

Tentative Agenda

212-1601-19

8–10 July 2019, Bratislava, Slovakia

Study Group 212 “Physics of Welding”
July 8–10 2019,
Crowne Plaza Bratislava, Bratislava, Slovakia

Monday 8 July 2019, 8:15–12:30 @ Room “CP Paris”	
1.	Opening
2.	Agenda
3.	Minutes of previous meeting
4.	Brief report on intermediate meeting at INP in Greifswald, Germany on March, 2019
5.	Vice-chairman of SG212
6.	Presentation of documents:
[1]	Investigating cathode spot behavior in argon AC TIG welding of aluminum through experimental observation L.H. Phan, S. Tashiro, H. V. Bui, T. Suga, T. Sato and M. Tanaka (Japan) Doc. 212-1618-19
[2]	Effect of Metal Vapor Transport on Tungsten Electrode Consumption During TIG Welding K. Tanaka, M. Shigeta and M. Tanaka (Japan) Doc. 212-1624-19
[3]	Modelling of tungsten inert-gas welding in argon-helium mixtures with metal vapour J. Xiang, F. F. Chen and A. B. Murphy (Australia) Doc. 212-1635-19
[4]	Numerical and experimental investigation of magnetically deflected TIG-arcs M. Trautmann, M. Hertel and U. Füssel (Germany) Doc. 212-1633-19
[5]	The effect of groove shape on penetration depth in the GTA welding of high Mn steel S. Miki, Y. Kisaka, F. Kimura, S. Tashiro, M. Tanaka, A. B. Murphy (Japan) Doc. 212-1614-19
[6]	In-situ observation of keyhole detouring flow in VPPA flat welding of aluminum alloy by Xray transmission system and tracer particles B. Xu, S. J. Chen, F. Jiang (China), S. Tashiro, V. A. Nguyen, M. Tanaka (Japan) Doc. 212-1637-19
[7]	Multiphysics in the Plasma Arc P. F. Mendez, M. A. R. Argaez, A. D. Alvarez, D. A. A. Chaer, A. M. Antonio, A. V. Sanchez (Canada) Doc. 212-1609-19
Coffee Break (10:20–10:45)	
[8]	A Novel Methodology to Predict Thermal Cycles and Isotherm Characteristics Y. Lu, Y. Wang, P. F. Mendez (Canada) Doc. 212-1610-19
[9]	Asymptotic Analysis of Thermocapillary-Driven Weld Pool Flows in Autogenous Fusion Welding D. Havrylov, P. F. Mendez (Canada) Doc. 212-1602-19



[10]	Weld Penetration Dynamic Evolution and Control J. S. Chen, J. Chen, Z. L. Feng, Y. M. Zhang (US) Doc. 212-1638-19
[11]	Modeling of molten pool behavior for one pulse one drop in GMAW using CFD D. W. Cho, J. H. Park, H. S. Moon, J. Cho (Korea) Doc. 212-1611-19
[12]	Simulation of Dross Formation Process in Gas Cutting During Three-Dimensional Particle Method T. Sugai, T. Katou, Y. Kitamura, T. Satou, H. Komen, M. Shigeta and M. Tanaka (Japan) Doc. 212-1621-19
[13]	A numerical model of FSW lap joint by using particle method F. Miyasaka and K. Mitsufuji (Japan) Doc. 212-1622-19

**Tuesday 9 July 2019, 8:15–18:35 @ Room “CP London I & II”
Joint Meeting of Comm.I, Comm.IV, Comm.XII and SG212
“Welding/joining and additive manufacturing technology”**

	Morning Session, 8:15–12:35
1.	Opening : Prof. Asai, Chairman of Commission XII
2.	Presentation of document:
	(Session chairman: Prof. Asai, Chairman of Commission XII)
[J1]	Arc-welding based additive manufacturing for body reinforcement in automotive engineering Ann-Christin Rosenkranz (Germany) Doc. XII-2428-19/ I-1425-19/IV-1451-19/212-1641-19
[J2]	Optimization of the controlled short circuit GMAW metal transfer process for the deposition rate increasing in Wire Arc Additive Manufacturing D. Kurushkin, I. Mushnikov, A. Popovich, O. Panchenko (Russia) Doc. XII-2352-19 I-1426-19/IV-1452-19/212-1642-19
[J3]	Increasing the manufacturing efficiency of WAAM by advanced cooling strategies Lukas Oster (Germany) Doc. XII-2357-19/ I-1427-19/IV-1453-19/212-1643-19
[J4]	Arc Characteristics and Metal Transfer Mode in Super-TIG Welding of Thick Wall Metal Additive Manufacturing S. M. Cho, G. J. Seo, J. H. Park, M. Cheepu (Korea) Doc. 212-1625-19/ I-1428-19/XII-2363-19/212-1644-19
[J5]	Multi Signal Sensing, Monitoring and Control in Wire Arc Additive Manufacturing S. F. Goecke, G. F. Gottschalk, A. Babu and M. J. M Hermans (Germany) Doc. 212-1639-19/ I-1429-19/IV-1454-19 /XII-2364-19
[J6]	Characterisation of heat transfer in wire arc additive manufacturing (WAAM) Philipp Henckell, Yarop Ali, Jan Reimann, Jean Pierre Bergmann (Germany) Doc. I-1417-19/IV-1455-19/XII-2365-19/212-1645-19
	Coffee Break (10:15–10:35)
	(Session chairman: Dr. Kautz, Chairman of Commission I)
[J7]	Microstructural development during wire arc additive manufacturing of copper based components Justin Baby, Murugaiyan Amirthalingam (India) Doc.XII-2353-19/ I-1430-19/ IV-1456-19/212-1646-19
[J8]	Wire arc additive manufacturing of high strength Al-Mg-Si aluminum alloys using similar filler wires with additional grain refiner René Winterkorn, Andreas Pittner, Robert Lahnsteiner, Michael Rethmeier (Germany) Doc. I-1410-19/IV-1457-19/XII-2366-19/212-1647-19



