

Design and Analysis of Crankshaft Using Al-Al₂O₃ Composite Material

Authors : Palanisamy Samyraj, Sriram Yogesh, Kishore Kumar, Vaishak Cibi

Abstract : The project is about design and analysis of crankshaft using Al-Al₂O₃ composite material. The project is mainly concentrated across two areas one is to design and analyze the composite material, and the other is to work on the practical model. Growing competition and the growing concern for the environment has forced the automobile manufactures to meet conflicting demands such as increased power and performance, lower fuel consumption, lower pollution emission and decrease noise and vibration. Metal matrix composites offer good properties for a number of automotive components. The work reports on studies on Al-Al₂O₃ as the possible alternative material for a crank shaft. These material have been considered for use in various components in engines due to the high amount of strength to weight ratio. These materials are significantly taken into account for their light weight, high strength, high specific modulus, low co-efficient of thermal expansion, good air resistance properties. In addition high specific stiffness, superior high temperature, mechanical properties and oxidation resistance of Al₂O₃ have developed some advanced materials that are Al-Al₂O₃ composites. Crankshafts are used in automobile industries. Crankshaft is connected to the connecting rod for the movement of the piston which is subjected to high stresses which cause the wear of the crankshaft. Hence using composite material in crankshaft gives good fuel efficiency, low manufacturing cost, less weight.

Keywords : metal matrix composites, Al-Al₂O₃, high specific modulus, strength to weight ratio

Conference Title : ICACME 2017 : International Conference on Advanced Composites and Materials Engineering

Conference Location : Mumbai, India

Conference Dates : February 07-08, 2017