



2nd European Military Additive Manufacturing Symposium

17th and 18th October 2023 | Maritim Hotel Bonn | Germany



Programme
-
Terms and Conditions

Supported by:



About the Conference

Additive manufacturing (AM) has introduced a novel production method in design, manufacturing, and distribution to end-users.

This technology has provided great freedom in design to create complex components, highly customisable products, and efficient waste minimisation. AM has been introduced in industry already for some time and it is still not yet at the end of its development and technical possibilities.

High performance structures exposed to great stress already found their way from prototyping into the production line! Many examples can be found: automobile, aviation, medical equipment and even building houses with concrete - the possibilities seem limitless.

The advantages in production and manufacturing are obvious and reach from conventionally 'un-constructible' structures to cost savings and advanced mechanical characteristics. From a military perspective, another point could be even more interesting: the logistical footprint is highly driven by spare parts.

On a battleship or in the field, what potential for our troops if containers with spare parts and the corresponding logistic chain could be immediately on hand. Parts and their line of communication could be increasingly re-placed by the right printer, the respective raw material and construction.

This may sound easy but it is not. While the technical potential of AM rises continuously, logistical and other non-technological limitations (i.e. certification and liability) remain fundamental.

The German Association for Defence Technology - Centre for Studies and Conferences will organise the 2nd European Military Additive Manufacturing (AM) Symposium on 17th and 18th October 2023 in Bonn, Germany to discuss the military perspective of AM. This symposium is supported by the European Defence Agency (EDA).

Please note: **The conference is limited to participants from EU member states and NATO countries.** Exceptions only with individual permission by the organizer.

This symposium aims to achieve higher visibility on certain levels and bring European stakeholders from military, industry and research together.

It is the intention of this symposium to address all the advantages and limitations from the perspective of industry, research and armed forces. It is setup to foster the mutual understanding of:

- what is already possible
- what is expected to come in the future
- where are the limits of the diverse stakeholders and what needs to be done to raise the treasure built in Additive Manufacturing



Join us!

The Conference Programme

October 17, 2023

- 08:00 **Conference Counter opens**
Visitor check-in / Opening of the exhibition / [Welcome coffee served](#)
- 09:00 **Welcome notes**
Colonel (ret.) Bernd Kögel, Managing Director, German Association for Defence Technology - Centre for Studies and Conferences (SGW)
- 09:10 **Keynote EDA**
Major General André Denk, Deputy Chief Executive, European Defence Agency
- 09:30 **Keynote Armed Forces**
Brigadier General Hennie Bouman, Sous Chef Logistics of the Defence Staff, Netherlands
- 09:50 **Keynote Industry**
Andreas Langfeld, President EMEA, Stratasys
- 10:10 [Coffee Break in the exhibition area](#)
- 10:45 **Conference continues with parallel Sessions A1 – A3**
A1: „AM solutions: Production on site in military operations I“
A2: “Use cases & implementation approaches”
A3: “AM training & education”
- 12:35 [Lunch in the exhibition area](#)
- 13:45 **Conference continues with parallel Sessions B1 – B3**
B1: „Deployable AM solutions: Production on site in military operations II“
B2: “Quality assurance & qualification”
B3: “Energetic materials & ballistic protection”
- 15:35 [Coffee Break in the exhibition area](#)
- 16:05 **Introduction to the speaker corners** (in plenary)
- 16:30 **Parallel speaker corners**
Four sequential Poster Presentations á 15“
- 17:45 [Beer Call in the exhibition area](#)
- 18:15 [Walking dinner buffet in the exhibition area](#)
- 21:00 Last order
- 21:30 End of day 1

October 18, 2023

- 08:00 Conference Counter opens
Opening of the Exhibition / [Welcome Coffee served](#)
- 08:30 **AM as a military capability enabler**
Martin Huber, European Defence Agency
- 08:50 **Legal issues: Intellectual property rights, liability, warranty & how to solve them**
Thomas Urband, PwC (GE)
- 09:10 **Export control challenges related to AM**
Mareike Heesing, Oppenhoff (GE)
- 09:30 [Coffee Break in the exhibition area](#)
- 10:10 **Conference continues with parallel Sessions C1 – C3**
C1: “AM integrated into the logistic system of armed forces”
C2: “AM meets AI & robotics”
C3: “AM & electronics”
- 12:00 [Lunch in the exhibition area](#)
- 13:10 **Conference continues with parallel Sessions D1 – D3**
D1: „Research & technology development - evolving opportunities”
D2: “Think Big: About rockets, jet engines, large scale naval propeller blades and concrete building structures”
D3: “Alloys, multi-material and multi nozzle technologies”
- 15:00 Return to plenary
- 15:05 Summary / Farewell
- 15:15 [End-of-Conference-Coffee / Communication & Networking](#)
- 15:45 The End



