

Aluminum and Laser Cutting

Aluminum – It has an atomic number of 13. Those that are superstitious could say that this is an unlucky number or perhaps an element destined to be bad luck. Of course, that is not the case. Aluminum is a wonderful alloy. Used in practically every aspect of our lives and continues to be revered for its properties of having strength while being light in weight. It has been around for some time now and was once considered a rare alloy during the 19th century. Through the years, refinement and processing of aluminum has become widely used in manufacturing from high-end, production quantities to low volume R&D shops. The aerospace, defense, and auto industries have made aluminum the go-to material for many of their products. Through my experience with lasers and the services A-Laser provides, I hope to address how aluminum has found a place in precision laser manufacturing.

The challenge of laser cutting aluminum is multi-faceted. It is thermally conductive, highly reflective and the molecular structure makes it soft compared to other alloys. How is this dilemma solved via laser technology? Options include fiber, CO₂, and UV laser technology. Higher wattage laser systems can cut thicker aluminum well and have found their place over router or CNC systems. However, for precision aluminum parts out of thin gauge like .001” to .010”, UV laser technology is better suited to take on such a project and be successful. With the vacuum tables equipped on our YAG-UV laser systems, they allow for holding the material flat and ease the processing on lower thicknesses. This is a non-contact method as the laser head hovers about the secured material. Deburring such a soft material by methods of sanding or tumbling can damage aluminum parts, so preventative methods are used to limit any post-laser burr.

Why use lasers over other methods like routing, CNC, stamping? From my perspective and experience, the need to seek out laser technology is the result of previous attempts with the before mentioned methods. Lasers have a well-formed beam diameter and with UV, a 20µm kerf provides the versatility for designers to achieve sharper corners and defined radii. Aluminum is a high-quality option for many projects by being durable and adaptable. Because of this, it is often an engineer’s choice. It’s lightweight, corrosion-resistant, and holds the ability to be formed is a great advantage over other materials. With the global concerns of our carbon footprint, aluminum is also a great choice because it can be recycled. With all these attributes, we will continue to see aluminum in many aspects of our lives. So, for tight tolerances, straight walls, and the opportunity to have precision laser-cut aluminum, seek out a service provider with experience. Ask them what technology they use for producing high-quality parts out of this wonderful and durable alloy. Good luck to you all!

Please read more at:

[Aluminum and Laser Cutting - A-Laser Precision Laser Cutting](#)

[A-Laser Precision Laser Cutting - Laser Ablation, UV and IR Lasers](#)