

Programme



Cellular Materials

CellMAT 2016

07 - 09 December 2016

Dresden, Germany

Welcome Note

Dear participants, dear colleagues, dear partners of the **CellMAT 2016**,

The activities in the development, manufacture and application of cellular materials are steadily growing. Meanwhile, R&D of cellular materials constitutes a discrete but well-connected research field of materials science and engineering. In the same manner as other materials, it is expected to be a driver of innovations and novel or better products.

Over the last years, applications have been identified in the fields of energy efficiency, light weight construction, novel and efficient conversion concepts or biomedical repair functions, just to mention a few. The CellMAT conference series was initiated in 2010 in order to bring together experts from the polymer, ceramic, glass and metal communities dealing with cellular materials.

The 4th CellMAT conference will cover all aspects of manufacturing, modification, joining, property analysis and modelling of cellular materials. In addition to this, featured side events will focus on specific topics.

International experts will give keynote/invited lectures about applications in the automotive industry and transportation, in mechanical engineering, for chemical and energy systems, for environmental purposes or for micro and medical devices and functions.

Thus, the three day conference comes up as a discussion panel for researchers, manufacturers, and users of cellular materials. During the conference, the best three posters will be honoured.

The CellMAT 2016 will be held from 07– 09 December, which is during the 581st Strietzelmarkt, one of the oldest and most traditional Christmas markets in Germany.

We cordially invite you to join the CellMAT 2016 conference, to share your experience in cellular materials with your fellow colleagues and to enjoy the very beautiful and special Christmas atmosphere during our conference.



Michael Scheffler

Otto von Guericke University,
Magdeburg (Germany)

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General Information

Conference venue

WYNDHAM GARDEN
Wilhelm-Franke-Straße 90
D-01219 Dresden (Germany)
T +49 (0) 800 10 10 88 0
info@wyndhamgardendresden.
com
www.wyndhamgardendresden.
com/en

Date

07.-09. December 2016

Conference Chair

Michael Scheffler
Otto von Guericke
University Magdeburg,
Germany

Congress Office

INVENTUM GmbH
Alexia Ploetz
Po box 20 07 14
D-53137 Bonn, Germany
cellmat@dgm.de

Conference Website

<https://cellmat.dgm.de>

Conference Language

The official congress
language will be English.

Proceedings

The papers presented at the
conference will be reviewed by
experts from the porous/cellular
materials community and publis-
hed by Springer.

Conference 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	560 EUR
DGM basic members	590 EUR
Non-members	630 EUR

Industry

DGM members	680 EUR
DGM basic members	730 EUR
Non-members	780 EUR

Poster Session

The oral poster session will be
held on Wednesday
07 December 2016 starting
at 19:00 in the lecture Room
Schumann/Weber.

Poster Evening

Authors will have the
opportunity to discuss their sub-
ject with delegates and answer
questions in front of their poster
on Wednesday evening.
Snacks and beverages will be
offered.

Guided City Tour & Conference Dinner

The meeting point for the city
tour is at the entrance of the
conference center.

Buses will take all participants to
the historic old town of Dresden
and will be guided through the
historical city center and the
581st Strietzelmarkt, one of
the oldest and most traditional
Christmas markets in Germany.

After the city tour all participants
are invited to take part in the
conference dinner at the
„Sopienkeller Dresden“.

Lab Tour

There will be the possibility to
visit the lab of Fraunhofer
Institute for Manufacturing
Technology and Advanced
Materials IFAM.

Please find more information on
page 29.
Registration is required.
Please note: The number of
participants is limited.

Programme Committee

J. Adler

Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Dresden, Germany

V. Altstaedt

University of Bayreuth, Germany

O. Andersen (Co-Chair)

Fraunhofer-Institute for Manufacturing Technology and Advanced Materials IFAM, Dresden, Germany

C. Aneziris

TU Bergakademie Freiberg, Germany

J. Banhart

Helmholtz-Zentrum Berlin für Materialien und Energie, Germany

R. K. Bordia

Clemson University, South Carolina, USA

P. Colombo

University of Padua, Italy

E. Di Maio

University of Naples Federico II, Naples, Italy

D. Dunand

Northwestern University, Chicago, USA

D. Enke (Co-Chair)

Universität Leipzig, Germany

G. Falk

Saarland University, Saarbrücken, Germany

T. Fey (Co-Chair)

Friedrich-Alexander-University Erlangen-Nürnberg, Germany

P. Greil

Friedrich-Alexander-University Erlangen-Nürnberg, Germany

H.-P. Heim

University of Kassel, Germany

T. Hipke

Fraunhofer-Institute for Machine Tools and Forming Technology (IWU), Chemnitz, Germany

Chr. Hopmann

RWTH Aachen, Germany

Y. Iwamoto

Nagoya Institute of Technology, Japan

K. D. Jandt

Friedrich-Schiller-University, Jena, Germany

K. J. Kang

Chonnam National University, Gwangju, South Korea

B. Kieback

TU Dresden, Germany

C. Körner

Friedrich-Alexander-University Erlangen-Nürnberg, Germany

A. Mortensen

Ecole Polytechnique Fédérale de Lausanne, Switzerland

H. Nakajima

Osaka University, Osaka Japan

A. Rabiei

North Carolina State University, USA

K. Rezwan

University of Bremen, Germany

M. Rodríguez Pérez

University Valladolid, Spain

Michael Scheffler

(Conference Chair)
Otto-von-Guericke University Magdeburg, Germany

S. Suzuki

Waseda University, Tokyo, Japan

F. Simancik

Institute of Materials & Machine Mechanics, Slovak Academy of Science, Bratislava, Slovak

H. Traut

Trexel GmbH, Wiehl, Germany

M. Tromm (Co-Chair)

University of Kassel, Germany

Topics

Topics

The conference is dedicated to all classes of materials including material combination/macrostructural and microstructural composite materials of all types and cellular parts.

