

Subcontracting CNC Honing

Everything You Need To Know



HoneAll



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Subcontracting CNC Honing: Everything You Need To Know

Precision machining is pivotal in a range of industries and the cornerstone of modern manufacturing processes, making possible the creation of highly intricate components with exceptional accuracy and quality. Industries, including aerospace, automotive, electronics, medical, and defence, heavily rely on precision machining to ensure that components meet strict specifications and tight tolerances.

If the parts that your manufacturing business produces require honing, but you don't have the capacity, expertise, or financial resources to undertake the work in-house, outsourcing to a specialist, such as Hone-All, can be a cost-efficient decision.

In this guide, we'll tell you everything you need to know about honing and, if there are any questions left unanswered, simply call our experts here at Hone-All, who will be delighted to assist you.

CNC Honing: An Overview

CNC honing is a precision machining process that is used to improve the surface finish and dimensional accuracy of cylindrical parts. The process involves the use of a honing tool, which consists of a series of abrasive stones or bonded abrasive sticks mounted on a rotating spindle. The honing tool is controlled by a Computer Numerical Control (CNC) system to achieve highly precise and automated control over the honing process.



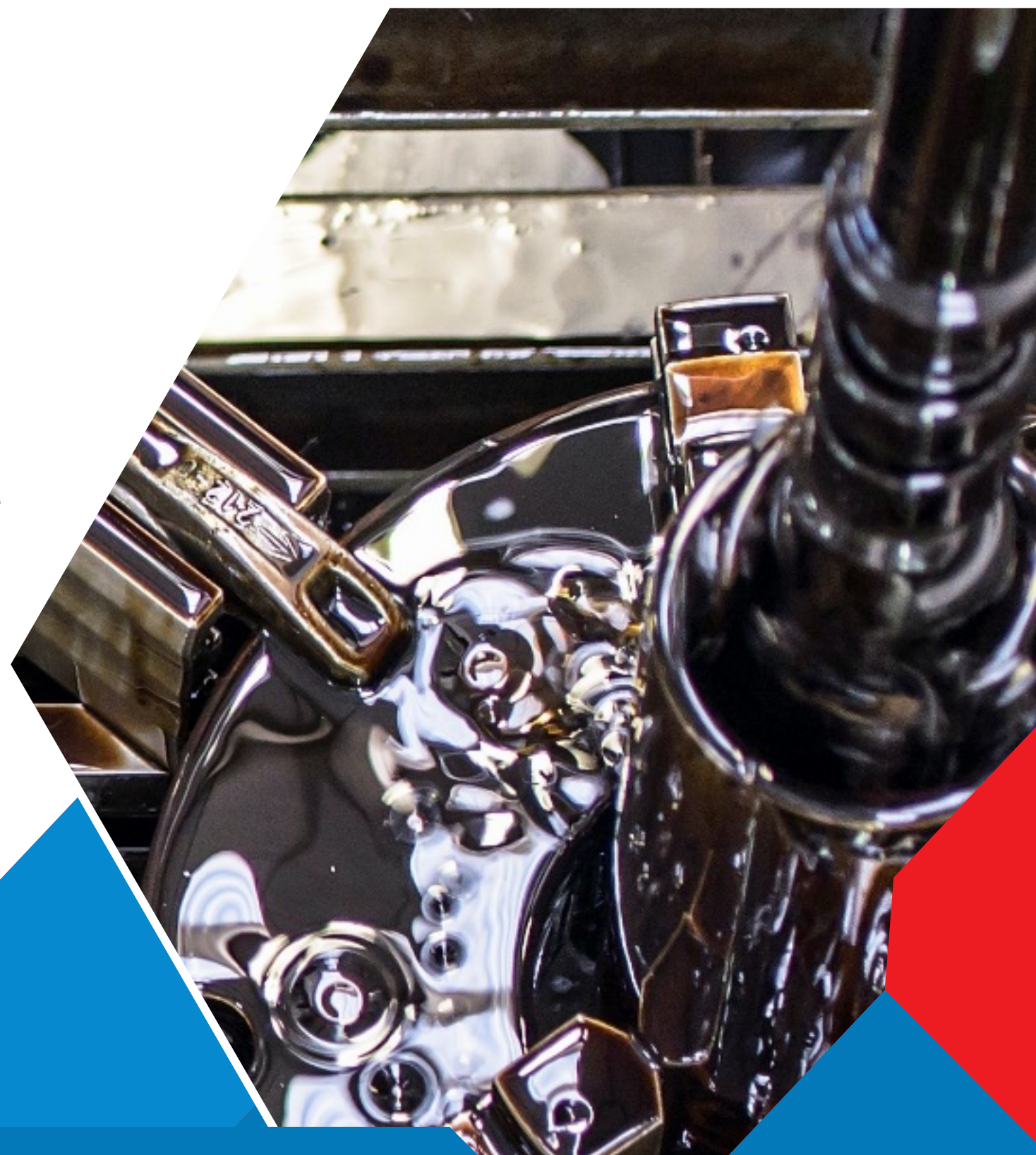
During CNC honing, the part is held securely in place while the honing tool is moved back and forth along its length. As the honing tool rotates, the abrasive stones, sticks or papers come into contact with the surface of the part, removing small amounts of material and creating a smooth, uniform finish. The CNC system controls the speed, feed rate, and stroke length of the honing tool, ensuring consistent and accurate results.

