

## عنوان مقاله:

.Simulation of the effect of using a finned tube on the thermal efficiency of a Helicopter shell and tube heat exchanger

## محل انتشار:

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## خلاصه مقاله:

In this paper, flow and heat transfer inside a helicopter shell and tube heat exchanger is simulated in three dimensions. This converter consists of a shell with ۹۰ U-shaped tubes inside. For further heat transfer, the tubes were simulated and compared once without fins and again with fins, which are produced longitudinally and integrally with the tube body. The current flowing in the shell is MIL-PRF ۲۳۶۹۹ oil and the flowing fluid in the tubes is JP-۴ fuel. These two fluids flow in opposite directions and exchange heat with each other. Using Aspen software, the design is done in such a way that the heat exchanger has minimum length and weight to have a better and higher effect on the efficiency of the helicopter. To investigate the effect of tube geometry and oil mass flow on the heat transfer between fuel and oil, simulation has been performed in ANSYS Fluent program. In this simulation, a part of the whole heat exchanger is selected as the geometry and the effect of changing the geometry of the tubes, mass flow of fuel and oil on the heat transfer coefficient, Colburn coefficient, coefficient of friction and their ratio, and outlet temperature changes are investigated. The results of this simulation show that the heat transfer rate between fuel and oil for a heat exchanger with finned tubes is about ۱۱% higher than without a fin. Also, reducing the mass flow of oil entering the shell increases the efficiency of the heat exchanger.

## کلمات کلیدی:

Shell and tube heat exchanger, Colburn factor, heat transfer, Fin-tube, friction factor

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