Pendants + Rings Marking Machine

BB-S7

User manual

- **Read and understand the User Manual before using the machine.**
- **Failure to follow the operating instructions may result to injury and/or machine damage.**

Take note: **The product images shown are for illustration purposes only. Actual appearance and technical specifications of the machine may vary due to product enhancement.**

<Please wear safety goggles and safety mask to avoid eye injury from metal chips and dusts and to prevent exposure from inhalable harmful elements and particles.>

***Debris produced during engraving process like metal chips and dusts may cause eye injury if they get stuck in your eye or may cause respiratory problems if inhaled.**

Edition: Oct, 2021

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Contents

Precautions for use

Read and follow the instructions carefully for safe use of the machine. Failure to follow safety precautions may result to injury and/or machine damage.

Intended use: BB-S7 is intended for engraving

- **Please follow the necessary safety precautions to prevent injury and/or machine damage.**
- **Please read carefully and understand the instructions below for proper and safe use of the machine.**

Failure to follow these instructions may result to machine damage.

Failure to follow these instructions may result to physical injury or harm.

■ Safety Precautions on Electrical System

 Do not use a damaged power cord or a loose electrical outlet. This may cause electric shock or fire.	 Do not plug in two or more devices in a single outlet simultaneously. Overloading your plug sockets may lead to overheating which may cause fire.
 Do not pull a plug by the cord. Do not grab a plug with wet hands. This may cause electric shock and burns.	 Pull out the power plug when the machine is not in use.
 If smoke comes out of the machine, switch off the machine immediately. Do not attempt to repair and/or disassemble the machine, contact our technical support for immediate diagnosis and repair.	 Plug the machine into a grounded outlet only. The machine may fail if plugged into an ungrounded outlet, causing property damage, physical injuries, electric shock or fire.

■ Safety Precautions on Machine Operation

 Use the machine properly and strictly follow the safety precautions. We will not be held responsible for any damages or injuries caused by mishandling or misuse of the machine.	 Avoid using materials that may get caught or jammed in the machine. The engraving and cutting performance and quality of the machine may vary depending on the materials used.
 Be sure to use goggles to prevent eye injury from metal chips and dusts. Use a safety mask to prevent exposure from inhalable elements and particles.	 Protect your fingers, hands and wrists during operation. The engraving cutter of the machine is sharp and may cause cuts and/or serious injuries if get caught in between the axis.
 **Be sure to use a Chip collector to remove the particles produced during engraving process.** Debris like metal chips and dusts may cause serious eye injury if they get stuck in the eye, and may cause respiratory problems if inhaled.	 Do not put any foreign objects or any fire hazards on the machine. Never put the machine near or above any heating devices or any flammable materials.
 Be sure to place the machine on a firm, flat and level surface. If the machine is not properly installed or placed, the machine may fall, causing physical injury, electric shock or fire.	 Be sure to keep the machine out of children's reach and sight. Children's curiosity may lead to injury.
 Do not disassemble, assemble or modify the machine. This can lead to machine failure and damage, causing fire or electric shock. Please contact our technical support for proper diagnosis and inspection, calibration, and repair.	 Avoid spilling water or any liquids on the machine. This may result to machine failure and damage, causing electric shock or fire. If any liquids or foreign objects gets inside the machine, the machine may vibrate excessively then fall. This may cause injury.

■ Safety Precautions on Machine Operation

Warning

Protect your hands, wrists and fingers. Do not let any of your body parts or any foreign objects get caught in the machine during operation. The tools of the machine are sharp, and may cause serious physical injury.

Warning

Please wear safety glasses during engraving process for safety. Debris like metal chips and dusts may cause serious eye injury if they get stuck in the eye.

Warning

Do not put any foreign objects or any tiny metals inside the machine. This may result to machine failure and damage, causing fire or electric shock.

Warning

If there is smoke, moisture, oil, dust or water in the place where the machine is installed, do not use the machine. This may cause electric shock or fire.

Caution

Do not attempt to disassemble and clean the machine if the machine suddenly generates some type of lubricant oil. Contact our technical support immediately.

■ Other Precautions

Warning

Do not disassemble or modify the machine. This can cause machine failure and damage.

Caution

Be sure that the machine is placed and kept in a room temperature. If the temperature drops below freezing, the machine may not work property.

Warning

In order to prepare for an emergency, in case of a sudden machine malfunction or failure, users are strictly advised to not leave the machine unattended while in operation. Users should refrain from engaging in any activity that diverts his/her attention while actually engaged in operating the machine.

<PROPER MACHINE DISPOSAL>

The machine contains valuable raw materials and electronic components which must be properly disposed of in equipment disposal containers.

According to European guidelines on proper equipment disposal:
●Do not dispose of together with household waste.
●Used electric and electronic equipment must be collected separately and not be placed in municipal waste.

Laser Specifications

The machine utilizes red laser ‘CLASS 2’ as a guide laser.

- **CLASS 2:** Class 2 laser is a relatively weak laser that is considered safe for normal operation Its visible beam does not cause any harm or damage on a person’s eye unless deliberately stared into it. It is not a skin or materials burn hazard as well.

Class	Class 2
Output	<1mW
Wavelength	650nm

Model

Model	BB-S4	BB-E4	BB-S7	BB-E7
Engraving area	213*161	216*158	112*100	112*100
Rotary Clamp	✖	✖	●	●
Spindle	✖	●	✖	●
DC Motor	-	38w	-	38w
Spindle RPM	-	15,000	-	15,000
Probe Sensor	✖	●	✖	●

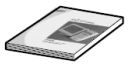
※ This table shows the differences between models. Please check **BB-E7**.

BB-S7

1. Package Contents

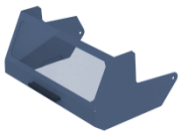
BB-S7 provides the following tools and devices. The contents of the package may vary if optional items are purchased.

Take note:
***Cutter, tip and spindle belts easily wear out. Make sure to replace them regularly or as per maintenance schedule.**
***All pictures shown are for illustration purpose only. Images may differ from the actual products.**
***Be sure to use a safety mask and safety glasses to avoid injury during machine operation.**

Name	Picture	Quantity	Usage
BB-S7		1EA	Marking machine **※Be sure to use a safety mask and safety goggles during machine operation for safety.**
Power adapter (CP-01&CP-02)		1EA	Power supply **※Use a grounded outlet only. Do not plug the machine into an ungrounded outlet.**
USB cable (CP-11)		1EA	For connecting to PC
USB		1EA	To install **MagicEngrave** software **※See program installation for further details.**
User manual		1EA	Operating manual
T-wrench(2.5mm) (CP-T25)		1EA	For tightening/unscrewing the bolt.
L-wrench(1.5mm) (CP-L15)		1EA	For tightening/unscrewing the bolt.
Ruler (CP-24)		1EA	For measuring the material.
Tool fixing bolt (M5x6)		3EA	To fasten the spindle tool.
L-tool fixing bolt (M3x4)		3EA	To fasten the L-tool tip.
Diamond tip(4Ø) (T40-DA22)		1EA	**For spindle:** Tool used for engraving
Diamond tip(3Ø) (T31-DA09)		1EA	**For L-tool:** Tool used for engraving the inside of a ring.
Bakelite plate (120x100x2t)		1EA	For calibrating the camera.

Multi-performance Clamp (CP-250)		1EA	To hold materials with different shapes in place.
Pin (CP-172)		6EA	To hold materials with irregular shapes in place.
Height adjustable clamp (CP-252)		1EA	To adjust the height of the clamp.
Finger chuck handle (CP-31)		2EA	To fasten the rotary clamp.
Flat finger chuck (CP-38)		3EA	For holding rings in place when engraving the inside or outside.
Round finger chuck (wide width) (CP-39)		3EA	For holding rings in place when engraving the inside or outside.
Finger skin (CP-41)		1SET	For protecting finger chuck.
Finger chuck spanner (CP-21)		1EA	For tightening/unscrewing the finger chuck.

***Optional (Sold separately)**

Back Cover (CP-253BB)		1SET	Back Port Cover
Front cover		1SET	To prevent inhaling of dusts and scattering of chips produced during engraving process.
Spacer block (CP-250S)		1SET	To adjust the height of the clamp.
Tailstock (CP-251)		1SET	To hold pens in place.
Pin clamp (CP-80)		1SET	To hold materials with different shapes in place.
Cutlery clamp (CP-83)		1SET	To firmly hold spoons in place.
Watch adapter (CP-84)		1SET	To firmly hold watch in place.

Bracelet adapter (CP-85)		1SET	To firmly hold bracelets in place.
Bar necklace adapter (CP-166)		1SET	Jig for holding materials with narrow width **(about 2-3mm)** in place. (Used for securing pendants, bar necklaces, etc.)
Curved tag adapter (CP-182)		1SET	Jig for holding curved materials in place. (Used for securing curved pendants, chain bracelets, etc.)
Round chuck finger (Narrow width)		3EA	For holding rings in place when engraving on the inside.

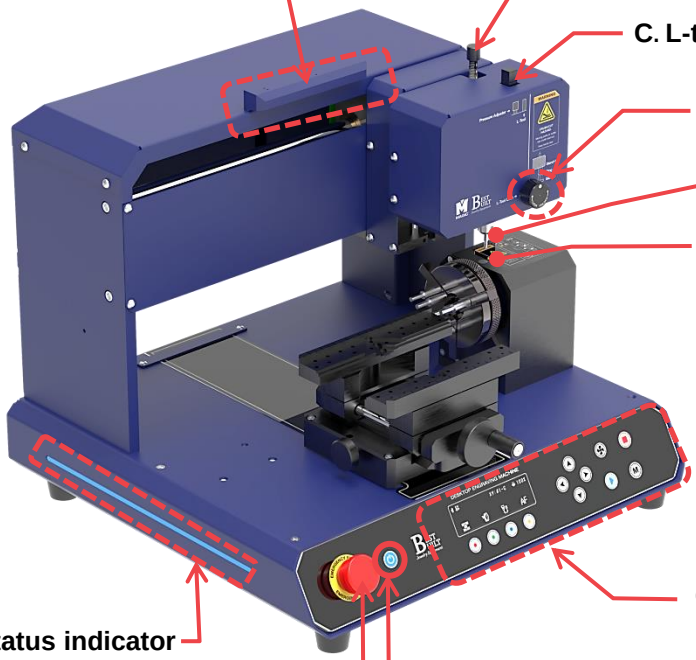
2. Specifications

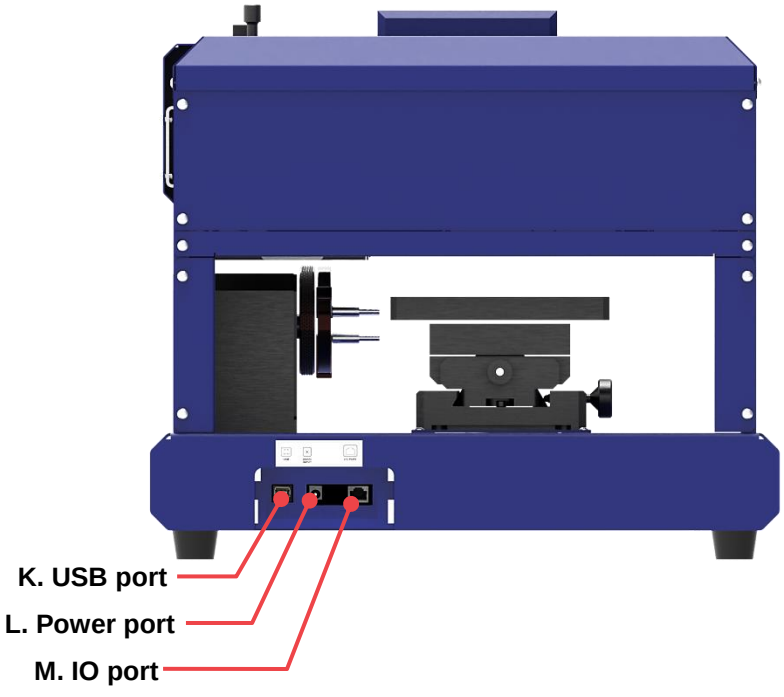
Operating voltage	AC 100~240V
Power consumption	25W
Frequency	50/60Hz
Dimensions	402.5 mm(W) x 376.5 mm(D) x 352.5 mm(H) 15.8 in(W) x 14.8 in(D) x 13.9 in(H)
Max. engraving area	140mm(X) x 100mm(Y) x 38.5mm(Z) 5.51 in(X) x 3.93 in(Y) x 1.51 in(Z)
Maximum material height	60mm/ 2.4 in
Rotary operating range (Based on 2mm/ 0.08in)	Cylinder outside diameter: MAX. 92mm (X) / MAX. 3.62 in (X) Cylinder inside diameter: MAX. 14mm (X) / MAX. 0.55 in (X)
Weight	26kg / 57.32lb
Bluetooth	Bluetooth LE module/ Bluetooth 5.0
Transfer speed	80mm/sec (X,Y), 18mm/sec (Z)
Temperature	15 – 40°C
Humidity	10 - 90%
Purposes	Metal marking, Pen marking, Ring marking (inside), Ring marking (outside), etc.

3. Description

(1) Machine

Protect your hands, wrists and fingers. Do not put any of your body parts inside the machine or anywhere near the head during operation.



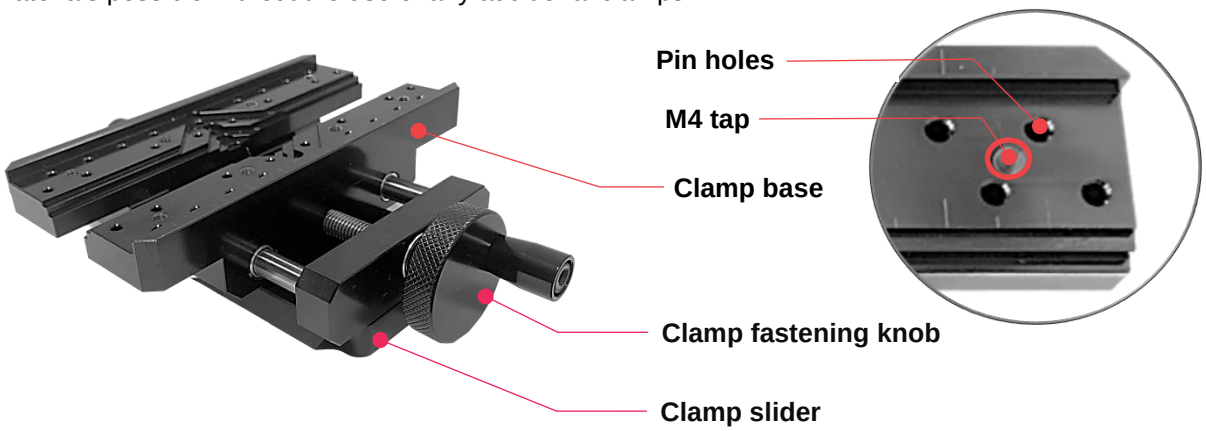


A	**Camera**	Shows actual view of material to design.
B	**Pressure Adjuster**	Adjusts the pressure of the engraving tool.
C	**L-Tool**	Secures the L-tool tip when engraving on the inside of rings or bangles. **※To change tools, use a 1.5mm L-wrench.**
D	**L-Tool Fixing Bolt**	Secures the L-tool.
E	**Spindle**	Secures the tool for engraving. **※To change tools, use a 2mm T-wrench.**
F	**Tool length sensor**	Automatic tool length measurement sensor.
G	**Control Panel**	Controls the power button and the manual control for regulating engraving operations.
H	**Status Indicator**	Shows the status of the device via blinking interval
I	**Emergency Switch**	Stops the machine during emergency.
J	**Power Switch**	Switches the power on/off.
K	**USB Port**	To connect USB cable to PC.
L	**Power Port**	To connect power adapter to supply power to the machine. **※Use a grounded outlet only. Do not plug the machine into an ungrounded outlet.**
M	**IO Port**	To connect the dust connector.

(2) Clamp

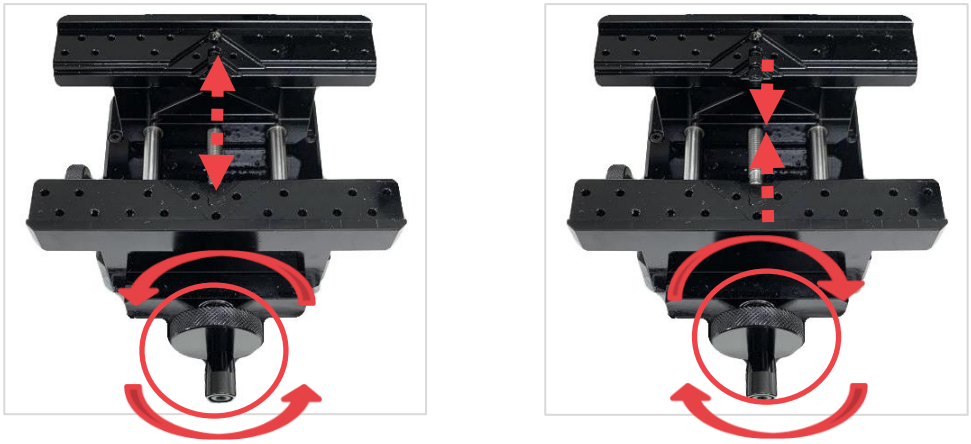
1) Multipurpose Clamp

The package includes a multifunctional clamp that is easily assembled, disassembled and transformed into 3 different types of clamps. It can be adjusted according to the height of the material, and can be expanded according to the material's thickness, size, and shape. This single clamp alone makes engraving on various materials possible without the use of any additional clamps.



[How to secure the material in place]

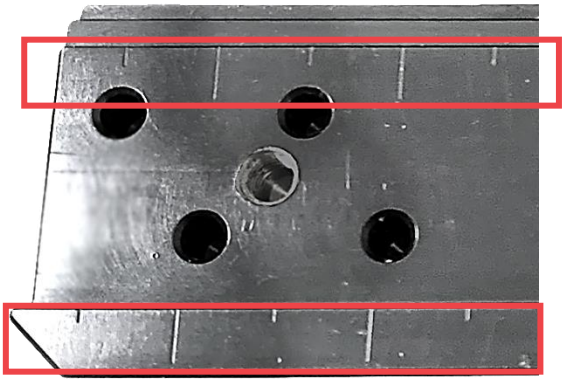
Use the clamping knob to secure your material in place. To loosen or widen the clamp, turn the clamping knob counterclockwise; to fasten it, turn the knob clockwise.



Caution **Marks may be left on the material if fastened tightly.**

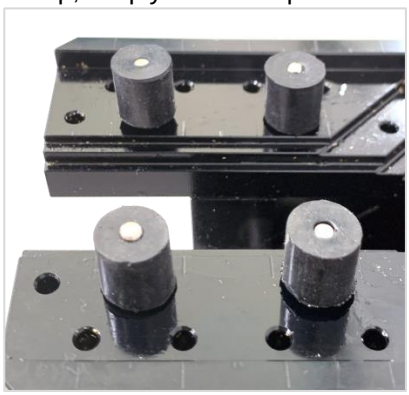
[How to position the material]

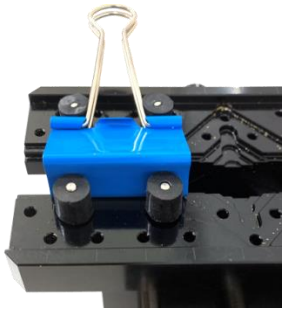
Use the vertical ruler bar as an alignment guide to help you position and align your material to the clamp with ease and accuracy. Properly place your material on the clamp then check the alignment.



[How to secure the material with irregular shape in place]

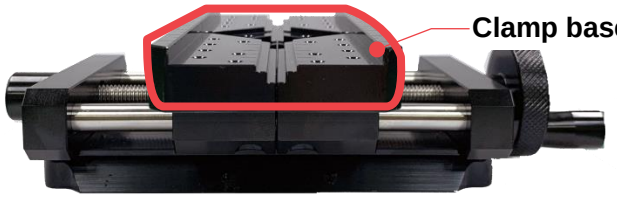
Use the clamping pins to firmly hold materials with irregular shapes in place. To secure the clamping pins to the clamp, simply insert the pins into the pin holes then fasten them.





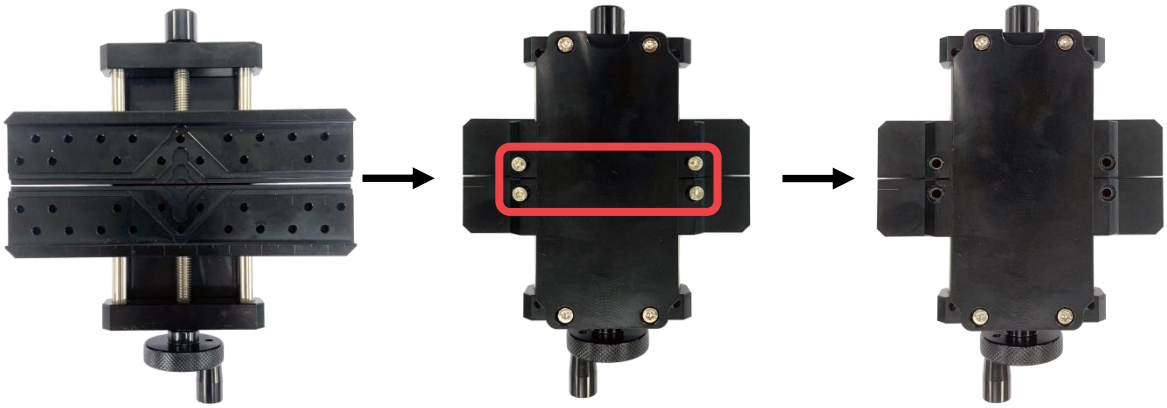

[How to adjust the height of the clamp]

Below are instructions on how to adjust the height of the clamp according to the thickness of the material.

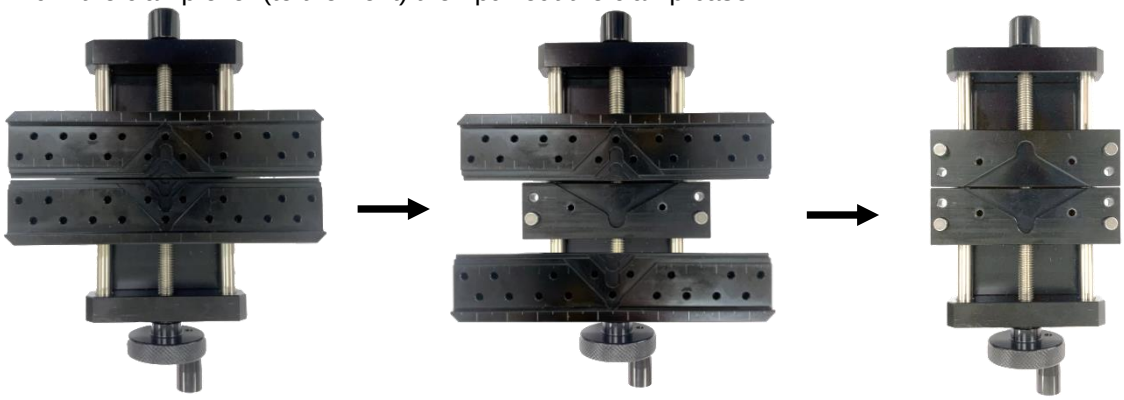


< Clamp with clamp base >

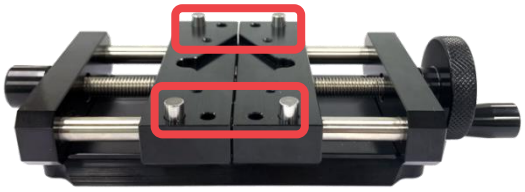
1. Turn the clamp over (to the back) then screw the bolts **(M4x20mm)**. **※Use a 3mm L-wrench to screw the bolts.**

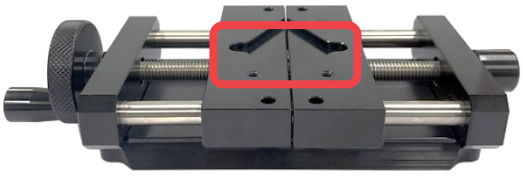


2. Turn the clamp over (to the front) then pull out the clamp base.



3. Remove the clamping pins then secure the material to the V groove of clamp without clamp base.
(See picture below for reference).





<Clamp without clamp base>

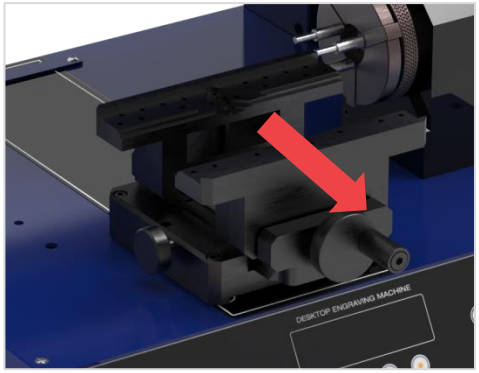
<Cylinder material>

[Height Adjustable Clamp]
Height adjustable clamp is used to adjust the height of your material.

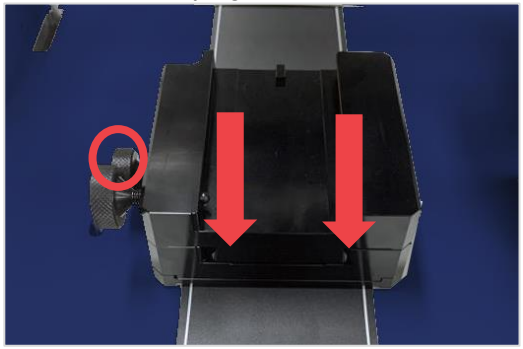
Height Adjustable clamp clamping knob

Height adjustable clamp (CP-252)		1EA	To adjust the height of the clamp.

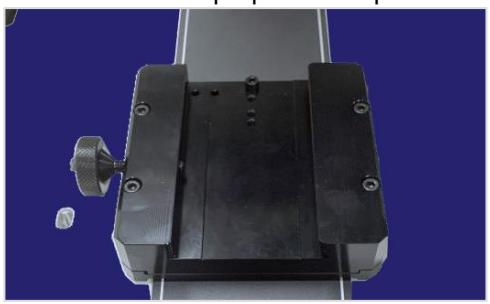
1. Turn the **Height Adjustable clamp clamping knob** counterclockwise to detach the Multipurpose Clamp.

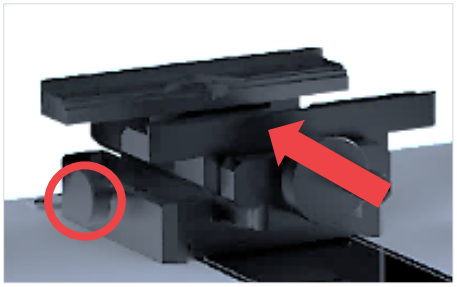


2. Turn the clamping knob counterclockwise to detach the height adjustable clamp.



3. Attach the multipurpose clamp then fasten it by turning the clamping knob clockwise.





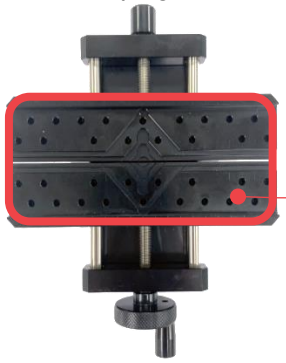
[How to adjust the height of the clamp]

※Optional device; sold separately

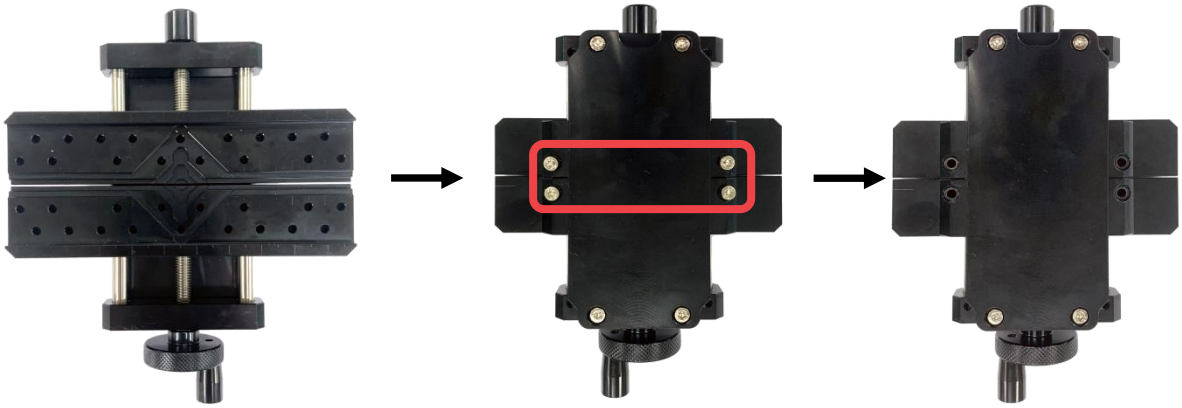
Below are instructions on how to adjust the height of the clamp according to the thickness of the material.

Spacer block (CP-250S)		1SET	To adjust the height of the clamp.

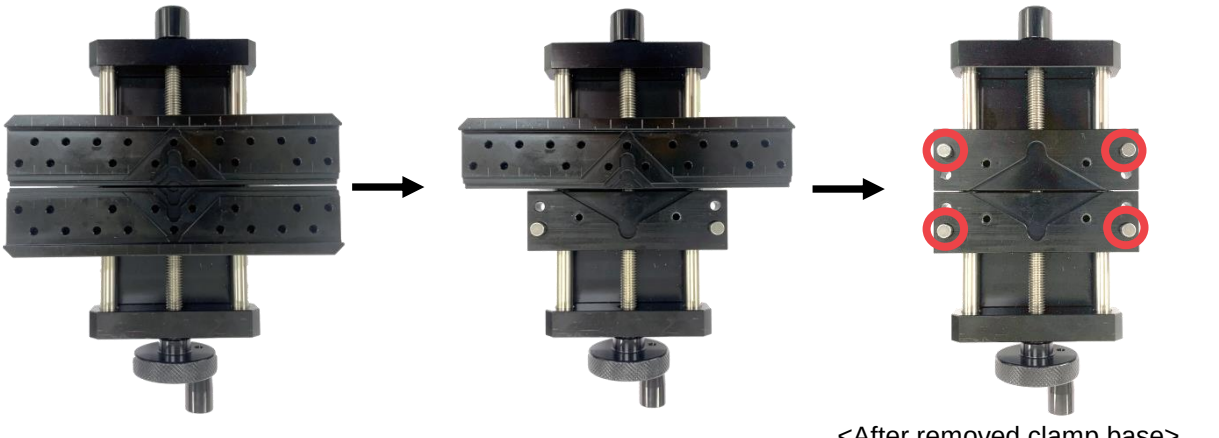
1. Turn the clamping knob counterclockwise to detach the clamp.



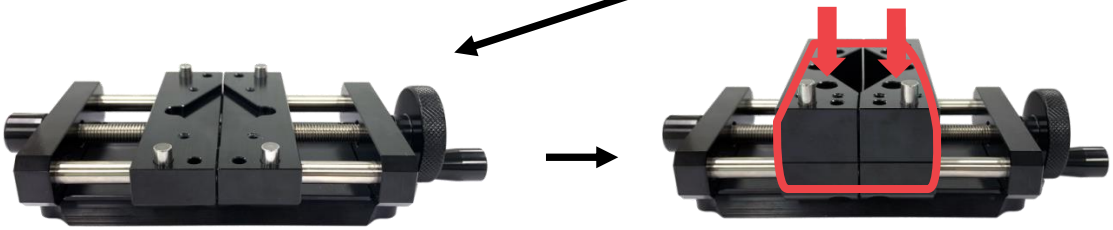
2. Turn the clamp over (to the back) then screw the bolts **(M4x20mm)**. **※Use a 3mm L-wrench to screw the bolts.**



3. Once the bolts are removed, turn the clamp over (to the front) then pull out the clamp base.
Then, reassemble the spacer block to pin.

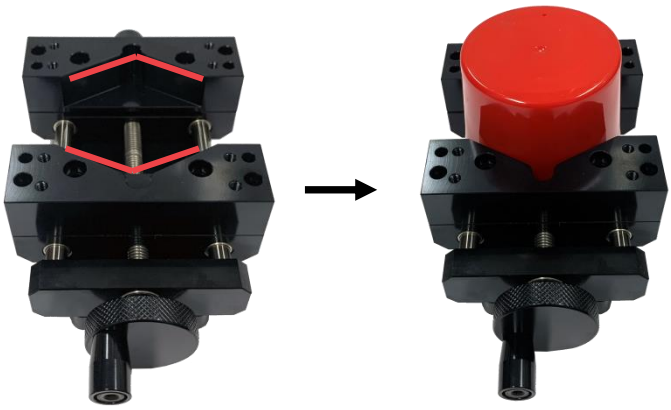


<After removed clamp base>

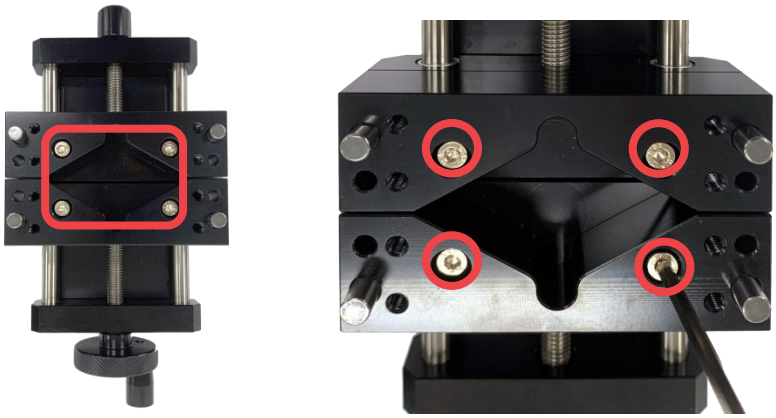


<Clamp Structure 1> **<Spacer block>**

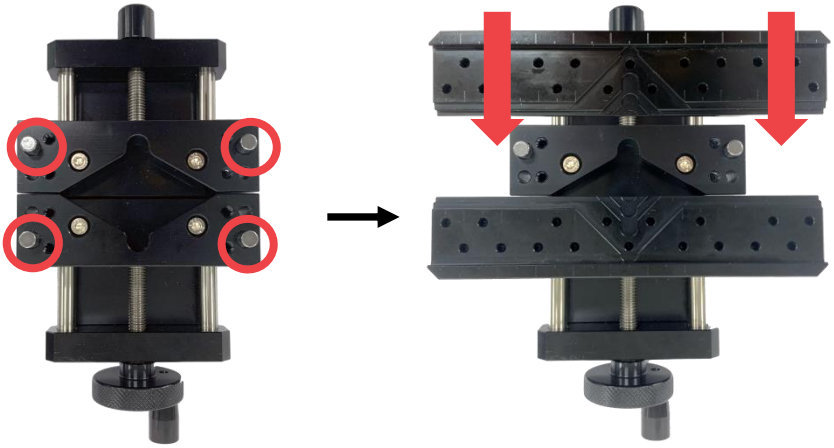
※ After secure the spacer block, then secure the material to the V groove of clamp.



4. Screw the spacer block fixing bolt **(M4x20mm). ※Use a 3mm L-wrench to unscrew the bolts.**

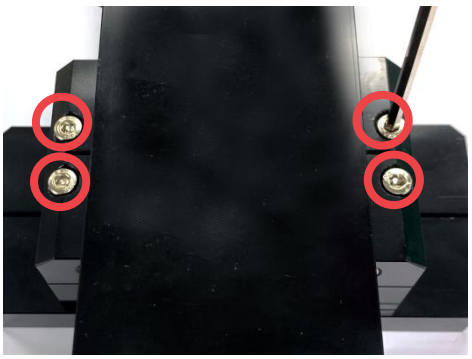


5. Secure the base clamp by attaching it to the pins.



6. Turn the clamp over (to the back) then unscrew the bolts **(M4x40mm)**.
※Use a 3mm L-wrench to unscrew the bolts.

<Back of the clamp>



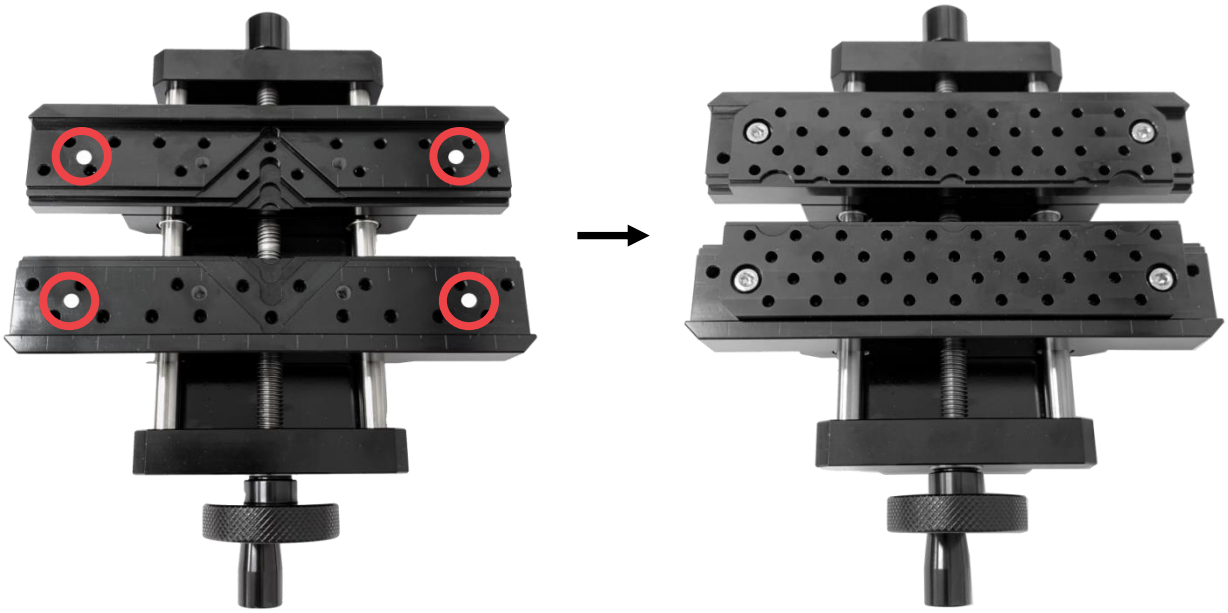
※ To assemble or reassemble the spacer block, use the appropriate bolts. Be sure to use and secure the spacer block using the correct type of bolts.

<Spacer block fixing bolt- M4x20mm>

<Clamp base fixing bolt- M4x40mm>

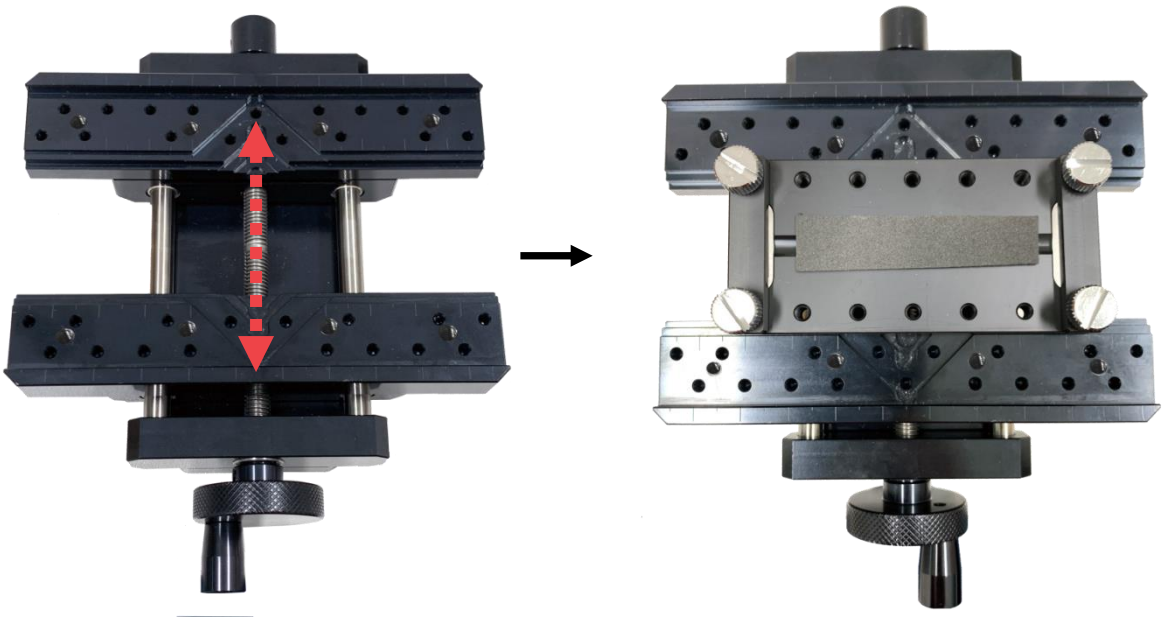
[Optional items for Multipurpose Clamp]
-Pin clamp(※Optional device; sold separately)

Pin clamp (CP-80)		1SET	To hold materials with different shapes in place.
Pin (CP-172)		5EA	To hold materials with irregular shapes in place.
Wrench bolt (M4x6)		5EA	To fasten the clamp.
L-wrench(3mm) (CP-L30)		1EA	For tightening/unscrewing the bolt.



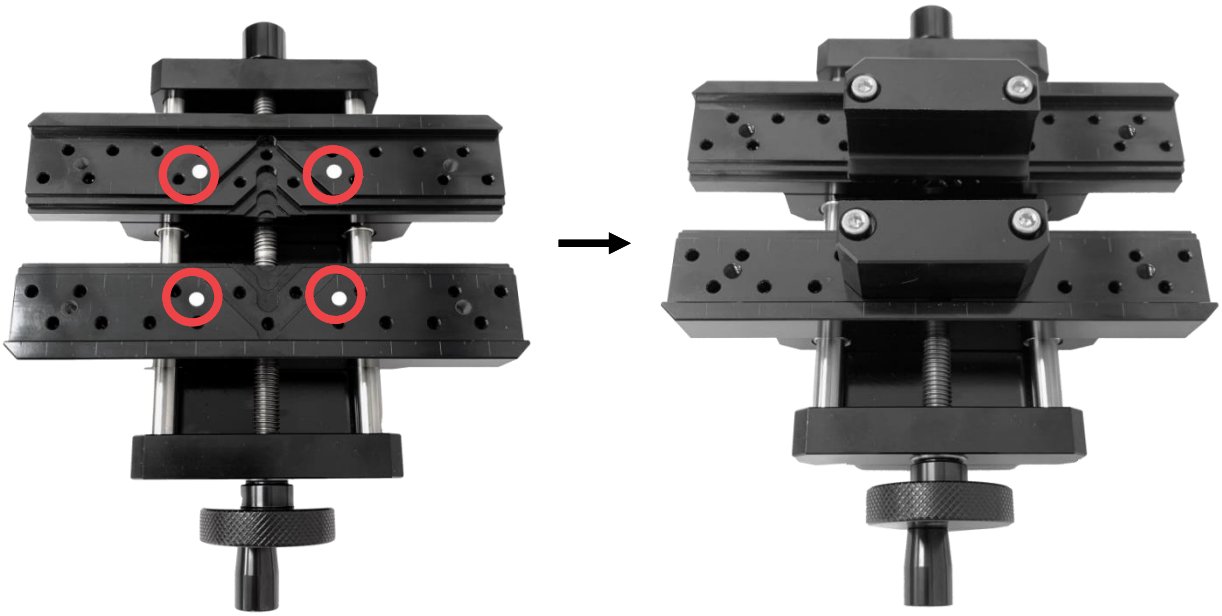
- Cutlery clamp (※Optional device; sold separately)

Cutlery clamp (CP-83)		1SET	To firmly hold spoons in place.



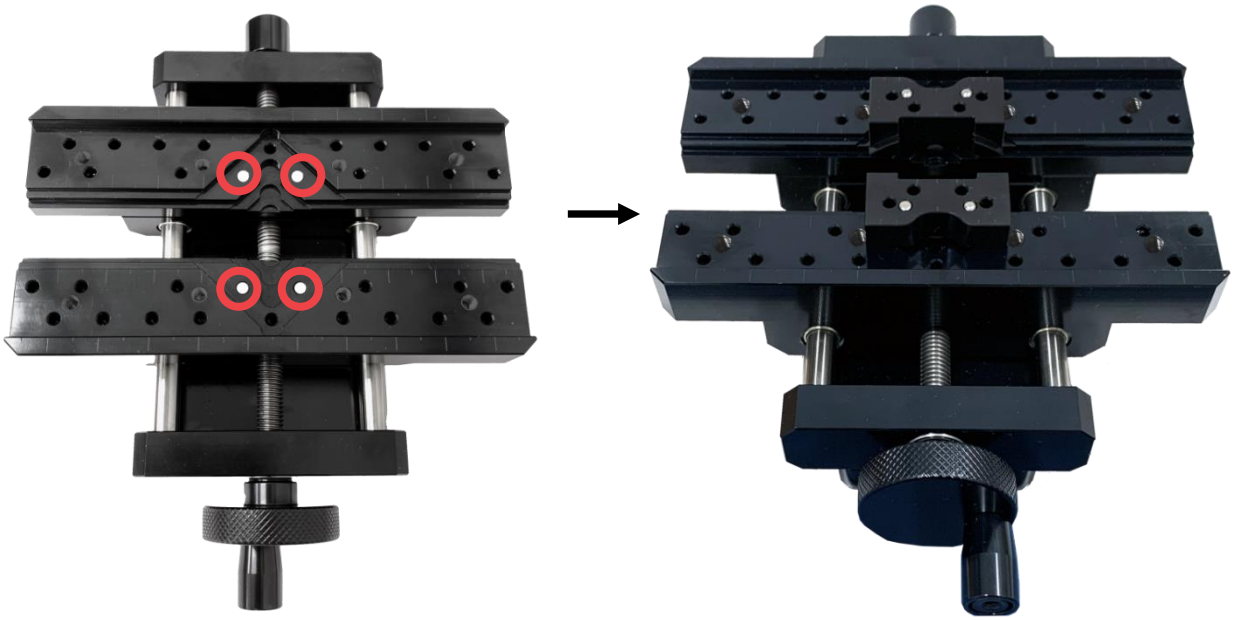
- Watch adapter (※Optional device; sold separately)

Watch adapter (CP-84)		1SET	To firmly hold watch in place.
Wrench bolt		5EA	To fasten the adapter.
L-wrench(3mm) (CP-L30)		1EA	For tightening/unscrewing the bolt.



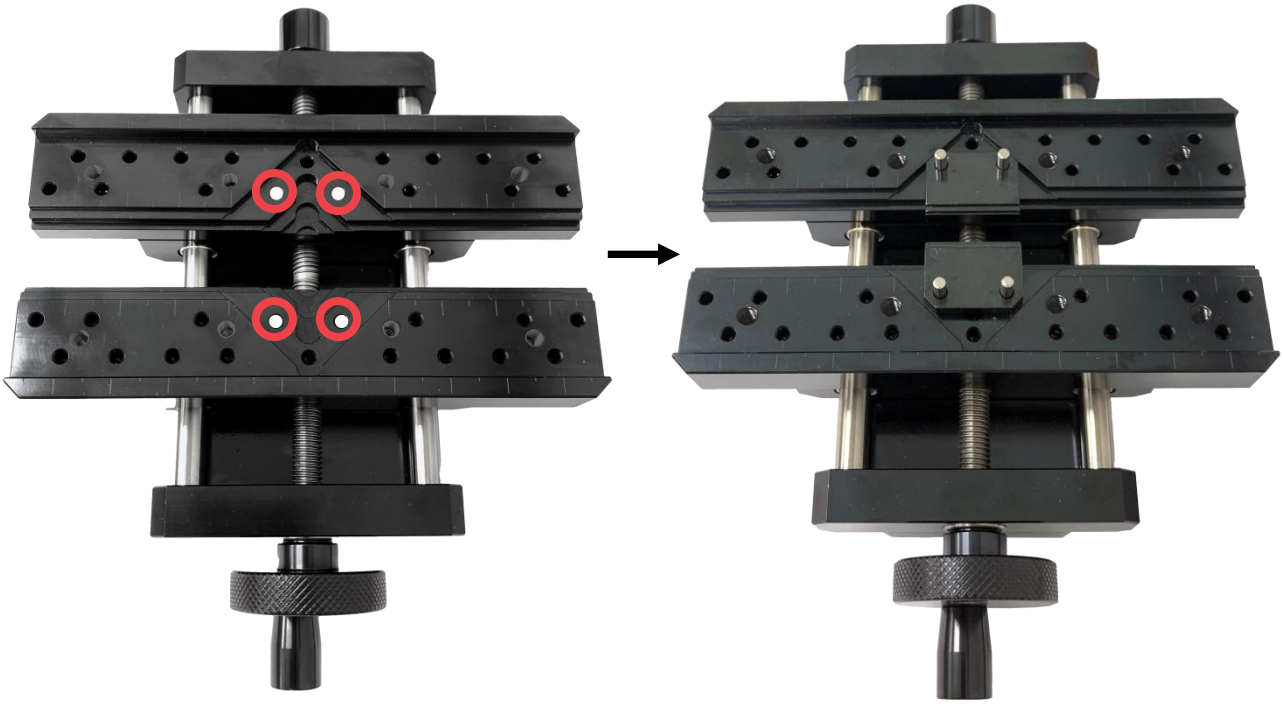
- Bracelet adapter (※Optional device; sold separately)

Bracelet adapter (CP-85)		1SET	To firmly hold bracelets in place.
Pin		4EA	To secure the adapter.

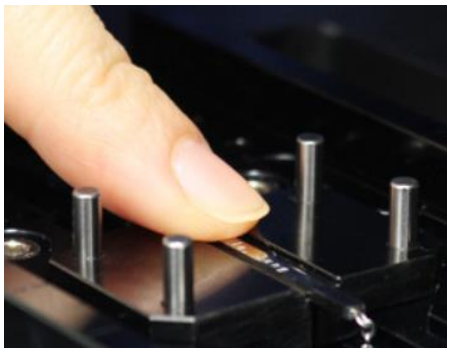


- Bar necklace adapter(※Optional device; sold separately)

Bar necklace adapter (CP-166)		1SET	Jig for holding materials with narrow width **(about 2-3mm)** in place. (Used for securing pendants, bar necklaces, etc.)
Pin		4EA	To secure the adapter.

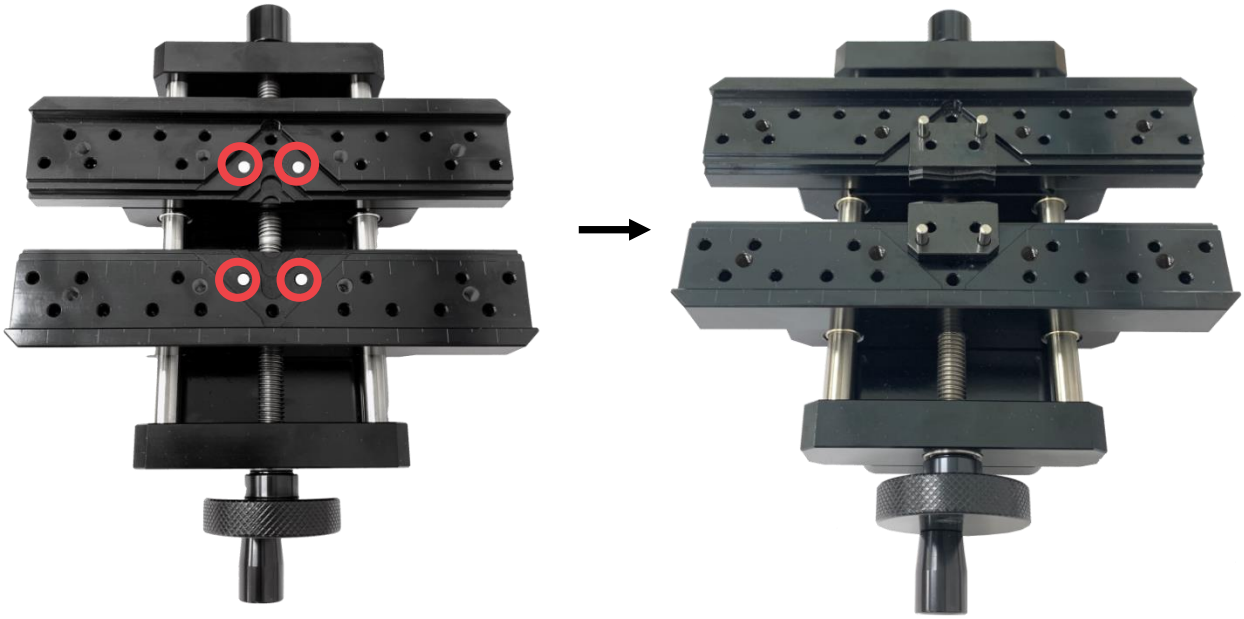


<u>*Materials like bar necklaces or pendants may come off easily when attaching to the jig. Press the material with your finger to secure it to the jig and be sure to not let your finger get caught while pressing.</u>



- **Curved tag adapter (※Optional device; sold separately)**

Curved tag adapter (CP-182)		1SET	Jig for holding curved materials in place. (Used for securing curved pendants, chain bracelets, etc.)
Pin		4EA	To secure the adapter.



