

# Experimental Investigation of Heat Transfer from Helical Coiled Tubes in a Water Tank

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## Abstract

Heat exchange in hot water storage tanks is commonly conducted with helical coiled tubes. In this study, steady state heat transfer from helical coiled tubes in water are investigated experimentally for laminar flow regime. Helical coiled tubes of different geometric sizes were incorporated into hot water tank. The water in this tank was heated between 50 to 80 °C at intervals of 10 °C via two electrical heaters (with a total power of 7,5 kW) placed at the bottom of the tank. Cold water at 20 °C was pumped through the helical coiled tubes with a flow rate range between 2 - 5 l/min. During the experiments, the inlet and outlet temperatures of the cold water to the helical coils were measured. Outer surface temperatures of the helical coil in each turn and the temperature of the water in the hot water tank were also measured. Then using these obtained data, Nu number was calculated and the effectiveness of the helical coiled tubes compared according to the  $\epsilon$ -NTU method.

**Keywords:** *helical coiled tube, heat exchanger, Nusselt number,  $\epsilon$ -NTU method*