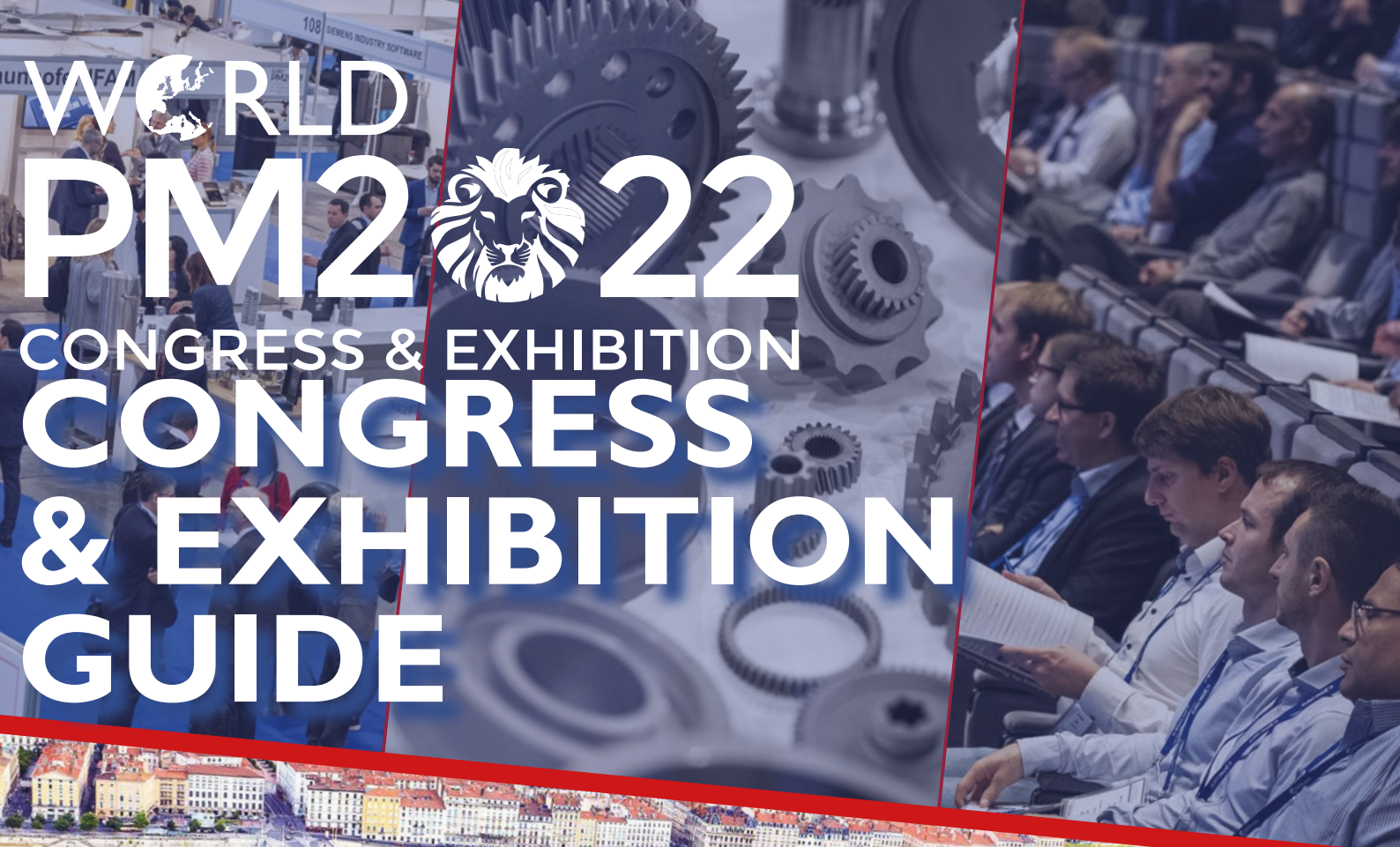
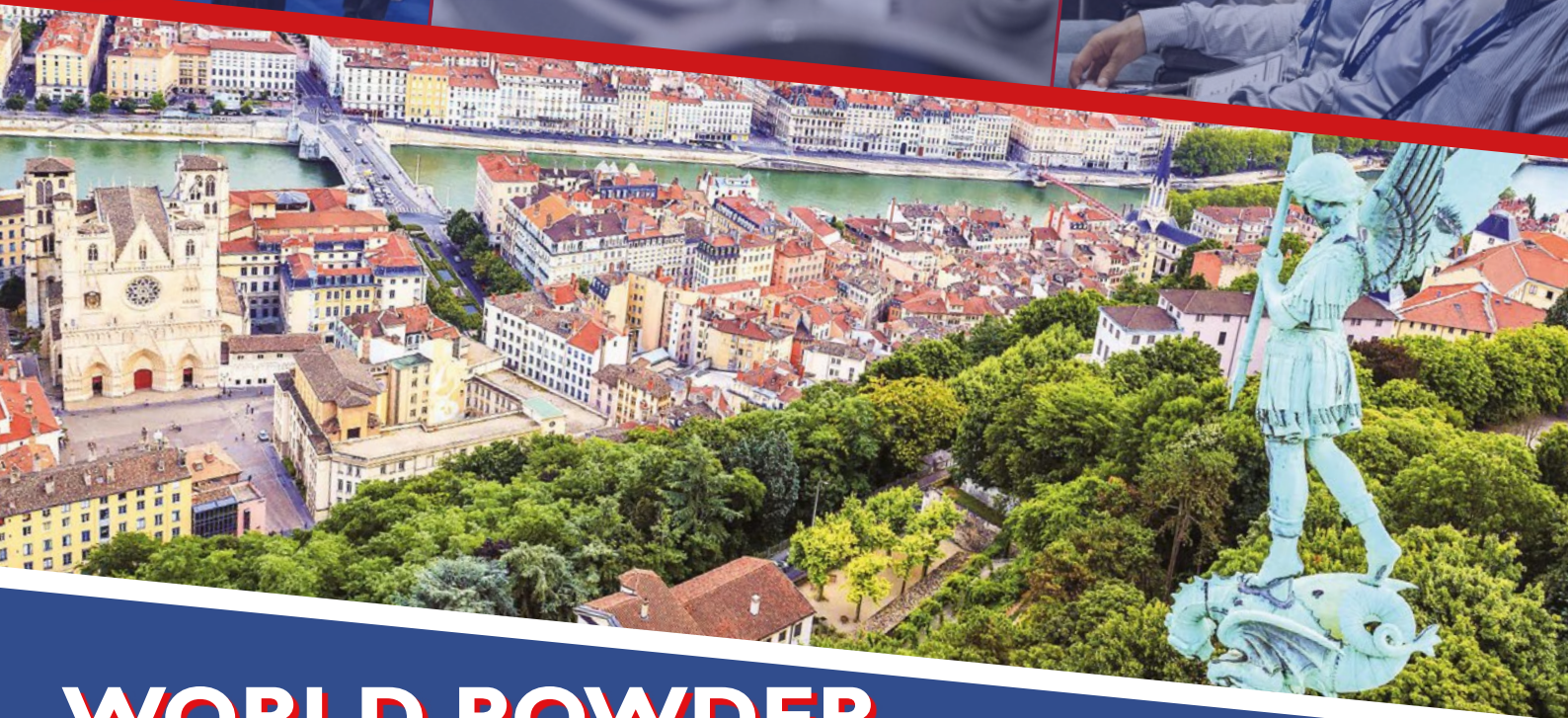




WORLD PM22

CONGRESS & EXHIBITION

CONGRESS & EXHIBITION GUIDE



**WORLD POWDER
METALLURGY**

Congress & Exhibition

9 - 13 October 2022

Lyon, France



worldpm2022.com

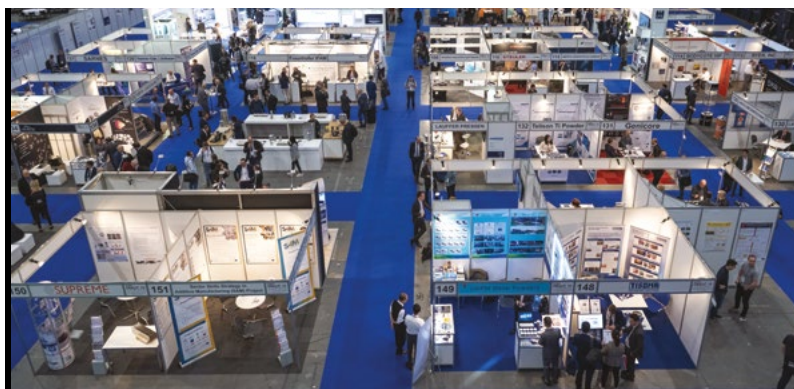


Improved sustainability enhanced performance

In the world of metal powders, Höganäs is always at the forefront of innovation.

From more sustainable production processes to new and patented powder compositions, we are dedicated to offering you the optimal solutions while reducing environmental impact. With our range of metal powders designed for efficient press and sinter processes, we can offer powders designed for any application.

Combining optimal powder performance with improved sustainability is a priority for Höganäs, as we are on a journey to becoming the first green metal powder producer. In addition to our material innovations, we have also committed to Science Based Targets and are founding members of the Additive Manufacturing Green Trade Association, demonstrating our ongoing committing to leading sustainable transformation in our industry.



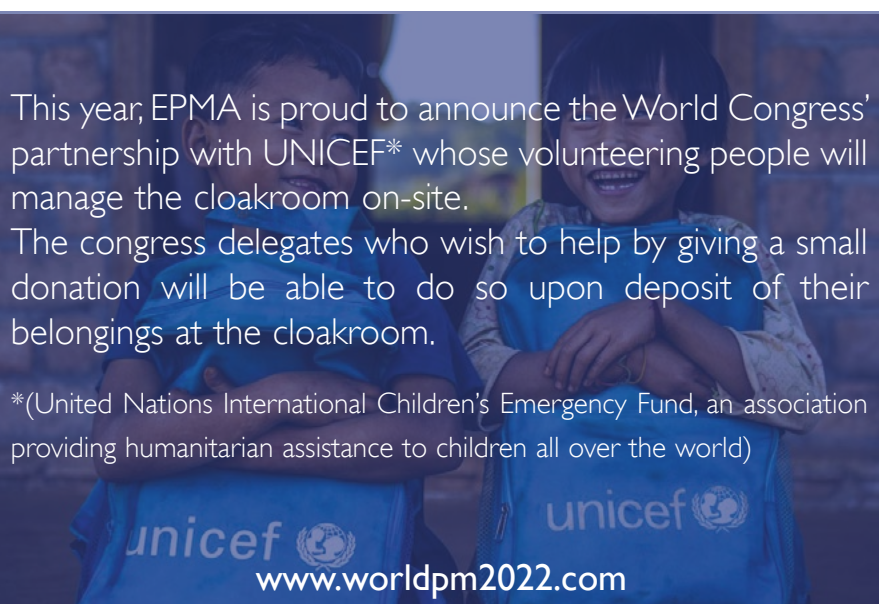
About World PM2022	4
Welcome from the President	7
World PM2022 Steering Committee	8
Technical Programme Committee	9
Event Sponsors	12
World PM2022 Floor Plans	14
Congress Schedule	16
EPMA Sectoral Groups	20
Congress by Strand	21
Campfire Meeting	23
Industry Corner	24
Plenary Session	26
Keynote Paper Awards	28
Congress Proceedings	30
Technical Sessions	31
Special Interest Seminars	34
Exhibition Information	41
Exhibition Directory	42
Exhibition Floor Plan	43
Media Partners	75
General Information	79
Industry Tours	80
General Information	82
Lunch & Social Events	83

unicef 

This year, EPMA is proud to announce the World Congress' partnership with UNICEF* whose volunteering people will manage the cloakroom on-site.

The congress delegates who wish to help by giving a small donation will be able to do so upon deposit of their belongings at the cloakroom.

*(United Nations International Children's Emergency Fund, an association providing humanitarian assistance to children all over the world)



www.worldpm2022.com

Why you should attend

The World PM2022 Congress & Exhibition is the foremost event for the international powder metallurgy community, and provides the focal point for Industry personnel, researchers, and suppliers to meet, network and develop their business.

The World PM2022 Congress programme will include over 300 technical papers presented in oral and poster sessions, including EPMA Keynote Paper Awards presentations, as well as thirteen in-depth Special Interest Seminars. Details of the full programme can be found in our mobile app and our website.

Running in parallel to the technical sessions, the World PM2022 Exhibition is one of the largest dedicated powder metallurgy industry exhibitions in 2022 with representatives from across the world joining the international Exhibition in Lyon.

The World PM2022 social programme will give delegates additional opportunities to network and will include Welcome reception, Posters and Awards reception and Congress dinner.

After 2 years as virtual event, it's time to come back to a face-to-face event.

Congress & Exhibition Organiser

World PM2022 is sponsored and organised by the **European Powder Metallurgy Association (EPMA)**, in co-operation with key members of the PM community in France and across the World.

Founded in 1989, EPMA is the leading PM trade association representing the interests of the entire European PM community and promoting PM technology throughout the world. EPMA Members will qualify for special discounts on their registration fees, and further information on membership and EPMA's services can be found at epma.com

For Further information on World PM2022 Congress & Exhibition, please contact:

European Powder Metallurgy Association



Congress:

Congress Manager: Sabine Hazoume sh@epma.com

Congress Assistant: Maurine Lavigne ml@epma.com



Sponsorship & Exhibition:

Membership & External Partnership Manager: Andy Cormack
ac@epma.com

For Registration Enquiries, please contact:

registration-wpm2022@vitamin-support.fr

The EPMA reserves the right to make changes to the final programme. All programme timings, content and fees correct at the time of creation.

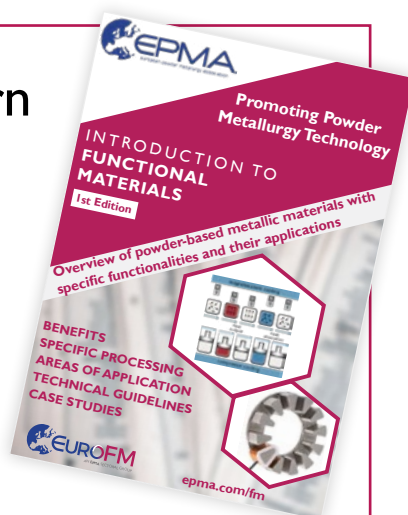
The most up-to-date information is always in the app, and in case of disputes, the mobile app is the authority over the printed guide.

World PM2022 Congress & Exhibition and all associated meetings, sessions and events are ruled according to EPMA Antitrust Guidelines. Details of which can be found here: epma.com/antitrust

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EPMA Membership Benefits

10 Reasons to join the EPMA

- 1 Enhance your market knowledge through access to unique industry information using our range of powder metal PM statistics, presentations and papers.
- 2 Improve your product development through access to EU and EPMA Member initiated R&D programmes.
- 3 Save money by receiving substantial discounts on attending and exhibiting at the leading annual Euro PM Congress and Exhibition and our series of training courses.
- 4 Obtain unique international access to government via our lobbying of the EU on key issues such as REACH, ISO standards and health and safety legislation.
- 5 Promote your sales through free advertising via an entry in the EPMA Members Directory on one of the world's most visited PM websites.
- 6 Keep updated on PM industry news and developments through the Email News service and the EPMA Newsletter – free to EPMA Members.
- 7 Develop your high-level networking opportunities through EPMA Sectoral Groups, training seminars and the general assembly.
- 8 Keep compliant with ISO 9001:2000 and ISO/TS 16949:2002 by participating in the EPMA Europe-Wide Benchmarking programme.
- 9 Access Member only content from a range of sources via the EPMA website Members Area.
- 10 Develop the market for your products by supporting promotion of PM technology via exhibitions and web-based information.

Join EPMA at www.epma.com/membership





Mr Ralf Carlström
EPMA PRESIDENT
Höganäs AB, Sweden

Welcome to World PM2022

It will be a pleasure to welcome you to the exceptional city of Lyon for the World PM2022 Congress & Exhibition. The history of Lyon goes back more than 2000 years ago. It was founded by the Romans in 43 BC, and it is strategically located between two hills and rivers. Lyon ("Lugdunum" in Latin) was the capital of France ("Gaul") for more than 300 years.

UNESCO listed Lyon as a World Heritage site in 1998 and the historic district takes visitors on a journey back through time.

Lyon is the third largest city in France, and it was historically known as an important area for production and weaving of silk. In modern time Lyon gained the reputation as the gastronomic capital of France.

France is an early adopter of new technologies and was one of the pioneering countries in Europe for developing and industrializing powder metallurgy. Most technologies covered by EPMA sectorial groups have activities or are currently being used in France. Several French companies have a leading role on the European powder metallurgy market.

World PM2022 offers a unique opportunity to share the latest trends in powder metallurgy. The extensive technical program provides you access to the latest results in key PM areas and the exhibition showcases the latest developments from the global PM supply chain. On top of this World PM2022 offers a lot of networking opportunities.

Finally, I would like to thank all involved in making this a successful congress starting from EPMA organisation to all volunteers and Members who have supported the production of the event.

Welcome to Lyon

08 09 22

Register on or before
8 September 2022 to benefit
from the early rate!

www.worldpdm2022.com/register



**WORLD
PM2022**
CONGRESS & EXHIBITION





World PM2022 Steering Committee



Prof Didier Bouvard
University Grenoble Alpes
France

After graduating in civil engineering in Paris, Didier Bouvard prepared a PhD. thesis on the constitutive behavior of geomaterials in Grenoble. Next he stayed as a postdoc at UNAM University in Mexico. Back to Grenoble, he was appointed as a CNRS researcher and started working on powder processing.

After a sabbatical year at UC Santa Barbara, he became a professor at Université Grenoble Alpes in 1994.

Since then, he has been investigating the sintering of metal and ceramic powders by coupling experiments and simulations in close connection with industrial companies. He is the author of about 250 papers in international journals and proceedings and he advised 28 PhD. students.

Didier Bouvard chaired several international meeting as the Sintering 2005 conference and the European Powder Metallurgy conference in 2007. He is a member of the board that co-organizes the Sintering conference series and a member of the European Powder Metallurgy Institute.



Mrs Adeline Riou
Aubert & Duval
Paris, France

Adeline Riou is Global Sales Manager for Metal Powders for additive manufacturing at Aubert&Duval and the co-author of the

"Introduction to Additive Manufacturing Technology" and "Introduction to Hot Isostatic Pressing Technology" guides published by EPMA.

Previous associative activities:

2009-2015 Co-chair of the EuroHIP group
2011-2014 Europe Vice chairman of the IHC-International HIP Committee
2001-2011 General Secretary of the HSS Forum industrial companies.

World PM2022 Steering Committee

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Dr Yves Bienvenu

Prof Regis Bigot

Dr Pierre Blanchard

Mr Jean Marc Borel

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Mr Thierry Calmes

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Prof Didier Bouvard
University Grenoble Alpes
France

Prof José M. Torralba
Univ Carlos III de Madrid
IMDEA Materials Institute, Spain



The EPMA would like to express its sincere thanks to the members of the Technical Programme Committee for their support and hard work in structuring the World PM2022 programme and for reviewing the submitted papers.

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Mr Alexander Angré

Dr Miren Aristizabal

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The EPMA would like to express its gratitude to the Session chairs for their generous help and support during the organisation of the event.

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Dr Animesh Bose	(Desktop Metal, MA, USA)
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Prof Jie Zhou	(Delft Technical University, Netherland)

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*Subject to them opting in

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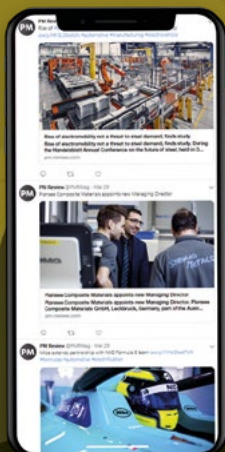
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SPRING 2022

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RTMP also operates an annealing and blending facility with comprehensive customer support and distribution capabilities in Suzhou, China. RTMP is the only global powder supplier, to manufacture its products entirely from a consistent, single ore base. Consequently, RTMP offers products of exceptional cleanliness and consistency.

RTMP offers a full range of ferrous powder products for virtually all Powder Metallurgy (PM) applications, and is committed to helping customers produce the best quality components possible by supplying superior powder products

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Höganäs

Höganäs develops, manufactures and sells metal powders that open up a world of opportunities. Our product range includes pure iron powders, low-alloy steel powders, stainless steel powders and press-ready powder mixes. Höganäs products are tailored to meet demands on part precision, productivity, performance and cost, and many of our brands, such as Distaloy®, Astaloy™ and Starmix®, are regarded as industry standards.

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Catamold facilitates cost efficient part production, delivers superior quality for high volumes projects and enables our customers to be successful in a dynamic and competitive market environment. Catamold has proven its advantages for many years in manifold applications by offering innovative and sustainable solutions. Catamold – We shape the future of MIM.

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Catamold facilitates cost efficient part production, delivers superior quality for high volume projects and enables our customers to be successful in a dynamic and competitive market environment. Catamold has proven its advantages for many years in many applications by offering innovative (and sustainable) solutions. Catamold – Inject your ideas.

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CREMER is a world leading manufacturer of thermal process plants and industrial furnaces for a wide range of processes and process temperatures (400°C < T < 2500°C) under various process atmospheres for the field of iron powder metallurgy in general, CIM, MIM, AM or the production of high-performance oxide or non-oxide ceramic components.

The applications of the CREMER thermal process plants range from de-binding and sintering to a wide range of thermal treatments for ferrous and non-ferrous powders and high-performance ceramics. These include calcination, carburization, carbonization, pyrolysis as well as customized engineering processes under various furnace atmospheres (e.g. H₂, O₂, Endo-gas, N₂-mixtures and air). In addition, the CREMER product portfolio also includes HIP and CIP plants for either AM applications or other processes where non-porous near net-shape parts are required.

CREMER stands for Made-in-Germany, continuity, flexibility and reliability. It is a middle-sized family business with more than 100 employees, a high production depth and extensive know-how in plant engineering and process engineering. CREMER provides outstanding 24/7 global customer full-service support out of its own workshop including turnkey installation, commissioning, training classes, spare part service and maintenance.

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SACMI Group is present in 30 Countries worldwide through a total of 80 Companies. Driven by continuous investments in research, unwavering promotion of technological innovation, conscientious attention to product and service quality, effective responses in the real needs of world markets, SACMI proposes a wide range of new equipment and technologies for the Powder Metal Industry, the result of over 100 year old experience as equipment supplier, exploiting the synergies between the main Companies in the group in their specialized fields and backed up by a worldwide network of after sales service centres.

Hydraulic multi axes presses from 80 to 1000 tons of force, electric presses up to 80 tons of force, customized automations and Sinter Hardening High Temperature Furnaces are the main solutions that make SACMI a complete partner for the powder metal industry.

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www.hilti.group



Plansee High Performance Materials is an expert in the field of molybdenum, tungsten, tantalum, niobium and chromium components.

Alloys and composite materials from Plansee come into their own in electronics, coating technology or high-temperature furnaces -wherever traditional materials are stretched beyond their limits.

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WELCOME RECEPTION

Sponsored by **Höganäs**

Date Sunday 09 October 2022

Venue Foyer 4,5,6

Time 17.30 - 19.30

Höganäs - The Welcome Reception (ticket holders only) is taking place on Sunday 09 October, from 17:30-19:30.

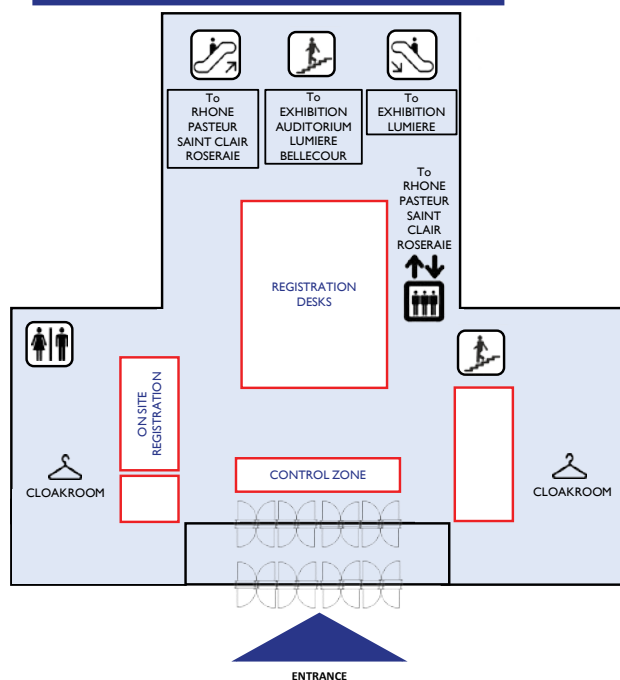
Light snacks and drinks will be served while attendees mingle and network with live background music.

Additional tickets can be purchased onsite subject to availability.

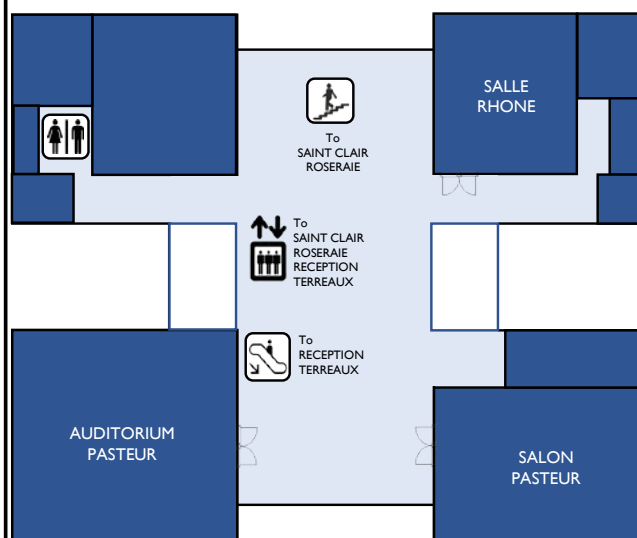
Dress Code: Business smart/smart casual.

