

Metal Additive Manufacturing Conference

*Industrial perspectives
in Additive Technologies*

November 21-23, 2018
WKO, Austria



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THE AUSTRIAN SOCIETY FOR
METALLURGY AND MATERIALS

Metal Additive Manufacturing Conference 2018

Wednesday 21 November 2018 - Friday 23 November 2018

**Wirtschaftskammer Österreich
Programme**

Wednesday 21 November 2018

Registration - (12:30-13:30)

Opening - Julius Raab Saal (13:30-15:00)

- Session Chairman: Sjöström, Johnny (Uddeholms AB)

time	[id] title	presenter
13:30	[67] OPENING	
14:00	[61] CHALLENGES OF ADDITIVE MANUFACTURING IN HIGH PERFORMANCE MARKETS	SEIDEL, Stefan (Pankl Racing Systems AG) ROTPART, Michael (voestalpine BÖHLER Edelstahl GmbH & Co KG)
14:30	[22] RESULTS AND CONCLUSIONS ON METALLIC MATERIALS MADE BY AM WITHIN THE AUSTRIAN LEADER PROJECT "ADDMANU"	BUCHMAYR, Bruno (Montanuniversitaet Leoben)

Powder Production & Characterization - Saal 7 (15:00-15:40)

- Session Chairman: Mr. Wu, Liang (voestalpine Additive Manufacturing Center GmbH)

time	[id] title	presenter
15:00	[19] THE WORLD MARKET FOR METAL POWDERS & STEELS, STATUS QUO AND OUTLOOK	BLITZ, Benedikt (SMR Premium GmbH)
15:20	[59] POWDER PRODUCTION TECHNOLOGIES	WALLNER, Stefan (voestalpine BÖHLER Edelstahl GmbH & Co KG)

Process Optimization & Control (I) - Julius Raab Saal (15:00-15:40)

- Session Chairman: Mr. Sjöström, Johnny (Uddeholms AB)

time	[id] title	presenter
15:00	[4] INFLUENCE OF VARIOUS GASES AND GAS MIXTURES DURING LASER BEAM MELTING	EFFINGER, Markus (Air Liquide Germany)
15:20	[17] EFFECT OF SHIELDING GAS FLOW RATE ON OXIDATION BEHAVIOR AND MECHANICAL PROPERTY IN LASER METAL DEPOSITION	EO, Durim (POSTECH, GIFT)

Coffee Break - (15:40-16:10)

Keynote (I) - Julius Raab Saal (16:10-16:40)

- Session Chairman: Mr. Wiedenegger, Armin (voestalpine High Performance Metals GmbH)

time	[id] title	presenter
16:10	[53] SURFACE FINISHING FOR 3D-PRINTED METAL PARTS: FROM SUPPORT STRUCTURE REMOVAL TO CORROSION PROTECTION	HANSAL, Wolfgang (Hirtenberger Engineered Surfaces)

Powder Production & Characterization (II) - Saal 7 (16:40-17:20)

- Session Chairman: Mr. Bleier, Harald (ecoplus. Niederösterreichs Wirtschaftsagentur GmbH)

time	[id] title	presenter
16:40	[46] ADVANCES IN MARAGING STEELS FOR ADDITIVE MANUFACTURING	ZUNKO, Horst (voestalpine Böhler Edelstahl GmbH)
17:00	[58] MICROSTRUCTURE INVESTIGATION OF POWDERS FOR ADDITIVE MANUFACTURING	ALBU, Mihaela (ZFE Graz)

