

## IMPROVING ACCURACY IN PROCESSING OF TOOTH WHEELS

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**Abstract:** In this article, the accuracy of the grinding of the gear wheels is considered. The results of the analysis of increasing the accuracy of grinding of cogwheels are shown that the intensification of modern machine-building production, increasing its efficiency and ensuring the competitiveness of products are possible with a significant increase in the productivity and accuracy of technological equipment. As a result, the accuracy of the grinding of gear wheels is being solved, the actual problem in machine-building production is being solved, as well as the accurately shaved limits of the accuracy of the surface of the gear wheels effectively affect the performance of machines and mechanisms.

**Keywords:** gear, shaft, hole, quality, transmission, technological base.

The preparation error of gear transmissions causes additional dynamic loads, noise, vibrations, and rotation unevenness. The system of tolerances of gear transmissions limits these errors, taking into account the operating conditions and performance of the transmission, the basis in the manufacture. One of the main technical requirements in the processing of gears is to increase the accuracy of stable machining.

Machinery and mechanisms are required to provide design and technological conditions, as well as different types of "Valve-hole" joints must meet the requirements. One of the main requirements is the exact centering of the shaft axis in the bushing hole from the exact centering requirements in the transmission of the moving gap used in the "Shaft-hole" combination.

Moving spacing in machines and mechanisms is a major part. At present, the required shaft can be used to provide very high accuracy adjustment of the bushing or centering by increasing the accuracy of the conductor diameter as required.

There is a design line of the shaft-hole connection. From Table 1 we can see several types of "shaft-hole" joints. Table 1 shows the most commonly used compounds in engineering. These include smooth cylindrical, slotted, RK-profile and dowel joints.

The "Valve-hole" joints consist of two cylindrical surfaces and two shafts in a smooth cylindrical joint. Such transmissions serve to move the parts slowly in the longitudinal direction, to direct the forward movement back again, to move easily to the parts that are easily moved, and to move them relative to each other in the arrangement of the working position. Serves to stimulate this type of transplanted. It is known from this type of transitions that it is not possible to obtain a zero gap, so sliding transitions are used for rotating joints.

Dowel joints are mainly prismatic, segmented, ponasimon, depending on the shape of the dowel and the method of installation. The most common are prismatic and segmental (GOST23360-78, STSEV 189-75, and 189-79). In a dowel joint, the accuracy requirement of the diameter transition dimensions is met, and the torque is transmitted through the dowel and the dowel groove. [2]

Slotted joints are adopted in the transmission of centering and torque (GOST25347-82). They are used to transmit large torque moments. There are three different types of slit joints; straight-sided, involute, and triangular (profile angle 300).

Centralization of slotted shafts and bushings is carried out in three different ways, depending on or in connection with technological and operational requirements; on the outer diameter, inner diameter and sides. [2]

The RK-profile contour is used to transmit large torque moments in equal-axis coupling mechanisms, in kinematics — torque transmission is not of great importance for precise transmission of rotation, but is a reversing mechanism.

The dynamic loads of the RK-profile compound are 60% higher than those of other compounds. [4]

During the technological operation, in addition to giving the required position to the workpiece, it is also necessary to ensure that it does not move in the device.

Although these two issues are different, they are theoretically solved in the same way, that is, by restricting any movement in space to a certain extent, or by depriving it of a degree of freedom and fixing it.

Bases are divided into three types depending on their use: design, technological and measurement base.

A design base is a base used to determine the position (position) of a detail or prefabricated joint in a product. The design base is divided into main and auxiliary base. The base base is called the design base, and the base base is used to determine the condition of a part or assembly in a product.

Auxiliary base is a design base that belongs to a given detail or assembly unit and is used to determine the condition of the item to be attached to them.

The technological base is the base used to determine the state of the whole process during the manufacture of the workpiece or product.

A measuring base is a workpiece or surface of a workpiece that begins to take a calculation from a base or measuring tool that is used to determine the relative position of an item and measuring instruments.

Using the given data, it is possible to summarize the selection of the following transitions based on the conditions of use of the part and the requirements for it.

Intermediate transitions (for N screw, h shaft) are adopted, fixed but designed for joints of parts, which provide good centering of connecting parts. When choosing an intermediate joint, it should be taken into account that they have the potential to create tension and cracks. The combs are not large enough to transmit a slightly greater torque and forces through the joint. Therefore, in the intermediate joints, the connecting details (with dowels, pins, slits, etc.) are additionally strengthened.

The H6 / h5 transmission mainly centers precisely, for example, on the pin and body of the lathe.

H7 / h6 lubricating gears of the lathe, short-acting joints, for example, the guide bushing for the spring-loaded tail section, in the detail combination, for precise orientation in adjusting or adjusting when short-motion is required, in forward-reverse motion. H8 / h7 to center when conversion alignment is not explicitly required. H8 / h8 transmission fixed closed details are used in low-precision required mechanisms, small loads and easy assembly

H7 / g6 conduction is used to ensure tightness in moving joints, in precise orientation, or in small transitions. Other accepted examples: piston shaft neck with connecting rod head, finger device for adjusting the manufactured detail. H6 / g5 and even H5 / g4 transfers have been adopted in ultra-precise mechanisms

H7 / f7 bearings that operate under constant speed and load are used in gearboxes, free-rotating shafts, and even wheels, couplings. More precise transmissions are used in high-precision bearing H6 / f6, used in hydraulic transmissions of passenger cars.

The H7 / e7, H7 / e8, and H7 / e9 transmission have high-speed rotating bearings, a variety of bearings, or large long-resistance, such as in a gear block.

The H8 / d9 transmission is used in the piston cylinder of steam engines and compressors.

All types of transplants, except dense transplants, are perforated. The clearance varies from maximum to minimum in the moving transmission. The gap is from maximum to zero in the intermediate transmission.

Grinding of Evolventa profile teeth is performed by copying and rounding methods. Copying is done with shaped circle stones, more efficient but less accurate. Grinding of gears is a type of final machining.

There are factors that affect its accuracy when grinding gears. One of the factors influencing the process of grinding gears and other technological processes is the radial kicking of gears. In solving this problem, Prof. Alikulov has achieved high results and created a scientific basis on the basis of many studies and experiments.

Based on this data, the accuracy can be increased several times by reducing the radial kick of the gear. When baseing the gear blade, the transitions should be made with minimal clearance. To do this, it is necessary to select and prepare high-quality precision of the gear wheel hole and machine tool surfaces. To increase the accuracy of these surfaces, I recommend a solution to the problem of increased quality of hole and mandrel processing based on conclusions in practice.

#### References

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