Technical Programme

Euro PM2021 International Powder Metallurgy Congress & Exhibition

18 – 22 October 2021
ONLINE EVENT

europm2021.com
**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 and seminars. |
| 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 industry news and developments through the Email News service and the EPMA newsletter – both free to EPMA Members. |
| 7 | Develop your high-level networking opportunities through EPMA Sectoral Groups, discounted seminars and the general assembly. |
| 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. |

www.epma.com/membership
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This version was last updated on 08/05/2021

Please note this document is a first version. Technical Programme may be subject to change.
About Euro PM2021 Virtual Congress

The Euro PM2021 Congress 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 Euro PM2021 Congress programme will include over 170 technical papers presented in oral and poster sessions, including EPMA Keynote Paper Award presentations, as well as eleven in-depth Special Interest Seminars. Details of the full programme can be found on the following pages, and on our website www.europm2021.com.

The event will be held entirely online in 2021, allowing delegates to remotely access technical sessions either live, or on demand. Live Q&A sessions with authors will provide opportunity for in-depth PM discussions.

Congress Organiser

Euro PM2021 is sponsored and organised by the European Powder Metallurgy Association (EPMA), in co-operation with key members of the PM community and across Europe.

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 www.epma.com

For further information on Euro PM2021 Congress please contact:

European Powder Metallurgy Association

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For Registration Enquiries, please contact:
Shocklogic
E: registration-epma@shocklogic.com

The EPMA reserves the right to make changes to the final programme. All programme timings, content and fees correct at time of creation. E&OE. An electronic version will be updated on www.europm2021.com as necessary.

Euro PM2021 Congress and all associated meetings, sessions and events are ruled according to EPMA Antitrust Guidelines. Details of which can be found here: www.epma.com/antitrust.
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.

www.qmp-powders.com

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. In the Höganäs Customer Development Centre, we invite customers and end users to work alongside our expert team with application engineering and prototyping.

www.hoganas.com

Miba is one of the leading strategic partners of the international engine and automotive industry. Our product portfolio includes sintered components, engine bearings, friction materials, power electronics components and coatings. Miba products makes conventional passenger vehicles and battery electric vehicles, trains, ships, aircraft and power plants more efficient, more reliable and more environmentally friendly.

www.miba.com

Hyperion Materials & Technologies is a global leader in advanced materials with nearly seven decades of experience developing and manufacturing tungsten carbide powders, cemented carbide, synthetic diamond, and cubic boron nitride products. Hyperion specializes in premium base materials, toolmaker components, engineered products, and process tools and solutions for the most demanding applications. With about 1,600 employees worldwide, Hyperion has its production footprint in North and South America, Europe, and Asia. We apply our materials science, engineering and manufacturing expertise to position our customers to win.

www.hyperionmt.com

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.

www.plansee.com
Industrial gases play an essential role in Additive Manufacturing (AM) across the entire value chain – from powder production and handling, to printing, through to surface finishing of the final printed part. Linde’s ongoing research into the effects of the atmosphere on AM powders and parts ensures we provide you with the best knowledge and service possible to improve your processes – through increasing efficiency, boosting productivity, and raising product and material quality.

www.linde-am.com

Tekna is world leader in induction plasma technology related to high performance materials. Over the last 30 years, Tekna has designed and manufactured more than 250 turnkey plasma systems. Our customer service and maintenance centers are dispatched in Americas, Europe and Asia.

The product offer ranges from 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.

Tekna is also leading manufacturer of plasma atomized spherical metal powders for Additive Manufacturing and MIM.

Tekna powders have been integrated in every AM platform and are part of major OEM’s supply chains in different industrial segments, such as aerospace, defense, medical, automotive, and oil & gas. The product portfolio for materials is currently composed of titanium alloys (Ti-6Al-4V), nickel-based alloys (718, 625, HX)*, aluminum alloys (AlSiMg) and specialty refractories: tungsten, tantalum, and molybdenum.

* Imphytek powders, JV between Tekna and Aperam

www.tekna.com
www.imphytekpowders.com

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.

www.pometon.com


www.aubertduval.fr
Part of global industrial engineering group Sandvik, Sandvik Coromant is at the forefront of manufacturing tools, machining solutions and knowledge that drive industry standards and innovations demanded by the metalworking industry now and into the next industrial era. Educational support, extensive R&D investment and strong customer partnerships ensure the development of machining technologies that change, lead and drive the future of manufacturing. Sandvik Coromant owns over 1,800 patents worldwide, employs over 7,600 staff, and is represented in 150 countries.

www.sandvik.coromant.com

SACMI is an Italian company world leader in the design, production and supply of industrial technologies and systems, specialized in equipment for ceramics, beverage & packaging, food processing and Powder Metal.

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 world wide network of after sales service centres.

SACMI also produces Sinter Hardening and High Temperature Furnace equipment

www.sacmi.com/metals

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. Recent developments include low temperature pushers for Aluminum sintering and continuous carburising with gas quenching.

www.fluidtherm.com

CREMER is a world leading manufacturer of furnaces and thermal process plants for a wide range of processes and process temperatures ( 400°C < T< 2500°C) under various furnace atmospheres (e.g. H2, O2, Endo-gas, N2-mixtures and air) 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 plants range from de-binding, sintering and combined de-binding & sintering (e.g. the new MIM Master neo), to a wide range of thermal treatments for ferrous and non-ferrous powders and high performance ceramics. These include calcination, carburization (e.g. CARBIDE2500 furnace technology), carbonization, pyrolysis and customized engineering processes under various furnace atmospheres (e.g. H2, O2, Endo-gas, N2-mixtures and air).

Since 2012 CREMER is also a manufacturer of Hot Isostatic Presses (HIP) and Cold Isostatic Presses (CIP). Therefore the product portfolio now not only includes thermal process plants for debinding & sintering, but also 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.

www.cremer-polyfour.de
Congress Proceedings

Proceedings from PM2002 – PM2015 are free to download from the EPMA website.

Proceedings from PM2016 – PM2021 are available to purchase as:

• Individual papers (PDF download)
• Grouped by topic (PDF download)
• Complete proceedings available by downloading

Proceedings for Euro PM2021 are included in the 'full delegate' registration package. For all other participants, proceedings can be pre-ordered on the registration form or purchased on EPMA website.
AM Additive Manufacturing Magazine

metalspain.com

additive-manufacturing@metalspain.com
### Virtual Congress Schedule

**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:

- **Brown** - Powder Production
- **Blue** - Applications
- **Pink** - Consolidation technologies
- **Red** - Tools for improving PM
- **Green** - Materials
- **Yellow** - Keynote Paper Award Presentation
- **Orange** - Special Interest Seminar
- **Burgundy** - Industry Corner

Please note schedules are listed in CET time (Brussels, Copenhagen, Madrid, Paris)

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#### Monday 18 October 2021

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Description</th>
<th>Room</th>
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<tbody>
<tr>
<td>09:00 - 12:15</td>
<td>Plenary Session</td>
<td>Room 1</td>
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<tr>
<td>12:15 - 13:00</td>
<td>Lunch Break</td>
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<tr>
<td>13:00 - 14:30</td>
<td>Session 1: Cerments and Applications</td>
<td>Room 1</td>
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<tr>
<td>13:00 - 14:30</td>
<td>Session 2: SIS HIP: Optimization of PM parts using HIP</td>
<td>Room 2</td>
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<tr>
<td>13:00 - 14:30</td>
<td>Session 3: AM Beam Based Technologies: Nickel-Based Materials</td>
<td>Room 3</td>
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<tr>
<td>13:00 - 14:30</td>
<td>Session 4: Applications: Automotive KNP</td>
<td>Room 4</td>
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<tr>
<td>14:30 - 14:45</td>
<td>Break</td>
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<tr>
<td>14:45 - 16:15</td>
<td>Session 5: Materials for Press &amp; Sinter KNP</td>
<td>Room 1</td>
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<tr>
<td>14:45 - 16:15</td>
<td>Session 6: SIS HIP: Key Industrial Applications of HIP</td>
<td>Room 2</td>
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<tr>
<td>14:45 - 16:15</td>
<td>Session 7: AM Sinter Based Technologies: Binder Jetting KNP</td>
<td>Room 3</td>
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<tr>
<td>14:45 - 16:15</td>
<td>Session 8: Applications: Biomedical KNP</td>
<td>Room 4</td>
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Please note schedules are listed in CET time (Brussels, Copenhagen, Madrid, Paris)

<table>
<thead>
<tr>
<th><strong>Tuesday 19 October 2021</strong></th>
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<tbody>
<tr>
<td><strong>09:00 - 10:30</strong></td>
<td>Session 9: Modelling and Super Hard Materials  Room 1</td>
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<tr>
<td><strong>09:00 - 10:30</strong></td>
<td>Session 10: SIS FM: Advances and Challenges for Hard Magnets  Room 2</td>
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<tr>
<td><strong>09:00 - 10:30</strong></td>
<td>Session 11: AM Beam Based Technologies: Hard Metals and Hard Materials  Room 3</td>
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<tr>
<td><strong>09:00 - 10:30</strong></td>
<td>Session 12: Sintering  Room 4</td>
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<td><strong>10:30 - 10:45</strong></td>
<td>Break</td>
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<tr>
<td><strong>10:45 - 12:15</strong></td>
<td>Session 13: Non-Ferrous Materials <strong>KNP</strong>  Room 1</td>
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<tr>
<td><strong>10:45 - 12:15</strong></td>
<td>Session 14: SIS FM: Functional Materials for Thermal Management  Room 2</td>
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<tr>
<td><strong>10:45 - 12:15</strong></td>
<td>Session 15: AM Beam Based Technologies: Steels  Room 3</td>
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<tr>
<td><strong>10:45 - 12:15</strong></td>
<td>Session 16: Compaction and Application  Room 4</td>
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<td><strong>12:15 - 13:00</strong></td>
<td>Lunch Break</td>
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<tr>
<td><strong>13:00 - 14:30</strong></td>
<td>Session 17: Magnetic and Iron based Functional Materials <strong>KNP</strong>  Room 1</td>
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<td><strong>13:00 - 14:30</strong></td>
<td>Session 18: SIS MIM: Sustainability of MIM  Room 2</td>
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<td><strong>13:00 - 14:30</strong></td>
<td>Session 19: Industry Corner - 1  Room 3</td>
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<tr>
<td><strong>13:00 - 14:30</strong></td>
<td>Session 20: Hot Isostatic Pressing  Room 4</td>
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<tr>
<th><strong>Wednesday 20 October 2021</strong></th>
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<tbody>
<tr>
<td><strong>09:00 - 10:30</strong></td>
<td>Session 21: High Temperature Applications  Room 1</td>
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<tr>
<td><strong>09:00 - 10:30</strong></td>
<td>Session 22: SIS HM: Outlook on Hard Materials  Room 2</td>
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<tr>
<td><strong>09:00 - 10:30</strong></td>
<td>Session 23: AM Sinter Based Technologies: Extrusion-Based Methods in AM  Room 3</td>
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<tr>
<td><strong>09:00 - 10:30</strong></td>
<td>Session 24: MIM Feedstocks <strong>KNP</strong>  Room 4</td>
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<tr>
<td><strong>10:30 - 10:45</strong></td>
<td>Break</td>
</tr>
<tr>
<td><strong>10:45 - 12:15</strong></td>
<td>Session 25: ODS and High Entropy Alloys <strong>KNP</strong>  Room 1</td>
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<tr>
<td><strong>10:45 - 12:15</strong></td>
<td>Session 26: SIS HM: HM Club Projects of EPMA  Room 2</td>
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<tr>
<td><strong>10:45 - 12:15</strong></td>
<td>Session 27: AM Beam Based Technologies: Related Process  Room 3</td>
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<tr>
<td><strong>10:45 - 12:15</strong></td>
<td>Session 28: PIM Materials  Room 4</td>
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<tr>
<td><strong>12:15 - 13:00</strong></td>
<td>Lunch Break</td>
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<tr>
<td><strong>13:00 - 14:30</strong></td>
<td>Session 29: Light Weight AM  Room 1</td>
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<tr>
<td><strong>13:00 - 14:30</strong></td>
<td>Session 30: Industry Corner - 2  Room 2</td>
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<tr>
<td><strong>13:00 - 14:30</strong></td>
<td>Session 31: AM Beam Based Technologies: Process Development and Simulation <strong>KNP</strong>  Room 3</td>
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<tr>
<td><strong>13:00 - 14:30</strong></td>
<td>Session 32: Gas Atomizer: Theory and Design  Room 4</td>
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Please note schedules are listed in CET time (Brussels, Copenhagen, Madrid, Paris)

