

Temperature Distribution Enhancement in a Conical Diffuser Fitted with Helical Screw-Tape with and without Center-Rod

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Abstract : Temperature distribution investigation in a conical diffuser fitted with helical screw-tape with and without center-rod is studied numerically. A helical screw-tape is inserted in the diffuser to create swirl flow that helps to enhance the temperature distribution rate with inlet Reynolds number 4.3×10^4 . Three pitch lengths ratios ($Y/L = 0.153, 0.23$ and 0.307) for the helical screw-tape with and without center-rod are simulated and compared. The geometry of the conical diffuser and the inlet condition for both arrangements are kept constant. Numerical findings show that the helical screw-tape inserts without center-rod perform significantly better than the helical tape inserts with center-rod in the conical diffuser.

Keywords : diffuser, temperature distribution, CFD, pitch ratio

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