



C-X Structural Performance of Welded Joints – Fracture Avoidance

Draft Agenda Annual Assembly 2025

X-2095-2025

Author: Mitsuru OHATA

Comments: Monday, 23 to Wednesday, 25 June 2025, 14.00 to 18.00, Room " Ex-Nov0 3(mod 71°)"
Meeting to be held in person only, not hybrid

1. Agenda for the meetings

Monday 23 June 2025

	Agenda Item	Responsibility	Action
14.00	1. Introduction	Mitsuru Ohata	
	1.1. Welcome	Mitsuru Ohata	Information
	1.2. Approval of the Agenda	Mitsuru Ohata	Motion required
14:05	2. Review of C-X Meeting, 2024-2025	Mitsuru Ohata	
	2.1. Approval of draft minutes of C-X meeting at Annual Assembly in Rhodos, 2024	Mitsuru Ohata	Motion required
	2.2. Approval of draft minutes of C-X intermediate meeting at GEDIK, Turkey, 2025	Mitsuru Ohata	Motion required
	2.3. Terms of reference and Operational plan of C-X	Mitsuru Ohata	Information
	2.4. Status of C-X papers in Welding in the World (WitW)	Mitsuru Ohata	Information
14.15	3. Technical presentation	Mitsuru Ohata	Information
	3.1. S1: Advancement of FFS –Fracture toughness evaluation	Authors	
	3.2. S2: Advancement of FFS –Defect assessment	Authors	
	3.3. S3: Simulation-based design –Fracture avoidance	Authors	
	3.4. S4: Fatigue assessment	Authors	
17:50	Close of Day 1 Activities		

Tuesday 24 June 2025

	Agenda Item	Responsibility	Action
14.00	4. WG: Fracture Toughness Test at Cryogenic Temperature	Jung Goo Park	Information
	4.1. Presentation	Authors	
17:10	5. Technical presentation	Mitsuru Ohata	Information
	5.1. S5: Environment induced fracture –Hydrogen	Authors	
18:10	Close of Day 2 Activities		

Wednesday 25 June 2025

	Agenda Item	Responsibility	Action
14.00	6. Technical presentation	Mitsuru Ohata	Information
	6.1. S5: Continued (Environment induced fracture – Hydrogen)	Authors	
14:40	7. SC-AM: Fracture Avoidance in Additively Manufactured Parts/Components	Mustafa Koçak	Information
	7.1. Presentation	Authors	
16.15	8. Technical presentation	Mitsuru Ohata	Information
	8.1. S6: Advancement of FFS –Welding residual stress	Authors	
17.35	9. Resolutions	Mitsuru Ohata	Motion required
	9.1. Recommendation of documents to Welding in the World	Delegate	Motion required
17.50	10. Next meeting	Mitsuru Ohata	Information
	10.1. Intermediate meeting	Delegate	Information
	10.2. 79th Annual Assembly		Information
18:00	Close out of C-X		

2. Commission Leadership

Commission X —Structural Performance of Welded Joints – Fracture Avoidance			
Chair	Mitsuru OHATA	Japan	ohata@mapse.eng.osaka-u.ac.jp
Vice Chairs	Gyubaek AN	Korea	gyubaekan@chosun.ac.kr
Sub-commission SC-AM :			
Chair	Mustafa Koçak	Turkey	MKOCAK@gedik.com.tr
Vice-Chair	Fikri Bashar Yalciner	Turkey	basharyalciner@gmail.com
Working group WG :			
Chair	Jung Goo Park	Korea	jgbest.park@samsung.com

3. Terms of Reference**C-X Summary for 2024 Annual Report**

The activity of Commission X has focused on developing a practical guideline for Fitness-for-Service (FFS) assessment for welded components. The C-X FFS consists of specific subjects not covered by existing standards/guidelines, which operates as a “supplement”. The C-X FFS gives state-of-the-art knowledge, advice and/or recommendations on the structural performance assessment of welds with respect to avoidance of brittle, ductile, and environment-induced fracture.