2) Rotary Clamp
※Basic Installation

BB-S7's package includes a rotary clamp that is used for engraving the inside and outside of a ring.

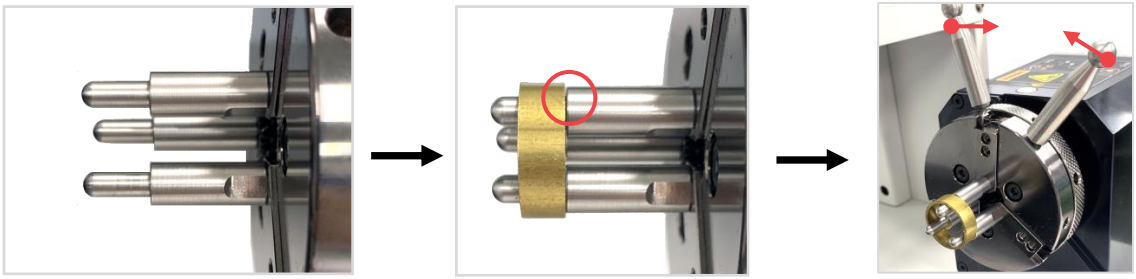
[How to activate ring engraving mode]

Press the rotary clamp button to activate ring inside/outside engraving mode.

[How to secure the ring in place]

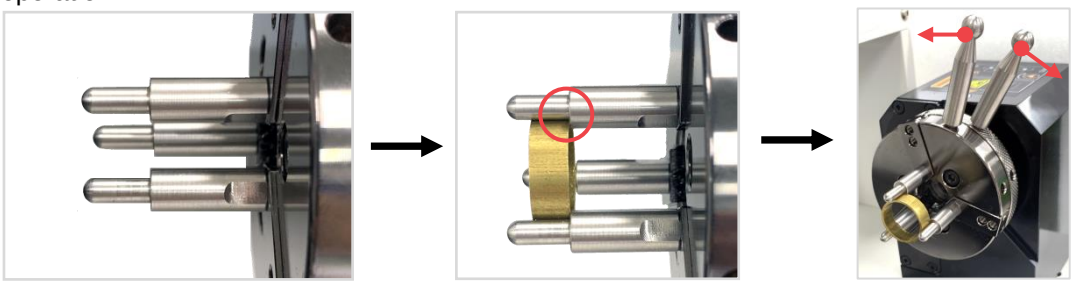
When engraving the outside

Place the ring onto the finger chucks. Rotate the rotary clamp to outward-inward directions to lock and secure the ring in place. Make sure that the ring is firmly attached and locked so it won't fall off or spin during operation.



When engraving the inside

Insert the ring in between the finger chucks. Rotate the rotary clamp to inward-outward directions to lock and secure the ring in place. Make sure that the ring is firmly attached and locked so it won't fall off or spin during operation.



[Finger Chuck Types]

Notice There are three types of finger chucks available to match the shape and size of the ring.

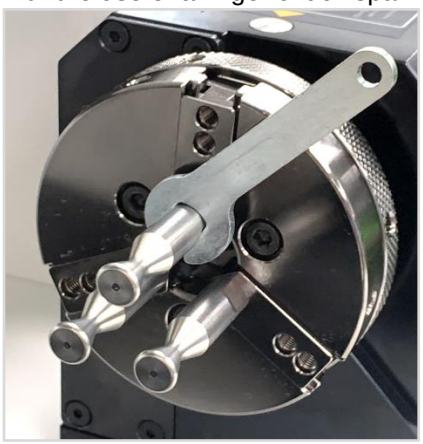
Flat chuck finger
※Included in the package

Round chuck finger (wide)
※Included in the package

Round chuck finger (narrow)
※Sold separately

[How to replace finger chucks]

Choose the appropriate finger chucks for your ring. Insert the finger chucks into the holes then fasten them tightly with the use of a finger chuck spanner. **※The finger chuck spanner is included in the package.**



3) Tailstock

※Optional device; sold separately

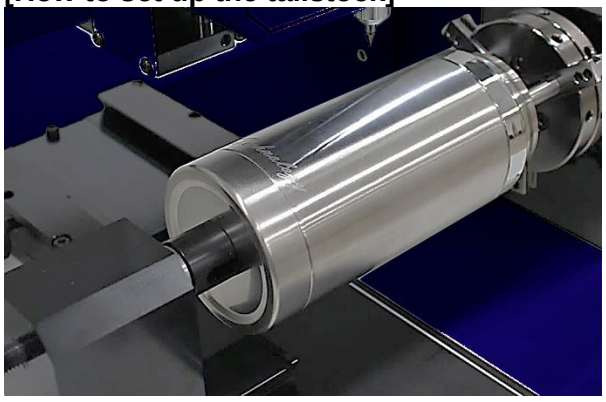
Tailstock is used to firmly hold cylindrical materials in place. It is specifically used to avoid objects with cylindrical shapes such as pen, tumbler and wine glasses to tilt to one side during engraving process.

-Height (from bottom to central axis): 69mm
-Lateral distance (from left to right): 109.5mm

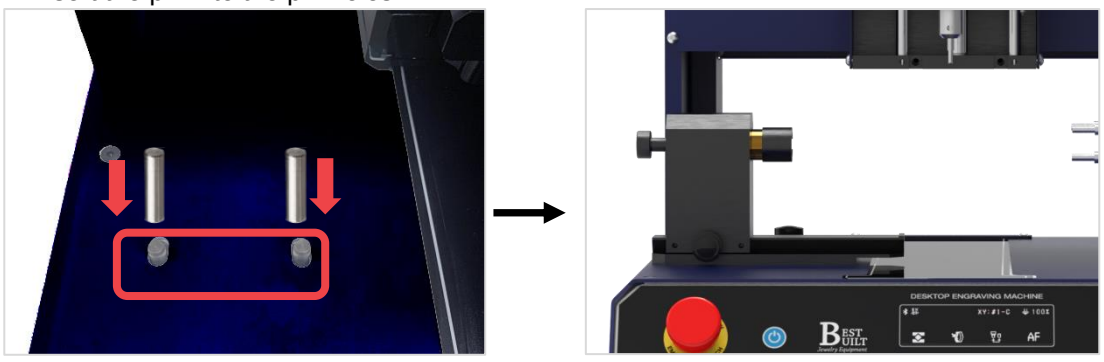
To set up the tailstock the following tools are needed:

Tailstock (CP-251)		1EA	To hold pens in place.
Pen adapter (CP-251P)		1EA	To hold pens in place; it goes with a tailstock.
Tailstock fixing bolt (CP-251B)		1EA	For fastening the tailstock.
Pin (6Øx25mm)		2EA	To secure the tailstock.

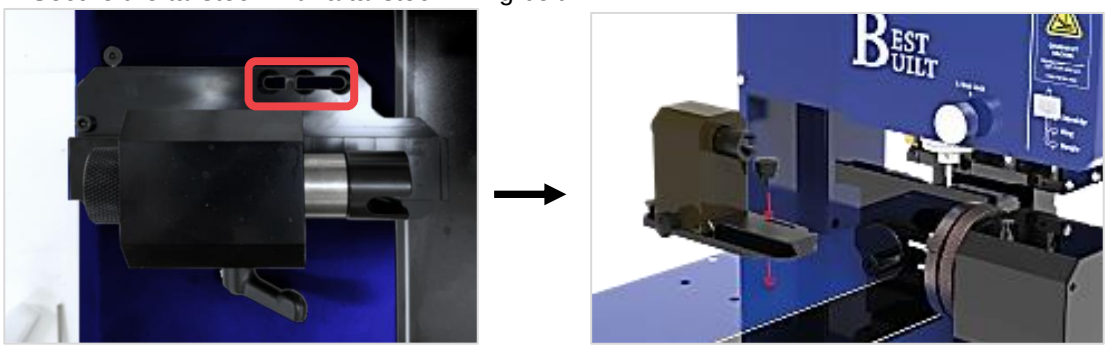
[How to set up the tailstock]



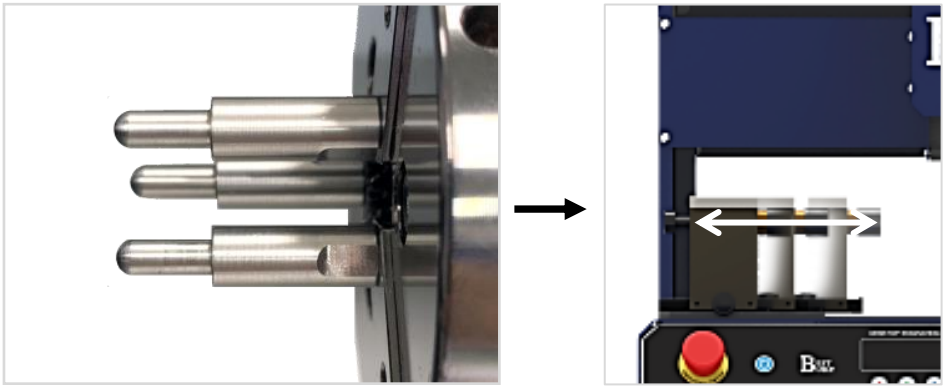
1. Insert the pin into the pin holes.



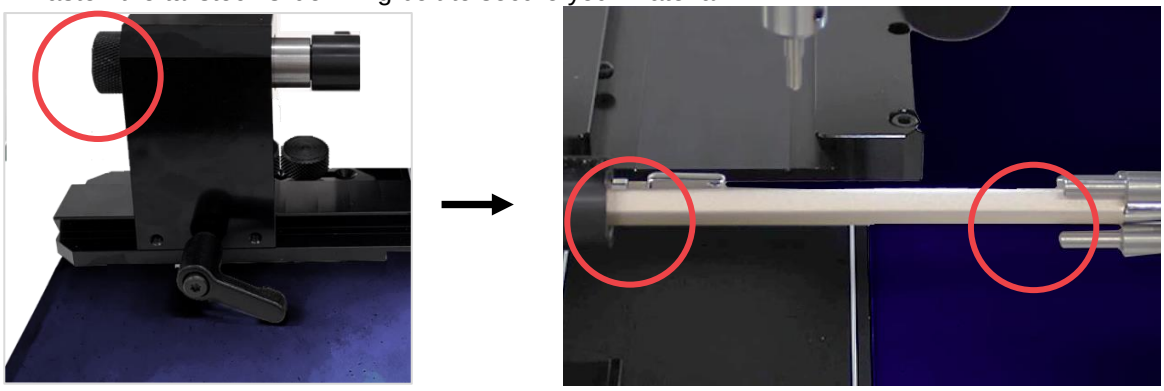
2. Secure the tailstock with a tailstock fixing bolt.



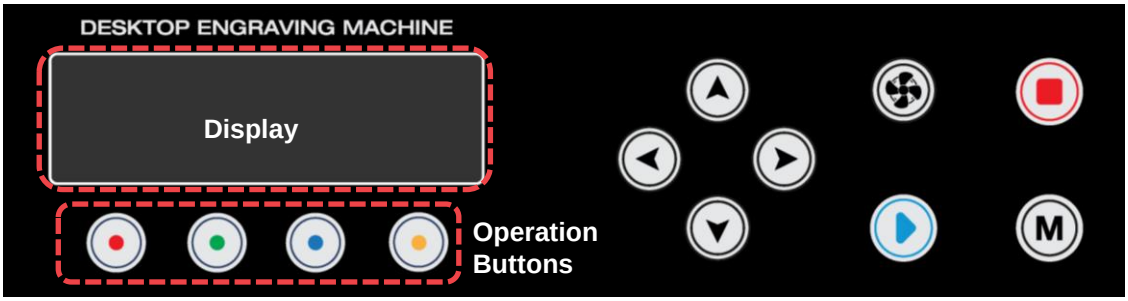
3. Use the finger chucks of the rotary clamp to clamp your material. Once your material is clamped, push the tailstock to the right side until it touches the tip of your material. ※**The device can slide left to right/right to left.**



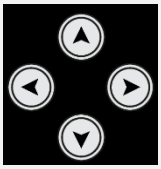
4. Fasten the tailstock slide fixing bolt to secure your material.



(3) Keypad



Display	Status display
Operation Buttons	Activate the operations intended to perform

	**Direction Key (X,Y/Z/A)**	Engraving area adjustment • Direction: (X) Moves X axis (Y)(Z)(A) Moves Y/Z/A axis **※Axis movement can be changed by using the operation buttons.**
	Vacuum ON/OFF	Chip collector power button • **Automatic control:** The device starts automatically once the engraving operation begins and stops automatically once the engraving operation is completed. • **Manual operation:** Automatic control is deactivated if the device is manually switched on. Once the engraving operation is completed, the device should be manually turned off. Warning We strictly advise our users to use the Chip collector during engraving operation for safety. The Chip collector prevents exposure form harmful inhalable particles and debris like metal chips and dusts which may cause eye injury if they get stuck in the eye or respiratory problems if inhaled.
	Start	Start marking button • **Start marking:** Long-press (for 2 seconds) the button to start marking. • **Repeat marking**: Press the button to finish marking, then double-press (tap twice) the button to repeat marking. • **Menu:** Press OK when using the menu.
M	**Menu**	Enter the menu mode.
	Stop	Stops/cancels marking.

(4) Menu

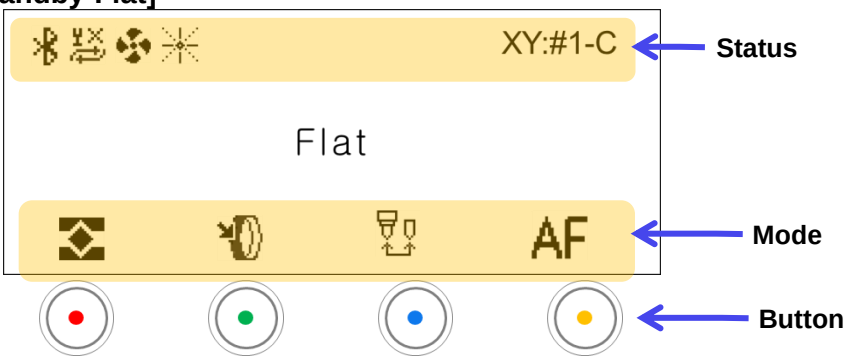
To enter Menu mode, press M button. Select a menu item using the ◀ and ▶ buttons then press ▶ button to enter the menu item.

1. Tool Change		Changes the tool.
2. Select Origin		Sets the current position to the clamp origin.
3. Calibration	**1. Touch Sensor**	Adjusts touch sensor settings.
	2. Pointer/Flat	Adjusts pointer/flat settings.
	3. Pointer/Rotary	Adjusts pointer/rotary settings.
	4. Pointer/L-Tool	Adjusts pointer/L-Tool settings.
4. Measure Z-Ref		1. Height Only 2. Horizontal(X) Slope 3. Vertical(Y) Slope 4. Plane(XY) Slope *In rotary mode, only [1. Height Only] is enabled.
5. Ring Inside Area Check		Sets a method for checking the inner diameter engraving area: 1. L-tool 2. Laser pointer
6. Chuck Revolution		Rotates the rotary chuck.
7. Adjust Brightness	**1. Status LED**	Adjusts status LED brightness
	2. Inside LED	Adjusts inside LED brightness
	3. Pointer	Adjusts focus laser pointer brightness
8. Vacuum Setup		Sets the Chip collector function. -Set to automatic control. -Set the Chip collector type: Dry/wet type
9. Tool-Pos Recording		Records your current location; set whether to activate or not.
10. Auto Zref on Repeat		Sets Auto Zref method for repetitive engraving: 1. No measurement 2. Height measurement 3. Height measurement + area check
11. Front cover		Selects whether to use the front cover or not. **※Optional device; sold separately**

(5) Display

The display shows the status, functions, mode, and check messages. Icons are displayed differently depending on the selected function. The four buttons at the bottom represent different functions and each function vary depending on the selected mode.

[Standby-Flat]

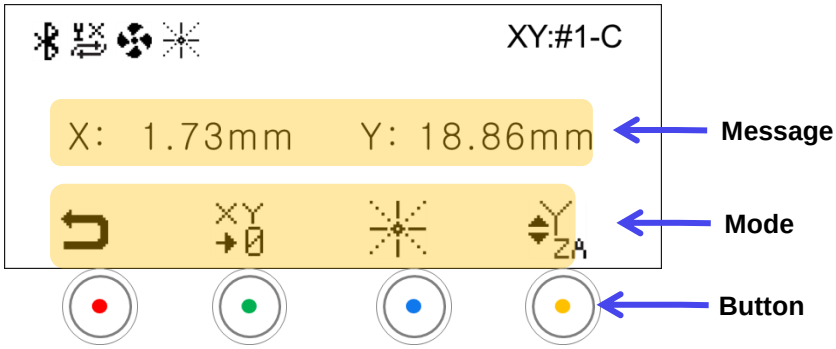


Status		**Bluetooth**	Icon appears when Bluetooth is activated
		Auto Zref on Repeat	• : No measurement • : Height measurement only • : Height measurement + area check
		Chip collector Power	Chip collector ON/OFF: Icon does not appear when OFF
		Focus Pointer	Laser pointer ON/OFF
		Front Cover	Selects whether to use the front cover or not. **※Optional device; sold separately**
	XY:#1-C	**X-Y Origin**	X-Y origin **•[#1]: Clamp No.** (1-5) **•[C]: Origin No.** (C: Center; origin No.: 1-8)

Mode		**Flat Mode**	Switches to flat mode
		Rotary Mode	Switches to Rotary mode • The mode changes in sequence (OUTER DIAMETER → INNER DIAMETER → OUTER DIAMETER) in a loop whenever the button is clicked. • Switched to the INNER DIAMETER mode instantly if double-clicked
		Tool change	Switches to tool change mode
		Auto focus	Activates camera auto focus position • Auto moves to view position after height measurement • Refreshes the camera display at MagicEngrave. **※Variety of features available for use once MagicEngrave software is enabled.**

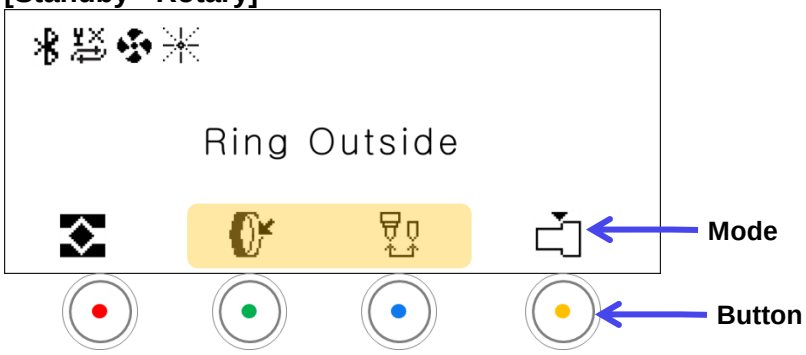
[Move Mode – Flat]

Press one of the buttons in the [STANDBY] mode to activate [MOVE].



Message		**X-Y Position**	The message on display varies depending on the Y-axis mode: •**Y→Y:** X-Y axis position •**Y→Z:** Z-axis position •**Y→A:** A-axis position
Mode		**Standby Mode**	• Switches to the STANDBY mode • Switches automatically to [STANDBY] mode if not in use for 10 seconds. Press any buttons to activate [MOVE] mode.
		Save Origin	Saves the current position as the XY origin *Short-press: Temporary save *Long-press: Permanent save Y-axis movement mode: Save XY Origin Z-axis movement mode: Save Z Origin A-axis movement mode: Save A Origin
		Laser Pointer	Turns ON/OFF the laser pointer
		UP-DOWN Button Settings	The mode changes in sequence (Y-axis → Z-axis → A-axis → Y-axis) in a loop whenever the button is clicked.

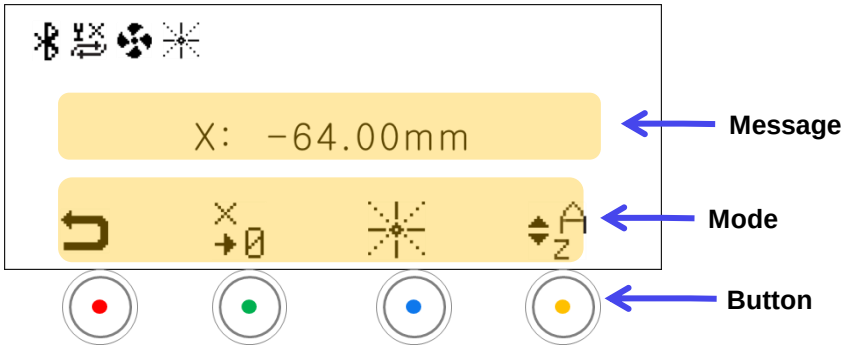
[Standby - Rotary]



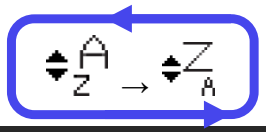
Mode		**Rotary Mode**	Switches to rotary mode • : Changes to rotary inner diameter mode • : Changes to rotary outer diameter mode
		Finger Mode	The mode changes in sequence **(Flat finger → Round finger → cylinder)** in a loop whenever the button is clicked. • : Flat Finger • : Round Finger • : Cylinder (Used for cylinder engraving / ring cutting)

[Move Mode - Rotary]

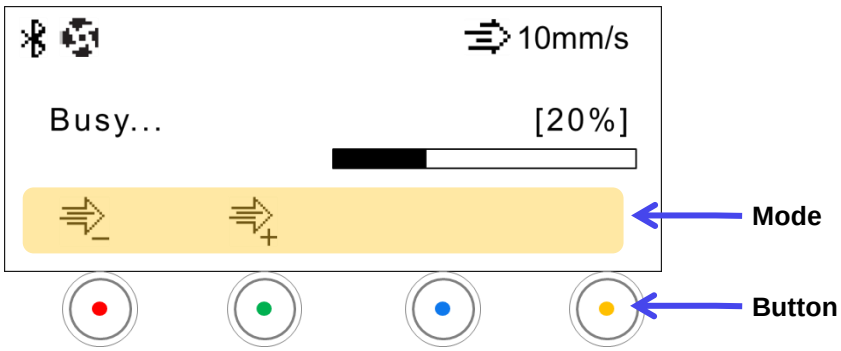
Press one of the buttons in the [STANDBY] mode to activate [MOVE].



Message		**A-axis Position**	Displays the A-axis position
Mode		**Standby Mode**	• Switches to the STANDBY mode • Switches automatically to [STANDBY] mode if not in use for 10 seconds. Press any buttons to activate [MOVE] mode.
		Save Origin	Saves the current position as the XY origin *Short-press: Temporary save *Long-press: Permanent save • **If** **(A-axis mode):** If the laser pointer is ON, the laser pointer position of the current finger is saved as the origin. • **If** **(Z-axis mode):** The SAVE ORIGIN icon changes to ', and the curent Z-axis position is saved as the origin. - Outer diameter mode: Z-axis origin of outer diameter - Inner diameter mode: Z-axis origin of inner diameter

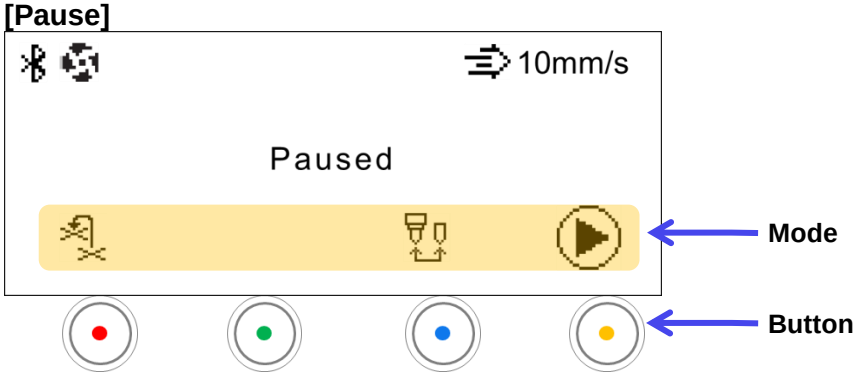
		**UP-DOWN Button Settings**	The mode changes in sequence (A-axis → Z-axis) in a loop whenever the button is clicked. 

[Engraving Mode]



Mode		**Engraving Speed Control**	Reduces engraving speed by 1mm/s whenever the button is pressed.
			Increases engraving speed by 1mm/s whenever the button is pressed.

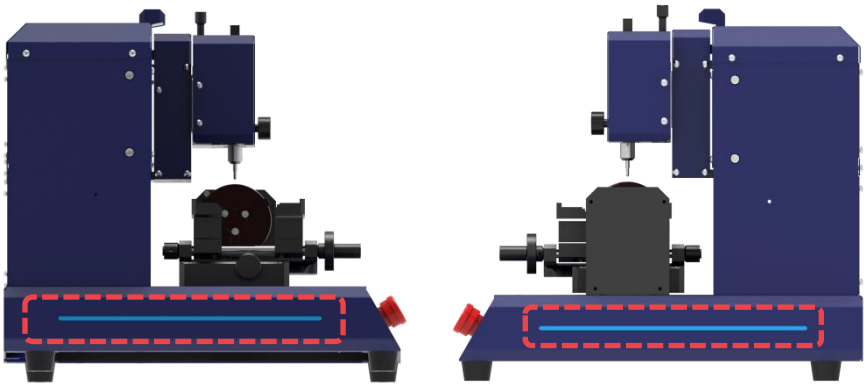
[Pause]



Mode		**Return back to Previous position**	Returns back to the previous position and resumes engraving.
		**Tool Change**	Switches to tool change mode
		**Resume**	Resumes engraving.

(6) Status indicator

The status indicator is placed at the bottom left side and bottom right side of the machine. It is used to indicate the status of the device.



The machine displays flashing or blinking lights to show its current status. The lights displayed indicate the following status:

Status	Blinking Interval
Waiting	———
Engraving	———
Operating	— — —
Notification	- - - - - - - -
Error	- - - - - - - -

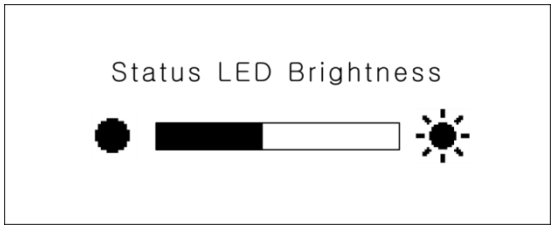
Long-press M button (for 2 seconds) to enter menu mode.

Select **[7. Adjust Brightness]** then press ▶ button.

7. Adjust Brightness	**1. Status LED**	Adjusts status LED brightness
	2. Inside LED	Adjusts inside LED brightness
	3. Pointer	Adjusts focus laser pointer brightness

Select [1. Status LED] then press ▶ button.

Adjust the brightness using the ◀ ▶ (Direction X) buttons.



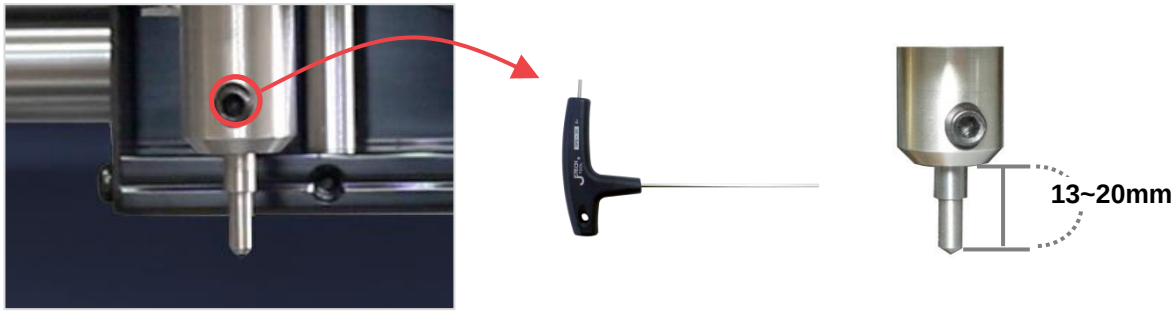
(7) Switching Tools

Do not let any of your body parts or any foreign objects get caught in the machine during operation. The tools of the machine are sharp, and may cause serious physical injury.

[Spindle]

Name	Picture	Quantity	Usage
T-wrench (2.5mm)		1EA	Tool for tightening/unscrewing of bolt.

As shown below, insert the **2.5mm wrench** into the fixing bolt. Turn the wrench to the left to unscrew bolt. To prevent the tool from falling to the floor, grab tool with your hand then pull it out. Once the tool is removed, replace it with a new tool then secure it using a wrench for tightening bolts. **※See package contents**



When unscrewing the tool fixing bolt, hold the tool with your hand while unscrewing to avoid the bolt from dropping on the floor.

[L-Tool]

Name	Picture	Quantity	Usage
L-wrench (1.5mm)		1EA	Tool for tightening/replacement of bolt.
L-tool fixing bolt (M3x4)		3EA	L-tool tip fixing bolt

As shown below, insert the **1.5mm wrench** into the fixing bolt. Turn the wrench to the left to unscrew bolt. To prevent the tool from falling to the floor, grab tool with your hand then pull it out. Once the tool is removed, replace it with a new tool then secure it using a wrench for tightening bolts. **※See package contents**

4. Installation

※ **Please follow the instructions below for proper installation of the machine, software and other devices.**

※ **The software program requires <u>Windows OS 7 or higher.</u>**

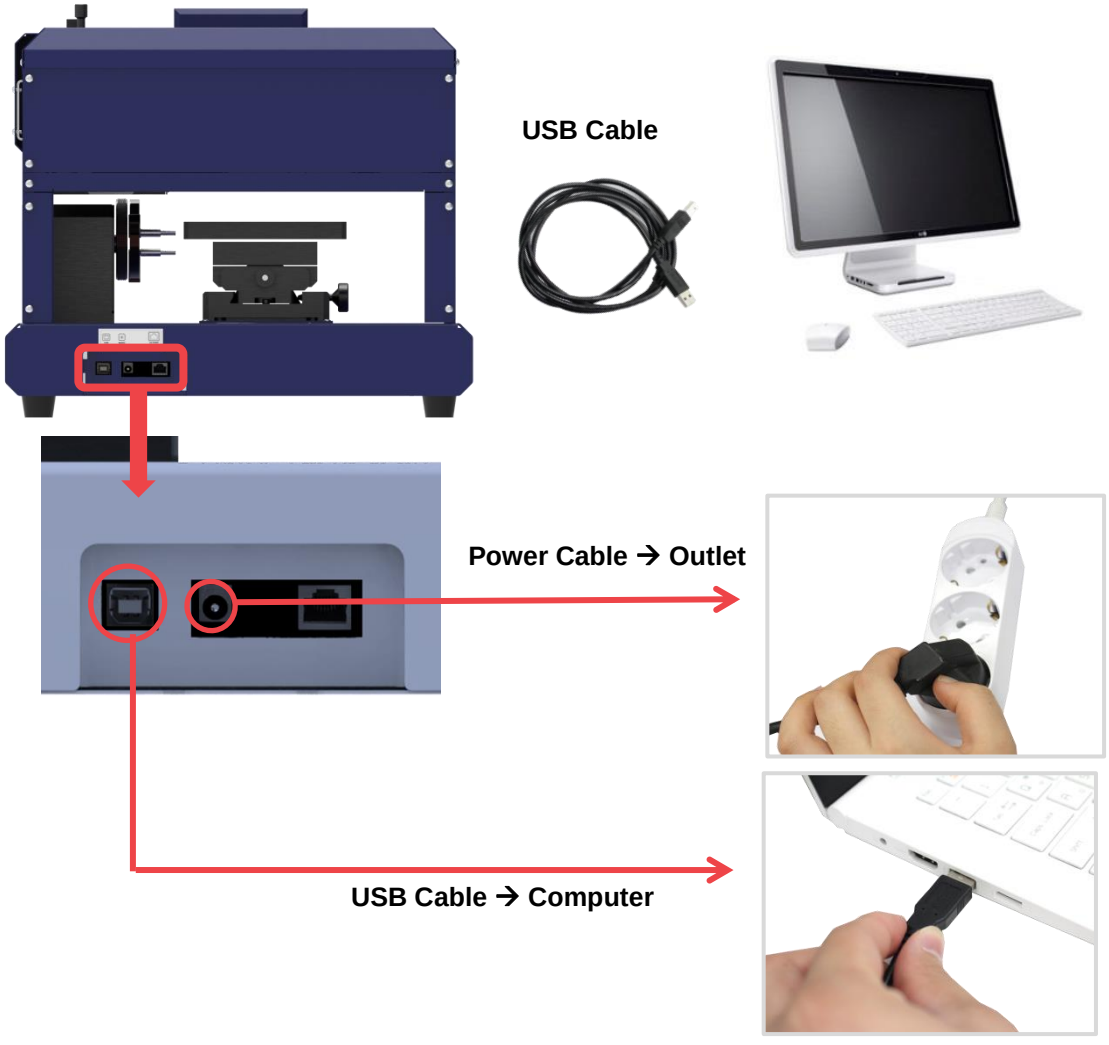
(1) Machine Installation

BB-S7 cannot operate alone as a desktop engraver. It cannot proceed to engraving and cutting operation without the use of a computer and a software.

The machine should be connected to a personal computer for the machine to operate. The software provided along with the machine must be installed to the computer to run the program for engraving, cutting and marking.

[How to install the machine]

1. To start the machine, plug its power cable into a grounded outlet. ※**See precautions for use for safety.**
2. To connect the machine to the computer, plug in the USB cable on the back of the machine then on the computer's USB port.

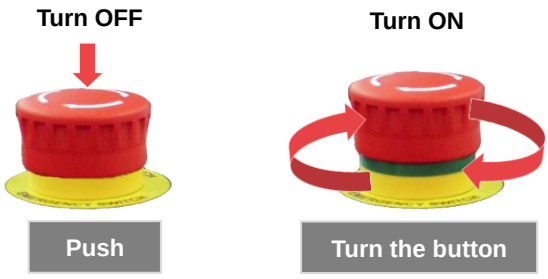


-Power switch

	Power	Turns ON/OFF the machine.

-Emergency Switch

※If the machine won't turn on, check the emergency switch.



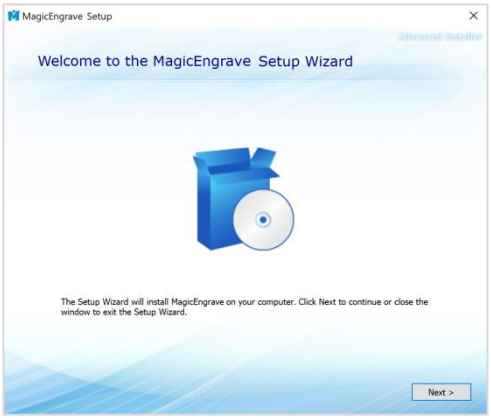
(2) Program Installation

BB-S7 comes with a software, MagicEngrave program. The program requires the use of Windows OS 7 or higher for the software to run.

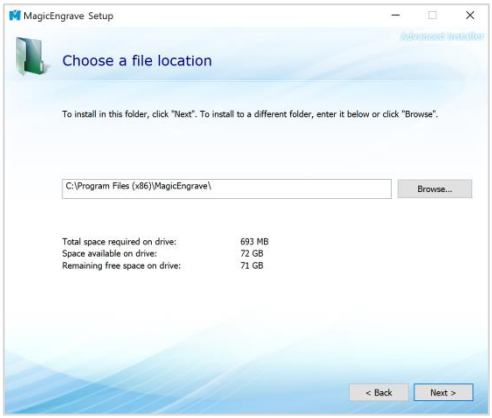
[How to install the software]

1. Insert the USB into your computer`s USB port. A notification will pop-up on your screen regarding installation.
※USB is included in the package.
2. Follow the instructions below to install the software.
3. Follow the steps in order until installation is complete.
4. In case program installation won't automatically run upon inserting the USB into your computer, go to My Computer's USB drive then run Install program.

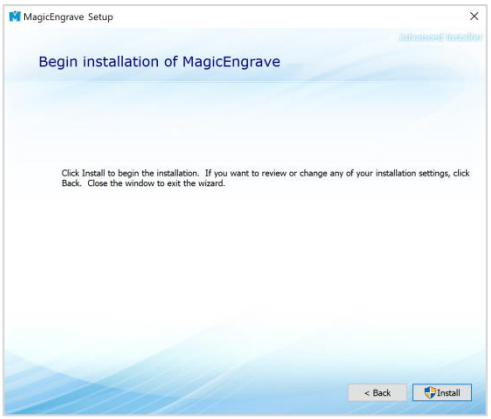
1. Setup wizard.



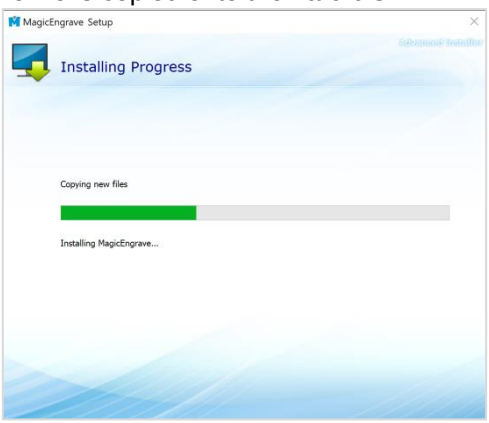
2. Select installation folder.



3. Confirm installation.

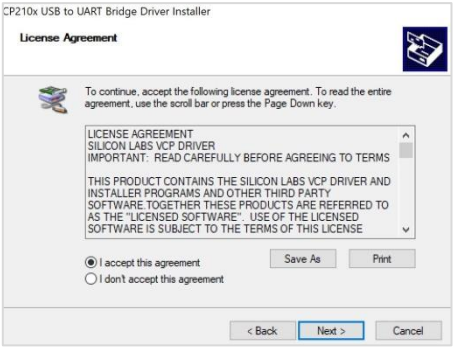


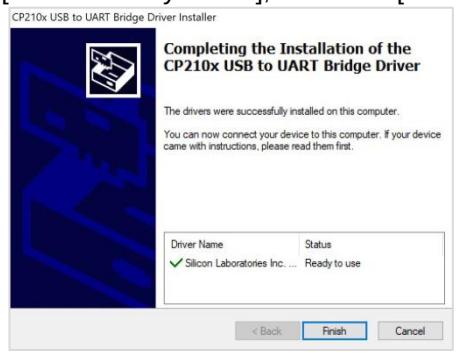
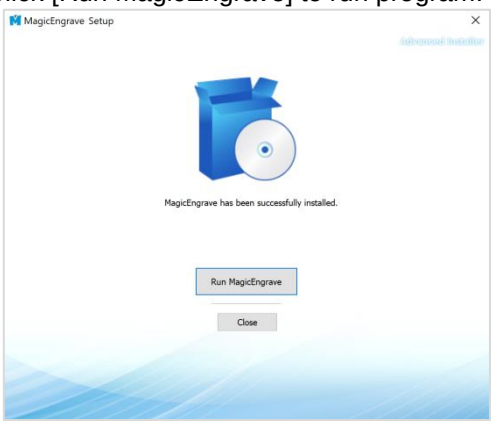
4. The file is copied onto the hard disk.



5. USB driver setup wizard.

6. Check [I accept the agreement], then click [Next].



6. Check [Status: Ready to use], then click [Finish].  	7. Click [Run MagicEngrave] to run program. 

- Program Description

Once the installation is completed, the following icon will appear on your desktop. The description of the icon is as follows:

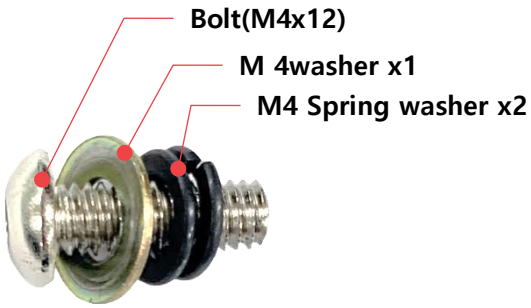
	As a design & marking software program, it features the following functions: marking design, marking option, Toolpath setting, transfer of Toolpath data.

(3) Front Cover

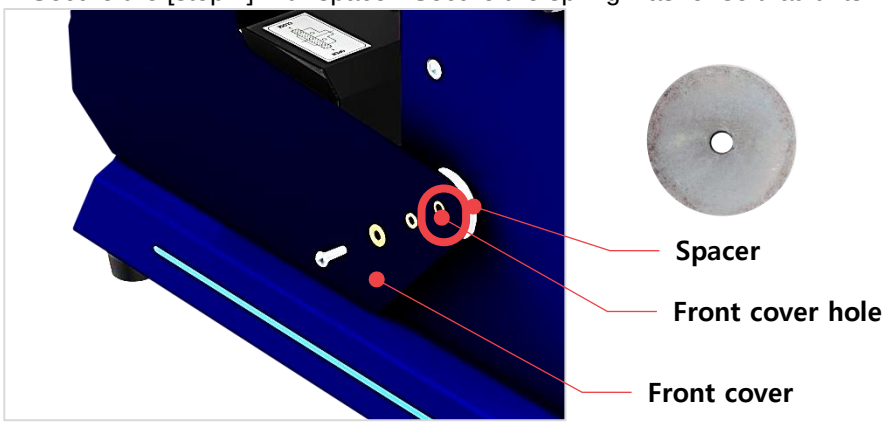
※Optional device; sold separately

[How to install the front cover]

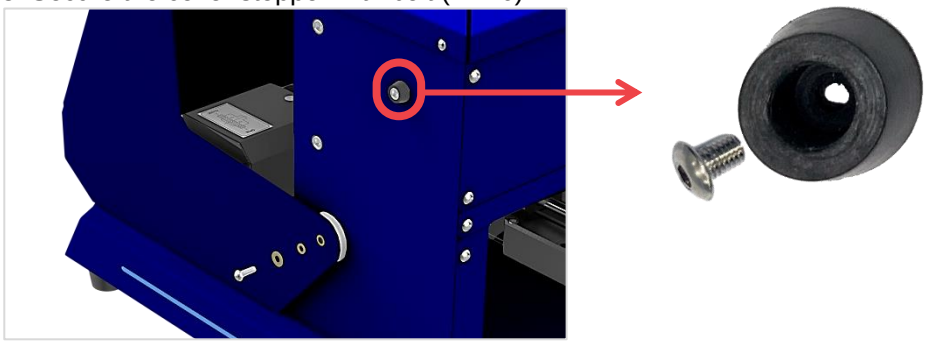
1. Set the [Bolt (M4x12) – M4 Washer – M4 Spring washer x 2] in order.



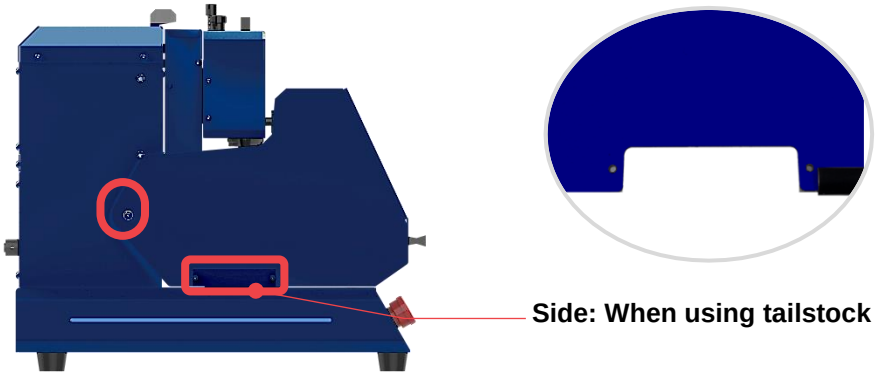
2. Secure the [step 1] with spacer. Secure the spring washer so that it fits into the front cover hole.



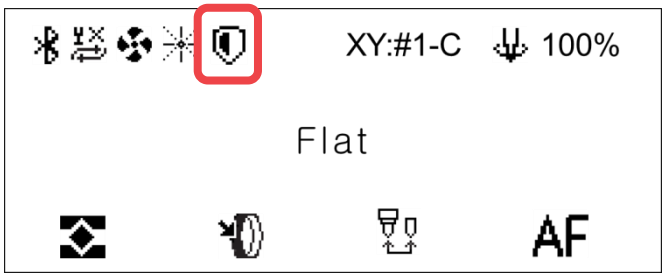
3. Secure the cover stopper with bolt (M4x6).



4. Secure the other side in the same way.



5. To enable Front Cover function, press  button on the keypad to enter [MENU]. Then, select **[11. Front Cover]** option on the menu. Front Cover icon will be displayed on the LCD screen (as shown below) once it's activated.



6. Check the positioning of the head and the clamp. Front Cover open and close function is disabled when the head is positioned at the right end (of the machine) and the clamp at the front.

[How to position the head and the clamp]

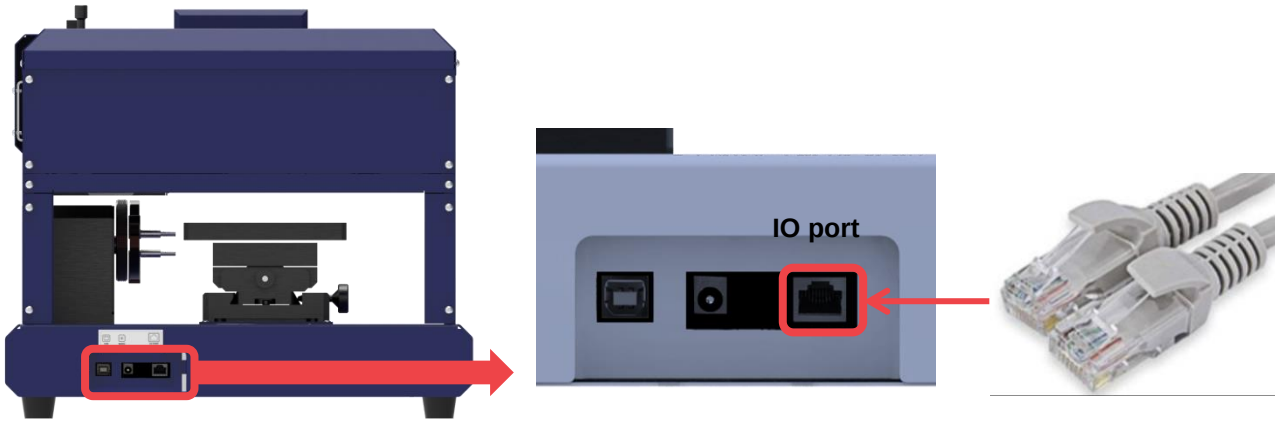
-Standby mode: Press  button on the keypad to move the head and the clamp to a position where the Front Cover can be opened and closed.

-Auto-positioning of the head and the clamp: The head and the clamp are automatically positioned upon completion of initial marking (i.e., when the engraving operation is completed).

(4) IO Port

※External IO port input to the machine is at 5V, use 5mA or less.

BB-S7 uses a LAN cable to control operation by receiving an external signal through the IO port.



OUT	**5V DC OUT**	Requires a DC 5V output to connect.
IN	**START/STOP**	Starts or stops engraving operation when DC 5V is connected.
OUT	**VACUUM ON/OFF**	Chip collector ON/OFF output status: DC 5V output: ON; GND output: OFF
OUT	**Universal Output**	Universal output port for DC 5V output and external devices.
IN	**Serial Communication Transmission**	Receives serial communication from external devices.
OUT	**Serial Communication Transmission**	Transmits serial communication from external devices.

****OUT: Signal received from external devices**

****IN: Signal received by the machine**

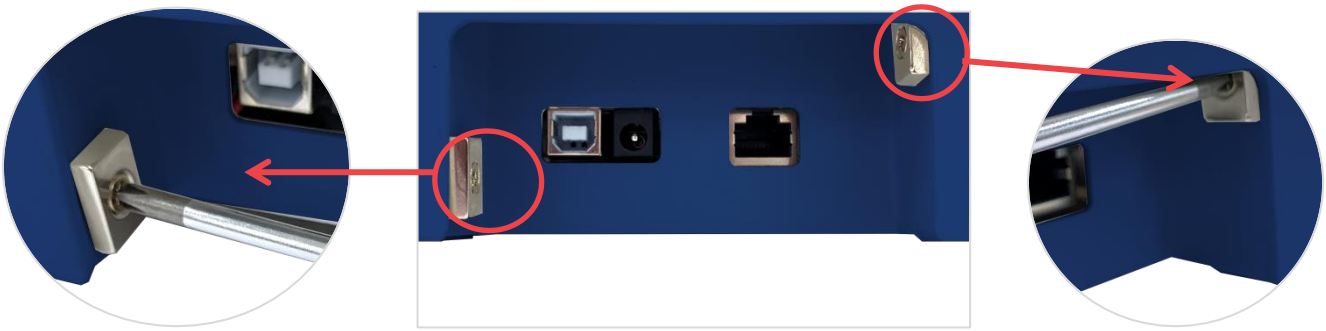
(5) Back Cover

-Optional (Sold separately)

Back Cover (CP-253BB)		1EA	Back Port Cover
Square Magnet		2EA	To secure the back cover.
Bolt (M3x8mm)		3EA	To secure the square magnet.

1. Assemble the back cover then attach it to the back side of the machine.

2. Insert the bolt into the square magnet then screw it into the machine.



3. Attach the back cover. The back cover is secured by the square magnets.

5. Operation of the Marking Machine

BB-S7 performs self-diagnosis upon turning ON. During self-diagnosis, the machine checks the following in order:

(1) Self-diagnose Procedures

1. If a certain axis is detected by the sensor, it moves away from the detected area.
2. Checks probe sensor and returns to the Origin point
3. Checks Z-axis sensor and returns to the Origin point
4. Checks Y-axis sensor and returns to the Origin point
5. Checks X-axis sensor and returns to the Origin point
6. Confirmation sound and standby

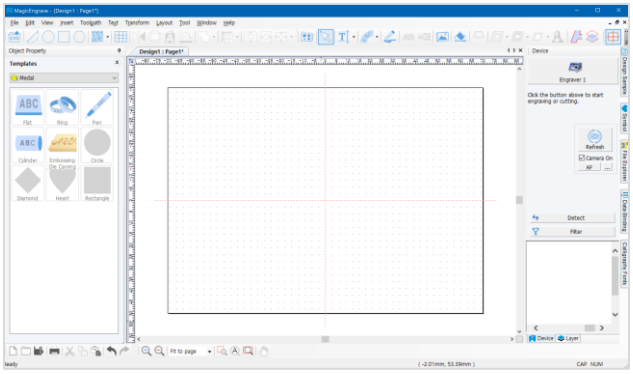
If no problem is found, it goes into standby mode with a confirmation sound.

(2) Marking Procedures

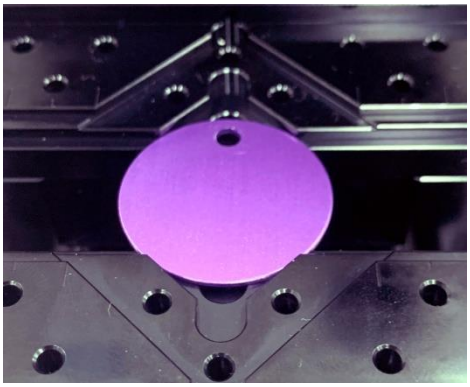
1. Turn on the marking machine.

※ If the machine does not turn on, check the emergency switch.

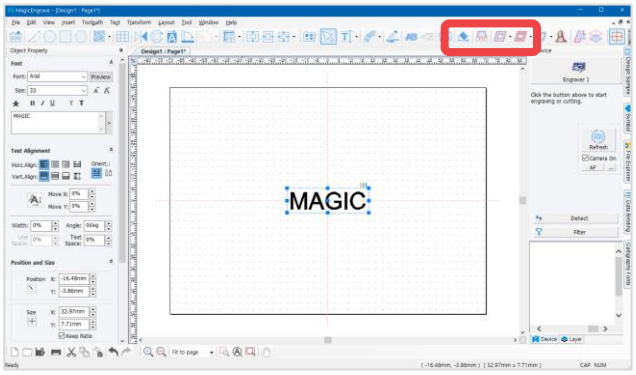
2. Run the program to connect it to the machine.



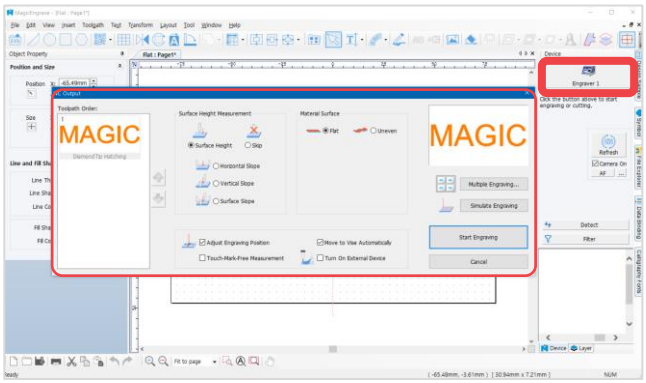
3. Place your material on the work area.



