*Section: Technical sciences*

**Fialko Nataliia,**
*Doctor of Technical Sciences, Professor,*
*Corresponding Member of NAS of Ukraine,*
*Honored Worker of Science and Technology of Ukraine,*
*Department Head*
*Institute of Engineering Thermophysics of*
*National Academy of Sciences of Ukraine*
*Kyiv, Ukraine*

**Prokopov Viktor**
*Doctor of Technical Sciences, Professor, Leading Researcher*
*Institute of Engineering Thermophysics of*
*National Academy of Sciences of Ukraine*
*Kyiv, Ukraine*

**Sherenkovskiy Julii**
*Candidate of Technical Sciences (PhD),*
*Senior Scientific Researcher, Leading Researcher*
*Institute of Engineering Thermophysics of*
*National Academy of Sciences of Ukraine*
*Kyiv, Ukraine*

**Yurchuk Volodymir**
*Candidate of Technical Sciences (PhD), Senior Researcher*
*Institute of Engineering Thermophysics of*
*National Academy of Sciences of Ukraine*
*Kyiv, Ukraine*

**Kutnyak Olha**
*Researcher*
*Institute of Engineering Thermophysics of*
*National Academy of Sciences of Ukraine*
*Kyiv, Ukraine*

# DETERMINING THE THRESHOLD PERMISSIBLE VALUES OF TECHNOLOGICAL PARAMETERS AT LASER HARDENING BASED ON THE METHOD OF POLYARGUMENT SYSTEMS

An important condition in the implementation of laser hardening technology for a cutting tool is the exclusion of a number of negative, unfavorable situations from the process. One of them takes place during the melting of the zone adjacent to the processed surface and located at some distance from the cutting edge. For this negative situation, it is necessary to determine the conditions for the beginning of melting of the zone and establish the boundary values of the corresponding technological parameters of the process.

The present work is concerned with finding the indicated threshold parameter values for the case of laser hardening of a cutting tool, which is a wedge-shaped body. In order to avoid fusion of the zone adjacent to the work surface and located at some distance from the cutting edge, the dependences of threshold values of the laser beam velocity on the distance between the cutting edge and the center of the beam are obtained.

To solve this problem, the method of polyargument systems was used as applied to the volumetric quasistationary heat transfer problem for a wedge-shaped body in the presence of a laser heating source moving at a constant speed. The main provisions of the construction of these methods are given [1-5].

The paper reveals the features of the behavior of the boundary values of the parameters in this physical situation. The monotonously decreasing character of

the dependence of the dimensionless threshold velocity on the distance between the cutting edge of the tool and the center of the beam is established. The analysis performed of this negative situation with various values of the angle of sharpening of the tool.

The obtained threshold values of the parameters should be taken into account when choosing the technological modes of laser hardening of the cutting tool.

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