C-IV Power Beam Processes

79th Annual Assembly Salzburg 2026

IV-1734-2026

Chair: Dr. Patrick W. Hochanadel

Agenda – Monday, 13 July 2026

Time	Agenda Item	Responsibility	Action
09.45	**1. Administrative Tasks**		
	1.1. Opening of the meeting	TBD	Information
	1.2. Anti-Trust and Code of Conduct Briefing	TBD	Information
	1.3. Administrative Officer to write meeting minutes	TBD	Assignment
	1.4. Attendees and Apologies, Identification of C-IV Delegates	TBD	Information
	1.5. Approval of the minutes from the last annual assembly in Genoa, Italy (Doc. IV-1714-2025)	TBD	**Motion Required**
	1.6. Adoption and Approval of Agenda (Doc. IV-1734-2026)	TBD	**Motion Required**
	1.7. Discussion of Joint Intermediate Meeting in Linares, Jaén, Spain	TBD	Information
	1.8. Presentation of Documents		
10.00	**2. Presentations for the Day**	Presenters	Information
12.50	**3. Adjournment for the Day**	P. Hochanadel	Information

Agenda – Tuesday, 14 July 2026

Time	Agenda Item	Responsibility	Action
08.30	1. Opening of Joint Session with C-I, C-IV, C-XII, and C-XIX	S. Yamane	Information
08.30	2. Presentations	Presenters	Information
10.10	3. Presentation by IIW Secretariat	E. Sciaccaluga	Information
15.45	4. Presentation by WitW Editor in Chief	N. Enzinger	Information
18.00	5. Adjournment for the Day	P. Hochanadel	Information

Agenda – Wednesday, 15 July 2026

Time	Agenda Item	Responsibility	Action
08.30	1. Continuation of C-IV Meeting	P. Hochanadel	Information
08.30	2. Presentations	Presenters	Information
10.30	3. Renewal Election for Commission IV	E. Sciaccaluga	**Motion Required**
12.30	4. Adjournment for the Day	P. Hochanadel	Information

Agenda – Thursday, 16 July 2026

Time	Agenda Item	Responsibility	Action
08.30	1. Opening of Joint Session with C-VIII	D. Werba	Information
08.30	2. Presentations	Presenters	Information
12.30	3. Administrative Tasks (C-IV Only)		
	3.1. Activities of Commission IV (Upcoming meetings including Joint Intermediate Meeting(s) and Annual Assembly	P. Hochanadel	Information
	3.2. Resolutions including Welding in the World	P. Hochanadel	**Motion Required**
	3.3. Other Business - Satisfaction Survey	P. Hochanadel	Information
12.40	4. Adjournment of the Meeting of Commission IV	P. Hochanadel	**Motion Required**

Members' List (C-IV Leadership and Delegates)

First name	Last name	Role	Country
Patrick	Hochanadel	Chair – C-IV	United States
Max	Nentwich	Vice-Chair – C-IV	United Kingdom
Raghawendra	Sisodia	Chair, Sub-Commission IV-A and Delegate	Hungary
Chris	Punshon	Chair, Sub-Commission IV-B and Delegate	United Kingdom
Hebert	Staufer	Chair, Sub-Commission IV-C and Delegate	Austria
Patricio	Mendez	Chair, Sub-Commission IV-D and Delegate	Canada
Tate	Patterson	Administrative Officer, Delegate	United States
Ali	Koruk	Delegate	Belgium
Pengfei	Fu	Delegate	China
Antti	Salminen	Delegate	Finland
Peer	Woizeschke	Delegate	Germany
Michelangelo	Mortello	Delegate	Italy
Masahiro	Tukamoto	Delegate	Japan
Su jin	Lee	Delegate	Republic of Korea
Aurel-valentin	Birdeanu	Delegate	Romania
Jozef	Barta	Delegate	Slovakia
Damjan	Klobcar	Delegate	Slovenia
Alexander	Kaplan	Delegate	Sweden
Mustafa	Koçak	Delegate	Turkey
Tate	Patterson	Delegate	United States

Appendix (Schedule of Presentations)

79th Annual Assembly Salzburg 2026

C-IV: Power Beam Processes

July 13-16, 2026

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. Raghawendra Sisodia (Hungary)
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 July 13, 2026, 0930-1230 Room: Paracelsus
Commission IV Meeting