Sessions A1 - A3 / Day 1: 10:45-12:35

Session A1:

Deployable AM solutions: Production on site in military operations I

- 10:45 Introduction by the Chairman
- 10:50 **Rapid deployment for use on site**
Marcus Witt,
METROM Mechatronische Maschinen (GE)
- 11:10 **Strategic Partnerships Development**
Kyle Burns,
Strategic Partnerships Development (USA)
- 11:30 **Concept for integration of metal FFF to support temporary self-sufficient operating defense units**
Marcus Ortloff,
Xerion Berlin Laboratories (GE)
- 11:50 **Designing a transportable additive manufacturing system for the medical missions in defence**
Dr. Paula Queipo Rodriguez,
IDONIAL Centro Tecnológico (ES)
- 12:10 Discussion / Q&A
- 12:35 Lunch

Session A2:

Use cases & implementation approaches

- 10:45 Introduction by the Chairman
- 10:50 **Additive Manufacturing in the German Armed Forces**
Dr. Felix Zimmer, Head of the 3D Printing Center of the Bundeswehr, Bundeswehr Research Institute for Material, Fuels and Lubricants (WIWeB) (GE)
- 11:10 **Realizing the Benefits of Additive Manufacturing in the Defense Industry: Two Case Studies**
Hussein Tarhini,
Fraunhofer-Einrichtung für Additive Produktionstechnologien IAPT (GE)
- 11:30 **Agile implementation of additive manufacturing**
Captain Alexander Rode,
Capability Development, Bundeswehr Planning Office (GE)
- 11:50 **Towards digital identities for life-cycle representation of AM components: A Blockchain approach**
Léon Klick, Autoflug
- 12:10 Discussion / Q&A
- 12:35 Lunch

Session A3:

AM training & education

- 10:45 Introduction by the Chairman
- 10:50 **Developing skills for the European Defence Sector - Education & Training in Additive Manufacturing (AM)**
Beatriz Lopez, European Federation for Welding, Joining and Cutting (PRT)
- 11:10 **Augmented Reality in military Additive Manufacturing**
Johannes Helmholtz,
Fraunhofer-Einrichtung für Additive Produktionstechnologien IAPT (GE)
- 11:30 **Basic training for the light additive manufacturing unit (eAFE) in the German armed forces Concept and practical experience**
Captain Maximilian Krönert, Bundeswehr Research Institute for Materials, Fuels and Lubricants (GE)
- 11:50 **The state of standardization in the field of qualification**
Dr. Georg Schlick,
Fraunhofer-Institut für Gießerei-, Composite- und Verarbeitungstechnik IGCV (GE)
- 12:10 Discussion / Q&A
- 12:35 Lunch





Sessions B1 - B3 / Day 1: 13:45-15:35

Session B1:

Deployable AM solutions: Production on site in military operations II

- 13:45 Introduction by the Chairman
- 13:50 **Military Use Cases / Lessons learned**
Commander (GE Navy) Sascha Hartig,
Coordinator for Additive Manufacturing in GE Navy,
Marinekommando (GE)
- 14:10 **How to integrate additive manufacturing in
military deployment logistics?**
Dr. Rob Basten,
Eindhoven University of Technology (NL)
- 14:30 **Producing spare parts on-demand, on-site: A real-life
mobile additive manufacturing use case**
Svein Hjeltnveit ,
Fieldmade (NOR)
- 14:50 **Increasing logistical efficiency through logistically
optimized systems and system fleets**
Joachim Kasemann,
Mark3D (GE)
- 15:10 Discussion / Q&A
- 15:35 Coffee Break in the exhibition area

Session B2:

