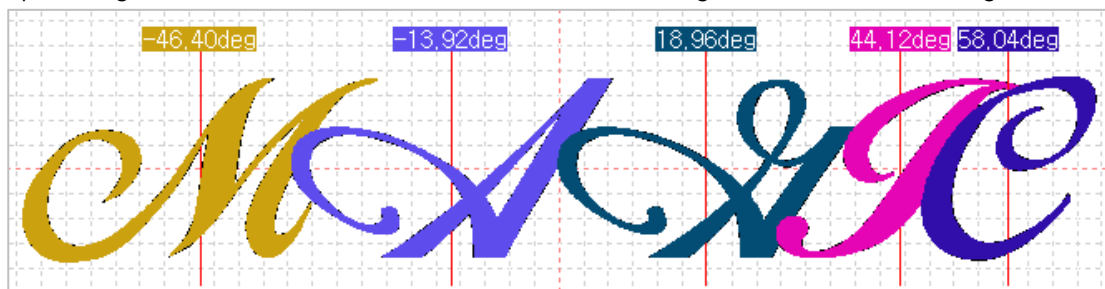
-Marking at Fixed Angle when rotary marking: Engrave the each text.




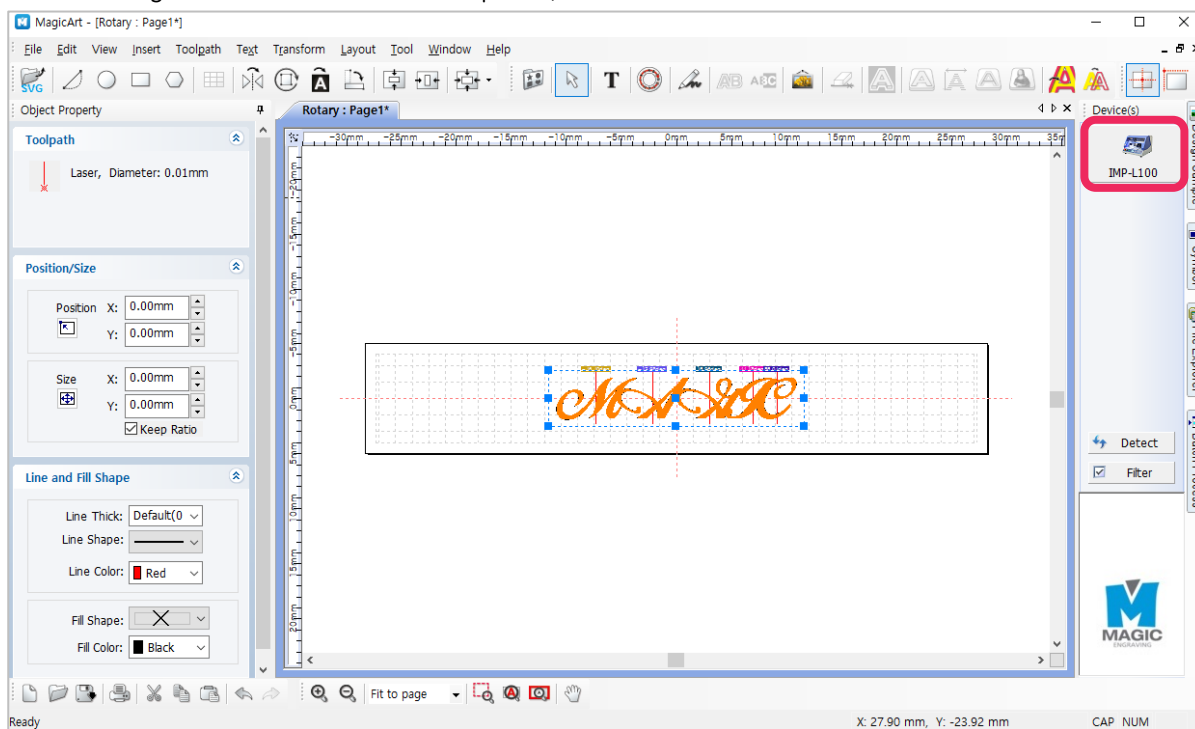
8. The "Toolpath" object is created as below and usually marked with red line on the screen. Scroll the mouse wheel to enlarge the toolpath object, and if it is not the desired toolpath, delete the toolpath and create it again by adjusting the toolpath option.



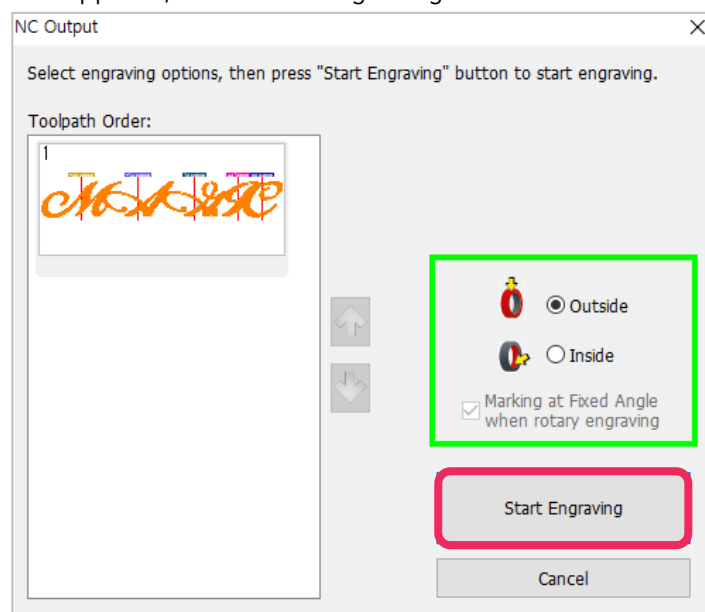
9. The toolpath angle is shown as below based on the entered ring size data and text length.



10. After selecting one or more created toolpaths, click  button.



11. Once "NC Output" window appears, click "Start Engraving" button.



<When marking the outer diameter>

- L type clamp

※L type clamp is purchased separately.

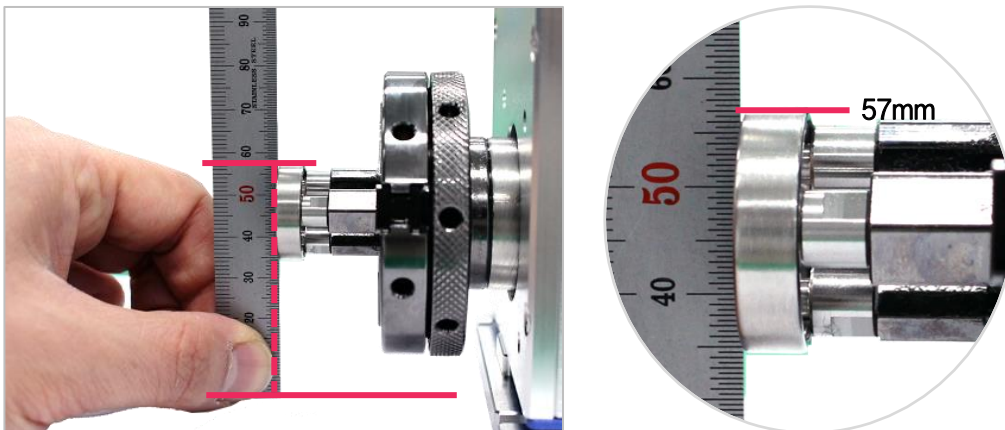


-Rotary Clmap

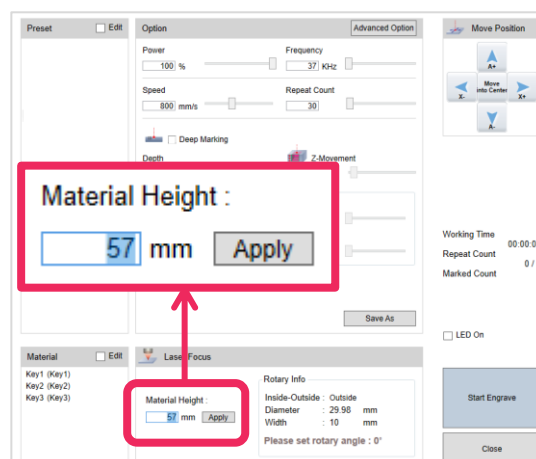
※Rotary clamp is purchased seaperatly.

When operating with rotary clamp, a marking error can be reduced by measuring the height of a material and entering it into a program.

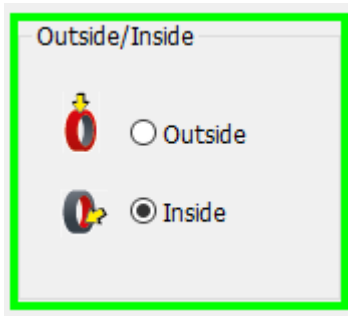
Tightly fix the material to the rotary clamp and measure a height from the laser engraver surface to the marking area, using an accessory ruler.



Enter the height into the [Material Height] in the option and click [Apply].



<When marking the inner diameter>



If inner diameter is selected, it is able to check angles automatically stated, using the diameter and width values.

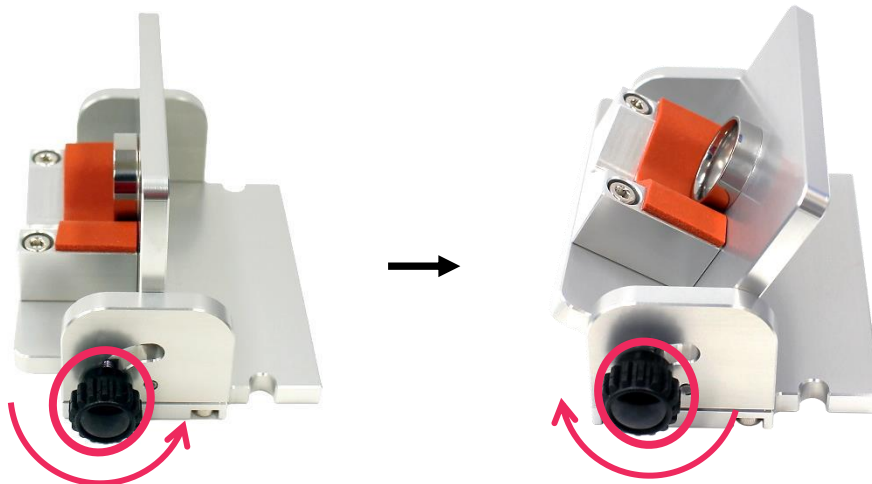
*In case of inner diameter marking outside the limit of 20°, marking may not be possible.

*If outside the indicated angle and the marking position, marking may not be possible.

-L type clamp

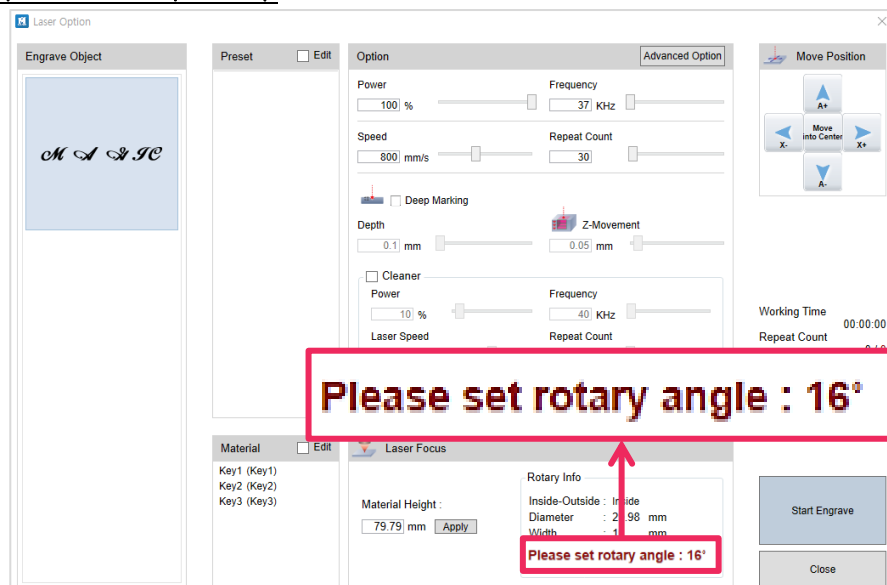
※L type clamp is purchased separately.

After loosen the fixing knob, Adjust the angle then fasten the fixing knob.

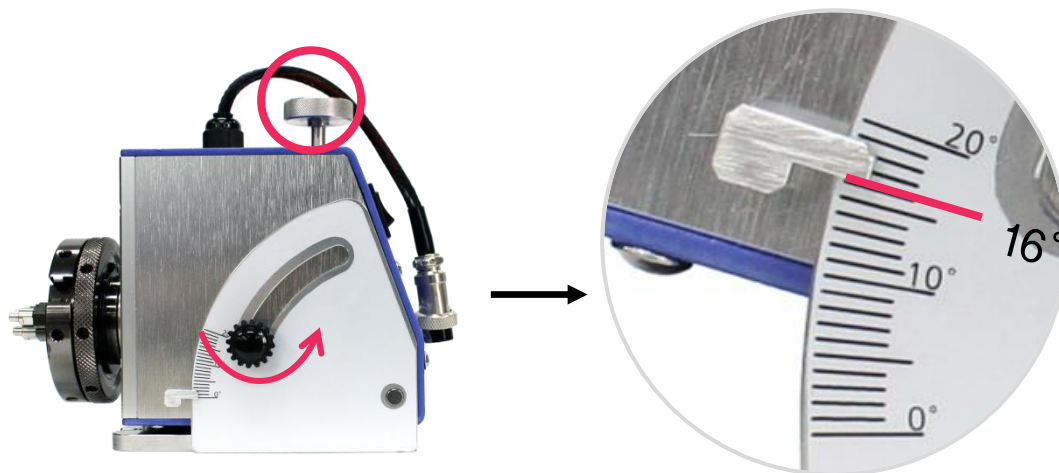


-Rotary Clamp

※Rotary clamp is purchased separately.



After loosen the angle fixing knob, Adjust the angle by turning the angle adjustment handle.



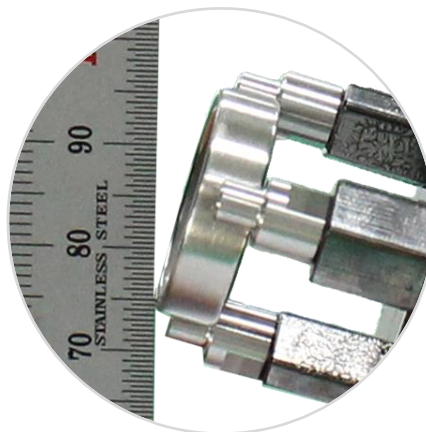
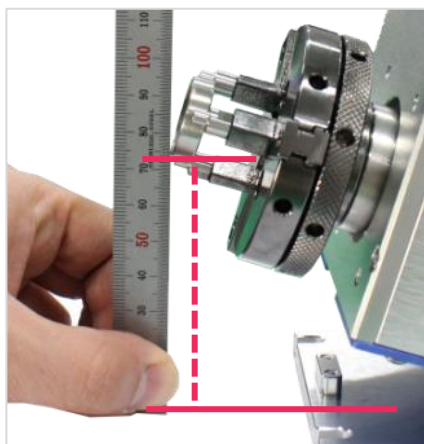
*Adjust the angle based on the bottom of the angle bar.

Then fix it by turning the angle fixing knob again.



When operating with rotary clamp, a marking error can be reduced by measuring the height of a material and entering it into a program.

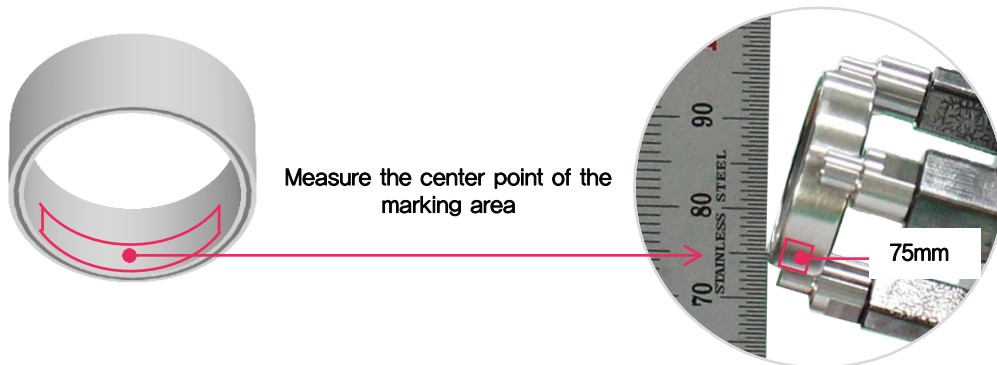
Tightly fix the material to the rotary clamp and measure a height from the laser engraver surface to the marking area, using an accessory ruler.



For ring inner diameter marking, measure the height after specifying a marking surface according to the marking position.

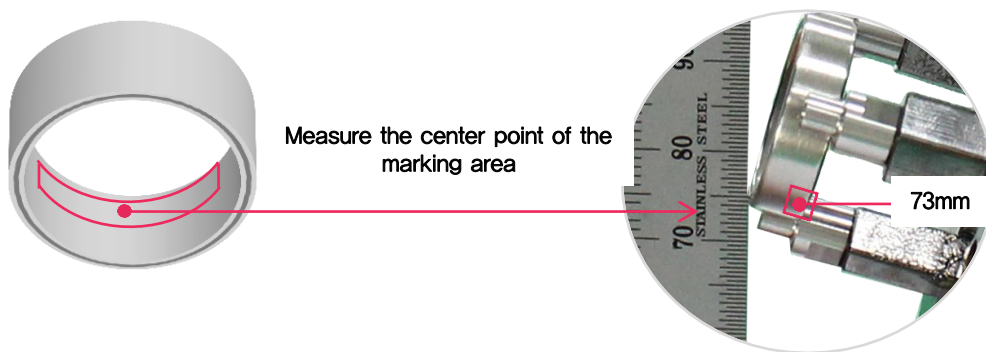
E.g.1) In case the outside of the inner diameter of a ring is marked, measure and enter the height of the outside of the secured ring.

Then, measure the height based on the center point of the marking area.

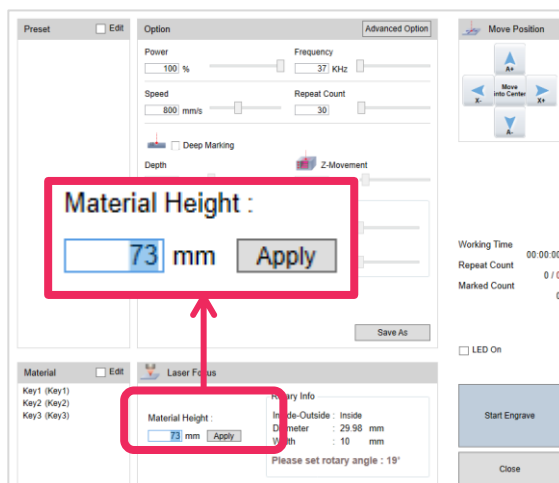


E.g.2) In case the inside of the bore of a ring is marked, measure and enter the height of the inside of the secured ring.

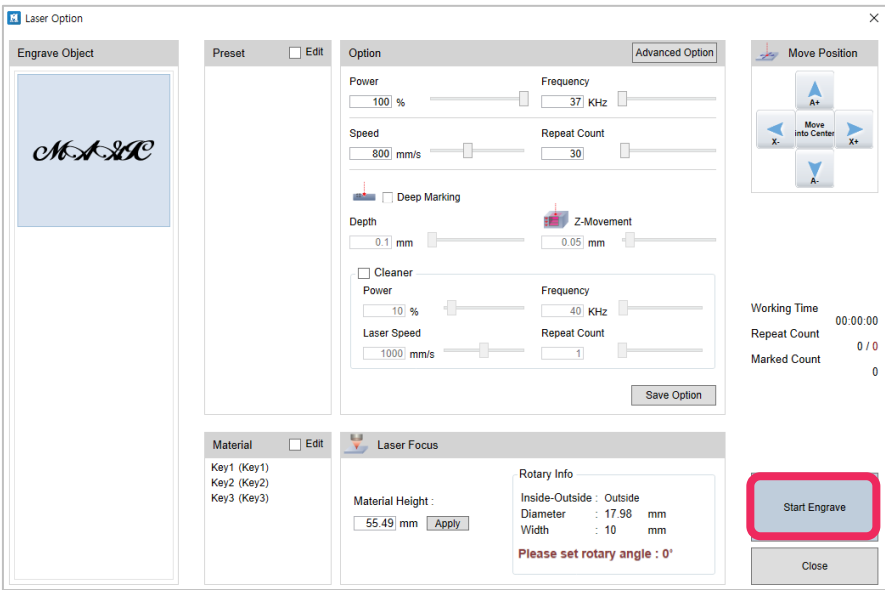
Then, measure the height based on the center point of the marking area.



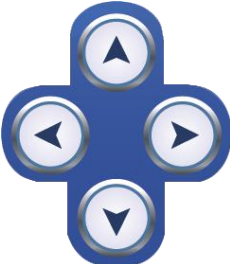
Enter the height into the [Material Height] in the Option tab and click [Apply].



12. A laser option window pops up. Select the Laser Option and click [Engrave]. Then, a Start page appears with a warning message. Click [Start].
(If the laser focus is set in advance when a material is placed, it is unnecessary to enter height at a laser option.)

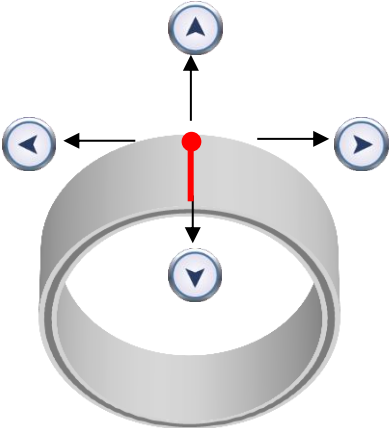


13. Once a red laser pointer on the material is turned on, check and adjust the position of the pointer, using the direction keys.
The area pointed by the red rectangular laser pointer refers to an actual marking zone. The round laser pointer in the middle represents the origin of the height of laser focus.



Whenever the direction key is pressed, the laser pointer moves up/down/left/right, showing an marking area. Check if the marking zone is matched with the area on the material to be actually engraved. If unmatched, adjust the position, using the direction keys.

Once the direction key is pressed, the laser pointer moves up/down/left/right in the marking zone. In other words, if a laser pointer is situated on the left side, press [←] to move the marking zone to the left.




14. Once the marking position setting is done, click the program Start button or  on the product on (2 seconds or longer). Then, the cover is automatically closed, and marking begins.



Photo Marking





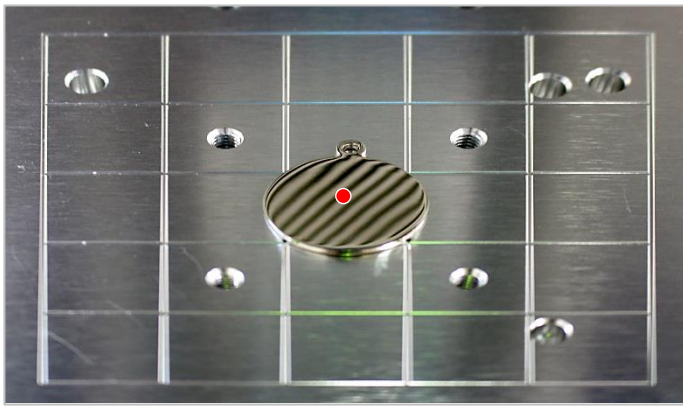
What is photo marking?


This is an marking method to display the shade of image with dots.

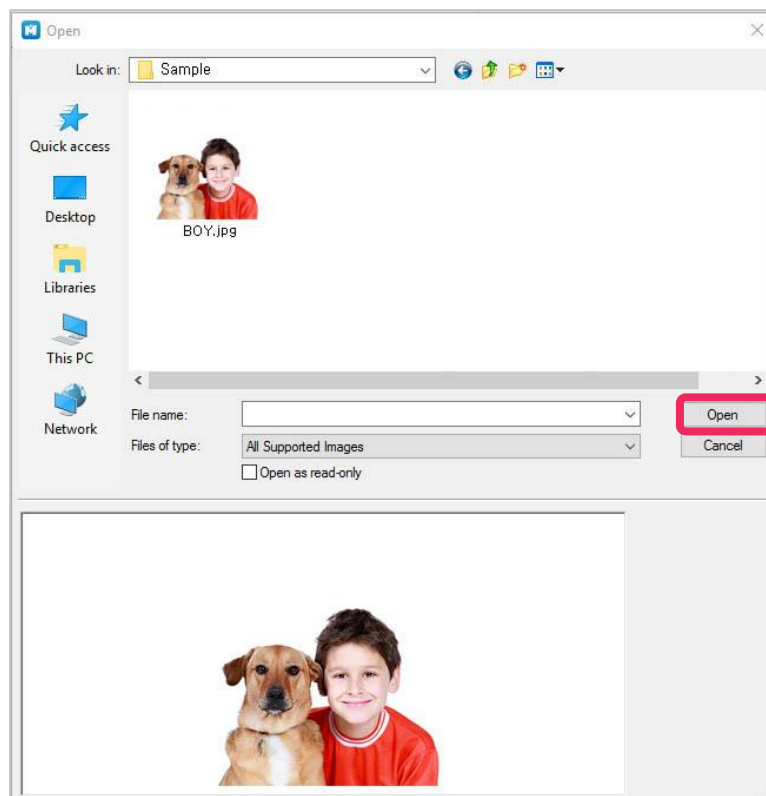


- Machine: Fiber Laser Machine L100
- Material: Metal pendant
- Toolpath: Photo Impact Engraving

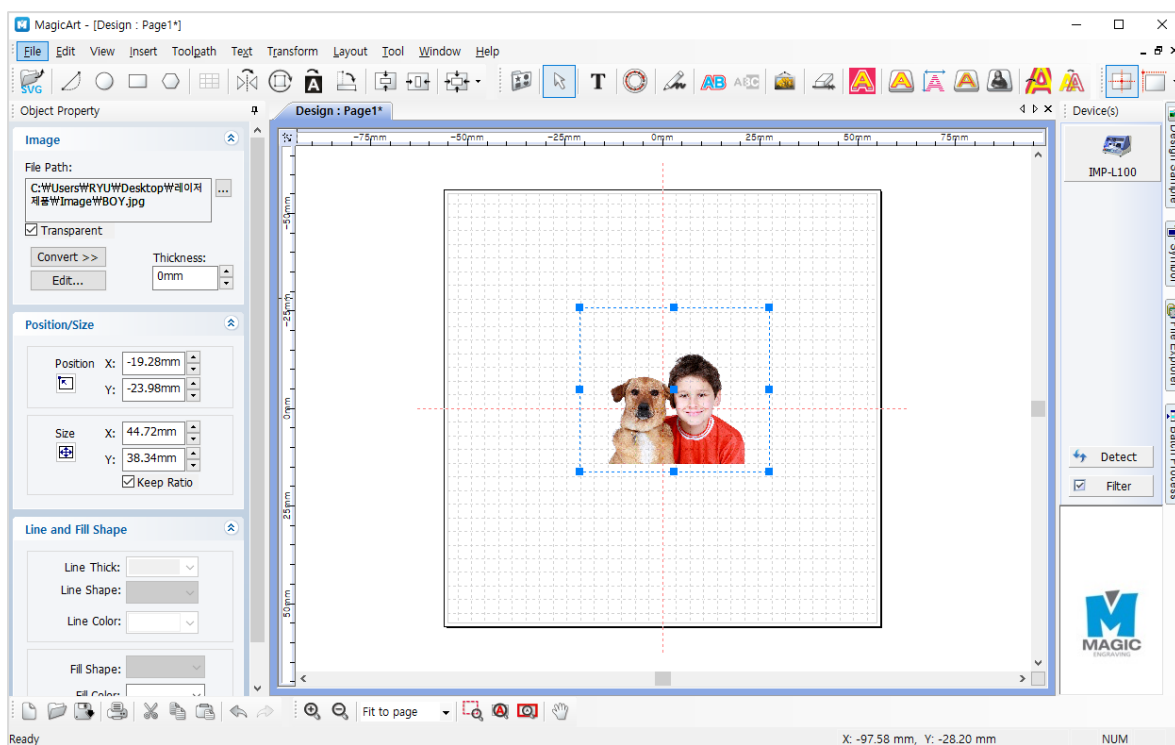
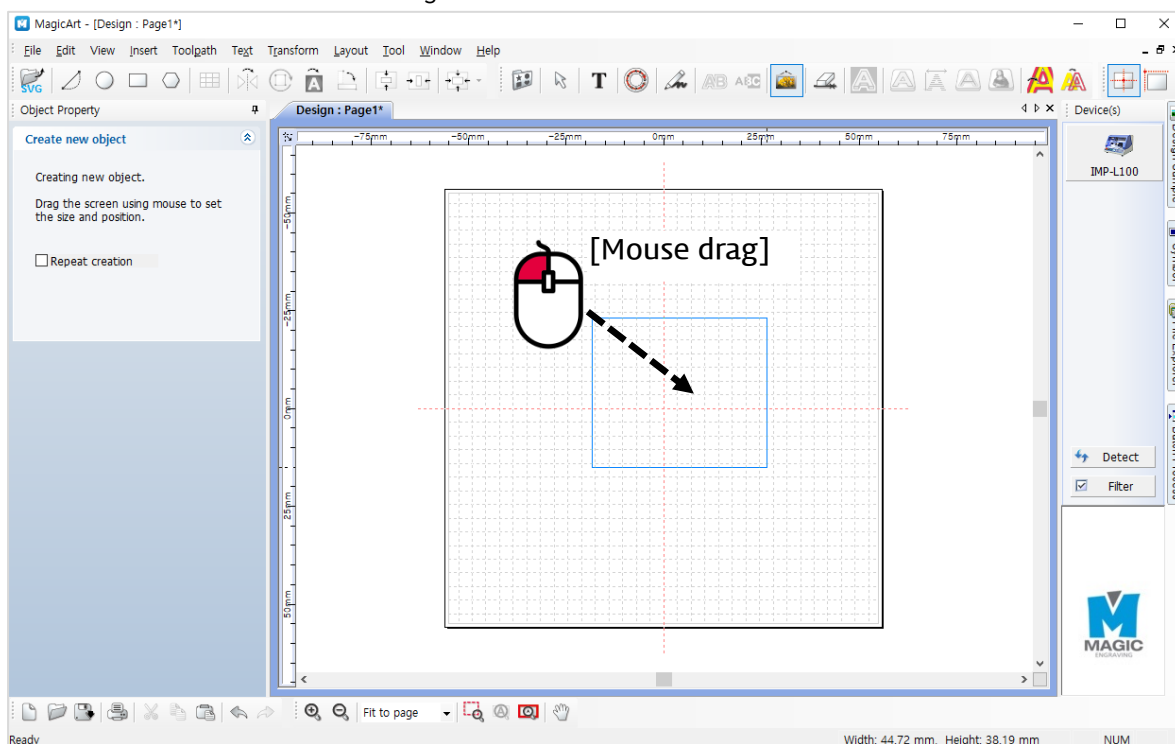
1. Place the material on the working area and set the laser focus, using   buttons.



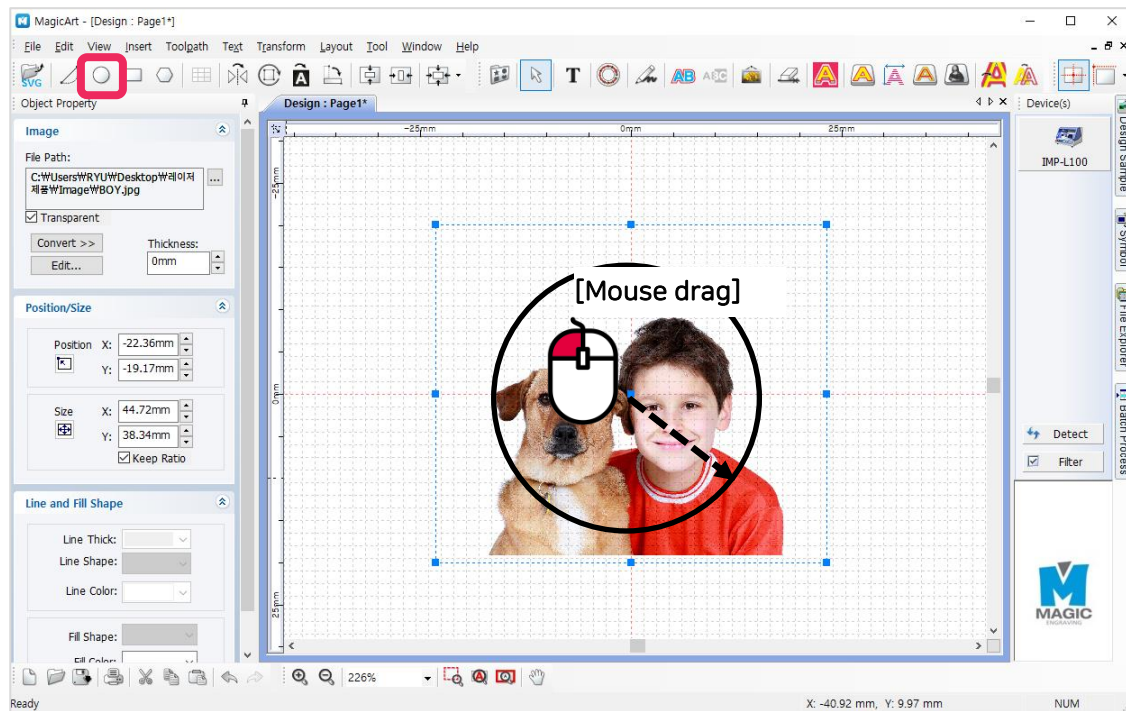
2. Click  [Image] to import an image for marking.



