

# MANUFACTURING METHODS FOR VIBRO –ROLLING OF THE EXTERIOR SURFACES

**POLOJINTEF CORBU Nicolae, MITRAN Tudor, PATER Sorin, BRATU Ion**  
Universitatea din Oradea  
corbunicolae@yahoo.com

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Estimation of the harshness based only on certain theoretical methods is a difficult task and the results obtained do not correspond to the reality if they are not correlated to experimental trials. For the analysis of the harshness of the vibro-rolled surfaces according to the parameters of the processing, experimental measurements have been carried out using the equipment based on the device for measuring the harshness HV10.

The parameters with major implications in the evolution of harshness have been considered as the rotation speed of the machine part ( $n$ ), the pressing force ( $F$ ) and the advance ( $s_o$ ). In order to study the effects of the frequency ( $f$ ) and of the amplitude ( $A$ ), the measurements have been carried out for two frequencies and three different amplitudes. With the aim of observing the influence of the processing parameters upon the harshness achieved by vibro-rolling, experiments have been made with three types of steel, 18MoCr10, OLC45 and OL37. For analysing the experimental results and in order to define certain mathematical relations which to describe the results in a compact form the approximation of these was made with the aid of the least squares method, using polynomial functions.

The domains of the chosen parameters for the experiments carried out are limited by the functional characteristics of the vibro-rolling installation.

The experiments carried out demonstrate that the methods used for the analysis of the influence of technological parameters on the characteristics of the surfaces obtained are correct and can be used also in the case of more ample experiments when the material resources allow this. By achieving a more performant vibro-rolling installation the domain of experimentations can be extended and larger volumes of data can be obtained, thus enabling a more precise evaluation of the influences studied.

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