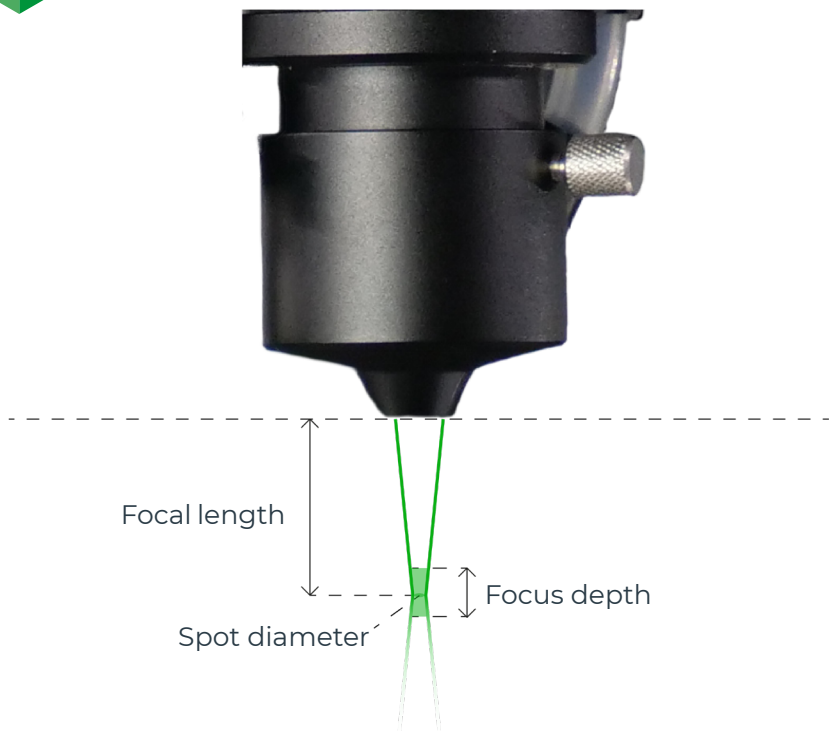
Laser table lens guide: how to choose, use, and maintain your lens?

GRAVOTECH by BRADY



What is a laser lens?

The laser lens is the optical element of your machine that focuses the laser beam. The laser beam is between 8 and 10 mm in diameter before the lens. The lens concentrates the beam at a thin point for greater precision and more concentrated power. This point is called the focal point.

Choosing **a focal length defines the diameter of the laser spot** and therefore the **width of the engraving line**.

FIND THE FOCAL LENGTHS AVAILABLE FOR YOUR MACHINE

	Machine model	1.5"	2.0"	2.5"	3.0"	3.5"	4.0"
CO2 laser	LS100	Ref. 47082	**Ref. 47200**	Ref. 62916	-	Ref. 27381	Ref. 27382
	LS100EX						
	LS900	Ref. 29257	**Ref. 27377**	Ref. 27379	-	Ref. 27381	Ref. 27382
	LightSpeed 300	Ref. 92681	**Ref. 92682**	-	Ref. 92683	-	**Ref. 92684**
Fiber laser	LS100EX	-	Ref. 69850	-	**Ref. 71684**	-	-
	LS900	-	Ref. 78609	-	**Ref. 83451**	-	Ref. 78733
Edge laser	LS900	-	-	-	**Ref. 81059**	-	-

*(**Green references** indicate the lenses supplied with the machine)*



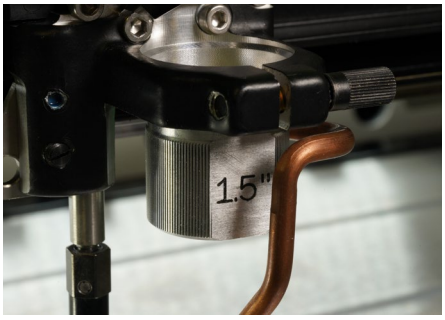
How to clean your laser lens and why it matters

Regularly cleaning your laser lens is **essential to maintain consistent engraving and cutting quality**, preserve the power of the laser beam, and prevent damage caused by dust, smoke, or material residues.

It is recommended to check the lens at least once a week, or more often for heavy use or materials that generate a lot of smoke.

Use the **lens cleaner** kit (Ref. 26327) that includes a lens cleaning solution, suitable wipes, and cotton swabs.

