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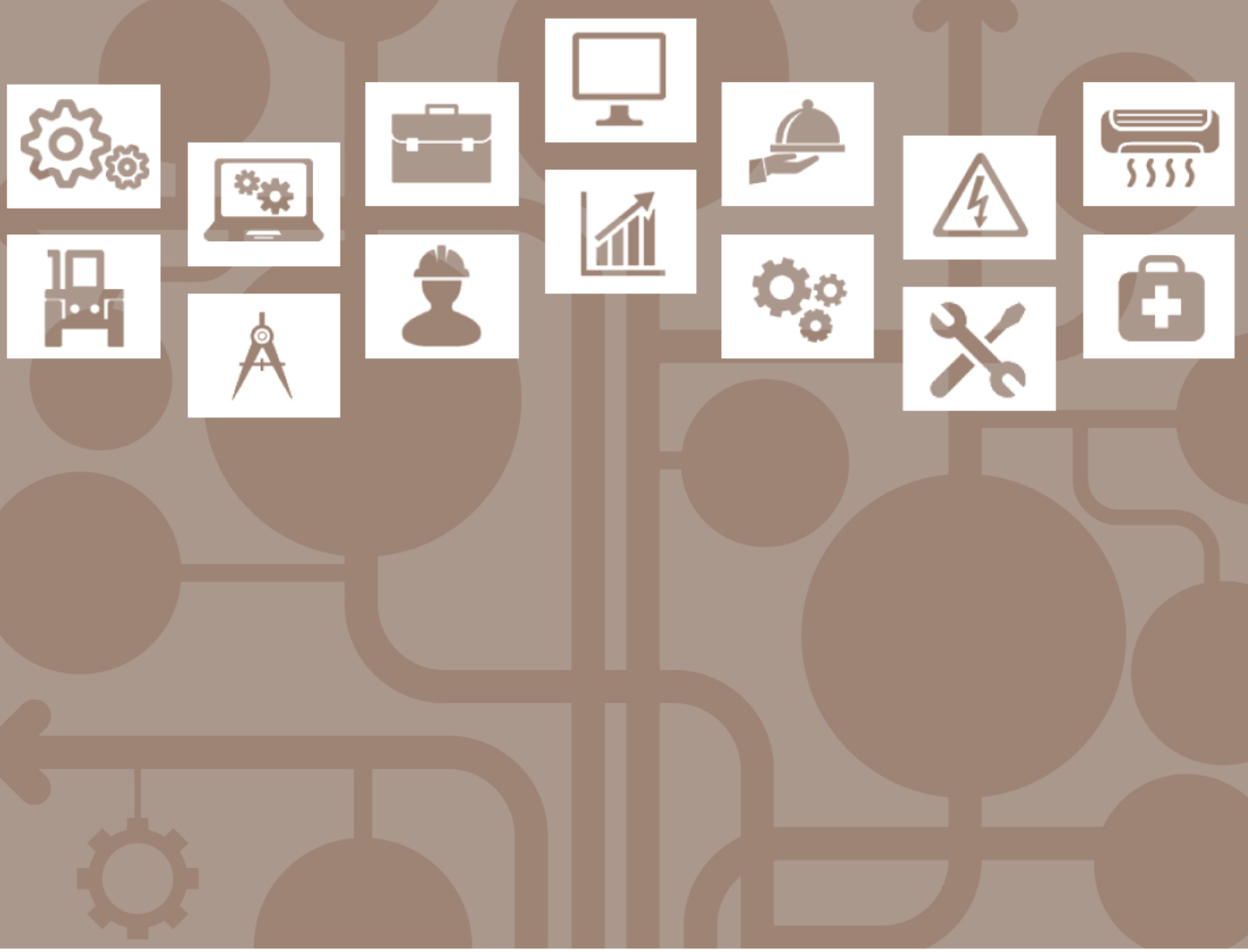
*Entry Level Assessment Blueprint*

# *Welding*



*Test Code: 4372 / Version: 01*

## 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
- Identify proper housekeeping techniques

### 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

### Weld Fit-Up and Quality

- 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

### Welding Symbols and Blueprint Reading

- Interpret weld and welding symbols
- Read and interpret blueprints and sketches
- Identify various joint designs (joint geometry) and welding positions

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

**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


**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
- Identify different modes of transfer and power sources in GMAW and FCAW

