

Patricio F. Mendez, Ph.D.

Professor

Weldco/Industry Chair in Welding and Joining

Director, Canadian Center for Welding and Joining

Department of Chemical and Materials Engineering

University of Alberta

ECERF W7-092

9107 116th St.

Edmonton, AB T6G 2V4

Canada

office: (780)248-1587

cell: (780)938-1587



UNIVERSITY OF
ALBERTA

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This is my report as Expert in C XII and SG 212. Attached are the agendas of both commissions. From the presentations and conversations at SG 212, Germany and Japan are still leading in investigating arc plasma; however, research in Canada is making big strides to catch up through partnerships with Germany and Japan and independent research.

I presented a paper on high-speed imaging of submerged arc welding that was considered by other leading researchers as the most meaningful in the whole SG 212. It is likely that a new line of research will spin off from that work. In that line, Canada is at the lead.

C XII had a smaller focus on laser-assisted processes than last year, and did not share a clear focus. I have the sense that most research is currently waiting for a big development to happen and to give direction to researchers. It is possible that our work on SAW will trigger a flurry of developments in waveforms for SAW.

Perhaps the most important event during the period of the meeting was the final game of the 2014 World Cup, undeservingly won by Germany. Revenge will have to be exacted through welding; I will make sure it happens.

PF Mendez





INTERNATIONAL INSTITUTE OF WELDING

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Doc.XII-2184r3-14

Annual Assembly 2014

Draft Agenda

Commission XII "Arc Welding Processes and Production Systems"

July 14-16, 2014

Sheraton Grande Walkerhill & W Seoul Walkerhill, Seoul, Korea

Monday 14 July 2014, 8.30h – 12.30 h, Room: Mugunghwa Hall 2 (1F)

1. Opening

2. Agenda

3. Brief report on intermediate meeting in Austria in March, 2014

4. Presentation of documents:

[1] Process control and supervision of gas metal arc welding processes by combined machine-vision data and quality models

U. Reisgen, M. Purrio, G. Buchholz and K. Willms (Germany)

Doc.XII-2165-14

[2] Development of arc sensor for cold metal transfer arc welding

C. Kim (Korea)

Doc.XII-2174-14

[3] Study of MAG welding without steel-backing for joints of steel structures

T.Suga, R.Kasai, R.Suzuki,T.Sasaki and T.Nakagomi (Japan)

Doc.XII-2154-14

[4] Narrow-Groove Tandem GMAW (NG-T-GMAW)

C. Conrardy, Ian Harris, Marc Purslow, Steve Massey (USA)

Doc.XII-2183-14

Coffee Break

[5] Research on Narrow-gap GMAW with Swing Arc System in Horizontal Position

H. Cui, L. Kong, Z. Jiang, X. Tang, F. Lu (China)

Doc.XII-2172-14

[6] A Study of Friction Stir Welding for Clad Pipelines

T. Katayama, Y. Kisaka, F. Kimura, Y. S. Sato, H. Kokawa (Japan)

Doc.XII-2176-14

[7] Possibilities for compensating a higher heat input, in particular by the torch offset relative to the top sheet at the fillet weld on a lap joint

M. Ebert-Spiegel, S.-F. Goecke, M. Rethmeier (Germany)

Doc.XII-2182-14

[8] Research on Arc Interference and Welding Operating Point Change of Twin Wire GMAW

D. Ye, X. Hua, J. Zhang, D. Wu, Y. Wu (China)

Doc.XII-2177-14

Tuesday 15 July 2014, 8.30 h -17.00 h., Room: Mugunghwa Hall 2 (1F) Joint Meeting of Comm.IV, Comm.XII and SG212

