



**The Manufacturers Association**

**JOB QUALIFICATION STANDARD (JQS)**

**Occupation:** WELDER

**Work Process:** General Shop Techniques

**Practical Hours:** 1000 hrs.

**DOL Standard:** Health and Safety/PPE: Adhere to safety practices when performing tasks within the working environment.

**Performance Objective:** Demonstrate the ability to adhere to federal, state and company safety, health and environmental rules and regulations to avoid workplace injury for an individual and their co-workers.

Performance Indicator	Qualification Date/Initial
Demonstrate the ability to adhere to personal grooming requirements in the facility.	
Demonstrate the ability to use personal protective equipment including eye, ear, hand, respiratory, body and foot protection, by ensuring that a correct fit and optimum protection is provided to the wearer for the specific task, in accordance with applicable safety legislation, government regulations, manufacturers' specifications and company standards/procedures.	
Demonstrate the ability to practice good housekeeping in the workplace by cleaning up spills or leaks, keeping work area clean and clear of obstructions, and storing tools or equipment so that the potential for accident or injury is prevented and tools or equipment are in place and available in compliance with safety regulations.	
Demonstrate the safe use of hand and power tools.	
Demonstrate the correct way to clean machines and floor area.	
Demonstrate the ability to prevent back injuries by adhering to proper work practices when performing the lifting of objects.	
Demonstrate the ability to identify all pinch points on primary and supportive machine tools and the proper placements of guards as part of a pre-operational check of the equipment in compliance with company standards.	
Demonstrate both emergency and standard shut down of all required equipment.	
Demonstrate the ability to follow fire safety procedures including: determining the potential for fire posed by the work being performed; locating and assessing the severity of the fire; selecting and operating fire extinguishing equipment; suppressing minor fires; activating alarms; following fire evacuation plans; and, reporting incidents; in accordance with applicable Acts, Regulations, Legislation, and Codes, manufacturers' specifications, and company standards or procedures.	
Demonstrate the proper fuel source and select the corresponding fire extinguisher.	
Demonstrate the ability to identify the impact of climatic extremes of wind, temperature, or precipitation on job functions, to ensure personal safety and efficient job performance.	



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Demonstrate the ability to work around energy sources by observing limits and procedures for approaching energy sources to ensure personal safety and protection of equipment in accordance with standards.	
Demonstrate the ability to report injuries to a supervisor or safety personnel promptly, ensuring that the injured person is attended to and information is reported precisely and accurately describing how the incident occurred, so that future recurrence of similar accidents is prevented.	
Demonstrate the ability to prevent back injuries by adhering to proper work practices when performing the lifting of objects.	
Demonstrate the ability to perform good practices in workplace ergonomics to prevent injury while performing work over an extended period of time.	

**DOL Standard:** Lock-Out/Tag-Out: Observe safe practices, in accordance with OSHA and organizational requirements, when performing Lock-Out/Tag-Out duties on equipment.

**Performance Objective:** Demonstrate the ability to adhere to lock-out/tag-out procedures and energy isolation for assigned machinery in accordance with facility regulations.

<b>Performance Indicator</b>	<b>Qualification Date/Initial</b>
Demonstrate the ability to recognize all protective tags and lockout devices that are used to isolate equipment and components from hazardous energy sources.	
Demonstrate the ability to perform a lock out procedure to isolate energy on an identified piece of equipment located on the shop floor.	

**DOL Standard:** Handling Hazardous Materials: Observe safe practices, in accordance with OSHA, EPA and organizational requirements, when handling and storing hazardous materials at the workplace.

**Performance Objective:** Demonstrate the ability to comply with OSHA regulations regarding hazardous materials and SDS communication, handling and storage.

<b>Performance Indicator</b>	<b>Qualification Date/Initial</b>
Demonstrate the ability to handle and store hazardous materials as assigned, while adhering to safe practices in accordance with OSHA and EPA requirements and guidelines, including completing the required documentation.	
Demonstrate how to identify and recognize hazardous situations and apply proper procedures (includes following guidelines to prevent spread of blood borne pathogens and spill control).	



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Demonstrate how to locate a material Safety Data Sheet (SDS) and describe how you interpret the information.	
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**DOL Standard:** Shop Practices: Apply a working knowledge of the expectations for an apprentice and the general shop practices required by the apprentice.

**Performance Objective:** Demonstrate the ability to display integrity by applying the apprentice’s work expectations as defined by the apprenticeship program.

