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Secondary jets from high viscosity complex fluid[1] GUSTAF MÅRTENSSON, THOMAS KURIAN, GUSTAV GRAEBER, Micronic Mydata AB
— Jetting of high viscosity, particle filled fluids (e.g. solder paste) is of great interest in any number of industries, for example electronics manufacturing. A current problem with this technique is the presence of particle satellites outside the region of the main deposit caused partly by a secondary jet being emitted upon impact. Up to now most detailed studies of corona splashes have been performed mainly on Newtonian fluids.[2] We experimentally study the impact dynamics of a non-Newtonian fluid, lead-free solder paste, with a particle volume fraction of 0.45 and particle size range between 15 and 25 μm. The collected films show that over a range of impact velocities, secondary jets are only emitted after impact for high velocities. These observations are important in that they indicate an upper limit on the impact velocity that can be used in a real application. A threshold criteria for the production of secondary jets as a function of viscosity, η, surface tension, γ, and speed, v, will be presented.

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[2]Xu, L. et al. 2005 "Drop Splashing on a Dry Smooth Surface," *PRL*, **94**, pp. 1-4

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