0945 Administrative Tasks

Session 1: C-IV Papers, LBW-1 (20 minutes per paper including questions)
Session Chair: Dr. Raghawendra Sisodia

[01] 1000: Dynamic Beam Lasers in Welding: Advancing Structural Integrity from Electronics to Heavy Industry
Robert Bernhard (Germany)
IV-1735-2026

[02] 1020: Tailored fusion zone in indirect laser welding of copper to aluminium by beam power modulation
Niclas Hober, Patrick Lemm, Marcus Glaser, Majd Mustafa, Leander Schmidt, Jean Pierre Bergmann (Germany)
IV-1736-2026

[03] 1040: The Relationship between Welding Result and Molten Pool Behavior in High-Power Laser Keyhole Welding
Kozue Kiyokawa, Keisuke Takenaka, Yuji Sato, Tsukamoto Masahiro (Japan)
IV-1737-2026

[04] 1110: Advancing Safer Nuclear Decommissioning through Advanced Laser Technologies

Su Jin Lee, Jeongsoo Choi, Danbi Song, Ryoonhan Kim, Kwang Hyeon Lee (Korea)
IV-1767-2026

1130 Session 2: C-IV Papers, EBW (20 minutes per paper including questions)
Session Chair: Mr. Chris Punshon

[05] 1130: Inline Quality Assurance Methods in Electron Beam Welding
Max Nentwich (United Kingdom)
IV-1739-2026

[06] 1150: Process optimization of an AlB4C MMC welded using EBW
Helmut Riedl, Norbert Enzinger, (Austria)
IV-1740-2026

[07] 1210: Non-Epitaxial Nucleation in High Energy Density Welds
Joris Hochanadel, Boyd Panton, Carolin Fink, Johan Westraadt, John Lippold (United States)
IV-1741-2026

[08] 1230: Dissimilar welding between high-strength steel and copper using an electron beam
António Pereira, Leandro Rodrigues, Dina Silva, Catarina Bastos, Nélia Silva, Bernardo Mascate (Portugal)
IV-1742-2026

1250 Close of Day 1 Activities

Tuesday July 14, 2026, 0830 -1800, Room: Karajan 1, 2, 3
Joint Meeting of C-I, C-IV, C-XII, and C-XIX

Morning Session, 0830-1300
Session 1, Chair: Professor Satoshi Yamane

0830: Opening of Joint Meeting of C-I, C-IV, and C-XII – Professor Satoshi Yamane

[11] 0830: Fundamental energy-material interaction framework for process harmonisation and transferability in fusion based additive manufacturing and welding
Stewart Williams (UK)
I-1732-2026/IV-1743-2026/XII-2834-2026/XIX-0048-2026

[12] 0850: Experimental study of different multi-camera configurations for in-situ monitoring of the DED-arc process

Akshay Manoj Shahane, Götz-Friedrich Gottschalk, Sven-Frithjof Goecke (Germany)
I-1733-2026/IV-1744-2026/XII-2835-2026/XIX-0049-2026

[13] 0910: Influence of Environmental Pressure on Microstructure and Mechanical Properties of Wire-Arc Directed Energy Deposited Al-Cu Alloy
Ji Chen, Hairui Wang , Dongsheng Wu, Hao Su , Shengli Li, Chuansong Wu (China)
I-1734-2026/IV-1745-2026/XII-2836-2026/XIX-0050-2026

[14] 0930: Overhang Structure Fabrication in Wire Arc Directed Energy Deposition Using Sand-Printed Supports
Chang Young Choi, Hwi Jon Son, Yeong Jae Kim, Young Tae Cho (Korea)
I-1735-2026/IV-1746-2026/XII-2837-2026/XIX-0051-2026

[15] 0950: Combination of laser-MIG hybrid welding and submerged arc welding processes for medium to thick EH36 plates welding
Chen Shen, Xueming Hua, Yuelong Zhang, Fang Li, Xiaopeng Wei (China)
I-1736-2026/IV-1744-2026/XII-2838-2026/XIX-0052-2026

1010: **Presentation by IIW Staff/Elisabetta Sciaccaluga (confirmed)**

Coffee Break (1015– 1045)