C-X advances the development of new assessment tools together with an expansion of FFS target and new, challenging, innovative research items; Artificial Intelligence (AI) / Machine Learning (ML) assisted assessment tools (Data-driven assessment), simulation-based design and structural integrity assessment tools (FEA-based Digital Twin)

The WG named “Fracture Toughness Test at Cryogenic Temperature” has launched activities with a call for participants. Moreover, a new sub-commission SC-AM named “Fracture Avoidance in Additively Manufactured Parts/Components” was set up. C-X will activate collaborations with other commissions or WGs relevant to hydrogen-induced fracture assessment of steel structures and fracture assessment of AM parts/components.

Annex : Detail of Agenda [Doc. X-2095-2025]

Annual Assembly 2025

Genoa, Italy

Agenda

C-X: Structural Performance of Welded Joints – Fracture Avoidance

June 23-25, 2025

Room@ Ex-Novo 3(mod 71°)

Chair: Mitsuru Ohata (Japan)

Monday, 23rd June – Room@ Ex-Novo 3(mod 71°) (14:00 – 18:00)

1. Preliminary Items

14:00 – 14:05

- (a) Welcome address (Prof. M. Ohata, C-X Chair, Osaka University, Japan)
- (b) Approval of agenda (X-2095-25)
- (c) List of C-X documents (X-2055-24)

2. Review of C-X Meeting, 2024–2025 (Prof. M. Ohata)

14:05 – 14:15

- (a) Approval of draft minutes of C-X meeting at Annual Assembly in Rhodes, 2024 (X-2043-2023)
- (b) Approval of draft minutes of C-X intermediate meeting at GEDIK, Turkey, 2025 (X-2054-2024)
- (c) Terms of reference and Operational plan of C-X (X-1998-22)
- (d) Status of C-X papers in Welding in the World (WitW)

3. Technical presentation

S1: Advancement of FFS –Fracture toughness evaluation

14:15 – 14:35 X-2114-2025

Update on the Comparison of Local Compression Methods and their Effects on Fracture Toughness
Yin Jin Janin, Georgia Schneider, Henryk Pisarski (TWI Ltd, Cambridge, UK)

14:35 – 14:55 X-2113-2025

Estimating the probability of low-temperature failure of ASME B31.3 pressure piping
Isabel Hadley, Yin Jin Janin, Charles Schneider (TWI Ltd, Cambridge, UK)

14:55 – 15:15 X-2116-2025

Influences of Welding Processes and Consumables on Ballistic Performance of Ultra High Hard Armour Steel Joints
V. Balasubramanian, S. Malarvizhi, S. Naveen Kumar (Annamalai University, India)
A. Hafeezur Rahman, V. Balaguru (Combat Vehicles Research & Development Establishment, Avadi, India)

S2: Advancement of FFS –Defect assessment

15:15 – 15:35 X-2115-2025

Flaw Distributions in Electro-Beam Welds
Yin Jin Janin, Georgia Schneide (TWI Ltd, Cambridge, UK)

15:35 – 15:45 X-2122-2025

Latest Developments in API 579 Technical Committee

Fikri Bashar Yalciner (NMDC Energy Abu Dhabi, Istanbul Gedik University, Turkey)

Mustafa Koçak (Istanbul Gedik University, Turkey)

----- Coffee break (15:45 – 16:15) -----

16:15 – 16:30

WitW (Welding in the World) report presentation

Majid Farajian, Lead Editor in Chief WitW

S2: Continued (Advancement of FFS –Defect assessment)

16:30 – 16:50 X-2101-2025

Non-destructive evaluation technology for thermal spray coatings

Akiyoshi Yokota (Shimadzu Corporation, Japan)

S3: Simulation-based design –Fracture avoidance

16:50 – 17:10 X-2097-2025

Ultimate tensile strength and tensile strain capacity of linepipe girth weld joint with softened HAZ