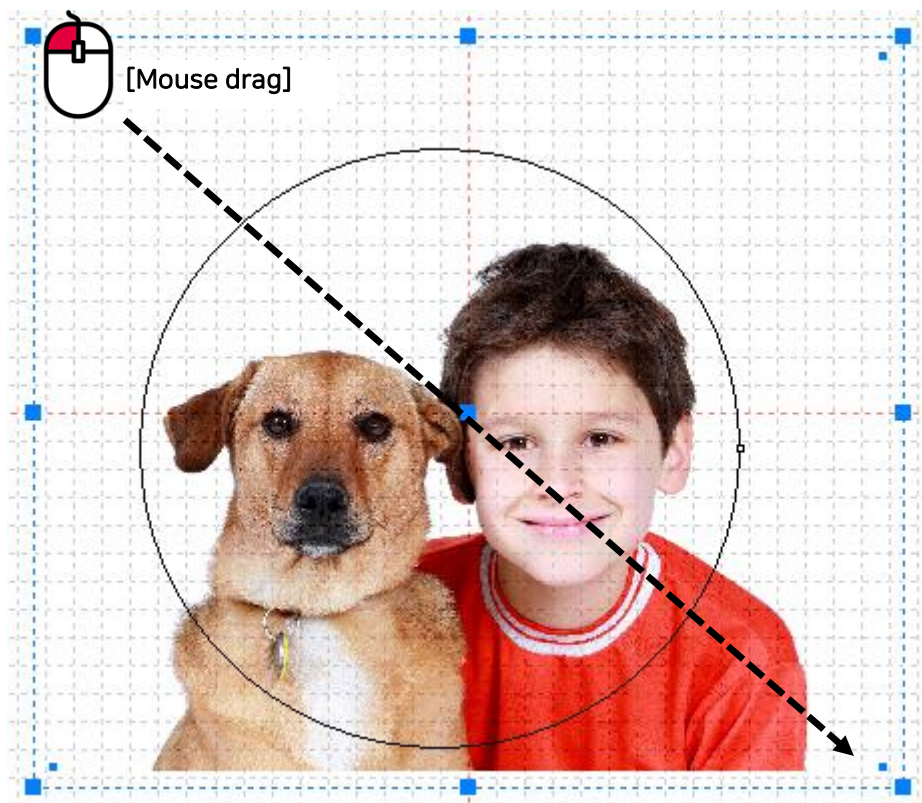
3. Adjust the size and location of the image.



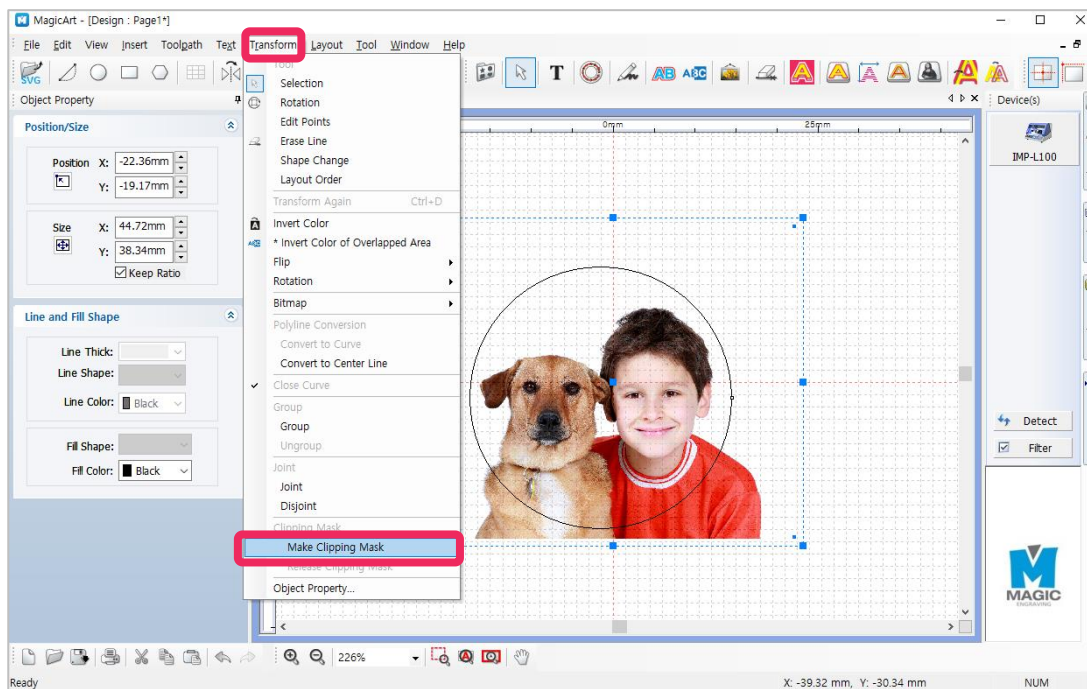
4. [Clipping Mask] function enables cutting out target area extracted from the image.
Create a shape to designate the target area and drag it on to the image.



5. Drag a mouse to select the target area and the whole image.



6. Select [Transform] menu → [Make Clipping Mask].

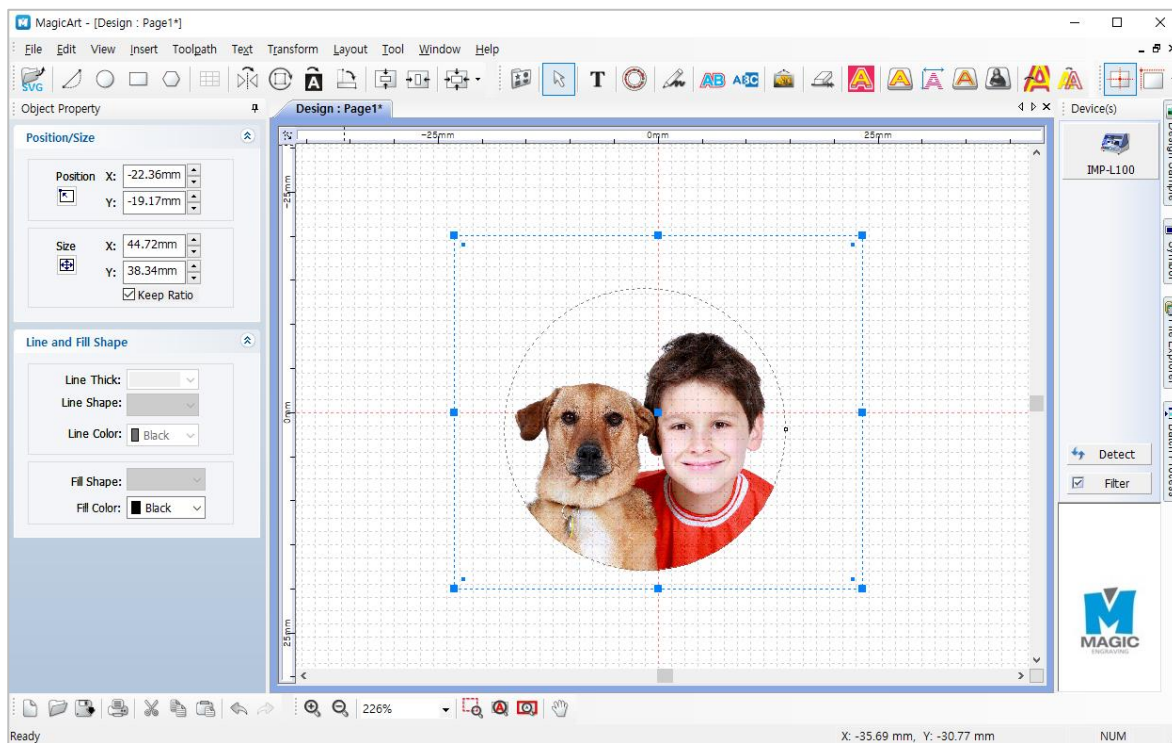



7. The target image remains except the outer image.

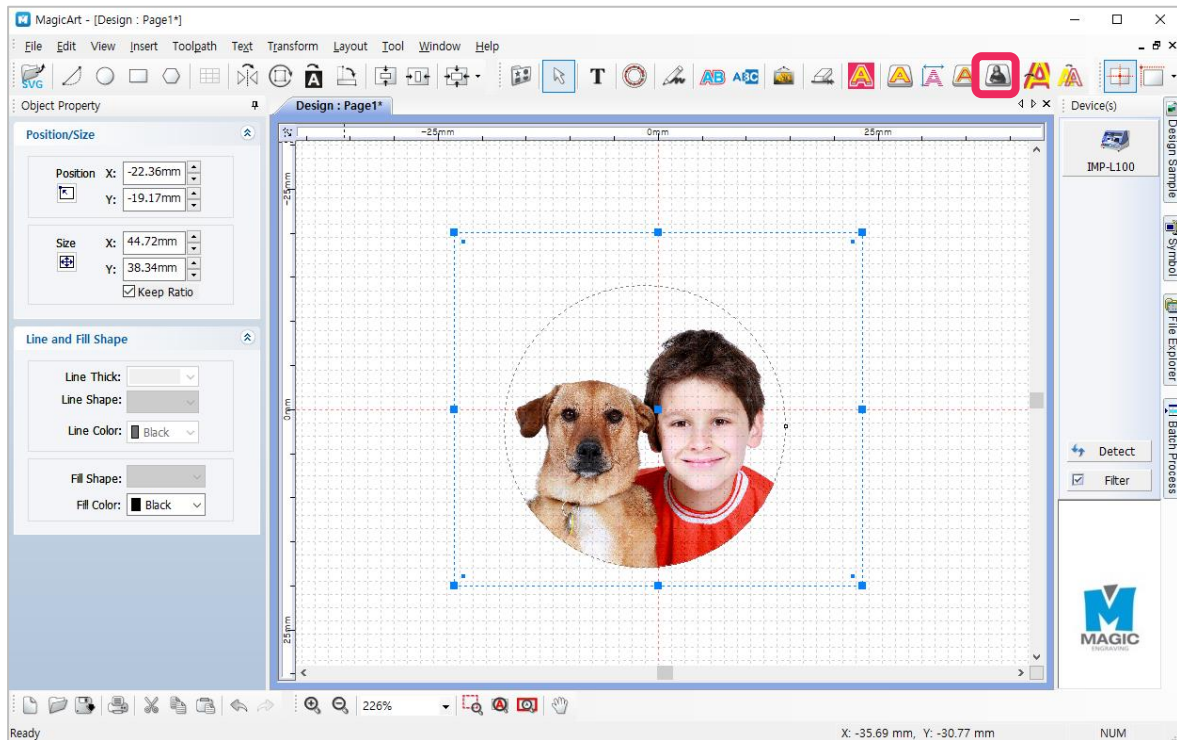


Notice

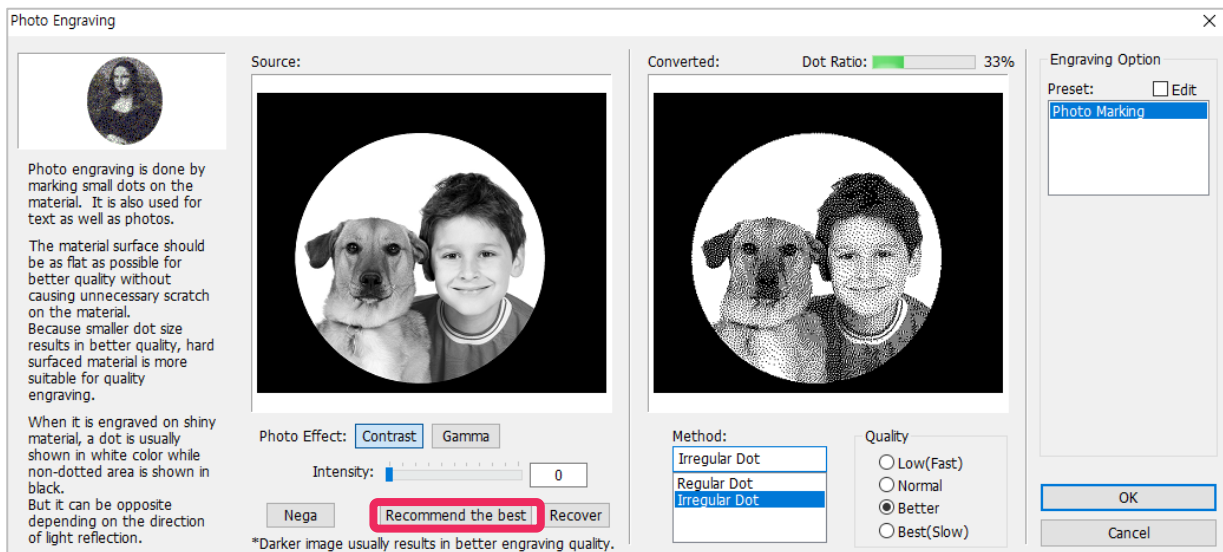
The whole actual image is already saved in the file, not erased.



8. Click  [Photo Impact Engraving Toolpath] button.



9. Adjust marking option in photo marking option window.



*** The black area cut by clipping mask is not being engraved.**



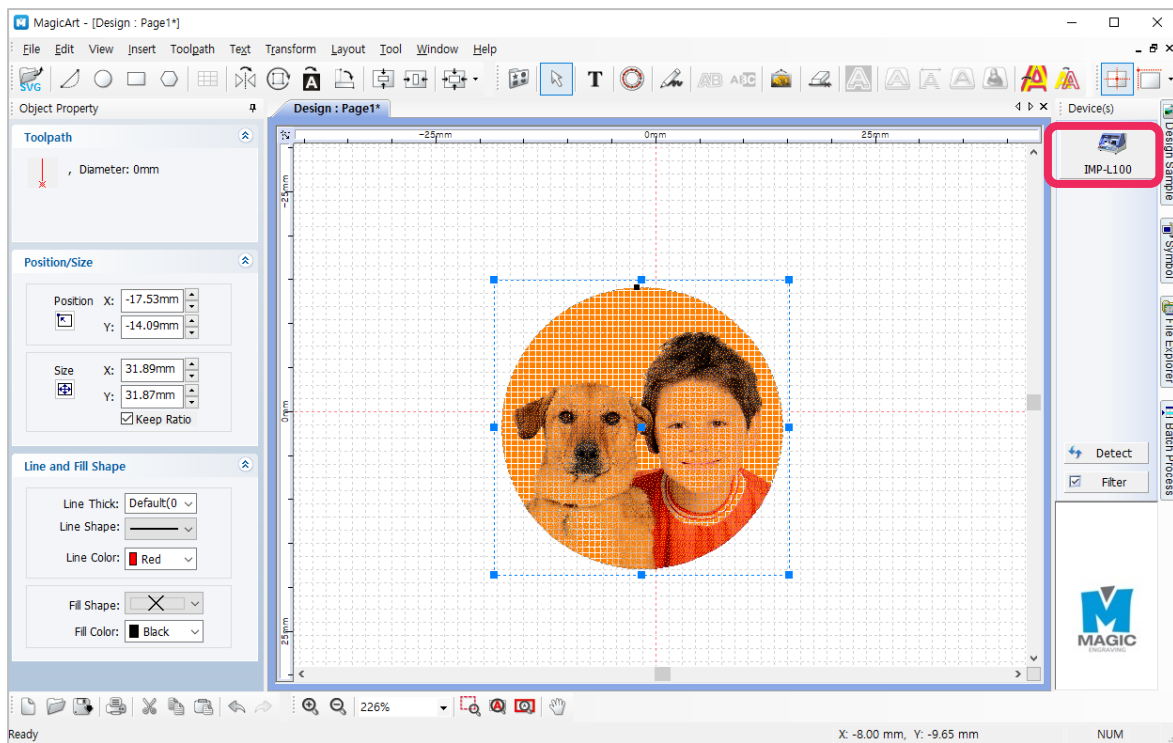
Notice

When marking a photo, bright part (white area) of image is expressed in dots. Since darker image shows higher quality, adjust the brightness darker. Normally, dot ratio 10-20% shows the best marking quality for a portrait. The optimal image condition depends on the brightness of background of the image. Adjust the image monitoring the image preview and the dot ratio. If 'image adjustment' is confusing, click "Recommend the best" button to automatically adjust the image.

10. Click "OK" button to create toolpath for photo marking. Double check the created toolpath and click



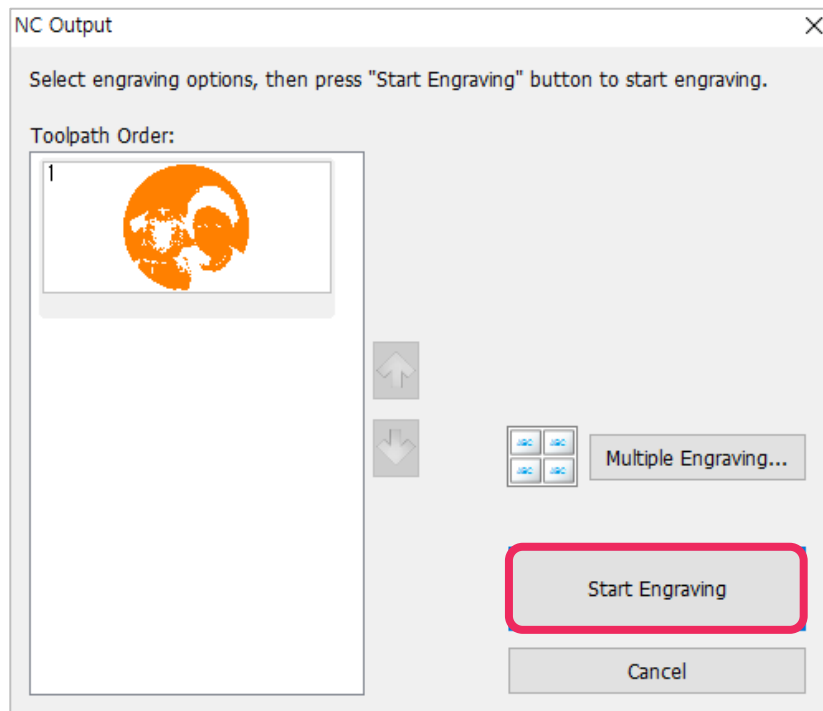
button.



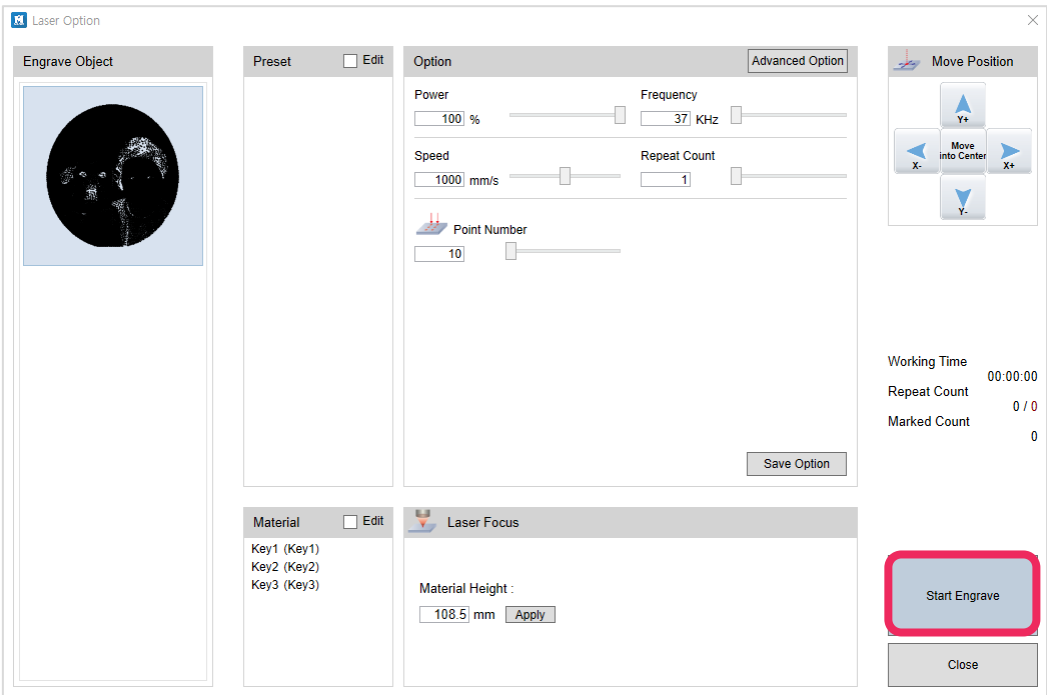
Notice

When marking a photo, white area of image appears as a dot. So the result of the toolpath is shown as negative image.

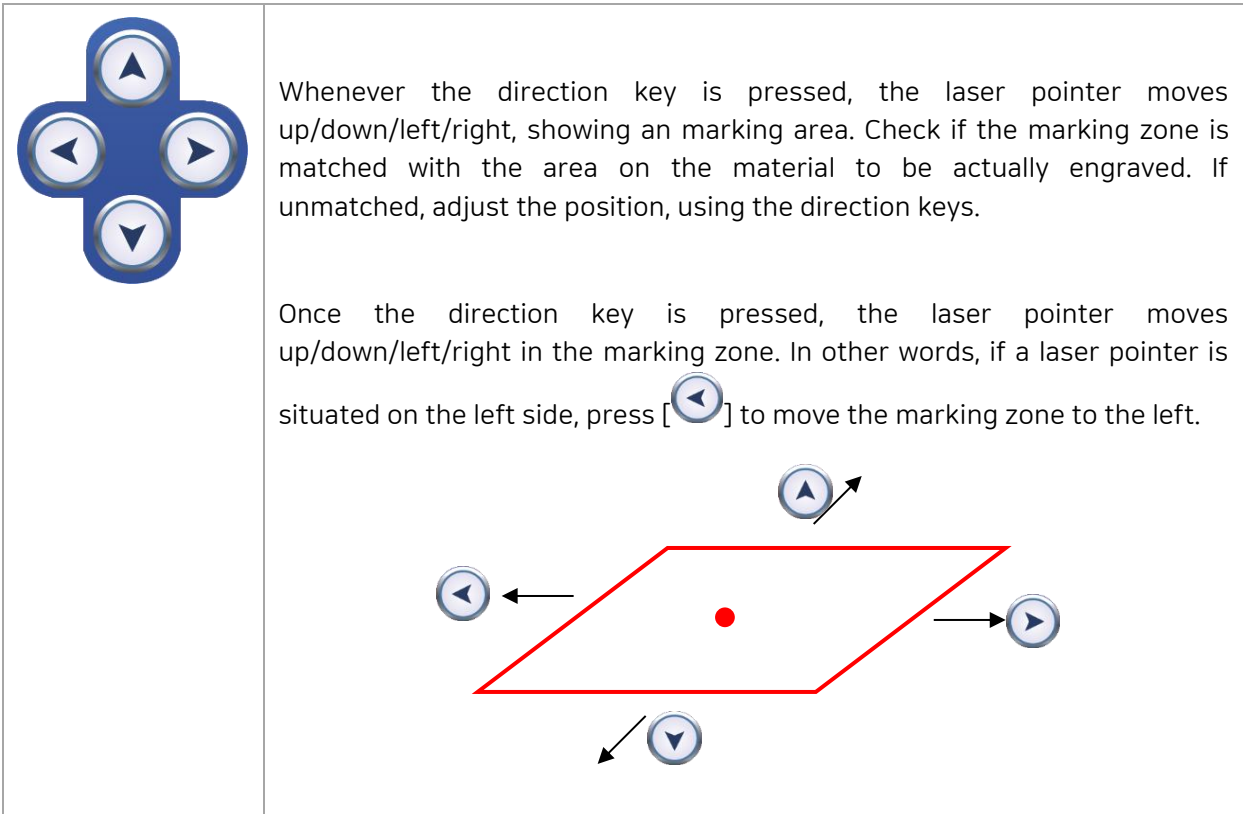
11. Once "NC Output" window appears, Click "Start Engraving" button to start transferring the toolpath to the selected product.




12. A laser option window pops up. Select the Laser Option and click [Engrave]. Then, a Start page appears with a warning message. Click [Start].
(If the laser focus is set in advance when a material is placed, it is unnecessary to enter height at a laser option.)



13. Once a red laser pointer on the material is turned on, check and adjust the position of the pointer, using the direction keys.
The area pointed by the red rectangular laser pointer refers to an actual marking zone. The round laser pointer in the middle represents the origin of the height of laser focus.



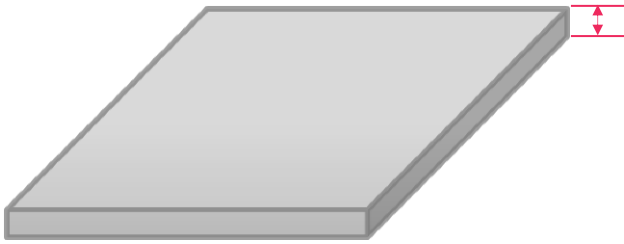
14. Once the marking position setting is done, click the program Start button or  on the product long (2 seconds or longer). Then, the cover is automatically closed, and marking begins.



Cutting Process

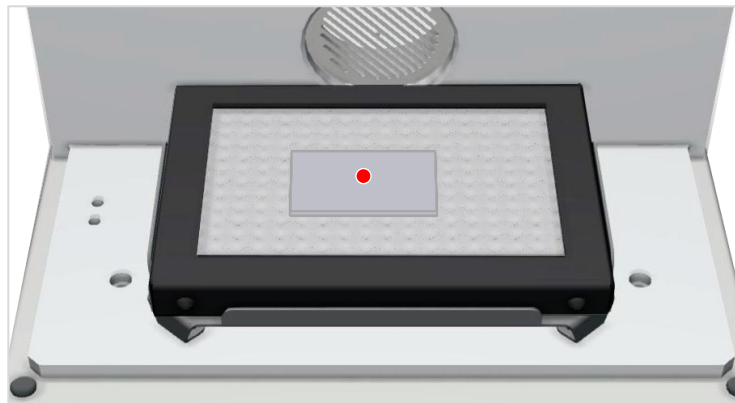
※Honeycomb table is purchased seaperatly.

1. Measure the thickness of a material to be cut.

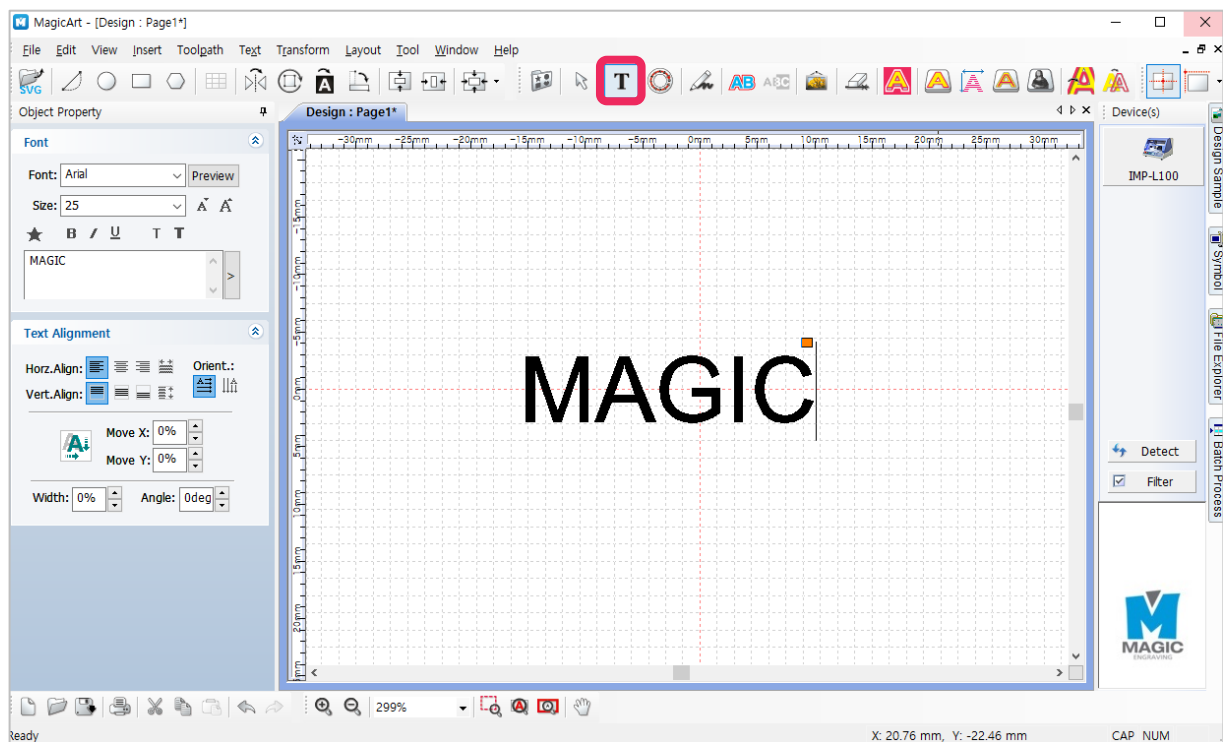



2. Place a material to be cut on the honeycomb table and place it on the working area.

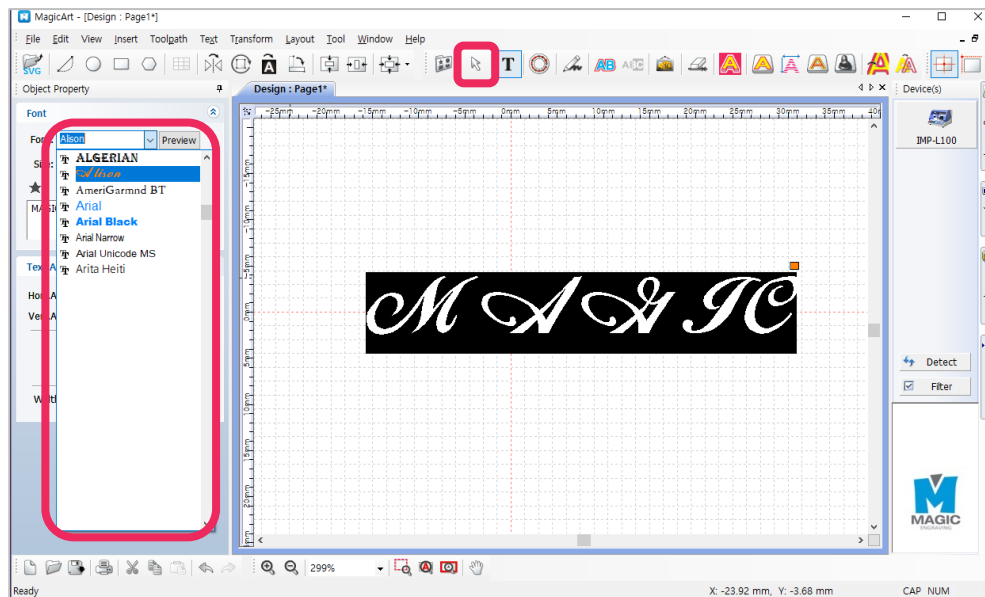
Then set the laser focus, using **Z+** **Z-** buttons.



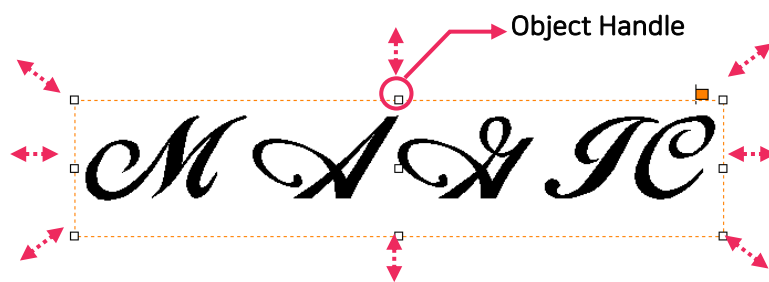
3. Press **T** [Text Input] on the toolbar to enter the text input mode, and click the work area you want and enter the text.



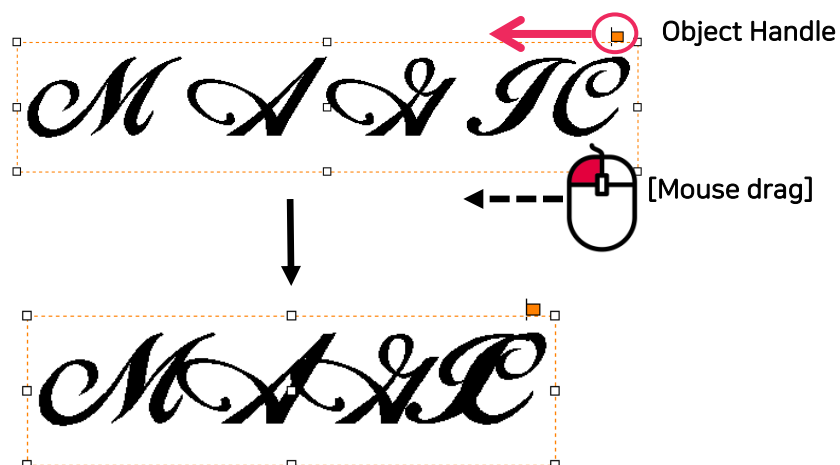
4. After entering text, press  [Selection] on the toolbar to select the text and designate the font.



