High-quality filler metals and specially designed equipment are two key factors in gaining the results you need when welding aluminum. Knowing the techniques to make successful aluminum welds, as well as proper welding procedures, weld preparation, troubleshooting and more are also critical. Together, Miller Electric Mfg. Co. and Hobart Brothers Company provide the training you need through seminars that include hands-on welding and informative instruction on aluminum welding technology.

- Industry Trends and Applications
- Codes and Standards
- Metallurgy
- Weld Preparation
- Welding Processes and Procedures
- Design and Performance
- Filler Metal Selection
- Weld Discontinuities - Cause and Correction
- Weld lab, welding procedures, fillet welds and groove welds, welding inspection and testing

23 Professional Development Hours can be used for AWS Re-certification.

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Course Overview:

To provide professionals, active in the design and fabrication of aluminum structures, educational support in the areas of welding technology associated with designing and welding of aluminum structures. This will include a detailed evaluation of the many aluminum alloys, their characteristics and applications, metallurgical considerations, welding procedure development, welding processes, weld design, weld discontinuities, trouble shooting welding problems and quality control.

Course Outline - Theory

Introduction:
- Industry trends
- Characteristics of aluminum applications
- Hobart's guide for aluminum welding brochure

Codes and Standards:
- Review of AA and AWS publications
- Alloy and temper designation system

Metallurgy:
- History of aluminum production
- Alloy system characteristics of element additions
- Effect of alloying elements on structure
- Weld bead, fusion zone and heat affected zone

Weld Preparation:
- Metal storage considerations
- Dew point calculations
- Cutting, thermal and mechanical cleaning techniques

Welding Processes and Procedures:
- GMAW (MIG)
  - Welding
  - Feedability
  - Polarity/arc cleaning
  - Metal transfer modes
  - Power sources
- GTAW (TIG)
  - Welding
  - Polarity
  - Square Wave AC
  - Inverter Technology
  - Tungsten electrode selection

Design & Performance:
- Corrosion types and performance
- Elevated temperature performance
- Strength performance/tensile and shear
- Weld joint design
- Toughness/elasticity/ductility
- Fatigue performance
- Post anodize color matching

Filler Metal Selection:
- Weld Metal properties
- How to use the Hobart filler metal selection chart
- Case studies

Weld Discontinuities - Cause & Correction:
- Weld cracking
- Porosity
- Inadequate fusion and penetration

AWS/D1.2 Structural Welding Code Aluminum
- Structural design
- Procedural qualification
- Performance qualification
- Fabrication and inspection

Course Outline - Practical

Welding Procedures:
- Safety procedures
- WPS preparation
- Sample preparation
- Pre-weld inspection
- Welding machine set up

Fillet Welds & Groove Welds:
- Select base and filler metal
- Prepare and clean base metal
- Review and select equipment settings

Welding, Testing & Inspection:
- Create weldments
- Record settings, practice and produce samples
- Visually inspect weldments
- Perform a fillet weld fracture test inspection
- Perform a fillet weld macroetch specimen inspection
- Perform a groove weld guided bend test (Root and face bends)
- Evaluation of radiographics (X-ray) inspection