



The Manufacturers Association

JOB QUALIFICATION STANDARD (JQS)

Occupation: TOOLMAKER

Work Process: Advanced Toolmaking

Practical Hours: 2100 hrs.

Standard: Toolmaking: Apply a working knowledge of planning and fabricating tools jigs or fixtures by cutting and preparing raw material.

Performance Objective: Demonstrate the ability to devise a detailed plan for the tool-building process.

Performance Indicator	Qualification Date/Initial
Demonstrate the ability to verify the features of tool components by reading bill of materials, engineering drawings, component prints, assembly, die, or part drawings to correctly identify: tolerances; sizes; diameters; revision level; projection and section views; pick-up datum point; component shapes; number of stations; number of working components; material specifications; thickness and type of steel; assembly process; number of functions; and, quantity and type of parts, tools, and dies; ensuring that all required component features are checked and identified.	
Demonstrate the ability to organize the tool-building plan to identify and document: types of machines and tools; job operations; sequencing of jobs; machining processes; required fixtures and tooling; and, assembly and fabrication sequences or processes; so that all features of the die or tool-building process conform to the engineering drawings, scheduled target dates, bill of materials, and job specifications.	
Demonstrate the ability to perform tool-building related calculations using conversion tables/charts, material and product-specifications tables/charts, and occupational graphs, to correctly identify clearances, tolerances, and variances of material contraction or expansion, so that all tooling clearances, dimensions, tolerances, size, and shapes are accurately determined and documented in accordance with engineering drawings, job specifications, die drawings, and bill of materials.	
Demonstrate the ability to assemble and verify tooling stock materials for surface condition, hardening ability, heat-treat response, type, grade, and dimensions by checking color codes, lettering, numerical stamps, charts, and stock lists, to ensure that the workpiece materials are the correct ones to build the die or tooling as specified in the engineering drawings, bill of materials, and job specifications.	
Demonstrate the ability to produce a detailed sketch of tooling components using engineering drawings, die, or part drawings, so that the tooling components and assemblies are correctly identified and sketched for shape, dimensions, tolerances, finishes, and assembly interrelationship and processes.	



The Manufacturers Association

JOB QUALIFICATION STANDARD (JQS)

Performance Objective: Demonstrate the ability to fabricate components of tools jigs or fixtures by cutting and preparing raw material.

Performance Indicator	Qualification Date/Initial
Demonstrate the ability to cut and prepare raw material to specified lengths and allowances by machining using a band saw or cut-off wheels and by measuring or checking dimensions, so that the rough- machined part conforms to engineering drawings and job specifications.	
Demonstrate the ability to block up and establish datum on a workpiece by measuring or checking with micrometers, verniers, and height gauges and by machining using mills or lathes, so that the datum faces are identified and the height, width, squareness, and grinding allowances of the blocked-up workpiece conform to the engineering drawings and job specifications.	
Demonstrate the ability to machine components of tools, jigs, or fixtures using pre-determined machining processes and by measuring or checking using gauge blocks, micrometers, verniers, height gauges, and dial test indicators, so that the dimensions, shapes, tolerances, and surface finish of the machined components conform to the engineering drawings and job specifications.	
Demonstrate the ability to heat-treat the components by following heat-treating processes and procedures, so that the components are tempered and hardened as required in the engineering drawings and job specifications.	
Demonstrate the ability to mark the tooling components using stamps, etching, or engraving tools by marking item number, hardness factor, and type of material, to facilitate traceability of components in accordance with company standards/procedures and job specifications.	
Demonstrate the ability to fabricate and assemble sub-assemblies by fastening, dowelling, fitting, and soldering, so that the assembled sub-assemblies are fabricated, aligned, mated, and assembled in accordance with the engineering drawings and job specifications.	
Demonstrate the ability to final fit sub-assemblies or tooling components by fastening, dowelling, fitting, and spot joining, so that the final-assembled workpieces are aligned, mated, and fabricated as specified in the engineering drawings and job specifications.	
Demonstrate the ability to inspect die or tooling fit and functions by trying out tooling and checking the components for failure, wear, or defects, to ensure that the fit and functionality of the dies or tooling conform to engineering drawings and job specifications.	
Demonstrate the ability to move workpiece by operating lifting and rigging equipment including (not limited to) hoists, overhead cranes, chain falls, lift pins, eye bolts, slings, cables, and chains, to remove, transport, and store materials, parts, and equipment in compliance with Safety Legislation and company standards/procedures.	
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 Manufacturers Association

JOB QUALIFICATION STANDARD (JQS)

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:	