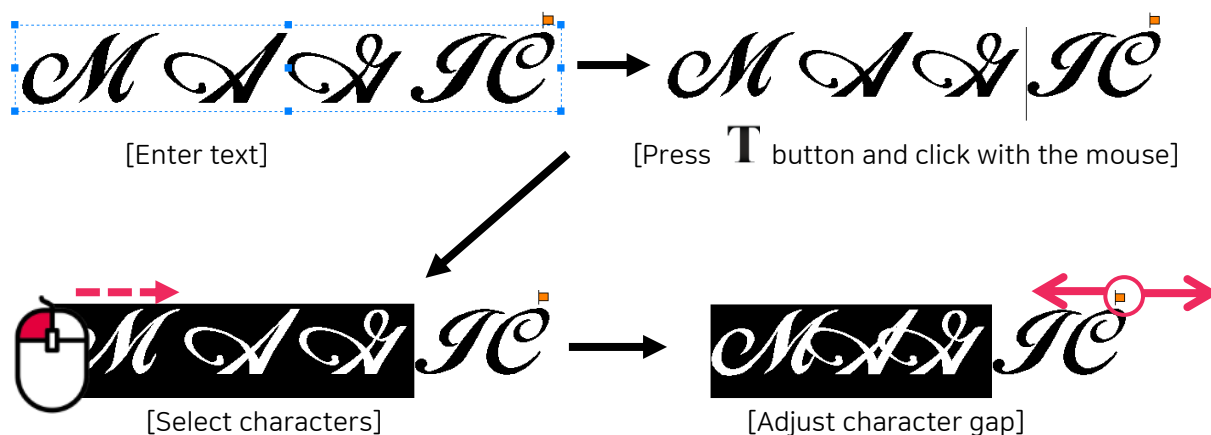
Adjust the text to the desired size. The size can be adjusted by using an object handle (a square in the picture below) as below, or from the object property window.



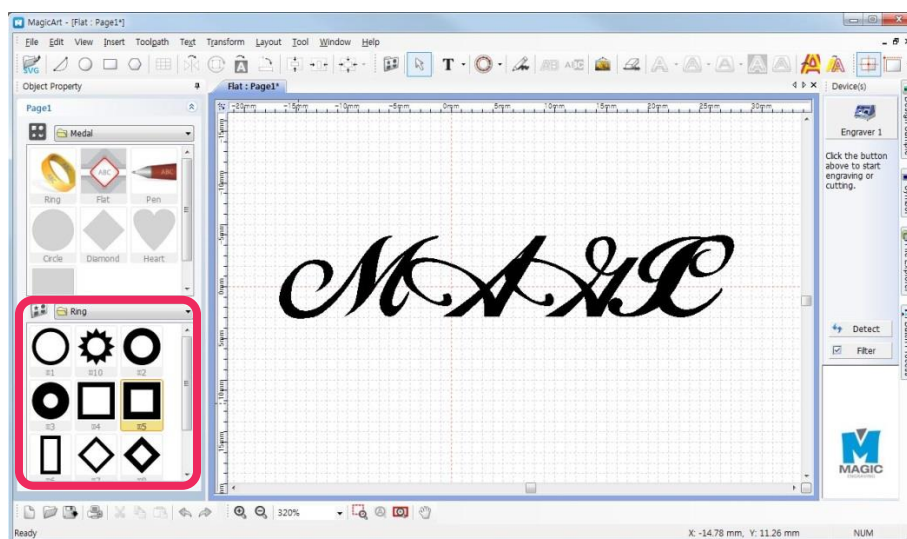
5. Drag the text gap adjustment handle (a square in the picture below) with the mouse to narrow or widen the gap between the characters.



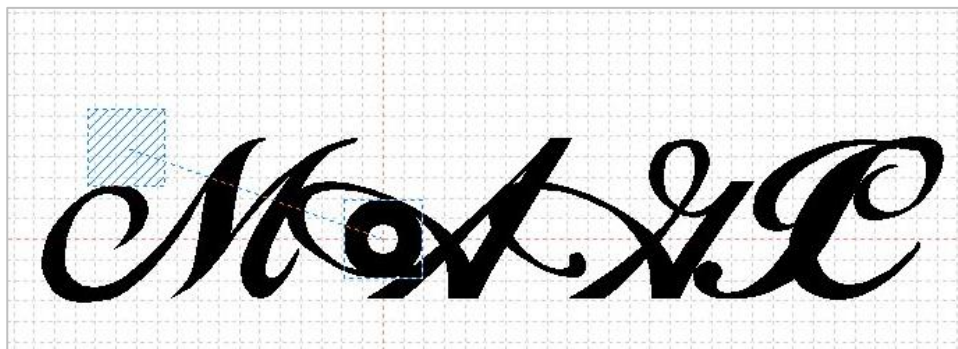
If the gap of some characters is partially adjusted, press **T** [Text Input] button and drag the mouse to select characters you want. Drag a text gap adjustment handle with the mouse and adjust the gap.



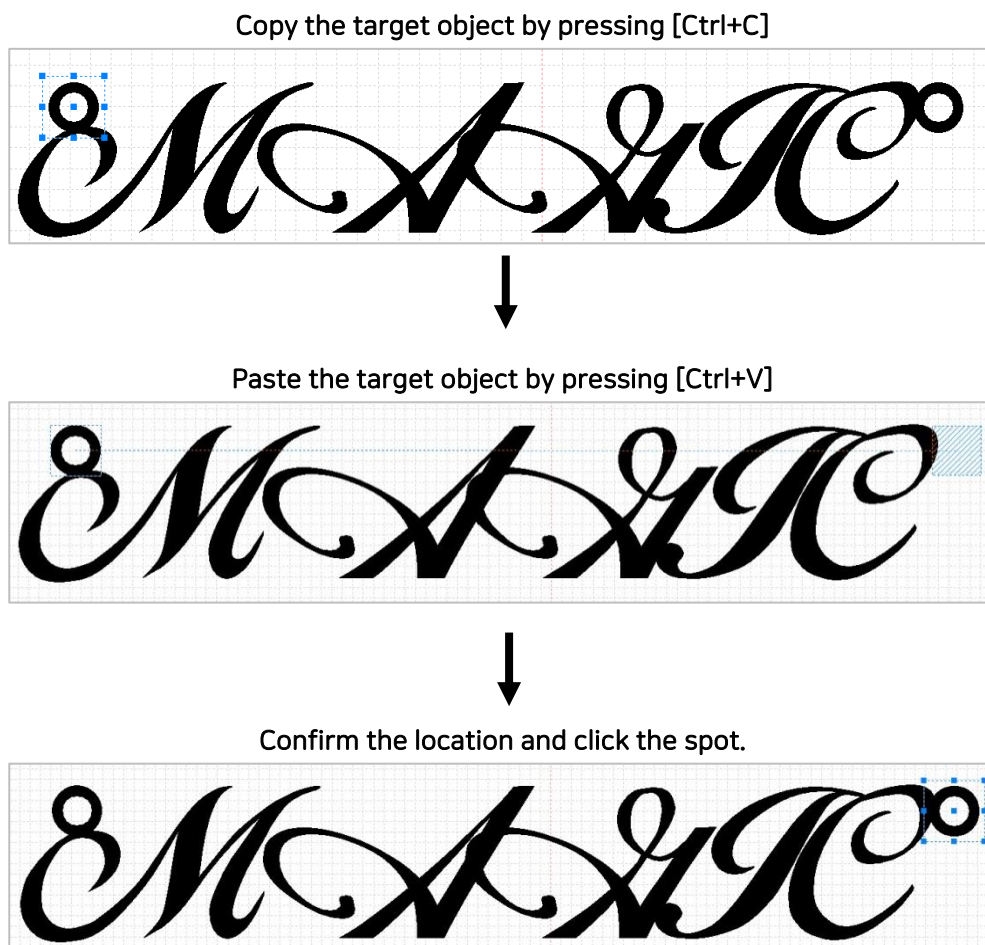
6. Insert a type of ring connected to the characters from the design sample section.



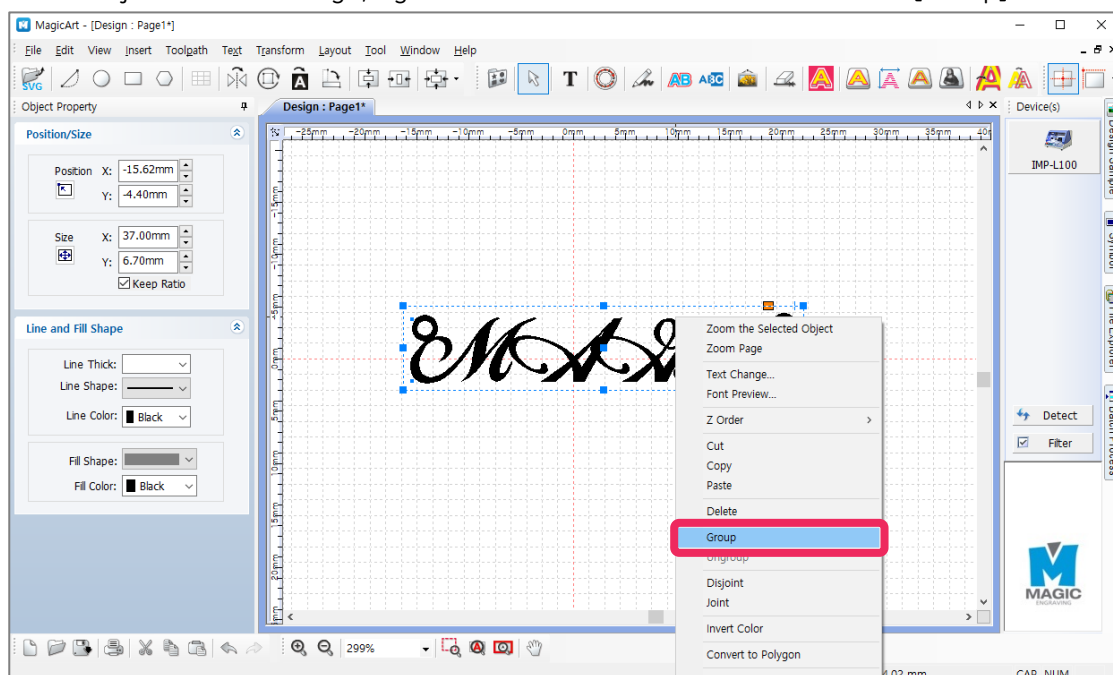
7. Select a type of ring and double click it to load in the work area.




8. [Copy] and [Paste] the ring type, then guideline for a location of the ring appears. Adjust the location and click the spot.

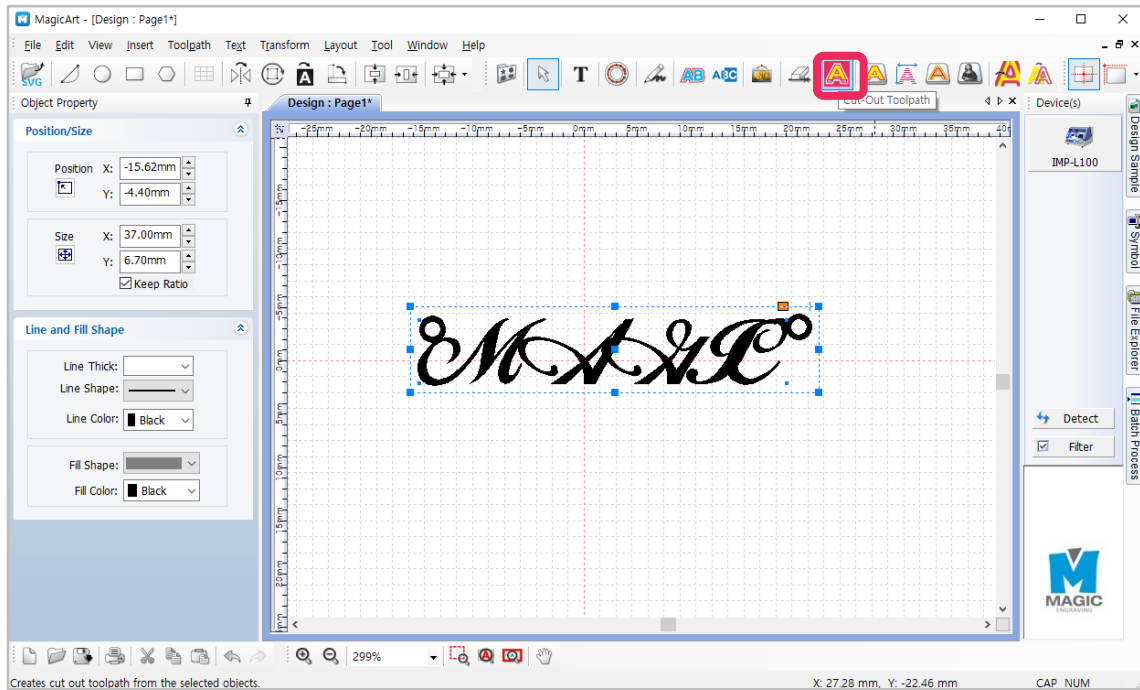


9. Select all the objects for the design, right-click on it to see the menu and select [Group].

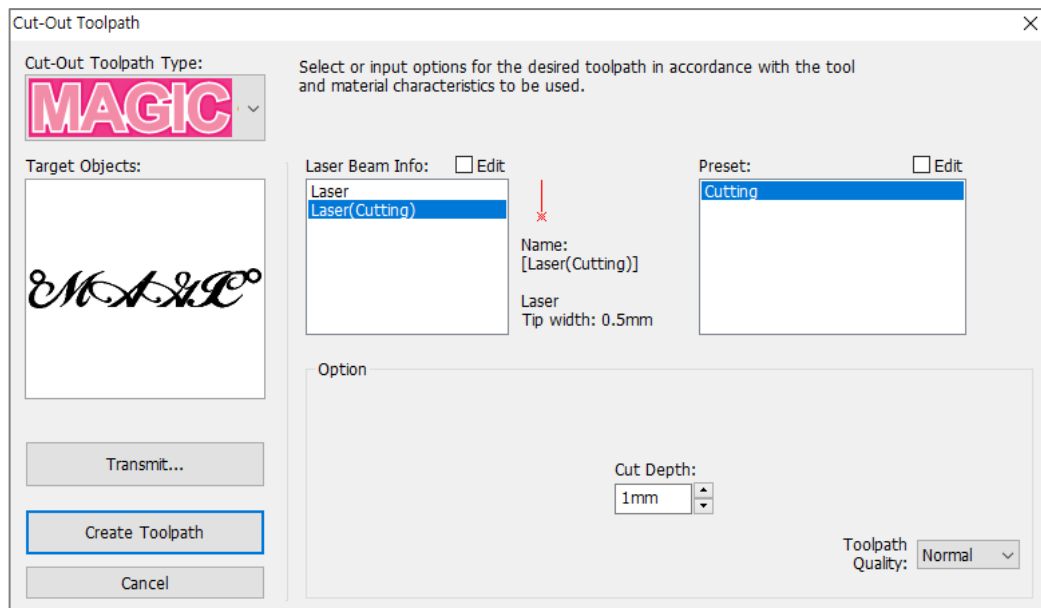


*Selecting the whole objects: Drag the object with mouse or select
Edit menu → Select All.

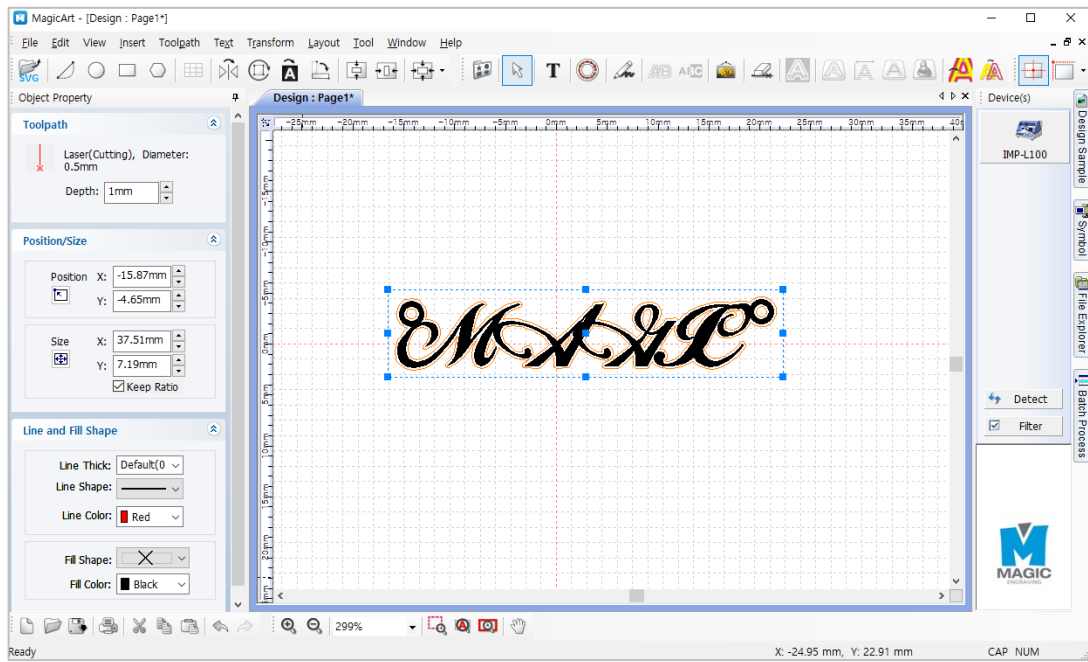
10. Once the design is completed, click  [Cut-Out Toolpath].



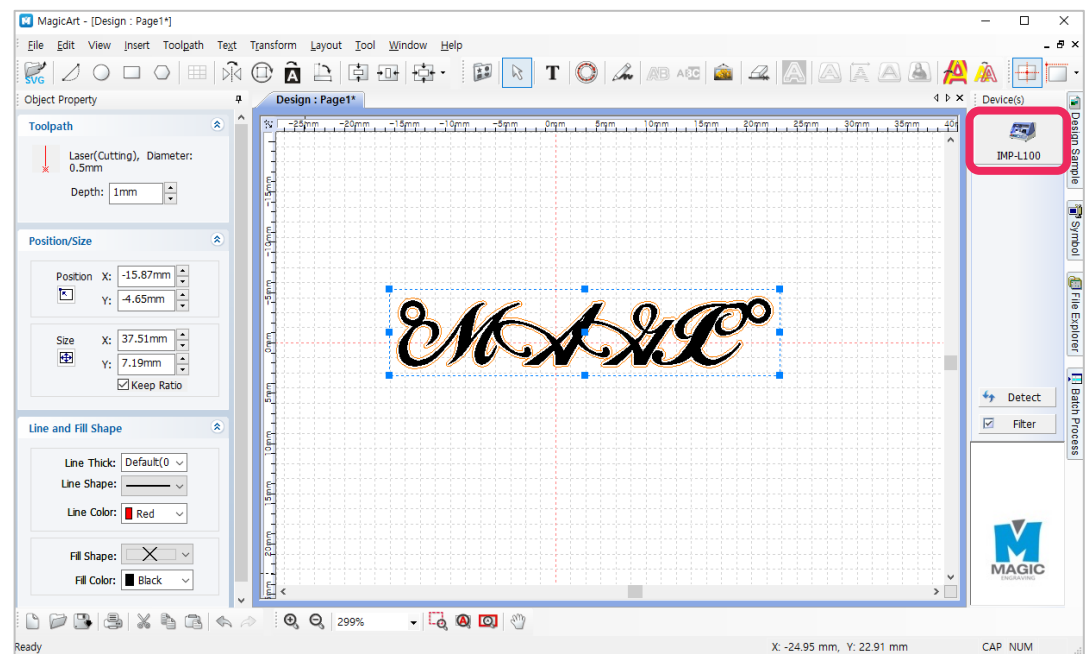
11. Once the "Cut-Out" window appears as seen in the figure below, select tool to be used for the cutting, input the measured material thickness and the other options and click "Create Toolpath."



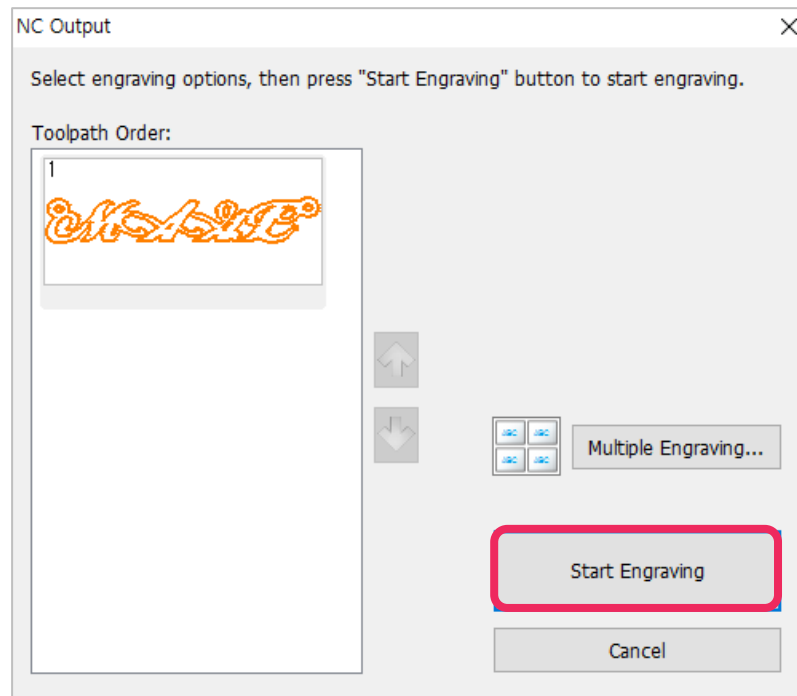
12. "Toolpath" is created.



13. Click  button.

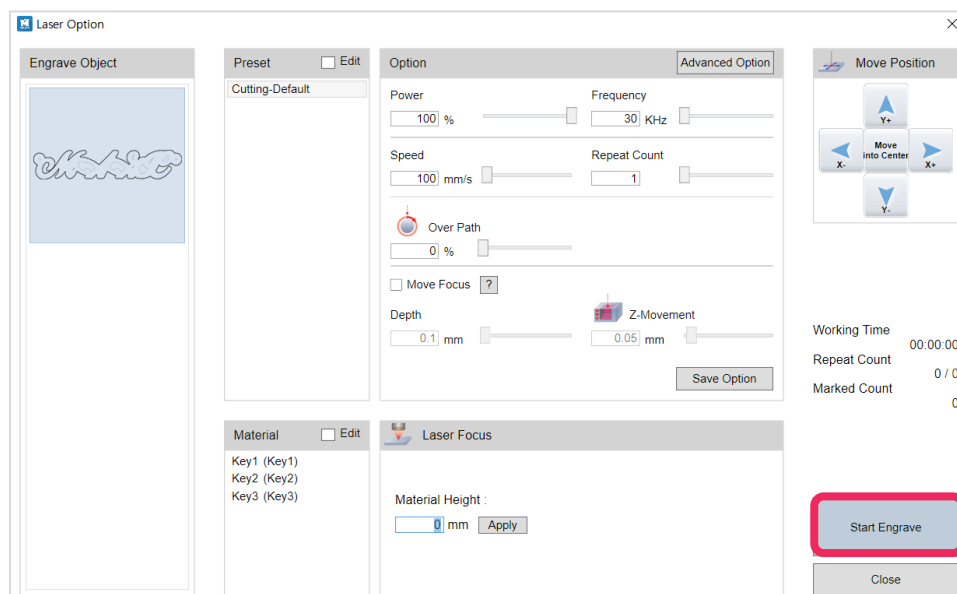


14. If the NC Output window appears, click [Start Engraving].



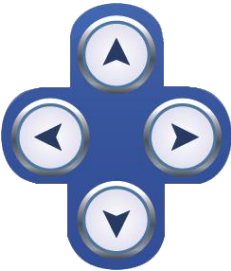
15. A laser option window pops up. Select the Laser Option and click [Engrave]. Then, a Start page appears with a warning message. Click [Start].

(If the laser focus is set in advance when a material is placed, it is unnecessary to enter height at a laser option.)




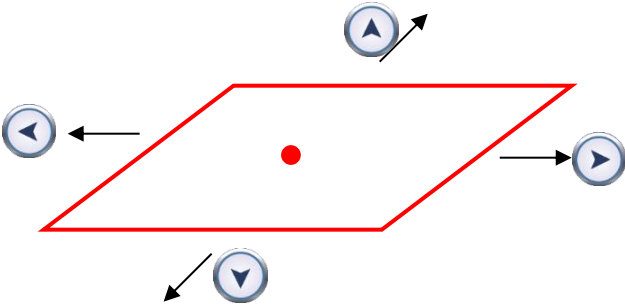
16. Once a laser on the material is turned on, check and adjust the position of the pointer, using the direction keys.


The area pointed by the red rectangular laser pointer refers to an actual marking zone. The round laser pointer in the middle represents the origin of the height of laser focus.



Whenever the direction key is pressed, the laser pointer moves up/down/left/right, showing an marking area. Check if the marking zone is matched with the area on the material to be actually engraved. If unmatched, adjust the position, using the direction keys.

Once the direction key is pressed, the laser pointer moves up/down/left/right in the marking zone. In other words, if a laser pointer is situated on the left side, press [] to move the marking zone to the left.



17. Once the marking position setting is done, click the program Start button or [] on the product long (2 seconds or longer). Then, the cover is automatically closed, and marking begins.



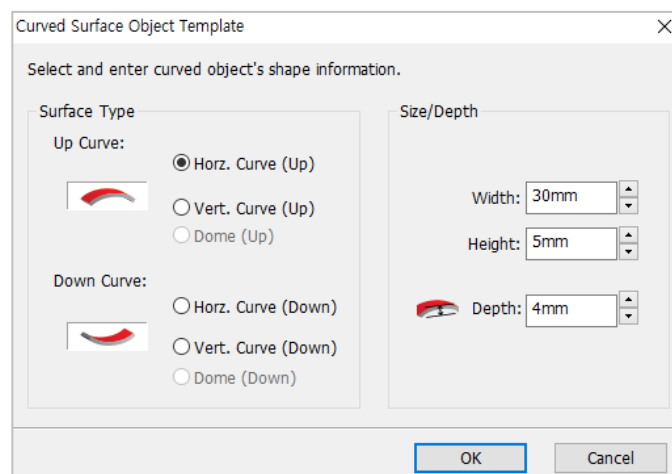
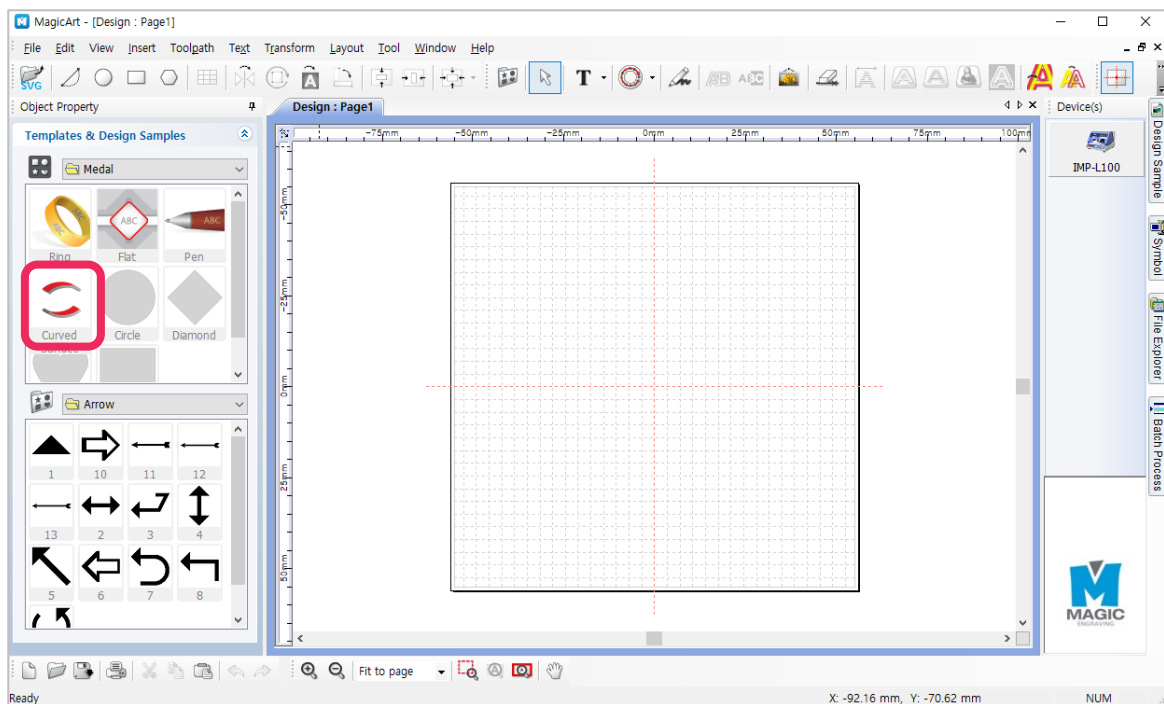
Curved Material Marking

For marking on curved surface, select a curved template. Enter the height and length of the curved surface. Then, z-axis automatically moves along the surface and marks letters one by one.



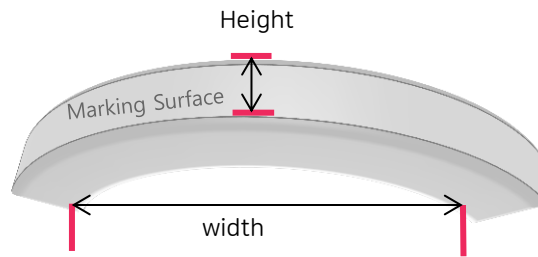
In terms of marking on curved surface, texts are only available.

1. Select the CURVED template.

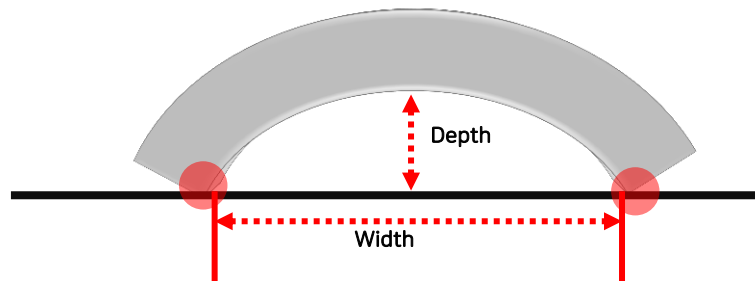




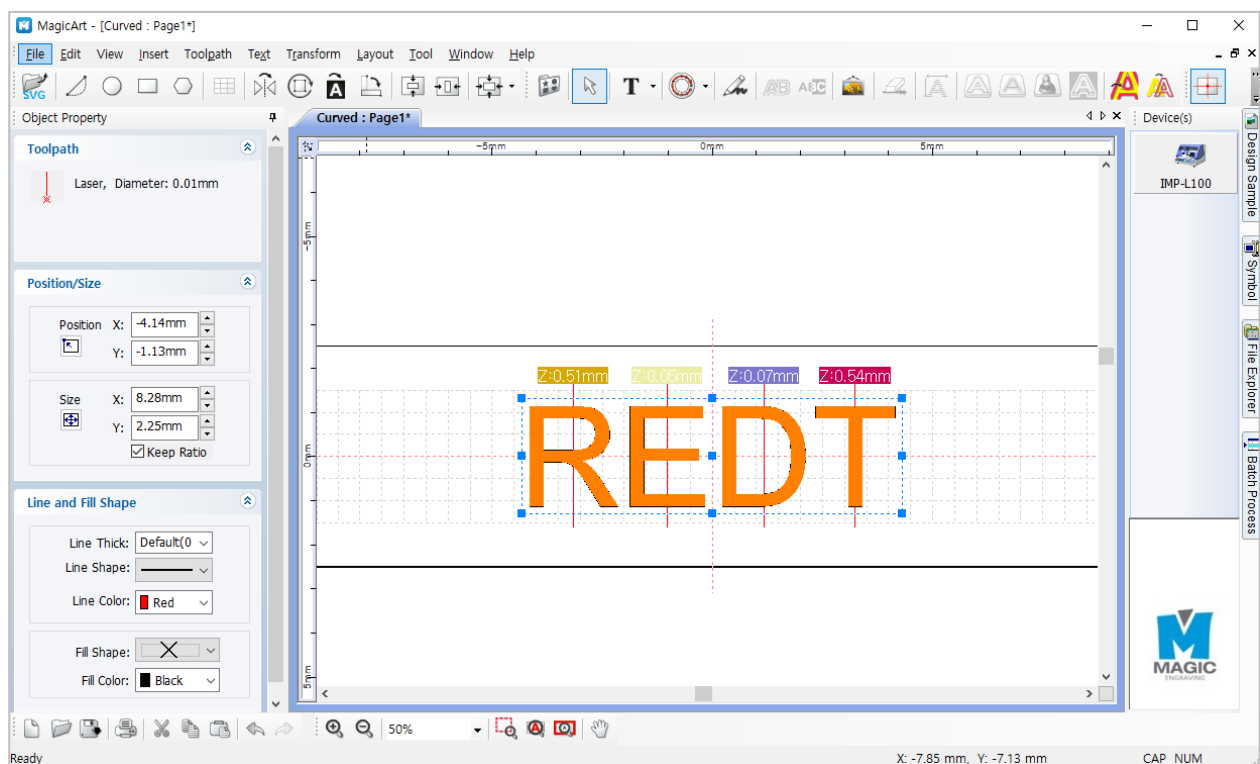
With the curvature information, z-axis shift is calculated. Therefore, if an incorrect size is entered, z-axis error can occur.



