

Fluid Flow in Roughened Square Tube for Internal Blade Cooling

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Abstract : A computational investigation has been undertaken to study fluid flow through roughened tube with turbulators. Such flows are of particular interest in cooling internally high pressure turbine blades. Turbulators are fixed in each side of the passage (tube) to promote turbulence and enhance heat transfer. The tube had an aspect ratio of 1 and the position of the ribs closest to the bend are at $0.45d$ from the entrance and exit of the bend. The aim of this study is to examine the tube roughened by turbulator by studying some flow parameters upstream and downstream of the turbulator. It is cleared that the eddies sizes are decreased downstream in the first two turbulators and increased after the turbulators increases the turbulence in the tube and enhanced the heat transfer in the blade.

Keywords : fluid flow, turbulator, computation, blade

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