### Thursday 21 October 2021

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
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<tr>
<td>09:00 - 10:30</td>
<td>Session 33: Light Weight Materials</td>
<td>Room 1</td>
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<tr>
<td>09:00 - 10:30</td>
<td>Session 34: SIS P&amp;S: CO2 reduction in Press&amp;Sinter - Part 1</td>
<td>Room 2</td>
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<tr>
<td>09:00 - 10:30</td>
<td>Session 35: AM Beam Based Technologies: Special Materials</td>
<td>Room 3</td>
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<tr>
<td>09:00 - 10:30</td>
<td>Session 36: Alternative Powder Production Processes</td>
<td>Room 4</td>
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<tr>
<td>10:30 - 10:45</td>
<td>Break</td>
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<tr>
<td>10:45 - 12:15</td>
<td>Session 37: Alternative Hardmetals KNP</td>
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<tr>
<td>10:45 - 12:15</td>
<td>Session 38: SIS P&amp;S: CO2 reduction in Press&amp;Sinter - Part 2</td>
<td>Room 2</td>
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<tr>
<td>10:45 - 12:15</td>
<td>Session 39: AM Sinter based Technologies - Other Processes</td>
<td>Room 3</td>
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<tr>
<td>10:45 - 12:15</td>
<td>Session 40: Influence of Powder Process on Material Properties</td>
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<tr>
<td>12:15 - 13:00</td>
<td>Lunch Break</td>
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<tr>
<td>13:00 - 14:30</td>
<td>Session 41: Special Ferrous Materials</td>
<td>Room 1</td>
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<tr>
<td>13:00 - 14:30</td>
<td>Session 42: Industry Corner - 3</td>
<td>Room 2</td>
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<tr>
<td>13:00 - 14:30</td>
<td>Session 43: Field Assisted Sintering Technologies</td>
<td>Room 3</td>
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<tr>
<td>13:00 - 14:30</td>
<td>Session 44: Design and modelling KNP</td>
<td>Room 4</td>
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### Friday 22 October 2021

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<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tr>
<td>09:00 - 10:30</td>
<td>Session 45: Hard metals Corrosion</td>
<td>Room 1</td>
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<tr>
<td>09:00 - 10:30</td>
<td>Session 46: SIS AM: Spare parts and Repair using AM</td>
<td>Room 2</td>
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<tr>
<td>09:00 - 10:30</td>
<td>Session 47: Testing &amp; Evaluation</td>
<td>Room 3</td>
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<tr>
<td>09:00 - 10:30</td>
<td>Session 48: Applications: Aerospace</td>
<td>Room 4</td>
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<tr>
<td>10:30 - 10:45</td>
<td>Break</td>
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<tr>
<td>10:45 - 12:15</td>
<td>Session 49: Ferrous Materials for AM</td>
<td>Room 1</td>
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<tr>
<td>10:45 - 12:15</td>
<td>Session 50: SIS AM: Sinter Based AM</td>
<td>Room 2</td>
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<tr>
<td>10:45 - 12:15</td>
<td>Session 51: Testing &amp; Evaluation: Powder Characterisation</td>
<td>Room 3</td>
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<tr>
<td>10:45 - 12:15</td>
<td>Session 52: Applications: Energy</td>
<td>Room 4</td>
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<tr>
<td>12:15 - 12:30</td>
<td>Closing Session</td>
<td>Room 1</td>
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# Virtual Congress by Topic

*Please note schedules are listed in CET time (Brussels, Copenhagen, Madrid, Paris)*

## Materials

### Monday 18 October
- 13:00 - 14:30: Session 1: Cermets and Applications
- 14:45 - 16:15: Session 5: Materials for Press & Sinter

### Tuesday 19 October
- 09:00 - 10:30: Session 9: Modelling and Super Hard Materials
- 10:45 - 12:15: Session 13: Non-Ferrous Materials
- 13:00 - 14:30: Session 17: Magnetic and Iron based Functional Materials

### Wednesday 20 October
- 09:00 - 10:30: Session 21: High Temperature Applications
- 10:45 - 12:15: Session 25: ODS and High Entropy Alloys
- 13:00 - 14:30: Session 29: Light Weight AM

### Thursday 21 October
- 09:00 - 10:30: Session 33: Light Weight Materials
- 10:45 - 12:15: Session 37: Alternative Hardmetals
- 13:00 - 14:30: Session 41: Special Ferrous Materials

### Friday 22 October
- 09:00 - 10:30: Session 45: Hard metals Corrosion
- 10:45 - 12:15: Session 49: Ferrous Materials for AM

## Consolidation technologies

### Monday 18 October
- 13:00 - 14:30: Session 3: AM Beam Based Technologies: Nickel-Based Materials | Refractory Metals
- 14:45 - 16:15: Session 7: AM Sinter Based Technologies: Binder Jetting

### Tuesday 19 October
- 09:00 - 10:30: Session 11: AM Beam Based Technologies: Hard Metals and Hard Materials
- 09:00 - 10:30: Session 12: Sintering
- 10:45 - 12:15: Session 15: AM Beam Based Technologies: Steels
- 10:45 - 12:15: Session 16: Compaction and Application
- 13:00 - 14:30: Session 20: Hot Isostatic Pressing

### Wednesday 20 October
- 09:00 - 10:30: Session 23: AM Sinter Based Technologies: Extrusion-Based Methods in AM
- 09:00 - 10:30: Session 24: MIM Feedstocks
- 10:45 - 12:15: Session 27: AM Beam Based Technologies: Related Process
- 10:45 - 12:15: Session 28: PIM Materials
- 13:00 - 14:30: Session 31: AM Beam Based Technologies: Process Development and Simulation

### Thursday 21 October
- 09:00 - 10:30: Session 35: AM Beam Based Technologies: Special Materials
- 10:45 - 12:15: Session 39: AM Sinter based Technologies - Other Processes
- 13:00 - 14:30: Session 43: Field Assisted Sintering Technologies

## Applications

### Monday 18 October
- 13:00 - 14:30: Session 4: Applications: Automotive
- 14:45 - 16:15: Session 8: Applications: Biomedical

### Friday 22 October
- 09:00 - 10:30: Session 48: Applications: Aerospace
- 10:45 - 12:15: Session 52: Applications: Energy

## Tools for improving PM

### Thursday 21 October
- 13:00 - 14:30: Session 44: Design and modelling

### Friday 22 October
- 09:00 - 10:30: Session 47: Testing & Evaluation
### Special Interest Seminars

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<th>Session</th>
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<tr>
<td>Monday 18 October</td>
<td>13:00 – 14:30</td>
<td>Session 2: SIS HIP: Optimization of PM parts using HIP</td>
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<td>Session 10: SIS FM: Advances and Challenges for Hard Magnets</td>
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<td>Session 18: SIS MIM: Sustainability of MIM</td>
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<td>Session 34: SIS P&amp;S: CO2 reduction in Press&amp;Sinter - Part 1</td>
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<td>Friday 22 October</td>
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<td>Session 46: SIS AM: Spare parts and Repair using AM</td>
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### Industry Corner

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Monday 18 October

Session 1: Cermets and Applications
Topic: Materials
Session Chair: Dr Siavash Momeni (Hilti AG, Liechtenstein)

Oral Presentations

Influence Of Cu And Al Addition On The Properties Of Ti(C,N)-Co(Ni-based Cermets)
Lengauer, W (Vienna University of Technology, Austria); Maschke, J; Biagi, A; Fürst, M (Vienna University of Technology, Austria)

Solid State And Liquid Phase Sintered Mo2C, WC, TiC And TiC5NS Modified NbC-Ni Cermets
Anwer, Z (KU Leuven, Belgium); Vleugels, J; Huang, S (KU Leuven, Belgium)

Femtosecond Laser Processing Of Hardmetals
Carmona, E (CEIT-BRTA, Spain); Pan Cabo, A; Lozada Cabezas, L; Sanchez Moreno, J-M (CEIT-BRTA, Spain)

Diamond Coated WC-Co Tools With Embedded Temperature Sensors
Pratas, S (Department of Materials and Ceramic Engineering, CICECO - Aveiro Institute of Materials, University of Aveiro, Portugal); Silva, E; Neto, M; Silva, (Department of Materials and Ceramic Engineering, CICECO - Aveiro Institute of Materials, University of Aveiro, Portugal); Fernandes, C; Figueiredo, D (PALBIT, S.A., Portugal)

Poster Presentations

Thermal Residual Micro-stresses Characterizations In NbC-Ni Cemented Carbides
Lavigne, O (Hyperion Materials and Technologies, Spain); Luzin, V (Australian Nuclear Science and Technology Organisation, Australia)

Heat Treatment And Characterization Of Lithography-based Additive Manufactured WC-Co Green Bodies
Rieger, T (Aalen University, Germany); Schubert, T; Schurr, J; Schwenkel, M; Bernthaler, T; Schneider, G (Aalen University, Germany); Rieger, T (Karlsruhe Institute of Technology, Germany)

Microstructure Evolution Of Cu[Ni] Infiltrated NbC-WC Binderless Cermets
Huang, J (KU Leuven, Belgium); Huang, S; Lauwers, B; Qian, J; Vleugels, (KU Leuven, Belgium); Zhou, P (Hunan University of Science and Technology, China)

Session 2: SIS HIP: Optimization of PM parts using HIP
Topic: Consolidation technologies
Session Chair: Dr Anke Kaletsch (RWTH Aachen University, Germany); Mr James Shipley (Quintus Technologies AB, Sweden)

Oral Presentations

The CALHIPSO project: towards a larger use of HIP technology in France
Bernard, F (University of Bourgogne, France)

Session 3: AM Beam Based Technologies: Nickel-Based Materials-Refractory Metals
Topic: Optimization of PM parts using HIP
Session Chair: Dr Heinrich Kestler (Plansee SE, Austria)

Pre KNP - Microstructure Control Of Additively Manufactured IN718 By L-PBF Process
Lacoste, L (Mines ParisTech - Centre des matériaux - PSL University - AddUp - Additive Factory Hub (AFH), France); Sakly, A; Lebel, S; Vayre, B (AddUp, France); Dépinoy, S; Collin, C (Mines ParisTech - Centre des matériaux - PSL University, France)

Optimization Of SLM Lattice Structures Of Inconel 718 For Improving The Mechanical Behavior.
Benait, S (IMDEA MATERIALS INSTITUTE, Spain); Jin, X; Perez Prado, T (IMDEA MATERIALS INSTITUTE, Spain); Campos, M (Universidad Carlos III de Madrid, Spain)

Feasibility Of Grain Refinement By Heterogeneous Nucleation In Molybdenum Processed Via Laser Powder Bed Fusion
Kaserer, L (University of Innsbruck, Austria); Rissbacher, L; Braun, J; Leichtfried, G (University of Innsbruck, Austria); Kestler, H (Plansee SE, Austria)