Shoma Onuki, Masaki Mitsuya (Tokyo Gas, Japan)

Mitsuru Ohata (The University of Osaka, Japan)

17:10 – 17:30 X-2098-2025

A Ductile Crack Growth Simulation Method Considering Weld Heterogeneity for Predicting the Leak Limit Tensile Strain in Girth-Welded High-Pressure Pipes

Hiroto Shoji, Mitsuru Ohata, Kauma Shimizu (The University of Osaka, Japan)

Fumiaki Kimura (Nippon Steel Engineering Co., Ltd., Japan)

S4: Fatigue assessment

17:30 – 17:50 X-2112-2025

Influence of filler metal features on the fatigue crack growth behavior of high-strength structural steels and their welded joints

J. Kovács, J. Lukács (University of Miskolc, Hungary)

Tuesday, 24th June – Room@ Ex-Novo 3(mod 71°) (14:00 – 18:00)

WG: Fracture Toughness Test at Cryogenic Temperature

14:00 – 14:40 X-2105-2025

Fracture toughness at cryogenic temperature

Jung Goo Park (Samsung Heavy Industries, Korea)

Gyubaek An (Chosun University, Korea)

14:40 – 15:00 X-2106-2025

Material Properties Evaluation of Materials for Hydrogen Carriers : A Report from the Korean Welding Society

Jisun Roh, Jung Goo Park (Samsung Heavy Industries, Korea)

Gyubaek An (Chosun University, Korea)

15:00 – 15:20 X-2102-2025

Investigates of mechanical properties at cryogenic temperature (-253 °C)

Gyubaek An, Daehee Seong (Chosun University, Korea)

Jeong-ung Park, JungGoo Park (Samsung Heavy Industries, Korea)

15:20 – 15:40 X-2102-2025

Formation Mechanism of Split Crack in Cryogenic Fracture Toughness Test of A5083-O plate

Xixian Li, Shohei Uranaka, Fuminori Yanagimoto, Tomoya Kawabata (The University of Tokyo, Japan)

----- Coffee break (15:45 – 16:15) -----

16:15 – 16:35 X-2118-2025

Fracture Toughness Evaluation of AISI 304L Weldments at Cryogenic Temperatures

I. Varfolomeev, Y. Sguaizer (Fraunhofer IWM, Freiburg, Germany)

F. Hadwiger (KRP Mechatec GmbH, Garching, Germany)

F. Haas (König + Co. GmbH, Netphen, Germany)

16:35 – 16:55 X-2103-2025

Effect of δ -ferrite and martensitic transformation on the cryogenic fracture toughness of SUS316L for liquid hydrogen storage tanks

Daiki Maeda, Shohei Uranaka, Kazuhiro Ogawa, Tomoya Kawabata (The University of Tokyo, Japan)

16:55 – 17:10

Future work of WG, Jung Goo Park (Samsung Heavy Industries, Korea)

S5: Environment induced fracture –Hydrogen

17:10 – 17:30 X-2100-2025

Degradation of tensile properties accompanied by the microstructural damage progression in accelerated hydrogen attack tests of 1.25Cr-0.5Mo steel plate for pressure vessels

Akitada Yasutomi, Yuta Honma (Japan Steel Works M&E, Inc. Muroran Plant, Japan)

Gen Sasaki (The Japan Steel Works, LTD, Japan)

Mitsuru Ohata (The University of Osaka, Japan)

17:30 – 17:50 X-2121-2025

Remaining Life Assessment of a Vertical Pressure Vessel Column with Hydrogen Induced Cracking (HIC) Defects

Mustafa Koçak (Istanbul Gedik University, Turkey)

Fikri Bashar Yalciner (NMDC Energy Abu Dhabi, Istanbul Gedik University, Turkey)