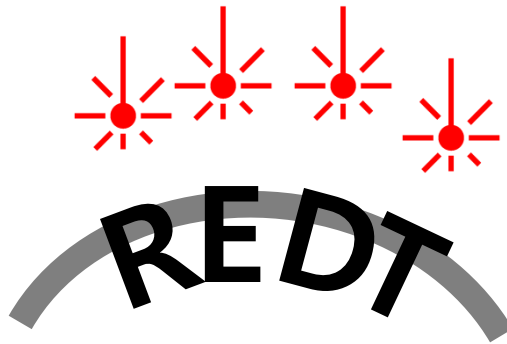
When entering curvature information, put the material on the floor as shown in the figure. Then, enter the distance between the two points which touch the floor.



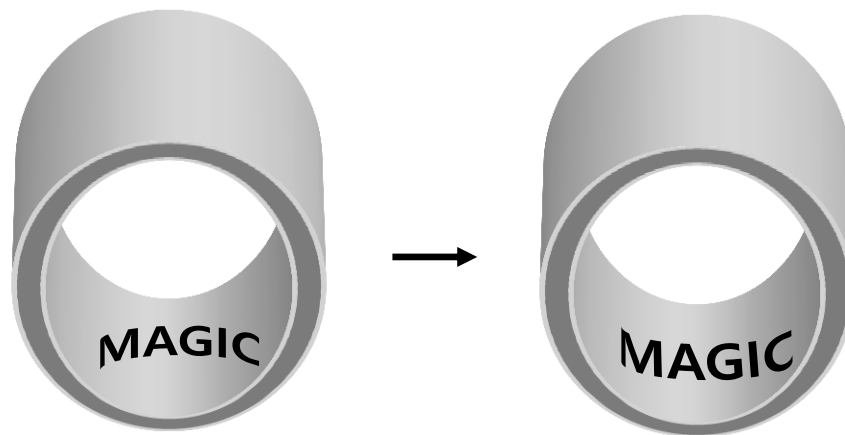
2. Enter texts and create a tool path. Then, z-axis information appears on the screen as shown in the figure below:



3. Send data and start marking. Then, z-axis automatically moves and marks according to angles.



Shape Distortion



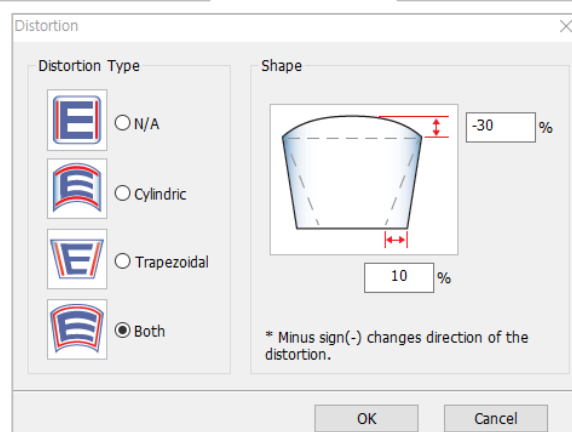
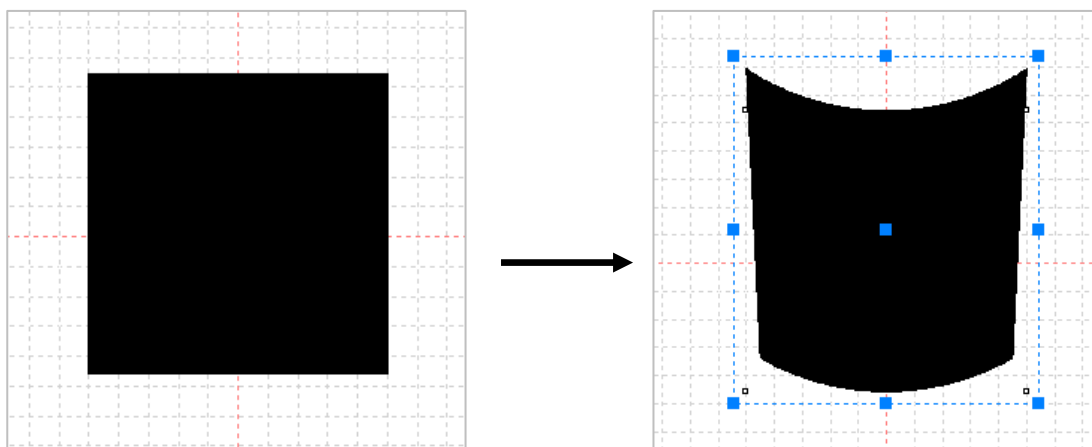
Due to curvature, text and shape can be distorted during laser marking. If marked under this mode, such distortion can be corrected.



- Check the guide laser on your own and enter the distortion value.
- This function is available for figures and texts only (NOT for pictures and circular texts).

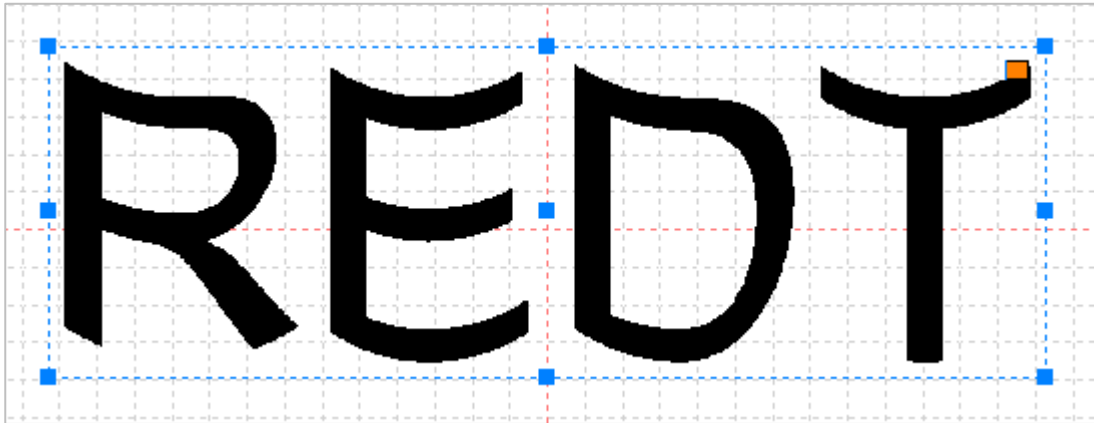
[Figure Shape Distortion]

Able to distort the shapes of the figures provided by MAGIC ART
Create figures and click [Menu] → [Transform] → [Distortion].



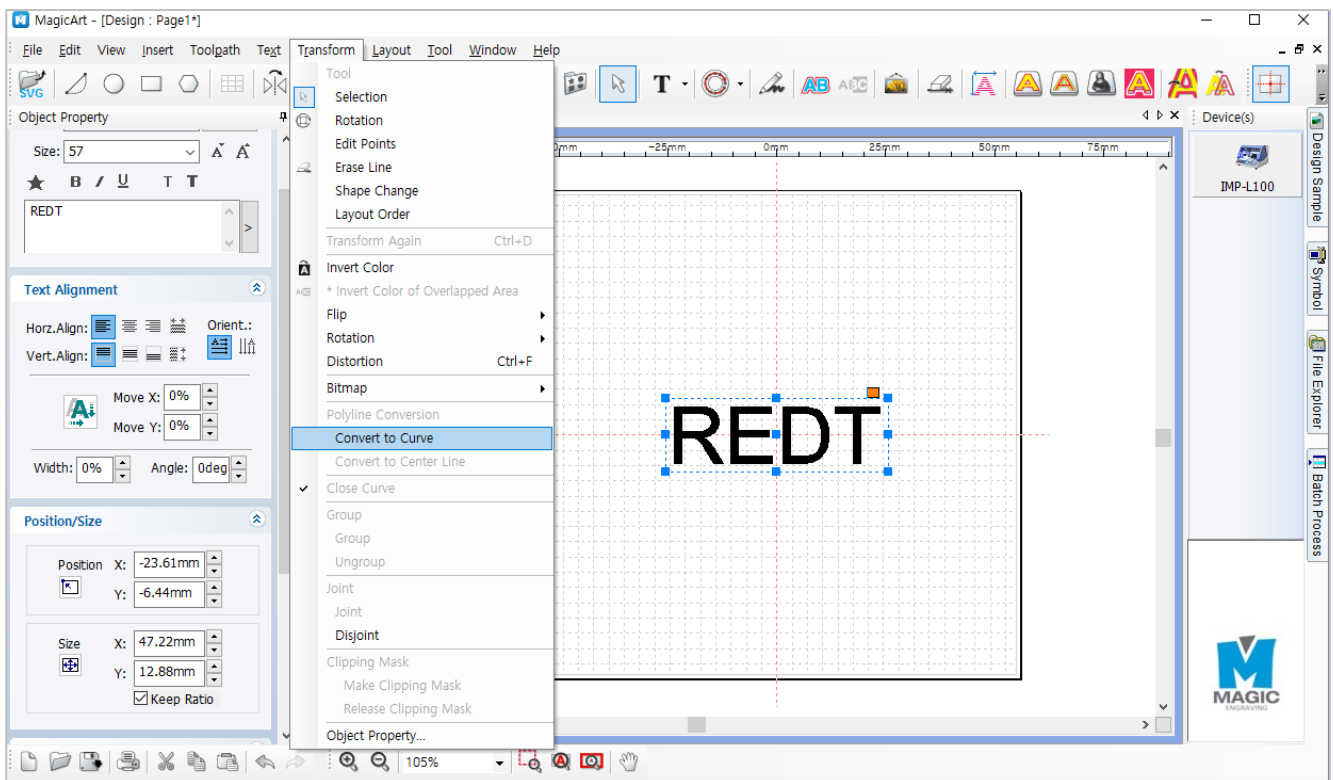
[Text Shape Distortion]

If [Distort Shape] is clicked without converting an object into a curve, texts are distorted one by one.

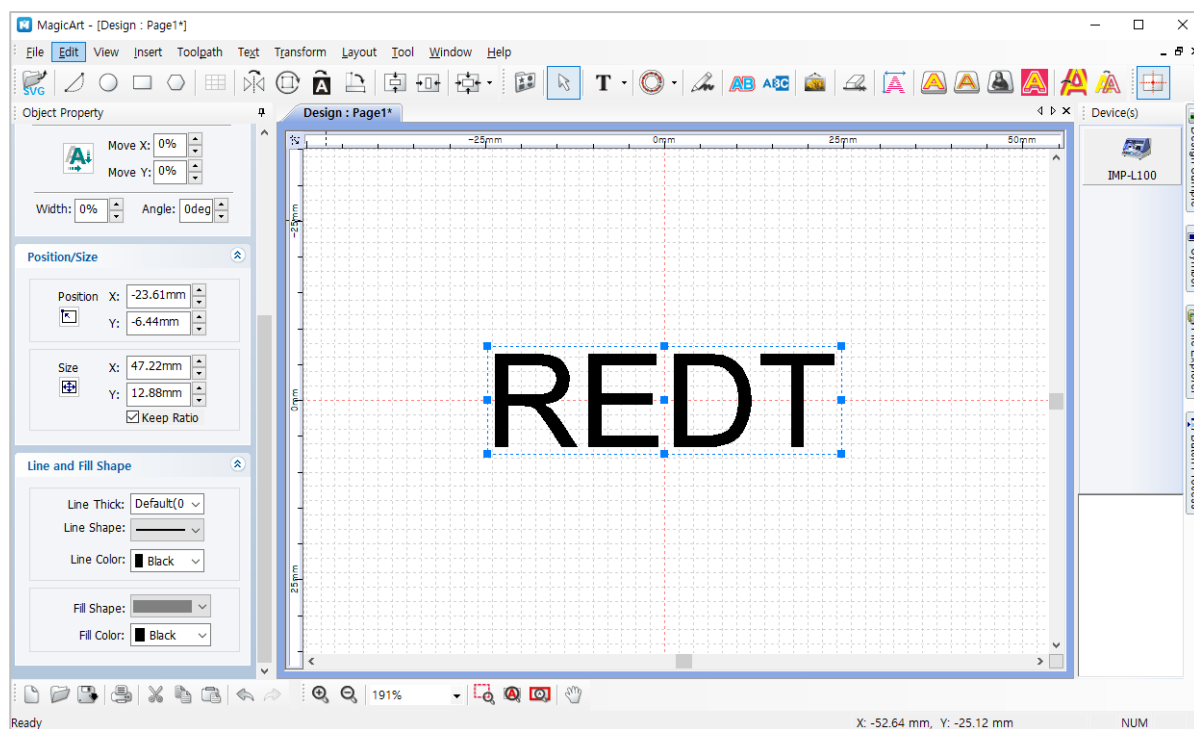
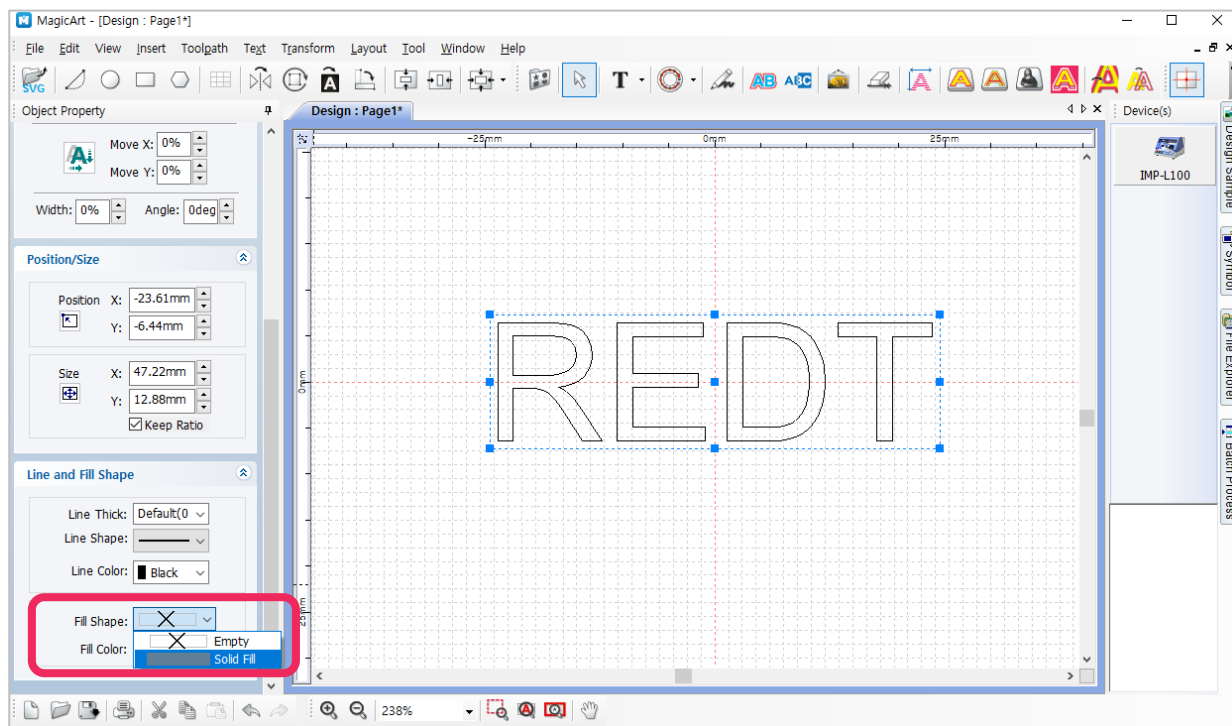


1. Enter texts and click [Menu] → [Transform] → [Convert to Curve].
(Or select an object and right-click → [Convert to Polygon])

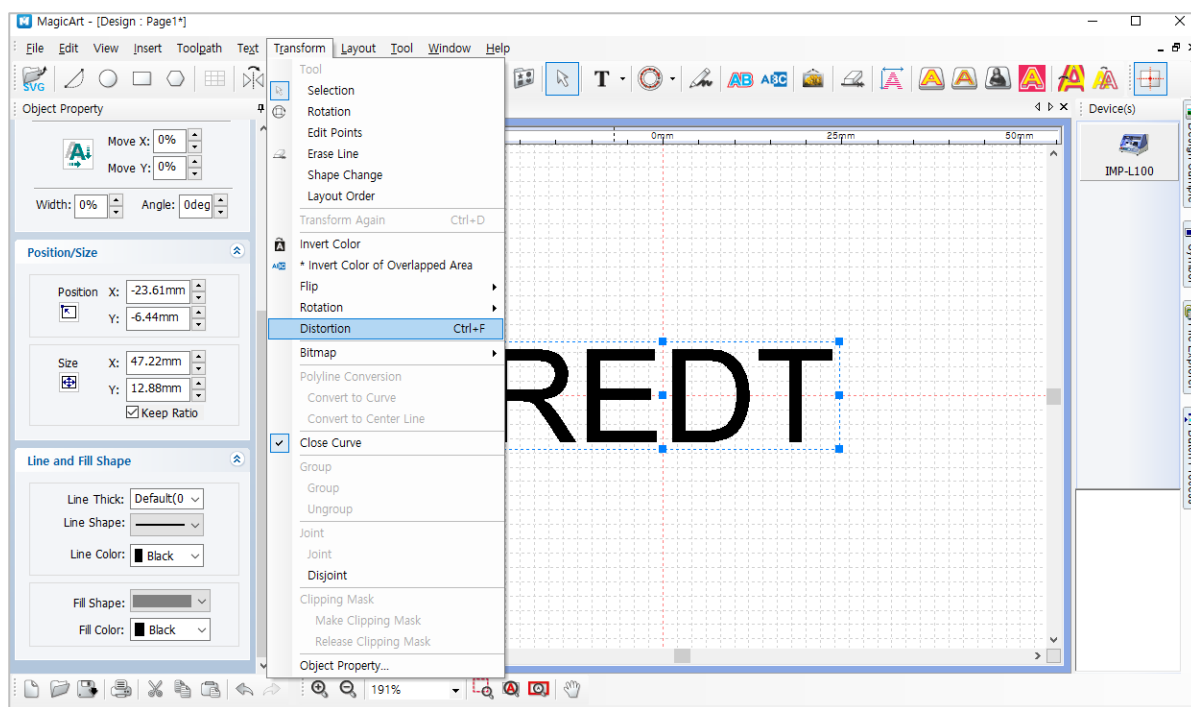
*** Texts change to figures when converted into curves so that they cannot be edited.**



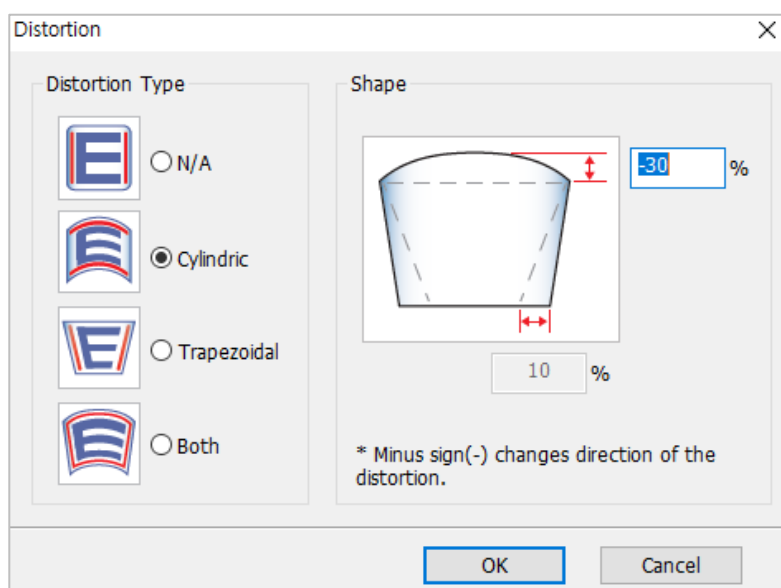
2. Once texts are converted into curves, change [Fill Shape] to [Infill] in the SHAPE on the left.



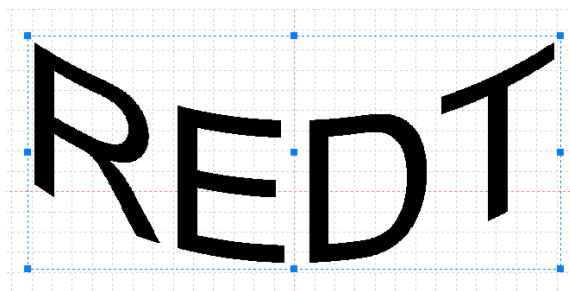
3. Click [Menu] → [Transform] → [Distortion].



4. Enter shape and values. If a negative value is entered, a direction of distortion changes.

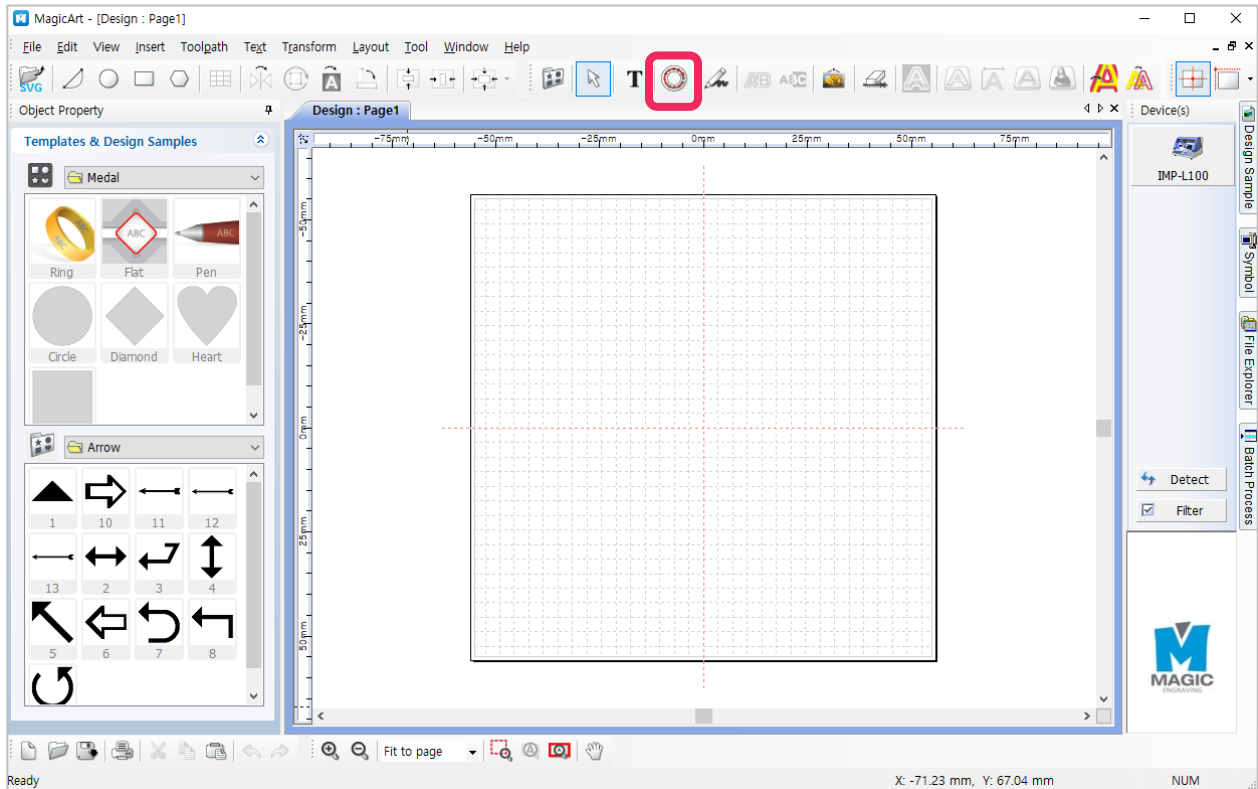


5. Enter shape and values. If a negative value is entered, a direction of distortion changes.




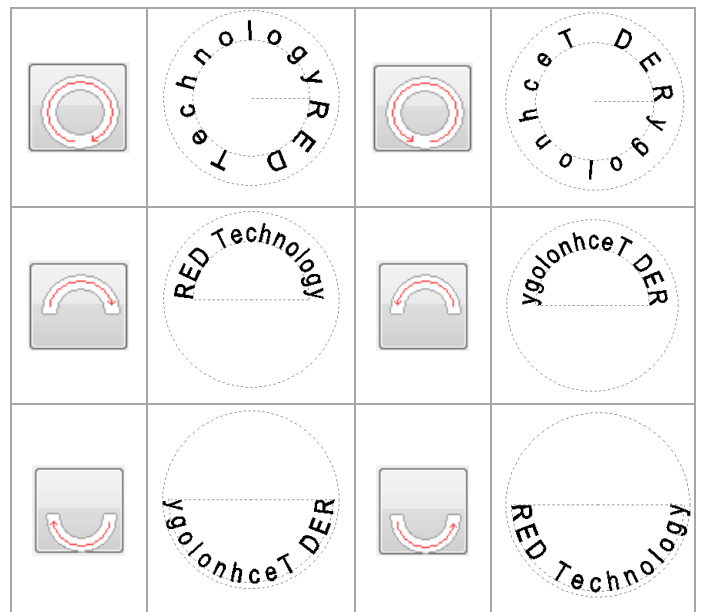
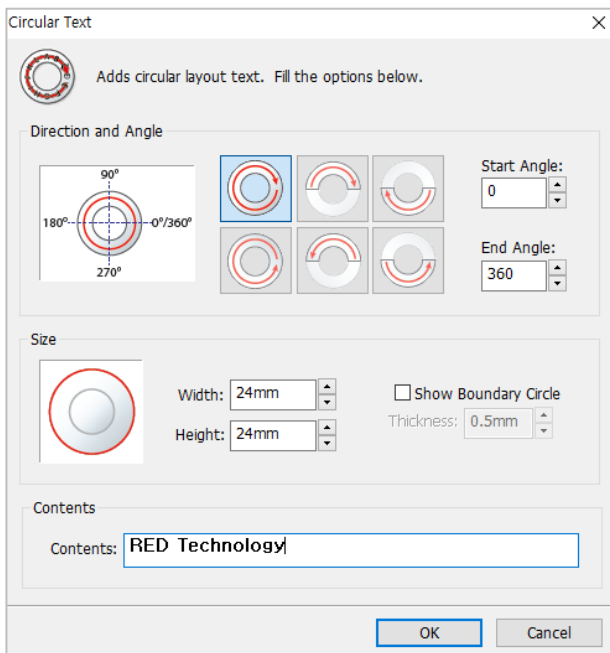
Layout of Text in a Circle

Text can be laid out in a circle by using circular text object.



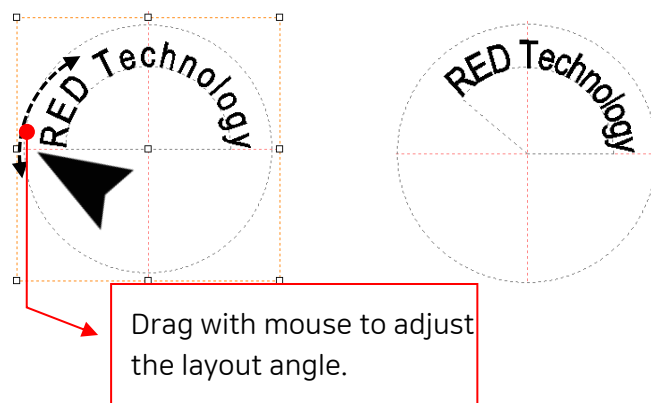
[Circular Text]

Click  button to display "Circular Text" window. Designate direction and angle, enter size and text, then click "OK" button.

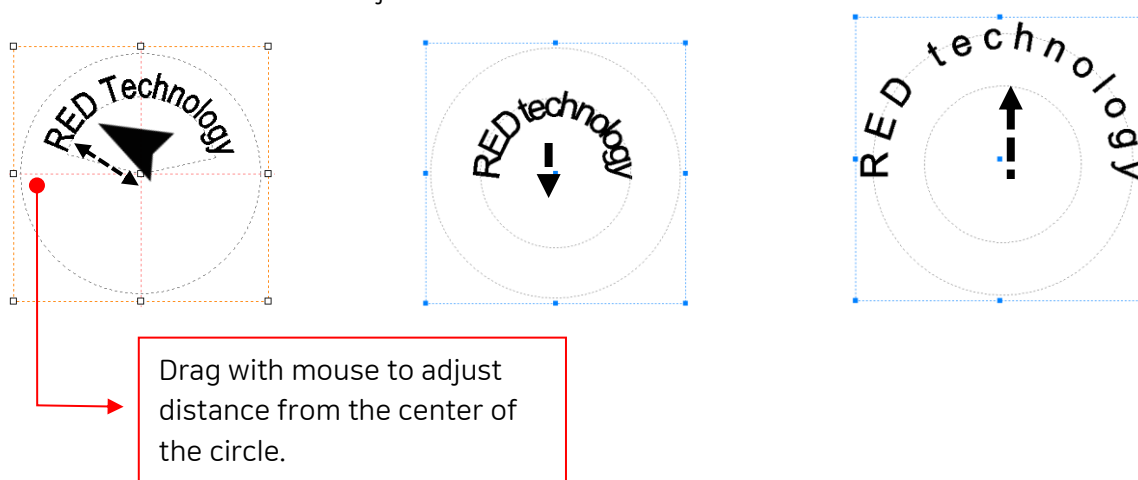


Adjusting layout angle

Drag the first character [R] or last character [y] in the text to adjust the angle of the layout.



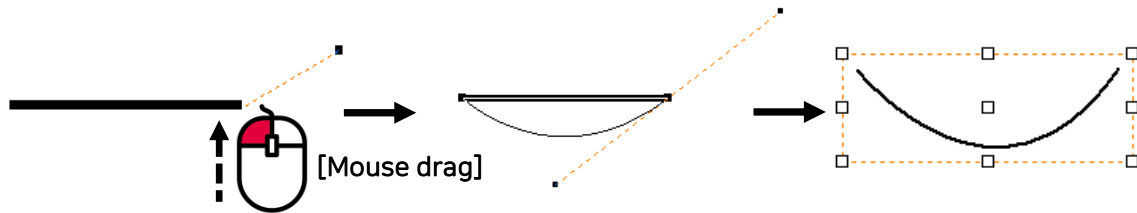
Drag other characters with mouse to adjust the distance to the center of the circle.



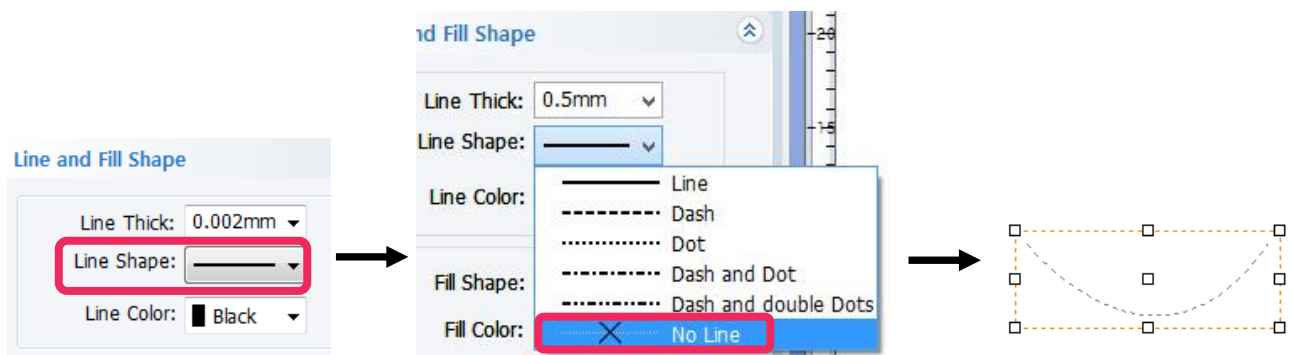
Layout of Text on a Curve

1. Click the  [Line/Curve] button.

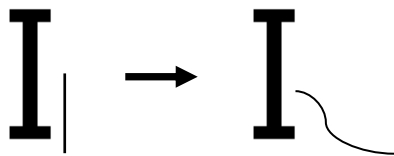
2. Click on a certain point with the mouse and designate a distance. Drag the mouse to make a curve appear. Press the right button on the mouse to create the curve.