General Topics

- Manufacturing
- Surface modification and functionalization
- Characterization: structure, in situ, structure characterisation
- Physical, chemical, mechanical, thermal, acoustic and optical properties
- Sustainable processing and recycling/materials from waste
- Standardisation

Application-related Topics

- Mechanical engineering
- Energy management and saving
- Chemical engineering and conversion
- Bioengineering, biomaterials and life science
- Biotechnology
- Medical engineering
- Microsystems technology

Programme Overview Wednesday

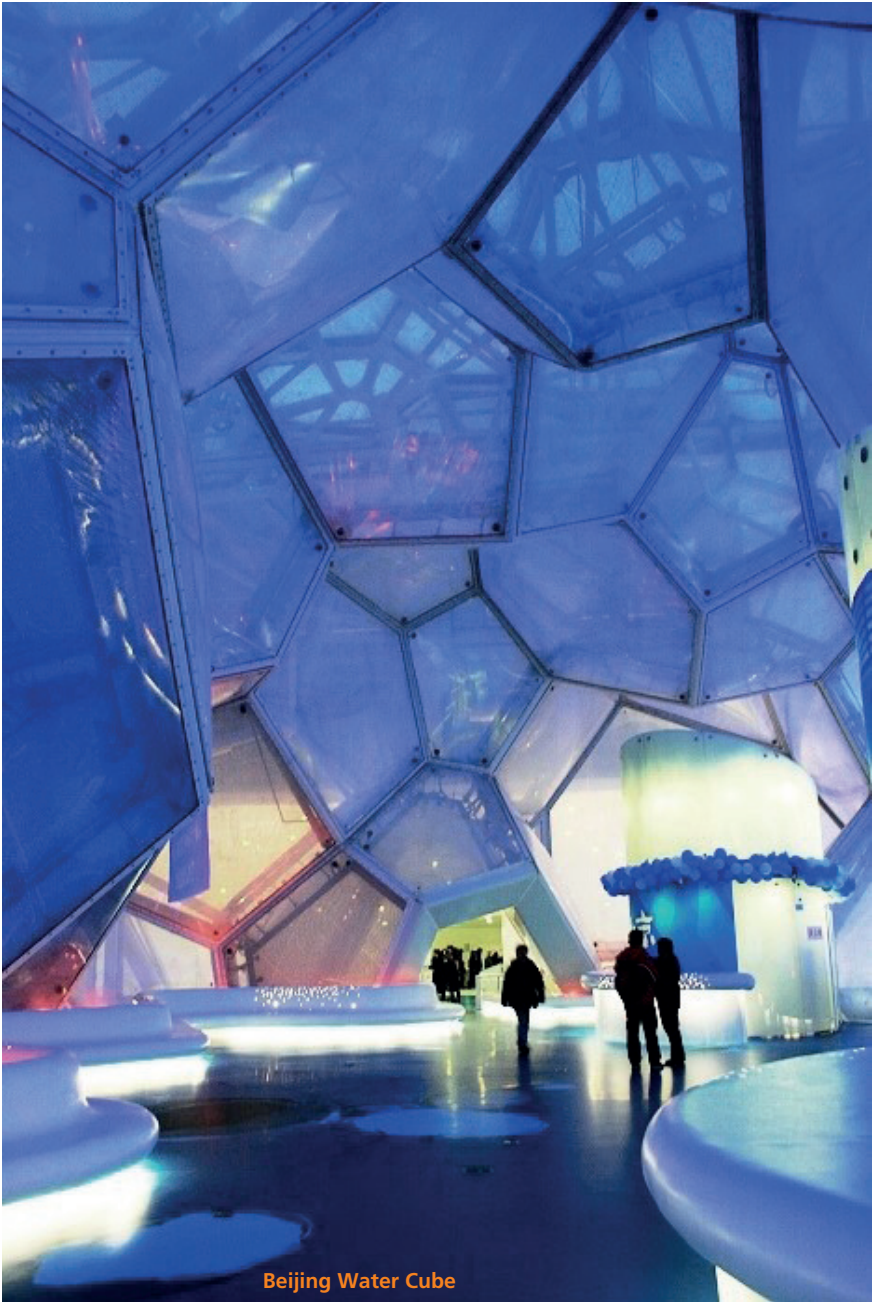
Wednesday			
	Room Schumann/Weber	Room Königstein	Room Lauenstein
10:00	Registration		
12:00	Opening Ceremony		
12:15	Opening Lecture D. Weaire		
13:00	Keynote Lecture S. Suzuki		Keynote Lecture C. Aneziris
13:10		Invited Lecture E. Di Maio	
13:40	A01: Manufacturing	A02: Surface modification and functionalization	Special Session CRC 920
15:40	Coffee Break		
16:00		Keynote J. Meinert	
16:10	A01: Manufacturing		Special Session CRC 920
16:40		B04: Bioengineering, biomaterials and life science	
18:20	Short Break		
19:00	Oral Postersession		
19:00	Postersession Evening		

Programme Overview Thursday

Thursday			
	Room Schumann/Weber	Room Königstein	Room Lauenstein
08:50			Keynote Lecture V. Altstadt
09:00	A01: Manufacturing	B02: Energy management and saving	B01: Mechanical engineering
10:30	Coffee Break		
10:50			Keynote Lecture Y. Iwamoto
11:00	A01: Manufacturing		
11:10		B02: Energy management and saving	
11:30		A03: Characterization: structure, in situ, structure characterisation	A04: Physical, chemical, mechanical, thermal, acoustic and optical properties
12:50	Lunch Break		
14:00	A01: Manufacturing B01: Mechanical engineering	A03: Characterization: structure, in situ, structure characterisation	A04: Physical, chemical, mechanical, thermal, acoustic and optical properties
15:50	Coffee Break		
16:00			Keynote Lecture C.B. Park
16:10	B01: Mechanical engineering		
16:20		A03: Characterization: structure, in situ, structure characterisation	
16:40			A04: Physical, chemical, mechanical, thermal, acoustic and optical properties
17:40	End of the 2nd Day		
18:00	Guided City Tour through Dresden		
20:00	Social Evening at the „Sophienkeller Dresden“		

Programme Overview Friday

Friday		
	Room Schumann/Weber	Room Königstein
08:50		Keynote M. Fröba
09:00	B01: Mechanical engineering	A04: Physical, chemical, mechanical, thermal, acoustic and optical properties
09:30		
10:30	Coffee Break	
11:00	B01: Mechanical engineering	A04: Physical, chemical, mechanical, thermal, acoustic and optical properties
12:30	Closing Remarks	



