



C-IV Power Beam Processes

78th Annual Assembly Genoa 2025

IV-1672-2025

Chair: Dr. Patrick W. Hochanadel

Agenda – 23 June 2025

Time	Agenda Item	Responsibility	Action
13.40	1. Administrative Tasks		
	1.1. Opening of the meeting	P. Hochanadel	Information
	1.2. Anti-Trust and Code of Conduct Briefing	P. Hochanadel	Information
	1.3. Request for Secretary to write meeting minutes	P. Hochanadel	Assignment
	1.4. Attendees and Apologies, Identification of C-IV Delegates	P. Hochanadel	Information
	1.5. Approval of the minutes from the last annual assembly in Rhodes, Greece (Doc. IV-1657-2024)	P. Hochanadel	Motion Required
	1.6. Adoption and Approval of Agenda (Doc. IV-1672-2025)	P. Hochanadel	Motion Required
	1.7. Discussion of Joint Intermediate Meeting in Trollhättan, Sweden	P. Hochanadel	Information
	1.8. Proposed C-IV Sub-Commission-D (Handheld Laser Beam Welding)	P. Hochanadel	Information
	1.9. Emerging Technologies Subgroup Briefing	P. Hochanadel	Information
	1.10. Presentation of Documents		
13.45	2. Presentations	Authors	Information
18.00	3. Adjournment for the Day	P. Hochanadel	Information

Agenda – 24 June 2025

Time	Agenda Item	Responsibility	Action
08.55	1. Opening of Joint Session with C-I, C-IV, C-VIII (Super-Joint Session in the afternoon), and C-XII	S. Yamane	Information
08.55	2. Presentations	Authors	Information
18.25	3. Adjournment for the Day	P. Hochanadel	Information

Agenda – 25 June 2025

Time	Agenda Item	Responsibility	Action
14.00	1. Opening of Session	H. Staufer	Information
14.00	2. Presentations	Authors	Information
17.50	3. Administrative Tasks		
	3.1. Structure of Commission IV – Proposed C-IV Sub-Commission D on Handheld Laser Beam Welding for discussion and vote	P. Hochanadel	Motion Required
	3.2. Activities of Commission IV (Upcoming meetings including Joint Intermediate Meeting(s) and Annual Assembly	P. Hochanadel	Information
	3.3. Other resolutions including Welding in the World	P. Hochanadel	Motion Required
	3.4. Other Business - Satisfaction Survey	P. Hochanadel	Information
18.00	4. Adjournment of the Meeting of Commission IV	P. Hochanadel	Motion Required

Members' List (C-IV Leadership and Delegates)

First name	Last name	Role	IIW user/e-mail	Country
Patrick	Hochanadel	Chair – C-IV	phoch@lanl.gov	USA
Max	Nentwich	Vice-Chair – C-IV	mnentwich@camvaceng.com	UK
Peer	Woizeschke	Chair, Sub-Commission IV-A and Delegate	peer.woizeschke@tu-dortmund.de	Germany
Chris	Punson	Chair, Sub-Commission IV-B and Delegate	cpunshon@camvaceng.com	UK
Hebert	Staufer	Chair, Sub-Commission IV-C and Delegate	staufer.herbert@fronius.com	Austria
Li	Chen	Delegate	ouchenxi@163.com	China
Antti	Salminen	Delegate	antti.salminen@utu.fi	Finland
Raghawendra	Sisodia	Delegate	raghawendra.sisodia@uni-miskolc.hu	Hungary
Michelangelo	Mortello	Delegate	Michelangelo.Mortello@iis.it	Italy
Masahiro	Tukamoto	Delegate	tsukamoto.masahiro.jwri@osaka-u.ac.jp	Japan
Su jin	Lee	Delegate	leesj@kimm.re.kr	Republic of Korea
Aurel-valentin	Birdeanu	Delegate	valentin@isim.ro	Romania
Jozef	Barta	Delegate	jozef.barta@stuba.sk	Slovakia
Damjan	Klobcar	Delegate	damjan.klobcar@fs.uni-lj.si	Slovenia
Alexander	Kaplan	Delegate	alexander.kaplan@ltu.se	Sweden
Mustafa	Koçak	Delegate	mkocak@gedik.com.tr	Turkey
Tate	Patterson	Delegate	tate.patterson@sveise.llc	USA

Appendix (Schedule of Presentations)

