



**AGRICULTURAL POWER &
TECHNOLOGY
WELDING TECHNICIAN
SKILLS STANDARDS
OD46903**

Competency-Based Education: OKLAHOMA'S RECIPE FOR SUCCESS

BY THE INDUSTRY FOR THE INDUSTRY

Oklahoma's *CareerTech* system of competency-based education uses industry professionals and certification standards to identify the knowledge and abilities needed to master an occupation. This industry input provides the foundation for development of instructional materials that help prepare the comprehensively trained, highly skilled employees demanded by our workplace partners.

TOOLS FOR SUCCESS

CareerTech relies on three basic instructional components to deliver competency-based instruction: skills standards, curriculum materials, and competency assessments.

Skills standards provide the foundation for competency-based instruction in Oklahoma's *CareerTech* system. The skills standards outline the knowledge, skills, and abilities needed to perform related jobs within an industry. Skills standards are aligned with national skills standards; therefore, a student trained to the skills standards possesses technical skills that make him/her employable in both state and national job markets.

Curriculum materials contain information and activities that teach students the knowledge and skills outlined in the skills standards. In addition to complementing classroom instruction, curriculum resources provide supplemental activities to enhance learning and provide hands-on training experiences.

Competency Assessments test the student over material outlined in the skills standards and taught using the curriculum materials. When used with classroom performance evaluations, written competency assessments provide a means of measuring occupational readiness.

Although each of these components satisfy a unique purpose in competency-based education, they work together to reinforce the skills and abilities students need to gain employment and succeed on the job.

MEASURING SUCCESS

Written competency assessments are used to evaluate student performance. Results reports communicate competency assessment scores to students and provide a breakdown of assessment results by duty area. The results breakdown shows how well the student has mastered skills needed to perform major job functions and identifies areas of job responsibility that may require additional instruction and/or training.

Group analysis of student results also provides feedback to instructors seeking to improve the effectiveness of career and technology training. Performance patterns in individual duties indicate opportunities to evaluate training methods and customize instruction.

TRUE TO OUR PURPOSE

"Helping Oklahomans succeed in the workplace" defines the mission of Oklahoma *CareerTech* and its competency-based system of instruction. Skills standards, curriculum, and assessments that identify and reinforce industry expectations provide accountability for programs and assure *CareerTech*'s continued role in preparing skilled workers for a global job market

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**AGRICULTURAL POWER AND TECHNOLOGY
WELDING TECHNICIAN
SKILLS STANDARDS
Frequency and Criticality Ratings**

Duty A: Maintain a Safe Work Environment

Duty B: Perform Shielded Welding

Duty C: Perform Gas Metal Arc Welding (GMAW)

Duty D: Perform Oxyfuel and Plasma Arc Cutting

Duty E: Perform Gas Tungsten Arc Welding (GTAW)

Duty F: Perform Oxyfuel Braze Welding

Frequency: represents how often the task is performed on the job. Frequency rating scales vary for different occupations. The rating scale used in this publication is presented below:

- 1 = less than once a week
- 2 = at least once a week
- 3 = once or more a day

Criticality: denotes the level of consequence associated with performing a task incorrectly. The rating scale used in this publication is presented below:

- 1 = slight
- 2 = moderate
- 3 = extreme

DUTY A: Maintain a Safe Work Environment

CODE	TASK	F/C
A.01	Interpret general safety information <ul style="list-style-type: none"> • Hand signals • Safety colors • Fire extinguisher • Emergency exits • First aid • Lifting • Clothing • Eye protection 	1/3
A.02	Organize/maintain a clean and safe work area	3/3
A.03	Comply with shop and equipment safety rules	3/3
A.04	Ventilate work area	2/3
A.05	Identify safety hazards	3/3
A.06	Report safety hazards in accordance with established procedure	1/3
A.07	Correct safety hazards	3/3
A.08	Maintain safety devices	3/3

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A.09	Complete accident reports	1/3
A.10	Demonstrate knowledge and use of MSDS	1/3

DUTY B: Perform Shielded Welding

CODE	TASK	F/C
B.01	Make a pad in the horizontal position	3/3
B.02	Make a multiple pass T-joint fillet weld in the horizontal position <ul style="list-style-type: none"> • Test the prepared coupon 	2/3
B.03	Make a square groove butt joint weld in the horizontal position	3/3
B.04	Make a pad in the vertical up position	2/2
B.05	Make a T-joint fillet weld in the vertical up position <ul style="list-style-type: none"> • Test the prepared coupon 	3/3
B.06	Make a square groove butt joint weld in the vertical down position <ul style="list-style-type: none"> • Test the prepared coupon 	3/3
B.07	Make a pad in the overhead position	1/2
B.08	Make a lap joint fillet weld in the overhead position <ul style="list-style-type: none"> • Test the prepared coupon 	1/2
B.09	Make a single V-groove butt joint weld in the flat position and test <ul style="list-style-type: none"> • Test the prepared coupon 	2/3
B.10	Make a single V-groove butt joint weld in the horizontal position and test <ul style="list-style-type: none"> • Test the prepared coupon 	2/3
B.11	Make a single V-groove butt joint weld in the vertical up position and test	2/3
B.12	Make a single V-groove butt joint weld in the overhead position and test	1/2
B.13	Identify and interpret welding symbols	3/3
B.14	Prepare joints for welding	3/3
B.15	Demonstrate knowledge of common welding principles <ul style="list-style-type: none"> • Equipment material selection • Testing welds • Flux chipping • Heat • Weld defects • Rod identification and selection 	3/3
B.16	Identify characteristics of a good weld	3/3