Beijing Water Cube

Programme Wednesday 10:00 - 14:00

Wednesday			
10:00	Registration		
	Room Schumann/Weber		
12:00	Opening Ceremony		
	M. Scheffler, Otto von Guericke University Magdeburg (Germany)		
12:15	Opening Lecture		
	A Mystery Tour through Cellular Materials D. Weaire, Trinity College of Dublin (Ireland)		
	Room Schumann/Weber	Room Königstein	Room Lauenstein
Session	A01: Manufacturing	A02: Surface modification and functionalization B03: Chemical engineering and conversion	Special Session CRC 920
Chair	O. Andersen, Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Dresden, Germany	F. Clemens, Swiss Federal Laboratories for Materials Testing and Research (EMPA) (Switzerland)	T. Fey, Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany)
13:00	Keynote Lecture Recent Progress in Fabrication Techniques of Porous and Cellular Metals in Japan S. Suzuki, Waseda University (Japan)		Keynote Lecture Multifunctional Carbon Bonded Filters for Metal Melt Filtration C. Aneziris, TU Bergakademie Freiberg (Germany)
13:10		Invited Lecture Imaginative Gas Foaming for Advanced Materials E. Di Maio, University of Naples Federico II (Italy)	
13:40	Cellular polymers based on polystyrene-block-poly(4-vinylpyridine) diblock copolymers: Synthesis, processing and characterization U. Handge (Sp), M. Schulze, V. Abetz, Helmholtz-Zentrum Geesthacht (Germany)	Functionally modified open porous metal foam C. Hannemann (Sp), S. Scholz, Fraunhofer Institute of Machine Tools and Forming Technology IWU, Chemnitz (Germany)	Numerical investigation of the mechanical behavior of ceramic foams during metal melt filtration M. Abendroth (Sp), C. Settgest, E. Werzner, TU Bergakademie Freiberg (Germany)

Programme Wednesday 14:00 - 15:20

14:00	Polymer-derived ceramic layer structures with graded multiscalar porosity T. Konegger (Sp), C. Drechsel, Vienna University of Technology (Austria)	TiO2 coatings on Ceramic Foams for Photocatalytic Applications D. Haase (Sp), J. Adler, H. Heymer, F. Saft, B. Faßauer, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Dresden (Germany)	Reactions between TiO2 (rutile) coatings and molten Al and AlSi7Mg A. Salomon (Sp), C. Aneziris, O. Fabrichnaya, D. Rafaja, C. Voigt, T. Zienert, TU Bergakademie Freiberg (Germany)
14:20	Fabrication of porous A6061 alloy with aligned unidirectional pores by dipping heat-resistant brittle materials D. Muto (Sp), T. Yoshida, S. Suzuki, T. Tamai, Waseda University (Japan)	Smart Foams for Water Remediation J. Pinto Sanz (Sp), A. Athanassiou, S. Barroso, A. Chavan, D. Fragouli, Italian Institute of Technology, Genova (Italy)	Kinetics of the interactions of carbon-bonded alumina filter in steel contact A. Schmidt, C. Aneziris, S. Dudczig, D. Rafaja, A. Salomon, TU Bergakademie Freiberg (Germany)
14:40	Effect of primary crystals on pore formation during semi-solid foaming of A2024 alloy T. Osaka (Sp), M. Saito, S. Suzuki, Waseda University (Japan)	Infiltration of Mg and Mg-Sn in the Si-foam and the formation of the intermetallic Mg2(Sn, Si) phase: A combined numerical and experimental study O. Tschukin (Sp), F. Wang, B. Nestler, Karlsruhe University of Applied Sciences/ Karlsruhe Institute of Technology (KIT) (Germany); J. Heimann, N. Jost, A. M. Matz, B. S. Mocker, Pforzheim University of Applied Sciences (Germany)	Formation and thermal stability of metastable aluminas under reducing atmosphere M. Rudolph (Sp), L. Amirkhanyan, C. Aneziris, C. Himcinschi, J. Kortus, M. Motylenko, D. Rafaja, A. Salomon, A. Schmidt, H. Stöcker, TU Bergakademie Freiberg (Germany) (Germany)
15:00	Sandwich manufacturing with foam core and coversheets out of aluminum – a new process without rolling J. Hohlfeld (SP), T. Hipke, Fraunhofer Institute of Machine Tools and Forming Technology IWU, Chemnitz (Germany), K. Holders, Havel metal foam GmbH (Germany)	Surface modified ceramic foams for phase dispersion in liquid multiphase systems K. Schelm (Sp), J. Samuel, M. Scheffler, M. Schwidder, Otto von Guericke Universität Magdeburg (Germany)	Mechanical properties of artificial and real open cell ceramic foams C. Settgest (Sp), J. Solarek, Y. Klemm, M. Abendroth, M. Kuna, H. Biermann, TU Bergakademie Freiberg (Germany)

Programme Wednesday 15:20 - 16:20

15:20	Metal Foam for Applications in Heterogeneous Catalysis and Biogas Desulfurization G. Walther (Sp), U. Gaitzsch, T. Büttner, B.Kieback, T. Weißgärber, Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Dresden (Germany); R. Kolvenbach, Alantum Europe GmbH, Oberha- ching (Germany); M. Lincke, Fraunhofer Institute for Ceramic Tech- nologies and Systems IKTS, Dresden (Germany) Influence of the spe- cimen manufacturing process on the fracture mechanical properties of carbon bonded alumina (Al2O3-C) H. Zielke (Sp), M. Abendroth, C. Aneziris, M. Kuna, A. Schmidt, TU Bergakademie Freiberg (Germany)		
15:40	Coffee Break		
Chair	Room Schumann/Weber	Room Königstein	Room Lauenstein
	A01: Manufacturing	B04: Bioengineering, biomaterials and life science	Special Session CRC 920
	U. Betke, Otto von Guericke University Magdeburg (Germany)	T. Konegger (Sp), Vienna University of Technology (Austria)	T. Fey, Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany)
16:00	Keynote Lecture Cellular Metals in Thermal Management Applications - Opportunities and Limitations J. Meinert, Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Dresden (Germany)		
16:10	Invited Lecture Production and characterization of density graded polymer foams with a focus on impact strength D. Rodrigue (Sp), Université Laval, Québec (Canada)		