78th Annual Assembly Genoa 2025

Venue: Centro Congressi Porto Antico

C-IV: Power Beam Processes

June 23-25, 2025

Room: Listed by day of meeting

Chair: Dr. Patrick Hochanadel (United States)

Vice-Chair – Commission IV: Mr. Max Nentwich (United Kingdom)

Chair – Sub-Commission IV-A (Laser Beam Processes): Dr. Peer Woizeschke (Germany)

Chair – Sub-Commission IV-B (Electron Beam Processes): Mr. Chris Punshon (United Kingdom)

Chair – Sub-Commission IV-C (Laser Hybrid Arc Welding): Dr. Herbert Staufer (Austria)

Monday June 23, 2025, 1340-1800 Room: Ex-Novo 2 (mod 7 2°)

Commission IV Meeting

Session 1: C-IV Papers (20 minutes per paper including questions)

Session Chair: Chris Punshon

[01] 1345: Specifics of Electron Beam Welding Technology for structures manufactured from 2219 aluminium alloy (ONLINE)

Rusynyk Maksym (Ukraine)

IV-1713-2025

[02] 1345: Electron Beam Welding for AIRBUS Helicopters gears assemblies

Philippe Corre (France)

IV-1673-2025

[03] 1405: Effect of Post-Weld Heat Treatments on Microstructure and Mechanical Properties of Electron Beam Welded Inconel 718 Alloy

Özlem GERÇEK ÖKSÜZ, Okay TUTAR (Turkey)

IV-1674-2025

[04] 1425: Comparative analysis of circular beam oscillation and normal electron beam welding for S1300QL steel joints

Raghawendra P.S. Sisodia, Piotr Sliwinski, Adam Skowronek, Krzysztof Matus, Adam Grajcar, Marek St. Węglowski (Hungary)

IV-1675-2025

[05] 1445: Development of an electron beam analyzer device to ensure constant quality in welds

O. Perrin (France)

IV-1676-2025

[06] 1505: Formations and properties of EBW with IMPFZ on heavy thickness TC4 alloy

Fu Pengfei, Tang Zhenyun, Li Lihang, Geng Kang, Mao Zhiyong, Zhao tong (China)

IV-1677-2025

1545-1615: Coffee break

1615 Session 2: C-IV Papers (20 minutes per paper including questions)

Session Chair: Max Nentwich

[07] 1620: Dynamic beam lasers and their impact on melt pool and keyhole stability in welding

Nina Armon, Rachel Assa, Eyal Shekel (Israel)

IV-1678-2025

[08] 1640: Process Parameter Influence on Pulsed Laser Cleaning of High-Thickness Painted Coatings

Thongchuea Nutchanat, Satsuki Hiura, Keita Marumoto, Toshitaka Uchida, Takuya Matsuzaki, Motomichi Yamamoto (Japan)

IV-1679-2025

[09] 1700: Microstructure and mechanical properties of laser welded PBF-LB/IN718

Saeid Parchegani Chozaki, Heidi Piili, Antti Salminen (Finland)

IV-1680-2025

[10] 1720: Estimation of bead size and catchment efficiency in laser cladding

Nitheesh Kumar, Gentry Wood, Yi Lu, and Patricio F. Mendez (Canada)

IV-1681-2025

[11] 1740: Numerical studies of the dynamic keyhole behavior during laser beam welding with an oscillating magnetic field

Fan Yang, Xiangmeng Meng, Stephen Nugraha Putra, Marcel Bachmann, Michael Rethmeier (Germany)

IV-1682-2025

Close of Day 1 Activities

Tuesday June 24 2025, 0855 -1830, Room: Grecale (OPZ)
Joint Meeting of C-I, C-IV, and C-XII

Morning Session, 0855-1300

Session 1, Chair: Professor Satoshi Yamane

0855: Opening of Joint Meeting of C-I, C-IV, and C-XII – Professor Satoshi Yamane

[12] 0855 Traveling Steady Pool Model for Efficient and Accurate Thermal Analysis in Welding and Additive Manufacturing

Sang-Hyun Ahn, Inyoung Songa, Junsung Bae, Gwang-Ho Jeong, Dae-Won Cho, Hee Shin Kange and Young Whan Park, (Korea)

I-1685-2025/IV-1706-2025/XII-2757-2025

[13] 0915: 0915: Exploring the Microstructure and Mechanical Properties of Bimetallic Layer Structures Fabricated by DED-Arc Trajectory Weaving

Shujun Chen, Haojie Gou, Zhaoyang Yan, Jun Xiao (China)

