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# Experimental Investigation of Inclined Circular Ring Turbulators on Heat Transfer and Fluid Flow Characteristics

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## Abstract

This paper demonstrates influence of various inclination of Circular Ring Turbulator (CRT) on thermal characteristics in circular type heat exchanger. "A wall linked circular inserts were analyzed having constant inner diameter to achieve uniform flow blockage area (FBA) of 40%". These CRTs located within the tube to prevailed different angular patterns (-10°, -15°, -20° and -25°) w. r. t. horizontal of tube. Influence of these geometries on fluid friction and heat performance were studied. Parameter constant throughout the investigation was diameter ratio and Pitch Diameter Ratio (PDR). Modified parameters throughout study were the angular inclinations of CRT and Reynolds number. Inner side of tube is preserved at constant heat flux having air as working medium at atmospheric temperature with variation of Reynolds number from 6,000 to 24,000 respectively.

Implementation of CRT as turbulator favorably improves rate of heat exchange within heated enclosure of tube to fluid domain throughout the test model. Out of all studied inserts, CRT having angular deflection of -25° gives peak value of heat transfer at extreme Reynolds number and at slightest Reynolds number CRT having angle inclination of -10° offers greater friction factor which is at 2.5 and

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