[J9]	Mechanical properties of Wire Arc Additive Manufactured Components of Ti-6Al-4V H. Staufer, Grunwald R. (Austria) Doc. IV-1434-19/ I-1431-19/ XII-2367-19/212-1648-19
[J10]	In situ synthesis of a novel Si-containing FeCoCrNi high-entropy alloy fabricated by selective laser melting Danyang Lina, Lianyong Xua, Hongyang Jinga, Yongdian Hana, Lei Zhaoa (China) Doc. XII-2354-19/ I-1432-19/ IV-1458-19/212-1649-19
[J11]	Streamlining parameter development and minimizing material costs in laser powder bed fusion Colt Montgomery (USA) Doc. I-1403-19/IV-1459-19/XII-2368-19/212-1650-19
[J12]	Multifunctional Large-Scale Machine for Additive Manufacturing – LASIMM E. Assunção, F. Barros, D. Barbosa (Belgium) Doc. XII-2435-19/ I-1433-19 /IV-1460-19/212-1651-19
	Afternoon Session, 14:00–18:35 (The current status and future plans regarding Welding in the World: Prof.Lippold)
	(Session chairman: Dr. Staufer, Chairman of Commission IV)
[J13]	The effect of oxygen on the gas tungsten arc weldability of laser-powderbed fusion fabricated 304L stainless steel Devon S. Gonzales, Stephen Liu, Daniel Javernick, Matthew Johnson (USA) Doc. I-1405-19/IV-1461-19/XII-2369-19/212-1652-19
[J14]	Bridging the “valley of death” in laser based metal additive manufacturing R. Bola, E. Assunção, L. Quintino (Portugal) Doc.IV-1432-19/ I-XXXX-19/ XII-2370-19/212-1653-19
[J15]	Innovative Laser Beam Joining Technology for Additive Manufactured Parts B. Gerhards (Germany) Doc. IV-1449-19/ I-1434-19/ XII-2371-19/212-1654-19
[J16]	Laserbeam-Hybrid-Welding – current results and prospect Brozek, S. Keitel (Germany) Doc. IV-1431-19/ I-1436-19/ XII-2373-19/212-1656-19
[J17]	Experimental and numerical study of the influence of the Laser hybrid parameters in partial penetration welding on the solidification cracking in the weld root N. Bakir, Ö. Üstündag, A. Gumenyuk, M. Rethmeier (Germany) Doc. IV-1441-19/ I-1437-19/ XII-2374-19/212-1657-19
[J18]	Laserbeam Submerged Arc Hybrid Welding – A novel hybrid welding technique for thick plate applications. Oliver Engels (Germany) Doc. IV-1446-19/ I-1438-19/ XII-2375-19/212-1658-19
	Coffee Break (16:15–16:35)
	(Session chairman: Prof. Tanaka, Chairman of SG212)
[J19]	Assessment of thermal cycles by boundary element method A. Artinov, V. Karkhin, P. Khomich, M. Bachmann, M. Rethmeier (Germany) Doc. 212-1607-19/ I-1439-19//IV-1461-19/XII-2376-19
[J20]	Numerical analysis of weld pool behavior in wire feed laser beam welding with oscillating magnetic field X. Meng, A. Artinov, M. Bachmann, M. Rethmeier (Germany) Doc. 212-1608-19/ I-1440-19/IV-1462-19/XII-2377-19



[J21]	Participatory Design of Laser Keyhole Welding Process using CFD-based Coupled Simulations of Thermal, Metallurgical and Mechanical Behavior S. W. Han, L. J. Zhang, J. X. Zhang, S. J. Na (China) Doc. 212-1612-19/ I-1441-19/IV-1463-19/XII-2378-19
[J22]	Effects of the Shielding Gas Flow on the Blowhole Generation for Aluminum Alloys Laser Welding T. Fujimoto, M. Hirano, E. Fujimoto, Y. Abe, M. Nakatani, M. Shigeta and M. Tanaka (Japan) Doc. 212-1613-19/I-1442-19/IV-1464-19/XII-2379-19
[J23]	Numerical modeling of keyhole instability and porosity formation in deep-penetration laser welding on NiCrMoV steel Y. Sun, H. C. Cui, X. H. Tang, F. G. Lu (China) Doc. 212-1623-19/ I-1443-19/IV-1465-19/XII-2380-19
[J24]	The visualization of contamination phenomena and countermeasure performance on vacuum laser beam welding via experimental and numerical approaches Y. K. Lee, J. Cheon, B. K. Min, J. H. Cho and C. L. Kim (Korea) Doc. 212-1628-19/ I-1444-19/IV-1466-19/XII-2381-19

