



6th International Conference

Thermal Management for EV/HEV



14 - 16 February 2017 | Berlin, Germany

Solutions for smart thermal energy distribution, fast charging
and battery's thermal management improvement

Learn from these experts among others:



Chairman:

Dr. Dirk Neumeister,
Head of Concepts and Systems
MAHLE International GmbH, Germany



Dr. Christian Hainzmaier,
Director Product Engineering
Electric Heating,
Webasto Thermo & Comfort SE, Germany



Dr. Petr Šedivý,
Head of Interior Aerodynamics and
Methodology Development,
ŠKODA AUTO A.S., Czech Republic



Alfred Jeckel,
HV Battery Design and Testing, Thermal
Management HV Components,
Daimler AG, Germany



Anouk Hol,
Concept Development Aerodynamics
and Energy Specialist,
VDL Enabling Transport Solutions, Netherlands



Thomas Gillet,
Thermal Systems Innovation
PhD Researcher,
Renault SAS, France

3 FULL DAYS 14+ SPEAKERS 2 ROUND TABLES 1 PANEL 6 WORKSHOPS
UNLIMITED NETWORK OPPORTUNITIES

Why should you attend?

- Learn about contemporary **strategies** for **energy efficient thermal comfort** of passengers in **passenger** and **commercial vehicles**
- Understand how to **monitor battery aging** and **prevent thermal runaways** while **increasing charging speed**
- Learn from different OEM's **experiences** and **achievements** and find out what are their current challenges
- Improve **systems efficiency** and **reliability** through advanced **modelling** and **simulation**
- Advance **powertrain architecture** for **optimum thermal distribution**

Meet our contributing experts:



Chairman:
Dr. Dirk Neumeister,
Head of Concepts and Systems
MAHLE International GmbH,
Germany



Thomas Gillet,
Thermal Systems Innovation
PhD Researcher,
Renault SAS, France



Dr. Carlos Ziebert,
Head of the Battery
Calorimeter Center,
Karlsruhe Institute of Technology,
Germany



Dr. Petr Šedivý,
Head of Interior Aerodynamics and
Methodology Development,
ŠKODA AUTO A.S.,
Czech Republic



Dr. Antti Lajunen,
Post-Doctoral Fellow,
McMaster Automotive Resource
Centre, Canada



Christian Huber,
CEO,
Li.plus, Germany



Anouk Hol,
Concept Development
Aerodynamics
and Energy Specialist,
VDL Enabling Transport
Solutions, Netherlands



Markus Hackmann,
Partner, Head of e-mobility,
P3 Group, Germany



Dr. Andreas Melcher,
Senior Researcher,
Karlsruhe Institute of Technology,
Germany



Dr. Christian Hainzmaier,
Director Product Engineering
Electric Heating,
Webasto Thermo & Comfort SE,
Germany



Dipl.-Ing. Jörg Gissing,
Head of Thermal management
department, **Forschungsgesell-**
schaft Kraftfahrwesen Aachen
mbH, Germany



Prof. Dr. Noshin Omar,
Director of Battery Innovation
Center,
Vrije Universiteit Brussel,
Belgium



Alfred Jeckel,
HV Battery Design and Testing,
Thermal
Management HV Components,
Daimler AG, Germany



Dr. Bernhard Brunnsteiner,
Lead engineer structural electrified
powertrain systems,
AVL List GmbH, Austria

Sponsorship

We have a variety of packages available to suit your requirements.
For all sponsorship and exhibition opportunities call on:
+49 (0)30 20 913-232 or email sponsorship@iqpc.de

Co-located with

Advanced **E-Motor**
Technology 2017



Media Partners:



Become a member of **Automotive IQ** and receive complimentary access to resources that will keep you informed at the forefront of industry trends and developments. You will receive access to our growing library of articles and interviews, multi-media presentations, webinars and whitepapers from industry leaders, a weekly email newsletter updating you on new content that has been added and special member-only discounts on events. Become a member here: www.automotive-iq.com/member-signup



