



Australian Government

MEM06004 Select heat treatment processes and test finished product

Release: 1

MEM06004 Select heat treatment processes and test finished product

Modification History

Release 1. Supersedes and is equivalent to MEM06004B Select heat treatment processes and test finished product

Application

This unit of competency defines the skills and knowledge required to select the appropriate process to achieve the desired result, record and maintain heat treatment information, and test treated materials.

Equipment used does not include drop and upset machinery, vacuum furnaces or rolling and extruding mill machinery.

Where destructive and/or non-destructive testing is required units defining the appropriate skills and knowledge should also be selected.

Where heat treatment is required appropriate heat treatment units should also be selected.

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

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

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

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

Band: A

Unit Weight: 6

Pre-requisite Unit

MEM06003	Carry out heat treatment
MEM11011	Undertake manual handling
MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information

Competency Field

Forging

Elements and Performance Criteria

Elements describe the essential outcomes.

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

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|---|--------------------------------------|-----|--|
| 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 | Select heat treatment process | 2.1 | Determine appropriate heating processes and equipment suited to the metal composition and the effects of heat and cooling on that metal composition |
| | | 2.2 | Determine heat treatment process to achieve specified result using reference material, metallurgist's report, and consultation with technical specialists or other appropriate personnel |
| | | 2.3 | Enter selection into production documentation |
| | | | |
| 3 | Test material | 3.1 | Prepare material for testing, as required |
| | | 3.2 | Carry out destructive and/or non-destructive testing of material properties using appropriate testing equipment |
| | | 3.3 | Identify any heat treatment faults and report, if appropriate |
| | | 3.4 | Rectify heat treatment faults, where possible |
| | | 3.5 | Record and maintain information relating to equipment, as required |

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.

- Heat treatment processes include one (1) or more of the following:**
- coatings and packings
 - preheating
 - soaking
 - quenching
 - tempering
 - annealing
 - normalising
 - carburising
 - sintering

- Metal composition includes one (1) or more of the following:**
- high/low carbon steel
 - ferrous/non-ferrous

- Equipment includes one (1) or more of the following:**
- salt baths
 - vacuum furnace
 - induction heating
 - kilns
 - gas fired furnaces

- Materials include one (1) or more of the following:**
- ferrous metals
 - non-ferrous metals

- Testing includes the following:**
- destructive methods
 - non-destructive methods

- Heat treatment faults include one (1) or more of the following:**
- thermal fractures
 - distortion

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.

the following:

- shrinkage
- oxidisation

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM06004B Select heat treatment processes and test finished product

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 MEM06004 Select heat treatment processes and test finished product

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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 specifications, reports and other applicable reference documents in selecting heat treatment process and testing of finished product
- determining the heat treatment process to achieve the desired result for the composition of the material
- identifying and rectifying heat treatment faults
- testing the treated material using destructive and non-destructive testing methods
- maintaining heat treatment and testing work documentation.

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)
- treatment material features and characteristics
- heat treatment processes and effects of heat on material characteristics
- material preparation including quenching, preheating, temperature requirements for different materials and processes
- types of destructive and non-destructive testing and their use
- heat treatment faults and corrections.

Assessment Conditions

- Assessors must:
 - have vocational competency in selecting heat treatment processes and testing finished product 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.

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