Programme Wednesday 16:20 - 17:20

16:20	Impact of the roughness of alumina and Al2O3-C substrates on the adhesion mechanisms in a model system P. Knüpfer (Sp), C. Aneziris, L. Ditscherlein, U. Peuker, A. Schmidt, E. Storti, TU Bergakademie Freiberg (Germany) Spodumene, a new reactive element in aluminum filtration B. Fankhänel (Sp), C. Aneziris, M. Stelter, C. Voigt, TU Bergakademie Freiberg (Germany); C. Scharf, TU Bergakade- mie Freiberg/ Helmholtz Centre Dresden Rossendorf (Germany)		
16:40	3D printing of porous ferroelectric ceramics using fused deposition modelling and flexible thermoplastic ceramic filaments F. Clemens, Swiss Federal Laboratories for Materi- als Testing and Research (EMPA) (Switzerland); M. Bach, TU Bergakademie Freiberg (Germany); T. Lusiola, M. Melnykowycz, Swiss Federal Laboratories for Materials Science and Technology (EMPA) (Swit- zerland)	Calcium phosphate coated macroporous Ti-Nb scaffolds as hard tissue implants R. Schmidt (Sp), A. Gebert, M. Calin, Leibniz Institute for Solid State and Materi- als Research Dresden (Ger- many); M. Schumacher, M. Gelinsky , TU Dres- den (Germany); J. Eckert, Montanuniversität Leoben (Austria)	
17:00	Verification of new simulation approaches in High-Pressure Foam Injection Molding with local core-back method M. Tromm (Sp), University of Kassel (Germany)	Macroporous bionano-composites : from encapsulation hosts to depollution devices S. Christoph (Sp), F.M. Fernandes, T. Coradin Sorbonnes Universités, UPMC Paris (France); P. Barré, PSL Research University (France)	Numerical simulation of the depth filtration of liquid aluminum considering temperature-dependence of viscosity E. Werzner (Sp), C. Demuth, H. Krause, D. Trimis, S. Ray, TU Bergakademie Freiberg (Germany); D. Trimis, M.A.A. Mendes, Karlsruhe Institut of Technology (KIT) (Germany)

Programme Wednesday 17:20 - 19:00

17:20	Investigations of corrosion resistance of laser separated open cell metal foam R. Baumann (Sp), R.E. Beyer, Fraunhofer Institute for Material and Beam Technology IWS/TU Dresden (Germany); P. Herwig, Fraunhofer Institute for Material and Beam Technology IWS, Dresden (Germany)	Manufacturing and measurement of bioinspired multifunctional porous ceramic material G. Buck (Sp), M. Keuper, C. Lauer, K. Klang, C. Berthold, K.G. Nickel, Eberhard Karls Universität Tübingen (Germany)	Numerical modeling of flow conditions during steel filtration experiments A. Asad, E. Werzner (Sp), C. Demuth, S. Dudczig, A. Schmidt, S. Ray, C. Aneziris, R. Schwarze, TU Bergakademie Freiberg (Germany)
17:40	Porous sodium borosilicate glasses by sol-gel processing of modified sodium water glasses H. Roggendorf (Sp), Martin Luther University Halle-Wittenberg (Germany)	Structure and properties of Bioactive Glass Foams for Bone Reconstruction L. Lefebvre (Sp), C. Charbonneau, J.P. Nadeau, National Research Council Canada, Vancouver (Canada)	In-situ X-ray microtomography characterization of damage in alumina and carbon-bonded alumina foam filters J. Hubáľková (Sp), C. Voigt, A. Schmidt, K. Moritz, C. Aneziris, TU Bergakademie Freiberg (Germany)
18:00	Improved Mechanical Stability of Ceramic Foams by Nanoparticle Infiltration S. Rannabauer (Sp), U. Betke, M. Scheffler, M. Scheunemann, G. Söffker, Otto von Guericke University Magdeburg (Germany)	Manufacturing of bioactive glass scaffolds with high porosity via unidirectional freeze-casting technique L. Henning (Sp), A. Gurlo, P. Kamm, F. Schmidt, S. Zavareh, Technische Universität Berlin (Germany); J. Banhart, Helmholtz Zentrum Berlin für Materialien und Energie/ Technische Universität Berlin (Germany)	Investigation of carbon-bonded alumina filters by μCT after contact with a steel melt E. Storti (Sp), C. Aneziris, H. Biermann, J. Gleinig, S. Dudczig, A. Weidner, TU Bergakademie Freiberg (Germany); P. Colombo, Università degli Studi di Padova (Italy)

18:20 **Short Break**

Programme Wednesday Postersession 19:00 - 21:30

Room Schumann/Weber	
19:00	Oral Postersession
Chair	T. Fey, Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany)
A01-30	Tubular open-porous silicon nitride-based ceramics obtained by casting methods with defined gas permeability T. Konegger (Sp), D. Brouczek, Vienna University of Technology (Austria)
A01-97	Porous metal ceramic composites as degradable implant and bone replacement materials J. Weise (Sp), J. Baumeister, S. Hein, Fraunhofer Institute for Manufacturing Technology and Applied Materials Research IFAM, Bremen (Germany)
A02-65	Comparison of packed bed and capillary reactors using TiO₂ supported on porous an non-porous glasses for photocatalytic methylene blue degradation B. Knauth (Sp), T. Gerhardt, V. Scherf, GNF Berlin-Adlershof e.V. (Germany); T. Enke, University of Leipzig (Germany)
A03-75	Infiltration of Cellular Silicon by molten Magnesium alloys J. Heimann, B. S. Mocker, A.M. Matz, N. Jost, Pforzheim University of Applied Sciences (Germany)
A04-21	On the elastic gradient of metal matrix syntactic foams A. Szlancsik (Sp), B. Katona, I. Orbulov, Budapest University of Technology and Economics (Hungary)
A05-53	Lead-containing waste glass as a source material for high-grade porous glass B. Knauth (Sp), GNF Berlin-Adlershof e.V. (Germany), T. Enke, University of Leipzig (Germany)
A04-55	Hybrid composites based upon drapable materials and Aluminum foam for energy absorption J. Hohlfeld (Sp), T. Hipke, S. Rybandt, Fraunhofer Institute for Machine Tools and Forming Technology IWU, Chemnitz (Germany)
B04-25	Microfluidic perfusion system for scaffold based 3D cell culture F. Schmieder (Sp), U. Klotzbach, F. Sonntag, Fraunhofer Institute for Material and Beam Technology IWS, Dresden (Germany)
CRC-6	Characterization by Raman spectroscopy of multi-walled carbon nanotubes as reinforcement or functional coating for carbon-bonded alumina filters C. Himcinschi (Sp), E. Storti, A. Schmidt, M. Rudolph, D. Rafaja, C. Aneziris, J. Kortus, TU Bergakademie Freiberg (Germany)
B08-142	High porosity open-cell metal foams as extended heat transfer surfaces for space radiative cooling T. Dixit (Sp), I. Ghosh, Indian Institute of Technology Kharagpur (India)
A05-69	Development a Decision Support System in Realiability Eng. in Promoting Innovation & Sustainability in Higher Education: An Empirical Study S. Al-Saadi (Sp), University of Technology (Iraq)
19:00	Posterdiscussion Evening

