

SELECTED TOPICS In Aerospace Engineering

EDITOR

ERWIN SULAEMAN



IIUM Press

INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

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***TWO-DIMENSIONAL ANALYSIS OF
COMPRESSORS***

The flow inside the compressor can be assumed as two-dimensional flow, if the following assumptions are considered:

- Blade height is small compared with the mean radius
- Flow is invariant in the circumferential direction
- No velocity in the radial direction

A compressor stage is composed of a rotor blade row followed by a stator blade row, as shown in Figure 4. The rotor blades (black) are fixed to the rotor drum and the stator blades are fixed to the outer casing. Inlet guide vanes are stator blades located upstream of the first stage to direct the inlet flow. They work as turbine nozzles; they accelerate the flow rather than diffuse it. Hence, they increase the kinetic energy of the flow at the expense of the pressure energy.

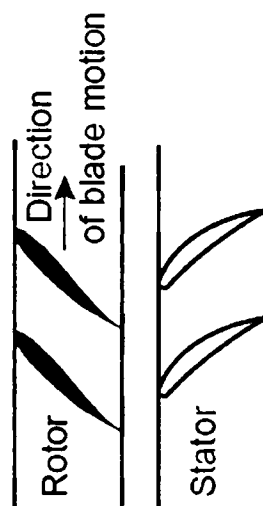


Figure 4 Stage blade rows.