



Australian Government

MEM18097 Manufacture cavity dies

Release: 2

MEM18097 Manufacture cavity dies

Modification History

Release 2. Quantum of hours of workplace practice removed. Supersedes and is equivalent to MEM18097 Manufacture cavity dies (Release 1).

Release 1. Supersedes and is equivalent to MEM18097A Manufacture cavity dies.

Application

This unit of competency defines the skills and knowledge required to prepare to manufacture and manufacture cavity dies, including matching use of hand and hand held power tools, assembly of the tooling components and trialling the tooling.

Where the selection and use of welding processes are required select appropriate units.

Where brazing or silver soldering is required unit MEM05006 Perform brazing and/or silver soldering should also be selected.

Where manufacture of press tools and gauges is required unit MEM18014 Manufacture press tools and gauges should also be selected.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Band: A

Unit Weight: 8

Pre-requisite Unit

MEM06007	Perform basic incidental heat/quenching, tempering and annealing
MEM07005	Perform general machining
MEM07006	Perform lathe operations
MEM07007	Perform milling operations
MEM07008	Perform grinding operations
MEM09002	Interpret technical drawing
MEM11011	Undertake manual handling
MEM12003	Perform precision mechanical measurement
MEM12006	Mark off/out (general engineering)

MEM12023	Perform engineering measurements
MEM12024	Perform computations
MEM12026	Perform advanced trade calculations in a manufacturing, engineering or related environment
MEM13015	Work safely and effectively in manufacturing and engineering
MEM14006	Plan work activities
MEM16006	Organise and communicate information
MEM18001	Use hand tools
MEM18002	Use power tools/hand held operations
MEM18003	Use tools for precision work
MEM18006	Perform precision fitting of engineering components
MEM18015	Maintain tools and dies
MEM18055	Dismantle, replace and assemble engineering components

Competency Field

Maintenance and diagnostics

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1	Determine job requirements	1.1	Follow standard operating procedures (SOPs)
		1.2	Comply with work health and safety (WHS) requirements at all times
		1.3	Use appropriate personal protective equipment (PPE) in accordance with SOPs
		1.4	Identify job requirements from specifications, drawings, job sheets or work instructions

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
2	Prepare to manufacture cavity die	2.1	Determine tooling requirements from customer's components drawings, prints or sample component
		2.2	Develop the tooling type and design and plan with reference to customer's specifications (written or verbal) for numbers, finish, quality and material
		2.3	Assess production machine to be used to produce components and consider in tooling design
		2.4	Interpret tool design from tooling drawings, prints or plan and check against customer requirements
		2.5	Determine selected production machine mounting requirements to ensure any special or additional provisions are incorporated in tooling design
3	Manufacture tooling	3.1	Select and obtain appropriate materials to meet tooling requirements for strength, durability, component finish and heat treatment qualities, where necessary, and account for materials availability
		3.2	Test selected material for hardness, as appropriate, to aid selection of machine tools, hand tools and hand held power tools to be used to fashion or shape tooling components
		3.3	Develop plan to sequence and stage manufacturing process, including establishing datum, mark out, rough out (machine or fashion), stress relieve/heat treat, finish size, fashion and fit and assemble componentry
4	Perform machining operations	4.1	Select appropriate machines and machining process from a range of standard tool room machines to shape/produce tooling components to specifications
5	Use hand and hand held power tools	5.1	Select a range of hand and hand held power tools and use to fashion/manufacture tooling components to specification

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

		5.2	Produce components sample or section for testing, where practicable
6	Assemble tooling components	6.1	Check and fit/assemble to specifications using acceptable tool making techniques and procedures components
7	Trial tooling	7.1	Check first-off component with precision instruments against specification
		7.2	Modify tooling to produce components to specification, as necessary
		7.3	Re-trial modified tooling and produce component
		7.4	Verify conformance to specification and report according to SOPs
		7.5	Record all deviations or modifications to original tooling design, prints or plans and report according to SOPs

Foundation Skills

This section describes those required skills (reading, writing, oral communication and numeracy) that are essential to workplace performance in this unit of competency.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Tooling includes one (1) or more of the

- forging dies
- extruding dies
- die casting (high and low pressure and gravity feed)

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following:

- plastic moulds (injection, compression, blow and foam)
- glass moulds
- dies requiring precision manufacture

Tool room equipment includes one (1) or more of the following:

- lathes
- mills
- copy/duplicator
- grinders
- electrical discharge machining (EDM) and wire cut equipment
- precision measurement
- hand and power tools

Unit Mapping Information

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Release 1. Supersedes and is equivalent to MEM18097A Manufacture cavity dies.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM18097 Manufacture cavity dies

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria on at least two (2) occasions and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- identifying and interpreting drawings, prints and/or sample components, specifications and customer requirements with respect to manufacturing cavity dies
- sketching or drawing the tooling design incorporating mounting requirements into tooling design and planning with reference to customer specifications for numbers, finish, quality and materials
- selecting and obtaining appropriate materials to meet tooling requirements and testing for hardness using appropriate hardness tester ensuring rating meets customers specifications
- shaping/producing tooling components to specifications using appropriate machines and machining processes
- fashioning/manufacturing tooling components using hand and hand held power tools to specifications
- assembling and fitting tooling components using acceptable tool making techniques and procedures
- producing first-off component/product and checking for conformance, trialling and modifying, where necessary, to meet specifications and verifying conformance
- recording/reporting modifications or alterations to original tooling design in accordance with SOPs.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- safe work practices and procedures and use of personal protective equipment (PPE)
- customers' tooling requirements and the type of tooling to be manufactured
- machine(s) in which the tooling is to be used
- tooling design concept and performance requirements in terms of customer specifications and proposed production machine(s)
- method of mounting the tooling in the production machine into which it is to be installed

- physical properties of a range of tool steels
- appropriate materials for each component of the tooling to be produced and reasons for selecting the chosen materials in terms of strength, durability, component finish, heat treatment requirements and availability
- procedures for hardness testing of materials
- tools, equipment, techniques and procedures for fitting/assembling the tooling components
- effect of material hardness on machinability of the material
- appropriate machinery and tools to be used to fashion or shape tooling components and reasons for selection
- procedures for documenting plans for the manufacture of tooling
- reasons for establishing a sequential plan for the manufacture of tooling
- hand and hand held power tools to be used to fashion/manufacture the required tooling components and reasons for selection
- precautions to be taken when fitting/assembling tooling components
- appropriate precision instruments for checking the components produced
- specifications of the finished product and causes of any non-conformance to specification
- tool making techniques/procedures to be applied to return the tooling to specification
- procedures for recording/reporting modifications and/or alterations to tooling design
- procedures for reporting/recording the conformance of the component/product produced by the tooling to specifications.

Assessment Conditions

- Assessors must:
 - have vocational competency in manufacturing cavity dies at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015* or its replacement and comply with the *National Vocational Education and Training Regulator Act 2011*, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires.
- Assessment must occur in a functioning workplace. Where assessment in the workplace would be unsafe, impractical or threatens the environment, assessment must occur in a sufficiently rigorous simulated environment that reflects the circumstances that would be experienced in a functioning workplace. Assessment must cover all aspects of workplace performance, including task skills, task management skills, contingency management skills and job role environment skills.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

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