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PM2022
CONGRESS & EXHIBITION

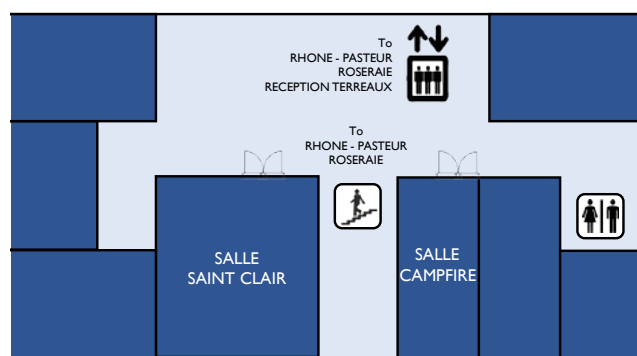
LEVEL 0 – RECEPTION TERREAUX



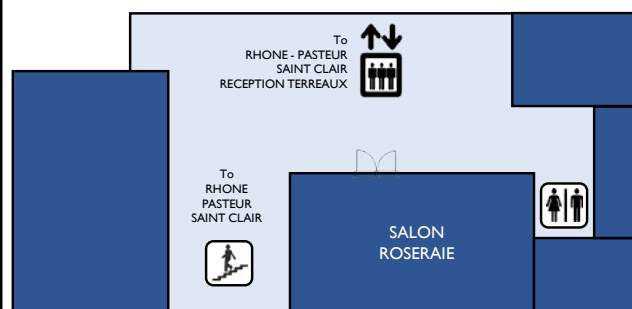
LEVEL 1 – RHONE / PASTEUR



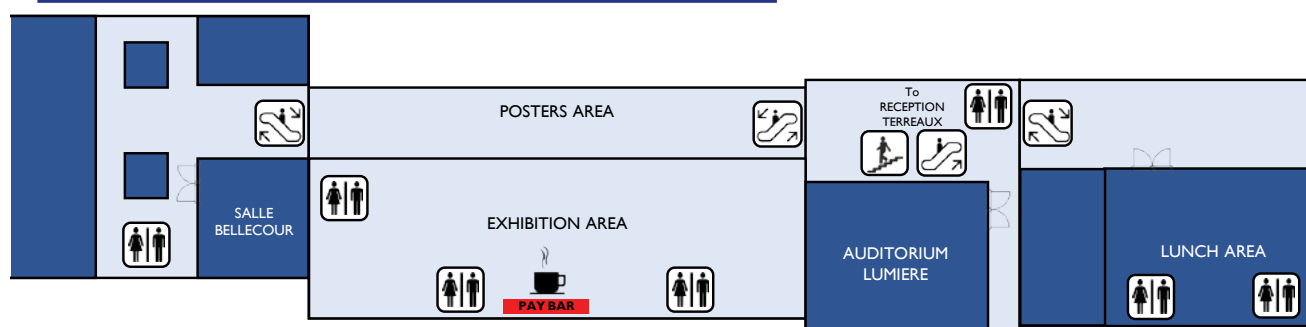
LEVEL 2 – SAINT CLAIR



LEVEL 3 – ROSERAIE



LEVEL -1 & -2 – EXHIBITION / LUMIERE / BELLECOUR



AM Additive Manufacturing Magazine

English + Spanish

Nº1-2020

equipos y materiales

FA fabricación aditiva

additive manufacturing



ExOne

Nº2-2020

equipos y materiales

FA fabricación aditiva

additive manufacturing



Nº3-2020

equipos y materiales

FA fabricación aditiva

additive manufacturing

Engineering

- Part screening
- Feasibility studies
- Identification of application cases
- General & AM specific part design
- Load simulation & stress analysis
- Topology & shape optimization



Nº4-2021

equipos y materiales

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additive manufacturing



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Congress Schedule

Registration, Technical Sessions, Special Interest Seminars and satellite meetings all take place at the Lyon Congress Center (LCC). Social events take place at the venue as indicated.

Interested in a particular topic?

The following seminars, technical sessions and meetings have been colour-coded to aid faster navigation throughout the Technical Programme and other EPMA booklets. Please see the guide below :

- | | | |
|----------------------------|------------------------|-------------------------------------|
| Powder Production | Applications | KNP Keynote paper Award 2022 |
| Consolidation technologies | Tools for improving PM | SIS Special Interest Seminar |
| Materials | | Campfire Meeting |
| | | Industry Corner |

Sunday 09 October 2022		Room
16:00 - 20:00	Registration and Information Desk Open	Main Entrance
17:30 - 19:30	Welcome Reception (Sponsored by Höganäs AB Sweden)	Exhibition Hallway
Monday 10 October 2022		Room
08:00 - 19:30	Registration and Information Desk Open	Main Entrance
08:45 - 11:00	Plenary Session	Auditorium Lumière
11:00 - 18:00	Exhibition Open	
12:30 - 14:30	Buffet Delegate Lunch, Exhibition and Poster Time	Forum I&2
12:45 - 13:15	Industry Corner : The EWF Personnel Qualification Scheme In Metal AM	Exhibition Hall
13:30 - 14:00	Industry Corner : Materials Developed For Additive Manufacturing	Exhibition Hall
14:30 - 16:00	Session 1 Hard Metals, cermets and diamond tools :Additive Manufacturing	Auditorium Lumière
14:30 - 16:00	Session 2 AM Sinter based Technologies : Binder Jetting Powders	Bellecour
14:30 - 16:00	Session 3 Compaction and Sintering : Modelling and Sintering KNP	Auditorium Pasteur
14:30 - 16:00	Session 4 Test and Evaluation : Structure Characterization	Salon Pasteur
14:30 - 16:00	Session 6 FM SIS : High Entropy Alloys and Their Possible Applications	Rhone 3
14:30 - 16:00	Session 7 EHQS SIS : ISO Activities & Standards for PM	Saint Clair 3
16:00 - 17:00	Break, Exhibition & Poster Time	
16:15 - 16:45	Industry Corner : New Challenges For High Performance Rare Earth Permanent Magnets	Exhibition Hall
14:30 - 18:30	Young Engineers Day Lectures	
17:00 - 18:30	Session 8 Hard Metals, cermets and diamond tools : Alternative Binders	Auditorium Lumière
17:00 - 18:30	Session 9 AM Sinter based Technologies : Binder Jetting Process Development	Bellecour
17:00 - 18:30	Session 10 Compaction and Sintering : Pressing and Lubricants	Auditorium Pasteur
17:00 - 18:30	Session 11 Test and Evaluation : Powder Characterization for AM	Salon Pasteur
17:00 - 18:30	Session 12 Light Materials : Titanium Alloys KNP	Rhone 3
17:00 - 18:30	Session 14 EHQS SIS : Sustainability & Chemicals in PM	Saint Clair 3
18:00 - 19:30	Poster & Awards Reception (Sponsored by MIBA AG Austria)	Exhibition Hallway
Tuesday 11 October 2022		Room
08:00 - 19:30	Registration and Information Desk Open	Main Entrance
09:00 - 17:00	Exhibition Open	
08:30 - 10:00	Session 15 AM Beam based Technologies : PBF Process Optimisation	Auditorium Lumière
08:30 - 10:00	Session 16 Hard Metals, cermets and diamond tools : Super Hard Materials	Bellecour
08:30 - 10:00	Session 17 Non Ferrous Materials :Titanium & Titanium Alloys	Auditorium Pasteur
08:30 - 10:00	Session 18 P&S SIS : P&S Global Market Trends	Salon Pasteur
08:30 - 10:00	Session 19 Secondary Operations	Rhone 3
08:30 - 10:00	Session 20 Powder Production : Powder Modification	Saint Clair 3
08:30 - 12:30	Young Engineer Day Exhibition Visit	
10:00 - 11:00	Break, Exhibition & Poster Time	
10:15 - 10:45	Campfire : Challenges and Opportunities of Multi-Material Additive Manufacturing	Salle Campfire
10:15 - 10:45	Industry Corner : Decarbonize And Reduce Cost With Onsite Hydrogen Solutions	Exhibition Hall



11:00 - 12:30		Session 22	AM Beam based Technologies : LPBF Process Development-Reproducibility	Auditorium Lumière
11:00 - 12:30		Session 23	Hard Metals, cermets and diamond tools : Processing I	Bellecour
11:00 - 12:30		Session 25	P&S SIS : Supply Chain issues for Alloying Elements induced by Electrification and their possible Consequences	Salon Pasteur
11:00 - 12:30		Session 26	Metal Injection Moulding	Rhone 3
11:00 - 12:30		Session 27	Powder Production : Gas Atomization Fundamentals	Auditorium Pasteur
11:00 - 12:30		Session 28	AM Sectoral Group Meeting	Saint clair 3
12:30 - 14:30			Buffet Delegate Lunch, Exhibition and Poster Time	Forum I&2
12:45 - 13:15			Industry Corner : Sustainable Energy Harvesting Systems Based on Innovative Mine Waste Recycling	Exhibition Hall
13:30 - 14:00			Campfire : PM Materials and Techniques for Materials in Extreme Environments	Salle Campfire
13:30 - 14:00			Industry Corner : BASF Catamold® – Inject Your Ideas	Exhibition Hall
14:30 - 16:00		Session 29	AM Sinter based Technologies : Binder Jetting Material Development	Auditorium Lumière
14:30 - 16:00		Session 30	Hard Metals, cermets and diamond tools : Modelling and Testing KNP	Bellecour
14:30 - 16:00		Session 31	Ferrous Materials : Steels for LPBF	Auditorium Pasteur
14:30 - 16:00		Session 32	AM SIS : Sustainability in AM	Salon Pasteur
14:30 - 16:00		Session 33	High Temperature Materials I	Rhone 3
14:30 - 16:00		Session 34	Powder Production : Gas Atomization Process Development	Saint Clair 3
14:30 - 16:00		Session 35	P&S Sectoral Group Meeting	Roseiraie
14:30 - 18:30			Young Engineer Day Industry Tour	
16:00 - 17:00			Break, Exhibition & Poster Time	
16:15 - 16:45			Campfire : Metal Binder Jetting Users Group	Salle Campfire
16:15 - 16:45			Industry Corner : SMC Materials For E-Mobility Application	Exhibition Hall
17:00 - 18:30		Session 36	AM Sinter based Technologies : Simulation	Auditorium Lumière
17:00 - 18:30		Session 37	Hard Metals, cermets and diamond tools : Processing II	Bellecour
17:00 - 18:30		Session 38	Ferrous Materials : Steels for Binder Jetting KNP	Auditorium Pasteur
17:00 - 18:30		Session 39	AM SIS : Emerging AM Technologies	Salon Pasteur
17:00 - 18:30		Session 40	High Temperature Materials II	Rhone 3
17:00 - 18:30		Session 41	Powder Production : Innovative Processes	Saint Clair 3
17:00 - 18:30		Session 42	FM Sectoral Group Meeting	Roseiraie
20:00 - 00:00			Congress Dinner	Cirque Imagine
Wednesday 12 October 2022				Room
08:00 - 19:30			Registration and Information Desk Open	Main Entrance
09:00 - 17:00			Exhibition Open	
08:30 - 10:00		Session 43	AM Beam based Technologies : LPBF of Tool Steels	Auditorium Lumière
08:30 - 10:00		Session 44	AM Sinter based Technologies : Stereolithography	Bellecour
08:30 - 10:00		Session 45	Light Materials : Al and Mg Alloy	Auditorium Pasteur
08:30 - 10:00		Session 46	HM SIS : Challenges in HM Industry	Salon Pasteur
08:30 - 10:00		Session 47	Field Assisted Sintering Technologies : Recycling and Shape Control KNP	Rhone 3
08:30 - 10:00		Session 48	Test and Evaluation : Powder Testing and Characterization	Saint Clair 3
08:30 - 10:00		Session 49	Other Consolidation Technologies	Roseiraie
10:00 - 11:00			Break, Exhibition & Poster Time	
10:15 - 10:45			Industry Corner : Global Markets For Metal Additive Manufacturing	Exhibition Hall
11:00 - 12:30		Session 50	AM Beam based Technologies : Corrosion/Wear Aspects	Auditorium Lumière
11:00 - 12:30		Session 51	AM Sinter based Technologies : Special Technologies	Bellecour
11:00 - 12:30		Session 52	Light Materials : Al Alloys KNP	Auditorium Pasteur
11:00 - 12:30		Session 53	HM SIS : Hard Materials in the Value Chain of HM	Salon Pasteur
11:00 - 12:30		Session 54	Field Assisted Sintering Technologies : Advanced Materials	Rhone 3
11:00 - 12:30		Session 55	Test and Evaluation : Testing and Evaluation for AM	Saint Clair 3
11:00 - 12:30		Session 56	MIM SIS : Sustainability of MIM	Roseiraie

*All timings, meetings, technical sessions, social events and tours included in this publication were correct at time of print. Any late or unavoidable changes made onsite will be updated in the World PM2022 mobile app. In case of disparity of information, the content in the mobile app should always be treated as the final authority.



World PM2022 Congress and Exhibition

12:30 - 14:30		Buffet Delegate Lunch, Exhibition and Poster Time	Forum 1&2
12:45 - 13:15		Industry Corner : New Cemented Carbide Grades for Improved Performance in Erosive and Corrosive Environments for Oil and Gas Applications	Exhibition Hall
13:30 - 14:00		Campfire : A Transversal Approach to the Development of PM	Salle Campfire
13:30 - 14:00		Industry Corner : FAST/SPS: A NEW Industrial Post-Process For The Full Densification Of 3D Complex Shapes From Additive Manufacturing!	Exhibition Hall
14:30 - 16:00		Session 57 AM Beam based Technologies : AM Powder Aspects	Auditorium Lumière
14:30 - 16:00		Session 58 AM Sinter based Technologies : Material Extrusion	Bellecour
14:30 - 16:00		Session 59 Other Ferrous Materials	Auditorium Pasteur
14:30 - 16:00		Session 60 Powder Production : Powder Characterization	Salon Pasteur
14:30 - 16:00		Session 61 Functional Materials : Soft Magnetic SMC	Rhone 3
14:30 - 16:00		Session 62 MIM SIS : Global MIM Market	Saint Clair 3
14:30 - 16:00		Session 63 HM Sectoral Group Meeting	Roseaie
16:00 - 17:00		Break, Exhibition & Poster Time	
16:15 - 16:45		Campfire : Non-destructive Quality Testing of Sintered Components	Salle Campfire
16:15 - 16:45		Industry Corner : Product Innovation Driven By Multi-Material Additive Manufacturing	Exhibition Hall
17:00 - 18:30		Session 64 Other Consolidation Technologies : Multi Material AM	Auditorium Lumière
17:00 - 18:30		Session 65 Digitalization I KNP	Bellecour
17:00 - 18:30		Session 66 Ferrous Materials : Fatigue and Mechanical Properties	Auditorium Pasteur
17:00 - 18:30		Session 67 Hot Isostatic Pressing	Salon Pasteur
17:00 - 18:30		Session 68 Functional Materials : Hard Magnetics	Rhone 3
17:00 - 18:30		Session 69 MIM Sectoral Group Meeting	Roseaie
17:00 - 18:30		Session 70 Energy Applications	Saint Clair 3
Thursday 13 October 2022			Room
08:00 - 16:00		Registration and Information Desk Open	Main Entrance
09:00 - 15:00		Exhibition Open	
08:30 - 10:00		Session 71 Hard Metals, cermets and diamond tools : Cermets and Hardmetals	Auditorium Lumière
08:30 - 10:00		Session 72 AM Beam based Technologies : Special Materials KNP	Bellecour
08:30 - 10:00		Session 73 Design and Modelling : Modelling of Sintering	Auditorium Pasteur
08:30 - 10:00		Session 75 Functional Materials I	Rhone 3
08:30 - 10:00		Session 76 HIP SIS : Metallurgical aspects of using HIP	Saint Clair 3
08:30 - 10:00		Session 77 Automotive Applications	Salon Pasteur
10:00 - 11:00		Break, Exhibition & Poster Time	
10:15 - 10:45		Campfire : The Relevance of Local Temperature Situations in Sinter Furnaces on the Individual Part Quality	Salle Campfire
10:15 - 10:45		Industry Corner : Laboratory And In-Line PM Parts Fast Non-Destructive Testing Control	Exhibition Hall
11:00 - 12:30		Session 78 AM Sinter based Technologies : Material Extrusion Feedstock	Auditorium Lumière
11:00 - 12:30		Session 79 AM Beam based Technologies : Deposition Processes	Bellecour
11:00 - 12:30		Session 80 Design and Modelling : Defects and Property Modelling	Auditorium Pasteur
11:00 - 12:30		Session 81 Ferrous Materials : PM Sintered Steels	Salon Pasteur
11:00 - 12:30		Session 82 Functional Materials II	Rhone 3
11:00 - 12:30		Session 83 HIP SIS : Hybrid Solutions using HIP	Saint Clair 3
11:00 - 12:30		Session 84 Biomedical Applications KNP	Roseaie
12:30 - 14:30		Buffet Delegate Lunch, Exhibition and Poster Time	Forum 1&2
12:45 - 13:15		Industry Corner : Implementation Of Alloying Design For The Development Of Sustainable Materials	Exhibition Hall
14:30 - 16:00		Session 85 AM Sinter based Technologies : Material Extrusion Application	Auditorium Lumière
14:30 - 16:00		Session 86 PM of High Entropy Alloys	Bellecour
14:30 - 16:00		Session 87 Design and Modelling : Process Modelling	Auditorium Pasteur
14:30 - 16:00		Session 88 Non Ferrous Materials : Other Non Ferrous Materials	Salon Pasteur
14:30 - 16:00		Session 90 Digitalization II	Rhone 3
14:30 - 16:00		Session 91 HIP Sectoral Group Meeting	Saint Clair 3

ADVANCED ENGINEERING

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ENGINEERING**



**COMPOSITES
ENGINEERING**



**AUTOMOTIVE
ENGINEERING**



**ADVANCED
METALS**



**CONNECTED
MANUFACTURING**



**SPACE & SATELLITE
ENGINEERING**



**PRODUCT TESTING
& QUALITY CONTROL**



An absolutely outstanding event!
We've met many great people who we will be looking to work with in the future, and overall it has been a very successful couple of days.

Matt Travis, Engineering Manager, JCB

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EPMA Sectoral and Working Groups focus on issues best handled at industry rather than company level. More information about the below groups can be found at www.epma.com/groups and by joining the sectoral group mailing lists at www.epma.com/maillinglist

Each group identifies and promotes the interests of EPMA Members in its area by providing the forum for the discussion of key issues, providing the industry voice to the wider world, and initiating collaborative projects.

Meetings are planned as follows:

Sectoral Groups

	Time	Meeting Type
European Additive Manufacturing Group (EuroAM) 		
Tuesday 11 October	11:00 - 12:30	Open Meeting
European Press & Sinter Group (EuroPress&Sinter) 		
Tuesday 11 October	14.30 - 16.00	Open Meeting
European Functional Materials Group (EuroFM) 		
Tuesday 11 October	17.00 - 18.30	Open Meeting
European Metal Injection Moulding Group (EuroMIM) 		
Wednesday 12 October	17.00 - 18.30	Open Meeting
European Hard Materials Group (EuroHM) 		
Wednesday 12 October	14.00 - 16.00	Open Meeting
European Hot Isostatic Pressing Group (EuroHIP) 		
Thursday 13 October	14.30 - 16.00	Open Meeting

CONGRESS DINNER



Date Tuesday 11 October 2022

Venue Cirque Imagine

Time 19.30 - 23.00

On Tuesday 11 October evening, join us to the Congress Gala Dinner in the magical and atypical place of the CIRQUE IMAGINE, where you will enjoy a gourmet meal together with a spectacular show.

A shuttle service will operate from the congress centre to the Cirque Imagine.

Tickets for the Gala Dinner are included in the full delegate packages.

Possibility for exhibitors and spouses to purchase tickets on-site during the online registration (subjected to availability on site).



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Applications	
Wednesday	
17:00 - 18:30	SESSION 70 : ENERGY APPLICATIONS
Thursday	
8:30 - 10:00	SESSION 77 : AUTOMOTIVE APPLICATIONS
11:00 - 12:30	SESSION 84 : BIOMEDICAL APPLICATIONS KNP

Consolidation technologies	
Monday	
14:30 - 16:00	SESSION 2 : SINTER BASED TECHNOLOGIES : BINDER JETTING POWDERS
14:30 - 16:00	SESSION 3: COMPACTION AND SINTERING : MODELLING AND SINTERING KNP
17:00 - 18:30	SESSION 9 : SINTER BASED TECHNOLOGIES : BINDER JETTING PROCESS DEVELOPMENT
17:00 - 18:30	SESSION 10 : COMPACTION AND SINTERING : PRESSING AND LUBRICANTS
Tuesday	
8:30 - 10:00	SESSION 15 : AM BEAM BASED TECHNOLOGIES : PBF PROCESS OPTIMISATION
11:00 - 12:30	SESSION 22 : AM BEAM BASED TECHNOLOGIES : LPBF PROCESS DEVELOPMENT-REPRODUCIBILITY
11:00 - 12:30	SESSION 26 : METAL INJECTION MOULDING
14:30 - 16:00	SESSION 29 : SINTER BASED TECHNOLOGIES : BINDER JETTING MATERIAL DEVELOPMENT
17:00 - 18:30	SESSION 36 : SINTER BASED TECHNOLOGIES : SIMULATION
Wednesday	
8:30 - 10:00	SESSION 43 : AM BEAM BASED TECHNOLOGIES : LPBF OF TOOL STEELS
8:30 - 10:00	SESSION 44 : SINTER BASED TECHNOLOGIES : STEREOLITHOGRAPHY
8:30 - 10:00	SESSION 47 : FIELD ASSISTED SINTERING TECHNOLOGIES : RECYCLING AND SHAPE CONTROL KNP
8:30 - 10:00	SESSION 49 : OTHER CONSOLIDATION TECHNOLOGIES
11:00 - 12:30	SESSION 50 : AM BEAM BASED TECHNOLOGIES : CORROSION/WEAR ASPECTS
11:00 - 12:30	SESSION 51 : AM SINTER BASED TECHNOLOGIES : SPECIAL TECHNOLOGIES
11:00 - 12:30	SESSION 54 : FIELD ASSISTED SINTERING TECHNOLOGIES : ADVANCED MATERIALS
14:30 - 16:00	SESSION 57 : AM SINTER BASED TECHNOLOGIES : AM POWDER ASPECTS
14:30 - 16:00	SESSION 58 : SINTER BASED TECHNOLOGIES : MATERIAL EXTRUSION
17:00 - 18:30	SESSION 64 : OTHER CONSOLIDATION TECHNOLOGIES: MULTI MATERIALS AM
17:00 - 18:30	SESSION 67 : HOT ISOSTATIC PRESSING
Thursday	
08:30 - 10:00	SESSION 72 : AM BEAM BASED TECHNOLOGIES : SPECIAL MATERIALS KNP
08:30 - 10:00	SESSION 78 : SINTER BASED TECHNOLOGIES : MATERIAL EXTRUSION FEEDSTOCK
11:00 - 12:30	SESSION 79 : AM BEAM BASED TECHNOLOGIES : DEPOSITION PROCESSES
14:30 - 16:00	SESSION 85 : AM BEAM BASED TECHNOLOGIES : MATERIAL EXTRUSION APPLICATION

Materials	
Monday	
14:30 - 16:00	SESSION 1 : HARD METALS, CERMETS AND DIAMOND TOOLS : ADDITIVE MANUFACTURING
17:00 - 18:30	SESSION 8 : HARD METALS, CERMETS AND DIAMOND TOOLS : ALTERNATIVE BINDERS
17:00 - 18:30	SESSION 12 : LIGHT MATERIALS : TITANIUM ALLOYS KNP
Tuesday	
8:30 - 10:00	SESSION 16 : HARD METALS, CERMETS AND DIAMOND TOOLS : SUPER HARD MATERIALS
8:30 - 10:00	SESSION 17 : NON FERROUS MATERIALS : TITANIUM & TITANIUM ALLOYS
11:00 - 12:30	SESSION 23 : HARD METALS, CERMETS AND DIAMOND TOOLS : PROCESSING I
14:30 - 16:00	SESSION 30 : HARD METALS, CERMETS AND DIAMOND TOOLS : MODELLING AND TESTING KNP
14:30 - 16:00	SESSION 31 : FERROUS MATERIALS : STEELS FOR LPBF
14:30 - 16:00	SESSION 33 : HIGH TEMPERATURE MATERIALS I
17:00 - 18:30	SESSION 37 : HARD METALS, CERMETS AND DIAMOND TOOLS : PROCESSING II
17:00 - 18:30	SESSION 38 : FERROUS MATERIALS : STEELS FOR BINDER JETTING KNP
17:00 - 18:30	SESSION 40 : HIGH TEMPERATURE MATERIALS II
Wednesday	
8:30 - 10:00	SESSION 45 : LIGHT MATERIALS : AL AND MG ALLOYS
11:00 - 12:30	SESSION 52 : LIGHT MATERIALS : AL ALLOYS KNP
14:30 - 16:00	SESSION 59 : OTHER FERROUS MATERIALS
14:30 - 16:00	SESSION 61 : FUNCTIONAL MATERIALS : SOFT MAGNETIC SMC
17:00 - 18:30	SESSION 66 : FERROUS MATERIALS : FATIGUE AND MECHANICAL PROPERTIES
17:00 - 18:30	SESSION 68 : FUNCTIONAL MATERIALS : HARD MAGNETICS
Thursday	
8:30 - 10:00	SESSION 71 : HARD METALS, CERMETS AND DIAMOND TOOLS : CERMETS AND HARDMETALS
8:30 - 10:00	SESSION 75 : FUNCTIONAL MATERIALS I
11:00 - 12:30	SESSION 81 : FERROUS MATERIALS : PM SINTERED STEELS
11:00 - 12:30	SESSION 82 : FUNCTIONAL MATERIALS II
14:30 - 16:00	SESSION 86 : PM OF HIGH ENTROPY ALLOYS
14:30 - 16:00	SESSION 88 : NON FERROUS MATERIALS : OTHER NON FERROUS MATERIALS

