



Australian Government

MEM48019 Monitor secondary steel making operations

Release: 1

MEM48019 Monitor secondary steel making operations

Modification History

Release 1. Supersedes and is equivalent to MSATCM508A Monitor secondary steelmaking operations.

Application

This unit of competency defines the knowledge and skills required to monitor the production of slabs prior to rolling.

It applies where a technician will be required to monitor the post steel making processes including adjustments within the ladle and control of the continuous casting of slabs in accordance with parameters provided and standard operating procedures (SOPs).

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

Pre-requisite Unit

MEM48001 Test the mechanical properties of materials

MEM48004 Interpret basic binary phase diagrams

MEM48014 Recommend a refractory for an application

Competency Field

Metallurgy

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
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 work information
2. Produce slabs to	2.1 Adjust contents of ladle in accordance with procedures

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
specification	2.2 Monitor continuous casting process in accordance with SOPs 2.3 Apply metallurgical principles to determine and prioritise required actions in accordance with SOPs 2.4 Record adjustments and variations to specifications and/or schedules and report to appropriate personnel 2.5 Refer all events outside of parameters or SOPs to appropriate personnel for remedial action immediately

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

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.

Metallurgical principles include:	• post steel making methods employed • types of steel including ingot characteristics, rimmed, capped, killed and semi-killed • factors contributing to successful casting • mode of solidification • continuous casting processes • metallurgical aspects.
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Unit Mapping Information

Release 1. Supersedes and is equivalent to MSATCM508A Monitor secondary steelmaking operations.

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 MEM48019 Monitor secondary steel making operations

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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:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- identifying and interpreting specifications, safety procedures and other reference material to monitor secondary steel making operations
- meeting specifications for furnace output on at least two occasions
- communicating within the workplace
- maintaining accurate records.

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)
- metallurgical principles
- post steel making methods employed including:
 - ladler stirring
 - ladle heating and ladle furnace
 - degassing including vacuum, ladle, stream and circulating
 - argon oxygen decarburation (AOD)
 - electroslag refining and remelting (ESR)
 - vacuum melting
- types of steel including ingot characteristics of rimmed, capped, killed and semi-killed
- factors contributing to successful casting
- ingots including:
 - influence of pouring techniques on structures of ingots
 - pit practices
 - teeming including type of ingot moulds
- mode of solidification including:

- types of ingot structure
- control of ingot structure
- ingot defects
- continuous casting processes including:
 - basic principles
 - need for concast
 - development including new technologies and facilities of continuous casting for concast
 - types of concast units including vertical continuous caster (VCC), horizontal continuous caster (HCC) and curvilinear
 - description of plant equipment and process principles, concast operations
- metallurgical aspects including:
 - instrumentation - sensor quality
 - solidification/internal quality
 - defects and their origin - avoidance of defects
- comparison of concast units and static ingot production.
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Assessment Conditions

- Assessors must:
 - have vocational competency in monitoring secondary steel making operations 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 that 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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