Aluminium, Magnesium, Titanium
Moving the World

LightMAT
2nd Conference & Exhibition on Light Materials – Science and Technology with the special Symposium ECAA

08. - 10. November 2017
Bremen, Germany

Programme

lightmat2017.dgm.de
Welcome to Bremen, Germany, home of the 2nd International Conference on Light Materials – Science and Technology (LightMAT 2017), which gives a comprehensive overview and new insight into the three most important light metals Aluminium, Magnesium and Titanium and their combinations.

The materials are viewed individually or in combination in multi-material designs, including the aspects of processing, joining and corrosion protection. In addition, promising enabling-technologies such as additive manufacturing are highlighted.

LightMAT 2017 provides a platform for academic and industrial researchers, scientists and engineers to present and discuss the recent development and progress made in Magnesium, Aluminium, Titanium and their alloys and materials combinations. Additional sessions are organized beyond single metals and address common processes and main applications, intended to provide comparison and cross fertilization, giving a wide overview of individual advances, challenges and highlights, covering:

- Conventional and advanced light weight applications and products in automotive, aerospace and other relevant transport and lightweight applications
- Fundamental aspects of the three metallic lightweight materials and their alloys, their processing and (physical) metallurgy issues involved
- Microstructure evolution, related properties and advanced simulation
- Industrial fabrication, processing, joining and corrosion protection issues
- Additive manufacturing of metallic structures enabling novel lightweight designs

We wish you a pleasant and extraordinary conference experience.

The conference Chairs

**Prof. Dr. Jürgen Hirsch**
Hydro Aluminium Rolled Products GmbH (Germany)

**Prof. Dr. Karl Ulrich Kainer**
Helmholtz-Zentrum Geesthacht (Germany)

**Prof. Dr. Christoph Leyens**
Technische Universität Dresden (Germany)

**Dr.-Ing. Axel von Hehl**
Stiftung Institut für Werkstofftechnik IWT (Germany)
Basic Information

Conference Location
Maritim Hotel & Congress
Centrum Bremen
Hollerallee 99
28215 Bremen
Germany

Conference Date
8th - 10th November 2017

Website
https://lightmat2017.dgm.de

Conference Office
Deutsche Gesellschaft für Materialkunde e.V.
c/o INVENTUM
Thorsten Weber
Marie-Curie-Straße 11-17
53757 Sankt Augustin
Germany
P +49 (0) 151 705 414 60
lightmat@dgm.de

Conference Language
The official conference languages is English.

Congress Fees
Young researchers up to 30 years
DGM members* 230 EUR
DGM-basic members 270 EUR
Non-members 300 EUR

Expert Researchers 31-40 years
DGM members* 460 EUR
DGM-basic members 490 EUR
Non-members 530 EUR

Professionals University
DGM members* 600 EUR
DGM-basic members 660 EUR
Non-members 720 EUR

Industry
DGM members* 700 EUR
DGM-basic members 770 EUR
Non-members 840 EUR

The conference fees include the Technical Programme, World-Café, refreshments during the official breaks, Lunch, Conference Dinner.

The congress fee is VAT-exempt according to §4, Ziffer 22 UStG.
The catering package contained to the congress fee includes 19% VAT.

Poster Mounting
Wednesday, 8th November 2017, 08:00 - 09:20 h
Poster remain on display during the whole congress.

Extended Coffee Break & Poster presentation:
Thursday, 9th November 2017, 16:10 - 17:00 h

Exhibition
An exhibition will take place during the conference. The exhibition is located at the lobby in front of the Saal Kaiser and will be open during the conference time.

Short Paper
Short paper from conference contributions are available on LightMAT website:
https://lightmat2017.dgm.de/program/

Lunch
Lunch will take place at the foyer of the Congress Centrum.

Conference Dinner
Thursday, 9th November 2017
19:30 - 22:30 h
Bremer Ratskeller
Am Markt
28195 Bremen
Bremen’s Ratskeller, the cellar-restaurant of the Town Hall! Here, at Bremen’s market place, 600 years of history blend with modern gastronomy. Where poets and royalty have indulged in the best of German wines you should enjoy a good sip and treat yourself to some of the fine creations from the kitchen of our family run restaurant. It is for good reason that the Ratskeller is known as the “delectable foundation” of the famous Town Hall of Bremen, a world heritage site.

How to get there
By foot: around 20 minutes walk from Maritim hotel
By Tram: No. 6 from Blumenthalstraße to Schüsselkorb (5 minutes drive)

A: Processing
B: Applications
C: Alloy Development
D: Hybrid Materials and Multi-material designs
E: Characterization and testing
F: Computational materials design Topic

Poster
List of Speakers
List of Exhibitors
Maps
Programme Committee

Dr. A. Förderreuther
Novelis Deutschland GmbH
(Germany)

Prof. O. Keßler
University of Rostock (Germany)

Dr. D. Lehmhus
Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM (Germany)

Prof. V. Ploshikhin
University of Bremen (Germany)

Prof. M. Schaper
Paderborn University (Germany)

C. Siemers
Technische Universität Braunschweig
(Germany)

Dr. K. Schimanski
Premium Aerotec (Germany)

Prof. L. Wagner
Clausthal University of Technology
(Germany)

Prof. H.-W. Zoch
University of Bremen (Germany)

Dr. Frank Boinski
Daimler AG (Germany)

Prof. Dr.-Ing. habil. M. Busse
Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM (Germany)

Dr. N. Hort
Helmholtz-Zentrum Geesthacht
(Germany)

Dr. M. Knüwer
Airbus Operations GmbH
(Germany)

Dr. B. Lenczowski
Airbus Group Innovations
(Germany)

Dr. C. Schäfer
Nemak Dillingen GmbH
(Germany)

Dr. T. Seefeld
Bremer Institut für angewandte Strahltechnik GmbH
(Germany)

Dr. W. Sillekens
European Space Agency ESA
(The Netherlands)

Dr.-Ing. D. Wieser
Arconic
(Germany)

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(Austria)

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Brunel University London
(United Kingdom)

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IMDEA Materials Institute
(Spain)

Prof. P. Pragnell
University of Manchester
(United Kingdom)

Prof. J. Robson
University of Manchester
(United Kingdom)

K. Vanmeensel
Katholieke Universiteit Leuven
(Belgium)
**Programme Wednesday, 8th November 2017**

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<td>Continuous production of magnesium wire by twin-roll casting</td>
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<td>Manufacture and characterisation of twin-roll cast aluminium-steel</td>
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**On the way to Additive Manufacturing - AM: Industrial AM-Production enabled by Al & Ti6-4 - Metal-Powders**