Powder Production	
Tuesday	
8:30 - 10:00	SESSION 20 : POWDER MODIFICATION
11:00 - 12:30	SESSION 27 : GAS ATOMIZATION FUNDAMENTALS
14:30 - 16:00	SESSION 34 : GAS ATOMIZATION PROCESS DEVELOPMENT
17:00 - 18:30	SESSION 41 : INNOVATIVE PROCESSES
Wednesday	
14:30 - 16:00	SESSION 60 : POWDER CHARACTERIZATION



Tools for improving PM

Monday

14:30 - 16:00	SESSION 4 : TEST AND EVALUATION : STRUCTURE CHARACTERIZATION
17:00 - 18:30	SESSION 11 : TEST AND EVALUATION : POWDER CHARACTERIZATION FOR AM

Tuesday

8:30 - 10:00	SESSION 19 : SECONDARY OPERATIONS
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Wednesday

8:30 - 10:00	SESSION 48 : TEST AND EVALUATION : POWDER TESTING AND CHARACTERIZATION
11:00 - 12:30	SESSION 55 : TEST AND EVALUATION FOR AM
17:00 - 18:30	SESSION 65 : DIGITALIZATION I KNP

Thursday

8:30 - 10:00	SESSION 73 : DESIGN AND MODELLING : MODELLING OF SINTERING
11:00 - 12:30	SESSION 80 : DESIGN AND MODELLING : DEFECTS AND PROPERTY MODELLING
14:30 - 16:00	SESSION 87 : DESIGN AND MODELLING : PROCESS MODELLING
14:30 - 16:00	SESSION 90 : DIGITALIZATION II

Social Events

Sunday

17:30 - 19:30	WELCOME RECEPTION (SPONSORED BY HÖGANÄS)	Höganäs
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Monday

18:00 - 19:30	POSTER AND AWARDS RECEPTION (SPONSORED BY MIBA)	Miba
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Tuesday

20:00 - 23:00	CONGRESS DINNER
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Special Interest Seminars

Monday

14:30 - 16:00	SESSION 6 : FM SIS : APPLICATIONS OF HIGH ENTROPY ALLOYS
14:30 - 16:00	SESSION 7 : EHQS SIS : ISO ACTIVITIES & STANDARDS FOR PM
17:00 - 18:30	SESSION 14 : EHQS SIS : CHEMICALS & SUSTAINABILITY IN PM

Tuesday

8:30 - 10:00	SESSION 18 : P&S SIS : P&S GLOBAL MARKET TRENDS
11:00 - 12:30	SESSION 25 : P&S SIS : SUPPLY CHAIN ISSUES FOR ALLOYING ELEMENTS INDUCED BY ELECTRIFICATION AND THEIR POSSIBLE CONSEQUENCES
14:30 - 16:00	SESSION 32 : AM SIS : SUSTAINABILITY IN AM
17:00 - 18:30	SESSION 39 : AM SIS : EMERGING AM TECHNOLOGIES

Wednesday

8:30 - 10:00	SESSION 46 : HM SIS : CHALLENGES IN HM INDUSTRY
11:00 - 12:30	SESSION 53 : HM SIS : CASE STUDIES IN THE VALUE CHAIN OF HM
11:00 - 12:30	SESSION 56 : MIM SIS : SUSTAINABILITY OF MIM
14:30 - 16:00	SESSION 62 : MIM SIS : GLOBAL MIM MARKET

Thursday

8:30 - 10:00	SESSION 76 : HIP SIS : METALLURGICAL ASPECTS OF USING HIP
11:00 - 12:30	SESSION 83 : HIP SIS : HYBRID SOLUTIONS USING HIP

Campfire Meeting

Tuesday

10:15 - 10:45	CHALLENGES AND OPPORTUNITIES OF MULTI-MATERIAL ADDITIVE MANUFACTURING
13:30 - 14:00	PM MATERIALS AND TECHNIQUES FOR MATERIALS IN EXTREME ENVIRONMENTS
16:15 - 16:45	METAL BINDER JETTING USERS GROUP

Wednesday

13:30 - 14:00	A TRANSVERSAL APPROACH TO THE DEVELOPMENT OF PM
16:15 - 16:45	NON-DESTRUCTIVE QUALITY TESTING OF SINTERED COMPONENTS

Thursday

10:15 - 10:45	THE RELEVANCE OF LOCAL TEMPERATURE SITUATIONS IN SINTER FURNACES ON THE INDIVIDUAL PART QUALITY
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Industry Corner

Monday

12:45 - 13:15	THE EWF PERSONNEL QUALIFICATION SCHEME IN METAL AM
13:30 - 14:00	MATERIALS DEVELOPED FOR ADDITIVE MANUFACTURING
16:15 - 16:45	NEW CHALLENGES FOR HIGH PERFORMANCE RARE EARTH PERMANENT MAGNETS

Tuesday

10:15 - 10:45	GLOBAL MARKETS FOR METAL ADDITIVE MANUFACTURING
12:45 - 13:15	SUSTAINABLE ENERGY HARVESTING SYSTEMS BASED ON INNOVATIVE MINE WASTE RECYCLING
13:30 - 14:00	BASF CATAMOLD® – INJECT YOUR IDEAS
16:15 - 16:45	SMC MATERIALS FOR E-MOBILITY APPLICATION

Wednesday

12:45 - 13:15	NEW CEMENTED CARBIDE GRADES FOR IMPROVED PERFORMANCE IN EROSION AND CORROSIVE ENVIRONMENTS FOR OIL AND GAS APPLICATIONS
13:30 - 14:00	A NEW INDUSTRIAL POST-PROCESS FOR THE FULL DENSIFICATION OF 3D COMPLEX SHAPES FROM ADDITIVE MANUFACTURING
16:15 - 16:45	PRODUCT INNOVATION DRIVEN BY MULTI-MATERIAL ADDITIVE MANUFACTURING

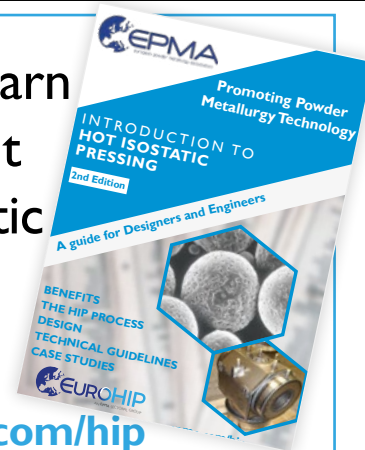
Thursday

10:15 - 10:45	LABORATORY AND IN-LINE PM PARTS FAST NON-DESTRUCTIVE TESTING CONTROL
12:45 - 13:15	IMPLEMENTATION OF ALLOYING DESIGN FOR THE DEVELOPMENT OF SUSTAINABLE MATERIALS

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What is a Campfire Meeting?

A small in size but large in content, relaxed meeting to discuss a particular topic for 30 minutes
Led by a facilitator, participants discuss the topic organically to drive the discussion
Opportunity to share expertise

Free access for all World PM2022 participants
Campfire Room: level Saint Clair

The World PM2022 Mobile App will also show the details of Campfire enabling you to add them to your onsite schedule.

Challenges and Opportunities of Multi-Material Additive Manufacturing

FACILITATOR

Dr Xiaoshuang Li (Aerosint)

Tuesday 11 October 2022, 10:15-10:45

Compared with the conventional manufacturing processes, multi-material additive manufacturing brings not only broader design freedom but also more functions to products. Direct energy deposition is known for making parts with different materials in a relatively high speed.

However, the resolution and geometrical complexity are limited. Recently, the invention of selective powder deposition system by Aerosint opens up a lot of doors to innovation. In combination with a powder bed based platform such as laser powder bed fusion, binder jetting, this system enables fabrication of metal-metal, metal-ceramic and ceramic-ceramic parts in a single manufacturing step. It is an emerging technology.

To drive the industrialization of this technology, a lot of challenges need to be tackled by researchers. By conducting fundamental research, they can contribute to understand, monitor and ultimately control the process. Opportunities come along with challenges. For end users, new applications and business cases are there to be explored to make manufacturing more sustainable.

PM Materials and Techniques for Materials in Extreme Environments

FACILITATOR

Dr Matthew Dunstan (US Army Research Lab)

Tuesday 11 October 2022, 13:30-14:00

With scientists and engineers continuing to push technological boundaries there is a need for materials that can withstand the ever-increasing extreme environments experienced during service as well as manufacturing technologies that can produce these materials in usable geometries.

This Campfire Meeting seeks to discuss various extreme environments (high temperature, erosion, corrosion, wear, high strain rate deformation, fatigue, combinatorial environments, etc.) and how powder metallurgy can be leveraged as both a manufacturing technique and a tool for materials development.

Of particular interest will be material systems (e.g., refractory alloys, high entropy alloys, metal-ceramic composites), processing methods (e.g., AM, SPS, HIP, powder forging), and environmental applications (e.g., aviation, energy, nuclear, space).

Metal Binder Jetting users group

FACILITATOR

Mr Benoit Verquin (CETIM)

Tuesday 11 October 2022, 13:30-14:00

Thanks to high level of productivity, limited post process and design opportunities, the interest of Metal Binder Jetting is currently growing and open the door to serial production. In parallel many sintered base AM process are developed.

We propose to gather the community of MBJ users and other sintered base AM processes during this Campfire meeting to have open discussion about it, and possibly to share feedback and define collaborative work topics as : Rule of good practice, Health and safety, Standardisation, Design rules....

Don't hesitate to propose your topic of interest during the meeting.

A transversal approach to the development of PM

FACILITATOR

Mr Alain Honnart (Metalvalue)

Wednesday 12 October 2022, 13:30-14:00

PM industry is handicapped by the price of powder and the price of consolidation technologies. Most of the development efforts are focused on narrow niches and do not solve that dilemma. A transversal approach based on several consolidation technologies and on the sieving of powder allows to develop a significant new market.

Non-destructive quality testing of sintered components

FACILITATOR

Dr Michael Weidner (Siemens Industry Software GmbH)

Wednesday 12 October 2022, 16:15-16:45

In this campfire meeting we will be talking about

- the actual need for NDT inspection
- the defect types that shall be detected
- the appropriate (surface- or volume-oriented) NDT methods
- open tasks with regard to quality testing of PM parts

The relevance of local temperature situations in sinter furnaces on the individual part quality

FACILITATOR

Dr-Ing Goetz Hartmann (MAGMA GmbH)

Thursday 13 October 2022, 10:15-10:45

Are the furnace temperatures during sinter processes uniform and constant during the sinter processes? Does the geometric arrangement of heating devices and sinter parts support this? Definitely no, but are these facts relevant? Is online sinter part temperature control helpful and feasible (sintering 4.0)? What about sinter furnace temperature simulation and virtual optimization? These questions would be brought up at this proposed campfire discussion.

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What is an Industry Corner Meeting?

- A 20-minute presentation on innovations or technological breakthroughs.
- At the end of the presentation, participants will have the opportunity to ask questions for 10 minutes.

Free access for all World PM2022 participants
Industry corner area in the Exhibition

The World PM2022 Mobile App will also show the details of Industry Corner Meetings enabling you to add them to your onsite schedule.

The EWF personnel qualification scheme in metal AM

SPEAKER

Mrs Ana Beatriz Lopez (AFS-Association Française du Soudage)

Monday 10 October 2022, 12:45-13:15

The IAMQS, International Additive Manufacturing Qualification System, was created by industry and for industry to ensure that companies and professionals are equipped with the right set of skills to implement AM/ 3D printing at the industrial level. It currently offers 11 Qualifications in Additive Manufacturing, covering Operators, Coordinator, Engineers, Designers and Supervisor. The speech will show a comprehensive summary of the Qualifications of personnel.

Materials developed for Additive Manufacturing

SPEAKER

Dr Solange Vives (Aubert & Duval)

Monday 10 October 2022, 13:30-14:00

Aubert & Duval will present superalloys and high-performance steels powders adapted for Additive Manufacturing processes. High temperature, corrosion resistance, high strength materials are difficult to process. Our work on crack reduction for these advanced materials during LPBF process will be highlighted as well as specific material properties.

New challenges for high performance rare earth permanent magnets

SPEAKER

Mr Gérard Delette (CEA-LITEN)

Monday 10 October 2022, 16:15-16:45

Sintered Nd-Fe-B magnets are the most powerful magnets produced by industry and enable considerable improvement of the compactness, yield and reliability of electrical machines. The demand for such magnets is rapidly growing (15-20 % per year) for the deployment of electrical vehicles and wind turbines. However, the sustainability of magnet production involves upscaling new manufacturing routes combining (i) a rational use of raw critical elements, (ii) more material saving by net shape process to avoid scraps and machining loss and (iii) large scale recycling of end-of-life products in an efficient value chain. Maintaining the performances of magnets to a high level, compliant with the motor design requirements, raises new challenges in the research activities focused on these materials. Some recent results obtained on the powder metallurgy platform hosted by CEA-LITEN will be described. The roadmap for the development of magnet manufacturing industrial pilot line will be presented.

Sustainable Energy Harvesting Systems Based on Innovative Mine Waste Recycling

SPEAKER

Dr Filipe Neves (START)

Tuesday 11 October 2022, 12:45-13:15

START, an innovation action project supported by the European Union (EU) and its Horizon Europe programme, aims to create a sustainable supply chain for green energy harvesting products based on the concept of converting mining waste into materials for waste heat recovery. The speech will show a comprehensive summary of the project, highlighting the importance of powder technology for the proposed technological solutions.

BASF Catamold® – Inject your ideas

SPEAKER

Dr Maik Schlesinger (BASF SE)

Tuesday 11 October 2022, 13:30 -14:00

Get to know the inventor and the leading supplier of ready-to-mold catalytic debinding Metal Injection Molding (MIM) feedstocks, Catamold®. BASF's Metal Systems team develops, produces and markets a high-quality range of innovative and sustainable MIM feedstocks for the Automotive, Information & Communication Technology and Functional applications.

SMC materials for E-Mobility Application

SPEAKER

Ph. D Zhou Ye (Höganäs AB)

Tuesday 11 October 2022, 16:15 -16:45

There are many applications of soft magnetic material in an EV. The working temperature of soft magnetic components in these applications can be varied from -40°C up to over 200°C. It is necessary to have not only a stable performance of the magnetic components under the working temperature, but also a good thermal durability in the applications. This presentation will make a short summary of SMC potential applications in E-mobilities and introduce the SMC performances at difference working temperature and its thermal durability

Global markets for metal Additive Manufacturing

SPEAKER

Mr Matthias Schmidt-Lehr (AMPOWER GmbH & Co. KG)

Wednesday 12 October 2022, 10:15-10:45

Presentation of the market overview of metal Additive Manufacturing based on the AMPOWER Report.

New Cemented Carbide Grades for Improved Performance in Erosive and Corrosive Environments for Oil and Gas Applications

SPEAKER

Dr Olivier Lavigne (Hyperion Materials and Technologies)

Wednesday 12 October 2022, 12:45-13:15

Hyperion Materials & Technologies has many years of experience in providing solutions to improve productivity within upstream oil & gas applications like drilling, completions, and production. Hyperion's cemented carbides offer erosion resistance superior to that of steel and Co-Cr superalloys as well as fracture toughnesses higher than those of ceramic materials like silicon carbide and aluminum oxide. Hyperion also serves as a partner to its customers during the design phase of new product development, working together to optimize cost without sacrificing functionality.

One of Hyperion's most recent innovations; tailored to the needs of the energy industry; was the development of two new cemented carbide grades, DZ07 and CR9C. These new grades support the evolution of new product designs in directional drilling, inflow control, hydraulic fracturing, and production choke flow control applications. These new, high-performance tools, that drive increased productivity, require improved material corrosion, erosion resistance, and toughness properties. Combining our core technical expertise in materials development with ability to simulate application performance in a lab setting was fundamental to the development of these two industry-leading grades, which have exhibited outstanding performance in a wide range of new products ranging from intelligent completions sleeves to various flow control valve components.



FAST/SPS: A NEW industrial post-process for the full densification of 3D complex shapes from additive manufacturing!

SPEAKER

Mr Romain Epherre (NORIMAT)

Tuesday 11 October 2022, 13:30 -14:00

Spark Plasma Sintering (or Field Assisted Sintering Technique) is an efficient powder densification technique. It is used to sinter a wide variety of materials (ceramics, metals, alloys, composites, etc.). Compared to conventional processes, it reduces the production time by 90% while enhancing material performance. The presentation will be split in two sections:

3D COMPLEX SHAPES:

Norimat has opened the gateway to a new hybrid technology, through developing a unique and simple process which enables the consolidation of 3D complex shapes. It allows the full densification (porosity <1%) of the green parts created by additive manufacturing, in only one additional post-process step, this taking less than 1h of thermal treatment time.

ENGEMINI: 1st modeling software for FAST/SPS

A software suite dedicated to the FAST/SPS process has been developed to help its users understand, develop, industrialize and produce new materials and parts using SPS. The applications target all users from R&D (Digital Twin) through to Production (Statistical Process Control)..

Product innovation driven by multi-material additive manufacturing

SPEAKER

Dr Xiaoshuang Li (Aerosint SA)

Wednesday 12 October 2022, 16:15 -16:45

The Selective Powder Deposition system developed by Aerosint SA disruptively change the way how powder patterns and beds can be formed. This system also allows the simultaneous deposition of multiple powders to form a thin layer. The different powders can have different patterns. In combination with the consolidation processes such as laser powder bed fusion, binder jetting, it allows additively manufacturing of multi-material parts. As a result, products with multiple functions integrated can be manufactured by a single process. Since it is still a new technology in the market, decision makers from various industry sectors need to be informed with it and brainstorm the product innovation driven by this technology.

The goal of this proposed industry corner meeting is to gather industry users from diverse business sectors and to review together how product can be innovated by using multi-material additive manufacturing.

Laboratory and in-line PM parts fast Non-Destructive Testing Control

SPEAKER

Dr Mihai Iovea (Accent Pro 2000 s.r.l.)

Thursday 13 October 2022, 10:15-10:45

First we propose a general discussion about the Non-destructive Techniques used for PM parts quality analysis. Then, we present an implemented high-resolution belt-based X-Ray Digital Radiography technique (based on using a TDI - Time Delay Integration X-Ray detector) for detecting internal defects, combined with a Laser dimensional profiler for in-line measuring 3D external shape of the parts. The parts are continuously traveling on belt with speed up to 10cm/s and are successively measured by laser profiler and X-ray techniques. By combining both NDT techniques in one equipment could be automatically measured with $\pm 1.5-3\%$ errors, the following parameters: External dimensions, local thickness, local density and internal defects type and size. The entire process takes around 20-80 seconds, depending on sample size, and could be fully controlled by computer which finally decides if sample is Good or Bad. For internal defects fast classification, a Learning algorithm could be adapted for fast automate database generation and permanent improvement of defects detection algorithm.

Implementation of alloying design for the development of sustainable materials

SPEAKER

PhD Eleonora Bettini (Sandvik Additive Manufacturing)

Thursday 13 October 2022, 12:45-13:15

Advanced calculation tools have been used and implemented in the development of new sustainable alloys for metal injection molding (MIM) and Additive Manufacturing (AM). Two examples will be presented.

Several Information and Communication Technology (ICT) components are commonly manufactured by MIM. However, the increasing size of new smartphones together with the addition of multiple cameras is a real challenge when trying to limit the total weight of the device. To overcome this problem, the use of advanced computational tools has been implemented in the development of a new Ni-free Low Density alloy, with high strength, hardness and sintered density, without compromising ductility.

Maraging steels are very versatile alloys due to the possibility of achieving different hardness-toughness levels by aging their martensitic structure at different temperatures and aging times. The very low amount of carbon makes these alloys suitable for laser powder bed fusion (L-PBF). However, maraging steels commonly contain high amount of Co, which has been recently strictly regulated due to its health & environmental hazards. For this reason, alloying design using advanced calculation tools has been implemented to develop a Co-free maraging steel, with comparable properties to one of the most common, but Co-containing, maraging steel (18Ni300).



Monday 10 October 2022

Opening plenary session : 08:45 – 11:15



Welcome from EPMA Executive director
Dr Lionel Aboussouan



State of the PM Industry in north America
Mr Rodney Brennen (MPIF president)



Overview of the status and trends in the Asian PM Industry
Mr Chiu-Lung Chu (APMA president)



Overview of the status and trends in the European PM Industry
Mr Ralf Carlström (EPMA president)

Plenary Speaker

Safran Additive Manufacturing Campus, towards industrial metal additive manufacturing serving the carbon-free aeronautics of the future

Mrs Anne Thenaisie (SAFRAN)

**Sustainability and PM**

Mr Fredrik Emilson - Group President & CEO (Höganäs AB)

The plenary session will include
Presentation of the PM Thesis competition
(sponsored by HILTI) and **Keynote Paper Awards Winners** (Sponsored by Taylor & Francis group).

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Date Monday 10 October

Venue World PM2022 Exhibition Area

Time 18.00 - 19.30

Taking place on Monday evening 18.00-19.30, Poster Authors will be presenting their posters in and around the exhibition area. Please stop by with a drink to find out more about their work.

The EPMA Distinguished Service Awards and Fellowship awards from 2020 to 2022 will be handed over during this reception.

This event is open to all participants.

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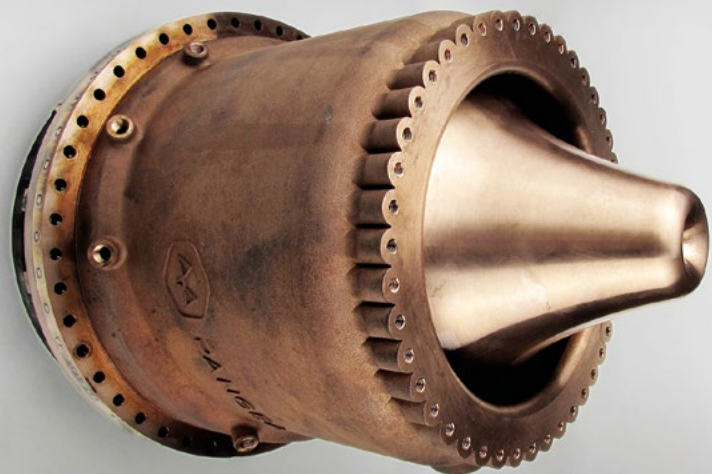


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Vol. 8 No. 1 SPRING 2022

THE MAGAZINE FOR THE METAL ADDITIVE MANUFACTURING INDUSTRY

**METAL
AM**



in this issue

PANGEA: MAKING THE UNMAKEABLE

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Monday 18 October 2022

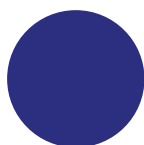
**Mr Gilmar Nogueira**
Université Grenoble Alpes, France**Using Discrete Simulations Of Compaction And Sintering To Predict Final Part Geometry**

Time: 14:30 - 16:00

Session: Compaction and sintering / Modelling and Sintering

Room: Auditorium Pasteur

Abstract: A DEM (Discrete Element Method) model is used to simulate compaction and sintering. A double-action die has been implemented for the compaction stage. The process kinematics are decomposed into loading, unloading, and ejection of the pellet. Interactions between the particles and the die are considered elastoplastic by implementing a large-density model. A qualitative approach is used in the sintering stage. The results are in good agreement with experimental data and FEM simulations from the literature, regarding density gradient, elastic spring-back, and final geometry. The simulations show that the friction coefficient is the primary factor for the density gradient in the pellet. This density gradient induces a non-homogeneous sintering, which results in a final geometry with a so-called diabolo effect. This is the first time that it has been reproduced by DEM with the advantage of more closely reproducing the particulate microstructure of the powder.

**Prof Dr Katsuyoshi Kondoh**
Osaka University, Japan**High Strength Ti-Zr Alloys With Balanced Ductility Fabricated By Powder Metallurgy And Additive Manufacturing Routes**

Time: 17:00 - 18:30

Session: Light materials/ Titanium Alloys

Room: Rhone 3

Abstract: The pre-mixed pure titanium (Ti) and zirconium hydride (ZrH₂) powder was consolidated by PM process (sintering and hot extrusion) or AM process (selectively laser melting, SLM) to fabricate Ti-Zr alloys, which have excellent corrosion resistance and biocompatibility for human bodies. It was clarified that both materials showed uniform solid-solution of Zr atoms in α -Ti matrix and fine grains due to Zr solute drag, resulting in the significant improvement of tensile strength. In addition, the elongation more than 15% was also obtained in all samples. The quantitative analysis on Zr solution strengthening behavior of both materials was carried out using Labusch model.

Tuesday 11 October 2022

**Dipl-Ing Louise Rosenblad**
KTH, Sweden**Constitutive Modelling Of Solid State Sintering Of Cemented Carbides**

Time: 14:30 - 16:00

Session: Hard Metals/ Modelling and testing

Room: Bellecour

Abstract: From a previously developed constitutive model of cemented carbide, the powder size- and configuration can be used to simulate the densification during the sintering process. However, small differences in experimental execution cannot be accounted for in the simulation, making the model sensitive. Here, we study how well the developed constitutive model can capture the experimental results of a dilatometer test. Three different experiments were performed where the only difference was the transition between the debinding and sintering process. From parameter adjustments, it is seen that the constitutive model is more suited to a certain experimental setup, which is a limitation of the model.

