

FORMLABS CUSTOMER SUPPORT GUIDES

Aligning the Form 3L lasers

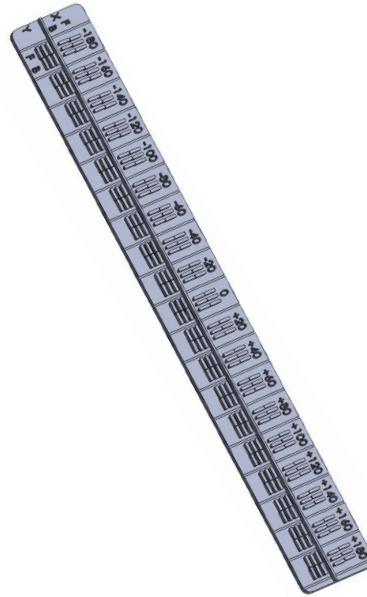
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Required Supplies:

- Form 3L/Form 3BL 3D printer
- Form 3L Build Platform
- Form 3L Resin Tank (unused or containing Clear or Grey Resin, provided by Formlabs Support if needed)
- Clear or Grey Resin cartridge (provided by Formlabs Support if needed)
- Magnifying glass or other form of magnification
- Clean solvent (e.g., IPA or TPM)
- Nitrile gloves

Estimated time: 1.5–2 hours



The Form 3L has two lasers that must align well with each other in order to produce accurate printed parts with good surface quality, particularly along the line where the two lasers meet. The printer performs regular self-tests to correct for most misalignments, but certain types of laser misalignments require additional calibration.

Use this guide to print the Laser Alignment Print (LAP), interpret it, and calibrate your Form 3L.

NOTICE: Wear gloves during this procedure. Wash skin with hand soap and water after handling resin. Do not use IPA to remove resin from skin.

Preparing the workspace

OVERVIEW: Prepare the Form 3L and a dust-free workspace for printing the Laser Alignment Print.

STEP 1: REMOVE ANY PREVIOUS PRINTS

If the printer recently completed another print, remove the build platform and printed part and clean the printer as necessary.

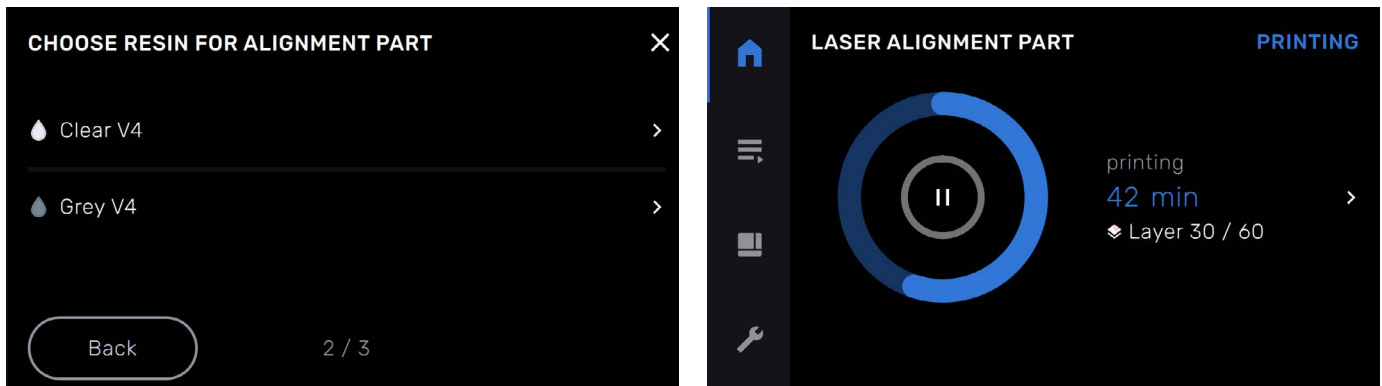
STEP 2: INSERT CONSUMABLES

Insert the resin tank, resin cartridge, and a clean build platform. Lower the cam handle to lock the build platform in place. Close the printer cover and press open the cartridge vent cap.

