

FRETTING CORROSION OF TIN PLATED CONTACTS

Fretting, an accelerated surface damage that occurs at the interface of contacting materials subjected to small oscillatory movement is a common problem in many engineering applications. The deleterious effect of fretting in electrical connections assumes significance as it influences the reliability and system performance. Gold and other precious metal plated contacts are the preferred choice where high reliability is warranted. However, non-noble metal plated contacts have also gained popularity due to the market pressure to reduce the cost factors. Based on the performance, cost criteria and the compelling need to adopt lead-free processes, tin plating is considered as the best candidate and has been recommended as the finish of choice for connectors. However, the susceptibility of tin plated contacts for fretting corrosion is a major limitation for its use in electrical connectors. A variety of factors, such as fretting amplitude, frequency, temperature, humidity, normal load, current load, corrosive gas environment, etc., influence the fretting corrosion behaviour of tin plated contacts. The fretting corrosion behaviour of tin plated copper alloy contacts have been studied in detail and the important findings are addressed in the following papers:

1. Young Woo Park, T.S.N. Sankara Narayanan and Kang Yong Lee, Effect of fretting amplitude and frequency on the fretting corrosion behaviour of tin plated contacts, [Surface and Coatings Technology, 201\(6\) \(2006\) 2181-2192](#).
2. Young Woo Park T.S.N. Sankara Narayanan and Kang Yong Lee, Fretting wear behaviour of tin plated contacts: Influence on contact resistance, [Surface Review and Letters, 13\(5\) \(2006\) 635-644](#).
3. Young Woo Park, T.S.N. Sankara Narayanan and Kang Yong Lee, Degradation of tin plated connectors by fretting corrosion - Evaluation of surface characteristics, [Tribology International, 40\(3\) \(2007\) 548-559](#).
4. Young Woo Park T.S.N. Sankara Narayanan and Kang Yong Lee, Effect of temperature on the fretting corrosion of tin plated brass connectors, [Wear, 262 \(2007\) 320-330](#).
5. T.S.N. Sankara Narayanan, Young Woo Park and Kang Yong Lee, Fretting corrosion of lubricated tin plated copper alloy contacts: Effect of temperature, [Tribology International, 41 \(2008\) 87-102](#).

6. Young Woo Park, T.S.N. Sankara Narayanan and Kang Yong Lee, Fretting corrosion of tin plated contacts, [Tribology International 41 \(2008\) 616-628](#).
7. T.S.N. Sankara Narayanan, Young Woo Park and Kang Yong Lee, Fretting corrosion of lubricated tin plated contacts, [Industrial Lubrication and Tribology, 60\(5\) \(2008\) 233-241](#).