**Dr Ing Christophe Reynaud**
CETIM, France**Development Of X40CrMoV5-1 (H13) On Binder Jetting Technologies**

Time: 17:00 - 18:30

Session: Ferrous materials/ Steels for Binder Jetting

Room: Auditorium Pasteur

Abstract: Cetim has launched further material project development on binder technologies. This work deals with the development of the tool steel X40CrMoV5-1 or H13 on two Metal Binder Jetting technologies, namely DM P2500 (Digital Metal) and Lab P-1 (Desktop Metal). The whole MJB H13 has been developed by adjusting the 17-4PH powder printing parameters and by developing a specific sintering recipe by using a vacuum metallic furnace under controlled atmosphere (one step debinding sintering). The presentation will be focused on sintering development. Controlling the final carbon content and achieving high density level without excessive component distortion by using SLPS process are the main challenges to overcome. The microstructure and the mechanical properties are compared. For both technologies, as sintered mechanical properties are consistent with data coming from MIM H13 materials and wrought materials.

Wednesday 12 October 2022

**Dr Simon Graham**
The University of Sheffield, United Kingdom**Solid-state Processing Of Surplus Aluminium Alloy Powders Through A Combination Of Field Assisted Sintering Technology And Hot Rolling**

Time: 08:30 - 10:00

Session: FAST/ Recycling and Shape Control

Room: Rhone 3

Abstract: Metal additive manufacturing techniques typically operate using powders with limited particle size ranges, but atomisation processes produce significant amounts of particles outside these ranges, resulting in an accumulation of out-of-size specification metal powders without a clear use case. Field assisted sintering technology (FAST) can provide an alternative, solid-state processing route to consolidate these powders into billets for subsequent processing, or directly into near-net shape components. In this study, surplus powders of A20X, an aerospace approved aluminium alloy developed by Aluminium Materials Technologies (ECKART GmbH), were processed using FAST and subsequently hot rolled to produce sheet material. Tensile properties were similar to hot rolled conventional cast material and comparable to additively manufactured product. This indicates that FAST is an effective option for processing surplus metal powders, whilst improving sustainability in the additive supply chain.





Dr Ing Johannes Trapp
Fraunhofer IFAM, Germany

Brake Discs Made Of Aluminum Matrix Composites

Time: 11:00 - 12:30

Session: Light materials/ Al Alloys

Room: Auditorium Pasteur

Abstract: Aluminum-based metal-matrix-composites (AMCs) show attractive properties to meet the growing demand for lightweight construction for example in the automotive and aerospace industries. Limiting factors are difficulties in processing and machining as well as comparably low operating temperatures. The first issue is addressed using spark plasma sintering (SPS) to produce fully dense net-shape compacts. Therefore, the electrical properties of the powders must be understood and adjusted. To increase operation temperature, alloys with thermally more stable Al₃Fe dispersoids, certain intermetallic phases, or complex constitutional alloys have been investigated. The latter are developed with the help of a systematic selection process to calculate the thermodynamic and kinetic criteria to predict the phases formed. Those AMCs show melting temperatures above 1000 °C while keeping the density below 4,5 g/cm³. Aiming for compressive strength > 800 MPa and elongation to fraction >1 % makes the materials suitable e.g. for front wheel brake disc applications.



Mr Denis Mutel
Université Laval, Canada

Rheological Characterization Of Water Atomized Tool Steel Powders Developed For Laser Powder Bed Fusion By Supervised And Unsupervised Machine Learning

Time: 17:00 - 18:30

Session: Digitization/ Digitalization I

Room: Bellecour

Abstract: Metal powders developed for powder-bed additive manufacturing processes need to achieve specific flow characteristics to be considered suitable. However, the relationship between powder flow and the morphological characteristics of individual particles can be difficult to establish. In this context, artificial intelligence appears to be the perfect tool to clarify the imprecision surrounding this type of interaction. The work summarized in this manuscript first uses a neural network architecture (Mask R-CNN) allowing the segmentation of individual water-atomized particles in micrographs acquired in scanning electron microscopy. The micrographs of individual particles or their shape descriptors (roundness, elongation, etc.) are then processed using different machine learning (ML) strategies, supervised or not, to relate the information collected on individual particles with the rheological properties of powder specimens. The approach developed aims to acquire new knowledge regarding specific particle characteristics that are required to optimize powder flowability for laser powder bed fusion

Thursday 13 October 2022



Ms Erika Soares Barreto
Leibniz-Institute for Materials Engineering IWT, Germany

Influence Of Oxygen In The Production Chain Of Metallic Glasses Via Laser Powder Bed Fusion

Time: 08:30 - 10:00

Session: AM beam based/ Special Materials

Room: Bellecour

Abstract: Laser powder bed fusion of metals (PBF-LB/M) is advantageous for manufacturing bulk metallic glasses with size and geometrical freedom. However, the oxygen uptake along the production chain can negatively impact the generation of high-quality, amorphous parts. In this context, Cu-Ti-based alloys were gas-atomized and additively manufactured using commercial and high purity feedstocks. The oxygen absorption in each processing step was tracked and related to the amorphous phase formation and glass-forming ability (GFA) of alloys. Results show an increasing oxygen absorption, considerably influenced by the starting feedstock, especially for commercial purity. In high purity material, the most contribution is inherent from the powder oxygen content. Findings reveal the lack of influence of the oxygen content in the GFA. TEM analysis of commercial powder and PBF-LB/M sample show uniform and featureless micrographs, displaying the absence of oxygen-induced nucleation. The present contribution enhances the qualification and economic processability of amorphous metals by PBF-LB/M.



Dr Luis Olmos
Universidad Michoacana de San Nicolás de Hidalgo, Mexico

Fabrication Of Tailored Ti-based Materials By Conventional Powder Metallurgy For Bone Implant Applications

Time: 11:00 - 12:30

Session: Applications/ Biomedical

Room: Roseraie

Abstract: This work proposes a methodology for fabricating materials with specific characteristics tuned for replacing human bones. A Ti64 alloy powder is used as the base materials and it is mixed with Ag, Ta, TiN and salt particles to obtain different features. A knee-bone like component is fabricated, including a highly porous core of Ti64/25Ta/5Ag and compact outer of Ti64/5Ag that is supposed to improve corrosion and osseointegration. Besides, a harder top surface in Ti64/10TiN composite should increase the wear resistance. The green component is sintered at 1260°C in argon. Its stiffness is close to the one of bones thanks to the added porosity, which also provides a permeability close to the one reported for trabecular bones. Tribocorrosion behavior in simulated body fluid is improved by TiN addition. In conclusion, the proposed processing route is able to produce complex components fulfilling specific features required for human bone replacement.

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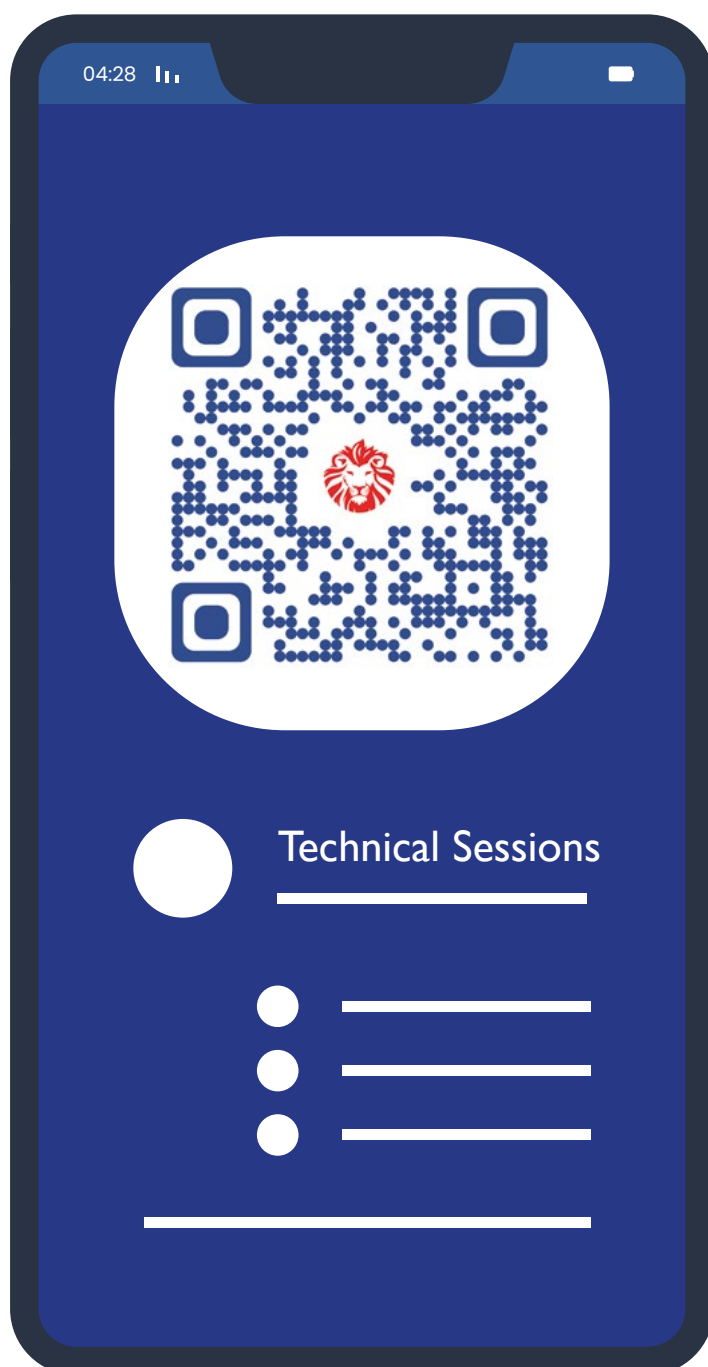
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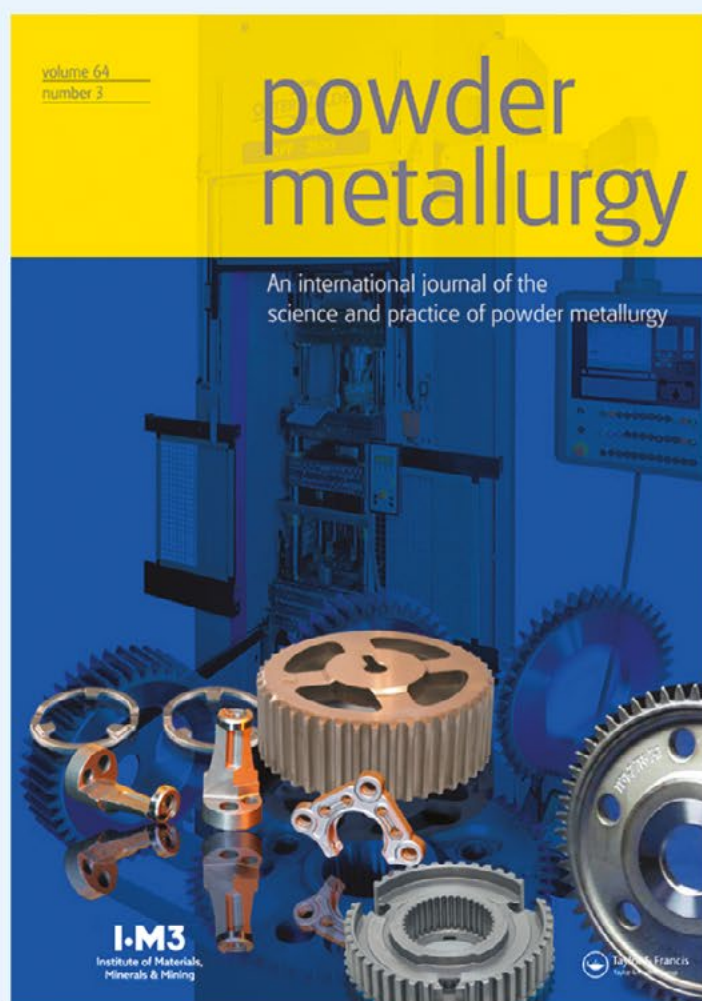
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Special Interest Seminar: Materials/Functional Materials

Session 6 - Monday 10 October - Time: 14:30 – 16:00

FM SIS: High Entropy Alloys and their possible applications

Chairs: Dr Sebastian Hein (Fraunhofer IFAM, Germany)
Mr Peter Kjeldsteen (Sintex a/s, Denmark)

Presentations:

Time 14:30 – 15:00: **High Entropy Alloys, an opportunity for the PM route**,
Prof José Manuel Torralba (Universidad Carlos III Madrid - IMDEA Materials, Spain)

Time 15:00 – 15:30: **Laser powder bed fusion of high entropy alloys (HEAs)**,
Dr Alper Evirgen (Oerlikon Balzers- Metco & AM, Germany)

Time 15:30 – 16:00: **Development of High Entropy Alloys for High Temperature Applications in Highly Efficient intensive energy: ACHIEF project**,
Dr Pilar Rey Rodriguez (AIMEN Centro Tecnológico, Spain)

Special Interest Seminar: Tools for improving PM /Test and Evaluation (EHQS)

Session 7 - Monday 10 October - Time: 14:30 – 16:00

EHQS SIS: ISO Activities & Standards

Chairs: Mr. Kenan Boz

Presentations:

Time 14:30 - 15:00: **Standardization Activities in TC119: Powder Metallurgy**,
Mr Mats Larsson (Höganäs AB, Sweden)

Time 15:00 – 15:30: **Standardization Activities in TC119-SC5: Specifications for powder metallurgical materials**, Dr Jesus Penafiel (Ames Group Sintering, S.A. , Spain)

Time 15:30 – 16:00: **Standardization Activities in TC261: Additive Manufacturing**,
Mr Benoît Verquin (CETIM, France)

Session 14 – Monday 10 October – Time: 17:00 – 18:30

EHQS SIS: Sustainability & Chemicals in PM

Chairs: Mr Bruno Vicenzi, Mr Kenan Boz

Presentations:

Time 17:00 – 17:30: **Health and Safety Aspects of Metal Powder Based Additive Manufacturing**, Dr Pelle Mellin (Swerim, Sweden)

Time 17:30 – 18:00: **Health and Safety in Powder Bed Fusion Processes – Dust Exposure and Powder Carry-over Risk**, Dr Georg Schlick (Fraunhofer IGCV, Germany)

Time 18:00 – 18:30: **Chemicals Management update for PM**, Mr Kenan Boz (EPMA, France)

Special Interest Seminar: Consolidation technologies/Compaction and sintering

Session 18 - Tuesday 11 October - Time: 08:30 – 10:00

P&S SIS: Global market trends

Chairs: Mrs Caroline Larsson (Höganäs AB, Sweden)
Dr Cesar Molins (AMES SA, Spain)



**Presentations:**

Time 08:30 – 09:00: **Global Market Trends and Opportunities for Aluminum Powder Metallurgy**, Mr Ian W. Donaldson (GKN, USA)

Time 09:00 – 09:30: **The role of hydrogen in the future energy- and mobility system**, Mr Juergen Rechberger (AVL, Austria)

Time 09:30 – 10:00: **Global metal powder market trends influenced by electrification and sustainability**, Dr Per-Olof Larsson (Höganäs AB, Sweden)

Session 25 – Tuesday 11 October – Time: 11:00 – 12:30

P&S SIS: Supply chain issues for alloying elements induced by electrification and their possible consequences

Chairs: Mrs Caroline Larsson (Höganäs AB, Sweden)
Dr César Molins (AMES SA, Spain)

Presentations:

Time 11:00 – 11:30: **The Role of Critical Minerals in Clean Energy Transitions**, Dr Toru Muta (International Energy Agency (IEA), France)

Time 11:30 – 12:00: **Critical Metals in low alloyed sintered steels - do we have to change our traditional alloy concepts?** Dr Volker Arnhold (PM Solutions, Germany)

Time 12:00 – 12:30: **Master alloys: an effective route for gaining flexibility in the selection of alloying elements**, Dr Raquel De Oro – Calderon (TU Wien, Austria)

Special Interest Seminar: Consolidation technologies/Beam based technologies

Session 32 - Tuesday 11 October - Time: 14:30 – 16:00

AM SIS: Sustainability in AM

Chairs: Dipl-Ing Claus Aumund-Kopp (Fraunhofer – IFAM, Germany)
Mrs Adeline Riou (Aubert&Duval, France)

Presentations:

Time 14:30 – 15:00: **Sustainability and (nano)safety in the Additive Manufacturing sector**, Dr Elias P. Koumoulos (IRES, Belgium)

Time 15:00 – 15:30: **Sustainability as opportunity for Additive Manufacturing**, Mr Babak Kianian (Höganäs AB, Sweden)

Time 15:30 – 16:00: **Sustainable Production of Inert Gas Atomised Metal Powders**, Dr Paul A. Davies (Sandvik Additive, UK)

Session 39 – Tuesday 11 October – Time: 17:00 – 18:30

AM SIS: Emerging AM Technologies

Chairs: Dipl-Ing Claus Aumund-Kopp (Fraunhofer – IFAM, Germany)
Mrs Adeline Riou (Aubert&Duval, France)

Presentations:

Time 17:00 – 17:30: **Multi-metal Additive Manufacturing: The Journey From New Technology to Industrial Adoption**, Dr Bram Neirinck (Aerosint, Belgium)

Time 17:30 – 18:00: **Additive manufacturing with nonferrous material using a MIM-pellet based MEX process**, Mr Vincent Morrison (AIM3D, Germany).

Time 18:00 – 18:30: **Practical developments in MoldJet®, a novel slurry-based feedstock additive manufacturing process**, Mr Hagai Peled (Tritone, Israel)

Special Interest Seminar: Materials/ Hard metals, cermets and diamond tools

Session 46 - Wednesday 12 October - Time: 08:30 – 10:00

HM SIS: Challenges in HM Industry

Chairs: Dr Steven Moseley (HILTI AG, Liechtenstein)
 Prof Luis Llanes (UPC, Spain)

Presentations:

Time 08:30 – 09:00: **Sinter-based Additive Manufacturing of Hardmetals**,
 Mr Animesh Bose (Desktop Metal, USA)

Time 09:00 – 09:30: TBA

Time 09:30 – 10:00: **Challenges in the recycling of hard metals**
 Mr Teemu Karhuma (Tikomet Oy, Finland)

Session 53 – Wednesday 12 October – Time: 11:00 – 12:30

HM SIS: Hard Materials in the Value Chain

Chairs: Dr Steven Moseley (HILTI AG, Liechtenstein)
 Prof Luis Llanes (UPC, Spain)

Presentations:

Time 11:00 – 11:30: **Alternative tooling solutions to cemented carbide**,
 Mr Rachid Msaoubi (Seco Tools, Sweden)

Time 11:30 – 12:00: **Tungsten Carbide PM products in high precision and high-performance engineered tooling and wear solutions**, Mr Jeffrey Taylor (Crafts Technology/Hyperion, USA)

Time 12:00 – 12:30: **Tailoring mechanical properties of cemented carbide materials for rock drilling applications**, Mr Krystof Turba (Sandvik Mining, Sweden)

Special Interest Seminar: Consolidation technologies/Metal Injection Moulding

Session 62 - Wednesday 12 October - Time: 14:30 – 16:00

MIM SIS: Global MIM market

Chairs: Dipl. Ing. ETH, MBA Georg Breitenmoser (Parmaco Metal Injection Molding AG, Switzerland)
 Prof. Dr.-Ing. Frank Petzoldt (Fraunhofer Institut - IFAM, Germany)

Presentations:

Time 14:30 – 15:00: **European MIM Market**, Dr Paul A. Davies (Sandvik, UK)

Time 15:00 – 15:30: **North American MIM market**, Dr Stefan Joens (Elnik Furnaces, USA)

Time 15:30 – 16:00: **Discussion on trends in MIM markets**,
 Prof. Dr.-Ing. Frank Petzoldt (Petzoldt Consulting, Germany)

Session 56 – Wednesday 12 October – Time: 11:00 – 12:30

MIM SIS: Sustainability of MIM

Chairs: Dipl. Ing. ETH, MBA Georg Breitenmoser (Parmaco Metal Injection Molding AG, Switzerland)
 Prof. Dr.-Ing. Frank Petzoldt (Fraunhofer Institut - IFAM, Germany)

Presentations:

Time 11:00 – 11:30: **MIM & Green**, Dr Jean-Claude Bihl (Alliance MIM, France)

Time 11:30 – 12:00: **Sustainability in Japan MIM**, Mr Kenji Doi (Osaka Yakin Kogyo Co., Ltd., Japan)

Time 12:00 – 12:30: **Discussion on MIM Sustainability Roadmap 2030**,
 Dipl. Ing. ETH, MBA Georg Breitenmoser (Parmaco Injection Molding AG, Switzerland)





Session 76 - Thursday 13 October - Time: 08:30 – 10:00

HIP SIS: Metallurgical aspects of using HIP

Chairs: Mr Jim Shipley (Quintus Technologies AB, Sweden)
Dr Ing Anke Kaletsch (RWTH Aachen University, Germany)

Presentations:

Time 08:30 – 09:00: **High temperature MoSiB-X materials tuned by HIP**,
Mr Uwe Gaitzsch (Fraunhofer IFAM, Germany)

Time 09:00 – 09:30: **Industrialization of PM+HIP for application in Nuclear Power Plants**,
Dr Thomas Geneves (Framatome, France)

Time 09:30 – 10:30: **Powder metallurgical production of tool steels and high-speed steels**,
Dr Harald Leitner (Voestalpine Böhler, Austria)

Session 83 – Thursday 13 October – Time: 11:00 – 12:30

HIP SIS: Hybrid solutions using HIP

Chairs: Mr Jim Shipley (Quintus Technologies AB, Sweden)
Dr Ing Anke Kaletsch (RWTH Aachen University, Germany)

Presentations:

Time 11:00 – 11:30: **Modeling powder metallurgy: challenges for additive and for Net Shape Hot Isostatic pressing**, Mr Stella Piergiorgio (Bakerhughes, Italy)

Time 11:30 – 12:00: **PM HIP Hybrid Materials**, Mr Iain Dandy (MTC Powder Solutions, Sweden),
Mr Tomas Berglund (MTC Powder Solutions, Sweden)

Time 12:00 – 12:30: **TBA**, Mr Andreas Scavini (Pres-X, Italy)

european powder
metallurgy association



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28-29 March 2023 | Barcelona, Spain

Additive Manufacturing Seminar

Metal Powders in AM

9-11 May 2023 | Metz, France

Metal Injection Moulding Seminar

Materials and Development in Metal Injection Moulding

21-22 June 2023 | Sandviken, Sweden

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Functional Materials for Mobility

28-29 June 2023 | San Sebastián, Spain

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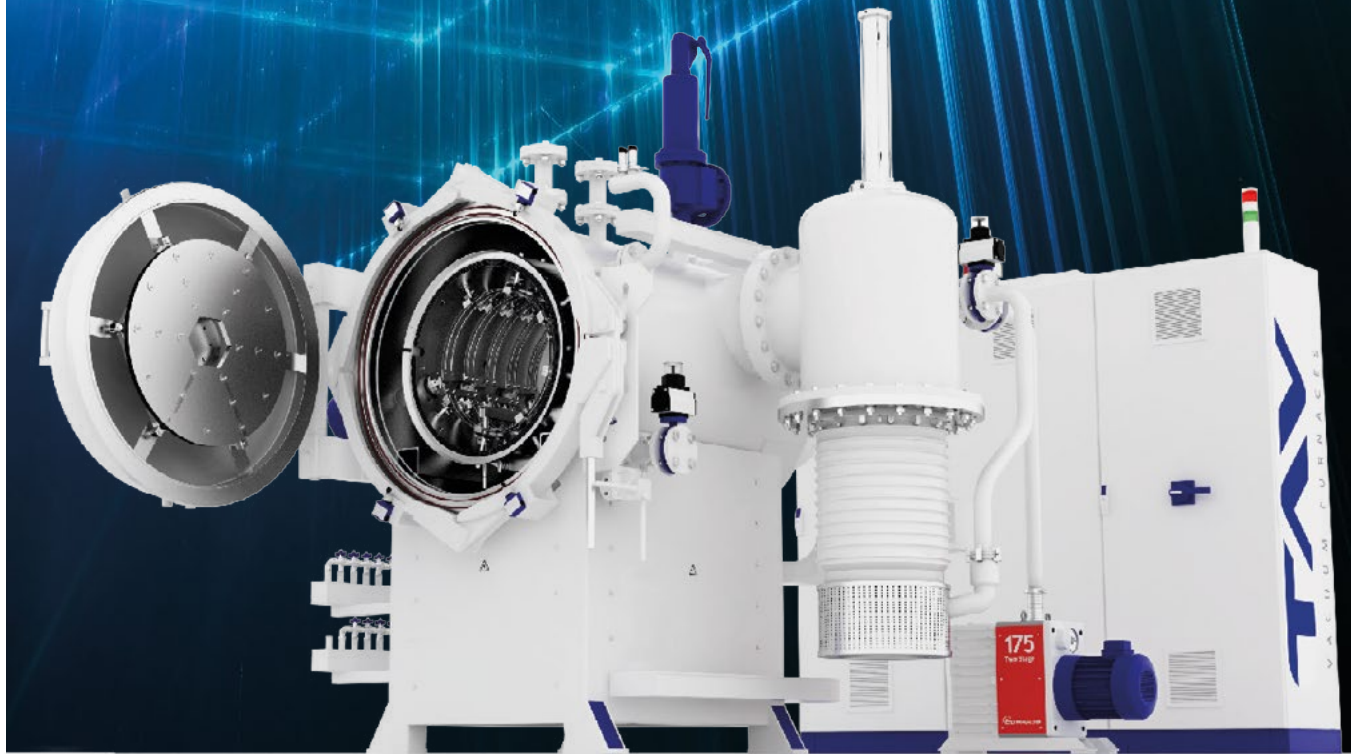
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TAV
V A C U U M F U R N A C E S

