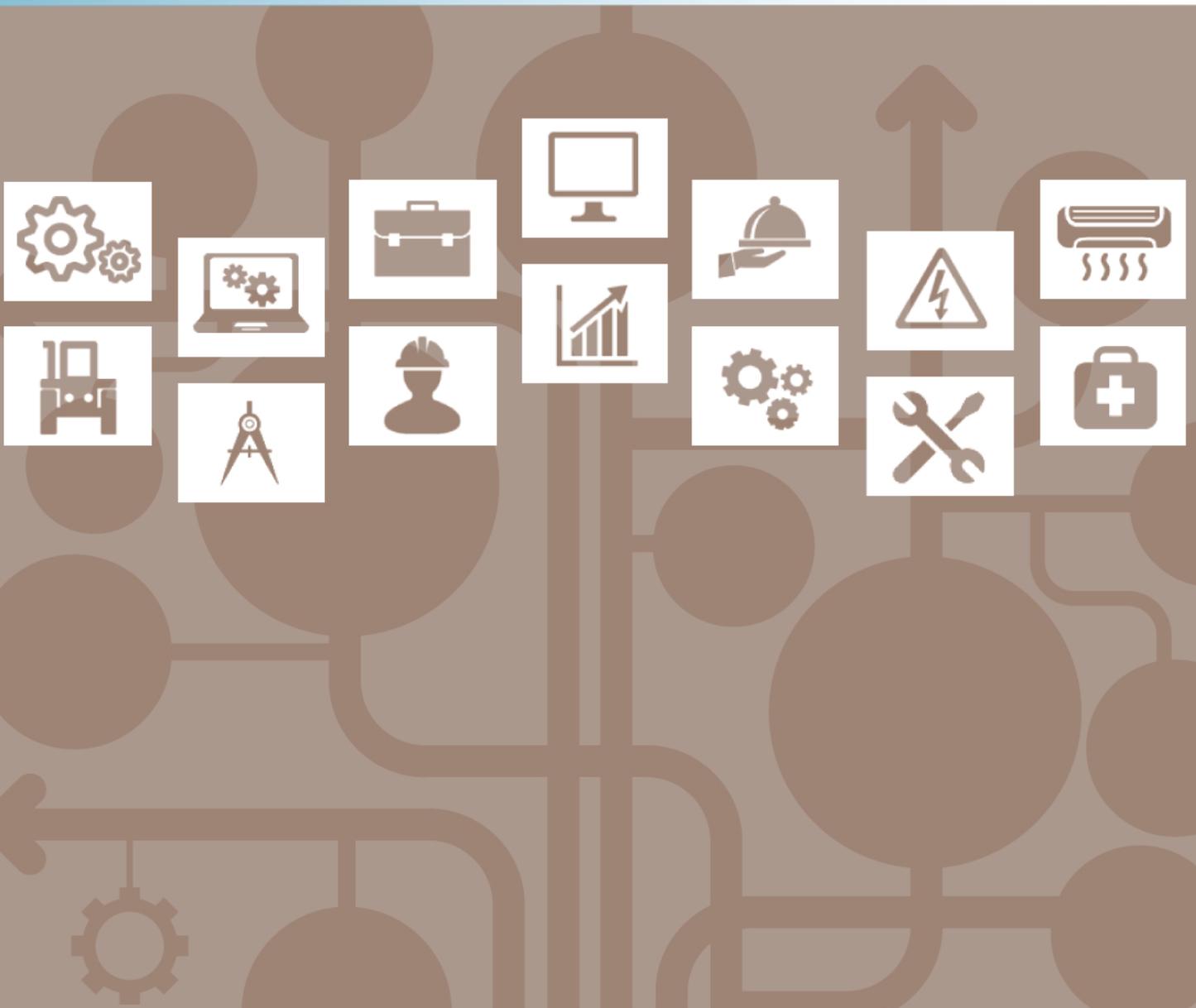


*Entry Level Assessment Blueprint*

*Welding*



## Specific Competencies and Skills Tested in this Assessment:

### Safety

- Identify various welding hazards and safe practices
- Display familiarity with industrial and OSHA safety standards
- Demonstrate knowledge of oxyfuel safety procedures
- Demonstrate knowledge of arc welding and cutting safety procedures
- Demonstrate proper and safe use of PPE, hand tools, and power equipment

### Welding Symbols and Blueprint Reading

- Interpret weld and welding symbols
- Read and interpret blueprints and sketches

### Oxyfuel Cutting (OFC)

- Identify oxyfuel cutting principles
- Identify and maintain oxyfuel equipment
- Assemble and disassemble oxyfuel equipment
- Handle and store compressed gas cylinders
- Cut and form metal with oxyfuel equipment