3. Closure: Dr. Kautz, Chairman of Commission I

Wednesday 10 July 2019, 8:15–12:40 @ Room “CP Berlin”

[14]	Study on weld pool formation in GMA process simulation with the application of a new model for the calculation of cathodic heat input O. Mokrov, M. Simon, R. Sharma, U. Reisgen (Germany) Doc. 212-1626-19
[15]	MIG Welding Software Benchmarking F. F. Chen, J. Xiang, D. G. Thomas and A. B. Murphy (Australia) Doc. 212-1636-19
[16]	Study on the weld pool behavior in paint coating in GMAW G. Zhang, G. Goett, D. Uhrlandt, U. Reisgen, S. Mann, P. Lozano (Germany) Doc. 212-1631-19
[17]	Modelling the Mushy Zone in MIG Welding A. B. Murphy, F. F. Chen, J. Xiang, D. G. Thomas and Y. Feng (Australia) Doc. 212-1634-19
[18]	Numerical simulation of the arc behaviour in GMAW with applied axial magnetic field D. Fan, L. Xiao, J. K. Huang (China) Doc. 212-1605-19
[19]	A simplified numerical model of metal transfer phenomena for high-current GMAW process L. Xiao, D. Fan, J. K. Huang (China), S. Tashiro, M. Tanaka (Japan) Doc. 212-1606-19
[20]	Visualization of arc plasma and molten wire behavior in CO ₂ arc welding process by three-dimensional numerical simulation Y. Ogino, S. Asai and Y. Hirata (Japan) Doc. 212-1615-19
Coffee Break (10:20–10:35)	
[21]	Computational study of droplet detachment mechanism in flux-cored arc welding by SPH method M. Shigeta, T. Sugai, M. Tanaka, H. Komen, N. Mukai and Y. Inoue (Japan) Doc. 212-1616-19



[22]	Numerical simulation of dynamic behavior in controlled short circuit transfer process S. Eda, Y. Ogino, S. Asai (Japan) Doc. 212-1627-19
[23]	A simplified voltage model in GMAW G. Zhang, G. Goett, D. Uhrlandt (Germany) Doc. 212-1630-19
[24]	Analysis of the coupled interaction of arc, droplet, keyhole and weld pool in the hybrid KPAW-Pulsed GMAW process D. Wu, Z. Wu, S. Tashiro, K. Nomura, X. Hua and M. Tanaka (Japan) Doc. 212-1619-19
[25]	Visualization of Submerged Arc Welding Phenomena by Experimental Observations and Particle-Based Simulation H. Komen, M. Shigeta, M. Tanaka, Y. Abe, T. Fujimoto, M. Nakatani (Japan) Doc. 212-1620-19
[26]	How to verify your SAW simulations G. Goett, D. Uhrlandt, A. Gericke (Germany) Doc. 212-1629-19
[27]	Investigation on the correlation between the variation of the plume velocity and the oscillation of keyhole size during the laser welding of 5083 Al-alloy Y. Huang (China) Doc. 212-1640-19
7.	Recommendation of publication for IIW Journal "Welding in the World"
8.	Miscellaneous
9.	Date and place of next meeting
10.	Closure

Commission XII

Wednesday 10 July 2019, 14:15–18:15 @ Room "AUSTRIA TREND Morava"

[*28]	Discovery of High-frequency Effects on Arc Light Radiation in Microplasma Arc Welding with Pulsed Current J. P. He, H. Zhang, S. L. Lin-Yang, F. X. Wang (China) Doc. 212-1603-19/XII-2358-19
[*29]	Dynamic Variations in Two-peak Distribution of Arc Light Radiation in Pulsed Microplasma Arc Welding F. X. Wang, J. P. He, A. Y. Wang, Y. T. Yun, S. L. Lin-Yang (China) Doc. 212-1604-19 /XII-2359-19
[*30]	Numerical simulation of gas flow in a novel welding process for reducing diffusible hydrogen S. Tashiro, N. Mukai, Y. Inoue, T. Suga, A. B. Murphy and M. Tanaka (Japan) Doc. 212-1617-19/XII-2360-19
[*31]	Estimation of the weld penetration depth by the surface measurement in TIG arc welding K. Nomura, S. Yamashita, F. Imura, S. Asai (Japan) Doc. 212-1632-19 /XII-2356-19

*The above four papers will be presented at Commission XII, under well cooperation with Commission XII.

