



INTERNATIONAL INSTITUTE OF WELDING

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Doc. I-1548-2023

Annual Assembly Singapore 2023

Final Agenda, Revision 2

C-I: Additive Manufacturing, Thermal Cutting and Thermal Spray

July 17 - 19, 2023

Room: Listed by day of meeting

Chair: Doug Kautz (USA)

Monday 17 July 2019, 1400 – 1830 @ Orchid Main 4302

1. Opening of the Meeting
2. Request Meeting Secretary to write the Minutes of Meeting
3. Attendees and Apologies, Identification of C-I delegates
4. Approval of the minutes from the last annual assembly in Tokyo (Doc. I-1509-2022)
5. Adoption and Agreement of Agenda (Doc. I-1548-2023)
6. Discussion of Joint Intermediate Meeting in Hachenburg, Germany
7. Presentation of documents:

1430: Session 1: C-I Papers (25 minutes per paper including questions)

[01] 1415: Wire arc additive manufacturing of Ti-6Al-4V alloy using CO₂ active interpass cooling: phase composition, grain size, orientation, texture, lattice defect and mechanical properties

Xiaosong Guo, Bintao Wu

Doc. I-1538-2023

[02]1440: Pass-to-Pass Microstructural Variations in Arc Based AM Deposits in As-Built Conditions

Stephen Liu, Jordan Ream and Zhenzhen Yu

Doc. I-1546-2023

[03]1505: Microstructure and mechanical properties of additively manufactured IC10 superalloy

Yu Wu

Doc. I-1565-2023

1530-1600: Coffee break

[04] 1600: Drop and hump behaviors in robotic cold metal transfer-based additive manufacturing with vertical position

Jun Xiong

Doc. I-1540-2023

[05] 1625: Analysis of gas flow Inside the kerf for thermal cutting processes using the Schlieren method and computational fluid dynamic

Dae-Won Cho

Doc. I-1541-2023

[06] 1650: Plasma Arc Additive Manufacturing Wear-resistant Parts

Liu Zhenying

Doc. I-1542-2023

[07] 1715: Improving the properties and microstructure of AlCoCrFeNi_{2.1} alloy prepared by spark plasma sintering through in-situ pressure and temperature

Zhuonan Chu

Doc. I-1543-2023

Tuesday 18 July 2023, 0815 -1835 @ Orchid Main 4202/4203/4204

Joint Meeting of C-I, C-IV, and C-XII

“Welding/joining and additive manufacturing technology”

Morning Session, 0830-1230

Session 1: Chair: Professor Satoru Asai

0830: Opening of Joint Meeting of C-I, C-IV, and C-XII – Professor Satoru Asai

[08] 0840: Tailoring grain structure of laser powder bed fusion processed nickel alloy via layer-wised thermal gradient control strategies

Jie Zhu, Kai Feng, Zhuguo Li (China)

Doc. XII-2604-2023/ I-1549-2023/IV-1572-2023

[09] 0900: Microstructure control and strengthening of LaF₃ nano-particles reinforced CrCoNi medium entropy alloy fabricated by selective laser melting

Yiwei Yu, Kai Feng, Zhuguo Li, Bolun Han, Chengcheng Zhang, Jie Zhu (China)

Doc. XII-2605-2023/ I-1550-2023/IV-1573-2023

[10] 0920 Pore defect reduction technique based on direct observation of bubble generation processes during laser metal deposition

Keigo Tanaka, Takuto Yamaguchi, Hideki Hagino (Japan)

Doc. XII-2606-2023/ I-1551-2023/IV-1574-2023

[11] 0940: Dynamic keyhole behaviors in laser processing of a medium-entropy alloy

Dongsheng Wu, Hisaya Komen, Manabu Tanaka, Ninshu Ma, Zihan Li, Yuan Li, Youxiong Ye, Tao Sun (China)

Doc. XII-2610-2023/I-1552-2023/IV-1575-2023

[12] 1000: Modification of microstructure and mechanical property of twin-wire directed energy deposition-arc fabricated TiAl-4822 alloy via process current

Chen Shen, Wenlu Zhou, Yuelong Zhang, Lin Wang, Fang Li, Xueming Hua (China)

Doc. XII-2598-2023/ I-1553-2023/IV-1576-2023

1020 Visit of WitW editor

Coffee Break (1030– 1100)

Session 2: Chair: Professor Satoru Asai

[13] 1100: Probing Build Profile in Gas Metal Arc Directed Energy Deposition

Sanghamitra Das, Prashant Kumar Chaurasia, Amitava De (India)

Doc. XII-2593-2023/I-1557-2023/IV-1577-2023

[14] 1120: Multi-physical modelling of element inhomogeneity phenomenon in TW-DED-Arc fabricated γ -TiAl Alloy

Jianwen Xin, Dongsheng Wu, Chen Shen, Hisaya Komen, Manabu Tanaka, Xueming Hua, Fang Li (China)

Doc. XII-2599-2023/ I-1558-2023/ IV-1578-2023

[15] 1140: Relieving anisotropy of mechanical properties by optimization of microstructure through ultrasonic vibration assisted laser direct deposition

Chun Yu, Jijin Xu, Zhiyuan Yu, Junmei Chen, Hao Lu (China)

Doc. XII-2600-2023/I-1559-2023/IV-1557-2023

[16] 1200: Probing Dimensional Consistency during Multi-track Multi-layer Gas Metal Arc Directed Energy Deposition of Aluminium Alloys

