

If you need incredibly accurate, high quality parts with an excellent finish that can be replicated hundreds, or even thousands, of times, CNC machining could be the subtractive process you need.

A vast range of part types and features can be produced depending on which CNC process is used - milling, turning or grinding.



## What is CNC machining?

CNC is a “subtractive” process whereby parts are produced via physical removal of material using sophisticated computer-controlled machines.

CNC machine types include simple mills with linear and rotary movement, lathes and more complex machines with multiple axes that can work multi-dimensionally to produce highly accurate parts which may be used for form, fit and functional testing.

The CNC process involves sending a complex program which has been processed using a 3D machining program to generate the required cutter paths to the CNC machine which then runs an automated process to carry out the required ‘machining’ procedures.

The CNC machine can be programmed to repeat the process, so multiple parts can be replicated to the same specifications.

## What CNC machining materials are available?

Numerous types of metal and plastic material can be machined using CNC machining. We keep a stock of commonly used materials in-house including:

- ▶ Acetal
- ▶ Aluminium 6082
- ▶ Nylon
- ▶ PEEK
- ▶ Stainless Steel 316/316L

Properties of the final part depend on the source material.

Other materials are available quickly from our suppliers. Please note, however, that as we specialise in fast turnaround times, we are unable to machine exotic materials such as Ti, Duplex Stainless and Inconel.

## CNC Benefits

- ▶ **Speed:** The fully automated aspect of CNC milling and turning means that production times are cut dramatically
- ▶ **Accuracy:** Through the use of computer CAD and CAM programming, it is possible to achieve incredible accuracy that is measured in microns
- ▶ **Repeatability:** Once created, the programme can be used to produce exact copies of the original prototype to precise specifications
- ▶ **Quality control:** The consistency of CNC milling and turning means that quality control for longer batch runs is easier to maintain
- ▶ **Cost effectiveness:** A programmable and repeatable system lowers the unit price of each part, making larger production runs easier to cost manage

## CNC Production Speeds

We offer three production speeds for CNC machining:

- ▶ 3-working days (see next page)
- ▶ 7-working days
- ▶ 12-working days

Machined parts are vapour honed, as standard, and then dispatched using next day delivery. If you're within a 15-mile radius of us, we will deliver your order.

**Please note:** production speed is subject to quantities required. Also, a delay between quote and order may affect the quoted production speed we can actually deliver, due to changes in our capacity.

## What capacity do we have?

We operate a suite of nine CNC machines capable of 3-axis milling, 2-axis turning, surface grinding. We also have two state-of-the-art robot assisted 5-axis VMCs.

## Low Volume Production

We can also CNC machine your low volume production work on our 5 axis VMCs, whether you need 50 or 5000 parts (or anywhere in between). Materials and billet sizes are as per 'Milling' (see next page). Production speed will be determined by the quantity needed.



## CNC 3-Day - requirements

If you want your CNC machined part dispatched in 3 working days, your part must meet all of the CNC 3-day production speed criteria detailed below.

### Milling

Your part must fit into one of these billet sizes:

- ▶ 200 x 100 x 90 mm (aluminium and acetal only)
- ▶ 150 x 50 x 40 mm
- ▶ 100 x 100 x 80 mm
- ▶ 100 x 100 x 40 mm
- ▶ 100 x 50 x 40 mm
- ▶ 50 x 50 x 40 mm

Parts can be made from: Aluminium 6082, Acetal (black and natural) and Clear Acrylic. If you require different materials, you will need to choose one of our other CNC production speeds.

### Turning

- ▶ 60mm max dia in Aluminium 6082
- ▶ 60mm max dia in Acetal (black and natural)
- ▶ 60mm max dia in Clear Acrylic
- ▶ 60mm max dia in Stainless Steel (316/304)

### Threaded holes

Threaded holes of M2 – M12 (model drill hole size) are supported on our CNC Express service. Standard threads only. For through tapped holes make hole size suit drill  $\varnothing$  M1-M12.

### Radii

As a natural result of the CNC machining process, the sharp inside corners of a part will be rounded (radiused). The resulting radii will be identified before the part is milled as this will depend on the depth of the feature.

### Text

Some considerations, should your part incorporate text:

- ▶ 0.5mm is the minimum stroke width for recessed text
- ▶ 0.5mm, or greater, spacing should be used between characters on raised text
- ▶ Recessed text is better than raised text

