Abstract

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experimentalnumerical comparison between the performance of helical cone coilsordinary helical coils used as dehumidifiers for humidification dehumidification in desalination units"

helicalspiral coils were used for too long as heat exchangers in powerchemicalmprocesses. this numerical research is introducing the concept of helical cone coils andrncomparing the performance of helical cone coils as heat exchangers to the ordinary helicalmcoils. helicalspiral coils are known to have better heatmass transfer than straightmubes, that's attributed to the generation of a vortex at the helical coil known as dean vortex, in this vortex is a secondary flow superimposed on the primary flow. the dean number which ruis a dimensionless number used in describing the dean vortex is a function of reynoldsmnumber square root of the curvature ratio, so varying the curvature ratio for the samerncoil would vary the dean number. experimental numerical investigation based on thermcommercial cfd software fluent was made to understand the difference between ordinarymhelical coilshelical cone coils. two coils having different heights of 4050 mm andmthicknesses 0.6 mm0.7 mm were used in the investigation. it was found that as the tapermangle enhances the heat transfer characteristics of the coil this increase is presented in annincrease in the coil exit temperature, the numerical simulation showed that the heat transferrncharacteristics of the helical cone coil is better than the ordinary helical coils.