Symposium E : Additive Manufacturing

November 20 (Mon.), 2023

Session Title : Additive Manufacturing 1

Time : 10:50 - 12:30, Nov. 20

Room # : Halla Hall B, 3F

Session Chair : Bhaskar Majumdar, New Mexico Tech

Kyung Tae Kim, Korea Institute of Materials Science

10:50 – 11:20 **Keynote** **K-E0199**

Microstructure and High Temperature Mechanical Properties (Tensile, Fatigue, Creep etc.) of Ni-based Superalloys (IN625, 718, 738) manufactured by Laser Powder Bed Fusion

Kee-Ahn Lee, Inha University, Korea

11:20 – 11:40 **Invited** **I-E0177**

In-situ synchrotron radiation X-ray diffraction study for understanding strengthening mechanisms of Al–Si alloy manufactured by laser powder bed fusion

Naoki TAKATA, Nagoya University, Japan

11:40 – 12:00 **Invited** **I-E0664**

Balancing mechanical properties and deposition efficiency: the impact of oxidation in laser directed energy deposition

Shanqing Xu, Swinburne University of Technology, Australia

12:00 – 12:15 **O-E0912**

The Effect of Grain Boundary Serration on Improving Hot Ductility of High Entropy Alloy Processed by Selective Laser Melting

Meng Yun Lee, National Tsing Hua University, Postech, High Entropy Materials Center, Korea

12:15 – 12:30 **O-E0939**

Creep and creep mechanism of electron beam-based powder bed fusion 316L stainless steel

Kwang-Hyeok Lim, Korea Advanced Institute of Science and Technology, Korea

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Session Title : Additive Manufacturing 2

Time : 14:00 - 15:35, Nov. 20

Room # : Halla Hall B, 3F

Session Chair : Kee-Ahn Lee, Inha University

Shanqing Xu, Swinburne University of Technology

14:00 – 14:30 **Keynote** **K-E0456**

Additive manufacturing of titanium alloys with exceptionally uniform mechanical properties

Ming-Xing Zhang, University of Queensland, Australia

14:30 – 14:50 **Invited** **I-E0768**

Optimizing Mechanical Properties of Additively Manufactured Aluminum Alloy through Controlled Microstructural Heterogeneity

Kyung Tae Kim, Korea Institute of Materials Science, Korea

14:50 – 15:05 **O-E0101**

Heterostructured Ti alloys with improved mechanical properties fabricated by direct laser deposition

Yufan Zhao, Northwestern Polytechnical University, China

15:05 – 15:20 **O-E1182**

Recent developments in additive manufacturing of metallic glasses and their composites

Łukasz Żrodowski, Warsaw University of Technology, Poland

Session Title : Additive Manufacturing 3

Time : 16:00 -18:10, Nov. 20

Room # : Halla Hall B, 3F

Session Chair : Naoki TAKATA, , Nagoya University

16:00 – 16:30 **Keynote** **K-E0720**

Recent advances on powder development and evaluation for additive manufacturing

Naoyuki NOMURA, Tohoku University, Japan

16:30 – 16:50 **Invited** **I-E0460**

Alloy Design of High Temperature γ/γ' Ni-base Superalloy for 3D Printability

Bhaskar Majumdar, New Mexico Tech., USA

16:50 – 17:05 **O-E0863**

A high-temperature titanium alloy suitable for additive manufacturing

Zhihao Zhu, Dalian University of Technology, China

17:05 – 17:20 **O-E0737**

Microstructure and Mechanical Properties of Titanium Based Oxide Dispersion Strengthened Alloy Produced via Directed Energy Deposition

Uijun Ko, Hanbat National University, Korea

17:20 – 17:35 **O-E0476**

On the Hydrogen Embrittlement Resistance of Additively Manufactured Alloy 625 under Cathodic Protection Conditions

Alex Kovacs, Curtin University, Australia

17:35 – 17:50 **O-E1179**

Novel approach to manufacture powders with tailored chemical composition for Additive Manufacturing

Bartosz Kalicki, Warsaw University of Technology, Poland

November 21 (Tue.), 2023

Session Title : Additive Manufacturing 4
Time : 10:50 - 12:30, Nov. 21
Room # : Halla Hall B, 3F
Session Chair : Jung Gi Kim, Gyeongsang National University
Cecilie Funch, The University of Sydney