Effect Of (electro)chemical Post-processing Parameters On The Surface Roughness Reduction And Support Removal Of INCO718 Produced By Selective Laser Melting.
Pazos, D (Cidetec Surface Engineering, Spain); Espinosa, E; Garcia-Blanco, M (Cidetec Surface Engineering, Spain)

Session 4: Applications: Automotive
Topic: Applications
Session Chair: Dr José Garcia (Sandvik Machining Solutions, Sweden); Prof Alberto Molinari (Trento University, Italy)

Oral Presentations

Pre KNP - Influence Of Heat Treatment And Densification On The Load Capacity Of Sintered Gears
Scholzen, P (Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen University, Germany); Rajaei, A; Hallstedt, B; Broeckmann, C (Chair and Institute for Materials Applications in Mechanical Engineering (IWM) of RWTH Aachen University, Germany); Brimmers, J; Bergs, T (Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen University, Germany)

Please note that “pre-KNP” refers to pre-selected KeyNote Papers. The final selection will be done in June.
FAST STEP 3: Field Assisted Sintering Technology For Swarf Titanium To Engine Parts In 3 Steps
Weston, N (The University of Sheffield, United Kingdom); Jackson, M (The University of Sheffield, United Kingdom); Holden, C (Northern Automotive Alliance Ltd, United Kingdom); Ingall, D (Transition International Ltd, United Kingdom); Lunn, D (W.H. Tildesley Ltd, United Kingdom); Williams, (Force Technology Ltd, United Kingdom); Balderson, J (Bentley Motors Ltd, United Kingdom)

Approach To Achieve Improved Elongation Combined With Sufficient Hardness, Tensile-And Fatigue Strength Utilizing Belt Furnace Sintering Conditions At 1120°C
Schneider, R (Hoganas GmbH, Germany); Ljung, K (Hoganas Sweden AB, Sweden); Szabo, C (Hoganas GmbH, Germany)

Hybrid-Additive Manufacturing Of Press Tools With Laser Metal Deposition Using Buffer Layers To Reduce Crack Issues
Belitz, S (Mercedes-Benz AG, Germany); Scheider, D (Mercedes-Benz AG, Germany); Zeidler, H (Technische Universität Bergakademie Freiberg, Germany)

Session 5: Materials for Press & Sinter
Topic: Materials
Session Chair: Prof Ilaria Cristofolini (Trento University, Italy), Prof Christoph Broeckmann (RWTH Aachen, Germany)

Oral Presentations
Pre KNP - The Complete High Cycle Fatigue Response Of Case-hardened Astaloy CrA + 1 % Cu + 0.2 % C
Schneider, M (GKN Sinter Metals Engineering GmbH, Germany)

Benchmarking Of Tooth Root Bending Fatigue Strength Of Different P|M Material Variants Which Have Been Subject To Various Heat Treatment Processes.
Szabo, C (Hoganas GmbH, Germany); Andersson, O; Andersson, M (Hoganas AB, Sweden)

Sintering Of PM Steels With High Mn Content -- Using The Masteralloy Route
Danninger, H (Technische Universität Wien, Austria); Prokofyev, M; Gierl-Mayer, C (Technische Universität Wien, Austria); Hellein, R; Müller, A (Mina Sinter Austria GmbH, Austria)

Carbon As Key Element For The Behavior Of "tailored" Liquid Phases During Sintering
Geraldinger, S (TU WIEN, Austria); De Oro Calderon, R; Gierl-Mayer, C; Danninger, H (TU WIEN, Austria)

Session 6: SIS HIP: Key Industrial Applications of HIP
Topic: Consolidation technologies
Session Chair: Dr Anke Kaletsch (RWTH Aachen University, Germany); Mr James Shipley (Quintus Technologies AB, Sweden)

Oral Presentations
Advanced Technology for Large Scale (ATLAS) PM-HIP
Gandy, D (EPRI, USA)

Faster manufacturing by additive manufacturing of shelled parts followed by HIP
Du Piessis, A (Stellenbosch University, South Africa)

Session 7: AM Sinter Based Technologies: Binder Jetting
Topic: Consolidation technologies
Session Chair: Dr Erich Neubauer (RHP-Technology GmbH, Austria)

Oral Presentations
Binder Jet 3D Printing Of Ti-6Al-4V Alloy For Biomedical Applications
Simchi, A (Sharif University of Technology, Iran); Petzoldt, F; Hartwig, T (Fraunhofer Institute IFAM, Germany)

Binder Jetting As Complementary Technology To Metal Injection Molding: Influence Of HIP On Microstructure And Mechanical Properties
Kaletsch, A (RWTH Aachen, Germany); Herzog, S; Broeckmann, C (RWTH Aachen, Germany); Andreeva, E; Hartwig, T (IFAM Bremen, Germany)

A Study On The Sinterability And Properties Of Binder Jet 3D Printing Bimodal INVAR36 Alloy Powder Blends
Lores, A (Tecnalia, Spain); Agote, I; Azurmendi, N (TECNALIA, Spain); Barthel, B; Aumund-Kopp, C (Fraunhofer IFAM, Germany)

Pre KNP - Binder-Jetting Of TiCN-based Cermets
Berger, C (Fraunhofer IKTS, Germany); Potschke, J; Fries, M; Moritz, T; Michaelis, A (Fraunhofer IKTS, Germany)

Poster Presentations
Print, Press Or Pour - Handshake Between Different Technologies
Hanitzsch, O (ExOne GmbH, Germany)

Session 8: Applications: Biomedical
Topic: Applications
Session Chair: Dr Thomas Ebel (Helmholtz Zentrum Geesthacht, Germany); Cristina Berges Serrano

Oral Presentations
Pre KNP - Titanium Scaffolds Fabricated By Direct Ink Writing And Functionalized With Dual-action Coatings With Osteoinductive And Antibacterial Properties
Torres Garrido, D (AMES PM TECH, Spain); Maria Manero, J; Rupérez, E (politechnic university of catalonia, Spain); Calero, J (AMES PM TECH, Spain)
Tuesday 19 October

**Session 9: Modelling and Super Hard Materials**

**Topic:** Materials

**Session Chair:** Dr Bjorn Hoschke (ZCC Cutting Tools Europe GmbH, Germany)

**Oral Presentations**

**Dynamic Carbon Window Modeling For The Design Of Cemented Carbides - Low Carbon Contents**

Lamelas Cubero, V (Kungliga Tekniska Högskolan (KTH), Sweden); Bonvalet-Rolland, M; Borgestam, A (Kungliga Tekniska Högskolan (KTH), Sweden); Walbrühl, M (QuesTek AB, Sweden)

**Empirical Model For Room Temperature Thermal Conductivity Of WC-Co Hardmetals**

Vornberger, A (Fraunhofer IKTS, Germany); Potschke, J; Herrmann, M; Michaelis, A (Fraunhofer IKTS, Germany)

**Influence Of Microstructural Assemblage Of The Substrate On The Adhesion Strenght Of Coated PcbN Grades**

Gordon Pozueyo, S (Universitat Politècnica de Catalunya - UPC, Spain); Roa, J-J; Jiménez Piqué, E; Llanes, L (Universitat Politècnica de Catalunya - UPC, Spain); Rodríguez Suarez, T; Franza, L (Element Six (UK), Global Innovation Centre, Virgin Island (United Kingdom); Saouab, R (Seco Tools AB, R&D Materials and Technology Development, Sweden)

**Metal-Diamond Materials Obtained By Electric Resistance Sintering: Microstructure, Processing And Mechanical Properties**

Lagos, M (TECNALIA, Spain); Agote, I; Leizao, I (TECNALIA, Spain); Viñuela, J; Beranoagirre, A (UPV-EHU, Spain)

**Session 10: SIS FM: Advances and Challenges for Hard Magnets**

**Topic:** Materials

**Session Chair:** Dr Sebastian Boris Hein (Fraunhofer IFAM Bremen, Germany); Dr Peter Kjeldsteen (Sintex a/s, Denmark)

**Oral Presentations**

**Overview on developments in bonded NdFeB magnets**

Grieb, B (Magnequench GmbH, Germany)

**Electric current assisted sintering of NdFeB magnet materials**

Prasad Mishra, T (Forschungszentrum Jülich, IEK-1, Germany); Leich, L; Weber, S; Röttger, A (Institut für Werkstoffe, Germany); Krenkel, M (Wilo SE, Germany); Bram, M (Institute of Energy and Climate Research, Germany)

**Challenges in the additive manufacturing of Nd-Fe-B magnets**

Weck, C (Fraunhofer IFAM, Germany)
Session 11: AM Beam Based Technologies: Hard Metals and Hard Materials

Topic: Consolidation technologies
Session Chair: Dr Diego Manfredi (Politecnico di Torino, Italy)

Oral Presentations

Investigations On Processability And Material Characteristics Of Diamond-metal Composites Fabricated By Laser Powder Bed Fusion
Ferreira, M (TU Dortmund, Germany); Schnell, N; Kleszczynski, S; Wegner, J; Witt, (University Duisburg-Essen, Germany); Tillmann, W (TU Dortmund, Germany)

Influence Of Z-increment On The Build Height, Porosity And Microstructure Of Laser Deposited WC-10wt%FeCr Thin Walls
Molobi, E (University of the Witwatersrand, South Africa); Sacks, N (Stellenbosch University, South Africa); Theron, M (CSIR National Laser Centre, South Africa)

Session 12: Sintering

Topic: Consolidation technologies
Session Chair: Dr Peter Vervoort (Eisenmann Thermal Solutions, Germany)

Oral Presentations

Powder Is The Future Of Metallurgy
Honnart, A (METALVALUE LTD, United Kingdom)

Hojati, M (Institute of Chemical Technologies and Analytics, Austria); Gierl-Mayer, C; Danning, H (TU Wien | Chemical Technologies and Analytics, Austria)

High Temperature Sintering Of Low Alloyed Steels: Effect On Mechanical Properties And On The Dimensional And Geometrical Precision
Molinari, A (University of Trento, Italy); Toledo Dos Santos, D; Cristofolini, I (University of Trento, Italy); Arnhold, V; Kruzhanov, V (Powder Metallurgy Consulting, Germany); Baumgärtner, F (Schunk Sintermetaltechnik, Germany); Creutziger, M (ONEJOON GmbH, Germany); Dougan, M-J (Ames, Spain); Hellein, R (Miba Sinter Group, Austria); Larsson, C (Höganas AB, Sweden); Lorenzon, I (Pometon SpA, Italy); Schneider, M (GKN SinterMetals, Germany); Weber H (Riedhammer GmbH, Germany); Winbert, L (GKN Hoeganaes Corporation Europe, Germany)

How Particle Size And Green Density Affect The Anisothermal And Isothermal Shrinkage Of Uniaxially Cold Compacted AISI 316L
Baselli, S (University of Trento, Italy); Molinari, A (University of Trento, Italy)

Poster Presentations

Effect Of Sintering Temperature On Microstructure And Physical Properties Of Differently Compacted Carbon And Mo Alloyed Steels
Hojati, M (TU Wien | Chemical Technologies and Analytics, Austria); Gierl-Mayer, C; Danning, H (TU Wien | Chemical Technologies and Analytics, Austria)

Session 13: Non-Ferrous Materials

Topic: Materials
Session Chair: Prof Elena Gordo (University Carlos III of Madrid, Spain)

Oral Presentations

Pre KNP - Effects Of Processing Defects On Damage Tolerance Of Sintered Beta Titanium Alloys Under Static And Dynamic Loading
Xu, P (Helmholz-Zentrum Geesthacht, Germany); Ebel, T; Pyczak, F (Helmholz-Zentrum Geesthacht, Germany)

