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# **PROGRAM OUTLINE**

## **WELDER LEVEL B**

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## **Program Outline**

### **Welder Level B**

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#### **Perform Shielded Metal Arc Welding (SMAW)**

Use the SMAW Process to Weld Groove Welds on Low Carbon Steel Plate  
Use the SMAW Process to Weld Groove Welds on Low Carbon Steel Pipe  
Use the SMAW Process to Fillet Weld Flange 5F (Vertical Up) on Low Carbon Steel Pipe

#### **Perform Semi-Automatic Welding (GMAW) (GMAW-P) (FCAW) (FCAW/MC)**

Describe GMAW, GMAW-P, FCAW, and FCAW/MC Equipment and their Operation  
Describe and Select Filler Metal and Shielding Gases for GMAW  
Use the GMAW-P Process to Weld Groove Welds on Low Carbon Steel Plate  
Use the GMAW and GMAW-P Processes to Weld Groove Welds on Low Carbon Steel Pipe  
Describe and Demonstrate GMAW-P Groove Welds Using Stainless Steel Filler Metal on Low Carbon Steel Sheet and Plate (e.g. 18 Gauge and Thicker)  
Describe and Demonstrate GMAW-P Groove Welds Using Stainless Steel Filler Metal on Low Carbon Steel Pipe  
Describe and Demonstrate Procedures Specific to GMAW and GMAW-P on Aluminum Plate  
Use the GMAW and GMAW-P Processes to Weld Groove Welds on Aluminum Plate  
Describe and Select Filler Metals and Shielding Gases for FCAW and FCAW/MC  
Use the FCAW Self-Shielded Process to Weld Fillet Welds on Low Carbon Steel Plate  
Use the FCAW Self-Shielded Process to Weld Groove Fillets on Low Carbon Steel Plate  
Use the FCAW Process to Weld Groove Welds on Low Carbon Steel Plate  
Use the FCAW/MC Process to Weld Groove Welds on Low Carbon Steel Plate  
Use the GMAW, FCAW, and FCAW/MC Process to Weld Groove Welds on Low Carbon Steel Pipe  
Describe and Demonstrate FCAW Fillet Welds Using Stainless Steel Filler Metal on Low Carbon Steel Plate  
Hardsurface Low Carbon Steel Plate

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*Program Outline Welder Level B Cont'd.*

## **Describe Basic Metallurgy Relating to Production, Properties and Weldability**

Describe the Grain Structure of Metals  
Describe the Alloy Content and Heat Treatments on the Weldability of Steel  
Describe Aluminum, Aluminum Alloys and Describe the Weldability

## **Perform Gas Tungsten Arc Welding (GTAW)**

Describe the GTAW Process and its Application  
Describe GTAW Equipment  
Use the GTAW Process to Fillet Weld Using Low Carbon Steel Filler Metal on Low Carbon Steel Sheet  
Use the GTAW Process to Groove Weld Using Low Carbon Steel Filler Metal on Low Carbon Steel Plate  
Use the GTAW Process to Groove Weld Using Low Carbon Steel Filler Metal on Low Carbon Steel Pipe  
Use the GTAW Process to Fillet Weld Using Stainless Filler Metal on Low Carbon Steel Sheet and/or Stainless Steel Sheet  
Use the GTAW Process to Groove Weld Using Stainless Steel Filler Metal on Thin Wall Stainless Steel Pipe  
Use the GTAW Process to Fillet Weld Using Aluminum Filler Metal on Aluminum Sheet

## **Read and Utilize Industry Drawings**

Read and Interpret Piping Drawings  
Perform Basic Pipe Layout

## **Layout and Fabricate Components**

Interpret and Apply Mechanical Drawings  
Layout Materials  
Prepare Materials  
Fabricate Project(s)

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*Program Outline Welder Level B Cont'd.*

**Describes Quality Control and Inspection**

- Identify Types and Uses of Destructive Testing Methods
- Identify Types and Uses of Non-Destructive Testing Methods
- Comply with Weld Procedure Specifications (WPS) and Data Sheets
- Describe the Scope of the Welding Supervisor and Inspector Responsibilities

**Describe Scope of Welding Standards, Codes, Specifications and Welder Qualifications**

- Identify Applicable Standards, Codes and Specifications
- Describe Materials and Filler Metal Classification Systems
- Describe Welding Procedure and Performance Qualification Tests
- Describe BCSA Jurisdiction

**Describe Specialized Welding and Other Welding Processes (AWS)**

- Describe Orbital Welding
- Describe Plastic Welding
- Describe Thermal Spray Process
- Describe Thermit Welding
- Describe Electro-Gas Welding
- Describe Electro-Slag Welding
- Describe Laser Welding
- Describe Plasma Welding
- Describe Flash Butt Welding
- Describe Electron Beam Welding
- Describe Friction and Friction Stir Welding
- Describe Stud Arc Welding Process
- Describe Resistance Welding Process