Shmuel De-Leon Energy Ltd. is a leading company in the field of power sources knowledge. The company provides comprehensive collection of power sources knowledge tools and services:

- Consulting services
 - Market research reports
 - Batteries, Fuel cells and EV seminars and conferences
 - Batteries, FC & EV Weekly newsletter
 - Energy Sources On-Line web DataBase
 - Power sources solutions
 - Representing Energy Storage testing and research equipment companies in Israel
- Visit our website: www.sdle.co.il

08:30 Registration and welcome coffee



Who is who

Discover who else is participating in the conference. The matchmaking picture wall will help you identify who you want to meet at the conference. Sponsored by **FUJIFILM**



09:00 Opening by Dr. Dirk Neumeister

09:10 10 kW, 800 Volts – new trends in future electric heating for passenger and commercial electric vehicles

- Trends in heater concepts and systems design
- Perspectives of 800 Volts technology implementation for electric heating
- Implementing 10 KW heating for larger cabins
- Future trends in commercial vehicle segment

Dr. Christian Hainzmaier, Director product engineering electric heating, **Webasto Thermo & Comfort SE, Germany**

09:50 Speed networking

Get in touch with the other conference guests in quick paced 1-1 meetings – make sure you bring a stack of business cards.



10:20 Refreshment break and networking

10:50 Assessment of HV components in electrified trucks and buses

- Thermal modeling methodology
- Thermal impact on aging of HV battery, e-motor and power electronics
- Prediction of component lifetime during real world driving conditions
- Safety assessment of thermal runaways of Li-Ion batteries

Dr. Bernhard Brunnsteiner, Lead engineer structural electrified powertrain systems, **AVL List GmbH, Austria**

DECENTRALIZED HEATING SOLUTIONS

11:30 Implementation as well as subjective and objective assessment of heating panels – thermal and acoustic evaluation

- Methodical process for the design of panel heating systems
- Concepts for panel heating systems and comparison of fluidic and electric systems
- Control concept for a electric panel heating system
- Proband studies for subjective thermal and acoustic comfort evaluation and comparison with objective measurements

Dipl.-Ing. Jörg Gissing, Head of thermal management department, **Forschungsgesellschaft Kraftfahrwesen Aachen mbH, Germany**

DESIGN AND OPTIMIZATION OF ENERGY EFFICIENT HVAC SYSTEMS

12:10 Efficient thermal management within electric buses

- Limited but possible opportunity for waste heat recovery
- Bus climate systems - heating of the cabin without ICE
- Novel thermal technology approach: heat pump solution
- Latest development in thermal management available for city buses

Anouk Hol, Concept development aerodynamics and energy specialist, **VDL Enabling Transport Solutions, The Netherlands**

12:50 Networking luncheon

14:20 Development of a model of an automotive multi-evaporator air-conditioning system (MEAC)

- State-of-the-art on MEAC
- Numerical simulation with LMS Imagine.Lab Amesim® 1D software
- Comparison with first experimental results from the test bench

Thomas Gillet, Thermal systems innovation PhD researcher, **Renault SAS, France**

15:00 Round table session

Energy efficient climate comfort in electric vehicles

Delegates will be sorted into two groups to facilitate a healthy and engaged discussion in a smaller group. After half an hour the delegates will swap round table and topic giving you the chance to participate in all discussions.



Table 1: Efficient strategies of air heating and cooling in e-vehicles

Moderator: Dr. Petr Šedivý, Head of interior aerodynamics and methodology development, **ŠKODA AUTO A.S., Czech Republic**

Table 2: Best practices in achieving energy balance

Moderator to be confirmed soon

16:00 Refreshment break and networking

THERMAL MODELLING AND SIMULATION

16:30 Simulation of energy efficiency and performance of cabin thermal management in electric vehicles

- Modeling of HVAC system with heat pump for electric vehicles
- Evaluation of system efficiency and performance
- Impact of thermal management on driving range
- Efficiency of thermal systems vs. passenger comfort

Dr. Antti Lajunen, Post-Doctoral Fellow, **McMaster Automotive Resource Centre, Canada**

17:10 Panel discussion

How can we ensure thermal comfort of passengers with spending as less energy as possible?