Printing the Laser Alignment Print

OVERVIEW: Print and wash the Laser Alignment Print before using it to calibrate your printer.

STEP 1: PRINT THE LAP



With the printer plugged in and powered on, tap the wrench icon to enter the **Settings** menu, then tap **Maintenance**, then **Laser Alignment**, then **Print Test Part**. Select your resin type and start the print job.

STEP 2: WASH THE LAP

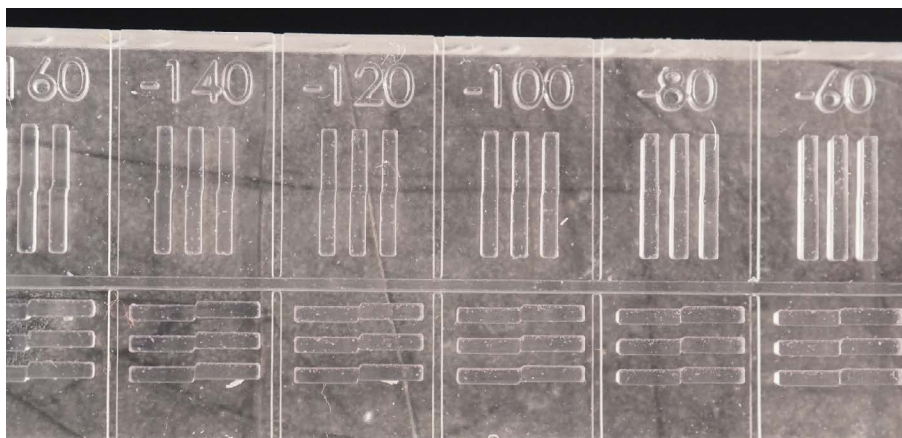
Wash the LAP in your solvent of choice and allow it to dry while still attached to the build platform.

Inspecting the Laser Alignment Print

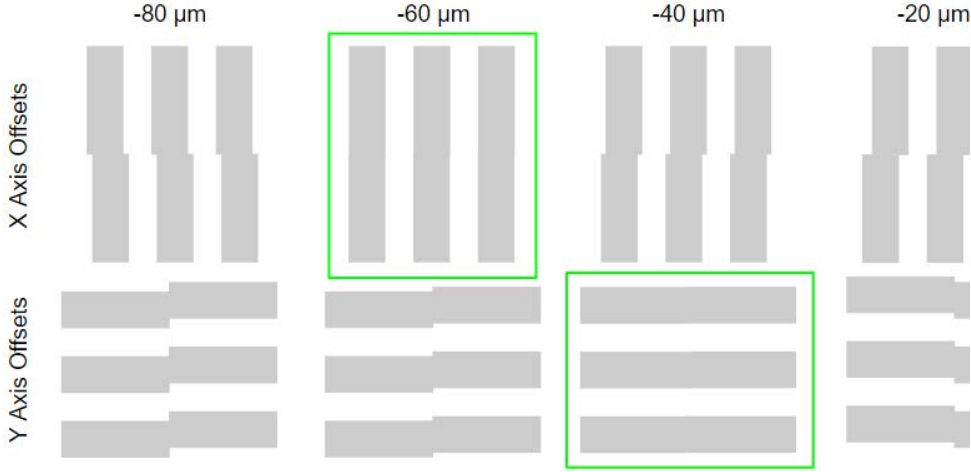
OVERVIEW: After washing the Laser Alignment Print, examine the embossed bars on the printed part.

STEP 1: EXAMINE THE X-AXIS BARS

Locate the set of X-axis bars on the LAP. The X-axis bars are oriented perpendicular to the long axis of the LAP, directly next to the number markings. An embossed X is located at the left end of the set of X-axis bars.



Using a magnifying glass or other source of magnification, select the offset that best aligns the two halves of the bars. If two neighboring sets of bars look roughly equivalent to one another, the midpoint offset value should be considered the correct alignment. In the example below, the $-60\ \mu\text{m}$ offset shows the best alignment.

