

## Butler Tech Welding Technology Essential Skills Profile

This profile provides an outline of the skills required for the successful completion of this career program. Additional information is located on the Butler Tech website at: <https://www.butlertech.org/high-school/> and selecting the corresponding career program.

### Recommended WorkKeys® Scores for Welding Technology

Applied Mathematics - 4	Graphic Literacy - 4
Workplace Documents - 4	

\*Practice tests and more information at: [www.act.org/workkeys](http://www.act.org/workkeys)

### Skills

Monitoring	Monitoring / Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.
Critical Thinking	Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
Quality Control Analysis	Conducting tests and inspections of products, services, or processes to evaluate quality or performance.

### Abilities Required

Near Vision	The ability to see details at close range (within a few feet of the observer).
Arm-Hand Steadiness	The ability to keep your hand and arm steady while moving your arm or while holding your arm and hand in one position.
Control Precision	The ability to quickly and repeatedly adjust the controls of a machine or a vehicle to exact positions.

### Knowledge Required in Welding Technology

Production and Processing	Knowledge of raw materials, production processes, quality control, costs, and other techniques for maximizing the effective manufacture and distribution of goods.
Design	Knowledge of design techniques, tools, and principles involved in production of precision technical plans, blueprints, drawings, and models.
Mechanical	Knowledge of machines and tools, including their designs, uses, repair, and maintenance.

## Welding Technology Activities

- Weld components in flat, horizontal, vertical, and overhead positions.
- Operate safety equipment and use safe work habits.
- Examine work pieces for defects and discontinuities, measure work pieces with straightedges or templates to ensure conformance with specifications.
- Recognize, set up, and operate hand and power tools common to the welding trade.
- Set-up and operate shielded metal arc welding, gas metal arc welding, flux core arc welding, and gas tungsten arc welding power sources.
- Weld carbon steel, aluminum, stainless steel, cast iron, and other alloys.
- Select and install torches, torch tips, select appropriate filler rods, and flux, according to welding chart specifications or types and thicknesses of metals.
- Light torches, turn on power supplies and strike arcs by taping and or scratching electrodes to metals being welded.
- Connect regulators to compressed gas cylinders, adjust valves to activate the flow of the gas, adjust desired pressure settings and set carburizing, neutral and oxidizing welding flames.
- Determine required equipment and welding methods, applying knowledge of metallurgy, geometry, and welding techniques.
- Monitor the fitting, burning, and welding processes to avoid overheating of parts or warping, shrinking, distortion, or expansion of material.
- Mark or tag material with proper job number, piece marks, and other identifying marks as required.
- Chip and or grind off excessive weld, slag, or spatter, by using chipping hammers, pneumatic scalers, power angle grinders, and or thermal cutting equipment.
- Prepare all material surfaces to be welded, ensuring that there is no loose or thick scale, slag, rust, moisture, grease, or other foreign matter.
- Preheat work pieces prior to welding or bending, using torches or heating furnaces.
- Develop templates and models for welding projects, using mathematical calculations based on blueprint information.
- Align and clamp work pieces together, using rules, squares, or hand tools, or position items in fixtures, jigs, or vises.
- Guide and direct flames or electrodes on or across work pieces to straighten, bend, melt, or build up metal.
- Position and secure work pieces, using hoists, cranes, wire, and banding machines or hand tools.
- Detect faulty operation of equipment or defective materials and notify supervisors.
- Melt and apply solder to fill holes, indentations, or seams of fabricated metal products, using soldering equipment.
- Clean or degrease parts, using wire brushes, portable grinders, or chemical baths.
- Melt and apply solder along adjoining edges of work pieces to solder joints, using soldering irons, gas torches, or electric-ultrasonic equipment.
- Use fire suppression methods in industrial emergencies.
- Grind, cut, buff, or bend edges of work pieces to be joined to ensure snug fit, using power grinders and hand tools.
- Repair products by dismantling, straightening, reshaping, and reassembling parts, using cutting torches, straightening presses, and hand tools.
- Check grooves, angles, or gap allowances, using micrometers, calipers, and precision measuring instruments.
- Operate metal cutting, shaping, straightening, and bending machines, such as press brakes and shears.
- Set up and use ladders and scaffolding as necessary to complete work.
- Hammer out imperfections in metal work pieces.

### Technology

Analytical or Scientific software	Spreadsheet software
Calendar and Scheduling software	Database User Interface and Query software
Computer Aided Design (CAD) software	

### Personality

Realistic: People interested in this work like activities that include practical, hands-on problems and solutions. They do well at jobs that need:	
Dependability	Maturity
Integrity	Independence
Attention to Detail	Cooperation

### Available Certifications

American Welding Society Certification (AWS) (12 Points)	American Welding Society Performance Qualifications. (AWS) (9 Points)
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### Possible College Credits

College Credit Plus in English, Math, Social Studies, or Science	Must be preapproved. Must pass a college course at an Ohio college or College Credit Plus class at Butler Tech.
Career Technical Credit Transfer	The Ohio Transfer to Degree Guarantee helps career and technical students transfer credits earned in high school to community college or four-year degree programs. The credit can be used at any Ohio public college or university: <ul style="list-style-type: none"><li>• If you successfully completed your career-technical program and passed certain required assessments.</li><li>• If you attend a similar program at a public Ohio college or university.</li></ul> For more information, go to <a href="http://www.transfercredit.ohio.gov">www.transfercredit.ohio.gov</a>
Articulated Credit	Butler Tech has agreements with certain colleges; if you attend one of those colleges, you can get credit toward a specific degree.

\*Additional college or post-secondary education may be required in this field

### Possible Career Pathways

Welder	Welding Inspector
Robotic Welding Operator/Programmer	Fabricator