Morning Session 8.30h-12.30h

[9] Determination of the Net Heat Input in Arc Welding

O. Liskevych, A. Scotti (Brazil)

Doc.XII-2187-14/IV-1186-14/212-1322-14

[10] Index for identifying hot or cold GMAW process conditions

G. Huisman, A. Burt (Germany)

Doc.XII-2178-14/IV-1187-14/212-1337-14

[11] Wire-feed additive manufacturing of metal components: technologies, developments and future interests

D. Ding, Z. Pan, D. Cuiuri, H. Li (Australia)

Doc.XII-2181-14/IV-1188-14/212-1338-14

[12] 3D Dynamic Distribution of Arc Radiation and Temperature in Pulsed-current micro-plasma arc welding
J. He, S. Lin-Yang, F. Wang (China)
Doc.XII-2188-14/IV-1189-14/212-1332-14

Coffee break

[13] Dynamic Variation of Keyhole Exit and its Inclination in Plasma Arc Welding
C.S. Wu, Z.M.Liu, G.K.Zhang (China)
Doc. XII-2173-14/IV-1190-14/212-1339-14

[14] Contact-less temperature measurement and control with applications to laser cladding
H. Köhler, C. Thomy, F. Vollertsen (Germany)
Doc.XII-2189-14/IV-1191-14/212-1340-14

[15] Estimation of Welding Deformation Based on CFD Process Simulation
J. Cheon, D.V. Kiran, S-W. Han, L. Wu, S-J. Na (Korea)
Doc.XII-2190-14/IV-1192-14/212-1327-14

[16] Interaction of CO₂-laser beam with argon plasma of GTA
U. Reisgen, A. Zabirow, I. Krivtsun, V. Demchenko, I. Krikent (Germany)
Doc. XII-2191-14/IV-1193-14/212-1329-14

Afternoon Session 14.00h-18.00h

- Working units visiting by IIW CEO Dr. C. Mayer

[17] 3D simulation of arc plasma and weld pool behavior for coupled arc assisted activating TIG welding
D. Fan, X.X. Wang, J.K. Huang, Y. Huang (China)
Doc. XII-2192-14/IV-1194-14/212-1330-14

[18] Additive manufacturing, a derivative of welding & joining technology- A literature review
S.Marya, J. Y. Hascoet, S.K.Panigrahi, M. Marya and V. Singh (France)
Doc.XII-2185-14/IV-1195-14/212-1241-14

[19] Super-high power fiber laser welding under low vacuum and its phenomena
S. Katayama, M. Mizutani, Y. Kawahito (Japan)
Doc. XII-2193-14/IV-1196-14/212-1342-14

[20] In-situ alloying of AISI 410L martensitic stainless steel with nitrogen during laser cladding
C.J. Van Niekerk, M. Du Toit, C. Van Rooyen (South Africa)
Doc. XII-2194-14/IV-1197-14/212-1343-14

Coffee break

[21] Molten Pool Flow Patterns in High Power Laser Keyhole Welding
S-W. Han, J. Cheon, S-J. Na (Korea)
Doc. XII-2195-14/IV-1198-14/212-1328-14

[22] Bridgeability of increasing gap in laser-GMA-hybrid welding of 22MnB5
H.Kügler, F.Möller, S.Kötschau, A.Geier, S.F.Goecke, F.Vollertsen (Germany)
Doc.XII-2169-14/IV-1199-14/212-1344-14

[23] High Speed Video of Metal Transfer in Submerged Arc Welding
P.F. Mendez, G. Goett, S. D. Guest (Canada)
Doc. XII-2196-14/IV-1166-14/212-1345-14

[24] Mechanism of Aluminum Oxide Removal in Variable Polarity Arc
J. Cho (Korea)
Doc. XII-2197-14/IV-1167-14/212-1346-14

Wednesday 16 July 2014, 8.30 h -12.30 h., Room: Mugunghwa Hall 2 (1F)

[25] Innovative GMA Welding of Steel Aluminum Mixed Compounds for Modern Multi-Material
Design in Vehicle Construction
U.Reisgen, K.Willms, M.Angerhausen (Germany)
Doc. XII-2155-14

