

C-III Resistance welding, Solid State Welding and Allied Joining Processes



Biography

Chair: **Jorge dos Santos**

Degree in metallurgical engineering followed by a MSc and PhD in Welding Technology, with emphasis on physical metallurgy of welded joints. After working in the offshore industry for three years I have joined the Helmholtz Zentrum Geesthacht, Germany. From 1986 until 2006 I acted as head of the Joining Technology Group and since 2007 I am responsible for the Solid-State Joining Processes Dept.. The work in the department is focused on the development of solid-state joining processes, particularly friction-based processes, including the understanding of microstructure formation and the determination of the mechanical performance of welded joints.

Agenda

72nd IIW Annual Assembly and International Conference 2019, Bratislava, 7–12 July 2019

Commission III meetings will be held in:

Austria Trend Hotel Bratislava

Rooms Váh and Hron

Vysoká 2A, Old Town

81106 Bratislava, Slovakia

On Tuesday, 9th July, we will be holding a Joint Meeting with Commission V “NDT and Quality Assurance of Welded Products” focused on automotive applications. Additionally, we will have the contributions of Sub Commission IIIA – Resistance Welding and Allied Processes (Chair Prof. M. Kimchi) and Sub Commission IIIB – Friction Based. Processes (Chair Prof. P. Vilaça).

The provisional programme of presentations is presented below.



The meeting schedule is presented in Appendix I to this agenda.

Monday 8 th July 2019		
08:15	08:45	Plenary session dealing with administrative issues of Commission III: 1. Welcome from the Chairman 2. Report on Intermediate Meeting 2019, General Motors R&D Centre (Detroit), USA 3. Publication of Commission III manuscripts in Welding in the World
09:00	10:15	Contributions from Sub-Commission IIIA – Resistance Welding and Allied Processes Chair Prof. M. Kimchi
10:15	10:45	Coffee Break
10:45	12:30	Contributions from Sub-Commission IIIA – Resistance Welding and Allied Processes Chair Prof. M. Kimchi
12:30	14:00	Lunch Break
14:00	16:15	Contributions from Sub-Commission IIIA – Resistance Welding and Allied Processes Chair M. Tumuluru
16:15	16:45	Coffee Break
16:45	18:15	Contributions from Sub-Commission IIIA – Resistance Welding and Allied Processes Chair M. Tumuluru
Tuesday, 9 th July 2019		
08:15	10:15	Joint Meeting Commission V and Commission III Chair Prof. M. Kreutzbruck
10:15	10:45	Coffee Break
10:45	12:30	Joint Meeting Commission V and Commission III Chair Dr. J. F. dos Santos
12:30	14:00	Lunch Break
14:00	16:15	Joint Meeting Commission V and Commission III Chair Prof. M. Kreutzbruck
16:15	16:45	Coffee Break
14:00	18:15	Joint Meeting Commission V and Commission III Chair Dr. J. F. dos Santos
Wednesday, 10 th July 2019		
08:15	10:15	Contributions from Sub-Commission III-B Solid-State Based Processes Chair: Prof. P. Vilaça
10:15	10:45	Coffee Break
10:45	12:30	Contributions from Sub-Commission III-B Solid-State Based Processes Chair: Prof. P. Vilaça
12:30	14:00	Lunch Break
14:00	16:15	Contributions from Sub-Commission III-B Solid-State Based Processes Chair: Prof. P. Vilaça
16:15	16:45	Coffee Break



16:45	17:45	Plenary Meeting Working Group "Standardisation" (WG-S) Chair: K. Matsuyama Status of Standardisation Work
17:45	18:15	Final Plenary Session Chair: J. F. dos Santos Resolutions Intermediate Meeting 2020 Planning for the coming IIW Annual Assembly 2020