10:50 – 11:20 **Keynote** **K-E0818**
Unlocking the Potential of Selective Electron Beam Melting: Revolutionizing Additive Manufacturing and Expanding Material Possibilities
Tang Huiping, Hangzhou City University, China

11:20 – 11:40 **Invited** **I-E0602**
Micro-cracking Behaviors of Melt Pools Deposited by Additive Manufacturing Processes
Yoon Suk Choi, Pusan National University, Korea

11:40 – 12:00 **Invited** **I-E0683**
Crack-free eutectic high-entropy alloy claddings on ductile cast iron by extreme high speed laser cladding. Crack-free eutectic high-entropy alloy claddings on ductile cast iron by extreme high speed laser cladding
Andrew Ang, Swinburne University of Technology, Australia

12:00 – 12:15 **O-E0430**
Adapting Material Extrusion Control System for a 3D Food Printer
Ichimori Izumi, Yamagata University, Japan

12:15 – 12:30 **O-E0286**
3D Bioelectronic Printer for Nerve Regeneration
Juyong Lee, Seoul National University, Korea

12:30 – 12:50 **Invited** **I-E1115**
Nonlinear thermal distortion and its compensation of additively manufactured components via electron beam powder bed fusion
Pan Wang, Singapore Institute of Manufacturing Technology, Singapore

Session Title : Additive Manufacturing 5
Time : 14:00 - 15:35, Nov. 21
Room # : Halla Hall B, 3F
Session Chair : Cecilie Funch, The University of Sydney
Takayoshi NAKANO, Osaka University

14:00 – 14:30 **Keynote** **K-E0309**
Elastic properties of additively manufactured biomedical Ti alloys
Masakazu TANE, Osaka Metropolitan University, Japan

14:30 – 14:50 **Invited** **I-E0091**

Hetero-microstructure effect on the mechanical and corrosion properties of directed energy deposition-processed Ti-Zr-Nb-Sn alloy

Jung Gi Kim, Gyeongsang National University, Korea

14:50 – 15:05 **O-E0636**

A Comprehensive Study on Process Optimization, Defect Investigation, and Aging Analysis of 18-Ni 300 Maraging Steel Processed via Selective Laser Melting

Biranchi Narayan Sahoo, Sardar Vallabhbhai National Institute of Technology, Surat, India

15:05 – 15:20 **O-E0514**

Effect of post-heat-treatment on microstructures and mechanical properties for D2 tool steels fabricated via direct energy deposition

Heechan Jung, Korea University, Korea

15:20 – 15:35 **O-E0380**

Dynamic strength of additively repaired stainless-steel under high strain-rate loading

Jesse Callanan, Los Alamos National Laboratory, USA

Session Title : Additive Manufacturing 6

Time : 16:00 -17:40, Nov. 21

Room # : Halla Hall B, 3F

Session Chair : Andrew Ang, Swinburne University of Technology

Yoon Suk Choi, Pusan National University

16:00 – 16:20 **Invited** **I-E0496**

Thermal stability of non-equilibrium microstructural features of additively manufactured austenitic stainless steel

Cecilie Funch, The University of Sydney, Australia

16:20 – 16:40 **Invited** **I-E0307**

Crystallographic texture control via metal additive manufacturing

Takayoshi NAKANO, Osaka University, Japan

16:40 – 16:55 **O-E0266**

Controlling microstructure of additive-manufactured Al-Fe-Cu alloy for high strength and thermal conductivity

Yue Cheng, Nagoya University, Japan

16:55 – 17:10 **O-E0469**

On the microstructure evolution in Inconel 718 alloy fabricated by laser powder-bed fusion

Shuai Wang, Southern University of Science And Technology, China

17:10 – 17:25 **O-E0182**

Nano-scaled microstructure characterization and analysis of 316L stainless steel fabricated by laser powder bed fusion

FEI SUN, Nagoya University, Japan

17:25 – 17:40 **O-E0443**

Materials and process innovations in laser-directed energy deposition high-strength aluminium alloys

Chaolin Tan, Agency For Science, Technology And Research (A*STAR), Singapore

November 22 (Wed.), 2023

Session Title : Additive Manufacturing 7

Time : 10:50 - 12:30, Nov. 22

Room # : Halla Hall B, 3F

Session Chair : Daisuke EGUSA, The University of Tokyo

10:50 – 11:20 **Keynote** **K-E0426**

Materials Integration for Additive Manufacturing

Makoto WATANABE, National Institute for Materials Science, Japan

11:20 – 11:40 **Invited** **I-E0458**

Research progress of graded alloy fabricated by additive manufacturing

Zhang Baicheng, University of Science and Technology Beijing, China

11:40 – 12:00 **Invited** **I-E1136**

Research progress of graded alloy fabricated by additive manufacturing

Mahyar Khorasani, Royal Melbourne Institute of Technology, Australia

12:00 – 12:15 **O-E0395**

ADefect evaluation during metal additive manufacturing by AE method and machine learning