4. Make your design then create a toolpath.



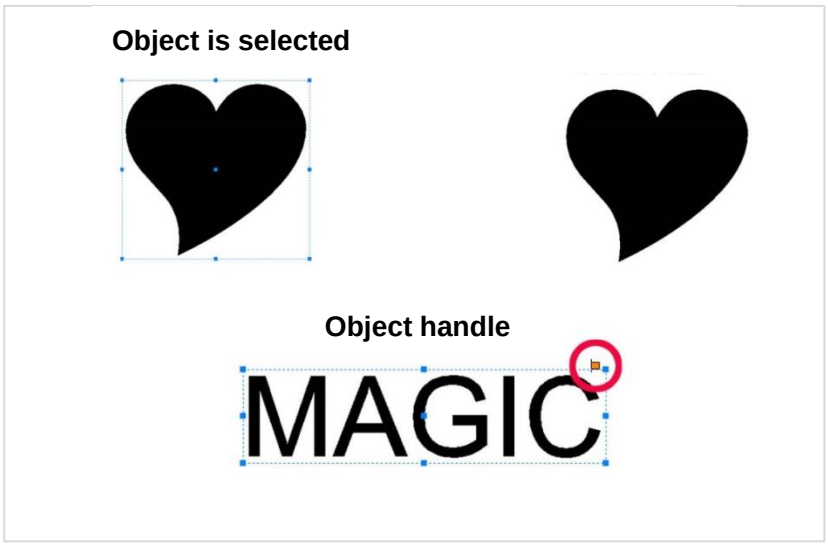
5. Click the [Machine] button to send the marking data.



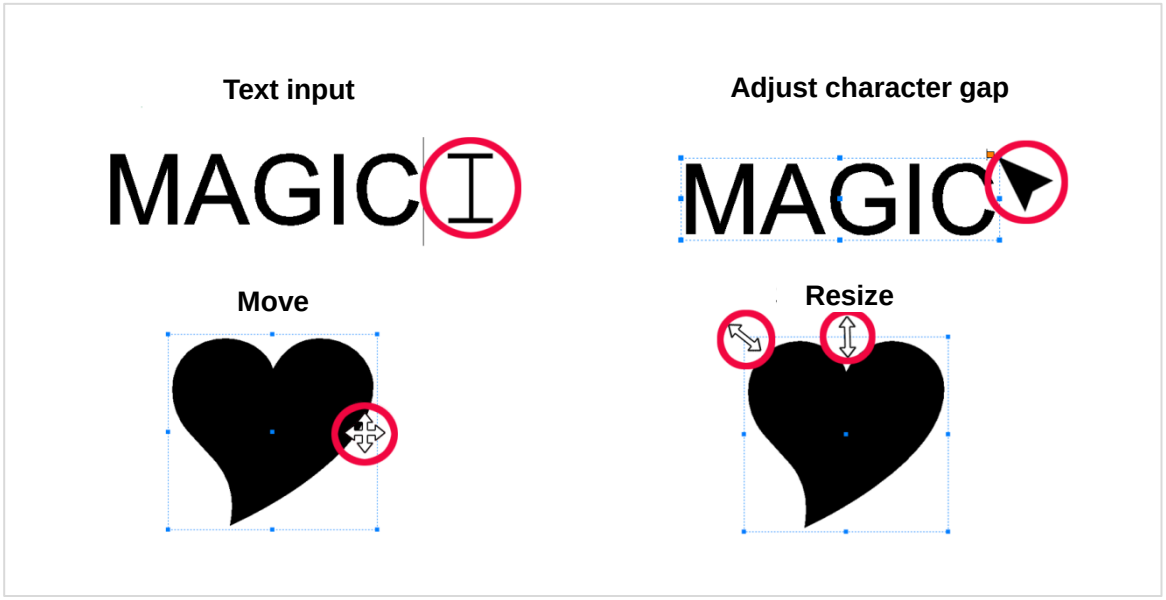
6. Press start  button on the machine to begin the engraving process.

Before Using the Program

The property of the object (i.e., size, shape, position, etc.) can be changed or modified when the object is selected.



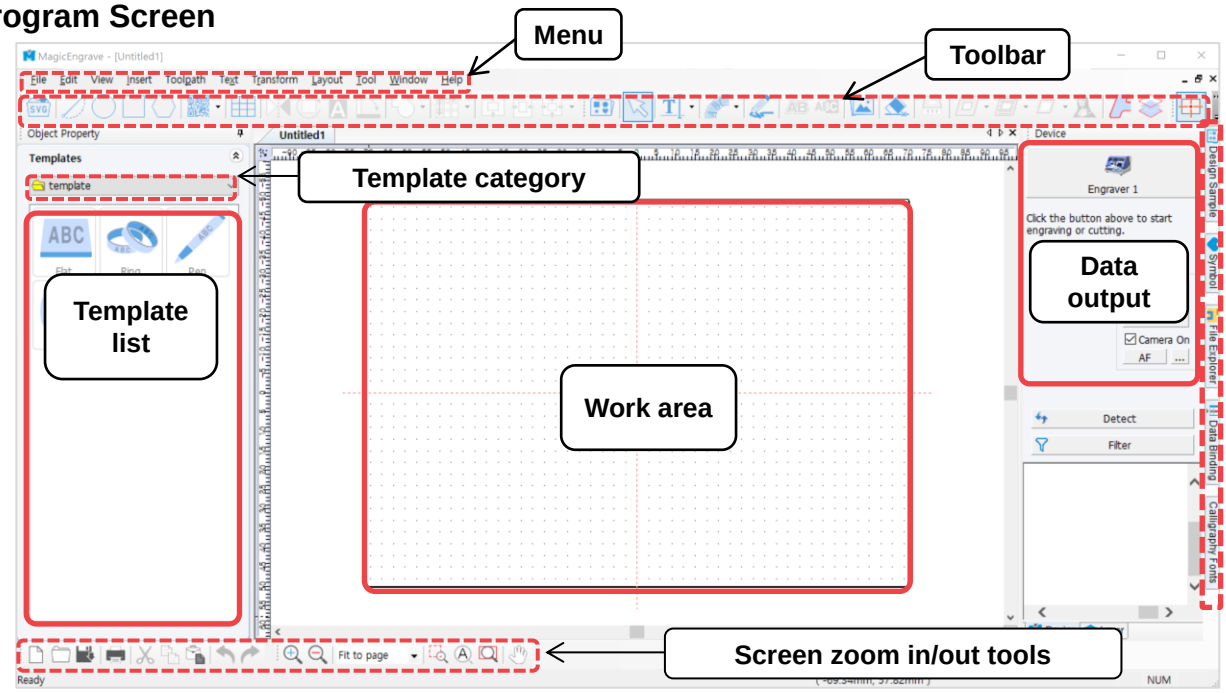
The mouse cursor display changes depending on the function (i.e., text input, resize, select, etc.).



Program Usage Description

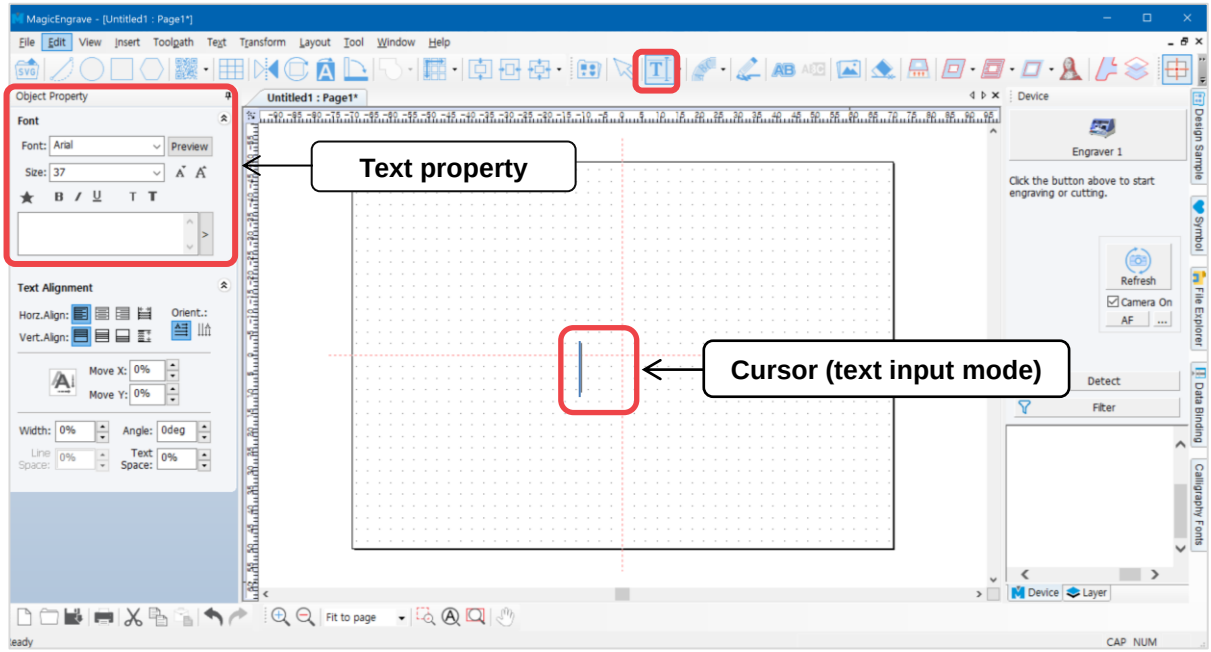
Shown below is the window that will appear once the program starts running. Icons displayed on the window may vary depending on the selected mode. The name of each category is as follows:

◈ Program Screen



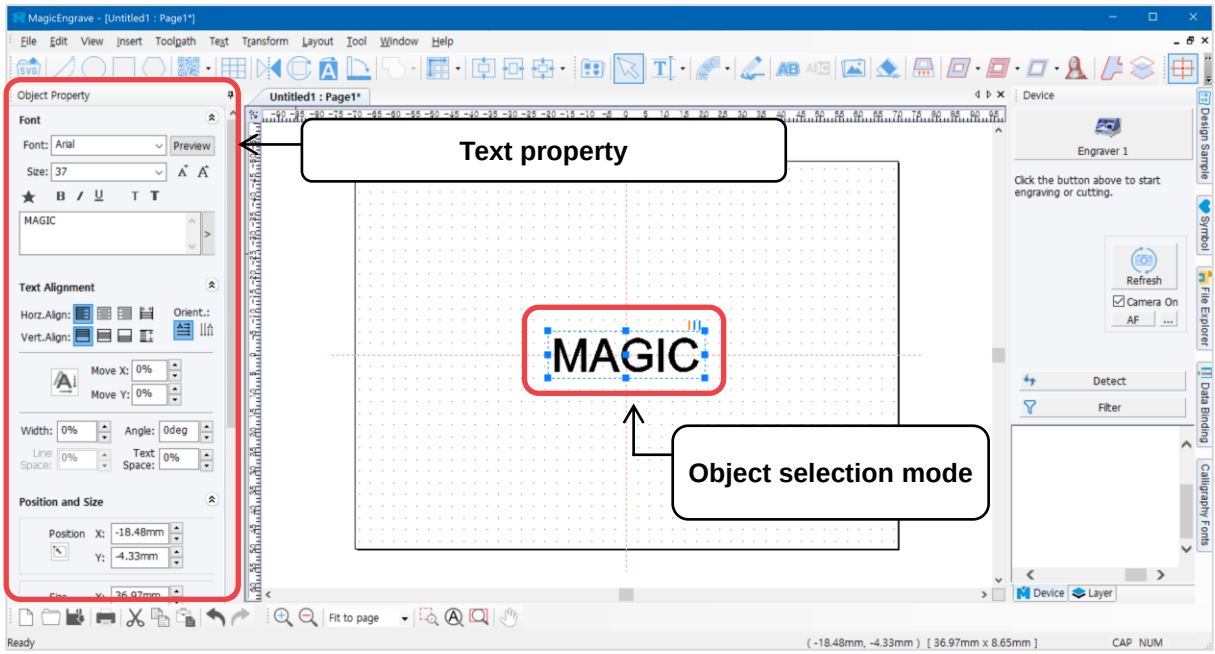
◈ Text Input Mode

Click  [Text Input] button on the upper center of your screen or double-click on the composition area to input text.



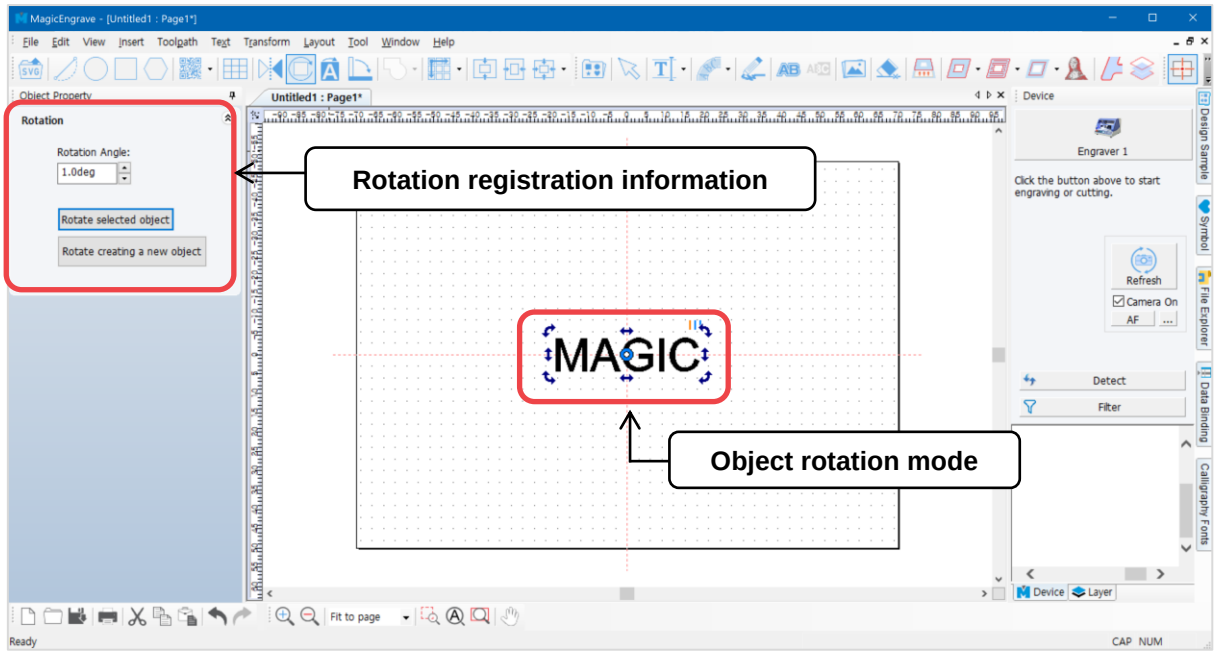
◈ Object Selection Mode

After entering the text, use [Selection] button with your mouse or right-click the text on the composition area to switch to selection mode. To switch to text input mode, double-click on the selection mode.



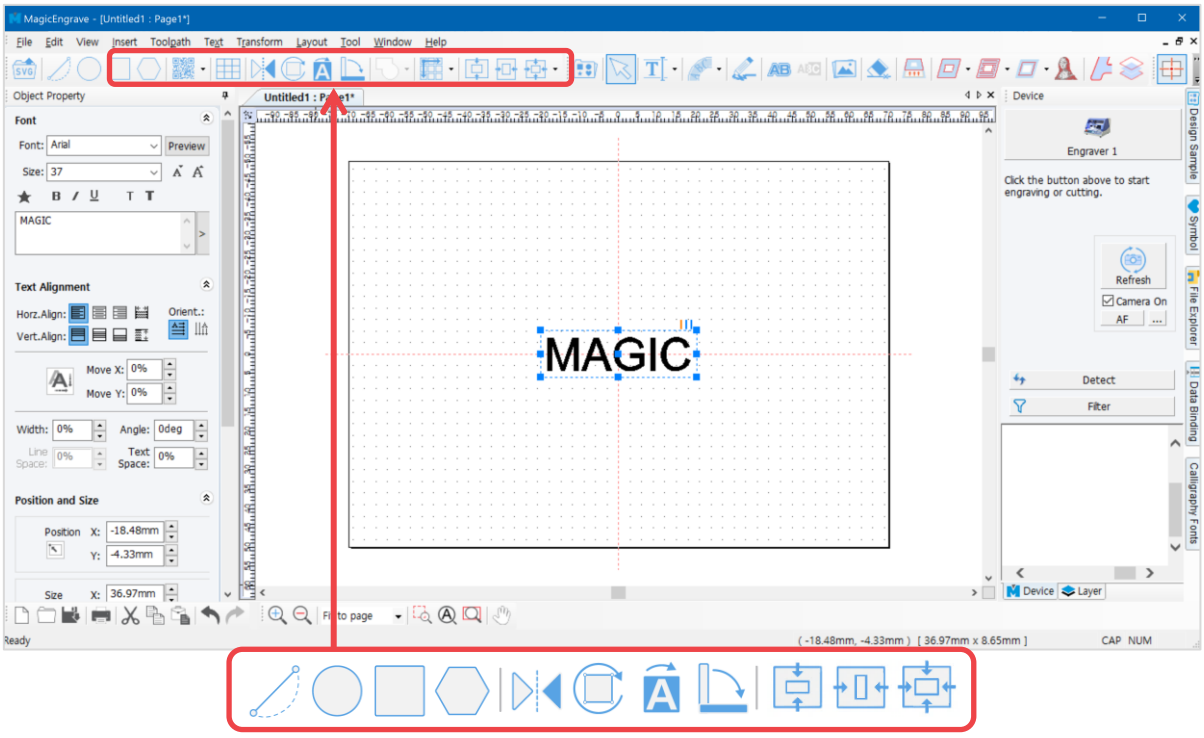
◈ Object Rotation Mode

To activate object rotation mode, double-click the text while in selection mode.

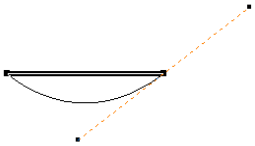


1. Toolbar

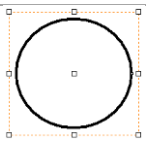
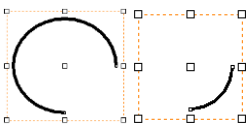
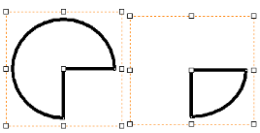
◈ Alignment Tools



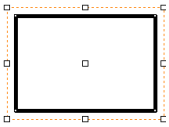
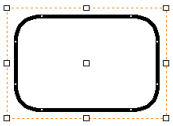
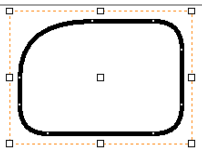
[Line/Curve]

	Click a certain point then hold your mouse and drag to make a dot line appear. Designate the distance then right-click to create a straight line. Then, press “Ctrl” key on the keyboard and move the mouse to create a horizontal line or a vertical line.
	Click a certain point and designate a distance. Hold your mouse and drag to make a curve appear. Right-click to create a curve.

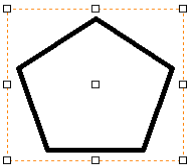
[Circle/Oval/Pie]

	Click the work area then hold your mouse and drag to designate the size of a circle. Press “Shift” key on the keyboard then drag your mouse to create a perfect circle.
	Click Arc button on the circle object property window to convert to arc. The start/end of an angle of an arc can be assigned, or adjusted by dragging the start/end with the mouse. Click CW/CCW button to create a reversed arc image.
	Click Pie button on the circle object property window to convert to pie (a filled arc). The start/end of an angle of a pie can be assigned, or adjusted by dragging the start/end with the mouse. Click CW/CCW button to create a reversed pie image.

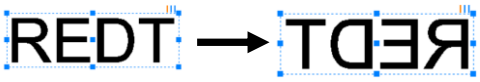
[Rectangle]

	Click the work area then hold your mouse and drag to designate the size of a rectangle. Press “Shift” key on the keyboard then drag your mouse to create a square.
	The curvature of each edge can be assigned on the rectangle object property window. Or, by dragging the edges of the rectangle with the mouse, the edges convert into round corners.
	Click Independent Corner button on the rectangle object property window to adjust the curvature of each corner individually.

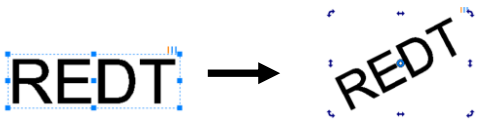
[Polygon]

	Click the work area then hold your mouse and drag to designate the size of a polygon. The number of vertices can be assigned on the polygon object property window.

[Mirror]

	Produces mirrored image.

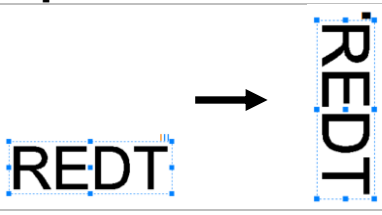
[Rotation]

	Double-click to select rotation then hold your mouse and drag to rotate the image.

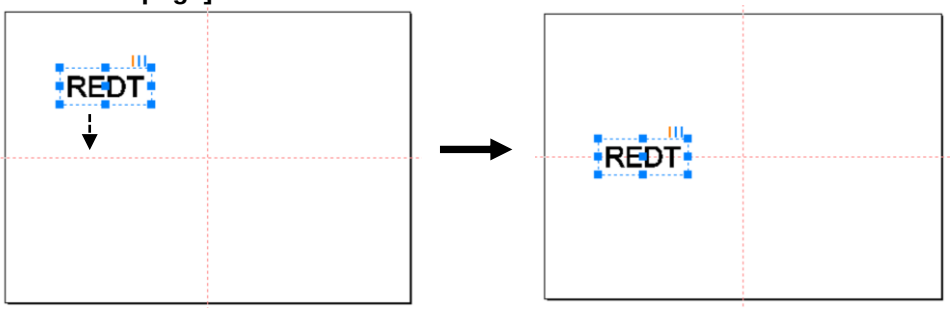
[Invert color]

	Inverts the color of the image.

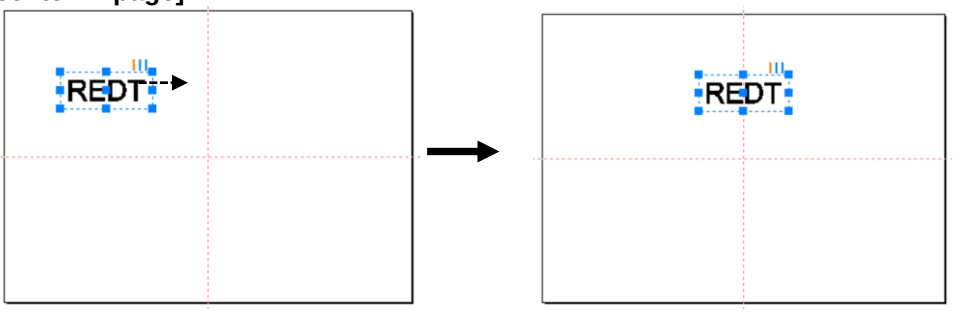
[90˚CW]

	Rotates the image by 90˚.

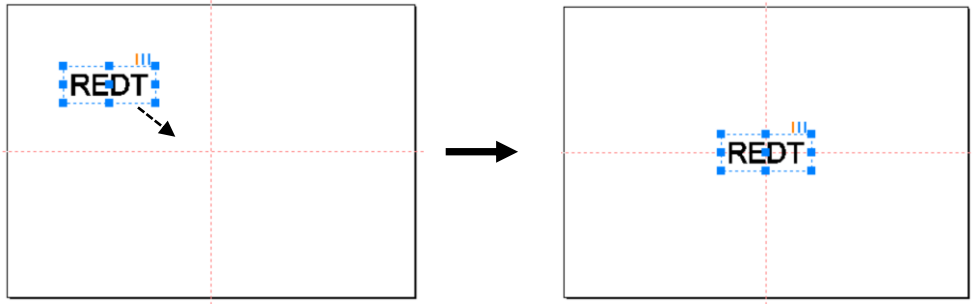
[Horizontal center in page]



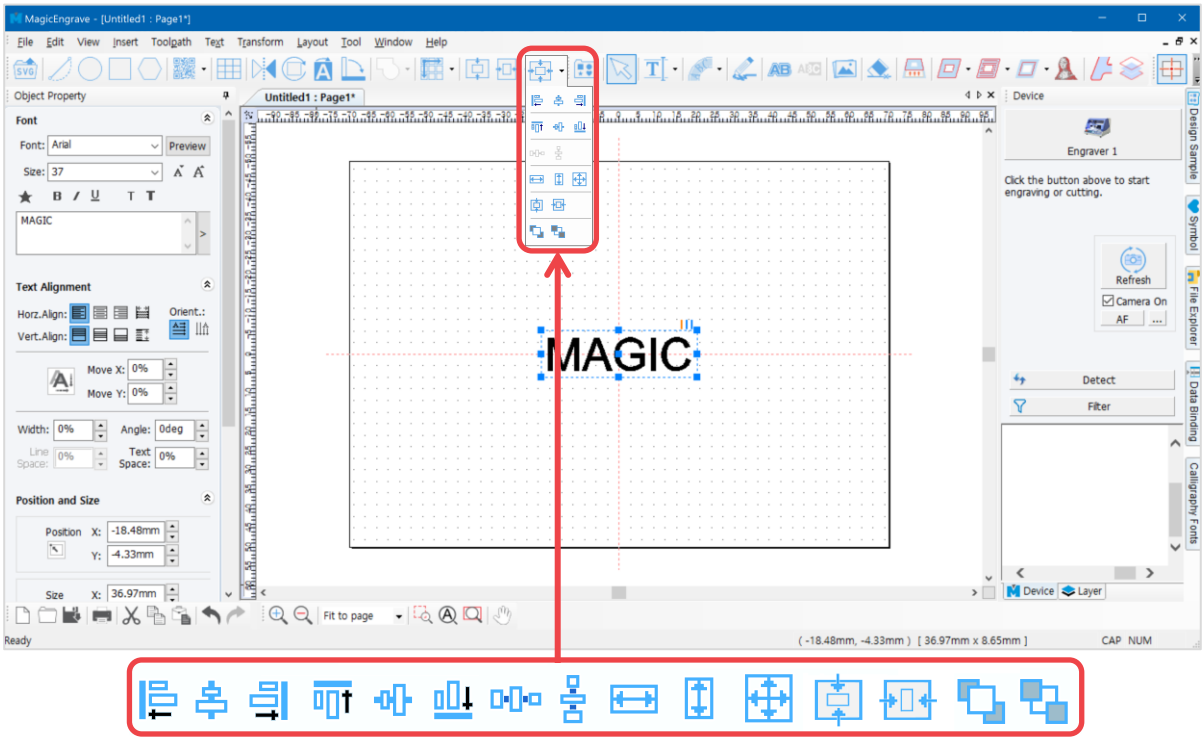
[Vertical center in page]



[Center in page]

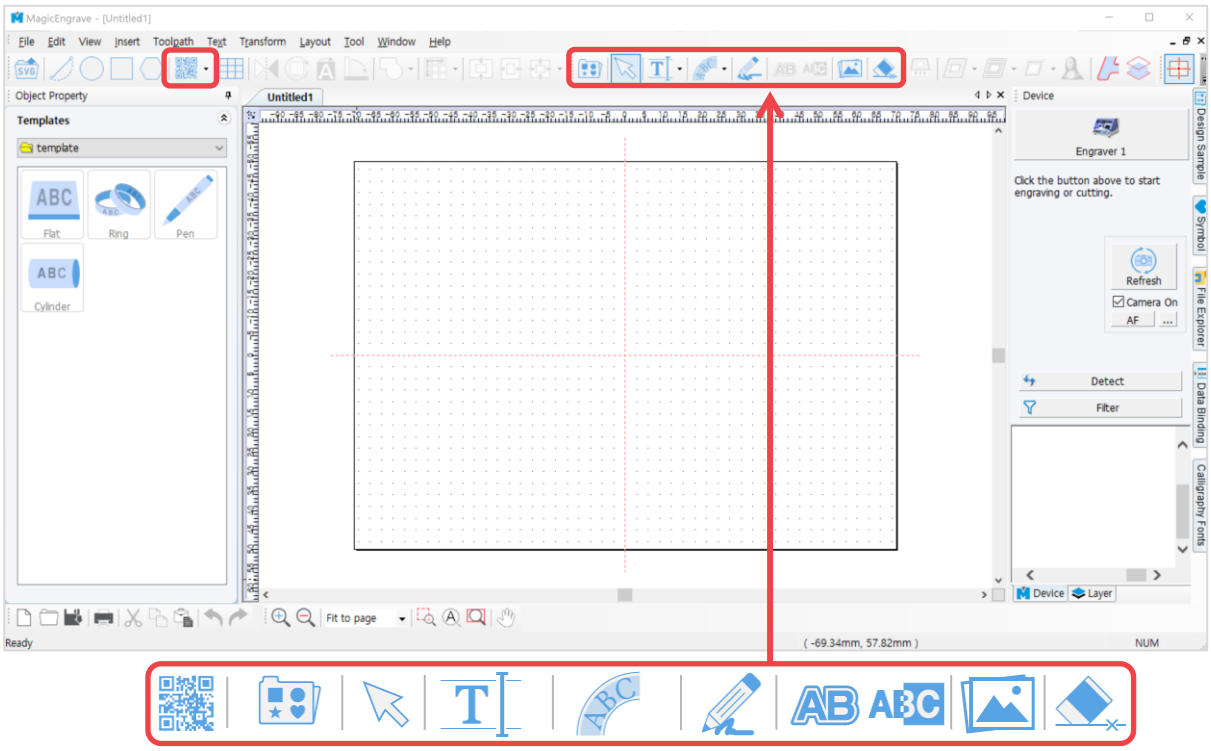


[Alignment options]



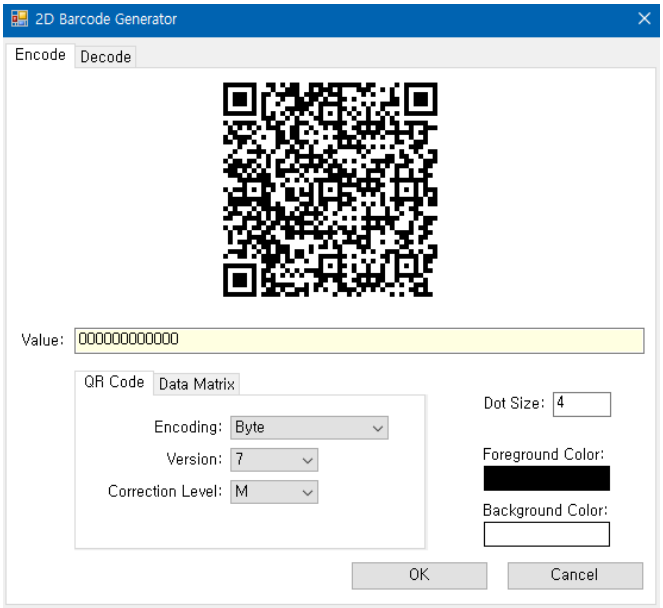
Alignment		Align to the left of base object
		Align to the center of base object
		Align to the right of base object
		Align to the top of base object
		Align to the center of base object
		Align to the bottom of base object
Adjust horizontal gap		Align horizontal gap between objects evenly
Adjust vertical gap		Align vertical gap between objects evenly
Same size		Make same width
		Make same height
		Make same size
Alignment		Horizontal center in page
		Vertical center in page
Order		Bring to front
		Send to back

◈ Object Tools



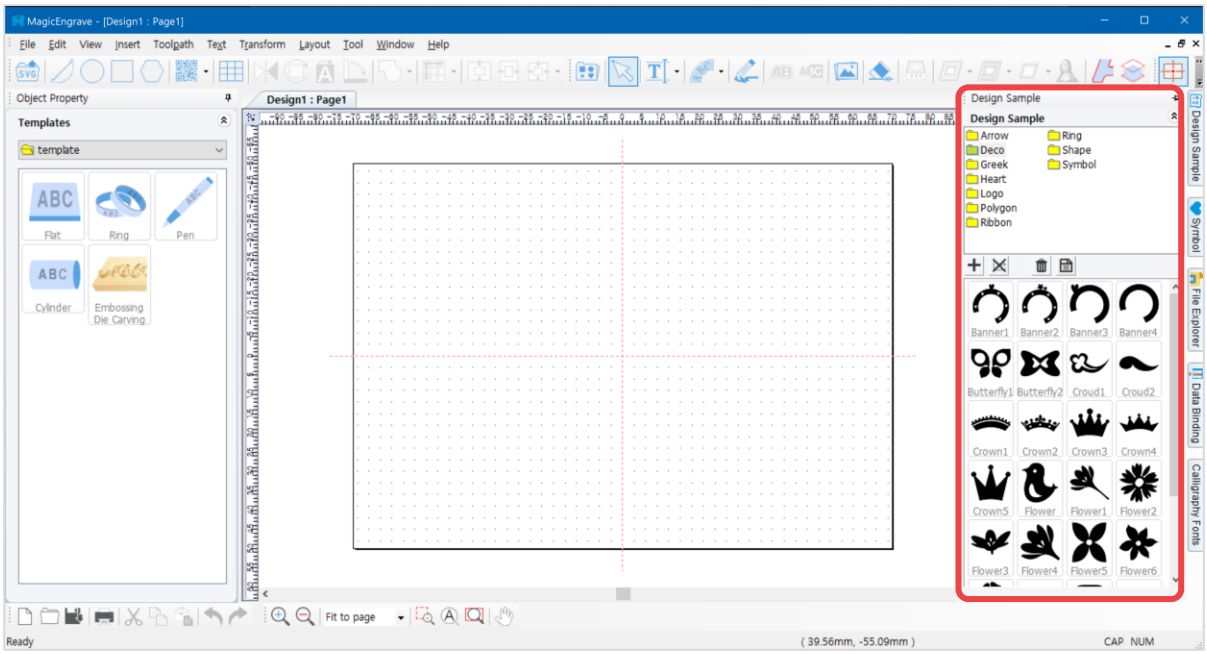
[Barcode]

Create a barcode object.



[Design sample]

Import design sample or save current object as design sample.



What is a Design Sample?

Design sample is the object saved in the design sample library. Design samples can be easily and quickly imported from the design sample library and edited freely.

[Selection]

Use selection mode to modify the object's property or adjust its size and position. To use, click the object created in the work area then adjust its property. To input text, right-click.

[Object selected]

MAGIC

[No object selected]

[Text input]

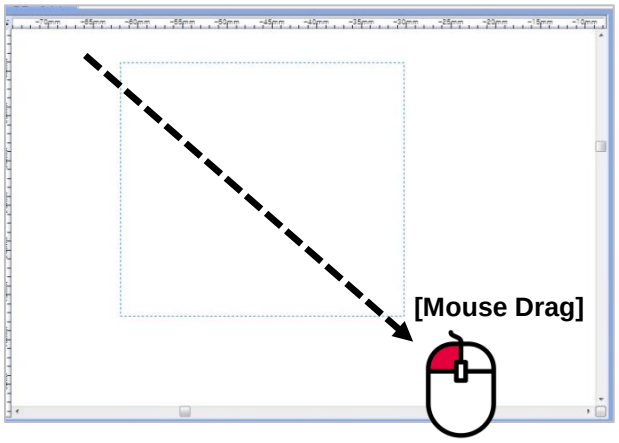
To input text, click button then click the object in the work area or, simply double-click to enter text.

Cursor (Text input mode)

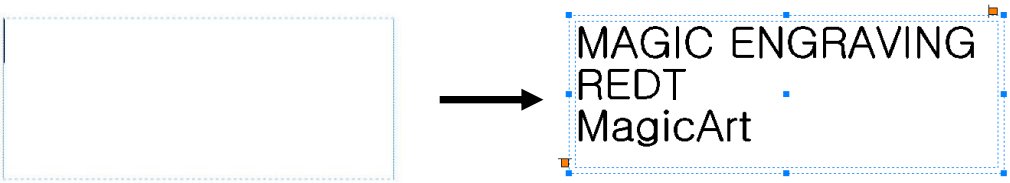
To modify the object's font style and size, click button then hold and drag the character/s with the mouse.

[Mouse drag]

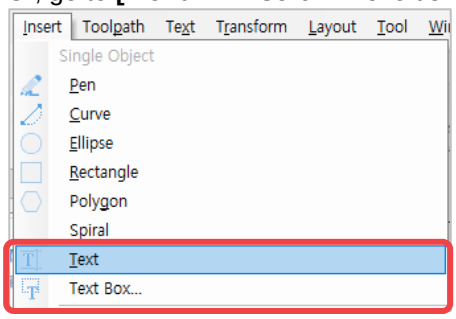
Click  button to create a text box. Then hold and drag the mouse to adjust the size of the text box. The size of the text box limits the number of character input.



A blinking cursor display indicates ‘enter text.’

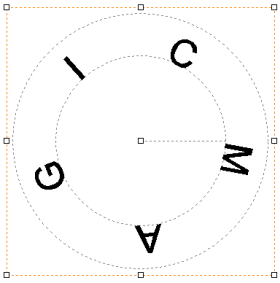


Or, go to **[Menu → Insert → Text box].**



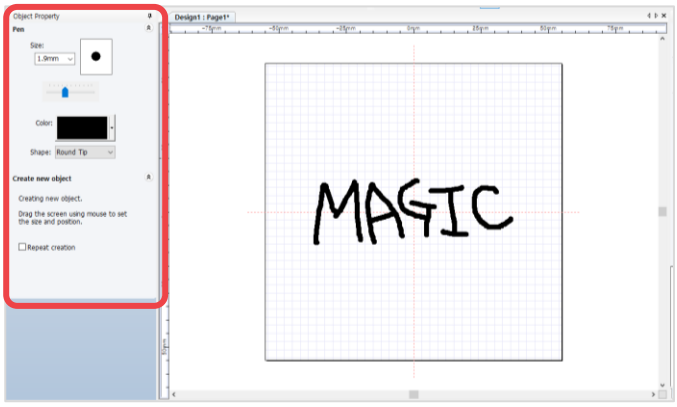
[Circular text]

Create text objects along a circle.



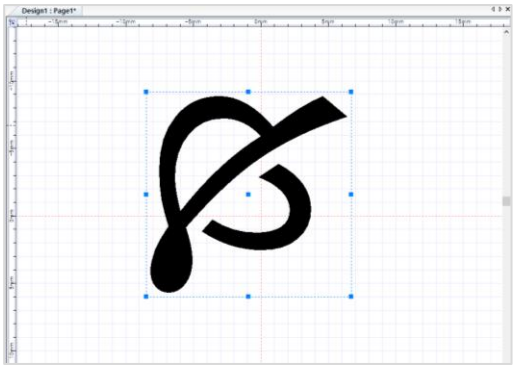
[Drawing pen]

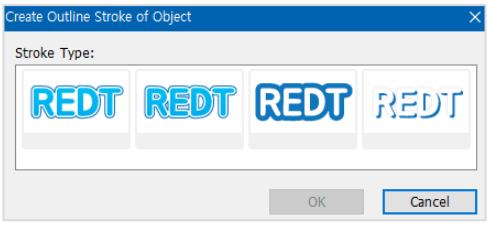
Hold and drag the mouse to draw character/s to create an object with the use of drawing pen. The drawing line's thickness can be adjusted in the drawing object property window.



[Outline stroke of object]

Apply outline stroke to the object.

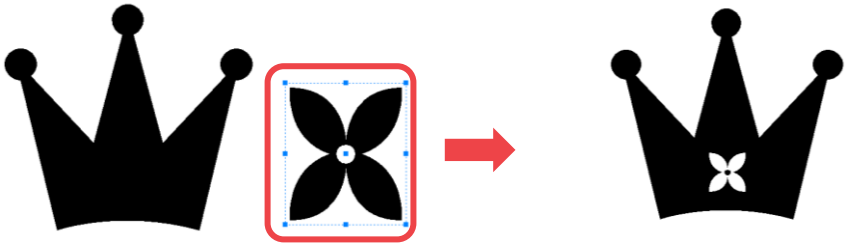




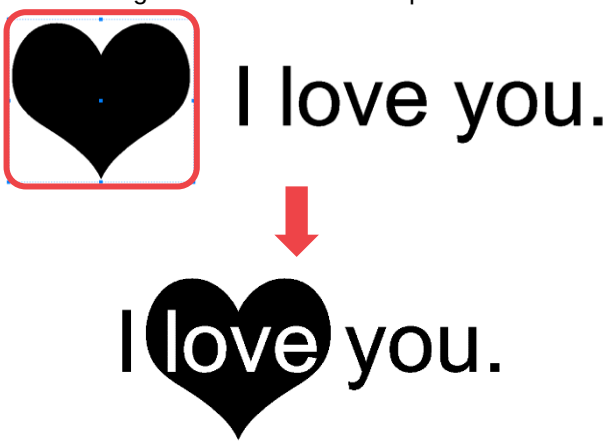
[Auto Inverts Color]

The color of one object auto inverts to opposite color to contrast the other object's color when overlapped.

Click ABC button then select the object to be placed over the target object. Upon pacing the selected object over the target object, the selected object auto inverts to an opposite color.



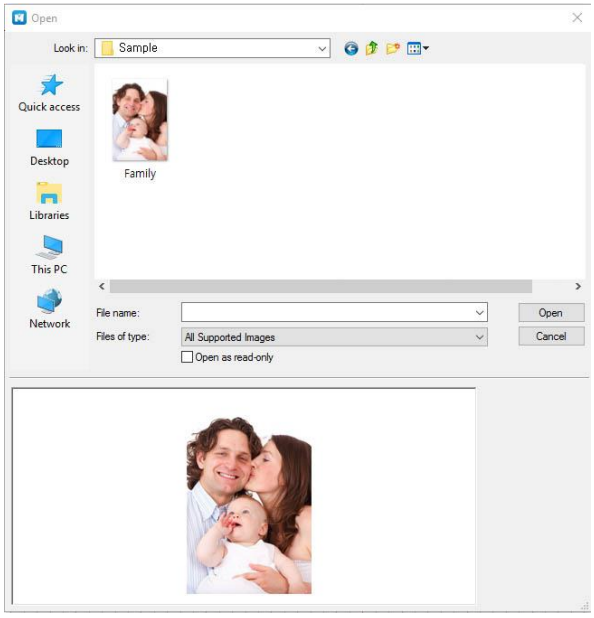
For texts, click the ABC button then drag the selected text and place it over the target object.



Notice **If the color is not inverted, go to [Layout menu → Order → Top Most] then place the selected object over the target object.**

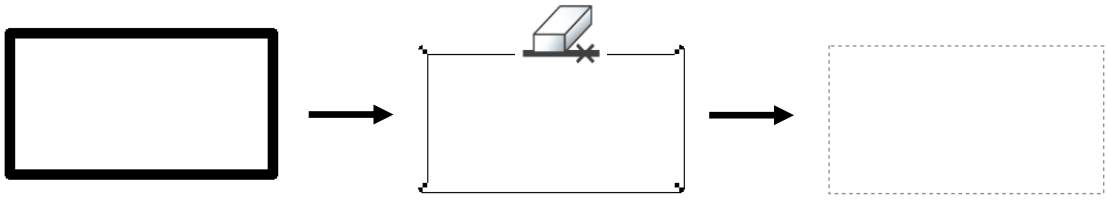
[Image]

Import image (e.g., bmp, jpeg, gif, png … etc.).



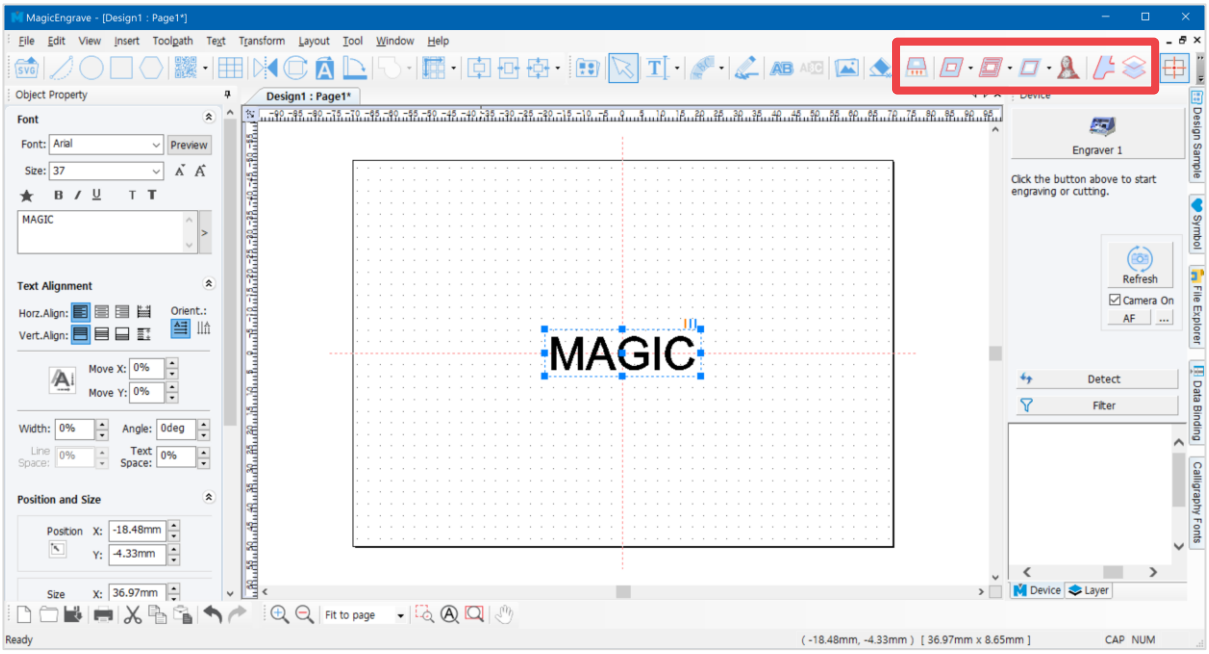
[Line eraser]

Erase the line of a created object.
Click the object to be erased then hold and move the mouse over the line to erase. (Take note that some objects may not be erased with the Line eraser tool).



◈ Toolpath

※Please refer to **[4. How to engrave for each toolpath]** for details.

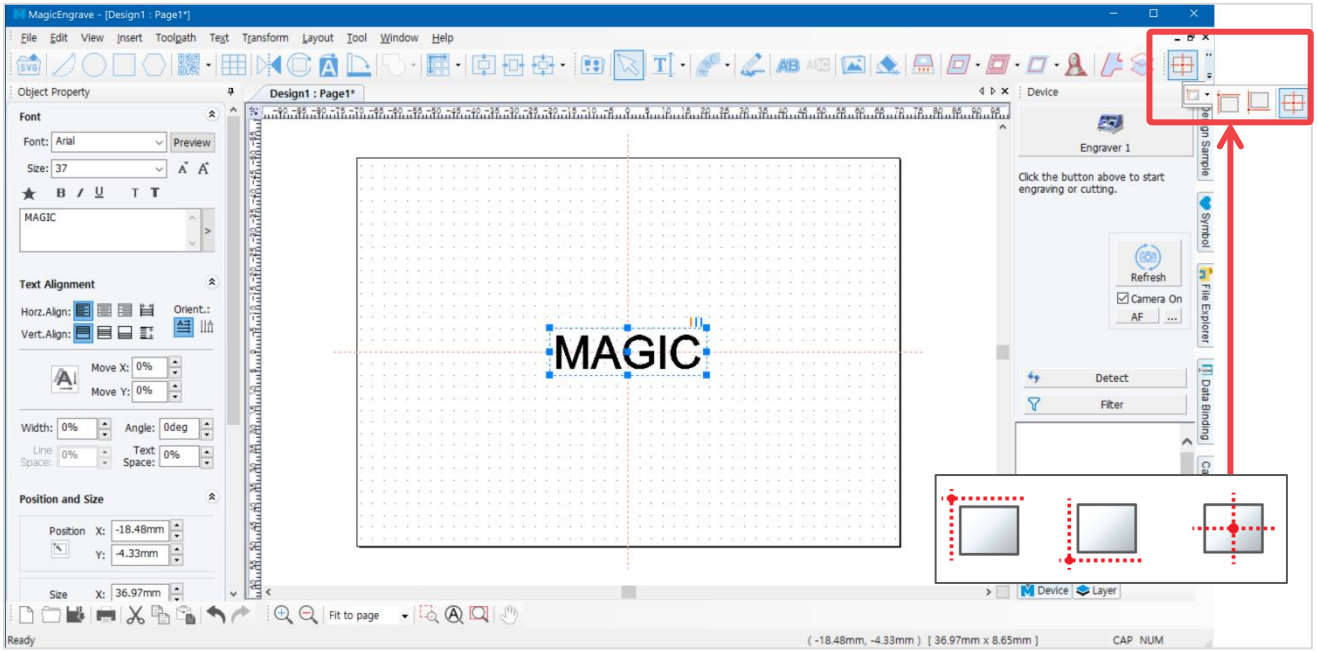


Note

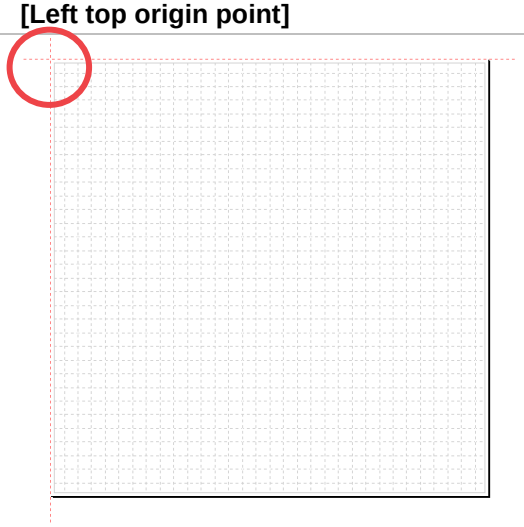
What is a Toolpath?

Toolpath is a path where the tool passes by for marking.
Toolpath is usually displayed in red color and the marking tool moves along the path as it engraves.

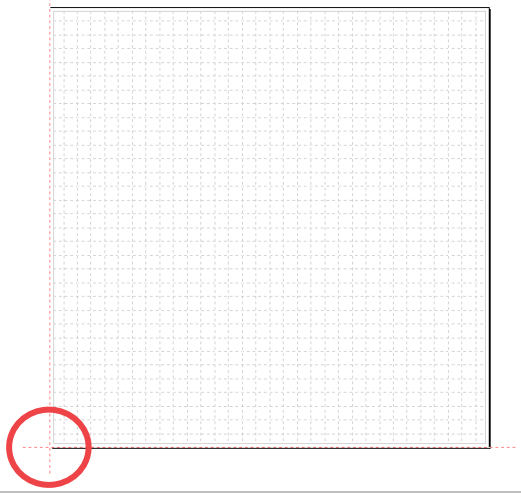
◈ Origin Point Setting Tools



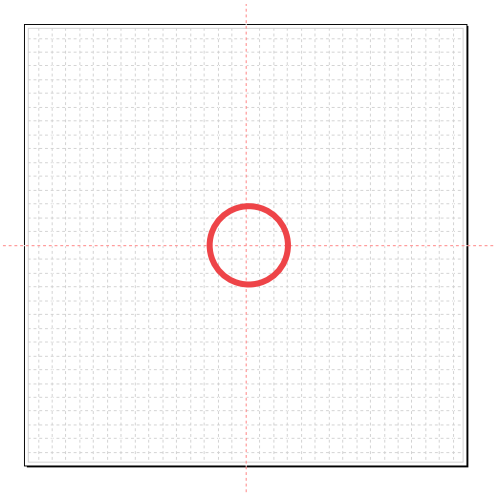
[Left top origin point]



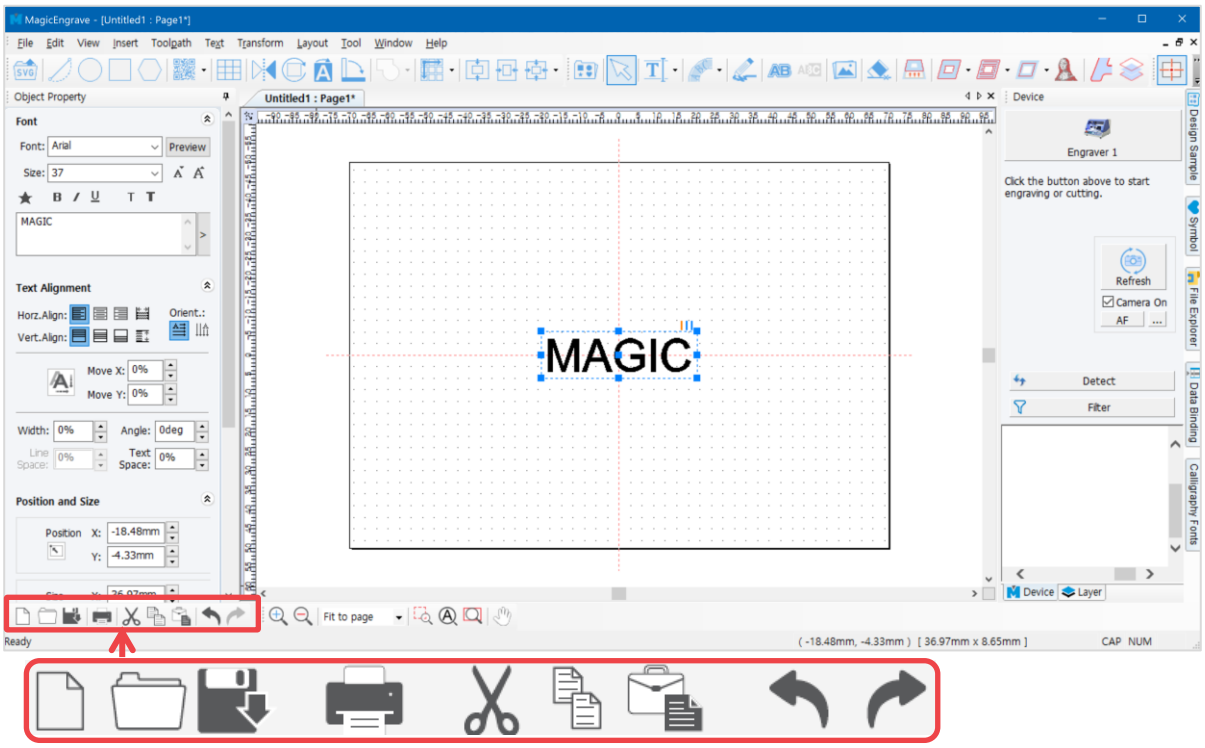
[Left bottom origin point]



[Center origin point]

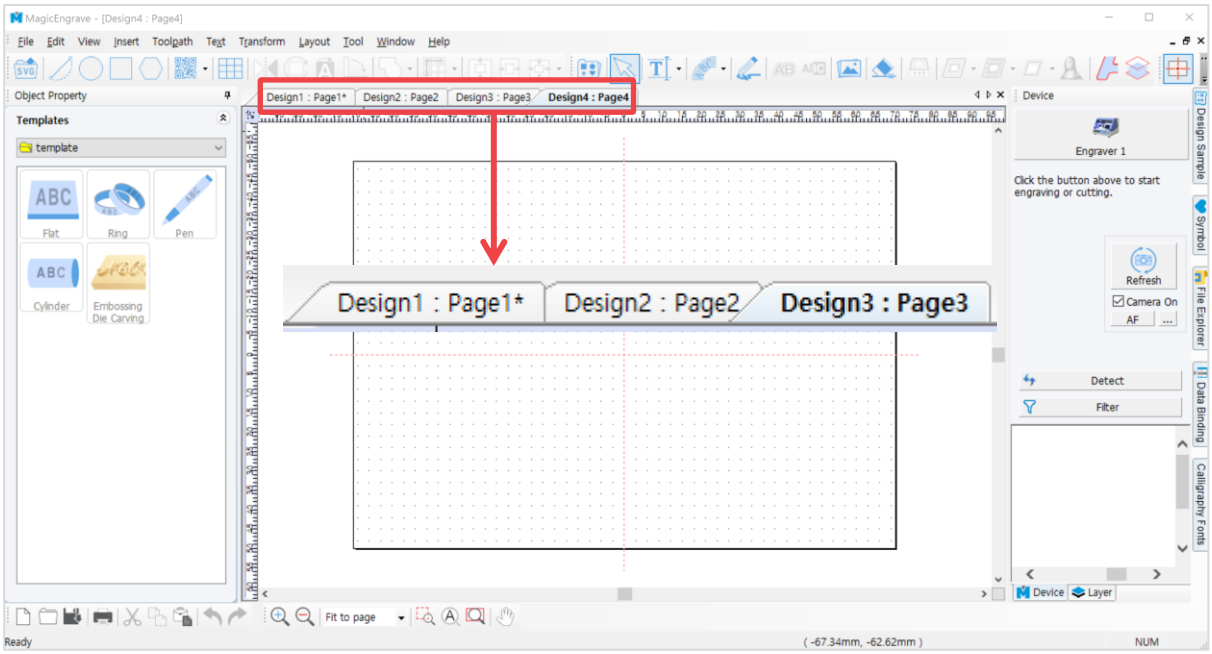


◈ Basic Tools



[New document]

Open a new page.