Process Optimization & Control (II) - Julius Raab Saal (16:40-18:00)**- Session Chairman: Mr. Wiedenegger, Armin (voestalpine High Performance Metals GmbH)**

time	[id] title	presenter
16:40	[12] THERMOELECTRIC MAGNETOHYDRODYNAMICS IN ADDITIVE MANUFACTURING	GAN, Teddy (University of Greenwich)
17:00	[26] A NEW METHOD FOR DESCRIBING THE MORPHOLOGY OF POWDER LAYERS IN DIRECT LASER MELTING	MITTERLEHNER, Marco (TU Wien)
17:20	[62] COMPARISON AND VALIDATION OF TOOLS FOR SIMULATION AIDED ADDITIVE MANUFACTURING	SEMBDNER, Philipp (Dresden University of Technology - Chair of Engineering Design and CAD)
17:40	[14] INVESTIGATION OF THE CORRELATION BETWEEN SIGNAL CHARACTERISTICS OF PHOTODIODE-BASED MELT POOL MONITORING AND PART QUALITY IN LASER-BASED POWDER BED FUSION OF ALS110MG	ROSENKRANZ, Claudia (Fraunhofer Research Institution for Casting, Composite and Processing Technology IGCV)

Related Processes (I) - Saal 7 (17:20-18:00)**- Session Chairman: Mr. Bleier, Harald (ecoplus. Niederösterreichs Wirtschaftsagentur GmbH)**

time	[id] title	presenter
17:20	[5] LITHOGRAPHY-BASED ADDITIVE MANUFACTURING OF FUNCTIONAL METAL COMPONENTS	MITTERAMSKOGLER, Gerald (Lithoz GmbH)
17:40	[71] 3D PRINTING OF «ALUMINUM - 10 -20 WT. % ALUMINA» COMPOSITES WITH CORE-SHELL PARTICLES AS RAW MATERIALS	ARNAUTOV, Alexey (National University of Science and Technology "MISIS")

Welcome Reception - (18:00-19:30)

Thursday 22 November 2018

Keynote (I) - Julius Raab Saal (09:00-09:30)

- Session Chairman: Prof. Asnafi, Nader (Örebro University)

time	[id] title	presenter
09:00	[29] ADDITIVE MANUFACTURING FOR DIGITAL DENTISTRY	STAMPFL, Jürgen (TU Wien)

Known Materials & Characteristics (I) - Julius Raab Saal (09:30-10:30)

- Session Chairman: Prof. Asnafi, Nader (Örebro University)

time	[id] title	presenter
09:30	[7] MICROSTRUCTURE, PASSIVITY AND CORROSION BEHAVIOUR OF 316L STAINLESS STEEL ELABORATED BY SELECTIVE LASER MELTING (SLM)	VIGNAL, Vincent (ICB, UMR 6303 CNRS - Univ. Bourgogne Franche Comté)
09:50	[28] HIGH TEMPERATURE TRIBOLOGICAL BEHAVIOUR OF AISI 316L PRODUCED BY SLM TECHNIQUE	LANZUTTI, Alex (University of Udine)
10:10	[24] FRACTURE BEHAVIOUR ASSESSMENT OF AM PROCESSED STEEL WITH THE USE OF MINIATURIZED SPECIMENS	MAŠEK, Martin (COMTES FHT a. s.)

Related Processes (II) - Saal 7 (09:30-10:30)

- Session Chairman: Mr. Lochbichler, Claus (voestalpine High Performance Metals GmbH)

time	[id] title	presenter
09:30	[31] MATERIAL EXTRUSION WITH FILAMENTS FOR THE PRODUCTION OF METAL PARTS AND FEEDSTOCK THEREFORE	KUKLA, Christian (Montanuniversitaet Leoben - Industrial Liaison Department)
09:50	[47] FILAMENT METAL PRINTING: SINTERED METAL PARTS BASED ON FFF WITH REINFORCED FEEDSTOCK	KITZMANTEL, Michael (RHP-Technology GmbH)
10:10	[48] XL MULTI-MATERIAL AM USING AN ECONOMIC BLOWN POWDER PROCESS	KITZMANTEL, Michael (RHP-Technology GmbH)

Coffee Break - (10:30-11:00)

Known Materials & Characteristics (II) - Julius Raab Saal (11:00-12:20)