Comparison Of Two Different Methods To Manufacture Pure Copper By Laser-powder Bed Fusion (L-PBF)
Baffie, T (CEA-LITEN, Univ. Grenoble-Alpes, France); De Terris, T; Ribiere, C (CEA-LITEN, Univ. Grenoble-Alpes, France)

Session 14: SIS FM: Functional Materials for Thermal Management

Topic: Materials
Session Chair: Dr Sebastian Boris Hein (Fraunhofer IFAM Bremen, Germany); Dr Peter Kjeldsteen (Sintex a/s, Denmark)

Oral Presentations

Thermal Management Solutions with Advanced Composite Materials and Additive Manufacturing
Weissgerber, T (Fraunhofer IFAM Dresden, Germany); Hutsch, T; Studnitzky, T; Klöden, B; Andersen, O (Fraunhofer IFAM Dresden, Germany)

Solid state thermal control devices and circuits
Kitanovski, A (University of Ljubljana, Slovenia)

Adding energy harvesting into thermal management – a win-win solution
Yin, H (TENology ApS, Denmark)

Session 15: AM Beam Based Technologies: Steels

Topic: Consolidation technologies
Session Chair: Dr Anke Kaltsch (RWTH Aachen University, Germany)

Oral Presentations

Impact And Tensile Properties Of Superduplex Stainless Steels Built Using Additive Manufacturing
Dixit, N (Sandvik Additive Manufacturing, Sweden); Larsson, A; Wallin, J; Kissel, H (Sandvik Additive Manufacturing, Sweden)

Parameter Optimization For Laser Powder Bed Fusion Of Case Hardening Steels
Schmitt, M (Fraunhofer IGCV, Germany); Schlick, G; Schilp, J; Reinhart, G (Fraunhofer IGCV, Germany)
Influence Of The Powder Particle Size Distribution On The Microstructure Of Laser Powder Bed Alloyed Cold Work Tool Steel
Koehler, M-L (RWTH Aachen, Germany); Herzog, S; Kalletsch, A; Broeckmann, C (RWTH Aachen, Germany); Norda, M; Petzoldt, F (Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Germany)

Mechanical Evaluation Of Punching Tools Manufactured From A Cold Work Tool Steel Via Electron Beam Melting (EBM)
Bottero, C (Mid Sweden University, Sweden); Selte, A; Maestro, J; Katsanos, D (Uddevollums AB, Sweden); Sjöström, W; Rännar, L (Mid Sweden University, Sweden)

Session 16: Compaction and Application

Topic: Consolidation technologies
Session Chair: Dr Pierre Blanchard (Welding Alloys Group, France), Prof Herbert Danninger (Technische Universität Wien, Austria)

Oral Presentations

Die Wall Lubrication Vs. Bulk Lubrication: Microstructure, Mechanical Properties And Dimensional And Geometrical Precision Of Low Alloyed Steels
Molinari, A (University of Trento, Italy); Toledo Dos Santos, D; Cristofolini, I (University of Trento, Italy); Zadora, M; Girardini, L (K4Sint Srl, Italy); Bordin, S; Libardi, S (TFM Group SpA, Italy); Albonetti, P (B.U. Advanced Technologies - Sacmi Imola S.C., Italy)

Productivity And Quality Improvements Achievable Through High-performance Lubricant Compositions In Standard Powder Metallurgy Compaction
Paris, V (Rio Tinto Metal Powders, Canada); Mousavinab, S (Rio Tinto Metal Powders, Canada); Thomas, Y (National Research Council Canada, Canada)

Influence Of Materials, Shape, And Process Variables On The Densification Equation Coefficients
Zago, M (University of Trento, Italy); Molinari, A; Cristofolini, I (University of Trento, Italy); Rambelli, A; Foschi, D (Sacmi Imola S.C., Italy)

Powder Metallurgy Fabrication And Characterization Of Ti6Al4V|xCu Alloys For Biomedical Applications
Olmos, L (UMSNH, Mexico); Chavez, J; Omar, O (Universidad de Guadalajara, DIP, Mexico); Solorio, V (Tecnológico Nacional de México.ITMorelia, Mexico); Bouvard, D (Univ. Grenoble Alpes, CNRS, France); Vergara, H (División de Estudios de Posgrado e Investigación, TecNM|Instituto Tec

Poster Presentations

Simulation Of The Process Of Gas Turbine Blades Parts Formation From Inhomogeneous Material.
Shishkina, Y (I.M.Frantsevich Institute for Problems of Materials Sciences (IPMS NASU), Ukraine); Bagluk, G; Kirilyuk, S (I.M.Frantsevich Institute for Problems of Materials Sciences (IPMS NASU), Ukraine); Titov, V (National Technical University of Ukraine “Igor Sikorsky Kyiv Polytechnic Institute“ (NTUU KPI), Ukraine)

Session 17: Magnetic and Iron based Functional Materials
Topic: Materials
Session Chair: Dr Yoko Pittini-Yamada (Meyer Sintermetal AG, Switzerland)

Oral Presentations

Pre KNP - Magnetic Aging, Strain Aging And Blue Brittleness - The Negative Role Of Nitrogen In PM Technology
Schneider, M (GKN Sinter Metals Engineering GmbH, Germany)

Fe Based Composites With Unique Damping Behaviour Prepared By Press-Sinter Technology
Hutsch, T (Fraunhofer IFAM, Germany); Weissgerber, T; Walther, G (Fraunhofer IFAM Dresden, Germany)

Fundamental Study Of The Hydrogen Decrepitation Process Of Nd-Fe-B Alloys
Martin, J-M (CEIT-BRTA, Spain); Checa, B-L; Burgos, N; Sarriegui, G (CEIT-BRTA, Spain)

Development Of A Lightweight, Nickel-Free, Non-magnetic Steel Powder And MIM Feedstock Made Thereof, For The Manufacture Of Components For A New Generation Of Hand-held Electronic Devices
Hermant, M (BASF SE, Germany); Davies, P; Harris, L (Sandvik Additive Manufacturing, United Kingdom); Bettini, E (Sandvik Additive Manufacturing, Sweden); Blömacher, M (BASF SE, Germany)

Poster Presentations

Improving Thermal Conductivity Of Microporous Catalytic Cermet Composites By Metal Foam Insertion
Ilyushchanka, A (O.V. Roman Powder Metallurgy Institute, Belarus); Smorygo, O; Vazhnova, A; Mikutski, V (O.V. Roman Powder Metallurgy Institute, Belarus); Tikhov, S; Valeev, ; Minyukova, T (Boreskov Institute of Catalysis, Russia)

The Effect Of The Introduction Of An Iron-chromium Alloy Powder On The Strength And Tribotechnical Properties Of A Sintered Friction Material Based On Copper
Ilyushchanka, A (O.V. Roman Powder Metallurgy Institute, Belarus); Lishok, A; Rahavy, A (O.V. Roman Powder Metallurgy Institute, Belarus)

Composition Al2O3|FeSiTiAl  For High Temperature Microwave Absorbing Application
Ilyushchanka, A (O.V. Roman Powder Metallurgy Institute, Belarus); Baray, S; Letsko, A (O.V.Roman Powder Metallurgy Institute, Belarus); Patra, M; Saini, L (DRDO, India)
**Session 18: SIS MIM: Sustainability of MIM**

**Topic:** Consolidation technologies  
**Session Chair:** Prof Frank Petzoldt (Fraunhofer IFAM Bremen, Germany); Georg Breitenmoser (Parmaco AG, Switzerland)

**Oral Presentations**

- **Sustainability of Inert Gas Atomised Powders for Additive Manufacturing and MIM**  
  Davies, P-A (Sandvik Osprey, United Kingdom)

- **Sustainability in MIM: A feedstock producer’s view**  
  Staudt, T (BASF, Germany)

- **Sustainability of the MIM process from the perspective of a parts manufacturer**  
  Schwarz, J (GKN Sinter Metals, Germany)

**Session 20: Hot Isostatic Pressing**

**Topic:** Consolidation technologies  
**Session Chair:** Dr Anke Kaletsch (RWTH Aachen University, Germany), Mr James Shipley (Quintus Technologies AB, Sweden)

**Oral Presentations**

- **Reduced Oxygen Content Of PM HIP Materials For Nuclear Power Plants**  
  Heikilä, I (Swerim, Sweden); Strandh, E; Eggertson, C (Swerim, Sweden); Johansson, F (MTC Powder Solutions, Sweden); Angré, A (Linde GAS, Sweden); Gårdstam, J (Quintus Technologies, Sweden); Forssgren, B (Ringhals AB, Sweden); Geneves, T (Framatome, France)

- **Super Duplex Stainless Steels Obtained By Advanced Manufacturing Technologies: PM-HIP And Laser Directed Energy Deposition**  
  Ordas, N (Ceit, Spain); Azeleeta, M; Ausejo, S; Iturriza, I (Ceit, Spain); Calleja, B; Rodriguez, R (Tubaceex Innovación AIE, Spain); Guraya, T (Universidad del País Vasco/Euskal Herriko Unibertsitatea, Spain); Lopez-Galilea, I (Ruhr-Universität Bochum, Germany)

**Poster Presentations**

- **A Comparative Study Of The Microstructure And Mechanical Properties Of The High Temperature Ti-based Alloy Products Fabricated By PM HIP Using The Rapidly Quenched Powder And By Traditional Technology**  
  Shulga, A (National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Russia)

**Session 21: High Temperature Applications**

**Topic:** Materials  
**Session Chair:** Dr Georg Josef Schlick (Fraunhofer IGCV, Germany)

**Oral Presentations**

- **High Temperature Deformation Behaviour Of A Ni-based Superalloy Astroloy Processed Via Spark Plasma Sintering**  
  Sabirov, I (IMDEA Materials Institute, Spain); Aristizabal, M; Iturriza, I (CEIT-BRITA, Spain); Potenciano, A (Carlos III University of Madrid, Spain); Torralba, J-M (IMDEA Materials Institute, Spain); Fernandez-Valdes, A (Centro de Investigación en Nanomateriales y Nanotecnología - CINN, Spain)

- **Assessment Of New Crack Reduction Strategies For Cobalt Based Superalloys Processed By Directed Energy Deposition**  
  Froeliger, T (ONERA, France); Toulabi, L; Locq, D (ONERA, France); Chauvet, E; Ferrandez, A (Poly-Shape, France); Dendievel, R (Univ. Grenoble Alpes, CNRS, Grenoble INP, SIMaP, France)

- **Chromium As Alloying Element In Mo Base Material: Mechanical Behavior At High Temperatures**  
  Gierl-Mayer, C (TU Wien, Austria); Stepan, T; Danninger, H (TU Wien, Austria); Caliskanoglu, O; Weinberger, T (Sirtetc GmbH, Austria)

- **A Comparison Of Different Approaches To Study The Porosity And Surface Defects For Electron Beam Melting**  
  Ghibaudo, C (Politecnico di Torino, Italy); Rizza, G; Marchese, G; Galati, M; Iuliano, L; Ugues, S; Biamino, S (Politecnico di Torino, Italy)

**Session 22: SIS HM: Outlook on Hard Materials**

**Topic:** Materials  
**Session Chair:** Prof Luis Miguel Llanes (Catalunya Univ Polytecnica, Spain); Mrs Susanne Norgren (Sandvik, Sweden)

**Oral Presentations**

- **The evolving regulation of cobalt**  
  Blakeney, M (The Cobalt Institute, United Kingdom)

- **To be announced**  
  Zeiler, B (International Tungsten Industry Association, Austria)