I-1686-2025/IV-1707-2025/XII-2758-2025

[14] 0935: Improvement of printing Accuracy in WAAM Using AC Synchro-feed Welding

Keiji KADOTA, Kenta TSUTSUI (Japan)

I-1687-2025/IV-1708-2025/XII-2759-2025

[15] 0955 Probing Melt Pool Stability and Dimensional Consistency for out-of-position Wire Arc Directed Energy Deposition

Gauravkumar Roshanlal Dak, Birendra Kumar Barik, Prashant Kumar Chaurasia, Götz-Friedrich Gottschalk, Akshay Manoj Shahane, Sven-F Goecke, Amitava De (India)

I-1688-2025/IV-1709-2025/XII-2760-2025

[16] 1015: Probing Smartphone based Photogrammetry for Part Profiling in Wire Arc Directed Energy Deposition

Birendra Kumar Barik, Prashant Kumar Chaurasia, Vikram Kumar, Gaurav Dak, Sven-F Goecke, Amitava De (India)

I-1689-2025/IV-1710-2025/XII-2761-2025

Presentation by IIW Staff/Elisabetta Sciacaluga (IIW)

Coffee Break (1045– 1115)

Session 2, Chair: Dr. Patrick Hochanadel

[17] 1115: Blue-IR Hybrid Laser System for Copper Welding

Toshiaki Sakai, Hiroto Kageyama, Naoki Mori, Akira Yukumoto, Hideki Kondo (Japan)

I-1657-2025/IV-1683-2025/XII-2762-2025

[18] 1135: Optimization and Characterization of Laser Beam Welding applied to Inconel 718 Additively Manufactured for Liquid Propulsion Systems

Rinaldo Rigon, Bruno Di Dato, Domenico Borrelli (Italy)

I-1658-2025/IV-1684-2025/XII-2763-2025/

[19] 1155: Underwater laser cutting technology in an environment simulated at a depth of 10m underwater

Su-Jin Lee¹, Ryoohan Kim, Jeongsoo Choi, Danbi Song, and In Duck Park (South Korea)

I-1659-2025/IV-1685-2025/XII-2764-2025

[20] 1215: Measurement of optical absorption using a calorimetric method during welding of pure copper with a blue diode laser

Keisuke TAKENAKA, Kazuki KODA, Mao SUDO, Hideaki SHIRAI, Yuji SATO, Masahiro TSUKAMOTO (Japan)

I-1660-2025/IV-1686-2025/XII-2765-2025

[21] 1235: A statistical investigation of the laser energy absorption and keyhole stability in high-power laser beam welding

Xiangmeng Menga, Stephen Nugraha Putra, Marcel Bachmann, Michael Rethmeier (Germany)

I-1661-2025/IV-1687-2025/XII-2766-2025

Afternoon Session, 1425-1830

Session 3, Chair: Mr. Doug Kautz

1425: Opening of Afternoon Session of C-I, C-IV, and C-XII – Dr. Patrick Hochanadel

[22] 1425: Investigation on the influence of electron beam modulation on the mechanical properties of additively manufactured titanium components

Georg Fischer, Peter Grass, and Ghazal Moeini (Germany)

I-1650-2025/IV-1688-2025/XII-2767-2025

[23] 1445: A Comprehensive Experimental Comparison of Solid and Metal-Cored Wires in WAAM

Batuhan Turgut, Ugur Gurol, Recep Onler (Turkey)

I-1654-2025/IV-1689-2025/XII-2768-2025

[24] 1505: Deposition Anomaly Detection Through Welding Current Analysis in Hybrid Manufacturing System Integrating Robot-assisted Wire Arc Additive Manufacturing and Machining

Sakufu Ko, Yuka Yamagata, Shigeru Aoki and Keita Terashima (South Korea)

I-1668-2025/IV-1690-2025/XII-2769-2025

[25] 1525: Thermal Modelling in High Deposition Rate Laser Directed Energy Deposition Process
E. A. Bonifaz, J. Li (USA)

I-1669-2025/IV-1691-2025 XII-2770-2025

[26] 1545: Microstructural and Mechanical Properties of Multi-Material Elements via DED Arc and Hybrid Manufacturing

Shafi Ussin, Ruizhi Zhang, Mohsen Amraei, Leroy Gardner, Antti Salminen (Finland)

I-1652-2025/IV-1692-2025/XII-2771-2025

Coffee Break (1615 – 1645)