Gaku Ito, The University of Tokyo, Japan

12:15 – 12:30 **O-E0929**

Experimental investigation of DLP 3D-printed Ti-6Al-4V

Chang Woo Gal, Korea Institute of Materials Science, Korea

Session Title : Additive Manufacturing 8-1

Time : 14:00 - 15:30, Nov. 22

Room # : Halla Hall B, 3F

Session Chair : Mahyar Khorasani, Royal Melbourne Institute of Technology

14:00 – 14:30 **Keynote** **K-E0503**

Computational developments in design for additive manufacture, lowering the certification bar: a Defence perspective

Christopher Wallbrink, The Defence Science and Technology Group (DSTG), Australia

14:30 – 14:45 **O-E0507**

Effect of compression direction on the hot deformation and microstructure evolution of selective laser melted 718 alloy

Wei Le, Northwestern Polytechnical University, China

14:45 – 15:00 **O-E0669**

A Simple Detection Method of Microdefects during Metal Additive Manufacturing Process Using Acoustic Emission Monitoring

Kaita Ito, National Institute for Materials Science, Japan

15:00 – 15:15 **O-E0713**

Development of Low-Cost Ti-6Al-4V Filler Wire Manufacturing Process for Wire Arc Additive Manufacturing

Anoop Maurya, Korea Institute of Materials Science, Korea

15:15 – 15:30 **O-E0867**

A multi-scale numerical and experimental study for solidification microstructure and defects of superalloys fabricated by selective laser melting additive manufacturing

Songzhe Xu, Shanghai University, China

Session Title : Additive Manufacturing 8-2

Time : 14:00 - 15:45, Nov. 22

Room # : 400, 4F

Session Chair : Makoto WATANABE, National Institute for Materials Science

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14:00 – 14:15 **O-E0195**

Data assimilation-integrated multi-phase-field simulation of solidification in SUS316L stainless steel during additive manufacturing

Shoichiro Nakamura, Tokyo Univercity of Agriculture and Technology, Japan

14:15 – 14:30 **O-E0425**

Development of bio-high entropy alloys (BioHEAs) via laser-powder bed fusion

Ryosuke Ozasa, Osaka University, Japan

14:30– 14:45 **O-E0910**

Effects of AlN addition on melt pool stability and microstructural evolution of additively manufactured AISI 316L by laser powder bed fusion

Jung-Wook Cho, Pohang University of Science And Technology, Korea

14:45 – 15:00 **O-E1107**

Effect of electropulsing on anisotropy of laser additive manufactured Ti6Al4V alloy

Wang Fubin, Harbin Engineering University, China

15:00 – 15:15 **O-E0751**

Material Extrusion and Photopolymerization Approaches for 3D Printing of Particle-Based

Double Network Hydrogels

Yosuke Watanabe, Yamagata University, Japan

15:15– 15:30 **O-E0608**

Process parameter optimization for the β-solidifying γ-TiAl alloy fabricated by laser powder bed fusion: Evaluation of microstructural and mechanical properties

Sung-hyun Park, Osaka University, Japan

Session Title : Additive Manufacturing 9-1

Time : 16:00 -18:40, Nov. 22

Room # : Halla Hall B, 3F

Session Chair : Zhang Baicheng, University of Science and Technology Beijing

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16:00 – 16:30 **Keynote** **K-E1139**

Mechanical behavior of titanium lattice structures fabricated by powder bed fusion

Laichang Zhang, Edith Cowan University, Australia

16:30 – 16:50 **Invited** **I-E0434**

Microscopic phase separations in BioHEA fabricated by laser powder bed fusion

Daisuke EGUSA, The University of Tokyo, Japan

16:50 – 17:05 **O-E0015**

Precipitation of Al-Cu-Mg based composites produced by additive manufacturing

Jiehua Li, Montanuniversität Leoben, Austria

17:05 – 17:20 **O-E0207**

Characterisation of reused AlSi7Mg powder

James Warner, The University of Sydney, Australia

17:20 – 17:35 **O-E0324**

Alloy Design for Additive Manufacturing of High-Fraction γ' Superalloys and the Resulting Changes in Microstructure and Mechanical Properties