Quality assurance & qualification

- 13:45 Introduction by the Chairman
- 13:50 **Applications and a Proposal for Cost-Effective Quality
Assurance for Additive Manufacturing with Aviation
Perspective**
Dr. Jürgen Kraus,
Director Additive Manufacturing,
MTU Aero Engines (GE)
- 14:10 **Effects on fatigue of LPBF and WAAM processed
metals for structural components by material
screening**
Dr. Benjamin Möller, Fraunhofer-Institut für
Betriebsfestigkeit und Systemzuverlässigkeit LBF (GE)
- 14:30 **Use of additive manufacturing techniques in the Spain
Air and Space Force in depot level maintenance**
Major David Pérez Jara,
Spanish Air and Space Force (ES)
- 14:50 **Zero-defect Additive Manufacturing for the defence
industry through intelligent in-situ monitoring and
control**
Prof. Dr. Bianca Maria Colosimo,
Politecnico di Milano (IT)
- 15:10 Discussion / Q&A
- 15:35 Coffee Break in the exhibition area

Session B3:

Energetic materials & ballistic protection

- 13:45 Introduction by the Chairman
- 13:50 **CerAMufacturing- Potential and possibilities of
Additive Manufacturing of technical ceramics for
functional and protective equipment**
Johannes Abel,
Fraunhofer-Institut für Keramische Technologien und
Systeme IKTS (GE)
- 14:10 **The EDF 2021 project ROLIAC**
Dr. Christopher Gottlieb Klingaa,
Danish Technological Institute (DK)
- 14:30 **Development of Additively Manufactured Boron
Carbide and Alumina Ceramics for Body Armour
Application**
M. Vozárová,
RHP-Technology (AT)
- 14:50 **Energy absorption capability of additively
manufactured cellular structures subjected to a
blast loading**
Prof. Dr. Bernd Michael Fischer,
French-German Research Institute of Saint-Louis (FR)
- 15:10 Discussion / Q&A
- 15:35 Coffee Break in the exhibition area



Parallel speaker corners

(Four parallel rounds of 15 minutes each (+ 5 minutes time to switch) at 16:30, 16:50, 17:10, 17:30 hrs)

Poster Session 1:

DA - AMTEM Project. Additive Manufacturing Techniques for Energetic Materials

Dr. Barbara Baschung, French-German Research Institute of Saint-Louis (FR)

Poster Session 2:

Non-destructive testing and Certification of the AM artefacts for Defence Industry

Dr. Alexander Ilkštöm Kravcov, MIExpE, University of Defence, Brno, Czech Republic

Poster Session 3:

ColdMetalFusion – From serial production to flexible spare parts production

Levent Akbas, Headmade Materials (GE)

Poster Session 4:

Shortened process chains through additive manufacturing

Dr. Hans-Günter Krull, Deutsche Edelstahlwerke Specialty Steel (GE)

Poster Session 5:

Products of Additive Manufacturing in Aerial Platforms

Dr. Ing. Jakub Hnidka, University of Defence, Brno, Czech Republic

Poster Session 6:

Improvement of armouring systems in terms of ballistic/blast efficiency and weight reduction based on auxetic structures and a specific metallic alloy

Stefano Lionetti, RINA Consulting (IT)

Poster Session 7:

State of the art & latest developments: a tour d'horizon

Michael Eichmann, Stratasys (GE)

Poster Session 8:

50.000 AM parts for the Ukraine: experiences & Lessons learned

Jonathan Hübner, 3YOURMIND (GE)



Parallel speaker corners

(Four parallel rounds of 15 minutes each (+ 5 minutes time to switch) at 16:30, 16:50, 17:10, 17:30 hrs)

Poster Session 9:

Digital Threads for Additive Manufacturing - a perspective from consulting
Lars Ruth, Deloitte Consulting (GE)

Poster Session 10:

Cooperation between a Research Organization and Special Forces in the Development of a Multi-Purpose Holder
Dr. Zdenek Joska, Czech University of Defence (CZ)

Poster Session 11:

Comparison of additively and conventionally produced Gun Propellants
Daniel Mitró, Fraunhofer Institute for Chemical Technology ICT (GE)

Poster Session 12:

Military Use Cases in Czech Army
Major Zdenek Joska, Ph.D., University of Defence, Brno, Czech Republic

Poster Session 13:

Research Laboratory FLAB-3Dprint -Research and Development of the process chain in context of additive manufacturing
Captain Dominik Leubecher, University of the Bundeswehr München (GE)

Poster Session 14:

Additive Manufacturing of Armor Components by WAAM using Titanium Wire drawn from Titanium Scrap
Dr. Roland Niefanger, Rheinmetall Waffe Munition (GE)