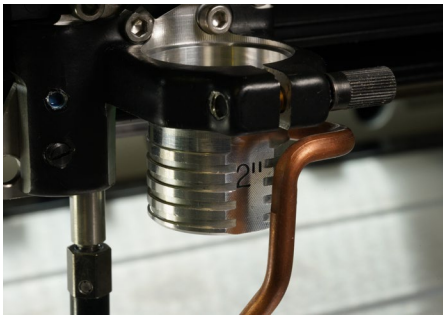
OUR MAIN LASER LENS



Lens 1.5"
Precision and sharpness

Perfect for: precision engraving, detailed ink stamps, precision cutting on thin materials, high-resolution photos and logotypes (> 800DPI)

Not suitable for: cutting thick materials (> 3 mm) and large engraving areas



Lens 2.0"
Multi-purpose

Perfect for: engraving and cutting of 2-ply plastics, engraving of letters (> 1 mm high) and medium-resolution photos and logotypes (< 500DPI)

Not suitable for: precision engraving or cutting of thick materials (> 8 mm)



Lens 4.0"
Thick cutting and fast engraving

Perfect for: cutting of thick materials (> 8 mm), engraving of large characters or large areas, engraving of objects with hollow or irregular surfaces, or low-detail designs (< 200DPI)

Disadvantages: Low resolution engraving and wide cutting lines

Laser beam properties

Spot diameter	0.06 mm
Focus depth	0.5 mm
Focal length	37.5 mm

Spot diameter	0.08 mm
Focus depth	LS range: 0.8 mm LightSpeed range: 0.9 mm
Focal lentgh	50.0 mm

Spot diameter	0.16 mm
Focus depth	LS range: 3.3 mm LightSpeed range: 3.7 mm
Focal length	100 mm

ENGRAVING & CUTTING COMPARISON

See below for comparative examples of our 3 main focal lenses. Ultra-detailed wood engraving and 10 mm acrylic cutting.



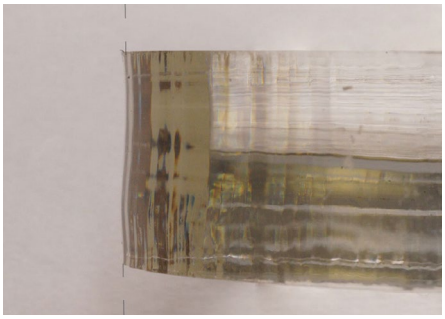
1.5" lens engraving
The most detailed and accurate engraving



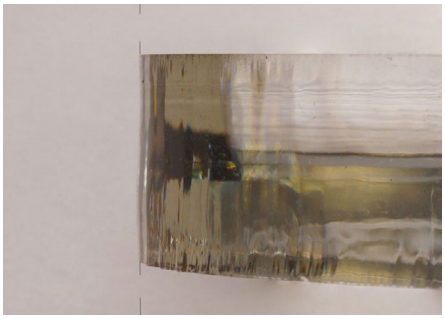
2.0" engraving
A fine result but some small details are missing



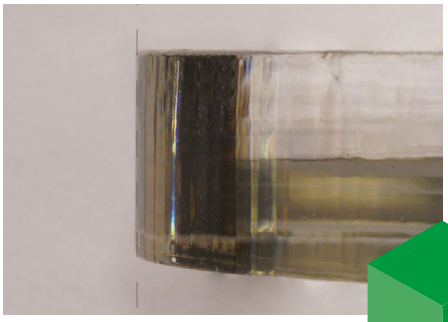
4.0" engraving
A rough engraving that looks blurred



1.5" cutting
A wave-shaped cut



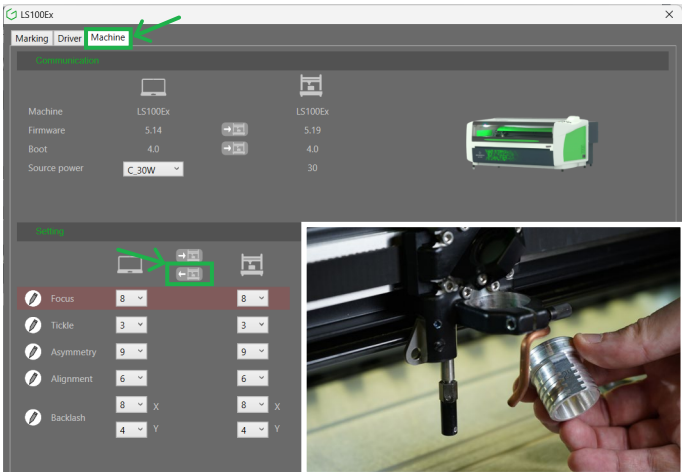
2.0" cutting
A slightly angled cutting edge



4.0" cutting
A totally straight cut

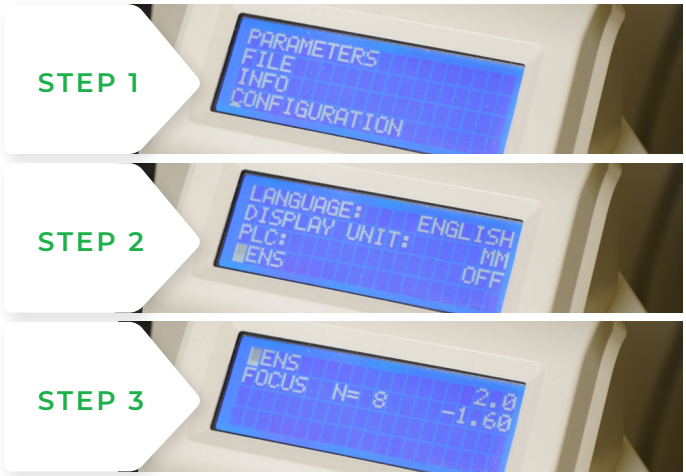
CALIBRATION PROCESS FOR LS RANGE

Follow these simple steps to change your laser lens and recalibrate your machine's automatic focal length.