Programme Thursday 08:50 - 09:50

Thursday			
	Room Schumann/Weber	Room Königstein	Room Lauenstein
	A01: Manufacturing	B02: Energy management and saving	B01: Mechanical engineering
Chair	Y. Iwamoto, Nagoya Institute of Technology (Japan)	D. Krummrich, University of Bremen (Germany)	M. Tromm, University of Kassel (Germany)
08:50			Keynote Lecture Influence of morphological scaling effects on the mechanical properties of polymer foams V. Altstadt, University of Bayreuth (Germany)
09:00		Invited Lecture Heat exchangers based on porous metal structures for high power density in adsorption heat pumps R. Herrmann (Sp), W. Mittelbach, SorTech AG (Germany); O. Andersen, C. Kostmann, Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Dresden (Germany); U. Wittstadt, Fraunhofer Institute for Solar Energy Systems ISE, Freiburg (Germany)	
09:30	Improving the Strength of ZTA Foams with Different Strategies: Infiltration and Recoating X. Chen (Sp), U. Betke, S. Rannabauer, M. Scheffler, G. Söffker, Otto von Guericke University Magdeburg (Germany)	Experimental and numerical investigations on conjugate heat transfer in open cellular structures S. Weise (Sp), S. Meinicke, T. Wetzels, B. Dietrich, Karlsruhe Institute of Technology (KIT) (Germany)	Mechanical behaviour of particulate aluminium-epoxy hybrid foams based on cold-setting polymers J. Weise (Sp), J. Baumeister, A. Queiroz Barbosa, Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Bremen (Germany); D. Lehmann, University of Bremen (Germany)

Programme Thursday 09:50 - 10:50

09:50	Cellular oxide ceramics by direct metal oxidation process T. Fey (Sp), P. Greil, Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany)	Improved Thermal Management of Batteries with PCM-filled Metallic Fibre Structures T. Klemm (Sp), J. Meinert, A. Stephan, Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Dresden (Germany)	Image-based geometrical modelling and finite element simulation of closed cell aluminum foams T. Mankovits (Sp), T.A. Varga University of Debrecen (Hungary)
10:10	Additive Manufacturing of Ceramics using Pre-ceramic Polymers P. Colombo (Sp), G. Franchin, P. Scanferla, University of Padova (Italy)	Numerical and Experimental investigation of the Phase Change of High Power Latent Heat Storages with 3D Wire Structures A. Schlott (Sp), F. Schubert, J. Meinert, Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Dresden (Germany); J. Hörstmann, Denso Automotive Deutschland GmbH, Eching (Germany)	
10:30	Coffee Break		

Programme Thursday 10:50 - 11:30

	Room Schumann/Weber	Room Königstein	Room Lauenstein
Chair	A01: Manufacturing	B02: Energy management and saving A03: Characterization: structure, in situ, structure characterisation	A04: Physical, chemical, mechanical, thermal, acoustic and optical properties
10:50	P. Colombo, Università degli Studi di Padova (Italy)	C. Voigt, TU Bergakademie Freiberg (Germany)	E. Bernardo, University of Padova (Italy)
			Keynote Lecture High-temperature hydrogen gas permeation properties of precursor-derived microporous amorphous silica-based membranes Y. Iwamoto, Nagoya Institute of Technology (Japan)
11:00	Invited Lecture Hierarchically structured SiOC glasses by freeze casting technique H. Zhang (Sp), M. Wilhelm, K. Rezwan, University of Bremen (Germany)		
11:10		Property adjustment of open-celled ceramic foams for high temperature applications assisted by numerical modelling A. Füssel (Sp), J. Adler, W. Beckert, D. Haase, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Dresden (Germany); L. Aldaz, M. Sánchez, F. Zaversky, National Renewable Energy Center (CENER) (France); J. Fernández-Reche, M.I. Roldán, Plataforma Solar de Almería - CIEMAT, Tabernas-Almería (Spain); A. Quet, A. Ravau, CEA Le Ripault (France); A.L. Ávila-Marín, Plataforma Solar de Almería - CIEMA, Madrid (Spain)	

