



**The Manufacturers Association**

**JOB QUALIFICATION STANDARD (JQS)**

**Occupation:** WELDER

**Work Process:** Welding Job Preparation

**Practical Hours:** 500 hrs.

**DOL Standard:** Welding Job Preparation: Apply a working knowledge of the preparing the work site, preparing job layout, fitting sub-assemblies and assemblies and preparing a job for a welding operation.

**Performance Objective:** Demonstrate the ability to prepare work site by planning work site lay out, setting up work area and communicating with supervisors and other workers so that work space is efficiently used, worker time and motion are reduced, work can proceed in a safe and orderly manner and communications eliminate or reduce confusion and errors.

Performance Indicator	Qualification Date/Initial
Demonstrate the ability to plan the work site layout by identifying work site variables; extracting site relevant details from information sheets, drawings and specifications; taking into account effects on site layout of concurrent operations and determining work site layout and space usage so that work can proceed in a safe and orderly manner.	
Demonstrate the ability to set up the work area by positioning equipment, machines and tools; identifying site relevant safety concerns and removing or avoiding hazards and occupying available work space so that there are sufficient lighting and ventilation, reduced interference from competing work activities, safe and efficient movement in the work space, sequence of operations is effective and non-productive activities are minimized.	
Demonstrate the ability to communicate with the supervisor, technical advisor and other workers to ensure that the types of metals to be joined and the geometry of prepared shapes are as specified by shop drawings, the shop supervisor or the customer.	

**Performance Objective:** Demonstrate the ability to lay out, cut and form metal to specification by preparing job layout; cutting metal to size using one of several processes; forming metal to required design; preparing welding joints and selecting material preparation method so that the finished product meets the requirements of the job specification.

Performance Indicator	Qualification Date/Initial
Demonstrate the ability to prepare job layout by reading and interpreting fabrication documents, blue prints and drawings; identifying dimensions, materials, tolerances, notes and symbols; making rough sketches of fabrication job; selecting required stock and transferring dimensions to job layout so that layout is completed in accordance with fabrication documents and with efficient use of materials.	
Demonstrate the ability to cut metal with oxy-fuel equipment by selecting fuel gases, tips, pressures required, personal equipment and tools and assembling them; activating the	



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equipment; making straight line, circle, bevel and piercing cuts and shutting down the equipment so that equipment is set up and used in accordance with manufacturer's instructions for the intended application and the cut is made to specification.	
Demonstrate the ability to cut and gouge metal with air carbon arc equipment by selecting power source, electrodes, pressurized air, personal equipment and tools and assembling them; activating the equipment; making the required cut and shutting down the equipment so that equipment is set up and used in accordance with manufacturer's instructions for the intended application and the cut is made to specification.	
Demonstrate the ability to cut metal with SMAW cutting equipment by selecting power source, electrodes, amperage and polarity setting, personal equipment and tools and assembling them; activating the equipment; making the required cut and shutting down the equipment so that equipment is set up and used in accordance with manufacturer's instructions for the intended application and the cut is made to specification.	
Demonstrate the ability to cut metal with plasma arc equipment by selecting orifice size, gas, gas pressure and heat settings; selecting and assembling personal equipment and tools; activating the equipment; making straight line, circle, bevel and piercing cuts and shutting down the equipment so that equipment is set up and used in accordance with manufacturer's instructions for the intended application and the cut is made to specification.	
Demonstrate the ability to cut metal using hand tools including hacksaws, snips, chisels, reamers, hand shears and pipe cutters by selecting the tool; checking the tool's operation and condition and making the required cut so that the tool is appropriate to the job; the tool is in good working condition; the tool is operated properly in accordance with manufacturer's recommendations and the cut is made to specification.	
Demonstrate the ability to cut metal using power tools including power shears, power saws, grinders, nibblers, notchers and punching machines by selecting the tool; installing consumables; adjusting the power tool's scope of operation; checking the power tool's performance and condition and making the required cut so that the tool is appropriate to the job; the tool is properly adjusted and in good working condition; the tool is operated properly in accordance with manufacturer's recommendations and the cut is made to specification.	
Demonstrate the ability to form metal to specified design using equipment such as rollers, benders, crimpers and beaders by selecting the equipment; adjusting the equipment's scope of operation; checking the equipment's performance and condition and applying the equipment to the work so that equipment is appropriate to the job; the equipment is properly adjusted and in good working condition; the equipment is operated properly in accordance with manufacturer's recommendations and the operation is done to specification.	
Demonstrate the ability to prepare welding joints by using equipment such as grinders and beveling machines so that weldment edges meet the requirements of the welding specification.	
Demonstrate the ability to select material preparation method such as flame cutting, grinding or nibbling so that distortion of components is minimized.	



