

DESIGN OF HEAT EXCHANGER (SHELL AND TUBE) IN PPSDM OIL AND GAS BASED CEPU ON FINITE ELEMENT METHOD (FEM)

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ABSTRACT

The Center for the Development of Oil and Gas Human Resources (PPSDM MIGAS) is a refinery industry and facilities for education and training in the field of oil and gas located in Cepu, Central Java. One of the units developed by PPSDM MIGAS is a refinery unit. This unit requires a cooler as a heat exchanger that serves to change the temperature. The purpose of writing is to be able to determine the speed of solar energy in the heat transfer process in the heat exchanger, and find out the type of cooler and the most optimal material used in the design of shell and tube type solar heat exchanger. Cooler in Oil Gas PPSDM is used to cool diesel from temperature 98°C to 39°C. Simulations were carried out using finite element method (ANSYS) in the form of 2D shape. Simulation is done by using cooling water variables with a value of h is 9, 12, 15, 18, 20 J/m²K, and variable of AISI 1010, AISI 1030, AISI 1050, and AISI 1070 in the shell and SS 302, SS 304, and SS 308 section in the tube. From the simulation done the speed of the heat transfer process 0,011 m/s by using the optimal cooling of water with value of h at 20 J/m²K and the optimal type of material used is SS 302 in the shell and AISI 1010 in the tube.

Keyword : cooler, finite element method, heat exchanger, solar