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INTERNATIONAL INSTITUTE OF WELDING
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IX-2863-2024 Minute of Meeting (MoM) for 2024 AA Meeting of Commission IX, Rhodes, Greece, July 8~10, 2024

COMMISSION IX

BEHAVIOR OF METALS SUBJECTED TO WELDING

IX-2863-2024

MINUTE OF MEETING (MoM) FOR 2024 AA MEETING OF COMMISSION IX, RHODES, GREECE, JULY 8~10, 2024

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**MINUTE OF MEETING (MOM) FOR 2024 AA MEETING OF COMMISSION IX,
RHODES, GREECE, JULY 8~10, 2024**

1. General

The 2024 Annual Assembly meeting of C-IX was held for three days on July 8~10, 2024 in Rhodos Palace Hotel, Rhodos island, Greece. This meeting has made 18 recommendations for publication in *Welding in the World*, 2 resolutions for TMB and one administrative information for TMB.

2. Meeting Schedule

July 08, 2024 (Monday)	09:00 - 09:20 09:20 - 13:00	Opening session Sub-Commission IX-L meeting Venue : Room Jupiter
July 09, 2024 (Tuesday)	09:00 - 12:30 12:30 - 13 :00	Sub-Commission IX-AM meeting Sub-Commission IX-NF meeting Venue : Room Jupiter
July 10, 2024 (Wednesday)	09:00 - 12:45 12:45 - 13:00	Sub-Commission IX-H meeting Summary of meetings & Closing Venue : Room Jupiter

3. Opening session

3.1 Welcome and Apologies

Chair of C-IX, Dr Hee Jin Kim, welcomed all those in attendance. One apology of absence was received from Prof. Bergman, Chair of IX-NF.

3.2 Approval of Agenda

The Chair reported the draft agenda (IX-2861-2024re1) that was posted at SharePoint and emailed in advance. The agenda was approved with no comments and questions.

3.3 Approval of Minute of meeting (MoM)

The Chair reported two MoM's, one for 2024 AA meeting in Singapore (IX-2823-2023re1) and the other for 2024 Intermediate meeting held in Incheon, Korea (IX-2825-2024). Both MoM's were approved with no comments and questions.

4. Elections

4.1 Chair Election of C-IX

As the current Chair ended his second term, Chair election was arranged by IIW Secretariat. Secretariat reported that the current Chair, Dr. Hee Jin Kim, was the only applicant for the Chair. Accordingly, it was recommended for him to take his third term for the Chair of C-IX. This recommendation was unanimously approved by all the national delegates attended.

Resolution 1. The recommendation to appoint Dr. Hee Jin Kim for his third term of C-IX Chair was unanimously agreed by the national delegates attended

4.2 Chair Election of IX-AM

The election for the Chair of newly created sub-commission IX-AM was proceeded as there were two applicants received. After one minute speech of each applicant, national delegates attended made their vote. After counting the vote, Prof. Peter Mayr was announced to be the first Chair of IX-AM.

Resolution 2. Peter Mayr was elected for the first Chair of IX-AM following the vote by national delegates.

5. Technical meeting of Commission IX-L:

Low alloy steel welds (Chair: Prof. Nobert Enzinger)

A total of 9 presentations were made and 6 papers were recommended for the publication *Welding in the World (WitW)*. There were 48 members attended.

1. IX-2860-2024 (IX-L-1290-2024) The effect of post weld heat treatment on mechanical properties and the micro- and nanostructure of creep-resistant 2.25Cr-1Mo-0.25V submerged-arc weld metal, *Ronald Schnitzer, H. Fleißner-Rieger, M. Schmitz-Niederau*
2. IX-2858-2024 (IX-L-1295-2024) Welding of 42SiCr treated by Quenching and Partitioning - Mechanical properties of the HAZ and preheating proposal, *J. Kaars, F. Dittrich, P. Mayr, J. Hensel*

Recommendation 1 : Recommended for publication in *WitW*.

3. IX-2832-2024 (IX-L-1291-2024) Welding Study on Nano-High Strength Steel in Baosteel, *Z. Qu, L. Xia, Q. Zheng*

4. IX-2833-2024 (IX-L-1292-2024) New Methodology for hydrogen-induced cold cracking sensitivity assessment in MAG welding of steel sheets for automotive chassis application, *D. Cornette, J. Haouas, K. Thihay*

Recommendation 2 : Recommended for publication in *WitW*.

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5. IX-2834-2024 (IX-L-1293-2024) Investigation of resistance to gaseous hydrogen of a longitudinal weld seam in a X65 pipeline using the hollow specimen technique, *F. Konert, J. Nietzke, T. Freitas, M. Rhode, O. Sobol, Th. Böllinghaus*

Recommendation 3: Recommended for publication in WitW.

