

How is laser cutting cost calculated?

laser Capabilities

Like all manufacturing businesses, the cost of goods is determined by many factors. For a precision laser cutting service this is also true. Every project will require a review of the details given by the customer. It is vital for both parties to have clear lines of communication so the best cost can be offered. The following will be a guide to how the cost to your next precision laser cutting project will be determined:

- **Material Type and Thickness:** Just about every new project a precision cutting service receives begins with the question “Can you cut “blank?”. Material choice and the needed thickness will determine what type of laser system is best for the job. Different systems can cut the same material but will vary in cutting speed. Additionally, cutting a thicker grade of material will increase the cut time and overall cost. The cost of the material can be high, especially if using a precious metal or a custom alloy. Many laser cutting service providers accept customer supplied materials or the additional material cost will be added if supplied by the service provider.
- **Geometry and Linear Distance:** The simple form of a washer, with an I.D and O.D, and total linear distance of 300mm will cut faster than the same 300mm linear distance of a complex design with intricate features. The reason is in most cases the laser speed will need to run slower.
- **Tolerance and Inspection:** How precise your project needs to be is also a factor in determining cost. The same simple washer of 300mm linear distance will cost more if an AQL level inspection is needed with a tolerance of +/- 0.0254mm. Does it require 100% inspection or just first and last part inspection with a tolerance of +/- 0.127mm? It comes down to the time and the laser adjustments needed for the project.
- **CAD and Laser Set-up:** Laser cutting machines require a set-up to be done including the material and laser system. This can be basic to using a set of known parameters called the “laser tool” or involve more engineering and system adjustments, which are done when the material is unknown and or the cutting profile is complex to the material used. Manufactures often “nest” parts to maximize material usage or tab part in the sheet to aid in the process or for post finishing plating for example. Custom nesting and tabs can add additional cost.
- **Handling of material Pre and Post laser:** Materials can be extremely delicate and prone to damage if not handled properly. Laser operators may need to take additional care and methods to keep the surface free from scratches and marring. Some materials may need to be stored in a controlled environment and only taken to the laser system just before cutting. Precious metals and scrap needs to be accounted for to be recycled by the customer.

- **Packaging:** All the efforts made by a precision laser cutting service can be lost if the completed parts are not packaged to prevent damage. Some projects require more than just using a box filled with those foam “peanuts”. Cost can increase if the packaging requires third party systems to be used like parts trays, gel-paks, custom plastic boxes and so on. Additional packing requires more labor and time.
- **Finishing:** Post laser processes are common and do add to the final cost. Finishing methods like sanding, passivation, tumbling, anodizing and powder coating are some of the post processing that may be required. In addition to added cost, it will add additional lead time.

As mentioned, communication with the customer is key in review. Knowing the quantities is another important element in establishing the final cost. R&D numbers generally do cost more as many laser cutting service providers have a minimum order amount. Keep in mind it is easier for a manufacturer to keep a machine operating and cut for example 10,000 parts, than to have many processed at quantities of 100 each. If your project is not at a high production level, but has potential to grow, the per unit costs will be lower in the production run.

Laser cutting costs, like all manufacturing, is determined by numerous factors including the material type, the quantity, the geometry and inspection level required. Each project’s cost is determined by its own requirements and the best laser method and accompanying procedures needed to result in a high-quality precision laser cut component.

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