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Heat Transfer of High Pressure and
High Temperature Water in Forced Convection

Kohei OKAMI*

Nowadays power plants require increasingly higher pressure and higher temperature steam to raise their efficiency. It is expected that generally steam in the supercritical region will be used more and more.

The available informations about the heat transfer coefficient of steam in the supercritical region is limited owing to the large and complex change of the physical properties of steam in that region. So many researchers are trying to study the heat coefficint of supercritical steam experimentally. But at present no clear results have been obtained. The author tried to get exploring data with newly built apparatus.

First the author designed and constructed the new apparatus, and then tried following experiment to confirm its characteristics at the region of moderate pressures and temperatures. In the past, heat transfer experiments have been performed under high heat flux to be applied to power plants, and in those studies the formula $N_u = f(R_e, P_r)$ has been used. The author tried to find heat transfer coefficient under lower heat flux. For the case of low heat flux, the author proposed new formula, $N_u = f(R_e, P_r, K)$.

In this case K means dimensionless number which shows how many heat flux is given to the fluid.

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