Poster Session 15:

Additive Manufacturing and NATO Codification impact
Dr. Bernhard Mueller, Fraunhofer-Institut für Werkzeugmaschinen und Umformtechnik IWU, *Dr. Andreas Leupold*, Leupold Legal

Poster Session 16:

Ballistic protection made with AM
Capt. Jiri Prochazka, Ph.D. and *Jindrich Villis*, University of Defence, Brno, Czech Republic



Sessions C1 - C3 / Day 2, 10:10-12:00

Session C1: AM integrated into the logistic system of armed forces

- 10:10 Introduction by the Chairman
- 10:15 **Portuguese Army Additive Manufacturing Capability Development**
Lieutenant Pedro Pinheiro,
Portuguese Army (PRT)
- 10:35 **Predictive Maintenance with Additive Manufacturing: Enhancing-Maintenance in the European Military**
Dr. Alexander Großmann, PwC (GE)
- 10:55 **Conditions for the functioning of Logistic Support in the Polish Armed Forces**
Colonel (ret.) Prof. Kazimierz Kowalski,
Military University of Land Forces (PL)
- 11:15 **Implementing Additive Manufacturing to Military Logistics – Possibilities and Constraints**
Lieutenant Commander Samu Rautio,
Finnish National Defence University (FIN)
- 11:35 Discussion / Q&A
- 12:00 Lunch

Session C2: AM meets AI & robotics

- 10:10 Introduction by the Chairman
- 10:15 **Generative and Future AI-aided Design of Functionally Graded Materials for Protection and Effectors**
Dr. Klaus Hoschke,
Fraunhofer-Institut für Kurzzeitdynamik,
Ernst-Mach-Institut, EMI (GE)
- 10:35 **Productivity and Quality: Automation and machine learning as enablers for industrial additive manufacturing**
Markus May,
3Faktur (GE)
- 10:55 **Secure AI software for the industrialization of additive manufacturing in the defense sector**
Dr. Omar Fergani,
1000Kelvin (GE)
- 11:15 **2ARMY – Automated Additive Repair and Manufacturing System for metallic parts**
Dimitrii Nikolaev,
IFT - Austrian Institute for Production Engineering and Photonic Technologies (AT)
- 11:35 Discussion / Q&A
- 12:00 Lunch

Session C3: AM & electronics

- 10:10 Introduction by the Chairman
- 10:15 **Additively Manufactured Electronics – more functionality at shorter lead time**
Dr. Friedrich Proes,
Fraunhofer-Einrichtung für Additive Produktionstechnologien IAPT (GE)
- 10:35 **Additive Manufacturing Technologies for Public Safety and Military Applications**
Christian Krebs,
Fraunhofer Institut für Hochfrequenzphysik und Radartechnik - FHR (GE)
- 10:55 **EM Shielding to protect sensitive Electronic Equipment**
Felix Wendt,
Fiberthree (GE)
- 11:15 **Additive Manufacturing of 3D Microelectronics & Integrated Circuit Packaging for Defence Applications: Opportunities and Challenges**
Martin Steinicke,
Nano Dimension (GE)
- 11:35 Discussion / Q&A
- 12:00 Lunch



Sessions D1 - D3 / Day 2: 13:10-15:00

Session D1: Research & technology development – evolving opportunities

- 13:10 Introduction by the Chairman
- 13:15 **High-speed Additive Manufacturing and Coating of Complex Metal Parts**
Dr. Tobias Stittgen,
ponticon (GE)
- 13:35 **3D powder bed printing, a closer look at post processing and finish**
Luigi Monaco,
Pulvermeister (GE)
- 13:55 **Three examples to present the latest research on laser and powder bed based additive manufacturing for polymers, metals and ceramics**
Prof. Dr. Brecht Van Hooreweder,
Director LEUVEN.AM (NL)
- 14:15 **Plasma Metal Deposition (PMD®) for manufacturing of large sized components for light weight alloys and metal matrix composites**
Dr. Erich Neubauer,
RHP-Technology (AT)
- 14:35 Discussion / Q&A
- 15:00 Please return straight to the plenary

Session D2: Think Big: About rockets, jet engines, large scale naval propeller blades and concrete building structures

