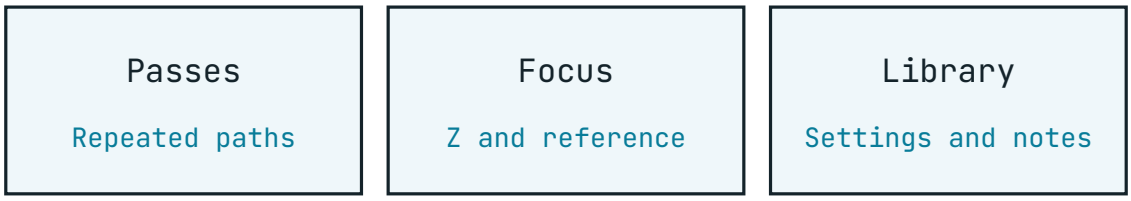
COMPARE PLANS AND OBSERVATIONS

Passes, focus, saving settings and checking results

Choose passes from supplied observations, inspect a focus range, save a reusable example preset and explain the decision in a test log.

Start disconnected

Use No Machine and keep both Output controls off in saved exercise projects. These cases provide observations for you to interpret. No connected laser or physical sample is needed.



Keep the reason for the choice, the test conditions and the settings together.

Passes
A pass repeats the path. Compare across one row to change passes at fixed speed. Compare down one column to change speed at fixed passes. Keep the material and other settings together with the record.

Focus
Focus Test plans Z offsets for a supported motorized Z axis. A manual-focus S30 uses its normal manual focus procedure. A profile cannot add a Z motor. Preview cannot measure sharpness.

Settings and evidence
A project stores a plan. A Material Library preset keeps settings and short Notes. A full log explains the observations, the choice and what is still unknown.

Try the starter files before opening the comparison answers. Save your own copies. The two printable guide editions are worksheets, not interactive PDF forms.

FOLLOW THE PASSES DEMONSTRATION

Follow the passes demonstration

1. In a separate new project, choose your configured profile while staying disconnected. Open Laser Tools > Material Test. Choose the test-specific Cut operation. Ordinary project Mode is called Line.

2. Set X Axis to Passes: Count 4, Min 1, Max 4. Set Y Axis to Speed: Count 3, Min 300, Max 900 mm/min. Set Base power to 90%. Keep 10 mm cells, 4 mm spacing, text and border on.

3. Preview the twelve cells. The recorded profile estimates 3:12 including labels and border. Different profile timing can change the estimate. Read the actual Preview after the final edits.

4. Given observations: 300 mm/min with one pass is charred; 900 with two passes does not separate; 600 with two passes meets the brief. Apply 600/90/2 to Cut sample in passes-settings-start.lzrproj. Air Assist is separate from the generator, whose sample air setting is off.

5. Compare passes-settings-demo.lzrproj. A separate unchanged square comparison at 800/80 plans 80 mm of burn in one pass and 160 mm in two. The estimate rises from 0:12 to 0:18; travel stays at 283 mm.

The test-recipes folder contains separate demo and practice Material Test recipes. The demonstration project uses 600/90/2. The independent exercise below uses different observations and numbers.

Why does the whole estimate grow by less than double?

YOUR TASK: CHOOSE, APPLY AND SAVE

Your task: choose, apply and save

Goal: the square separates with acceptable edges. Compare the following supplied observations for Example Basswood, nominally 3 mm. Power is fixed at 80%, Air Assist off. Batch, focus measurements and finished dimensions are unknown.

A: 400 mm/min, one pass
Separates, but edges are too charred.

B: 800 mm/min, one pass
Does not separate.

C: 800 mm/min, two passes
Separates with acceptable edges.

D: 800 mm/min, three passes
Separates, but edges are too charred.

Your candidate and the observation that supports it:

---

1. Open passes-practice-start.lzrproj. In Layers, select Cut sample and its Line entry. Enter your chosen Speed, Power and Passes; keep Air Assist off and the 20 x 20 mm square unchanged.

2. For an optional offline Preview, enable Output on the layer and entry. Read paths and time, then close Preview and return both Output controls off. Save As your own copy.

3. Compare passes-settings-answer.lzrproj only after your attempt. Keep this independent case separate from the demonstration.

4. Click Library above Select, then Material Library. Select Cut sample and click From Layer. Click E, name it Practice cut case, set Example Basswood and Thickness 3 mm, and write short Notes that identify this as a supplied example. Save, then Export your library.

The comparison library-cut-case-answer.json is a native Material Library export, for comparison or Import. library-cut-case-applied.lzrproj shows its settings applied to the square. Import adds a preset to your local library; it is optional. Keep your own library export separately.

YOUR TASK: INSPECT A FOCUS RANGE

Your task: inspect a focus range

1. Use a separate new project and select a configured profile while staying disconnected. Open Laser Tools > Focus Test. Do not use Frame or Start.

2. Set Z min to -1 mm, Z max to +1 mm and Samples to 4. Select Current Z. The reference file supplies the same planning-only speed, power, line length and spacing used in the video.

3. Click Preview after the final edits. Count the lines and write every height label below. In this version Samples counts intervals, so include both endpoints.

4. Compare focus-settings-reference.json after your attempt. It is readable reference data, not an importable recipe, machine profile or run file. Return to your unbound exercise project afterwards.

Number of lines and all height labels:

What does Current Z measure from?

What can this two-dimensional Preview tell you, and what remains unknown?

Demonstration reference

The video uses -2 to +2 mm with Samples 8, producing nine lines in 0.5 mm steps. Material uses an absolute Z reference and material height. Zero material height disables Preview in that mode. No physical Z movement or focus result is demonstrated.

YOUR TEST LOG AND EXPLAINED ANSWERS

Your test log and explained answers

Passes answer
Choose C: 800 mm/min, 80%, two passes, Air Assist off. It is the only supplied candidate that meets both separation and edge requirements. The plan is a 20 x 20 mm square. Do not record its physical size as measured.

Focus answer
Five lines: -1, -0.5, 0, +0.5, +1 mm. Current Z uses offsets from the current Z position. The native software check estimates 0:28. Preview checks the paths and labels, but cannot choose the sharpest physical line or establish safe travel.

Preset answer
The comparison preset keeps Line 800/80/2, Air Assist off and example Notes. From Layer also copies sub-layers when present. The video shows a separate two-operation name tag to demonstrate that behavior.

Choosing quality
If the darker sample loses a required letter opening while the lighter one keeps it, the lighter one meets that brief. Change one useful variable for the next comparison and keep the result with the original record.

Use the space below as a reusable log. For this exercise, explicitly write supplied example for status and unknown for measurements you do not have. Keep the full log with your project and put the short version in preset Notes.

Status, task, material/batch, thickness, machine/module and preparation:

Speed with units, power, passes, interval if relevant, Air Assist and changed parameter:

Observations, chosen candidate, reason and next comparison:

Planned size, measured size, edge/back/fit checks and remaining unknowns:
