

Welding Technician 2

Exam Information	Description
Exam number 597 Items 48 National Career Cluster Advanced Manufacturing Construction Certification available Yes	The Welding Technician 3 industry certification exam assesses advanced welding skills. It evaluates the processes that prepare learners to apply technical knowledge and skill in the workplace and in project construction. The exam covers the knowledge, attitude, skills, and habits required to perform tasks autonomously and with minimum supervision, including the selection and use of appropriate techniques and equipment.

Exam Blueprint and Performance Skills

Standard	Percentage of exam score
1. Development Activities*	5%
2. Work-Place Readiness*	3%
3. Welding Processes and Procedures	8%
4. Welding Safety Practices*	17%
5. Read and Interpret Welding Symbols	22%
6. FCAW Process*	14%
7. GTAW Process*	17%
8. CAC-A or Gouging Process*	5%
9. Plasma Arc Cutting Process*	8%

*Includes performance skill evaluation

Standard 1 - Development Activities (5% of exam score)

Candidates will participate in personal and leadership development activities through SkillsUSA or another appropriate career and technical student organization.

Objective 1 Candidates will use communication skills to effectively communicate with others.

1. Understand when it is appropriate to listen and to speak.
2. Understand and follow verbal and written instructions for classroom and laboratory activities.

Objective 2 Candidates will effectively use teamwork to respectfully work with others.

1. Identify and understand different roles in working with a team.

Objective 3 Candidates will use critical thinking and problem-solving skills.

1. Analyze the cause of the problem.
2. Develop a solution to address the problem.
3. Implement the plan.
4. Evaluate the effectiveness of the plan.

Objective 4 Candidates will be dependable, reliable, steady, trustworthy and consistent in performance and behavior.

1. Set and meet goals on attendance and punctuality.
2. Prioritize, plan and manage work to complete assignments and projects on time.

Objective 5 Candidates will be accountable for results.

1. Use an achievement chart for activities and behaviors in class that encourages a personal evaluation of classroom performance.
2. File a weekly/bi-weekly written report on progress toward completion of assignments and projects.

Objective 6 Be familiar with the legal requirements and expectations of the course

1. Be familiar with the course disclosure statement and all requirements for successful completion of the course.
2. Demonstrate workplace ethics, e.g. fair, honest, disciplined.

Optional: Standard performance evaluations on the final page of this document

Standard 2 - Work-Place Readiness (3%)

Candidates will participate in work-place readiness activities.

Objective 1 Candidates will demonstrate employability skills.

1. Use a career search network to find career choices.
2. Write a resume including a list of demonstrated skills.
3. Write a letter of application.
4. Complete a job application.
5. Participate in an actual or simulated job interview.

Objective 2 Participate in a work-based learning experience outside the classroom.

1. Plan and implement a work-based learning experience aligned with their career goal.

Optional: Standard performance evaluations on the final page of this document

Standard 3 - Welding Processes and Procedures (8%)

Candidates will understand welding processes and procedures.

Objective 1 Identify weld joints, weld types and weld positions.

1. Identify the five welding joints: butt, corner, edge, lap and tee.
2. Identify fillet and groove welds.
3. Identify the four welding positions: flat, horizontal, vertical, and overhead.

Standard 4 - Welding Safety Practices (17%)

Candidates will demonstrate appropriate welding safety practices for laboratory and work settings.

Objective 1 Implement safety practices related to welding.

1. Identify, select, and properly use appropriate personal protective equipment (PPE).
2. Verify that all equipment is in good operating condition and that appropriate safety devices are in

- place and working (e.g., guards in place, tool rests adjusted, etc.).
3. Maintain a neat, well-organized laboratory or shop working area.

Objective 2 Identify fire hazard conditions and actions to take in case of fire.

1. Identify, select, and properly use appropriate personal protective equipment (PPE).
2. Verify that all equipment is in good operating condition and that appropriate safety devices are in place and working (e.g., guards in place, tool rests adjusted, etc.).
3. Maintain a neat, well-organized laboratory or shop working area.

Objective 3 Take appropriate actions in an accident or emergency.

1. Demonstrate the use of simple first aid in an accident with an injury.
2. Locate first aid kits and investigate their contents and use in appropriate settings.
3. Discuss appropriate safety responses in an accident or emergency.

Optional: Standard performance evaluations on the final page of this document

Standard 5 - Read and Interpret Welding Symbols (22%)

Candidates will read and interpret welding symbols and drawing symbols identified in blueprints.