Session 2, Chair: Dr. Patrick Hochanadel

[16] 1045: Dissimilar copper-stainless steel welding by blue laser in heat pumps manufacturing
António Pereira, Miriam Tavares, Dina Silva, Catarina Bastos, Nélia Silva, Bernardo Mascate (Portugal)
I-1694-2026/IV-1748-2026/XII-2339-2026/XIX-0053-2026

[17] 1105: Fundamental mechanisms of spatter formation during full penetration laser welding revealed by high-speed synchrotron X-ray imaging
Christian Diegel, Leander ScFcohmidt, Klaus Schricker, Marc Seibold, Hannes Friedmann, Peter Hellwig, Fabian Fröhlich, Falk Nagel, Alexander Rack, Herwig Requardt, Yunhui Chen (Germany)
I-1695-2026/IV-1749-2026/XII-2840-2026/XIX-0054-2026

[18] 1125: 6kW High-power and High-brightness Blue Laser using Wavelength Beam Combining Technology
Kazuya Hatakeyama, Norihiro Dejima, Yoshio Okamoto, Yasuo Tanahashi, Yuto Oki, Takuya Tsujimoto, Nao Senga, Yoshihiro Kimura, Ryohei Hirose, Yojiro Ichiraku, Tsutomu Yamada, Kaname Saito, Masaki Omori (Japan)
I-1696-2026/IV-1750-2026/XII-2841-2026/XIX-0055-2026

[19] 1145: Numerical and experimental investigation of metal vapour dynamics in electron beam welding for in-orbit manufacturing
Federico Faustini, Tiberiu Minea, Adrien Revel, Guillaume Mohara (France)
I-1697-2026/IV-1751-2026/XII-2842-2026/XIX-0056-2026

[20] 1205: Modeling Temperature Dependence of Laser Absorptivity for Copper in Laser Additive Manufacturing
Susumu Kato, Haruhisa Koguchi, Tetsuji Shimizu, Keisuke Takenaka, Yuji Sato, Masahiro Tsukamoto, (Japan)
I-1698-2026/IV-1752-2026/XII-2843-2026/XIX-0057-2026

Afternoon Session, 1400-1800
Session 3, Chair: Mr. Doug Kautz

1400: Opening of Afternoon Session of C-I, C-IV, and C-XII – Dr. Patrick Hochanadel

[21] 1405: Development of net-shape wire based additive manufacturing for the International Space Station
Goncalo Pardal, Xin Chen, Stewart Williams, Anthony Lecossais, Batiste Allilaire, Sebastien Girault, Mathieu Chevalier, Advenit Makaya, Caterina Lantaffi, Rob Postema (United Kingdom)
I-1699-2026/IV-1753-2026/XII-2844-2026/XIX-0058-2026

[22] 1425: Wire Arc Directed Energy Deposition of High-Strength Steels: Initial Results and Future Directions
Ruslan Kim, Kaue C. Riffel, Antonio J. Ramirez (United States)
I-1700-2026/IV-1754-2026/XII-2845-2026/XIX-0059-2026

[23] 1445: Analysis of Mechanical and Metallurgical Properties of ER110S-G HSLA Steel Parts Manufactured by Wire Arc Additive Manufacturing (WAAM)
Bruno Cota, Matheus Miranda, Valdemar Duarte, Telmo Santos, Tarcísio Brito, Gustavo Carvalho (Brazil)
I-1701-2026/IV-1755-2026/XII-2846-2026/XIX-0060-2026

[24] 1505: Geometrical and mechanical properties of mild steel DED-Arc plates
Max Mierzwa, Erhan Özel, Mirco Olesch, Rahul Sharma, Nils Rittich, Helen Bartsch, Markus Feldmann (Germany)
I-1702-2026/IV-1756-2026/XII-2847-2026/XIX-0061-2026

[25] 1525: Experimental Investigation and Process Window Development for Bead Geometry Control in SS316L SI DED-Arc Additive Manufacturing
Antti Salminen, Ashish Ganvir, Mohsen Amraei, Shafi Uddin (Finland)
I-1703-2026/IV-1757-2026/XII-2397-2026/XIX-0062-2026

1545: **Presentation by *Welding in the World* (Editor in Chief – Prof. Norbert Enzinger – confirmed)**
Coffee Break (1600 – 1615)

Session 4, 1615-1800
Chair: Prof. Isabelle Choquet

[26] 1615: Influence of Ultrasonic Frequency Pulsing on Arc Characteristics, Droplet Transfer, and Melt Flow in GMAW
Yuan Zhao, Zewu Qi, Bojin Qi (China)
I-1737-2026/IV-1758-2026/XII-2848-2026/XIX-0063-2026

