

HONING: WHAT IS IT, PROCESS AND EQUIPMENT

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Honing is a technology for abrasive processing of cylindrical iconic parts using special nozzles, hones, which provides the necessary surface roughness and maximum accuracy of their parameters.

As a rule, the cavities of various structural components are honed, but external processing of dimensional parts is also carried out, which requires modified or specialized grinding and horizontal boring machines. The technology is applicable both to products made of ferrous (steel, cast iron) and non-ferrous (aluminum, magnesium, zinc alloys, bronze, brass) metals [1].

Special machines are used for the honing process. These are devices with a vertical or horizontal arrangement in the space of the spindle. Each of them has its own purpose depending on the work being done. Honing equipment is specialized for a narrow profile. The manufacture of universal machines is a thing of the past.

Honing is used mainly as a final operation for processing high-precision holes in parts and is a more efficient technological operation than lapping and polishing with abrasive suspensions and pastes. As a rule, honing is carried out after the operations of grinding, boring, reaming, reaming, pulling; in some cases, rough honing replaces grinding operations. The range of sizes of honed holes is very wide: diameter from 5 to 500-800 mm, length up to 20 m. Honing is often used to machine multiple coaxial holes at the same time.

Honing and some of its varieties are used in the processing of internal, external and flat surfaces. These include honing with additional oscillating

movements, honing of intermittent (multi-tiered) holes, combined honing of a hole and the end adjacent to it, honing of limited spherical surfaces, processing of working surfaces of piston rings, diamond countersinking and reaming.

Honing with an additional oscillating movement is one of the advanced processing methods. On the basis of studies conducted in our country and abroad, it has been established that the introduction of an additional oscillating (oscillatory) movement into the composition of movements during honing makes it possible to increase the accuracy of the geometric shape of machined holes, improve the machinability of hard-to-machine materials and increase the productivity of metal removal. The intensification of the metal removal process in the case under consideration occurs due to the fact that with the correct choice of the parameters of the processing mode, the honing process has a continuous character, and the cutting grains do not follow the trajectories of the previous grains during their movement. As a result, their cutting properties are used to a greater extent [2].

References

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