

# Shielded Metal Arc Welding: Grades 9, 10, 11, 12

Adopted 2014

## Demonstrate welding safety techniques

### **1.1 Determine the hazards of welding and develop the proper attitude toward safety.**

1. Identify some common hazards in welding and proper PPE used in welding. [1.1.1](#)
  2. Demonstrate how to avoid welding fumes and electric shock when welding. [1.1.2](#)
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### **1.2 Demonstrate safe materials handling procedures.**

1. Explain uses for material safety data sheets. [1.2.1](#)
  2. Demonstrate safety techniques for storing and handling cylinders. [1.2.2](#)
  3. Demonstrate proper material handling methods. [1.2.3](#)
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## Demonstrate an understanding of shielded metal arc welding equipment and connections

### **2.1 Demonstrate an understanding of SMAW equipment and how to properly connect the equipment for welding.**

1. Explain shielded metal arc welding (SMAW) safety and explain welding electrical current. [2.1.1](#)
  2. Compare welding power supplies and their characteristics. [2.1.2](#)
  3. Demonstrate how to set up welding power supplies and a machine for welding. [2.1.3](#)
  4. Identify tools used for weld cleaning. [2.1.4](#)
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### **2.2 Demonstrate electrode selection and storage procedures in compliance with the welding codes.**

1. Explain factors that affect electrode selection. [2.2.1](#)
2. Explain the importance and roles of the American Welding Society (AWS) and the American Society of Mechanical Engineers standards. [2.2.2](#)
3. Select appropriate types of filler metals and explain the storage and control of filler metals. [2.2.3](#)
4. Select the proper electrode for an identified welding task. [2.2.4](#)

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**2.3 Strike an arc, run beads, and make fillet welds in a number of positions using SMAW electrodes.**

1. Set up shielded metal arc welding (SMAW) equipment, strike an arc describing the methods and extinguish the arc. [2.3.1](#)
2. Strike and extinguish an arc explaining the methods used. [2.3.2](#)
3. Describe causes of arc blow and wander. [2.3.3](#)
4. Make stringer, weave, and overlapping beads. [2.3.4](#)
5. Make fillet welds in the:
  - Horizontal (2F) position
  - Vertical (3F) position
  - Overhead (4F) position[2.3.5](#)

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**2.4 Research and explain applicable welding codes.**

1. Locate and apply codes governing welding. [2.4.1](#)
2. Locate and apply codes governing weld imperfections and their causes. [2.4.2](#)

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**2.5 Research and explain various weld imperfections and their causes.**

1. Locate and apply nondestructive examination practices [2.5.1](#)
2. Perform a visual inspection of fillet welds. [2.5.2](#)

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**2.6 Research and explain types of weldment testing and welder qualification test requirements.**

1. Explain welder qualification tests and the importance of quality workmanship. [2.6.1](#)
2. Identify common destructive testing methods. [2.6.2](#)