[Open]

Open a file in “*.dgn” file format.

Select a file on the “Open” window and click “Open” button.

[Save document]

Save the design created on program as “*.dgn” file format.

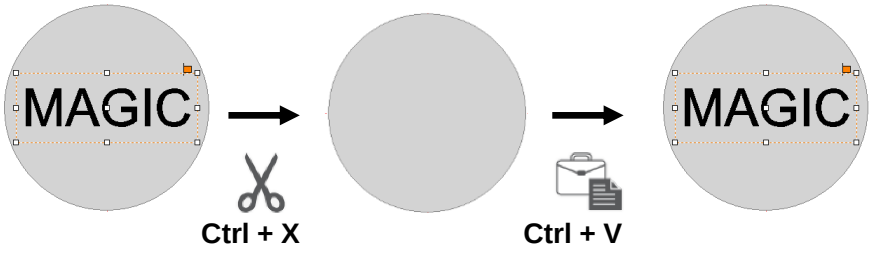
Choose the location (folder) in which the file will be saved then enter the file name before clicking “Save” button.

[Print]

Print the design created on program.

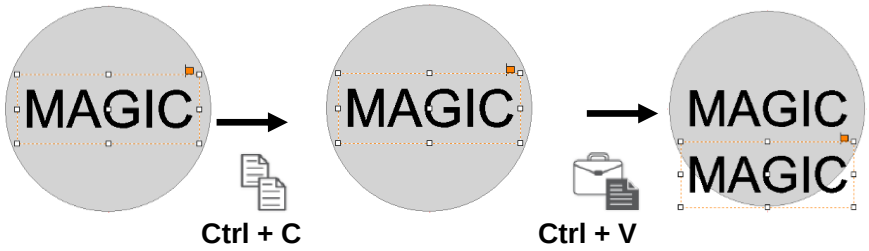
[Cut]

Cut the selected object. Click cut on the menu or press Ctrl+X on the keyboard.



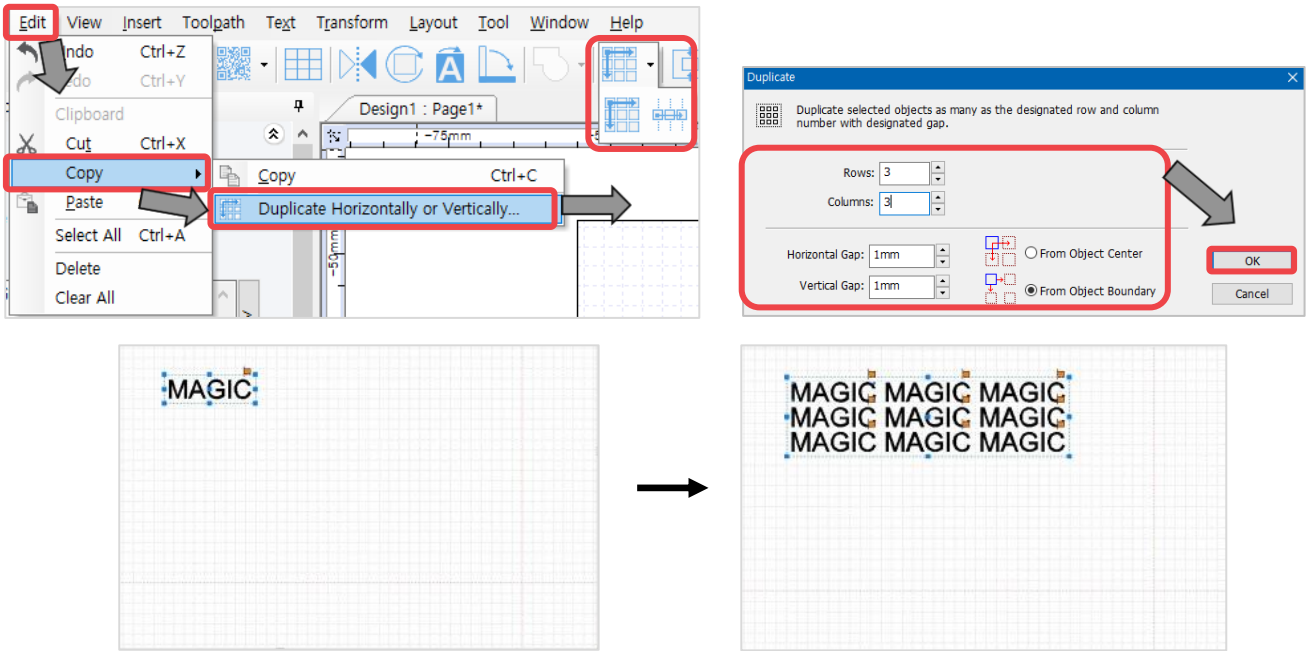
[Copy]

Copy the selected object. Click on the menu or press Ctrl+C on the keyboard.



[Duplicate Horizontally or Vertically]

Click icon in toolbar to multi-copy the same object at once, or go to [Edit → Copy → Duplicate Horizontally or Vertically…].



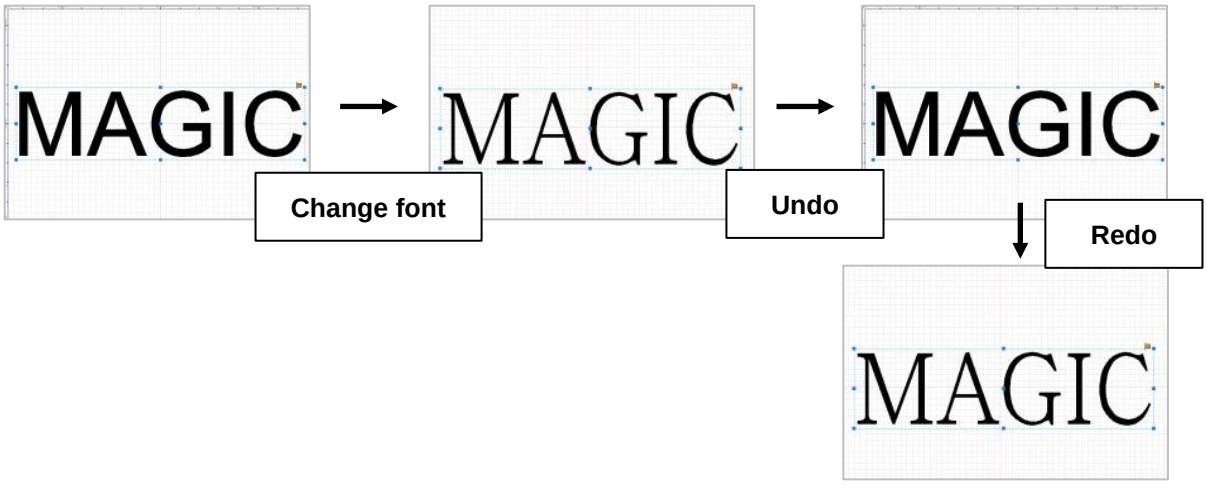
[Paste]

Paste the cut or copied object. Click on the menu or press [Ctrl+V] on the keyboard.

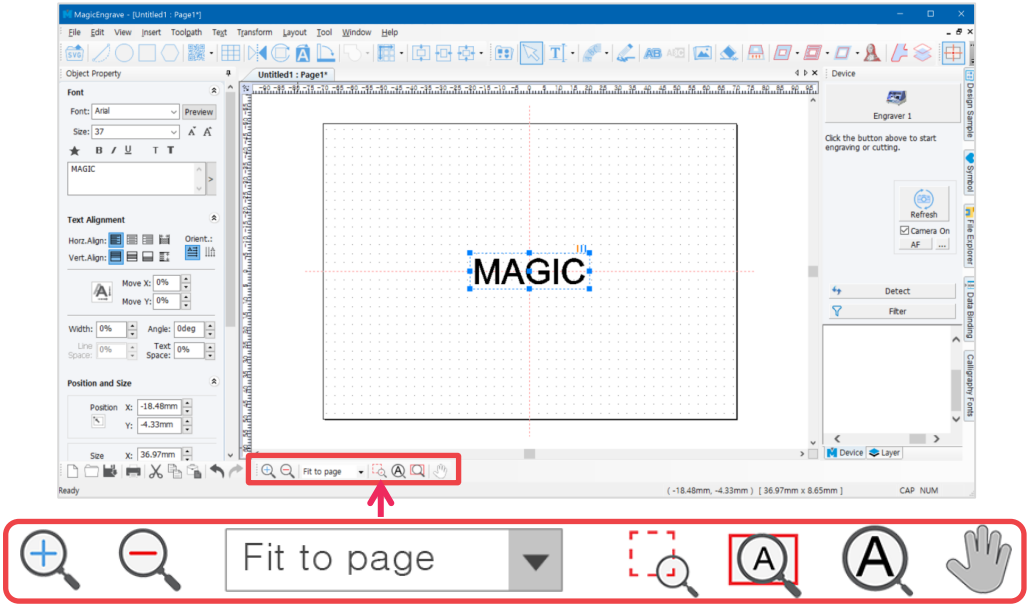
[Undo / Redo]

-Undo: To reverse the action recently done.
Go to [Menu] → [Tool] → [Option] → [General] to adjust the number of undo action.

-Redo: To restore the action that was previously done.

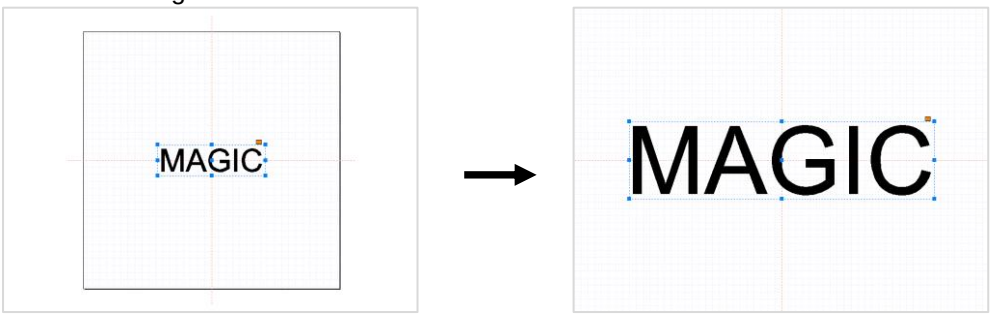


◈ Zoom in/out/move Tools



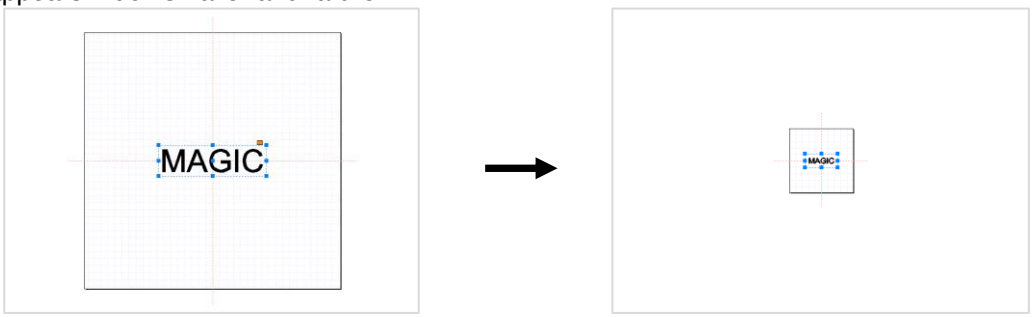
[Zoom in]

The screen appears much larger and nearer.



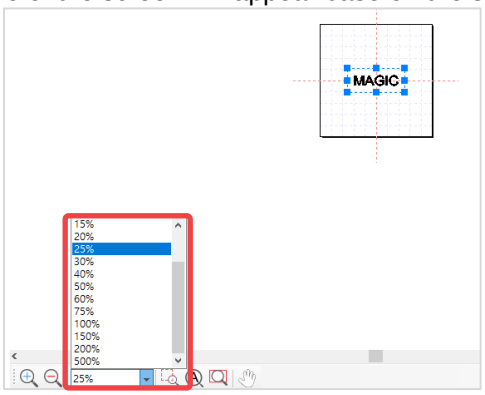
[Zoom out]

The screen appears much smaller and farther.



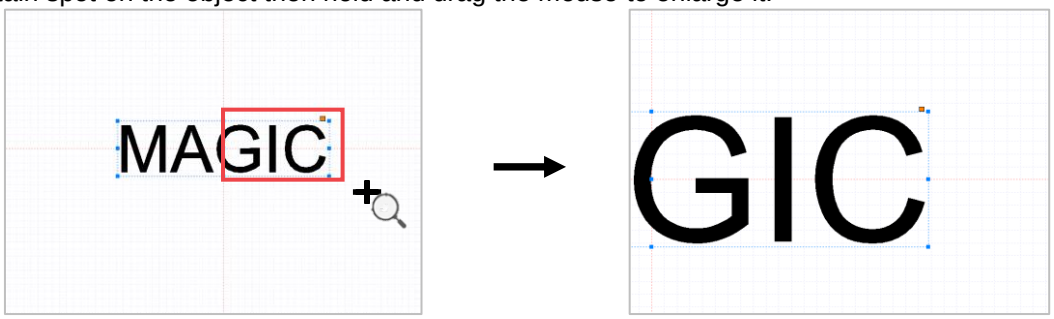
Fit to page **[Zoom in/out ratio]**

Select the desired screen ratio. The size of the screen will appear base on the selected ratio.



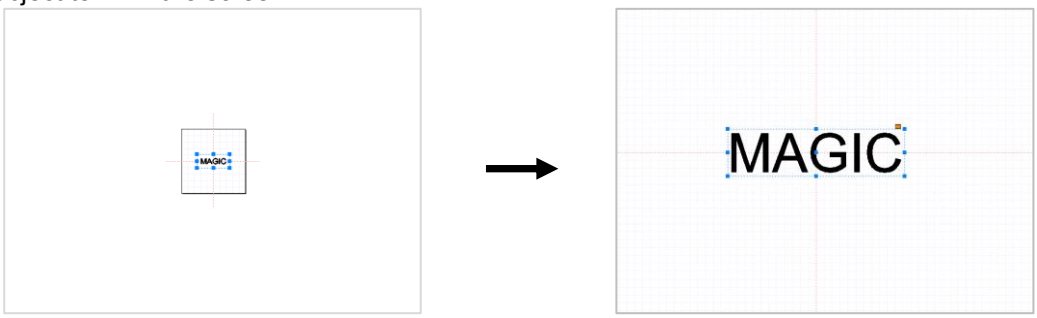
[Magnifier]

Select a certain spot on the object then hold and drag the mouse to enlarge it.



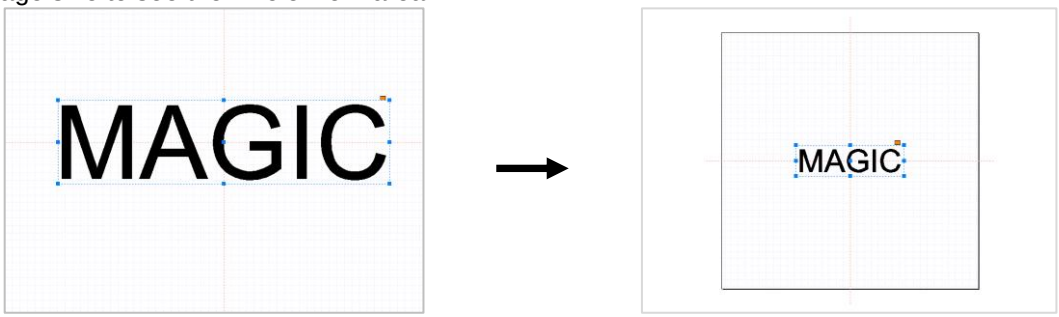
[Fit to object]

Enlarge the object to fill in the screen.



[Fit to page]

Adjust the page size to see the whole work area.

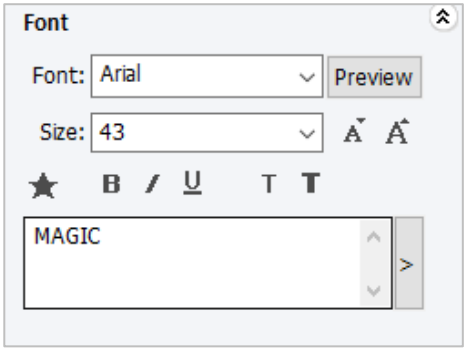


[Panning]

Drag the screen with the mouse to move it.

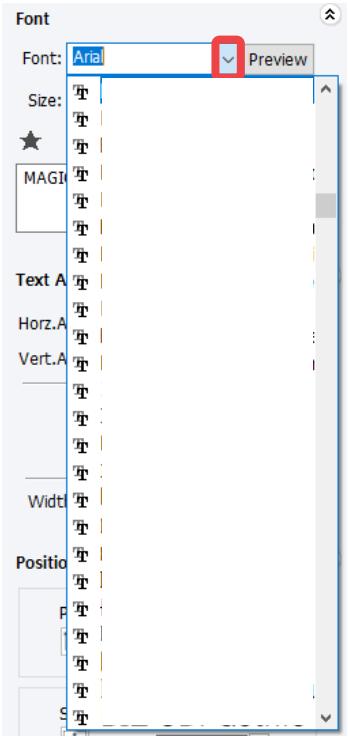
2. Text Object Property

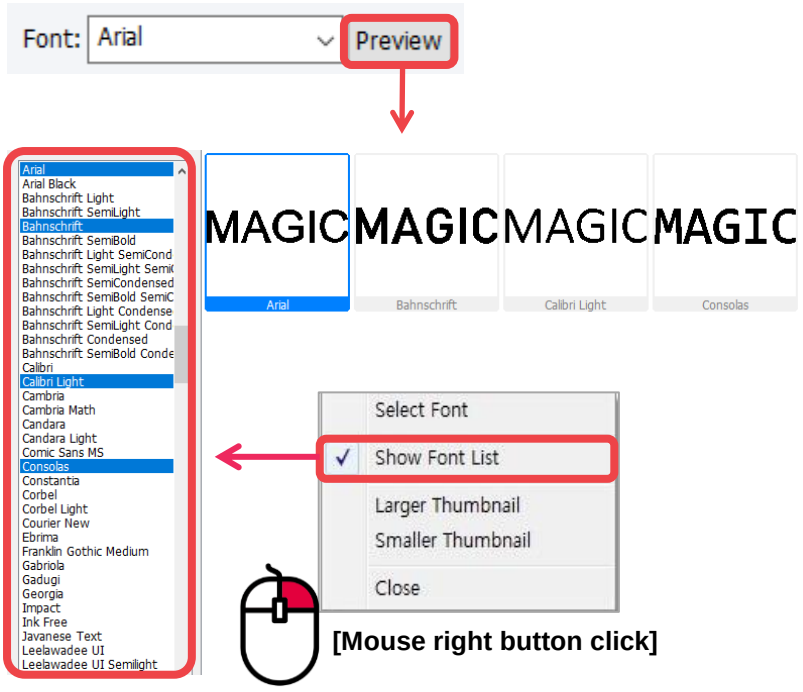
Select the text object to see its property. The property of the object will appear on the left side of the screen.



[Font]

Designate font. Click “Preview” button or the arrow beside it to designate font.





[Mouse right button click]

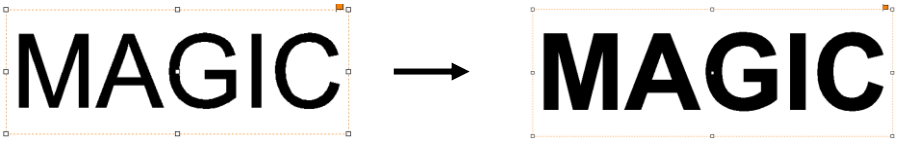
*Right-click the font preview window to see menu. Click “Show Font List” then designate the fonts to be shown in preview.

[Size]

Adjust the size of the selected text. Click  [size] button to adjust the size of the font or the arrow beside it.

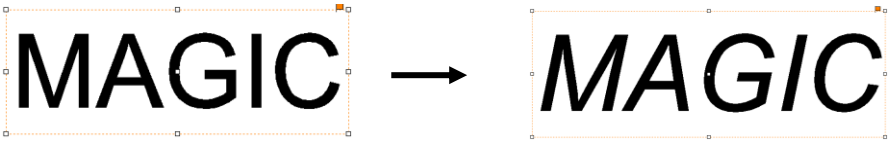
[Bold]

Change text style to bold.



[Italic]

Change the text style to italic.

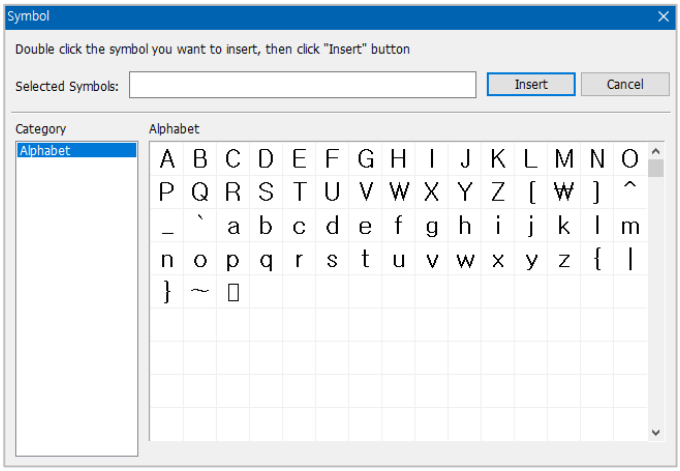


[Reduce or increase font weight by one level]

Adjust the weight of font.

[Symbol]

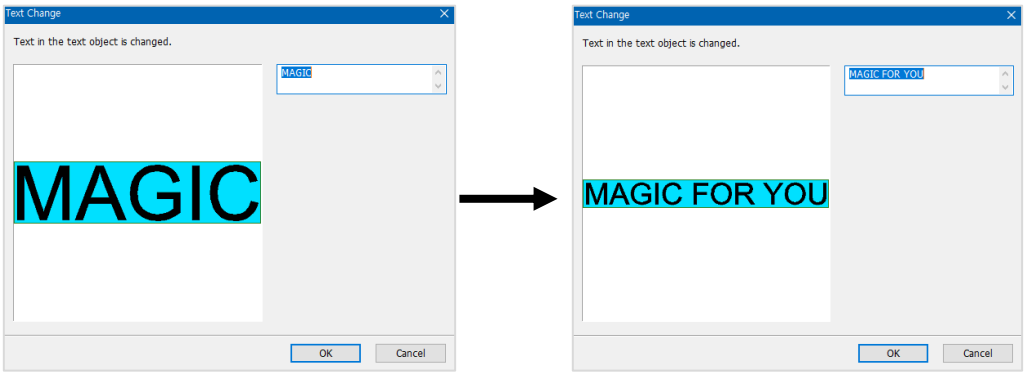
Insert symbols.

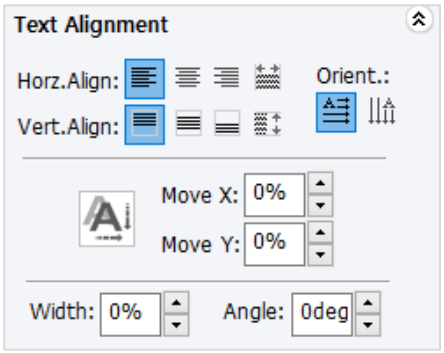


[Text change]

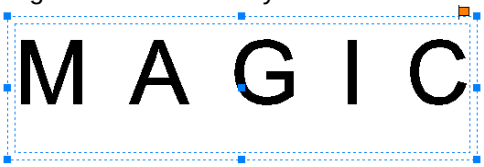
Modify the entered text. Edit the text on the text field or click 

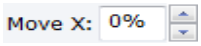
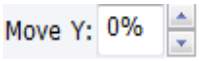
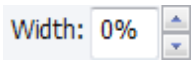
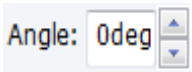
button to add long texts.

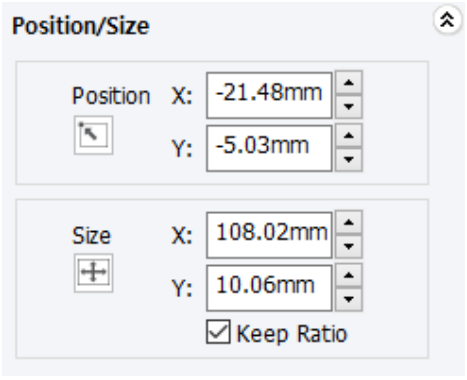




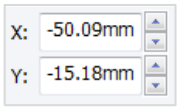
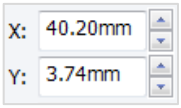
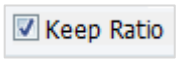
[Text Alignment]

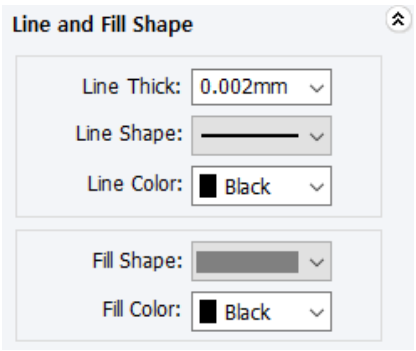
[Align to left]	Align characters to the left in the text box. 
[Align to center]	Align characters to the horizontal center in the text box. 
[Align to right]	Align characters to the right in the text box. 
[Both]	Align characters evenly to both sides in the text box. 
[Align to top]	Align characters 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]	Arrange characters horizontally. 
[Vertical text]	Arrange characters vertically. 
	Move the selected character horizontally (left, right). 
	Move the selected character vertically (up, down). 
	Adjust the width of the selected character. 
	Rotate the selected character. 

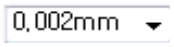
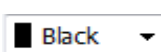


[Position/Size]

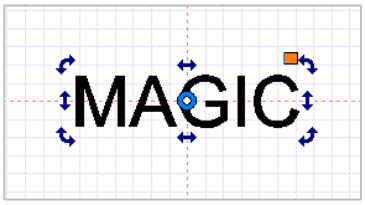
	Designate the location of the selected object
	Designate the size of the selected object
	Click “check” to maintain the same ratio for the object’s width and height. Click “uncheck” to adjust the object’s width and height separately.

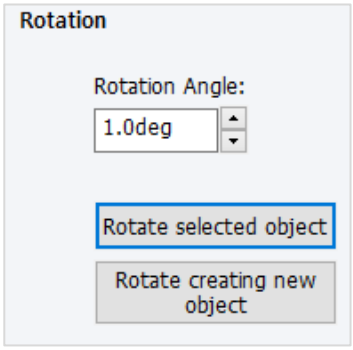


[Line and Fill Shape]

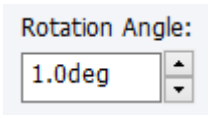
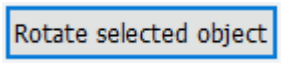
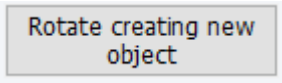
	Line thickness of the selected object
	Line type of the selected object
	Line color of the selected object
	Color filled inside of the selected object
	Shape filled inside of the selected object

3. Rotation Tool Property

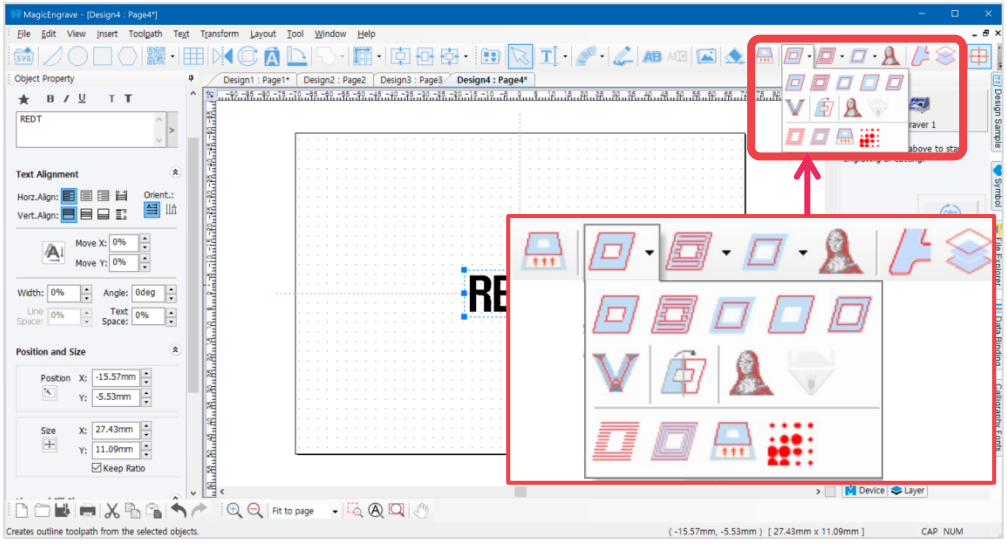




[Rotation]

	Designate the rotation angle of the selected object. Enter the desired angle of rotation or click the up/down arrow buttons.
	Rotate selected object according to the angle entered.
	Add a new object and rotate it according to the angle entered.

4. How to Engrave for Each Toolpath



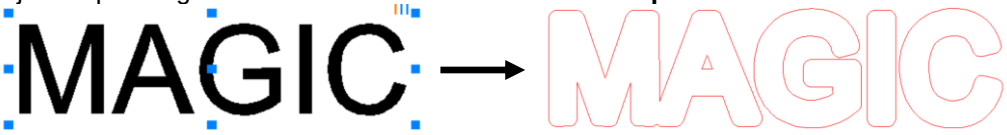
Note

What is a Toolpath?

Toolpath is a path where the tool passes by for marking.
Toolpath is usually displayed in red color and the marking tool moves along the path as it engraves.

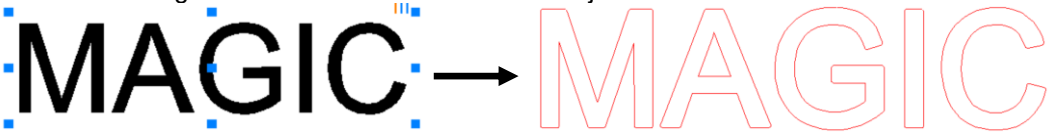
[Cut-out toolpath]

Creates a toolpath that will cut out the selected object. The toolpath boundary will be wider than the boundary of the selected object depending on the thickness of the tool. ***This toolpath must be used when cutting.**



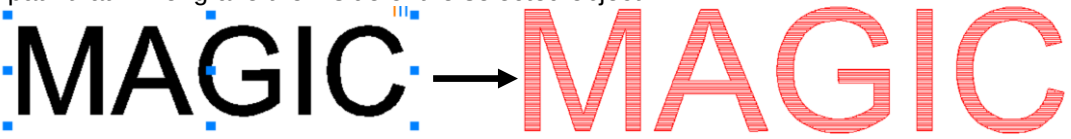
[Outline toolpath]

Creates a toolpath that will engrave the outline of the selected object.



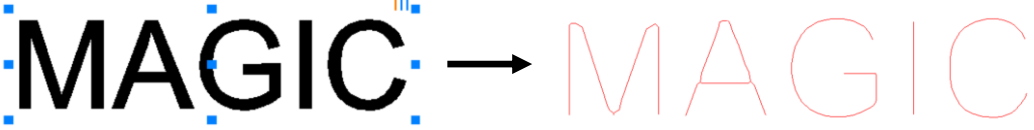
[Hatching toolpath]

Creates a toolpath that will engrave the inside of the selected object.



[Single line toolpath]

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

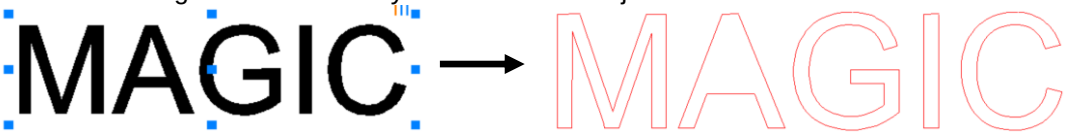


Notice

“Single line toolpath” process may cause deviation on center line.
It is recommended to use fonts with thinner lines to reduce deviation.

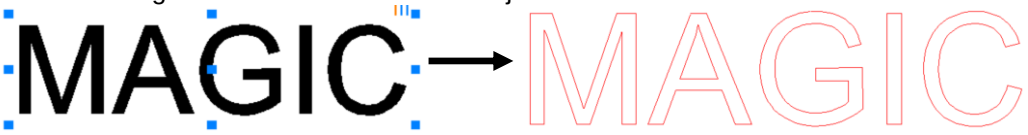
[Boundary-line toolpath]

Creates a toolpath that will engrave the boundary of the selected object.

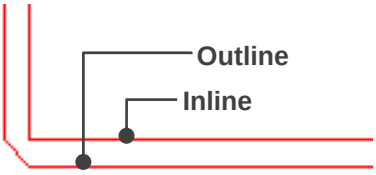


[Inline toolpath]

Creates toolpath that will engrave inline of the selected object.

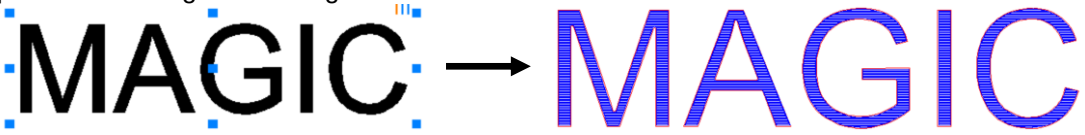


Notice **The toolpath is created within the borders of the selected object.**



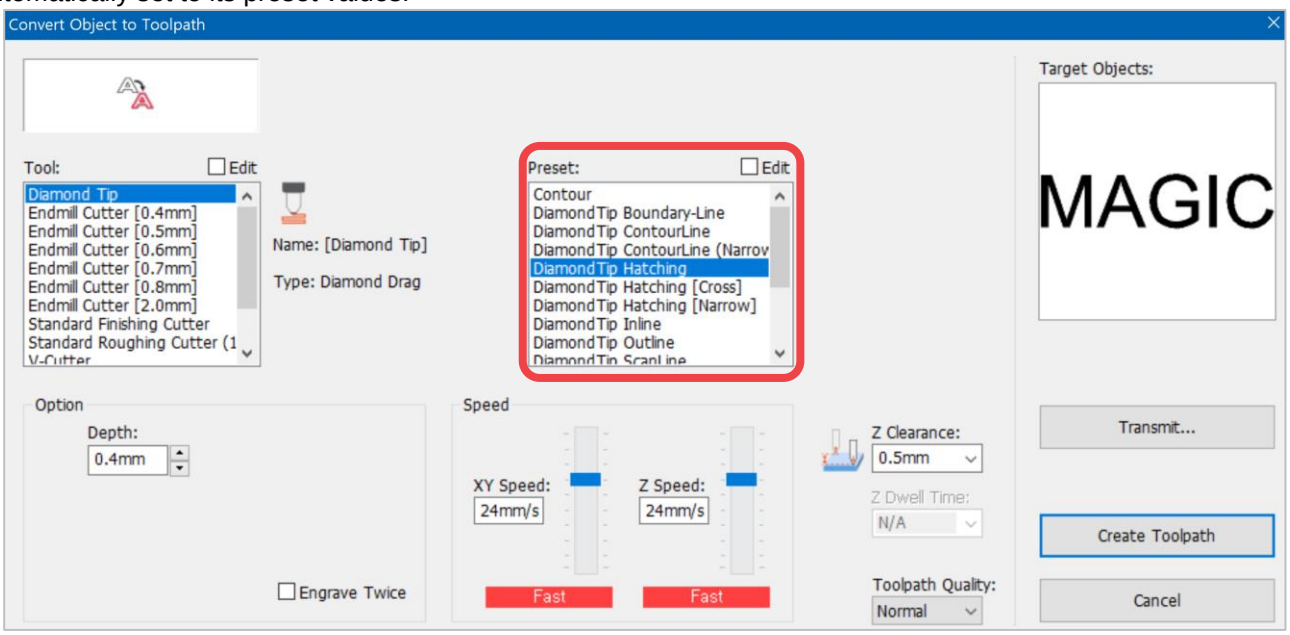
[V-cut toolpath]

Creates a toolpath that will engrave V-cut groove.



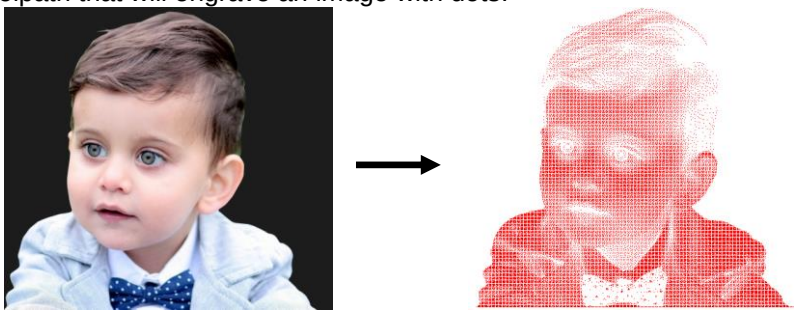
[Convert object to toolpath]

Convert the selected object to toolpath. It's not necessary to set toolpath settings each time. It will be automatically set to its preset values.



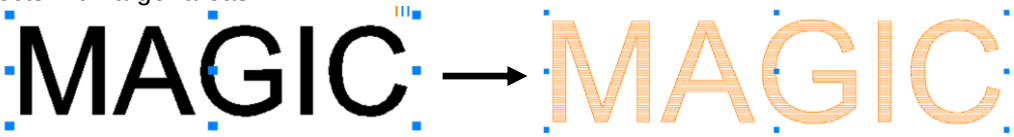
[Photo impact engraving toolpath]

Creates a toolpath that will engrave an image with dots.



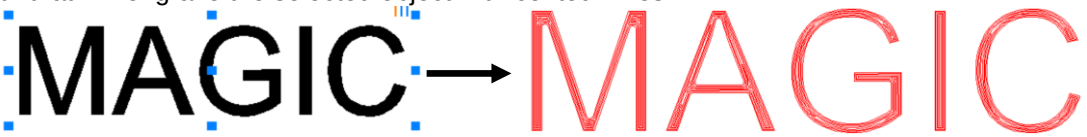
[Scan-line toolpath]

Creates toolpath that will engrave inside area of the selected object's boundary.
"Scan line toolpath" may appear similar to "Hatching toolpath" but it is specifically used to engrave on logos, patterns or objects with larger areas.



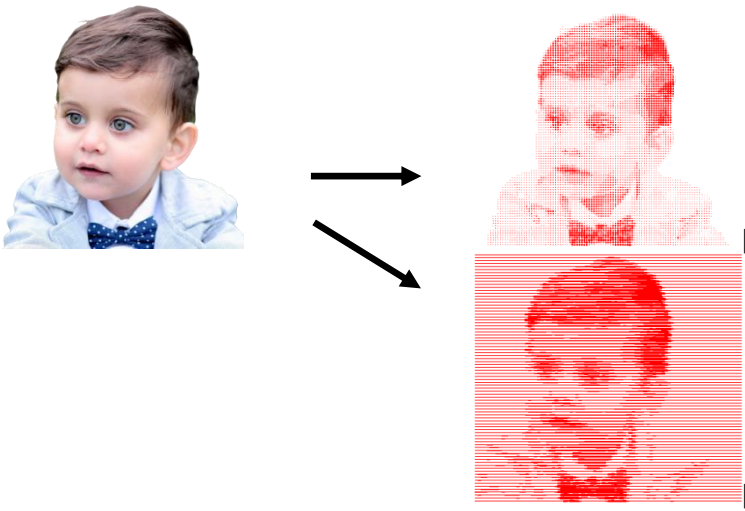
[Contour line toolpath]

Creates a toolpath that will engrave the selected object with contour lines.



[Photo halftone engraving toolpath]

This converts an image into a half-toned image and engraves the object in dots or horizontal lines using a V-cut tool. This process is only applied to engraving machines with rotating-spindle function like BB E7, E4 etc.



[Dot]

[Horizontal Line]

Note

What is Half-toned Engraving?

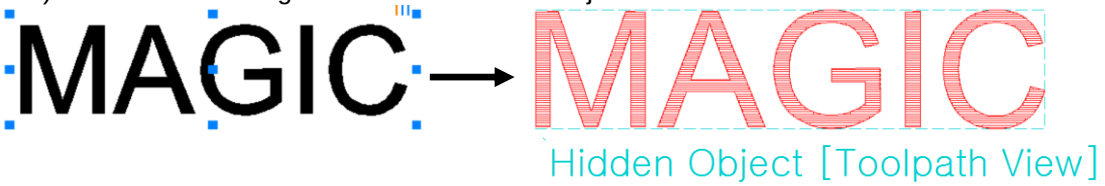
Half-toned engraving converts light and dark areas of a picture or an image into lines or dots in different sizes to express a fine image.

[Simulate toolpath processing]

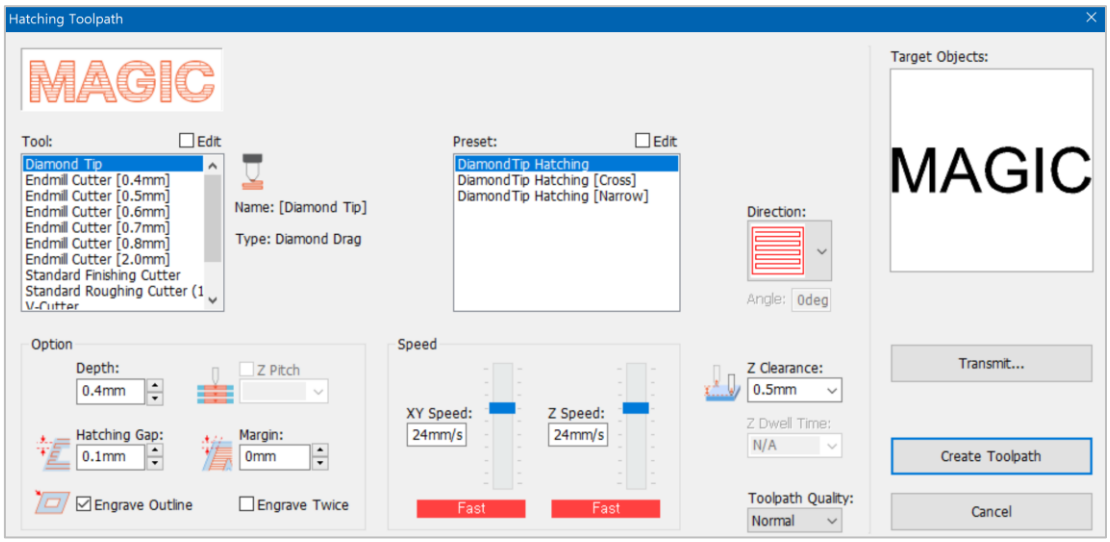
Click this button to see the predicted image result of the toolpath processed by the selected tool.

[Show toolpath only]

Click this button to make the toolpath the only visible object on the screen (while all the other objects are temporarily hidden). Click this button again to reveal the other objects.



5. Create Toolpath



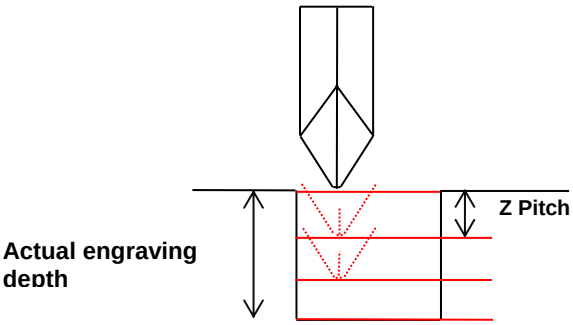
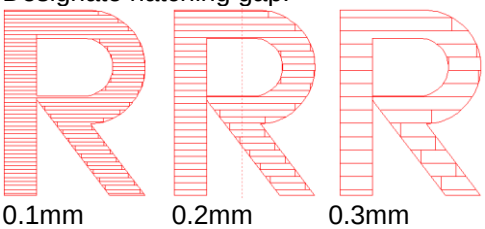
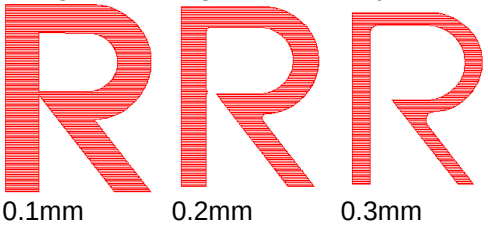
Notice **Tools in [Tool] option may vary according to types of models.**

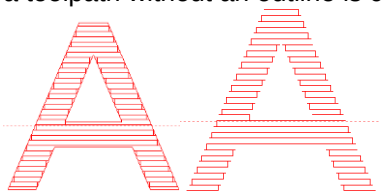
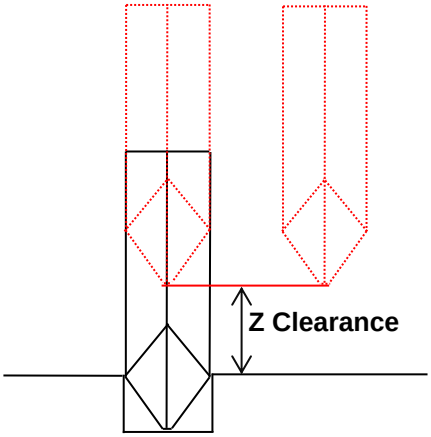
Tool	Designate a tool to be used for engraving. Each tool setting value can be changed by clicking Edit or Add button.
Preset	Hatching gap, depth, engraving speed and others are pre-set for each engraving option. It is not necessary to assign each value every time as the values is automatically pre-set. Each value can be changed by clicking Edit or Add button.

<table>
<tr><td colspan="2">Direction</td><td>The following hatch lines are applied to hatching toolpath only:

  : A tool path is created in the horizontal direction
  : A tool path is created in the vertical direction
  : A tool path is created in the left diagonal direction
  : A tool path is created in the right diagonal direction
  : A tool path is created in the cross hatched direction

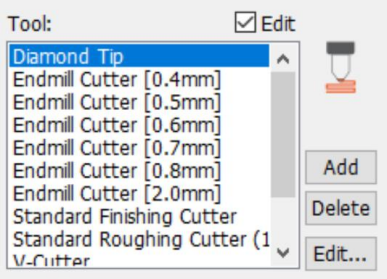
<u>※ These toolpaths are not recommended to be applied to materials with plated surfaces as they may cause possible damage to the material.</u></td></tr>
<tr><td rowspan="3">Option</td><td>Depth</td><td>Engraving: Refers to the applied pressure and not the actual engraving depth. The higher the pressure is, the deeper it imprints.

Cutting: Refers to the actual engraving depth when using rotary tools like end mills, V cutters, etc.</td></tr>
<tr><td>Z Pitch</td><td>Designate the depth when cutting the engraving depth little by little. This option is necessary when cutting thick materials with a thin tool.
  </td></tr>
<tr><td>Hatching gap</td><td>Designate hatching gap.
  </td></tr>
<tr><td></td><td>Margin</td><td>Designate a margin between object outline and toolpath.
  </td></tr>
</table>

<table>
<tr><td></td><td>Engrave outline</td><td>If this option is checked, a toolpath with an outline is created. If unchecked, a toolpath without an outline is created.
 
with outline without outline</td></tr>
<tr><td rowspan="3">Speed</td><td>XY speed</td><td>Designate a speed at which XY axis will move during the engraving.</td></tr>
<tr><td>Z speed</td><td>Designate a speed at which Z axis will move during the engraving.</td></tr>
<tr><td colspan="2">Engraving speed is displayed in colors according to tools or engraving options.
 
</td></tr>
<tr><td rowspan="2">Move Option</td><td>Z clearance</td><td>This designates the height to be applied for the clearance between the tool and the surface of material when moving to another engraving location.
When moving to another engraving location, it is necessary to lift Z axis to prevent the tool from coming in contact with the material surface before moving.
 
</td></tr>
<tr><td>Z dwell time</td><td>This designates no-load rotation time of end-mill and V-cutter after they reach the target depth and before moving to X, Y axis point. It is possible to damage the tool as rotation speed reduces while engraving. Set up the Z-dwell time to recover the full rotation speed before engraving.
✻Recommended time: 0.5 ~1 second.</td></tr>
<tr><td colspan="2">Transmit</td><td>Toolpath output window is displayed</td></tr>
</table>

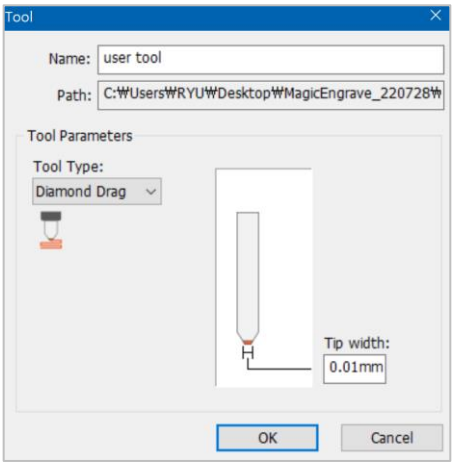
(1) Tool: Add/Delete/Edit

Check “Edit” button to see Add/Delete/Edit buttons.



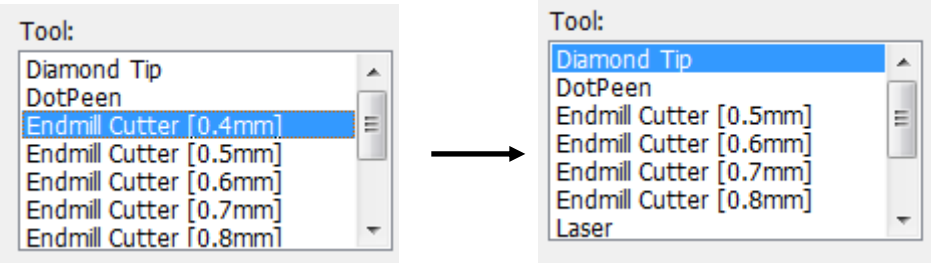
Add

Designate a name for the tool to be added along with its type and other options like tip width, then click “OK” button. The tool will then be added to the tool selection list.



