

عنوان مقاله:

Evaluating the Effects of Blade Tip Clearance in Various Stages on the Performance of an Axial Compressor

محل انتشار:

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خلاصه مقاله:

In the current study, the influence of blade tip clearance in different stages of a three-stage compressor is investigated. Performance diagrams of compressor were verified against experiment when there is no change in the tip clearance, after which the effect of tip clearance for the cases, 1, 1.5 and 2 mm, in the first, second and third stages of rotor was studied. The results indicated that the impact of tip clearance increase did not have any effect on choked flow rate value in the first and second stages, and only the change in the third stage tip clearance reduced the choked flow rate. For the same tip clearance value, the highest compressor performance loss occurs in the case of applying the tip clearance in the third stage, which is also the final stage and is highly sensitive to tip clearance changes. Moreover, modifying the tip clearance is effective on the flow angle in the trailing edge and as the tip clearance increases, the same thing happens about the flow angle. The maximum value of flow angle changes by modifying the tip clearance belongs to the third stage of the compressor.

کلمات کلیدی:

Variable tip clearance, Compressor performance, Stall margin, Flow angle

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