**Peter Sander**  
VP Manager Emerging Technologies & Concepts Germany  
Airbus Operations GmbH Hamburg, Germany

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Integrated computational and experimental materials engineering (ICEME) for vehicle lightweighting
PhD. Kaan İnal
Associate Professor; Department of Mechanical and Mechatronics Engineering; University of Waterloo, Canada

Computational Materials Engineering tools capable of integrating microstructure based material and process design with performance driven structural optimization can play a significant role in enhancing manufacturing competitiveness. Automotive industry is embracing ICEME tools to adopt aggressive engineering strategies to meet impending fuel economy and vehicle mass targets in a sustainable manner. This talk presents multiscale computational frameworks involving coupled micro-scale and macro-scale numerical models for high strength aluminum alloys, Advanced High Strength Steels (AHSS), magnesium alloys and composite materials. For the micro-scale computations, a new 3D finite element analyses based on rate-dependent crystal plasticity theory is developed that incorporates 3D microstructures accurately constructed from 2D electron backscatter diffraction (EBSD) data into finite element analyses. Mechanism based constitutive laws that permit strain hardening and saturation without external adjustment are employed. The macro-scale computations are done with advanced yield functions informed by micro-scale models. The so-called Extended Finite Element Models (XFEM) and Element Free Galerkin approaches are used. Coupling these models with optimization frameworks based on genetic algorithms and neural networks provide a comprehensive ICEME toolset to satisfy design and performance requirements with materials and processes while meeting cost, mass and performance requirements simultaneously. An illustration of this integrated approach for a component level application with extruded aluminum alloys will also be presented.

Room

08:30 Integrated computational and experimental materials engineering (ICEME) for vehicle lightweighting
09:15 Strength and corrosion resistance of AlMgSi alloys A. Wimmer
09:35 Inhibitor containing plasmaelectrolytic oxide layers on magnesium alloy AZ31 M. Schneider
09:55 Effects of shot peening on the HCF performance of Ti-6Al-4V by variation of coverage and impact angle J. Fuhr
10:15 High speed forming, a smart way to manufacture complex parts with high performance alloys Y. Marchal
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11:55 Grain refinement in vibration-assisted laser welding of aluminium T. Radel
12:15 Lunch & Exhibition

10:00 Lunch & Exhibition
10:30 Coffee Break & Exhibition
11:00 A.5: Cold Forming and Laser Welding Dr. D. Lehmhus
11:15 D.2: Session 2 Dr. A. Fördereuther
11:30 E.4: Session 4 Prof. M. Schaper
11:45 ECAA.4: Session 4 Prof. O. Keßler
11:55 ECAA.5: Session 5 Prof. Dr. J. Hirsch
12:15 Lunch & Exhibition

Programme Thursday, 9th November 2017

Venue: Saal Kaisen

Room

Saal Kaisen

09:00 Integrated computational and experimental materials engineering (ICEME) for vehicle lightweighting
PhD. Kaan İnal
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Programme Thursday, 9th November 2017

Additive Manufacturing: Cybersecurity challenges, threat models, and a new design based security approach
Prof. Nikhil Gupta
Composite Materials and Mechanics Laboratory, Mechanical and Aerospace Engineering Department, New York University, Tandon School of Engineering, USA

Additive manufacturing (AM), also called 3D printing, is one of the fastest growing industrial fields in the past decade. The AM process chain heavily relies on software programs starting from the first step of product design to the final step of manufacturing the part using a 3D printer. The digital nature of the AM cyber-physical system makes it vulnerable to cybersecurity risks such as sabotage and intellectual property theft. In hardware sector, the design of a product remains the same for years, even decades, and the monetary losses from stolen intellectual properties can be significant. This presentation discusses the unique challenges faced by the AM process chain. The threats can be internal or external, which are discussed in various threat models. The unique challenges faced by AM methods also need specialized solutions. A new design based security approach is discussed where security features are embedded in the CAD model designs. In the presence of these features, the CAD files print as high quality components only under a specific set of process flow conditions, while other processing conditions provide a lower quality or defective part. This design approach can augment the network security tools deployed by cybersecurity experts to develop a robust cybersecurity strategy for high value parts.

14:00 Room Saal Kaisen
15:00 Room Saal Kaisen
Microstructural and mechanical characterization of high strength aluminum alloy processed via selective laser melting
K.-P. Hoyer

15:20 Room Salon Franzius
Processing and mechanical properties of a metastable titanium alloy (Ti-6Al-4V-6Mo-3Cr) by selective laser melting
F. Schubert

15:40 Room Salon Scharoun
Towards property driven process optimization – on a framework for through-process simulation of AA6xxx car body sheet production
Dr.-Ing. T. Brüggemann

16:00 Room Saal Focke Wulf
Weldable Metallic Joining Elements in Fibre Reinforced Thermoplastics
A. Kunze

16:10 Room Saal Kaisen
Weldable Metallic Joining Elements in Fibre Reinforced Thermoplastics
A. Kunze

17:00 Room Salon Scharoun
Corrosion of multi material designs
S. Oberhauer

World-Café
Discussion in small groups about three different questions. The results of the World-Café will be presented on Friday.

18:00 Room Saal Kaisen
Conference Dinner @ Bremer Ratskeller
Bremer Ratskeller
Am Markt
28195 Bremen

Extended Coffee Break & Poster presentation

15:40
Oral Poster Session
Every oral poster got a presentation time of 3 minutes + 2 minutes for questions.
- Effect of Prior Heat Treatment on Nanostructuring of 7XXX Aluminum Alloy Under Cold Severe Straining
  Dr. S. Krymsky
- Towards property driven process optimization – on a framework for through-process simulation of AA6xxx car body sheet production
  Dr.-Ing. T. Brüggemann
- Mechanical properties of high copper containing AlCuSi cast alloys at elevated temperature
  Dr. S. Bozorgia
- Shock Assisted Fast Production of Superconducting MgB2 and Hybrid Power Transmission Lines
  Ph.D. B. Godibadze
- Microstructure and mechanical properties of Ti-15Mo alloy prepared by equal-channel angular pressing
  A. Terynková

16:10
Extended Coffee Break & Poster presentation

17:00
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Discussion in small groups about three different questions. The results of the World-Café will be presented on Friday.