Selected experts of the day will join the panel to discuss their vision and experiences, and come to the best solution in the following topics:

- Ideas on how to achieve perfect interplay between the drivetrain (e-motor, battery or hybrid engine) and the cabin heating system
- Low energy heating technologies & decentralized heating sources as an alternative to "conventional" air heating
- Best practices on smart materials implementation for heat extraction and cooling
- Materials and technologies for cabin insulation to reach the lowest heat dissipation

With the selected speakers of the day



17:50 Closing remarks of Dr. Dirk Neumeister and end of day one

18:30 Evening event

Join us for an informal evening get-together! This is an excellent opportunity for you to meet the other attendees and make new business contacts.

08:00 Registration and welcome coffee

08:30 Opening by Dr. Dirk Neumeister

INNOVATIVE BATTERY THERMAL MANAGEMENT & TESTING METHODS

08:40 Advanced Battery Thermal Management for Battery Electric Vehicles

- Present and future thermal management options
- Advanced simulation tools
- Increasing safety levels
- Decreasing solutions' costs

Prof. Dr. Noshin Omar, Director of battery innovation center, **Vrije Universiteit Brussel, Belgium**

09:20 PCM integration into battery packs – adding safety and increasing efficiency

- An overview on passive cooling via Phase Change Materials (PCM)
- Case study for battery thermal management of an all-electric vehicle
- Enhanced safety by passively preventing thermal runaway propagation

Christian Huber, CEO, **Li.plus, Germany**

10:00 Refreshment break and networking

10:30 Thermal challenges of Li-Ion batteries for future electric powertrains

- Thermal characteristics of Li-Ion battery
- Fast charging
- High energy density Li-Ion cells
- New cooling methods

Alfred Jeckel,
HV battery design and testing, Thermal management HV components, **Daimler AG, Germany**

11:10 Methodologies for electrochemical and thermal characterization of Li-ion cells to improve thermal management and prevent thermal runaway

- Combined electrochemical-thermal characterization techniques for cells: battery calorimetry, thermography
- Influence of ageing phenomena on different modes of heat generation
- Combination of experiments with multi-scale electric, electrochemical and thermal simulations
- Using thermal and thermodynamic data in battery management systems

Dr. Carlos Ziebert,
Head of the battery calorimeter center,
Karlsruhe Institute of Technology, Germany

11:50 Battery price development until 2025

- Current state of the battery market for PHEV/ BEV
- Outlook on cell technology roadmap
- Deep dive in battery price development (Cell, Module, System)

Markus Hackmann,
Partner, Head of e-mobility, **P3 Group, Germany**

12:30 Networking luncheon

14:00 Mathematical modelling and simulation of the thermal behaviour of Li ion cells with respect to thermal runaway

- Mathematical modelling of the thermal evolution of Li-ion cells
- Implementation/Simulation
- Classification of the thermal state of cells
- Incorporation in battery management systems

Dr. Andreas Melcher,
Senior researcher,
Karlsruhe Institute of Technology, Germany

OPTIMIZED THERMAL MANAGEMENT FOR E-MOTORS (Co-located with Advanced E-Motor Technology)

15:50 Novel concepts to enhance heat transfer to significantly raise system performance

- Advanced approaches for optimized heat transfer
- Technical requirements and challenges
- Pushing the limits: Effective solutions for smart heat transfer



Speaker to be confirmed soon

16:30 R&D in thermal management of e-motors

- Data, analysis methods, and experimental techniques to improve and better understand thermal management of e-motors
- New materials and parts designs for better passive thermal performance
- Exploring possibilities of efficient heat transfer to compliment passengers comfort


Speaker to be confirmed soon

17:10 Optimize design for cooling systems for e-motors

- Understanding thermal processes through simulation of e-motors
- Design for thermal efficiency and optimal heat transfer
- Optimize working modes to achieve the best performance

Speaker to be confirmed soon

17:50 Collocated technical round table discussions

 **Delegates will be sorted into two groups to facilitate a healthy and engaged discussion in a smaller group.**

After twenty minutes the delegates will swap round table and topic giving you the chance to participate in all discussions.

