2013 IIW Annual Assembly Report

Satya S. Gajapathi

Satya Gajapathi (SG) was a CCIIW bursary recipient to attend the 2013 IIW Annual Assembly in Essen, Germany. He was a Delegate/Expert in Commission IV (Power Beam Processes) and an active participant in Commission XII (Arc Welding Processes and Production Systems).

The purpose of SG's visit was to receive the Granjon prize which was awarded only second time to any Canadian researcher, 20 years after the first. SG was invited to present his research on the topic of micro electron beam welding in Commission IV (Power Beam Processes) meeting. This was SG's first attendance to IIW Assembly and it was aimed at getting exposure to the welding activities carried out worldwide, which could lead to collaborations and direct benefits to Canadian industry through SG's employment here.

The participation started by attending the Commission IV meetings on September 12 where SG presented in the morning session. The presentation was followed by some insightful questions that led to more in-depth discussions later on the topic with experts from Germany and US. SG attended the IIW opening ceremony on the evening of September 12 where he was honored with the Granjon Prize. The opening ceremony along with the Canadian delegation reception and the IIW gala banquet on September 13 evening were good opportunities to meet the delegates from around the world and share views and ideas on welding technology. The meetings continued from September 12 through September 14 and SG attended the meetings of Commission IV and Commission XII, the agendas of which are attached in the appendix.

Highlights of Commission IV Meetings:

Commission IV saw many interesting presentations and discussions on recent trends in laser and electron beam technology.

Using lasers for brazing WC-Co inserts to metals was interesting as it can lead to faster brazing times and low residual stresses and material degradation.

[9] Dissimilar laser brazing of ceramics to WC-Co alloy
K. Nagatsuka, Y. Sechi, K. Nakata (Japan)
Doc.IV-1126-13

Substituting current use of arc welding techniques with laser beam welding to join thin metal sheets could control distortions to a great extent; Mr. Hasegawa from Japan showed how they have achieved this by coupling laser welding with in-process cooling.

[10] Application of Single Mode Fiber Laser Welding and Temperature Control Technology to Architectural Structures and Metal Products of Thin Sheets
T. Hasegawa, M. Okubo, R. Takamatsu, T. Kawakami, Y. Utsuno (Japan)
Doc.IV-1127-13

Spatter formation is known to be an important issue in laser welding of various metals and there were three high quality presentations that provided deeper understanding of the issue and solution methodology.

[29] Spatter formation in laser welding with beam oscillation
Schweier (Germany)
Doc.IV-1144-13

[31] High-Speed X-Ray Analysis of Spatter Formation in Laser Welding of Copper
A.Heider, M. Boley, R. Weber, T. Graf (Germany)
Doc.IV-1146-13

[33] Spatter formation in welding
K. Hofmann, F. Hugger, S. Kohl, M. Dobler, M. Schmidt (Germany)
Doc.IV-1148-13

Highlights of Commission XII Meetings:

Increasing productivity and improved weld quality through Laser-GMAW Hybrid Welding was an important focus of the Commission XII meetings.

[19] Influences on the strength of laser GMA hybrid welded joints in the case of sheet thicknesses to 40 mm
G. Wetzel, J. Neubert, B. Kranz (Germany)
Doc.XII-2132-13/IV-1137-13/212-1283-13

[20] Fiber laser - MIG arc hybrid welding of thick titanium plates
J. Liao, N. Yamamoto K. Nakata (Japan)
Doc.XII-2134-13/IV-1129-13/212-1285-13

[23] Laser Arc Hybrid Welding for Large-Sized Thin Plate Structures Made of High Tensile Steel
H.Matsuo, K.Yamamoto, K. Yamamoto, K.Oowaki, I.Kawaguchi (Japan)
Doc.XII-2146-13/IV-1128-13/212-1292-13

[25] Effect of Laser-MIG hybrid welding parameters on properties of welded HSLA sheets for automotive applications
S. Chatterjee, R. Mulder, Tony v.d. Veldt (Netherlands)
Doc. XII-2152-13/IV-1150-13/212-1306-13

Highlights of the Conference and Summary:

The conference had an active participation from all the welding communities worldwide. A number of unique welding challenges/applications and their solution strategies were discussed in different commissions which were a huge learning opportunity. It was particularly impressive to find about the progress made in laser and electron beam technology in Germany, China, and Japan. Participation in the assembly also provided the opportunity to make the international community familiar with the current trends of welding technology in Canada.