

Book of ABSTRACT

39th Colloquium on Advanced Manufacturing
and Repair Technologies in Vehicle Industry

QUALITY PRODUCTION IMPROVEMENT

Częstochowa

2024

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QUALITY PRODUCTION IMPROVEMENT

39TH INTERNATIONAL COLLOQUIUM
ADVANCED MANUFACTURING AND REPAIR TECHNOLOGIES
IN VEHICLE INDUSTRY

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QUALITY PRODUCTION IMPROVEMENT 2024

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A measuring device is developed to measure the electrical resistance of different joining methods. In addition, our goal is to perform a surface treatment on the substrate that can increase the electrical conductivity of the conductive adhesive. With the resistance measuring device, the resistance of bonding surfaces without surface treatment and already surface treated can be compared, if the bond is made with an electrically conductive adhesive and compare them with the conductivity of other joining methods.

Keywords: Li-ION battery, electrically conductive adhesive, surface treatment, battery cell joining

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A REVIEW OF MICRO-WETTING PHENOMENA: RECENT ADVANCES, APPLICATIONS AND CHARACTERIZATION TECHNIQUES

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Abstract

The targeted modifications of surface properties, such as improved wettability, are crucial in various fields including aerospace, nanotechnology, nuclear science, electronics, and industrial manufacturing. The wettability of most materials is determined based on traditional macroscopic contact angle measurements (sessile drop, captive bubble techniques). However, these measurement techniques can yield significantly different results depending on the surfaces heterogeneity, droplet (bubble) size, anisotropic wetting behavior (in nature on rice leaves, spider silk, cactus spines etc.) and environmental vibrations. Furthermore, macroscopic contact angle measurements are limited to characterizing the average wettability of the surface-liquid system and along one direction only. In microscale wetting analysis, however, the examination of droplet shapes from different angles provides additional insights into surface properties, chemical, and physical heterogeneities. Research in this field highlights significant differences between macro- and micro-scale contact angles. Moreover, micro-scale surface wetting takes into account the material's physical and chemical properties, including surface roughness, pore size and distribution, as well as chemical composition. In this work, we describe and discuss the state of the art of micro-wetting science and the measurement methods, characteristics and results of micro-wetting itself.

Keywords: Contact angle, Wettability, Measurement, Imaging, Macro-/micro-scale