Table 1: Thermal management strategies for modern E-Motors in order to achieve the best performance

Table 2: Comparing practices of thermal simulation in order to understand the way to an ideal design

Moderators to be confirmed soon

18:30 Closing remarks of Dr. Dirk Neumeister and end of conference



“You can succeed on your own terms but you can’t succeed alone”

Join our **interactive workshops** and benefit from **in-depth sessions**, hosted by selected industry experts. Our **industry experts** will share their **expertise** with a **limited group of peers**. Our workshop leaders will actively **foster open exchange** and **discussion** to help you **face challenges**, **discover solutions**, and **make decisions** crucial to **business excellence**.

08:30 Workshop registration and welcome coffee

09:00 – 11:30 Workshop A

Combined electrochemical-thermal characterization and modelling of Li-ion cells to prevent thermal runaway

Use this workshop to gain further understanding into the combined electrochemical-thermal characterization and modelling of **Li-ion cells**. The workshop will be divided in two parts.

The first part will explore the **characterization of Li-ion cells** in battery calorimeters under different thermal conditions in order to study the **influence of ageing phenomena** on different modes of heat generation and to collect data that can be used in battery and thermal management systems.

In the second part, a **general thermal model** will be derived, discussed and extended with respect to thermal runaway. You will have the opportunity to discuss the application of such model and give simplifications of the model suitable for the use in thermal management systems and for **solving issues of thermal runaway**.

Moderators: Dr. Andreas Melcher, Dr. Carlos Ziebert
Karlsruhe Institute of Technology, Germany

09:00 – 11:30 Workshop B

Innovative e-motor design and smart material packaging

In this workshop you will discuss the following aspects:

How will the next-generation e-motor design look like?

What are the current challenges in e-motor technology design and how can they be addressed?

How does smart material packaging in e-motor technology look like?

And what are the ways to improve efficiency, cost, weight and production?

11:30 – 12:30 Networking luncheon

12:30 – 15:00 Workshop C

Alternative heating solutions with heat-based cabin surfaces

This workshop’s primary goal is to discuss and find **solutions for minimizing thermal energy consumption** without compromising cabin comfort. Smart solutions on reducing climate control need with **zone-based cabin temperature controls** as well as possibilities of dashboard and **steering wheel heating** will be explored with the ultimate goal of energy optimization. What are the current trends and how can you advance cabin comfort to the next level?

12:30 – 15:00 Workshop D

Global market trends of e-motor development from light to heavy duty vehicles

This session is designed to give you a profound insight into latest and upcoming **market trends of e-motor technology** for both, **light and heavy duty vehicles**. You will discuss the **future trends** of e-motor technology in **Europe, USA and Asia**. How is the European market preparing to react on the **Chinese market**? How will the next 1-5 years look like in this respect?

15:00 – 15:15 Networking break

15:15 – 17:45 Workshop E

Implementation of modern heat transfer materials for passive cooling improvement and systems cost reduction

This workshop’s primary goal is to learn about **modern materials** and their appliance in **maximizing passive thermal energy dissipation** without increase in **systems cost**. There are ways to achieve **optimal heat transfer** from electronic components – by using **passive measures** such as radiators and dissipation plates. Such systems costs are cheaper than the ones with active cooling thus a **competitive advantage** can be **achieved**. Join us and learn more about it.

