Development of aluminium based composite material for cylinder liner application

A.Deepankumar[1], K.Ganeshram[1], S.Kalyanasundharam[1], R.Saravanakumar[2]
[1]UG Students & [2]Faculty member, Department of Mechanical Engineering, KPR Institute of Engineering and Technology, Coimbatore, India.

Abstract

Thermal conductivity is the property of the material which is essential for the heat transfer applications.The thermal conductivity of the composite material will vary with varying composition.Now a days, aluminium based composites are widely used in many application because of light weight and low cost. The main objective of this work is to find suitable alternate material for the cylinder liners. The aluminium composites using alumina and graphite with various proportions (sample1: Gr1%, $Al_2O_3$6%, sample2: Gr1%, $Al_2O_3$12%, sample3:Al_2O_3 12%) were fabricated and tested for their suitability as cylinder liners.An experimental setup was fabricated to measure the thermal conductivity of samples.Thermal conductivity of the samples was determined and the values are compared.The results showed that the thermal conductivity of the material is decreasing with increase in graphite composition. The decrease in thermal conductivity results in less heat loss which is more suitable for cylinder liners.

Keywords: Thermal conductivity, aluminium composite, alumina and graphite, cylinder liner, heat loss.