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**Wednesday 20 October**

**Session 18: SIS MIM: Sustainability of MIM**

**Topic:** Consolidation technologies  
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**Oral Presentations**

- **High Temperature Deformation Behaviour Of A Ni-based Superalloy Astroloy Processed Via Spark Plasma Sintering**  
  Sabirov, I (IMDEA Materials Institute, Spain); Aristizabal, M; Iturriza, I (CEIT-BRITA, Spain); Potenciano, A (Carlos III University of Madrid, Spain); Torralba, J-M (IMDEA Materials Institute, Spain); Fernandez-Valdes, A (Centro de Investigación en Nanomateriales y Nanotecnología - CINN, Spain)

- **Assessment Of New Crack Reduction Strategies For Cobalt Based Superalloys Processed By Directed Energy Deposition**  
  Froeliger, T (ONERA, France); Toulabi, L; Locq, D (ONERA, France); Chauvet, E; Ferrandez, A (Poly-Shape, France); Dendievel, R (Univ. Grenoble Alpes, CNRS, Grenoble INP, SIMaP, France)

- **Chromium As Alloying Element In Mo Base Material: Mechanical Behavior At High Temperatures**  
  Gierl-Mayer, C (TU Wien, Austria); Stepan, T; Danninger, H (TU Wien, Austria); Caliskanoglu, O; Weinberger, T (Sirtetc GmbH, Austria)

- **A Comparison Of Different Approaches To Study The Porosity And Surface Defects For Electron Beam Melting**  
  Ghibaudo, C (Politecnico di Torino, Italy); Rizza, G; Marchese, G; Galati, M; Iuliano, L; Ugues, S; Biamino, S (Politecnico di Torino, Italy)

**Session 22: SIS HM: Outlook on Hard Materials**

**Topic:** Materials  
**Session Chair:** Prof Luis Miguel Llanes (Catalunya Univ Polytecnica, Spain); Mrs Susanne Norgren (Sandvik, Sweden)

**Oral Presentations**

- **The evolving regulation of cobalt**  
  Blakeney, M (The Cobalt Institute, United Kingdom)

- **To be announced**  
  Zeiler, B (International Tungsten Industry Association, Austria)
### Session 23: AM Sinter Based Technologies: Consolidation-Based Methods in AM

**Topic:** Consolidation technologies

**Session Chair:** Dr. Sofía Tsipas (University Carlos III of Madrid, Spain)

### Oral Presentations

**Experimental Investigations Of Extrusion 3D Printing And Sintering Of Copper MIM Feedstock**

Singh, G (University of Grenoble Alpes, France); Missiaen, J; Bouvard, D; Chaix, J (University of Grenoble Alpes, France)

**Improving The Removability Of Support Structures Using Ceramic Separation Layers In A Metal 3D Printing Process**

Dreier, T (University of Rostock, Chair of Microfluidics, Germany); Schmidt, E-S; Seitz, H (University of Rostock, Chair of Microfluidics, Germany)

**A Comparative Study Of Mechanical Properties For MIM Standard 17-4PH Samples Manufactured Via Binder Jetting And Material Extrusion**

Masurtschak, S (LORTEK S.COOP, Spain); Irastorza, U; San Sebastian Ormazabal, M (LORTEK S.COOP, Spain); Andres, U (MIM TECH ALFA S.L., Spain); Rodriguez Guérrrez, P (EIPC EIBAR PRECISION CASTING, S.L., Spain)

**Mechanical Properties Of 3D Printed MAX Phases**

Tsipas, S (University Carlos III de Madrid, Spain); Tabares, E; Cifuentes, S-C; Jimenez-Morales, A (University Carlos III de Madrid, Spain); Kitzman, M; Neubauer, E (RHP Technology GmbH, Austria)

### Poster Presentations

**Feasibility Study On Processing Different Metal Injection Moulding Feedstocks With Piston-based Feedstock Fabrication**

Welkens, L (Fraunhofer IAPT, Germany); Janzen, K; Langerich, J (Fraunhofer IAPT, Germany); Emmelmann, C (Hamburg University of Technology, Germany)

### Session 24: MIM Feedstocks

**Topic:** Consolidation technologies

**Session Chair:** Mr. Marko Maetzig (ARBURG GmbH + Co KG, Germany)

### Oral Presentations

**Unraveling The Homogeneity Of MIM Feedstock**

Medkour, S (BASF SE, Germany); Hening, I; Koban, W; Hermant, M (BASF SE, Germany)

**Pre KNP - Effect Of Backbone Selection On The Solvent Debinding Of Metal Injection Moulding Feedstocks**

Kukla, C (Montanuniversität Leoben, Austria); Cano, S; Schuschnigg, S; Holzer, C; Gonzalez-Gutierrez, J (Montanuniversität Leoben, Austria)

**Feedstocks For Powder Injection Molding And Material Extrusion: Description Of Flow Performance**

Hauserova, B (Tomas Bata University, Czech Republic); Filip, P (Czech Academy of Sciences, Czech Republic)

**Pre KNP - Accelerated PIM Processing By Chemical Modifications In The Binder During The Debinding Stage**

Berges, C (Universidad de Castilla-La Mancha, Spain); Naranjo, J-A; Herranz, G (Universidad de Castilla-La Mancha, Spain)

**Pre KNP - Development Of High-entropy Alloys Using Field Assisted Sintering And Gas Atomized Commodity Powders As Raw Materials**

Torralba, J-M (Universidad Carlos III de Madrid, IMDEA Materials Institute, Spain); Venkatesh Kumarana, S (IMDEA Materials Institute, Spain)

**New High Entropy Alloys Compositions: From Design To Mechanical Characterization**

Olmos, P (Universidad Carlos III de Madrid, Spain); Monclus, M; Molina-Aldagueria, J (IMDEA Materiales, Spain); Prieto, E (Universidad Carlos III de Madrid, Spain)

**Study Of The Thermal Stability Of ODS Ferritic Stainless Steel Through In-situ Annealing Monitoring By TEM**

Campos, M (Universidad Carlos III de Madrid, Spain); Meza, A; Rabana, M-E (Universidad Carlos III de Madrid, Spain); Hernández-Mayoral, M (CIEMAT, Spain)

**Pre KNP - Accelerated PIM Processing By Chemical Modifications In The Binder During The Debinding Stage**

Berges, C (Universidad de Castilla-La Mancha, Spain); Naranjo, J-A; Herranz, G (Universidad de Castilla-La Mancha, Spain)

**Session 25: ODS and High Entropy Alloys**

**Topic:** Materials

**Session Chair:** Mr. Peter Kjeldsteen (Sintex a/s, Denmark)

**Pre KNP - Accelerated PIM Processing By Chemical Modifications In The Binder During The Debinding Stage**

Berges, C (Universidad de Castilla-La Mancha, Spain); Naranjo, J-A; Herranz, G (Universidad de Castilla-La Mancha, Spain)

**Assessment Of Refractory Based High Entropy Alloys For High Temperature Tooling Applications**

Neubauer, E (RHP Technology GmbH, Austria); Kovacova, Z; Kitzmantel, M (RHP Technology GmbH, Austria)

**Study Of The Thermal Stability Of ODS Ferritic Stainless Steel Through In-situ Annealing Monitoring By TEM**

Campos, M (Universidad Carlos III de Madrid, Spain); Meza, A; Rabana, M-E (Universidad Carlos III de Madrid, Spain); Hernández-Mayoral, M (CIEMAT, Spain)

**Session 26: SIS HM: HM Club Projects of EPMA**

**Topic:** Materials

**Session Chair:** Prof. Luis Miguel Llanes (Catalunya University Polytechnica, Spain); Mrs Susanne Norgren (Sandvik, Sweden)

**Recent & Current Club Projects of EPMA**

(Micromech II, Simucrack IV, Kinetic II)

**Roebuck, B (NPL, United Kingdom)**

**Future Activities of Club Projects**

To be announced
Session 27: AM Beam Based Technologies: Related Process

Topic: Consolidation technologies
Session Chair: Dipl.-Ing Claus Aumund-Kopp (Fraunhofer IFAM, Germany)

Oral Presentations

Fabrication Of Sensor-Integrated Parts Using Cold Spray Additive Manufacturing
Kindermann, P (Fraunhofer IGCV, Germany); Binder, M; Wunderer, M (Fraunhofer IGCV, Germany); Straßer, M (University of Munich, Applied Sciences, Germany)

Adhesion Efficiency Between Shape Memory Wires Of Nitinol In Aluminum Alloy Matrix Produced By Indirect Additive Manufacturing
Cruz, F (Univ. Coimbra, Portugal); Alves, B; Gatoes, D; Freitas Rodrigues, P; Vieira, T; Ramos, S (Univ. Coimbra, Portugal)

Metallic Extrusion Additive Manufacturing Technology (MEX) Versus Selective Laser Melting (SLM)
Reis Cruz, F (Univ. Coimbra, Portugal); Gatoes, D; Vieira, T (Univ. Coimbra, Portugal); Santos, C (IPL - Instituto Politécnico de Leiria, Portugal)

SLM Processing Of Tool Steels: Microstructure And Mechanical Properties Optimization By thermal Treatment.
San Sebastian, M (LORTEK S. COOP, Spain); Garciandia, F; Mancisidor, A-M (LORTEK S. COOP, Spain)

Session 28: PIM Materials

Topic: Consolidation technologies
Session Chair: Dr Gemma Herranz (Castilla La Mancha Univ, Spain)

Oral Presentations

Metal Injection Moulding Of High Purity Tungsten And Molybdenum
René, R (Formatec Ceramics, Netherlands)

Enhancement Of Fatigue Properties Of MIM Ti-6Al-4V By Microstructural Refinement
Limberg, W (Helmholtz-Zentrum Geesthacht, Germany); Fang, Z-Z; Sun, P (University of Utah, USA); Ebel, T (Helmholtz-Zentrum Geesthacht, Germany); Gerdts, F (Element22 GmbH, Germany)

Superelastic Behaviour Of Low Modulus Alloy Ti-35Nb-6Ta Processed By MIM And FFF
Otte, A (Karlsruhe Institute of Technology, Germany); Limberg, W; Ebel, T; Xu, P (Helmholtz-Zentrum Geesthacht, Germany)

Co-Sintering Of Cermet And Black Zirconia For Aesthetic Products
Mannschatz, A (Fraunhofer IKT, Germany); Szokup, S; Müller-Köhn, A; Pötschke, J; Moritz, T; Michaelis, A (Fraunhofer IKT, Germany); Von Witzleben, M; Jegust, S (Inmatec Technologies GmbH, Germany)

Session 29: Light Weight AM

Topic: Materials
Session Chair: Dr José Manuel Martin (CEIT, Spain)

Oral Presentations

Process-Microstructure-Property-Relationship Of The Near-Alpha Ti6242S Alloy Fabricated By Laser Powder Bed Fusion
Fleißner-Rieger, C (Montanuniversität Leoben, Austria); Clemens, H; Mayer, S (Montanuniversität Leoben, Austria); Pfeifer, T (Pankl Racing Systems AG, Austria); Jörg, T (voestalpine BÖHLER Edelstahl GmbH & Co KG, Austria)

Evaluation Of The Processing Capability Of Aluminium Alloy 6061 For Metal Binder Jetting
Hein, S-B (Fraunhofer IFAM, Germany); Wieland, S; Weber, D (Fraunhofer IFAM, Germany)

On The Formation Of Aluminium Matrix Composites With Alumina Additives By Laser Powder Bed Fusion
Gromov, A (National University of Science and Technology MISIS, Russia); Nalivaiko, A; Ozherelkov, D; Arnautov, A (National University of Science and Technology MISIS, Russia)

Poster Presentations

Study Of Al-SiC Composites Manufactured By Laser Powder Bed Fusion (L-PBF)
Manlay, M (CEA, France); Soulier, M; Flament, C; Garandet, J; Chaffron, L (CEA, France)

Session 31: AM Beam Based Technologies: Process Development and Simulation

Topic: Consolidation technologies
Session Chair: Prof jie Zhou (Delft Technical University, Netherlands)

Oral Presentations

Pre KNP - Efficient Process Parameter Optimisation Procedure In Laser Powder Bed Fusion
Montero-Sistiaga, M (NLR (Netherlands Aerospace Centre), Netherlands); De Smit, M; Haagsma, R; Bennett, I (NLR (Netherlands Aerospace Centre), Netherlands)

Towards Increased Quality Of Ti-6Al-4V Medical Parts By Using Argon-Helium To Reduce Spatter Formation
Dubiez-Le Goff, S (Linde AG, Germany); Fischer, M; Volpi, G (3D MEDLAB, France); Forêt, P (Linde AG, Germany)

Laser Powder Bed Fusion Of Hot-working Tool Steel 1.3397 Processed At Elevated Temperatures
Ma, T (RISE, Sweden); Vikner, P (Aubert&Duval, France)

Analytical And Numerical Modeling Of Powder Spreading In Powder-Bed Processes For Additive Manufacturing
Soulier, M (CEA, France); Burr, A; Roux, G; Laucournet, R; Maisonneuve, J (CEA, France)
Please note that “pre-KNP” refers to pre-selected KeyNote Papers. The final selection will be done in June.

