



Australian Government

Department of Education, Employment and Workplace Relations

MEM06004B Select heat treatment processes and test finished product

Release: 1

MEM06004B Select heat treatment processes and test finished product

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers selecting the appropriate process to achieve the desired result, recording and maintaining heat treatment information, and testing treated materials.
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Application of the Unit

Application of the unit	<p>This unit applies to the heat treatment of ferrous and non-ferrous metals using a variety of equipment. Equipment range does not include drop and upset machinery, vacuum furnaces or rolling and extruding mill machinery.</p> <p>Band: A</p> <p>Unit Weight: 6</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM06003C	Carry out heat treatment

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine job requirements	1.1. Heat treatment process to achieve specified result is determined using reference material, metallurgist's report, consultation with technical specialists or other appropriate personnel. 1.2. Knowledge of metal composition and effects of heat and cooling is applied to selection of appropriate process and equipment.
2. Record and maintain heat treatment information	2.1. All relevant task information is recorded according to standard operating procedures. 2.2. Information relating to equipment and processes is maintained as required.
3. Test material	3.1. Material is prepared for testing as required. 3.2. Properties of material are tested using appropriate testing equipment as required. 3.3. Heat treatment faults are identified and reported if appropriate. 3.4. Heat treatment faults are rectified where possible.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: <ul style="list-style-type: none"> • preparing materials for testing • using appropriate equipment to test materials • identifying heat treatment faults • rectifying heat treatment faults • reading, interpreting and following information on written job instructions, specifications, standard operating procedures, reports and other applicable reference documents • entering routine and familiar information onto proformas and standard workplace forms • checking and clarifying task-related information

REQUIRED SKILLS AND KNOWLEDGE**Required knowledge**

Look for evidence that confirms knowledge of:

- material characteristics and properties
- heat treatment processes
- effect of heat on material characteristics
- material preparation
- quenching, preheating, temperature requirements for different materials and processes
- types of destructive and non-destructive testing
- heat treatment faults and corrections
- hazards/control measures within the scope of this unit
- use and application of personal protective equipment
- safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE	
<p>The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.</p>	
<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to determine the appropriate process to achieve the desired result, maintain documentation of jobs, and test the treated material. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.</p>
<p>Context of and specific resources for assessment</p>	<p>This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with selecting heat treatment processes and testing finished products or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
<p>Method of assessment</p>	<p>Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to tools, equipment, materials and documentation required and must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.</p>

EVIDENCE GUIDE

Guidance information for assessment	
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Range Statement**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Heat treatment process	Coatings and packings, preheating, soaking, quenching, tempering, annealing, normalising, carburising, sintering
Metal composition	High/low carbon steel, ferrous/non-ferrous
Equipment	Salt baths, vacuum furnace, induction heating, kilns, gas fired furnaces etc. Equipment range does not include drop and upset machinery, vacuum furnaces or rolling and extruding mill machinery.
Material	Ferrous and non-ferrous metals
Testing	Testing includes destructive and non-destructive methods
Heat treatment faults	Thermal fractures, distortion, shrinkage, oxidation, etc.

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units		

Competency field

Competency field	Forging
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