Objective 1 Use intermediate math and measuring skills to enhance layout techniques.

1. Calculate the circumference of a circle.
2. Use Pythagorean Theorem to calculate the missing side of a triangle (3-4-5 rule).
3. Correctly use and interpret reading on a dial caliper.

Objective 2 Read and interpret welding blueprints.

1. Interpret the tolerance dimensions found on a blueprint in decimals, fractions, and degrees.
2. Draw blueprints for simple welding projects.

Objective 3 Identify and apply basic welding symbols.

1. Identify and interpret basic welding symbols including bevel groove weld, plug or slot weld, melt through, intermittent fillet weld, and contour symbols.
2. Identify and interpret drawings describing the anatomy of a groove and fillet weld.
3. Draw welding symbols for given specification.
4. Interpret a welding print and welding procedure specifications.

Standard 6 - (FCAW) Process (14%)

Candidates will use the Flux Cored Arc Welding (FCAW) process.

Objective 1 Setup for FCAW operations on carbon steel

1. Properly setup welding machine.
2. Identify wire classification.

Objective 2 Properly set up and complete fillet and groove welds in the vertical and horizontal position with FCAW process.

1. Make 1F (flat position-fillet weld) welds on carbon steel.
2. Make 2F (horizontal position-fillet weld) welds on carbon steel.
3. Make 1G (flat position-groove weld) welds on carbon steel.

Optional: Standard performance evaluations on the final page of this document

Standard 7 - (GTAW) Process (17%)

Candidates will use the Gas Tungsten Arc Welding (GTAW) process.

Objective 1 Setup for GTAW operations on carbon steel.

1. Properly set up a welding machine.
2. Identify filler rod classifications.
3. Identify tungsten electrode classifications; lanthanated, ceriated, thoriated and pure.

Objective 2 Properly set up and complete fillet and groove welds in the flat and horizontal position with GTAW process.

1. Make 1F (flat position-fillet weld) welds on carbon steel.
2. Make 2F (horizontal position-fillet weld) welds on carbon steel.
3. Make 1G (flat position-groove weld) welds on carbon steel.

Optional: Standard performance evaluations on the final page of this document

Standard 8 - (CAC-A) or Gouging Process (5%)

Candidates will conduct weld inspection and testing.

Objective 1 Set up for Carbon Arc Cutting (CAC-S) gouging operations on carbon steel.

1. Properly set up Carbon Arc machine.
2. Identify Carbon Arc electrodes.

Objective 2 Properly set up and complete gouging operation.

1. Perform straight gouging operations on carbon steel.
2. Pierce a hole through a carbon steel plate.

Optional: Standard performance evaluations on the final page of this document

Standard 9 - Plasma Arc Cutting Process (8%)

Candidates will fabricate a project, made from metal, using a blueprint and welding processes.

Objective 1 Set up for plasma arc cutting operations on carbon steel.

1. Properly set up Plasma Arc machine.

Objective 2 Properly set up and complete cutting operation.

1. Perform straight cutting operations on carbon steel.
2. Perform shape cutting operations on carbon steel.

Optional: Standard performance evaluations on the final page of this document

Performance Skills Evaluation

Exam name: Welding Technician 2

Candidate Name: _____

Performance assessments may be completed and evaluated any time before the certification is issued. The following performance skills can be used in connection with the associated standards and exam. The evaluator will function as the subject matter expert to determine if the candidate meets the skills requirements with a Yes/No for passing.

Standard 1 – Development Activities File a regular written report on progress toward completion of assignments and projects.	Pass:
Standard 2 – Work-Place Readiness Candidates will plan and implement a work-based learning experience aligned with their career goal.	Pass:
Standard 4 – Welding Safety Practices Maintain a neat, well-organized laboratory or shop working area.	Pass:
Standard 6 – (FCAW) Process Use FCAW process to make 1G (flat position-groove weld) welds on carbon steel.	Pass:
Standard 7 – (GTAW) Process Use GTAW process to make 1G (flat position-groove weld) welds on carbon steel.	Pass:
Standard 8 – (CAC-A) or Gouging Process Use Carbon Arc Cutting process to pierce a hole through a carbon steel plate.	Pass:
Standard 9 – Plasma Arc Cutting Process Use Plasma Arc cutting process to perform straight cutting operations on carbon steel.	Pass:

Evaluator Name: _____

Date: _____