Monitoring and Evaluating Cutting Tool Wear using a IFM G4 Microscope

Miroslav Zetek, Tomáš Bakša, Václav Schorník, Ivana Zetková
Faculty of Mechanical Engineering, University of West Bohemia. Univerzitní 8, 306 14 Pilsen. Czech Republic. E-mail: mzetek@rti.zcu.cz, baksa@rti.zcu.cz, schorník@rti.zcu.cz, zetkova@rti.zcu.cz

Evaluation of cutting tool wear is the technique generally used when monitoring cutting tool life. Different tool wear types increase depending on the cutting conditions and machined material on the cutting edge surface. The evaluated parameters depend on the tool wear type and where the tool wear is created. All these parameters are described by ISO 3685 standards. When a standard optical microscope is used, it is very difficult to determine the volumetric parameters and, in many cases, the actual (real) area of the tool wear. A standard optical microscope works on the basis of 2D screening. The new microscope works on the basis of 3D scanning, so the user has full information about the surface. This article is focused on the evaluation of the volumetric parameters on the cutting edge, on the size of the built up edge (BUE), and on the formation of the crater. Different coating types on the cutting inserts were used for the testing, and a IFM G4 microscope was used for monitoring and evaluating the tool wear.

Keywords: Cutting tool wear, 3D scanning, Crater tool wear, Built up Edge (BUE)

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