IIM KALPAKKAM CHAPTER
Metallurgy Materials Engineering

Technical Lecture

Topic: ***Cyclic plasticity in bearing steels subjected to rolling contact fatigue***

Speaker: ***Dr. Abir Bhattacharyya*****, Assistant Professor, Department of Metallurgical and Materials Engineering, Indian Institute of Technology (IIT), Jodhpur, Rajasthan**

Date & Time: ***16th* August, 2019, Friday, 15:00 hrs**

Venue: ***MDL* Seminar Hall, MMG**

All are invited!

Tea will be served at 14:45 hrs

G. Sainath
(For IIM Kalpakkam Chapter)

Abstract

The spatial distribution of subsurface stresses in the bearing-raceway contact region and the evolution of these stresses with fatigue cycles governs the failure of a bearing-raceway assembly during rolling contact fatigue (RCF) loading. The accuracy of RCF life prediction in existing bearing life models is limited due to assumption of (i) elastic stresses in life calculations, (ii) uncertainty in the endurance limit of the bearing steels. To improve the life-prediction models, and to incorporate the effects of case-hardening on RCF life of a bearing, an experimental methodology is proposed that enables accurate measurement of the location and magnitude of the cyclically evolving elastic-plastic von Mises stresses in terms of micro-hardness numbers. Mechanistic methodologies to determine cyclically evolving plastic strain amplitudes and to construct stress-life (S-N) diagrams for RCF loading are proposed after incorporating the depth dependent Young's modulus and yield strength gradient in materials. The results obtained by following this methodology can be used to improve bearing fatigue life.