18:00
Refreshment time
In recent years, magnesium and its alloys were successfully introduced into weight-saving applications in the transportation industries in order to reduce fuel consumption and greenhouse gas emissions as well as to increase the performance of modern cars. Besides advantages, e.g., superior specific strength and excellent processability, applications of magnesium alloys are limited due to their inferior properties at elevated temperatures, e.g., limited creep resistance and insufficient corrosion performance, especially when in galvanic contact with other metallic materials. Current developments are revealing possibilities to improve these properties by using modern alloys and processing routes. While the majority of industrial applications utilize high-pressure die cast products, the use of wrought magnesium alloys is still at an early stage. Within the framework of on-going research and development, the corrosion behavior of both cast and wrought magnesium materials in standalone uses or in galvanic couples with other metallic materials is gaining increasing attention. The magnesium industry has to face new challenges with regard to market issues, the breakdown of the western magnesium industry and finally the carbon footprint discussion of the life cycle assessment of components for the transportation industry. This presentation will first address these issues and challenges, then discuss new developments, and finally show some examples of new and potential applications.

**Aluminium Applications in Automotive**

**Dr. Axel Förderreuther**

Novels Deutschland GmbH, Senior Manager, Global Automotive Technology Strategy

Aluminium is the most important lightweighting material in the automotive industry and the go-to material after steel. It combines affordability with proven manufacturing methods and global availability in a variety of semi products. Coming from low and medium volume the aluminium industry has been transitioning recently to mass production. New processes and recent alloy developments have expanded the application range to include the highest strength levels. Joining methods like resistance spot welding open the door to material-agnostic manufacturing concepts side by side with steel. These developments position the aluminium industry to continue its long-term success story well into the future of electric driving.
Programme Friday, 10\textsuperscript{th} November 2017

Room Saal Kaisen

13:00 Evaluation of World-Café
   Presentation of the results of the World-Café.

13:40 Closing Remarks

14:00 Ende of LightMAT 2017 & Facility Visits

Facility Visits

Airbus

The Facility Visit at Airbus will show and explain aircraft construction in Bremen to you. „Bremen delivers the wings“ - most of this revolves around control systems, wings and flaps. But also small components and parts of the A400M are produced in Bremen.

Picture ©Airbus

Daimler

The two-hour tour begins with a film shown in the cinema of the Mercedes-Benz Customer Centre. You will then be taken to the production halls by bus to be shown the body-in-white assembly and final assembly shops (Daimler reserve the right to make modifications).

Picture ©Daimler AG

IFAM-Materialise-Bias-IWT

Get an insight to the light weight center Bremen and it’s local institutes like:

- Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM
- materialise
- BIAS – Bremer Institut für angewandte Strahltechnik GmbH
- Stiftung Institut für Werkstofftechnik IWT
### Wednesday, 8th of November 2017

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<tbody>
<tr>
<td>11:20</td>
<td>Coupled Thermal-Mechanical Simulation for Continuous Casting of Lightweight Alloys</td>
<td>A. Horr1; J. Kronsteiner1; S. Scheibhofer1; C. Mühlstädt1; S. Ucsnik1</td>
<td>LKR Leichtmetalikkompetenzzentrum Ranshofen GmbH (Austria)</td>
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<tr>
<td>11:40</td>
<td>Continuous production of magnesium wire by twin-roll casting</td>
<td>M. Teuber1; M. Ullmann1; R. Kawalla1</td>
<td>TU Bergakademie Freiberg (Germany)</td>
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<td>12:00</td>
<td>Manufacture and characterisation of twin-roll cast aluminium-steel clad strips</td>
<td>M. Stoibchenko1; O. Grydin1; M. Schaper1</td>
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<td>Grain Refinement of Aluminum Cast by Heterogeneous Nucleation Sites of L12 modified Al3Ti</td>
<td>Y. Watanabe1; H. Sato1</td>
<td>Nagoya Institute of Technology (Japan)</td>
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<td>12:40</td>
<td>New core technology for light metal casting</td>
<td>M. Heuser1; J. Weise1; M. Busse1; F. Handels1; J. Hilbers1</td>
<td>Osaka University (Japan)</td>
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<td>15:00</td>
<td>The Influence of Indirect Hot Extrusion and Heat Treatment Parameters on the Properties of Flat Profiles Made of the Aluminium Alloy EN AW-7475</td>
<td>O. Golovko1; D. Behne1; A. Rossberg1; H.J. Maier1; C. Klose1</td>
<td>Leibniz Universität Hannover (Germany); Arconic Extrusions Hannover (Germany)</td>
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<td>Study of hot-workability of titanium alloys through hot torsion testing and its application to the optimization of forging and extrusion processes</td>
<td>C. Bunte1; N. Deferrari2</td>
<td>Universidad Tecnológica Nacional (Argentina); Instituto Nacional de Tecnología Industrial (Argentina)</td>
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<td>15:40</td>
<td>Temperature Controlled Front Face Flow Drilling of Magnesium Alloys</td>
<td>S. Hannich1; D. Biermann1; F. Walther1; P. Wittke1</td>
<td>TU Dortmund University (Germany)</td>
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<td>16:20</td>
<td>Tensile properties of TiC particles reinforced Aluminum matrix composites prepared via powder metallurgical process</td>
<td>H. Kurita1; Y. Sakaeda1; N. Yodosh1; T. Miyazaki1; L. Chaffron3</td>
<td>Shizuoka University (Japan); Tohoku University (Japan); French Alternative Energies and Atomic Energy Commission CEAM (France)</td>
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<td>16:40</td>
<td>High strength Aluminium matrix composites reinforced with nanoparticulate materials</td>
<td>M. Leparoux1; K. Kallip1; N.K. Babu1</td>
<td>Empa (Switzerland); Empa (Switzerland) / Tallinn University (Estonia)</td>
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<td>High shearing technology for the fabrication of in situ Al3Ti/Al composites</td>
<td>Y. Zeng1; P. Randelzhofer1; C. Koerner1</td>
<td>Friedrich-Alexander-Universität Erlangen-Nürnberg FAU (Germany)</td>
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<td>Development of Al-Mg-Sc thin foils for use in fibre-reinforced metal laminates</td>
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<td>A. Wimmer1</td>
<td>Neuman Aluminium (Austria)</td>
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<td>Inhibitor containing plasmaelectrolytic oxide layers on magnesium alloy AZ31</td>
<td>M. Schneider1; K. Kremer1; D. Tabatabai2; W. Fürbeth2</td>
<td>Fraunhofer Institute for Ceramic Technologies and Systems IKTS (Germany); DEHEMA-Forschungsinstitut (Germany)</td>
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<td>Effects of shot peening on the HCF performance of Ti-6Al-4V by variation of coverage and impact angle</td>
<td>J. Fuhr1; L. Wagner1; M. Wollmann1; M. Basha2</td>
<td>Curtiss-Wright Surface Technologies (Germany); Clausthal University of Technology (Germany)</td>
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<td>10:35</td>
<td>Improved formability of aluminium alloys at low temperatures for automotive applications</td>
<td>B. Gruber1; F. Grabner1; T. Kremmer1; S. Kirnstötter1; R. Schneider1; R. Schäublin1; S. Zaefferer6; D. Raabe6; P.J. Uggowitzer5; S. Pogatscher1</td>
<td>Montanuniversität Leoben (Austria); LKR Leichtmetalikkompetenzzentrum Ranshofen GmbH (Austria); AMAG rolling GmbH (Austria); voestalpine Automotive Components Schwbisch Gmünd GmbH &amp; Co. KG (Germany); ETH Zurich (Switzerland); Max-Planck-Institut für Eisenforschung MPIE (Germany)</td>
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<td>High speed forming, a smart way to manufacture complex parts with high performance alloys</td>
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<td>Manufacture of tailored tubes at elevated temperatures by heat assisted incremental tube forming</td>
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Topics

