Applied Load and Calibration of the Hardness Tester

Jozef Petrik, Marek Solc, Vojtech Miklos
Department of Integrated Management, Faculty of Metallurgy, Technical University of Košice, Letná 9, 042 00 Košice, Slovakia, jozef.petrik@tuke.sk

Introduction into problems - It is expected that the measured value of the hardness will not be dependent on the applied test load and operators carried out the measurement. The Vickers hardness tester was calibrated by three operators using loads between 49.03 and 980.7 N and one CRM (standard) for a full load range. The uncertainty of obtained results was calculated in accord with standard ISO 6507-2 and tolerances analyze method. The capability of the calibration was evaluated by GRR method of the Measurement systems analysis (MSA). The method of total dispersion zone was used for estimation the impact of the variability between operators at particular loads on the measured value of the hardness. The influence of the load on the hardness expressed by Meyer's index "n" excluded ISE (indentation size effect). The influence of operators on the resultant hardness is weak, and the impact of applied load is ambiguous. The values of uncertainty calculated in accordance with the standard and by tolerance analysis are comparable.

Keywords: Vickers hardness test, calibration, uncertainty, capability

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