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Microscopy Study of Fretting Corrosion Caused by the Tin Plating Thickness

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Abstract;

In recent years, there has been increasing demand to miniaturize wiring harness connectors in automobiles due to the increasing volume of electronic equipment and the reduction of the installation space allocated for the electronic equipment in automobiles for the comfort of the passengers. With this demand, contact failure caused by the fretting corrosion seems to become a serious problem in the future. There are many reports about fretting contact resistance transitions from the low contact resistance level to the high contact resistance level, but there are few reports about observation of the microstructure transition. In our previous study, we conducted observation using SEM, TEM and micro hardness measurement using a Nano-Indentation tester on low and high fretting contact resistance samples (dimple-flat configuration) under the fixed test conditions (contact load: 1N, tin plating thickness:5 μ m).

In this report, we examined microstructure observation of dimple and flat fretting contacts, modifying the tin plating thickness as a parameter . Based on the observation results, we considered the change of the contact microstructure and the difference of the contact resistance rising curve behavior caused by the tin plating thickness.