1. Save your actual configuration

Start by opening our driver's interface by opening your machine's printing preferences on your computer. In the **«machine»** tab, back up your current settings by clicking on the **«Send to computer»** button. Then, unscrew the fleece screw to remove your current lens and attach your new lens in its place.



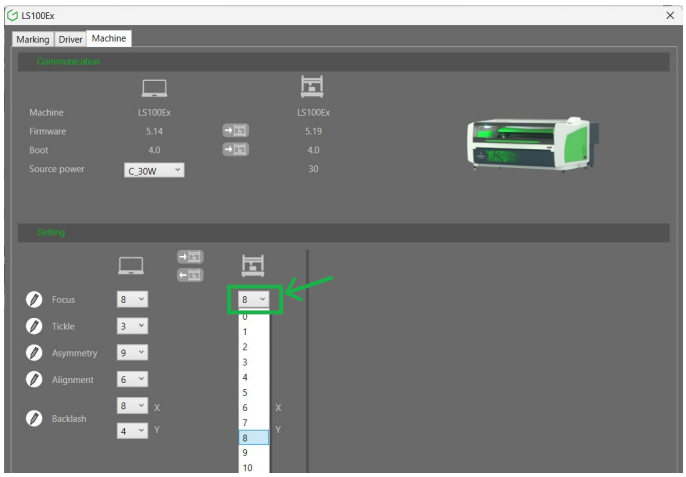
2. Changing your machine settings

In your machine's menus (X button), select **«Configuration»** then **«Lens»** and indicate the focal length of your new lens.



3. Run the calibration test in the driver

Calibrate your machine perfectly to its new focal length by launching the calibration job via the driver interface. Prepare a sheet of anodized aluminum and run the job! The machine will engrave 13 lines.

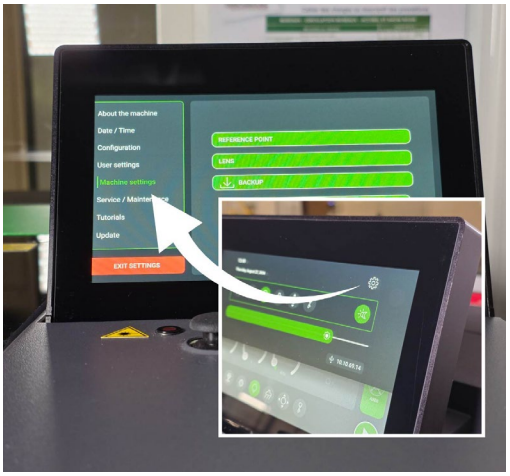


4. Select the best calibration

Finally, select the number of the engraved line you feel is best engraved in the **«Focus»** field of the driver interface.
Your machine is now perfectly calibrated to its new focal lens!

CALIBRATION PROCESS FOR LIGHTSPEED

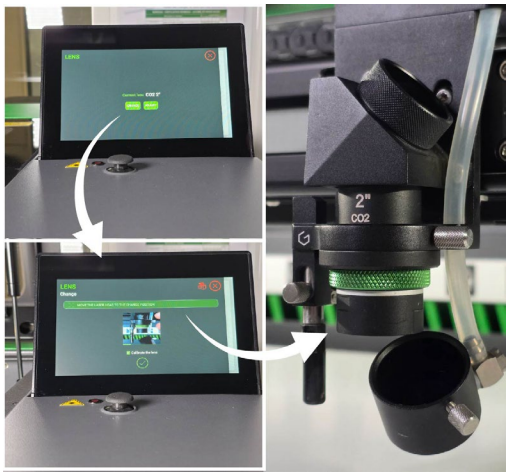
Follow these simple steps to change your laser lens and recalibrate your machine's automatic focal length.



1. Go to the machine settings

Access the quick toolbar by swiping down on the machine's home screen, then tap the gear icon to open Settings.

In the «Device Settings» menu, go to the «Lens» settings and select «Change».



2. Change the lens

From the drop-down menu, select the focal length of your new lens, check the "Calibrate lens" box, and confirm.

Move the laser head to the "change position" using the button on the screen. Remove the laser nozzle, replace the lenses, and reinstall the laser nozzle.



3. Follow the calibration instructions

After confirming the lens change, select "fine adjustment" to calibrate your lens and follow the on-screen instructions.

Do you need additional information?

Contact a Gravotech expert

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