Prashant Kumar Chaurasia, Birendra Kumar Barik, Atanu Das, Sven F Goecke, Amitava De (India)

Doc. XII-2602-2023/ I-1560-2023/IV-1579-2023

Afternoon Session, 1400-1830 **Session 3: Chair: Dr. Herbert Staufer**

[17] 1400: Comparison new joining approaches of mixed materials for highly loaded light weight and high temperature application such as ceramics connected to metal among others

Dirk Dittrich (Germany)

Doc. XII-2627-2023/I-1554-2023/IV-1557-2023

[18] 1420: Towards Improving Computational Efficiency of Thermomechanical Model for Laser Powder Bed Fusion

Neelima Patnaikuni, Kajal Khan, Amitava De (India)

Doc. XII-2628-2023/ I-1555-2023/IV-1556-2023

[19] 1440: Development of Hot-wire Laser Additive Manufacturing for Dissimilar Materials of Stainless steel/Aluminum alloys

Keita MARUMOTO, Takahiro HOURAI, Daiji MORITA, Chisako ODA, Takafumi FUJII, Takashi YUZAWA, Ryogo KOBA, Motomichi YAMAMOTO (Japan)

Doc. XII-2629-2023/ I-1556-2023/IV-1458-2023

[20] 1500: Mechanical and microstructural investigation of Laser+Wire DED deposited thin walled stainless steel structures

M. Ghasempoor-Mouziraji, N. Helthuis, I. Gibson, D. Alonso, C. Goulas

Doc. XII-2630-2023/I-1563-2023/IV-1562-2023

[21] 1520: Potential of thermography for the monitoring of the WAAM process

Johanna Müller, Jonas Hensel (Germany)

Doc. XII-2631-2023/I-1532-2023/IV-1580-2023

[22] 1540: Modelling tools and use for digital quality control in AM and welding

Jialuo Ding, Yongle Sun, Xin Chen, Pradeeptta Taraphdar, Alireza Mosalman Haghghi, Stewart Williams, Murugaiyan Amirthalingam (UK)

Doc. XII-2632-2023/ I-1535-2023/ IV-1581-2023

Coffee Break (1600 – 1630)

Session 4: Chair: Doug Kautz

[23] 1630: In-situ alloying with elementary powders in additive manufacturing

Kevin Hoefler, Phillip Schmidt, Jonas Hensel (Germany)

Doc. XII-2633-2023/I-1533-2023/IV-1582-2023

[24] 1650: Analysis of resulting component properties of 3D-graded additive structures made of iron and nickel-based material by 3DPMD

Robert Rimpl, André Hälsig, Kevin Hoefler, Jonas Hensel (Germany)

Doc. XII-2634-2023/ I-1534-2023/Doc. IV-1583-2023

[25] 1710: New processes and digitalisation for AM application to welding and rapid qualification

Stewart Williams, Jialuo Ding, Wojciech Suder, Jian Qin, Shakirudeen Lasisi (UK)

Doc. XII-2635-2023/ I-1536-2023/Doc. IV-1584-2023

[26] 1730: Superior quality and performance levels for aluminium wires for DED AM

Lingling Ren, Zhenbiao Wang, Chengde Li, Shuai Wang, Jialuo Ding, Stewart Williams (China)

Doc. XII-2636-2023/ I-1537-2023/Doc. IV-1585-2023

1750: Close Out of Joint Meeting of C-I, C-IV, and C-XII

Wednesday 19 July 2023, 1400 - 1830 @ Orchid Main 4302
Commission I Meeting, continued from Monday

1430: Session 2: C-I Papers (25 minutes per paper including questions)

1400: Open and Welcome – D. Kautz

[27] 1405: A Review of Digital Twinning and Visualization Process Applications for Arc Additive Manufacturing Systems

Hengrui Li

Doc. I-1544-2023

[28] 1430: EBSD analysis on Ti6AL4V alloy fabricated by Wire Arc Additive Manufacturing using CO2 active interpass cooling

Xiaosong Gou

Doc. I-1545-2023

[29] 1455: Improving corrosion resistance of spark plasma sintering-produced AlCoCrFeNi_{2.1} high entropy alloy via in-situ process pressure and temperature control

Zhuonan Chu, Zexi Shao, Bintao Wu

Doc. I-1539-2023

[30] 1520: A methodology for the development of functionally graded powder spreading in laser powder bed fusion process using discrete element method

Choudhury S S, Annabattula R K, Amirthalingam M

Doc. I-1561-2023

Coffee Break (1600– 1630)

[31] 1630: Effect of Co on the Erosion-Corrosion Behavior of Duplex Stainless Steel Surfacing Layer

Yefeng Bao, Shangzhi Wei, Yu Liu, Yongfeng Jiang, Ke Yang, Qining Song

Doc. I-1547-2023

[32] 1655 Presentation by IIW and vote on Chair

[33] 1720: Influences of Process Parameters on the Microstructure and Mechanical Properties of CoCrFeNiCu Based High-Entropy Alloy in a Laser Powder Bed Fusion Process

Vito Burgio

Doc. I-1564-2023

Continuation of Commission I Administrative Tasks:

8. Structure of Commission I: Election of Subcommission Chair

9. Activities of Commission I

10. List of Documents (Doc. I-1381-19)

11. Joint Workshops/Meetings with Other IIW Units

12. Resolutions by Commission I from 2019 Meeting

13. Other Business

- Recommendations for Welding in the World
- Satisfaction Survey
- Preparations for Upcoming Annual Assemblies and Intermediate Meetings

14. Adjournment of the 2023 C-I Meeting