Appendix I

Commission III Meeting Schedule

International Institute of Welding

A world of joining experience

IIW Commission III

Chair: Prof. Dr. Jorge F. dos Santos

Monday, 8 th July				
08:15	08:45	Plenary Session Commission III Chairman: Prof. Dr. Jorge F. dos Santos Co-Chair: Prof. H.S. Chang 1. Welcome from the Chairman 2. Report on Intermediate Meeting 2019, General Motors R&D Centre (Detroit), USA 3. Publication of Commission III manuscripts in Welding in the World		
III-A Resistance Welding and Allied Processes Chair: Prof. M. Kimchi				
Time Start	Time End	Title and Authors	Manuscript / Abstract	IIW Doc Number
08:45	09:15	Fatigue life investigation of resistance spot-welded dual and complex-phase steels using the LWF-KS-II concept, by Gökhan Tümkaya, Gerson meschut, David Hein, Germany	AA19 WITW	XIII-2821-19
09:15	09:45	Improving the properties of AA7075 resistance spot welded joints by chemical oxide removal and post weld heat treating, by Marcell Gáspár, Ádám Dobosy, Miklós Tisza, Imre Török, Yangchun Dong, Kailun Zheng, Hungary	AA19 WITW	III-1929-19
09:45	10:15	Novel resistance welding technology for joining of steel-aluminium hybrid components, by Anastasiia Zvorykina, Oleksii Sherepenko, Sven Jüttner, Germany	AA19 WITW	III-1930-19
10:15	10:45	Coffee Break		
10:45	11:15	Liquid Metal Embrittlement of a Zinc-Coated Dual Phase Steel during Resistance Spot Welding, by Julian Frei, Michael Rethmeier, Germany	AA19	III-1954-19
11:15	11:45	Microstructural characterization of a double pulse resistance spot welded 1200 MPa TBF steel, by Manfred Stadler, Martin Gruber, Ronald Schnitzer, Christina Hofer, Austria	AA19 WITW	III-1932-19
11:45	12:15	A Study on Fatigue Strength of Resistance Spot Welded High-strength Steel Sheets Applied Tempering Treatment, by Akira Sato, Sho Matsui, Seiji Furusako, Izuru Nishikawa and Muneyoshi Iyota, Japan	AA19	III-1933-19
12:15	12:45	Liquid Metal Embrittlement in Resistance spot welding: methodology for evaluation, by Y. Benlatreche and T. Dupuy, France	AA19	III-1959-19
12:45	14:00	Lunch Break		



III-A Resistance Welding and Allied Processes
Chair: M. Tumuluru

14:00	14:30	The influences of temper conditions in EN AW-7075 on resistance spot welding and potential solutions, by Gregor Gintrowski, Zeqin Liang, Stefan Kempa, Patrick Lester, Julio Malpica, Alexander Schiebahn, Uwe Reisgen, Germany	AA19 WITW	III-1942-19
14:30	15:00	Numerical simulation of capacitor discharge welding of aluminum projections by an iterative coupled thermal-electric and mechanical model, by Johannes Vinz, Stefan Heilmann, Uwe Füssel, Germany	AA19	III-1945-19
15:00	15:30	Electrode wear investigation of aluminum spot welding by motion overlay, Stefan Heilmann, Jörg Zschetzsche, Uwe Füssel, Germany	AA19	III-1947-19
15:30	16:00	A Study on Controlling Nugget Characteristics of Resistance Spot-welded High-strength Steel Sheets using Insert Materials, by Muneyoshi Iyota and Yuta Matoba, Japan	AA19	III-1950-19
16:15	16:45	Coffee Break		
16:45	17:15	Effect of Rivet Coatings on Joining Process and Mechanical Performance of Self-piercing Riveted Joints, by Md Abdul Karim, Jin-Hee Bae, Dong-Hyuck Kam, Cheolhee Kim, Yeong-Do Park, Korea	AA19	III-1960-19

Tuesday, 9th July

Joint Meeting Commission V and Commission III
Chair: Prof. M. Kreutzbruck, Prof. J. F. dos Santos

