40 years of expertise in laser safety and laser technologies, serving your most critical challenges.

Optimising Overlap (Through-Penetration) Welding of Copper and Aluminium

Ref: AC2-4

Optimising overlap (through-penetration) welding of copper and aluminium

Grade of Laser Welding Specialist (for automated applications only, not for manual laser welding)

Your design is fixed: it will be overlap welding on special materials – aluminium alloys and copper!

To implement this choice as effectively as possible, discover and learn good practice, from design through parameter setting to inspection.
The “Mastering Laser Welding” training course combined with this specialisation allows you to achieve the grade of Laser Welding Specialist.

Practical information

DATES (INTER-COMPANY / IN-HOUSE)
• 10–11 December 2026

ORGANISATION
IREPA LASER - Strasbourg / Illkirch

DURATION
1.5 days (10.5 hours)

PRICES
1420€ excl. VAT

TECHNICAL/TEACHING LEAD:
Teaching: Franck RIGOLET | Technical: Frédérique MACHI

DO YOU HAVE A DISABILITY?
Contact our disability officer at referent.handicap@irepa-laser.com

Key information

PREREQUISITES
Grade of Laser Welding Technologist (“Mastering Laser Welding” training course)

ACCESSIBLE LASER CLASSES
/

CERTIFICATION
Teaching equipment:
• 6 kW fibre laser
• 6kW disk laser with BrightLine Weld function
• 750W single-mode fibre laser
• Lasers combined with scanner heads and a robot or CNC system
• Metallographic preparation and examination laboratory
Validation:
• Assessment of learning outcomes and course certificate
Note:
The grade of Laser Welding Specialist will be awarded after achieving the grade of Laser Welding Technologist and 1 specialisation offered in our catalogue.
The grade of Laser Welding Expert will be awarded after achieving the grade of Laser Welding Technologist and 2 specialisations offered in our catalogue.

TECHNICAL/TEACHING LEAD:
Teaching: Franck RIGOLET | Technical: Frédérique MACHI

Training objectives

- Know how to anticipate the difficulties of welding reflective materials.
- Be able to design an overlap (through-penetration) joint with a laser beam.
- Be able to define the functions of the tooling.
- Be able to select equipment according to requirements (laser, optical system, monitoring…).
- Be able to define the operating parameters.
- Be able to check and interpret analysis results.
- Be able to identify and correct defects.

Target audience

- Project and/or product managers.
- R&D managers.
- Technical managers.
- You are already a Laser Welding Technologist (“Mastering Laser Welding” training course) and wish to develop your product and your skills further.

Programme

Over 1.5 days

Laser welding and reflections
• What are the operating difficulties?
• Choosing the available technologies for processing reflective materials
Overlap joint design
• Design before welding
• Advantages and points to watch
• Where is the effective cross-section?
• Tooling
Choosing the optical components to install
• Choosing the focal diameter and trajectory types
• Innovative technological solutions, beam shaping, oscillation
Choosing the operating parameters
• Focal point position
• Trajectory type
• Power/speed
• Ramps
• Energy distribution
Inspection methods
• Metallurgical weldability of aluminium alloys and copper
• Formation of intermetallics
• Defects in overlap joints, interpretation and corrective measures
• Non-destructive testing
• Mechanical and electrical testing of welded joints
• Metallography
Procedure qualification
• Approach
• Documentation
Case study
• Practical exercise