Programme Thursday 11:30 - 12:50

11:30	Synthesis of a cellular glass ceramic from water potibilisation sludge and clay for structural and chemical applications R. Schouwenars (Sp), I. Martínez-Herrera, R. Ramírez-Zamora, M. Solís López, V. Sánchez-Orendain, Universidad Nacional Autónoma de México (Mexico); F. Espejel Ayala, Centro de Investigación y Desarrollo Tecnológico en Electroquímica (Mexico)	Influence of Slurry Composition on Properties of Cellular Alumina: A Computed Tomographic Study U. Betke (Sp), S. Dalicho, A. Lieb, S. Rannabauer, F. Scheffler, M. Scheffler, Otto von Guericke University Magdeburg (Germany)	Hierarchical porous structures and properties of cellulose aerogels K. Ganesan (Sp), A. Barowski, R. Lorenz, German Aerospace Center, Cologne (Germany)
11:50	Effects of pore array orientation on compressive properties of cellular structures K. Dahm (Sp), I. Brown, P. McGavin, M. Ryan, Callaghan Innovation Ltd. (New Zealand)	Effect of temperature modification on in situ formed stabilization phase in Al-Pb metallic emulsions I. Budai (Sp), University of Debrecen (Hungary)	Studies on the influence of density on the morphology and mechanical properties of cellular long fibre reinforced polyurethane composites S. Geller (Sp), M. Gude, O. Weissenborn, TU Dresden (Germany)
12:10	Porous Ceramic Coatings on Cellular Metal Structures for Application in Biotechnology R. Hauser (Sp), O. Andersen, B. Kieback, Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Dresden (Germany); A. Werner, T. Bley, TU Dresden (Germany)	X-ray microtomography of the failure mechanism in epoxy syntactic foams at quasi-static and dynamic strain rates P. Li (Sp), R. Huang, Nanyang Technological University (Singapore)	Effects of strut porosity on the mechanical properties of sintered steel foams A. Kaya (Sp), C. Fleck, Technische Universität Berlin (Germany); M. Ipekoglu, Turkish-German University, Istanbul (Turkey)
12:30	Influence of blowing agent on the foam structure of a polyolefinic compound S. Kahlen (Sp), D. Nicolussi, D. Mileva, G. Grestenberger, M. Jerabek, A. Hartl, Borealis Polyolefine GmbH (Austria); D. Salaberger, Upper Austria University of Applied Sciences (Austria)	Microstructural investigation of fibre reinforced foam concrete with lightweight aggregates based on ultra high performance concrete (UHPC) C. Umbach (Sp), B. Middendorf, A. Wetzel, University of Kassel (Germany)	Impact testing of polymer-filled auxetics using Split Hopkinson Pressure Bar O. Jiroušek (Sp), J. Falta, T. Fila, P. Zlámal, Czech Technical University in Prague (Czech Republic)

Programme Thursday 12:50 - 15:30

12:50	Lunch Break		
	Room Schumann/Weber	Room Königstein	Room Lauenstein
	A01: Manufacturing B01: Mechanical engineering	A03: Characterization: structure, in situ, structure characterisation	A04: Physical, chemical, mechanical, thermal, acoustic and optical properties
Chair	A. Weidner, TU Bergakademie Freiberg (Germany)	R. Herrmann, SorTech AG (Germany)	L. Adler, Friedrich-Alexander Universität Erlangen-Nürnberg (Germany)
14:00	Invited Lecture Novel glass and glass-ceramic foams from gel casting E. Bernardo (Sp), H. Elsayed, A. Rincon Romero, University of Padova (Italy)	Invited Lecture Structural characterization of a perlite-metal syntactic foam M. Borovinšek (Sp), Z. Ren, M. Vesenjak, University of Maribor (Slovenia)	Invited Lecture A probabilistic constitutive model for closed-cell foams J. Hohe (Sp), C. Beckmann, Fraunhofer Institute for Mechanics of Materials IWM (Germany)
14:30	Parametric Finite Element Study of Closed-Foam Cell M. Mirzaali (Sp), F. Libonati, M. Strano, P. Vena, L. Vergani, Politecnico di Milano (Italy); V. Mussi, Consorzio Musp, Piacenza (Italy)	Deformation behavior of two-dimensional steel honeycomb structures in combined compression-shear mode C. Baumgart (Sp), L. Krüger, TU Bergakademie Freiberg (Germany)	Nanoscale infrared spectroscopy and chemical imaging with AFM-IR M. Unger (Sp), Physical Electronics GmbH (Germany)
14:50	Evaluation of multi-layer foam liner for protective helmet liners in oblique impacts Y. Mosleh (Sp), M. Cajka, B. Depreitere, J. Ivens, J. Vander Sloten, KU Leuven (Belgium)	Evaluation of the Mechanical and Morphological Properties of Novel Sandwich Structures Manufactured using the Polyurethane Spray Coat Method O. Weissenborn (Sp), S. Geller, M. Gude, TU Dresden (Germany)	Highly anisotropic porous material made from expanded metal M. Fink (Sp), O. Andersen, B. Kieback, Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Dresden (Germany)
15:10	Structure and properties of hierarchical sandwich honeycomb cores J. Pflug (Sp), EconCore N.V. (Belgium); D. Vandepitte, I. Verpoest, KU Leuven (Belgium)	The influence of the melt viscosity on the foaming behavior and foam structure of aluminum R. Albrecht (Sp), G. Lange, Technical University of Ilmenau (Germany)	Designing one-phase phononic crystals M. Wormser (Sp), F. Warmuth, C. Körner, Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany)

Programme Thursday 15:30 - 16:20

15:30	Mechanical properties of auxetic cellular materials fabricated using selective electron-beam melting (SEBM) N. Novak (Sp), Z. Ren, M. Vesenjak, University of Maribor (Slovenia)	Porous TiO₂- and CeO₂-Containing Glass-Ceramics via Phase Separation and Selective Leaching – Potential and Limitations A. Barascu (Sp), D. Enke, Leipzig University (Germany)	Iron and steel matrix syntactic foams: A review of production and properties J. Baumeister (Sp), J. Weise, Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Bremen (Germany); D. Lehmhus, University of Bremen (Germany); D. Dinh Luong, N. Gupta, New York University (United States)
15:50	Coffee Break		
	Room Schumann/Weber	Room Königstein	Room Lauenstein
	B01: Mechanical engineering	A03: Characterization: structure, in situ, structure characterisation	A04: Physical, chemical, mechanical, thermal, acoustic and optical properties
Chair	J. Baumeister, Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Bremen (Germany);	T. Fey, Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany)	V. Altstädt, University of Bayreuth (Germany)
16:00			Keynote Lecture Fundamental mechanisms of cell nucleation in plastic foaming C. Park, University of Toronto (Canada); A. Wong, University of Toronto (Canada)/Dow Chemical Company, Midland (USA)
16:10	Invited Lecture ROHACELL® Triple F - A Novel High Temperature Particle Foam K. Bernhard, Evonik Industries AG (Germany); F. Becker, T. Richter, Evonik Resource Efficiency GmbH (Germany)		

Programme Thursday 16:20 - 17:20

16:20

Fast real-time synchrotron X-ray tomography to study dynamic processes in liquid aluminium foams

F. García Moreno (Sp), Helmholtz Zentrum Berlin für Materialien und Energie (Germany); J. Banhart, P. Kamm, Helmholtz Zentrum Berlin für Materialien und Energie/Technical University of Berlin (Germany); R. Mokso, Lund University (Sweden)