Time Start	Time End	Title and Authors	Manuscript / Abstract	IIW Doc Number
08:15	08:30	Introduction of Commission V "NDT and Quality Assurance of Welded Products", M. Kreutzbruck, Germany	–	–
08:30	08:45	Introduction of Commission III "Resistance Welding, Solid State Welding and Allied Joining Processes", J. F. dos Santos, Germany	–	–
08:45	09:15	Review on NDT of spot welds, by M. Kreutzbruck, Germany		V-1892-19
09:15	09:45	Automated and robotized inspection of steel and aluminium spot welds using air coupled ultrasound technology in the car body shop, by Nico Lehmann, Germany		V-1893-19
09:45	10:15	Ultrasonic welding of Mg alloys and Mg alloy to steels, by Zhili Feng, Jian Chen, Yong Chae Lim, Hui Huang, Xin Sun, USA	AA19	III-1961-19
10:15	10:45	Coffee Break		
10:45	11:15	Realtime Ultrasonic Testing of Spot Weld using adaption layers, York Oberdörfer, Germany		V-1894-19
11:15	11:45	Refill Friction Stir Spot and Resistance Spot Welding of Aluminium Joints with Large Total Sheet Thicknesses, by Christopher Schmal and Gerson Mesut, Germany	AA19 WITW	III-1965-19
11:45	12:15	Defects in friction stir welds: detectability, harmfulness and consequences for industrialization of aerostructure parts, Amarylis Ben Attar, France		V-1895-19
12:15	12:45	Role of Spot Weld Electrode Geometry on Liquid Metal Embrittlement Crack Development, C. DiGiovanni, L. He, E. Biro, N. Y. Zhou, Canada	AA19	III-1931-19
12:30	14:00	Lunch Break		



Joint Meeting Commission V and Commission III
Chair: Prof. M. Kreutzbruck, Prof. J. F. dos Santos

Time Start	Time End	Title and Authors	Manuscript / Abstract	IIW Doc Number
14:00	14:30	Compensation of Peltier Effect using Dual Head Servo Micro Spot Welder, by Hanjun Lin, Munkhchimeg Raash, Dongjun Kim, Kwangeun Cho, Do Ik Son, Hee Seok Chang, Korea	AA19	III-1935-19
14:30	15:00	NDT of spot welds by automated evaluation of the residual magnetic flux density, Christian Mathiszik, Johannes Vinz, Jörg Zschetzsche, Uwe Füssel, Germany	AA19	III-1946-19
15:00	15:30	Computational Analysis of Inhomogeneous Behavior in Friction Stir Welding of Aluminum Alloy By Using A New Coupled Method of MPS and FEM, Hisashi SERIZAWA and Fumikazu MIYASAKA, Japan	AA19	III-1948-19
15:30	16:00	Low-Temperature Linear-Friction-Welding of Steel, by Hidetoshi FUJII and Yasuhiro AOKI, Japan	AA19	III-1949-19
16:15	16:45	Coffee Break		
16:45	17:15	Improving resistance spot weldability of galvanized ultrahigh-strength steels by using double-side cover plates, by Zhanxiang Ling, Min Wang, Liang Kong, Ting Chen, Hua Pan, Ming Lei, PR China	AA19	III-1951-19
17:15	18:00	Conclusion, Discussion	-	-

Wednesday, 10th July

Joint Meeting Commission V and Commission III
Chair: Prof. M. Kreutzbruck, Prof. J. F. dos Santos

