

Jet Impingement Heat Transfer on a Rib-Roughened Flat Plate

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Abstract : Cooling by impingement jet is known to have a significant high local and average heat transfer coefficient which make it widely used in industrial cooling systems. The heat transfer characteristics of an impinging jet on rib-roughened flat plate has been investigated numerically. This paper was set out to investigate the effect of rib height on the heat transfer rate. Since the flow needs to have enough spacing after passing the rib to allow reattachment especially for high Reynolds numbers, this study focuses on finding the optimum rib height which would be the best to maximize the heat transfer rate downstream the plate. This investigation employs a round nozzle with hydraulic diameter (D_h) of 13.5 mm, Jet-to-target distance of (H/D) of 4, rib location= $1.5D$ and and finally jet angles of 45° and 90° under the influence of $Re = 10,000$.

Keywords : jet impingement, CFD, turbulence model, heat transfer

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