

DESIGN AND ANALYSIS OF AUTOMOTIVE BUMPER BEAM USING POLYMER MATRIX COMPOSITE

S. Neelagandan ¹, G Ajith Kumar ², S Prathivraj ³

1,2 Student PERI institute of technology, Mannivakkam

3. Assistant professor, PERI institute of technology, Mannivakkam

Abstract :

An automotive bumper beam is a structural component with intended function to absorb kinetic energy during dynamic loading condition. Generally, most of the researches focus on the substitution of new material such as polymeric based composite to achieve higher energy absorption capacity. This project is aimed to investigate the most suitable geometry of bumper beam at conceptual design stage. The various geometry of automotive bumper such as Box, Channel, T and I- sections were analyzed. The suitable shape of bumper beam was selected due to its high stiffness, low weight and high load sustainability. Also, compare the analysis results for epoxy polymer/ glass fiber material with steel, aluminum and copper materials.

Key words: composite; polymer matrix; bumper beam; conceptual design.

INTRODUCTION

It is a truism that technological development depends on advances in the field of materials. One does not have to be an expert to realize that a most advanced turbine or aircraft design is of no use if adequate materials to bear the service loads and conditions are not available. Whatever the field may be, the final limitation on advancement depends on materials. Composite materials in this regard represent nothing but a giant step in the ever-constant endeavor of optimization in materials.

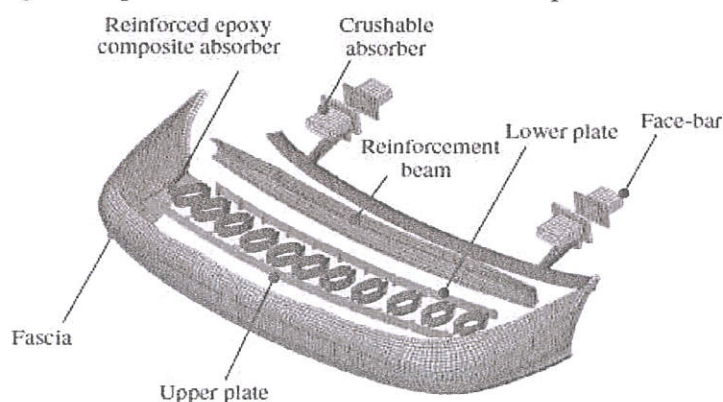


Fig :AUTOMOTIVE BUMPER SYSTEM COMPONENT

Dr. R. Palson Kennedy
Dr. R. PALSON KENNEDY, M.E., Ph.D.,
PRINCIPAL
PERI INSTITUTE OF TECHNOLOGY
Mannivakkam, Chennai - 600 048.