

INTISARI

Penelitian ini bertujuan untuk mengetahui efek dari variasi bilangan *weber* terhadap dinamika tumbukan *single droplet* pada sebuah permukaan spefisik yang dipanaskan. Meterial benda yang dipanaskan adalah *Stainless Steel Grade 304* dengan variasi bilangan *weber* bernilai 10, 30 dan 60. Nilai variasi temperatur benda uji yang akan diteliti adalah 100 °C, 120 °C, 150 °C, 180 °C, 200 °C dan 220 °C. *High speed video camera* digunakan untuk mengamati fenomena dinamika tumbukan *droplet* yang jatuh dengan durasi singkat yakni 1 - 2 milisekon. Dengan bantuan aplikasi MATLAB, hasil rekam dari *high speed video camera* diolah dengan teknik *image processing* untuk mendapatkan nilai *spreading factor*, *apex height*, *contact angle*, *front velocity*, *rear velocity*, *contact time*, serta hasil *regime* fenomena dinamika tumbukan *droplet* pada bidang miring. Didapatkan informasi awal bahwa peningkatan variasi nilai *weber* dapat meningkatkan nilai *spreading factor* dengan persentase rata – rata 16%.

Kata kunci : *droplet*, *single droplet*, *image processing*, *spreading factor*, *apex height*, *contact angle*, *front velocity*, *rear velocity*, *contact time*

ABSTRACT

The objectives of this research are to understand the effect of Weber Number variations of single impacting droplet on a specific heated surface. The heated material is Stainless Steel Grade 304 with the Weber Number variations valued at 10, 30, and 60, respectively. The temperature variants of the specimens that were observed were at 100 °C, 120 °C, 150 °C, 180 °C, 200 °C, and 220 °C. High speed video camera was used to investigate the phenomenon of impacting droplet which fell at brief duration, between 1 - 2 milliseconds. Initial information obtained that the increase of Weber Number variations could raise the spreading factor value. Using MATLAB program, the result of recorded pictures from the high speed video camera processed with the image processing technique to obtain the spreading factor value, apex height, contact angle, front velocity, rear velocity, and the contact time, as well as the result of the impacting droplet dynamics regime phenomena. Initial information obtained that the increase of Weber Number variations could raise 16% of spreading factor.

Keywords: droplet, single droplet, image processing, spreading factor, apex height, contact angle, front velocity, rear velocity, contact time.