

# Fretting in Copper-to-Copper Contacts under AC and DC Current Conditions

**D. Gagnon\***, **M. Braunovic\*\***

\*IREQ, Institut de Recherche d'Hydro-Quebec, Varennes, QC, Canada, J3X 1S1

gagnon.daniel@ireq.ca

\*\*MB Interface, 5975 Place de L'Authion, Suite 503, Montreal. QC, Canada, H1M 2W3

milenko37@sympatico.ca

## **Abstract**

The effect of fretting on the contact resistance behavior of copper-to-copper wire-plate combinations under AC and DC current carrying conditions was investigated. The fretting conditions were as follows: frequency 1 Hz, slip amplitude 100 microns and load 400 g (4N). The current level in both AC and DC conditions was 50 mA. In addition to contact resistance measurements, SEM and EDX were used to examine the surface damage in the fretted contact zones. The results indicate that the overall contact resistance behavior of copper-to-copper wire-plate couples subjected to the same fretting conditions but under AC and DC currents was practically the same. The characteristic feature of the samples under AC current conditions is a pronounced distortion of the waveforms of the contact voltage. The results of SEM surface analysis of the contact zones indicates that the surface damage resulting from fretting under AC current conditions was different from that under DC current conditions.

*Key words: Fretting, fretting damage, voltage waveforms, deterioration, contact resistance.*