Weld on Sweden
MAKES INDUSTRY GROW

Invitation to training

Advanced Design of Welded Structures, SK8

Target audience: Design, Simulation, Analysis, Research and Development.

Date and time: December 15 – 17, 2026, at 9-16

Venue: Weld on Sweden, Framtidsvägen 14, Växjö and online via Teams

Lecturer: Professor PhD. Zuheir Barsoum

Welding is the primary method for joining lightweight metallic structures, and the increasing use of high-strength steels demands more accurate design and analysis methods. Modern approaches based on finite element analysis and fracture mechanics, together with the latest IIW recommendations, provide a comprehensive framework for reliable fatigue assessment by integrating measurement, analysis, testing, and evaluation.

This course aims to give participants a clear and efficient understanding of these methods and recommendations, enabling them to assess fatigue life of welded joints, understand the effects of residual stresses and weld imperfections, select and apply suitable analysis techniques for complex structures, and evaluate improvement methods and quality systems to ensure structural integrity.

Prerequisites: Suitable prior knowledge for this course includes familiarity with fatigue design according to a relevant standard or completion of course SK2 or SK4 offered by Weld on Sweden.

Program

Day 1

General aspects of fatigue; the phenomenon of fatigue in welded structures; stress concentration; weld defects and residual stresses. Weld details and symbols. Evaluation methods (Nominal Stress Method, Hot Spot Method, Effective Notch Method, Fracture Mechanics), design principles, safety philosophy, and partial safety factors.

Day 2

Fatigue strength based on the different evaluation methods; weld quality and weld quality systems; multiaxial fatigue; spectrum loading; residual stress relaxation; techniques for improving fatigue life; comparison with other design codes and standards.

Day 3

Industrial case studies: application of fatigue assessment methods to complex welded structures and geometries using advanced finite element analysis, highlighting practical challenges and solutions.

Exercises:

1) Introduction to the effective notch stress method
2) Conceptual design of welded joints subject to different types of loading
3) Fatigue life analysis of welded structure using fracture mechanics

Participants are requested to bring their own computer for the exercises.

Course literature: A. Hobbacher, Recommendations for Fatigue Design of Welded Joints and Components (ISBN 978-3-031-57666-9), 2024 edition, course slides and additional materials provided in digital format (PDF).

Course certificate: Obtained after completion of the course.

Fee: 29 500 SEK. The course fee includes digital course literature, coffee, lunch and certificate of attendance. VAT will be added by 25%. Payment terms 30 days.

Registration via the website or to Ali Bahrami ali@weldonsweden.se, +46703336354.