<b>Performance Indicator</b>	<b>Qualification Date/Initial</b>
Demonstrate the ability to respect for company’s time and property.	
Demonstrate the ability to accept responsibility for one’s decision and actions.	
Demonstrate the ability to know the jobs assigned to you.	
Demonstrate a working knowledge of the company policy manual.	
Demonstrate an ability to show up on time every day with a desire to work hard and add value to the company.	
Demonstrate the ability to follow instructions laid out by your supervisor.	
Demonstrate a dedication to the trade and to the quality and professional standards set forth by the company.	
Demonstrate how to performing a preventive maintenance procedure for a given machine to extend machine life and minimize downtime in accordance with company-approved maintenance specifications and overall program goals.	

**Performance Objective:** Demonstrate the ability to display initiative by showing a willingness to work and seek out new work challenges.

<b>Performance Indicator</b>	<b>Qualification Date/Initial</b>
Demonstrate the ability to take initiatives in seeking out new responsibilities and work challenges, increasing the variety of scope of one’s job.	
Demonstrate the ability to pursue work with energy, drive and determination to accomplish one’s tasks.	
Demonstrate the ability to establish and maintain personally challenging, but realistic work goals.	
Demonstrate the ability to strive to exceed standards and expectations.	



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**Performance Objective:** Demonstrate the ability to display dependability and reliability by showing responsible behaviors at work.

<b>Performance Indicator</b>	<b>Qualification Date/Initial</b>
Demonstrate the ability to behave consistently, predictably and reliably.	
Demonstrate the ability to fulfill obligations, complete assignments and meet deadlines.	
Demonstrate the ability to follow written and verbal directions.	
Demonstrate the ability to comply with organizational rules, policies and procedures.	
Demonstrate the ability to comply with regular and punctual attendance.	

**Performance Objective:** Demonstrate the ability to display adaptability by showing the capability to adapt to new, different or changing requirements.

<b>Performance Indicator</b>	<b>Qualification Date/Initial</b>
Demonstrate the ability to be open to learning and considering new ways of doing things.	
Demonstrate the ability to actively seek out and carefully consider the merits of new approaches to work.	
Demonstrate the ability to embrace new approaches when appropriate and discard approaches that are no longer working.	
Demonstrate the ability to effectively change plans, goals, actions or priorities to deal with changing situations.	

**Performance Objective:** Demonstrate the ability to display business fundamentals in serving and protecting the organization and industry.

<b>Performance Indicator</b>	<b>Qualification Date/Initial</b>
Demonstrate the ability to understand one's role in the functioning of the company and the potential impact of one's performance can have on the success of the organization.	
Demonstrate the ability to recognize the importance of maintaining privacy and confidentiality of company information, as well as that of customers and co-workers, and comply with intellectual property laws.	



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**Performance Objective:** Demonstrate the ability to plan and prioritize work to manage time effectively and accomplish assigned tasks.

<b>Performance Indicator</b>	<b>Qualification Date/Initial</b>
Demonstrate the ability to plan and schedule tasks so that work is completed on time.	
Demonstrate the ability to prioritize various competing tasks.	
Demonstrate the ability to effectively allocate time and resources efficiently.	
Demonstrate the ability to take the necessary actions when project go off track.	

**Performance Objective:** Demonstrate the ability to actively look for ways to identify market demands and meet client needs.

<b>Performance Indicator</b>	<b>Qualification Date/Initial</b>
Demonstrate the ability to understand and anticipate customer need.	
Demonstrate the ability to provide personalized service with prompt and efficient responses to meet the requirements, requests and concern of clients.	
Demonstrate the ability to be pleasant, courteous and professional when dealing with internal and external clients.	
Demonstrate the ability to evaluate client satisfaction.	

**Performance Objective:** Demonstrate the ability to display teamwork by working and communicating effectively with others in a respectful manner.

<b>Performance Indicator</b>	<b>Qualification Date/Initial</b>
Demonstrate the ability to establish a high degree of trust and credibility with others.	
Demonstrate the ability to interact professionally and respectfully with supervisors and co-workers.	
Demonstrate the ability to develop constructive working relationships and maintain them over time.	
Demonstrate the ability to use appropriate strategies and solutions for dealing with conflicts and differences to maintain a smooth workflow.	



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**DOL Standard:** Technical Mathematics: Apply a working knowledge of calculating and solving mathematical problems when interpreting specifications and performing tasks within the manufacturing environment.