AM: Special Topic - Additive Manufacturing Alloys

Room: Salon Franzius & Saal Kaisen

Wednesday, 8th of November 2017

11:20  Tailored Al-alloy developments for Laser Powderbed-Fusion 3D-printing – from applied process & welding metallurgy to high strength & convincing ductility
F. Palm1
1Airbus Defence & Space (Germany)

11:40  Aging response of an A357 Al alloy processed by Selective Laser Melting
R. Casati1; M. Vedani1
1Politecnico di Milano (Italy)

12:00  Heat treatment behaviour of aluminium alloy Al-7Si-0.6Mg produced by laser additive manufacturing
M. Becker1; O. Kessler1; P. Rometsch2; K. Yang3; B. Mikseret1
1University of Rostock (Germany); 2Monash University (Australia)

12:20  Intensified Intrinsic Heat Treatments during Selective Laser Melting of Ti-6Al-4V
P. Barriero Vila1; J. Gussone1; J. Haubrich1; S. Sandboes2; J. Cesar Da Silva3; P. Cloetens4; N. Schell1; G. Requena1
1German Aerospace Center DLR (Germany); 2RWTH Aachen University (Germany); 3European Synchrotron Radiation Facility ESRF (France); 4Helmholtz-Zentrum Geesthacht HZG (Germany)

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14:20  Application of Selective Laser Melting for precise optical components
E. Hilpert1; N. Heidler1; S. Risse1
1Fraunhofer Institute for Applied Optics and Precision Engineering IOF (Germany)

15:00  Microstructural and mechanical characterization of high strength aluminum alloy processed via selective laser melting
K.-P. Hoyer1; F. Hengsbach1; P. Koppa1; M. Burns2; T. Tröster1; M. Schaper1
1Paderborn University (Germany)

15:20  Processing and mechanical properties of a metastable titanium alloy (ti-5al-5v-5mo-3cr) by selective laser melting
F. Schubert1; B. Schober2; A. Marquardt2; A. Seidel2; L. Kroll2; C. Leyens2; C. Zopp1
1Chemnitz University of Technology (Germany); 2Technische Universität Dresden (Germany); 3Fraunhofer Institute for Material and Beam Technology IWS (Germany)

15:40  Experimental and numerical study on additive manufactured Ti6Al4V lattice structures
P. Mehmert1; A. Salem2; H. Schafstall3
1simufact engineering GmbH (Germany); 2Materials Resources LLC (USA)

16:00  Material Design by Additive Manufacturing – impact of exposure-strategies and -parameters on material characteristics of AlSi10Mg processed by Selective Laser Melting
A. Pfaff1
1Fraunhofer Institute for High-Speed Dynamics, Ernst-Mach-Institut, EMI (Germany)

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1Paderborn University (Germany)

17:20  Effect of different Mechanical Processes for Surface Treatment on Properties of the Titanium Alloy Ti6246
H. Polanetzki1; I. Stoll1; L. Wagner1
1MTU Aero Engines AG (Germany); 2Clausthal University of Technology (Germany)

17:40  Additive Manufacturing of Magnesium Alloys
L. Jauer1; L. Heemann1; D. Knoop1; A. von Hehl1; H.-W. Zoch1; Y. Wessarges2; J. Hermsdorf2; S. Kaierle2
1Stiftung Institut für Werkstofftechnik IWT (Germany); 2Laser Zentrum Hannover e.V (Germany)

Thursday, 9th of November 2017

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1Chemnitz University of Technology (Germany); 2Technische Universität Dresden (Germany); 3Fraunhofer Institute for Material and Beam Technology IWS (Germany)

B: Applications

Room: Salon Franzius

Friday, 10th of November 2017

10:30  Titanium in Transport Technology
M. Wollmann1; L. Wagner4
1Clausthal University of Technology (Germany)

11:15  Effect of different Mechanical Processes for Surface Treatment on Properties of the Titanium Alloy Ti6246
H. Polanetzki1; I. Stoll1; L. Wagner1
1MTU Aero Engines AG (Germany); 2Clausthal University of Technology (Germany)

11:35  TRILLIUM®, a new aluminium brazing technology
R. Westergaard1; A. Oskarsson1; S. Koscielski1
1Gränges Sweden AB (Sweden)

12:00  Additive manufacturing of hot bonded inserts in sandwich structures with metal 3D printing
J. Kranz1; J. Jeroen Vermeulen2; N. Torke1
1Materialise GmbH (Germany); 2Atos (Germany)

12:20  Predict macro to microscale properties of AM parts by manufacturing process simulation
P. Mehmert1; A. Salem2; H. Schafstall3
1simufact engineering GmbH (Germany); 2Materials Resources LLC (USA)

12:40  Quality assurance in serial production of AM-Titanium components for aerospace applications – status and challenges for the future
K. Schimanski1; A. Hemmen1; D. Tolksdorf1; K. Schimanski1
1Premium AEROTECH GmbH (Germany)

13:00  Numerical and experimental study of additive manufactured Ti6Al4V lattice structures
A. Taube1; W. Reschentik1; K.-P. Hoyer1; G. Kullmer1; M. Schaper1
1Paderborn University (Germany)

13:20  Minimizing the distortions during the AM build-up phase by simulation based, adaptive support structure
C. Kobert1; S. Bergmann2; C. Werners; V. Ploshikhin1
1University of Bremen (Germany); 2BEGO Medical GmbH (Germany)