[26] An Investigation on Effect of Process Parameters on Weld Bead Profile of Modified 9Cr-1Mo
Steel by Pulsed GMAW
S. Krishnan, D.V. Kulkarni, A. De (India)
Doc. XII-2170-14

[27] Development of Two Piece Type Contact Tip for Long Life
M. Kutsuna and T. Murakami (Japan)
Doc. XII-2171-14

[28] Improved brazing of galvanized and press-hardened steels using CF-TIG
M.Häßler, S.Rose, U.Füssel (Germany)
Doc. XII-2179-14

Coffee Break

[29] The effect of pulsed frequency on the plasma jet force with ultra high frequency pulsed arc welding
M.Yang, Z.Yang, B.Qi, B Cong (China)
Doc.XII-2186-14

[30] Development of self-shielded flux cored arc welding power source
Z.Liu, D.Mori, T.Uezono, T.Era, T.Ueyama (Japan)
Doc. XII-2175-14

[31] Metallographic structure variation of welds in pulsed-current microplasma arc welding
J.He, F.Lu, F.Wang, F. Xiang (China)
Doc.XII-2180-14

[32] Retrofitting modular monitoring and control systems for arc welding processes
S.Gorny, D. Liebenow, H. Musa (Germany) ...Participation from Young professional program
Doc.XII-2198-14

5. Recommendation of publication for IIW Journal “Welding in the World”

6. Miscellaneous

7. Date and place of next meeting

8. Closure



Annual Assembly 2014

Doc. 212-1321r4-14

Draft Agenda

Study Group 212 "Physics of Welding"

July 14-15, 2014

Sheraton Grande Walkerhill & W Seoul Walkerhill, Seoul, Korea

Monday 14 July 2014, 14.00 h – 18.00 h, Room: Cosmos Hall (3rd Floor)

1. Opening
2. Agenda
3. Minutes of previous meeting
4. Brief report on intermediate meeting in Austria in March, 2014
5. Presentation of documents:
 - [1] How to convert high-speed images of a welding arc in to time-resolved 2D temperature profiles
Gregor Gött, Dirk Uhrlandt (Germany)
Doc. 212-1331-14
 - [2] Temperature measurements of gas tungsten arcs
K. Konishi, M. Shigeta, M. Tanaka (Japan)
Doc. 212-1323-14
 - [3] Three dimensional spectroscopic observation of argon and metal vapor behavior in MIG arc welding
K. Nomura, K. Kataoka, T. Kishi, K. Yoshii, Y. Hirata (Japan)
Doc. 212-1325-14
 - [4] Study of laser radiation absorption in a TIG welding arc
R. Kozakov, G. Goett, D. Uhrlandt, B. Emde, J. Hermsdorf, V. Wesling (Germany)
Doc. 212-1333-14

[5] Modelling of the cathode sheath region in TIG welding
M. Lohse, M. Hertel, U. Füssel, S. Rose, E. Siewert (Germany)
Doc. 212-1334-14

Coffee Break

[6] Influence of different shielding gases on material transfer and arc properties in GMA welding
M. Hertel, U. Füssel, S. Rose, D. Uhrlandt (Germany)
Doc. 212-1335-14

[7] Numerical simulation of metal transfer in argon gas shielded GMAW
Y. Ogino, Y. Hirata (Japan)
Doc. 212-1324-14

[8] Fingering Instabilities in Liquid Metal Melt Pools
Chuangxin Zhao and Ian Richardson (Netherlands)
Doc. 212-1336-14

[9] Analysis of Heat Transfer and Material Flow in Reverse Dual-Rotation Friction Stir Welding
Lei Shi, C.S. Wu (China)
Doc. 212-1326-14

6. Recommendation of publication for IIW Journal “Welding in the World”

7. Miscellaneous

8. Date and place of next meeting

9. Closure of regular meeting of SG212

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