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**Performance Objective:** Demonstrate the ability to fit sub-assemblies and assemblies by making jigs, fixtures and templates; checking measurement and fit of components; pre-heating components or assemblies; performing tack welding and planning for control of distortion so that measurements are within tolerances allowed, assemblies are dimensionally stable and fitting/ tacking facilitates welding.

Performance Indicator	Qualification Date/Initial
Demonstrate the ability to make jigs, fixtures and templates with or without actual components by identifying requirements from drawings and plans; creating jigs and fixtures to ensure materials are aligned and held in position for welding and creating templates to layout patterns so that the jigs, fixtures and templates are effective in maintaining dimensional stability during and after welding.	
Demonstrate the ability to check measurements and fit of components by performing trial fit of assemblies; using measuring tools and layout equipment to correct errors in alignment and measurement so that linear and geometric measurements are within the tolerances required by drawings, specifications or standards.	
Demonstrate the ability to pre-heat components or assembly by selecting preheat equipment and measuring devices; planning preheat sequence and procedure; applying heat so that work is prepared for assembly and inter pass temperatures are maintained without causing distortion or excessive residual stresses.	
Demonstrate the ability to perform tack welding by applying the correct tacking sequence so that intended root openings are maintained and do not impede the weld process.	
Demonstrate the ability to plan for the control of distortion by applying stiffeners, presetting parts, using back to back, or neutral axis assembly of similar components and flame straightening or cold straightening prior to tacking so that distortion is limited.	

**Performance Objective:** Demonstrate the ability to prepare assembly for welding by planning sequence of operations; verifying fabricated materials and assemblies; preparing the job for welding; ensuring correct consumables are on hand and checking weld joint fit up and condition so that the assembly is prepared to meet the preconditions for welding, allowing the job to be carried out efficiently and effectively without wasting time or resources.

Performance Indicator	Qualification Date/Initial
Demonstrate the ability to plan sequence of operations by reading and interpreting weld procedure specifications, employer's procedures, data sheets, codes, standards or contract documents; confirming dimensions, materials, tolerances, notes, symbols, weld sizes and locations; determining adequacy of weld preparation and type and size of weld consumables; confirming pre-heat interpass and post heat requirements, welding process(s), parameters and electrical characteristics; identifying sequence of operation and inspection requirements so that	



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the sequence of operations minimizes distortion and prevents avoidable repetition, waste and unacceptable quality of welds.	
Demonstrate the ability to verify fabricated materials and assemblies by obtaining all required materials and assemblies as described on the blue print or the bill of materials; verifying through stamping or other identification processes or systems; verifying that lifting equipment, positioning equipment, jigs and/or fixtures, preheat gear, preheat monitoring gear, welding power source and attachments (feeders), fume extraction equipment, air power tools and electrical power tools are available and obtain if necessary so that materials classification, size and condition are correct.	
Demonstrate the ability to prepare job for welding by ensuring the weldment can be manipulated safely and effectively; reporting to proper authority any discrepancies or errors for correction and carrying out any required pre-heating so that all welding and inspection operations can be completed as specified.	
Demonstrate the ability to ensure correct consumables are on hand by reading and interpreting weld procedure specification documents or following directions of supervisor; identifying the correct welding consumable required; verifying location of welding consumable storage and the availability of electrode conditioning and storage ovens and electrode quivers if required so that all welding operations can be completed as specified to the level of efficiency required by the employer.	
Demonstrate the ability to check that the weld joint fit up, tack weld locations and size and fixture condition are in accordance with the applicable welding specification or accepted shop practice.	
Demonstrate the ability to check that joints to be welded are clean and dry in each weld location in accordance with the applicable weld specification or accepted shop practice.	

<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>	