15:15 – 17:45 Workshop F

Thermal management for e-motors

To **significantly improve efficiency** of e-motor technology thermal management is of very high importance. This workshop is an interactive session which will focus on understanding the relevance of **heat transfer** when it comes to **improve performance** and **efficiency of e-motors**. In this interactive session you will discuss the recent findings related to **innovation of thermal management** and the **possibilities** and **limitations**.



Automotive
a division of IQPC



Co-located with

Advanced E-Motor
Technology 2017



Thermal Management for EV/HEV

14 - 16 February 2017 | Berlin, Germany

Conference Packages	1st Early Bird Book & pay by 04.11.2016	2nd Early Bird Book & pay by 09.12.2016	3rd Early Bird Book & pay by 20.01.2017	Standard Price
<input type="checkbox"/> Bronze 2 day conference	save € 100 € 2,649 + VAT	save € 100 € 2,649 + VAT	save € 100 € 2,649 + VAT	€ 2,749 + VAT
<input type="checkbox"/> Silver 2 day conference + 1 workshop	save € 400 € 2,849 + VAT	save € 300 € 2,949 + VAT	save € 200 € 3,049 + VAT	€ 3,249 + VAT
<input type="checkbox"/> Gold 2 day conference + 2 workshops	save € 500 € 3,049 + VAT	save € 400 € 3,149 + VAT	save € 300 € 3,249 + VAT	€ 3,549 + VAT
<input type="checkbox"/> Platinum 2 day conference + 3 workshops	save € 600 € 3,249 + VAT	save € 500 € 3,349 + VAT	save € 400 € 3,449 + VAT	€ 3,849 + VAT

- The delegate fee includes the following services:
- Access to the purchased conference packages
 - Catering during the entire conference
 - Conference documentation

EVERY REGISTRATION INCLUDES A COMPLIMENTARY MEMBERSHIP TO AUTOMOTIVE IQ

Please indicate your choice on our workshop day on Thursday, 16 February 2017

Workshop A ☐ | Workshop B ☐ | Workshop C ☐ | Workshop D ☐ | Workshop E ☐ | Workshop F ☐

A: Combined electrochemical-thermal characterization and modelling of Li-ion cells to prevent thermal runaway
B: Innovative e-motor design and smart material packaging
C: Alternative heating solutions with heat-based cabin surfaces
D: Global market trends of e-motor development from light to heavy duty vehicles
E: Implementation of modern heat transfer materials for passive cooling improvement and systems cost reduction
F: Thermal management for e-motors

Only one discount applicable per person.

CAN'T MAKE IT TO THE CONFERENCE? PURCHASE THE 2-DAY DOCUMENTATION FOR € 990,- +VAT.
Documentation will be sent 6 weeks after the event

Please fill out in Capitals!

DELEGATE ☐ Mr ☐ Mrs ☐ Ms ☐ Dr

Family Name First Name

Position Email

Telephone Fax

Organisation

Address

Postcode/Town

Approving Manager:

Signature

I agree to IQPC Gesellschaft für Management Konferenzen mbH payment terms.

Yes, I would like to receive information about products and services via email.

PAY BY BANK TRANSFER QUOTING REFERENCE DE20241.006:

IQPC Gesellschaft für Management Konferenzen mbH,
HSBC Trinkaus & Burkhardt AG,
IBAN: DE32 3003 0880 0430 0760 19, SWIFT-BIC: TUBDDEDD

BY CREDIT CARD: Please debit my credit card ☐ VISA ☐ AMERICAN EXPRESS ☐ MasterCard

Card No

Expiry date / Security code

Cardholder's name

Signature

Card billing address (if different from Company address)

BY CHEQUE: Made payable to IQPC Gesellschaft für Management Konferenzen mbH

4 Ways to Register

Fax: +49 (0)30 20 91 32 40

Post: IQPC Gesellschaft für
Management Konferenzen mbH
Friedrichstraße 94
10117 Berlin, Germany

Online: www.thermal-management-conference.com

Email: eq@iqpc.de

For further information

Phone: +49 (0)30 20 91 32 74

BOOKINGCODE

EQ

Venue and Accommodation

Berlin, Germany

Hotel information follow soon.

