**Static And Dynamic Analysis Of Helicopter Rotor Blade**

**Abstract:**

In the helicopter, the main rotor blade is mostly influenced by the aerodynamic forces and centrifugal forces during rotation. In this project both aerodynamic and centrifugal forces are considered for analysis. Dynamic analysis is performed and mainly aimed at calculating the vibrations and controlling them. The main objective is to perform modal analysis and calculate natural frequencies of the rotor blade. Later on perform harmonic analysis to plot the rotor blade response at these natural frequencies due to operational load. There by checking for resonance and avoiding it , will reduce vibrations on helicopter. catia v5 software is used to create a 3D model of the rotor blade. This 3D model is converted into parasolid and imported into Ansys to perform finite element analysis. From the analysis the strength and dynamic characteristics of rotor blade are calculated and documented. The Finite element analysis has been carried out for Aluminium, Eglass/Epoxy and Carbon/Epoxy materials. The results obtained are documented, compared and finally the best material is concluded.

Keywords: Rotor blade, static analysis, dynamic analysis, catia v5, ANSYS