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Validating Material Modelling of OFHC Copper Using Dynamic Tensile Extrusion (DTE) Test at Different Impact Velocity NICOLA BONORA, GABRIEL TESTA, ANDREW RUGGIERO, University of Cassino and Southern Lazio, GIANLUCA IANNITTI, TECHDYN Engineering, MAGNUS HÖRNQVIST, NOOSHIN MORTAZAVI, Chalmers University of Technology — In the Dynamic Tensile Extrusion (DTE) test, the material is subjected to very large strain, high strain rate and elevated temperature. Numerical simulation, validated comparing with measurements obtained on soft-recovered extruded fragments, can be used to probe material response under such extreme conditions and to assess constitutive models. In this work, the results of a parametric investigation on the simulation of DTE test of annealed OFHC copper - at impact velocity ranging from 350 up to 420 m/s - using phenomenological and physically based models (Johnson-Cook, Zerilli-Armstrong and Rusinek-Klepaczko), are presented. Preliminary simulation of microstructure evolution was performed using crystal plasticity package CPFEM, providing, as input, the strain history obtained with FEM at selected locations along the extruded fragments. Results were compared with EBSD investigation.

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