



INTISARI

Multiple droplets adalah tetesan air yang terus menerus dijatuhkan pada suatu permukaan. *Spray cooling* merupakan salah satu contoh aplikasi penggunaan *multiple droplets* untuk proses pendinginan. *Spray cooling* biasanya digunakan untuk mendinginkan permukaan panas pada proses reaksi inti nuklir, pembentukan material *quenching*, dan peralatan elektronik.

Pada penelitian ini dipelajari lebih lanjut tentang pengaruh *wettability* terhadap fenomena yang terjadi pada *spray cooling*. Proses visualisasi dilakukan untuk mempermudah pengamatan karakteristik dari setiap tetes *droplet*. Teknik *image processing* digunakan untuk mengambil data secara *sequential* dari gambar yang berhasil diambil dengan menggunakan *high-speed camera*. Variabel suhu permukaan dan jenis material dicari korelasinya terhadap sifat *wettability*. Kemudian dicari hubungan antara sifat *wettability* dengan laju pendinginan.

Hasil yang didapat dalam penelitian ini diketahui bahwa suhu permukaan tidak terlalu berpengaruh terhadap sifat *wettability*. Sedangkan jenis material mempunyai pengaruh yang sangat signifikan terhadap sifat *wettability*. Sifat *wettability* antara suatu permukaan dengan cairannya sangat berpengaruh terhadap laju pendinginannya. Semakin baik sifat *wettability*-nya semakin cepat pula laju pendinginannya.

Kata kunci : *Droplets, wettability, heat transfer, contact angle, spreading factor.*

ABSTRACT

Multiple droplets are a drop of water that continuously dropped on a surface. Spray cooling is an application of the use of droplet on a cooling system. Spray coolings are usually used in a cooling system of the nuclear reaction of power plant, material quenching and other electronic devices.

In this study, correlations between wettability and phenomena that happens in spray cooling are investigated and discussed. Visualization process is used to study the dynamic characteristics of droplet impingement in more details. Image processing technique is used to capture the data from the sequential images from a high-speed camera. Variable such as surface temperature and specimen variety are to be studied for its correlation to wettability. Then, correlation between wettability and cooling speed is to be analyzed.

The results of this study show that surface temperature does not have significant effect to wettability. However, specimen variety affects wettability in very significant way. Then, the wettability between a surface and its liquid has an effect to its cooling speed. When the quality of the wettability is increased, the cooling speed will also be increased.

Key words : *Droplets, wettability, heat transfer, contact angle, spreading factor.*