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JOB QUALIFICATION STANDARD (JQS)

Occupation: WELDER

Work Process: Oxy-acetylene Welding and Cutting/Plasma Cutting

Practical Hours: 100 hrs.

DOL Standard: Oxyfuel Cutting: Apply a working knowledge of the Oxyfuel cutting process in accordance with government safety regulations, manufacturer’s recommendations and approved industry standards.

Performance Objective: Demonstrate the ability to practice safe practices for users of oxyfuel gas welding, cutting, soldering, brazing, and related materials and equipment.

Performance Indicator	Qualification Date/Initial
Demonstrate the ability to perform a leak test to check connection for leaks after assembly and before lighting the torch.	
Demonstrate the ability to use the proper equipment to light a torch, such as a friction lighter, stationary pilot flame or other suitable sources of ignition.	
Demonstrate the ability to follow a manufacturer’s procedures for the sequence of operation in lighting, adjusting and extinguishing torch flames.	
Demonstrate the ability to select proper hose and hose connections and verify the proper working condition of these components.	
Demonstrate the ability to select proper pressure regulators and verify the proper working condition of this component and its union nuts and connections before use.	
Demonstrate the ability to select compressed gas cylinders and verify markings and the proper working condition of these components.	

Performance Objective: Demonstrate the ability to lay out, cut and form metal to specification by preparing job layout; cutting metal to size using an oxyfuel process; 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 maintain oxyfuel equipment by inspecting, testing, checking, identifying and reporting deficiencies; adjusting, repairing and replacing user maintainable	



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defective components associated with oxyfuel 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 safely set up a work area, correctly perform a correct lighting procedure and perform a correct shut down procedure.	
Demonstrate the ability to monitor and perform manual oxyfuel gas cutting operations to include square cuts, bevel cuts, piercing, straight cutting, and shape cutting while maintaining gas pressures, speed of travel and tip to metal distance.	
Demonstrate the ability to correct common cutting faults to include cut edge quality, kerf lines and dross adherence (slag).	

DOL Standard: Brazing/Soldering: Apply a working knowledge of the set-up and brazing and soldering with oxyfuel equipment.

Performance Objective: Demonstrate the ability to braze or solder materials with the oxyfuel gas (OFG) process by selecting and configuring oxy-fuel-gas apparatus; obtaining consumables; brazing lap and tee joints and carrying out shut down procedures so that process operations are correctly performed in accordance with the equipment manufacturer’s recommendations and the requirements of the applicable standard.

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 select and configure oxy-fuel-gas heating equipment by selecting torch, heating tip, filler alloy type and diameter, flux type, adjusting gas pressures selecting personal equipment and tools, and assembling them so that all the equipment necessary to braze deoxidized copper using the oxyfuel gas (OFG) process is available and is correctly set up in accordance with manufacturer’s instructions for the intended application.	
Demonstrate the ability to obtain consumables by determining the applicable brazing/soldering procedure or following directions of supervisor; identifying the type and size of filler metal and flux type so that the correct consumables are available for the intended application in accordance with the brazing/soldering procedure specification or applicable standards.	
Demonstrate the ability to braze/solder lap and tee joints by choosing the equipment configuration including fuel gas, oxygen pressures and heating tip sizes; testing the settings and adjusting the operation of the equipment; preparing the joint ; preheating the joint and adding the filler alloy so that the correct combination of penetration, fill and flow of filler alloy through the joint is achieved, the correct joint profile and size are achieved for the brazing/soldering	



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application and that it meets the inspection requirements of the applicable fabrication standards.	
Demonstrate the ability to carry out shut down procedure by storing heating equipment, post cleaning braze/solder joint assemblies, removing residual fluxes so that the joint is capable of performing in the intended service environment.	

DOL Standard: Plasma Arc Cutting: Apply a working knowledge of the safe set-up, operation and correction of common cutting faults for the Plasma Arc Cutting equipment in accordance with government safety regulations, manufacturer’s recommendations and approved industry standards.

Performance Objective: Demonstrate the ability to weld with the plasma arc welding (PAW) process by setting up welding equipment; installing consumables; adjusting welding parameters; fillet welding; groove welding; cleaning welds and measuring welds so that processes are correctly completed in accordance with manufacturer’s instructions and the applicable standard.

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 set up welding equipment by configuring welding machine (power source), welding cable assemblies, welding torch, gas cup, shielding gas types, purging equipment, tungsten electrode type and size and assembling them so that all the equipment necessary to weld using the PAW process is available and is correctly set up or installed in accordance with manufacturer’s instructions.	
Demonstrate the ability to install consumables by choosing the shielding gases, purging equipment and the type and size of filler rod for the welding application and the composition and thickness of the base material so that the correct gases and filler rod are deployed in accordance with manufacturer’s instructions.	
Demonstrate the ability to adjust welding parameters by connecting the power source to the available power supply; connecting the work lead clamp to bare metal on the component to be welded; selecting the correct polarity; adjusting current, purge flow rate and purge time and gas flow rates by following either written or verbal instructions; testing the settings and adjusting the operation of the equipment so that the correct balance of penetration, fusion, profile and weld size is achieved for the weld and that it meets the requirements of the applicable standards.	
Demonstrate the ability to groove weld using the PAW process on single bevel or square or single vee joint, with backing, in the flat, horizontal and vertical positions, using any one of mild steel, stainless steel, aluminum or other alloys, in the work environment identified by the	



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employer so that passes are done in the correct sequence and each pass of the weld meets the weld inspection requirements of the applicable fabrication standards.	
Demonstrate the ability to correct common cutting faults to include cut edge quality, kerf lines, cutting direction (based on square side of cut) and dross adherence (slag).	
Demonstrate the ability to clean welds using wire brush, grinder or other appropriate abrasive process so that welds are free of oxide and surface irregularities and meet the weld inspection requirements of the applicable fabrication standards.	
Demonstrate the ability to measure welds for completeness using fillet gauges, measuring tape or other devices so that welds meet the requirements specified by the engineering drawings, company procedures and the applicable standards.	

Apprentice Signature:	Completed: MM/DD/YY
Mentor Signature:	Completed: MM/DD/YY
Supervisor Signature:	Completed: MM/DD/YY
Comments:	