**Poster Presentations**

**Effect Of Gas Flow Rates On Powder Stream Characteristics And Their Potential Consequences On Alloy Deposition From Coaxial Nozzles**
Mouchard, A (University of Limerick, Ireland); Tanner, D; Pomery, M; Robinson, J (University of Limerick, Ireland); Mcauliffe, B (Lufthansa Technik Turbine Shannon, Ireland); Donovan, S (Rolls-Royce plc, United Kingdom)

**Session 32: Gas Atomizer: Theory and Design**
**Topic:** Powder production
**Session Chair:** Mr Peter Vikner (Aubert&Duval, France), Dr Pierre Blanchard (Welding Alloys Group, France)

**Oral Presentations**

**Numerical Simulation And Experimental Testing Of Different Close-Coupled Gas Atomiser Designs**
Urionabarrenetxea Gomez, E (CEIT-Basque Research and Technology Alliance (BRTA), Spain); Amatriain, A; Avello, A; Martin, J-M (CEIT-Basque Research and Technology Alliance (BRTA), Spain)

**Analysis Of The Average Particle Size Lubanska’s Mathematical Model For A Close Coupled Gas Atomizer**
Costa Da Silva, F (Institute for Technological Research - IPT, Brazil); Fiocco Colombo, G; Leite De Lima, M (Institute for Technological Research - IPT, Brazil)

**Powder Production For Advanced Hot Isostatic Pressing – Technical Features And Challenges**
Cornelius, J (INTECO melting and casting technologies GmbH, Austria); Klochay, V; Ryabtsev, A; Yavtushenko, P (PJSC Ruspolymer, Russia); Holzgruber, H; Scheriau, A (INTECO melting and casting technologies GmbH, Austria)

**Poster Presentations**

**An Investigation Of Powders Of A Heat-resistant Composite Cobalt-based Material Prepared By VIGA Method**
Ilyushchanka, A (O.V. Roman Powder Metallurgy Institute, Belarus); Letsko, A; Talako, T; Reutzionak, Y; Machnev, V (O.V. Roman Powder Metallurgy Institute, Belarus); Yulkhvid; Sanin, V; Andreev, S (Mherzhavov Institute of Structural Macrokinetics and Materials Science, Russia)

Thursday 21 October

**Session 33: Light Weight Materials**
**Topic:** Materials
**Session Chair:** Dr Martin Bram (Forschungszentrum Jülich GmbH, Germany)

**Oral Presentations**

**Development Of TiN Coatings By Gas Nitriding On AM Ti-6Al-4V Open-Cell Porous Structures For PEMFC Bipolar Plates**
Lozares, J-M (Universidad Carlos III de Madrid, Spain); Gordo Odériz, E; Romero Villarreal, C (Universidad Carlos III de Madrid, Spain); Urrea Alcazar, J; Blasco Puchades, J-R (AIDIMME, Spain)

**Poster Presentations**

**Structure Of Porous Materials Based On Aluminosilicate Powders And Basalt Fiber**
Savich, V (O.V. Roman Powder Metallurgy Institute, Belarus); Azarau, S; Drobysch, A; Yeutukhova, T (Belarusian National Technical University, Belarus); Formikha, I; Hamzeleva, T (O.V. Roman Powder Metallurgy Institute, Belarus); Patsiushyk, Y (State Research and Production Powder Metallurgy Association, Belarus)

**Effect Of Powder Geometry And Sintering Temperature Managed By Mechanically Milled On Pressureless Sintering Of Mg Powders With AC Field Assisted Sintering Technique (FAST)**
YahşI, Y (Ege University, Turkey); Ipek, R; Eroglu, S-M; Ferik, S-R; Tekin, T (Ege University, Turkey)

**Session 34: SIS P&S: CO2 reduction in Press&Sinter - Part I**
**Topic:** Consolidation technologies
**Session Chair:** Dr Cesar Molins (AMES Group, Spain); Dr Caroline Larsson (Höganäs AB, Sweden)

**Oral Presentations**

**Innovation to drive net zero carbon operations in material manufacturing**
Painter, N (Ricardo Energy and Environment, United Kingdom); Odeh, N (Ricardo Energy and Environment, United Kingdom)

**CO2 Reduction in Press and Sinter parts making**
Gutes, M (PMG Holding GmbH, Germany)

**The Road towards Climate Neutrality for the PM Industry from a powder production perspective**
Vidarsson, H (Höganäs AB, Sweden)

**Session 35: AM Beam Based Technologies: Special Materials**
**Topic:** Consolidation technologies
**Session Chair:** Dr.-Ing Thomas Weißgärber (Fraunhofer IFAM, Germany)

**Oral Presentations**

**Mechanical Properties And Microstructural Analysis Of Fe-Co Based Soft Magnetic Alloys Manufactured By Laser Powder Bed Fusion**
Mancisidor, A-M (Lortek S.COOP, Spain); Garcianida, F; Escribano, R; San Sebastian, M; Vázquez, L (Lortek S.COOP, Spain)

Microstructures And Mechanical Properties Of A Modified Al7075 Alloy Processed By Additive Manufacturing
Reux, G (CEA de Grenoble, France); Opprecht, M; Garandes, J; Flamant, C (CEA de Grenoble, France)

Session 36: Alternative Powder Production Processes
Topic: Powder production
Session Chair: Dr Raquel De Oro Calderon (TU Wien, Austria), Prof Elena Gordo (University Carlos III of Madrid, Spain)

Oral Presentations
Spherical Iron Powder Manufactured By Hydrogen Reduction For MIM And AM Application
Walther, G (Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Branch Lab Dresden, Germany); Schubert, T; Weißgärber, T (Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Branch Lab Dresden, Germany); Fries, M (Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Germany); Hoffmann, M (OSTEC GmbH, Germany)

Atomization Of Ti64 Alloy Using The EIGA Process: Upscaling And Process Instrumentation
Deborde, A (MetaFensch, France); Sasaki, L; Hans, S (Aubert & Duval, France); Delfosse, J (Safran Tech, France); Jourdan, J (JLL - Institut Jean Lamour, France); Mcdonald, N (MetaFensch, France)

Use Of Mechanical Alloying To Develop Novel Titanium-Niobium Alloy Powders Suitable For The Selective Laser Melting Process
Borgman, J (Loughborough University, United Kingdom); Wang, J; Zani, L; Conway, P; Torres-Sanchez, C (Loughborough University, United Kingdom)

Poster Presentations
Influence Of High-Energy Ball-Milling Treatment On The Structure Of Shs-Powders Based On Tantalum Diboride
Ilyushchanka, A (State Scientific Institution «O.V. Roman Powder Metallurgy Institute», Belarus); Talako, T; Reutsionaik, Y; Letsko, A; Machnev, V (State Scientific Institution «O.V. Roman Powder Metallurgy Institute», Belarus); Prikhna, T (V.Bakul Institute for Superhard materials NASU UKRAINE, Ukraine)

Session 37: Alternative Hardmetals
Topic: Materials
Session Chair: Dr Steven Moseley (Hilti Corporation, Liechtenstein)

Oral Presentations
Pre KNP - High Entropy Based Hardmetals
Potschke, J (Fraunhofer IKTS, Germany); Vornberger, A; Von Spalden, M (Fraunhofer IKTS, Germany)

Mechanical Properties Of WC-FeNiCoCr And WC-NiCoCrTiAl Based Hardmetals
Moreno, J-M (CEIT-BRTA, Spain); Soria Biurrun, T; Lozada Cabezaz, L (CEIT-BRTA, Spain); Martinez Pampillega, R; Ibarreta Lopez, P (FMD CARBIDE, Fabricación Metales Duros, S.A.L., Spain)

(W,Mo)-based Hardmetals With Ni-rich Binders
Lengauer, W (Vienna University of Technology, Austria); Hatzl, G; Fürst, M (Vienna University of Technology, Austria)

WC-based Cemented Carbides With Fe-Mn And Fe-Mn-Si Binders
De Oro Calderon, R (TU Wien, Austria); Lunzer, M (TU Wien, Austria)

Session 38: SIS P&S: CO2 reduction in Press&Sinter - Part 2
Topic: Consolidation technologies
Session Chair: Dr Cesar Molins (AMES Group, Spain); Dr Caroline Larsson (Höganäs AB, Sweden)

Oral Presentations
An overview on energy efficiency of presses and latest trends for consumption optimization
Albonetti, P (SACMI Imola S.C., Italy)

Opportunities for CO2-reduction in sintering furnaces
Khartik, N-K (Cremer Thermoprozessanlagen GmbH, Germany)

Sintering atmosphere in heat treatment furnaces - Contribution of industrial gases for reducing the carbon footprint
Bustamante Valencia, L (Air Liquide, France); Coudurier, L (Air Liquide, France); Spizizza, A (Air Liquide, Italy)

Sustainability and carbon footprint: High Temperature Sintering (HTS) of Structural Parts Molinari, A (University of Trento, Italy); Volker, A (PM Solutions, Germany); Kruzhavanov, V (PM Consulting, Germany)

Session 39: AM Sinter based Technologies - Other Processes
Topic: Consolidation technologies
Session Chair: Dr Christian Kukla (Montanuniversitaet Leoben, Austria)

Oral Presentations
Metal Part Manufacturing By A Combination Of Fused Filament Fabrication And Gel Casting
Riecker, S (Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Germany); Studnitzky, T; Andersen, O; Weißgärber, T (Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Germany)

Sinter-Based Additive Manufacturing Using The Innovative MoldJet Process
Teuber, R (Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Germany); Andersen, O; Studnitzky, T; Weißgärber, T (Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Germany)
Session 40: Influence of Powder Process on Material Properties

Topic: Powder production

Session Chair: Prof Marco Actis Grande (Politecnico di Torino, Italy), Dr José Manuel Martin (CEIT, Spain)

Oral Presentations

Assessment of Aluminium Alloy Powder Properties For Additive Manufacturing
Franceschini, A (IRT M2P, France); Bellavoirole, M; Chehab, B (C-TEC, France); Deborde, A (METAFENSCH, France)

Investigations Of Air Atomized And Coarser Gas-atomized AISI12 Powders To Evaluate Cost Reduction Potentials For Additive Manufacturing Processes
Ludwig, I (Fraunhofer Research Institution for Additive Manufacturing Technologies IAPT, Germany); Kluge, M; Grube, M; Imgrund, P (Fraunhofer IAPT Additive Manufacturing Technologies, Germany); Emmelmann, C (Hamburg University of Technology - Institut für Laser- und Anlagenstechnik (iLAS), Germany)