- Session Chairman: Dr. Michelic, Sebastian (qoncept dx GmbH)

time	[id] title	presenter
11:00	[40] INFLUENCE OF INCLINATION ANGLE ON THE MICROSTRUCTURE AND ROUGHNESS OF DOWNSKIN OF 3D-PRINTED 316L POWDER	SKALON, Mateusz (Technische Universität Graz)
11:20	[38] MATERIAL PROPERTIES OF A LASER CLADDED AND HIP'ED AEROSPACE COMPONENT	HOLM, Mads (FORCE Technology)
11:40	[42] CORROSION BEHAVIOUR OF AM 316L STAINLESS STEEL	ANDREATTA, Francesco (University of Udine)
12:00	[8] INVESTIGATIONS ON THE MICROSTRUCTURE AND MECHANICAL PROPERTIES OF GAS ATOMIZED HOT WORK TOOL STEELS MANUFACTURED BY SELECTIVE LASER MELTING USING POWDER BED PREHEATING	GIEDENBACHER, Jochen (Research & Development, University of Applied Sciences Upper Austria)

Related Processes (II): Related Processes (II) - Saal 7 (11:00-11:20)

- Session Chairman: Prof. VIGNAL, Vincent (ICB, CNRS-Univ de Bourgogne)

time	[id] title	presenter
11:00	[63] LASER METAL DEPOSITION (LMD) AS A COMPLEMENTARY TECHNOLOGY TO SELECTIVE LASER MELTING (SLM)	GÖRGL, Richard (Joanneum Research Materials)

Known Materials & Characteristics (III) - Saal 7 (11:20-12:20)

- Session Chairman: Prof. VIGNAL, Vincent (ICB, CNRS-Univ de Bourgogne)

time	[id] title	presenter
11:20	[51] ON THE FORMATION OF PROCESS-INDUCED DEFECTS IN H13 TOOL STEEL PROCESSED BY LASER BEAM MELTING	XIA, Fengchen (voestalpine additive manufacturing center)
11:40	[44] FEASIBILITY INVESTIGATION FOR LASER POWDER BED FUSION OF HIGH-SPEED STEEL AISI M50 WITH BASE PLATE PREHEATING SYSTEM	SAEWE, Jasmin (Fraunhofer Institute for Laser Technology (ILT), Aachen)
12:00	[27] LASER BEAM MELTING OF H13 TOOL STEEL	WU, Liang (voestalpine Additive Manufacturing Center GmbH)

Lunch - (12:20-14:00)**Keynote (II) - Julius Raab Saal (14:00-14:30)**

- Session Chairman: Prof. Schnitzer, Ronald (Chair of Design of Steels, Montanuniversität Leoben)

time	[id] title	presenter
14:00	[65] DIGITAL PHOTONIC PRODUCTION ALONG THE LINES OF INDUSTRY 4.0	POPRAWA, Reinhart (Fraunhofer ILT)

Application (I) - Saal 7 (14:30-15:10)

- Session Chairman: Mr. Gromov, Alexander (NUST "MISiS")

time	[id] title	presenter
14:30	[9] INDUSTRIAL SOLUTIONS FOR ADDITIVE MANUFACTURING	NACHTIGALL, Frank (TRUMPF)
14:50	[13] "EVALUATING ADDITIVE MANUFACTURING TECHNIQUE TO PRODUCE DIES FOR HIGH-PRESSURE DIE CASTING"	MATTAR, Taha (Central Metallurgical R&D Institute (CMRDI))

New Materials (I) - Julius Raab Saal (14:30-15:30)

- Session Chairman: Prof. Schnitzer, Ronald (Chair of Steel Design, Montanuniversität Leoben)

time	[id] title	presenter
14:30	[10] INFLUENCE OF HEAT TREATMENT AND HIP ON PRECIPITATION HARDENING OF INTERMETALLIC-REINFORCED STAINLESS TOOL STEEL MANUFACTURED BY LASER POWDER BED FUSION	MARTIN VILARDELL, Anna (Karlstad University)
14:50	[69] ADVANCEMENTS IN METAL AM AND TOOLING APPLICATIONS – AN INSIGHT ON THE EFFECT OF POWDER QUALITY AND MATERIAL PROPERTIES	SJÖSTRÖM, Johnny (Uddeholms AB)
15:10	[20] SURFACE MODIFICATION OF AM PRODUCED STAINLESS TOOL STEELS FOR PLASTIC MOULDING TOWARDS ENHANCED TRIBOLOGICAL PERFORMANCE AND CORROSION RESISTANCE	OIKONOMOU, Christos (Uddeholms AB)