Session 4, Super-Joint Meeting (C-I, C-IV-C-VIII, CXII, and CXIV)

Chair: Mr. David Werba – Handheld Laser Welding

[27] 1645: Handheld laser beam welding – about various influences on resulting properties
Simon Jahn, Martin Schmitz, Robert Prowaznik, Mario Rockser, Michael Wolters (Germany)

I-1662-2025/IV-1693-2025/VIII-2402-2025/XII-2772-2025

[28] 1705: Advancements in handheld laser welding (HH LBW) for multi-pass butt joint applications

J. Eduardo Alvarez Rocha, Doug J. Hamre, Felipe Castro Cerda, Patricio F. Mendez (Canada)

I-1663-2025/IV-1694-2025/VIII-2403-2025/XII-2773-2025

[29] 1725: Optimizing Handheld Laser Welding: Analyzing the Effects of Laser Power and Wobble Optic Parameters

Corey Cox (United States)

I-1664-2025/IV-1695-2025/VIII-2404-2025/XII-2774-2025

[30] 1745: Hand held laser welding investigation on process mechanisms and recommendations for joining various materials suitable for storage hydrogen storage solutions and lightweight structures.

Jan Frostevarg and Farid Akhtar (Sweden)

I-1690-2025/IV-1711-2025/VIII-2406-2025/XII-2775-2025

[31] 1805: Understanding Laser Beam Welding under Space Conditions

A. Brimmer, E. Choi, W. McAuley, K.C. Riffel, B. Panton, A.J. Ramirez (United States)

I-1684-2025/IV-1712-2025/VIII-2405-2025/XII-2775-2025

1825: Close Out of First Day Joint Meeting of C-I, C-IV, and C-XII – P. Hochanadel

Wednesday June 25, 2025, 1400-1800 Room: Ex-Novo 2 (mod 7 2°)
Commission IV Meeting (continued from Monday)

0900: Session 3: C-IV Papers (20 minutes per paper including questions)
Session Chair: Dr. Herbert Staufer

[32] 1400: Development of narrow-gap welding technique for austenitic stainless steel using hot-wire laser welding

Shoichiro YOSHIDA, Takayuki MURATA, Taichi NISHIDA, Narutaka NAKAMURA, Keita MARUMOTO, Motomichi YAMAMOTO (Japan)

IV-1696-2025

[33] 1420: Microstructural evolution and mechanical properties of Vacuum Laser Beam Welded In718 superalloy and 304 stainless steel dissimilar joint

S. Zhang, M. Jiang, X. Chen, Y. Chen (China)

IV-1697-2025

[34] 1440: Influence of Laserbeam Rotating to the Porosity of Laser-MIG-Hybrid Welded AW 6063-T6 Aluminum Alloy for Battery Trays

Staufer, H.; Gaisberger, J.; Schorn, M., (Austria)

IV-1698-2025

[35] 1500: Microstructure and mechanical properties of heat-treated high-strength aluminum alloys fabricated by hot-wire laser AM

Keita MARUMOTO, Kumi KODAMA, Takahiro HOURAI, Daiji MORITA, Motomichi YAMAMOTO (Japan)

IV-1699-2025

[36] 1520: Laser additive manufacturing technology of submarine repair application

James Chen and James Huang (Canada)

IV-1700-2025

1540-1610: Coffee break

0900: Session 4: C-IV Papers (20 minutes per paper including questions)
Session Chair: Dr. Jan Froesevarg

[37] 1610: Scaling Analysis for Enhanced Quality, Economics, and Productivity of Industrial Laser Cladding

M. Grams, G. Wood (Canada)

IV-1701-2025

[38] 1630: Electron Beam Welding to Improve Joining Quality in Electric Vehicle Components

Max Nentwich (United Kingdom)

IV-1702-2025

[39] 1650: Joining Technology Development for AM RAFMS Components

Derek Holiver, Anrej Turk, Shaumik Lenka, and Dhairyasheel Patil (United Kingdom)

IV-1703-2025

[40] 1710: Large scale plate joining and longitudinal seam welding using Local Vacuum Electron Beam Welding

Chris Punshon (United Kingdom)

IV-1704-2025

[41] 1730: Research on The Effect of Ti/Zr Addition on the Microstructure and Mechanical Properties of Laser-Welded Joints in SiCp/2A14 Aluminum Matrix Composites

Wenqiang Gao, Shuili Gong, Jing Yang, Yue Gong, Jianxun Zhang, Zhiying Wang (China)

IV-1705-2025