Glass Engraving

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Outline

- Material Overview
- Processing Techniques
- Rotary Attachment
- Application Inspiration

Laser Compatibility

Majority of glass is processed by a CO_2 laser system

- **Speedy Series**
- Engrave glass only, no cutting

Laser Compatibility

Glass mirrors can be processed using a fiber laser system

- **Speedy Series**
- **SpeedMarker Series**

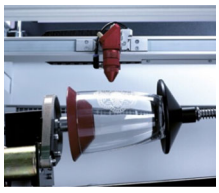
Types of Applications

Glass is a popular material used for personal engravings, optics, decorations, interior design, and awards

- Drinking glasses
- Champagne flutes
- Mirrors
- Awards

Glass Engraving Methods

- Lasers
- Sandblasting/sandcarving
- Hand etching



KONICS IMAGING

Laser Advantages

Glass is only superficially etched by the laser system

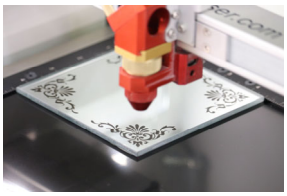
- The laser beam heats the surface of the glass and fine glass particles are removed
- No residual blasting agents are required
- No dust exposure due to blasting agents - the resulting gases and particles are efficiently removed and filtered by the Trotec exhaust systems

Laser Advantages

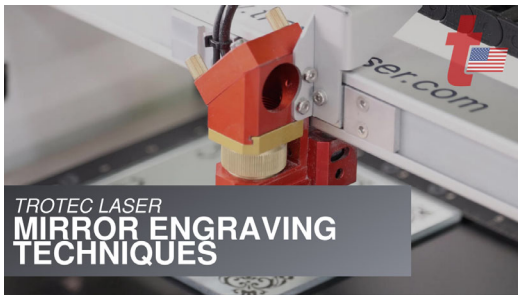
- No risk of breakage due to non-contact processing
- A great alternative to sandblasting
  - No template required in comparison to sandblasting
  - If deep engraving is required, a laser can create perfect sandblasting template
  - No additional consumable, such as sand, required
- Ease of operation from single pieces to series production

Engraving Mirrors – Fiber Lasers

- Add decorative elements to any standard mirror
- Engrave mirror from above, through the glass. The glass will not react with fiber laser so only the mirror laser will be ablated
- Apply acrylic lacquer to the back of the mirror to create bright pops of color in the engraved, now transparent, areas



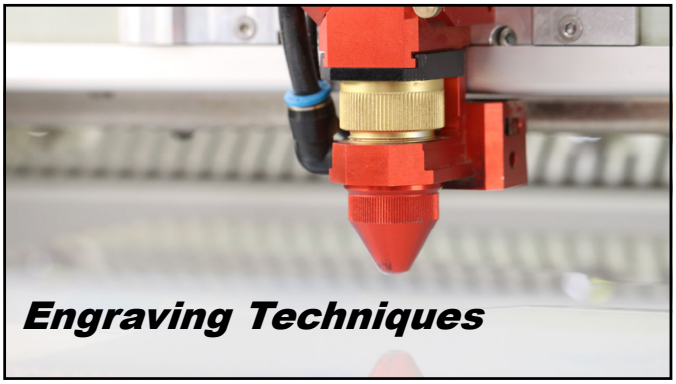
Engraving Mirrors – Fiber Lasers



Trotec DIY

Engraving Glass

- Engraving quality may vary from piece to piece
- Lower quality glass can be engraved more easily than crystal glass (Higher lead content)
- Expensive glass may have stresses in the material that are aggravated by heat during processing, causing glass to fracture



Engraving Techniques

Processing Tip

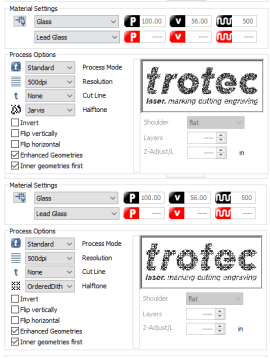
Removing the nose cone:

- Gain more clearance between the engraving object and the laser head
- Extra precaution to avoid laser head crashing into object
- Common in rotary application or when processing irregular objects and anything with a “lip”
  - Example: serving trays

Bare Glass

Minimize the effect of heat on large surfaces:

- Optimize engraving results
- Convert graphic to greyscale
  - E.g. black graphic into 70-80% grey
- In print settings, select rasterization type “ordered dithering” or “Jarvis” but keep same parameters. This will reduce the amount of heat applied to glass
- Choose “ordered dithering” or “Jarvis” based on the dot pattern and end result you are looking for



Damp Paper Towel

Key Points:

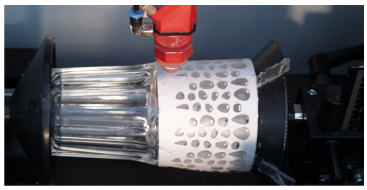
- Place wet paper towel over engraving area to help displace heat and prevent cracking
- Results in clear, white engraving
- No bubbles or wrinkles in paper towel
- Disable air assist
- After engraving, residue will easily wipe off

Trotec DIY

Application Tape

Key Points:

- Alternative to wet paper towel
- Engraving is grayish rather than bright white
- No bubbles or wrinkles
- After engraving, clean glass to remove any adhesive residue



Dish Soap

Key Points:

- Apply a smooth, thin, even layer of dish soap
- Can dissipate the heat of the laser
- Easy to clean

Blazer Orange – Ikonics Imaging

Key Points:

- Apply with squeegee or other smoothing tool to remove air bubbles
- Ideal for creating sandblasting templates
- Use when working with laser & sandcarver, specifically for stage carving applications

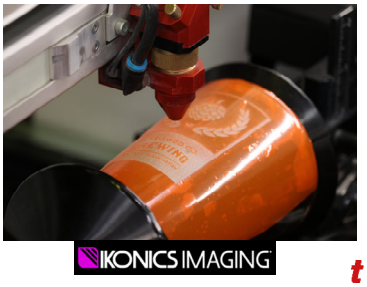


Photo Engraving

Key Points:

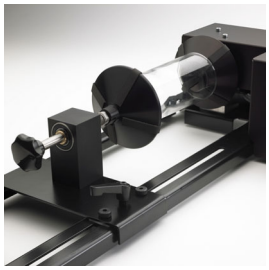
- Use gray scale rasterization of 70% black
  - Results in less heat being applied to the glass
- Average resolution of 500 dpi
- Use “ordered dithering” rasterization method
  - Fits image data optimally to the material

Techniques Video

Trotec Rotary Attachment

Trotec Rotary Options

- Tilt-able rotary attachment
- Rotary attachment with rollers
  - Most common for engraving glasses and cups
- Rotary attachment with cones
  - Should be used for objects with handles or tapered curves
- Combination rotary attachment
  - Cones and rollers can be exchanged



Tilt-able Rotary Attachment

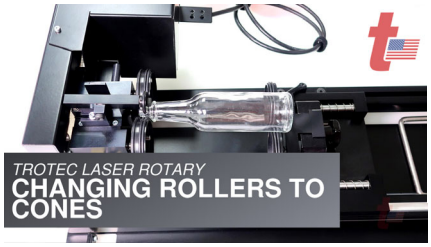
- Available for all Speedy flatbed lasers and the SP500 large format laser, with the exception of the Speedy 100 system
- Allows for level adjustments if object is more conical, results in more consistent engravings

