



The Manufacturers Association

JOB QUALIFICATION STANDARD (JQS)

Occupation: TOOLMAKER

Work Process: Universal Grinder, Cylindrical Grinder, Cutter Grinder, E.D.M.

Practical Hours: 300 hrs.

DOL Standard: Advanced Grinding: Apply a working knowledge for setting up, operating, or tending to machines that universally, cylindrically or cutter grind a workface to meet requirement hardness, shape and finish specifications.

Performance Objective: Demonstrate the ability to safely setup and operate machine tools to perform routine grinding operations.

Performance Indicator	Qualification Date/Initial
Demonstrate the ability to select a grinding wheel for cylindrical grinding.	
Demonstrate the ability to check the condition of the wheel for cylindrical grinding.	
Demonstrate the ability to true, balance and dress a grinding wheel for cylindrical grinding.	
Demonstrate the ability to locate and position the workpiece in a cylindrical grinder.	
Demonstrate the ability to grind horizontal, vertical and angular flat surfaces during cylindrical grinding.	
Demonstrate the ability to grind simple and complex geometric surfaces on a cylindrical grinder.	

Performance Objective: Demonstrate the ability to perform pedestal/tool & cutter machine grinding operations in accordance with an Operational Plan.

Performance Indicator	Qualification Date/Initial
Demonstrate the ability to select the grinding wheel for pedestal/tool & cutter machine grinding.	
Demonstrate the ability to check grinding wheel condition for pedestal/tool & cutter machine grinding.	
Demonstrate the ability to select machine feeds and speeds for pedestal/tool & cutter machine grinding.	
Demonstrate the ability to sharpen a clamp tool in a pedestal grinder by setting up workholding devices including angle plate, magnetic holders, vises, chucks, centers, jigs, V-block, and mandrels, so that workpiece is aligned, secured, and stable during grinding operations.	



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Demonstrate the ability to sharpen tools or cutters in a pedestal grinder by holding against grinding wheel, so that the ground cutting edge of tools and cutters conforms to tool geometry standards, to ensure optimum metal removal and finish.	
Demonstrate the ability to quench and cool cutters by following required procedures, so that cutters can be sharpened in accordance with engineering drawings, job specifications, and OSHA.	
Demonstrate the ability to check ground surfaces using surface gauges, fixed gauges, optical comparators, micrometers, and calipers, to ensure surface is finished in micro-inches or microns, as specified in engineering drawings and customer specifications.	
Demonstrate the ability to final finish tool or cutters using a finer abrasive wheel or whetstone so that the ground cutting edge of tools and cutters are ground in accordance with tool geometry standards, engineering drawings, and job specifications.	
Demonstrate the ability to perform final inspection using precision measuring instruments and checking devices, fixed gauges, micrometers, optical comparators, calipers, and surfaces gauges, to ensure that the tolerances and dimensions of the sharpened workpiece conforms to the engineering drawings and customer specifications.	
Demonstrate the ability to communicate with co-workers to identify previous job operations, availability of tools, parts, and machinery, scheduling requirements, and any other information needed to complete the grinding job, ensuring that the information communicated is clear, concise, and accurate.	
Demonstrate the ability to complete work documentation including tracking sheets, required sign-offs, inspection reports, and procedure sheets, to ensure the finalization of the workpiece, and to facilitate traceability of work in accordance with engineering drawings, customer specifications, and company procedures.	
Demonstrate the ability to practice good housekeeping in the workplace by cleaning up spills and leaks, keeping work area clean and clear of obstructions, and storing tools or equipment, so that the potential for accident or injury is minimized and tools or equipment are in place and available, in compliance with company procedures.	



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Standard: Electrical Discharge Machining: Apply a working knowledge of the Electrical Discharge Machining (EDM) process including the setting up, operating, or tending of machines that use electrodes to spark erode, burn, die sink, wire burn or wire erode a workpiece.

Performance Objective: Demonstrate the ability to safely setup and operate electrical discharge machines to perform routine machining operations.

Performance Indicator	Qualification Date/Initial
Demonstrate the ability to identify and select Electrical Discharge Machining (EDM) process using information from CAD data, engineering drawings and job specifications to ensure that the process selected is the correct one to cut parts or components.	
Demonstrate the ability to develop EDM electrodes by selecting the correct material according to the workpiece material, complexity and quantity of electrodes, surface finish, tolerances, flushing or removal rates, engineering drawings, and job specifications.	
Demonstrate the ability to identify, select, and set up EDM machining components including cutting tools, tool holders, EDM wire and guides, to pre-determined reference points by using information from the engineering drawings, prepared sequence sheet, and tool lists, to ensure that tools and tooling selected are the correct ones to cut the workpiece efficiently and safely.	
Demonstrate the ability to identify, select and set machine parameters including rotations, flushing rates, and power settings using speed and feed charts and according to the type, size, grade, and hardness of material to be cut, so that the workpiece is machined efficiently and safely without damage to tooling, machine, or workpiece and ensures personal safety in accordance with engineering drawings and job specifications.	
Demonstrate the ability to position, align, and secure workpiece in EDM machine to specified datums and required alignments using workholding devices to locate and position the workpiece and ensure maximum stability during machining, in accordance with engineering drawings and job specifications.	
Demonstrate the ability to cut the workpiece by EDM and measuring or checking using verniers, depth micrometer, and indicators, so that the completed shape, contour, and size of the machined workpiece conforms to engineering drawings and job specifications.	
Demonstrate the ability to maintain material identification by marking or stamping workpiece and completing shop documentation, to facilitate traceability of the final product or work-in-process and to maintain inventory control in accordance with company standards/procedures and job specifications.	
Demonstrate the ability to perform final inspection using precision measuring and checking devices instruments including (not limited to) inside and outside micrometers, vernier height gauges or indicators, gauge blocks, and pin gauges, to ensure that the tolerances and dimensions of the completed workpiece conform to the engineering drawings and job specifications.	
Demonstrate the ability to move workpiece by operating lifting and rigging equipment including hoists, overhead cranes, chain falls, lift pins, eye bolts, slings, cables, and chains, to remove,	



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transport, and store materials, parts, or equipment in compliance with Safety Legislation and company standards.	
Demonstrate the ability to complete work documentation including tracking sheets, sign-off sheets, inspection reports, or procedure sheets, to record the finalization of jobs and to facilitate traceability of work-in-process, ensuring that all data is recorded accurately and clearly in accordance with engineering drawings, job specifications, and company standards.	
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 company standards.	

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