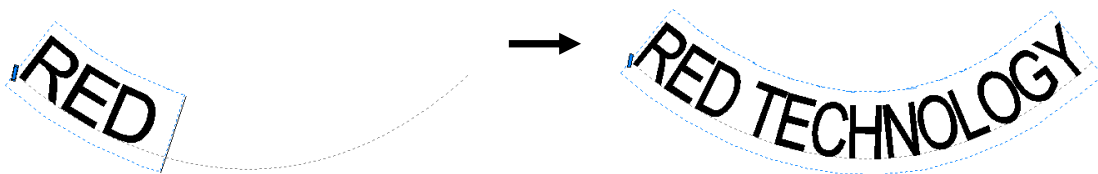
3. Select "No Line" on the "Line and Fill Shape" window on the object property window.



4. Click **T** [Text Input] button, and move the mouse cursor to the curve line. The cursor shape will change as below.



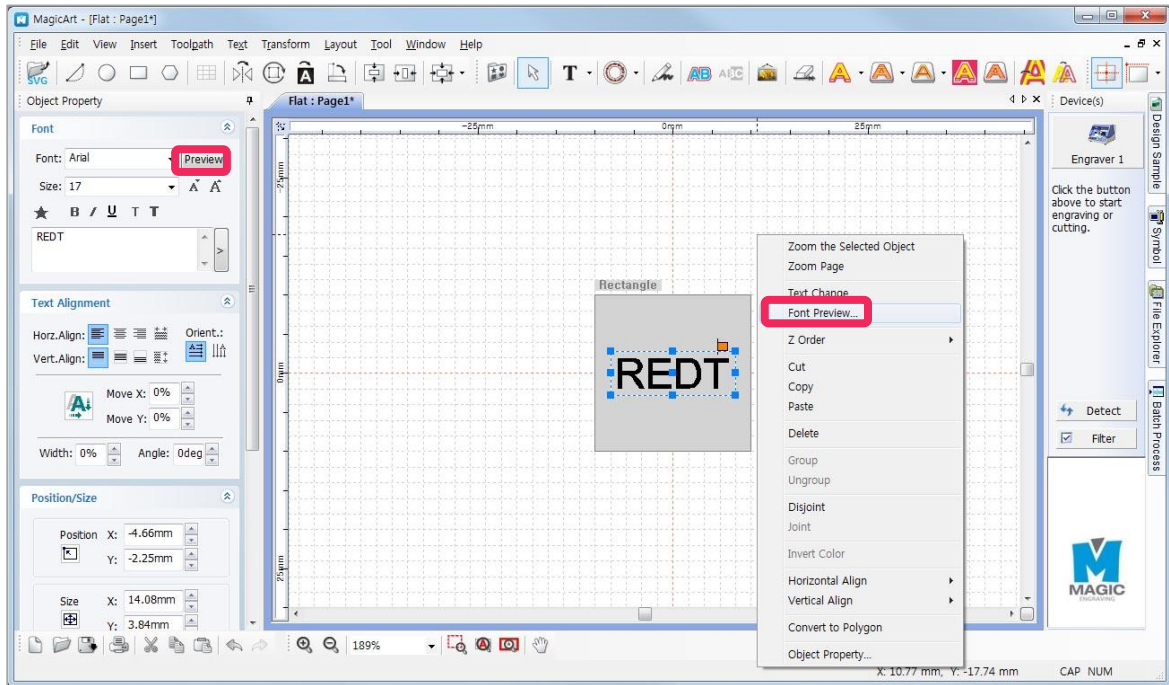
5. In state of the changed cursor shape, click to enter the text input mode.



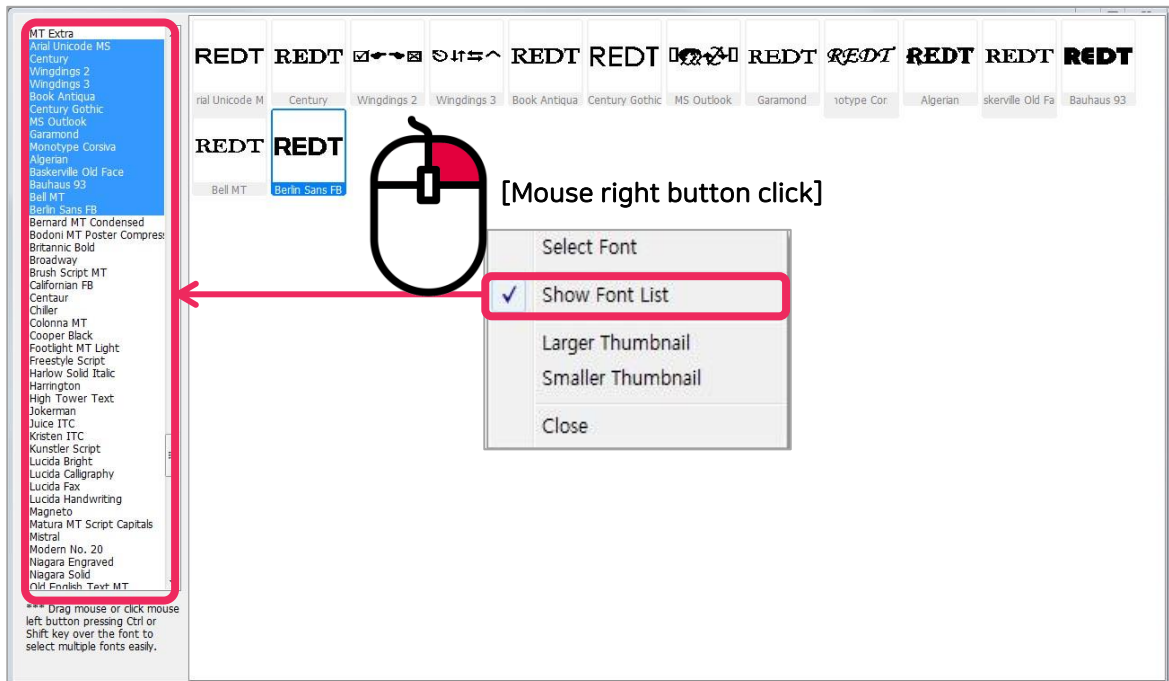
Font Preview

Apply the fonts installed on the computer to the text objects and preview the shape to select the most suitable font.

Select text object, click "Preview" button in the object property window or right-click the mouse and select "Font Preview" menu. Then, "Font Preview" window will appear.




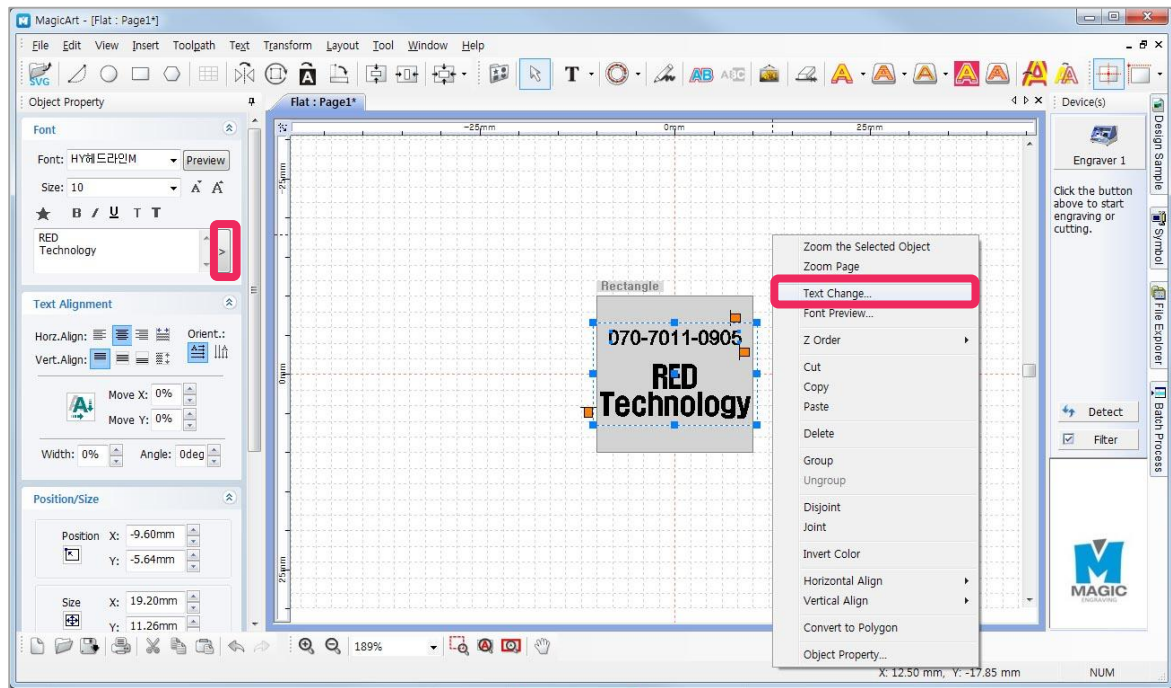
Drag the font list in the font preview window, or click a font while pressing "Ctrl" or "Shift" key, then the preview of the selected font appears automatically. Double click the preview image of the font to select it.



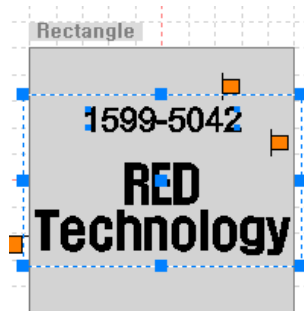
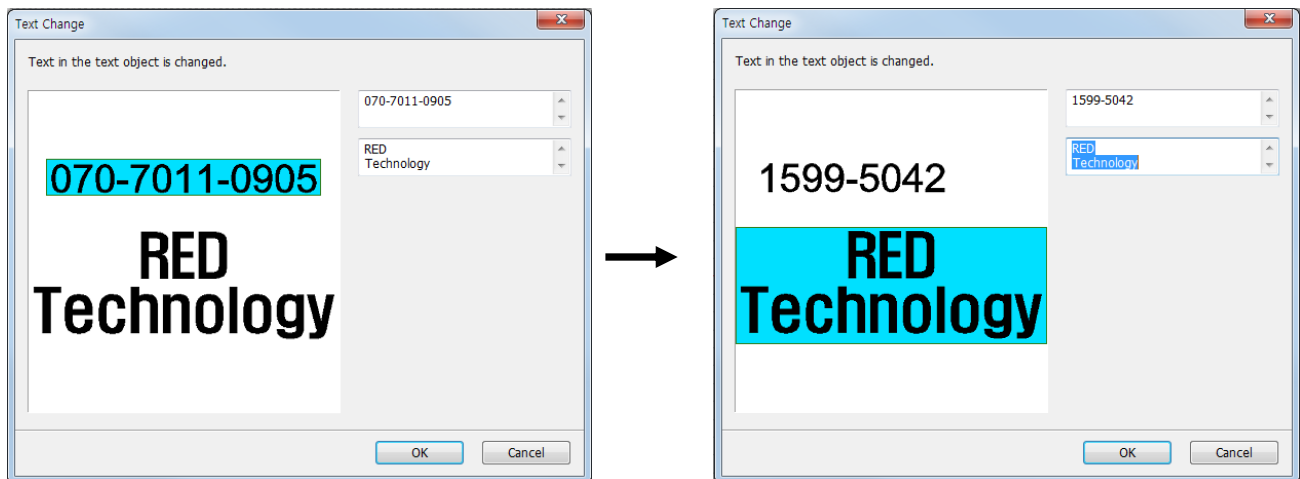
Text Change

The text contents in text objects can be easily changed by the "Text Change" feature.

Import a saved design sample, file, or select text objects designed on the screen. Click  [Text change] button or right- click the mouse, and select "Text Change" on the menu.



Change contents in the "Text Change" window, and click "OK" button. The changed texts will be shown on the screen.



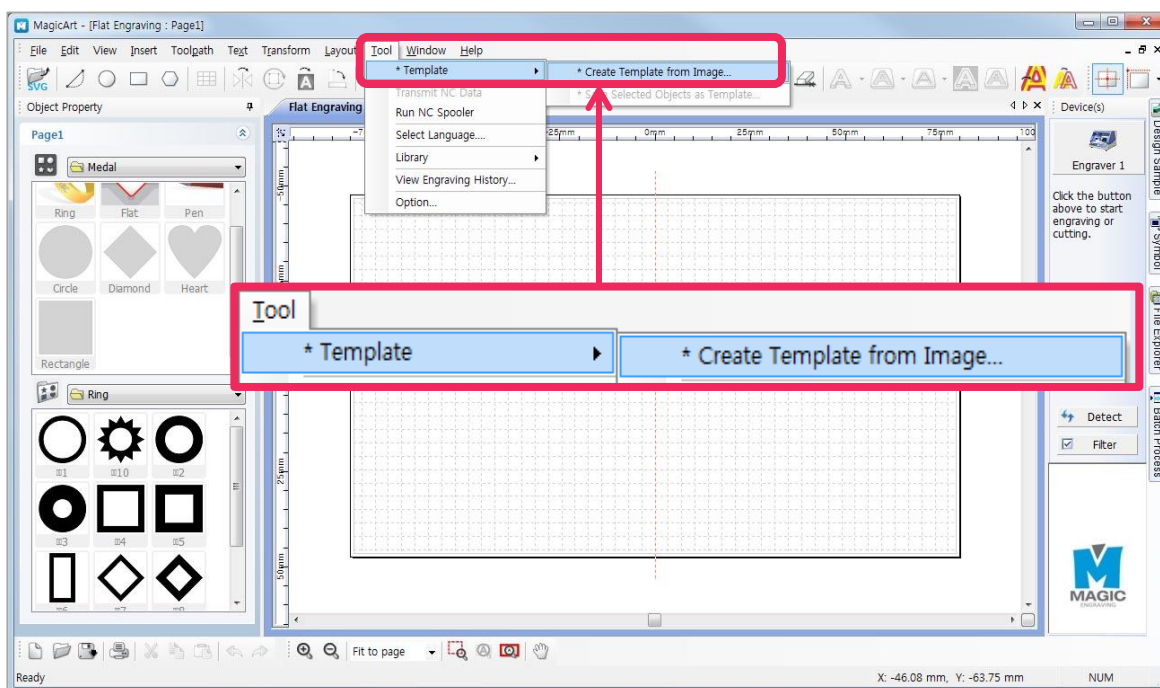
Template Creation

Template is an image corresponding to the materials to be engraved by 1:1 ratio. Load a template that is the most similar to the material to be engraved, and enter the text to be engraved. This way allows you to create the location of marking and the size of text to be engraved more easily and conveniently. Circle, heart, square and diamond-shaped templates are initially provided by the program and users can freely add more templates.

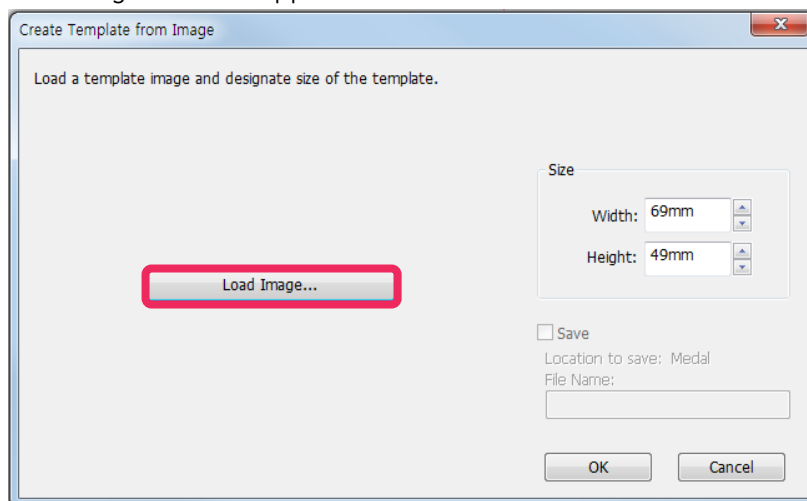
The shape of a template can be designed by graphic program (Illustrator, Photoshop, CorelDraw and etc.) and loaded by SVG file format. Also scanned image file such as jpeg, bmp, png, etc. can be applied as template.

[Creating template #1]

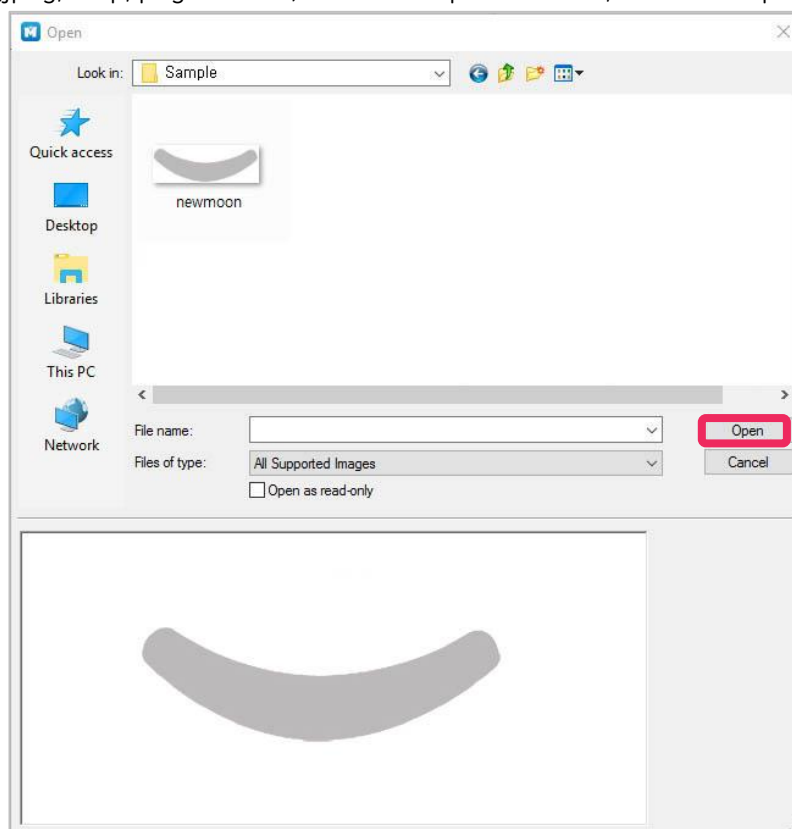
1. Select Tool menu → Template → Create Template from Image.



2. "Create Template from Image" window appears.



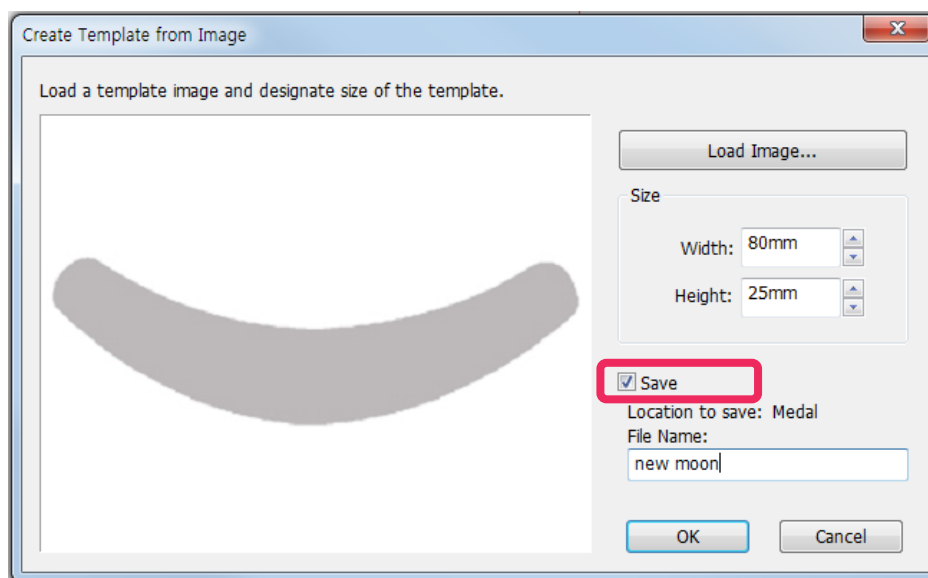
3. Select image files (jpeg, bmp, png and etc.) from the "Open" window, and click "Open" button.

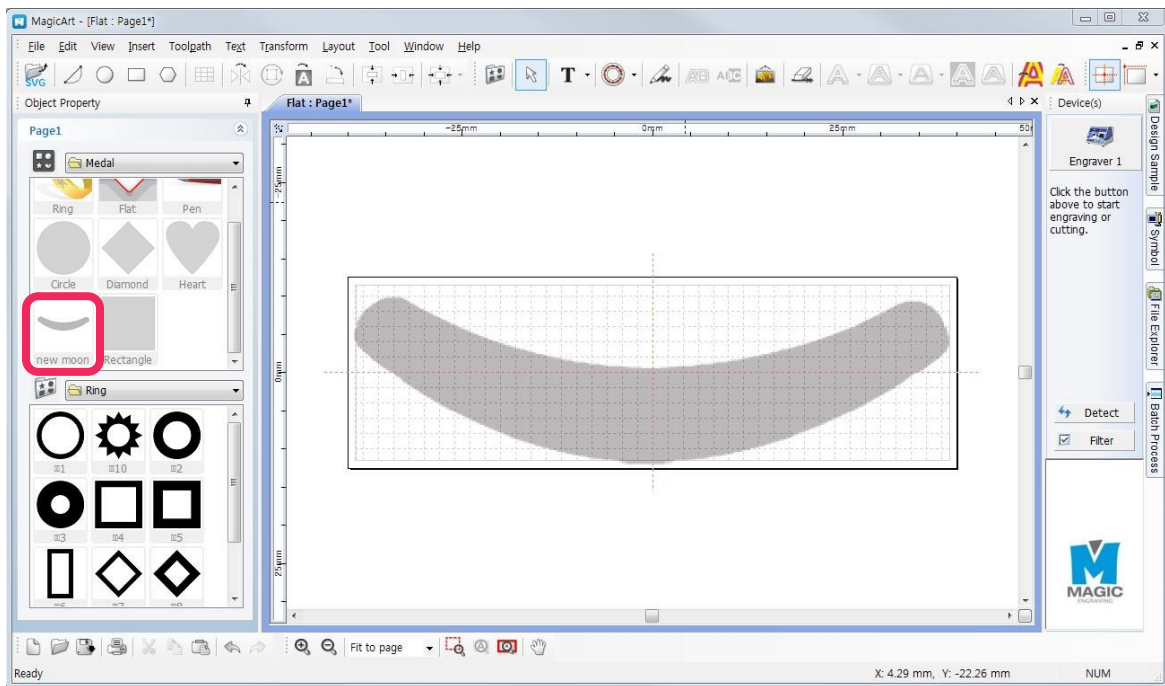


4. Input size of the template.

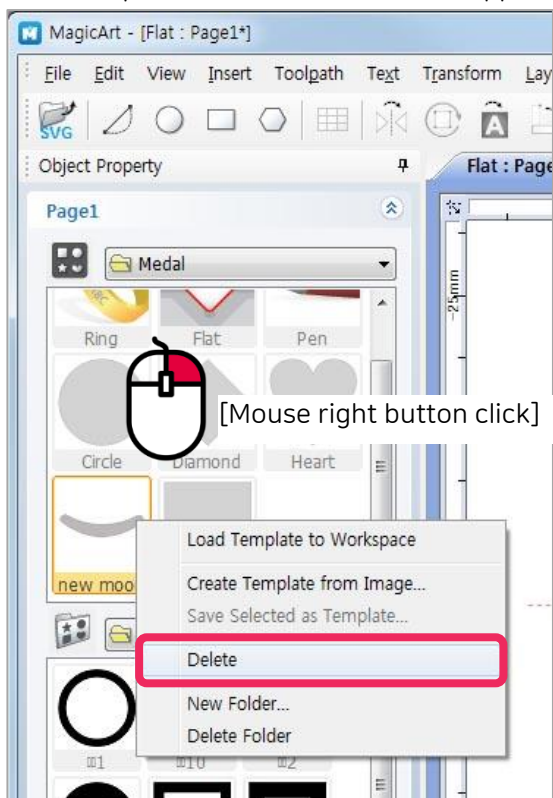
Check "Save" to save the loaded image as a template for later use and enter a name for the template.

Click "OK" button to load the image as a template. If "Save" is checked, and the template name is given, the loaded image will be saved as a template in the template library simultaneously.




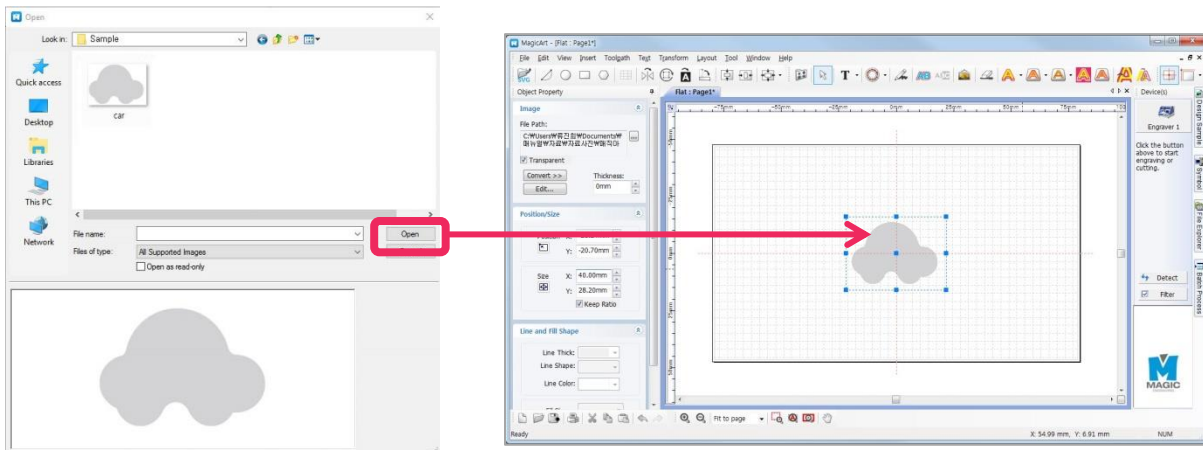


* Right-click in the template category window for more template related features. The template can be deleted by "Delete" on the menu that appears by right-click in template list window.

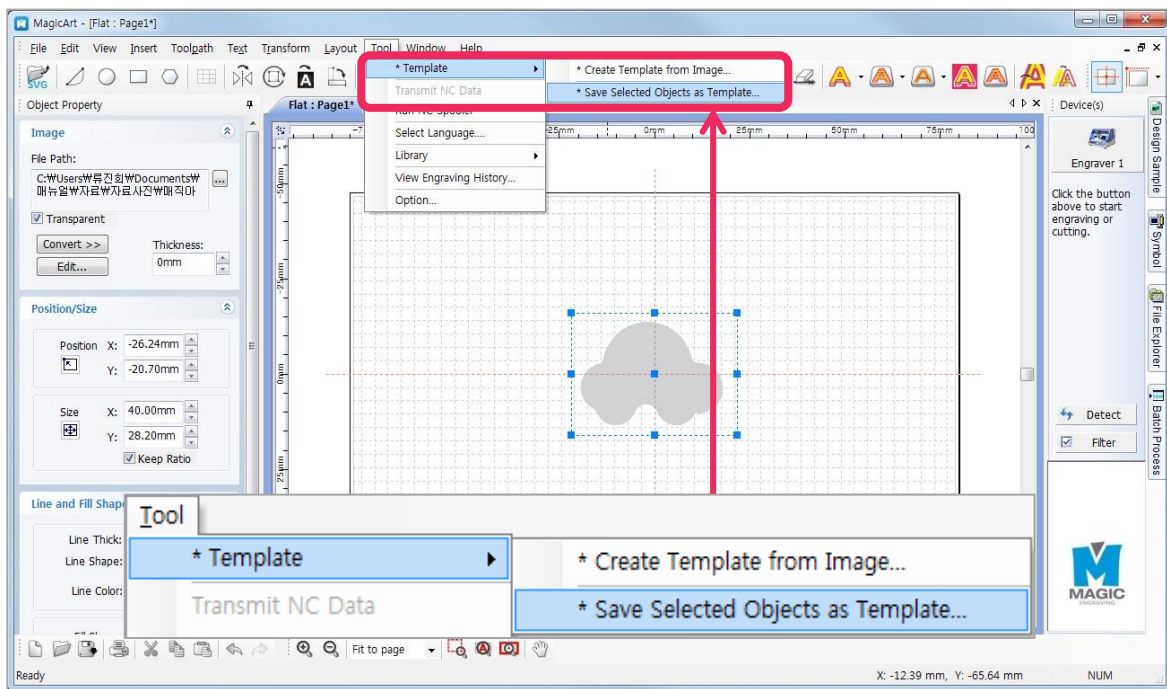


[Creating template #2]

1. Press  [Image] button to import an image.



2. Select Tool menu → Template → Save Selected Object as Template.
Type a name of new template on "Input" window.



Input

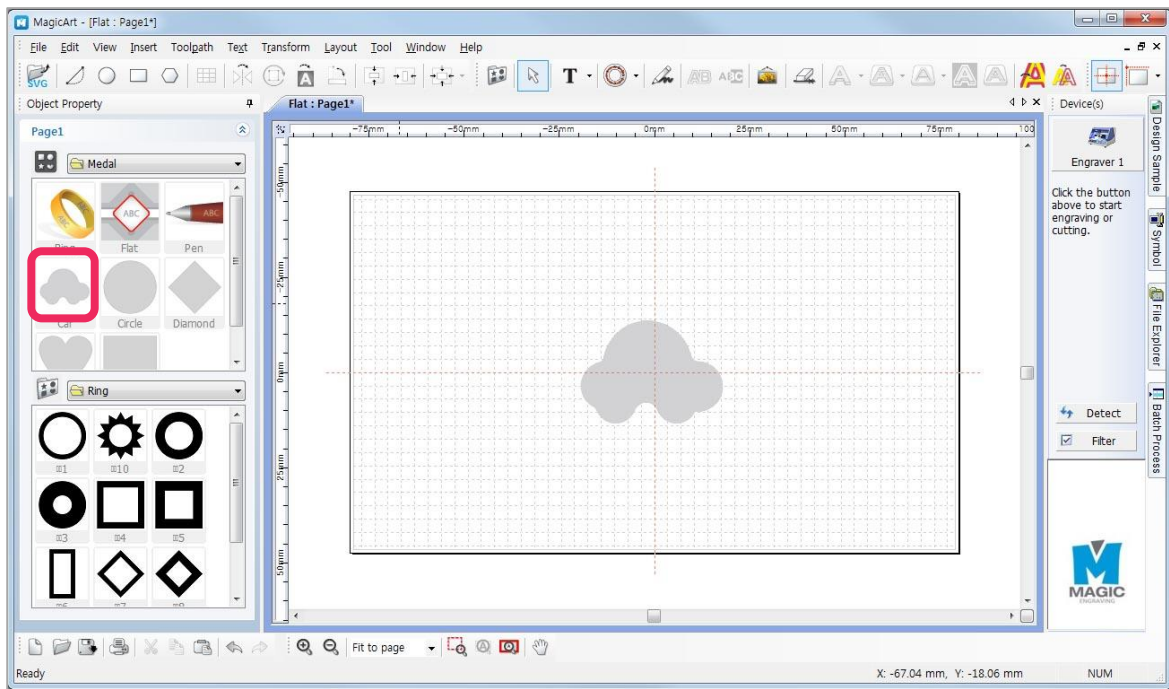
Input name.

Car

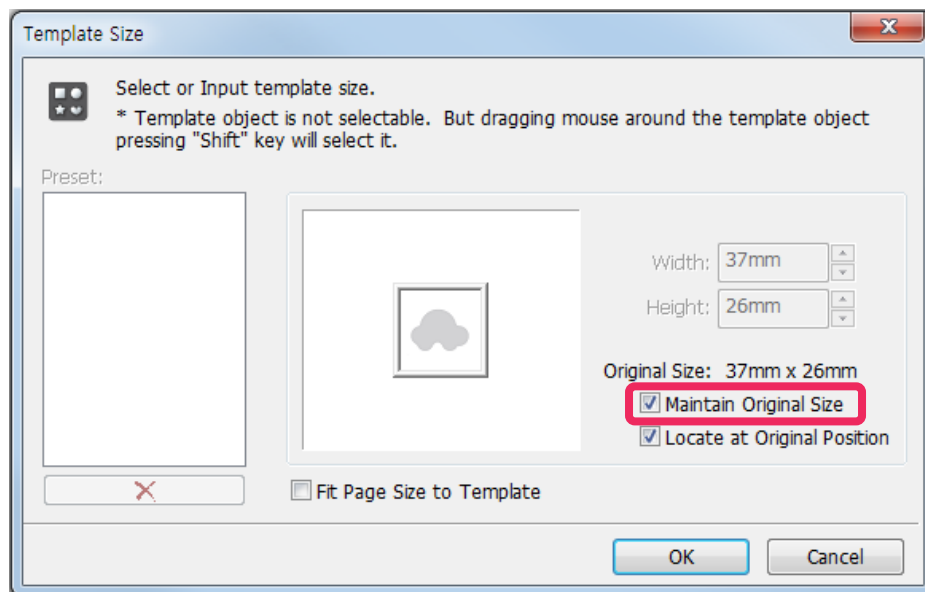
OK

Cancel

3. The saved template is added in the template library.



The template saved in the "Save Selected Object as Template" menu is saved as designated size to the screen. When loading the template, check "Maintain Original Size", then the template will be loaded with the original size designated when saving the template.

