

Content

7 Exterior Trends

- Form & Function – Light integration into an active grill shutter** 1
E. Dahl, Röchling Automotive SE, Worms
- Active Aeroblades in an SUV – The next step in active aerodynamics** 9
A. Kieschke, N. Wilhelm, H. Heidorn, I. Senchenkov, Dr. Ing. h.c. F. Porsche AG, Weissach
- BMW NA5/6/7 phygital – BMW iX3 – New Generation of car and headlamp** 25
J. Pelhan, T. Cigale, Forvia Hella; S. Schäfer, Covestro Deutschland AG

7 Interior Trends

- Foam injection moulding of TPE as a sustainable alternative for soft-touch applications in automotive interiors** 39
S. Pirl, GK Concept GmbH, Dresden; L. Pieper, J. Wolters, C. Hopmann, Institute for Plastics Processing in Industry and Craft (IKV), RWTH Aachen University, Aachen
- The aesthetics of post-consumer recycled PP – New opportunities and challenges** 57
G. Grestenberger, A. Legras, D. Mileva, J.-G. Stocker, Borealis
- Post-Consumer Recycled Materials in Automotive Interior – From Material Development to Foamed Serial Components** 63
F. Schockemöhle, Pöppelmann Kunststoff-Technik GmbH & Co. KG, Lohne

7 AI Trends

- From Household Plastic Waste to Car Interior – Applying AI-Based Gas Sensors for Odor Characterization of Recyclates** 73
T. Baeyens, D. Kugele, M. Wolf, Robert Bosch GmbH, Renningen
- Digital Twins Drive Efficiency: Transforming Automotive Bonding Processes Integrating Simulation, VR Planning, and Predictive Maintenance for Robust Dispensing and Assembly Systems** 83
G. Haag, E. Beckmann, RAMPF Production Systems GmbH, Zimmern o. R.

7 Spotlight Session: PU Coating

FrontIQ Light – The Future of Automotive Lighting: Seamlessly Integrating Design and Function through 3K Injection Molding and In-Mold Decoration 97

A. Bierbaumer, KraussMaffei Technologies GmbH, Munich;

F. Bürkel, LEONHARD KURZ Stiftung & Co. KG, Fürth

PUEdge – Process-reliable polyurethane coating of complex plastic components in the injection molding tool 101

F. Summerer, Summerer Technologies GmbH & Co. KG, Schechen

**PU-Coatings in Automotive Manufacturing
Sustainable Innovation or Future Special Waste?** 107

S. Killmer, M. Engelking, D. Weißberg, Volkswagen AG, Wolfsburg

7 Lightweight Design

Mass production of the multi-functional trunk compartment for the Mercedes-Benz E-Class made from a fully deep-drawn organic sheet using a one-shot process 123

A. Kempel, Pöppelmann Kunststoff-Technik GmbH & Co. KG, Lohne

Lightweight, Functional and Individual – Composite and Press-Lamination Technologies as Key Enablers for Sustainable Automotive Interior Design 133

A. Rekelkamm, R. Janotta, FRIMO GmbH, Lotte

Thermoset Injection Molding of Magnet-Polymer Hybrid Components for Axial Flux Machines in High Performance Applications 137

R. Sujatta, B. Schilder, Mercedes-Benz AG, Stuttgart;

V. Schöppner, Universität Paderborn, Paderborn

Gamechanger in structural components – From metal to plastic 153

P. Zwickhuber, ENGEL Austria GmbH, Schwertberg

7 Sustainability

Simply Mono(materials) at Škoda 163

D. Kopáč, T. Silovská, Škoda Auto a.s., Mladá Boleslav, Czech Republic

Complexity vs. Sustainability

Efficient approaches to improve the recyclability of interior components 165

D. Wessels, Volkswagen AG / Volkswagen Nutzfahrzeuge, Wolfsburg;
J. Ewert, Volkswagen Osnabrück GmbH

Automotive closed-loop post-consumer recyclates: Advances in plastic sorting and physical recycling of end-of-life vehicles 179

M. Schlummer, D. Arends, L. Strobl, M. Wende, Fraunhofer IVV, Freising;
M. Brunnermeier, Fraunhofer IBP, Valley

Polyamide extrusion foam for single-material applications 189

J. Geerds, C. Mack, Fraunhofer ICT, Pfinztal

7 Surface Technologies

Introduction of selective coating using digital methods Maskless multicolor painting 203

O. Tiedje, V. Wegmann, T. Hess, Fraunhofer IPA, Stuttgart

7 Tool Technologies

STARgate HRS® & GLOW HRS Two unprecedented products to revolutionize hot runner technology for the automotive industry 213

