

# DESIGN & OPTIMIZATION OF CLUTCH GEAR USING METAL MATRIX COMPOSITES

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

BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING

**Submitted by**

**K RAVITEJA**

**16815A0317**

**CH POTHU RAJU**

**16815A0307**

**G SWAMY**

**16815A0312**

**S PRAMOD KUMAR**

**15811A03C5**

Under the guidance of

**Sri. V.HARI KIRAN, M.Tech (Ph.D)**

**Associate Professor & HOD**



DEPARTMENT OF MECHANICAL ENGINEERING

AVANTHI INSTITUTE OF ENGINEERING & TECHNOLOGY

**(Approved by AICTE-New Delhi, Accredited by NAAC with B<sup>+</sup> Grade, Permanently  
affiliated to Jawaharlal Nehru Technological University Kakinada.)**

**Tamaram, Makavarapalem, Visakhapatnam- 531113**

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# AVANTHI INSTITUTE OF ENGINEERING & TECHNOLOGY

(Approved by AICTE, Permanently Affiliated to JNT University, Kakinada)

Tamaram, Makavarapalem, Narsipatnam (RD), Visakhapatnam-531113



DEPARTMENT OF MECHANICAL ENGINEERING

## CERTIFICATE

This is to certify that project work is entitled **“DESIGN & OPTIMIZATION OF CLUTCH GEAR USING METAL MATRIX COMPOSITES”** is a bonafide record done by **K.RAVITEJA (16815A0317), CH.POTHURAJU (16815A0307), G.SWAMY (16815A0312), S.PRAMODKUMAR (15811A03C5)** students of final year **B.Tech** in the Department of **Mechanical Engineering**, Avanti Institute of Engineering and Technology, Visakhapatnam.

EXTERNAL EXAMINER

Mr. V Hari Kiran

Assoc.Professor & HOD

PROJECT GUIDE

Mr. V Hari Kiran

Assoc.Professor & HOD

HEAD OF THE DEPARTMENT

## ABSTRACT

Gears are one of the most critical components in power transmission system of an automobile and also many rotating machinery. Many studies have been conducted on optimum gear design. The main objective is to design metal matrix composite gears before and after optimization. Metal matrix material composites are preferred mostly due to their low density. Also the high specific mechanical properties make these alloys one of the most interesting material alternatives for the manufacturing,

Stainless steel Metal Matrix Composites with Sic and Tic content, particularly applicable for high wear resistant applications, are to be discussed in the present paper: Metal composite materials (including composites with metal matrix-Metal-matrix composites /MMCs/) with carbide containing mixture on the surface layer are particularly suited in the chemical industry. They are superior with their improved strength, high modulus of elasticity and high wear resistance compared to conventional metal alloys. The micro hardness, wear resistance and roughness characteristics of metallic composite materials with SiC and TiC carbides are investigated in order to develop a method and to get control of the mechanism of formation of stable multiphase systems.

In the present work materials considered are gear are manufactured, tested in and laboratory and the results are validated with Finite Element Analysis performed using ANSYS software