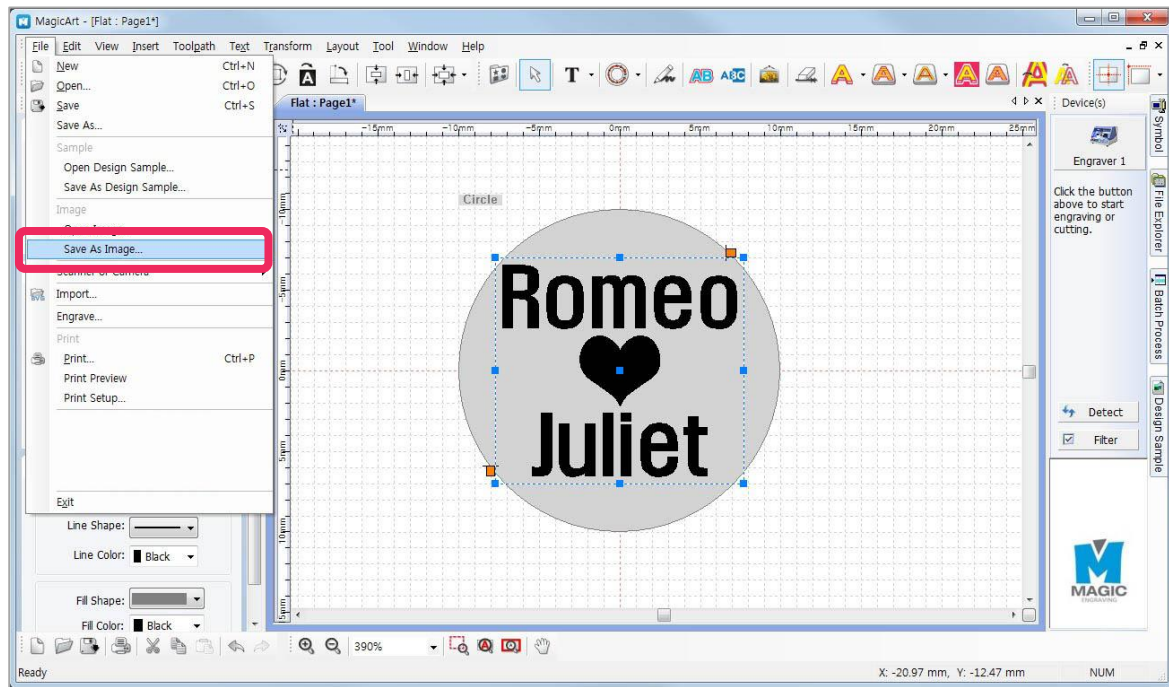


Saving as Design Sample

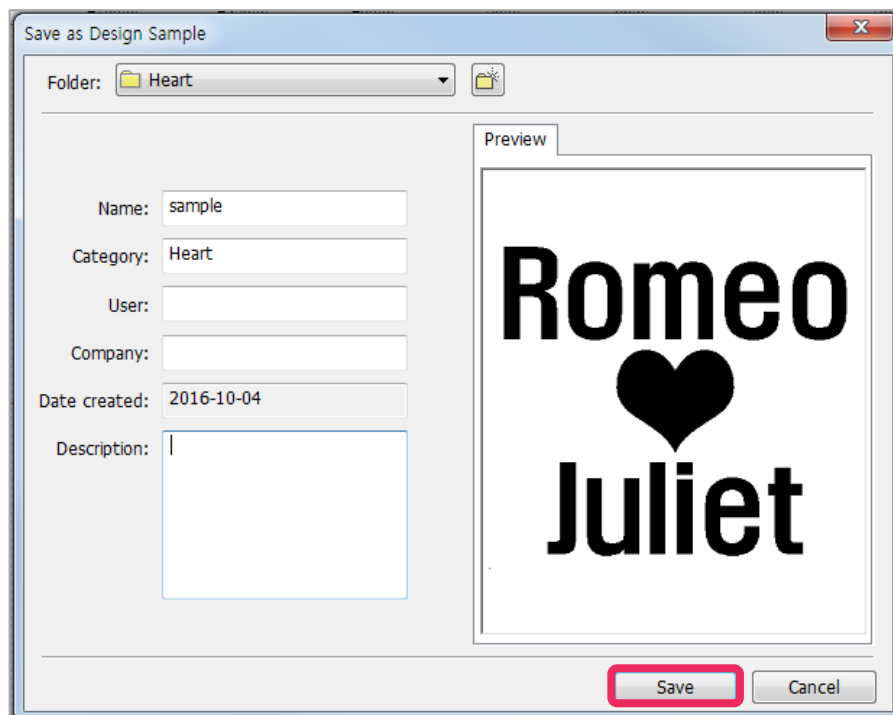
Edited contents can be saved as design sample for easier access to the design.

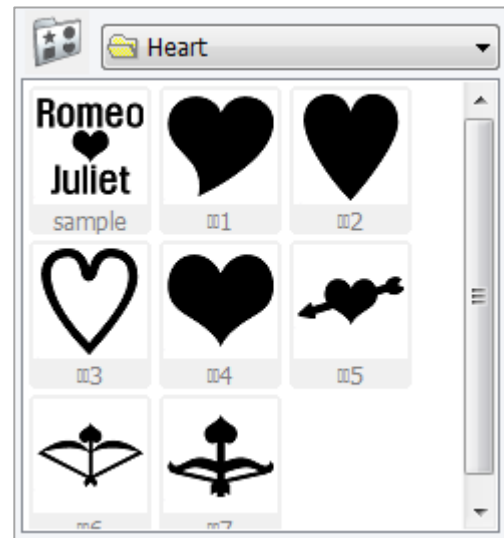
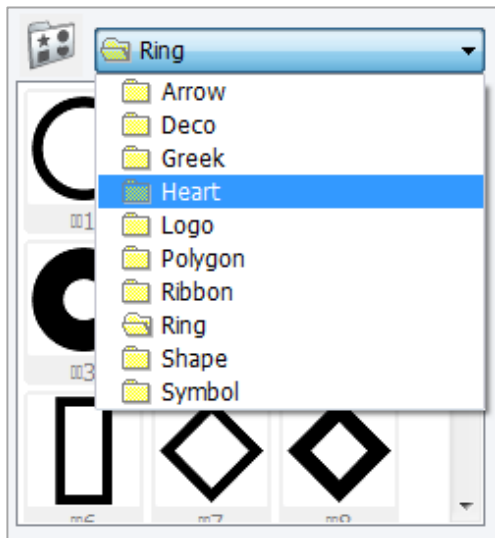
[Saving as design sample #1]

1. Edit contents and select the objects.



2. Click File menu → Save as Design Sample and select a folder or create new folder. Enter the name and click "Save" button to save it.

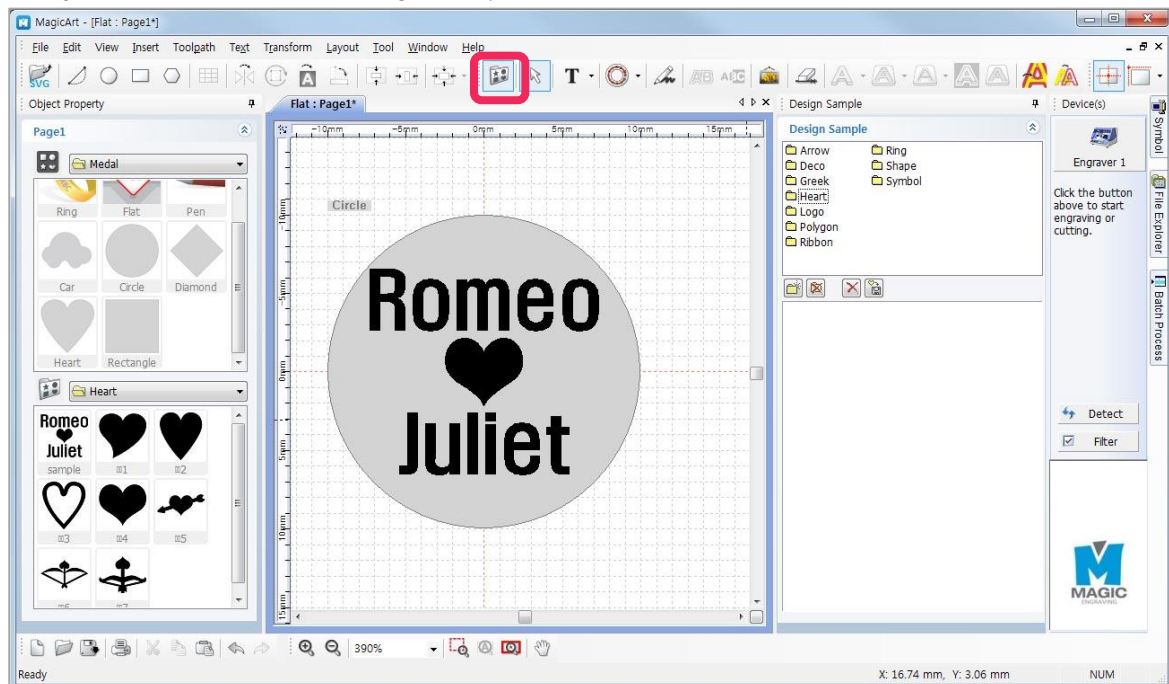




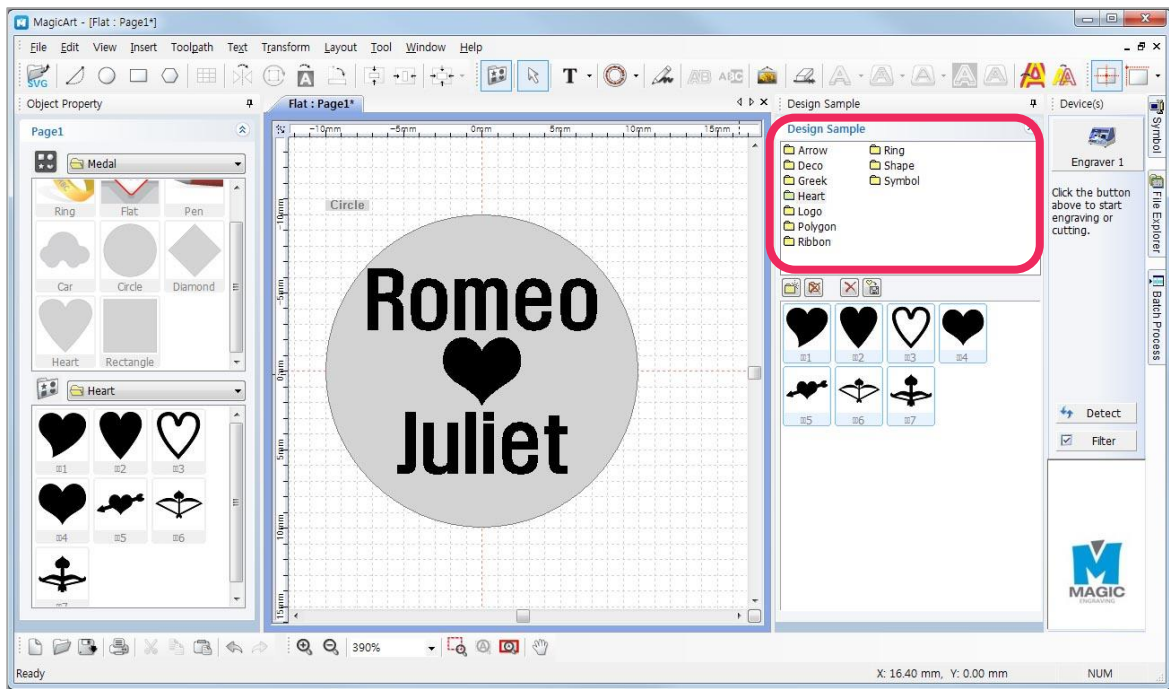
[Saving as design sample #2]




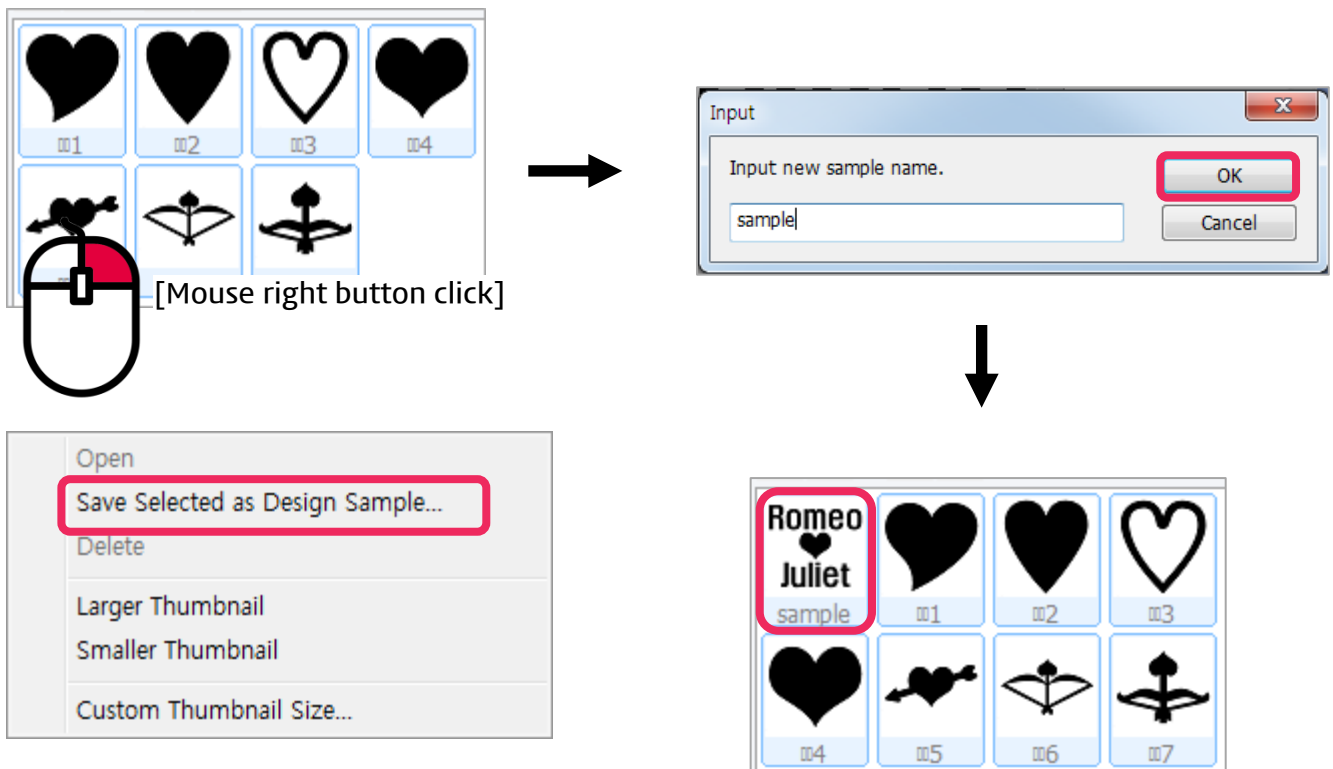
1. Select objects, and click [Design Sample] button.



2. Select a folder to save the objects from design sample library window.



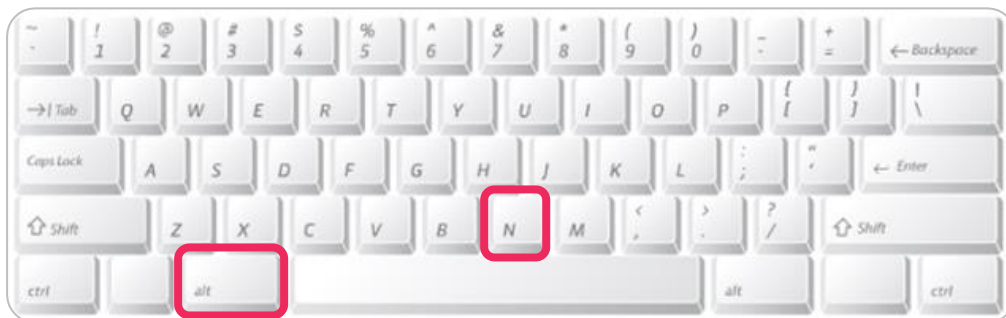
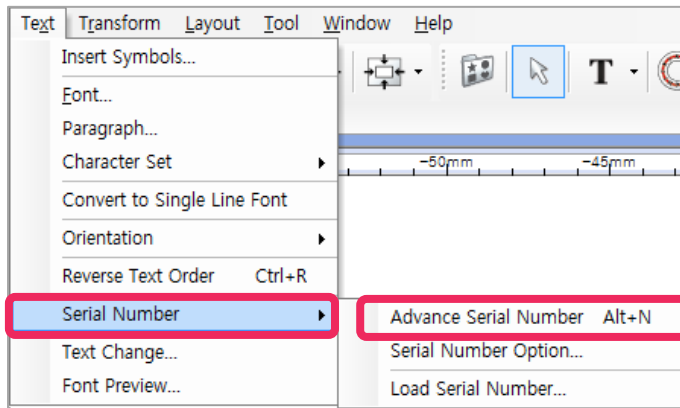
3. Click  [Save selected image as sample] or right-click the design sample image, and click "Save Selected as Design Sample" menu.
Enter the name to be saved, and click "OK" button to save it in the design sample library.



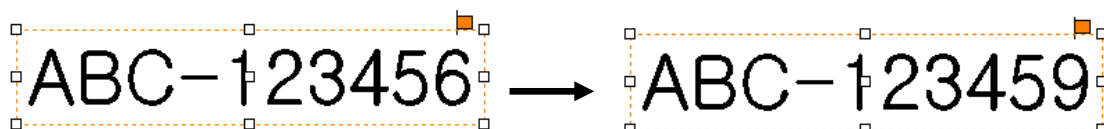
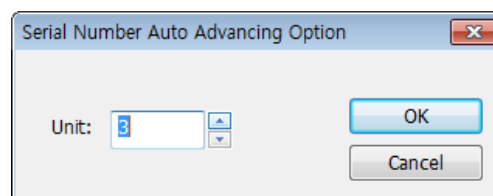
Auto Change of Serial Number

Use this function when changing numbers by certain unit.

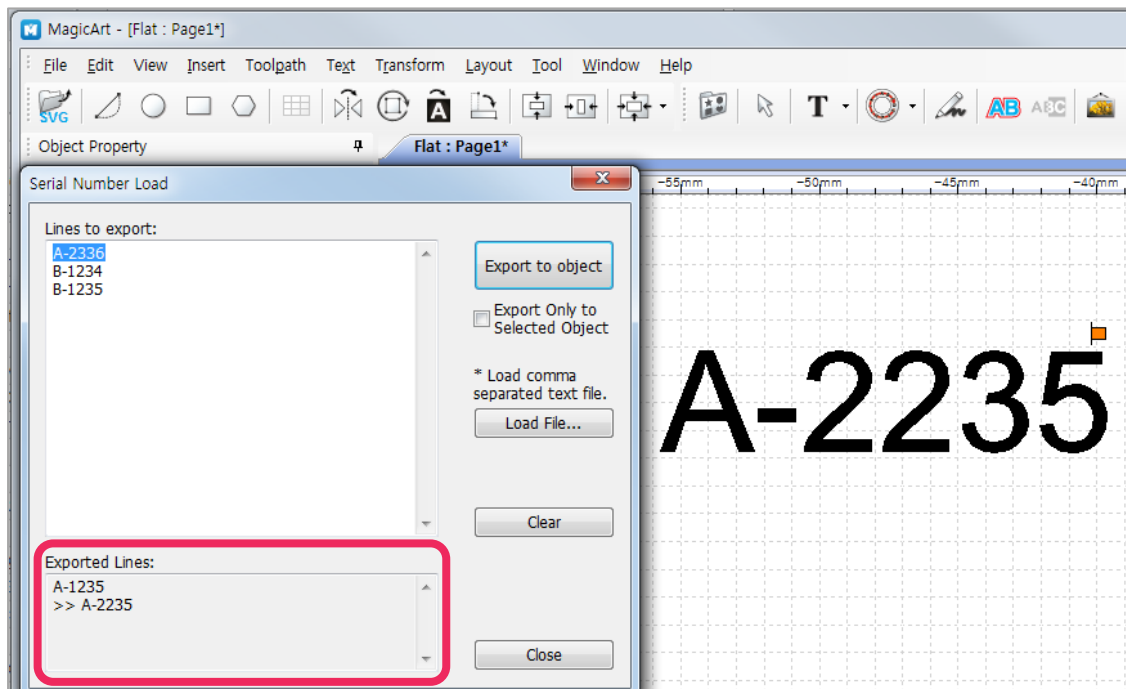
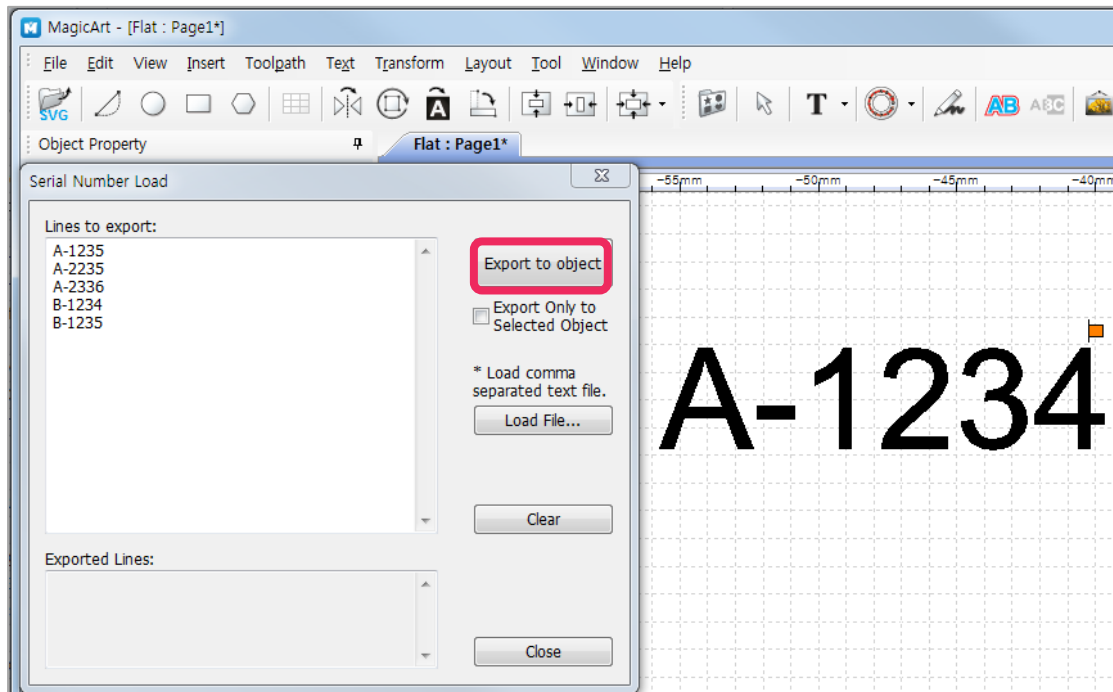
1. Edit the font and size of text object with number, and press "Alt+N" key on a keyboard, or select Text menu → Serial Number → Advance Serial Number to change the number automatically.



2. Select Text menu → Serial Number → Serial Number Option and enter a unit from the "Serial Number Auto Advancing Option" to change the serial number by the designated unit automatically.



3. If the serial number is not regular, then select Text menu → Serial Number → Load Serial Number. Enter serial number in the “Lines to export” field or click “Load File” button to load it from a file (.txt or .csv file format).
Once serial numbers are loaded, click “Export to object” button. The text on the selected text object is automatically changed, and the serial number is deleted from the list. The deleted numbers will be shown in the “Exported Lines”.





Serial numbers can be loaded from comma separated values file (.csv) or text file (.txt). Each row of the file is recognized as one serial number, and the contents of each row separated by comma are shown in the next line.

Lines to export:
A-1234



A-1234

Lines to export:
A-1234,Part NO



A-1234
Part NO


Loading and Editing Image

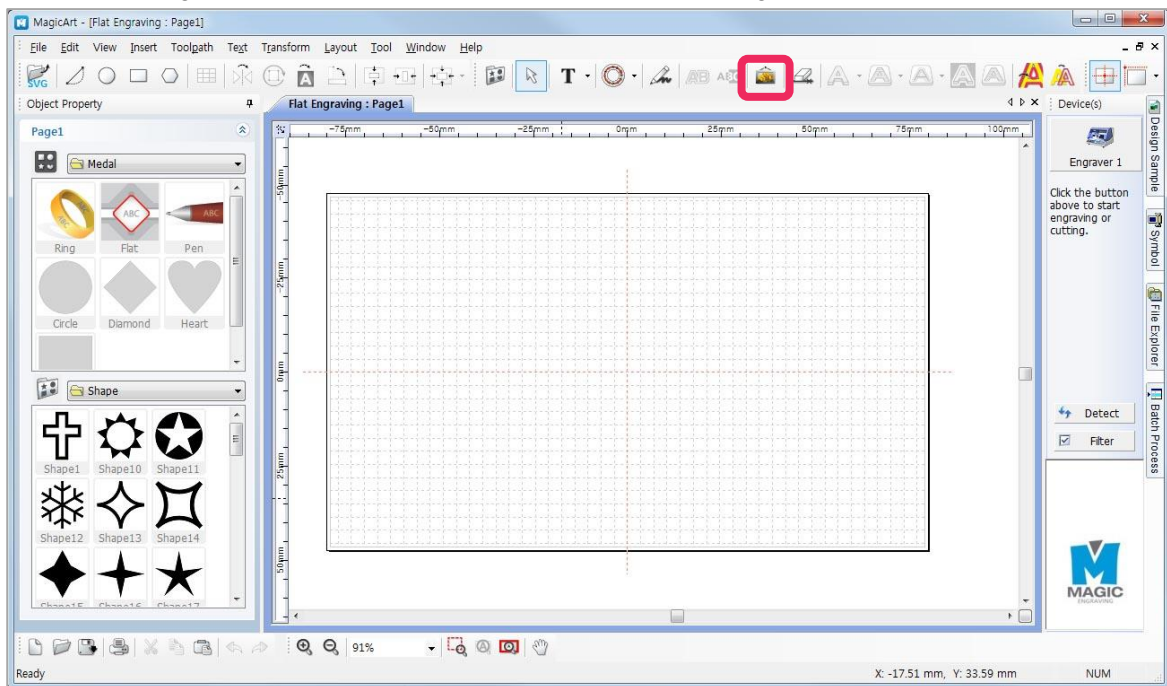
1. Loading an image

This program provides a function to load various types of image files. Supported image file types are as follows.

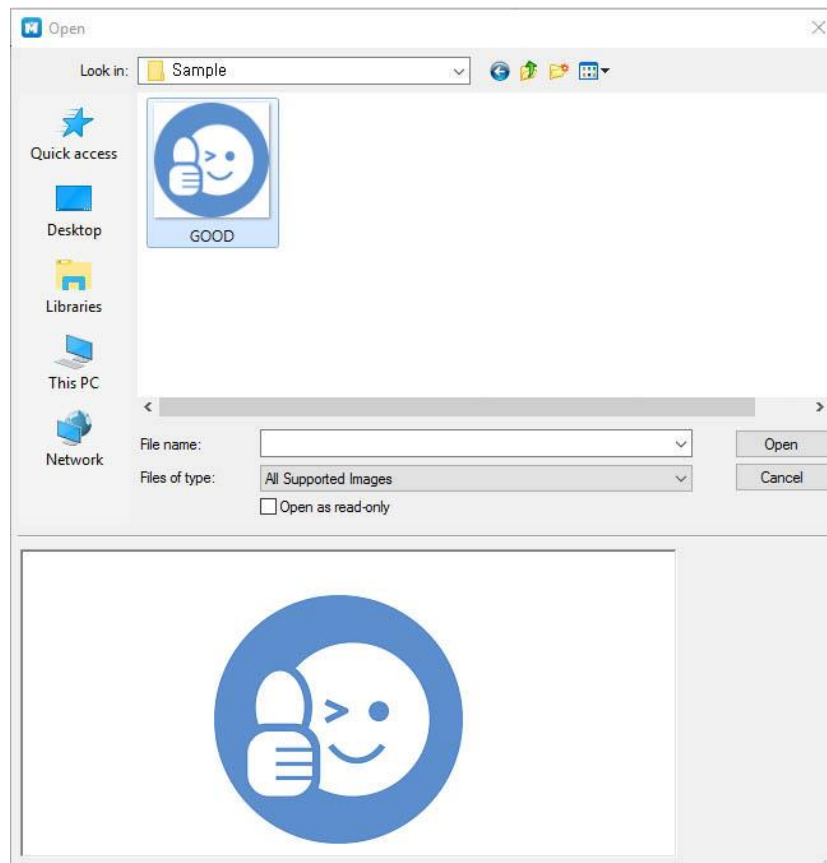
BMP	Windows or OS/2's bitmap graphic file
GIF	CompuServe graphic file
JPG/JPEG	JPEG bitmap graphic file
PNG	Portable Network Graphics bitmap graphic file
PCX	Z Soft PC paintbrush bitmap file
TIF/TIFF	Tagged Image File Format bitmap file
WMF	Windows meta file

Image file can be loaded by following method.

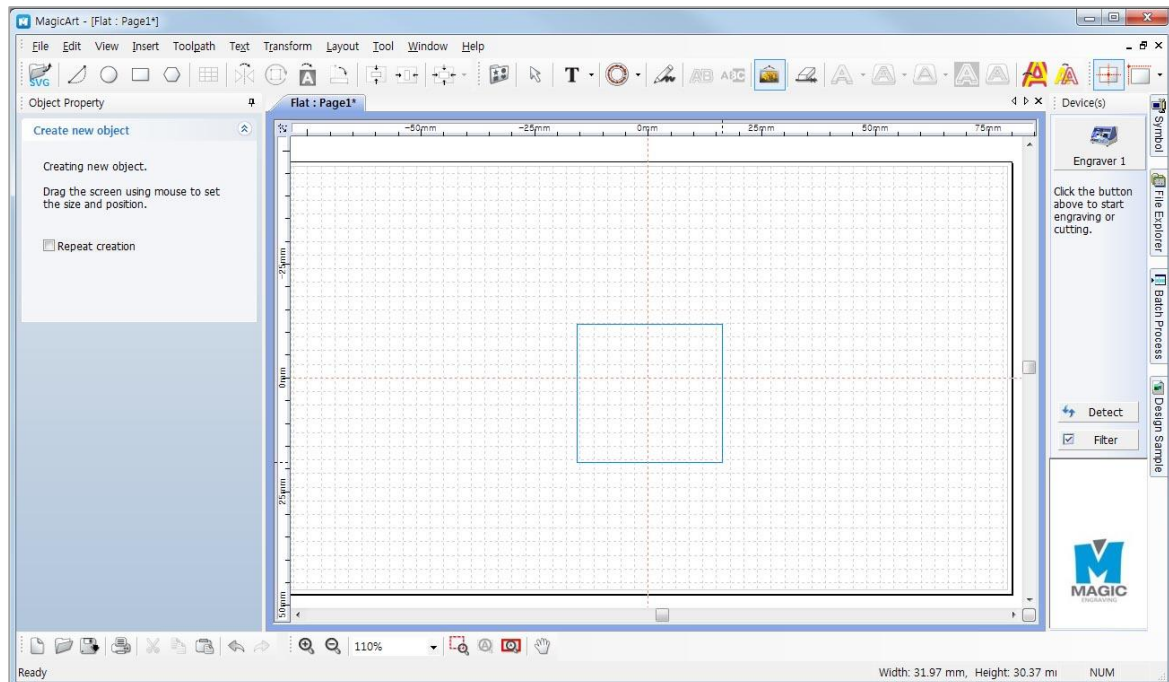
1. Select  [Image] on the toolbar or select Insert menu → Image.

