

Choosing a Laser Cutter

There are several variables to consider when choosing a laser cutter. From the end user perspective here are a few of the critical points.

Access to Service

If you can maintain and repair the laser yourself this is less of an issue; but if not, it could be critical to choose a laser where the local supplier also services the equipment. Without local service the alternative is to have a technician flown in at some date in the future. In the interim (days/weeks) your lab is down with students sitting around.

Laser Power

Critical is 50 watt minimum, and if you want to cut thicker materials (0.375") on one pass then 100 watt (which pushes you to the larger platforms). For E³ the Universal Laser VLS 3.50 with a 12"x 24" material size is sufficient but 50 watt is the highest power laser available in this level of laser.

Driver Interface

Laser cutters are similar to document printers. They both have a driver that must be installed that takes the document you send and translates it into the needed format for the device. Included with the driver is a myriad of settings and options.

For laser cutters, it is good practice to evaluate the ease and intuitive nature of the interface. Does it take a technician to understand how to use the laser or is it plug and play easy?

Also critical is pre-defined material settings. I specify acetal as the sheet material for making laser parts. The Universal Laser driver has an 'acetal' pre-set which saves lots of time trying to find a good setting to start making parts (you may find you can get better results tweaking these settings, but it makes for a quick start up to very good parts). When I set up the Trotec Speedy 300 at BSM there was not acetal preset. I used some of the other 'plastics' settings to find a good set of values to work with the acetal, but it was an involved process.

All said, I like the interface with the Trotec better than with the Universal. The Trotec interface launches automatically and custom settings are easier and much more flexible than with the Universal, but unless there has been a change there is no pre-set value for acetal.

Honeycomb Cut Table

In Engineering³ we use the laser to cut out parts (not just engrave them). Most (if not all) laser cutters have the option of adding a honeycomb table insert for cutting parts. YOU NEED THIS so don't forget to add this to your order.

Managing Warped Sheets!!!!

When you get your acetal (and other material) sheets it is almost guaranteed they will be warped to some degree. If you cut on a warped sheet you will get catawampus parts. The laser cuts normal to the cut table so a sheet at an angle will have holes, et. al. that are not going through the material perpendicular to the surface. This is a major frustration.

I've played around with several processes to manage to the need for good parts but within a reasonable set up and production time. My default solution is to have a stack of ballast objects I can set on the sheet (on areas not to be cut) to weight down the sheet to a relatively flat state.

*I have six (4 in diameter by 1.25 in wide) aluminum disks sitting next to my current laser cutter.

WARNING: Depending on the laser cutter, and specifically the clearance between the laser head and the material to be cut, this can be a very RISKY thing to do.

On the Universal Laser VLS 3.50 (and with the 2.0 lens) there is 1.5 inches of clearance between the laser head and the plastic sheet. My 1.25 inch aluminum disks present no collision hazard to the laser head.

On the Trotec Speedy 300 there is less than an inch of clearance between the laser head and the plastic sheet. If I randomly place a large weight in the path of the laser head on the Trotec, the head will crash into the weight and misalign the head (at least 2 hours of down time if you can align the head yourself) or damage the head to a non-repairable state.

If you can determine clear head pathways then the weights can still be used with the Trotec, but the risk to damage from making a mistake is significant.

Final Thoughts and Disclaimers

The Trotec Speedy 300 and the Universal VLS 3.50 are different sizes, but functionally I like the clearance of the Universal (laser head to material) as it allows use of weights to flatten sheet material and not risk crashing the head. The Trotec is faster and has easier access to components for cleaning, and requires only a single task to clean the lens. The Universal requires three different areas (mirrors and lenses) to be cleaned, but all are easy to access.

All said, I'm leaning heavily toward endorsing the Universal lasers for Engineering³, especially if the teachers using the laser are not technician types. The Universal VLS 3.50 is smaller than the Trotec Speedy 300, but Trotec has a version similar in size to the VLS 3.50 if the larger size is not needed. Alternately, if a larger size laser is needed for larger projects outside E3, Universal has lasers in the class size as the Trotec Speedy 300.

I have not worked with any Epilog laser cutters at all so I cannot comment on these.