



25 mm

## Convective heat transfer enhancement inside tubes using inserted helical coils

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Convective heat transfer was experimentally investigated in tubes with helical coils inserts in turbulent flow regime within Reynolds number range of  $14400 \leq Re \leq 42900$ . The present work aims to extend the experimental data available on wire coil inserts to cover wire diameter ratio from 0.044 to 0.133 and coil pitch ratio from 1 to 5. Uniform heat flux was applied to the external surface of the tube and air was selected as fluid. The effects of Reynolds number and wire diameter and coil pitch ratios on the Nusselt number and friction factor were studied. The enhancement efficiency and performance criteria ranges are of (46.9--82.6%) and (100.1--128%) within the investigated range of the different parameters, respectively..... Correlations are obtained for the average Nusselt number and friction factor utilizing the present measurements within the investigated range of geometrical parameters and Re

**Keywords:** convective heat transfer, turbulent flow, enhanced tubes, helical coils.

Abstract 200-250 words

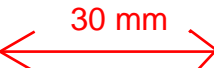
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The aim of augmented heat transfer is to achieve higher heat transfer coefficients and consequently accommodate high heat fluxes to reduce the size and cost of heat exchangers. Enhancement techniques are classified into:

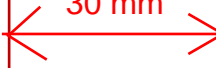
methods in which the inner surface of the tube is roughened e.g., repeated or helical ribbing, sanding, internal fins or corrugation;.....



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