### Arc Cutting Process (Carbon Arc and Plasma Arc)

- Identify arc cutting process principles
- Assemble and disassemble arc cutting equipment
- Identify and maintain arc cutting equipment
- Exhibit an understanding of arc cutting consumables
- Demonstrate appropriate use of arc cutting equipment

### Physical Characteristics and Mechanical Properties of Metals

- Identify metals by physical characteristics
- Explain the pre-heating and post-heating processes
- Exhibit understanding of distortion control methods
- Identify basic mechanical properties of metals

### ***Specific Competencies and Skills continued:***

#### **Weld Fit-Up and Quality**

- Identify various joint designs (joint geometry) and welding positions
- Clean and prepare materials for groove and fillet welds
- Identify welding defects and/or discontinuities
- Test welds using various techniques
- Use standard measuring and layout tools
- Describe welding industry codes, standards, and procedures

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

- Explain principles of SMAW
- Set up and maintain SMAW equipment
- Demonstrate selection and application of SMAW consumables
- Perform fillet and groove welds on plate in all positions

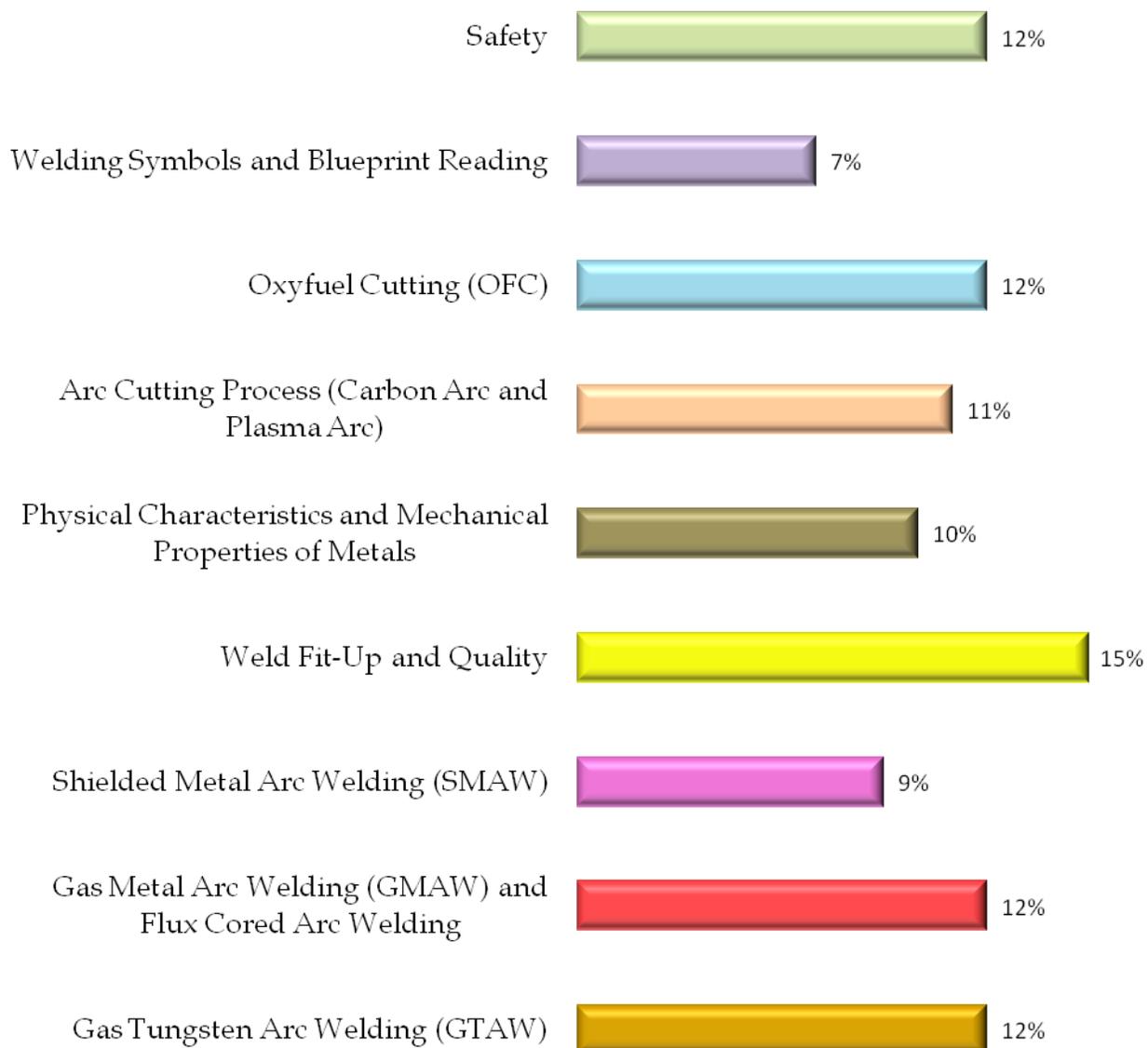
#### **Gas Metal Arc Welding (GMAW) and Flux Cored Arc Welding (FCAW)**