13:40  Aluminum powder spheroidization by over-liquidus remelting and its influence on the powder SLM processing behaviour
M. Skalon1; C. Höller1; M. Hebda2; K. Sulikowska2; G. Pottlacher1; C. Sommitsch1
1Graz University of Technology (Austria); 2Cracow University of Technology (Poland)

14:00  Feasibility of manufacturing magnesium microscale structures by selective laser melting
L. Heemann1; D. Knoop1; A. von Hehl1; H.-W. Zoch1; Y. Wessarges2; J. Hermsdorf2; S. Kaierle2
1Stiftung Institut für Werkstofftechnik IWT (Germany); 2Laser Zentrum Hannover e.V (Germany)

14:20  Additive Manufacturing of Magnesium Alloys
L. Jauer1; L. Heemann1; D. Knoop1; A. von Hehl1; H.-W. Zoch1; Y. Wessarges2; J. Hermsdorf2; S. Kaierle2
1Stiftung Institut für Werkstofftechnik IWT (Germany); 2Laser Zentrum Hannover e.V (Germany)
Topics
C: Alloy Development
Room: Saal Kaisen

Friday, 10th of November 2017
09:15 Microstructure and mechanical properties of as-cast and heat treated Mg-Ca-Y-Zr Alloys
S. You1; Y. Huang1; H. Dieringa1; K.U. Kainer1; N. Hort1
1Helmholtz-Zentrum Geesthacht HZG (Germany)
09:35 Effect of Alloying Elements on the Texture and the Anisotropy of the Mechanical Properties of Magnesium Alloys with REE, Lithium, and Aluminum
S. Betsofen1; R. Wu1; A. Petrov1
1Moscow Aviation Institute (Russia); 2Harbin Engineering University (China)
09:55 The Effect of Precipitates on Twinning in Magnesium Alloys
J. Robson1; P. Hidalgo-Manrique1
1University of Manchester (United Kingdom)
10:35 Al-Cu-Li Alloys: Phase Composition, Texture, and Anisotropy of Mechanical Properties
S. Betsofen1
1Moscow Aviation Institute (Russia)
10:55 Atomistic experimental and simulation investigation on the modification of Al-Si alloys
P. Schumacher1; J. Li1
1Montanuniversität Leoben (Austria)
11:15 Design concept of hardenable magnesium-lean alloys processed by high-speed extrusion
M. Chova1; L. Hauser1; R. Schäublin1; D. Horwatisch1; T. Hametner1; S. Pogaitscher1; P.J. Uggowitzer1; J.F. Löffler1
1ETH Zürich (Switzerland); 2AIT Austrian Institute of Technology (Austria); 3Montanuniversität Leoben (Austria)
11:35 A thermodynamic database for both Ti-based alloys and TiAl-based materials
H. Chen1; Y. Yang1; G. Chen1; A. Engström1
1Thermo-Calc Software AB (Sweden)
11:55 Precipitation hardening on mechanical and corrosion properties of extruded Mg10Gd modified with Nd and La
P. Maier1; M. Behchly1; C. Mendis1; N. Hort1
1Hochschule Stralsund (Germany); 2Brunel University London (United Kingdom); 3Helmholtz-Zentrum Geesthacht HZG (Germany)

D: Hybrid Materials and Multi-material designs
Room: Salon Franzius

Thursday, 9th of November 2017
09:15 Corrosion properties of Al/steel-hybrid joints manufactured by ultrasound enhanced friction stir welding (USE-FSW)
S. Benfer1; W. Fürbeth1; M. Thomá1; G. Wagner1; B. Straß1; B. Wolter1
1DECHEMA-Forschungsinstitut (Germany); 2Chemnitz University of Technology (Germany); 3Fraunhofer IZFP (Germany)
09:35 Investigation of the coatings for hybrid high pressure die-casting of Al cast-steel sheet components
L. Gerdt1; K. Bobzin1; M. Öte1; S. Wiesner1
1RWTH Aachen University (Germany)
09:55 Ultrafine-grained laminated metal composites – a new promising class of materials for lightweight applications
F. Kümmel1; H.W. Höppel1; M. Göken1
1Friedrich-Alexander-Universität Erlangen-Nürnberg FAU (Germany)
10:35 APM aluminium-polymer foams and derived materials: A survey on properties, applications and development trends
J. Weise1; J. Baumeister1; D. Lehnhus1
1Fraunhofer IFAM (Germany); 2University of Bremen (Germany)
10:55 Continuous, free-formable sandwich design with 3D fibre reinforced core for increased lightweight level of applications in large-scale production
K. Schäfer1; J. Stiller1; J. Tröltzsch1; D. Nestler1; L. Kroll1
1Chemnitz University of Technology (Germany)
11:15 Adaptive forming of hybrid sheet metal components at elevated temperatures
M. Tulk1; C. Guilleaume1; A. Brosius1
1Technische Universität Dresden (Germany)
11:35 Computed Tomography Examination of Hybrid Components after Dynamic 3-Point Bending Test
P. Kutz1; Z. Wang2; M. Ellouz1; T. Kordisch1; T. Troester1
1University of Applied Sciences Bielefeld (Germany); 2Paderborn University (Germany)
11:55 Qualification of an intrinsic hybrid laminate for cyclically stressed components
A. Busch1; R. Brandt1
1University of Siegen (Germany)
14:20 Joining of multi-material lightweight structures by power ultrasonics
F. Baile1
1University of Kaiserslautern (Germany)
15:00 Weldable Metallic Joining Elements in Fibre Reinforced Thermoplastics
A. Kunze1; A. von Hehl1; H.-W. Zoch1
1Stiftung Institut für Werkstofftechnik IWT (Germany)
15:20 Joining Technique for Light Weight AI-Steel Hybrid Structure
X. Fang1; F. Zhang1
1University of Siegen (Germany)

Friday, 10th of November 2017
09:15 No adhesion without pretreatment at novel magnesium/plastic hybrid components
U. Jüptner1; K.-H. Lindner2
1JUBO Technologies GmbH (Germany); 2TWI GmbH (Germany)
09:35 Laser and plasma surface treatment of aluminium substitutes wet-chemical processes for fiber metal laminates
A. Klotzbach1; J.-S. Pap1; J. Standfuß1; S. Dieckhoff1; M. Burchhardt2
1University of Applied Sciences Belefeld (Germany); 2Paderborn University (Germany)
09:55 Al-Cu and Al-St Bimetal Wire for Lightweight Structures
A. Berger1; V. Fux1
1Fraunhofer Institute for Material and Beam Technology IWS (Germany)
**Wednesday, 8th of November 2017**