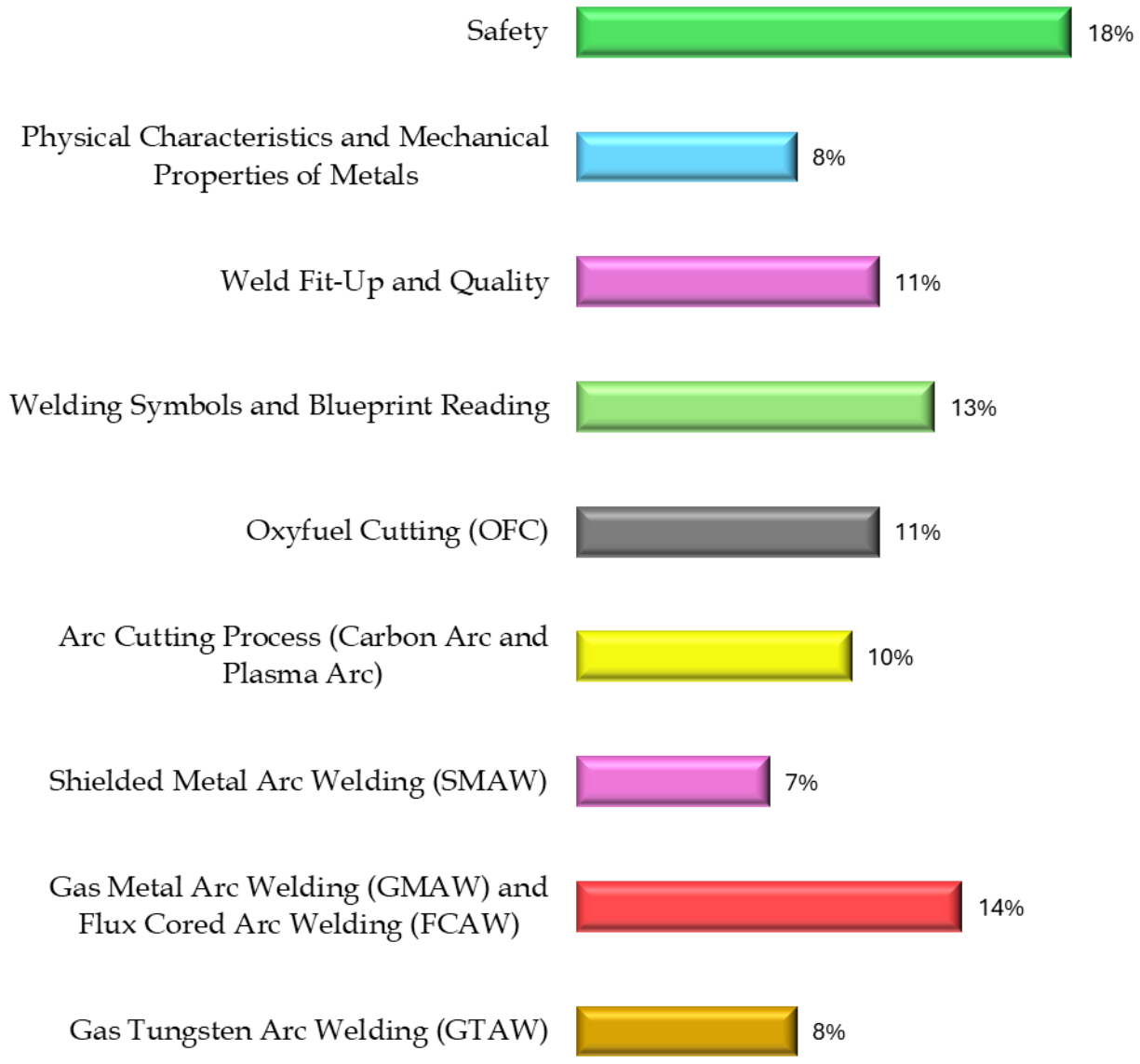
***Specific Competencies and Skills continued:***

**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:** 179
**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

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

Which is a ferrous metal?

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

Which number is the smallest?

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

The _____ welding process involves a non-consumable electrode.

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

## Performance Assessment:

**Administration Time:** 2 hours and 35 minutes
**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 flame cut to specified dimensions.

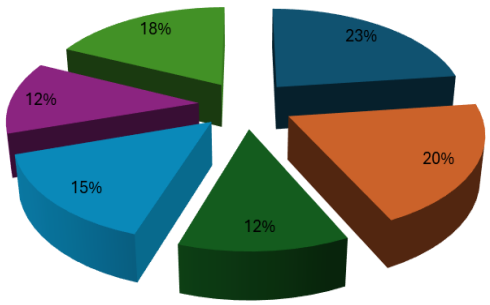
20% **SMAW V-Groove, 3G**
Participant will select and set up equipment correctly and safely, tack the steel pieces to the base, and perform three weld passes in a V-groove according to specifications.

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 stinless steel and filler rod, weld a lap joint according to specifications.

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:** Participant will select and set up equipment correctly and safely, and using 2 pieces of aluminum and filler rod, weld a Tee-joint in the horizontal position according to specifications.