

## **Influence of design parameters on contact interlocking caused by material transfer**

Martin Reichart\*, Alexander R. Neuhaus, Clemens Schrank, Georg Vorlauffer  
AC<sup>2</sup>T research GmbH, Viktor Kaplan Strasse 2, 2700 Wiener Neustadt, Austria

### **Abstract:**

Contacts, switching DC loads, can create material transfer pip and crater formations which may cause non-opening faults due to interlocking. Both, the material transfer formation and the capability to open the contacts at pronounced material transfer, are affected by the design parameters of the contact system. Since the decoupling of these two phenomena cannot be carried out in experimental investigations a variation of design parameters without a changed material transfer formation is generally not possible.

Therefore a finite element model of a contact system, similar to a mass produced relay, with simple predetermined material transfer on the contacts was designed. By simulating the dynamic opening process and calculating relevant physical quantities (e.g. the separation force) the influence of certain design parameters on the opening capability was investigated. The calculations showed essential dependencies of the required force to open the contact system on certain design parameters.

Although for real switches there is a non-predictable interdependence between the widely scattering material transfer formation and the opening capability, the calculation can assist to optimize a well defined switchgear design, if material transfer is assumed.

\*Corresponding author:

Martin Reichart

reichart@ac2t.at

Fax: +43 2622 81600 99

Phone: +43 2622 81600 31