HEAT TRANSFER ANALYSIS BY USING COPPER INSERTS IN FORCED CONVECTION

A Project report submitted

In partial fulfillment of the requirements for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

MECHANICAL ENGINEERING

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CERTIFICATE

This is to certify that project work is entitled **"HEAT TRANSFEER ANALYSIS BY USING COPPER INSERTS IN FORCED CONVECTION "** is a bonafide record done by **R. MADHU (15811A03B5), R.GOPI (15811A03B1), S.SAI KUMAR (15811A03B9), S. KASI (15811A03B7)** students of final year **B.Tech** in the Department of **Mechanical Engineering**, Avanti Institute of Engineering and Technology, Visakhapatnam. This work was done for the fulfillment of the requirements of the award of **Bachelor of Technology** during the year 2018-2019.

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ABSTRACT

Conventional sources of energy have been depleting at an alarm rate, which makes future sustainable development of energy use very difficult. Thus, researches on seeking ways to reduce the size and cost of heat exchangers have been conducted. Heat transfer enhancement technology has been developed and widely applied to heat exchanger applications over the past decades.

Convective heat transfer in a tube is dynamically different from one without inserts. It is well established that the swirl created in the medium facilitates energy transportation from the tube wall thereby increasing the heat transfer coefficient 'h', in the tube flow.

In the present project work, experiments are carried for the plain tube without any inserts, for different heat inputs and different flow rates and different heat transfer coefficients are calculated for each case. The same procedure is repeated with the straight tape insert, twisted tape insert with number of turns 2,3 and helical tape insert with number of turns 7,9.

Thus, by these augmentation techniques, it is observed that the heat transfer rate is significantly increasing and the obtained experimental results are theoretically verified with the energy balance equation.