



The Manufacturers Association

JOB QUALIFICATION STANDARD (JQS)

Occupation: TOOLMAKER

Work Process: Milling

Practical Hours: 1500 hrs.

Standard: Milling - Apply a working knowledge for setting up, operating, or tending to machines that mill, plane, shape, groove, or profile metal work pieces to meet required specifications.

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

Performance Indicator	Qualification Date/Initial
Demonstrate the ability to select milling cutting tools (end mills, face mills, shell cutters, slot drills, boring bars, slitting saws, and boring head) by using information from engineering drawings and job instructions to ensure that the tools selected are the correct ones needed to mill the workpiece to specifications.	
Demonstrate the ability to identify and prepare milling cutting tools by sharpening or replacing tools so that the cutting shape and angle is prepared for optimum cutting and personal safety in accordance with manufacturer’s specifications and company standards.	
Demonstrate the ability to set-up and maintain milling adjustable support tools (indexing heads, vises, angle plates, sine bars, and tables) ensuring that the support tool is the correct one for the application and the workpiece is located and secured during machining in accordance with job specifications.	
Demonstrate the ability to set-up milling cutting tools to required operational alignments using arbors, collets, and drill chucks to ensure the tools are in position and held securely during machining in accordance with job specifications.	
Demonstrate the ability to select speeds and feeds of lathe using speed and feed charts and in accordance with the size, type, and hardness of workpiece material, so that the mill performs optimum cutting without damage to workpiece, cutting tools, or machine and ensures personal safety in accordance with job specifications.	
Demonstrate the ability to perform fly-cutting using a milling machine, single-point tool bit, and required cutting fluid so that the size, shape, squareness, and flatness of the fly-cut workpiece conforms to job specifications.	
Demonstrate the ability to face-mill using a milling machine, multi-point tool bit, face mill, and required cutting fluids so that the size, shape, squareness, and flatness of the faced workpiece conform to job specifications.	
Demonstrate the ability to machine steps, cut-outs, angles, and open slots using a milling machine, end mill, and required cutting fluid so that the size, shape, and angle of the end-milled workpiece conforms to job specifications.	



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Demonstrate the ability to machine a pocket or slot using a milling machine, slot drill, center cutting end mill, and required cutting fluid so that the size, shape, and angle of milled pockets or slots conform to job specifications.	
Demonstrate the ability to machine a hole using a milling machine, drill bits, reamers, slot drills, and required cutting fluid so that the diameter, depth, and tolerance of the milled hole conforms to job specifications.	
Demonstrate the ability to bore holes using a milling machine, boring bar, boring head, and required cutting fluid so that the diameter, finish, depth and location of the bored hole conforms to job specifications.	
Demonstrate the ability to deburr the workpiece using files, scrapers, emery cloth, sanders and hand or pedestal grinders to remove excess material and ensure safe handling in accordance with engineering drawings, job specifications.	
Demonstrate the ability to perform final inspection using precision measuring instruments and checking devices including inside and outside micrometers, vernier height gauges or indicators, gauge blocks, and pin gauges to ensure that the tolerances and dimensions of the workpiece to conform to the engineering drawings and job specifications.	
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 and ensure that data is recorded accurately and clearly in accordance with engineering drawings and job specifications.	
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.	

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