

Abstract Submitted  
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**Full multiphase description of materials: application on tin.** GREGORY ROBERT, LAURIANNE PILLON, GABRIEL SEISSON, CEA, DAM, DIF, F-91297 Arpajon, France, CAMILLE CHAUVIN, CEA, DAM, CEG, F-46500 Gramat, France — When a solid material is subjected to dynamic loading, a shock wave propagates from the impacted to the free surface where it is reflected. The behavior at free surface depends on the local state of matter and its roughness. When the material is in solid phase, spall appears in the bulk and the free surface remains intact. However, when a liquid or mixed solid/liquid phase appears, micro-spall occurs. Combined with roughness effects, the free surface crumbles into a particles cloud and leads to micro-jetting. Describing these processes in hydrodynamic codes remains a challenge since the equation of state (EoS), phase change kinetics, strength and damage modelling are all together involved in this description. Using tin as a school material, we initiated a program of work to improve our understanding of these mechanisms. It is based on a full modelling, implemented in a hydrocode. Here, we introduce this model based on a simple way to connect EoS, strength law and damage modelling. We show that the material description in the hydrocode calculation is improved. Details on stochastic analysis techniques used to determine the EoS (Pooh code) and the strength (CALiXt code) parameters will also be provided.

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