



Australian Government

MEM06014 Perform power hammer forging of complex shapes

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Modification History

Release	Comments
1	This unit of competency was first released in MEM Manufacturing and Engineering Release 5.0.

Application

This unit of competency defines the skills and knowledge required to forge complex shapes using a power hammer where specialised methods of holding, positioning and lifting complex forgings are required. For the use of hand-held hammers to forge complex shapes, see MEM06009 Hand forge complex shapes.

Where basic use of power hammer is required, MEM06002 Perform hammer forging should also be selected.

Where the interpretation of technical drawings is required, MEM09002 Interpret technical drawing should also be selected.

Where the selection and use of engineering measurement is required, MEM12023 Perform engineering measurements should also be selected.

Where the selection and use of tools is required, MEM18001 Use hand tools and unit MEM18002 Use power tools/hand held operations should also be selected as appropriate.

Commonwealth and state/territory laws and regulations governing work and training environments must be complied with.

Band: A

Unit Weight: 4

Licensing/Regulatory Information

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

Pre-requisite unit(s)

MEM06011 Perform power hammer forging

MEM11011 Undertake manual handling

MEM13015 Work safely and effectively in manufacturing and engineering

MEM16006 Organise and communicate information

Competency field(s)

Forging

Unit sector(s)

N/A

Elements and Performance Criteria

Elements	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, sketches, job sheets or work instructions
2. Set up and operate power hammer	2.1 Set up power hammer and operate in accordance with SOPs to meet job requirements 2.2 Select and use complex open die tooling, following safe operating procedures
3. Forge complex shapes	3.1 Position the material to be forged in the forming equipment in accordance with SOPs 3.2 Mark and measure hot forgings to meet specifications, making allowance for material shrinkage and oxidation 3.3 Use power hammer tools and fixtures attached to power hammer 3.4 Check forging to ensure conformance to tolerances and specifications 3.5 Handle forgings in accordance with WHS requirements and SOPs
4. Heat complex forgings	4.1 Select plant and equipment to meet job requirements 4.2 Apply techniques to heat complex forgings 4.3 Perform preheating and post-forging heat treatment in accordance with procedures

	4.4 Apply correct techniques for handling hot metal, including balancing and pivoting
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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, accessibility of the item, and local industry and regional contexts) are included.	
Forging includes one or more of the following:	• forging using a mandrel • forging a boss • forging a ring or bush • forging a crankshaft • three-way forging • punching and opening of large diameter holes.
Forging plant equipment includes one or more of the following:	• porter bar (vee, tee, foot, socket or dog bar) • cradle sling.
Power hammer open dies include one or more of the following:	• flat die • combination die • double taper die • single taper die.
Material calculations include 1 or more of the following:	• thermal expansion and contraction • material wastage • oxidation and shrinkage allowance.
Heat treatment of forgings includes one or more of the following:	• annealing • normalising.

Heating equipment includes one or more of the following:	• diesel equipment • electrical equipment • induction-forging equipment • gas equipment • solid-fuel equipment • oil-fuel equipment • ceramic-chip equipment • oxy-fuel equipment.
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Unit Mapping Information

Current Code and Title	Previous Code and Title	Comments	Equivalence
MEM06014 Perform power hammer forging of complex shapes	MEM06008 Hammer forge complex shapes	Superseded	Equivalent

Assessment Requirements for MEM06014 Perform power hammer forging of complex shapes

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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 and include the ability to:

- follow work instructions, standard operating procedures (SOPs) and safe work practices
- select and use measuring guides
- set up and safely operate hammer forging equipment
- select and use complex open die tooling in accordance with procedures
- use appropriate and safe methods for holding, positioning and lifting complex-shaped forged material, including hot materials
- perform hammer forging of complex shapes to meet specifications
- select and operate heating equipment to perform preheating, forging and post-forging heat treatment for complex forgings.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

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)
- power-hammer tools and power-hammer forming tools and their application to produce a range of hammer forged articles
- hammer forging and punching techniques
- procedures for measuring forged articles and numerical operations and calculations/formulas for complex shape tooling
- effects of material shrinkage and oxidation on the dimensions of the forged article

- methods of overcoming/allowing for the effects of shrinkage and oxidation when hammer forging articles
- procedures for safe handling of material to be hammer forged
- heating equipment and its use for preheating, forging, and post-forging heat treatment
- heat treatment processes.

Assessment Conditions

- Assessors must:
 - have vocational competency in performing power hammer forging of complex shapes 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.
- Where possible assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions. This must cover all aspects of workplace performance, including environment, 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.

Link

Companion volumes, including implementation guides, are found on the national training register - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=45a7f1d5-61a5-447a-9688-7abbd7e1a5c7>.