16:40

Aluminum Foam Sandwiches for Protective Structures against Forcible Entry

R. Vogel (Sp), T. Hipke, F. Schneider, Fraunhofer Institute for Machine Tools and Forming Technology IWU (Germany); K. Fivaesh, S. Szyniszewski, University of Surrey (UK)

Analysis of capillary-driven fluid propagation in complex porous membrane microstructures using a Voronoi-based generation algorithm

P. Altschuh (Sp), A. Kneer, Karlsruhe University of Applied Sciences (Germany); B. Nestler, M. Selzer, Karlsruhe Institute of Technology (KIT) (Germany)

The effect of a negative Poisson's ratio on thermal stresses in cellular metallic structures

L. Adler (Sp), C. Körner, Friedrich-Alexander Universität Erlangen-Nürnberg (Germany)

17:00

Sandwich structures consisting of aluminum foam core and fiber reinforced plastic top layers

C. Drebenstedt (Sp), W.-G. Drossel, S. Rybandt, Fraunhofer Institute for Machine Tools and Forming Technology (Germany); M. Trautmann, G. Wagner, TU Chemnitz (Germany)

Numerical analysis of effective thermal conductivity of plastic foams

A. Akue Asseko (Sp), C. Duborper, Mines Douai (Douai Cedex) / IFMAS (Villeneuve d'Ascq) (France), B. Cosson, P. Krawczak, M. Lacrampe, Mines Douai (Douai Cedex) (France)

Programme Thursday 17:20 - 20:00

17:20

Differences in compression load behaviour of aluminium foam between static and dynamic testing

R. Vogel (Sp), F. Schneider, Fraunhofer Institute for Machine Tools and Forming Technology IWU (Germany); F. Groß, University of Applied Sciences Zwickau (Germany)

Processing and mechanical properties of porous ceramic-polymer composites with unidirectional porosity

J. Seuba (Sp), S. Meille, CNRS/INSA Lyon (France), S. Deville, CNRS/Saint-Gobain (France)

17:40

End of the 2nd Day

18:00

Guided City Tour through the historical city centre of Dresden and the 581st Strietzelmarkt

20:00

Social Evening at the „Sophienkeller Dresden“



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Since 1434, the Strietzelmarkt has preserved its distinctive character despite a few changes. The world's largest Erzgebirge step pyramid, which made its way into the Guinness Book of World Records in 1999, is 14.62 meters tall and can be seen far and wide. More than 2.5 million people visit the romantic Altmarkt Square every year.

The market's name comes from Stollen, the well-known Christmas bread, which is also known as "Striezel" in Middle High German.

Programme Friday 08:50 - 09:50

Friday

	Room Schumann/Weber	Room Königstein
Chair	B01: Mechanical engineering	A04: Physical, chemical, mechanical, thermal, acoustic and optical properties
08:50	M. Scheffler, Otto von Guericke University Magdeburg (Germany)	J. Seuba, CNRS/INSA Lyon (France)
		Keynote Lecture Pseudomorphic transformation of controlled pore glasses into ordered nanoporous materials with hierarchical pore structures M. Fröba (Sp), M. Bilo, F. Brieler, University of Hamburg (Germany); D. Enke, C. Küster, Leipzig University (Germany);
09:00	Invited Lecture Low Density Nanocellular Foams based on PMMA: Production, Structure and Properties V. Bernardo, J. Martin-de-Leon, M. Rodríguez Pérez (Sp), CellMat Laboratory, University of Valladolid (Spain)	
09:30	Material Modelling and FE Simulation of Cellular Rubber D. Juhre (Sp), Otto von Guericke University Magdeburg / German Institute of Rubber Technology (Germany); R. Raghunath, German Institute of Rubber Technology (Germany)	Radiative thermal conductivity of ceramic sponges B. Dietrich (Sp), Karlsruhe Institute of Technology (KIT) (Germany)

Programme Friday 09:50 - 11:00

09:50	Separation of pore cluster and defect influences on the failure behavior of Macro-Porous Ceramics D. Krummrich (Sp), T. Hochrainer, University of Bremen (Germany)	Destructive and non-destructive analysis of polymer-derived ceramic foams N. Mantzel (Sp), S. Rannabauer, M. Scheffler, Otto von Guericke University Magdeburg (Germany)
10:10	Geometrical internal structure properties of closed-cell aluminium alloy foam under compressive deformation M. Ulbin (Sp), M. Vesenjak, M. Borovinšek, Z. Ren, University of Maribor (Slovenia); I. Duarte, University of Aveiro, Division of Mechanical Engineering, Aveiro (Portugal); Y. Higa, K. Shimojima, Okinawa National College of Technology, Nago (Japan)	Water diffusion in glass fiber reinforced polyurethane foam (R-PUF): hygro-mechanical coupling and durability of mechanical properties F. Cerdan (Sp), A.-G. Denay, A. Roy, RESCOLL - Société de Recherche, Rochefort (France); S. Castagnet, J.-C. Grandidier, E. Lainé, Institut Pprime, Université de Poitiers, Chasseneuil (France); P. Kitzman, G. de Combarieu, Gaztransport & Technigaz, Saint-Rémy-lès-Chevreuse (France)

10:30

Coffee Break

Programme Friday 11:00 - 12:10

	Room Schumann/Weber	Room Königstein
Chair	B01: Mechanical engineering R. Vogel (Sp), Fraunhofer Institute for Machine Tools and Forming Technology IWU (Germany)	A04: Physical, chemical, mechanical, thermal, acoustic and optical properties S. Rannabauer, Otto von Guericke University Magdeburg (Germany)
11:00	Invited Lecture Open Cell Flexible Foams with high Tortuosities and a Strain Rate Dependent Mechanical Performance C. Saiz-Arroyo (Sp), CellMat Technologies S.L. (Spain); E. Lopez-Gonzalez, S. Muñoz-Pascual, M.A. Rodríguez-Pérez, CellMat Laboratory, University of Valladolid (Spain)	Invited Lecture Light and tight: towards optimized cellular materials with a periodic lattice-shell structure by finite element modeling B. Eidel (Sp), University of Siegen (Germany)
11:30	Static and dynamic crush performance of structures filled with cellular metals M. Vesenjak (Sp), University of Maribor (Slovenia); J. Dias-de-Oliveira, I. Duarte, T. Rodrigues, University of Aveiro (Portugal); L. Krstulovic-Opara, University of Split (Croatia)	On the indentation resistance of polymer foam composites A. Boyce (Sp), V. Deshpande, N. Fleck, University of Cambridge (United Kingdom)
11:50	Enhanced compression test procedure for the determination of elastic properties of cellular metals U. Jehring (Sp), O. Andersen, T. Lappan Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM (Germany)	Characterizing local mechanical properties of biological materials by pin indentation K. Klang (Sp), C. Lauer, C. Berthold, Eberhard Karls Universität Tübingen (Germany)