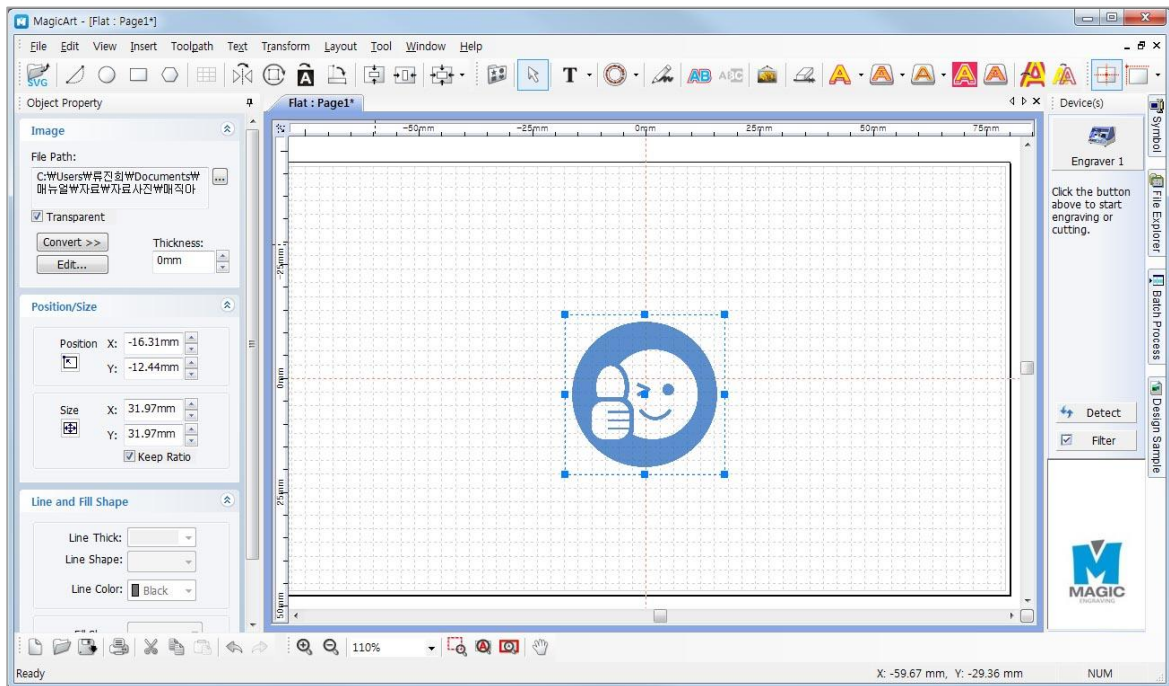


2. When "Open" window appears as the figure below, select the image to be loaded, and click "Open" button.



3. Drag the work area with the mouse to load the image by desired size.



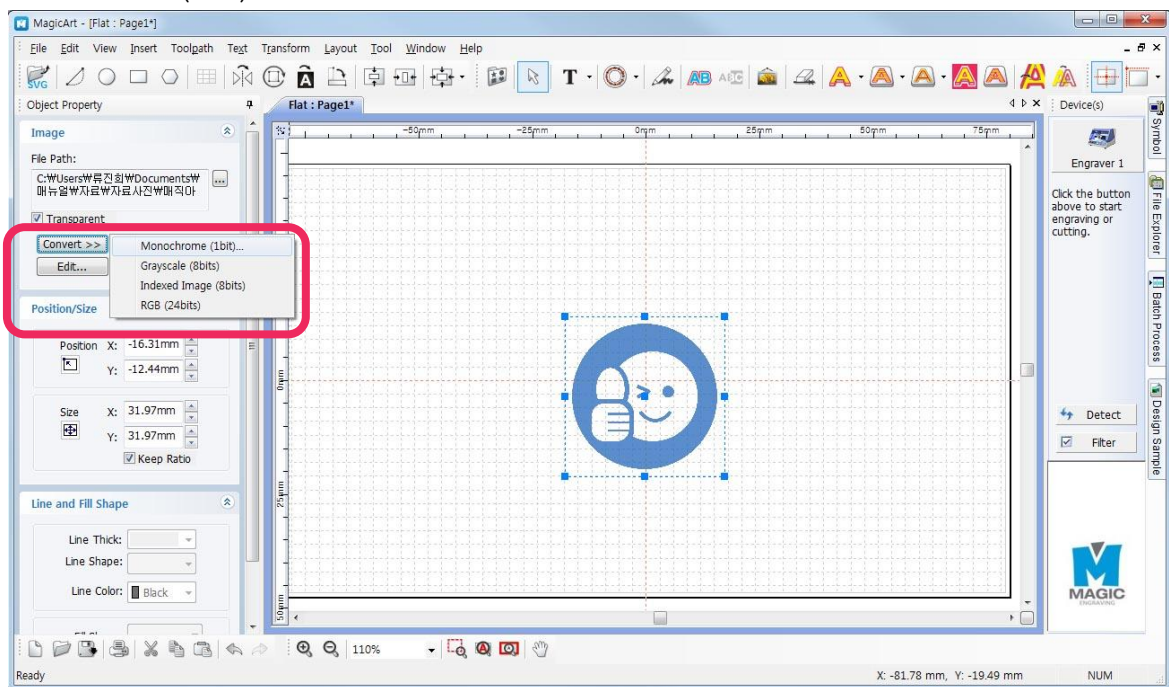


2. Converting and editing image

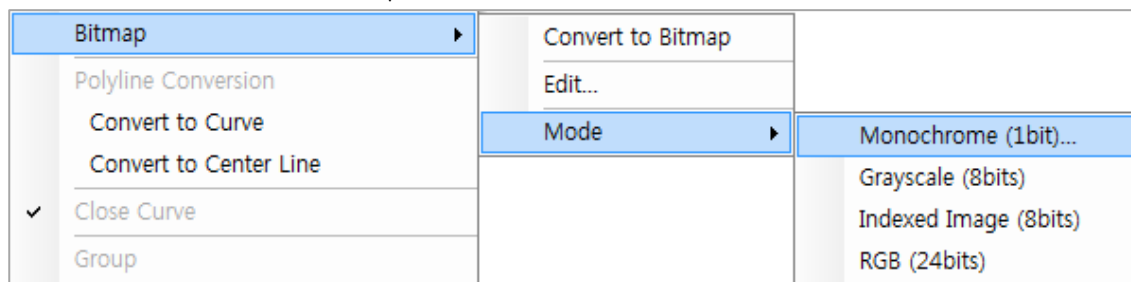
Only single color image can be engraved. Since multiple color images cannot be engraved by product, it should be converted to single color (1 bit) image.

[Converting to single color image]

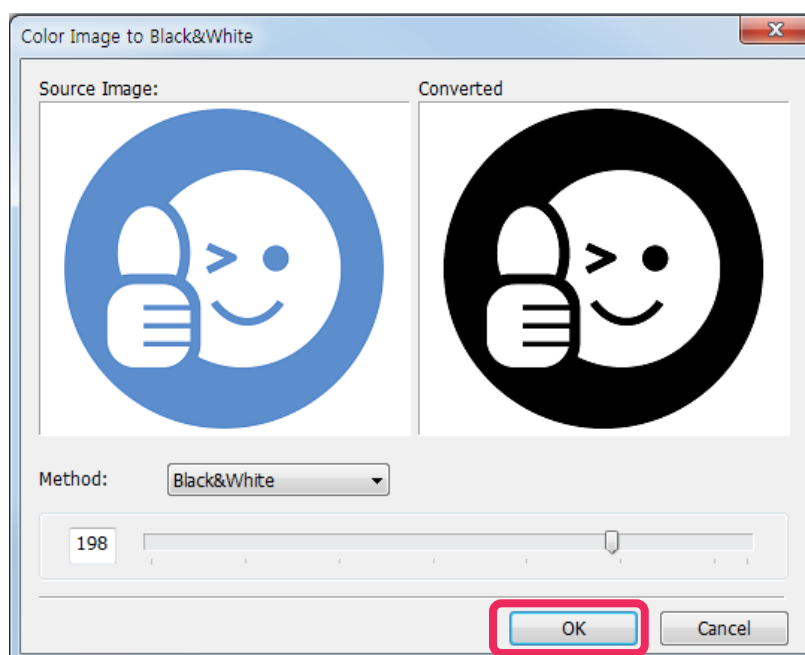
1. Select the image object you want to convert, and click "Convert" button in the image object window and select "Monochrome (1bit)."



Or select the Transform menu → Bitmap → Mode → Monochrome (1bit).



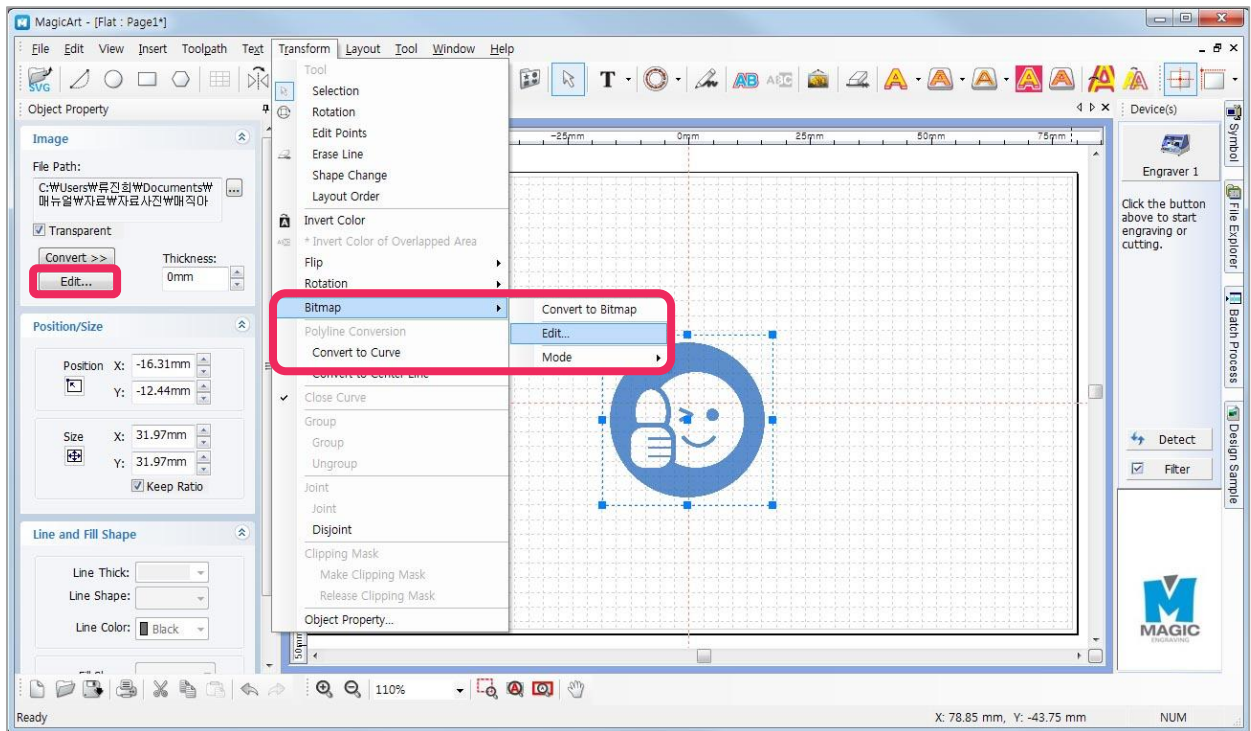
2. "Color Image to Black & White" window appears as below. Adjust the slider to change it to the most suitable single color, and click "OK" button.



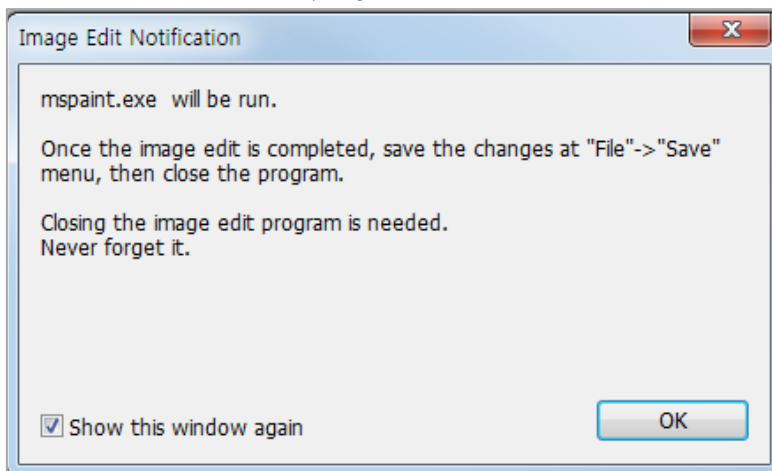
[Editing image]

Loaded image can be edited by "Paint" program in Windows.

Select the image object to be edited, right-click it to select "Edit" or select Transform menu → Bitmap → Edit.



Click [OK] to run Windows Paint program.



Then, Windows Paint program will show the image.

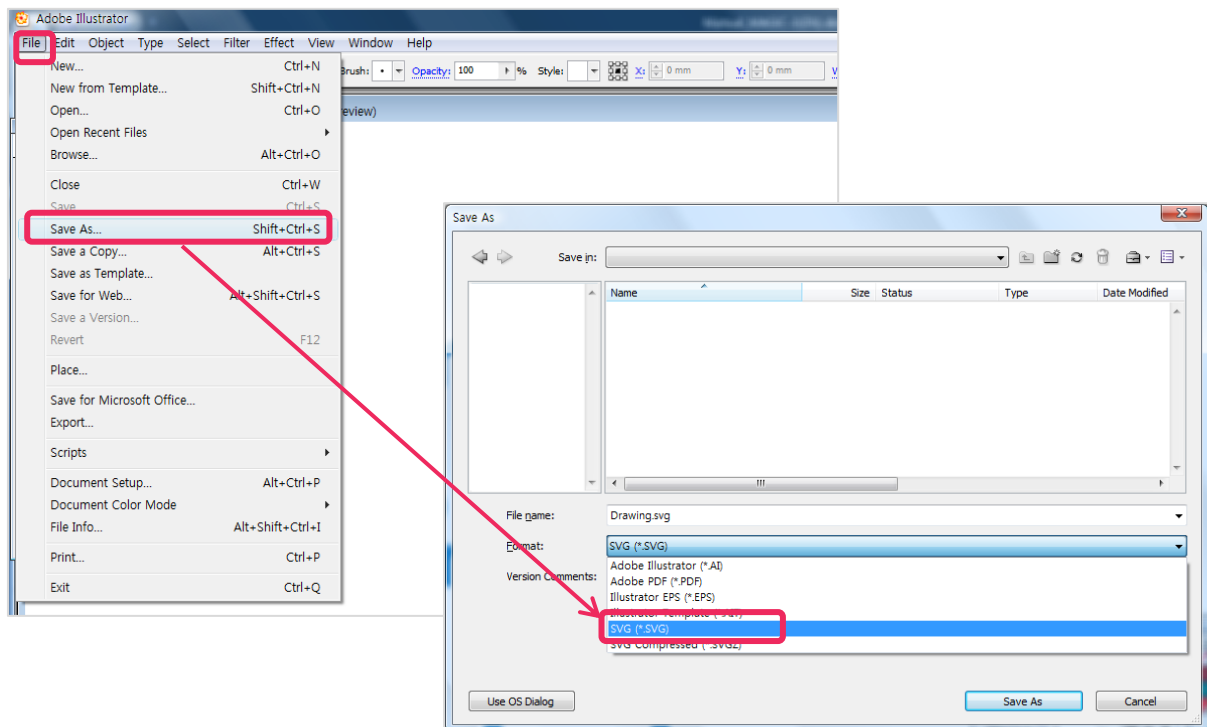
After editing the image, press "Save" from the File menu of Paint, and close the program to apply the edition.

Import a File in SVG Type

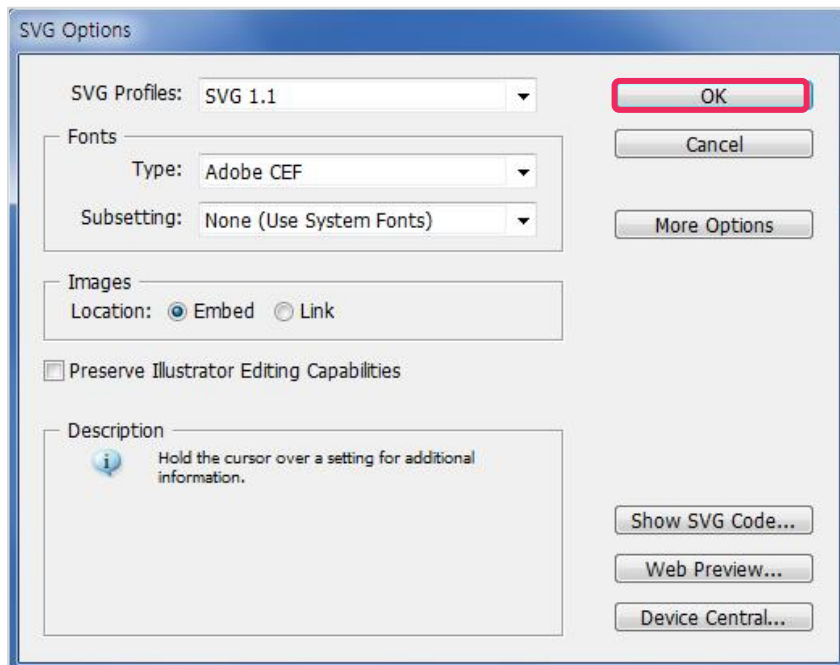
Loading vector graphic files such as SVG file is also supported.

The SVG file is created by various graphic programs such as Illustrator, CorelDraw and etc.

1. Select File menu → Save As from Illustrator program to save a file in SVG type.

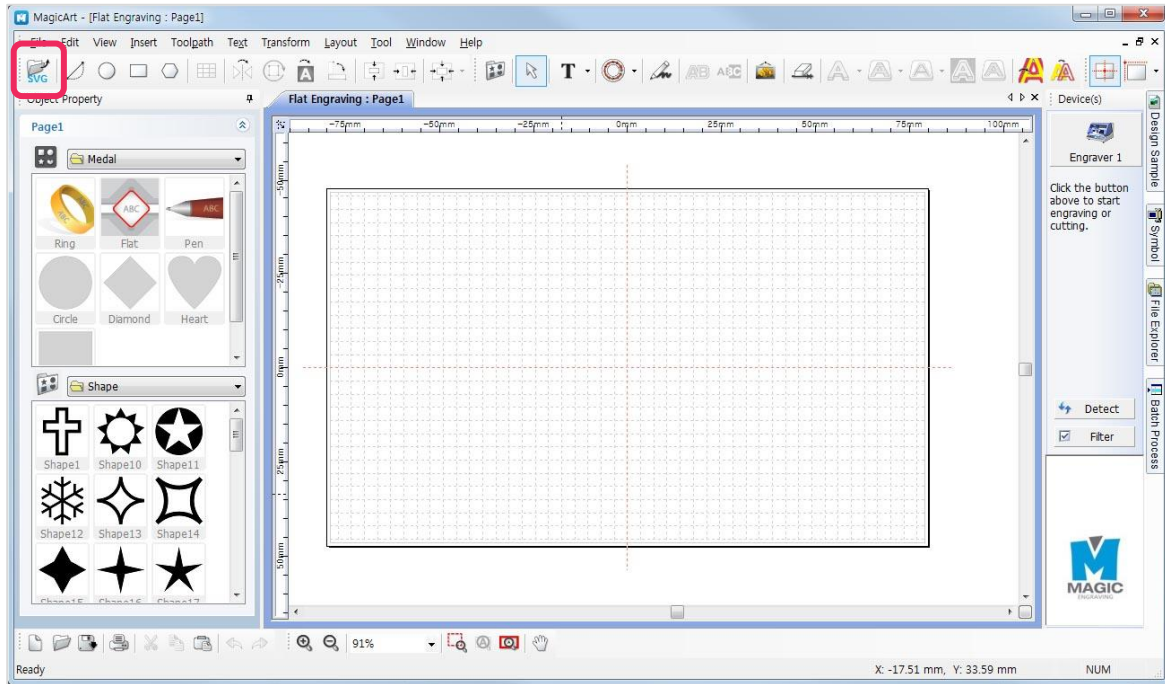


2. SVG option window appears. Press "OK" button to complete the save.

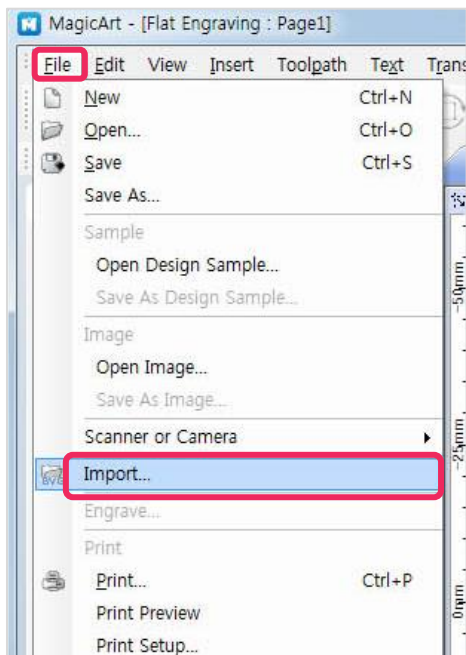




3. Click **SVG** button to load the SVG file.



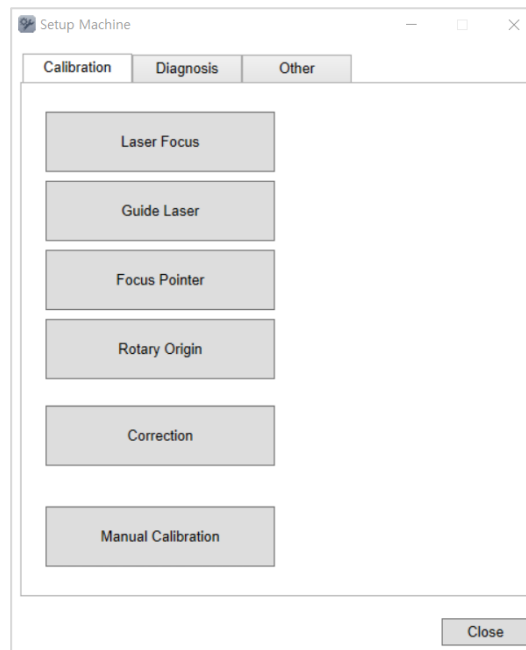
4. Or select File menu → Import to import a file.



Product Setting

- ※ The product is being released in default setting. Please contact the customer service center before changing the setting.
- ※ Set the product in the following order: **Laser Focus Calibration - Guide Laser Calibration-Rotary Origin Calibration.**
- ※ An product setting program is separately provided. Start the program first to set the marking machine.
- ※ Calibrate a proper material according to the marking machine. The warranty shall not cover any damage resulting from the use of an improper material.

※ **Choose a metallic material.**

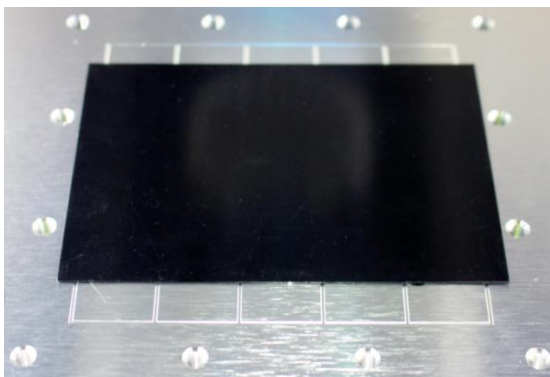


1. Laser Focus Calibration

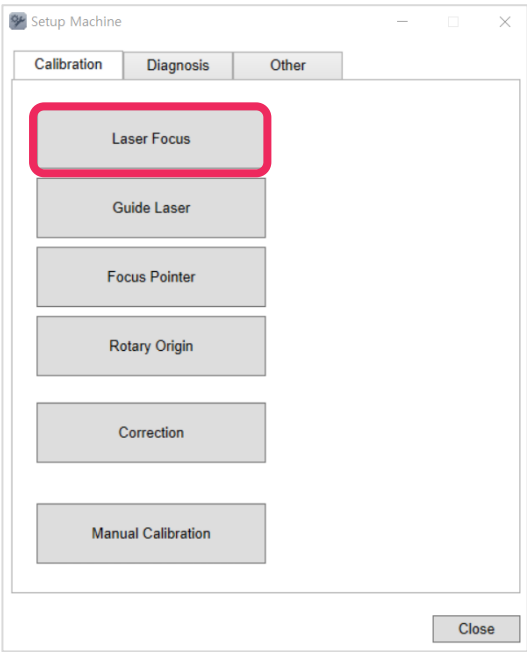
Calibrate the laser focus according to the height of a material and improve marking accuracy. It is divided into 4 stages. In each stage, the head moves according to the distance specified in the previous stage, and the moving interval shortens.

1. Switch on the machine.
2. Place a material (length: 80mm, width: 40mm) on the working area.

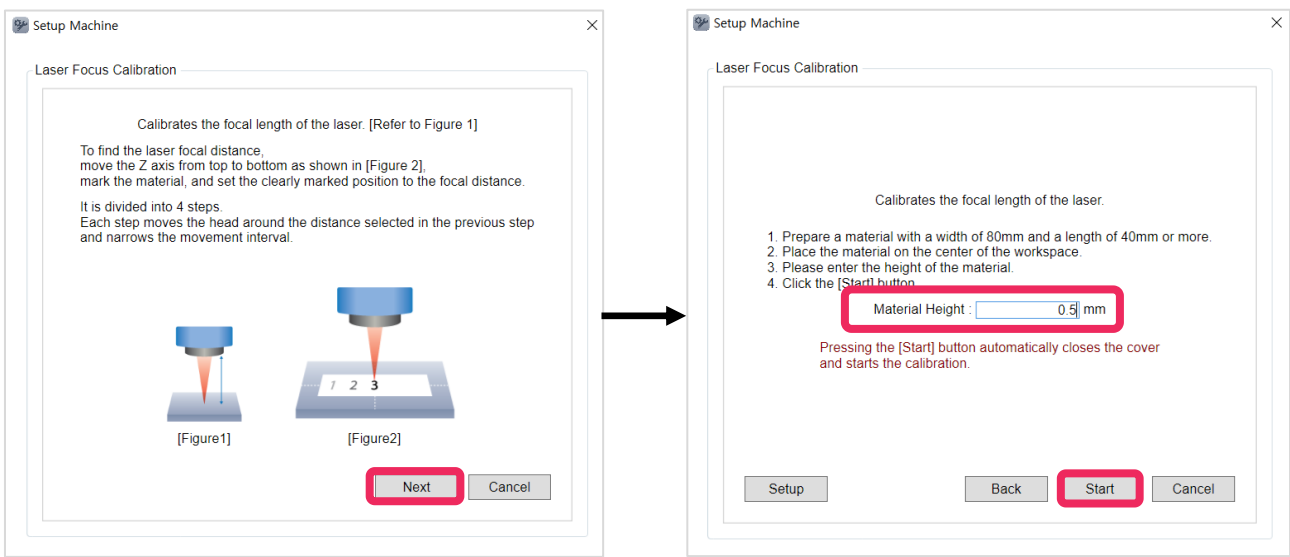
※ **Choose a metallic material.**



3. Click [Laser Focus] on the Product Setting.



4. After checking the message, click [Next]. Then, the laser focus calibration procedure appears. Enter the height of a material.



5. Check the warning message and click [Start].

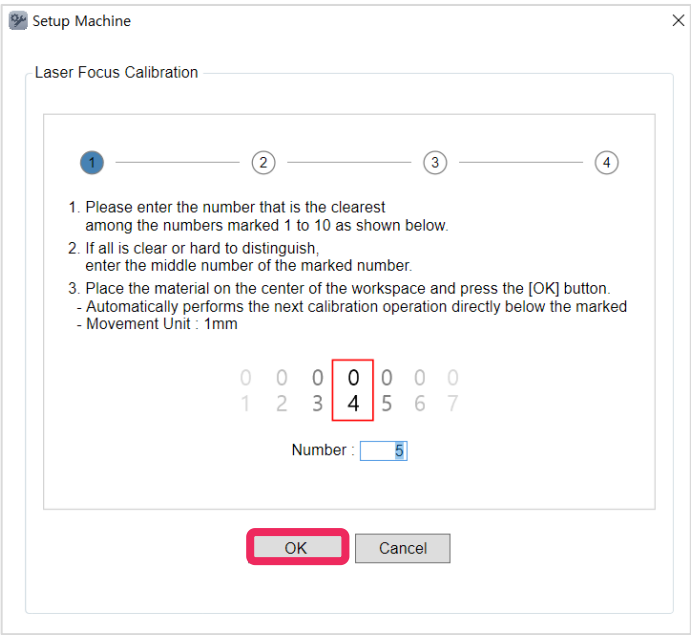


6. The numerals and circles are engraved on the fixed material.
The numerals range from '01' to '10'. However, the numerals actually engraved can differ depending on the laser focus.

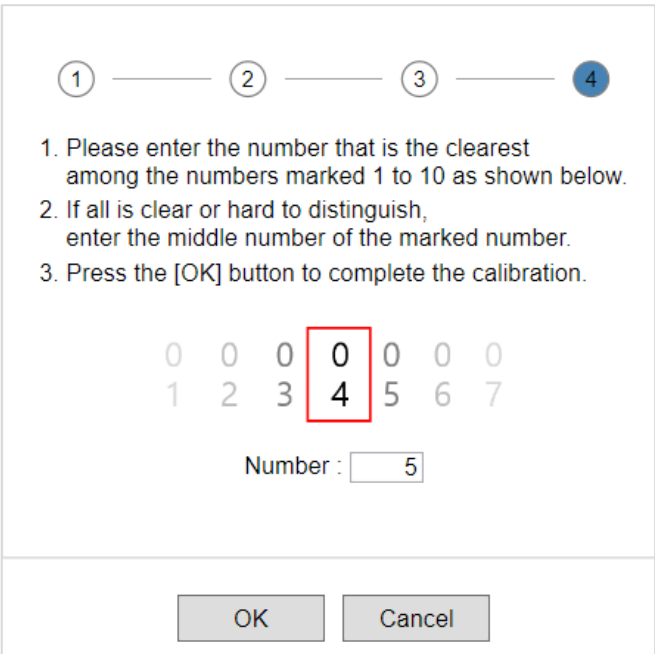


7. Enter the middle number among the engraved numerals on the Engrave Machine Setting page and click [OK].

※ E.g.) In this example, '5' is positioned in the middle. Therefore, '5' is entered.



8. Repeat the processes (Clauses 5-6) 4 times and finish the calibration with the laser focus-optimized options.

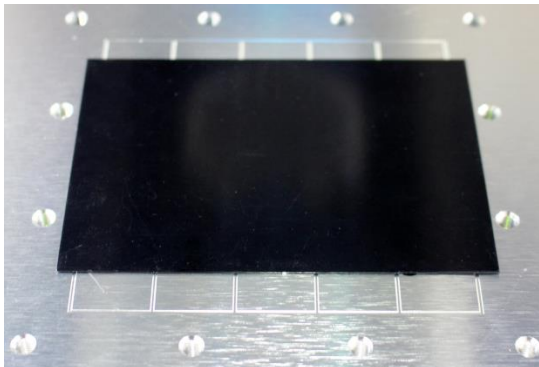


2. Guide Laser Calibration

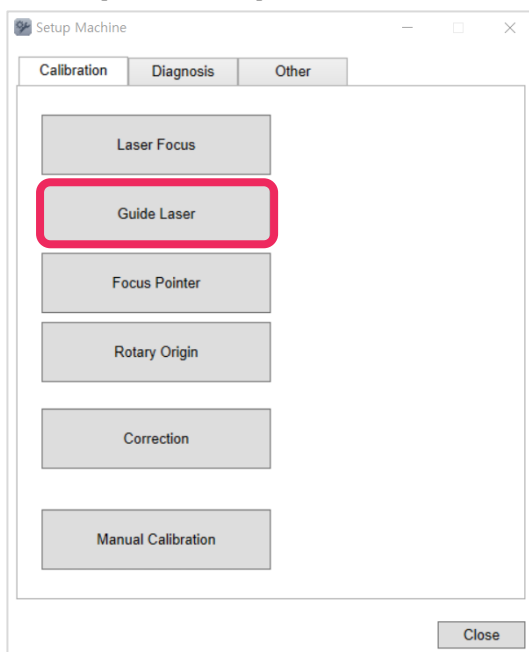
Calibrates the size and position of a guide laser.

1. Place a material on the working area.

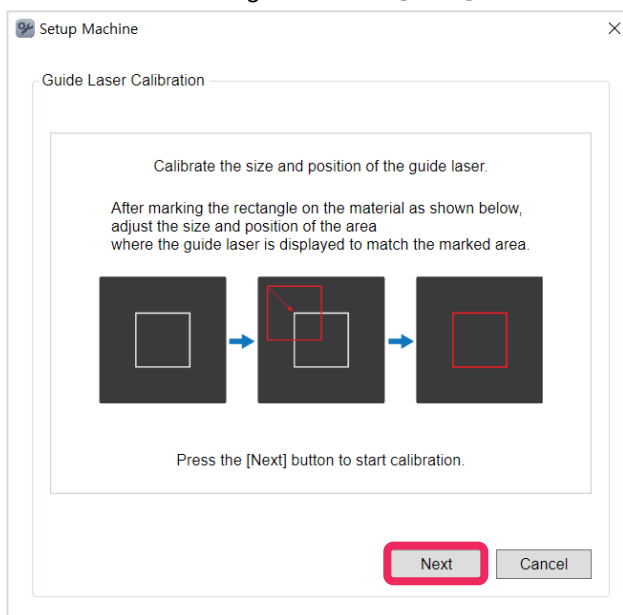
※ Use a metallic material.



