Mechanical Contact Experiments and Simulations - DTU Orbit (03/12/2018)

**Mechanical Contact Experiments and Simulations**

Mechanical contact is studied under dynamic development by means of a combined numerical and experimental investigation. The experiments are designed to allow dynamical development of non-planar contact areas with significant expansion in all three directions as the load is increased. Different geometries and different materials are analyzed including contact between dissimilar materials. The numerical implementation is performed with a finite element computer program based on the irreducible flow formulation, and contact between deformable objects is modelled by applying the penalty method. The overall investigation serves for testing and validating the numerical implementation of the mechanical contact, which is one of the main contributions to a system intended for 3D simulation of resistance welding. Correct modelling of contact between parts to be welded, as well as contact with electrodes, is crucial for satisfactory modelling of the resistance welding process. The resistance heating at the contact interfaces depends on both contact area and pressure, and as the contact areas develop dynamically, the presented tests are relevant for assessing the validity and accuracy of the mechanical contact modelling. Experimental results and numerical predictions show good agreement as regards geometry and force-displacement curves.

**General information**

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