**Performance Objective:** Demonstrate the ability to use basic mathematics to solve problems.

<b>Performance Indicator</b>	<b>Qualification Date/Initial</b>
Demonstrate the ability to add, subtract, multiply and divide whole numbers, fractions, decimals and percentages.	
Demonstrate the ability to convert decimals to fractions and convert fractions to percentages.	
Demonstrate the ability to calculate averages, ratios, proportions and rates.	
Demonstrate the ability to take measurement of time, temperature, distance, length, width, height and weight and convert one measurement to another.	
Demonstrate the ability to translate practical problems into useful mathematical expressions.	

**DOL Standard:** Prints and Drawings: Apply a working knowledge of foundational drawing and print reading skills when interpreting specifications and performing tasks within the manufacturing environment.

**Performance Objective:** Demonstrate the ability to interpret information found on a blueprint and call out critical information regarding the drawing.

<b>Performance Indicator</b>	<b>Qualification Date/Initial</b>
Demonstrate the ability to identify symbols, notations, and lines to industry standards.	
Demonstrate the ability to determine dimensions, critical features and tolerances on machine drawing.	
Demonstrate the ability to interpret pictorial drawings to industry standards.	
Demonstrate the ability to interpret multi-view drawings to industry standard.	
Demonstrate the ability to locate part numbers and correlated those numbers to manufacturing and inspection tasks performed on the job.	



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**Performance Objective:** Demonstrate the ability to apply math concepts to solve calculations on prints or drawings necessary for planning and setting up machining operations.

<b>Performance Indicator</b>	<b>Qualification Date/Initial</b>
Using a sample print, demonstrate how to calculate a missing angle from a triangle.	
Using a sample print, demonstrate how to solve missing measurements in right angles.	
Using a sample print, demonstrate how to calculate the area of a circle.	
Using a sample print, demonstrate how to solve for the unknown hypotenuse of a right triangle using the Pythagorean Theorem.	

**Performance Objective:** Demonstrate the ability to measure of part features using the application of Geometric Dimensioning and Tolerancing (GD&T) principals.

<b>Performance Indicator</b>	<b>Qualification Date/Initial</b>
Demonstrate the ability to identify GD&T feature control frames.	
Demonstrate the ability to identify standard GD&T dimensional tolerance.	
Demonstrate the ability to identify GD&T tolerances for form orientation, location.	

**DOL Standard:** Measuring and Improving Work: Apply common systems for designing and measuring work processes and the commitment to continuous improvement through empowerment and management by people and data.

**Performance Objective:** Demonstrate the ability to conduct the process of collecting and comparing data trends using the company's quality Statistical Process Control (SPC) software platform.

<b>Performance Indicator</b>	<b>Qualification Date/Initial</b>
Demonstrate the ability to perform statistical calculations to determine the mean, median, and mode for a set of data.	
Demonstrate the ability to record points on a control chart.	
Demonstrate the ability to identify a process that is in or out of control.	
Demonstrate the ability to work towards the mean during process.	
Demonstrate the ability to identify a production problem, propose a remedy, having been given the authorization to implement the process improvement and carry it out.	



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**DOL Standard:** Problem Solving: Apply a working knowledge of analyzing information and evaluating results to choose the best solution and solve problems.

**Performance Objective:** Demonstrate the ability to use logical thought processes to analyze and draw conclusions.

Performance Indicator	Qualification Date/Initial
Demonstrate the ability to identify inconsistent or missing information.	
Demonstrate the ability to critically review, analyze, synthesize, compare and interpret information.	
Demonstrate the ability to draw conclusions from relevant and or missing information.	
Demonstrate the ability to test possible hypotheses to ensure the problem is correctly diagnosed and the best solution is found.	
Demonstrate the ability to distinguish between deviations and problems in processes or equipment.	

**Performance Objective:** Demonstrate the ability to apply critical thinking skills to solve problems by generating, evaluating, and implementing solutions.

Performance Indicator	Qualification Date/Initial
Demonstrate the ability to identify early warning signs in processes or equipment.	
Demonstrate the ability to apply the “5 Why’s” technique through root cause analysis.	
Demonstrate the ability to document troubleshooting information.	

**Performance Objective:** Demonstrate the ability to use creative thinking tools by applying critical thinking and problem-solving methodologies to your own workplace situations.