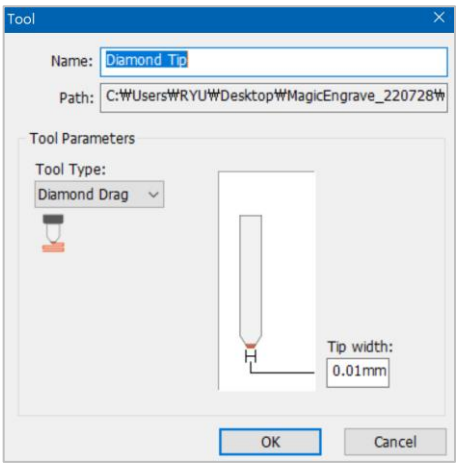
Delete

Select a tool to be deleted then click “Delete” button to remove the tool from the list.



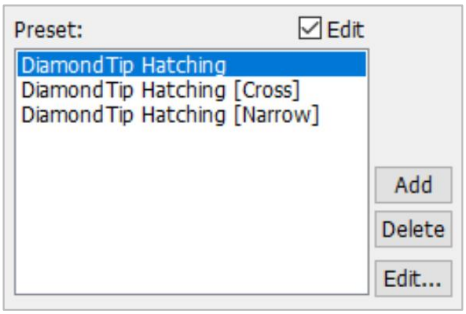
Edit...

Select a tool to modify then click “Edit” button. Click “OK” button to save the modified value.

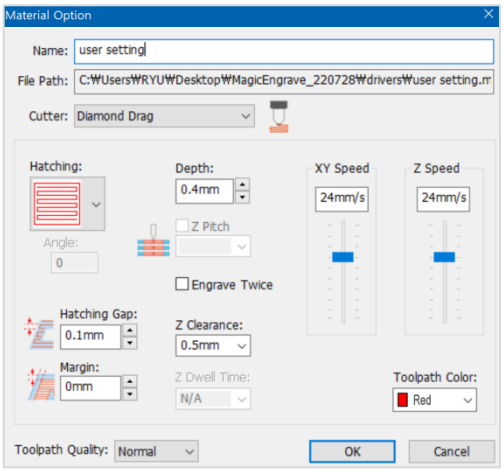


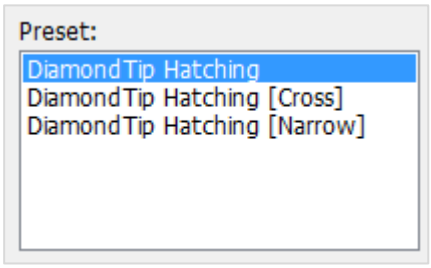
(2) Engraving Option: Add/Delete/Edit

Check “Edit” button to see Add/Delete/Edit buttons.

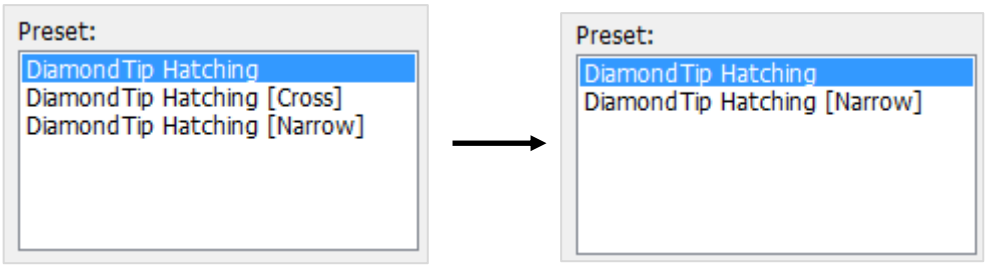


Add Enter a name then set the hatching gap, engraving depth and speed. Click “OK” button and the option will be added to the selection list.

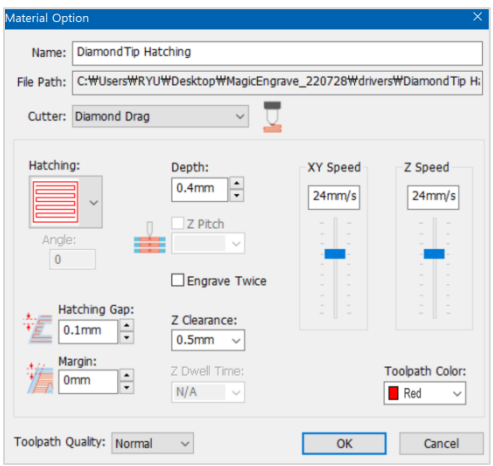




Delete Select an option to be deleted then click “Delete” button to remove the option from the list.

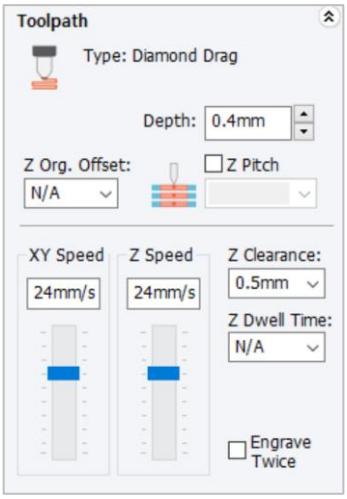


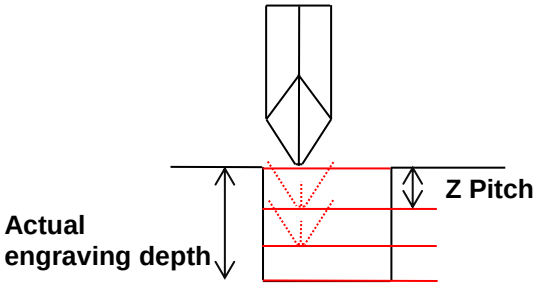
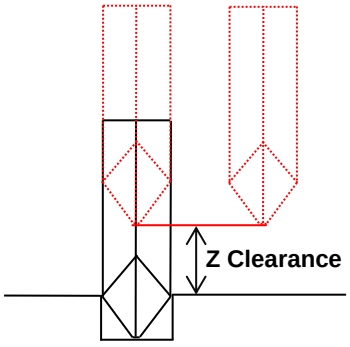
Edit... Select a tool to modify then click “Edit” button. Click “OK” button to save the modified value.



6. Toolpath Object Property

Select the toolpath object to see its property and/or to adjust its speed and depth. The toolpath object property will appear on the left side of the screen.



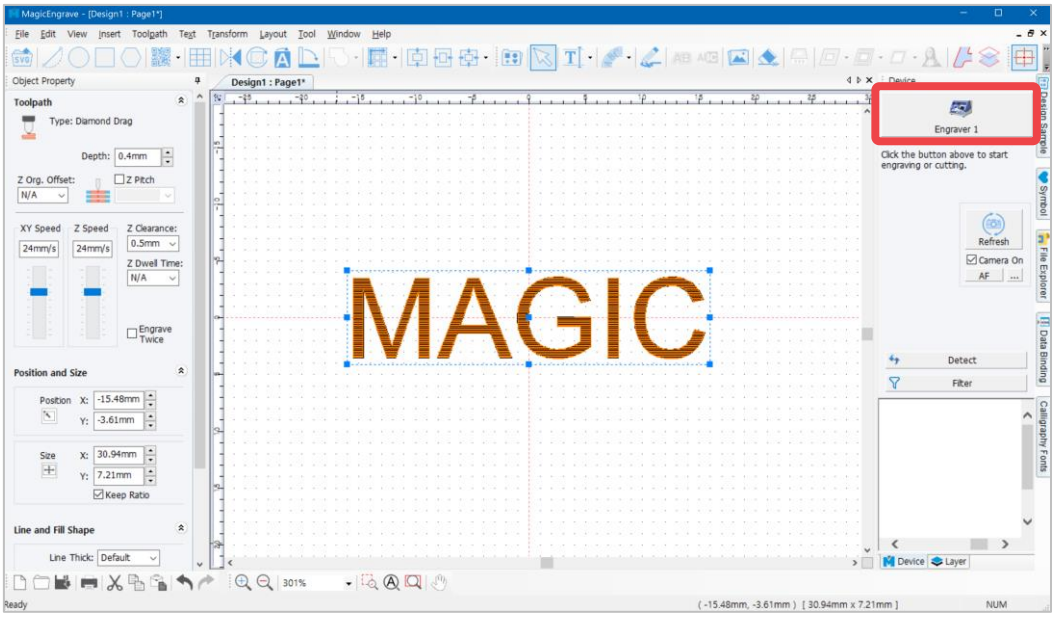
Depth	**Engraving**: Refers to the applied pressure and not the actual engraving depth. The higher the pressure is, the deeper it imprints. **Cutting**: Refers to the actual engraving depth when using rotary tools like end mills, V cutters, etc.
Z pitch	Designate the depth when cutting the engraving depth little by little. This option is necessary when cutting thick materials with a thin tool. 
XY speed	Designate a speed at which XY axis will move during the engraving.
Z speed	Designate a speed at which Z axis will move during the engraving.
Z clearance	This designates the height to be applied for the clearance between the tool and the surface of material when moving to another engraving location. When moving to another engraving location, it is necessary to lift Z axis to prevent the tool from coming in contact with the material surface before moving. 

Z dwell time	This designates no-load rotation time of end-mill and V-cutter after they reach the target depth and before moving to X, Y axis point. It is possible to damage the tool as rotation speed reduces while engraving. Set up the Z-dwell time to recover the full rotation speed before engraving. ✻Recommended time: 0.5 ~1 second.
Engrave twice	Engrave the design twice.

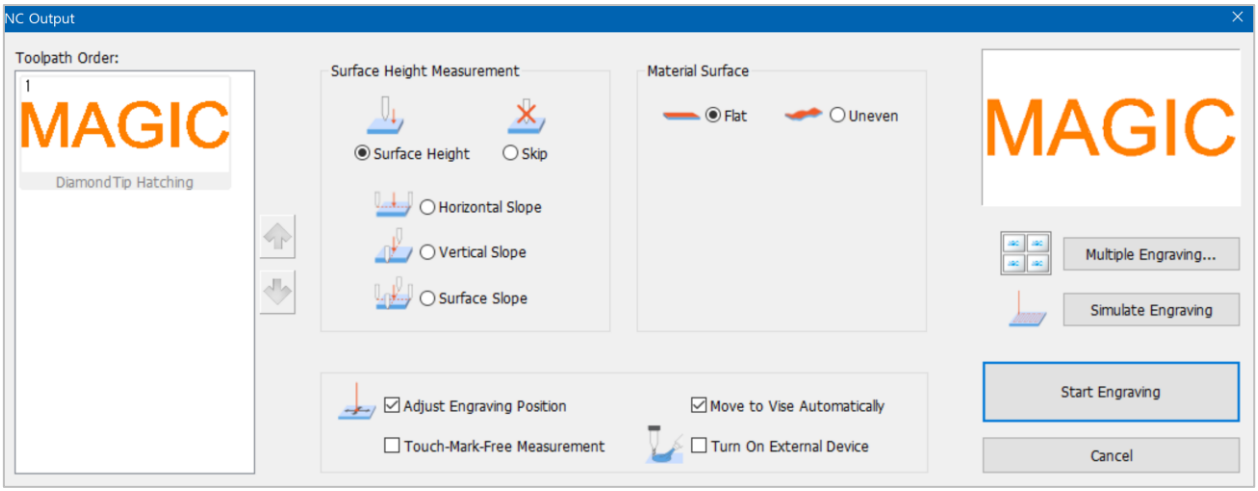
7. NC Data Output

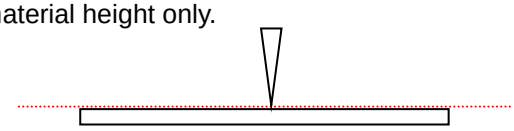
(1) Transfer the Toolpath Data after Creating a Toolpath

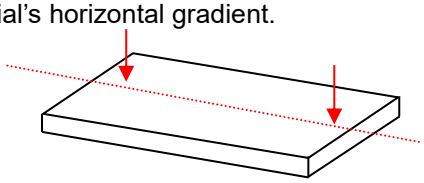
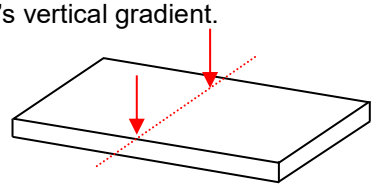
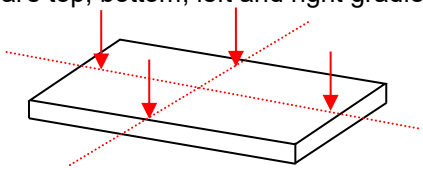
Select a toolpath then click the  “Engraver” button on the top-right of the screen to transfer the data of the selected toolpath to the BB-S7 machine.



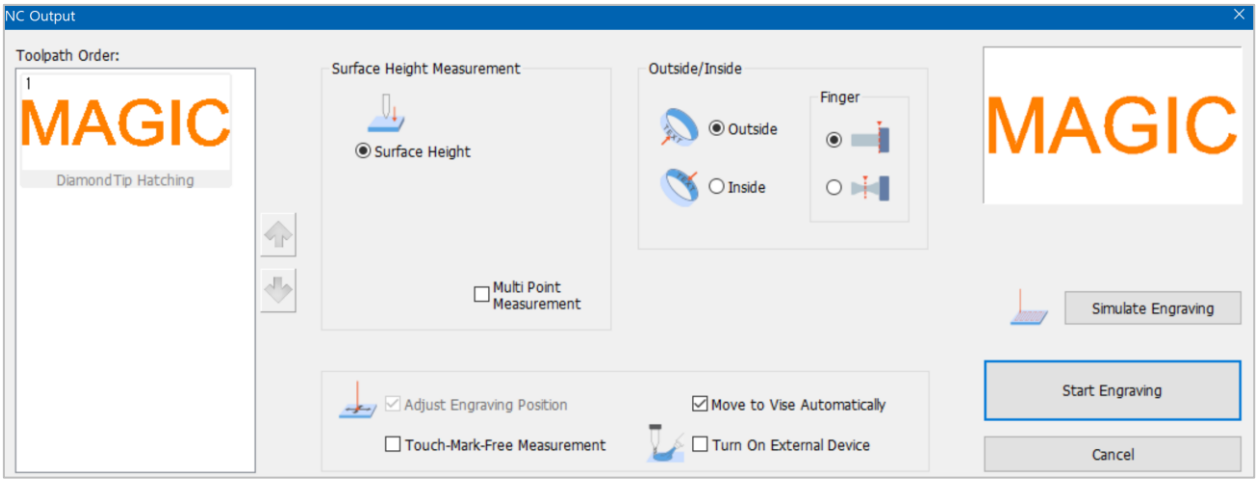
On the NC output window, select a measuring method and other options, then click “Start Engraving” button to start transferring the toolpath data to the selected machine.

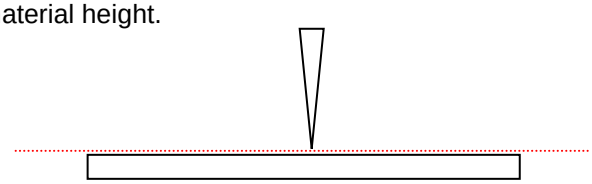


Toolpath order		The toolpaths are put in order if two or more toolpaths are selected for engraving. The order can be modified by clicking [Up]/[Down] button on the right.
Surface height measurement	**Surface height**	Measures material height only. 
	Skip	Skips material’s height measurement and allows the use of the previous height measurement data if the material has not been removed from the clamp during the previous engraving process.

	Horizontal slope	Measures material's horizontal gradient. 
	Vertical slope	Measures material's vertical gradient. 
	Surface slope	Measures material's top, bottom, left and right gradient. 
Material surface	**Flat**	Engraves flat-surfaced materials.
	Uneven	Engraves curve-surfaced materials.
Multiple engraving		Engraves materials repeatedly in constant vertical/horizontal intervals. **✻A vise is used for this automatic engraving and available for separate purchase.**
Simulate engraving		Displays engraving simulation on the material by using laser pointer to ensure that it follows a correct path.
Adjust engraving position		Select this option to re-adjust the engraving location. The laser pointer then adjusts to the engraving location before engraving. If this option is not selected, engraving process will initialize immediately.
Move to vise automatically		Move automatically to the flat or rotating vise based on the selected template.
Touch-Mark-Free Measurement		Prevents height measurement points from leaving any marks.
Turn on External Device		Enables automatic external device operation.

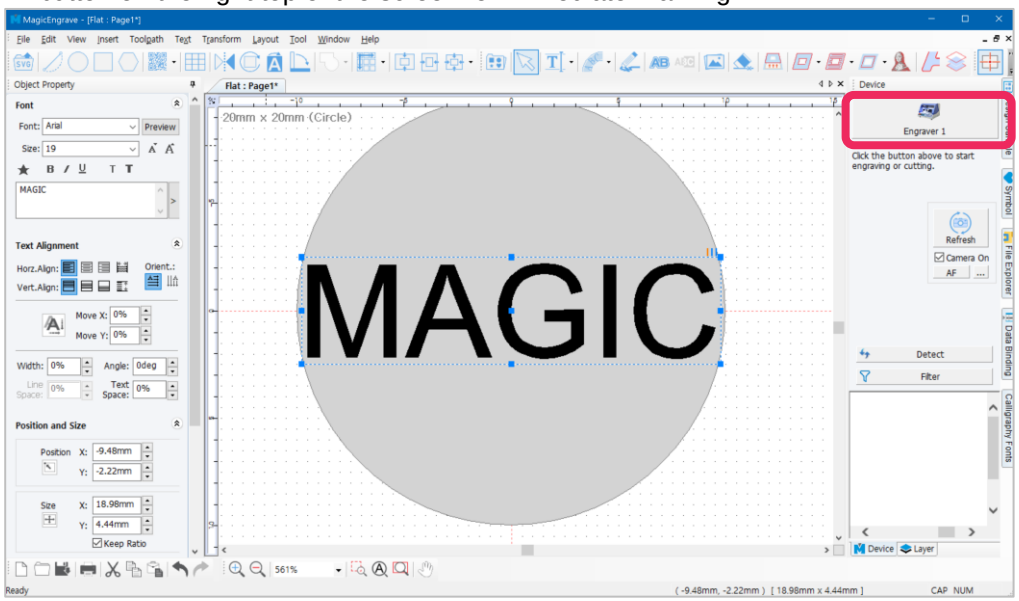
✻ **“NC output” window when selecting ring template.**



Surface height	Measures material height. 
Multi-point-measurement	Measures material height by dividing the whole material into several parts (up to 5 times)
Outside	Engraves the outside of the ring.
Inside	Engraves the inside of the ring.
	Place the material on the flat chuck finger.
	Place the material on the round chuck finger

(2) Transfer the Toolpath Data after Entering Text

Transfer the text data to the engraving machine without creating a toolpath. After creating a text design, click  button on the right top of the screen for immediate marking.



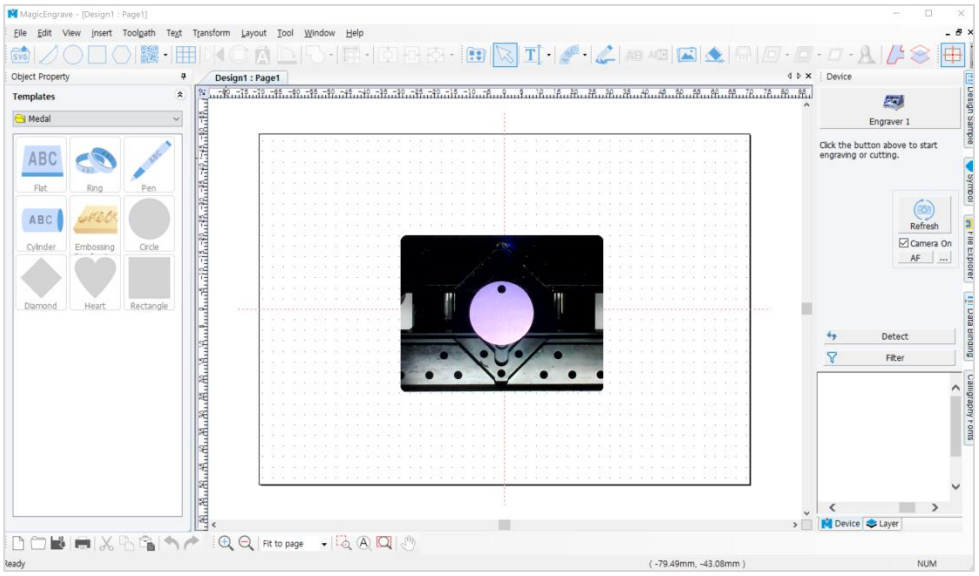
(3) Camera

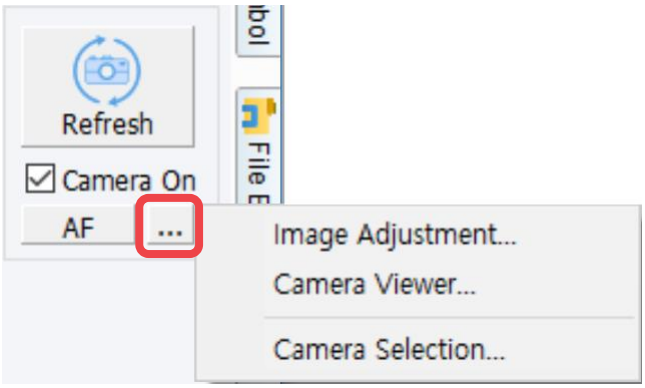
Enable the camera function.

BB-S7 has a built-in camera used for viewing the marking area. The camera captures the actual image of the material being engraved then sends the image data to the software along with the material's size and location, allowing users to design, position and adjust the size of their design directly on the material while viewing the camera.

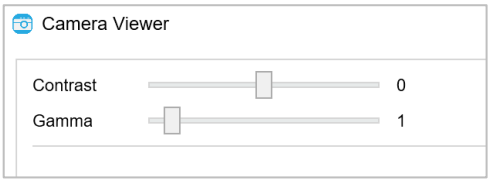
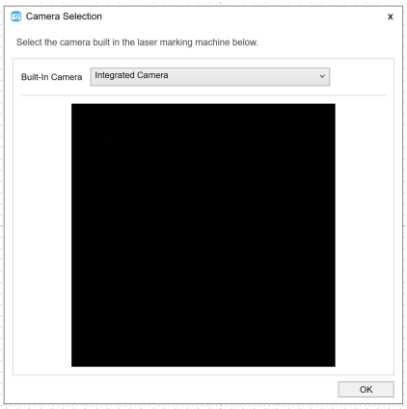
[Camera positioning system specifications]

-Filming area: 90mm x 70mm
-Filming target: flat surface engraving (not available for rotary engraving)
-Camera resolution: 1600 x 1200
-Precision: 0.2mm (*Precision is a calculated number. The actual precision is affected by calibration.)





Refresh	Refresh the camera image displayed in the MagicEngrave Program.
Camera On	Enable/Disable the camera function. When [Camera on], auto positioning is activated.
AF	See 8. Auto Focus for details.

Image Adjustment	Set the camera image options such as contrast, grayscale etc. 
Camera Viewer	View the camera image in a new window. 
Auto Focusing Sensor	Set the camera image displayed in the MagicEngrave Program (with maximum size restriction).
Auto Renewal Frequency	Set the timer the camera image auto displays in the program. Timer: 5 ~ 30 seconds
Camera Selection	Select a camera device. If there are multiple camera devices connected to your PC, the camera for laser is automatically set by default or, select the device manually. 

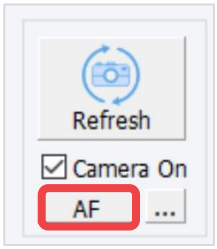
8. Auto Focus

BB-S7 has built-in auto focusing systems that enable auto focusing on materials to be marked with a material height detection camera.

Notice

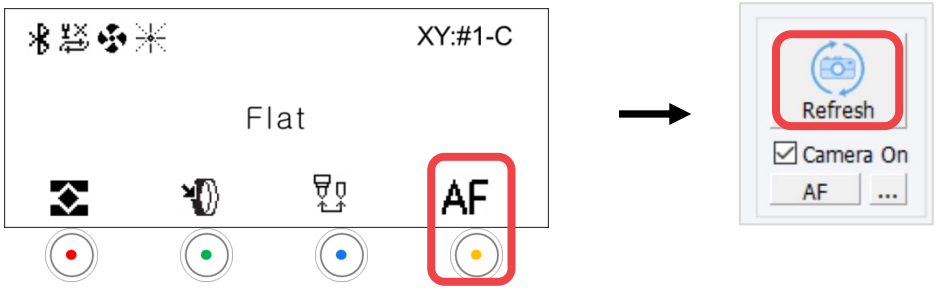
<u>*Click the [AF] button to enable the camera auto-positioning function.</u>
<u>*Refocusing is required upon changing the material.</u>
<u>*Features become available once MagicEngrave program is enabled.</u>

1. Click [AF] on the program.



① Clamp moves to the center.
② Measure the height of the material
③ Tool moves to the right end of the machine
④ Software updates the camera image

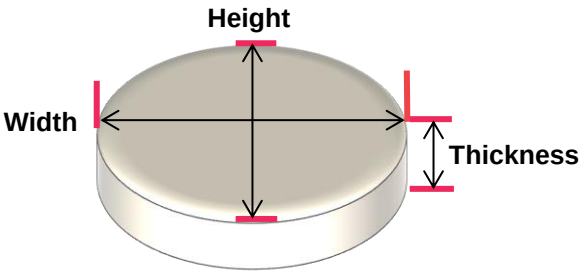
2. Press the [AF] button on BB-S7 operation buttons then click the [Refresh] button on the program to refresh the camera display.



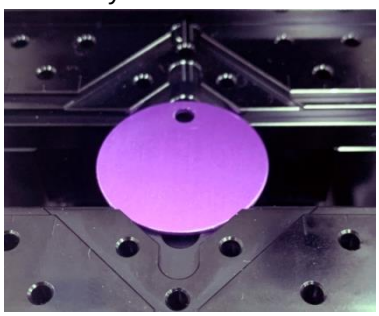
3. To cancel autofocus, press  button on BB-S7 machine.

Marking Process

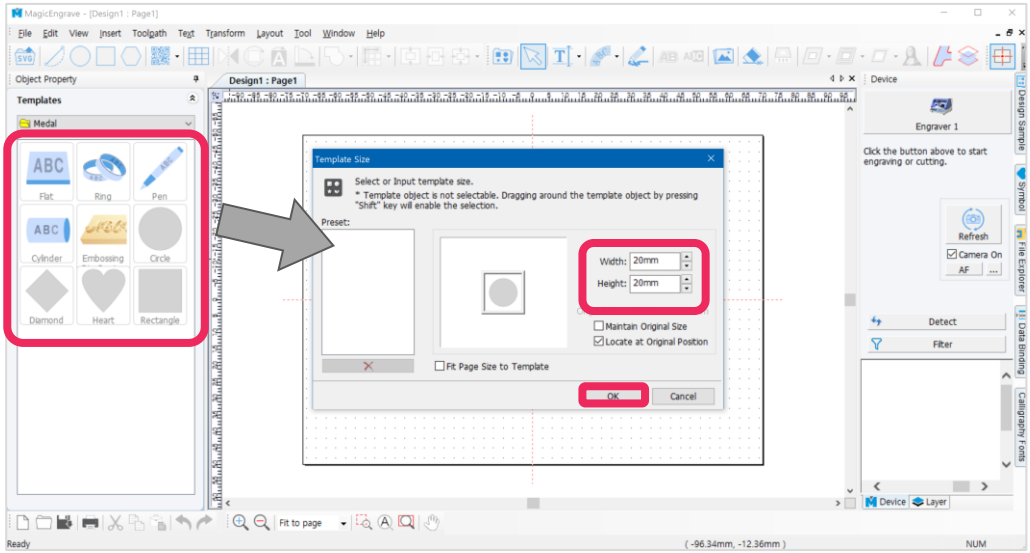
1. Measure the size and height of your material.



2. Place your material at the center of the clamp.

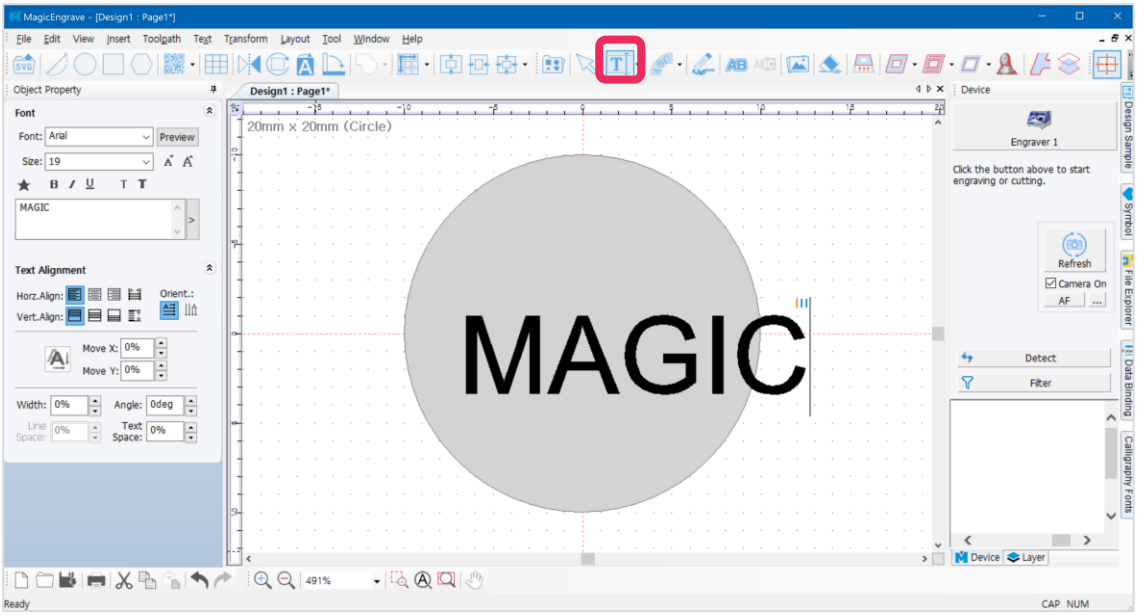


3. Select a template that matches the shape or type of your material from the template category. Enter the size of your material then click “OK” button.

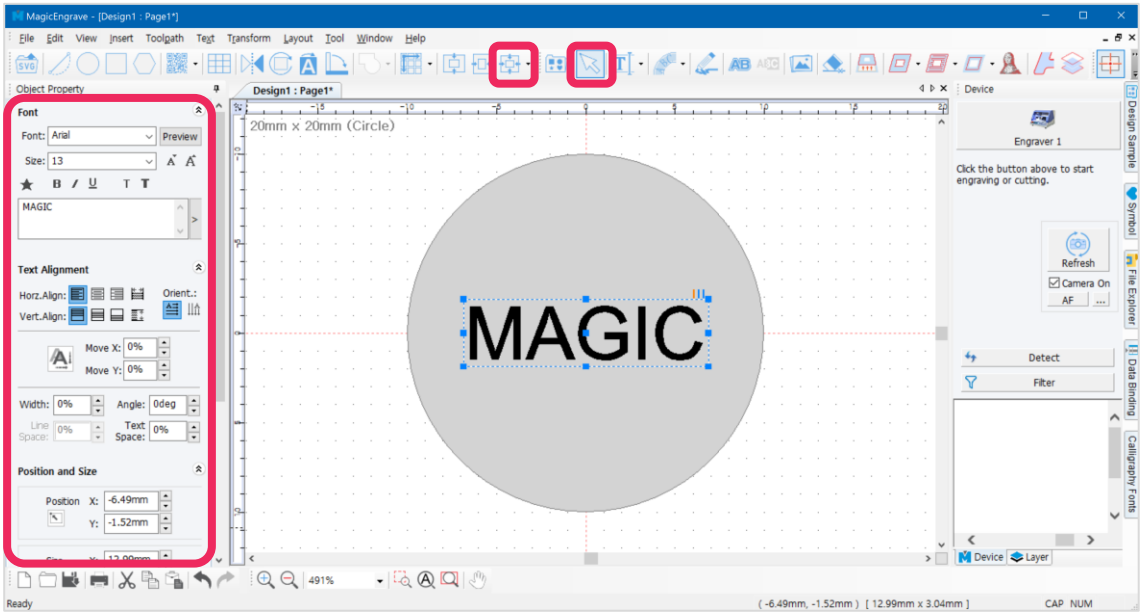


Maintain original size	The actual size of the registered template is loaded; not the size entered.
Locate to original position	The template is loaded to where it was initially created. If this option is selected, the template is loaded at the center of work area.
Fit page size to template	The size of the page is adjusted to the size of the template.

4. The selected template will appear on the screen. Click  [Text input] button then click at any target location to enter text.

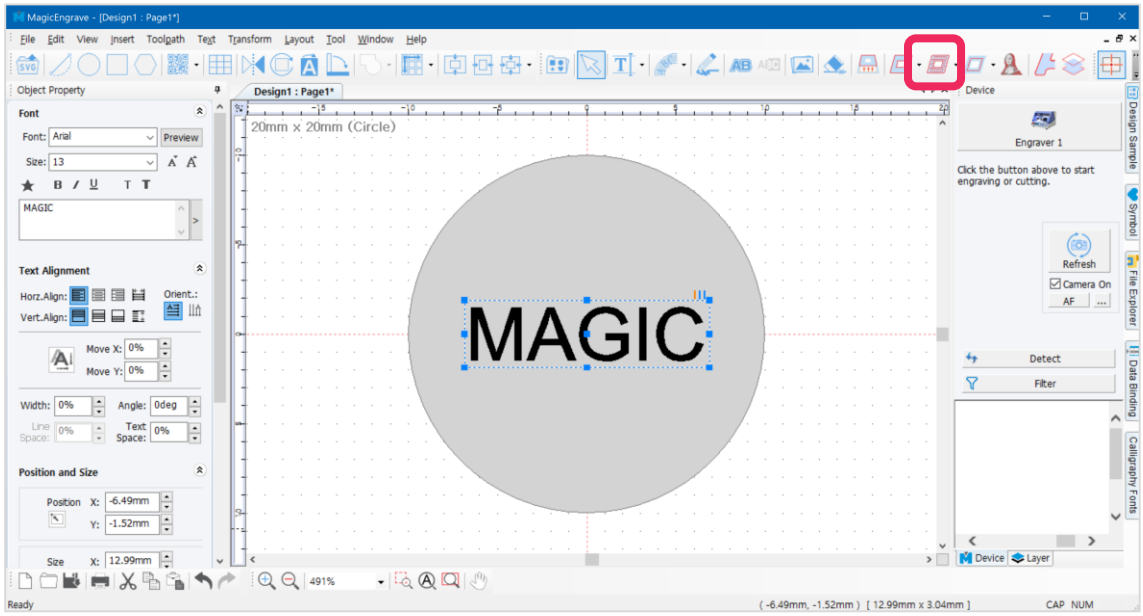


5. Once the text is completed, click  [Selection] button on toolbar. Enable the object selection mode to select the entered text then modify the size, font and thickness of the object. Lastly, click  [Center in page] button to position the object at the center of the work area.

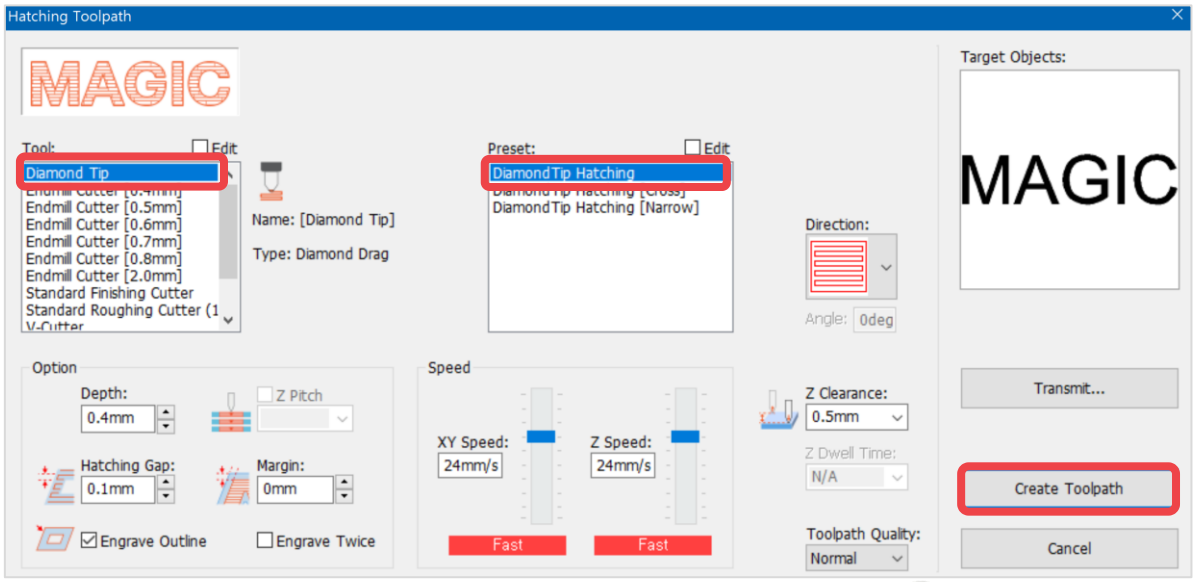


6. Upon completing the design, click [Hatching toolpath].

✻Click icon on the top right of the screen for immediate marking without creating a Toolpath.



7. Select an engraving option and tool from “Hatching Toolpath” window and if necessary, designate gap and depth before clicking “Create Toolpath” button.



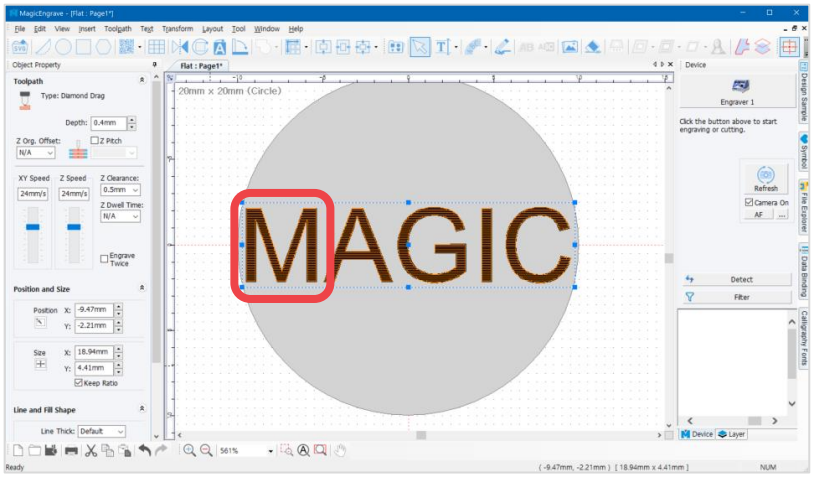
-Scan line toolpath-

-Hatching toolpath-

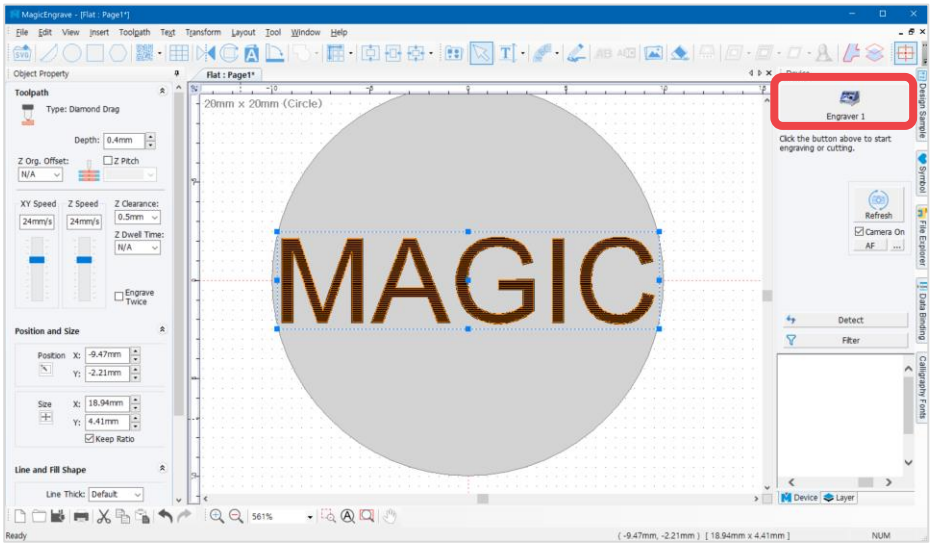
Notice

For better engraving quality on large areas (e.g., large fonts or images) use “Scan line toolpath.” Although this may require more time to process.

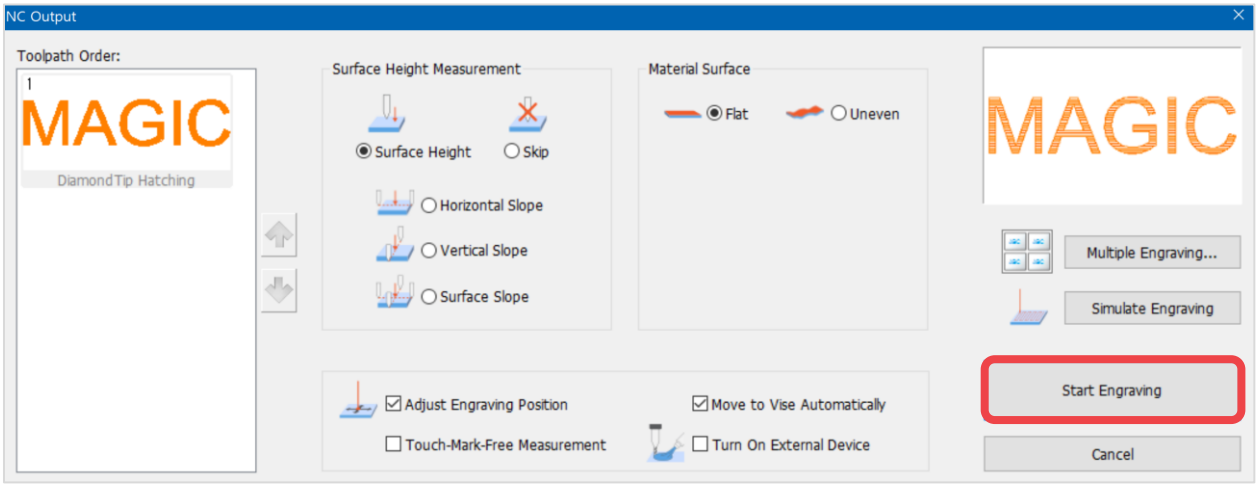
8. Toolpath object is created.



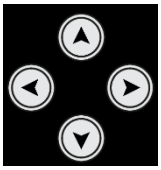
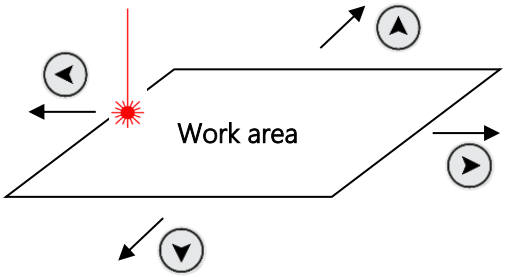
9. Click  button.



10. Once “NC Output” window appears, specify how the engraving material is measured then click “Start Engraving” button.



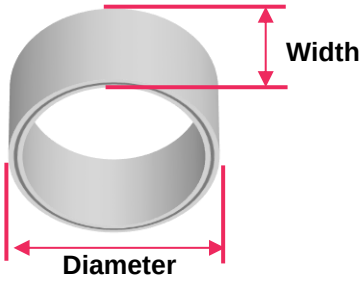
11. Once the tool is positioned to the center of the material and the laser pointer turns on, use the direction key buttons to position the laser pointer to the engraving area. The area that the laser pointer points to is where the actual engraving takes place.

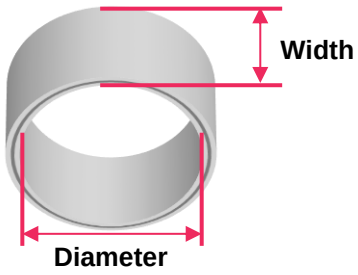
	Press the direction key buttons to move the laser pointer to the left, top, right and bottom areas of the engraving area. (Long press to move the laser pointer farther). Check if the laser pointer points to the area on the material where you want to engrave. If the laser pointer is out of range, adjust the position using the direction keys.
	The laser pointer automatically points to the area where the engraving takes place (based on the target location on the work area). When the direction key is pressed, the laser pointer moves to the area to be engraved (left, top, right or bottom) from its target location. If the engraving area needs to be adjusted to the left, press  key to move the pointer to the left. 

12. After positioning the laser pointer and determining the location of the engraving area, long-press and hold  button (for more than 3 seconds) until it beeps to confirm that the machine is ready to engrave then close the cover.

Ring Inner/Outer Marking Process

1. Measure the width and diameter of the ring.

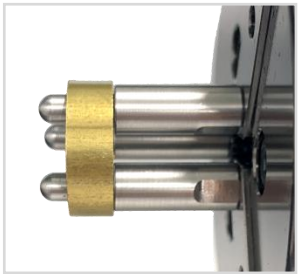




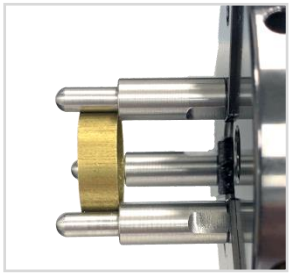
<Outer marking – Ring outside size>

<Inner marking – Ring inside size>

2. Insert the ring into the chuck finger (as shown below) then tighten the rotation clamp to firmly secure the ring.

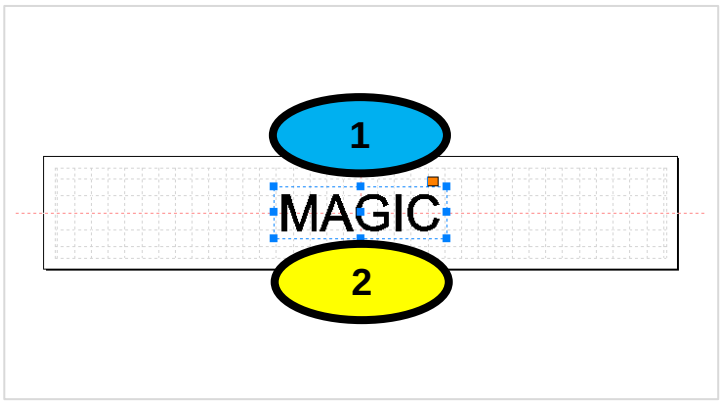


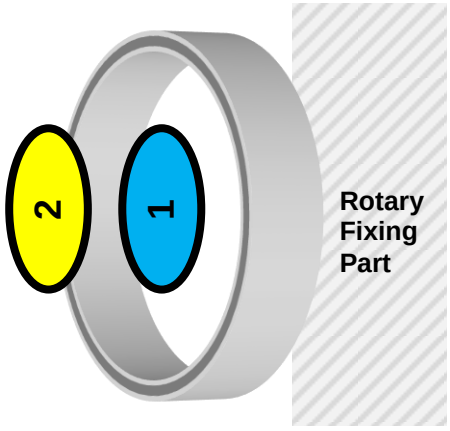
[Ring outer engraving]



[Ring inner engraving]

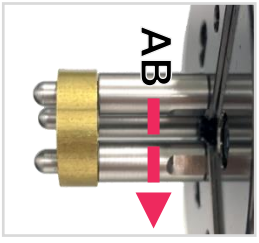
[Object position]



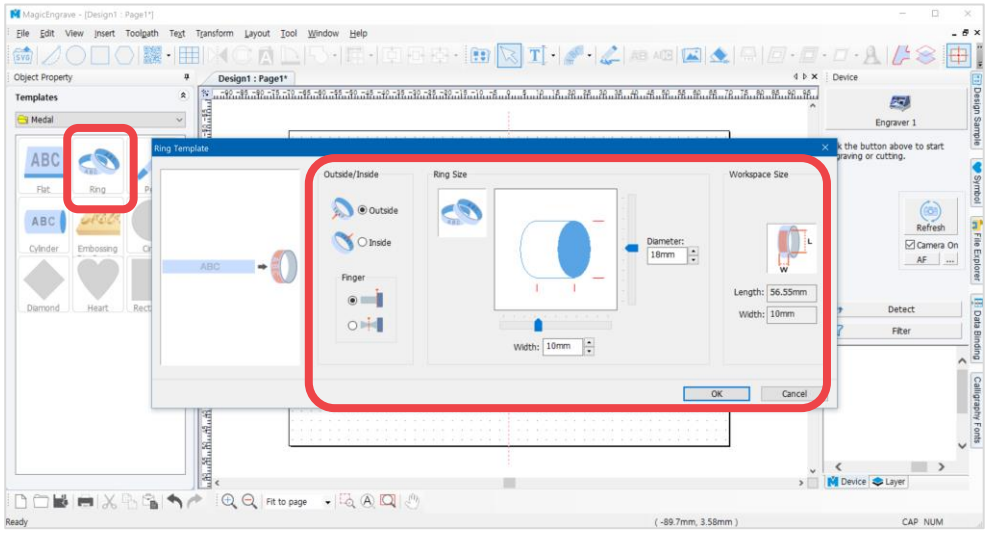


[Engraving direction]

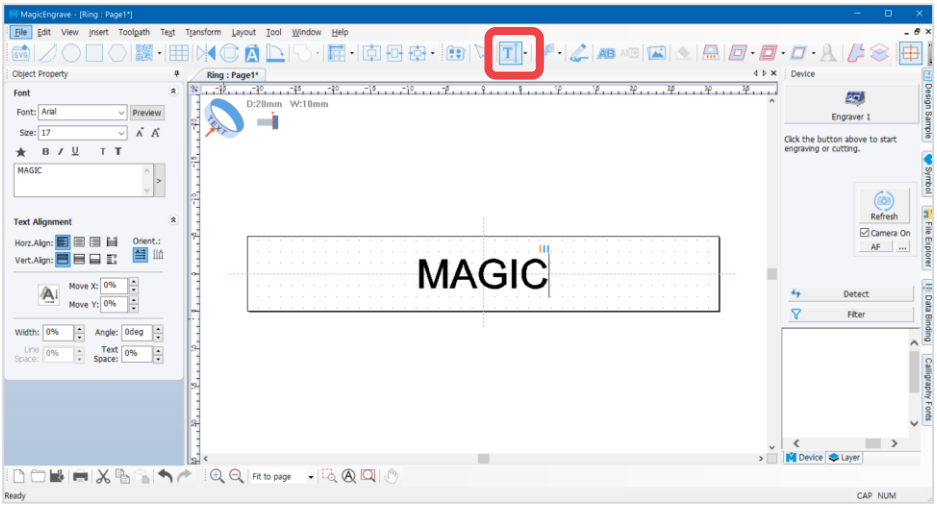
The direction of the characters to be engraved on the ring is shown in the picture below. Check the target location (where you want your characters to be engraved on the ring) then firmly secure the ring.



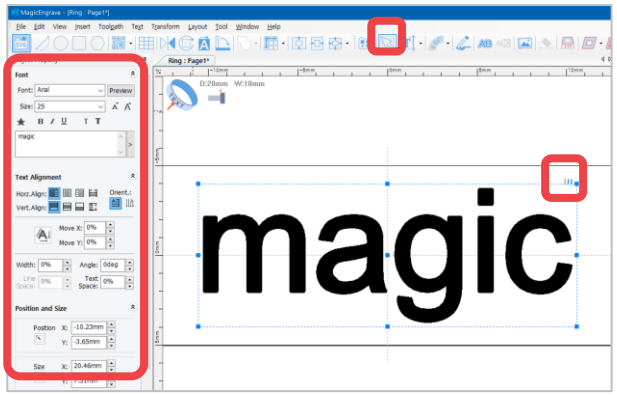
3. Double click “Ring” template in the object property window. When [Insert Rotary Object Template] window appears, select one engraving option: outside or inside. Then enter the width and diameter of the ring and click “OK.”

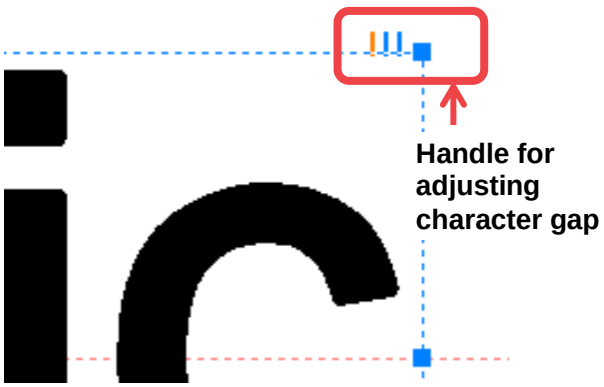


4. The template will appear at the center of the screen. Select [Text Input] on the toolbar then click at any target area on the work area to enter the text to be engraved.



