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Non-Newtonian Effects of Ink-Jet Printed Droplets

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The influence of non-Newtonian effects on the droplet formation in an ink-jet printer has been investigated both experimentally as well as with a simple theoretical model. For the experiments, Newtonian liquids and model systems of solutions of flexible polymers (PEO, polyethylene oxide) and stiff polymers (Xanthan Gum) were used. The non-Newtonian effects were modeled by only taken into account the influence of the elongational viscosity and not the stress history effect. It is shown that the elongational viscosity in itself is not sufficient to understand the filament formation; the stress history effects can not be neglected.

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