Programme Friday 12:10 - 13:00

12:10	Structure - Mechanical Property Relations of Sea Urchin Spines - a Highly Porous Composite Material C. Lauer (Sp), C. Berthold Eberhard Karls Universität Tübingen (Germany)
12:30	Closing Remarks

Friday Lab Tours

13:00	Lab Tours
 Registration via e-mail to cellmat@dgm.de is required. Please note: The number of participants is limited. Meeting point: Conference check-in. Duration of lab tour: max. 2 hours. Fraunhofer-Institut für Fertigungstechnik und Angewandte Materialforschung IFAM Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM Winterbergstraße 28 01277 Dresden (DE) http://www.ifam-dd.fraunhofer.de	

Fraunhofer IFAM Dresden is involved in fundamental and applied research to develop new sintered and composite materials, as well as cellular metallic materials manufactured with innovative technologies derived from powder metallurgy. The scope of our services includes the industrial implementation of the results we obtain, up to the manufacturing of prototype components. Substantial experience with technology and material structures makes it possible for us to design cellular metallic and composite materials in which combinations of properties are tailored to individual applications. The design of materials and components is facilitated by special technologies, such as melt spinning, melt extraction, Spark Plasma Sintering, microwave sintering, 3D Metal Printing and moulding techniques. The development is focussed on lightweight materials, materials for tribological applications and thermal management, high temperature materials and hydrogen storage alloys to be used in transportation industry, electronics, energy technology, and mechanical engineering.

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Exhibitors

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Das Fraunhofer-Institut für Werkzeugmaschinen und Umformtechnik IWU ist Motor für Neuerungen im Umfeld der produktionstechnischen Forschung und Entwicklung. Wir erschließen Potenziale für wettbewerbsfähige Fertigungen in Deutschland. Im Fokus der Wissenschaft und Auftragsforschung stehen Bauteile, innovative Verfahren und Prozesse sowie die dazugehörigen komplexen Maschinensysteme – die ganze Fabrik.

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Speziell auf dem Gebiet der Metallschaumherstellung und -verarbeitung verfügen wir über langjährige Erfahrung und spezielles Know-how. In unserem Metallschaumzentrum in Chemnitz bieten wir das komplette Dienstleistungsportfolio an – von der Idee bis zum Prototyp – und können so unsere Kunden bei der Realisierung von Leichtbaulösungen unterstützen. Gern beraten wir auch bezüglich alternativer Werkstoffkonzepte und bei Fragen rund um alle gängigen Werkstoffe.

Exhibitors

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The Cluster of Excellence Engineering of Advanced Materials – Hierarchical Structure Formation for Functional Devices (EAM) is the only interdisciplinary research collaboration of its type in Germany to focus on the investigation of functional materials and their processing at all length scales. Its research centers on the fundamental and applied aspects of designing and creating novel high-performance materials.

Situated at the Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU) it is part of the Excellence Initiative of the German federal and state governments.

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Since 1997, Volume Graphics has been developing software for industrial computed tomography (CT) at our company headquarters in Heidelberg, Germany. Our range of products supports all types of analyses and visualizations – including the analysis of cell structures – directly on industrial CT data.

VGStudio MAX is our extendable high-end software; VGStudio offers a budget entry into the world of CT data analysis and visualization; VG InLine brings industrial CT in or close to the production process; VGMetrology turns a scanner CT into a comprehensive and precise metrology device; and myVGL is the free, universal CT data viewer.

VGStudio MAX can be extended with modules for coordinate measurement, nominal/actual comparison, wall thickness analysis, porosity and inclusion analysis, fiber composite material analysis, transport phenomena simulation, and foam structure analysis.

With the Foam Structure Analysis Module for VGStudio MAX 3.0, you determine cell structures in porous foams and filter materials with the click of a button. You can use the module for segmenting the CT data into cells, struts, and contact surfaces and for getting numerous statistical values for further analysis.

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Havel metal foam

The Havel metal foam GmbH was founded in 2013 at Industrial area Kirchmöser (Brandenburg/Havel), Germany.

HMF are specialised on manufacturing of aluminum foam, aluminum foam sandwiches and shaped elements on an industrial scale.

Whenever lightweight meets high mechanical requirements, our products make sense. Unique advantages are weldability, non-flammability and the possibility, for example, to foam in attachment points or to weld.

Innovative lightweight construction solutions can be realised for sectors such as transport, infrastructure, shipbuilding, construction and aviation by implementing creative ideas and taking advantage of a diverse range of 'Havel Lite' products.

We have a production capacity of 500 000m² p.a. and are equipped with infrared oven, electrically heated conventional oven and water cutting.

HMF is the world's single manufacturer of serial parts of aluminum foam, aluminium foam sandwiches and 3-D parts.

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The Physical Electronics GmbH is a stable partner for high-tech companies located in Munich, Germany, more than 21 years. Our core values are market-oriented approach, continuous improvement and excellent customer support. The Marketing of innovative ideas and the sale & service of fascinating products is our daily business. Areas of our expertise are in AFM-IR, an innovative combination of sub 50nm high spatial resolution IR Spectrometry and AFM microscopy, Surface Science and Nanomechanical Testing. Providing the highest possible level of After Sales Support for our customers, we have established a very effective service organization able to meet the requirements of Industry, Institutes and Universities.

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- Physical Electronic's partner for Surface Science Equipment-FIB-ToF-SIMS, XPS (ESCA) and Auger Spectroscopy
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- Lab Services-Unique combination of analytical equipment (AFM-IR the only one in Europe, TOF-SIMS & XPS)
- Customer Support-Analytical & Technical Support+ Service & Maintenance
- Marketing & Sales- Consulting & Quotation

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