

HONING HEYDAY

In the last decade honing has transformed from a specialised skill, manual operation with relatively narrow application, into a clean, rapid, consistent process, thanks to the introduction of conversational programming and electronically controlled machines. Honing has been de-skilled and made accessible, but that's not the only reason that the honing market is expanding, as Martin Elliott of Delapena explains.

Honing is now in a period of growth, thanks to the capability of the latest machines and continuous development of abrasives for an ever-expanding range of applications. Beyond just precision finishing, honing is now also a good way to remove material, to replace internal grinding and to create tight geometry and an exact surface finish (holding tolerances down to a micron, with sub-micron adjustment), all to a consistent standard. This close tolerance finishing can also mean that reaming and hand polishing operations can be eliminated altogether. Indeed, new applications for honing appear every day.

The technology once restricted to the highest end machines and used only by the largest OEMs, has cascaded to become available and accessible to a mass market. New honing machines now bring affordable computer controlled efficiency and precision to a much wider audience. Conversational programming eases set up and a de-skilled operation improves not only safety, but also the rapidity of the process. In fact honing is

now suitable in a production line, in-cycle or in-process, which offers significant efficiency savings and an impressive return on investment. With improved process and speed of material removal, honing should now be considered for grinding as well as lapping – potentially one efficient process rather than the expense of two or even three!

Honing now boasts increased scope, ease of use and measurable advantages, including the potential time savings, cost savings, efficiency savings and return on investment from using this process to transform a production line. As just one example, consider the improvement in cycle time that took a batch of 300 parts from 25 hours manual honing down to just 45 minutes on the right machine with right tooling, fixtures and process.

Material Difference

Use of the honing process is entirely application driven and new applications appear every day. From obvious uses in hydraulics to something more obscure such as honing glass tubes for precision dosing syringes, or producing a tapered choke in the barrel of a sporting rifle. Honing is particularly appropriate for working with harder materials but can be used for stock of every hardness.

The scope for materials that can be honed with the latest machines has vastly expanded: Aluminium, brass, titanium and hard steel can be honed as standard, with harder materials such as ceramics, glass, molybdenum and inconel also within honing capability. These more 'exotic' materials may require job-specific abrasives and these can be developed to order.

Markets such as aerospace and automotive work on the frontier of research and development, with a continuous drive to find lighter and stronger materials. This delivers a stream of challenging new materials and applications for honing; particularly as the tolerances required in technically advanced componentry are constantly being refined. The standard expectation is now two microns and part of the preference for honing is because this



process can achieve this close tolerance work with ease and speed.

Voluminous Scope

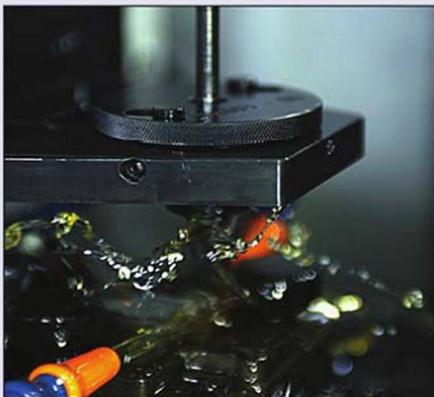
In terms of volume, honing machines now exist for everything from prototyping and small batch production of 20 to 250 parts, through medium batch size or honing in process, right up to high volume production in excess of one million components. A huge number of parts are suitable for honing and some common examples include spools for hydraulic and servo valves, cylinder liners, bushes, gears, carbide dies and ceramic sleeves.

The next step for honing is to enter the fourth industrial revolution and for honing machines to join the internet of things; this will allow the specific honing expertise held by the few to empower manufacturing anywhere in the world. Exciting times for honing!

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