

Flow Behavior and Performances of Centrifugal Compressor Stage Vaneless Diffusers

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Abstract : Flow parameters are calculated in vaneless diffusers with relative width 0,014 - 0,10 constant along radii. Inlet flow angles and similarity criteria were varied. Information about flow structure is presented - meridian streamlines configuration, information on flow full development, flow separation. Polytrophic efficiency, loss and recovery coefficient are used to compare diffusers' effectiveness. The sample of narrow diffuser optimization by conical walls application is presented. Three tampered variants of a wide diffuser are compared too. The work is made in the R&D laboratory "Gas dynamics of turbo machines" of the TU SPb.

Keywords : vaneless diffuser, relative width, flow angle, flow separation, loss coefficient, similarity criteria

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