CHANHEE LEE, Changwon National University, Korea

17:35 – 17:50 **O-E1119**

Warpage of thin-wall cantilever beam in selective laser melting process: experimental and inherent strain method modelling

Chen Wang, Singapore Institute Of Manufacturing Technology (SIMTech), A*STAR Research Entities, Singapore

17:50 – 18:05 **O-E0296**

Controlling microstructure of additive manufactured Al-Si eutectic alloys based on computational thermal-fluid dynamics simulation

Masayuki Okugawa, Osaka University, Japan

18:05 – 18:20 **O-E0451**

Bio-additive manufacturing for control of bone matrix microstructure

Aira Matsugaki, Osaka University, Japan

18:20 – 18:40 **Invited** **I-E0603**

Study on PBF Additive Manufacturing Process and Characterization using Non-Spherical Hydrogenation-Dehydrogenation Titanium Powder

Bin Lee, Kyung Hee University, Korea

Session Title : Additive Manufacturing 9-2

Time : 16:00 - 18:00, Nov. 22

Room # : 400, 4F

Session Chair : Jung-Wook Cho, Pohang University of Science and Technology

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16:00 – 16:15 **O-E0115**

Nano-structured Fe-TiB_2 high-modulus steel through direct energy deposition

Renlong Xiong, Wuhan Institute of Technology, China

16:15 – 16:30 **O-E0662**

The effect of preheating and feature size on crack formation with the focus on crystallographic texture: Pure chromium fabricated by laser powder bed fusion

Ozkan Gokcekaya, Osaka Univeristy, Japan

16:30 – 16:45 **O-E0239**

Fundamental Characteristics of Three-Dimensional Additive Manufacturing Products of Zero Thermal Expansion Metal

Nobuuyki Oyama, NIPPONCHUZO K.K., Japan

16:45 – 17:00 **O-E1030**

Magnetic field assisting laser additive manufacturing

Chaoyue CHEN, Shanghai University, China

17:00 – 17:15 **O-E0956**

Development of 3D printers employing multiple molding methods and composite gel materials

Tsubasa Honma, Yamagata University, Japan

17:15– 17:30 **O-E0727**

Nanomechanical investigations into the effects of hydrogen on the mechanical behavior of additively-manufactured alloy

Yakai Zhao, Agency for Science, Technology and Research (A*STAR), Singapore

17:30 – 17:45 **O-E0735**

Effect of Oxygen and Nitrogen on the Microstructure and Hardness of Ti-6Al-4V Fabricated by Laser Powder Bed Fusion

Woohyeok KIM, HANBAT National University, Korea

17:45– 18:00 **O-E0200**

Superior cryogenic tensile strength of Carbides reinforced NiCoCrC medium-entropy alloy

fabricated via additive manufacturing

So-Yeon Park, Inha University, Korea

November 23 (Thurs.), 2023

Session Title : Additive Manufacturing 10-1

Time : 09:00 - 10:25, Nov. 23

Room # : Halla Hall B, 3F

Session Chair : Tsuyoshi MAYAMA, Kumamoto University

Feng He, Northwestern Polytechnical University

09:00 – 09:30 **Keynote** **K-E1162**

Constitutive Model and Finite Element Simulation of Additive Manufacturing Metallic Materials

Hyoung Seop Kim, Pohang University of Science and Technology, Korea

09:30 – 09:50 **Invited** **I-E0235**

Potential microstructural descriptors of additive-manufactured 316L stainless steel

Yoshitaka ADACHI, Nagoya University, Japan

09:50 – 10:10 **Invited** **I-E1178**

Melt pool flow induced uniform dispersion of reinforcing particles in additively manufactured metallic composites

Li Zan, Shanghai Jiao Tong University, China

10:10 – 10:25 **O-E0124**

Effects of Laser Powder Bed Fusion (LPBF) process parameters on Ti6246 microstructure and mechanical properties.

