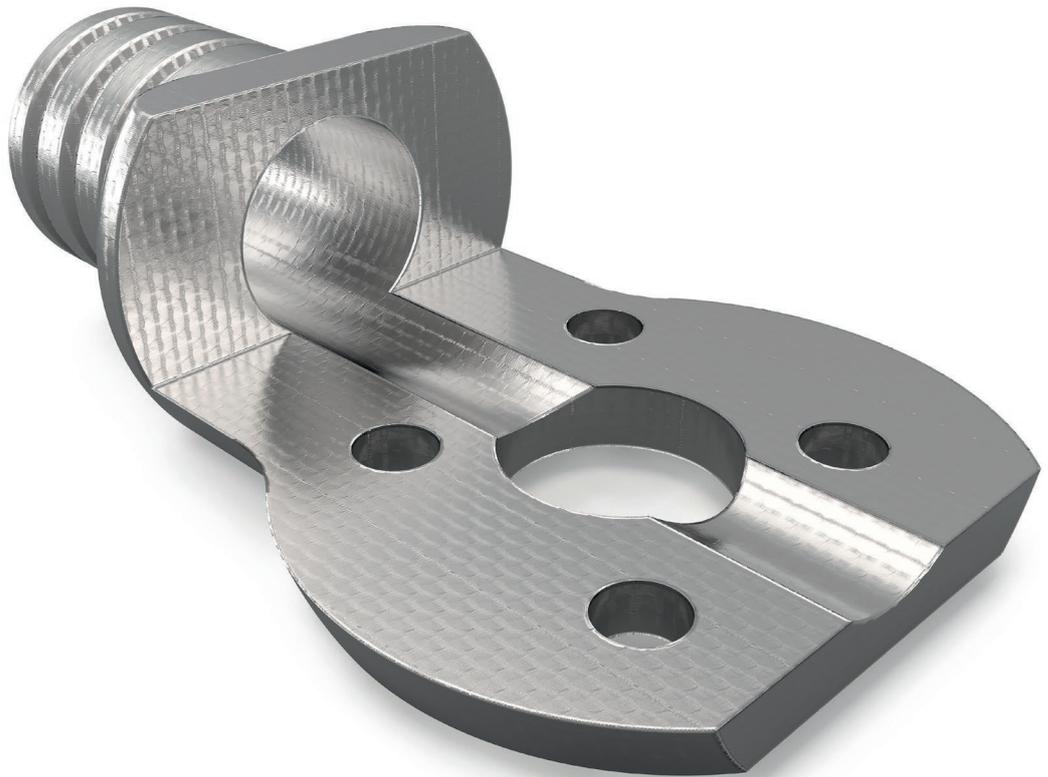


CNC MACHINING

Proto Labs' CNC Machining offers parts that are machined from real blocks of engineering-grade plastic and metal materials for improved part functionality and cosmetic appearance.



We employ three-axis milling from up to six orthogonal sides of the part to machine as many features as possible. We also offer turning, a process, which includes live tooling to create off-axis holes, flats, slots and grooves. Machined parts work well for testing the functionality of prototypes and are often used as jigs, fixtures and one-offs.

With Proto Labs CNC Machining, product designers and engineers can get one to 200+ machined parts in three days or less.

DESIGN CONSIDERATIONS

Size.

Maximum part size is approximately 254mm by 178mm by 95mm. The maximum depth that can be milled from either side of the part is 51mm. ABS, acetal and aluminium offer larger part capabilities. Machined parts smaller than 6.4mm by 6.4mm by 6.4mm are not recommended.

Turned minimum and maximum part diameters are approximately 4mm and 75mm. Minimum and maximum part lengths are approximately 6mm to 228mm. No diameter should be less than 1.3mm and walls thinner than 0.5mm are not allowed.

Materials.

There are more than 30 different engineering-grade plastic and metal materials in Proto Labs CNC Machining Service that can be used during prototyping. Here are some of our most frequently machined materials:

- ABS
- Acetal
- Acrylic
- Nylon
- Polycarbonate
- Polypropylene
- PVC
- PTFE
- PEEK
- PEI
- Aluminium
- Brass
- Copper
- Stainless Steel
- Carbon Steels
- Titanium

Wall thickness.

Unlike injection moulding, CNC machining can produce very thick walls without sink or warp and there is no requirement that wall thicknesses be uniform. However, walls thinner than 0.5mm typically do not survive the machining process.

Tolerances.

Typically, tolerances of +/- 0.13mm are expected and achieved on well-designed parts.

Milled shape.

Sharp inside corners on a part will be radiused (rounded) as a natural result of the CNC-milling process.

Our automated quotes highlight, with colour coding, material that is left on your part, such as resulting radii.

Text on parts.

Recessed text should have a minimum stroke width of 0.5mm. The spacing between characters on raised text should be 0.5mm or greater. If your design permits it, opt for raised text versus recessed because it is easier to read.

Surface finishes.

All machined plastic parts are left as-milled, which typically means they show visible tool marks. Some metal parts, on the other hand, allow more choice. Soft metals like brass, copper and aluminium can be lightly bead blasted leaving a fine matte finish.

Hard metals like steel and stainless steel can also be de-burred with a light bead blast that removes metal slivers and sharp or rough areas. Some sharp edges may remain.

QUICK STATS

VOLUME:

1 to 200+ parts

SPEED:

Shipped in 1 to 3 days

QUESTIONS?

Your automated interactive Quote[®] will address potential machinability issues and offer suggestions directly on your 3D CAD model. If any additional guidance is needed, our Customer Service Engineers are always available at +44 (0) 1952 683047 to discuss your design.

Learn more about our CNC machining service at protolabs.co.uk/CNC-Machining