[27] 1635: Influence of the electromagnetic weld pool support on arc stability
F. Akyel, Ö. Üstündag, N. Bakir, C. Brunner-Schwer (Germany)
I-1738-2026/IV-1759-2026/XII-2849-2026/XIX-0064-2026

[28] 1655: Predicting and Mitigating Distortion in Wire L DED Using Thermomechanical Simulations and Experimental Validation
Dik Baas, Björn Nijhuis, Christiaan Kok, Constantinos Goulas (Germany)
I-1739-2026/IV-1760-2026/XII-2850-2026/XIX-0065-2026

[29] 1715: Tailoring Microstructure and Mechanical Properties in Deep-Penetration Vacuum Laser Welding of Inconel 718 via High-Frequency Beam Oscillation
Meng Jiang, Lijun Yang, Xi Chen, Yanbin Chen (China)
I-1740-2026/IV-1761-2026/XII-2851-2026/XIX-0066-2026

[30] Hot cracking in welding: A multiscale simulation study
Fang Han, Zhihang Zhang, Zhibo Dong (China)
I-1741-2026/IV-1762-2026/XII-2852-2026/XIX-0067-2026

1755: Close Out of First Day Joint Meeting of C-I, C-IV, C-XII, and C-XIX – Dr. Isabelle Choqet

Wednesday July 15, 2026, 0830-1230 Room: Paracelsus
Commission IV Meeting (continued from Monday)

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

[31] 830: Analysis of Laser beam tandem submerged arc hybrid welding using high-speed imaging
Michael Clemens, Simon Olschok, Uwe Reisgen (Germany)
IV-1763-2026

[32] 0850: Integrated Wobbling Laser and Hot-Wire Approach for Laser–Arc Hybrid Welding of Pipeline Steels
James Chen, Hanwen Yang, Xiaoye Zhao, Adrian Gerlich (Canada)
IV-1764-2026

[33] 0910: Comparison of Process Effects in Copper Welding Using Blue Lasers with Different Fiber-Core Diameters in a Hybrid IR/Blue Laser System
Yoshiya Miyamoto, Maito Katayama (Japan)
IV-1765-2026

[34] 0930: Coaxial Multi-Laser Wire Directed Energy Deposition of Titanium Alloy with Isotropic Mechanical Property
Kai Yu, Caiyou Zeng, Baoqiang Cong, (China)
IV-1766-2026

[35] 0950: Mitigation Strategies for Oxygen-Rich Segregation in Vacuum Laser Welded Joints of Ta10W Alloy via Surface Microalloying
Jianfeng Gong , Liqun Li, Hongbo Xia (China)
IV-1738-2026

1010-1030: Coffee break

Session 4: C-IV Papers (20 minutes per paper including questions)
Session Chair: TBD

1030: Commission IV Chair Election (Renewal)

[36] 1035: Investigation of Bilateral Dual-Focus Laser Welding Parameters for TC4 Titanium Alloy T-Joint Configurations
Xuyi Ma, Wei Lu, Yue Gong, Fei Xu, Xiaolong Zhao (China)
IV-1768-2026

[37] 1055: Effect of Filler Metal Supply Condition on Welding Quality in Hot-Wire Laser Cladding Using Band Filler
Keita Marumoto, Yo Watanabe, Masanori Gokou, Motomichi Yamamoto, (Japan)
IV-1769-2026

[38] 1115: Influence of reduced ambient pressure on structure born sound emissions during laser deep penetration welding
Andreas Krämer Ronald Pordzik Tom Siemonsen Tim Radel (Germany)
IV-1770-2026

[39] 1135: Laser Welding of Dissimilar 316L Stainless Steel and Inconel 600 Using Dynamic Beam Shaping
Aleksey Kovalevsky (Israel)
IV-1771-2026

[40] 1155: Laser Beam Welding with loval Vacuum for E-Mobility Applications
Markus Schleser, Philipp Liebe, Benedikt Gerhards, Christian Otten, Dennis Ittermann) (Germany)
IV-1772-2026

[09] 1215: Local Vacuum Electron Beam Welding of Low alloy steel of >250mm thickness for pressure containment plant
Chris Punshon, Sungwoo Cho, Chris Clark, Phillip Konradt (United Kingdom)
IV-1773-2026

