

**McCreery, G. E.; Stoots, C. M.**

**Drop formation mechanisms and size distributions for spray plate nozzles.** (English)

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Summary: This article describes the results of an experimental investigation of drop formation mechanisms and drop diameter distributions for spray plate nozzles. Spray plate nozzles are comprised of a distribution nozzle which projects a high velocity jet of water concentric on a plate. The resultant water film flows radially outward on the plate and breaks into drops after the liquid detaches from the plate and flows outward as a sheet. The drop size distribution is determined by a balance between shear forces with air and flow instabilities and turbulence in the liquid sheet flow, which tend to fracture the liquid sheet and drops, and surface tension forces, which tend to hold the liquid sheet and drops together. Experimental results include short duration photographs of nozzle jet flow, liquid film flow, and of water drop formation. Drop diameter distributions were obtained with a phase Doppler particle analyzer (PDPA). The variations of drop mean diameter, volumetric mean and Sauter mean diameters as functions of pressure, distribution nozzle-to-plate distance, and plate diameter are quantified.

**MSC:**

76Txx Multiphase and multicomponent flows

**Keywords:**

drop; drop size distribution; liquid jet; liquid sheet; spray nozzle

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