Sponsorship

We have a variety of packages available to suit your requirements. For all Sponsorship and Exhibition opportunities call **Damian Pigot** on: **+49 (0)30 20 913-232** or email **Damian.Pigot@iqpc.de**

Payment Terms

Payment is due on receipt of the invoice.

Cancellations and Substitutions

CANCELLATIONS AND SUBSTITUTIONS

DELEGATES MAY BE SUBSTITUTED AT ANY TIME. IQPC GESELLSCHAFT FÜR MANAGEMENT KONFERENZEN MBH DOES NOT PROVIDE REFUNDS FOR CANCELLATIONS. HOWEVER, SAVE WHERE WRITTEN NOTICE OF CANCELLATION IS RECEIVED MORE THAN SEVEN (7) DAYS PRIOR TO THE CONGRESS, A CREDIT TO THE VALUE PAID AT THAT DATE WILL BE ISSUED, WHICH MAY BE USED AGAINST ANOTHER IQPC GMBH CONGRESS FOR UP TO ONE YEAR FROM ITS DATE OF ISSUE. FOR CANCELLATIONS RECEIVED SEVEN (7) DAYS OR LESS PRIOR TO AN EVENT (INCLUDING DAY SEVEN), NO CREDIT WILL BE ISSUED. IN THE EVENT THAT IQPC GMBH CANCELS AN EVENT, PAYMENTS RECEIVED AT THE CANCELLATION DATE WILL BE CREDITED TOWARDS ATTENDANCE AT A FUTURE IQPC GMBH CONGRESS OR, IN THE EVENT OF A POSTPONEMENT BY IQPC GMBH, A RESCHEDULED DATE. IF THE DELEGATE IS UNABLE TO ATTEND THE RESCHEDULED EVENT, THE DELEGATE WILL RECEIVE A CREDIT IN LIEU OF PAYMENTS MADE TOWARDS A FUTURE IQPC GMBH EVENT, VALID FOR ONE YEAR FROM THE DATE OF ISSUE. IQPC GMBH IS NOT RESPONSIBLE FOR ANY LOSS OR DAMAGE AS A RESULT OF A SUBSTITUTION, ALTERATION, POSTPONEMENT OR CANCELLATION OF AN EVENT DUE TO CAUSES BEYOND ITS CONTROL INCLUDING, WITHOUT LIMITATION, NATURAL DISASTERS, SABOTAGE, ACCIDENT, TRADE OR INDUSTRIAL DISPUTES OR HOSTILITIES.

YOUR DETAILS

PLEASE CONTACT OUR CUSTOMER SERVICE MANAGER (TEL: +49 (0)30 20913330 OR VERTEILER@IQPC.DE) AND INFORM THEM OF ANY INCORRECT DETAILS WHICH WILL BE AMENDED ACCORDINGLY OR IF YOU PREFER NOT TO GET INFORMATION PER FAX ☐ EMAIL ☐ OR PHONE ☐ ANYMORE.

SPEAKER CHANGES

OCCASIONALLY IT IS NECESSARY FOR REASONS BEYOND OUR CONTROL TO ALTER THE CONTENTS AND TIMING OF THE PROGRAMME OR THE IDENTITY OF THE SPEAKERS.

DATA PROTECTION

PERSONAL DATA IS GATHERED IN ACCORDANCE WITH THE DATA PROTECTION ACT 1998. YOUR DETAILS MAY BE PASSED TO OTHER COMPANIES WHO WISH TO COMMUNICATE WITH YOU OFFERS RELATED TO YOUR BUSINESS ACTIVITIES. IF YOU DO NOT WISH TO RECEIVE THESE OFFERS, PLEASE TICK THE BOX BELOW.

☐ PLEASE DO NOT PASS MY INFORMATION TO ANY THIRD PARTY.