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# Number of Blades of Rotating Blades Effected on the Nucleate Boiling Heat Transfer Enhancement of distilled water

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This study examined the nucleate pool boiling heat transfer characteristics of distilled water at atmospheric pressure on a horizontal circular plate with rotating blades installed above a heating surface. The experiments were performed to explore the effects of number of blades as well as the visualization of pool boiling phenomena on nucleate boiling characteristics and the heat transfer coefficient. The rotating blades were made from copper material, with the number of blade of 2, 3 and 4 blades, a diameter of 30 mm, a blade angle of 90o, a core of 5 mm, and a length of 50 mm. The study examined the effect of a varying the number of blade on the pool boiling heat transfer characteristics, the heat transfer coefficient and the pool boiling phenomenon. The results showed that, the number of blade of 4 blades yielded a higher heat transfer coefficient than the number of blade of 2 and 3 blades, because the increased number of blade provided more chance for the bubbles to strike the rotating blades. Hence, the rotating blades did create a commotion of the working fluid above the heating surface. High speed camera frames were captured using an Aos Promon Studio at 500 fps at the heat fluxes about 160-610 kW/m2 to identify the location of bubble nucleation for each configuration, and to predict the liquid supply pathways. The photographic observations show that, the pool boiling pattern with the heat flux value about 160 kW/m2 was the isolated bubble regime, and with the heat flux value about 610 kW/m2 was the column regime.

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