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



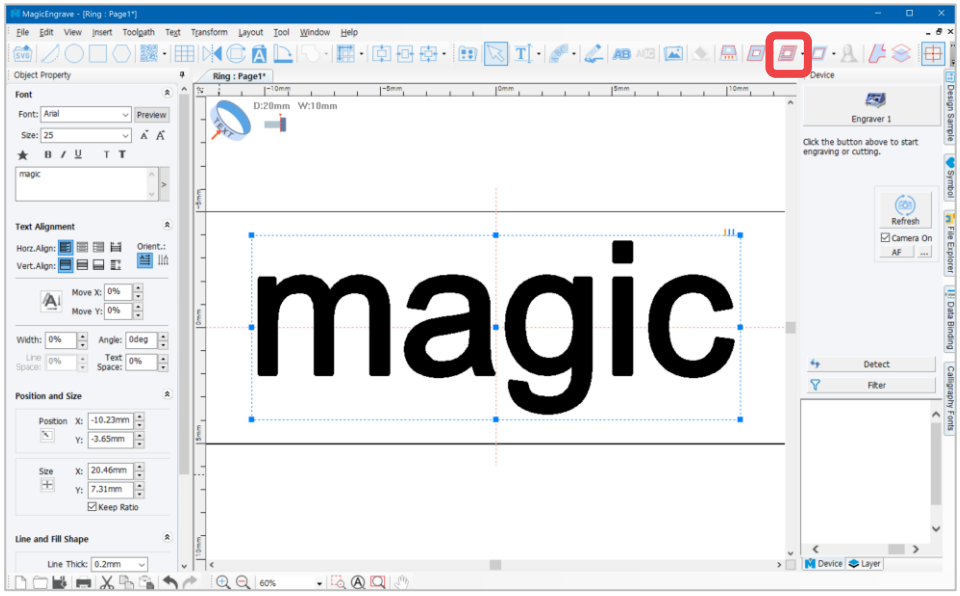


Note

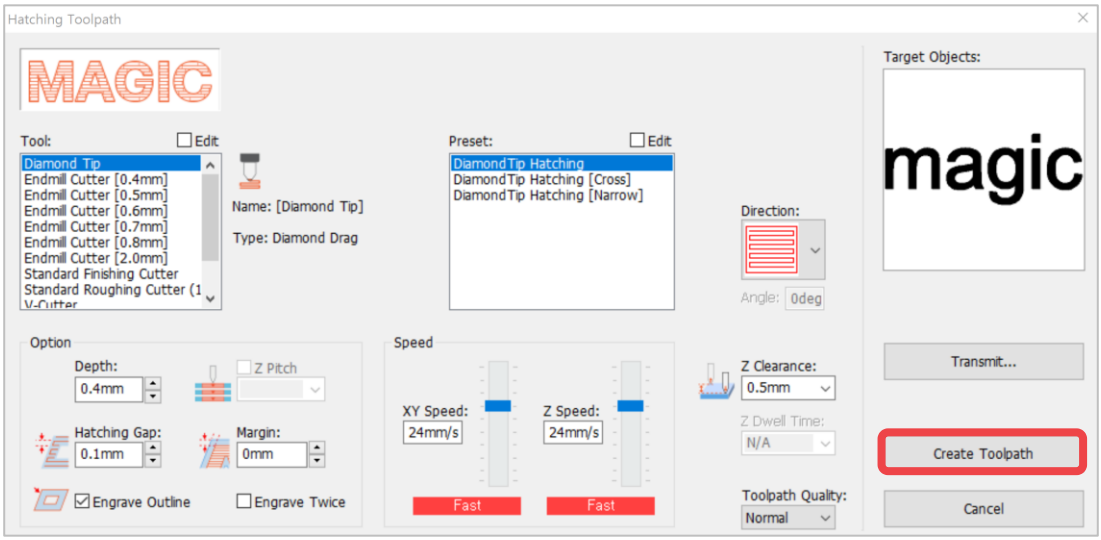
What is Handle for adjusting gaps between characters?
Handle for adjusting gaps between characters is a function that adjusts gaps between characters by dragging characters to target positions.

6. Upon completing the design, click  [Hatching Toolpath] button.

✻Click  button on the top right of the screen for immediate marking without creating a Toolpath.



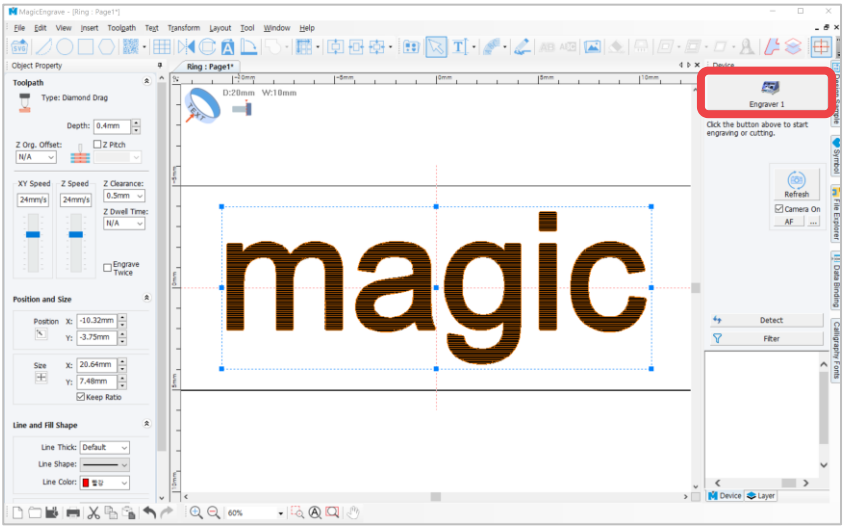
7. The “Hatching Toolpath” window will appear (as shown in the picture below). Select the tool, toolpath gap and depth then click “Create Toolpath” button.



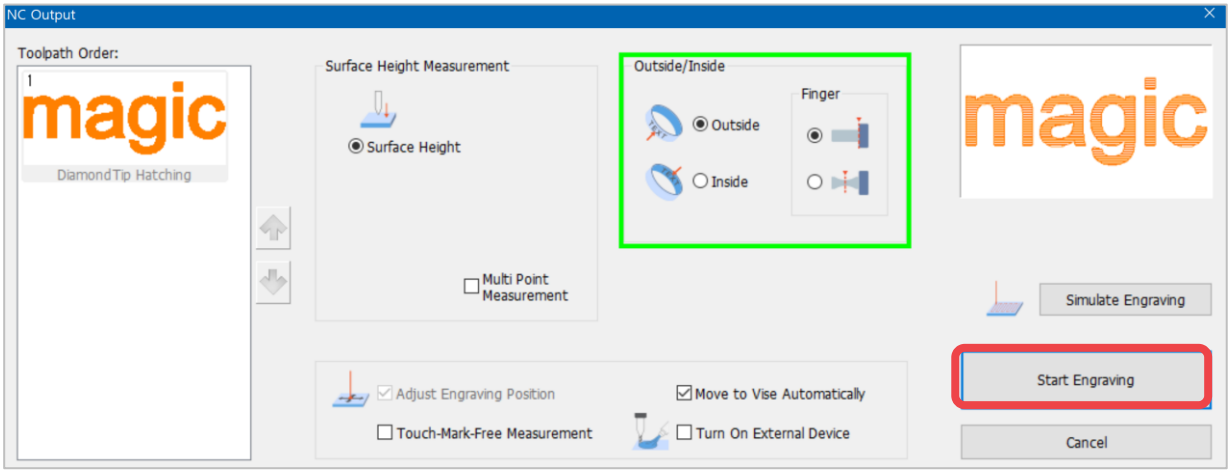
8. The “Toolpath” object is created with red lines marked or filled on each text (as shown in the picture below). Scroll up the mouse wheel to zoom in the image of the toolpath object to check the line style. You may delete the toolpath object and create a new one if the toolpath is not your preferred style.

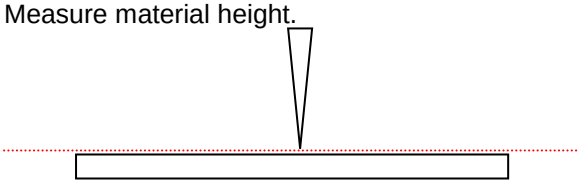
[Toolpath creation]

9. After selecting your preferred toolpath, click  button.

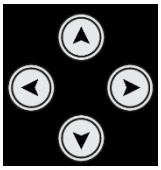
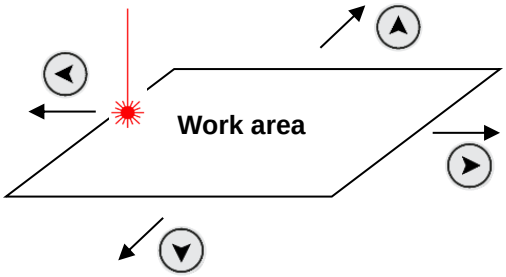


10. Once “NC Output” window appears, specify how the engraving material is measured then click “Start Engraving” button.



Surface height	Measure material height. 
Multi point measurement	Measure material height by dividing the whole material into several parts (up to 5 times)
Outside	Engrave on the ring’s ring outer diameter.
Inside	Engrave on the ring’s ring inner diameter.
	Place the material on the flat chuck finger.
	Place the material on the round chuck finger

11. Once the tool is positioned to the center of the material and the laser pointer turns on, use the direction key buttons to position the laser pointer to the engraving area. The area that the laser pointer points to is where the actual engraving takes place.

	Press the direction key buttons to move the laser pointer to the left, top, right and bottom areas of the engraving area. (Long press to move the laser pointer farther). Check if the laser pointer points to the area on the material where you want to engrave. If the laser pointer is out of range, adjust the position using the direction keys.
	The laser pointer automatically points to the area where the engraving takes place (based on the target location on the work area). When the direction key is pressed, the laser pointer moves to the area to be engraved (left, top, right or bottom) from its target location. If the engraving area needs to be adjusted to the left, press  key to move the pointer to the left. 

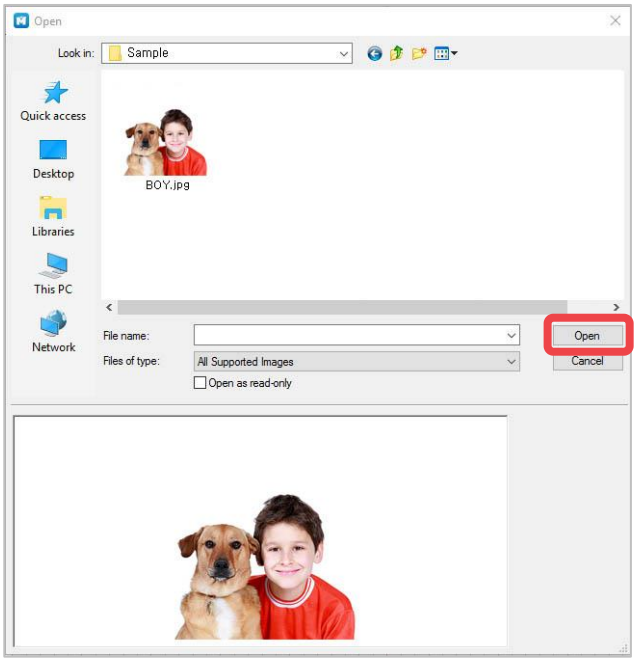
12. After positioning the laser pointer and determining the location of the engraving area, long-press and hold  button (for more than 3 seconds) until it beeps to confirm that the machine is ready to engrave then close the cover.

Photo Marking

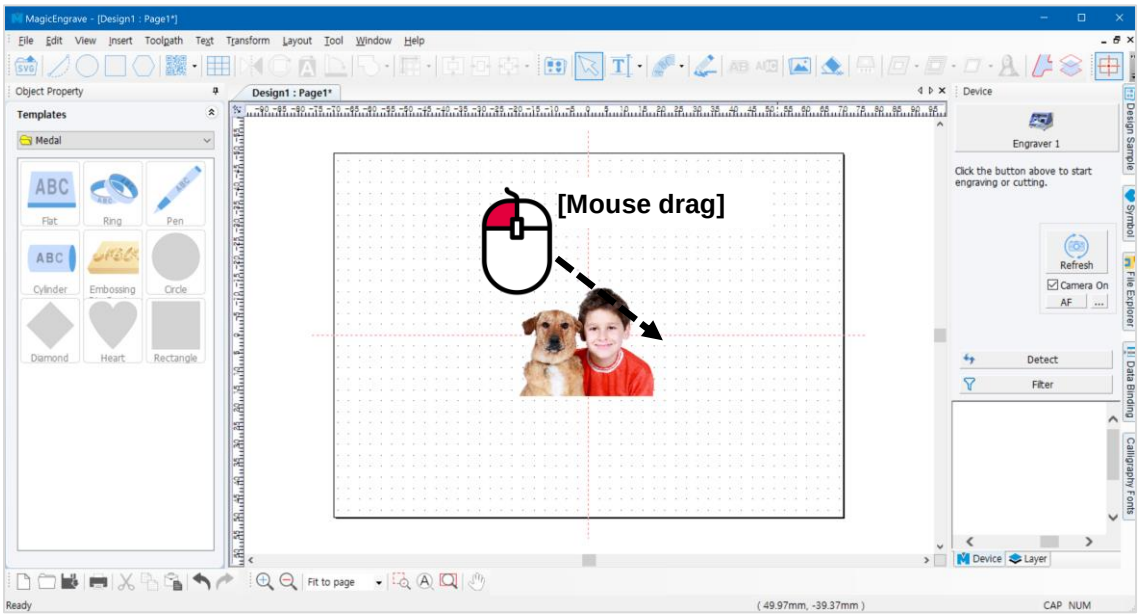
What is Photo Marking?
Photo marking is a marking method that marks the shade of an image with dots.

1. Place the material on the clamp.

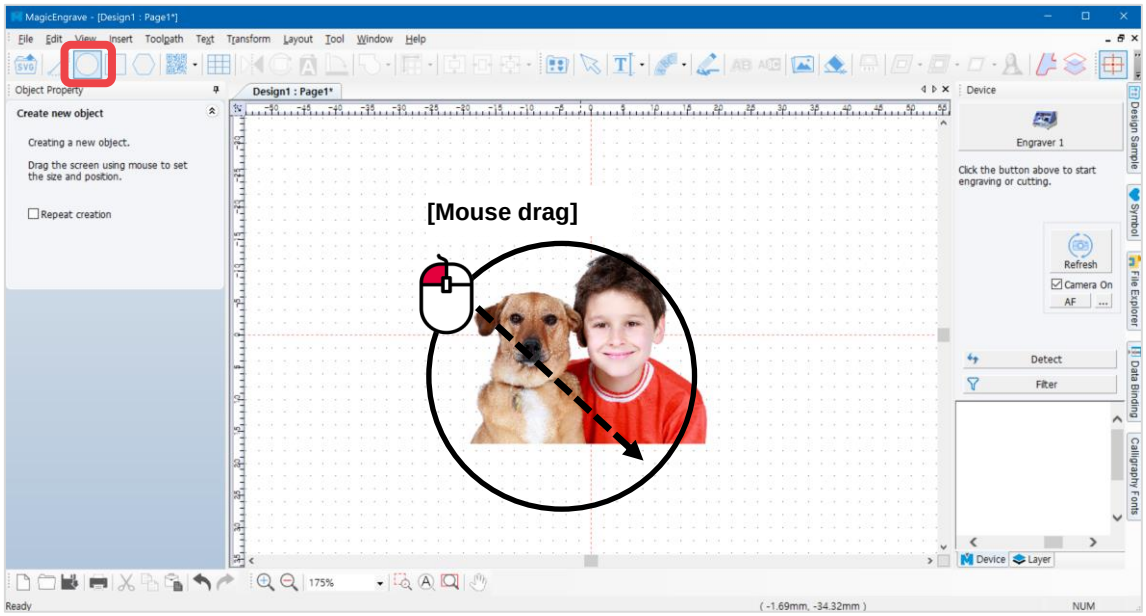
2. Click  [Image] to import an image for marking.



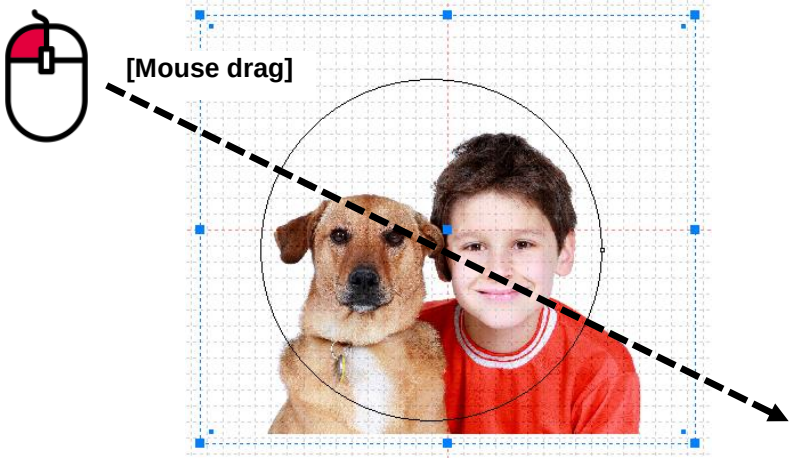
3. Adjust the size and location of the image.



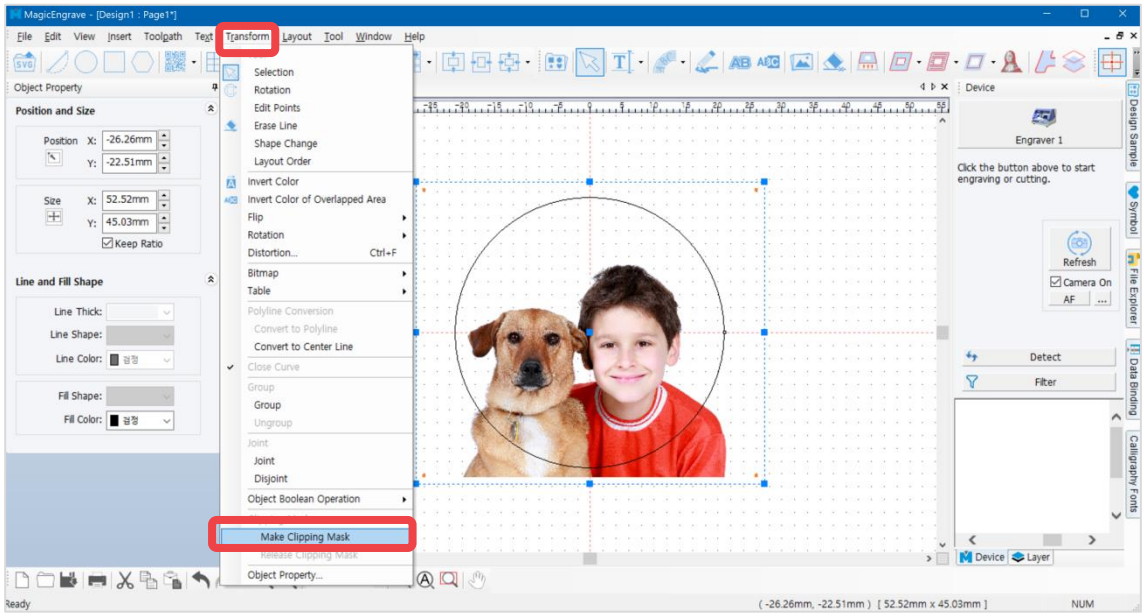
4. **[Clipping Mask]** feature enables clipping or cropping of the target image. Drag the mouse over the image then create a shape.

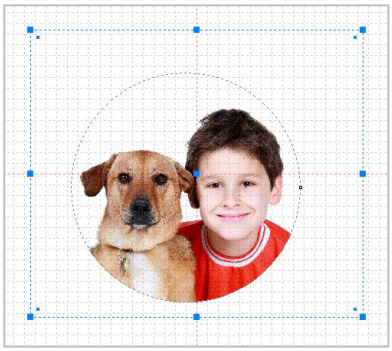


5. Drag and hold the mouse to select the target image or select [Menu] → [Edit] → [Select All].



6. Then select [Menu] → [Transform] → [Make Clipping Mask]. Only the cropped image (target image) remains.

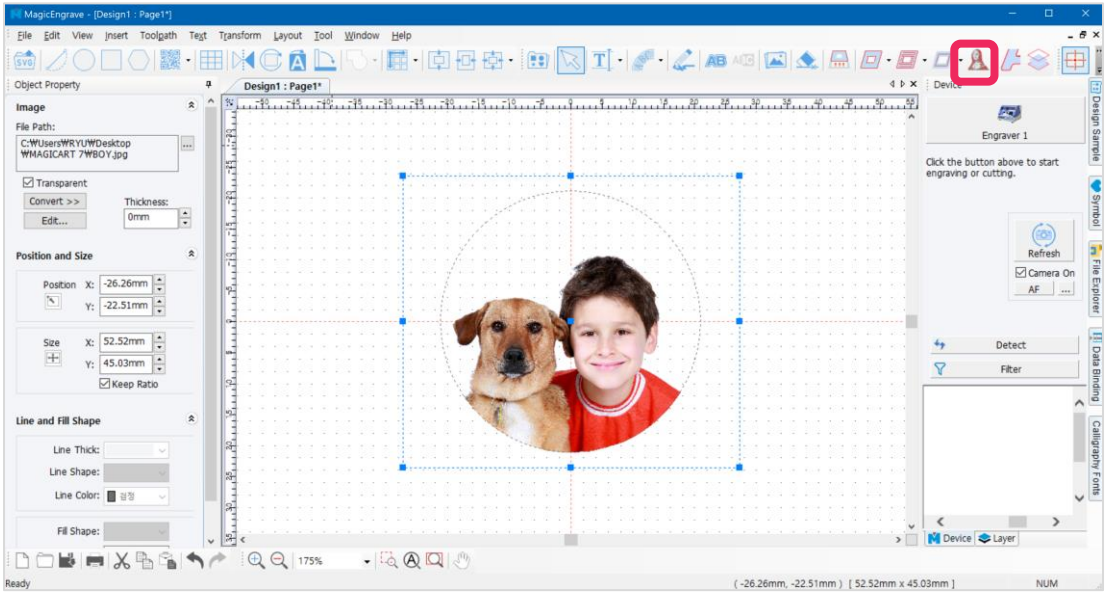




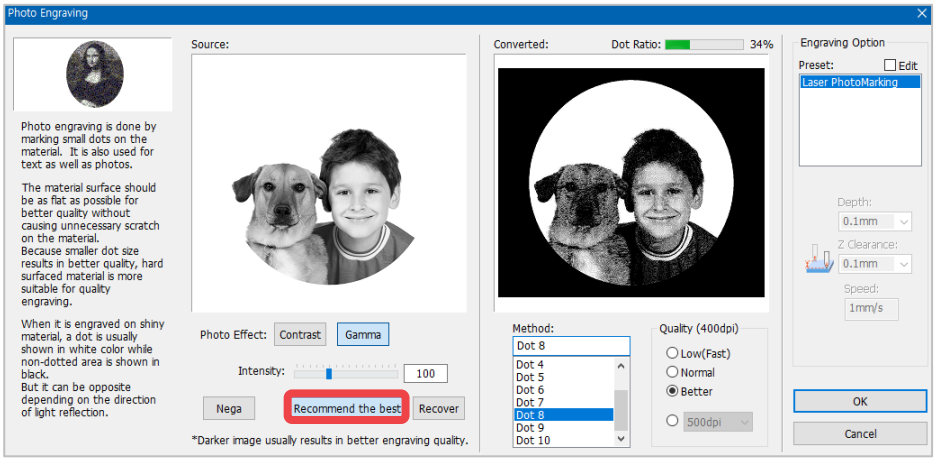
Notice **The original image is saved; not deleted or cropped out.**

7. Click  [Photo Impact Engraving Toolpath] button.

✻Click  button on the top right of the screen for immediate marking without creating a Toolpath.



8. Adjust marking options in photo marking option window.

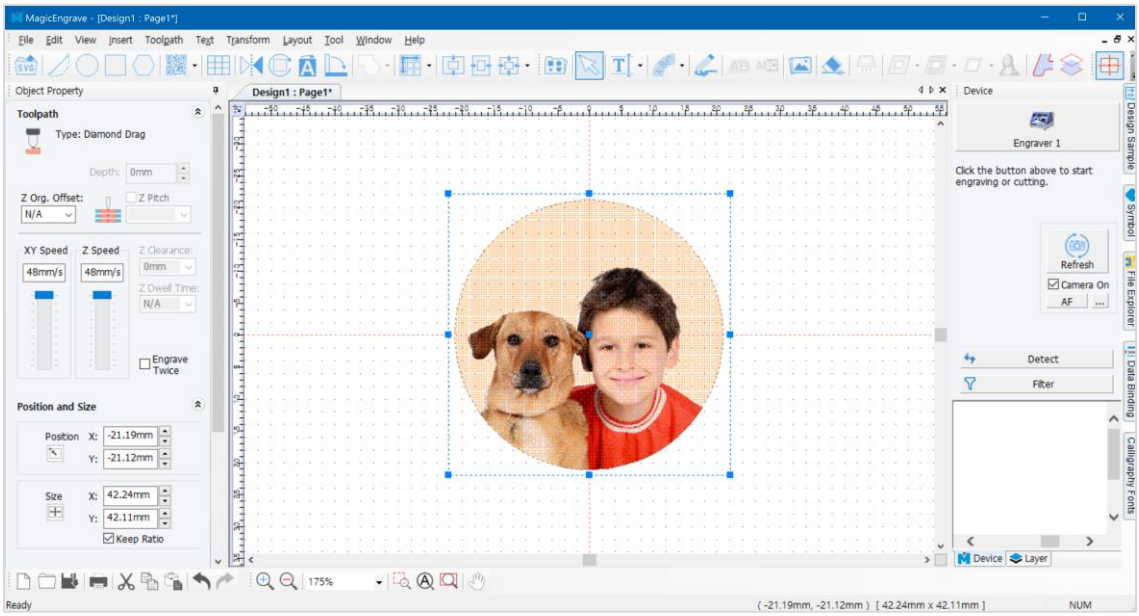


✻ **The black area is not engraved; only the cropped image.**

Notice

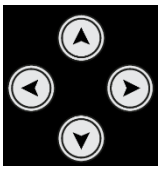
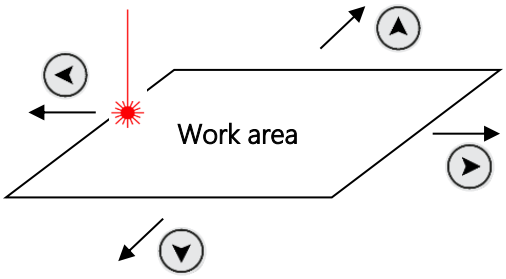
During photo marking process, the brighter area (white area) of an image is not visibly expressed with dots unlike the darker area where dots are highly visible with higher marking quality. Therefore, it is recommended to adjust the brightness of an image to darker. Normally, a dot ratio of 10-20% provides the best marking quality for a portrait. Take note that the image's optimal conditions vary depending on the brightness of background of the image. Check image preview then adjust the image's brightness and dot ratio. If 'image adjustment' is confusing, click "Recommend the best" button to automatically adjust the image.

9. Click “OK” button to create a toolpath for photo marking. Set the laser marking option then click  [Engraver] button.



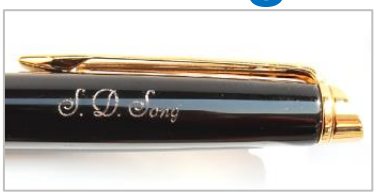
Notice During marking process, the white area of the image appears with dots. The image result of the toolpath is shown as a negative image.

10. Once the tool is positioned to the center of the material and the laser pointer turns on, use the direction key buttons to position the laser pointer to the engraving area. The area that the laser pointer points to is where the actual engraving takes place.

	Press the direction key buttons to move the laser pointer to the left, top, right and bottom areas of the engraving area. (Long press to move the laser pointer farther). Check if the laser pointer points to the area on the material where you want to engrave. If the laser pointer is out of range, adjust the position using the direction keys.
	The laser pointer automatically points to the area where the engraving takes place (based on the target location on the work area). When the direction key is pressed, the laser pointer moves to the area to be engraved (left, top, right or bottom) from its target location. If the engraving area needs to be adjusted to the left, press  key to move the pointer to the left. 

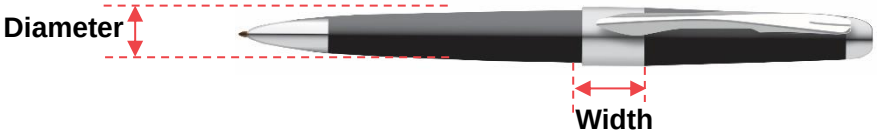
11. After positioning the laser pointer and determining the location of the engraving area, long-press and hold  button (for more than 3 seconds) until it beeps to confirm that the machine is ready to engrave then close the cover.

Pen Engraving Process

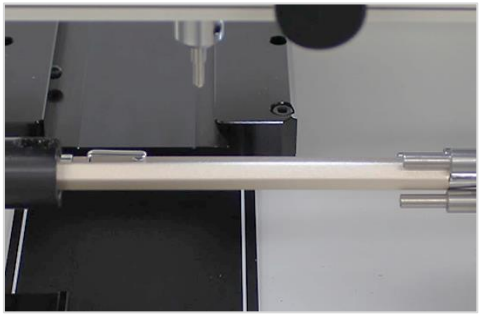


-Tailstock is sold separately.

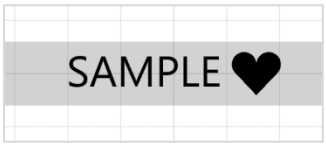
1. Measure the width and diameter of the pen.



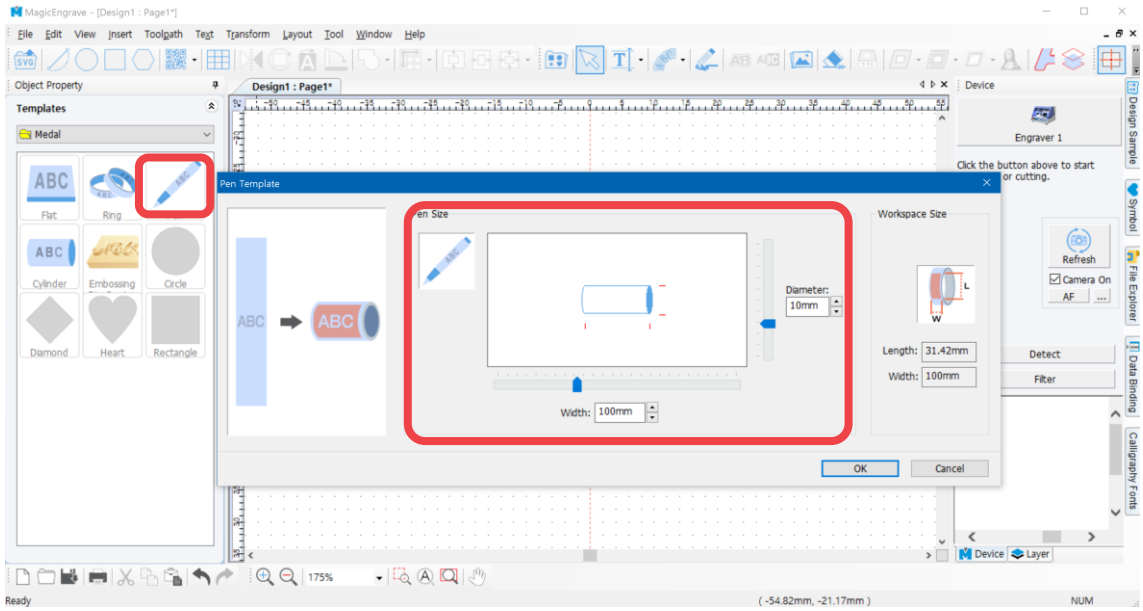
2. Secure the pen to the engraver by using a pen clamp.



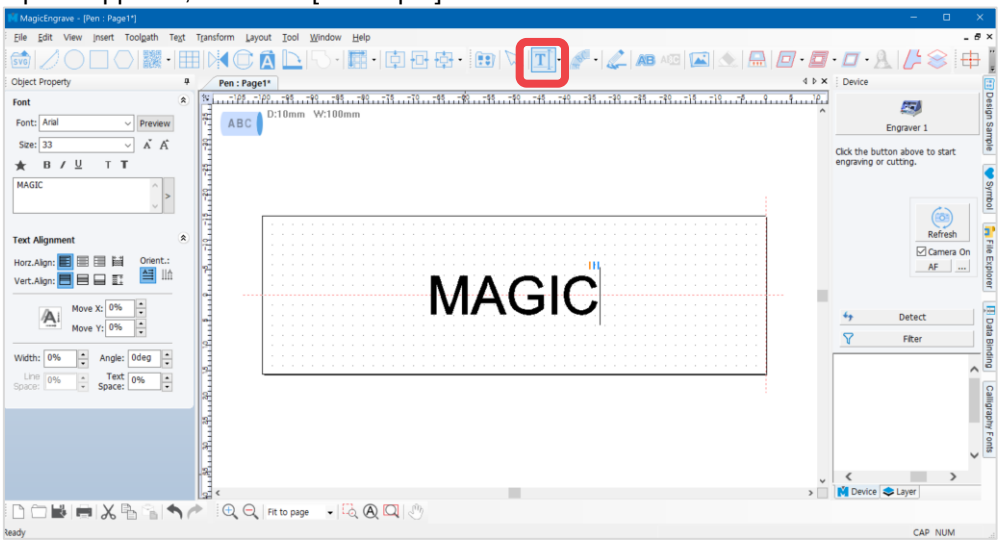
Notice **The pen jig may differ depending on model types. The instructions are almost the same for all types of engravers regardless of the type of jig used. Be sure to follow the instructions below to determine the correct positioning of the pen when engraving.**



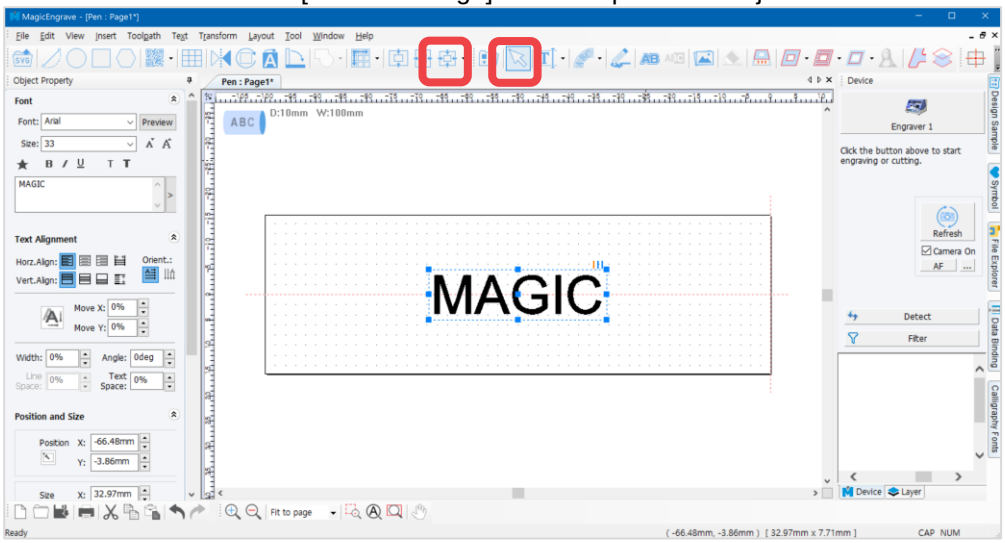
3. Select a pen template in the object property window. Enter the width and diameter of the pen then click “OK” button.



4. Once the template appears, click [Text Input] on the toolbar. Click the work area then enter text.

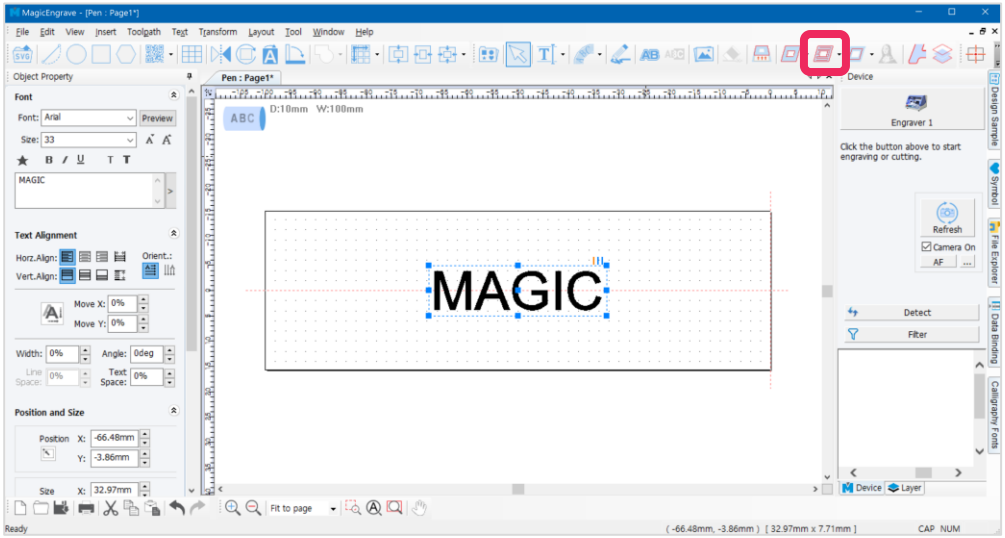


5. After entering the text, click [Selection] on the toolbar to enter object selection mode, then adjust the size and font of the text. Click [Center in Page] button to place the object at the center of the work area.

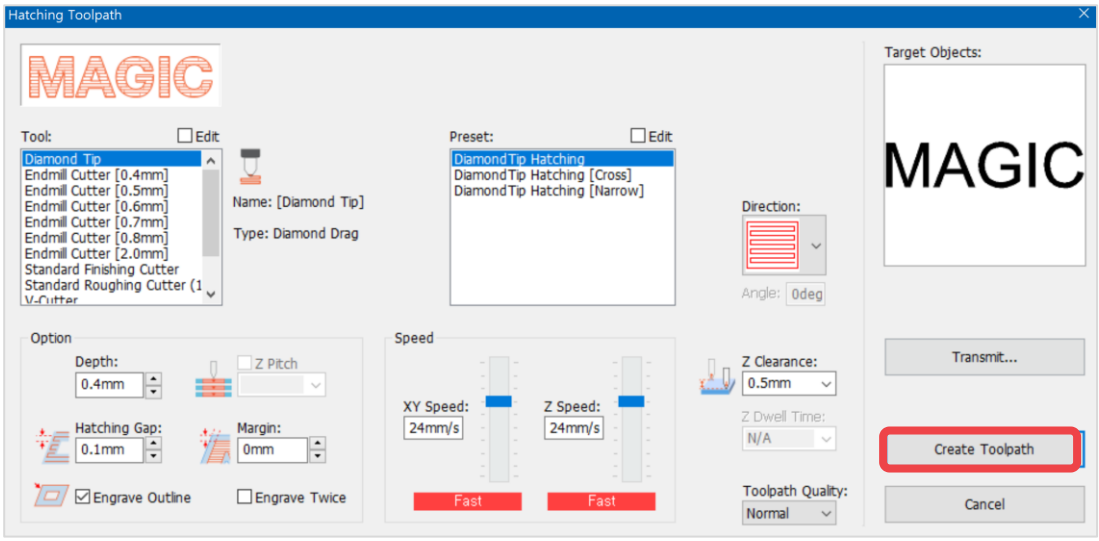


6. Upon completing the design, click [Hatching Tool path].

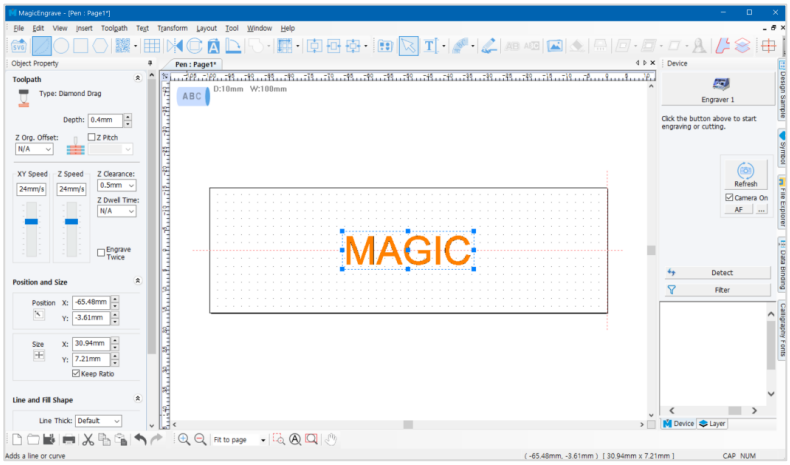
✻Click button on the top right of the screen for immediate marking without creating a Toolpath.

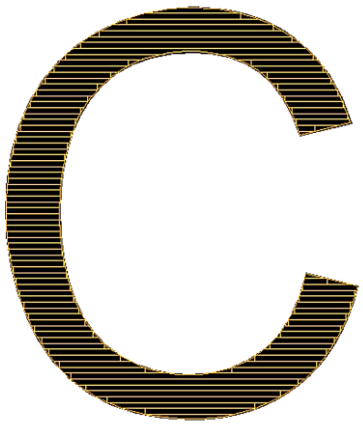


7. Select engraving option and tool from the “Hatching Toolpath” window. If necessary, designate the hatching gap and depth then click “Create Toolpath” button.

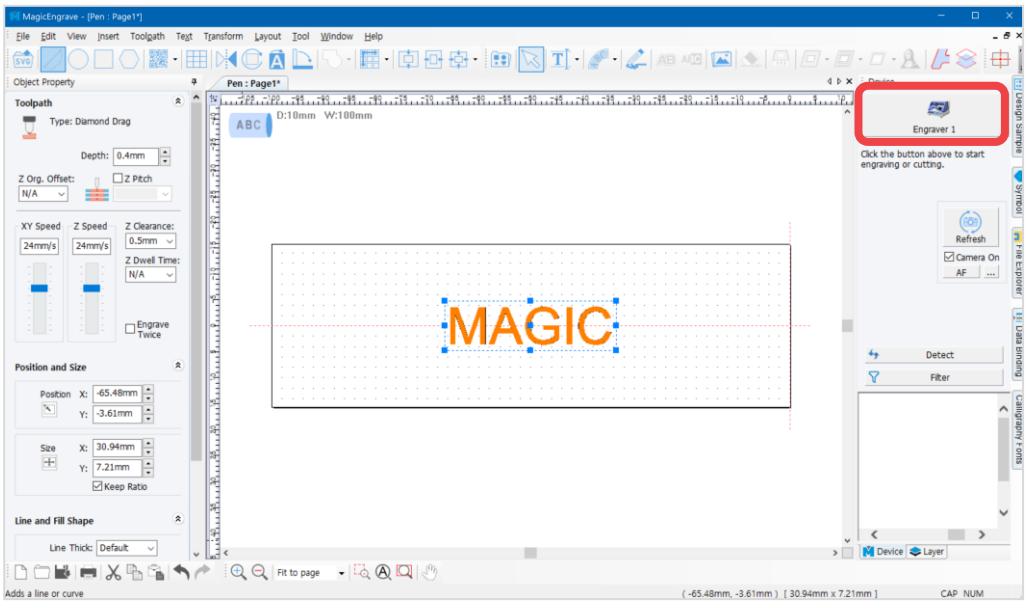


8. “Toolpath” object is created.

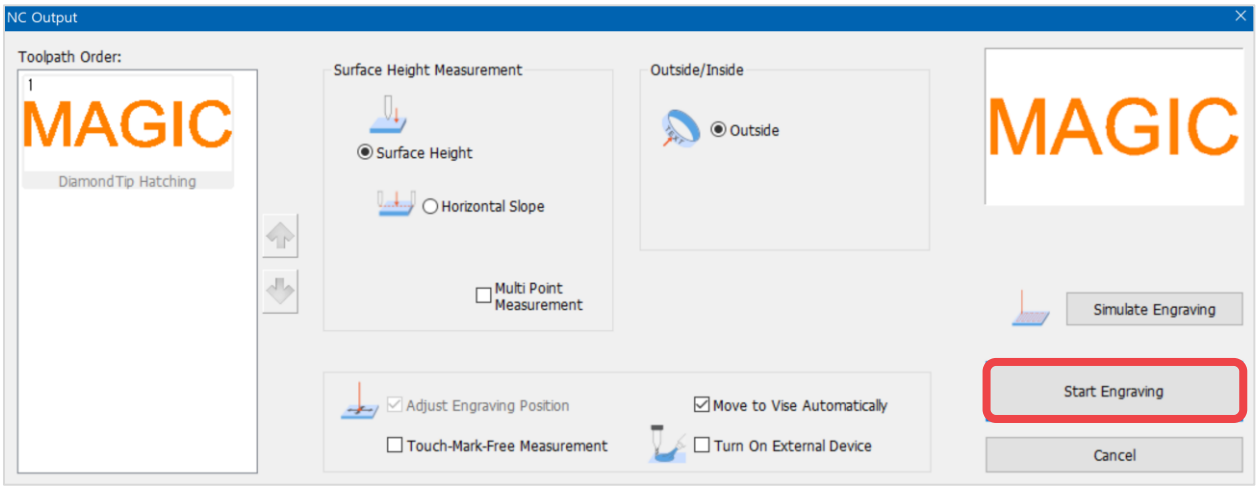




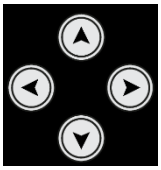
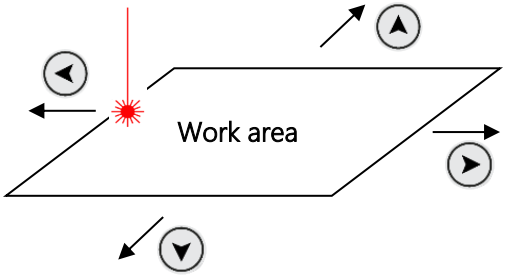
9. Click  button.



10. Once “NC Output” window appears, specify how the engraving material is measured then click “Start Engraving” button.



11. Once the tool is positioned to the center of the material and the laser pointer turns on, use the direction key buttons to position the laser pointer to the engraving area. The area that the laser pointer points to is where the actual engraving takes place.

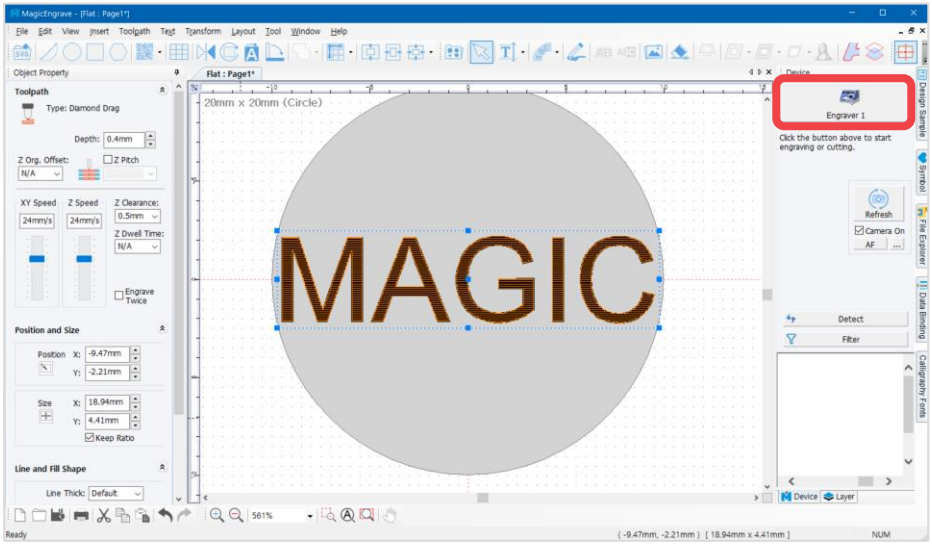
	Press the direction key buttons to move the laser pointer to the left, top, right and bottom areas of the engraving area. (Long press to move the laser pointer farther). Check if the laser pointer points to the area on the material where you want to engrave. If the laser pointer is out of range, adjust the position using the direction keys.
	The laser pointer automatically points to the area where the engraving takes place (based on the target location on the work area). When the direction key is pressed, the laser pointer moves to the area to be engraved (left, top, right or bottom) from its target location. If the engraving area needs to be adjusted to the left, press  key to move the pointer to the left. 

12. After positioning the laser pointer and determining the location of the engraving area, long-press and hold  button (for more than 3 seconds) until it beeps to confirm that the machine is ready to engrave then close the cover.

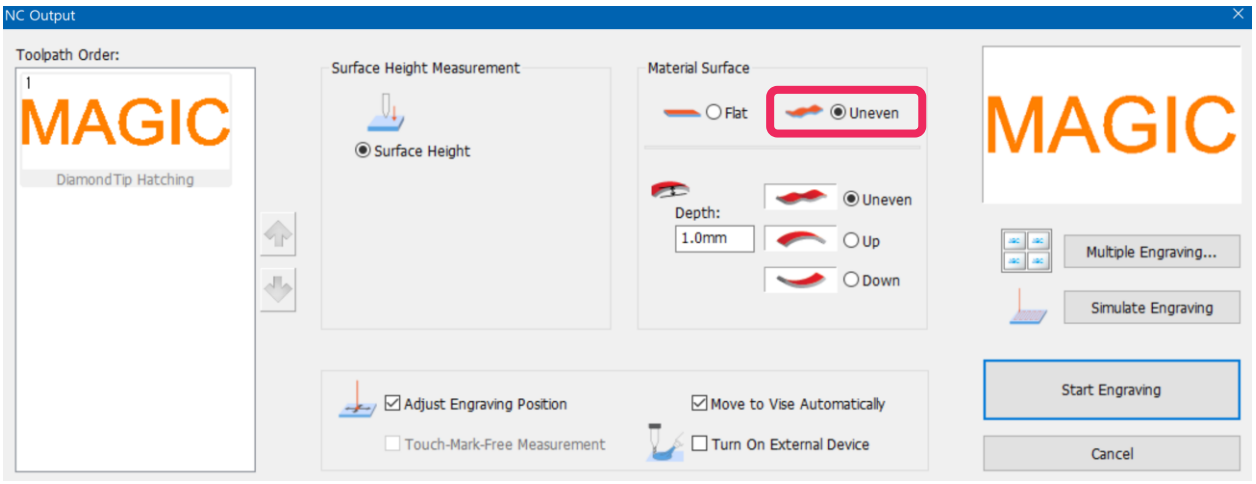
Engraving Curved Materials

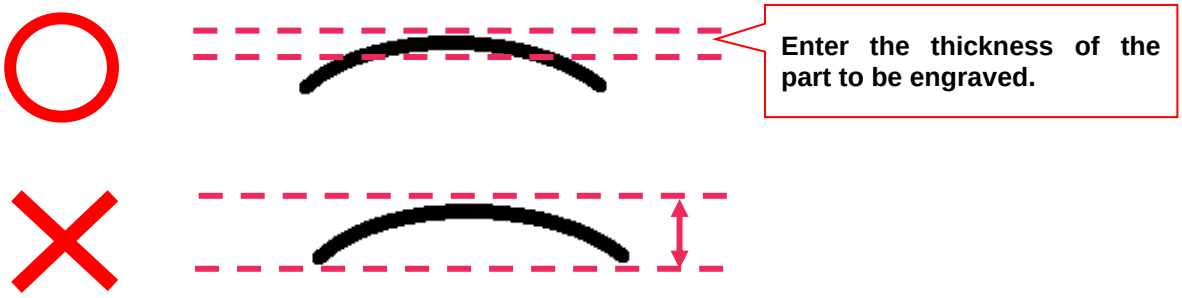
Scratch on the surface of a curved material is likely to be caused by the tool touching the surface of the material when it moves. This can be avoided by entering the thickness of the material's surface to set the Z-movement height automatically.

1. Create a toolpath then click  button.



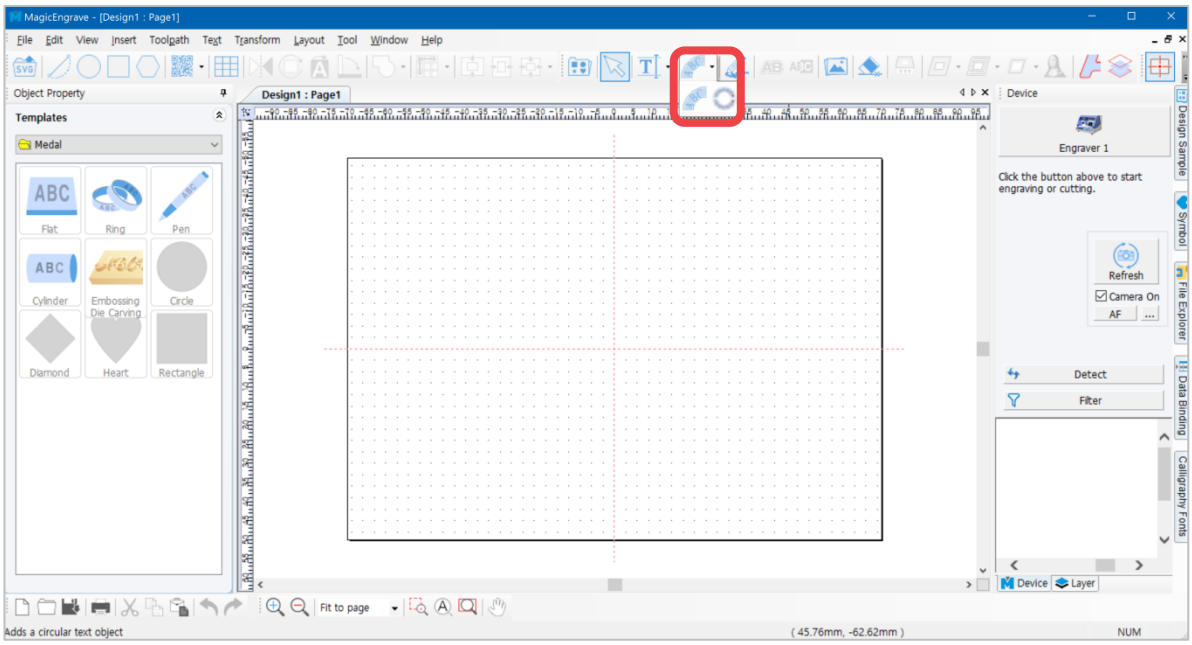
2. Once "NC Output" window appears, click "Uneven" to see different kinds of curved materials. Select a shape that resembles the shape of the material then enter its thickness (the thickness of the area to which the engraving is applied) then click "Start Engraving" button.