Powder Spheroidization For Additive Manufacturing
Altenberend, I (Tekna Plasma Systems Inc, Canada); Vert, R; Dobrec, R (Tekna Plasma Systems Inc, Canada)

Session 41: Special Ferrous Materials

Topic: Materials

Session Chair: Dr Christian Gierz-Mayer (Vienna Technical University, Austria), Dr Robert Hellein (R&D Miba Sinter Group, Austria)

Oral Presentations

Sintered Hadfield Steel Containing Graphite Nodules In Its Volume
Ramos Filho, A-I (Federal University of Santa Catarina, Brazil); Schroeder, R; Oliveira Neves, G; Hammes, G; Binder, C; Nelmo Klein, A (Federal University of Santa Catarina, Brazil)

Processability And Mechanical Properties Analysis Of Dual Phase Low Alloy Steel Powder (DP 600) Produced On Multi-laser Powder Bed Fusion Systems
Zhu, D; (GKN Sinter Metals Engineering GmbH, Germany); Höges, S; Blümer, S (GKN Sinter Metals Engineering GmbH, Germany); Schade, C; Horvay, K (Hoeganaes Corporation, USA)

Session 43: Field Assisted Sintering Technologies

Topic: Consolidation technologies

Session Chair: Dr Ilígi Agote (TECNALIA, Spain), Dr Erich Neubauer (RHP-Technology GmbH, Austria)

Oral Presentations

Field Assisted Sintering Technique|Spark Plasma Sintering (FAST|SPS) As Promising Method For Upcycling Of Waste Materials
Bram, M (Forschungszentrum Jülich GmbH, Germany); Jäger, S (Bergische Universität Wuppertal, Germany); Prasad Mishra, T (Forschungszentrum Jülich GmbH, Germany); Weber, S (Ruhr-Universität Bochum, Germany)

Experimental Investigation Of The Relationship Between Powder Geometry And Sintering Pressure And Pore Ratio
Aydin, S-M (EGE UNIVERSITY, Turkey); Yahsi, Y; Tekin, T; Ferik, S-R; Ipek, R (EGE UNIVERSITY, Turkey)

Poster Presentations

Modeling And Implementation Of Solid-Phase Electric Discharge Synthesis Of Porous Permeable Titanium Powder Materials
Savich, V (O.V. Roman Powder Metallurgy Institute, Belarus); Golodok, R; Kuznechik, O; Smorygo, O (O.V. Roman Powder Metallurgy Institute, Belarus)

Mechanical And Micro-Structural Properties Of Mechanically Alloyed Mg22AL Sintered With Electric Field Technique
Tekin, T (EGE UNIVERSITY, Turkey); Aydin, S-M; Yahsi, Y; Ferik, S-R; Ipek, R (EGE UNIVERSITY, Turkey)

Session 44: Design and modelling

Topic: Tools for improving PM

Session Chair: Dr Mark Dougan (AMES SA, Spain)

Oral Presentations

Pre KNP - A Finite Element Based Model Of The Influence Of Density On PM Mechanical Properties
Andersson, M (Höganäs AB, Sweden); Schneider, M (GKN Sinter Metals Engineering GmbH, Germany)

"Design For Sintering 2" Club Project – Towards a New Methodology Describing The Anisotropy Of Dimensional Changes
Cristofolini, I (University of Trento, Italy); Molinari, A; Zago, M; Uku Uçak, O (University of Trento, Italy); Dougan M-J (AMES S.A., Spain); Schneider M (GKN Sinter Metals Engineering GmbH, Germany); Pedersen, P-H (Sintex a/s, Denmark); Bolitschek, J; Voglhuber, J (MIBA)
Sinter Austria GmbH, Austria; Vincenzi, B (EPMA, France)

**Numerical Simulation Of Solid-state Sintering Of Copper Parts Fabricated By Extrusion 3D Printing Using MIM Feedstock**
Singh, G (University of Grenoble Alpes, France); Bouvard, D; Missiaen, J; Chaix, J (University of Grenoble Alpes, France)

**Quantitative Simulations Of Sintering Of Titanium With Diffuse Interface Methods**
Ivanikov, V (Helmholtz-Zentrum Geesthacht, Germany); Ebel, T; Willumeit-Römer, R; Cyron, C (Helmholtz-Zentrum Geesthacht, Germany); Thomsen, F (Fliensburg University of Applied Sciences, Germany)

### Friday 22 October

#### Session 45: Hard metals Corrosion

**Topic:** Materials

**Session Chair:** Dr Gian Pietro De Gaudenzi (F.I.L.M.S. - Gruppo OMCD SpA, Italy)

**Oral Presentations**

**Corrosion Effects On Hertzian Contact Fatigue Behavior Of A WC-Co Cemented Carbide**
Zheng, Y (Universitat Politècnica de Catalunya, Spain); Fargues, G; Llanes, L (Universitat Politècnica de Catalunya, Spain); Lavigne, O (Hyperion Materials and Technologies, Spain)

**Corrosion Behaviour Of Ni-based Hardmetals In Aggressive Acid Media**
Pereira, P (DURIT - Metalurgia Portuguesa do Tungsténio, Lda, Portugal); Ferro Rocha, A-M; Bastos, A-C; Senos, (University of Aveiro, Portugal); Sacamento, J (DURIT - Metalurgia Portuguesa do Tungsténio, Lda, Portugal); Malheiro, L-F (Faculty of Engineering of the University of Porto, Portugal)

**The Corrosion Effects On CoNi-base Hardmetals With Different Co:Ni Ratios And Additives In Simulated Service Conditions**
De Gaudenzi, G-P (F.I.L.M.S. SpA - Gruppo OMCD, Italy); Garabelli, M; Tedeschi, S (F.I.L.M.S. SpA - Gruppo OMCD, Italy); Rossi, F (Università del Salento, Italy); Bozzini, B (Politecnico di Milano, Italy)

**Effect Of Cr Addition On The Corrosion Behaviour Of Hardmetals With Fe-based Co-free Binders**
Romero, C (Universidad Carlos III de Madrid, Spain); De Nicolás, M; Jiménez-Morales, A; Gordo, E (Universidad Carlos III de Madrid, Spain); Llanes, L-M (Universidad de Cataluna, Spain)

**Effect Of Using Zinc Recycled Cemented Tungsten Carbide Scrap Powder On The Slurry Erosion Of WC-6wt%Co Alloys**
Sacks, N (Stellenbosch University, South Africa); Mantu, M; Mokoena, L (University of the Witwatersrand, South Africa); Freemantle, C (Pilot Tools Pty Ltd, South Africa)

#### Session 46: SIS AM: Spare parts and Repair using AM

**Topic:** Applications

**Session Chair:** Mrs Adeline Riou (Erasteel, France); Dipl.-Ing Claus Aumund-Kopp (Fraunhofer IFAM, Germany)

**Oral Presentations**

**Additive Manufacturing For Repair: Comparison Of Power Bed Fusion And Solid-state Material Deposition Processes**
Toualbi, L (Onera, France)

**To be announced**
Schlingmann, T (EOS, Germany)

**Cold Spray Delivering for Defence – The Moment Critique**
Stewart, C (Speed3D, Germany)

#### Session 47: Testing & Evaluation

**Topic:** Tools for improving PM

**Session Chair:** Prof Didier Bouvard (Univ. Grenoble Alpes, France)

**Oral Presentations**

**Semi in-situ measurement of microstructural changes in PM steel during indentation**
Holmberg, A (Uppsala Universitet, Sweden); Kassman Rudolph, A; Wiklund, U (Uppsala Universitet, Sweden); Andersson, M (Höganas AB, Sweden)

**New Analytic Approach For Acoustic Material Testing**
Ritter, J (Germany, Germany)

**Deeper Process Understanding For Metal Binder Jetting By Using X-ray CT**
Sperling, P (Volume Graphics GmbH, Germany); Barthel, B (Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Germany)

#### Poster Presentations

**A Study Into The Automation Of Non-Destructive Inspection And Quality Assurance Control Of Ceramic Armour Plate And Parts**
Ilovea, M (Accent Pro 2000 S.R.L., Romania); Gundogdu, K; Stephenson, J-D (Integrity NDT, Turkey); Cerit, M; Tunç, A; Karalti, O; Mert, B (Nurol Teknoloji, Turkey)

**Results Of Studying Wettability Of Powder Materials In High-Viscosity Liquids**
Ilyushchanka, A (State Research and Production Powder Metallurgy Association, Belarus); Kryvans, A; Piatiushyk, Y (State Research and Production Powder Metallurgy Association, Belarus)

#### Session 48: Applications: Aerospace

**Topic:** Applications

**Poster Presentations**
Session Chair: Stefano Lionetti, Dr Pierre Blanchard (Welding Alloys Group, France)

Oral Presentations

Additive Manufacturing Of An Opto-mechanical Telescope: Evolution Of Powder, Material And Final Part Properties
Meisnar, M (European Space Agency, United Kingdom); Prante, N; Pambagian, L; Rohr, T (European Space Agency, United Kingdom)

Study Of Nickel-chromium Super Alloys Processed With Plasma Metal Deposition To Enable Additive Manufacturing Of Large Parts
Ariza, E (RHP Technology GmbH, Austria); Neubauer, E; Bielik, M; Meuthen, J; Kitzmantel, M (RHP Technology GmbH, Austria)

On LPBF Process Development And Optimization For Aerospace Applications
Cordova Gonzalez, L (University of Twente, Netherlands); Gibson, I (University of Twente, Netherlands)

Poster Presentations

How Ceramic 3D Printing Can Help Investment Casting To Compete With Direct Metal Laser Sintering
Mak, L (Admatec Europe BV, Netherlands); Saurwait, J (Admatec Europe BV, Netherlands); Ziemba, J (Aristocast, USA)

Session 49: Ferrous Materials for AM

Topic: Materials
Session Chair: Mr Alexander Angré (Carpenter Powder Products AB, Sweden)

Oral Presentations

Binder Jetting Of A Dual Phase Steel - From Powder To Part
Schak, C. (GKN Sinter Metals Engineering GmbH, Germany); Schade, C; Horvay, K (Hoeganaes Corporation, USA); Höges, S (GKN Sinter Metals Engineering GmbH, Germany)

Heat Treatment And Mechanical Properties Of A Novel Ultrahigh Strength Co-free Maraging Steel Fabricated By Additive Manufacturing
Deirmina, F (Sandvik Additive Manufacturing, Sandvik Machining Solutions AB, Sweden); Bettini, E; Harlin, P; Dixit, N (Sandvik Additive Manufacturing, Sandvik Machining Solutions AB, Sweden); Lövquist, S (AB Sandvik Coromant, Sweden); Hagen, B; Magnusson, H (Swerim AB, Sweden); Holländer Pettersson, N; Lindwall, G (KTH Royal Institute of Technology, Sweden)

Influence Of Powder Properties On The Mixing Behavior Of Metal Powders In LPBF
Norda, M (Fraunhofer IFAM, Germany); Köhler, M-L; Herzog, S; Broeckmann, C (IWM Aachen, Germany); Petzoldt, F (Fraunhofer IFAM, Germany)

Preliminary Processability Evaluation Of H13 Steel By Electron Beam Melting
Ghibaudo, C (Politecnico di Torino, Italy); Saboori, A; Marchese, G; Gobber, F; Biamino, S; Ugues, (Politecnico di Torino, Italy)

Session 50: SIS AM: Sinter Based AM

Topic: Consolidation technologies
Session Chair: Mrs Adeline Riou (Erasteel, France); Dipl.-Ing Claus Aumund-Kopp (Fraunhofer IFAM, Germany)

Oral Presentations

Core value for Binder Jetting – Sintering process
Sakratidis, A (Digital Metal, Sweden)