1235 Close of Day 3 Activities

Thursday July 16, 2026, 0830-1230 Room: Paracelsus

Joint Meeting of C-IV and C-VIII (Handheld Laser Beam Welding) and Commission IV Meeting (continued from Monday)

Session 1: HLBW Papers (20 minutes per paper including questions)
Session Chair: Mr. David Werba (C-VIII Chair)

[41] 0830: Recent developments in handheld laser beam welding
Simon Jahn (Germany)
IV-1774-2026/VIII-2415-2026

[42] 0850: Advancements in handheld laser welding (HLBW) for multi-pass butt joint applications
J. Eduardo Alvarez Rocha, Ivan O. Pigozzo, Doug J. Hamre, Felipe Castro Cerda, Patricio F. Mendez (Canada)
IV-1775-2026/VIII-2416-2026

[43] 0910: Handheld laser beam welding (HLBW) characterization: caustic profiling and power metering
Ivan Pigozzo, Jose Eduardo Alvarez-Rocha Nitheesh Kumar Ramasamy, Doulgas J. Hamre, Mitchell R. Grams, Patricio Fernando Mendez (Canada)
IV-1776-2026/VIII-2417-2026

[44] 0930: Safe Operation of Handheld Laser Welding Machines

Daisuke Kondo (Japan)
IV-1777-2026/VIII-2418-2026

[45] 0950: Influence of oxygen and sulfur concentration on surface tension of the melt pool and spatter formation in full penetration laser welding
Niclas Hober, Christoph Baumer, Christian Diegel, Leander Schmidt, Jean Pierre Bergmann, (Germany)
IV-1778-2026/VIII-2419-2026

1010-1030: Coffee break

Session 2: C-IV Papers (20 minutes per paper including questions)
Session Chair: Dr. Patricio Mendez (C-IV-D Chair)

[46] 1030: Edge-Directed vs. Contact-Driven Joining: A Study of Blue Laser Welded Cu-Al Dissimilar Joining Made with Bend, Lap, and Fillet Configurations
Mounarik Mondal, Nikhil Kumar, Masilamani Chelladurai Asirvatham, Anand Mohan, James D. McLaggan, Tanveerkhan S. Pathan (United Kingdom)
IV-1779-2026/VIII-2420-2026

[47] 1050: Pulsed Laser Welding of 1J22/3J01 Dissimilar Alloys: Hot Cracking Mechanism and Suppression via Laser Preheating
Jiacai Wang, Hanlin Guo, Li Fu, (China)
IV-1780-2026/VIII-2421-2026

[48] 1110: Investigation of Phenomena and the Effects of Process Parameters on High-Strength Aluminum Alloys in Wire Laser Additive Manufacturing Using Cold-Wire and Hot-Wire Methods
Pinmanee Pinmanee, Kumi Kodama, Keita Marumoto, Motomichi Yamamoto, Daiji Morita, Yasutomo Tanihara (Japan)
IV-1781-2026/VIII-2422-2026

[49] 1130: Microstructural Evolution and Mechanical Performance of Laser Beam Welded Aluminum Alloy Butt Joints
Mungu Kang, Taeseoung Lim (South Korea)
IV-1782-2026/VIII-2423-2026

[50] 1150: Dual-ring spiral laser scanning for welding LPBF Ti600 lattice nodes: Trajectory-governed melt-pool dynamics and thermal regulation
Cheng Liu, Ming Lou, Yunwu Ma, Yongbing Li, (China)
IV-1783-2026/VIII-2424-2026

[51] 1210: Comprehensive Investigation of Electron Beam Welding of Inconel–Copper Dissimilar Metals

Raghawendra Pratap Singh Sisodia, Piotr Sliwinski, Dániel Koncz-Horváth, Marcell Gáspár, Manoj kumar Pal (Hungary)
IV-1784-2026/VIII-2425-2026

1230 Administrative Activities

1240 Close of Day 3 Activities

NOTE: Overflow/Waitlist is given below:

1. Laser material processing of glass - applications and systems, Stephan Kottwitz (Germany)
2. DED Process Selection for 253MA Heat Exchanger Applications: Laser and Arc Ozan Can Ozanera, Ali Korukb, Reza Talemi (Belgium)