CNC honing is commonly used in industries such as automotive, aerospace, and hydraulic cylinder manufacturing, where highly precise and reliable results are essential. It is particularly effective for improving the roundness, straightness, and surface finish of cylinders, bores, and other cylindrical components. By removing imperfections and inconsistencies, and creating specific surface finishes, CNC honing enhances the performance and lifespan of the machined parts.

What Is Honing Used For?

Honing serves several purposes, including creating precise bore sizes, improving roundness and straightness, achieving specific surface finishes, removing machining marks, and enhancing the performance of sliding or sealing surfaces. Because honing can achieve tighter tolerances than other machining methods, it is effective for honing cylindrical components, such as engine cylinders, hydraulic cylinders, gears, and connecting rods. It also can be used to achieve a desired surface finish, such as a mirrored or crosshatch finish for oil retention purposes, or for cleaning rust or degradation due to age, wear, or exposure to the weather.

By refining the surface properties and geometric features, honing enhances the functionality, durability, and reliability of parts in many applications.



How Is Honing Carried Out?

Honing can be performed using various methods and machine configurations, depending on the specific requirements of the project and the type of workpiece being honed:

Manual Honing: A traditional honing method in which the operator manually controls the process, it usually involves the use of a manual machine and bespoke tooling to hone very small or intricate parts where clamping could cause issues or damage to the shape of the bores.

CNC Honing: Computer Numerical Control (CNC) honing involves the use of automated machines with programmable controls which offer precise control over the honing process, including speed, pressure, stroke length, and tool movement. CNC honing is ideal for high-precision honing applications and repetitive production runs.

Vertical Honing: In vertical honing, the workpiece is held vertically, and the honing tool is lowered into the bore of the component. This configuration is commonly used for honing larger parts or when gravity assists with lubrication delivery.

Horizontal Honing: In horizontal honing, the workpiece is positioned horizontally while the honing tool moves into the bore of the component. This method is often used for honing much larger parts or when specific tool orientations are required.





Our honing technical specifications

Minimum Bore Diameter	1.5mm 0.059"
Maximum Bore Diameter	500mm 19.685"
Maximum O.A.L.	3000mm 118.110"
Bore Tolerance	±0,005 ±0.0002"
Surface Finish	0.05μ 2√

Common Misconceptions About CNC Honing

When outsourcing your CNC honing project to Hone-All, it's vital that you have realistic expectations and a clear understanding of what will be achieved.

So, what are the most common misconceptions about CNC honing of which you should be aware?

1) CNC Honing Is An Alternative To Deep Hole Drilling

One of the most common misconceptions of CNC honing is that it is the same as deep hole drilling or boring. Often, honing is mistakenly believed to be capable of creating a bore from scratch; in reality, its main function is to finish an existing bore. This misconception can lead to improper expectations and unrealistic goals for the honing process.

2) Large Amounts Of Material Can Be Removed Through Honing

Another misunderstanding is about the amount of material that can be removed during the honing process. It is most cost-effective to remove small amounts, typically less than 0,5mm but to a maximum of 1mm. If larger amounts of material need to be removed, other methods, such as re-drilling or boring, would be a more suitable and economical option.

3) Honing Can Correct Drill Wander Or Concentricity Problems

Some customers assume that honing can correct drill wander or concentricity problems. However, honing merely follows the existing bore and cannot rectify these issues. Drill wander and concentricity are, typically, the result of previous machining processes; honing can only refine the existing bore according to its original specifications.

4) Honing Can Be Effective Even If Little Material Is Left

Insufficient material left in the bore is another common mistake in CNC honing. To achieve the desired surface finish, a certain amount of material must be present in the bore to ensure the bore will clean up at the desired size. If customers fail to leave enough material, the honing process may not be able to deliver the desired results, compromising the overall quality of the finished product.

To avoid these mistakes, it is crucial that customers have a clear understanding of the capabilities and limitations of CNC honing. Consulting with the expert team at Hone-All can provide valuable insights into the process and ensure that the honing process is process planned appropriately for optimal results.

Key Considerations When Outsourcing Your CNC Honing

Outsourcing CNC honing can be a cost-effective solution to achieve high-quality, precise bore finishes that simply cannot be achieved through other machining methods. However, there are several key considerations that will help to ensure successful outsourcing of your CNC honing needs.

