

# CASCADE STUDIES OF SWEPT, CDA AND TANDEM BLADES FOR AXIAL FLOW COMPRESSORS/FANS

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## ABSTRACT

The design and development of high-speed multi stage axial compressors has become one of the most important technical challenges in recent years. Compressor has a dominant influence on the gas turbine characteristics. Efficient axial compressor design can only be accomplished with high flow deflection and low losses across the blade. It is desired that the flow over the cascade blades be two-dimensional but after entry into the cascade the flow acquires three dimensionality due to the presence of boundary layers on the end walls of the tunnel and on the blade surfaces. Information about the flow on the surface of an object being studied is usually most critical. Key aspects of surface flows that may be investigated using flow visualization techniques include stagnation point location, separation lines, location of boundary layer transition, characteristic unsteadiness, extent of separation zones, types of critical points and their locations. The simplest and most frequently used method for surface flow visualization is to attach tufts to the surface of interest. The flow visualization experiments were conducted on three different kinds of blades, which are the controlled diffusion airfoil (CDA), the tandem CDA blades and the swept blades in axial flow compressors. The experiments were conducted using a low speed cascade wind tunnel.

## References:

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