Performance Indicator	Qualification Date/Initial
Demonstrate the ability to apply critical thinking techniques to identify and articulate problems.	
Demonstrate the ability to apply critical thinking techniques to develop and implement solutions.	
Demonstrate the ability to apply critical thinking techniques to identify obstacles and solve problems.	



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**DOL Standard:** Hoisting and Lifting Equipment: Apply a working knowledge of moving loads using hoists and rigging equipment to safely handle and move parts and equipment.

**Performance Objective:** Demonstrate the ability to select and safely use hoisting and lifting equipment to move workpieces to desired locations.

Performance Indicator	Qualification Date/Initial
Demonstrate the ability to inspect a hoist to determine it is safe for use.	
Demonstrate the ability to manipulate manual and powered hoists using cantilevered and gantry configurations.	
Demonstrate the ability to calculate the center of gravity for load balance.	
Demonstrate the ability to select and use the proper eyebolts for lifting parts.	
Demonstrate the ability to perform rigging using sling techniques.	
Demonstrate the ability to perform rigging using come-a-long techniques.	
Demonstrate the ability to perform rigging using blocking techniques.	
Demonstrate the ability to perform rigging using chaining techniques.	
Demonstrate the ability to interpret critical information from a load chart.	
Demonstrate the ability to use a manual pry bar and truck to move a load.	
Demonstrate the ability to use a hydraulic jack to lift a load.	
Demonstrate the ability to use a dolly to move a load.	

**DOL Standard:** Welding Fundamentals: Apply a working knowledge of performing safe welding operations, identifying features of joint types, positions, welding symbols, applying craft tools and the providing for the care and maintenance of welding equipment.

**Performance Objective:** Demonstrate the ability to adhere to safety precautions prior to welding or cutting operations to protect oneself and others from potential injury in the workplace.

Performance Indicator	Qualification Date/Initial
Demonstrate the ability to assure that fire protection and fire extinguishing equipment are properly located at the site, and that fire watchers are assigned and hot-work authorization procedures are followed where required.	
Demonstrate the ability to handle the equipment safely and use it so as not to endanger lives and property.	



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Demonstrate the ability to cut or weld only where all safety precautions have been met.	
Demonstrate the ability to mark hot materials where others may unknowingly come in contact with hot material remaining from welding.	
Demonstrate the ability to adhere to precautions set forth to protect the general welding or cutting area by practicing good housekeeping by verifying welding equipment, machines, cable, and other apparatus shall be located so that it does not present a hazard to personnel; verifying that signs are posted designating welding areas, and indicating that eye protection and other applicable protective devices shall be worn; verifying noncombustible and flame-resistant protective screens or shield are in place to protect workers and others from radiant energy and splatter; verifying required eye, face protection and protective clothing are worn; and verifying that adjacent wall and others surfaces have low reflectivity to ultraviolet radiation when arc welding is carried out.	
Demonstrate the ability to adhere to eye and face protection requirements in compliance with ANSI/ISEA standards for the welding and cutting process to be performed.	
Demonstrate the ability to adhere to glove requirements in compliance with ANSI/ISEA standards for the welding and cutting process to be performed.	
Demonstrate the ability to adhere to legging requirements in compliance with ANSI/ISEA standards for the welding and cutting process to be performed.	
Demonstrate the ability to adhere to cape and sleeve requirements in compliance with ANSI/ISEA standards for the welding and cutting process to be performed.	
Demonstrate the ability to adhere to other protective clothing requirements in compliance with ANSI/ISEA standards for the welding and cutting process to be performed.	
Demonstrate the ability to adhere to noise control requirements in compliance with ANSI/ISEA standards for the welding and cutting process to be performed.	
Demonstrate the ability to adhere to respiratory protection requirements in compliance with ANSI/ISEA standards for the welding and cutting process to be performed.	
Demonstrate the ability to adhere to general ventilation requirements to prevent personnel exposures to hazardous concentrations of airborne contaminants are maintained below the allowable limits specified by the authority having jurisdiction.	
Demonstrate the ability to adhere to fire prevention and protection requirements, in compliance with ANSI/ISEA standards, when performing welding or cutting work.	
Demonstrate the ability to adhere to confined space requirements, in compliance with ANSI/ISEA standards, when performing welding or cutting work.	

**Performance Objective:** Demonstrate the ability to maintain welding equipment and supplies by inspecting, testing, checking, identifying and reporting deficiencies; adjusting, repairing and replacing user maintainable defective components associated with oxy-fuel equipment and storing components and consumables associated with oxy-fuel and arc welding equipment so that equipment and consumables are stored and maintained at a standard of repair that is safe and functionally effective.



