

POD014

**An automated evaluation for the Rockwell indentation test**

Reinhold Bethke<sup>1</sup>, Jan Gäbler<sup>1</sup>, Markus Rauhut<sup>2</sup>, Damjan Hatic<sup>2</sup>, Ali Mogiseh<sup>2</sup>,  
Thomas Waibel<sup>2</sup>, Michael Eder<sup>3</sup>, Stephan Eder<sup>3</sup>, Serhan Bastürk<sup>4</sup>, Nazlim  
Bagcivan<sup>4</sup>

<sup>1</sup>Fraunhofer IST, Braunschweig, Germany <sup>2</sup>Fraunhofer ITWM, Kaiserslautern,  
Germany <sup>3</sup>BAQ GmbH, Braunschweig, Germany <sup>4</sup>Schaeffler AG,  
Herzogenaurach, Germany

reinhold.bethke@ist.fraunhofer.de

Coating adhesion is one of the most important parameters for evaluating the quality and functional reliability of thin-films for tribological purposes. The Rockwell indentation test, standardized in ISO 26443 and DIN 4856, is an established test method in industry and research for determining coating adhesion. A hardness indentation according to Rockwell C is performed on the coated component. Any damage to the coating around the indent is qualitatively assessed and classified into adhesion classes according to the visual impression. For this purpose, comparative images are used which schematically show typical crack and spalling patterns in various forms. The evaluation can only be carried out by experienced personnel, but nevertheless, evaluation differences occur with different persons. The documentation is complex and there is no possibility for automation. This procedure no longer meets the current requirements of quality assurance. Therefore, there is an urgent need to be able to carry out an automated quality check of the layer adhesion.

In a project, funded by the Federal Ministry for Economic Affairs and Energy, (Ptj\_03TNH023A) the basics for an automated coating adhesion test are developed. The overall objective of the project is to move the Rockwell indentation test for evaluating the adhesion of hard coatings from a subjective assessment to an objective measurement and to prepare the results for standardization.

The Poster will show the automatic Rockwell indentation device, the technical innovation of the software and fields of application.

**Keywords**

Coating adhesion

ceramic coatings

Rockwell indentation test