FACTORS AFFECTING THE QUALITY OF GLASS SURFACES IN MECHANICAL PROCESSING

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Annotation. This work presents an analysis of the effect of abrasive material, chemical composition of glass, lubrication-cooling technological means on the process of mechanical processing of glass materials.

Information about the influence of technological conditions on the process of glass grinding is provided by foreign scientists: Altshuller V.M., Apasenko V.I., Burman L.L., Kachalov N.N., Burmistrov V.V., Vakser D.B., Shrabchenko A. .I., Maslov V.P., Rogov V.V., Filatov Yu.D., Khrulkov V.A., Shukin E.D., Ed N. and others. presented in their works, they made a great contribution to solving the problems of improving the quality and efficiency of processing brittle non-metallic materials. Below is a summary summarizing the main findings from these studies.

Effect of abrasive material. The grinding process can be influenced, first of all, by the abrasive, its grain size and the homogeneity of the grain size. Bonded abrasives are also affected by some special properties, primarily hardness and porosity.

Different grades of polishing powders differ in their physical and mechanical properties, which gives different efficiency in polishing and different quality in polished surfaces. Hardness, brittleness, crushing strength and the shape of the grains are important in grinding [1,2].

The effect of the chemical composition of the glass. Grinding under the same processing conditions depends primarily on its chemical composition. Swellings of different composition have different rolling properties [3,4]. The general rule is as follows: with an increase in the percentage of silicon oxide (SiO_2) and boron oxide (B_2O_3) in the composition, the hardness of the glass increases, as a result, the rate of grinding decreases. Metal oxides such as calcium oxide (CaO), sodium oxide (Na_2O), especially lead oxide (PbO) reduce hardness and accelerate grinding.

Effect of pressure and rotation speed. When machining with a free abrasive, pressure and speed only affect the machining process. The quality of the polished surface does not depend on these factors. As the pressure increases, the number of rotations of the bottle increases. But when the pressure is higher than 700-900 *g/sm* 2 , the efficiency of grinding decreases due to the difficulty of the abrasive to enter the space between the glass and the grinding wheel [5].

Effect of lubrication-cooling technological means. The grinding fluid performs an important mechanical function: it washes away the grinding product (glass and abrasive particles produced by grinding) and removes heat. In addition, it has a physic-chemical effect on the processing area, reduces the state of stress-

deformation in the contact area, accelerates or slows down the grinding process, changes the quality of the processing surface.

Effect of the technological process on the defects of the formed surfaces. At the modern stage of the development of scientific research, which places high demands on the quality of the treated surfaces, the study of the surface layer defects after grinding is gaining importance. Microscopic examination of the polishing effect of individual particles shows what particles are left on the surface and subsurface of the original flat glass.

On the outer surface, under a specific relief, bulges and depressions are formed, and this relief cracks and cracks are directed towards the inside of the glass. The size of the micro-bubbles in the relief layer (in the area of cracks) is longer than the visible light wave. In these micro irregularities, light is scattered and the polished glass surface becomes dull and opaque.

The use of diamond-abrasive tools allows to achieve high quality indicators and accuracy in processing. In order to reveal the technological possibilities of diamond-abrasive tools, it is necessary to consider the effect of processing parameters on the quality of the processed surface and the model representation of this effect.

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