

Welding

General Assessment Information

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Test Type: The Welding assessment is included in NOCTI’s Teacher assessment battery. Teacher assessments measure an individual’s technical knowledge and skills in a proctored proficiency examination format. These assessments are used in a large number of states as part of the teacher licensing and/or certification process, assessing competency in all aspects of a particular industry. NOCTI Teacher tests typically offer both a written and performance component that must be administered at a NOCTI-approved Area Test Center. Teacher assessments can be delivered in an online or paper/pencil format.

Revision Team: The assessment content is based on input from subject matter experts representing the following states: Kansas, Michigan, North Carolina, Pennsylvania, and Virginia.



48.0508- Welding
Technology/Welder



Career Cluster 13-
Manufacturing



51-4121.06- Welders, Cutters,
and Welder Fitters

Written Assessment

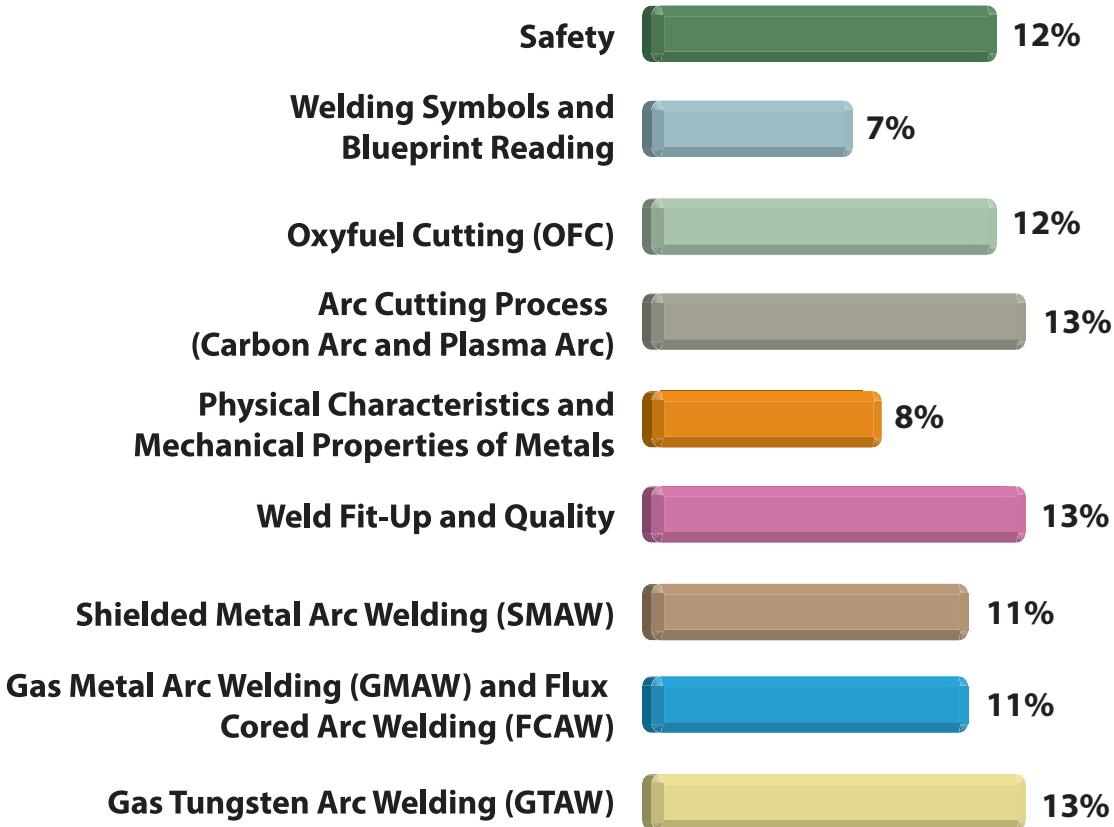
NOCTI written assessments consist of questions to measure an individual’s factual theoretical knowledge.

Administration Time: 3 hours

Number of Questions: 156

Number of Sessions: This assessment may be administered in one, two, or three sessions.

Areas Covered



Specific Standards and Competencies Included 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

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Specific Standards and Competencies (continued)

Physical Characteristics and Mechanical Properties of Metals

- Identify metals by physical characteristics and shapes
- 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

- 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 (metric and English)
- 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



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Specific Standards and Competencies (continued)

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



Sample Questions

Before cutting or welding, a container should be

- A. burned out
- B. steam cleaned
- C. filled with flux
- D. filled with oxygen

When a cutting attachment is added to a welding torch body, the oxygen valve on the torch body is opened

- A. one complete turn
- B. half way
- C. completely
- D. two and one-half turns

What is the most common reason for post-weld heat treatment?

- A. normalizing
- B. tempering
- C. stress relieving
- D. annealing

The number 70 of an E-7018 electrode indicates the electrode's

- A. tensile strength
- B. position
- C. type of coating
- D. polarity

In GTAW of aluminum and magnesium, the current supply recommended for best results is

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

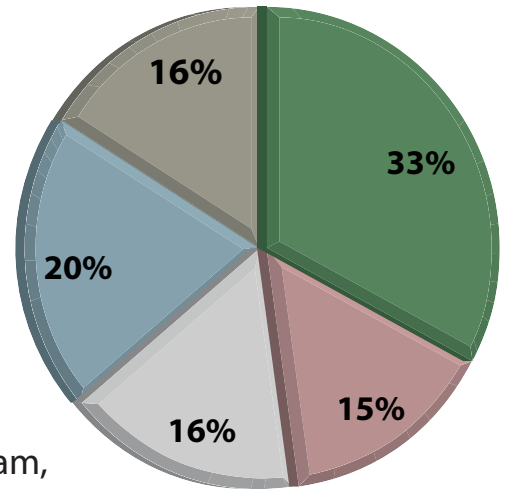
Performance Assessment

NOCTI performance assessments allow individuals to demonstrate their acquired skills by completing actual jobs using the tools, materials, machines, and equipment related to the technical area.

Administration Time: 2 hours 40 minutes

Number of Jobs: 5

Areas Covered:



33% 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.

15% SMAW V-Groove, 3G

Participant will select and set up equipment correctly and safely, fit and tack the assembly on a bench, weld material according to specifications, and perform a visual inspection.

16% GMAW Tee Joint, 2F

Participant will select and set up materials correctly and safely, weld material according to specifications, and perform a visual inspection.

20% Aluminum GTAW Tee Joint, 2F

Participant will select and set up equipment correctly and safely, clean material as necessary, determine appropriate shielding gas flow rate, weld according to specifications, and then perform a visual inspection.

16% Stainless Steel GTAW Lap Joint, 2F

Participant will set up equipment correctly and safely, select the correct type and diameter of tungsten, fit and tack material appropriately, weld according to specifications, and perform a visual inspection.

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.

