

The Flow Dynamic Simulation and Experiment of Piezoelectric Printhead

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Abstract

This paper investigates the flow dynamic behaviors with respect to different frequency of the piezoelectric print head by using the way of simulation and experimental method. Its geometric model is divided into three zones for easy description as channel zone, nozzle zone and ejection observing zone. The length, width and orifice diameter of the micro-channel are 2,000 μm , 400 μm and 30 μm , respectively. The moving wall is located on the top wall of the channel zone in order to obtain proper condition for single drop generation; we applied the numerical simulation by commercial CFD software CFD-ACE+ 2006. The most important purpose of this study is to find out the optimal frequency to eject droplets periodically and control the volume of droplet ejection which may provide the reference for experimental work later on. The results show that by fixing the contact angle and frequency from 2,000Hz to 20,000HZ. After simulation analyses, this paper also discuss about piezoelectric print head manufacture. Aiming piezoelectric print head do a series test, discussing about frequency effect to the print head.

Key words: piezoelectric printhead