



Australian Government

MEM06012 Perform drop and upset forging

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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 select, set up and operate drop and upset forging equipment to forge material to meet size, shape and finish specifications.

Where routine, repetitive cold upset forging is required, MEM07024 Operate and monitor machine and process should 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 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. Identify and select drop and upset forging equipment and tools for specific operation	2.1 Select equipment suitable for the size of material and forging procedures needed to meet job requirements 2.2 Select dies, punches and other tools suitable for the equipment, material and forging procedures needed to meet job requirements 2.3 Determine need for die replacement, taking into account relief allowances, cracking and dimensions
3. Set up and operate drop and upset forging equipment	3.1 Set up, adjust and operate equipment 3.2 Apply die setting techniques appropriate for the die and punch alignment 3.3 Apply die preheating procedures appropriate for die and job requirements
4. Prepare material	4.1 Calculate the amount of material required, making allowance for scale, flash and fin 4.2 Prepare materials and heat in accordance with job requirements and/or specifications
5. Drop and upset forge material	5.1 Drop forge material using procedures and techniques to meet job requirements 5.2 Apply lubricant appropriate for die and forging release

	5.3 Determine correct grain flow to meet job requirements 5.4 Identify galls, folds and cracks and rectify 5.5 Carry out removal of flash or fin in accordance with SOPs
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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.	
Equipment includes one or more of the following:	• drop hammer using open and closed dies • open die forging hammer using closed loose dies • upsetting machine or heading machine (aka horizontal upsetting machine).
Materials include one or more of the following:	• ferrous materials (steel) • nonferrous material (copper and aluminium bronze).
Lubricants include one or more of the following:	• graphite bearing oil or grease • cellulose granules • wax.
Correct removal of forged material includes one or more of the following:	• use of ejector pins • using appropriate draft angle in dies.

Unit Mapping Information

Current Code and Title	Previous Code and Title	Comments	Equivalence

MEM06012 Perform drop and upset forging	MEM06005 Perform drop and upset forging	Superseded	Equivalent
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Assessment Requirements for MEM06012 Perform drop and upset forging

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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
- set up and use a range of drop forging and upset (and cold upset) forging equipment
- prepare and forge materials using drop and upset methods, including using lubricants for forged material release
- perform material finishing and correction of forging galls, folds and cracks as necessary.

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)
- drop and upset forging techniques
- characteristics of drop hammers and upsetting machines
- reasons for and rectification of incorrect alignment of dies and punches
- preparation of dies (pre-heating, lubrication, assessment of defects and conformance to determine replacement requirements)
- techniques for materials pre-heating
- tools, techniques and equipment for drop and upset forging
- techniques for setting, adjusting and operating drop hammers and upsetting machines
- characteristics of galls, folds, and cracks in drop and upset forged products and how to rectify these defects

- removal of flash and fins from drop/upset forged articles
- calculations for material volume, weight and allowances, including allowances for scale, flash and fin
- thermal expansion and contraction and its impact on die design.

Assessment Conditions

- Assessors must:
 - have vocational competency in performing drop and upset forging 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.
- 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.

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>.