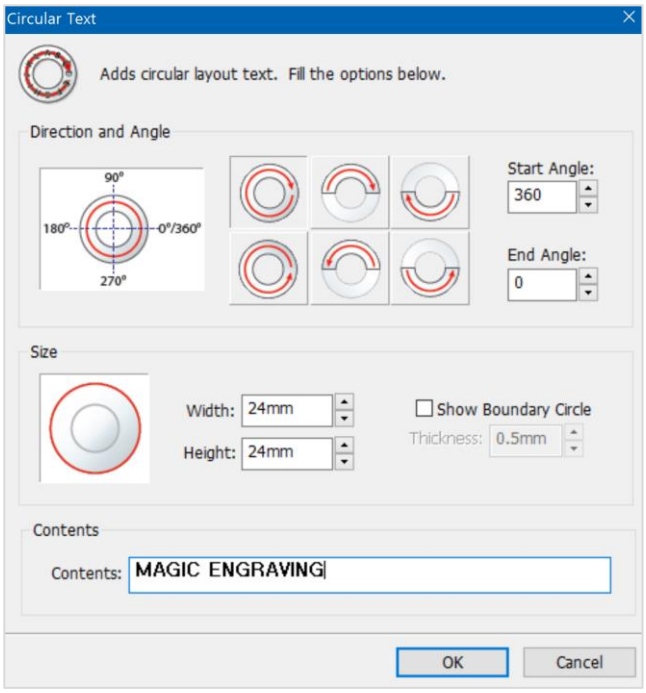
Layout of Text in a Circle

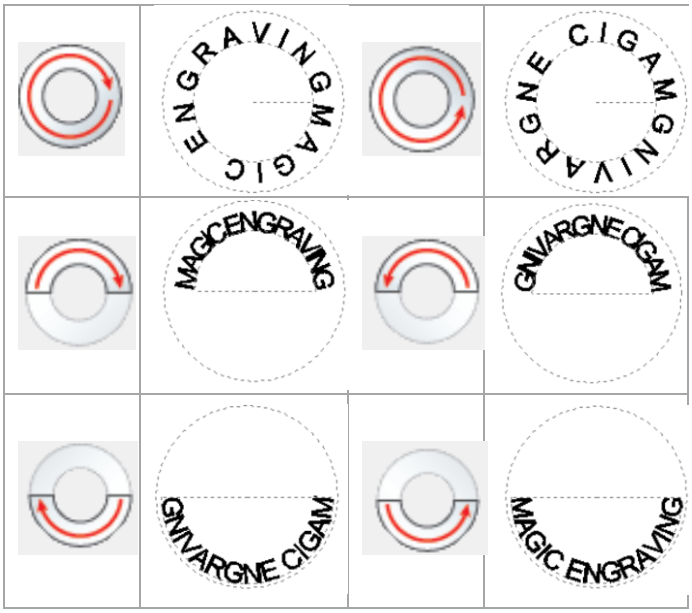
Texts can be arranged around a circle by using circular text object.



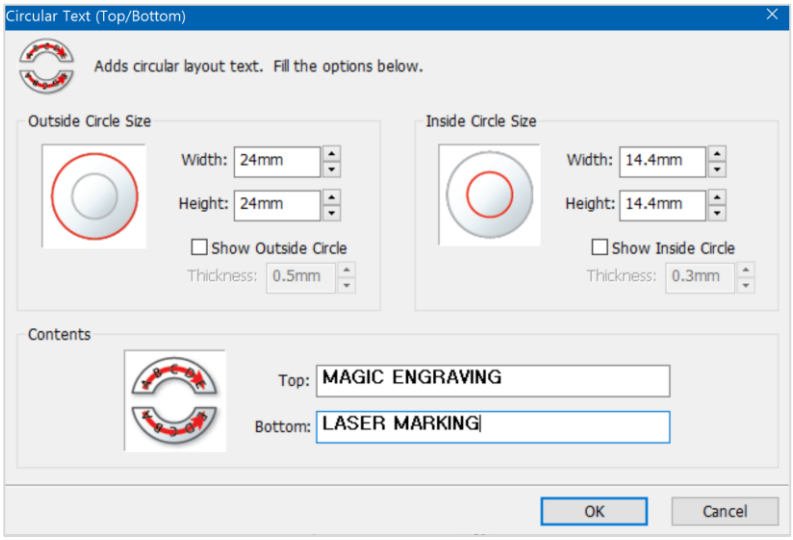
[Circular Text]

Click button to display “Circular Text” window. Assign a direction and an angle, enter the text and size, then click “OK” button.



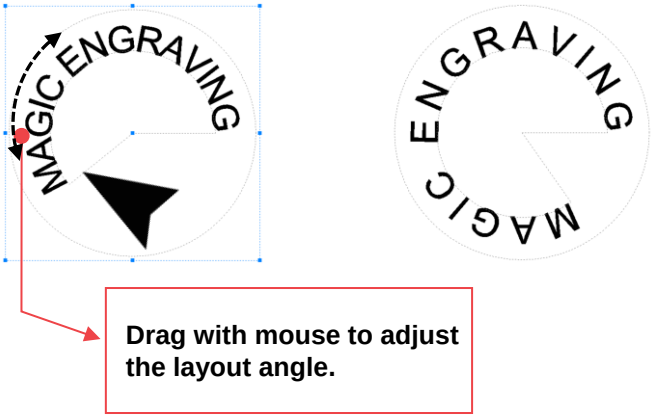


[Circular Text- Top/Bottom]

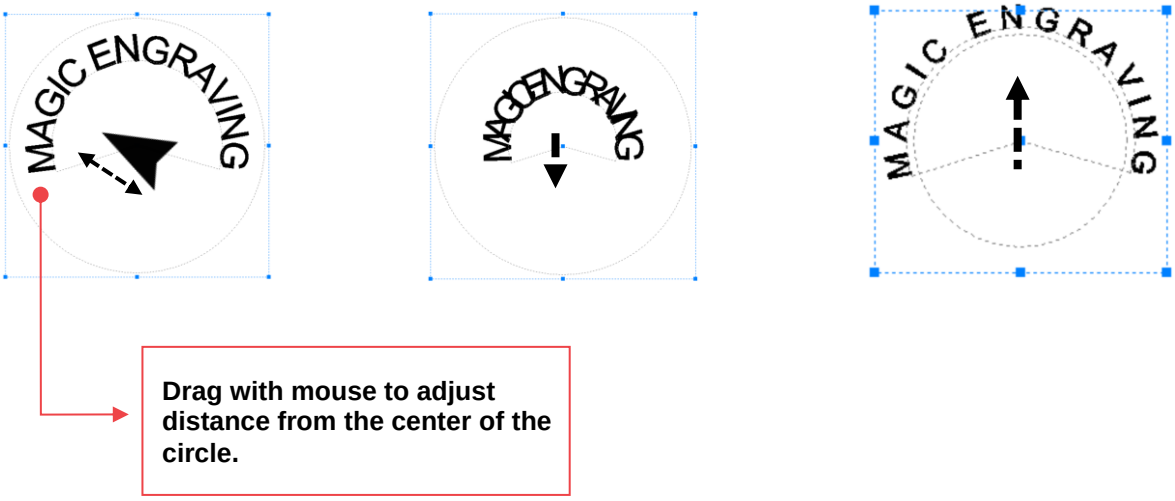


[Adjusting layout angle]

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



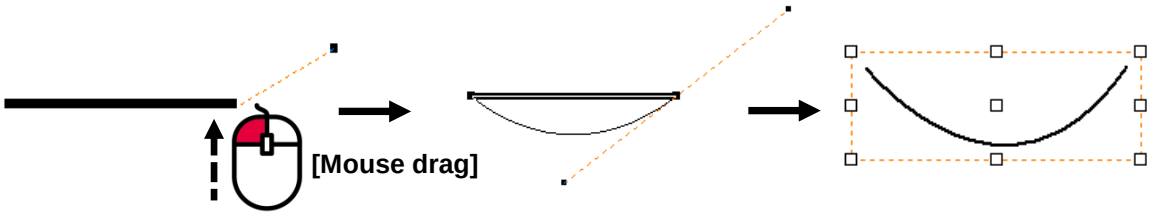
Drag other characters with the mouse to adjust the distance to the center of the circle.



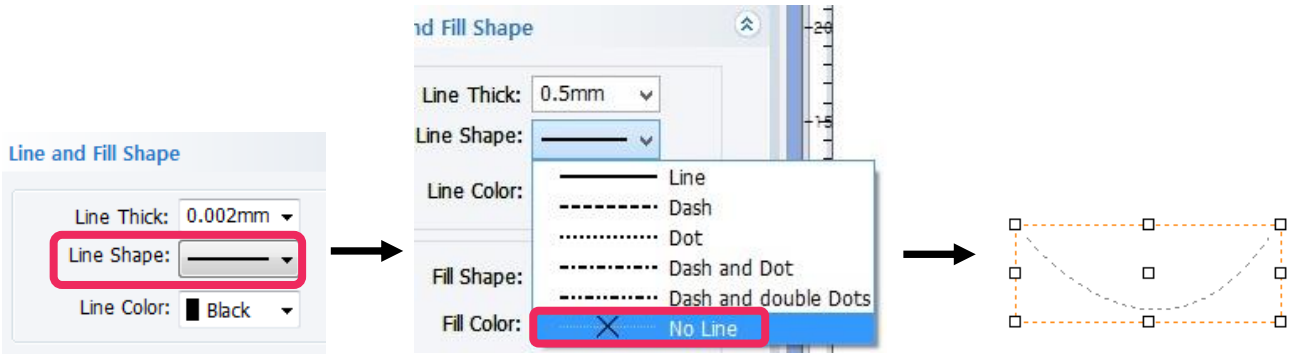
Layout of Text in a Curve

1. Click the  **[Line/Curve]** button.

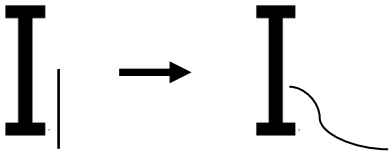
2. Left-click to display the dotted lines then designate a distance. Drag the mouse to make a curve appear then right-click to create one.



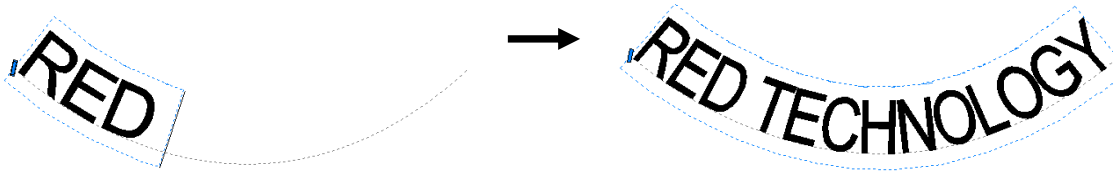
3. Select “No Line” on the “Line and Fill Shape” window on the object property window.



4. Click  [Text Input] button then move the mouse cursor to the curve line. The cursor will change to text cursor as shown below.



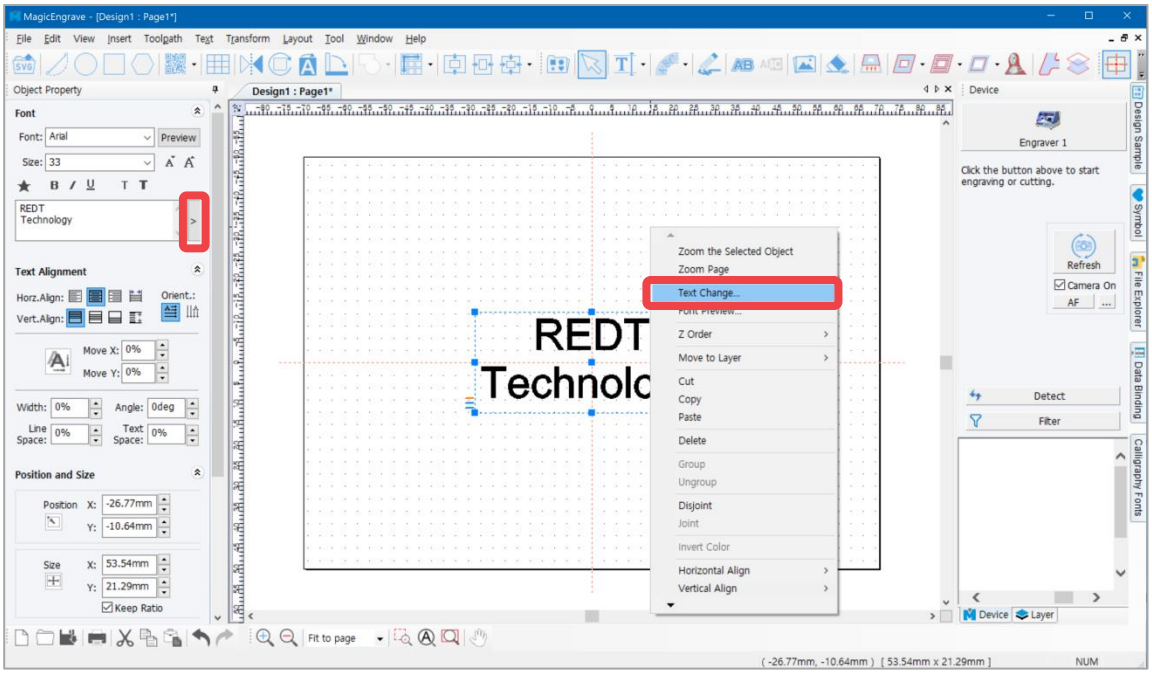
5. When the cursor changes to text, click the curve line then enter the text.



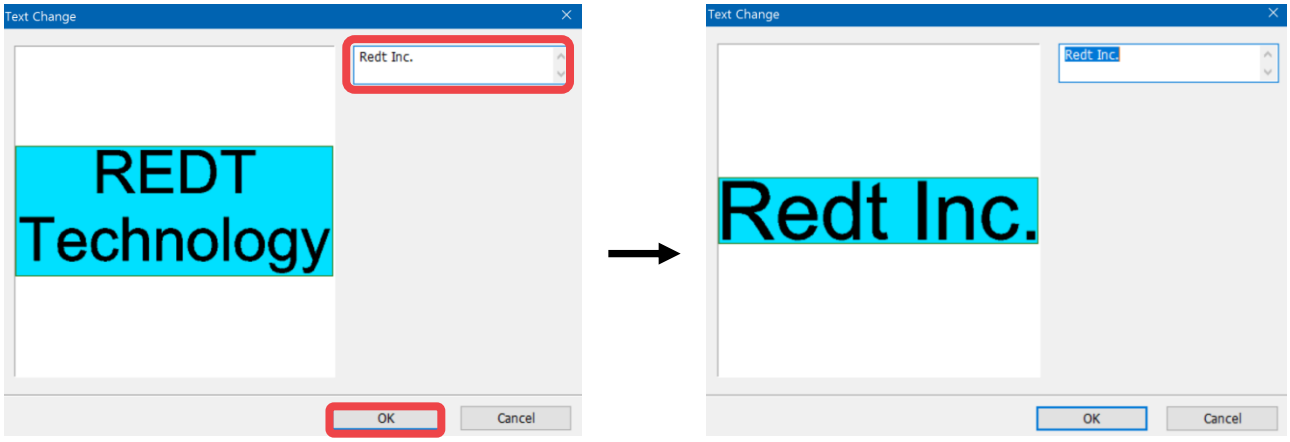
Text Change

The content of a text can be changed by using [Text Change] feature.

Open a saved design sample, file or select the text objects entered on the work area. Click  [Text change] button or right-click with the mouse then select [Text Change] on the menu. Or, select [Menu] → [Text] → [Text change].



Change the content in the “Text Change” window then click “OK” button. The modified text will be shown on the screen.

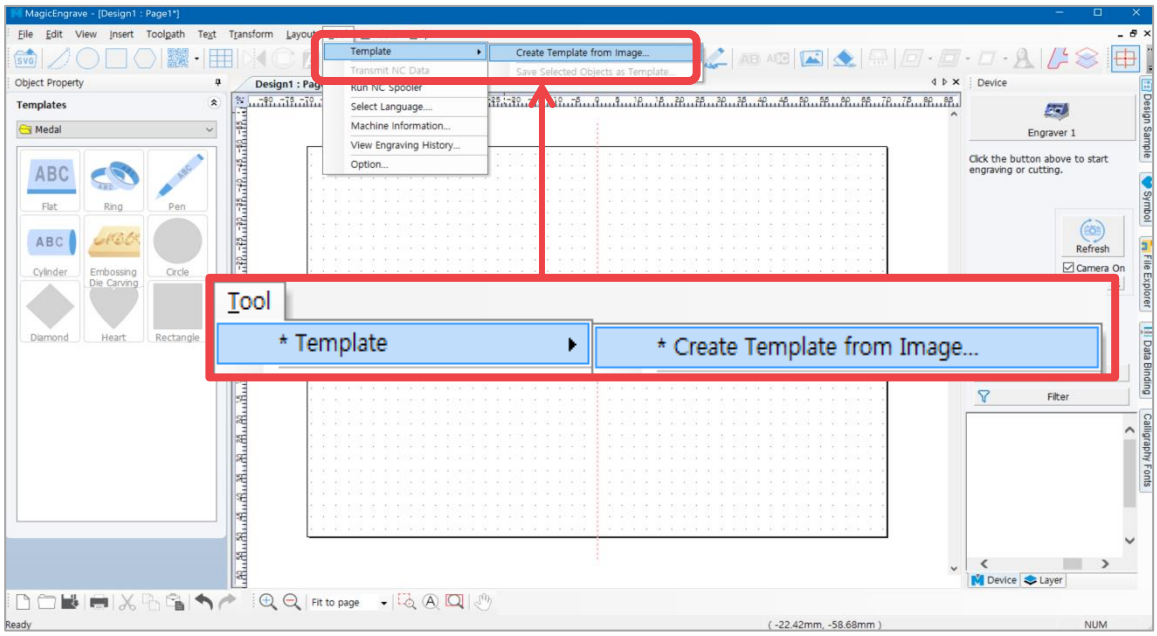


Template Creation

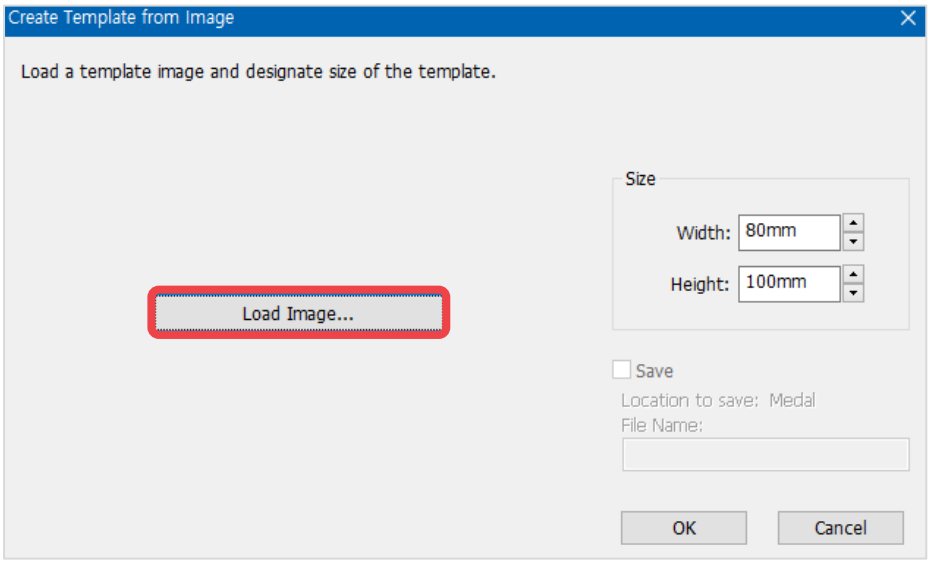
Template is an image that corresponds to the material to be engraved by 1:1 ratio. Load a template similar to the shape of the material to be engraved then enter the text. This allows you to easily and conveniently position your text and determine its size. Templates such as circle, heart, square and diamond are available in the program, and users can freely add more templates. Templates can be created by using graphic programs like Illustrator, Photoshop and CorelDraw, or by loading images in SVG file format, jpeg, bmp, png, etc.

[Creating template #1]

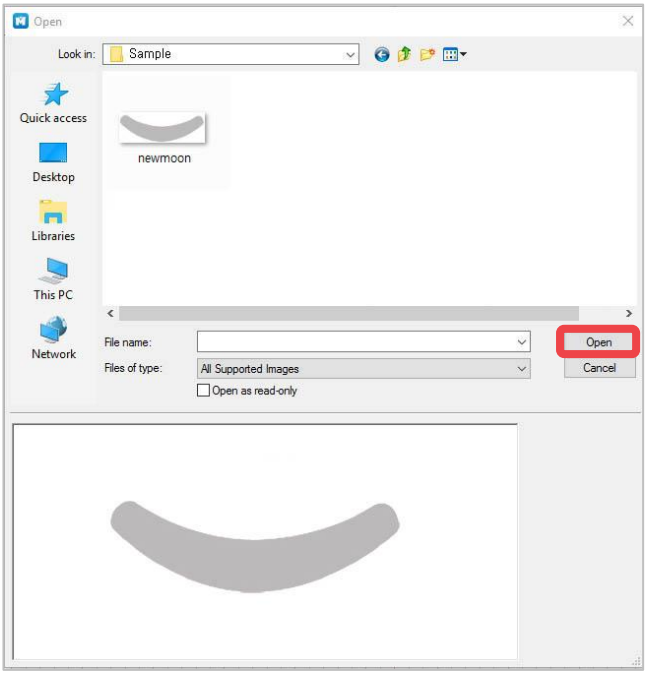
1. Select [Menu] → [Template] → [Create Template from Image].



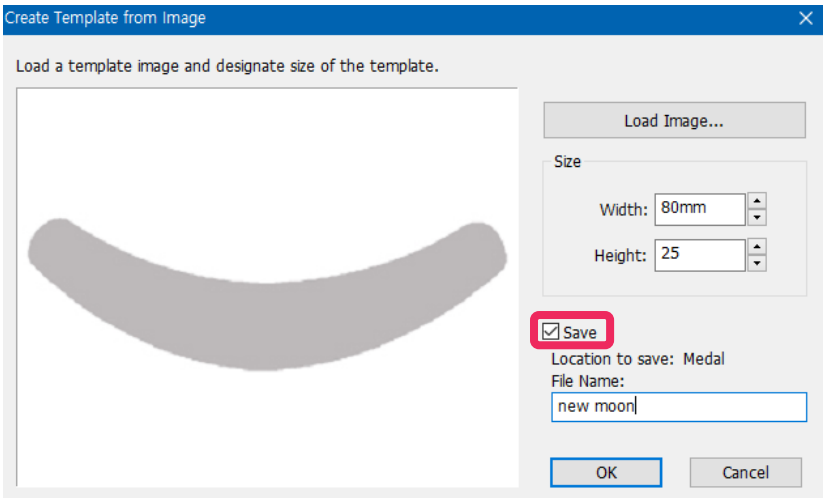
2. "Create Template from Image" window will appear.

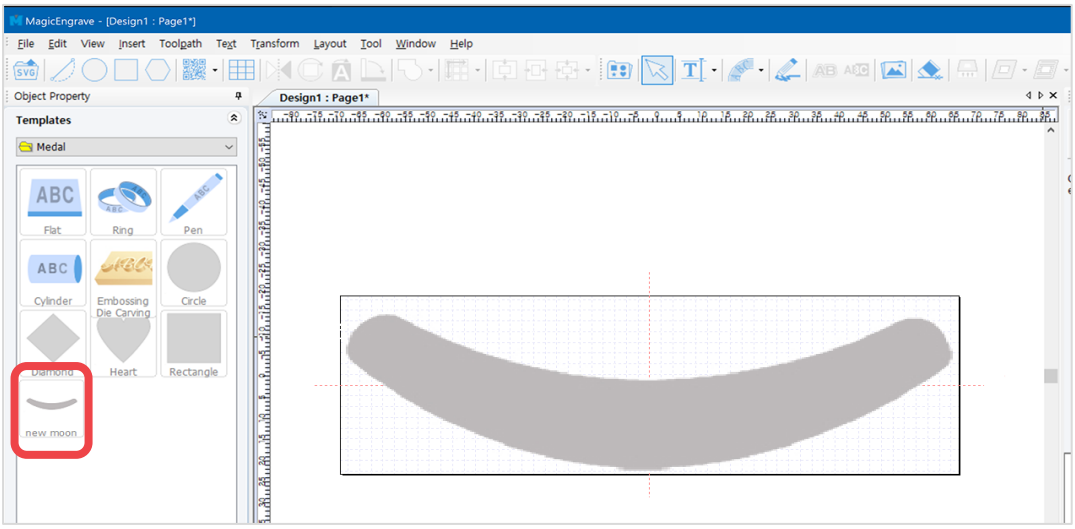


3. Select the image file (jpeg, bmp, png and etc.) from the “Open” window then click “Open” button.



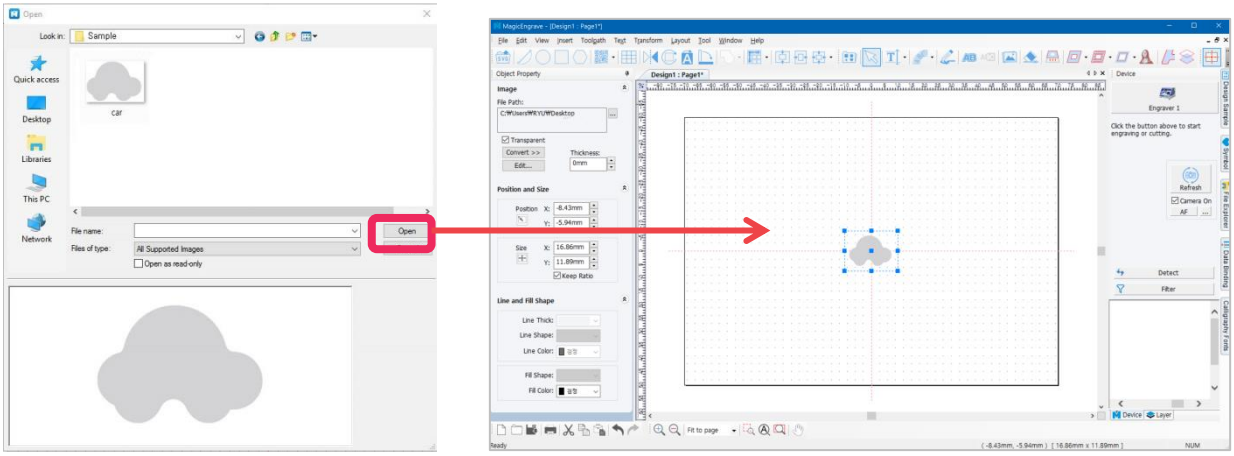
4. Enter the size of the template. Check “Save” to save the image as a template for later use then enter the file name. Click “OK” button to load the image as a template. The image will be saved as a template in the template library.



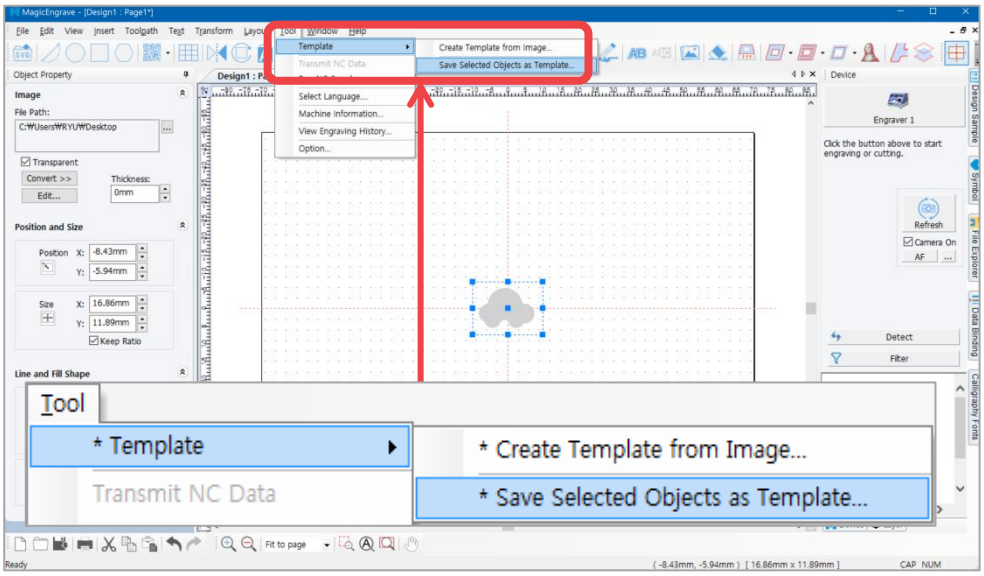


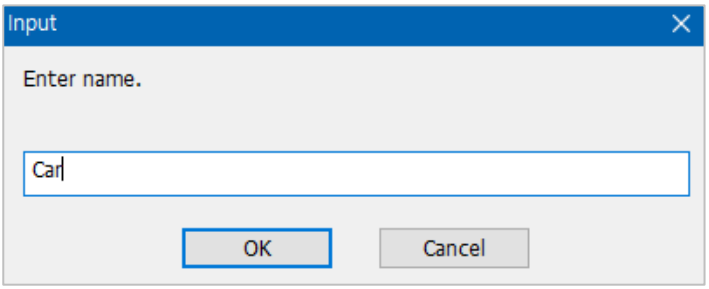
[Creating template #2]

1. Click  [Image] button to open an image file.

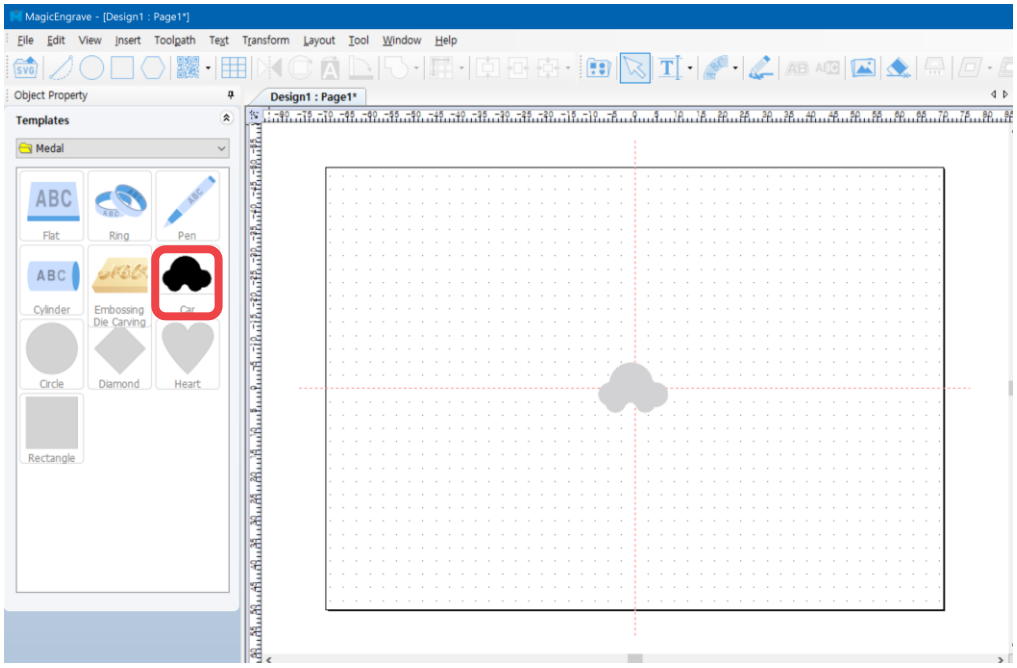


2. Select [Menu] → [Template] → [Save Selected Object as Template].
   Enter a new template name in “Input” window then click “OK” button.



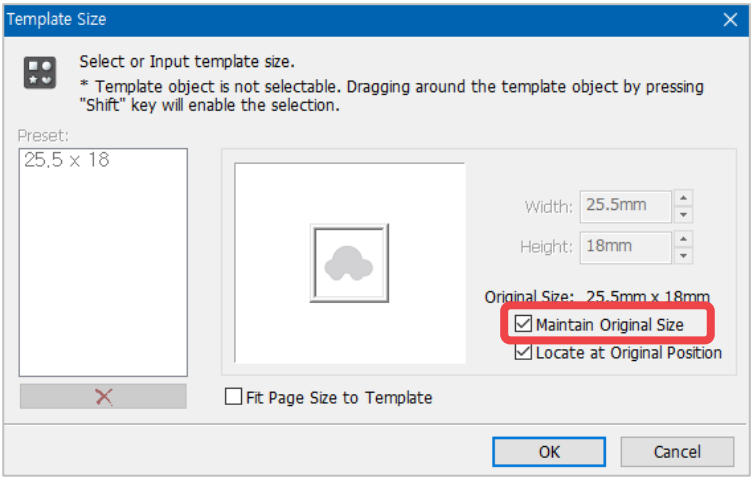


3. The saved template is added to the template library.

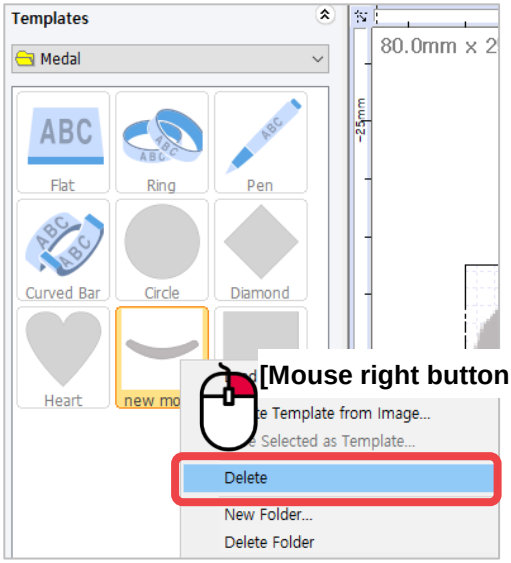


Notice

The saved template in the “Save Selected Object as Template” menu is saved based on the size designated on the screen. When loading a template, check “Maintain Original Size” so the template will be loaded based on the original size designated when the template was saved.



✻ Templates can be added or deleted. “Add” or “Delete” option can be selected by right-clicking in the template category window.



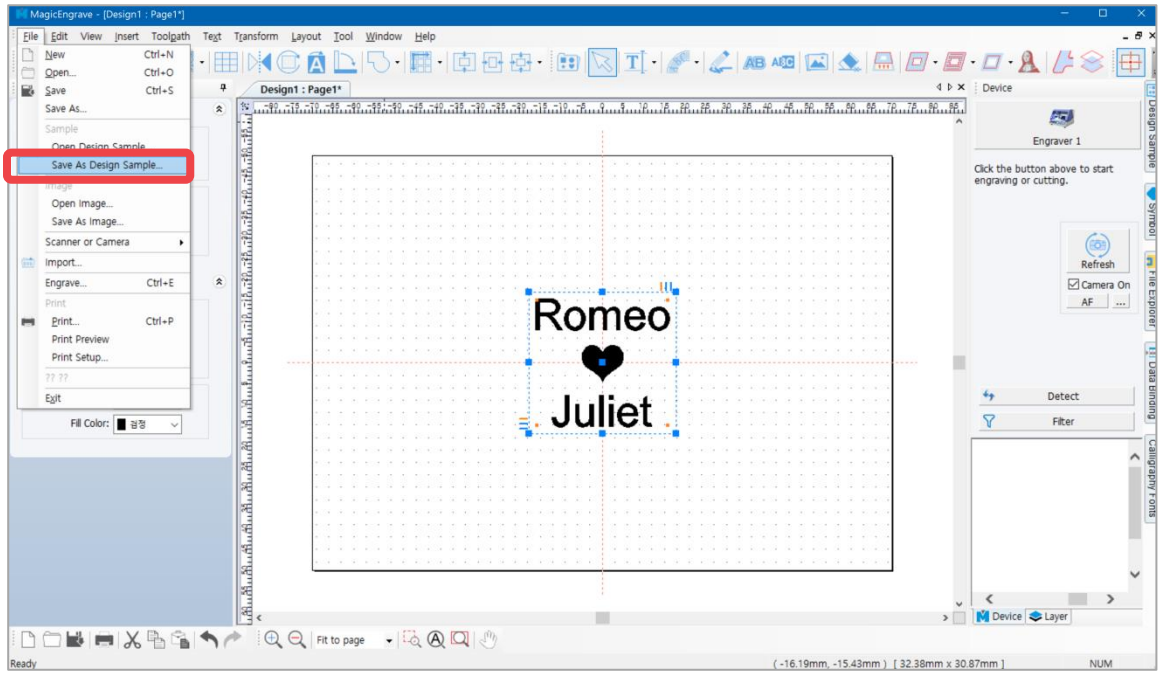
[Mouse right button click]

Saving as Design Sample

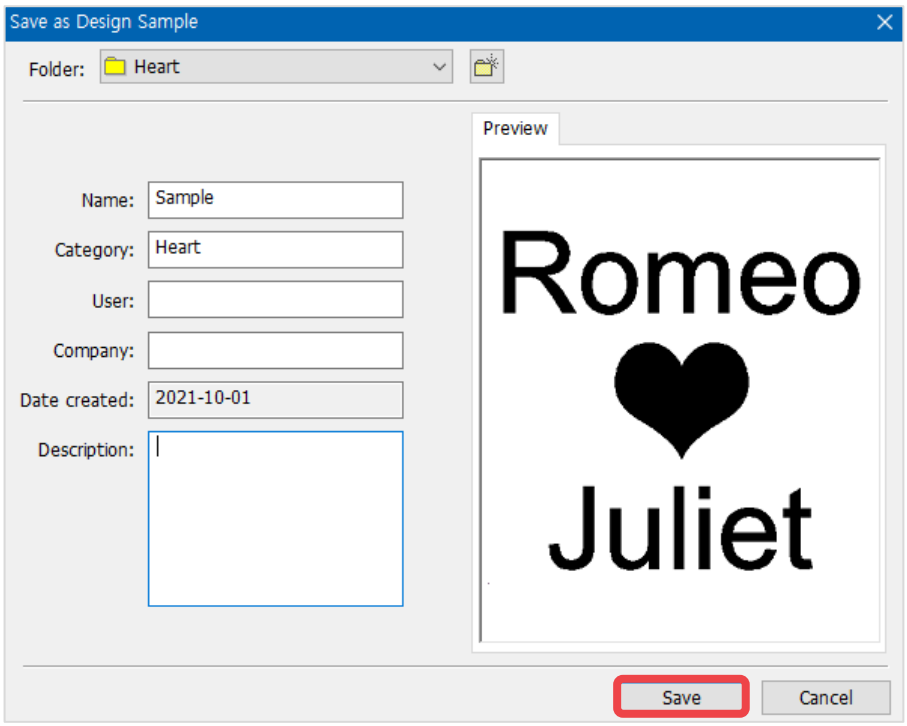
Edited texts, contents or designs can be saved as design samples for future use.

[Saving as design sample #1]

1. Edit contents and select the objects.

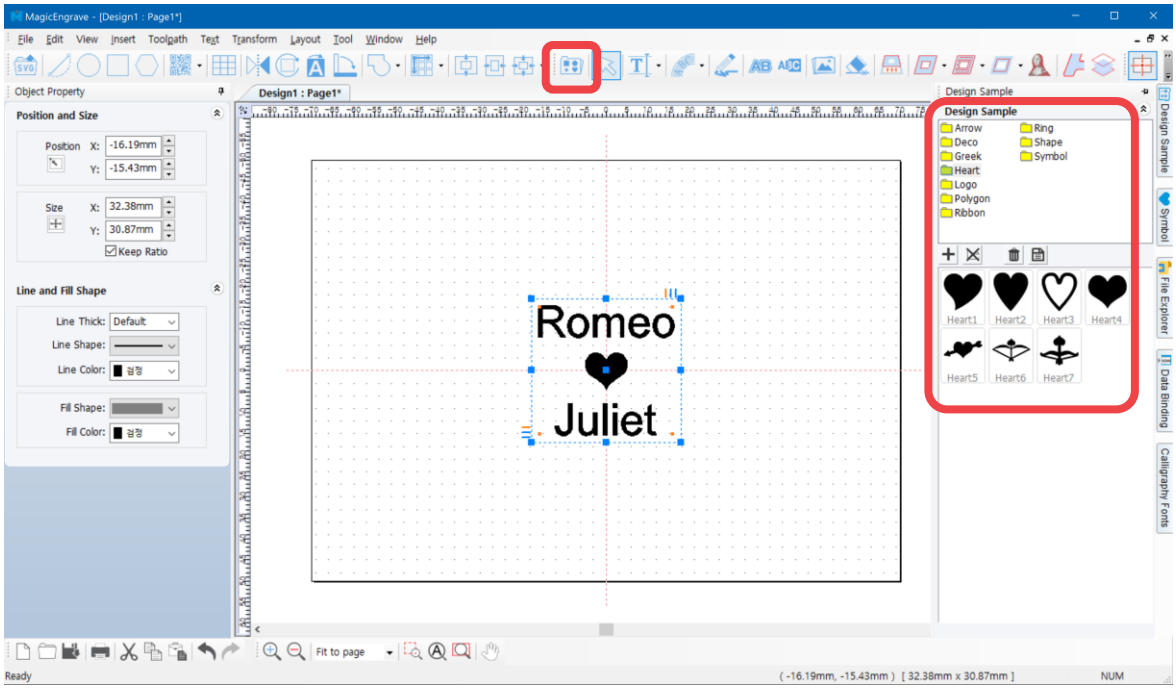


2. Click File [Menu] → [Save as Design Sample] then select a folder or create new folder.
Enter the name then click “Save.”

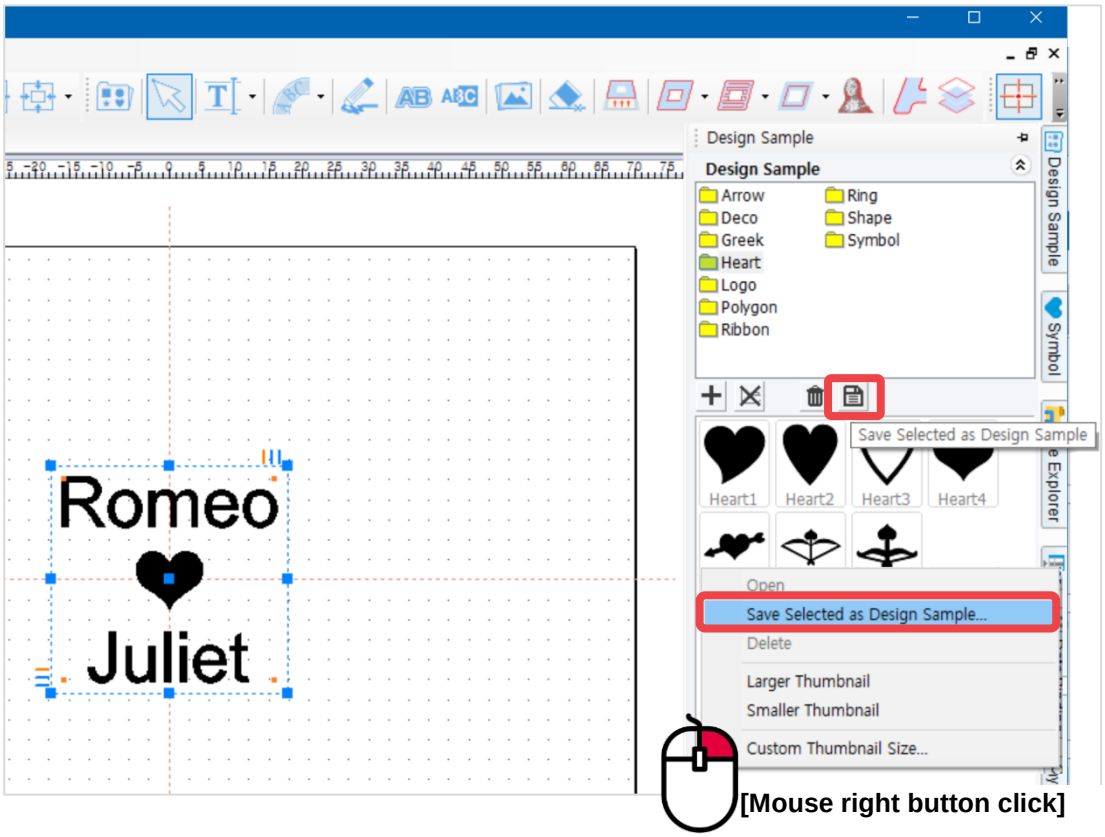


[Saving as design sample #2]

1. Select the objects then click  [Design Sample] button. Select a folder from the design sample library window to save the created design.

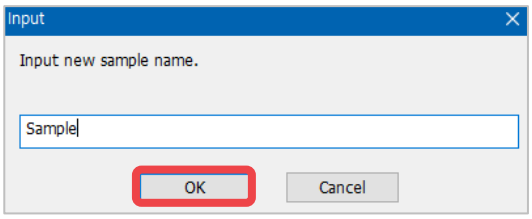


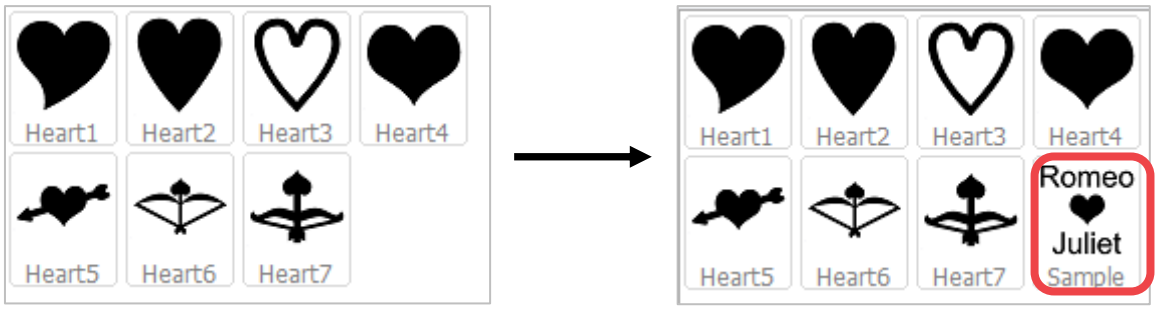
2. Click  [Save selected image as sample] or right-click the design sample image then click “Save Selected as Design Sample” on the menu.



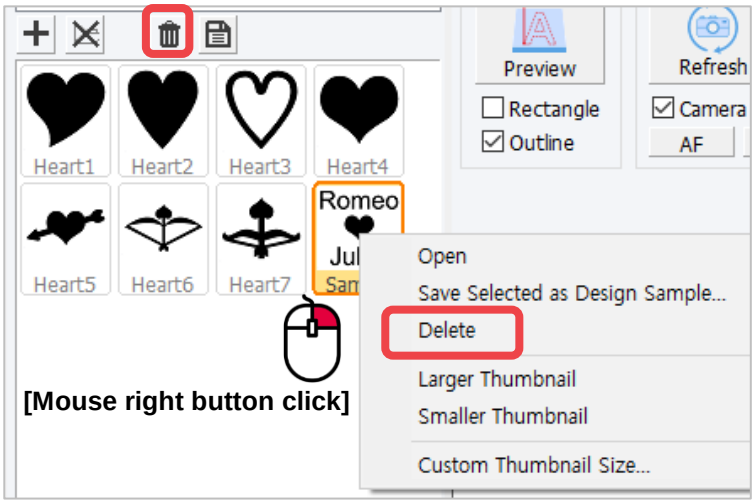
[Mouse right button click]

3. Enter the name of the design created then click “OK” button. The design will be saved in the design sample library.





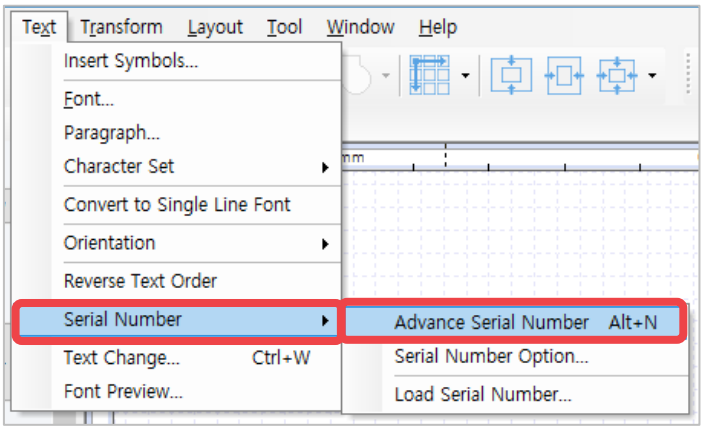
✻ Right-click in the design sample window to see more features. The design sample can be deleted by right-clicking in the design sample window then select or “Delete” on the menu.

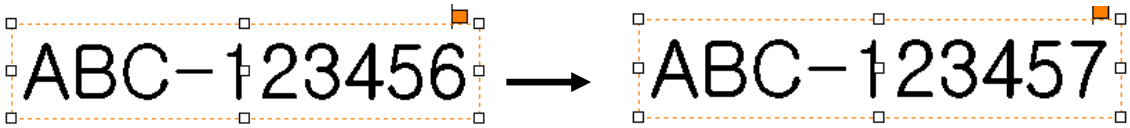


Auto Change of Serial Number

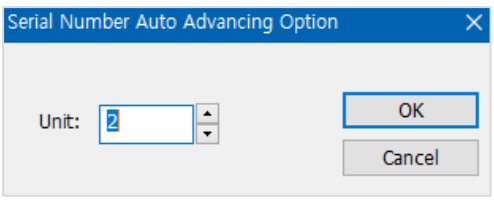
Use this function when changing numbers by certain unit.

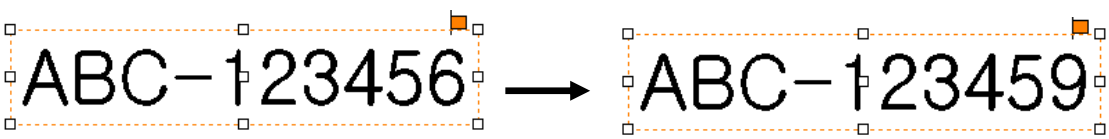
1. Edit the font and size of text object with a number then press “Alt+N” key on a keyboard, or select [Menu] → [Text] → [Serial Number] → [Advance Serial Number] to change the number automatically.



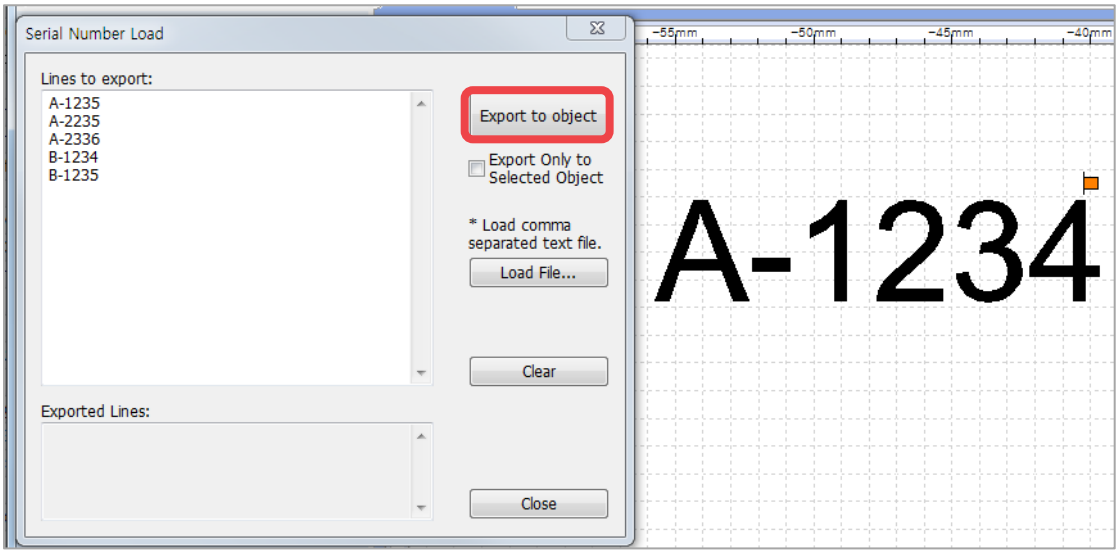


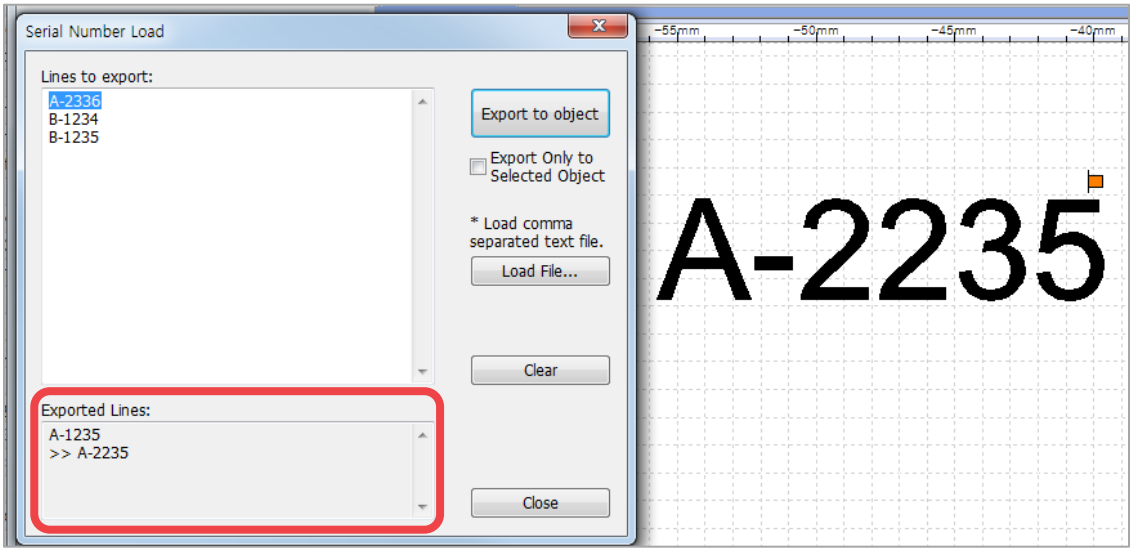
2. Select [Menu] → [Text] → [Serial Number] → [Serial Number Option] then enter a unit from the “Serial Number Auto Advancing Option” to change the serial number based on the assigned unit automatically.