Exhibition Information



- Exhibition Directory
- Exhibition Floor Plans

- Exhibitor Company Profiles

- The World PM2022 Exhibition in Lyon will reconnect the entire Powder Metallurgy supply chain, bringing customers, suppliers, researchers and delegates together again.
- Held in the imposing Lyon Congress Centre, the 3700m² Exhibition will bring together from across the globe to showcase innovations, exchange ideas and network

Exhibition Hours

- Monday 10 October - 11:00 - 18:00
- Tuesday 11 October - 09:00 - 17:00
- Wednesday 12 October - 09:00 - 17:00
- Thursday 13 October - 09:00 - 15:00

Exhibitor Name	Stand
ACCENT PRO 2000 s.r.l.	148
AIM3D 	156
Air Products 	147
ALD Vacuum Technologies GmbH 	157
Alvier AG PM-Technology 	90
Arburg GmbH 	139
Asociación Centro Tecnológico Ceit 	168
Association Française du Soudage	209
Atomising Systems Ltd. 	123
Aubert & Duval 	193
BASF SE 	161
Carpenter Powder Products AB 	86
CEA 	117
CETIM 	165
CODINA	39
Cremer Thermoprozessanlagen GmbH 	175
DORST Technologies 	93
ECM Group	97
Elnik Systems, LLC 	133
EROVA AG 	124
Excalibure 	160
Fluidtherm Tech 	53
Fraunhofer IFAM 	48
Fraunhofer IKTS 	110
Genicore 	207
GGP Metalpowder AG 	9
Goeller Verlag	220
Granutools 	155
Graphit Kropfmühl GmbH	50
Hexagon Product Development Pvt LTD	88
Hoeganaes 	106
Höganäs AB 	99
Hygear 	5
ICD Applied Technologies 	122
Imerys Graphite & Carbon 	145
Incus GmbH	195
Indutherm Erwärmungsanlagen GmbH 	183
Inovar	130
IRT M2P 	120
Jiangsu Yuan Advanced Materials Co., Ltd. 	208
Komage Gellner Maschinenfabrik KG 	40
Krahn Ceramics GmbH	180
Kymera International 	221
Lauffer Pressen 	146
LECO Europe BV 	118
Linde 	87
LÖMI GmbH 	11
Mahler GmbH 	116

Exhibitor Name	Stand
Makin Metal Powders 	158
Malvern Panalytical 	182
MBN Nanomaterialia SpA	160
Mimete 	198
MIMplus Technologies GmbH & co. KG 	33
MPIF	218
MUT Advanced Heating GmbH 	190
Nanjing East Precision Machinery Co., Ltd.	33
Nanjing Hanrui Cobalt Co., Ltd. 	210
NEOCHIMIE / AMPERE ALLOYS 	105
NORIMAT 	98
Nova Swiss	42
OECHSLER AG	166
Oerlikon 	95
Osterwalder AG 	36
Pilamec Ltd	47
PMC Tec GmbH 	197
Pollen AM 	189
PolyMIM GmbH 	115
Pometon SpA 	135
POUDMET SAS 	38
Praxair Surface Technologies GmbH	205
ProGrit GmbH 	31
PVA Industrial Vacuum Systems GmbH	85
Quintus Technologies AB 	136
Retech 	181
Rio Tinto Metal Powders 	34
ROBOWORKER Automation GmbH	91
Royal Metal Powders 	179
SACMI Imola SC 	45
SAM Project 	217
Sandvik Osprey Ltd 	169
Sarnes GmbH	109
Sentes-BIR A.S. 	196
SLM Technology 	131
SMS Group	137
START Project 	217
Steel Service Krefeld GmbH 	184
SUMCA sas 	41
System 3R 	84
TAV Vacuum Furnaces 	30
Tekna 	108
Thermo-Calc Software	129
TISOMA 	10
TOPCAST Srl 	107
VTT Technical Research Centre of Finland 	96
Wilhelm Oberste-Beulmann GmbH & Co. KG 	80
Xitiz Technomech LLP	29

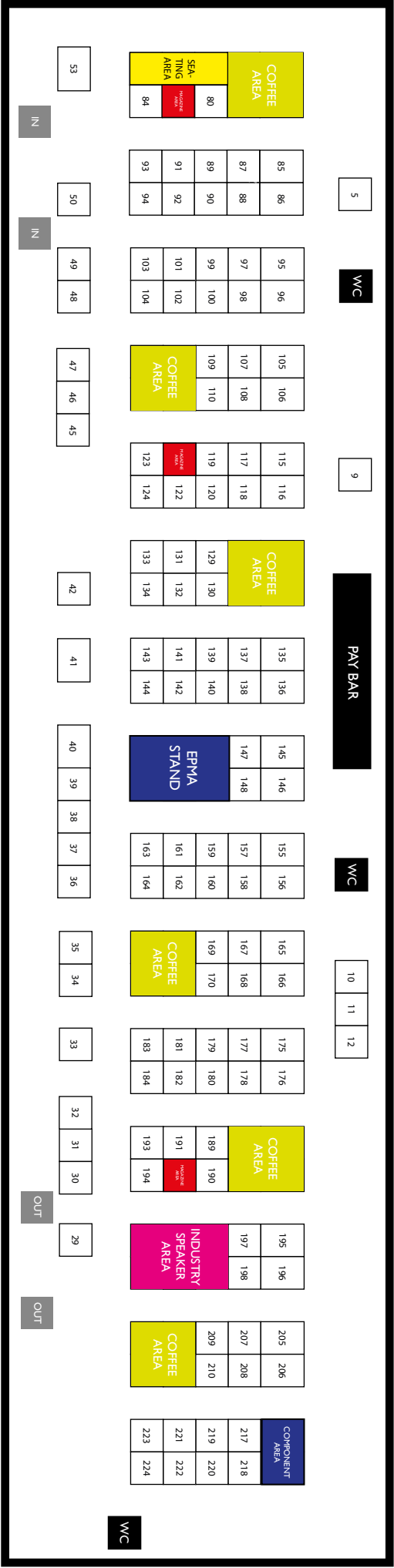




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Stand 148

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NON-DESTRUCTIVE TESTING /
EQUIPMENT R&D / MANUFACTURER



AFS-ASSOCIATION FRANCAISE DU SOUDAGE

AFS is the French organization authorized to implement the IAMQS – International Additive Manufacturing Qualification Scheme of the EWF. This qualification program complies with the ISO and ASTM standards currently being developed for the qualification of personnel in metal additive manufacturing. Implementation is made in partnership with FRANCE ADDITIVE.

AFS is also involved in the fields of personnel qualification in assembly (adhesive bonding and welding) and the certification of companies according to ISO 3834 standards concerning the quality management of welded components.

Stand 209

AFS-ASSOCIATION
FRANCAISE DU SOUDAGE

90 rue des Vanesses
93420 VILLEPINTE
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CERTIFICATION BODY



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Stand 156

AIM3D GmbH

Industriestraße 12
18069 Rostock
Germany

Contact: Sabine Machu

Phone: +49 381 3676 6090

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Web: www.aim3d.de

ADDITIVE MANUFACTURING



Air Products

Air Products serves customers in industrial markets, technology, and healthcare worldwide with a unique portfolio of products, services and solutions, providing atmospheric gases, process and specialty gases. With operations in over 50 countries and 19,000 employees. In the Metals Processing segment, we serve our customers in the Powder Metallurgy Industry with equipment and service to help them improving their production chain, reduce their operating costs and produce high quality parts. This includes Powder Production processes, Sintering, HIP operations as well as additive manufacturing applications and more.



Stand 147

Air Products

Hersham Place
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KT12 4RZ
United Kingdom

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Phone: +44 1932 213000

Web: www.airproducts.co.uk

INDUSTRIAL GAS SUPPLIER





Stand 157

ALD Vacuum Technologies GmbH

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ALD Vacuum Technologies GmbH

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Germany

Contact: Mr Lehnert, Mr Schulten

Phone: +49 6181 307-0
Web: www.ald-vt.com

EQUIPMENT



Stand 90

Alvier AG PM-Technology

Alvier AG PM-Technology provides turnkey solutions for the production of complex Powder Metallurgy (PM) parts. This includes engineering services for the design of PM parts and PM tools and the production of compaction tools, sizing tools or helical gear tools. Additionally we give full technical support on-site at the customer during the run-off of a new component. Alvier also supplies production equipment like helical gear systems, specialized die-sets and pick-and-place devices. All solutions are customized to the individual requirements.

Alvier AG PM-Technology
Fabrikstrasse 17

Buchs SG
CH 9470
Switzerland

Contact: Ekkehard Gutowski
Phone: +41 81 750 07 50

Fax: +41 81 750 07 51
Web: www.alvier.com

EQUIPMENT



Stand 139

ARBURG GmbH + Co KG

Arburg is a PIM pioneer with more than 50 years of experience in the industry and one of the world's leading manufacturers of plastic processing machines. The product portfolio encompasses Allrounder injection moulding machines with clamping forces of between 125 and 6,500 kN, the Freeformer for industrial additive manufacturing and robotic systems, customer and industry-specific turnkey solutions and further peripherals. An international sales and service network ensures first-class, local customer support: Arburg is represented by its own organisations at 34 locations in 25 countries and by trading partners in more than 50 countries. The machines are produced exclusively at the headquarters in Lossburg, Germany. From a total of roughly 3,500 employees, around 2,900 work in Germany. About 600 further employees work in Arburg's organisations worldwide.

ARBURG GmbH + Co KG
Arthur-Hehl-Strasse
72290 Lossburg
Germany

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Phone: +49 7446 330

Web: www.arburg.com/info/pim/

EQUIPMENT



Stand 168

Asociación Centro Tecnológico Ceit

Ceit-IK4 is a non-profit research centre that was created by the University of Navarra in 1982. Our primary mission is to carry out applied industrial research projects under contract, working closely with our clients' R&D departments.

Asociación Centro Tecnológico Ceit
Paseo de Manuel Lardizábal
15 - 20018 San Sebastián
Spain

Contact: Manuel Esteban
Email: mestebanm@ceit.es
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RESEARCH





Stand 123

Atomising Systems Ltd.

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Atomising Systems Ltd.
371 Coleford Road
Sheffield S9 5NF
United Kingdom
Contact: Paul Rose
Phone: +44 114 2626 200
Fax: +44 114 2626 201
Web: www.atomising.co.uk

EQUIPMENT / RAW MATERIALS / RESEARCH



Stand 193

Aubert & Duval

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Aubert & Duval
Tour Maine-Montparnasse
33 Avenue du Maine
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RAW MATERIALS



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Stand 39

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Contact: Eloi Sàbat
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EQUIPMENT (FURNACE MESH BELTS)



Stand 161

BASF SE

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BASF SE
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Carl-Bosch-Strasse 38
67056
Ludwigshafen am Rhein
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Contact: Dr. Maik Schlesinger
Phone: +49 621 60-59578
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RAW MATERIALS (MIM FEEDSTOCK AND SERVICE PROVIDER)





Stand 183

Blue Power Casting Systems GmbH

BLUE POWER is specialised in development and manufacturing of small to medium-sized equipment for metal powder production, namely gas atomisers and air-classifiers. The plants are particularly easy and quick to-clean and therefore highly suitable for flexible small-scale powder production or R&D with frequent alloy changeover; minimum metal loss or cross contamination from batch to batch. Furthermore BLUE POWER is offering equipment for investment casting, vacuum casting, continuous casting, granulation and smelting equipment.

Blue Power Casting
Systems GmbH

Brettener Strasse 32
75045 Walzbachtal
Germany

Contact: Jutta Hofmann

Phone: +49 7203 9218 29

Web:

www.bluepower-casting.com

EQUIPMENT / RAW MATERIALS /
RESEARCH

Stand 86

Carpenter Additive

Carpenter Additive is the market leader in the manufacture, development and processing of high-quality metal powders and solutions and services, among others for additive manufacturing. We produce and process high-performance powders for HIP near net shape and HIP mill forms, thermal spray, gas turbine refurbishment, additive manufacturing, high-temperature brazing, PTA welding and MIM processing. Carpenter Additive's PowderRange series of fully optimized, off-the-shelf powders for AM are supplied to quality management standards AS 9120, AS 9100, ISO 9001 and ISO 13485, and are dispatched within 24 hours of receipt of order. A business unit of Carpenter Technology Corporation, Carpenter Additive has metal powder facilities in the UK, Sweden, and the USA.

Carpenter Powder
Products AB

P.O. Box 45
SE-644 21 Torshälla,
Sweden

Contact: Per Ingo

Phone: +46 16 15 01 00

Web: www.carpenteradditive.com

ADDITIVE MANUFACTURING /
RAW MATERIALS / SOFTWARE

Stand 117

CEA

The French Alternative Energies and Atomic Energy Commission, or CEA, is a major center for research in service to government, the economy, and citizens. The objective of CEA research is to bring these stakeholders real-world solutions in four main areas: The energy transition / The digital transition / The medicine of the future / Defense and security. The CEA's mission is to catalyze and accelerate innovation for France's industrial economy. The organization's purpose is to make companies operating in all industries more competitive through high-performance, differentiating products and novel solutions to help navigate a changing society. Active in every region in France, the CEA works closely with local businesses to create value and long-lasting jobs. A total of 215 CEA startups benefit from the organization's support as they continue to grow, providing the necessary agility to bring the CEA's know-how and breakthrough technologies to the market.

CEA

CEA Grenoble
17 rue des martyrs
38054 Grenoble Cedex 9
France

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Email: lux.aixala@cea.fr

Web: www.cea.fr

RESEARCH



Stand 165

CETIM

Cetim provides technological and organisational research programmes, in a more and more open context at European and international levels. The most significant points of this evolution concern, in particular:- the renewal of sectorial and multi-sectorial actions through mergers bringing a significant importance;- stronger specialisation of competences around large federating projects in order to acquire visibility at European level.

CETIM

7 RUE DE LA PRESSE
CS 50802
Saint Etienne 42952
France

Contact: Patrick Ebai

Email: patrick.ebai@cetim.fr

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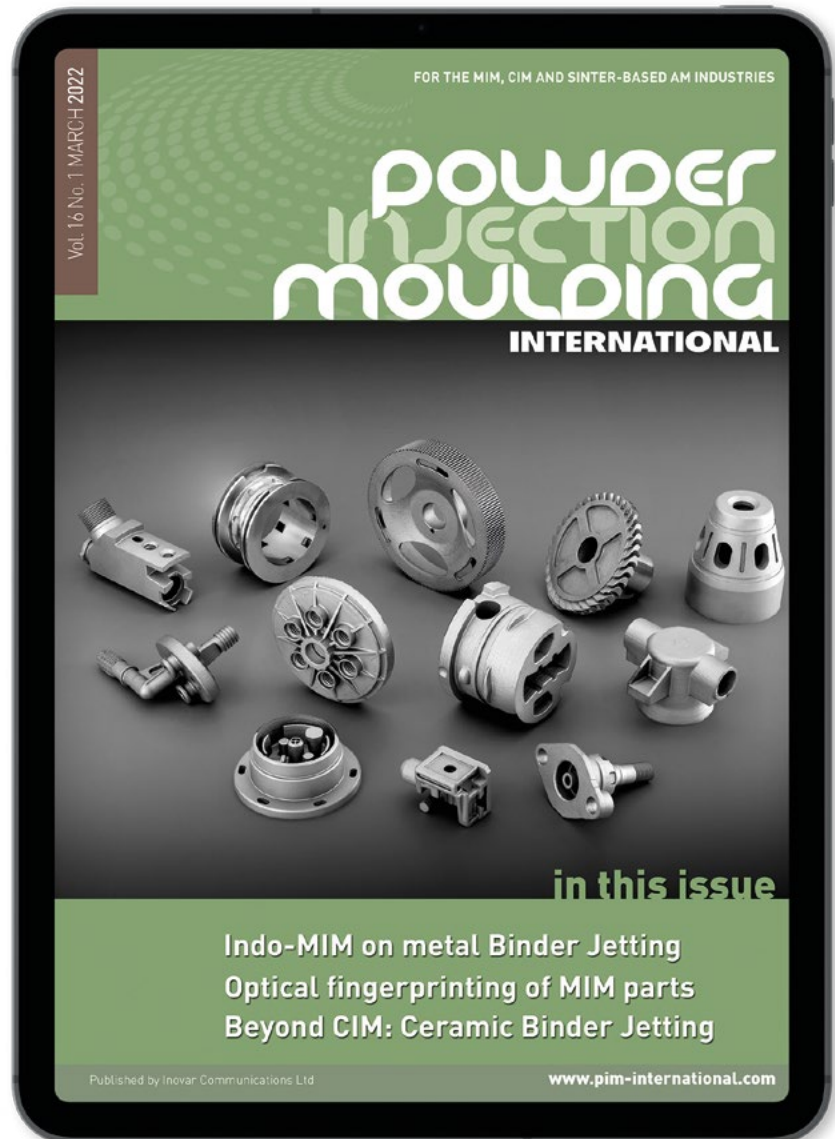
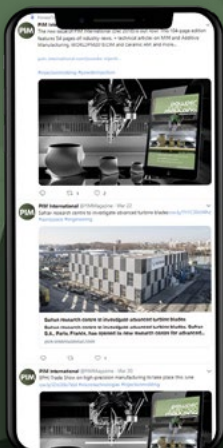
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Stand 175

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Cremer Thermoprozessanlagen GmbH

Auf dem Flabig 6
52355 Düren-Konzendorf
Germany

Contact: Dr Ing Ingo Cremer

Phone: +49 2421 96830-0

Fax: +49 2421 63735

Web:

www.cremer-furnace.com

EQUIPMENT



Stand 93

DORST Technologies

Dorst Technologies is a global leader in powder pressing technology with local support in all industrialized countries. Whether the drive is electric, hydraulic, or mechanical, DORST TECHNOLOGIES offers the most capable powder compacting and sizing press systems with excellent productivity and highest precision at minimum energy consumption. Available are smart digital services as soft- and hardware-packages for Industry 4.0 / IoT, as well as customized automation / part handling systems, software for easy programming and optimization of the press cycle. DORST offers individual services, such as press overhauls and upgrades, preventive maintenance programs and last not least worldwide expert support in operation, set up and maintenance.

DORST Technologies

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Kochel am See D-82431
Germany

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Web:

www.dorst-technologies.com

EQUIPMENT



Stand 133

Elnik Systems, LLC

ELNIK SYSTEMS - Celebrating 50 years of Excellence and 25 years' experience in the Debind and Sinter equipment industry. Our dedication to our customers experiences and success makes Elnik is the only partner you will ever need for your MIM and Metal AM processing equipment demands. A manufacturer and seller of 1st stage debinding (Solvent/Catalytic/Water), ONE-Step - 2nd stage Debind and Sinter furnaces, water cooling systems, and gas generation equipment. Our Equipment philosophy incorporates integration across shelving and rack design for reduced handling/staging time. Elnik also offers a Laboratory MIM furnace that provides real test results leading to easy scale up into production. This furnace is also easily adaptable to use for AM/3D printed Metal parts. Innovation drives our organization and all experimentation work is performed through our partnership with our sister company DSH Technologies, LLC, (Your Partner in MIM/AM).

Elnik Systems, LLC

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USA

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Web: www.elnik.com

EQUIPMENT



EROWA®

EROWA AG

The EROWA PM System is the standard tooling for powder compacting tools. EROWA PM Tooling System completely includes - the manufacturing in the toolshop - the quality control - and the use of punches and dies in the powder press. Setting-up of a new job in a press is done in two minutes with micron accuracy and without any alignment work.

EROWA has 35 years of experience in Tooling system technology as well as for measuring, presetting, robot loading and process control software for tool and die making.



Stand 124

EROWA AG

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EQUIPMENT



world

Técnica Cerámica



Trade magazine that provides information on materials, equipment and manufacturing techniques for the industrial ceramics sector.

www.tecnicaceramica.com

Contact: tecnicaceramica@publica.es





European Powder Metallurgy Association (EPMA)

The European Powder Metallurgy Association (EPMA), formed in Brussels in 1989, has three key missions: Promoting Powder Metallurgy Technology, Representing the European Powder Metallurgy Industry and Developing the Powder Metallurgy Future. The EPMA serves all types of corporate members, from component producers, metal powder manufacturers, equipment producers through to end-users, research centres, universities and individuals who have an interest in PM. The EPMA covers all aspects of the PM supply chain. Visit us at the EPMA Stand for more information.

EPMA Stand

European Powder Metallurgy Association (EPMA)

1 Avenue du Général de Gaulle
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France

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Phone: +33 3 44 58 15 24
Web: www.epma.com

ASSOCIATION



EXCALIBURE



Stand 160

EXCALIBURE

Association EXCALIBURE is a non-profit organization dedicated to French powder metallurgy technology and advanced materials. Established on March 2019, the first French network EXCALIBURE focuses on 4 main topics:

- Promote PM technology among French companies
- Boost collaborative projects amid industrial sectors and public & private R&D organizations
- Pool innovative equipment and technical knowledge in PM sector
- Train and educate teams and workforce of tomorrow

By proceeding with technological and scientific survey to raise awareness amid French industrial sectors, we have recently released the French White Paper fully dedicated to PM technology.

EXCALIBURE

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71210 Torcy
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Web: www.excalibure.fr

PM ASSOCIATION



Stand 53

Fluidtherm Tech

NEWS! Fluidtherm introduces Roller Hearth sintering furnaces in TWO models; Version TMax.1300°C & an easily affordable version TMax. 1180°C: to challenge traditional mesh belt furnaces. Its USP is a reduction of sintering cost in excess of 25% due to the elimination of mesh belts (energy & purchase).

Apart from all facilities to design and manufacture most types of furnaces for the PM industry, Fluidtherm Technology operates a versatile thermal process prototyping facility for process & product development, failure analysis and client servicing. We manufacture Belt, Pusher & Walking Beam furnaces for operation to 1700°C for sintering, sinter hardening, powder processing, steam treatment & heat treatment of metal & ceramic parts.

Fluidtherm Tech

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India

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Web: www.fluidtherm.com

MANUFACTURER OF INDUSTRIAL FURNACES



Stand 48

Fraunhofer IFAM

Fraunhofer IFAM is one of Europe's largest R&D facilities with a focus on metal powder-based manufacturing technologies. Located in Bremen and Dresden, we offer contract research and services on all aspects of part production – from powder to component. Our R&D activities focus on Additive Manufacturing, Metal Injection Moulding, composite and cellular materials, Lightweight Structures, Functional Printing, Magnetic Materials, SMC and quality concepts.

Fraunhofer IFAM

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Web: www.ifam.fraunhofer.de

CONTRACT R&D





Stand 110

Fraunhofer IKTS

Fraunhofer IKTS is Europe's largest R&D institute dedicated to the material research in the field of ceramics, hardmetals, cermets and others ceramic-based materials. Furthermore, IKTS offers a wide range of processing techniques for manufacturing of ceramics and hardmetals. Here, powder pressing, extrusion, powder injection molding and several different sinter-based AM technologies offer customized solutions. In-depth characterization with unique measurements, e.g. at high temperatures, are available at IKTS as well.

Fraunhofer IKTS

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Germany

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Johannes Pötschke
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-7641
Web: www.ikts.fraunhofer.de



Stand 207

GeniCore Sp. z o.o.

GeniCore top priority as a spark plasma sintering manufacturer is to provide an innovative approach to sintering technology to offer unique system performance that represents the highest quality solution among the spark plasma sintering suppliers.

GeniCore Sp. z o.o.
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01-919 Warsaw
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Phone: +48 519 563 722
Web: genicore.eu

EQUIPMENT MANUFACTURER



Stand 9

GGP Metalpowder AG

With a total capacity of 15.000 t/year GGP is the biggest producer of electrolytic Cu powder worldwide. New products: ultra-light and ultra-fine dendritic Cu powders for Electronic industry. Specialty: silver-coated Cu powders from 3-20% Ag.

The product range further contains water-atomized Cu & Cu-alloys, leaded bronze, lead powder, tin and zinc powders.

ISO 9001 certified. With a worldwide sales network GGP is well presented in all key industries.

GGP Metalpowder AG
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RAW MATERIALS / POWDER PRODUCER



Stand 220

Goeller Verlag

Göller Verlag GmbH is publisher of cfi ceramic forum international, CERAMIC APPLICATIONS and refractories WORLDFORUM. cfi ceramic forum international is reporting on technologies for the ceramic industry and powder metallurgy. CERAMIC APPLICATIONS is the platform for advances in the development of ceramic components and systems for sustainable, economic applications in their wide range of industrial sectors. Refractories WORLDFORUM is the most comprehensive technical and scientific journal for the entire refractories sector.

Goeller Verlag

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Web: www.goeller-verlag.de

MEDIA





Stand 155

Granutools

Combining decades of experience in scientific instrumentation with fundamental research on powder characterization, Granutools instruments and services are here to help you with all processes and developments involving powders. Granutools instruments and services help you to: understand your materials properties before, during and after processes, measure the impact of humidity, heat, storage and mixing, develop better powders and granules, optimise your formulations, mixes, and batches and control your products and supplies.

Our equipment line has five instruments: GranuFlow: Powder Vertical Flow Rate through Apertures, GranuHeap: Automated Angle of Repose and Static Cohesion, GranuDrum: Powder Flow Rheometer for Cohesive Index and Dynamic Angle of Repose, GranuPack: Automated Tapped Density and Packing Dynamics, GranuCharge: Electrostatic Charges Measurement Before/After Flow Through Pipes.