- Explain principles of GMAW and FCAW
- Set up and maintain GMAW and FCAW equipment
- Demonstrate selection and application of GMAW and FCAW consumables
- Perform fillet and groove welds on plate in all positions



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

- Explain principles of GTAW
- Set up and maintain GTAW equipment
- Demonstrate selection and application of GTAW consumables
- Perform fillet and groove welds on ferrous and nonferrous metals in all positions

**Written Assessment:****Administration Time:** 3 hours**Number of Questions:** 172**Areas Covered:**

**Sample Questions:**

An SDS (Safety Data Sheet) provides detailed information

- A. about matching the base metal metallurgy with the welding filler metal
- B. about the operating specifications of welding equipment and machinery
- C. regarding appropriate uses of different weld joint geometries
- D. regarding possible hazards resulting from the use of a product

A neutral oxygen-acetylene flame has a temperature range of

- A. 230 to 280 degrees Fahrenheit
- B. 500 to 550 degrees Fahrenheit
- C. 3000 to 35000 degrees Fahrenheit
- D. 5800 to 6300 degrees Fahrenheit

Oxygen cylinders should be \_\_\_\_\_ fuel gas cylinders when not in use.

- A. stored separately from
- B. chained to
- C. the same color as
- D. at the same pressure as

In the PAC (Plasma Arc Cutting) process, compressed air must be

- A. completely dry
- B. moist
- C. lubricated
- D. CO<sub>2</sub>

Which of the following is a ferrous metal?

- A. aluminum
- B. copper
- C. magnesium
- D. mild steel

When welding 3-G certification test weld, the weld must be welded in the \_\_\_\_\_ position.

- A. vertical
- B. flat
- C. overhead
- D. horizontal

Which number is the smallest?

- A. 0.250
- B. 0.500
- C. 0.005
- D. 0.050

Which condition would cause an electrode holder to overheat?

- A. loose connection
- B. excessively long cable
- C. insufficient current flow
- D. low voltage

The \_\_\_\_\_ welding process involves a non-consumable electrode.

- A. SMAW
- B. GMAW
- C. GTAW
- D. SAW

Argon and helium gases are

- A. inert
- B. reactive
- C. neutral
- D. oxidizing

## Performance Assessment:

**Administration Time:** 3 hours

**Number of Jobs:** 6

### Areas Covered:

**23% Oxyfuel Cutting**

Participant will select and set up equipment correctly and safely, lay out the project according to the provided diagram, and cut to specified dimensions.

**20% SMAW V-Groove, 3G**

Participant will select and set up equipment correctly and safely, tack the steel pieces to the base, and perform three weld passes in a V-groove according to specifications.

**12% GMAW, 2F**

Participant will select and set up materials correctly and safely, and using tubing, steel, and welding wire, weld material according to specifications.

**15% Aluminum GTAW Tee Joint, 2F**

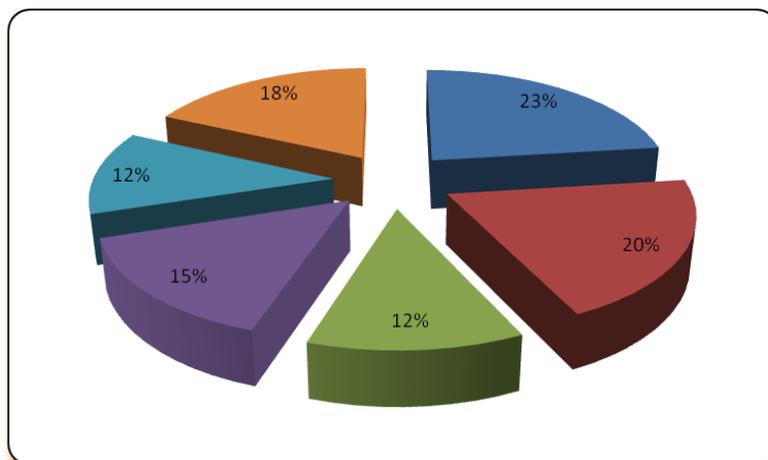
Participant will select and set up equipment correctly and safely, and using aluminum and filler rod, weld a Tee-joint in the horizontal position according to specifications.

**12% Stainless Steel GTAW Lap Joint, 2F**

Participant will set up equipment correctly and safely, and using stainless steel and filler rod, weld a lap joint according to specification.

**18% Uphill FCAW, 3F**

Participant will set up equipment correctly and safely, and using mild steel and filler material, weld a root pass and a cap pass according to specifications.



**Sample Job:** Aluminum GTAW Tee Joint, 2F

**Maximum Time:** 20 minutes

**Participant Activity:** The participant will use two pieces of sheet aluminum and filler rod to weld a Tee-joint in the horizontal position.

