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**Generation of highly-viscous microjets**[1] YOSHIYUKI TAGAWA, HAJIME ONUKI, YUTO OI, Tokyo Univ of Agri & Tech — An ink-jet printing system (or a liquid-dispensing device) has ecological and cost advantages compared to other printing systems such as offset printing and gravure printing since it requires a small amount of liquids. However, most ink-jet printers are not able to eject high-viscous liquids more than 10 cSt. This limitation severely restricts applications of the ink-jet system. Here we present a novel jet-generation system, discharging jets of high-viscous liquids up to 1,000 cSt. The system employs an impulsive force and converges the force efficiently in order to accelerate the liquid-air interface strongly for generating viscous jets: It consists of a liquid container and a thin tube partially inserted in the liquid. The liquid-air interface inside the thin tube is set deeper than that outside of the tube. We then add an impulsive force on the bottom of the container, leading to the microjet generation inside the thin tube. The pressure field under the impulsive force is estimated using pressure-impulse approach, deriving the jet velocity. The jet velocity is experimentally measured with varying the impulsive force and liquid levels in the tube and the container. It is found that the measured velocities agree with the estimation. Owing to the simple structure of the generation system and an ability for ejecting viscous liquids, it could extend the limits of existing ink-jet printers and may be applicable for next-generation technologies such as 3D printing systems and needle-free injection devices.

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