

## DESIGN AND ANALYSIS OF COMPOSITE LEAF SPRING UNDER STATIC LOADING

Meruva Manikanteswara Reddy\*, Mohammad Sarfaraz ahanger, Shubham Sharma,  
Dasari Tharun, Mohammad Mursaleen\*

Department of mechanical engineering, National Institute of Technology Srinagar.

\*Corresponding author

### ABSTRACT

In modern vehicles it is necessary to reduce weight and increase strength of each component in order to attain a good travel range, for e.g., in electric vehicles (EV) the mileage is greatly reduced by the weight of powering batteries (>10% of total vehicle weight). The more the weight on a vehicle, the more work there is to be done for suspension system and consequently less comfort for the passenger. To solve this problem the suspension system needs modification both in terms of geometry and material of the suspension.

Therefore, for the required changes from the proven history of leaf springs, they can be considered, and leaf springs have good load bearing capacity and can provide less deflection for high loads resulting in a comfortable ride. In this article, semi elliptical laminated type leaf spring is considered as case study model which is designed in SOLIDWORKS 2020 and the static structural analysis was carried out over it in ANSYS Workbench 19.2 software to predict the behaviour of leaf springs.

Material wise E-Glass/epoxy and Jute E-Glass/epoxy are used as composite materials to analyse the application of leaf spring for the weight of the vehicle. Results like stress, strain and deformation values of composite leaf spring are compared with conventional leaf spring. Weight optimization for E-Glass/epoxy and Jute E-Glass/epoxy respectively is observed to be significantly better when compared to EN 47 material and also deformation values are observed to be satisfactory.

**Keywords:** electric vehicle (EV), leaf spring, composite material, E-Glass/epoxy.

