

عنوان مقاله:

Pressure Drop Characteristics of CuO-Base Oil Nanofluid Flow Inside Flattened Tubes under Constant Heat Flux

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خلاصه مقاله:

In this study, an experimental investigation has been carried out to study the pressure drop characteristics of CuO-Base oil nanofluid flow inside horizontal flattened tubes under constant heat flux. The nanofluid is prepared by dispersion of CuO nanoparticle in a base oil and stabilized by means of an ultrasonic device. Nanofluids with particles weight fractions of 0.2%, 0.5%, 1% and 2% were used. The copper tubes of 11.5 mm I.D. were flattened into oblong shapes and used as test sections. The required data were acquired for laminar fully developed flow regimes. The effect of different parameters such as mass velocity, flattened tube internal height, nanofluid particles concentration and fluid temperature on pressure drop is studied. For a given flattened tube and a specific fluid, the results show that by increasing of mass velocity, the pressure drop is increased as it was expected. Moreover, the pressure drop increases at a given mass velocity as the tube profile is more flattened. Also, the effect of increase in nanoparticles concentration on pressure drop has been investigated. Observations show that by using nanofluid instead of base fluid, the pressure drop increases and this enhancement grows at higher nanoparticles concentration. As a result, it can be concluded that decreasing the internal height of the flattened tubes and enhancing the concentration of nanoparticle both have adverse effect on the flow pressure drop. Also, the results show that the amount of increase in pressure drop, caused by employing nanofluid instead of the base fluid, is miniscule compared to that of produced by flattening the tube.

کلمات کلیدی:

Pressure Drop, Nanofluid, Flattened tube and Constant Heat Flux

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