17:50 – 18:10 X-2104-2025

Susceptibility to hydrogen embrittlement in Hastelloy-based weld metal at ambient temperature for liquefied hydrogen storage tanks

Chenjun Yu, Shohei Uranaka, Mitsuo Kimura, Tomoya Kawabata (The University of Tokyo, Japan)

Wednesday, 25th June – Room@ Ex-Novo 3(mod 71°) (14:00 – 18:00)

S5: Continued (Environment induced fracture –Hydrogen)

14:00 – 14:20 X-2119-2025

Fracture Mechanics Based Assessment of the Hydrogen Readiness of Existing Pipeline Valves

F. Dittmann, I. Varfolomeev (Fraunhofer IWM, Freiburg, Germany)

M. Gerstenberg, R. Fussik (GASCADE Gastransport GmbH, Kassel, Germany)

V.H. Skrzypczak (DNV Energy Systems Germany GmbH, Hamburg, Germany)

14:20 – 14:40 X-2117-2025

Effect of Hydrogen on the Fracture Toughness of X65 Pipeline Steel Welded Joints in High-pressure Natural Gas/Hydrogen Mixtures

Yongdian Han, Xue Liu, Youfu Xiao, Yun Cheng, Lei Zhao, Lianying Xu (Tianjin University, China)

SC-AM: Fracture Avoidance in Additively Manufactured Parts/Components

14:40 – 15:20 X-2120-2025

Discussion on Contents of Proposed IIW Recommended Practice for “Defect Assessment of AM Components”

Mustafa Koçak (Istanbul Gedik University, Turkey)

Fikri Bashar Yalciner (NMDC Energy Abu Dhabi, Istanbul Gedik University, Turkey)

15:20 – 15:40 X-2109-2025

A Robust Shrinkage -Strain Method for Estimating Residual Stress and Distortion in Fusion-Based Metal AM Components

Zetao Jin, Pingsha Dong (The University of Michigan, USA)

15:40 – 16:00 X-2099-2025

Fracture behaviors in Charpy impact test for wire arc additive manufactured (WAAM) carbon steel wall component

Kazuma Shimizu, Mitsuru Ohata, Ryo Kinugawa, Hiroto Shoji (The University of Osaka, Japan)

Fikri Bashar Yalciner (NMDC Energy Abu Dhabi, Istanbul Gedik University, Turkey)

Mustafa Koçak, Ugur Gürol (Istanbul Gedik University, Turkey)

----- Coffee break (16:00 – 16:15) -----

S6: Advancement of FFS –Welding residual stress

16:15 – 16:35 X-2096-2025

Statistical Analysis of Residual Stresses in Electron Beam Joints

Yoshiki Mikami, Kento Morita, Zhou Hongchang (JWRI, The University of Osaka, Japan)

Yuya Sato, Tetsuya Tagawa (JFE Steel Corporation, Japan)

16:35 – 16:55 X-2110-2025

Closed-form weld residual stress estimate for pressure vessel and piping components – a preview of API 579 RP-1/ASME FFS-1 revisions

Pingsha Dong (The University of Michigan, USA)

16:55 – 17:15 X-2108-2025

FE analysis of boxing welded joints with various thicknesses enhanced by LTT elongated bead

Ninsyu Ma (JWRI, The University of Osaka, Japan)

17:15 – 17:35 X-2111-2025

Effects of Laser Shot Peening on Laser Welded Fe-Cr-Mn-Co-Ni-Based High-Entropy Alloys Using the Neutron Diffraction Method

Jeongung Park, Gyubaek An (Chosun University, Korea)

4. Resolutions

17:35 – 17:50

- (a) Recommendation of documents to Welding in the World
- (b) Others

5. Next Meeting

17:50 – 18:00

- (a) Intermediate meeting:
 - Date : February or March, 2026
 - Place : TBD
- (b) 79th Annual Assembly
 - Date : TBD 2026
 - Place : TBD
- (c) Any other business

6. Closing