Granutools

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INSTRUMENTS FOR POWDER CHARACTERIZATION



Stand 50

Graphit Kropfmühl GmbH

The GK Group extracts and refines natural graphite, processes and refines synthetic graphite, and produces dispersions, pastes and lubricant premixes in powder form. Our strong commitment to research and development work ensures that our product portfolio is being continuously optimized. The GK Group operates its own mine at its headquarters in Kropfmühl, Germany, and holds majority stake-holdings in graphite mines in Sri Lanka and Mozambique. Since 2008, the company has been part of AMG Advanced Metallurgical Group N.V. and, as a global expert in critical raw materials, it is at the cutting edge when it comes to technologies and high-quality products for reducing CO₂ emissions.

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Web: www.gk-graphite.com

RAW MATERIALS



Stand 88

Hexagon Product Development Pvt Ltd

Hexagon is India based manufacturer of 3D Tumbler Powder mixers, popularly known as Alphie mixers. We make these mixers in range from 2.5 Ltr to 3000 ltr capacity. We offer customised solution like liquid dosing, stainless steel construction, SCADA based control panel, removable and non removable drum design etc. We export to more than 42 countries. Our machines are CE certified. 3D Tumbler mixers are ideal for uniform powder mixing of dry and free flowing powder. The mixing occurs without any centrifugal force as the mixer does not rotate, but it inverts. Mixing occurs without use of any blade or agitation. These mixers are considered as gentle or low shear mixers.

Hexagon Product Development Pvt Ltd
Ratnakar business hub, Plot no 10, Por Ramangamdi Road
GIDC, Por 391 243, Gujarat
India

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Phone: +91 92271 27517
Web: www.alphiemixer.com

MACHINE MANUFACTURER



Stand 106

Hoeganaes Corporation

GKN Hoeganaes is a global leader in the development and production of metal powders for the manufacture of high precision components. We have over 65 years of experience with metal powders, technology, quality systems and over 700 people serving our world class customers. While the single largest application for our ferrous powders is in the production of pressed and sintered components, GKN Hoeganaes serves a diverse set of industries, including additive manufacturing, casting, brazing, chemical, and other metallurgical applications. GKN Hoeganaes' global footprint now includes production and mixing facilities across North America, Europe and Asia, serving global customers with the most advanced PM solutions.

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Cinnaminson NJ
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USA

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Web: www.hoeganaes.com

RAW MATERIALS



The First Sustainable World PM Delegate Bag

Delegate Bags Supplied By



Visit Us on Stand #34

This year's World PM2022 Delegate Bag, provided free of charge to attendees by our Sponsor Rio Tinto, is a first for our event. It represents Powder Metallurgy's potential to reduce waste by utilising recycled and sustainable materials.

- Recycled PET felt bag and handle
- Recycled rPET strap
- Weight reduction of 50% compared with Euro PM2019 bag



Find out more about Rio Tinto's sustainable future here:
www.riotinto.com/sustainability



Stand 99

Höganäs AB

Höganäs develops, manufactures and sells metal powders that open up a world of opportunities. We are on an ongoing sustainability business transformation journey to become the first green metal powder producer in the world. Our product range includes pure iron powders, low-alloy steel powders, stainless steel powders and press-ready powder mixes. Höganäs products are tailored to meet demands on part precision, productivity, performance and cost, and many of our brands, such as Distaloy®, Astaloy™ and Starmix®, are regarded as industry standards. In the Höganäs Customer Development Centre, we invite customers and end users to work alongside our expert team with application engineering and prototyping.

Höganäs AB

Corporate Headquarters
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Web: www.hoganas.com

RAW MATERIALS POWDER PRODUCER



Stand 5

Hygear

At HyGear, we develop technologies to generate and recycle hydrogen at the end-users' site. These technologies have been applied in various industrial applications over the past decades, offering advantages in reliability, cost, and environmental impact. In years to come, we will continue to focus on these industrial applications and grow our installation base in hydrogen energy applications, thus becoming an enabler for a clean and sustainable future.

Hygear

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Web: www.hygear.com

GAS GENERATION /
RECYCLING EQUIPMENT

Stand 122

ICD Applied Technologies

ICD manufacture components using a range of technologies such as 3D metal additive manufacturing and powder metal Hip technology which is supported by multi axis CNC and lathe capabilities. The company also manufactures complex cannisters through a process called e-HIP which allows for the net shape manufacture of critical powder metal components. Working in a variety of metal powders, from steels, Inconel, through to titanium and aluminium ICD also supply metal powders to the open market.

ICD Applied Technologies

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Rotherham, S66 3ZQ
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Web: www.icd-at.com

RAW MATERIALS / MANUFACTURER /
SERVICE PROVIDER

Stand 145

Imerys Graphite & Carbon

We have over 100 years of experience in the development and production of high quality synthetic and natural graphite powders, conductive carbon blacks, water based dispersions and silicon carbide for end applications including, but not limited to:

- Powder Metallurgy and Hard Metals
- Lithium-ion batteries
- Alkaline batteries
- Lead acid batteries
- Fuel cells
- Conductive polymers, plastics and rubbers
- Carbon brushes
- Brake pads and Clutches
- Refractories

Innovation is an integral part of Imerys Graphite & Carbon's strategy. Our team of 30 researchers and three R&D facilities are dedicated to the development of tailored solutions for our customers' evolving needs.

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Web: www.imerys.com

RAW MATERIALS





Incus GmbH

Incus GmbH is an engineering company based in Vienna, Austria, that provides a unique metal additive manufacturing technology – Lithography-based Metal Manufacturing (LMM). LMM technology combines, for the first time in metal AM feature resolution, surface aesthetics, mechanical properties, and economic efficiency.



Stand 195

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Web: www.incus3d.com

3D PRINTING



IRT M2P

The Institute for Technological Research into Materials, Metallurgy and Processes (IRT M2P), puts its expertise, equipment and network of academic laboratories to work for R&D projects in collaboration with industrial actors. Among other things, IRT M2P's semi-industrial pilot equipment enables faster product and process development in an environment representative of real-world constraints. Combining developments from technology suppliers, manufacturers and end-users operating in different lines of business also accelerates the process of bringing innovations to maturity via IRT M2P.

All industrial partners can benefit from the range of technologies and platforms available via customised services, private R&D projects or multi-partner projects with joint funding from the public/private sector. IRT M2P's resources are also available for vocational training.



Stand 120

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Director
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Web: www.irt-m2p.fr

RESEARCH & DEVELOPMENT



Komage Gellner Maschinenfabrik KG

KOMAGE is the leading manufacturer of tailor made pressing systems. The product range includes mechanical, hydraulic and electrical press systems with a pressing force from 5 up to 1200 tons. KOMAGE also provides various types of automation systems that are fully integrated in the control system of the press. Intensive research and development make KOMAGE a synonym for highest technological standards.



Stand 40

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EQUIPMENT



Krahn Ceramics GmbH

KRAHN Ceramics has its headquarters in Hamburg and acts as an innovative project partner and generator of ideas for the processing of ceramic and metal powders. Customers are accompanied throughout all process stages from the raw material to the finished component. The portfolio includes products and services such as powders, binders and compounds for injection molding, as well as processing and forming processes, debinding and sintering and finally surface finishing.

KRAHN Ceramics has more than 30 years of experience in the field of technical ceramics and operates worldwide. As part of the family-owned Otto Krahn Group, it can draw on strong structures and a comprehensive network in Europe, Asia and the USA.

Stand 180

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Phone: +49 40 32092-317
Web: krahn-ceramics.com

RAW MATERIALS



YOUNG ENGINEERS DAYS



STUDENT IN PM?

IMPROVE YOUR POWDER

METALLURGY KNOWLEDGE!

Aimed at helping to foster and develop the next generation of PM academics and industrialists, **EPMA Young Engineers Day 2023** will take place at Euro PM2023 Congress & Exhibition on 1-4 October in Lisbon, Portugal.

LECTURES ON PM

NETWORKING

TOUR OF THE EXHIBITION



**EURO
PM2023**
CONGRESS & EXHIBITION

youngengineers.epma.com



Stand 221

Kymera International

Kymera International is a leading, global developer and manufacturer of advanced specialty materials across a diverse range of end-markets. Kymera International spans seven countries with 13 facilities. We care deeply about the world in which we do business and the people whose lives we touch. Our environmental, social and governance (ESG) efforts are the upmost important and include implementing sustainability measures, creating inclusive workplaces for employees of all backgrounds, and practicing ethical business conduct. Our company brings together some of the top specialty material manufacturers across the globe including: SCM Metal Products, ACuPowder, ECKA Granules, Reading Alloys, Innobraze, Telex Metals, and AmeriTi Manufacturing. We come from different backgrounds, but we share one goal: deliver innovation and value in every particle we produce.

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RAW MATERIALS



Stand 146

Maschinenfabrik Lauffer GmbH & Co. KG

LAUFFER, featuring this year its 150th anniversary, is a leading manufacturer of powder and sizing CNC presses for the P/M industry. During the last years, LAUFFER extended its portfolio by adding the servo-hydraulic C-Line and the servo-electric E-Line powder presses. The new lines perfectly complement our portfolio with their smaller footprints, high energy and cost savings and are ready for IoT. For all press models, LAUFFER offers tailored solutions in multi-platen design as well as fully automated production lines for mass production.

Our LAUFFER designed HMI, a most flexible and intuitive operation concept allows simple programming of the press cycle. Set-up and maintenance, overhauls, retrofits and upgrades of presses are also part of the LAUFFER portfolio and offered by our Service expert team.

Maschinenfabrik
Lauffer GmbH & Co. KG
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72160 Horb a. Neckar
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Phone: +49 7451 902-0
Web: www.lauffer.de

EQUIPMENT



Stand 118

LECO Europe BV

Being the authority in elemental determination since 1936, LECO brand is well known worldwide by its advanced instrumentation for accurate analysis of metals, alloys, refractory, ores, and large variety of inorganic materials by combustion/fusion. LECO analyzers for determination of Carbon, Sulfur, Oxygen, Nitrogen and Hydrogen are well suited for routine quality control and research applications. We also offer macro thermogravimetric analyzers; metallographic sample preparation equipment; macro and micro indentation hardness testers; equipment for microstructural analysis; with complete line of consumables and accessories supply.

LECO Europe BV
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Phone: +49 2161 902330 0
Web: eu.leco.com

LABORATORY INSTRUMENTS



Stand 87

Linde GmbH

Advancing AM with ADDvance® from Linde. Linde's efficient gas supply solutions and advanced application technologies are helping customers to increase energy efficiency, boost productivity, raise product and material quality, and decrease emissions across the entire AM value chain. Highlights include our ADDvance® powder cabinet, which protects metal powders from ambient air; and our ADDvance® O₂ precision technology, which continuously analyzes and optimizes the printing chamber atmosphere. Bespoke gas mixtures developed to optimize 3D printing outcomes include our ADDvance® Laser230 argon/helium mix for L-PBF, and our ADDvance® Sinter250 argon/hydrogen mix for FDM. We complement these with argon supply management solutions for HIP processes.

A strong commitment to research and strategic alliances helps keep our customers ahead of the AM innovation curve.

Linde GmbH
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85716 Unterschleißheim
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Web: www.linde-am.com

PROCESS GAS AND EQUIPMENT FOR 3D PRINTING AND HIP





LÖMI GmbH

LÖMI was established in 1991 and is a manufacturer of Solvent Recycling, Solvent Debinding and Plastic Recycling Systems. Over more than 30 years, we have been supplying Debinding Systems for injection moulded and additively manufactured parts and have become the world market leader for Solvent Debinding Systems. Our steady growth is a result of a comprehensive understanding of the debinding process, based on many years of collaborative research with universities and research institutions. We also work closely with powder and feedstock producers, as well as PIM and AM parts manufacturers. Our systems are operated world-wide for instance in automotive, aerospace, and medical industries.



Stand 111

LÖMI GmbH

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Web: www.loemi.com

EQUIPMENT



Mahler GmbH

For almost 60 years MAHLER Industrial Furnaces has been a synonym for innovative furnace systems in outstanding quality and so MAHLER became one of the market leaders in the field of continuous sintering furnaces. MAHLER Belt Furnaces for Sintering of PM - parts are operated under an atmosphere of endogas or hydrogen/nitrogen. By using the MAHLER rapid dewaxing zone energy savings of up to 50% are possible. The ceramic muffle inside the sintering zone guarantees low maintenance costs. A strong sinter hardening unit achieves high cooling rates and martensitic structure even for heavy components.

MAHLER High Temperature Sintering Furnaces are suitable for sintering of PM parts in protective atmosphere up to 1300°C in different atmospheres.



Stand 116

Mahler GmbH

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EQUIPMENT SUPPLIER



MAKIN METAL POWDERS (UK) LIMITED

MAKIN METAL POWDERS supplies Copper, Bronze and Tin Powder, Infiltrants and Press Ready Premixes from a custom-built manufacturing and logistics facility in Rochdale, UK. MMP products, in spherical, irregular or dendritic morphology, are used in multiple application areas including Additive Manufacturing, Aerospace, Automotive, Smelting & Refining, Iron Powder Production, Powder Metallurgy and PTFE Sealing Systems. With its parent GRIPM and holding company GRINM, MAKIN METAL POWDERS has global reach and capability, selling both directly and through a network of agents and distributors in over 40 countries. MMP and the GRIPM group continue to develop capacity and capability to provide local support in all of our major markets.



Stand 158

MAKIN METAL POWDERS (UK) LIMITED

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Web: www.makin-metals.com

RAW MATERIALS /
NON-FERROUS POWDER



Malvern Panalytical S.A.S

World leading supplier of expert analytical instrumentation and service. Our scientific instruments help users better understand and shape everything from proteins, metals and polymers to the soil and air around us.



Stand 182

Malvern Panalytical S.A.S

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Web: www.malvernpanalytical.com

ANALYTICAL INSTRUMENTATION





MBN Nanomaterialia SpA

MBN is an advanced materials company specialized in production of nanostructured powder through the proprietary Mechanomade® process, a mechano-chemical powder technology.

Mechanomade® materials have an ultrafine crystalline structure which delivers unique mechanical properties resulting in superior performance compared to existing alloys for a variety of applications.

The expertise in material engineering & technologies allows MBN to offer a wide range of solutions in metal bond powder for tools industry, high temperature ODS steel, Cermet materials for thermal spraying and next-gen steels for AM by laser deposition. MBN has also a plant for manufacturing biomed titanium powder for coating of medical prosthesis.

Our team of materials engineers, researchers, chemists and mechanics supports customers in the R&D and prototyping of innovative products as in the application process.

Stand 167

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(TV)
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Web: www.mbn.it

MATERIALS / COATINGS



Metal AM

Metal Additive Manufacturing magazine is the leading news source for commercial and technical developments in the metal AM industry. Published quarterly in print and online, each issue features a number of exclusive in-depth articles and special features on metal Additive Manufacturing, as well as our extensive industry news rundown. Each new issue of Metal AM, as well as the complete archive, is available to download free of charge.

Stand 130

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Web: www.metal-am.com

MEDIA



Metal Powder Industries Federation (MPIF)

MPIF is the North American-based trade organization covering all segments of the PM Industry: parts fabricators, powder producers, and equipment manufacturers, as well as companies involved with metal additive manufacturing, metal injection molding, isostatic pressing, and refractory metals. For over 75 years, MPIF has served the PM world by providing standards, statistics, conferences, seminars, publications, and information. MPIF promotes the market for industry products through its consolidated marketing and advertising efforts. MPIF headquarters also manages the industries technical society, APMI International, publisher of the International Journal of Powder Metallurgy, and the Center for Powder Metallurgy Technology (CPMT), fostering research and education in support of PM's future. MPIF will host PowderMet2023, June 18-21, 2023, in Las Vegas, Nevada.

Stand 218

Metal Powder Industries
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USA

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Web: www.mpif.org

PM TRADE ASSOCIATION



Mimete

MIMETE srl produces gas atomised iron, nickel and cobalt base powders, as well as customised powders grades designed according to customer requirements. MIMETE is equipped with a tailor made VIGA plant (Vacuum Inert Gas Atomiser), which ensures the highest purity and sphericity of the powder, and with sieving and blending machines working under inert atmosphere. Moreover the in-house laboratory, accredited ISO/IEC 17025:2017, is available for third party analyses, both for powder customers and also for any other application and industry. MIMETE is certified ISO 9001, EN 9100, EN 9120, ISO 45001 and ISO 14001.



Stand 198

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Web: www.mimete.com

RAW MATERIALS



MUT ADVANCED HEATING

Stand 190

MUT Advanced Heating GmbH

MUT ADVANCED HEATING GmbH is a specialist in high temperature technologies and processes and consistently breaks new grounds in the area of heat treatment. MUT ADVANCED HEATING GmbH develops, manufactures and performs maintenance of the customized heat treatment facilities: vacuum and process gas furnaces, graphite furnaces, metal coldwalled (tungsten, molybdenum) furnaces, rotary tube furnaces, continuous belt furnaces, sintering and debinding furnaces, retort furnaces, laboratory furnaces, catalytic and thermal waste gas treatment, process visualization.

MUT Advanced Heating
GmbH

Fritz-Winkler-Str. 1-2
D-07749 Jena

Germany

Contact: Diana Doeherl
Phone: +49 3641 5656-0
Fax: +49 3641 5656-11
Web: www.mut-jena.de

EQUIPMENT

HANRUI 寒锐钴业
COBALT

Stand 210

Nanjing Hanrui Cobalt Co., Ltd

Hanrui Cobalt Co., Ltd (300618. SZ) was founded in 1997 in Nanjing, China and Listed on Shenzhen Stock Exchange in 2017. After 25 years of development, it has owned fourteen subsidiaries and branches worldwide with more than 1,400 staff, whose business covers the exploration and operation of cobalt and copper mines, as well as the ore mining and refining in DR Congo, sales, R&D, and production of Cutting-edge materials in China used in Li-ion Batteries for EVs. Hanrui is committed to building a Vertically Integrated Supply Chain of Li-ion Batteries, from the field of Lithium, Nickel, Copper and Cobalt resources to R&D and production of Li-ion Battery Materials, by strategic allying with some Battery and EV manufacturers.

Nanjing Hanrui Cobalt Co., Ltd
31st Floor KINGMO
1698 Shuanglong dadao Ave
Jiangning District
Nanjing City 211106
China PRC

Contact: He Qian
Phone: +86 135 8405 3495
Email: hq@hrcobalt.com
Web: www.hrcobalt.com

HARD MATERIALS / RAW MATERIALS

NEOCHIMIE

Stand 105

Neochimie

Neochimie is a French major supplier of metal powders, metal salts and chemicals since 1983. Our product portfolio includes a complete range of metal powders : Carbonyl Nickel, Aluminium, Carbonyl Iron, Iron, Copper, Tin, Zinc, Silver; also Bronze, Brass and minor metals as Selenium, Titanium, Molybdenum. We also provide a wide range of chemical specialties and metal salts.

Thanks to proactiveness and flexibility Neochimie has built a strong reputation across Europe to meet customers' expectations. We offer different grain sizes and quality on metal powders and chemicals. Our goal is to provide the best service and support to our customers in term of logistic, packaging request, promptly available stock and sourcing.

Neochimie

5 rue Antoine Balard
PA du Vert Galant
F95310 Saint Ouen
l'Aumône
France

Contact: Romain FAUQUE
Phone: +33 1 34 40 33 10
Web: www.neochimie.com

RAW MATERIALS

NORIMAT GROUP

Stand 98

NORIMAT

NORIMAT is an specialist in Spark Plasma Sintering. Our mission is to break down the barriers limiting the uptake of this great technology by the wider industry. We are a French based start-up of 21 people.

NORIMAT offers project-based consulting, material development and industrial transfer services to partners interested in exploring SPS, or those with a clear application in mind.

NORIMAT extends this support by developing state of the art modelling and simulation solutions dedicated to SPS technology. Our ENGEMINI software enables SPS users to develop, industrialise, produce and optimise using SPS faster and more efficiently than ever before.

NORIMAT

51 Rue de l'Innovation
31670 Labège
France

Contact: Douglas Armstrong
Phone: +33 06 49 77 76 36
Web: www.norimat.com

FORMING / PART DEVELOPMENT / MODELLING



SAM

SECTOR SKILLS STRATEGY IN ADDITIVE MANUFACTURING



What?

We aim to address the critical issue of workforce development for Additive Manufacturing (AM) by developing a shared skills vision and collaborative learning solutions for the sector at European level.

How?

As a consortium of project partners from all over Europe, we are looking to develop a central system for the identification of the AM skills necessary to supply industry now and in the future.

Why?

We are engaged in addressing current and future Industrial AM skills needs, through the creation of an AM Observatory and the implementation of a European AM Qualification System.





Stand 42

Nova Swiss

Nova Swiss SARL designs and produces high pressure systems for critical applications involving pressures up to 150.000 psi (10.000 bar) and temperatures up to 2000°C. For years, we supply Hot and Cold Isostatic Presses for different applications as food processing, powder compacting or R&D (geology, material).

Nova Swiss SARL can also take charge of the maintenance (periodic regulatory servicing, reproof tests, calibration) for systems including Hot and Cold Isostatic Presses.

Nova Swiss

31 Rue Denis Papin
77240 Cesson
France

Contact: Thimon Jacques
Phone: +33 1 64 41 18 48
Web: www.novaswiss.com

HOT AND COLD ISOSTATIC PRESS
DESIGN AND MANUFACTURE

Stand 166

OECHSLER AG

Powder Injection Molding empowers innovation. Based in Ansbach, Germany OECHSLER was founded in 1864. We are full-stack manufacturing partner for high-precision polymer-based solutions and supply our products globally to automotive, industrial, and medical sectors. Having in-house development, tool making, serial manufacturing, assembly and testing capabilities we stand out within the industry. Our pioneer spirit made us extend our footprint with the integration of the highly innovative engineering technology, powder injection molding, into our portfolio. We are in position to translate ideas into customized solutions made of ceramic, metals and polymers. Since decades material combinations, hybrid parts, are in high volume serial production and is also one of our competences. OECHSLER has set high quality standards in the serial production that combines technology, functionality and design.

OECHSLER AG

Matthias-Oechler-Straße 9
91522 Ansbach
Germany

Contact: Ashu Sharma
Phone: +49 1752445199
Email: powderinjection@oechsler.com
Web: www.oechsler.com/en/products/powder-injection-molding/

MANUFACTURER



Stand 95

Oerlikon

Oerlikon is your partner for additive manufacturing solutions at any industrial level. Our advantage is clear: we're integrating and scaling the entire additive manufacturing (AM) value chain to handle your project from point A to Z. We offer comprehensive AM solutions including:

- Metal Powders
- Rapid Prototyping
- Series Production

Ultimately, if you can imagine it, we can build it. Come build with us. It's time to rethink what's possible in AM.

Oerlikon

Kapellenstraße 12
Feldkirchen 85622
Germany

Contact: Dieter Sporer
Phone: +41 58 274 20 25
Web: www.oerlikon.com/am

ADDITIVE MANUFACTURING



Stand 36

Osterwalder AG

OSTERWALDER AG is the market and technology leader in electric presses. As a customer-focused solutions provider, we offer for PM industry the most effective products and services. We provide electric presses from 80 to 5000 kN, single and multi-plate. With our precise electric presses, we reduce the CO2 emissions annually of the press by 70%.

Osterwalder supplies more than just a press. We support our customers in coping with their challenges – such as costs, performance, productivity, quality, and connectivity around the compacting process. We have developed an HMI supporting our customers in the best way to control the compacting process. Based on the HMI and our interface IoT:Connect, we build our products and services to achieve the benefits of a Smart Factory midterm.

Osterwalder AG

Industriering 4
Lyss, 3250
Switzerland

Contact: Sabine Tkemaladze
Phone: +41 32 387 14 77
Web: www.osterwalder.com

EQUIPMENT



PM THESIS COMPETITION

THE REWARDS - ON THE YEAR OF THE AWARD

- Financial prizes for Masters and Doctorate levels
- Complimentary registration to the Congress & Exhibition, plus an opportunity to share a 3 minutes presentation during the plenary.

THE RULES

- The applicants must be a graduate of a European university
- The subject of the thesis must be capable of being classified under the topic of powder metallurgy
- The thesis must have been officially accepted or approved by the applicant's teaching establishment maximum 3 academic years before the application and up to the year of the congress

THE DEADLINE

- All submissions must be received by end of April, check exact date on the website

To find out more or to submit your thesis, please visit

thesiscompetition.epma.com

[@europmassoc](https://twitter.com/europmassoc) [#epmathesiscomp](https://twitter.com/epmathesiscomp)



Pilamec Ltd

Processing by crushing, milling, sieving of metallic and non-metallic materials. Tight particle size distribution control of final product to customer specification. Laboratory facility including Laser Particle Size Analyser, Flow Rate measurement, Apparent Density testing all to customer specific requirements. Blending facilities associated with a variety of packaging options. Re-packaging to customer requirements and specific weights. Material drying prior to processing via fluidised bed driers. Batch Ball Milling including a 15kg volume ball mill for pre-production trials, 150kg volume Ball Mill for small lot production and extended trial processing, several 500kg production Ball Mills, all steel or ceramic lined.

Producers of Silicon Metal Powder in lump or powder form down to 2 micron. Small lot metal powder traders. All processing and trading supported by experienced technical back up.