Business Models & Engineering - Saal 7 (15:10-15:30)

- Session Chairman: Mr. Gromov, Alexander (NUST "MiSiS")

time	[id] title	presenter
15:10	[30] VALUE ENGINEERING FOR 3D METAL PRINTING AND BEST PRACTISE IN DESIGN & ENGINEERING	NINAUS, Manfred (M&H CNC Technik)

Coffee Break - (15:30-16:00)**Application (II) - Saal 7 (16:00-17:00)**

- Session Chairman: Ms. Rosenkranz, Claudia (Fraunhofer-Einrichtung für Gießerei-, Composite- und Verarbeitungstechnik (IGCV))

time	[id] title	presenter
16:00	[23] THE APPLICATION OF POWDER RHEOLOGY FOR AM POWDERS	PANZL, Gerhard (Montanuniversitaet Leoben)
16:20	[21] 3D METAL PRINTING FROM AN INDUSTRIAL PERSPECTIVE – PRODUCT DESIGN, PRODUCTION AND BUSINESS MODELS	ASNAFI, Nader (Örebro University)
16:40	[72] POWDER BED FUSION (PBF) METAL ADDITIVE MANUFACTURING (METAL AM) APPLICATION AND CASE STUDY IN OIL & GAS SECTOR	SWAMINATHAN, Kameshwaran Swaminathan (Technip FMC)

New Materials (II) - Julius Raab Saal (16:00-17:40)

- Session Chairman: Prof. Krakhmalev, Pavel (Karlstad University)

time	[id] title	presenter
16:00	[25] PRECIPITATION KINETICS DURING NON-LINEAR HEAT TREATMENT IN LASER ADDITIVE MANUFACTURING	BAJAJ, Priyanshu (Max Planck Institute for Iron Research)
16:20	[39] INFLUENCE OF POWDER CHARACTERISTICS ON FINAL PROPERTIES OF POWDER-BED LASER ADDITIVELY MANUFACTURED ODS Fe-14Cr STEEL	VASQUEZ, Elodie (DEN-Service de Recherches Métallurgiques Appliquées, CEA, Université Paris-Saclay)
16:40	[37] DESIGNING A NOVEL Fe-Ni-Al-Ti MARAGING STEEL TAILOR-MADE FOR LASER METAL DEPOSITION	KÜRNSTEINER, Philipp (Max-Planck-Institut für Eisenforschung)
17:00	[41] PROCESS AND ALLOY DESIGN FOR IN-SITU PRECIPITATION STRENGTHENING OF Al-Sc ALLOYS DURING LASER METAL DEPOSITION	KÜRNSTEINER, Philipp (Max-Planck-Institut für Eisenforschung)
17:20	[43] SURFACE MULTIFUNCTIONALITY FOR ENHANCING FRICTION AND WEAR PERFORMANCE OF 3D PRINTED LIGHTWEIGHT COMPONENTS USING TECHNOLOGY HYBRIDS	RODRIGUEZ RIPOLL, Manel (AC2T research GmbH)

Design - Saal 7 (17:00-17:20)

- Session Chairman: Ms. Rosenkranz, Claudia (Fraunhofer-Einrichtung für Gießerei-, Composite- und Verarbeitungstechnik (IGCV))

time	[id] title	presenter
17:00	[36] ADDITIVE MANUFACTURING OF MICROLATTICE STRUCTURES AT THE RESOLUTION LIMIT OF THE SELECTIVE LASER MELTING PROCESS	GÖRTLER, Michael (Joanneum Research Forschungsgesellschaft mbH)

Conference Dinner - (18:30-21:00)

Friday 23 November 2018

Keynote (III) - Julius Raab Saal (09:00-09:30)

- Session Chairman: Prof. Poprawe, Reinhart (Fraunhofer - Institut für Lasertechnik ILT)

time	[id] title	presenter
09:00	[66] GENERATIVE DESIGN – NATURE AS BLUEPRINT	Mr. PIRKLBAUER, Peter (Airbus Operations GmbH)