Prince Cobbinah, The University of Tokyo, Japan

Session Title : Additive Manufacturing 10-2

Time : 09:00 - 10:15, Nov. 23

Room # : 303B, 3F

Session Chair : Takuya ISHIMOTO, University of Toyama

09:00 – 09:15 **O-E0169**

Layered light-metals materials produced by a double spray forming machine

Dmitri LOUZGUINE, Tohoku University, Japan

09:15 – 09:30 **O-E0254**

Design strategy for eliminating cracking and improving mechanical properties of Al-Mg-Si alloys fabricated by laser melting deposition

Wenzhe Li, Beijing Institute of Technology, China

09:30 – 09:45 **O-E0465**

Mesoscopic chemical heterogeneities in laser powder bed fused CoCrMo and Ni mixed powders and their effect on the mechanical properties

Siyuan Wei, Agency For Science, Technology and Research, Singapore

09:45 – 10:00 **O-E0566**

Evaluation of physical properties of food ink for 3D food printers and three-dimensional noodle food modelling

Fujiwara Koki, Yamagata University, Japan

10:00 – 10:15 **O-E0816**

Post-processing technology of DLP-based additive manufacturing for 3D transparent yttria construction

Sinuo Zhang, Korea Institute of Materials Science, Korea

Session Title : Additive Manufacturing 11-1

Time : 10:50 -12:45, Nov. 23

Room # : Halla Hall B, 3F

Session Chair : Yoshitaka ADACHI, Nagoya University

Li Zan, Shanghai Jiao Tong University

10:50 – 11:20 **Keynote** **K-E1160**

Friction stir based additive manufacturing technologies

Fengchao Liu, Chinese Academy of Sceicne, Institute of Metal Research, China

11:20 – 11:40 **Invited** **I-E0300**

Crystal plasticity analysis of plastic deformation behavior of AM structure with customized local texture

Tsuyoshi MAYAMA, Kumamoto University, Japan

11:40 – 12:00 **Invited** **I-E1123**

Deformation faulting and dislocation-cell refinement in a selective laser melted 316L stainless steel

Feng He, Northwestern Polytechnical University, China

12:00 – 12:15 **O-E1042**

Application of Laser Powder Bed Fusion in-situ alloying technology on medium entropy alloys

Yaqing Hou, China Iron And Steel Research Insititute Group, China

12:15 – 12:30 **O-E0660**

Characterization on Microstructure and Deformation Mechanisms of Selective Laser melted Ti-6Al-4V

Yoon-Hwan Jo, Changwon National University, Korea

Session Title : Additive Manufacturing 11-2

Time : 10:50 -12:10, Nov. 23

Room # : 303B, 3F

Session Chair : Pan Wang, Singapore Institute Of Manufacturing Technology, A*STAR Research Entities

10:50 – 11:10 **Invited** **I-E0562**

Crystallographic texture formation and corrosion resistance of powder bed fusion-manufactured 316L stainless steel

Takuya ISHIMOTO, University of Toyama, Japan

11:10 – 11:25 **O-E0049**

Enhanced mechanical performance of duplex stainless steels via in-situ formation of core-shell nano-inclusions upon selective laser melting

Haokai Dong, South China University Of Technology, China

11:25 – 11:40 **O-E0176**

Transmission Electron Microscopy Studies on Orientation-Controlled 316L Austenitic Stainless Steel Produced by Laser Powder Bed Fusion

Kazuhisa Sato, Osaka University, Japan

11:40 – 11:55 **O-E0533**

Research on Microstructure and Mechanical Properties of Al-Mn-Mg-Sc-Zr-Hf Alloy Manufactured by Laser Powder Bed Fusion

Qiuge Li, Northwestern Polytechnical University, China

11:55 – 12:15 **Invited** **I-E0657**

Enhancing Additive Manufacturing through Core-Shell Composite Powders and in situ Dispersoid Synthesis for Metal Matrix Composites

Ho Jin RYU, Korea Advanced Institute of Science and Technology, Korea

12:15 – 12:30 **O-E0078**

Computational design of novel Ni superalloys with low crack susceptibility for additive manufacturing

Hao Yu, Northeastern University, China

12:30 – 12:45 **O-E0085**

The new Thermo-Calc Additive Manufacturing Module

Johan Bratberg, Thermo-Calc Software, Sweden

Session Title : Additive Manufacturing 12

Time : 14:00 -14:50, Nov. 23

Room # : Halla Hall B, 3F

Session Chair : Kazuhisa Sato, Osaka University

14:00 – 14:20 **O-E0078**

Computational design of novel Ni superalloys with low crack susceptibility for additive manufacturing

Hao Yu, Northeastern University, China

14:20 – 14:35 **O-E0085**

The new Thermo-Calc Additive Manufacturing Module

Johan Bratberg, Thermo-Calc Software, Sweden