Comparison of Laser Powder Bed Fusion, Binder Jet & MIM for Stainless Steel alloys
Davies, P (Sandvik, United Kingdom)

Market Analysis of Metal Binder Jetting
Schmidt-Lehr, M (AMPower, Germany)

Session 51: Testing & Evaluation: Powder Characterisation

Topic: Tools for improving PM
Session Chair: Dr Ken Mingard (NPL - National Physical Laboratory, United Kingdom)

Oral Presentations

Thermal Properties Of Powders Mixtures For In-situ Alloying In Laser Powder Bed Fusion Additive Manufacturing
Botete, R (Stellenbosch University, South Africa); Blaine, D; Becker, T (Stellenbosch University, South Africa)

Powder Reuse Assessment Through Advanced Characterization Techniques For Additive Manufacturing Applications
Carrozza, A (Politecnico di Torino, Italy); Virgillito, E; Aversa, A; Manfredi, D; Bondioli, F; Fino, P; Lombardi, M (Politecnico di Torino, Italy)

Application Of Novel And Standard Techniques To Evaluate Physical And Particulate Powder Properties For AM And The Impact On Part Properties
Blackwell, C (Manufacturing Technology Centre, United Kingdom); Dawes, J; Mills, F (Manufacturing Technology Centre, United Kingdom); Heikkilä, I; Strandh, E (Swerim AB, Sweden); Pambagian, L (European Space Agency, Netherlands); Meisnar, M (RHEA for European Space Agency, United Kingdom)

Batch To Batch Differentiation For Quality Control In Additive Manufacturing
Neveu, A (GranuTools, Belgium); Rigo, O (Sirris, Belgium); Lamy, G (University of Liège, Belgium); Francqui, F (GranuTools, Belgium)

Session 52: Applications: Energy

Topic: Applications
Session Chair: Dr Riccardo Casati (Politecnico di Milano, Italy), Dr Raquel De Oro Calderon (TU Wien, Austria)

Oral Presentations
Please note that “pre-KNP” refers to pre-selected KeyNote Papers. The final selection will be done in June.

Characterization Of Alloy 600 Heat Exchanger- reactor Mock-ups Obtained By Laser Powder Bed Fusion (L-PBF) Process
Baffie, T (CEA-LITEN, France); Gloriod, D; Anxionnaz-Minvielle, Z; Gaillard, G; Ribiere, C (CEA-LITEN, France)

Smart And Light Heat Exchangers Made With Additive Manufacturing
Tirelli, V (Aidro hydraulics & 3D Printing, Italy)

Exploring Custom Designs Of MIM Components To Optimise Large Scale Production Of SOFC Interconnectors
Herranz, G (Universidad de Castilla La Mancha, Spain); Gallego, A; Delfa, A; Berges, C; Naranjo, J-A; Antón, G (Universidad de Castilla La Mancha, Spain); Andújar, R; Campana, R (Centro Nacional del Hidrógeno- CNH2, Spain)

Lithography-based Copper Manufacturing And Debinding|Sintering
Resch, A (CEA-Liten, France); Roumanie, M (CEA-Liten, France); Croutxe-Barghorn, C (LPIM, France)
HYDROGEN VS. CARBON
A SURGE TOWARD LOW-OR ZERO-CARBON IRON AND STEEL PRODUCTION FOCUSES ON THE USE OF HYDROGEN

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SIS Presentations

Monday 18 October

◆ Session 2: SIS HIP: Optimization of PM parts using HIP
Topic: Consolidation technologies
13:00 – 14:30

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

Presentations:
The CALHIPSO project: towards a larger use of HIP technology in France
Bernard, F (University of Bourgogne, France)

◆ Session 6: SIS HIP: Key Industrial Applications of HIP
Topic: Consolidation technologies
14:45 – 16:15

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

Presentations:
Advanced Technology for Large Scale (ATLAS) PM-HIP
Gandy, D (EPRI, USA)
Faster manufacturing by additive manufacturing of shelled parts followed by HIP
Du Plessis, A (Stellenbosch University, South Africa)

Tuesday 19 October

◆ Session 10: SIS FM: Advances and Challenges for Hard Magnets
Topic: Materials
09:00 – 10:30

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

Presentations:
Overview on developments in bonded NdFeB magnets
Grieb, B (Magnequench GmbH, Germany)
Electric current assisted sintering of NdFeB magnet materials
Prasad Mishra, T (Forschungszentrum Jülich, IEK-1, Germany); Leich, L; Weber, S; Röttger, A (Institut für Werkstoffe, Germany); Krengel, M (Wilo SE, Germany); Bram, M (Institute of Energy and Climate Research, Germany)
Challenges in the additive manufacturing of Nd-Fe-B magnets
Weck, C (Fraunhofer IFAM, Germany)
Session 14: SIS FM: Functional Materials for Thermal Management

Topic: Materials

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

Presentations:
Thermal Management Solutions with Advanced Composite Materials and Additive Manufacturing
Weissgaerber, T (Fraunhofer IFAM Dresden, Germany); Hutsch, T; Studnitzky, T; Klöden, B; Andersen, O (Fraunhofer IFAM Dresden, Germany)

Solid state thermal control devices and circuits
Kitanovski, A (University of Ljubljana, Slovenia)

Adding energy harvesting into thermal management – a win-win solution
Yin, H (TEGnology ApS, Denmark)

Session 18: SIS MIM: Sustainability of MIM

Topic: Consolidation technologies

Session Chairs:
Prof Frank Petzoldt (Fraunhofer IFAM, Germany)
Mr Georg Breitenmoser (Parmaco Metal Injection Molding AG, Switzerland)

Presentations:
Sustainability of Inert Gas Atomised Powders for Additive Manufacturing and MIM
Davies, P-A (Sandvik Osprey, United Kingdom)

Sustainability in MIM: A feedstock producer's view
Staudt, T (BASF, Germany)

Sustainability of the MIM process from the perspective of a parts manufacturer
Schwarz, J (GKN Sinter Metals, Germany)
Wednesday 20 October

◆ Session 22: SIS HM: Outlook on Hard Materials 09:00 – 10:30
Topic: Materials

Session Chairs:
Prof Luis Miguel Llanes (Catalunya Univ Polytechnica, Spain)
Mrs Susanne Norgren (Sandvik, Sweden)

Presentations:
The evolving regulation of cobalt
Blakeney, M (The Cobalt Institute, United Kingdom)
To be announced
Zeiler, B (International Tungsten Industry Association, Austria)

◆ Session 26: SIS HM: HM Club Projects of EPMA 10:45 – 12:15
Topic: Materials

Session Chairs:
Prof Luis Miguel Llanes (Catalunya Univ Polytechnica, Spain)
Mrs Susanne Norgren (Sandvik, Sweden)

Presentations:
Historical Background of Club Projects
Moseley, S (Hilti, Liechtenstein)
Recent & Current Club Projects of EPMA (Micromech II, Simucrack IV, Kinetic II)
Roebuck, B (NPL, United Kingdom)
Future Activities of Club Projects
To be announced

Thursday 21 October

◆ Session 34: SIS P&S: CO2 reduction in Press&Sinter - Part 1 09:00 – 10:30
Topic: Consolidation technologies

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

Presentations:
Innovation to drive net zero carbon operations in material manufacturing
Painter, N (Ricardo Energy and Environment, United Kingdom)
CO2 Reduction in Press and Sinter parts making
Gutes, M (PMG Holding GmbH, Germany)
The Road towards Climate Neutrality for the PM Industry from a powder production perspective
Vidarsson, H (Höganäs AB, Sweden)

◆ Session 38: SIS P&S: CO2 reduction in Press&Sinter - Part 2
09:00 – 10:30
Topic: Consolidation technologies

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

Presentations:
An overview on energy efficiency of presses and latest trends for consumption optimization
Albonetti, P (SACMI Imola S.C., Italy)

Opportunities for CO2-reduction in sintering furnaces
Khartik, N-K (Cremer Thermoprozessanlagen GmbH, Germany)

Sintering atmosphere in heat treatment furnaces - Contribution of industrial gases for reducing the carbon footprint
Bustamante Valencia, L (Air Liquide, France); Coudurier, L (Air Liquide, France); Spizzica, A (Air Liquide, Italy)

Sustainability and carbon footprint: High Temperature Sintering (HTS) of Structural Parts
Molinari, A (University of Trento, Italy); Volker, A (PM Solutions, Germany); Kruzhanov, V (PM Consulting, Germany)

Friday 22 October

◆ Session 46: SIS AM: Spare parts and Repair using AM
09:00 – 10:30
Topic: Applications

Session Chairs:
Mrs Adeline Riou (Erasteel, France)
Dipl.-Ing Claus Aumund-Kopp (Fraunhofer IFAM, Germany)

Presentations:
Additive Manufacturing For Repair: Comparison Of Power Bed Fusion And Solid-state Material Deposition Processes
Toualbi, L (Onera, France)

To be announced
Schlingmann, T (EOS, Germany)

Cold Spray Delivering for Defence – The Moment Critique
Stewart, C (Speed3D, Germany)
Session 50: SIS AM: Sinter Based AM
Topic: Consolidation technologies

10:45 – 12:15

Session Chairs:
Mrs Adeline Riou (Erasteel, France)
Dipl.-Ing Claus Aumund-Kopp (Fraunhofer IFAM, Germany)

Presentations:
Core value for Binder Jetting – Sintering process
Sakratidis, A (Digital Metal, Sweden)

Comparison of Laser Powder Bed Fusion, Binder Jet & MIM for Stainless Steel alloys
Davies, P (Sandvik, United Kingdom)

Market Analysis of Metal Binder Jetting
Schmidt-Lehr, M (AMPower, Germany)
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Due to excellent early sales of Virtual Exhibition Space, our first Exhibition Hall is fully reserved. Ensure your company is represented at the heart of PM Industry by reserving your place in Exhibition Hall Two.

The layout will be identical to Hall One, with all sizes of Exhibition Booth still available for a limited time only. Find all the details in our Exhibition Package, or on our website at http://www.europm2021.com/exhibition.

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www.metal-am.com

Metals
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Terms and conditions

EPMA reserves the right to alter the programme, speakers, and dates at any time, without notice. Should for any reason the event change or the event be cancelled due to an act of terrorism, extreme weather, disease control, industrial action or any eventuality beyond the control of the EPMA, we shall endeavour to reschedule, but the delegate hereby indemnifies the EPMA and holds the EPMA harmless from and against any costs, damages and expenses, incurred by the delegate.

Payment

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Cancellation Policy

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(Defined as companies who sell directly to the open market not further down the supply chain.)

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If you require assistance with choosing the correct fee, please email Euro PM2021 Registrations pm2021@epma.com with a brief company description and current website link to assist with registration.

General Information

Congress Language

The congress will be conducted in English.

Congress Proceedings

The congress proceedings are included in the registration package for delegates and are provided in the form of a downloadable file. If proceedings are not included in your registration type, they can be purchased on EPMA website.

Online Presence and Referencing

EPMA has agreements with ProQuest LLC, Cambridge Scientific Abstracts, EBSCO and Scopus to enable the wider circulation of papers presented at EPMA conferences and to enhance their standing in the academic community. The papers from Euro PM2021 will subsequently be made available to the subscribers of these products after October 2021.

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9 - 13 October 2022
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www.worldpm2022.com
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<tr>
<th>Attendees type</th>
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<tbody>
<tr>
<td>Chairs, TPC members, Technical Session, Speakers</td>
<td>EPMA Member/ End user</td>
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<tr>
<td>Full package (fees+proceedings) before VAT</td>
<td>740</td>
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<td>Registration Fees before VAT</td>
<td>490</td>
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Payments: Credit card and bank transfer
Please note bank transfer will not be possible after 08 October 2021

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