# ABSTRACT

The dissertation presents the results of research on transfer and flow abrasive machining to remove surface unevenness in channels of ABS and Nylon polymer products manufactured with the additive method (FDM printing).

In the introduction, the concepts related to the expected condition of the internal surfaces used for the flow of liquids and gases are explained, and the types of methods for the treatment of channels for polymer and metal products are characterized. In the chapters devoted to the theory of the problem of work, the information is divided into three chapters. The first chapter concerns the characteristics of the process efficiency and the classification of surface properties to the functional requirements of the product. The second chapter presents an analysis of removing surface irregularities; classifies methods of treating internal surfaces and discusses typical methods of removing surface irregularities, most often used in industrial plants. The third chapters describes the theoretical basics of transfer and flow abrasive machining, the importance of technological parameters, the composition of the abrasive paste on the final surface effect obtained. In the following chapters of the theory issues, the dissertation also presents an analysis of domestic and foreign literature related to the process of removing internal surface irregularities, methods of removing irregularities and pressing and flow abrasive machining. Based on a thorough analysis of the literature and preliminary own research, the aim and thesis of the dissertation were formulated and the scope of the dissertation was determined. The next chapter of the work presents the results of the research on the influence of the cross-linking parameters of the medium on the viscoelastic properties of the silane-based polymer in the abrasive paste. It has been shown that the temperature and concentration of the cross-linking solution determine the viscoelastic properties of the polymeric medium and its use as a medium for the AFM abrasive paste. The influence of the pressing force of individual polymer media on the conditions of the flow abrasive machining was also analyzed. The polymer medium showed the highest value of the compaction force, in the shortest time during which the transfer was selected for further research.

In the following parts of the dissertation, the research on the influence of the abrasive paste composition (type of material, size, grain content) on the change of surface roughness in the channels by the flow abrasive machining method is described. The change in roughness parameters is expressed as the relative change in roughness value (RIR) factor. $R_a$, $R_z$, $R_{ku}$ were selected as the roughness parameters described in the tests.

The tests were carried out on samples made of ABS and Nylon. The research was carried out for two types of diamond grain materials (D) and silica (S), five grain sizes and five grain contents in the AFM paste.

The research results was presented in the chapter devoted to the analysis of the change in roughness after flow abrasive machining, on the basis of which it is possible to select the range of parameters at which the surface irregularities in the channels are effectively removed. The influence of treatment parameters such as pressure, frequency, and the number of flow cycles was investigated.

The paper presents the results of the research to assess the effectiveness of the internal surface condition when changing the height of additional markers after flow abrasive machining.

In the last part of the dissertation, the obtained results were summarized and conclusions were formulated. The directions for further research were also defined.

Appendixes presents in tabular form the recommendations for the industry related to the selection of the abrasive paste composition and parameters in the process of removing channel surface unevenness using the flow abrasive method.