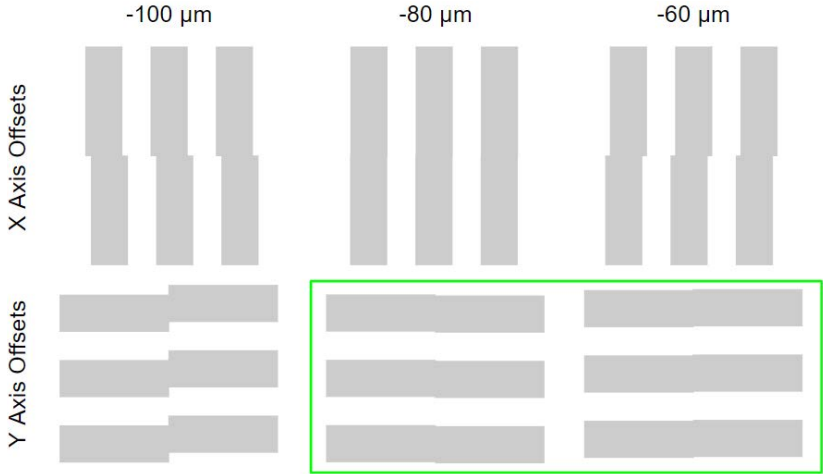


Record the offset that best aligns the bars.

STEP 2: EXAMINE THE Y-AXIS BARS

Locate the set of Y-axis bars on the LAP. The Y-axis bars are oriented parallel to the long axis of the LAP. An embossed Y is located at the left end of the set of Y-axis bars.

Using a magnifying glass or other source of magnification, select the offset that best aligns the two halves of the bars. If two neighboring sets of bars look roughly equivalent to one another, the midpoint offset value should be considered the correct alignment. In the example below, the $-80\ \mu\text{m}$ offset and $-60\ \mu\text{m}$ offset show equivalently good alignment. The proper offset would then be $-70\ \mu\text{m}$.

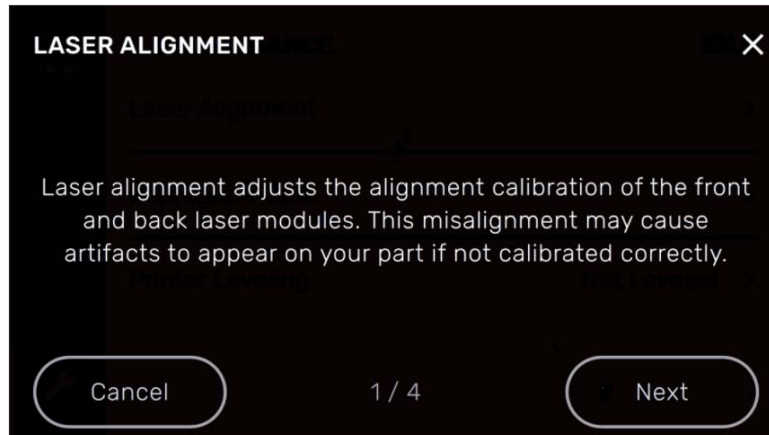


Record the offset that best aligns the bars.

Calibrating the printer

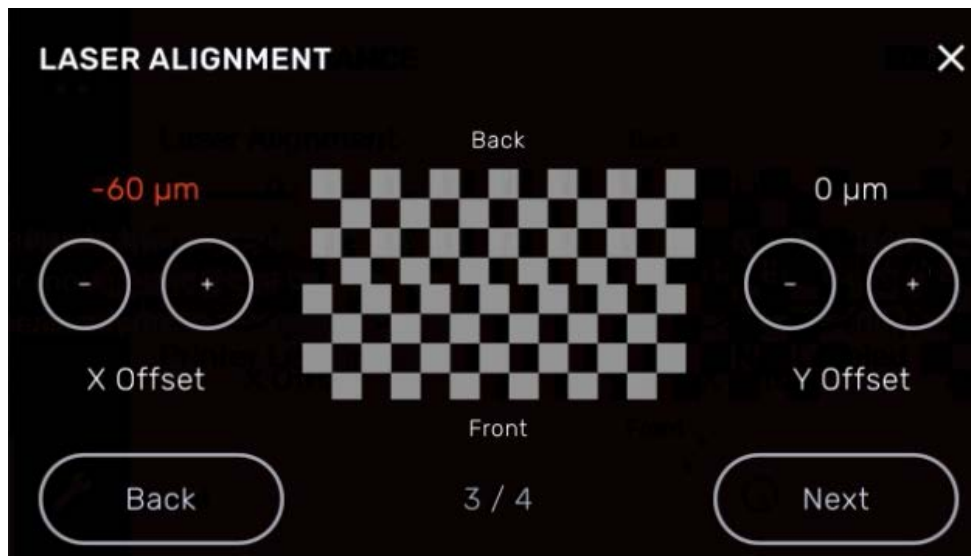
OVERVIEW: After determining the correct offsets using the LAP, input the offsets on the printer's touchscreen.