11:20

**Atomistic characterization on the solute clustering and precipitation of Mg alloys**

J. Li¹; P. Schumacher¹

*Montanuniversität Leoben (Austria)*

11:40

**In-situ Differential Scanning Calorimetry of Dissolution and Precipitation Behaviour in Mg-Y-Nd Alloy WE43**

L. Burgsch¹; O. Keßler¹; B. Milkereit¹; C. Schick¹

*University of Rostock (Germany)*

12:00

**Mechanical properties of Mg and Mg alloys during and after high current density pulses**

F. Körkemeyer¹; D.A. Molodo¹; K.D. Molodo¹; A. Dalinge¹; G. Gerstein¹; A. Tripathi¹; S. Zaefferer¹; H.I. Maiér¹

*Leibniz Universität Hannover (Germany)*; *RWTH Aachen University (Germany)*; *Max-Planck-Institut für Eisenforschung MPIE (Germany)*

12:20

**Visco-Plastic Self-Consistent Modelling to Determine Dominant Slip and Twinning Systems in Magnesium WE43 at High Strain Rate**

A. Platts¹; J. Robson¹; M. Lunt²

*University of Manchester (United Kingdom)*; *Defence Science and Technology Laboratory (United Kingdom)*

12:40

**Corrosion fatigue assessment of creep-resistant magnesium alloys DieMag422 and AE42 using electrochemical responses**

M. Klein¹; G. Frieling¹; F. Walther¹

*TU Dortmund University (Germany)*

15:00

**A mechanical model of cellular solids for energy absorption**

M. Avalle¹; G. Belingardi¹

*Università degli studi di Genova (Italy)*

15:20

**Atom probe tomography of early natural aging and pre-aging of AA 6016**

P. Gumiratschewki²; G. Rank¹; P. Uggowitz²; S. Gerst¹; S. Pogatscher¹

*Montanuniversität Leoben (Austria)*; *AMAG rolling GmbH (Austria)*; *ETH Zurich (Switzerland)*

15:40

**Quality control on the fly: Alloy identification on-site using handheld XRF and LIBS analyzers**

R. Tatura¹

*analytic instruments gmbh (Germany)*

16:20

**Influence of non-uniform stress states and strongly localized strain distribution on the fatigue behavior of wrought magnesium alloys**

J. Denk¹; O. Huber¹; H. Saage¹

*University of applied sciences Landshut (Germany)*

16:40

**Crack growth behaviour of aluminium wrought alloys in the very high cycle fatigue regime**

F. Bülbül¹; M. Wicke¹; T. Kirsten¹; A. Brückner-Fort²; M. Zimmermann²; H.-J. Christ¹

*University of Siegen (Germany)*; *University of Kassel (Germany)*; *Technische Universität Dresden (Germany)*

17:00

**Influence of an additional heat treatment on the dimensional stability and the fatigue behaviour of die cast specimens made of the alloy A380Cu28Fe**

J. Schumacher¹; B. Clausen¹

*Stiftung Institut für Werkstofftechnik IWT (Germany)*

17:20

**Fatigue life of welding joints in carbon-manganese-boron-steel strips**

M. Mühler¹; R. Brandt²

*Mubea Fahrwerkselemente GmbH (Germany)*; *University of Siegen (Germany)*

17:40

**Fracture toughness of TiB reinforced Ti3Al2.5V composite prepared by the combination of high-energy ball milling and hot isostatic press followed by reactive sintering**

K. Sakayanagi¹; H. Kurita¹; Y. Sakaida¹; L. Ropars²; J. Defosses²; S. Gourde³

*Shizuoka University (Japan)*; *Airbus Group Innovations (France)*

 (**Thursday, 9th of November 2017**

09:15

**The effect of ultra-fine grained structure on the phase transformations in metastable beta titanium alloys**

K. Václavová¹; J. Stráskyy¹; J. Veselý¹; P. Známal¹; I. Semenova¹; V. Polyakova¹; M. Janecek¹

*Charles University (Czech Republic)*; *JFA State Aviation Technical University (Russia)*

09:35

**The effect of hot working on mechanical properties and microstructure of biocombustible Ti-Nb-Ta-Zr-O alloy**

J. Strásky¹; D. Preisler¹; P. Harcuba¹; M. Janecek¹

*Charles University (Czech Republic)*

09:55

**Ultrasonic characterization of beta to omega phase transformation in metastable beta-titanium alloys**

J. Nejezchlebova¹; M. Janoska¹; H. Seiner¹; L. Bodnarova¹; P. Sedlak¹; M. Landa¹; J. Smilauerova¹; J. Strasky¹; P. Harcuba¹; M. Janecek²

*Institute of Thermomechanics (Czech Republic)*; *Charles University (Czech Republic)*

10:35

**Damage analyses of cohesive layer of intrinsic aluminum CFRP hybrid composites produced in high pressure die casting with polymer based decoupling layer**

A. Struβ¹; T. Hochrainer¹

*University of Bremen (Germany)*; *Graz University of Technology (Austria)*

10:55

**Thermal cycling stability of silicon particle reinforced aluminum**

J. Kinast¹; M. Boin¹; R. Wimpory¹; A. Undisz¹; A. Tümermann¹

*Fraunhofer Institute for Applied Optics and Precision Engineering IOF (Germany)*; *Helmholtz-Zentrum Berlin für Materialien und Energie HZB (Germany)*; *Friedrich Schiller University Jena (Germany)*

11:15

**Effect of dispersoids on microstructure evolution of Mg-Mg4Si alloys**

M. Kenyon¹; J. Robson¹; Z. Liang²; N. Kamp²

*University of Manchester (United Kingdom)*; *Novelis Deutschland GmbH (Germany)*

11:35

**Deformation studies of aluminium alloy 7075-T651 in equi-biaxial tension**

R. Nelamane Vijayakumar¹; S. Nedunchezhian¹; R. Velmurugan¹; S.K. Singh²; B. Pant²

*Indian Institute of Technology Madras (India)*; *Vikram Sarabhai Space Centre (India)*

11:55

**Influence of elevated temperature on mechanical properties of friction drilled internal threads in AlSi10Mg, AZ31 and AZ91 profiles**

P. Wittke¹; M. Teschke¹; S. Hannich¹; D. Biermann¹; F. Walther¹

*TU Dortmund University (Germany)*

14:20

**Titanium copper dihybrid composite cladding**

Y. Fouad¹; H. Al Harba²

*King Saud University (Saudi Arabia)*

14:40

**Elastic moduli and elastic anisotropy of cold sprayed light-metal coatings**

M. Janovska¹; H. Seiner¹; J. Cizek²; P. Sedlak¹; M. Landa¹

*Institute of Thermomechanics (Czech Republic)*; *Brno University of Technology (Czech Republic)*

