

## Standards and Competencies

- 1. Identify safety standards and demonstrate safety and health practices of welders in accordance with ANSI Z49.**
  - a. Demonstrate proper use of equipment used for protection of personnel.
  - b. Demonstrate proper use and inspection of equipment used for ventilation.
  - c. Demonstrate Hot Work operation.
  - d. Demonstrate working in confined spaces properly.
  - e. Understand precautionary labeling.
- 2. Demonstrate an understanding of practical measurement**
  - a. Identify basic metal-working tools used in measuring.
  - b. Use visual measuring tools to accuracy of 1/32”.
  - c. Employ the components of a combination square set.
  - d. Use layout and marking tools as required.
- 3. Read and interpret prints.**
  - a. Apply information found in the information block of the drawing.
  - b. Identify the basic views used on prints including assembly, detail and fit-up drawings.
  - c. Identify common types of lines, abbreviations and symbols in accordance with national drawing standards (ANSI).
  - d. Identify basic welding symbols and components of a symbol (such as arrow, reference line, tail, size, length and location) in accordance with the current national welding symbol standard AWS A2.4, current edition.
- 4. Produce welds using Shielded Metal Arc Welding (SMAW) process to AWS QC10 standards.**
  - a. Demonstrate safety procedures for SMAW.
  - b. Demonstrate ability to correctly set up SMAW power sources, related welding equipment and do basic process and equipment troubleshooting for welding of carbon steel.
  - c. Select correct type of electrode based on carbon steel.
  - d. Prepare carbon steel for welding.
- 5. Produce welds using Gas Metal Arc Welding (GMAW) process to AWS QC10 standards.**
  - a. Demonstrate correct safety procedures for GMAW.
  - b. Demonstrate ability to correctly set up GMAW power sources, related welding equipment and do basic process and equipment troubleshooting.
  - c. Identify short circuiting, globular, spray, and pulsed transfer welding of carbon steel.
  - d. Select correct type of filler metal, type of shielding gas, amperage and voltage based on carbon steel sheet and/ or plate (1/16” to 3/8” thickness).
  - e. Prepare the carbon steel for welding.
- 6. Produce welds using a Gas Tungsten Arc Welding (GTAW) process to AWS QC10 standards.**
  - a. Demonstrate safety procedures for GTAW power sources, related welding equipment and do basic process and equipment troubleshooting for regular or pulsed welding of carbon steel sheet.
  - b. Select the correct type of tungsten and/ or filler metal based on carbon steel sheet.

- c. Prepare carbon steel for welding.
- 7. Produce cut materials using an Oxygen Fuel Cutting (OFC) process to AWS QC10 standards.**
- a. Demonstrate safety procedures for OFC.
  - b. Demonstrate ability to correctly set up the OFC equipment for cutting and do basic process troubleshooting.
- 8. Demonstrate knowledge of visual inspection.**
- a. Examine and measure undercut.
  - b. Examine and measure porosity.
  - c. Measure fillet weld size.
  - d. Examine and measure weld reinforcement.
  - e. Determine acceptability of welded samples in accordance with provided acceptance criteria.
- 9. Demonstrate knowledge of welding positions and terminology.**
- a. Weld a single-bevel groove weld with melt-through in a corner or butt joint in the vertical up position/progression with SMAW.
  - b. Weld a fillet weld in a T-joint in the horizontal position with SMAW.
  - c. Weld a flare-V-groove weld in a butt joint in the vertical down position/progression with GMAW.
  - d. Weld a fillet weld in a T-joint in the horizontal position with GMAW.
  - e. Weld a fillet weld in a lap joint in the horizontal position with GTAW.
  - f. Lay out, weld, cut and prepare coupons for evaluation.