STEP 1: OPEN THE LASER ALIGNMENT MENU



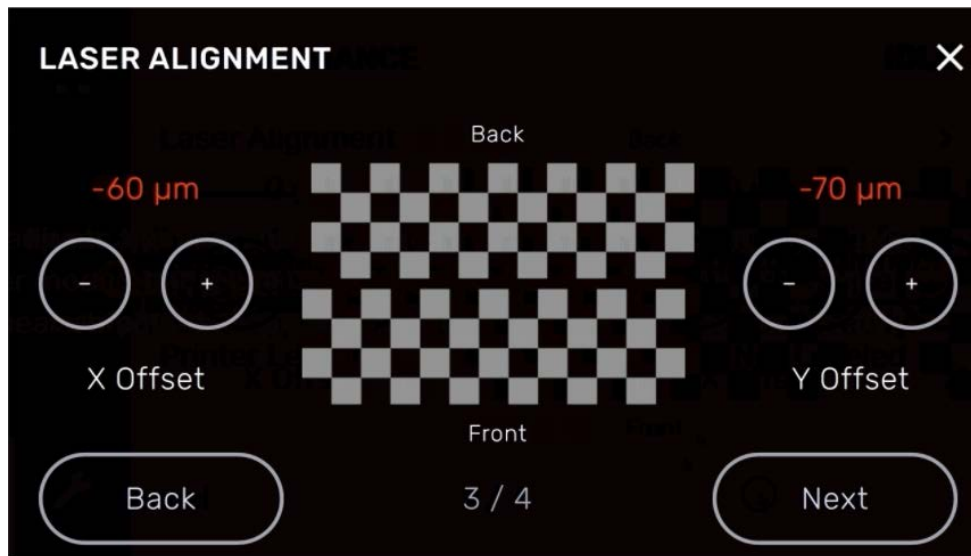
With the printer plugged in and powered on, tap the wrench icon to enter the **Settings** menu, then tap **Maintenance**, then **Laser Alignment**, then **Enter Calibration Values**. Read the on-screen instructions. Tap **Next** until you reach a screen with options to change the **X Offset** and **Y Offset**.

STEP 2: INPUT THE X OFFSET



Using the + and - buttons labelled **X Offset**, input the correct X-axis offset from the LAP. Tapping the + and - button changed the offset in increments of 10 µm, up to ±300 µm.

STEP 3: INPUT THE Y OFFSET



Using the + and - buttons labelled **Y Offset**, input the correct Y-axis offset from the LAP. Tapping the + and - button changed the offset in increments of 10 μm , up to $\pm 300 \mu\text{m}$.

STEP 4: COMPLETE THE CALIBRATION

When both offset values are correct, tap **Next** to save them to the printer. Tap **Done** to complete the calibration procedure and return to the **Maintenance** screen.

Finalizing the repair

OVERVIEW: *After calibrating the printer, print a test print and perform final checks.*

STEP 1: PRINT A TEST PRINT

Run a short test print of your choice. Clean the printed parts and assess their accuracy and surface quality relative to parts printed before the calibration. Contact [Formlabs Support](#) or your [authorized reseller](#) if you have any additional questions.