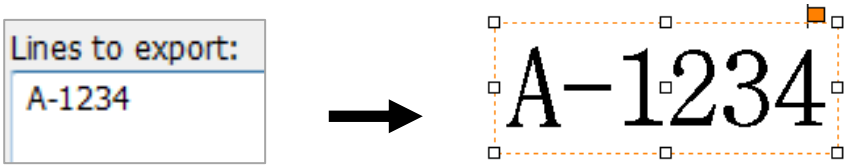
3. If the serial number is not consistent, select [Menu] → [Text] → [Serial Number] → [Load Serial Number]. Enter serial number in the “Lines to export” field or click “Load File” button to load from a file (.txt or .csv file format). Once the serial numbers are loaded, click “Export to object” button. 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.”

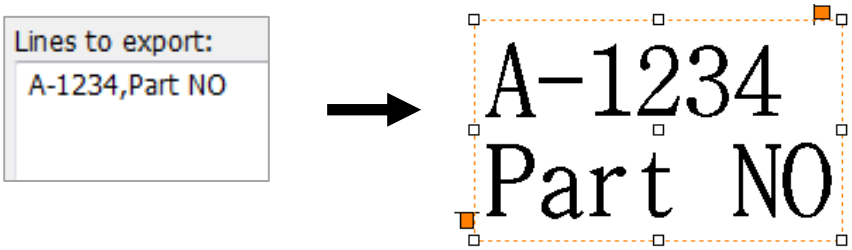




Notice

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





Loading and Editing Image

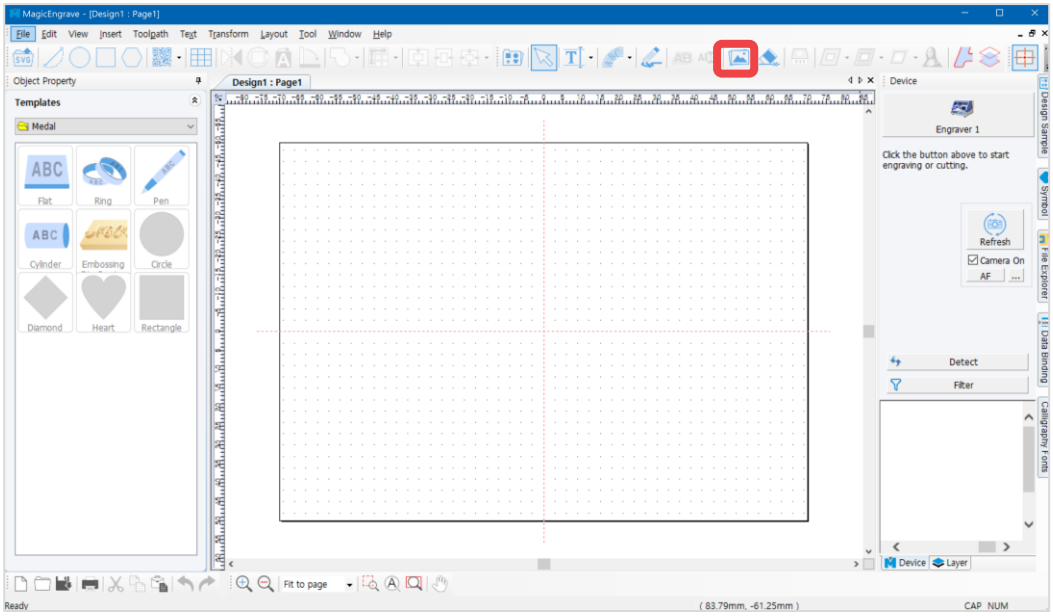
1. Loading an image

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

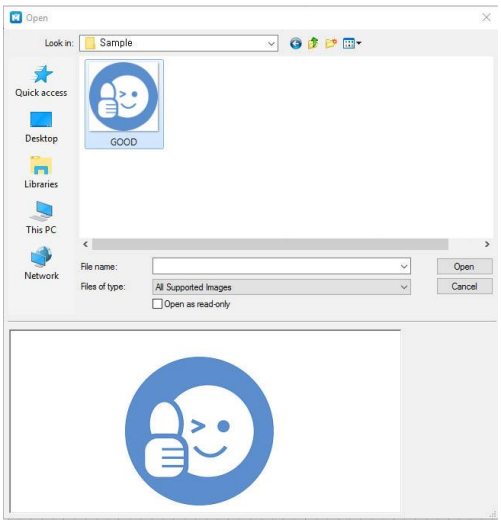
BMP	Windows or OS/2's bitmap graphic file
GIF	CompuServe graphic file
JPG/JPEG	JPEG bitmap graphic file
PNG	Portable Network Graphics bitmap graphic file
PCX	Z Soft PC paintbrush bitmap file
TIF/TIFF	Tagged Image File Format bitmap file
WMF	Windows meta file

Image file can be loaded through the following methods.

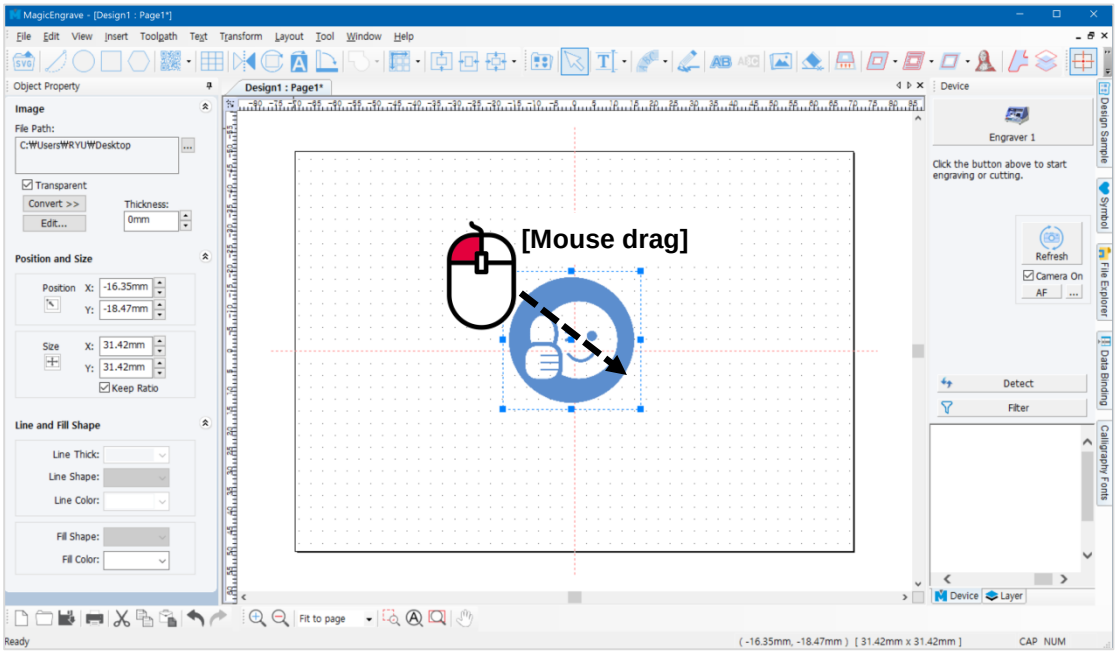
1. Select  [Image] on the toolbar or select [Menu] → [Insert] → [Image].



2. When "Open" window appears (as shown in the picture below), select the image to load then click "Open" button.



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

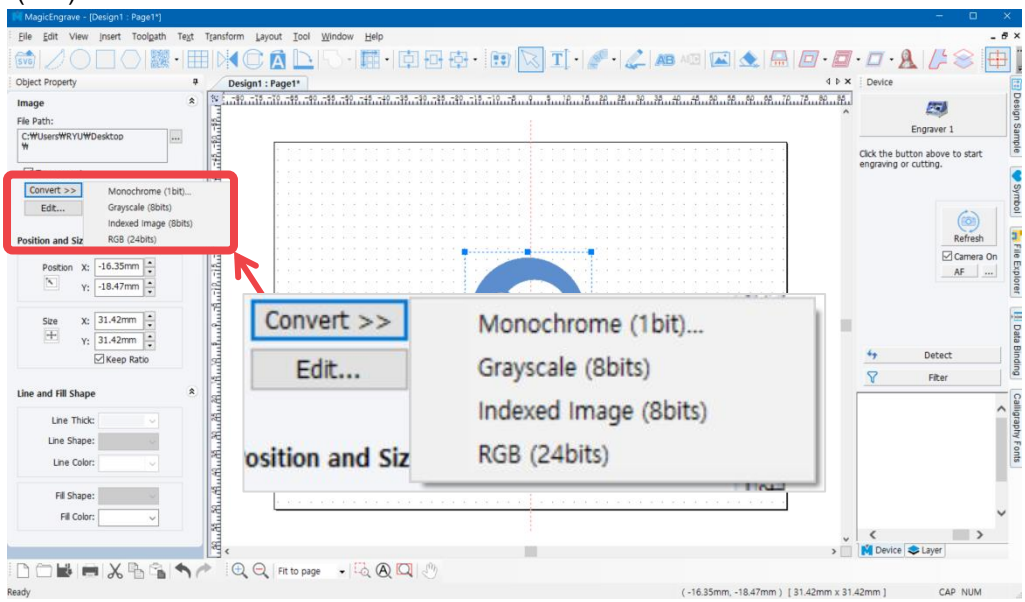


2. Converting and editing image

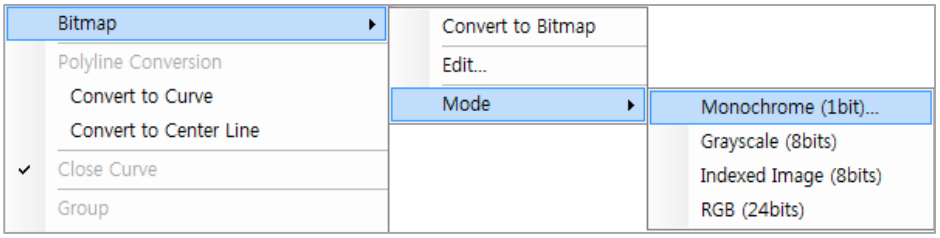
The machine can only engrave single-color images; not multi-color images. Multi-color images should be converted to single-color (1 bit) image.

[Converting to single-color image]

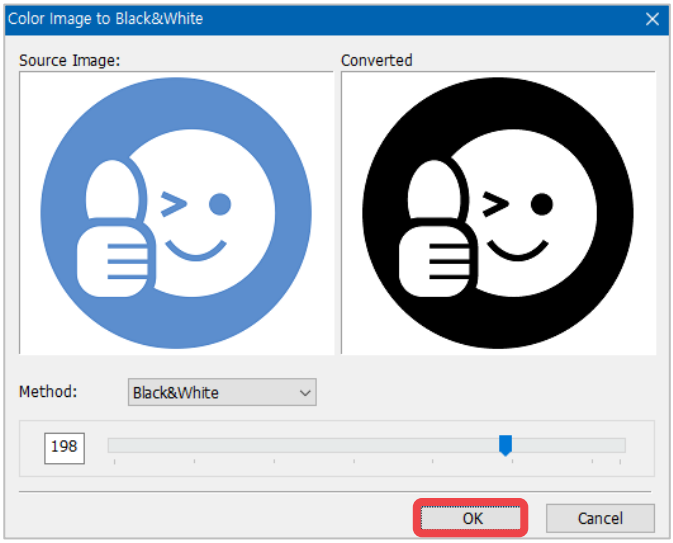
1. Select the image you want to convert. Click “Convert” button in the image object window then select “Monochrome (1bit).”



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

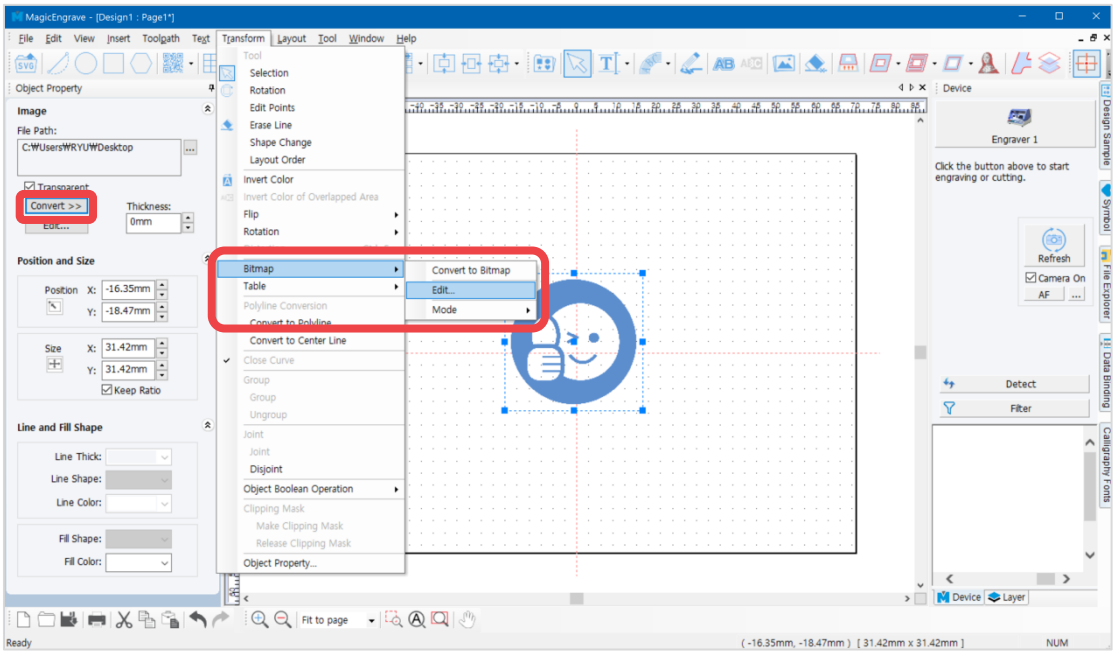


2. When “Color Image to Black & White” window appears, move the slider to adjust the level of color then click “OK” button.

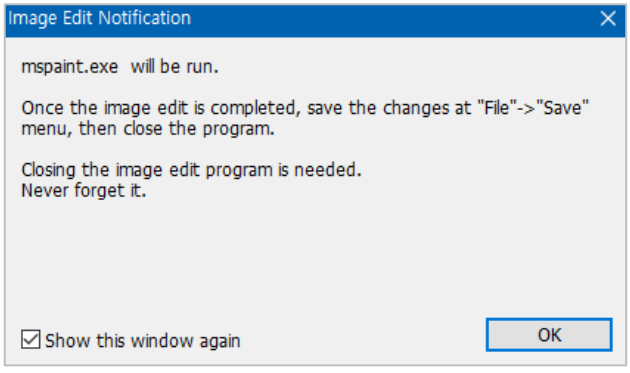


[Editing image]

Loaded image can be edited via “Paint” program in Windows.
Select the image object to be edited then right-click to select “Edit” or, select [Menu] → [Transform] → [Bitmap] → [Edit].



Click [OK] to run Windows Paint program.

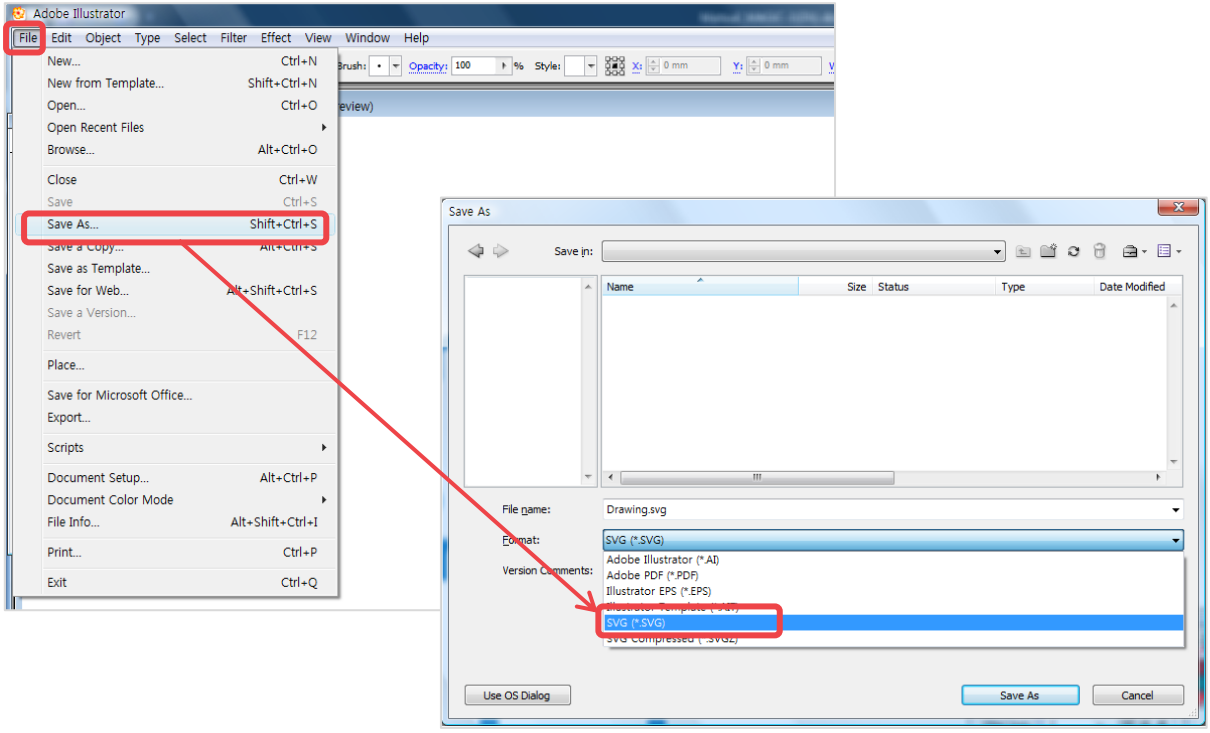


Then “Image Edit Notification” will appear.
Once editing is completed, click “Save” from Paint File menu then close the program to apply the changes.

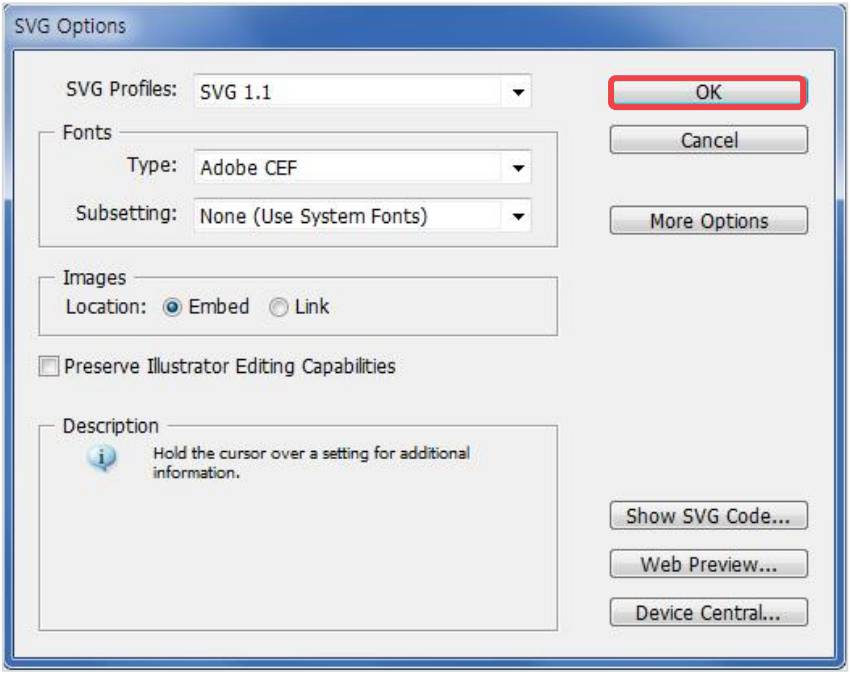
Import a File in SVG format

MagicEngrave supports vector graphic files in SVG format. If a design is created in programs like Illustrator or CorelDraw, the design can be loaded as long as it is saved as SVG file.

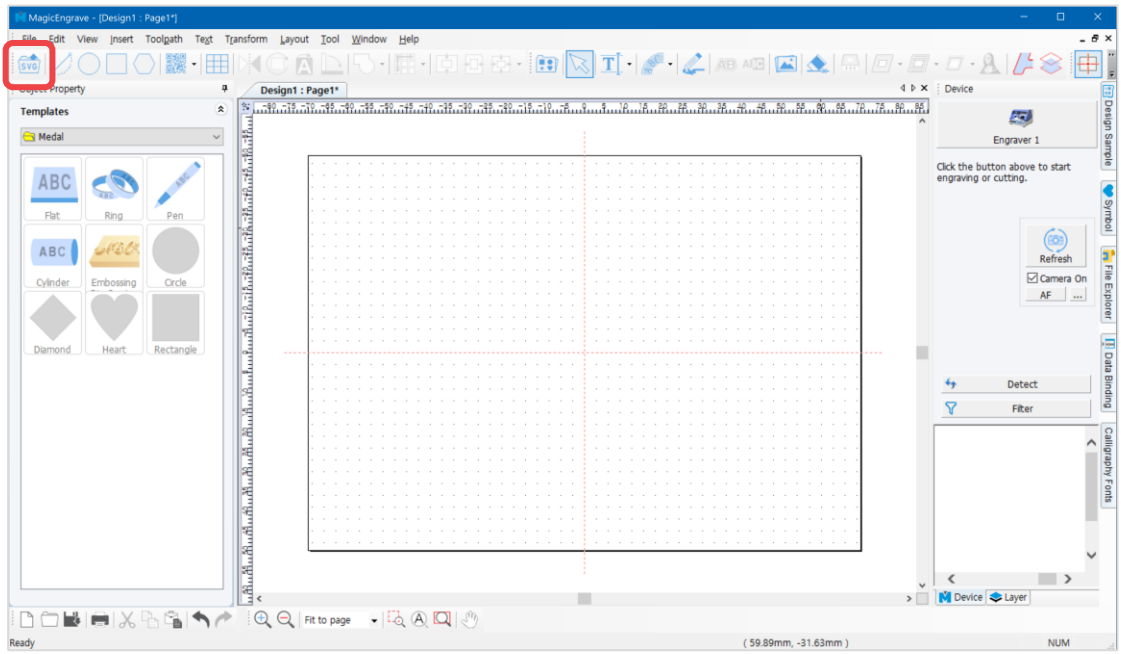
1. Select File menu → Save As from Illustrator program to save a file in SVG format.



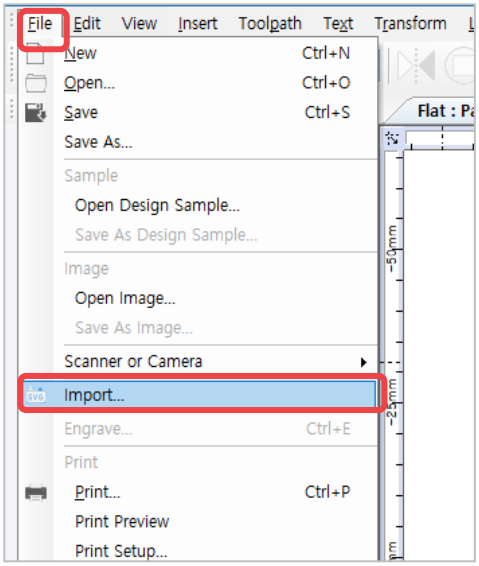
2. When SVG option window appears, click “OK” button to save changes.



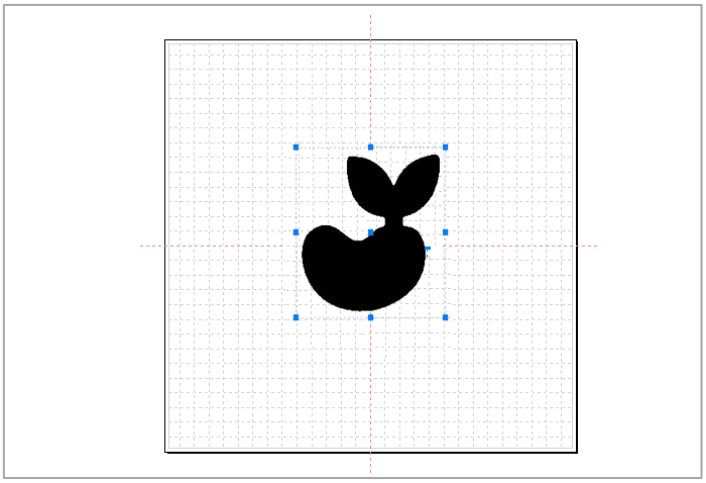
3. Click  button to load the SVG file.



4. Or select [Menu] → [File] → [Import…] to import a file.



5. Once the file is imported, click the work area to display the image.



Calibration

※ The machine is initially set up at the factory. Please contact your reseller first before making any changes to the settings of the machine.
※ Only carbide and diamond tools can be calibrated. Do not calibrate tools such as endmill and cutter.
※ Be sure to unlock the pressure lock when calibrating the machine. Nose, tool and material can be damaged if the head is fixed or when the pressure lock is locked.

1. Touch Sensor (Tool Calibration)

1. Place and secure the material on the clamp.

2. **When attaching the tool, keep the length short as possible**.

3. Press (Flat) on operation button to move the tool to the clamp.

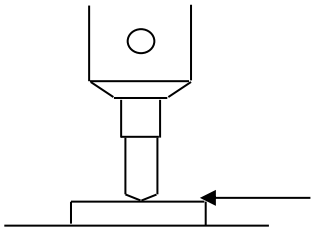
4. Press (M) button to enter menu mode.

5. Use buttons. When **3.Calibration** menu appears on the LCD window, press and hold button to run the menu.

6. Select "**1.Touch Sensor**" then press and hold button to run the menu.

7. The tool will be lowered and come in contact with the material and will be placed in the center of the clamp.

8. Lower the tool by loosening the fixing bolt of the tool with a wrench, or lift the material with your hand to make the tool and material come in contact as shown in the picture below.



The tool comes in contact with the material

9. Long-press and hold button (for more than 3 seconds) until it beeps to confirm that the setting is saved then the tool will measure the material's height.

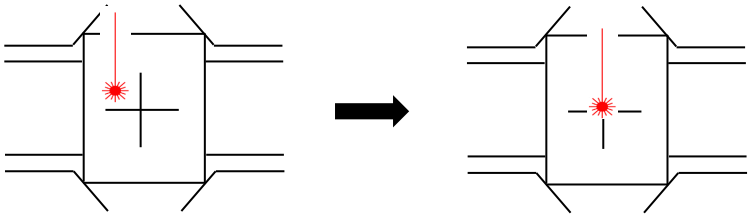
2. Laser Pointer Calibration

[Spindle]

1. Place and secure a flat material on the clamp.
2. Press (M) button to enter menu mode.
3. Use buttons. When **3.Calibration** menu appears on the LCD window, press button to run the menu.
4. Select the "**3.Pointer/Flat**" then press button to run the menu.

5. The tool draws a cross (＋) line on the material and the laser pointer is turned on.

6. Move the laser pointer to the center of the cross by using the direction keys then press button.

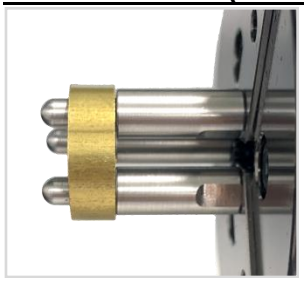


7. The laser pointer moves closer to the material to calibrate the laser pointer's origin. Move the laser pointer to the center of the cross by using the direction keys on the engraving machine then long-press and hold the button (for more than 3 seconds) until it beeps to confirm that the setting is saved.

[Rotation clamp]

1. Remove the installed clamp. To remove the installed clamp, turn the clamping knob to the left then pull out the clamp and spacer block.

2. Secure the ring to the rotation clamp.
(When setting the laser pointer origin, rings with 18mm width (Max.18mm(0.7in) can be used. Rings with width over 18mm (Over 18mm(0.7in) cannot be used.



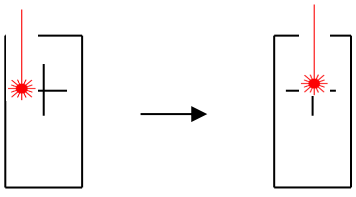
3. Press button to move the tool to the clamp.

4. Use buttons. When **3.Calibration** menu appears on the LCD window, then press button to run the menu.

5. Select the "**4.Pointer/Rotary**" then press button to run the menu.

6. The tool draws a cross (+) on the material and the laser pointer is turned on.

7. Use the direction keys to move the laser pointer to the center of the cross then press button to save the settings.

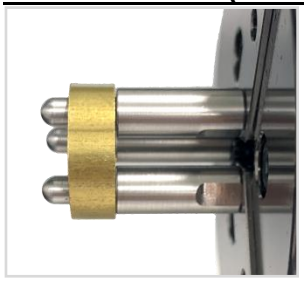


8. The laser pointer moves closer to the material to calibrate the laser pointer's origin. Move the laser pointer to the center of the cross by using the direction keys on the engraving machine then press and hold the button (for more than 3 seconds) until it beeps to confirm that the setting is saved.

[L-Tool]

1. Remove the installed clamp. To remove the installed clamp, turn the clamping knob to the left then pull out the clamp and spacer block.

2. Secure the ring to the rotation clamp.
(When setting the laser pointer origin, rings with 18mm width (Max.18mm(0.7in) can be used. Rings with width over 18mm (Over 18mm(0.7in) cannot be used.



3. Press button to enter menu mode.

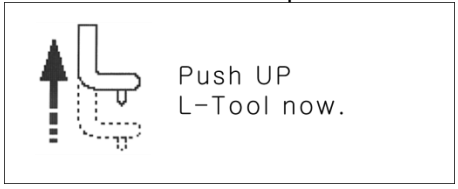
4. Press button. When **3.Calibration** menu appears on the LCD window, then press button to run the menu.

5. Select the "**5.Pointer/L-Tool**" then press button to run the menu.

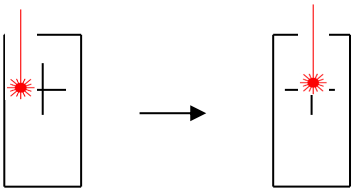
6. When a "Pull DOWN" message appears on the LCD window (as shown below), pull the L-Tool down to the engraving line 1 (RING1) then press button.

7. The tool draws a cross (+) line on the material.

8. When "Push UP message appears on the LCD window (as shown below), push the L-Tool up then press the button. The laser pointer is turned on.



9. Move the laser pointer to the center of the cross by using the direction keys then press the button to confirm that the setting is saved.

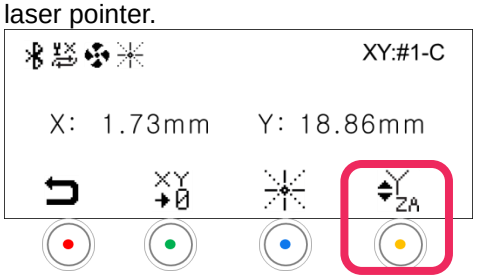


10. The laser pointer moves closer to the material to calibrate the laser pointer's origin. Move the laser pointer to the center of the cross by using the direction keys on the engraving machine then long-press and hold the button (for more than 3 seconds) until it beeps to confirm that the setting is saved.

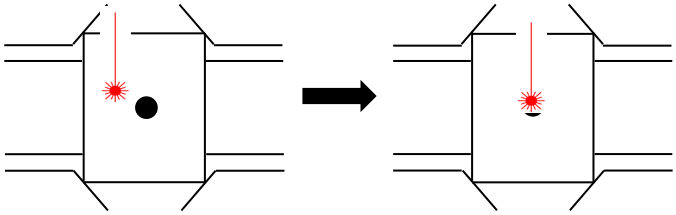
3. Saving Multi-performance Clamp Origin Position

1. Press one of the buttons to switch to **[Move mode-Flat]**.

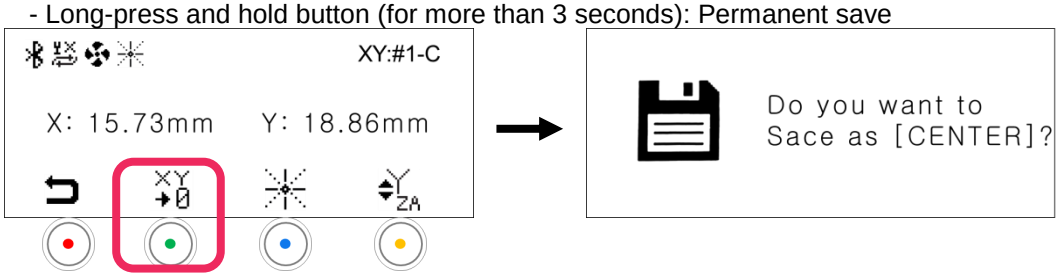
2. When the LCD window displays the following (as shown below), press [Laser pointer] button to turn on the laser pointer.



3. Use the direction keys to set the laser pointer origin.



4. Press the button to display save confirmation on the LCD window.
   - Short press button: Temporary save (message guide X)
   - Long-press and hold button (for more than 3 seconds): Permanent save



5. Press the button to save the setting.

4. Saving New Clamp Origin Position

1. Press  button to enter menu mode.

2. Use  buttons. When **2. Select Origin** menu appears on the LCD window, press  button to run the menu.

3. When menu appears on the LCD window (as shown below), use  buttons to select “Clamp” and use  buttons to select “Origin.”

4. Long-press and hold the  button (for more than 3 seconds) until it beeps to confirm that the setting is saved.

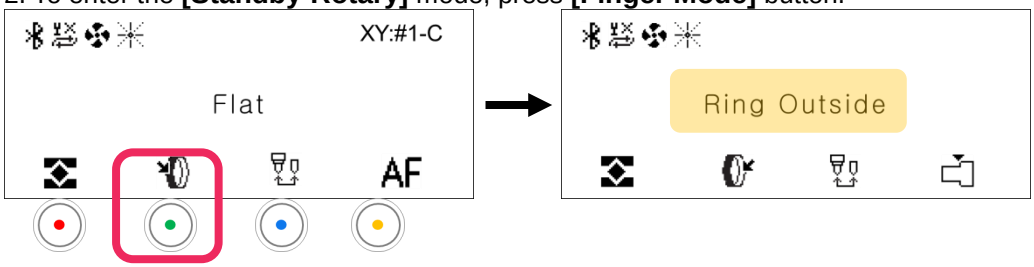
5. Chuck Finger Origin point

1. Attach the chuck finger to the rotary clamp.


[Flat chuck finger]

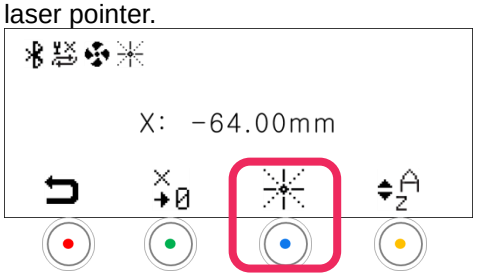

[Round chuck finger]

2. To enter the **[Standby-Rotary]** mode, press **[Finger Mode]** button.

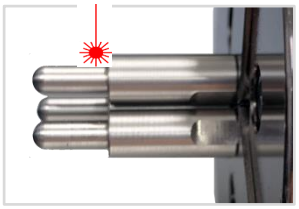


3. Press  button to switch to **[Move mode-Rotary]**.

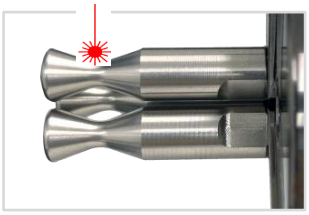
When the LCD window displays the following (as shown below), press  [Laser pointer] button to turn on the laser pointer.



4. Use the direction keys to match the laser pointer to the base point of each chuck finger as shown below.



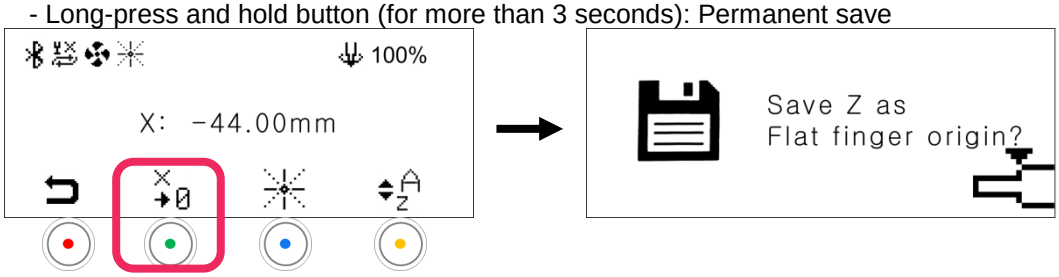
[Flat chuck finger]



[Round chuck finger]

5. Press the button to display save confirmation on the LCD window. And press button to change mode. **(Flat finger → Round finger → cylinder)**.

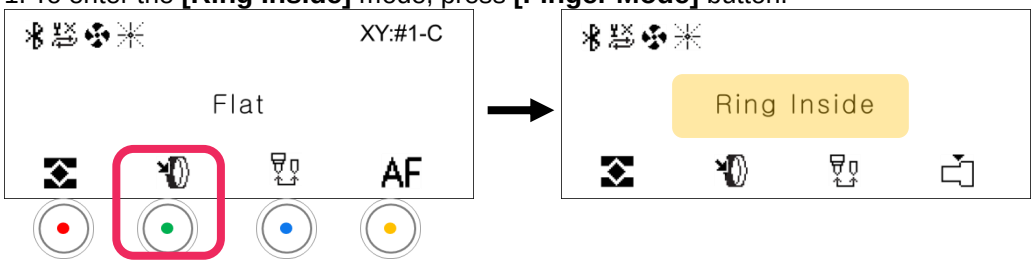
- Short press button: Temporary save (message guide X)
- Long-press and hold button (for more than 3 seconds): Permanent save



6. Press the button to save the setting.

6. Rotation Clamp Origin point (Z axis)

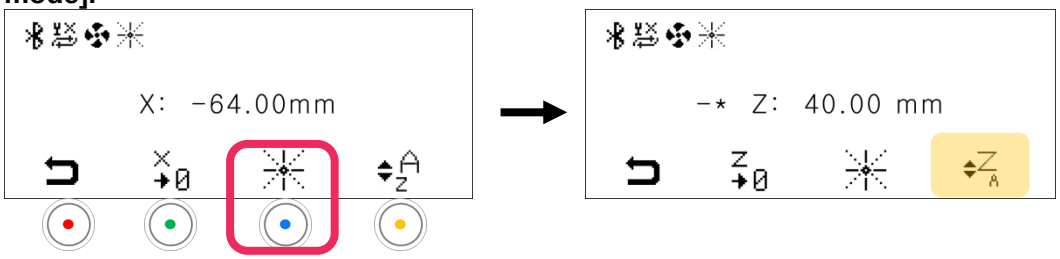
1. To enter the **[Ring Inside]** mode, press **[Finger Mode]** button.



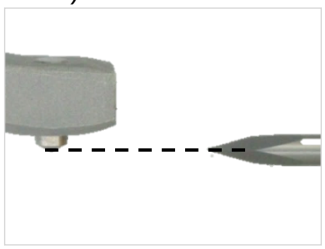
2. Set the sharp tool into the rotation chuck as shown below.


3. Press  button to switch to **[Move mode-Rotary]**.

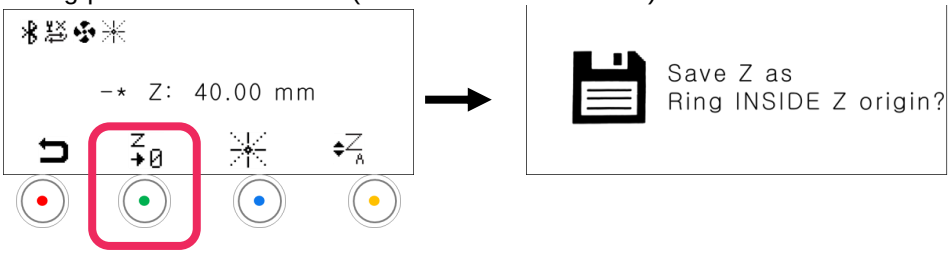
4. When the LCD window displays the following (as shown below), press  button to change the **[Z-axis mode].**



5. Use  buttons to horizontally align the tip of the engraving tool to the tip of the blade (as shown below). Use  buttons to adjust the distance between tools. Be sure the tips are closer to each other.



6. Press the  button to display save confirmation on the LCD window.
   - Short press button: Temporary save (message guide X)
   - Long-press and hold button (for more than 3 seconds): Permanent save

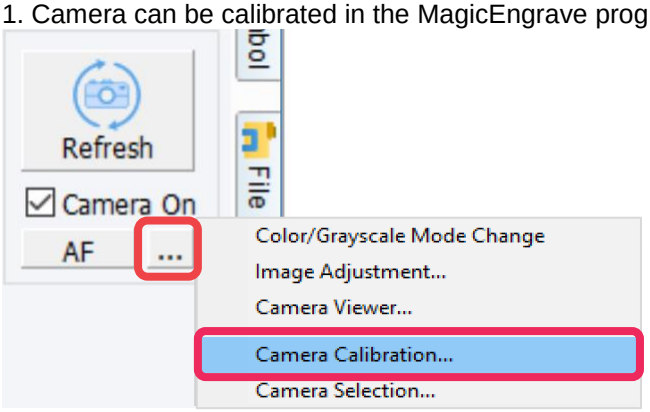


7. Press the  button to save the setting.

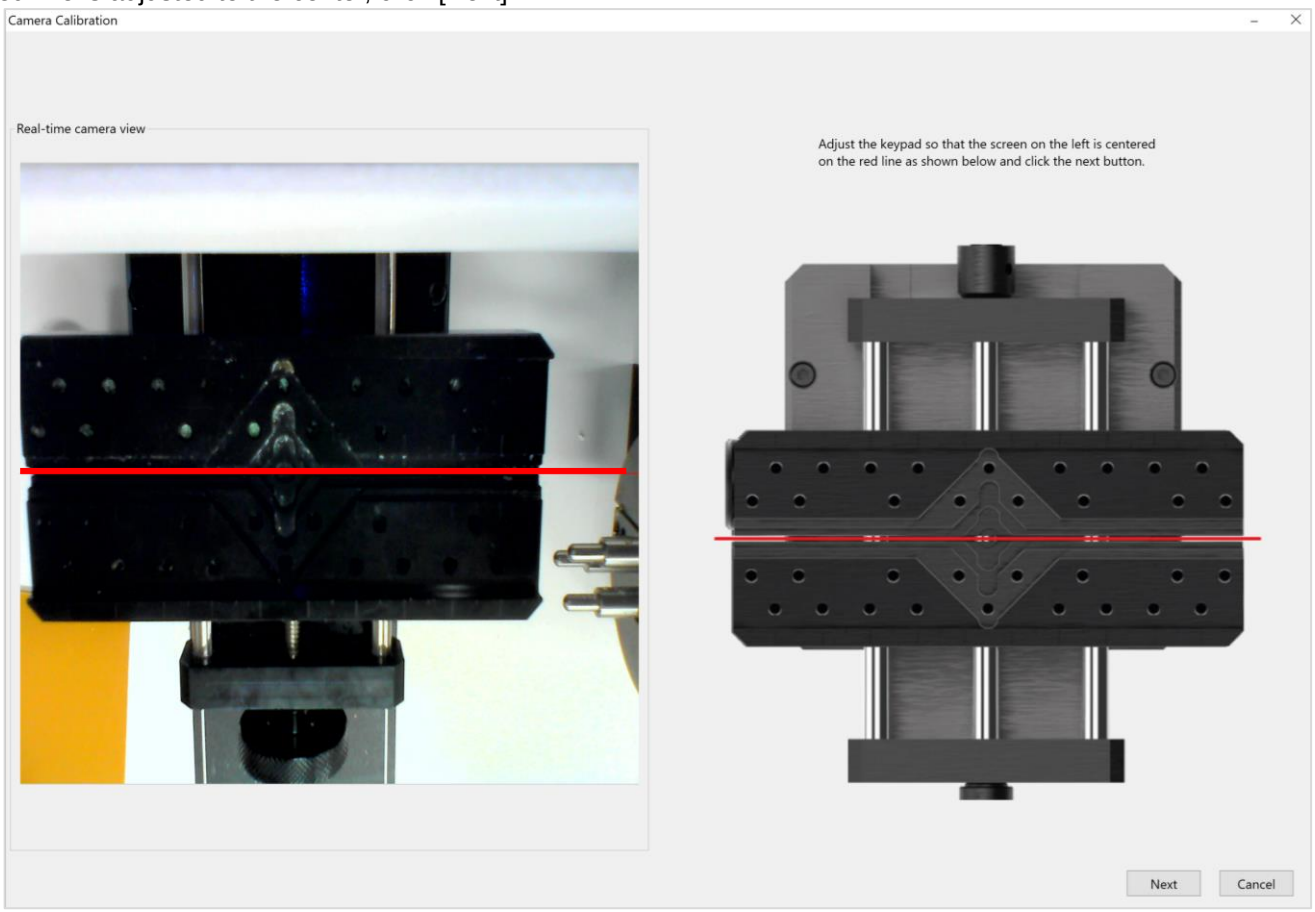
7. Camera calibration

Bakelite plate (120x100x2t)	

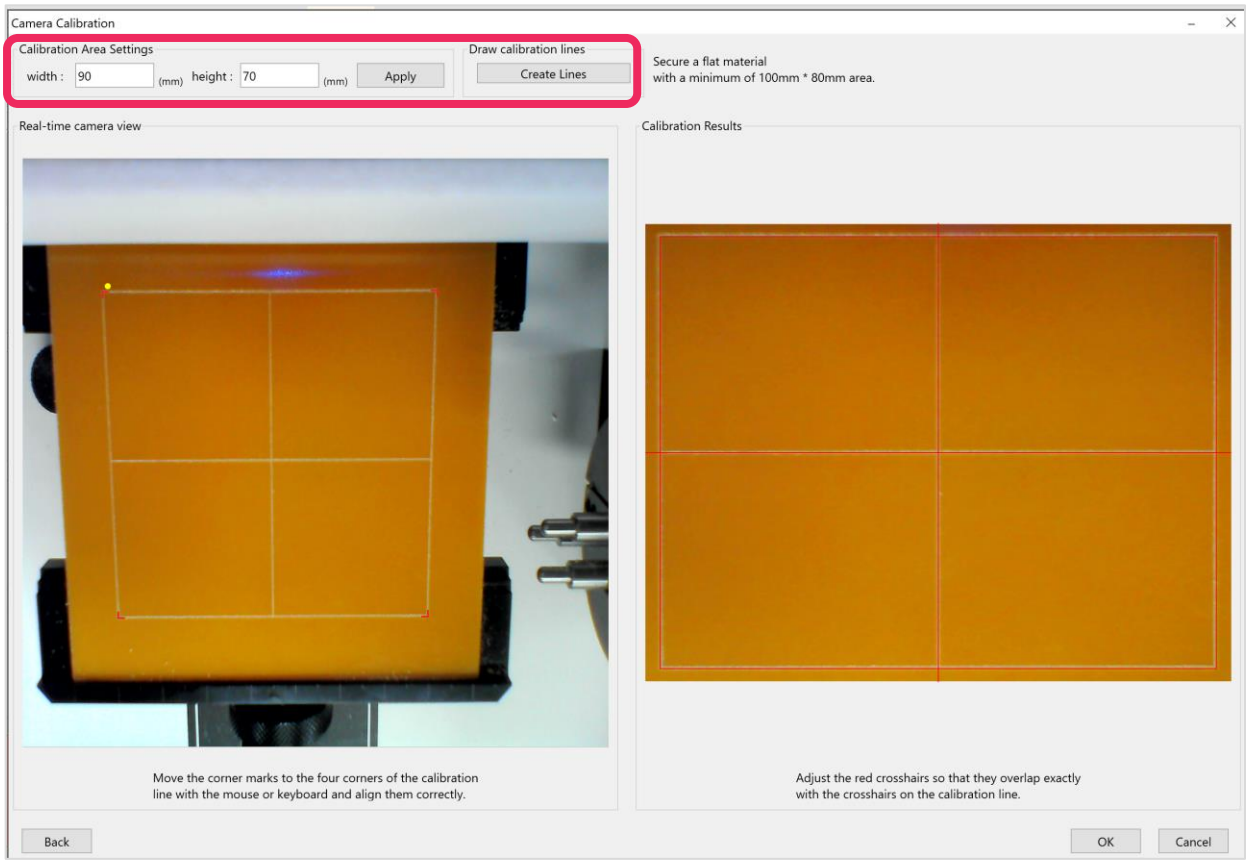
1. Camera can be calibrated in the MagicEngrave program.



2. Use the button to adjust the red line (that appears on the screen) to center of the clamp. Once the red line is adjusted to the center, click [Next].

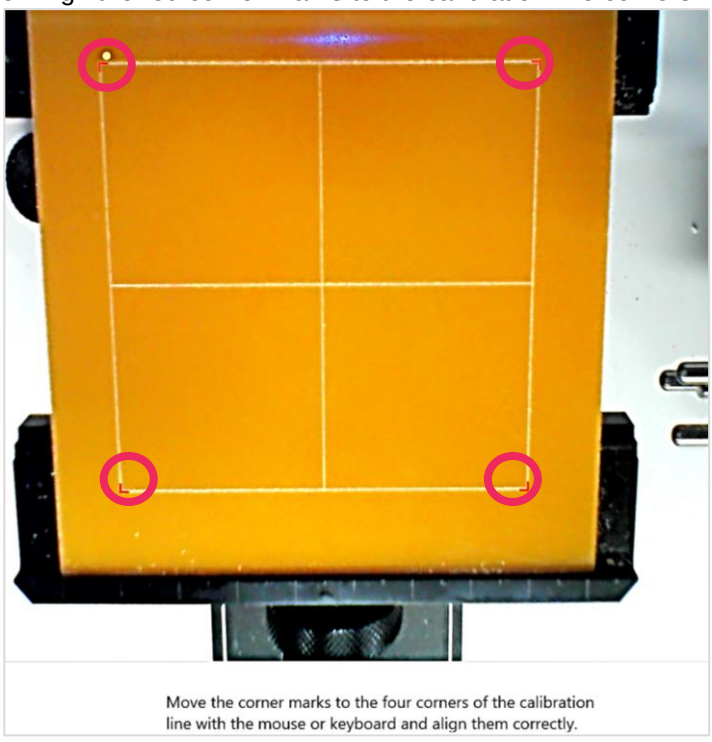


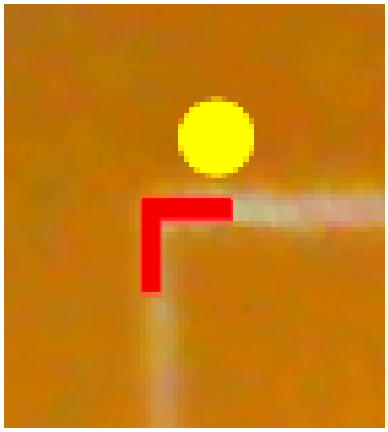
3. Place and secure the bakelite to the clamp. Set the calibration area to 90 x 70mm then click [Create Line]. Check the calibration results then click [OK].



4. Press and hold the  button (for more than 3 seconds) until it beeps to start engraving. A rectangle will be engraved for calibration.

5. Align the red corner marks to the calibration line corners with the mouse or keyboard.





< Actual camera view on program >