

## Introduction

The GfKORR – Gesellschaft für Korrosionsschutz e.V. (German Society for Corrosion Protection) is an interdisciplinary association of experts from industry and R&D, aiming at reducing corrosion and consequential damages in all eligible areas of life and technology. The GfKORR dedicates itself to comprehensive root cause analysis and supports efficient knowledge transfer in all areas of corrosion to improve integrity of assets, safer living and environmental protection.

This year the GfKORR offers further topics like this seminar with the focus on harmful gas testing and new developments for protection of electronics. The surface and material characterization in electronics is essential for the correct functioning of assemblies, coatings and protection measures.

The seminar covers test methods which are helpful for process and material validation as well as spot check control of the reliability of the produced assemblies.

## Target Groups

Production engineering, quality assurance, process technology

## Organisation

### Registration

For organisational reasons, please send your registration to:

GfKORR - Gesellschaft für Korrosionsschutz e.V.  
Theodor-Heuss-Allee 25  
60486 Frankfurt / Main  
Phone: +49 (0) 69 7564-360 /-436  
Fax: +49 (0) 69 7564-391  
E-Mail: [gfkorr@dechema.de](mailto:gfkorr@dechema.de)  
Web: <https://gfkorr.de/Veranstaltungen>

### Participation fees <sup>\*)</sup>

Members of GfKORR, EFC	650,- €
Non-Members	670,- €

<sup>\*)</sup> no VAT requested according to § 4.22 UStG

The registration fees include the seminar documents.

After registration you will receive a confirmation and the invoice. One day before the training you will receive the access link by email.

### Conditions of participation

The receipt of the registration is considered as binding confirmation of the participant. Upon receipt, you will receive confirmation and an invoice for the order due. Registered participants can cancel in writing free of charge no later than 12 April 2022. After this date 80% of the participation fee will be charged. In case of absence or cancellation of participation, the full participation fee is to be paid. Furthermore, you may nominate a substitute participant.



**GfKORR – Gesellschaft für Korrosionsschutz e.V.**



## Training

# Reliability Testing and Protection

**26 - 27 April 2022**  
**Online-Event**

in cooperation with



## Programme – 26 April 2022

### 13:30 Welcome

Introduction of the agenda, ZESTRON and GfKORR  
Introduction of participants  
Dr.-Ing. Helmut Schweigart  
Dr. O.K. Wack Chemie GmbH

### 14:00 Accelerated corrosion and migration test for electrical circuits for SMT and power electronic circuits

Solder pastes consisting of a flux and a metal powder such as SnAgCu and solder alloys used to connect components to SMT boards. Besides solder pastes, adhesives consisting of silver particles and an epoxy resin with hardener systems are also commonly used to bond components to printed circuit boards. All of these materials contain ingredients that can cause corrosion or migration over extended periods of operation of the electrical circuits and lead to complete failure of the electrical circuits. In order to estimate the risk of materials in the operation of the electrical circuits, time consuming measurements are required.

In this study, we developed a rapid measurement method based on a Pressure Cooker test from the JEDEC standard. In a short time, the risk of corrosion or migration can be estimated within a few days, instead of weeks.

Wolfgang Schmitt  
Heraeus Deutschland GmbH & Co. KG

### 14:25 Creep Corrosion: Current Understanding of the Mechanisms and Accelerated Lab Testing Using Mixed Flowing Gas (MFG)

Creep corrosion is the mass transport process in which solid corrosion products (typically sulfide and chloride) migrate over a surface without the influence of an electric field. It was first reported by Egan and Mendizza for Ag<sub>2</sub>S on a gold surface 1960 and has been observed on printed circuit boards in environments containing reduced sulfur compounds in recent years. This presentation will review the current understanding of the mechanisms of the creep corrosion and discuss the feasibility of simulating creep corrosion in accelerated lab testing using Mixed Flowing Gas testing.

Chen Xu  
Nokia

### 15:10 Coffee Break

## Programme – 26 April 2022

### 15:40 Single Gas (H<sub>2</sub>S) Testing under High Voltage – Understanding Harmful Gas Reliability of Silicone Gel covered Power Semiconductor Devices

Power semiconductor devices are widely used in harsh environments and can be exposed to sulphur containing atmospheres. The corrosion dynamics of silicone gel covered devices is not fully understood yet and unclear influencing factors lead to an even higher complexity. Therefore, accelerated test methods are required to evaluate the robustness of power modules in critical applications.

Dipl.-Ing. Michael Hanf  
Universität Bremen

### 16:10 Final Discussion of Day 1

### 16:30 End of Day 1

## Programme – 27 April 2022

### 09:30 Welcome and summary of day 1

Dr.-Ing. Helmut Schweigart  
Dr. O.K. Wack Chemie GmbH

### 09:45 Risk assessment of humidity related failures in electronics due to residues from PCBA laminate/solder mask and flux use for soldering process

This talk will cover the importance of PCBA cleanliness based on contamination arising from PCBA laminate/solder mask as well as flux residues from wave and reflow process. PCBA design-flux residue connection will be elucidated as well as test methods for residue quantification and humidity interaction affecting reliability.

Dr. Rajan Ambat  
Technical University of Denmark

### 10:30 Coffee Break

## Programme – 27 April 2022

### 11:00 Validation Check of LEDs – Comparison of conventional methods with Iodine Vapour Test

Errors in production of LED modules could lead to delamination or other failure effects in regard to the used transparent encapsulation systems due to thermal, climatic and corrosive loads during operation. In order to avoid this and to take appropriate countermeasures, the corresponding components are tested both as part of the type approval and in the surface-mounted state. By a validation tests using iodine vapor tests on commercially available LED modules critical points and penetration paths can be identified under moderate test conditions and prove the effectiveness of this test in a just as reliable way as the established, more complex methods such as testing under H<sub>2</sub>S-atmosphere.

Stefan Strixner  
Zestron Europe

### 11:45 Lunch

### 12:45 Conformal coating with ALD (Atomic Layer Deposition)

Content of the presentation are the basics as well as ALD thin film coating for electronic assemblies, such as Medical and Space. Furthermore, examples of different degradation process mitigation will be presented and discussed.

Marko Pudas  
Picosun Oy

### 13:15 Process conditions and properties of Ag and Cu sinter materials and their potential effect to package reliability

Introduction to sintering, sintering vs. soldering. Process technology and parameter for sintering; impact on the quality of the sinter joint. PINK sintering equipment: SIN200+. Comparison of different silver sinter materials with regards to the process parameters and the sintering atmosphere. Comparison of different copper sinter materials. Activated Paste regarding residues on the surface and the risks in following processes.

Jonathan Potschka  
PINK GmbH Thermosysteme

### 13:45 Final Discussion

### 14:15 End of Event

Unforeseen program changes are reserved.