

DESIGN AND ANALYSIS OF HOLLOW GUIDE BLADE

A project report submitted in the partial fulfillment of the requirements for award of degree of

BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING

Submitted by

V.MURALI KRISHNAM NAIDU	18815A0368
K.NOOKA PAVAN KUMAR	18815A0325
S.SESHADRI	18815A0378
P.NAVEEN KUMAR	18815A0343

Under the guidance of

M.V.D.K RAJU

Assistant professor

DEPARTMENT OF MECHANICAL ENGINEERING



AVANTHI INSTITUTION OF ENGINEERING AND TECHNOLOGY

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(Affiliated to Jawaharl Nehru technological university Kakinada, A.P)

TAMARAM, MAKAVARAPALEM, NARASIPATNAM-531113

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AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY



CERTIFICATE

This is to certify that the project entitled “**DESIGN AND ANALYSIS HOLLOW GUIDE BLADE**” is this record of the work carried out by **V. MURALI KRISHNAM NAIDU (18815A0368)**, **K. NOOKA PAVAN KUMAR (18815A0325)**, **S. SESHADRI (18815A0378)**, **P. NAVEEN KUMAR (18815A0343)** students of final year B. Tech in the department of Mechanical engineering. This work is done for the partial fulfillment for the award of BACHELOR OF TECHNOLOGY during year 2018-2021.

Project Guide

Head of the Department

External Examiner

ABSTRACT

Hollow guide blades of gas turbine are responsible for extracting energy from the high temperature and high-pressure gases. Gas turbine blade operated at high temperature provides better efficiency and maximum work output. The present paper deals with structural analysis of gas turbine blade. The analysis was carried out to know the mechanical stresses and deformation experienced by the gas turbine rotor blade. Design model of turbine blade is created by using CATIA V5 R20 software. The turbine blade is analyzed for its' structural performance due to the loading condition using ANSYS 16.2 software to study the variation of stresses on gas turbine blade for aluminum 2024 alloy, titanium alloy and stainless-steel 409M (SS-409M) alloy material. Among these three materials stainless steel has maximum equivalent stress 4.08×10^3 N/m² and minimum deformation of 3.75×10^{-5} m.

Keywords: Hollow guide, blade section, blade Materials, Computations, Von Misses stress, Mode shapes and deformations.