Rotary Chart

	Speedy 100	Speedy 300	Speedy 360	Speedy 400	SP 500
Rotary attachment, tilt-able		✓	✓	✓	✓
Rotary attachment with cones	✓	✓	✓	✓	✓
Rotary attachment with rollers		✓	✓	✓	✓
Combined rotary attachment (cones and rollers can be exchanged)		✓	✓	✓	✓
Maximum workpiece length	13.77 in	19.09 in (cone) 26.77 in (roller)	26.7 in (cone) 29.3 in (roller)	29.9 in (cone) 37.8 in (roller)	33.07 in (cone) 40.94 in (roller)
Maximum workpiece diameter*	4.64 in	7.24 in (cone) 3.7 in (roller)	8.1 in (cone) 3.7 in (roller)	10.63 in (cone) 7.1 in (roller)	9.84 in (cone) 5.9 in (roller)
Maximum weight	6.6 lbs	6.6 lbs (cone) 22 lbs (roller)	6.6 lbs (cone) 22 lbs (roller)	6.6 lbs (cone) 22 lbs (roller)	6.6 lbs (cone) 22 lbs (roller)

**The maximum diameter depends on the inserted lens*

Rotary Attachment: Video



Rotary Attachment

- Round & conical designs can be engraved along the entire circumference
- Automatically turns work piece during engraving process ensuring it remains in the correct position
- Parameters provided within JobControl® laser software
  - Just enter the diameter of your workpiece and height of your graphic

***Note:** Make sure laser is off before plugging in rotary attachment

Rotary Attachment

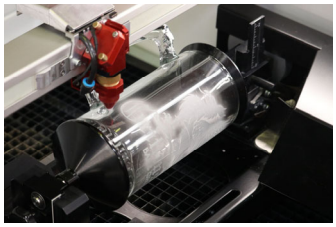
Using the rotary to engrave glasses with curves & handles:

- Make sure glasses are accurately placed so handle is not rotating into engraving field and move Y axis to the very top
- Clamp the workpiece so handle is slightly above laser beam. Workpiece is rotated backwards so there is no risk of collision with the laser head

Rotary Attachment

Using the rotary to engrave glasses with curves & handles:

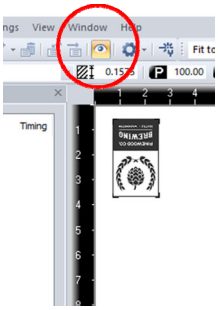
- Handles: make sure circumference of glass is large enough to accommodate the length of the graphic or graphic will be placed too close to the handle
- Check the position in the JobControl® laser software by using the “What you see is what you get” function



“What you see is what you get”

See the exact position of your graphics in JobControl® laser software by using the “What you see is what you get” function

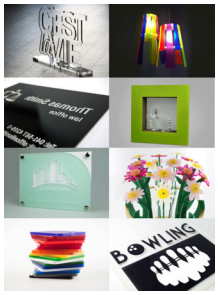
- If you are using the crosshairs, simply move the Y axis in the target position for lasering. Then place the job on the plate to the crosshair
- By moving the Y axis again, you can check the dimension of the job on your workpiece and correct any faulty positions of the workpiece or the job
- **TIP: Select the option "Minimize to Job Size” in the JobControl® Print window to help position the graphic on the workpiece**



Handle Engraving Video

Trotec Rotary Attachment: Video

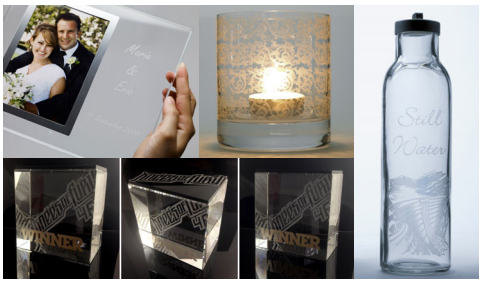
Glass Alternatives from Trotec



Acrylic can be a wonderful alternative to glass because of its low cost and resiliency

- TroGlass Clear
- TroGlass Color Gloss
- TroGlass Frosted
- TroGlass LED
- TroGlass Reverse
- TroGlass Satins
- TroGlass Duo
- TroGlass Color Gloss Metallic
- TroGlass Glitter

Application Inspiration



Application Inspiration


Application Inspiration: Video