15:00

**Investigations on the structure of PEO layers**

A. Friedemann¹; P. Plagemann¹; T.M. Gesing²

*Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM (Germany)*; *University of Bremen (Germany)*

15:20

**Corrosion of multi material designs**

S. Oberhauser¹; I. Sieber¹

*IrinCoa GmbH (Germany)*
Wednesday, 8th of November 2017

11:20 Influence of interrupted quenching on microstructure and properties of 7xxx aluminium alloys
S. Pogatscher1, G. Köl1, H. Antetokoudis1, T. Kremmer1, P. Durnitchkowitsch1, D. Pischmann1, P.J. Uggowitzer1
1Montanuniversität Leoben (Austria); 2AMAG rolling GmbH (Austria); 3ETH Zurich (Switzerland)

11:40 Post-pre-ageing natural ageing stability in Al-Mg-Si alloys: the dependence on pre-ageing time
Z. Yang1, L. Li1, H. Ren1, D. Liu1, Y. Fan1, W. Bo1, H. Chen1, R. Jin1, J. Xin1, J. Chen1, W. Yu1, Y. Zhang1
1Helmholtz-Zentrum Berlin für Materialien und Energie HZB (Germany); 2Novelis Research and Development Center Göttingen (Germany); 3Novelis Research and Development Center Sierre (Switzerland)

12:00 Welding-time-temperature-precipitation-diagram of aluminium alloy 6082 T6
H. Fröck1, P. Wiechmann1, B. Milkeriet1, M. Reich1, O. Kellner1
1University of Rostock (Germany)

12:20 Prediction of Mechanical Properties of Al-Mg-Si Alloys Based on Microstructural Parameters
N. Pappenberg1, J. Österreicher1, 1LKR Leichtmetallkompetenzzentrum Ranshofen GmbH (Austria); 2AIAT Austrian Institute of Technology (Austria)

12:40 Multi-scale modelling of pre-strain dependent precipitation strengthening in 6xxx series alloys in a deformed component
Z. Liang1, S. Jurendic1, E. Combaiz1, D. Leyrza2, A. Desposi1, R. Burrows1, C. Bezencon1, 1Novelis Deutschland GmbH (Germany); 2Novelis Research and Development Center Sierre (Switzerland)

15:00 Comparison of S-phase coarsening in alloy 2618A during ageing, creep, and fatigue
C. Rockenhäuser1, M. Metzger1, P. von Harttrott1, B. Skrotzki1
1Bundesanstalt für Materialforschung und -prüfung (Germany); 2Fraunhofer Institute for Mechanics of Materials IMM (Germany)

15:20 The Influence of Trace Elements (In, Sn) on the Precipitation Process in AlCu-Alloys by Small Angle X-Ray Scattering, DSC and PALS
F. Lotter1, D. Petschke1, T.E.M. Staab1, 1Julius-Maximilians-Universität Würzburg (Germany)

15:40 Influence of short-term heat treatment on the mechanical properties of AlMgSi profiles
S. Kernebeck1, 1University of Wuppertal (Germany)

16:20 Method for efficient development of fast and accurate models predicting the mechanical properties of precipitation-hardenability aluminium alloys after heat treatment
A. Tönjes1, A. von Hehl1
1Stiftung Institut für Werkstofftechnik IW T (Germany)

16:40 Modelling of the age-hardening behaviour in AA6xxx within a through-process modelling framework
C. Bolllmann1, T. Brüggemann1, Z. Liang1, F. Mao1, 1Aleris Rolled Products Germany GmbH (Germany); 2Hydro Aluminium Rolled Products GmbH (Germany); 3Novelis Research and Development Center Göttingen (Germany); 4Institut für Metallkunde und Metallphysik, RWTH Aachen University (Germany)

17:00 Modelling of quench sensitivity in automotive 6xxx aluminium alloys
D. Leyrza1, L. Savi2, Z. Liang1, A. Desposi1, 1Novelis Switzerland SA (Switzerland)

17:20 Modelling the effect of cooling rate on tensile properties of 6xxx series aluminium alloys for automotive applications
O. Myhr1, O. Engler2, J.R. Leinum2, H.-J. Brinkman2
1Norsk Hydro ASA (Norway); 2Hydro Aluminium Rolled Products GmbH (Germany)

17:40 Testing and simulation of deformation and damage behavior of different aluminium profiles
D. Sun1, F. Andrieux1, C. Fehrenbach1, 1Fraunhofer Institute for Mechanics of Materials IMM (Germany)

Thursday, 9th of November 2017

09:15 Recrystallization and Texture of Alloy 5182 Automotive Sheet
Q. Guo1, X. Lei1, X. Yang1, R.E. Sanders1
1AMAG rolling GmbH (Austria); 2Novelis Research and Development Center Göttingen (Germany); 3ETH Zurich (Switzerland)

09:35 Heterogeneous Nucleation Sequence at the Interface of TiB2 to Form Al
J. Li1, P. Schumacher1
1Helmholtz-Zentrum Berlin für Materialien und Energie HZB (Germany)

09:55 Mechanical and electrical properties of bolted aluminium alloy bus bars exposed to high temperatures
R. Kesz1, T. Fuhrmann2, S. Schlegel2, B. Milkeriet1, O. Kessler1
1University of Rostock (Germany); 2Technische Universität Dresden (Germany)

10:35 Texture and Formability of Alloy 5182-O Sheet
X. Lei1, Q. Guo1, A. Chapuis1, X. Yang1, R. Sanders1
1Chongqing University (China)

10:55 Influence of natural aging and repeated solid solution treatments on the microstructure and the mechanical properties of the alloys 7020 and 7175
M. Paulisch1, A. Treff1, I. Driehorst1, W. Reimers1
1Technische Universität Berlin (Germany)

11:15 Scanning Electron Microscopy of Low-Contrast and Nanoscale Precipitates in Homogenized Aluminium Alloys
J. Österreicher1, A. Schif1, G. Buret3
1LKR Leichtmetallkompetenzzentrum Ranshofen GmbH (Austria); 2Institut für Metallkunde und Metallphysik, RWTH Aachen University (Germany)

11:35 Recrystallization and Texture of Alloy 6014-T4 Automotive sheet
Z. Fan1, A. Chapuis1, X. Lei1, X. Yang1, R.E. Sanders1
1Chongqing University (China)

14:20 Framework for through-process simulation of rolling, microstructure evolution and forming properties for aluminium sheet production
T. Brüggemann1, M. Loeck2, H. Aretz1, G. Gottstein2, K.-F. Karhausen1
1Hydro Aluminium Rolled Products GmbH (Germany); 2HoDforming GmbH (Germany)

