Organisational Information

Sign up at: <u>www.ecpe.org/events</u>

Registration Deadline:

17 September 2024

Participation Fee:

| € 650,– * | for industry |
|------------|---|
| € 480,- * | for universities/institutes |
| € 145,– * | for students/PhD student (limited spaces; copy of students ID required) |
| * plus VAT | , |

- The on site participation fee includes dinner, lunches, coffee/soft drinks and digital proceedings. The reduced (PhD) students fee includes all except for dinner (can be booked for an extra fee of € 50,-*)
- > The online participation includes remote access via the meeting software Webex and digital proceedings.
- Digital proceedings will be provided by download link latest one day before start of the event. A printed handout is available on request.
- Upon receipt of registration confirmation via email you are signed-up for the event. The invoice will be sent via email.
- Three participants from each ECPE member company free of charge. Allocation in sequence of registration.
- > 10% discount on university/institute fee for participants from ECPE competence centres.
- Further information (hotel list and maps) will be provided after registration and can be found on the ECPE web page.
- Cancellation policy: Full amount will be refunded in case of cancellation upon to 2 weeks prior to the event. After this date 50 % of the fee is non-refundable (replacement is possible).

Organisational Information

| Organiser | ECPE e.V. Ostendstrasse 181 90482 Nuremberg, Germany www.ecpe.org |
|----------------------|--|
| Technical Chair | Prof. Till Huesgen, Hochschule Kempten Dr. Jacek Rudzki, Semikron Danfoss Dr. Helmut Schweigart, Zestron Europe |
| Technical Contact | DiplPhys. Thomas Harder, ECPE e.V. Thomas.harder@ecpe.org |
| Organisation | Marietta Di Dio, ECPE e.V. +49 911 81 02 88 – 13 <u>Marietta.didio@ecpe.org</u> |
| Venue | Zestron Europe a Business Division of Dr. O.K. Wack Chemie GmbH Untere Au 9 85107 Baar-Ebenhausen Germany (Shuttle bus from Munich Airport) or online via Webex |
| | |







European Center for Power Electronics e.V.

Hybrid Event

Announcement

ECPE Hybrid Workshop

Sinter Technology in Power Electronics

24 -25 September 2024 Baar-Ebenhausen (near Ingolstadt) / hybrid

Cluster in cooperation with Leistungselektronik

ZESTROM



ECPE Hybrid Workshop

Sinter Technology in Power Electronics

24 – 25 September 2024 Baar-Ebenhausen, Germany / hybrid

Sinter technology is coming more and more in the focus for high performance power electronic applications. Sintering is overcoming the limitations of common solder materials, which are further on well suited for many discrete and small module device applications. Sinter systems enable to perform at harsh ambient conditions seen from extended mission profiles for automotive and industrial applications. These mission profiles typically drive longer high-temperature operating life, higher temperature cycles and require faster switching. Also, due to the significantly lower thermal resistance, the power density can be increased.

The main benefits of silver as well as copper sintering are:

- High thermo-mechanical stability
- Highest electrical conductivity
- High thermal conductivity

Metal sintering is a surface interdiffusion of adjacent atoms to create a solid interconnection joint out of a metal particle network. To control the densification and the joint strength of the sinter connection the primary process influencers are the temperature, the time, the pressure, the nature of the sintering atmosphere, and the microstructure of the sinter paste.

Sintering is an emerging technology compared to wellestablished soldering. Thus, it needs a careful consideration of the entire process chain including paste printing and drying, chip placement, and the final sintering step. The sequence of the steps as well as the parametrization depends on the targeted paste, the finishes, and the size of the joining area.

As for all processes, there is still the necessity for quality management. The Workshop presentations will start with evaluation of sinter pastes, go to testing of sinterability of the metal finishes and end up with the final control of the sinter joints.

Beside the standard sinter technology there will be an outlook to futures potential alternatives.

The workshop is chaired by:

Prof. Till Huesgen, Hochschule Kempten (D) Dr. Jacek Rudzki, Semikron Danfoss (D) Dr. Helmut Schweigart, Zestron Europe (D)

All presentations and discussions will be in English.

List of Topics

Tuesday, 24 September 2024

10:00 Start of Registration / Webex started

Introduction

- Welcome & Introduction
- Introduction & Overview: Sinter Technology in Power Electronics

Materials and Surfaces

- Surface Finishes (Sinterable Metallisations)
- Material Systems (Sinter Pastes, Die Top System®)
- Surface Treatment (Cleaning) and Analysis
- Failure Analysis and Sinterability

12:30 Lunch Break

Process and Equipment

- Sinter Equipment w. Batch System
- Inline Sintering System
- Large Area Sinter Interconnections

Quality Testing and Reliability

- Thermal Analysis of Sinter Layers
- Acoustic Microscopy
- Power Cycling Test
- Mechanical & Thermomechanical Simulations

17:30 End of 1st Day

18:00 Visit of Zestron's Analytical Center

18:30 h Networking BBQ Dinner at Zestron Facility

List of Topics

Wednesday, 25 September 2024

08:30 Start of 2nd Day / Webex started

Application Examples

- Application Report: Sinter Technology in Automotive Power Electronics (EVs)
- Application Report: Large Area Sinter Interconnections

Alternative Technologies and Future Trends

- Nano-Technology based Joining
- Hybrid Pastes
- Cu Sintering using Nano Materials
- Sintering using Cu-Flakes
- Sinter-Lamination

12:30 Lunch Break End of Workshop