Stand 47

Pilamec Ltd

Units 16 – 19
Lydney Harbour Estate
Lydney
Gloucestershire GL15 4EJ
United Kingdom

Contact: Stephen Mason
Phone: +44 1594 843 660
or +44 7702 802 621
Web: www.pilamec.co.uk

PROCESSING AND TRADING



PMC Tec GmbH

Metal Powders, for PM and various other applications, developed for and with our customers: Press Ready Mixes and Binder Treated PM Powder Mixes with Outstanding Dusting and Flowability Properties for the PM industry are produced in our premises. We offer Steel Powders, Various Auxiliaries and Additives and Mixing As A Service, supply Stainless Steel Powders, water or gas atomised for Thermal Spray, Filtration AM, PM, MIM. For Soft Magnetic Applications such as inductive elements from kHz to MHz we offer Coated and Uncoated Powders. Hard and Soft Carbonyl-Iron from 0-6µm up to 0-40µm is sold all over Europe. Our philosophy is to offer customised solutions for everyday use, based on chosen raw materials, knowhow, creativity and quality by design. Consequently, we maintain stable partnerships with our long-standing customers, based on mutual trust and reliability. Fast response, high availability and flexibility characterises PMCtec, certified to ISO 9001 and 14001


Stand 206

PMC Tec GmbH
Wolfsburgstrasse 31
06502 Thale
Germany

Contact: Gregor Nitsch
Phone: +49 3947 776-300
Web: www.pmctec.com

RAW MATERIALS / METALS / PM



Pollen AM

Pollen AM is a manufacturer of industrial 3D printers using injection molding granules as consumables. Founded in September 2013 after two years of R&D. Pollen AM is most certainly the first company in the world to offer such a versatile range of machines on the market. Pam Series MC is the most versatile 3D printer on the market and is compatible with thermoplastics, elastomers, metals and technical ceramics.


Stand 189

Pollen AM
19 rue Marceau
94200 Ivry sur Seine
France

Contact: Didier Fonta
Phone: +33 7 60 40 30 29
Web: www.pollen.am

3D PRINTER



PolyMIM GmbH

PolyMIM GmbH has been producing and marketing its line of standard and custom-made polyMIM® feedstock since 2005. Metal injection moulding allows for cost-effective production of complex metal components by combining the processes of injection moulding and sintering. We developed an environmentally sound water-soluble binder system. Thus polyMIM® combines the cost and quality advantages of metal injection moulding with ecological demands. In 2013 the new polyPOM feedstock based on a catalytic binder system was added to the range. All common MIM metal alloys are available as ready-to-mould standard feedstock compounds. Our portfolio includes low alloy, stainless, copper, titanium and hard metal feedstock. PolyMIM GmbH meets highest quality requirements and is certified in accordance with DIN ISO 9001.


Stand 115

PolyMIM GmbH
Am Gefäch
D- 55566 Bad Sobernheim
Germany

Contact: René Kaul
Phone: +49 6751 85769 437
Web: www.PolyMIM.com

RAW MATERIALS FOR MIM AND 3D-PRINTING (AM)





Stand 135

Pometon SpA

Pometon, founded in 1940, is today the largest European producer of copper powder and offers a unique service to its clients producing ferrous and non-ferrous powders and stainless steel shots. Pometon produces pure powders such as iron, copper (both electrolytic and atomized), bronze, brass, tin and zinc, and press-ready iron and bronze premixes. Based in Maerne, Venice, Pometon controls subsidiaries in UK, Spain, Germany, India, Turkey, Korea and a second production site in Serbia, works with the major automotive brands and the best global players in the chemical industry, in the aerospace and electronics sectors. Pometon R&D department works in collaboration with the most important worldwide universities with the objective of producing customized powders to meet individual customer requirements and to ensure that product quality remains consistent over time.

Pometon SpA

Via Circonvallazione, 62
30030 Maerne di Martellago
(VE)
Italy

Contact: Ilaria Rampin
Phone: +39 0412903611
Web: www.pometon.com

RAW MATERIALS



Stand 38

POUDMET SAS

With an exceptionally high level of technical experience in the production of non-ferrous metallic powders since 90 years, Poudmet offers a wide variety of tailor-made water and air atomized products with the most modern and unique production equipment in Europe: Copper; bronze, brass, Copper-phosphorous, tin, tin alloys powders. Main applications: Powder Metallurgy, Friction, Chemical, Brazing & Welding, Diamond Tooling. ISO 9001 Certification. Production plant in France, part of AUREA Group.

POUDMET SAS

26, rue du Moulin
Senecourt
Baillevall F 60140
France

Contact:
Martine Chambrelent
Phone: +33 3 44 69 12 31
Fax: +33 3 44 69 12 30
Web: www.poudmet.fr

RAW MATERIALS



Stand 130

Powder Injection Moulding International

PIM International is the only publication dedicated to serving the global PIM industry, comprising the metal and ceramic injection moulding sectors. Each issue includes specially commissioned features from industry experts covering end-user markets, regional developments and process innovations. We also regularly report on visits to PIM companies around the world.

Powder Injection Moulding International

11 Park Plaza
Battlefield Enterprise Park
Shrewsbury SY1 3AF
United Kingdom

Contact: Paul Whittaker
Phone: +44 1743 211991
Web:
www.pim-international.com

MEDIA



Stand 130

Powder Metallurgy Review

Powder Metallurgy Review is the international magazine for the Powder Metallurgy industry. Each issue focuses on the latest developments and technological innovations in the PM industry, including ferrous and non-ferrous components, hard metals, high alloy steels, superalloys, and more. Published quarterly, it is available as a free digital download or through subscription to our print edition.

Powder Metallurgy Review

11 Park Plaza
Battlefield Enterprise Park
Shrewsbury SY1 3AF
United Kingdom

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Phone: +44 1743 211991
Web:
www.pm-review.com

MEDIA



A Linde company



Praxair Surface Technologies GmbH

Over 50 years of metal powder manufacturing experience, Praxair Surface Technologies pioneered many of the technologies in metal powder manufacturing and is recognized as a leader in high performance industrial powders. Now, through our line of TruForm™ metal powders and precision alloys, we apply this expertise to metal powders specifically for demanding AM applications. TruForm™ metal powders are premium grade, for trusted quality to meet some of the tightest specifications in the world. Our production processes and unmatched capacity allow us to produce TruForm™ metal powders at high volumes, with flexible lot sizes ranging from 5 kg to 2,500 kg.

Stand 205

Praxair Surface Technologies GmbH
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87487 Wiggensbach
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Phone: +33 6 07 77 48 94
Web: www.praxairsurfacetechologies.com

POWDER MANUFACTURER
(GAS ATOMIZATION)

Stand 31

ProGrit GmbH

ProGrit is specialized in clamping, measuring and tooling technology for the compaction of metal and ceramic powder. Innovative products combined with unique know how and purposeful engineering leads to the comprehensive mastery of the technology chain of compaction of metal and ceramic powders, building the base of success for our customers. In addition to the innovative products ProGrit offers technical and economical consulting in the field of compaction, grinding, measurement, tool and production technology for the machine tool industry and the tool and die manufacturing. ProGrit also offers comprehensive and holistic consulting & engineering services - from the analysis of the current state up to the industrial realization and implementation of complex engineering solutions.

ProGrit GmbH
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8623 Wetzikon
Switzerland
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Phone: +41 44 844 54 26
Web: www.progrit.ch

EQUIPMENT



Stand 85

PVA Industrial Vacuum Systems GmbH

PVA is an internationally well-established German supplier of furnaces for the production, treatment and refining of high-quality materials in vacuum and controlled gas atmospheres. PVA Industrial Vacuum Systems GmbH is member of PVA TePla AG group, a group of system makers for industrial and semiconductor vacuum process applications. Focus and core competence of PVA is in particular on the processes of SINTER-HIP, VACUUM SINTERING, HIGH-VACUUM BRAZING, DIFFUSION BONDING, PLASMA NITRIDING, HIGH-TEMPERATURE HEAT-TREATMENT/PURIFICATION as well as MELTING/CASTING, in which PVA has achieved excellent international reputation and technology leadership. With its history and experience of furnace making in Germany since more than 50 years and well over 1,000 delivered systems worldwide, PVA is a stable and reliable partner, well known for its quality and for professional solutions.

PVA Industrial Vacuum Systems GmbH
Im Westpark 10-12
35435 Wetztenberg
Germany
Contact: Wolfgang Rein
Phone: +49 641 68690-0
Web: www.pvatepla-ivs.com

MANUFACTURER OF VACUUM FURNACES



Stand 136

Quintus Technologies

Quintus Technologies is the global leader in high pressure technology. The company designs, manufactures, installs, and supports high pressure systems in three main areas: densification of advanced materials, sheet metal forming and high pressure processing for food and beverage innovation, safety, and shelf life. Quintus has delivered over 1,900 systems to customers within industries from energy, medical implants, space, aerospace, automotive and food processing. The company is headquartered in Västerås, Sweden, with a presence in 45 countries worldwide.

Quintus Technologies
Quintusvägen 2
SE-721 66 Västerås
Sweden
Contact: Mari Groen
Phone: +46 72 142 79 27
Web: www.quintustechnologies.com

EQUIPMENT





Stand 181

Retech

Since 1963, Retech Systems LLC has been a global leader in the supply of vacuum metallurgical processing equipment. Retech as integral part of Seco/Warwick Group is leading furnace manufacturer in the world. Our technologies include Vacuum Metal Powder systems that combine vacuum induction melting technology and the inert gas atomization process to allow for a broad range of potential powder sizes of oxygen-sensitive metals and alloys, Plasma Arc, Electron Beam Cold Hearth Melting and more.

Retech

683 Northland Ave.
Buffalo
NY 14211
USA

Contact: Aamir Abid,
Christopher Jackson
Phone: +1 (716) 463-6400
Web:
www.retechsystemsllc.com

EQUIPMENT



WORLD PM2022 SPONSOR



Stand 34

Rio Tinto Metal Powders

Rio Tinto Metal Powders (RTMP) was established in 1968 as Quebec Metal Powders Ltd. (QMP) and is wholly owned today by Rio Tinto, a renowned large scale international mining and metallurgical company. Rio Tinto Metal Powders' world headquarters are located in Sorel-Tracy, Canada with sales offices, technical representatives and agents around the globe. RTMP also operates an annealing and blending facility with comprehensive customer support and distribution capabilities in Suzhou, China. RTMP is the only global powder supplier; to manufacture its products entirely from a consistent, single ore base. Consequently, RTMP offers products of exceptional cleanliness and consistency. RTMP offers a full range of ferrous powder products for virtually all Powder Metallurgy (PM) applications, and is committed to helping customers produce the best quality components possible by supplying superior powder products.

Rio Tinto Metal Powders

Mergenthalerallee 77
D 65760 Eschborn
Frankfurt a.M.
Germany

Contact: Jean-Marc Borel
Phone: +49 6196 96 000
Fax: +49 6196 48 1762
Web:
www.qmp-powders.com

RAW MATERIALS



Stand 179

Royal Metal Powders

Royal Metal Powders, Inc. located in Maryville, Tennessee, U.S. is a manufacturer of high-quality copper-based powders. Royal produces both air and water atomized copper powders, offering a wide product range to serve the needs of its customers worldwide. Royal currently produces copper and copper based alloy products. Royal products include: copper; brass; bronze; bronze premix; infiltrating; copper/nickel and copper phos powders. Applications include: powder metallurgy, MIM powders, friction, brazing, chemicals, water filtration, and numerous industrial applications. In addition to our main copper-based products we offer tin powders, electrolytic copper powders, and copper/tin powders. Royal has R&D capabilities and offers a full technical service department to support our customers.

Royal Metal Powders

457 Continental Dr
Maryville
TN 37804
USA

Contact: David Hunt
Email: dhunt@royalmetalpowers.com
royalmetalpowers.com
Web: www.chemet.com

RAW MATERIALS



WORLD PM2022 SPONSOR



Stand 45

SACMI Imola SC

SACMI is an International Group world leader in the design, manufacture and supply of industrial solutions, specialized in equipment for Powder Metal, ceramics, beverage and packaging.

SACMI Group is present in 30 Countries worldwide through 80 Companies. Driven by continuous investments in research and technological innovation, conscientious attention to market needs and customer service quality, SACMI proposes a wide range of best in class equipment and technologies for the Powder Metal Industry.

From hydraulic to full electric presses, from furnaces to fully integrated automations, Customers benefit from a complete supply with a single partner.

SACMI Imola SC

via Selice Prov.LE, 17/A
40026 Imbola (BO)
Italy

Contact: Andrea Zaccherini
Phone: +39 0542607995
Web: www.sacmi.com

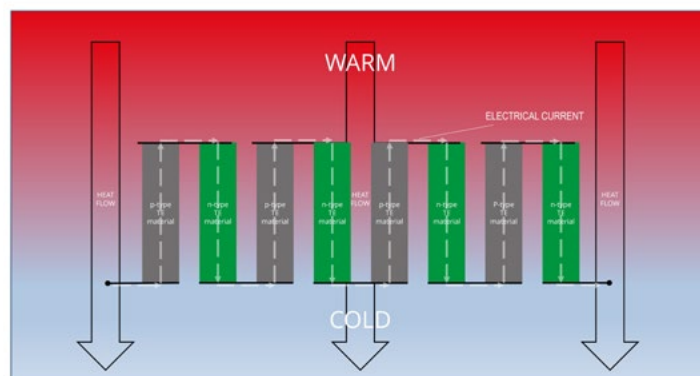
EQUIPMENT



START – Sustainable energy harvesting systems based on innovative mine waste recycling

Primary objective: Build an European innovation ecosystem for thermoelectric (TE) waste heat harvesting systems

SCHEMATICS OF A THERMOELECTRICAL MODULE

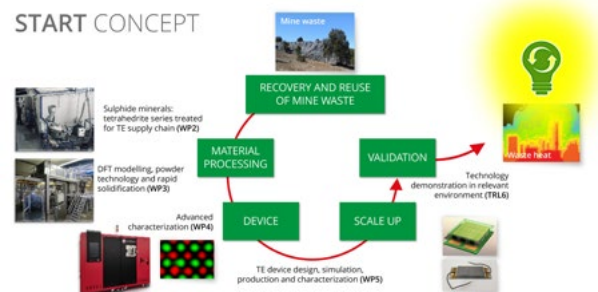


How: By incorporating **sulphides (tetrahedrite)**, present in many **European mine wastes**, into advanced sulphide p-type TE thermoelements.

Expected impact towards a more **sustainable and resilient EU**:

- **Reducing EU dependence** on primary critical raw materials
- **Promotion of circular economy** processes
- **Production** of TE energy harvesting systems to:
 - ✓ **reduce fossil fuels consumption**
 - ✓ **increase overall efficiency** of energy production and consumption systems
 - ✓ **reduce greenhouse gas emissions**

START CONCEPT



Duration: 01 June 2022 – 31 May 2026 | Budget: 9.2 M€

www.START-HEproject.com



(Coordinator)



Geological Survey of Austria



Co-funded by
the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Health and Digital Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.



SAM Project

As Europe seeks to retain its leading position in industrial competitiveness, there is an urgent need to establish a strategy for Additive Manufacturing (AM) skills at European, National and Regional levels. To meet this challenge the EU funded project 'Sector Skills Strategy in Additive Manufacturing (SAM)' started in January 2019. The initiative tackles the current European need for developing an effective system to identify and anticipate the right skills for the AM sector demands in response to the increasing labour market needs, thus, contributing for the smart, sustainable and inclusive growth of the AM sector. SAM project is co-funded by the Erasmus+ programme of the European Union.

Stand 217

SAM Project

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Web: www.skills4am.eu

EU PROJECT



Sandvik Additive Manufacturing

Leading experts in a wide range of materials for AM. As the world-leading manufacturer of gas-atomized Osprey metal powder, our range of alloys is extensive, with the widest AM alloy program around and can even customize batches. Adding our leading expertise in post processing methods, like metal cutting, sintering, heat treatment and hot isostatic pressing, we master every step of the value chain for additive manufacturing. Within Sandvik we have a long tradition of delivering advanced materials and premium products to some of the most demanding industries around the globe, such as aerospace, nuclear, medical, chemical, automotive and oil and gas. In additive manufacturing, printing makes up just one of seven steps you need to master; to ensure that your finished component performs at its best. To help you fully benefit from the possibilities of additive manufacturing, we take you through a three-phase process: Plan it. Print it. Perfect it.



Stand 169

Sandvik Additive Manufacturing

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81181 Sandviken
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Web: www.additive.sandvik.com
www.metalpowder.sandvik.com

RAW MATERIALS / METAL POWDER /
AM CONSULTANCY AND PRODUCTION



SARNES ingenieure GmbH & Co. KG

SARNES ingenieure – emission control and furnaces for heat treatment. Located near Stuttgart in the SouthWest of Germany, SARNES ingenieure GmbH & Co KG is a manufacturer of emission control and furnaces for heat treatment. Building and developing conveyor belt sintering furnaces and protective gas systems for line-production for the PM industry since 1980. Best annealing, sintering and hardening furnaces with lowest energy consumption are SARNES furnace benefits for the customer. The optimization of combustion processes, burner development and gas-fired conveyor belt sintering furnaces, heat and material conveyance (open reaction spaces, gastight muffle furnaces) in manufacturing plants and an analytical and empirical understanding of furnace atmospheres are basic features of our work and our systems.



Stand 109

SARNES ingenieure GmbH & Co. KG

Doktor-Rudolf-Eberle-
Straße 20
76534 Baden-Baden
Germany

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Fax: +49 7249 951864
Web: www.sarnes.de

EQUIPMENT



Sentes-BIR A.S.

Sentes-BIR is a metal powder manufacturer based in Turkey with over 40 years of experience. As a one of the largest producer in Europe, our company is ISO 9001, IATF 16949, ISO 13485 and AS 9100 certified to supply its products to esteemed companies of automotive, medical and aerospace industries. Our metal powders are used in additive manufacturing, brazing, press&sinter and surface coatings applications.

Recently established 'additive manufacturing business unit offers process development and powder validation for powder bed-based process'.



Stand 196

Sentes-BIR A.S.

Kemalpaşa OSB
Ansızca San Sit No:343
İzmir 35730
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Web: www.sentes-bir.com

POWDER MANUFACTURER





Stand 131

SLM Technology Private Limited

SLM produces Atomised and Sponge Iron Powder in India with total capacity of 20,000 MT. It produces both carbon and hydrogen reduced sponge iron powder for powder metallurgy and Friction applications. It also produces custom bonded mixes for press ready usage. SLM supplies to all major PM parts manufacturers based in India. It exports Iron Powder to over 20 countries around the world.

For over 30 years, the company has earned a reputation of stable quality supplier amongst its customers.

SLM Technology Private Limited

Plot No: 185/A, IDCO Plot Kalunga-770 031
Rourkela, Odisha
India

Contact: Piyush Agarwal
Phone: +91 99378 22224
Web: www.slmmetal.com

RAW MATERIALS



Stand 137

SMS group GmbH

SMS group is renowned worldwide for its future-oriented technologies and outstanding service for the metals industry. The company applies its 150 years of experience and its digital know-how to provide the industry continuously with innovative products and processes – even beyond its core business – and generates worldwide sales of more than 2.7 billion euros. SMS is the right partner for challenging projects, and supports its customers throughout the lifecycle of their plants, enabling profitable and resource-efficient value creation chains. Paving the way for a carbon-neutral and sustainable metals industry is the company's stated goal. As a global player with German roots, SMS takes responsibility for its about 14,000 employees.

SMS group GmbH
Ohlerkirchweg 66
41069 Moenchengladbach
Germany

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Email: yannik.wilkens@sms-group.com
Web: www.sms-group.com

EQUIPMENT



Stand 219

START Project

START, an innovation action project supported by the European Union (EU) and its Horizon Europe programme, aims to create a sustainable supply chain for green energy harvesting products based on the concept of converting mining waste into materials for waste heat recovery. START will transform waste secondary sulphide materials, widely available in Europe, into sustainable high added-value components for tellurium-free thermoelectric devices. With this unique technological solution, START contributes to an efficient use of resources while promoting the diversification of the sources of renewable energy production systems using green energy harvesting through thermoelectrics, in line with the strategies outlined in the European Green Deal and in the EU Action Plans on Critical Raw Materials and on Circular Economy.

START Project
Laboratório Nacional de Energia e Geologia, I.P.
Estrada do Paço do Lumiar 22
1649-038 Lisboa
Portugal

Contact: Dr. Filipe NEVES
Phone: +351 210 924 600
Web: www.START-HEproject.com

EU RESEARCH PROJECT



Stand 184

Steel Service Krefeld GmbH

SSK is an international trading and service company located in Dusseldorf, West Germany. The company is specialized to supply tool steels and specialty steels. SSK runs warehouses in Germany and in United Kingdom and is one of the largest mill independent suppliers for precision tool steel flats in Europe. In cooperation with its international supplier base SSK has started to supply metal powder in specialty steels and alloys like 1.2709, 1.4404, 1.4542, 2.4668 and 2.4856. Material can be delivered ex-warehouse Germany or ex-production for additive manufacturing industry.

Steel Service Krefeld GmbH
Kimplerstr 294
D-47807 Krefeld
Germany

Contact: Juergen Beesen
Phone: +49 2151 93144-0
Web: www.steelservicekrefeld.com

DISTRIBUTOR



**SUMCA sas**

Sumca is your partner when developing tooling systems for the PM industry. Our knowledge base covers ferrite (Including SMC), carbide and ceramic markets. Our objective is to provide high performance tools using the latest materials and surface treatments, whether this is a single replacement punch, developing a quick change strategy, designing a multilevel tool set or an adapter; or utilising our proven designs for CROSS PRESS TOOLING. We would be pleased to see you on our stand to discuss your project and welcome you to the sumca system.

**Stand 41****SUMCA sas**

Z.I. Route de Cigne
Ambrières les Vallées 53300
France

Contact: Trevor Hird
Phone: +33 2 43 08 80 15
Fax: +33 2 43 04 96 74
Web: www.sumca.fr

EQUIPMENT / TOOLING

system 3R

System 3R

System 3R offers Tooling, Measuring Equipment and Automation for efficient and accurate production of punches and dies. Gives an increased productivity in the tool shop by a reduction of the set-up times, improved accuracy & quality and reduced number of rejections.

System 3R Tooling and Measuring Equipment are worldwide the most used products in powder compacting presses, reducing the set-up times, giving an improved accuracy resulting in the required quality of the compacts.

**Stand 84****System 3R**

GFMS – TU System 3R
Roger-Federer-Allee 7
2504 Biel/Bienne
Switzerland

Contact: Hans Waelti
Phone: +41 79 749 27 38
Web: www.system3r.com

EQUIPMENT

**TAV VACUUM FURNACES**

TAV VACUUM FURNACES is a leading manufacturer of vacuum furnaces and supplier of the PIM industry for over 30 years. Our product range for the PIM industry includes high-temperature vacuum sintering furnaces, high-pressure sinter-HIP furnaces and debinding/pre-sintering furnaces.

We provide our customers with turn-key installations and comprehensive technical support in every step of the process.

TAV vacuum furnaces are currently operating all over the world in the most prestigious companies operating in a wide range of industries: aviation/aerospace, automotive, medical, tools, additive manufacturing, commercial heat treatment, IGT manufacturers, heat exchanger manufactures, sintering specialists and R&D laboratories.

Stand 30**TAV VACUUM FURNACES**

Via dell'Industria 11
24043 Caravaggio
Italy

Contact: Stefano Quintini
Phone: +39 0363 355711
Web: www.tav-vacuumfurnaces.com

EQUIPMENT

**Tekna**

Tekna produces high-purity metal powders for 3D printing in the aerospace, medical and automotive sectors, as well as optimized R&D plasma systems for rapid material development easily scalable to industrial solutions for 24/7 operation: Spheroidization process allows to transform angular powder into highly spherical powder especially designed for advanced part manufacturing processes such as Additive Manufacturing, Metal Injection Molding and near net shape Hot Isostatic Pressing. Nanopowder synthesis process is designed to produce a wide range of high purity materials (Ceramics, Pure Metals, Alloys,...) at high yield even below 100 nm.

Over the last 30 years, Tekna has designed and manufactured more than 250 turnkey plasma systems, supported by customer service and maintenance centers based in Americas, Europe and Asia.

**Stand 108****Tekna**

2935 Industrial Boulevard
Sherbrooke J1L 2T9
Canada

Contact: Jochen Altenberend
Phone: +33 7 88 56 71 76
Web: www.tekna.com

EQUIPMENT SUPPLIER /
POWDER PRODUCER



Thermo-Calc Software AB

Thermo-Calc Software is a leading developer of software and databases for calculations involving computational thermodynamics and diffusion-controlled simulations. Its flagship software product Thermo-Calc has been used for more than 30 years by leading industrial/governmental and academic researchers and engineers to perform multicomponent calculations for both fundamental and applied research. Applications for additive manufacturing include generating chemistry and temperature dependent properties for FEM codes, where handbook data may be insufficient, predicting compositional segregation and phase formation during solidification, predicting crack susceptibility, simulating the growth and dissolution of precipitate phases during thermal cycling and thermal post-processing and designing new alloys specifically tuned for AM processes.

Stand 129

Thermo-Calc Software AB
Råsundavägen 18
169 67 Solna
Sweden

Contact:
Andreas Markström
Phone: +46 8 545 959 30
Web: www.thermocalc.com

SOFTWARE SUPPLIER / DEVELOPER



TISOMA Anlagenbau und Vorrichtungen GmbH

The foundation of TISOMA Anlagenbau und Vorrichtungen GmbH was in 1996. All plants are designed, planned and constructed by us in accordance with the requirements of our customers. We are able to use the knowledge of more than 40 years. The demand of our client forms the center of our work having as motto: The client does not want the explanation, but the solution of his problem. The base of our capabilities is our highly qualified personnel. We are in the position to serve with our staff members the following fields of business: Hard metals, Sintered metals, Ceramics, Powder injection moulding (MIM/CIM), plants for heat treatment, customized systems.

Stand 10

TISOMA Anlagenbau und
Vorrichtungen GmbH
Gewerbepark Am Bahnhof 3,
Barchfeld-Immelnborn, 36456,
Germany

Contact: Nico Schellenberg
Phone: 0049 3695 5579 0
Web: www.tisoma.de

EQUIPMENT



Stand 107

Topcast Srl

TOPCAST is a company specialised in casting machines design and manufacturing. Competence developed in the investment casting field, thermal processes, induction heating and power electronics set it as an ideal partner also for custom applications. A group of qualified engineers and designers, constantly updated and oriented to the research of enhanced technological solutions, grants a product range definitely at the state of the art.

