

Hybrid methods for analyzing burr formation in 2D-orthogonal cutting

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Abstract

Any kind of machining process leads to unintentional burr. To avoid or at least minimize burr, hybrid methods for analyzing burr formation have been investigated. A very important aspect of this investigations is the downscaling of the machining process and its influence on burr formation, in particular to locate nonlinearities. The scaling is realized by decreasing the depth of cut and similarly the cutting edge radius of the tool or by using a constant depth of cut and a decreasing cutting edge radius.

The subject of this investigations is the effect of the downscaling on the burr shape, acting forces and thermo-mechanical quantities in the burr shear zone. Therefore on the one hand, simulations of the machining of the workpiece material LSn-63 have been realized with DEFORM and AdvantEdge. On the other hand in order to verify the simulation results, selected experimental investigations have taken place, such as force measurement with a KISTLER measurement platform, temperature measurement with a high-speed infrared camera and the application of the method of visioplasticity.