R. Soligon, Oerlikon HRSflow, San Polo di Piave, Italy

Print & Inject – 3D-Printed Mold Inserts as a Bridge Between Design Freedom and Serial-Production Materials in Injection Molding 231

S. Krell, L. Liebenstund-von Wirth, SK Industriemodell GmbH, Übach-Palenberg

7 New Material Resources

Closing the Loop: Painted Bumper Solutions with Recycled Polypropylene A journey through challenges, limitations and success 241

P. Rohrer, D. Mileva, I. Traxler, Borealis Polyolefine GmbH, Linz, Austria

Mycelium Materials in Interior Feel the Future: Soft, Light and 100% Bio-Based 249

S. Caba, A. C. Friedrich, EDAG Engineering GmbH, Fulda

7 Interior

Investigation of the circularity of natural fibre-reinforced compounds for automotive applications 261

F. Pithan, D. Malecha, KIMW GmbH, Lüdenscheid

**Particle foams in the circular economy
Secondary raw materials from end-of-life vehicles** 267

J. Grunwald, M. Mörl, General Industries Deutschland, Kassel

Closing the Loop: Creating New Tailgates through PP-LGF Recycling 279

S. Kulkarni, SABIC, Geleen, The Netherlands; A. Forestieri, Owens Corning, Besana Brianza, Italy; J. Schoberer, Audi, Ingolstadt; A. Bueno, OPMobility, Sainte-Julie, France

7 AI Tools in Series production

Plastic injection moulding with recyclates in automotive interiors: Stable quality with engineering AI based on the robust design method 289

F. Thurner, Contech Software & Engineering, Fürstenfeldbruck

AI in the production of fans 303

J. Wiedemann, Wirthwein SE, Creglingen

7 Composite Trends

Modular, Durable and Demountable Composite Structures for Circular Mobility – Reversible adhesive joints and standardized modules implemented on the RECREATE CityBot 307

A. Erler, EDAG Engineering GmbH, Munich; S. Caba, EDAG Engineering GmbH, Fulda

**Designed for Circularity
Thermoplastic Composites for EV Battery Enclosures** 323

K. Seidel, Teijin Automotive Technologies, Wuppertal

**The European GFRP market
Current market developments and trends with a focus on the automotive** 333

E. Witten, V. Mathes, AVK – Industrievereinigung Verstärkte Kunststoffe e. V., Frankfurt am Main

7 Functional Materials

- Multifunctional and Sustainable Materials for Next-Gen ADAS Modules** 347
B. Horneff, J. Heinisch, LG Chem Europe GmbH, Frankfurt am Main
- Metal- and Polymer-Coated Glass Fibres for Composite EV Applications**
Multifunctional Coated Fibre Technology for Next-Gen Mobility 359
N. Savla, S. Schwellenbach, FibreCoat GmbH, Aachen
- Thermoplastic solutions for battery thermal management:
Pentatonic Thermal+** 373
M. Lipperheide, G. Mimberg, Kautex Textron GmbH & Co. KG, Bonn

7 Research


- Circular Polymer Production Technologies –
Enabling the use of closed-loop polyamides for automotive parts** 387
M. Thomas, Fraunhofer Center Circular Economy for Mobility CCEM, Wolfsburg;
A. Utgenannt, DOMO Engineering Materials SPA, Leuna; S. Hintze, Polytec Group, Lohne;
S. Kanani, Tailorlux GmbH, Münster
- Plastics as a chance for E-Mobility – Sustainable battery system housings –
projects at the research campus Open Hybrid LabFactory** 395
W. Berlin, Technische Universität Braunschweig, Braunschweig;
M. Gernuks, Volkswagen AG, Wolfsburg

7 Process

- Overview of Particle foam: Current Developments, applications and
future opportunities in the automotive sector** 405
S. Heck, T. Michel Formenbau GmbH & Co. KG, Lautert

7 Product Innovations/Technology

- Recycling-orientated thermoplastic composite lightweight structures
for automotive engineering** 419
A. Liebsch, D. Wohlfahrt, R. Kupfer, M. Gude, Dresden University of Technology –
Institute of Lightweight Engineering and Polymer Technology (ILK), Dresden;
T. Kuntze, Fraunhofer Institute for Material and Beam Technology, Dresden



Biobased Plastics in Technical and Long-Term Applications

Durability and performance of new bio-based plastics and composites

431

C. Bonten, M. Seitz, Institut für Kunststofftechnik, University of Stuttgart