6. IX-2829-2024 (IX-L-1284-2024) Continuous Cooling Transformation diagram of a high-strength all-weld metal with a yield strength exceeding 1100 Mpa, *D. Schrittwieser, D.M. Morales, H. Pahr, R. Schnitzer*

Recommendation 4 : Recommended for publication in WitW.

7. IX-2830-2024 (IX-L-1285-2024) Effect of silane-doped argon shielding gases for gas metal arc welding, *Kai Treutler, Philipp Neef, Volker Wesling*

Recommendation 5 : Recommended for publication in WitW.

8. IX-2831-2024 (IX-L-1286-2024) Effects of cooling rate on microstructural evolution and low temperature impact toughness of inter-critically reheated coarse-grained heat affected zone (ICCGHAZ) in 420 MPa offshore engineering steel, *Savyasachi Nellikode, Siva Prasad Murugan, Jun-Ho Chung, Hyungkwon Park, Yeong-Do Park*

9. IX-2835-2024 (IX-L-1294-2024) Physical simulation-based analysis of multipass welding in S500 shipbuilding steel, *M. Gáspár, J. Kovács J. Sainio, H. Tervo, V. Javaheri, A. Kaijalainen*

Recommendation 6 : Recommended for publication in WitW.

6. Technical meeting of Commission IX-AM:

Metallurgy of AM (Chair: Prof. P. Mayr)

The newly elected Chair, Prof Peter Mayr, chaired this meeting. A total of 10 presentations were made and 6 papers were recommended for the publication *Welding in the World (WitW)*. There were 54 members attended.

1. IX-2836-2024 (IX-AM-012-2024): Effect of Substrate Preheating and In-Situ Cooling on Dimensional Accuracy, Microstructure, and Hardness of Wire Arc Additive Manufacturing Components, *T. Reindl, N. Hempel, P. Mayr*

Recommendation 7 : Recommended for publication in WitW.

2. IX-2837-2024 (IX-AM-013-2024): Origin of anisotropy in tensile properties in thin wall of martensitic stainless steel fabricated by wire arc additive manufacturing, *Z. Lyu, Y. S. Sato, S. Tokita, Y. Zhao, J. Jia, A. Wu*

3. IX-2859-2024 (IX-AM-014-2024): Specimen design for determination of fatigue strength parameters on WAAM materials, *K. Treutler, M. Wächter, M. Hupka, M. Leicher, A. Esderts, V. Wesling*

Recommendation 8 : Recommended for publication in WitW.

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4. IX-2838-2024 (IX-AM-015-2024): Influence of machining on residual stresses in additive manufactured high-strength steel components, *K. Wandtke, L. Engelking, D. Schroepfer, R. Scharf-Wildenhain, A. Hälsig, A. Kromm, T. Kannengiesser, J. Hensel*

Recommendation 9 : Recommended for publication in *WitW*.

5. IX-2828-2024 (IX-AM-016-2024): High strength plasma wire arc additive manufacturing (PWAAM) on a high carbon steel – a detailed characterization of the transition zone, *M. Moschinger, R. Hou, J. Inoue, N. Enzinger*
6. IX-2840-2024 (IX-AM-017-2024): Insitu alloying of Al-Cu-Si using dual-wire plasma additive manufacturing, *S. Reinbacher, T. Klein, C. Simson, P. Spörk-Erdely, N. Enzinger*

Recommendation 10 : Recommended for publication in *WitW*.

7. IX-2839-2024 (IX-AM-018-2024): Additive manufacturing of iron aluminides: microstructure, machinability, and surface integrity, *J. Witte, D. Schroepfer, K. Treutler, T. Kannengiesser, V. Wesling*

8. IX-2841-2024 (IX-AM-019-2024): Development of high-efficiency wire and laser additive manufacturing technology for stainless steel, *Y. Banno, S. Tsubota, Y. Fujiya, M. Kimura*

Recommendation 11 : Recommended for publication in *WitW*.

9. IX-2843-2024 (IX-AM-020-2024): Hydrogen embrittlement in additively manufactured 316L – The relationship between surface quality and the influence of hydrogen on mechanical properties, *J. Nietzke, F. Konert, K. Poka, B. Merz, M. Rhode, O. Sobol, T. Böllinghaus*

Recommendation 12 : Recommended for publication in *WitW*.

10. IX-2842-2024 (IX-AM-021-2024): Proposal of IIW working group for performance and quality assessment of large-scale AM products in shipbuilding industry, *S.-B. Shin, S.-W. Song, C.-W. Ji*

7. Technical meeting of Commission IX-NF:

Non-ferrous materials (Chair: Jean P. Bergman)

Due to the absence of the Chair, the vice-Chair of C-IX, Prof. Koda Kadoi, chaired this meeting. There was one paper presented and this paper was recommended for the publication *Welding in the World (WitW)*. There were 54 members attended.

