

Modelling of real area of contact between tool and workpiece in metal forming processes including the influence of subsurface deformation - DTU Orbit (09/11/2017)

Modelling of real area of contact between tool and workpiece in metal forming processes including the influence of subsurface deformation

New equipment for testing asperity deformation at various normal loads and subsurface elongations is presented. Resulting real contact area ratios increase heavily with increasing subsurface expansion due to lowered yield pressure on the asperities when imposing subsurface normal stress parallel to the surface. Finite element modelling supports the presentation and contributes by extrapolation of results to complete the mapping of contact area as function of normal pressure and one-directional subsurface strain parallel to the surface. Improved modelling of the real contact area is the basis for estimating friction in the numerical modelling of metal forming processes.

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