Consult An Expert At Hone-All

Firstly, it is crucial to consult an experienced CNC honing specialist before machining the bore that will require honing. This will provide you with valuable insights on the best machining method, sequence of machining, and the level of stock removal that is viable and cost-effective, thereby increasing the likelihood of achieving your required specifications at the lowest price. The knowledge and expertise of an expert can be invaluable in optimising the honing process and achieving the desired results.

Define The Project Specifications

Before embarking on the project, it is important to evaluate the stock removal that is required, bore type, and any interruptions in the bore, such as keyways or slots. Specialised honing tools or stones may be necessary for these specific features and can massively impact the overall project cost. Understanding the complexity of the bore and the desired specification will enable you to select the most appropriate routing sequence to achieve and accommodate your needs.

Supply A High-Quality Bore

Supplying a high-quality bore prior to honing will lower your costs and reduce the chances of quality issues arising during the honing process. The initial machining should be performed accurately to minimise any defects or inconsistencies. This will also help us to focus on refining the bore rather than correcting initial machining errors.

Understand The Desired Finish And Tolerances

Before requesting a quote for your honing project, it is essential that you have a clear understanding of the desired finish and tolerances. Different technologies and complexities in honing services can vary which will affect the cost. By specifying the required finish and tolerances from the outset, you can receive more accurate cost estimates and ensure that we can meet the specification that you require.

Frequently Asked Questions (FAQs)

Have a question about honing? Check these commonly asked questions and, if you still need professional advice, simply call our helpful team of experts.

+ Can Honing Correct Concentricity Issues?

Honing cannot correct concentricity issues but can only refine the existing bore according to its original specifications.

+ How Much Material Needs To Be Left In For Honing?

This depends on the size of the part and the surface finish required. Usually, 0,2mm will be sufficient but if in doubt, or if you have a bore in a really poor condition, chat to one of our experts who will be able to advise.

+ How Close To The Base Of A Blind Bore Can You Get With Honing?

Again, there's no single answer to this as the bore size will determine how close to the base we can go. However, as a general rule, the smaller the bore size, the closer we can get; for example, with a diameter of 5mm we could get within 2-3mm but with a 100mm+ diameter we can only reach within 10-12mm from the base.

+ Can You Hone Flat Surfaces?

No, honing is effective with round surfaces only. To hone a flat surface, you would need to use a polishing method called lapping.

+ Can Honing Be Done Around Bends Or Corners?

No, to achieve a satisfactory finish you should use extrude honing in which an abrasive media is pumped with hydraulics through the bores of the component.

Frequently Asked Questions (FAQs)

+ Can Honing Correct Roundness Issues?

Yes, it can as honing can produce extremely accurate roundness; however, each project is assessed on case-by-case basis to give you a clear understanding of what can be achieved depending on the condition of the bore prior to honing.

+ What Sort Of Finishes Can Be Achieved With Honing?

An extensive range of surface finishes can be achieved through honing; the exact finish will depend on several factors, including the material, the abrasive grit size, the honing process parameters, and the project aims. Surface finishes include smooth polished finishes, crosshatch patterns, and a wide variety of controlled surface roughness specifications.

+ Can Honing Remove A Step In The Bore?

Yes, it can if the step is minor, but it can be difficult to achieve consistent size and finish unless sufficient material is left in the workpiece to machine out any step in the bore.

+ What Materials Can Be Honed?

Honing is a highly versatile process than can be applied to a range of materials, including all metals from the hardest of alloys to the softest of aluminium's, stainless steel, cast iron, etc. but has also been carried out on glass, ceramics, and polymer plastics – in fact, almost anything!

+ Can You Hone Angled Holes?

Yes, we can hone angled holes if we design a fixture or if a fixture is supplied by the customer to reposition the component so that the bore is then parallel to the honing tool.

Why Choose Hone-All For Your CNC Honing?

At Hone-All, we recognise the importance of understanding each customer's individual needs. With over four decades of experience in honing, and an unparalleled level of industry knowledge of different sectors, we can hone the most exotic of materials and bores within the most intricate shapes. Where a part is exceptionally complex or outside our previous experience, we have access to a vast library of solutions to ensure that we deliver outstanding results at a competitive price.

We also have one of the largest selections of honing machines and the broadest subcontract capacity for honing in the UK, both manual and CNC. All our honing work is carried out at our Leighton Buzzard site, with no outsourcing to other precision machinists.

- **All work meets international quality standards, including BS EN 9100:2018 and ISO 9001:2015**
- **In-built metrology to control stock removal for more efficient and higher-quality results**
- **A commitment to delivering outstanding results while controlling cost, quality, and lead times**
- **Full on-site control of all elements in the honing process to ensure quality-driven outcomes**
- **Surface finishes of 0,05µ**

Get In Touch With Hone-All Today

To request a free, no-obligation quotation or to discuss your honing requirements with one of our expert team, please call us on 01525 370666 today or [send us an enquiry](#).