1. IX-2847-2024 (IX-NF-62-2024): Process and joint properties of GMA-welded alloy AW6082 with MA-6063 filler metal, *Judith Schenk, Kevin Hoefer, Jonas Hensel*

Recommendation 13 : Recommended for publication in *WitW*.

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8. Technical meeting of Commission IX-H:

Weldability of stainless and nickel base alloys (Chair: Elin M. Westin)

In this meeting, a total of 10 presentations were made and 5 papers were recommended for the publication to *Welding in the World* (WitW). There were 70 members attended.

1. IX-2849-2024 (IX-H-966-2024): Enhancing duplex stainless steel additive manufacturing with DED-LB/w: Microstructural, analysis and process optimization, *E.M Westin, M.A Valiente Bermejo, B. Axelsson, K. Hurtig, P. Hagqvist, I. Choquet*

Recommendation 14 : Recommended for publication in WitW.

2. IX-2850-2024 (IX-H-969-2024): Directed energy deposition-arc of 2205 duplex stainless steel using nitrogen-bearing shielding gas, *Tamás Tóth, E.M Westin, Markus Köhler, Klaus Dilger*

Recommendation 15: Recommended for publication in WitW.

3. IX-2851-2024 (IX-H-968-2024): Effect of solution annealing heat treatment on hot cracking susceptibility of new Ni-based superalloy G27, *Achmad Ariaseto, Joel Andersson, Olanrewaju Ojo*

4. IX-2856-2024 (IX-H-978-2024): Conventional welding of additively Manufactured materials, *Vamadevan Gowreesan, W. Greaves*

5. IX-2852-2024 (IX-H-964-2024): Coupled prediction of weld bead shape and solidification microstructure of austenitic stainless steels using computer simulation, *Naoki Sahara, Shotaro Yamashita, Hiroyuki Hirata, Kazuyoshi Saida*

6. IX-2853-2024 (IX-H-973-2024): On the issue of assessing the probability and preventing the occurrence of "ductility dip cracking" mechanism under conditions of multi-layer welding arc 3D-overlaying process on nickel and cobalt alloys, *Yarovytsyn O.V., Cherviakov M.O., Zviahintseva H.V., Volosatov I.R., Khrushchov H.D., Nykytenko Yu.O.*

7. IX-2857-2024 (IX-H-979-2024): Weldability evaluation of corrosion resistant alloy weld metals for high-temperature service using transvarestraint test, *A.B.F. Sousa, F.E. Cavalcante Neto, J.S. de Souza, M.T. Piza Paes, G. Dalpiaz, R. R. Marinho, R. Gonsiorocki Mombru, É.M. Miná, M.F. Motta, H.C. de Miranda, Cleiton Carvaiho Silva*

Recommendation 16 : Recommended for publication in WitW.

8. IX-2826-2024 (IX-H-967-2024): Assessing ferrite content in duplex stainless steel weld metals: WRC '92 predictions vs. practical measurements, *Lukas Quackatz, Elin Westin, Axel Griesche, Arne Kromm, Thomas Kannengiesser, Kai Treutler, Volker Wesling, Sten Wessman*

Recommendation 17 : Recommended for publication in WitW.

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9. IX-2854-2024 (IX-H-963-2024): Condition of lacy ferrite formation during FA-mode solidification in austenitic stainless steels and the pitting corrosion resistance, *Kota Kadoi, Mari Kogure, Hiroshige Inoue*

10. IX-2855-2024 (IX-H-965-2024): Effect of deformation-induced martensite on the toughness of austenitic weld metal, *Hayato Tachibana, Hajime Matsuo, Takahiro Kamo*

Recommendation 18 : Recommended for publication in *WitW*.

9. Summary and Others

9.1 Recommendations

From the sub-commission meetings, a total of 18 papers were recommended to the publication in *Welding in the World*. These recommendations proceeded to a vote by national delegates. The vote was unanimous by all delegates attended.

9.2 Administrative matters

- Dr. Hee Jin KIM was re-elected for the Chair of C-IX (Resolution 1)
- Prof. P. Mayr was elected for the Chair of IX-AM (Resolution 2)

9.3 Date and Place of Next meetings

- 2025 Intermediate Meeting

March 10 ~ 12, 2025, University West, Trollhattan, Sweden

Administrative information 1 : Schedule of Intermediate meeting 2024

March 10 ~ 12, 2025, University West, Trollhattan, Sweden

- 2025 AA meeting

June 23~25, 2025, Genoa, Italy

10. Adjournment of the meeting

The meeting was adjourned as scheduled with words of thanks by Chair for the engagement in this meeting. Special thanks were extended to the presenters and authors of papers.

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