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Performance Indicator	Qualification Date/Initial
Demonstrate the ability to maintain oxy-fuel equipment by inspecting, testing, checking, identifying and reporting deficiencies; adjusting, repairing and replacing user maintainable defective components associated with oxy-fuel equipment including cylinders, gauges, hoses, tips, torches, and flashback arresters using leak detection solutions, oil & grease removers, wrenches, tip cleaners and hose clamps so that oxy-fuel equipment is maintained at a standard of repair that is safe and functionally effective within manufacturer's and workplace standards.	
Demonstrate the ability to maintain arc welding equipment by inspecting, testing, checking, calibrating, adjusting and replacing defective components associated with arc welding equipment including welding cables, electrode holders, ground clamps, feeders & guns, flow meters, shielding gas hoses using pliers, wrenches and leak detection solutions so that welding equipment is maintained at a standard of repair that is safe and functionally effective within manufacturer's and workplace standards.	
Demonstrate the ability to store welding consumables by storing, inspecting, maintaining storage conditions, protecting and replacing defective items associated with consumables for welding including ovens, quivers, flux storage containers, cylinders, electrodes, and wire using knowledge of manufacturer's recommendations so that welding consumables are stored and maintained free from contamination and damage in accordance with recognized workmanship standard.	

**Performance Objective:** Demonstrate the ability to use craft-specific measuring and small hand and power tools in accordance with government safety regulations, manufacturer's recommendations and approved industry standards.

Performance Indicator	Qualification Date/Initial
Demonstrate the ability to safely and properly use small hand tools to include: chipping hammer, wire brush, side cutters, hammer, cold chisel, pliers, vise grips, hack saw and scalers.	
Demonstrate the ability to safely and properly use pneumatic and electric powered hand tools to include: wheel grinders, pedestal grinders, disc grinders and portable drills.	
Demonstrate the ability to safely and properly use a bench grinder.	
Demonstrate the ability to safely and properly use an abrasive cut-off saw.	
Demonstrate the ability to safely and properly use a die grinder.	
Demonstrate the ability to safely and properly use a drill press.	
Demonstrate the ability to safely and properly use a nibbler.	
Demonstrate the ability to accurately use welding measuring tools, to include a fillet gauge, contour gauge and throat gauge.	



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Demonstrate the ability to accurately use fit-up measurement tools, to include a measuring tape, ruler, vernier, micrometer, level, center head, combination square, protractor, bevel angle and calibration tool.	
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**Performance Objective:** Demonstrate the ability to identify and interpret features of joint types, positions and welding symbols as applied to the welder operations.

<b>Performance Indicator</b>	<b>Qualification Date/Initial</b>
Demonstrate the ability to identify joint types and positions (butt, tee, lap, corner and edge).	
Demonstrate the ability to identify joint positions (flat, horizontal, vertical, progression up, progression down, overhead).	
Demonstrate the ability to discuss the application and limitations of different joints.	
Demonstrate the ability to identify the components of welding symbols on a print (reference line, arrow side and other side significance, multiple reference lines, arrows, broken arrows, tail, specifications and notes, process).	
Demonstrate the ability to identify basic weld symbols (fillet, groove, plug/slot) and their application.	

**Performance Objective:** Demonstrate the ability to identify and safely manipulate the functions and controls of welding power sources in accordance with government safety regulations, manufacturer’s recommendations and approved industry standards.

<b>Performance Indicator</b>	<b>Qualification Date/Initial</b>
Demonstrate the ability to safely control welding power sources, to include constant current, constant voltage, inverters, transformers, transformer rectifiers, generators, engine drives, amperage controls, principle of inductance, tapped control, saturable reactor, shunt, and magnetic amplifier.	
Demonstrate the ability to control the effects of power sources on the welding process, to include amperage, voltage, voltage trim, remote controls output characteristics, current type, polarity, slope control, inductance, square wave, high frequency, AC balance, transformer rectifier, inverter, welding current output frequency and inverter controls.	



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<b>Apprentice Signature:</b>	<b>Completed:</b> MM/DD/YY
<b>Mentor Signature:</b>	<b>Completed:</b> MM/DD/YY
<b>Supervisor Signature:</b>	<b>Completed:</b> MM/DD/YY
<b>Comments:</b>	