

SUMMARY

Firstio Noveldo Ananda, Mechanical Engineering, The Faculty Of Engineering At Brawijaya University, Juni 2016, Effect of Hole Width Variation on The Surface of Boiling Water Efficiency in Pool Boiling Process, Supervising Lecturer: Agung Sugeng Widodo, Francisca Gayuh Utami Dewi.

Since the global issues of depletion of fossil energy reserves in the world exist, encouraging energy users primarily who consume energy in medium until large scale to be anticipated by improving the thermal system. Coal is a types of fossil fuel that play an important role in the power plant system which is very important role in the supply of electricity for the various sectors of industry in several region in Indonesia. One of the step to anticipate the scarcity of that fossil fuels is by increasing the efficiency of boilers in the power plant system primarily in industrial field that use fossil fuels as fuel for the boiler that is by making the surface roughness of heat exchanger in the process, in this case the boiler. Modifications to the surface will improve the nucleation on the surface so the rate of heat transfer in boiling process also increases. It is observed that the irregularities on the heated including surface roughness and impurities considered as additional nucleation sites during the boiling process.

In this study observed the effect of surface roughness of the plate with a hole wide variation on the efficiency of boiling water on pool boiling process. In this research using the aluminum plate by the surface roughness in the form of line-shaped hole with a depth of 0.5 mm and a width of 0,4 mm hole (specimen 1); 0,6 mm (specimen 2); 0,8 mm (specimen 3); and plain plate (without roughness), which is the plate acts as a boiler surface with 80mm long, 30mm wide, and has a 1,5mm of thickness. The heater used is an electric heater with a voltage of 220 volts and a current of 2 amperes. Furthermore, collecting the data of the surface temperature, water temperature, and time during the boiling process. Also observing the processes that occur the surface.

These results indicate that the surface roughness on the boiler in the form of wide differences holes on each specimen affect the value of heat flux, heat transfer coefficient and the efficiency of the boiling process. The Plate which has a surface roughness with the widest hole producing the biggest boiling heat flux and the highest efficiency because the bubbles are formed by large holes will be greater so that heat is transferred more and more. That matter, which increases boiling heat flux and boiling efficiency.

Keywords: heat transfer coefficient, heat flux, efficiency, pool boiling.