



MINIMUM DEPTHS OF THE CUT-OFF LAYER AS THE FACTOR INCREASE IN ACCURACY OF TURNING

1. Senior teacher M.A. Jurayev, DSc.,
2. professor D.E. Alikulov,
3. assistant Sh.O. Ozodova

Tashkent state technical university named Islam Karimov

Annotation. In article the problem of ensuring accuracy with blade tools and the analysis of the basic reasons which are not allowing achievements of necessary accuracy during the turning and also possibilities of increase in accuracy of turning by ensuring the minimum value of the cut-off layer is considered.

Keywords: machining, quality of processing, processing accuracy, quality class, the reached accuracy, economic accuracy, the blade tool, methods of setup of the machine for the size, precision setup of cutters for the size, minimum the value of the cut-off layer.

To veil quality of processing of details from a sort and features of the selected fair processing. At the same time problems of fair processing consists not only permission of issues of receiving details of the correct form and the exact sizes within admissions, but also in permission of a problem of receiving a durable surface during the work of details in machines.

For this purpose the roughness of a surface should be minimum, these surfaces should be received under such physical conditions of cutting at which surface layer life owes wear proof. For this purpose it is necessary to eliminate: adverse changes of a surface layer arising when roughing; reduction of deformation and the related temperature increase at fair processing.

Depending on requirements imposed to quality of processing both for accuracy, and for quality of a surface, as fair processing apply: expansion, drawing, grinding, thin turning and milling, etc.

Machining with blade tools except for broaches, broach and development carry to the tool preliminary for alighting and final for free surfaces of details of machines. Such application developed because a blade way of processing such as turning, milling, planning and some other ways of processing do not provide the required accuracy or quality of a surface of the processed detail surface.

The worker of high qualification under the corresponding conditions of processing can reach fair turning 7 quality class. However, on comparison with grinding it will be uneconomical. Medium economic accuracy of fair turning on previously configured machine is 9-10 quality class.



In view of considerable percent of application of turning in mechanical engineering it is necessary to consider that the problem of improvement of quality and accuracy when turning is very relevant.

The analysis of different literary data shows that the accuracy of methods of processing depends on the minimum depth of a possible dischargeable metal layer. At expansion and drawing it makes 0.03 mm. When turning such metal layer makes 0.06 mm. It is obvious that turning in serial and mass production by processing on the set-up equipment is almost not possible to receive the accuracy of the diametrical sizes higher than 9th quality class.

At the set properties of a technological system the dominating factor defining the reached processing accuracy on lathes is setup of the machine for the size. In order to that the processed surface received the required sizes and arrangement, it is necessary that the edge of the tool held a certain position concerning surfaces of the details forming base and to provide the high accuracy of turning, first of all, it is necessary to provide the minimum depth of the cut-off layer. As at the same time, owing to small sections of shaving and small values of contact of a cutter with a product of effort of cutting and heating of a detail at minimum cutting depths, turns out very insignificant owing to what there are no significant changes in crystal structure and a peening of a surface layer of metal that provides high wear resistance of surfaces of thinly processed details. Small forces of cutting at the same time allow is limited to very insignificant efforts at a clip of details. Owing to small values of efforts of deformation at installation and processing of details it turns out also insignificant what provides the high accuracy and the correct micro geometry at thin turning. As a result of these factors it is possible to predict the accuracy of the sizes of the details processed above the given conditions from confidence there correspond 7-6 quality class, and it is possible to maintain admissions about 5-8 microns, on diameter of 15-100 mm, values of ellipticity and conicity within 3 microns.

At set a technological system the reached accuracy in many respects is defined by setup of the machine for the size. In order that the processed surface received the required sizes and arrangement, it is necessary that the edge of the tool held a certain position concerning surfaces of the details forming base and allowing to remove shavings of the minimum thickness.

Therefore we analyzed the question of removal of turning of shavings of the minimum thickness. As, the less extreme thickness of a dischargeable metal layer in fair processing, the more precisely it is possible to process details. At the same time it is possible to provide not only high accuracy but also higher class of roughness of the received surface.

Experiments were made on the lathe. To reduce influence of spindle radial error motion on thickness of a dischargeable layer, it was used specially developed



device of selection of a radial gap of a spindle which provided radial beating of a spindle within 2 microns. As the processed material served preparations with a diameter of 50 mm from steel of the brand CT5, CT40X crude and CT40X improved.

Specially developed device for precision installation of a cutter on the size by means of which installation were made with an accuracy of 0.2 microns was used to a possibility of exact installation on depth of cutting.

Processing was carried out with a cutter plates from T15K6 hard alloy which after sharpening were led up on the special finishing machine pine forest carbide paste by means of what it was provided sharpness of the cutting edge in limits $\rho=10$ micron, a face angle $\gamma= +16^{\circ}$, an outside angle $\alpha= 16^{\circ}$, cutting speed $v=150-200$ m/min. Motion $s=0.02-0.1$ of mm / about.

After removal of shaving from the processed section were made additional check by determination of the actual depth by means of measurement of diameter of a sample before processing by the equestrian with the minimeter.

On the basis of the results stated above it is possible to tell that under certain conditions cutting shaving can remove steadily thickness when turning equal 5 microns. providing to the minimum thickness of shaving when turning on the configured machines in the conditions of serial and mass productions it is possible to increase considerably turning accuracy from 9 to 7th quality class and to considerably improve roughness of a surface. As a result in serial and mass productions it is possible to replace preliminary and in certain cases clean grinding of cylindrical surfaces with turning.

Literature:

1. Reference book of technologist of the mecanician. Under the editorship of V.M. Kovan, A.G. Kosilova, etc. M.: Mechanical engineering, 2001.
2. Push V.E., Small movements in machines, - M.: Mechanical engineering, 2009.-171 with
3. Bobtsov A.A., Boykov V.I., Bystrov S.V., Grigoriev V.V. Actuation mechanisms and systems for micro movements of nodes of giving. - St. Petersburg: To SPBT ITMO, 2017.-131 pages.