



## ***EXPERIENCED WORKER ASSESSMENT BLUEPRINT***

### **WELDING**

**Test Code: 0121**

**Version: 02**

#### ***Specific competencies and skills tested in this assessment:***

##### **Thermal Cutting Processes**

Cut and form metal with oxyfuel equipment  
Cut materials with arc cutting processes

##### **Basic Heat Treat/Metallurgy/Distortion Control**

Examine metals visually for identification

##### **Welding Terms/Symbols/Blueprint Reading**

Read and interpret blueprints and sketches  
Read/understand welding symbols

##### **Welding Inspection; Destructive and Non-Destructive Testing Methods**

Clean ferrous & nonferrous metals mechanically and/or chemically for welding  
Prepare plate/pipe for welding  
Use hand tools (hacksaw, files, chisels) to prepare materials  
Use power equipment to wirebrush, buff, sand, drill, grind cut or punch metal  
Set up for welding groove and fillet welds  
Test metals using guided bend tester  
Test metals using tensile testing machine  
Understand/comprehend welding procedures  
Joint design

##### **Knowledge of Welding Consumables**

Identify electrodes/wires  
Electrode (SMAW) selection

##### **Safety**

Perform all shop tasks to industrial safety standards

##### **Power Source Principles**

Perform routine maintenance on welding and shop equipment  
Check wiring, controls and battery  
Service starters: manual, recoil, battery and alternating current  
Electric arc physics

## ***Welding continued***

### **Oxyfuel Welding & Brazing**

Assemble and disassemble oxyfuel portable equipment  
Assemble and disassemble oxyfuel stationary equipment  
Handle and store compressed gas cylinders  
Perform leak test on oxyfuel equipment with approved testing medium  
Set up for welding in the flat, horizontal, vertical and overhead positions  
Adjust parameters & weld ferrous materials with the OFW process  
Brazing ferrous and nonferrous materials with TB process  
Set up for welding, brazing or soldering pipe/tubing joints

### **Shielded Metal Arc Welding**

Set up for welding in the flat, horizontal, vertical and overhead positions  
Assemble and disassemble SMAW equipment  
Adjust parameters & weld ferrous materials with the SMAW process

### **Gas Metal Arc Welding/Flux Cored Arc Welding**

Set up for welding in the flat, horizontal, vertical and overhead positions  
Assemble and disassemble GTAW equipment  
Adjust parameters and weld ferrous materials with GTAW process  
Adjust parameters and weld nonferrous materials with the GTAW process

### **Basic Knowledge of Measuring Instruments**

Use standard measuring and layout tools

### **Welding Qualifications and Procedures**

Verification of preheat temperatures

### **Welding Costs**

## **Written Assessment:**

Administration Time: 3 hours

Number of Questions: 184

### **Areas covered:**

3%	Thermal Cutting Processes
5%	Basic Heat Treat
9%	Terms/Symbols/Blueprints
3%	Inspection/Testing Methods
6%	Components
5%	Safety
4%	Power Source Principles
2%	Oxyfuel Welding and Brazing
14%	Shielded Metal Arc
20%	Gas Metal & Flux Cored Arc Welding
12%	Gas Tungsten Arc Welding
5%	Measuring Instruments
7%	Qualifications and Procedures
5%	Welding Costs

## ***Welding continued***

### **Sample Questions:**

Tensile strength is the resistance a metal has to being

- A. bent
- B. compressed
- C. pulled apart
- D. twisted.

Which of the following weld test methods would be most useful in detecting internal defects?

- A. dye penetrant
- B. visual
- C. ultrasonic
- D. magnetic particle

For GMAW - MIG of aluminum and stainless steel, the recommended type welding current is

- A. alternating current high frequency
- B. direct current reverse polarity
- C. direct current straight polarity
- D. direct current straight polarity high frequency.

Inert gas is kept flowing after the welding arc is broken in order to

- A. shield the ceramic cup
- B. purge the torch lines of argon
- C. shield the tungsten and the work from contamination
- D. keep the flow meter from freezing up.

As a rule, to control cost, speed of construction and quality of weld, you should

- A. use a 1/4" electrode for vertical fillet welds
- B. use direct current whenever possible
- C. weld in the flat position whenever possible
- D. do all of the above.

## **Performance Assessment:**

Administration Time: 6 hours

Number of Jobs: 10

### **Refer to List of Materials, Tools and Equipment for Experienced Worker Assessments**

#### **Areas covered:**

- 12%     **Single V Groove with Backing Strip – Test Position 3G**  
*Equipment set-up, material alignment and fit up, following directions, safety, appearance, undercut, overlap, surface porosity, melt-thru of backing, complete joint penetration and root face bend.*
  
- 12%     **Single V Groove Pipe Weld – Test Position 5G**  
*Equipment set-up, material alignment and fit up, following directions, safety, appearance, undercut, overlap, surface porosity, melt-thru, undercut, overlap, complete joint penetration and root face bend.*
  
- 10%     **Silver Brazing Stainless Steel– Test Position Horizontal (2F)**  
*Equipment set-up, material alignment and fit up, following directions, safety, complete flow through, leg size of fillet, length of fillet and finished appearance.*

## ***Welding continued***

- 10%     **T-Joint Fillet Weld – Test Position 2F**  
*Equipment set-up, material alignment and fit up, following directions, safety, appearance, undercut, overlap, surface porosity, fillet weld break test and penetration.*
- 11%     **Single V Groove Pipe Weld – Test Position 5G**  
*Equipment set-up, material alignment and fit up, following directions, safety, surface porosity, appearance, undercut, overlap, complete joint penetration, root face bend, and melt-thru.*
- 10%     **T-Joint Fillet Weld on Aluminum – Test Position 3F Vup**  
*Equipment set-up, material alignment and fit up, following directions, safety, surface porosity, appearance, melt-thru, undercut, overlap and fillet weld break test.*
- 10%     **T-Joint Fillet Weld on Stainless Steel – Test Position 2F**  
*Equipment set-up, material alignment and fit up, following directions, safety, surface porosity, melt-thru, undercut, overlap and appearance.*
- 8%     **Lap Joint Fillet Weld – Test Position 2F**  
*Equipment set-up, material alignment and fit up, following directions, safety, surface porosity, melt-thru, undercut, overlap and appearance.*
- 8%     **Weld Bead Removal by Air Carbon Arc Gouging**  
*Equipment set-up, following directions, safety, complete bead removal, finished appearance, width of gouge and slag removal.*
- 9%     **Oxyfuel Cutting with Cutting Torch**  
*Equipment set-up, finished parts conform to print, following directions, safety, cut tolerance and appearance of cut.*

**Sample Job:**                   Single V Groove with Backing Strip - Test Position 3G  
Welding Process: Shielded Metal Arc Welding (SMAW)

**Estimated Job Time:**     50 minutes

**Participant Activity:**     The participant is to weld the root pass throughout the entire joint length using the vertical-up direction. Participant should not tack weld on back of test plate. Remaining weld layers are to be made so that a portion of each layer remains visible to the evaluator for inspection upon completion of the job. The cap pass **MUST** be a minimum of 4" long to allow for two bend test specimens to be cut from this section.