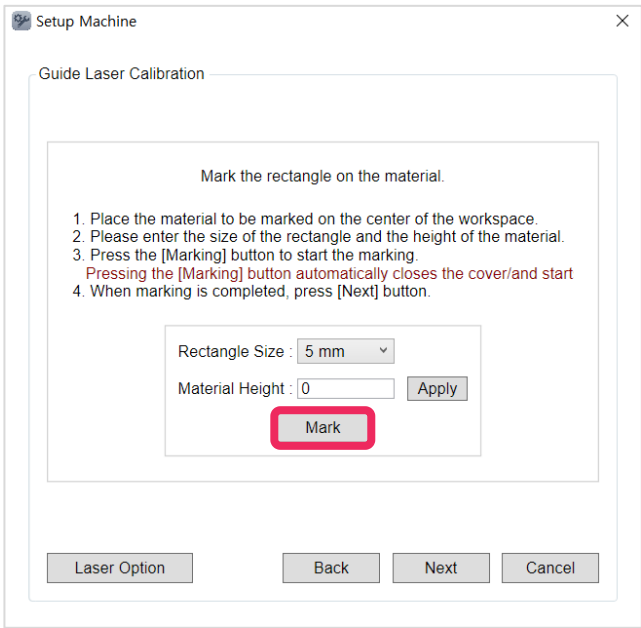
2. Click [Guide Laser] on the Product Setting.




3. Check the message and click [Next].

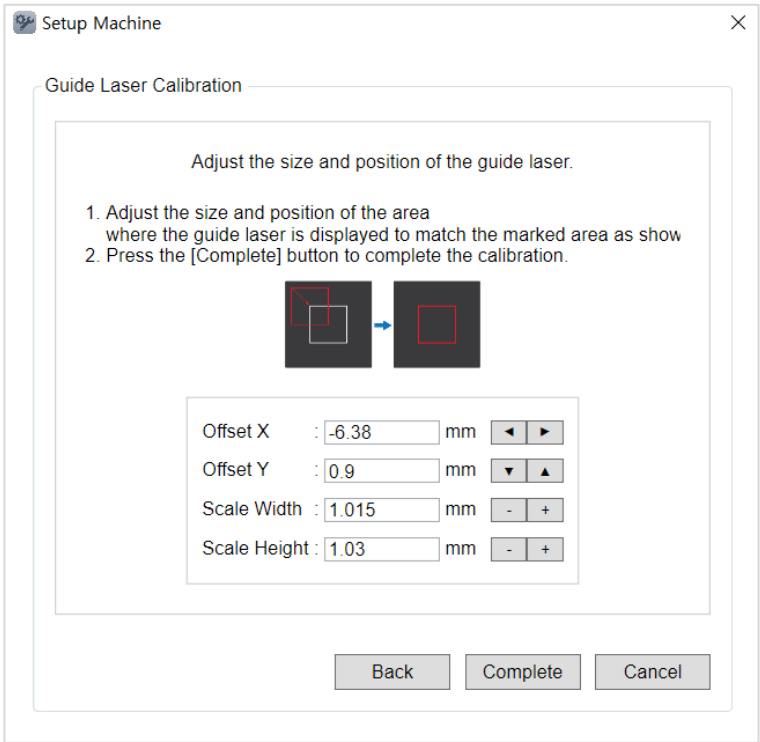


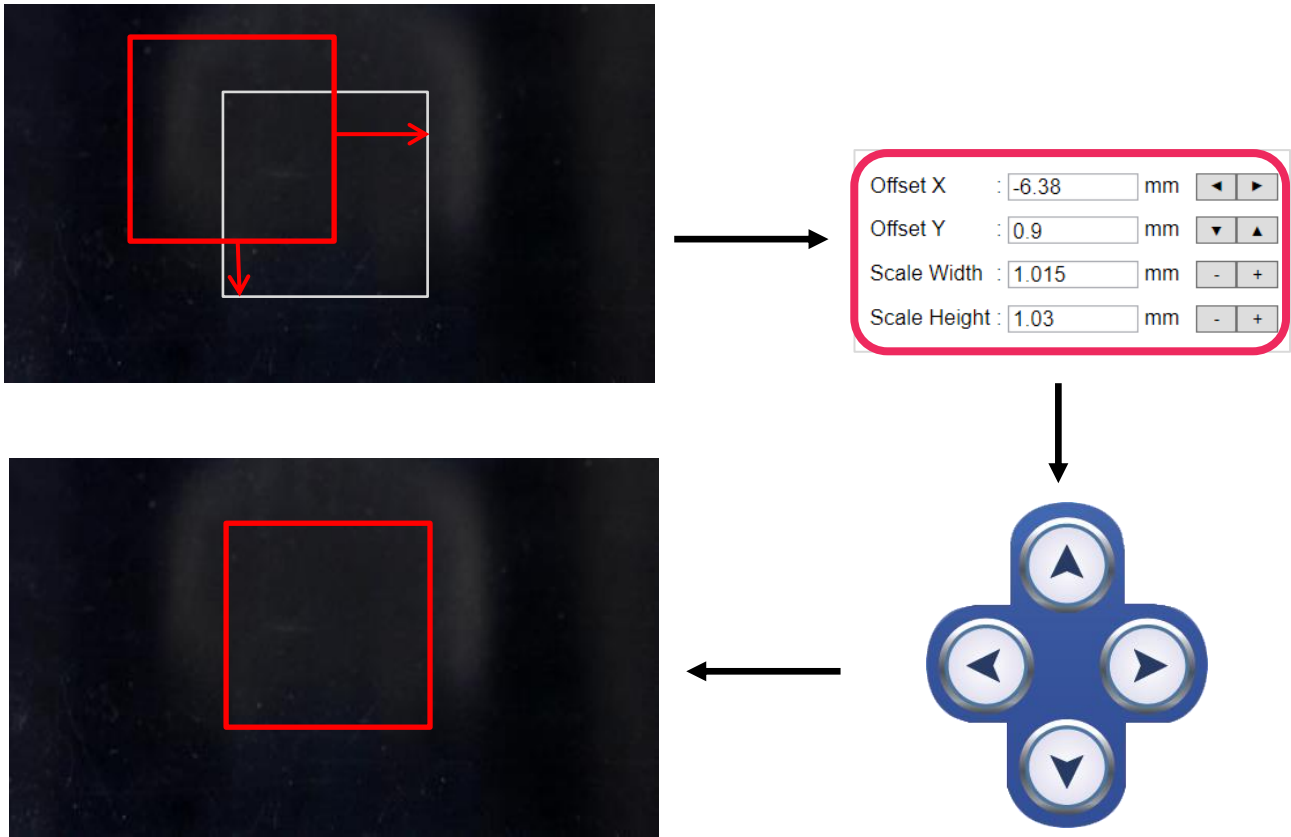
4. Set the size and height of a material (a rectangle to be marked) and click [Apply].
To mark the rectangle, click [Mark]. Then, the cover is automatically closed, and the rectangle is being engraved on the material.



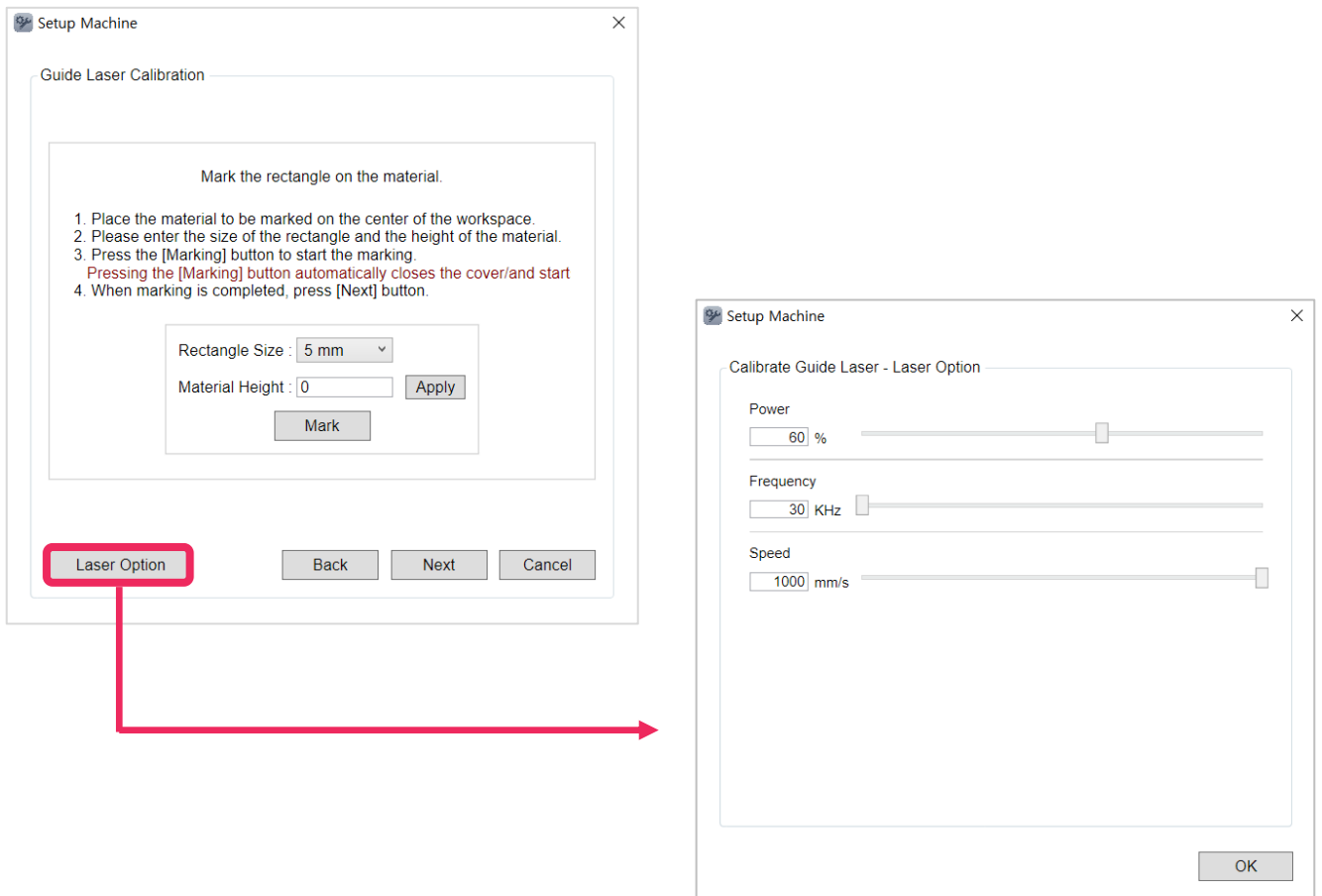
A 20mm rectangle is being engraved on the 0.5mm-high material.

4. Once a guide laser appears after the end of marking, adjust the offset values, width and height according to the rectangle in '2. Parameter Setting' and click [Apply]. Or, move it using the  buttons and click [START] long (1 second or longer) to end the calibration.





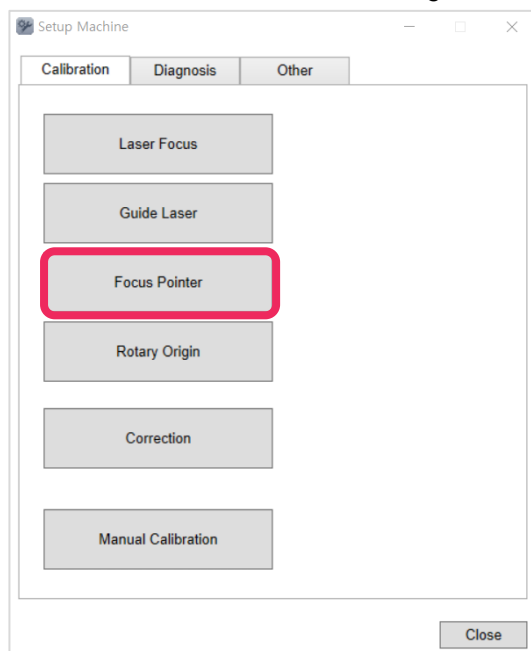
* Select the laser option on the Guide Laser page and adjust laser options.



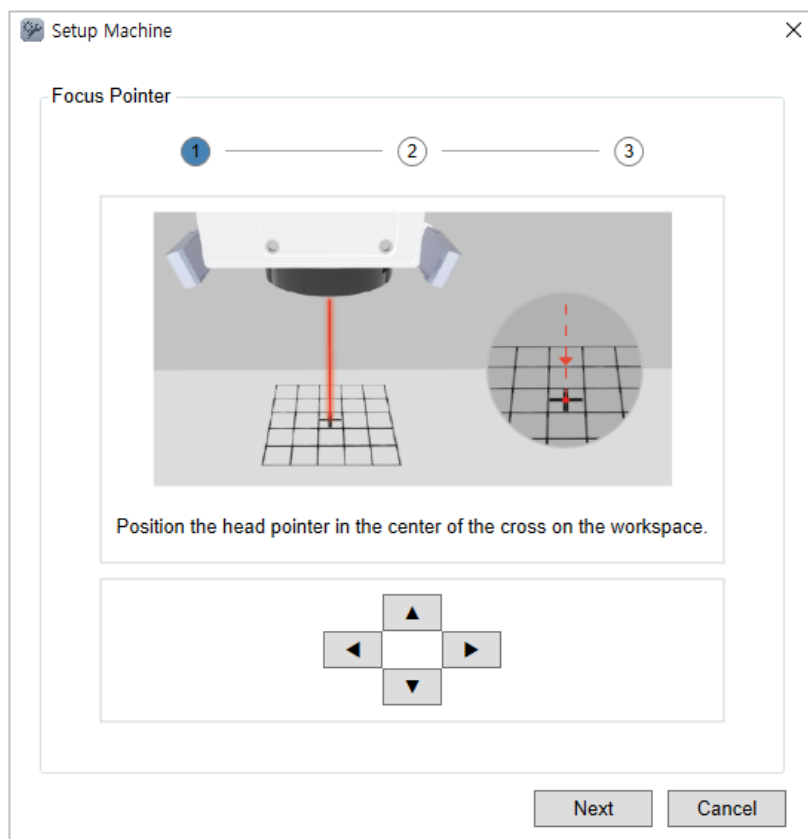
3. Focus Pointer

Set the position of the head laser pointer and V laser pointers.

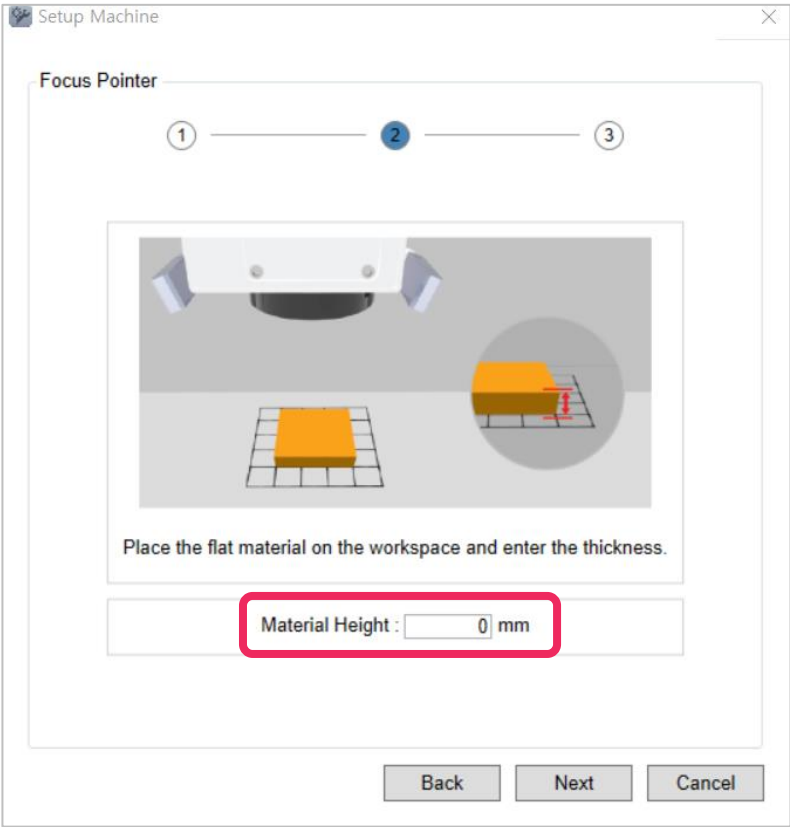
1. Select [Focus Pointer] in the Engraver Settings.



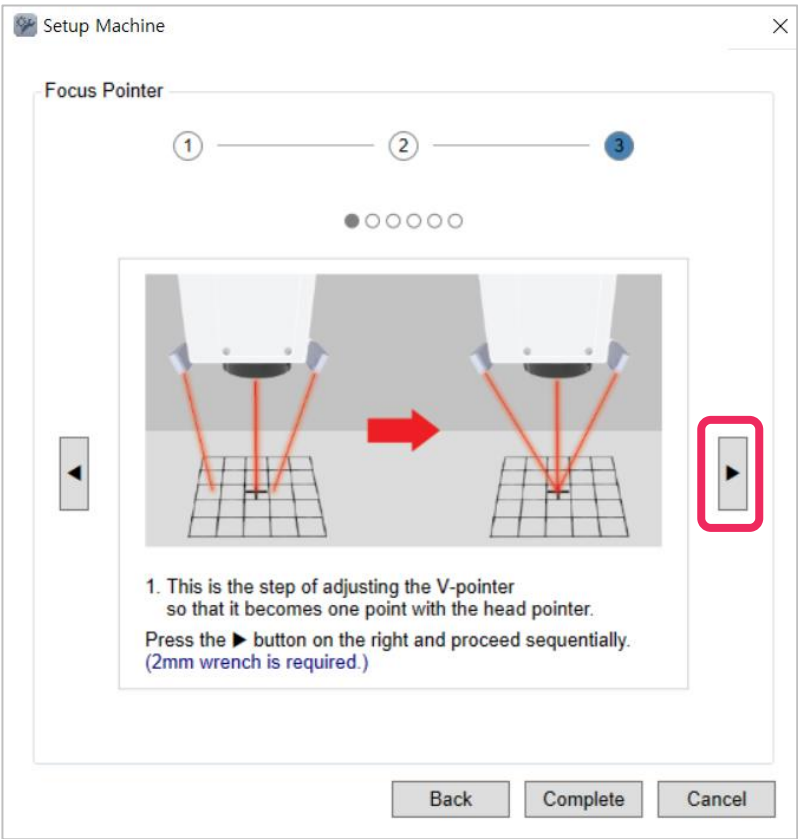
2. Adjust to make head pointer in the center of the cross on the workspace, using the arrow buttons. Then, click [Next].



3. Place the flat material on the workspace and enter the thickness. Then click [Next].

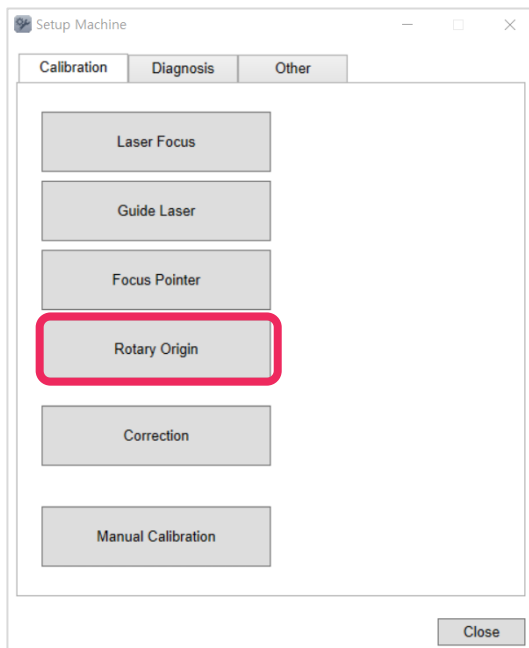


4. Press the ► button on the right and proceed sequentially. (2mm wrench is required.)
All step is 4 step, both pointer must proceed in the same way.

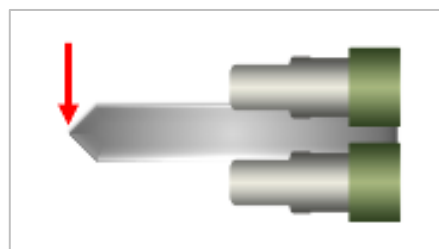
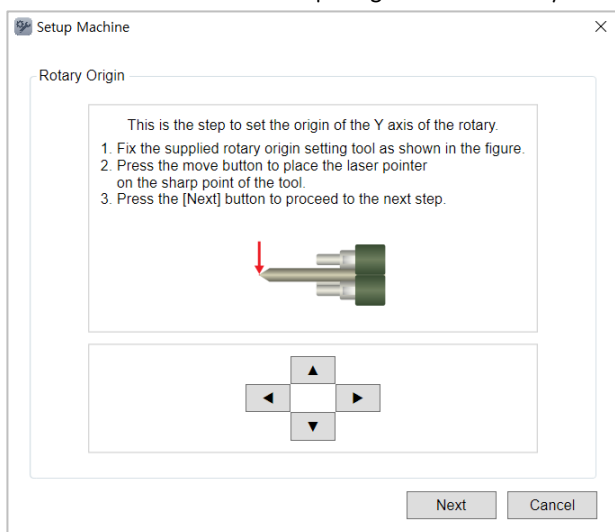





4. Rotary Origin

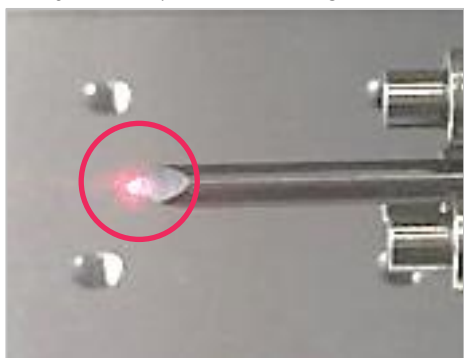
1. Fix the rotary clamp to the working area.
2. Click [Rotary Origin] on the Product Setting.



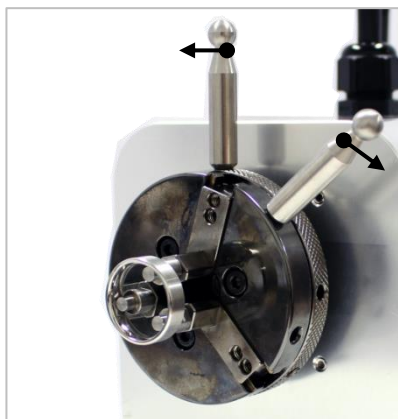
3. Fix the tool with a sharp edge to the rotary as described below:



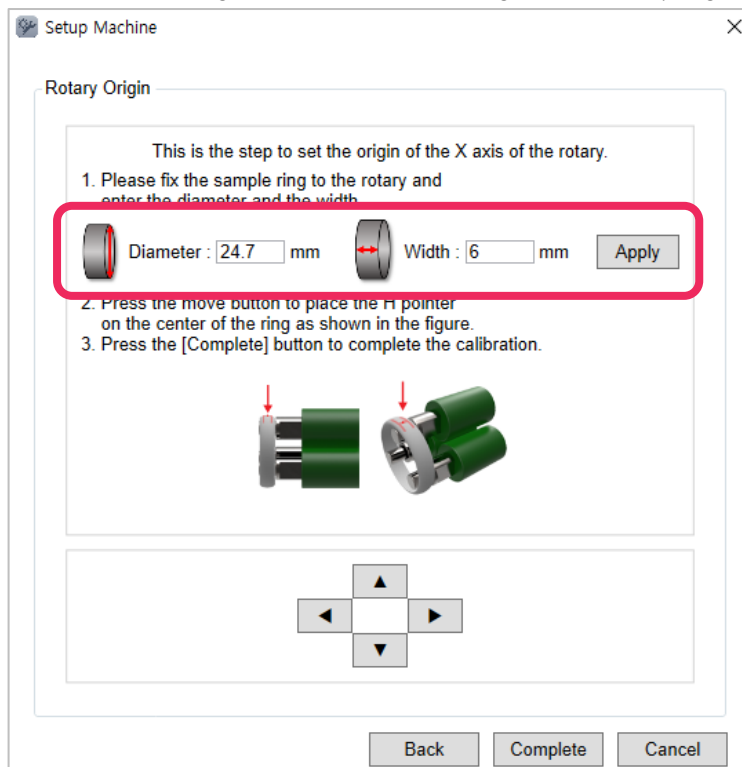
4. To position the laser pointer at the tip, adjust the product with the direction keys. Then, click [Next]. Or, adjust the position, using the   buttons and click  long (1 second or longer).



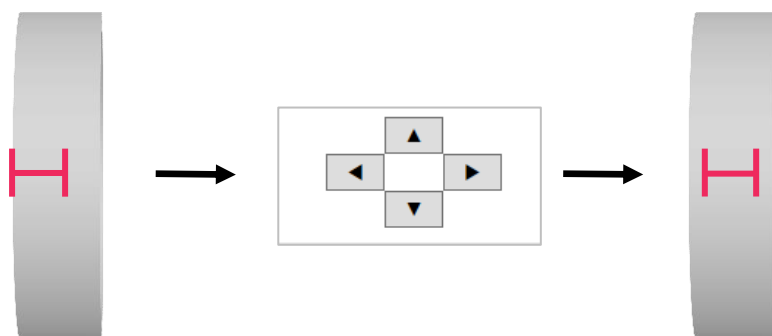
5. Remove the fixed tool, then Insert the ring into the chuck finger as below, and tighten the rotation clamp to set it.



6. Move to the stage II. And insert the ring size on the program.



7. Move to the [H pointer] to the center of the ring by using arrow buttons. Then, click [Complete].

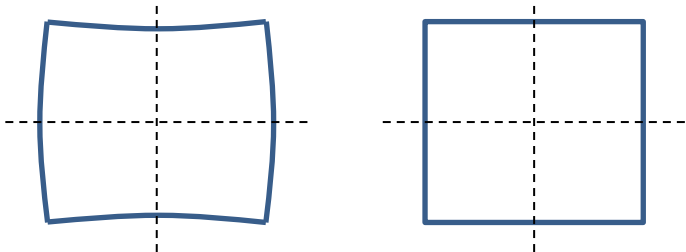


5. Manual Calibration

Reference to the [4. Installation → (4) Manual Calibration] in page 13.

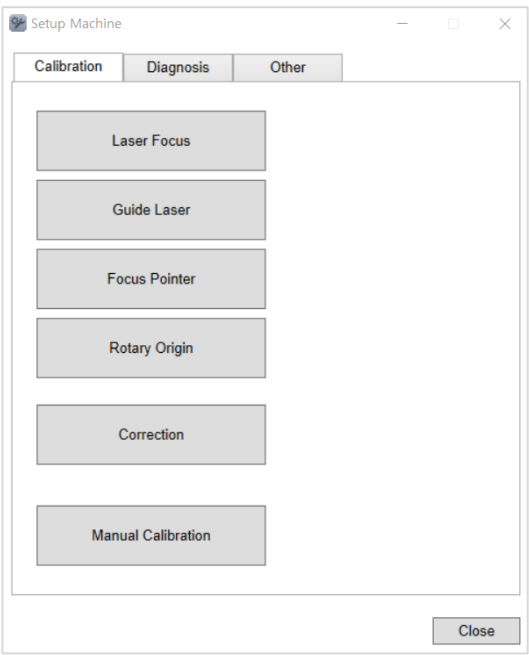
6. Correction

When the laser passes the scan head and comes all the way through the lens, the farther it moves away from the central point the greater distortion in shapes and sizes is introduced as shown in the figure on below. The process of calibrating such a distortion, as shown in the figure on right, is known as correction.

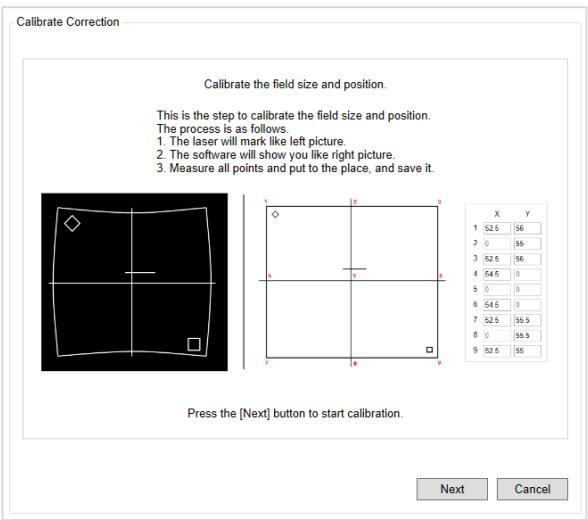


1. As the laser marks the area that measures the same or larger than the maximum size (110x110 mm), prepare the material that measures at least 120x120 mm in size.

2. Click [Correction] on the Product Setting.



3. The following screen provides the brief explanation on the calibration process. Click the “Next” button to start calibration.



4. Enter the height of the material and click the "Apply" button. Then Click the "Mark" button to start marking

Calibrate Correction

Mark the 9 points rectangle on the material.

1. Place the material to be marked on the center of the workspace.
Please prepare the material that the size is 130x130 mm or more.
The laser will mark maximum size.

2. Please enter the height of the material.

3. Press the [Mark] button to start the marking.
Pressing the [Mark] button automatically closes the cover and starts marking.

1. Material Height : mm

2. Mark

Laser Option

Back

Next

Cancel

5. Click the "Next" button to move on to the next step. Measure all sides marked with arrows as shown in the figure below. If there is any side that measures less than 110 mm, enter the smallest value, and click the "Mark" button. If all sides measure 110 mm or more, this step can be skipped.

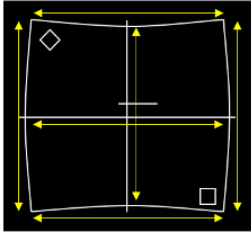
Calibrate Correction

Mark the 9 points rectangle on the material.

1. Measure the size of all the areas indicated by arrows as shown below.

2. If even one of the measured values is smaller than 110mm/enter the smallest value and press the

3. If all values are greater than 110mm, skip this step.



1. Minimum Size : mm

2. Mark

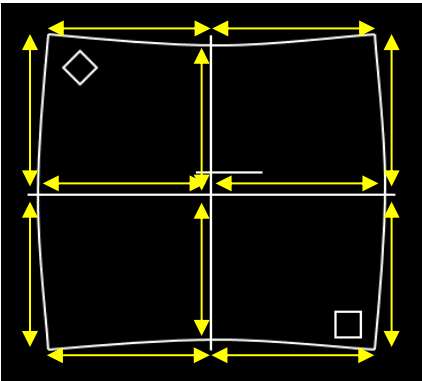
Laser Option

Back

Next

Cancel

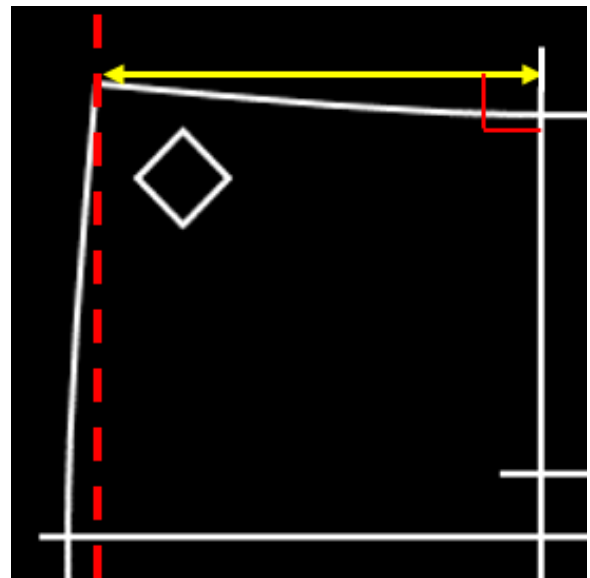
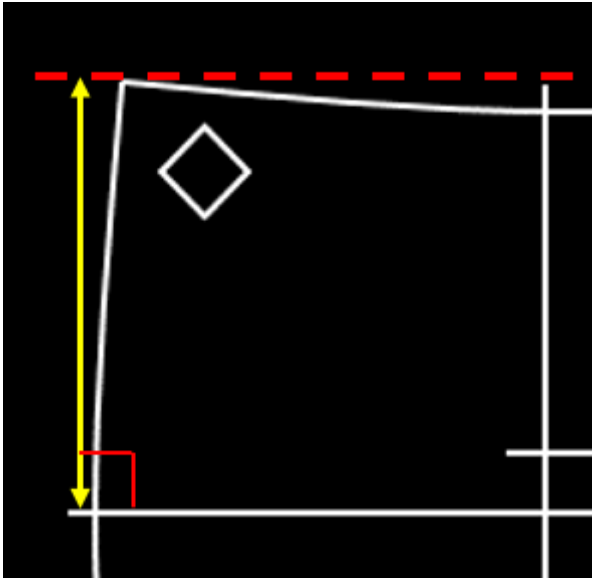
6. This step is to measure the size of all sides and enter measured values to complete the calibration process. Measure the size as shown in the figure below.



149



Make sure that the size is measured from each corner as shown in the figures below.



7. Enter the sizes and click the “Complete” button to finish the calibration process.

Calibrate Correction

Measure coordination for every point.

1. Measure coordination for every point and put to right place.
2. Press the [Complete] button to complete the calibration.

	X	Y
1	55.4	59.5
2	0	58.5
3	54.7	59.7
4	58	0
5	0	0
6	57	0
7	55.2	58.9
8	0	57.9
9	54.4	59.1

Back Complete Cancel