- 13:10 Introduction by the Chairman
- 13:15 **Digital thread from Research to Product: Additively Manufactured Pre-Assembled small Jet-Engine**
Benjamin Bäumer,
EOS Electro Optical Systems (GE)
- 13:35 **New Technology: Cold Spray Additive Manufacturing (CSAM) for rockets and aviation components**
Markus Brotsack,
Impact Innovations (GE)
- 13:55 **Wire-Arc Additive Manufacturing of Large Titanium Parts**
Dr. Alexandre Benoit,
Naval Group (FR)
- 14:15 **Behaviour of multilayer 3D-printed reinforced concrete components under high loading rates**
Vahan Zohrabyan,
University of the Bundeswehr München (GE)
- 14:35 Discussion / Q&A
- 15:00 Please return straight to the plenary

Session D3: Alloys, multi-material and multi nozzle technologies

- 13:10 Introduction by the Chairman
- 13:15 **Development of additive manufacturing feedstocks dedicated to production elements for military applications**
Tadeusz Gorewoda, Łukasiewicz Research Network - Institute of Non-Ferrous Metals (PL)
- 13:35 **400% productivity in Material Extrusion for quick response applications**
Joscha Kriegelsteiner,
Liqtra (GE)
- 13:55 **Metal-Powder-Application by Hermle – CGS meets**
Tobias Siemer,
Hermle Maschinenbau (GE)
- 14:15 **Multi-Material Additive Manufacturing Solutions for Defence Applications**
Ismail Ünsal,
Fraunhofer-Institut für Gießerei-, Composite- und Verarbeitungstechnik IGCV (GE)
- 14:35 Discussion / Q&A
- 15:00 Please return straight to the plenary



Visitor Tickets | Accommodation

The conference is open for

- A) Public Services (Armed Forces, Civil Services, Parliaments, Ministries, Embassies),
- B) Research (Universities, Research Institutes) and
- C) Industry

from EU / NATO member states.

Rates:

	Attendance both days	Lunch	Walking Dinner (day 1)
Category A) Public Services	75,00 €	+ 8,40 € each	+ 8,40
Category B) Research	280,00 €	included	included
Category C) Industries	1190,00 €	included	included

Prices do not include German taxes (19% VAT) or accommodation.

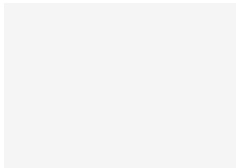
Special rates are available for Exhibitors, Speakers, participation on one day only, "Early-Bird-Rates" for Categories B and C till 21st July.

For details visit www.European-Military-AM-Symposium.eu

Please book your accommodation directly at the conference hotel: +49 228 81080 (booking code: "DWT")

Exhibition Options

Option A (Exhibition Space) | 290,00 € / m²



- Stand in the Size and Position of your Choice
- 1 Ticket per 6 m² booked Space
- 20% Discount for additional "full Tickets"
- 70% Discount for "exhibition only Tickets"
- Security Charge

Option B (System Booth) | 380,00 € / m²



- Option A included
- Octanorm System Stand
- Carpet Expo Rips Grey
- Booth Cleaning at Night

Option C (System Booth, Illumination, Furniture) | 460,00 € / m²



- Option B included
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- Front-Banner with your Logo 200 x 50 cm
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- Sideboard, Counter, Brochure Stand
- Lockable Storage Area (if needed)
- Choose the Colour of your Carpet

Option D (Premium Booth) | 560,00 € / m²



- Option A included
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 - Wood-Construction
 - Printed Stretchframe-System
- Presentation Technology (TV, Beamer)
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- Graphics at the Booth / Counter / ...
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This conference is restricted to visitors from EU member states and NATO countries .

Please register online:
www.European-Military-AM-Symposium.eu

For advice please contact:

Visitors: info@dwt-sgw.de
Exhibitors: stephan.bruess@dwt-sgw.de

With your registration you agree to the following:

- (1) Your personal data is stored electronically.
- (2) Photos and/or films might be taken during the event and published without further notice/permission.
- (3) You consent to the distribution of a list of participants (name/function/office) and photos taken during the event to the participants.
- (4) With your registration / signature you accept the conditions of participation in this invitation, the general terms and conditions and the data protection agreement of the Centre for Studies and Conferences, which can be viewed at www.dwt-sgw.de

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Cancellation conditions

Cancellations are free of charge for participants up to 5 working days before the conference. Exhibitors have the option of free cancellation up to five weeks before the event.

This Conference is organised by:

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