DUTY C: Perform Gas Metal Arc Welding (GMAW)

CODE	TASK	F/C
C.01	Set up and shut down GMAW equipment using correct safety precautions <ul style="list-style-type: none"> • Identify the major parts of GMAW equipment • Shielding gases and their uses • Power sources for GMAW 	3/3
C.02	Construct a multiple pass T-joint fillet weld in the horizontal position with short arc	2/3
C.03	Construct a square groove butt joint in the flat position with short arc	3/3
C.04	Construct a square groove butt joint in the horizontal position with short arc	3/3
C.05	Construct a square groove butt weld in the vertical up position with short arc	3/3
C.06	Construct a square groove butt weld in the overhead position with short arc	1/1

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C.07	Construct a T-joint fillet weld on mild steel in the horizontal position with short arc	3/3
C.08	Demonstrate knowledge of terms associated with the GMAW process <ul style="list-style-type: none"> • Spray arc • Advantages of the GMAW process • Most common application of the GMAW process 	3/3
C.09	Identify factors to consider when selecting filler wire for the GMAW process	2/3
C.10	Identify common welding mistakes	3/3
C.11	Identify the characteristics of a good weld <ul style="list-style-type: none"> • Effects of electrode wire stickout on volts and amps 	3/3
C.12	Identify and interpret welding symbols	3/3
C.13	Use proper safety procedures for usage, storage, and transportation of bottled gas	3/3

DUTY D: Perform Oxyfuel and Plasma Arc Cutting

CODE	TASK	F/C
D.01	Set up equipment for oxyacetylene cutting	3/3
D.02	Turn on, light, adjust to a neutral flame, and turn off oxyacetylene cutting equipment	3/3
D.03	Make ninety degree cuts on mild steel and restart a cut	3/3
D.04	Make flame-beveled cut on mild steel plate	1/2
D.05	Cut hole in mild steel	3/3
D.06	Cut orange peel	2/2
D.07	Lay out pattern on mild steel plate	2/2
D.08	Perform safety inspections of equipment and accessories	3/3
D.09	Make minor external repairs to equipment and accessories (preventative maintenance only)	3/3
D.10	Set up for manual plasma arc cutting operations on plain carbon steel, aluminum, and stainless steel plate	2/2
D.11	Operate manual plasma arc cutting equipment	3/3
D.12	Perform shape cutting operations on plain carbon steel, aluminum, and stainless steel plate	3/3
D.13	Demonstrate knowledge of safety rules for handling oxygen, welding equipment, welding gases, and oxyfuel welding equipment	3/3

DUTY E: Perform Gas Tungsten Arc Welding (GTAW)

CODE	TASK	F/C
E.01	Set up and shut down GTAW equipment using correct safety precautions	3/3
E.02	Identify and interpret welding symbols	3/3
E.03	Use proper safety procedures for usage, storage, and transportation of bottled gas	3/3
E.04	Demonstrate knowledge of terms associated with the GTAW process <ul style="list-style-type: none"> • Spray arc 	3/3
E.05	Identify common welding mistakes	3/3
E.06	Identify the characteristics of a good weld	3/3
E.07	Construct a multiple pass T-joint fillet weld in the horizontal position	2/3

E.08	Construct a square groove butt joint in the flat position	3/3
E.09	Construct a square groove butt joint in the horizontal position	3/3
E.10	Construct a square groove butt weld in the vertical up position	3/3
E.11	Construct a square groove butt weld in the overhead position	1/1
E.12	Construct a T-joint fillet weld with aluminum in the horizontal position	3/3
E.13	Demonstrate knowledge of proper surface preparation for GTAW welding <ul style="list-style-type: none"> • Removing oxides from a clean metal surface 	2/2

DUTY F: Perform Oxyfuel Braze Welding

CODE	TASK	F/C
F.01	Braze weld a square groove butt joint	1/3
F.02	Braze weld a lap joint	1/3
F.03	Braze weld a tee or fillet joint	1/2
F.04	Demonstrate knowledge of terms associated with oxyacetylene braze welding <ul style="list-style-type: none"> • Identify advantages and disadvantages of braze welding • Differences between braze and fusion welding • Purposes for using flux 	2/2
F.05	Demonstrate knowledge of proper surface preparation for braze welding	2/2
F.06	Describe the reactions of molten bronze when the temperature of the base metal is too hot, too cold, and correct	2/2
F.07	Use proper safety procedures for usage, storage, and transportation of bottled gas	3/3
F.08	Demonstrate knowledge of safety rules for handling oxygen, welding equipment, welding gases, and oxyfuel welding equipment	3/3