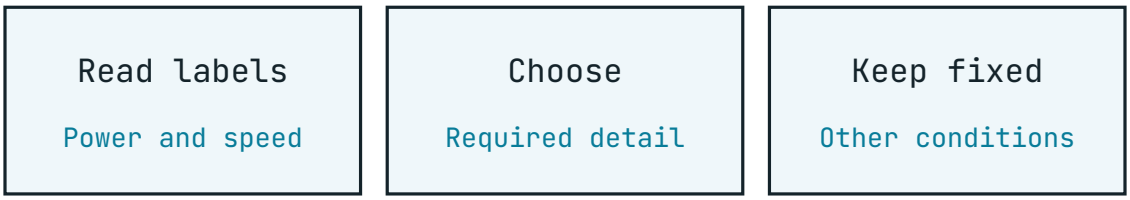
WHAT THE TEST CAN TELL YOU

Planning and reading material tests

Plan a useful test, choose settings from supplied observations, and save your own speed, power and interval examples.

Start here

Work disconnected. The observations in this guide are given examples, so you can practise choosing and applying settings without a laser or test piece. Begin with No Machine and keep both Output controls off in saved exercise projects.



Choose from the stated observations. Preview estimates paths and time, not surface quality.

Compare like with like
Keep material, thickness, preparation, focus, cell size, interval and passes with the test record. When a grid varies power and speed, compare along one row or one column.

Choose for the job
Select cells that keep the required detail and edge quality. If two meet the same requirements, compare their speed. Darkest is not automatically best.

Read Preview correctly
Preview checks labels, paths and estimated time. Surface quality comes from the observations, which are supplied for these exercises.

Open starters first and comparison answers afterwards. Keep the supplied files unchanged and save your own copies. Both layer Output and Fill-entry Output are off in every native project in the pack.

PLAN A BROAD TEST, THEN NARROW IT

Plan a broad test, then narrow it

1. Use a separate new project and select your configured machine profile while staying disconnected. Open Laser Tools > Material Test. A seed from the Material Library supplies base settings; check the resulting fields.

2. For the demonstration, set X Axis to Power: Count 5, Min 20%, Max 100%. Set Y Axis to Speed: Count 5, Min 1000, Max 5000 mm/min.

3. Keep Fill, 0.10 mm interval, one pass, 8 mm cells, 3 mm cell spacing and the example 7 mm overscan fixed. Preview the grid and read its actual labels.

4. Given a useful result at 3000 mm/min and 60%, prepare a narrower comparison: Power 50% to 70%, Speed 2500 to 3500 mm/min, with Count 3 on each axis. Preview again after the edits.

5. Give the test a useful Recipe name and click Save Recipe. The optional material-test-wide.json and material-test-narrow.json are separate Material Test recipes. Interval Test uses its own controls; its reference JSON is not an importable recipe.

How many cells are in the broad and narrow grids?

What stays fixed when you compare two cells in one row? What changes in one column?

The lesson demonstration returns to the broad grid to explain the supplied observations. It then applies 3000 mm/min and 60% to the demonstration rectangle. Your independent cases below use different numbers.

YOUR TASK: CHOOSE SPEED AND POWER

Your task: choose speed and power

Goal: even engraving, clean edges and the required fine detail. All candidates use the same material and setup within this example. Keep 0.10 mm interval and one pass fixed.

A: 2200 mm/min, 30%
Too faint for the brief.

B: 2200 mm/min, 50%
Meets every stated quality requirement.

C: 2600 mm/min, 60%
The same required quality as B.

D: 2600 mm/min, 85%
Scorched edges.

Which candidate do you choose, and what breaks the tie?

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1. Open speed-power/test-settings-start.lzrproj. In Layers select Engrave and its Fill entry.

2. Apply your chosen Speed and Power. Keep one pass, 0.10 mm Line Interval and the 40 x 25 mm rectangle unchanged.

3. For an optional offline Preview, enable Output on both the layer and its entry. Inspect the paths and Duration, then close Preview and return both Output controls off.

4. Save As your own project. Compare speed-power/test-settings-answer.lzrproj after making your choice. The demonstration file material-result-demo.lzrproj uses the demonstration numbers instead.

YOUR TASK: CHOOSE AND COMPARE INTERVALS

Your task: choose and compare intervals

Keep your chosen speed and power. Given observations: 0.08 mm is too dark; 0.12 mm keeps coverage and required detail; 0.16 mm fills but loses required fine detail; 0.20 mm shows stripes.

Which interval meets every requirement? Why is 0.16 mm unsuitable here?

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1. After choosing speed and power, open interval/interval-settings-start.lzrproj. It already contains those case-1 answer values. Enter your chosen Line Interval in the Engrave Fill entry and save your own copy.

2. Keep No Machine and both Output controls off in that saved copy. Compare interval/interval-settings-answer.lzrproj after your attempt.

3. For the separate Interval Test exercise, use a new project, select your configured profile and stay disconnected. Open Laser Tools > Interval Test.

4. Set Min interval 0.08 mm, Max interval 0.20 mm, Samples 4, your chosen speed/power, Cell W/H 15 mm and Cell spacing 4 mm. Choosing a seed can reset the range, so set the final values afterwards.

5. Click Preview after the last edit. Record all four labels. Compare interval-settings-reference.json only after your attempt. This JSON is a readable reference, not an importable recipe. Return to your unbound exercise project afterwards.

Four Preview labels:

Saved project Speed, Power, Passes and Line Interval:

EXPLAINED ANSWERS AND REUSABLE TEST RECORD

Explained answers and reusable test record

Speed and power
Choose C: 2600 mm/min and 60%. B and C both meet the supplied brief; C is faster. Keep 0.10 mm interval and one pass for this first answer.

Interval
Choose 0.12 mm. It meets both coverage and required detail. The four equally spaced labels are 0.08, 0.12, 0.16 and 0.20 mm, with a 0.04 mm increment.

Time comparison
On this 40 x 25 mm rectangle at 2600/60, 0.10 mm plans 250 rows and about 4:26; 0.12 mm plans 208 rows and about 3:42. Fewer rows explains the shorter estimate. The given observations supply the quality choice.

Demonstration comparisons
The supplied interval-demo-start.lzrproj and interval-result-demo.lzrproj preserve the lesson's 3000/60 example before and after choosing 0.15 mm. Keep these separate from your independent answer.

Pack folders: speed-power contains three rectangle projects and test-settings-artwork.svg. interval contains four rectangle projects and interval-settings-reference.json. test-recipes contains material-test-wide.json and material-test-narrow.json for the separate Material Test dialog. Both printable guide editions are included. These worksheets are not interactive PDF forms.

Machine/profile, material batch, thickness and preparation:

Goal and fixed settings:

Changed parameter, observations and chosen candidate:

What still needs checking on the actual material?