Measurement of Water Droplet Diameter Using Experiment, Theory and High-Speed Visualization Technique

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Sarravanan D. [a] ; Illias S. [a] ; Hussain S. [a] ; Mohamad M.S. [a] ; Ani M.H. [b]

[a] Faculty of Mechanical Engineering & Technology, Universiti Malaysia Perlis, Pauh Putra Campus, Perlis, Malaysia

Abstract

Before starting any experimental work regarding droplet impact experiments, it is very important to verify and confirm the droplet size and diameter. The main reason behind this would be to ensure that every single droplet is almost of the same size before any scientific analysis is carried out. Therefore, the aim of this study is to perform a single water droplet diameter measurement through experimental work, theoretical calculation and high-speed digital imaging technique. In the experimental work, distilled water was used as a test liquid. A digital microscope was used to measure the inner and outer sizes of the droplet dispenser nozzle. The water drop test was performed up to 1000 times (200x5). The average reading of a single droplet weight was measured. The droplet diameter was also calculated using a theoretical calculation. On top of that, the droplet diameter was also measured using a high-speed video camera. From the overall result, it was found

that the droplet diameter calculated using theoretical calculation and the one measured using high-speed video camera imaging closely agreed with each other.

Author keywords

Droplet diameter; Experimental measurement; High-speed video camera; Nozzle size; Theoretical calculation

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Corresponding authors

Corresponding author	S. Illias
Affiliation	Faculty of Mechanical Engineering & Technology, Universiti Malaysia Perlis, Pauh Putra Campus, Perlis, Malaysia

Email address suhaimi@unimap.edu.my

Abstract

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Corresponding authors

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