Topcast Srl
Via Leopoldo di Toscana 9-11
Monte San Savino
(Arezzo) 52048
Italy

Contact: Giacomo Fontani
Phone: +39 3428634156
Email: fontani@topcast.it
Web: www.topcast.it

EQUIPMENT



Stand 96

VTT Technical Research Centre of Finland Ltd

VTT is one of Europe's leading research institutions. We are owned by the Finnish state. We advance the utilisation and commercialisation of research and technology in commerce and society. VTT PowderPiloting boosts up your development from early stage feasibility studies to pilot scale processing and production of powder-based materials and components. We can also support you in adoption of resource efficient manufacturing and alternative materials for substitution. With VTT's broad expertise and versatile facilities we can solve the missing information from your production chain.

VTT Technical Research
Centre of Finland Ltd
Kivimiehentie 3, Espoo
FI-02044 VTT
Finland

Contact: Tuomas Pinomaa
Phone: +358 40 687 3054
Web: www.vttresearch.com
www.vtt.fi/powder

RESEARCH INSTITUTE





Oberste-Beulmann
Edelstähle – Special Steels



Stand 80

Wilhelm Oberste-Beulmann GmbH & Co. KG

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Wilhelm Oberste-Beulmann
GmbH & Co. KG
An der Hasenjagd 2
Remscheid 42897
Germany

Contact:
Stephan Oberste-Beulmann
Phone: +49 15209360130
Web:
www.oberste-beulmann.de

HARD MATERIALS / RAW MATERIALS



Stand 29

Xitiz Technomech LLP

Xitiz Technomech LLP has established itself as a leading manufacturer of highly innovative Vacuum Furnaces for various metallurgical application. In a short time Xitiz has accomplished many milestones in the field of MIM/PM. In conjunction with our Application & Innovation Lab, Xitiz research team supports its customers with Individual System Application Development.

Xitiz manufactures the most advanced metal injection molding (MIM) debinding and sintering Vacuum furnace. Xitiz also makes the ultra-high temperature Vacuum sintering furnaces for metal Carbide and ceramics Sintering. We undertake the turn-key projects for any upcoming industries including developments, machineries and raw material. Most of our furnaces are loaded with built in recipes for well-known metals and ceramics. These recipes are proven in our research centers.

Xitiz Technomech LLP
C-13, Shayona City Part – 4
R.C. Technical Road
Ghatlodiya, Ahmedabad
380061
India

Contact: Jaydev Patel
Phone: +91 9722 574065
Web: www.xitiz.us

EQUIPMENT

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3d Adept

3d Adept is a Communication Company dedicated to the 3D printing industry. 3D Adept Media provides the latest trends and analysis in the 3D printing industry in English & French. Our media include an online media and a bimonthly magazine, 3D Adept Mag. All issues of 3D Adept Mag are available to download free of charge. Our mission is to help any company develop its services and activities in the 3D printing industry.

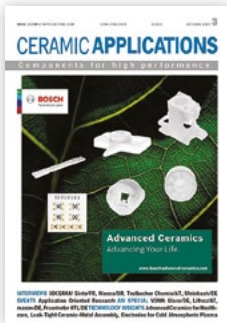
www.3dadept.com/magazine-3d-adept-mag



Aluminium News

Aluminium News is the quarterly magazine from the Aluminium Federation, launched in May 2019, and aims to keep you abreast of the latest news, views and reviews in the fast-moving aluminium industry.

<https://alfed.org.uk/media/aluminium-news-magazine/>



Ceramic Applications

Ceramic Applications is the platform for advances in the development of ceramic components and systems for sustainable, economic applications in their wide range of industrial sectors. Design engineers need regular updates on innovative applications of ceramic materials as they can provide extraordinary combinations of mechanical, electrical, thermal and chemical properties for enhanced system engineering. Ceramic Applications aims to bridge the knowledge of ceramic manufacturers and the design engineers in the various industrial user sectors.

www.ceramic-applications.com



Ceramic Forum International

CFI Ceramic Forum International is the technical-scientific journal for the ceramic industry and provides a global overview of state-of-the-art technology and processes for all market sectors with a focus on tiles, tableware, sanitary ware, heavy clay and advanced ceramics, raw materials, refractories and powder metallurgy. CFI is the official main media partner of ceramitec 2018.

www.cfi.de

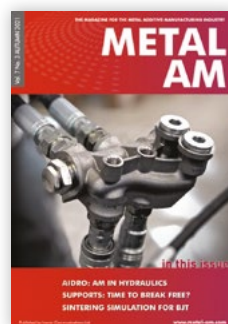


Diamante A&T Magazine

Diamante A&T is a quarterly international magazine featuring articles on diamond tools technology and industrial diamond applications in stone, building and mechanical sectors. First published in 1995 by G&M Associated, Diamante A&T

is the leading magazine for tools manufacturers, distributors and end users thanks to the quality of its articles always a step ahead in reporting new research and latest technologies.

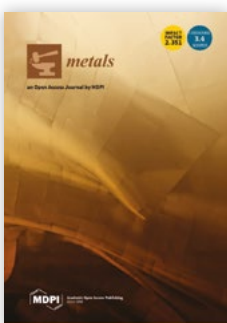
www.gmassdiamante.com



Metal AM

Metal AM magazine is the leading global media resource that is focused on the industrialisation of metal AM technologies from design and manufacturing to end-use applications. Published quarterly in both digital and print formats, supported by a content rich website, e-newsletter and rapidly-expanding social media presence. Metal AM reaches an expanding global audience that reflects the fastest growing metal component manufacturing process.

www.metal-am.com



Metals

Metals (ISSN 2075-4701; CODEN: MBSEC7) is an international, open access metallurgy journal published monthly online by MDPI. It has been indexed by Science Citation Index Expanded (SCIE) and Scopus (Elsevier). The Impact Factor of /Metals/ is 2.117, ranking 18/79 (Q1) in Metallurgy & Metallurgical Engineering, 185/314 (Q3) in Materials Science, Multidisciplinary.

www.mdpi.com/journal/metals

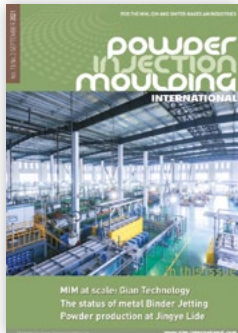


Modern Metals

Metals and Mining Review print and online magazine provides a platform for Metals & Mining industry insiders to share their experiences, challenges and insights for management and operations functions.

<https://www.metalsminingreview.com/magazine/>





Powder Injection Moulding International

PIM International is the leading global media resource for commercial and technical developments in metal (MIM) and ceramic (CIM) injection moulding, as well as the closely related sinter-based AM process. It is focused on the industrial application of these technologies, from design and manufacturing to end-use applications. Published quarterly and available in both print and digital formats.

www.pim-international.com



Powder Metallurgy Review

PM Review is the leading global media resource for the for the design, production and application of press and sintered Powder Metallurgy components, as well as HIP/CIP and powder forging. This includes ferrous and non-ferrous components, hard materials, PM high alloy steels, superalloys, diamond tools and sintered magnets. PM Review also focuses on metal powder production for all end-use areas, including Additive Manufacturing. Published quarterly in both digital and print formats it supported by a content rich website, weekly e-newsletter and regular social media campaigns that promote PM as a progressive and dynamic metal forming technology.

www.pm-review.com



Taylor & Francis

Taylor & Francis is one of the leading research publishers in the world. Its key components include Taylor & Francis, Routledge, CRC Press, FI000 Research and Dovepress. We have published over 145,000 book titles and actively publish 2,700+ journals. Taylor & Francis is one of the world's leading publishers of high-quality, cross-disciplinary knowledge and specialty research which leads to modern advances in humanities and social sciences, science and technology, engineering, medicine and healthcare. Our journals program began in 1798 with the publication of Philosophical Magazine, and since then the knowledge that we have published has been helping to shape human understanding and drive policy, discoveries and change.

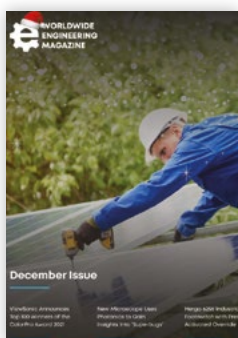
www.tandfonline.com



Tecnica Ceramica

Professional magazine that informs about materials, equipment and manufacturing techniques for the industrial sector.

www.publica.es



WorldWide Engineering

Worldwide Engineering Magazine provides a tailored platform for the engineering community. With varying monthly topics and features occurring throughout each year, there are plenty of opportunities to promote your business to a targeted readership at the appropriate time.

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EURO PM2023

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**TECHNICAL
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CONSOLIDATION
TECHNOLOGIES

MATERIALS

APPLICATIONS

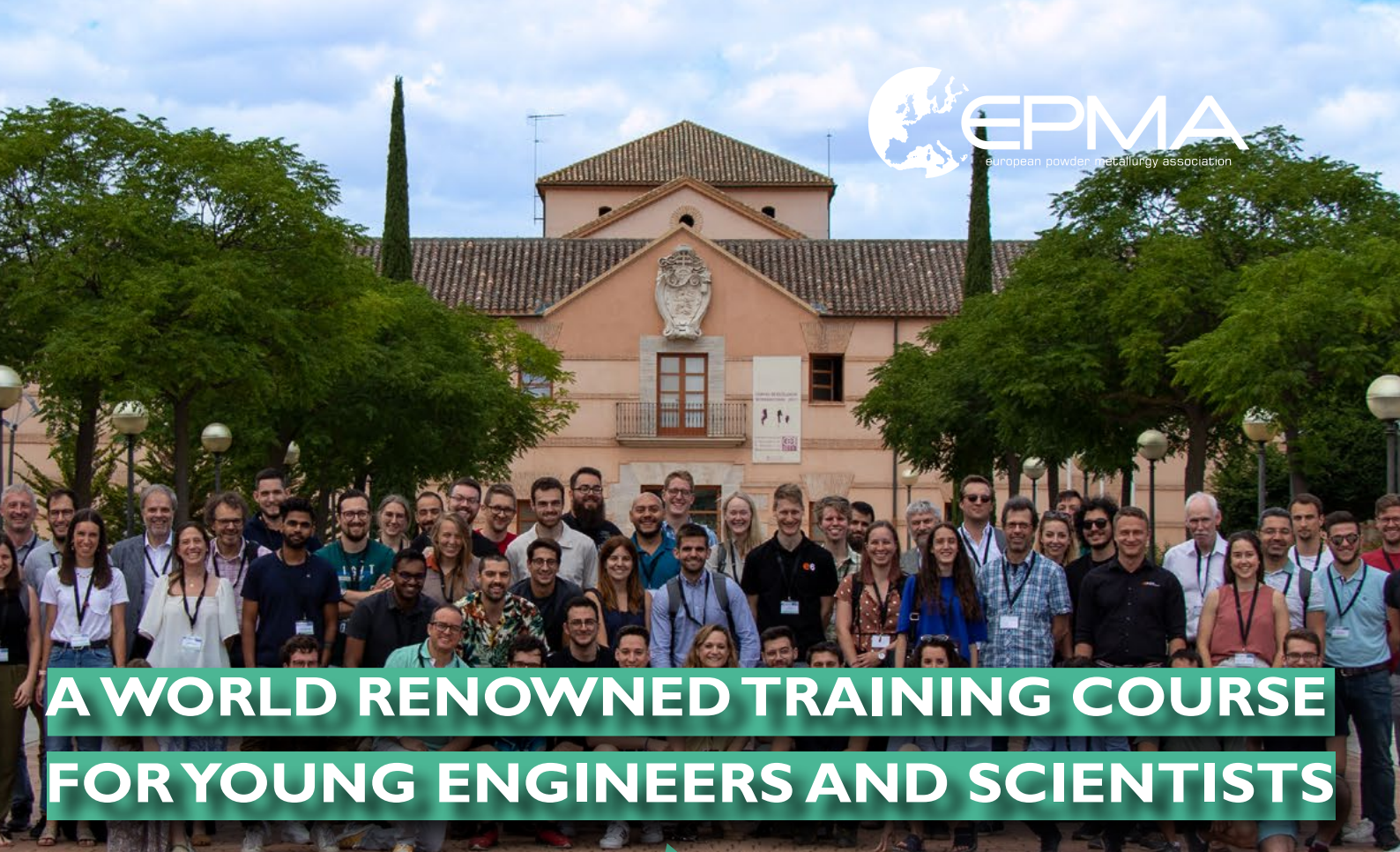
TOOLS FOR
IMPROVING PM

A more detailed topic list can be found at www.europm2023.com

EURO POWDER METALLURGY
Congress & Exhibition
1 - 4 October 2023
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General Information



-
- Industry Tours
 - General Information

- Lunch and social events tickets

Industry Tours*

Tours are available to all registered delegates and exhibition stand personnel, during the online registration and before Friday 09 September 2022. Please note that tours cannot be booked onsite.

Only ticket holders can take part in the tours. Tickets are non-transferable to another person. All the tours are held on Friday 14 October 2022 with a departure from the congress centre.

If you purchase a ticket to an industry tour, your details will be shared with the host company.

Please note that visits are subject to availability at the time of booking. Lunches are included in all the visits.

CETIM – MANUTECH

Location : Saint Etienne

Departure Time: 08:00 at Lyon Congress Centre

Description:

Going to the future



Since 1965, Cetim, the French Technical Centre for Mechanical Industry, has been supporting innovation & competitiveness of companies thanks to its multidisciplinary skills, digital expertise and unique R&D capacity. With its International subsidiaries and its 8,000 customers in more than 50 countries, Cetim has become a World leading player to overcome environmental and Industry 4.0 main challenges with innovative solutions and services. In addition, Cetim is part of the Carnot Institute Network, under the aegis of the French government to enlarge the scope of R&D and promote partnership research with SMEs. For more information, please visit www.cetim.fr and follow them on Twitter, Facebook, LinkedIn and YouTube channel.

The visit will be focused on Cetim's expertise and activities on Additive Manufacturing, Part finishing and Fatigue optimization. A visit of their two technological platforms dedicated to material processing is planned. These platforms are equipped with various AM technologies and various surface finishing devices. They will present their powder bed fusion equipments : an Aconity Midi+ 2 lasers machine with online monitoring system and also their sinter-based equipments (DM P2500, Lab P-I, Elnik MIM furnace). Examples of part development will be shown. A visit of their Fatigue testing platform will follow. It enclosed their biomechanical laboratory for testing implant devices such as dental implant, HIP Stem, their platform for testing bigger mechanical part and for characterizing fatigue material properties. The visit will be ensured by experimented engineers

In parallel, a visit of Manutech, near CETIM, is planned.

Manutech USD brings together in Saint-Etienne (France) academic (Université Jean Monnet, Centrale Lyon, Ecole Nationale d'Ingénieurs Saint-Etienne, Mines Saint-Etienne) and industrial partners (CETIM, Groupe HEF, Groupe WeAre) sharing their resources and knowledge to provide an open femtosecond laser technological platform. Manutech USD is dedicated to increasing the technological readiness level of projects from the research stage up to scalable industrial solutions in the field of surface structuration and functionalization. As an expert in science and technology engineering and multi-scale surface functionalization, Manutech USD allows you to texturize and characterise your surfaces and define the adequate economical and industrial process.

Manutech USD develops and exploits tools and processes able to structure any geometrical shape at the μm and nm scales and to characterize them. Our expertise encompasses the treatment of all materials without exception, high-speed processing and its deployment on surfaces of all sizes.

During the visit, different femtosecond laser environment will be introduced, focused on High precision, low TRL, large surface, speed increase, to see the capability of Manutech USD to improve T.R.L. around femtosecond laser use. Then, two applications of femtosecond laser integration on special machinery will be presented, coupling with powder bed additive manufacturing, and coupling with mechanical turning machine.

After both visits of CETIM and Manutech, delegates will enjoy a lunch in CETIM premises before taking the coach back to Lyon Congress Centre. Estimated arrival time to Lyon congress centre should be 14:30.

Max participants : 50

Required: ID copy (will be asked after your registration) – Please note that the access is subject to the authority's approval.

EDF-BUGEY NUCLEAR POWER

Location : Saint Vulbas

Departure Time : 08:15 at Lyon Congress Centre

Description :



The Bugey Nuclear Power Plant is located in Bugey in the Saint-Vulbas commune (Ain), about 75 km from the Swiss border. The site occupies 100 hectares. It is on the edge of the Rhône River, from where it gets its cooling water, and is about 35 km upstream from Lyon and 72 km from Grenoble. About 1,200 people work at the site.

The site houses 4 currently operating units, all being pressurized water reactors. The 5th reactor (unit 1) is currently being dismantled. It was the last UNGG reactor built in the world.

Some of the cooling comes from direct use of the Rhône water (units 2 and 3) while some is done by the use of cooling towers (units 4 and 5).

The visit will start with a general presentation of the EDF Group and Bugey site. Then you will visit the power plant: outside presentation, discovery of the turbine hall, explanations on the transformer, explanations on the cooling towers.

The visit will finish around 12:00 and will be followed by a lunch before coming back to the congress centre around 14:00.

Max participants: 16

*at the time this booklet is printed it is unfortunately no longer possible to register to any Industry Tours



Needed : ID copy (we be asked after your registration) – you will have to present a passport still valid the day of your visit. Entrance will be refused without this document. Wear flat security shoes and covered shoulders and legs, a helmet will be provided at the beginning of the visit.

Please note the Electronics are forbidden when entering the site. You will have to deposit them at the EOA.

ESRF (Synchrotron):

Location : Grenoble

Departure Time: 08:00 at the Lyon congress centre



Description :

The ESRF was conceived as a true European collaboration for the advancement of X-ray science. In 1988, eleven European countries joined forces to build the world's most performing and bright « third-generation » light source. This visionary project has made an outstanding contribution to the excellence of European science. Almost thirty years later, the ESRF is a world reference, developing innovative technologies which also benefit other national synchrotrons. Today, the ESRF continues to lead the way in pushing back the boundaries of scientific exploration of matter; by constructing the first in a new generation of synchrotrons. The visit will start with a 1h presentation of the site following by a visit of the facilities by little groups.

Learn more about the synchrotron here <https://www.esrf.fr/about/press-room/intro-esrf-journalists>

Max participants: 15

Needed: ID copy (will be asked after your registration) – Please note that the access is subject to the authority's approval.



Beaujolais Escape

Location : Beaujolais

Departure Time: 09:30 at the Lyon congress centre

Description :

Well know all over the world for its vineyards, the Beaujolais region attracts not only Beaujolais fans, but also walkers and those who likes exploring charming villages.

The tour takes place on board of a comfortable and fully equipped car.

- 09.30 Departure from Lyon to the Beaujolais region
- 10.00 Visit of a winemaker domain, discover of the wine tools from the Middle Ages to nowadays, followed by a commented wine tasting with its Cabriens des Monts du Beaujolais (goat cheese).
- 12.30 Lunch in a traditional farm with regional products and wine
- 14.30 Pass through the Golden stones region with a stop in the village of Oingt, a charming little village overlooking the vineyard.
- 15.30 Departure back to Lyon
- 16.00 Arrival at the congress center

Max participants : 50



General Information

Onsite Information

The World PM2022 Registration and Information Desk will be open:

Sunday 09 October – 16:00 – 19:30
 Monday 10 October – 08:00 – 19:30
 Tuesday 11 October – 08:00 – 19:30
 Wednesday 12 October – 08:00 – 19:30
 Thursday 13 October – 08:00 – 16:00

All registration documentation including tickets, congress guide and proceedings will be distributed from the registration desk onsite.

Name Badges: All participants are required to wear their badge at all times during World PM2022 in order to allow access to the technical sessions, exhibition and other associated events. Badges will be controlled at various key points during the event for the purpose of access, control and security.

Internet

Wi-Fi is available throughout the Congress Center.
 SSID:WORLDPM2022



Congress Language

The congress will be conducted in English.

Photography

Photography is strictly forbidden in all technical sessions and special interest seminars. Official photographs, taken by EPMA photographers will be available via www.worldpm2022.com post event.

Congress Proceedings

The congress proceedings are included in the registration package for all full Delegates: Presenting Authors, Session Chairs, EPMA Members and Non-members, and are provided with a link to download. If proceedings are not included in your registration type, they can be purchased on our website.

Online Presence and Referencing

EPMA has agreements with Scopus to enable the wider circulation of papers presented at EPMA conferences and to enhance their standing in the academic community. The papers from World PM2022 will subsequently be made available to the subscribers of these products after October 2022.

Proceedings are also available on www.epma.com/publications including Proceedings more than 4 years old available to download free of charge.

Going Green



EPMA have made a few changes this year being mindful of being more green and the footprint World PM2022 leaves behind and we want to share some of these with you. Rather than providing single use plastic water bottles, we ask participants to bring their own reusable water bottles and fill them up at our many water machines. The paper cups provided at these water machine are fully recyclable. Recycling bins are placed around. We ask that you use these. For most of our events, we will use re-usable, washable dishes. Away from catering, we have also taken the decision to reduce the number of pages in this Congress guide again by including the technical programme in the app only to reduce the amount of paper we are using. We also tried to create when possible re-usable roller banners and most of the signage in the Congress Center will be made of recyclable cardboards. These are small changes, but collectively over the whole event they make a big difference.



General Information on France

Electricity: The electrical current in France is 220V/50 Hz. Round European-style two-pin plugs are used.

Currency: The monetary unit is the Euro (EUR). Bank notes are printed in values of €5, €10, €20, €50, €100, €200 and €500; and coins in values of 1, 2, 5, 10, 20 and 50 cent, and €1 and €2. If changing currency, it is recommended to request smaller value notes of €5-€20 as it can be difficult to find establishments to take larger notes. It is advised against taking larger notes as problems regarding counterfeiting mean they are rarely accepted.

Major credit and debit cards (some restrictions apply to American Express and Diners) are accepted in shops, restaurants and hotels, but in some they are not, be sure to check before ordering. Cash is withdrawn with your Visa, MasterCard, Maestro or Cirrus card at any ATM. Taxis may not accept card payments so it is essential to have some local currency.

Travel Health: There are no specific health risks associated with travel to France. Ensure coverage by your own health insurance and bring necessary documents on the trip. If you're a European citizen from within EU/EEA, a European Health Insurance Card (EHIC) gives you access to medically necessary, state-provided healthcare during a temporary stay in France.

Tipping: If you are having a lunch in a cafe or restaurant it is normal to leave a small amount of change for the server; around 50 cents is plenty. If you are having dinner and you receive good service then it is nice to leave a few Euros for your server; around one to two is usually enough. You can leave around 5-10 percent if you are very happy with your meal. This will be more than appreciated. Essentially tipping in France is more of a gesture, and less of an obligation. So, if you receive exemplary service then it is nice to leave a larger tip to demonstrate your appreciation.

Communications: The international access code for France is +33. The main emergency number is 112 (European emergency number, no area code needed, 114 for deaf or hard of hearing people). You can also use 15 for Emergency Medical Assistance Service, 17 to contact the Police Service and 18 for the Fire Brigade (no area codes needed).

Lunch and Social Event Tickets

Welcome Reception

Höganäs - The Welcome Reception (ticket holders only) is taking place on Sunday 09 October, from 17:30-19:30. Light snacks and drinks (sponsored by Höganäs Sweden) will be served while attendees mingle and network with live background music.

Additional tickets can be purchased onsite subject to availability.
Dress Code: Business smart/smart casual.

Höganäs 

Lunch Monday - Thursday

Lunch (ticket holders only) will be buffet style, held in the Forums at the -2 level, to allow participants maximum flexibility at lunch times, with time to visit the World PM2022 Exhibition and Poster Display. Additional tickets can be purchased onsite subject to availability. Post lunch coffee is served in the Exhibition Area.

Paybar

For participants without a lunch area ticket, or for any participants who would like refreshments/snacks outside of the allocated break times lunch and refreshments can be purchased from the onsite pay bar in the exhibition area. The pay bar will be open the same as the Exhibition opening hours enabling participants to purchase drinks and snacks at times outside of the scheduled break times.

Refreshment Breaks

The PM2022 Exhibition area houses six coffee stations, which will provide refreshments throughout the event.

Congress Dinner

The Congress Dinner (ticket holders only) is taking place on Tuesday 11 October at the Cirque Imagine. Coaches will depart from the congress center and take guests to the venue.

Additional tickets can be purchased onsite subject to availability.
Dress Code: Business smart/smart casual.

If you are unable to attend, please return your ticket to the reception desk to assist with final numbers.



© Cirque imagine



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Poster & Awards Reception

Poster Authors will be presenting their posters in and around the exhibition area. Please stop by with a drink to find out more about their work. This event is open to all participants, no ticket required. Drinks will be available from the coffee areas, with a special drinks buffet.

The Poster and Award Reception will take place Monday 10 October at 18:00 around the Exhibition Hall. (sponsored by Miba).

The **Peter Brewin award** will reward the best overall submitted and displayed poster at the event (in the opinion of an independent panel of three judges).

The **Fellowship Award** will reward an individual who will be elected to be an EPMA Fellow through achievements and accomplishments made to the benefit of EPMA and the PM and particulate materials industry.

The **EPMA Distinguished Service Awards** are presented in recognition of an individuals' outstanding contribution to the European PM industry over a number of years (recipients are selected by the EPMA Council and receive their award at the annual congress in Europe)

Due to Covid restrictions and previous "online" congresses, we were not able to distribute those rewards physically in the last couple of years. This is why the winners of 2020 & 2021 will also be a part of the ceremony and receive their rewards this year.



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Continuous Furnaces



Batch Furnaces



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