08:15	08:45	Experimental-and-Computation Method for Evaluating Dynamic Viscosity of Alloys during Friction Stir Welding, by U. Reisgen, A. Schiebahn, R. Sharma, A. Maslennikov, P. Rabe, V. Erofeev, Germany, Russia	AA19 WITW	III-1956-19
08:45	09:15	Study on Properties of 6061 Aluminum Alloy/CF-PPS Refill Friction Stir Spot Welding Joint, by LI Hong, LIU Xusheng, ZHANG Yisheng, YUAN Tao, JACEK Senkara, PR China	AA19	III-1934-19
09:15	09:45	Determination of strength properties of intermetallic phases in dissimilar metal joints, by Tobias Broda, Steffen Keitel, Jean Pierre Bergmann, Germany	AA19	III-1936-19
09:45	10:15	FSW-Tech – Developing Qualification for FSW Personnel, by L. Quintino, E. Assunção, R. Bola, Portugal	AA19	III-1937-19
10:15	10:45	Coffee Break		
10:45	11:15	Influence of rotational speed and direction on process conditions, tensile strength and fatigue behavior of friction stir welded EN AW 5754 joints, by Michael Grätzel, Abootorab Baqerzadeh Chehreh, Tobias Köhler, Philipp Wittke, Frank Walther and Jean Pierre Bergmann, Germany	AA19 WITW	III-1939-19
11:15	11:45	Influence of different Ni coatings on the mechanical and metallurgical properties of ultrasonic welded 1 mm EN AW 1050 / 1 mm EN CW 004A dissimilar joints, by Tobias Köhler, Michael Grätzel, Ludwig Kleinhenz, Jean Pierre Bergmann, Germany	AA19	III-1943-19
11:45	12:15	Microstructure and Mechanical Properties of Ultrasonic Torsional Welded Metal/Glass Ceramic Joints, by Andreas Gester, Guntram Wagner, Alexander Wagner, Germany	AA19	III-1944-19



Time Start	Time End	Title and Authors	Manuscript / Abstract	IIW Doc Number
12:15	12:45	Thermal joining of hybrid materials with steel cover sheets and polymer core, Christopher SCHMAL, Gerson MESCHUT, Dr.-Ing. Azeddine CHERGUI, Germany	AA19 WITW	III-1941-19
12:45	12:45	Lunch Break		
14:00	14:30	Weld interface characteristics in spin collision-impact stud welding of copper to low carbon steel, by Jianping HE, Steven MOORE, Bryan A. CHIN, PR China	AA19 WITW	III-1953-19
14:30	15:00	The Effect of Pre-hole size on the Joint Quality in FDS SOP Joining for AHSS, by Mokyoung Lee, Sunghun Jung, Sangho Uhm, Hongchul Jeong, Korea	AA19	III-1955-19
15:00	15:30	Modelling Material Flow and Heat input in Friction Riveting of Polymeric Materials G. Pina Cipriano, P. Vilaça, S. T. Amancio-Filho, Austria, Finland	AA19	III-1940-19
15:30	16:00	Refill Friction Stir Spot Welding of AA 6061-T6: influence of process on tool life, by Maura C. Vioreanu, Willian S. de Carvalho, Viorel A. Serban, Sergio T. Amancio-Filho, Austria	AA19	III-1938-19
16:15	16:45	Coffee Break		
III-WGS Standardisation Chair: Prof. K. Matsuyama				
16:45	17:15	1. Opening of the WG-S session 2. Adoption of this agenda III-WGS-01-2019 3. IS work reports 3.1 General information (including ISO/TC44/SC 6 and IEC works) III-WGS-02-2019 ISO works related to IIW/C-III 2018-2019 3.2 Further information on resistance welding and related matters: Responsibility of all resistance welding standards developed by IIW/C-III were decided to transfer to ISO/TC44/SC6 at the last Intermediate meeting of C-III held in Detroit this March. No more we discuss on this item in our C-III. 3.3 Further information on friction based processes • ISO 18785 series on FSSW : 60.60 Published in 2018-II PL: Jorge dos Santos (See WG-B4) • ISO/DIS 25239 series on FSW (See III-1927-19 to 1298-19) 40.20 Launched for DIS voting PL: Axel Meyer (See WG-B1) Voting ends : 2019-08-14 4. WG-STAND news - IIW observer to ISO/TC44 and ISO/TC44 observer to IIW - ISO's OBP(Online Browsing Platform) https://iso.org/obp/ui/ - Thomas medal selection rule has been changed. 5. Any other business and news - Selection of a new chair for this SC-WGS, or restructuring of this SC. - Nomination of Dr. dos Santos as a candidate of the Thomas Medal Award 2020. 6. Next meeting 7. Closure of the meeting	AA18	III-1962-19 III-1963-19
17:15	17:15	Final Plenary Session Commission III Chairman: Dr. Jorge F. dos Santos 1. Resolutions 2. Intermediate Meeting 2020 3. Planning for the coming IIW Annual Assembly 2020	AA19	III-1958-19