

**High-quality filler metals and specially-designed equipment** are two key factors in gaining the results you need when welding aluminum.

Making high-quality aluminum welds also requires knowing proper welding techniques and preparation, developing suitable welding procedures that help prevent discontinuities, and the ability to quickly resolve issues before they impact process quality and productivity.

Together, **Miller Electric and Hobart Brothers** provide the training you need through hands-on welding exercises and classroom instruction dedicated to aluminum welding technology

## 2023 Dates

Note: Registration ends 3 weeks prior to class start date

- February 21-23 (Appleton, WI)
- April 18-20 (Appleton, WI)
- September 12-14 (Troy, OH)
- October 17-19 (Troy, OH)

## Seminar Hours

- 8:00 AM - 5:00 PM each day

## Course Enrollment Fee

- \$450 per student

## What is Included (per Student)

- (23) Professional Development Hours that can be used for AWS recertification.
- (1) Guide for Aluminum Welding
- (1) Miller Digital Elite™ welding helmet
- (1) Pair of Miller TIG/multi-task gloves
- (1) Pair of Miller Slag™ safety glasses
- (1) Miller Classic Cloth Jacket
- Lunch & light breakfast each lecture day

## Registration Form

Name	
Company	
Address	
City	
State	
Zip	
Phone	
E-Mail	
Seminar Date	
Visa/Mastercard	
Card Number	
Expiration (MM/YY)	
Security Code	
Signature	
PO#	
Shirt Size	

## Email Registration Form To:

[MillerTraining@MillerWelds.com](mailto:MillerTraining@MillerWelds.com)

## Accommodations

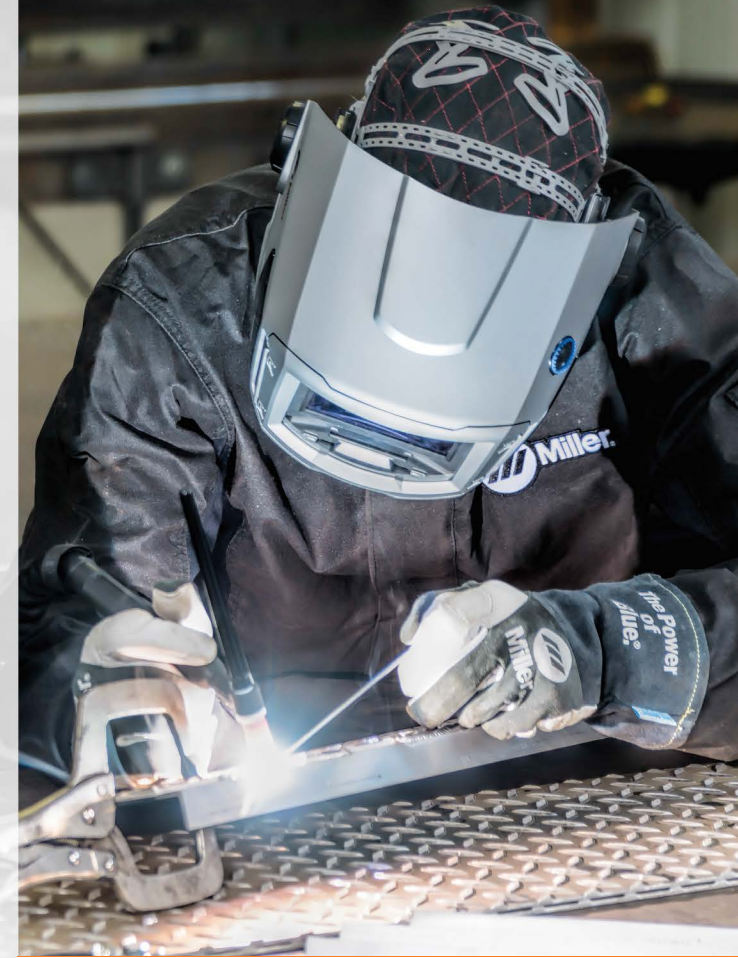
Reserved by participant in a common location.

## Transportation

Participants should make arrangements for transportation to and from the hotel. Shuttle service may or may not be provided by the hotel.

## Cancellations

Cancellations will be accepted and refunds made up to 14 days prior to the seminar date. Make non-refundable airline reservations at your own risk.



# Advanced Aluminum Welding Seminar

## Course Objective

To provide aluminum fabrication professionals with educational support in the areas of welding technology needed to successfully design and weld high-quality and cost-effective aluminum weldments

This course will include a detailed evaluation of the many aluminum alloys—characteristics, applications and metallurgical considerations—as well as welding processes, weld design, welding procedure development, weld discontinuities, process troubleshooting, and quality control.

*Take away every usable **FACT** about welding aluminum*

*Experience the practical **FEEL** of a successful aluminum weld*

## Course Outline - Theory

### Introduction

- Industry Trends
- Characteristics of Aluminum
- Typical Applications

### Codes and Standards

- Aluminum Association Publication Overview
- AWS Publication Overview
- Alloy and Temper Designation System

### Metallurgy

- History of Aluminum Production
- Characteristics of Alloying Element
- Effects of Alloying Elements on Structure
- Weld Bead, Fusion Zone and Heat affected zone

### Weld Preparation

- Base Metal & Filler Metal Storage
- Dew Point Calculations
- Thermal and Mechanical Cutting
- Cleaning Techniques

### Process & Procedures: GMAW (MIG)

- Feedability
- Polarity & Arc cleaning
- Metal transfer modes
- Power sources

### Process & Procedures: GTAW (TIG)

- Polarity

- Square Wave AC
- Inverter Technology
- Tungsten Electrode Selection

### Design & Performance:

- Corrosion Types and Alloy Performance
- Elevated Temperature Performance
- Tensile and Shear Strength
- Weld Joint Design
- Toughness/Elasticity/Ductility
- Fatigue Performance
- Post-Anodize Color Matching

### Filler Metal Selection:

- Weld Metal Properties
- The Hobart Filler Metal Selection Chart
- Case Studies

### Weld Discontinuities

- Cracking
- Porosity
- Inadequate Fusion & Penetration

### D1.2 Structural Welding Code

- Structural Design
- Procedure Qualification
- Performance Qualification
- Fabrication and Inspection

## Course Outline - Practical

### Welding Procedures

- Safety
- WPS Preparation
- Sample Preparation
- Pre-Weld Inspection
- Welding Power Source Set Up

### Fillet Welds & Groove Welds:

- Selecting Base Metal & Filler Metal
- Preparing & Cleaning Base Metal
- Parameter & Power Source Configuration

### Welding, Testing & Inspection:

- Create Weldments
- Record Settings
- Visually Inspect Weldments
- Perform a Fillet Weld Fracture Test & Inspection
- Perform Fillet Weld Macroetch Inspection
- Perform a Groove Weld Guided Bend Test
- Evaluation of Radiographs (X-Ray Inspection)