

Master's/Bachelor's Thesis

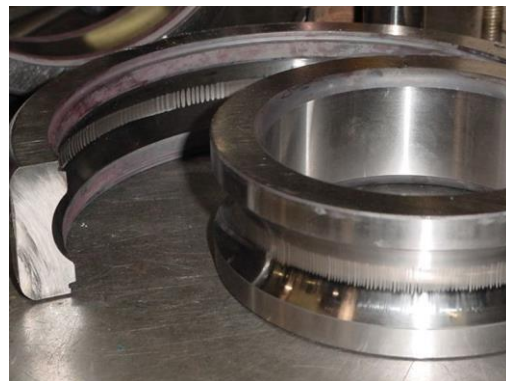
Inverter-Induced Bearing Currents under WBG Supply

Motivation

With the advent of modern, inverter-based drive technology, the endangerment of bearings due to inverter-induced bearing currents in variable-speed-based ac drive systems has been experienced both with small and large motor-inverter systems. Pitting and fluting of the bearing races and balls, caused by current flow, cause increased heat generation and can eventually lead to bearing failure. The use of extremely fast-switching wide-band-gap devices, as recently also considered for modern drive systems, calls for the existing models to be revisited, so as to predict – and avoid – drive failure under these new supply systems.

Research Questions

- How do the operating parameters relevant for the occurrence of inverter-induced bearing currents change at WBG supply?
- How do these changes affect the occurrence of inverter-induced bearing currents?



Bearing damaged from inverter-induced bearing currents;
source: AEGIS/Electro-Static Technology

Tasks

- Literature research and identification of suitable, simple models to describe the occurrence of inverter-induced bearing currents.
- Analysis of the sensitivity of the occurrence of inverter-induced bearing currents towards the different operating parameters that change with WBG supply.
- Possibly selected experimental investigations in the institute's own laboratory.

Contact

Univ.-Prof. Dr.-Ing. **Annette Muetze**
Electric Drives and Machines Institute
Graz University of Technology
Inffeldgasse 18, A-8010 Graz, Austria
Tel: +43 (316) 873-7240
E-mail: muetze@tugraz.at
www.eam.tugraz.at