14:40 Dissolution and precipitation behaviour for hot forming of 7021 and 7075 aluminium alloys
M. Österreich1, M. Kirov2, E. Mukeli3, O. Kessler1
1University of Rostock (Germany); 2LKR Leichtmetallkompetenzzentrum Ranshofen GmbH (Austria); 3ETH Zurich (Switzerland)

15:00 „HoDforming“ a new hot forming technology for high strength Aluminium sheet
J. Hirsch1, P. Amborn2, M. Lentz1
1Hydro Aluminium Rolled Products GmbH (Germany); 2HoDforming GmbH (Germany)

15:20 Numerical prediction of edge cracks during multi-pass hot-rolling of an AlMg4.5Mn alloy
G. Falkinger1, P. Simon1, B. Gerold1, M. Schmidt1
1AMAG rolling GmbH (Austria)
Multi-objective optimisation of crush properties, production costs and CO2 footprint of 6xxx series aluminium extrusions

R. Osthus¹; T. Furu²; H.H. Nguyen¹; O R. Myhr²
¹SINTEF Raufoss Manufacturing AS (Norway); ²Norsk Hydro ASA (Norway)

10:55
The Effect of Grain Morphologies on the Formability of Aluminum Alloys
K. Inal¹; J. Hirsch²; R. Mishra³
¹University of Waterloo (Canada); ²Hydro Aluminium Rolled Products GmbH (Germany); ³General Motors (USA)

11:15
Atom packing changes of Ti nanoparticles on heating by molecular dynamics simulations
L. Zhang¹
¹Northeastern University (USA)

11:35
Optimization of Al-alloys by analysis of multi-dimensional data from materials simulation
U. Diekmann¹; P. Becker²; A. Miron¹
¹Matplus GmbH (Germany); ²Metatech GmbH (Germany)
List of Speakers

Ameur, M.
Andritsos, L.
Avalle, M.
Barriobero Vila, P.
Becker, M.
Beckmann, F.
Benfer, S.
Berger, A.
Betsofen, S.
Bollmann, C.
Bozorgi, S.
Brüggemann, T.
Bunte, C.
Burgschat, L.
Busch, A.
Bühlbul, F.
Casati, R.
Chen, H.
Cihova, M.
Dalle Donne, C.
Denk, J.
Diekmann, U.
Dittrich, D.
Dumitrascshkewitz, P.
Falkinger, G.
Fan, Z.
Fang, X.
Fauad, Y.
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Fuhr, J.
Fukuda, Y.
Förderreuther, A.
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Godibadze, B.
Golovko, O.
Gruber, B.
Guo, Q.
Gupta, N.
Hannich, S.
Heemann, L.
Heuser, M.
Hilpert, E.
Hirsch, J.

ECAA-91
F-186
E: Wed 15:00
D: Thu 14:20
AM: Wed 12:20
AM: Wed 12:00
AM: Wed 12:40
D: Thu 09:15
D: Fri 09:55
C: Fri 10:35; C: Fri 09:35;
ECAA-63; C-65
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ECAA-91
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D: Fri 09:55
C: Fri 10:35; C: Fri 09:35;
ECAA-63; C-65
List of Exhibitors

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Leading research institutions, industrial players and SMEs form the consortium AGENT-3D as a strategic alliance for research, innovation and growth in additive manufacturing made up out of over 100 partners at present. It is one of the ten selected research programs funded by the Federal Ministry of Education and Research within the program “Zwanzig20 – partership for innovation” which aims the strengthening of SMEs in the eastern part of Germany. It is our joint aim to ensure that Germany maintains technological leader in the primary fields of additive manufacturing. AGENT-3D consists of several subprojects, such as AGENT-Basis, -management or technology projects including AGENT_elF (functional integration), MultiBeAM (development of multi-material components), FunGeoS (functional geometry structures) or CastAutoGen (hybrid processing). The development focus of AGENT-3D is on technology, market and society.

For developing Additive Manufacturing to a key technology of future industry AGENT-3D counts on diversity. The cross-industry competences of our partners involves materials technology, manufacturing technologies, machinning as well as system engineering, process controlling and design.

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From the very first stone wedge, handheld power has been the driving force for the evolution of mankind. This idea has been consistently transferred to chemical analysis. In many areas our handheld power solutions have fundamentally changed processes and operational tactics. analyticon instruments is the distributor for handheld XRF (X-Ray Fluorescence) and LIBS (Laser Induced Breakdown Spectroscopy) analyzers, Raman spectroscopy, NIR (Near-Infrared), FTIR (Fourier Transform Infrared Spectroscopy), Colorimetry and PCR (Polymerase Chain Reaction) in the DACH-region. Our vision “Lab in your Hand” enables to conduct element analysis - even without a lab expert - where it is actually needed: On the spot. This is why we focus on handheld technologies supported by our comprehensive expertise. At analyticon, highest precision also applies to service. We stand for individual, highly qualified consulting and support.

In our service center near Frankfurt am Main, the original products are first checked and then further refined. analyticon academy offers training courses, further education, workshops and user meetings led by specially qualified trainers and noted experts.

EcoMaT - Center for Eco-efficient Materials & Technologies

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The research and technology center EcoMaT deals with the subject of lightweight construction as forward-looking technology focusing at its holistic systemic importance through interdisciplinary and inter-sectoral cooperation. Around 500 people from science and industry perform research and develop together under one roof on approximately 22,000 square meters close to Bremen airport. From an application-oriented perspective, technologies are systematically observed and analyzed. This includes the integration of the technological insights in the manufacturing process. Through short distances and joint projects, the innovation processes are expedited and can already be used across industries at an early stage of development.

In EcoMaT the Airbus group will be the anchor tenant together with TESTIA GmbH and the Fibre (Fiber Institut Bremen). More than 10 additional tenants like the DLR, Daimler and Broetje-Automation are involved in EcoMaT. Investor and owner of the EcoMaT is the Business Development Agency of Bremen (WFB Wirtschaftsförderung Bremen GmbH). The EcoMaT will go into service in the beginning of 2019.

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MATPLUS GmbH provides the leading software solutions for the optimization of advanced metallic materials and processes. Our customers benefit from our comprehensive practical experiences.

JMatPro® is a simulation software, which calculates a wide range of temperature dependent materials properties for alloys and is particularly aimed at multi-component alloys used in industrial practice. Use Cases are the calculation of materials properties, the generation of material cards for CAE-calculations and the development of materials and processes.

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