NEW SYSTEM BASED ON IMAGE PROCESSING AND ANALYSIS TECHNIQUES FOR VICKERS AND BRINELL HARDNESS SEMI-AUTOMATIC MEASUREMENT

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Abstract

Mechanical tests for measurement of hardness are fundamental to evaluate some metallic materials properties, like wear resistance, ductility and flow tension. The manual process for hardness measurement is very interpretive and subjective, as the reading of needed values (diameters or diagonals) of the indenter on the material in test depends directly on operator's viewpoint (parallax effect), appropriate calibration of test machine and operator's experience. Additionally, one must notice that operator's fatigue or tiredness, due to a high number of tests done, is highly prone to measurement errors.

In this context, the main goals of this work were the development and analyze of a semi-automatic system, based on image analysis and processing techniques, able to determine the Vickers and Brinell hardness values from indentation images. The results obtained using the system developed were compared with those obtained by the conventional manual process. From this comparison, one could conclude that the system developed obtained more accurate and faster results.

Key-words: Hardness test, Vickers and Brinell hardness, image analysis and processing techniques.