Make Arc Erosion and Welding Tendency under 42 VDC in Automotive Area

L. Doublet*, N. Ben Jemaa*, F. Hauner**, D. Jeannot **
*: University of Rennes 1, PALMS Laboratory, 35042 RENNES, FRANCE
**: Metalor Technologies (France) SAS, Contacts Division, BP 29, 28190 COURVILLE-SUR-EURE, FRANCE

Abstract - **In this paper, we will give the progress of a research program on arc phenomena and their consequences on contact materials for the next car generation power system 42 VDC. We investigated make arc erosion, welding tendency and welding forces for materials Ag, AgZnO, AgNi and AgSnO2 under resistive load and with a current range from 10 to 90 A. Using previous testing apparatus, developed for 14 VDC [10], we have simulated a mechanical bounce observed in relays (600 µs duration and 80 µm height) at make.**

We have found that a low material transfer from the cathode to the anode takes place at low current. However, at higher current, the transfer is in a reverse direction and the amount of material transferred is higher but this amount depends mainly on the bounce profile. In addition, the welding phenomenon appears at high current levels and can reach up to 20 % of the welding tendency. However, high welding tendency does not correspond high welding forces: this is the case of AgZnO compared to Ag.