New Materials (III) - Julius Raab Saal (09:30-10:30)

- Session Chairman: Prof. Poprawe, Reinhart (Fraunhofer - Institut für Lasertechnik ILT)

time	[id] title	presenter
09:30	[15] LASER POWDER BED FUSION OF ADVANCED HIGH STRENGTH STEELS –MODIFICATION OF DEFORMATION MECHANISM BY INCREASING STACKING FAULT ENERGY	Mr. EWALD, Simon (RWTH Aachen University - Digital Additive Production DAP)
09:50	[16] FORMATION QUALITY MECHANICAL PROPERTIES AND PROCESSING BEHAVIOUR OF PURE ZINC (Zn) METAL PARTS PRODUCED BY LASERBASED MANUFACTURING FOR BIODEGRADABLE IMPLANTS	Mr. VOSHAGE, Maximilian (Digital Additive Production (DAP), RWTH Aachen University)
10:10	[33] ADDITIVE MANUFACTURING OF NdFeB PERMANENT MAGNETS BY SELECTIVE LASER MELTING	Mr. GÖRTLER, Michael (Joanneum Research Forschungsgesellschaft mbH)

Postprocessing (I) - Saal 7 (09:30-10:10)

- Session Chairman: Mr. Gradinger, Rudolf (LKR Leichtmetallkompetenzzentrum Ranshofen GmbH)

time	[id] title	presenter
09:30	[6] POST PROCESSING OF METAL PARTS MADE BY ADDITIVE MANUFACTURING	Mr. NUTAL, Nicolas (CRM Group)
09:50	[3] ANODIZING OF ADDITIVE MANUFACTURED ALUMINIUM ALLOYS: CHALLENGES	Dr. REVILLA, Reynier (Vrije Universiteit Brussel)

Coffee Break - (10:30-11:00)

New Materials (IV) - Julius Raab Saal (11:00-12:20)

- Session Chairman: Prof. Stampfl, Jurgen (TU Wien)

time	[id] title	presenter
11:00	[60] LASER ADDITIVE MANUFACTURING OF NIOBIUM SILICIDE-BASED HIGH TEMPERATURE MATERIALS	Prof. DONG, Hongbiao (University of Leicester)
11:20	[56] RECENT DEVELOPMENTS OF LIGHT ALLOY PRECURSOR MATERIAL FOR ADDITIVELY MANUFACTURED ULTRA-LIGHTWEIGHT PARTS	Mr. GRADINGER, Rudolf (LKR Leichtmetallkompetenzzentrum Ranshofen GmbH)
11:40	[64] NEW PRODUCT SOLUTIONS BY USING WAAM AS A NEW TECHNOLOGY IN AM	Mr. EMMERLING, Philip (FIT AG)
12:00	[49] PRELIMINARY STUDY OF THE PROCESSING PARAMETERS EFFECT ON THE MICROSTRUCTURE AND PROPERTIES OF TITANIUM GRADE 1 SPECIMENS FABRICATED VIA ADDITIVE MANUFACTURING	Dr. PÉREZ-SORIANO, Eva Maria (University of Seville)

Postprocessing (II) - Saal 7 (11:00-12:00)

- Session Chairman: Mr. Kitzmantel, Michael (RHP-Technology GmbH)

time	[id] title	presenter
11:00	[11] SURFACE ENGINEERING FOR PARTS MADE BY ADDITIVE MANUFACTURING	Mr. HATZENBICHLER, Markus (FOTEC)
11:20	[34] EFFECT OF SURFACE MECHANICAL ATTRITION TREATMENT (SMAT) ON THE MECHANICAL PROPERTIES OF AISI 316L PROCESSED BY SELECTIVE LASER MELTING (SLM)	Mr. PORTELLA, Quentin (ICD-LASMIS/University of Technology of Troyes)
11:40	[45] HOT ISOSTATIC PRESSING WITH INTEGRATED HEAT TREATMENT	Ms. BOHRT, Stephanie (Department of Industrial Furnaces and Heat Engineering of RWTH Aachen University)

Lunch - (12:20-14:00)**Plant Visit - (14:00-16:00)**