



**Australian Government**

# **PMASMELT261 Bake carbon anodes**

**Release: 1**

# PMASMELT261 Bake carbon anodes

## Modification History

Release 1. Supersedes and is equivalent to PMASMELT261B Bake carbon anodes

## Application

This unit of competency covers the skills and knowledge required to operate the carbon bake processes in the production of carbon anodes used in the aluminium smelting process.

This unit of competency applies to operators who are required to operate and monitor all equipment in the carbon anode bake process, apply re-start, start-up and shutdown procedures, isolate and de-isolate plant, and recognise and respond to 'out-of-parameter' issues.

This unit of competency applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate. The operator would be part of a team during start up and shut down procedures.

This unit of competency does not require the operation of a central control panel.

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

## Pre-requisite Unit

Nil

## Competency Field

Operations

## Unit Sector

## Elements and Performance Criteria

Elements describe the essential outcomes.

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

1	<b>Plan and prepare for operations</b>	1.1	Interpret and confirm work requirements before proceeding
		1.2	Identify and control hazards
		1.3	Ensure appropriate authorisations have been obtained/issued
		1.4	Identify work flow path blockages (interruptions or

- bottlenecks)
- 2     **Conduct pre-start requirements to procedures**
    - 2.1    Conduct routine pre-start equipment checks
    - 2.2    Conduct isolation as appropriate for pre-start inspections
    - 2.3    Prepare equipment for operation
    - 2.4    Complete routine equipment checklists
    - 2.5    Complete reports as required for equipment inspections
  
  - 3     **Conduct carbon bake operations to procedures**
    - 3.1    Start up anode bake and ancillary equipment
    - 3.2    Monitor equipment operation and check operational variables are within parameters
    - 3.3    Verify equipment performance throughout the process
    - 3.4    Adjust equipment/variables in accordance with procedures
    - 3.5    Apply operating principles to identify problems and take action
    - 3.6    Shut down anode bake and ancillary equipment as required
    - 3.7    Conduct routine housekeeping activities
    - 3.8    Recognise and respond to emergencies should one arise
    - 3.9    Complete records as required for equipment operation and performance
  
  - 4     **Isolate and de-isolate plant**
    - 4.1    Isolate plant
    - 4.2    Make safe for required work
    - 4.3    Check plant is ready to be returned to service
    - 4.4    De-isolate and prepare plant for return to service

## 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.

### Regulatory framework

The latest version of all legislation, regulations, industry codes of practice and Australian/international standards, or the version specified by the local regulatory authority, must be used, and include one or more of the following:

- legislative requirements, including work health and safety (WHS)
- industry codes of practice and guidelines
- environmental regulations and guidelines
- Australian and other standards
- licence and certification requirements

All operations to which this unit applies are subject to stringent health, safety and environment (HSE) requirements, which may be imposed through state/territory or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

**Equipment and tools** Equipment and tools include one or more of the following:

- carbon anode furnace
- ancillary equipment, such as scrubbers and fans
- conveyors
- cranes
- mobile equipment, such as scissor lifts, forklifts and front-end loaders
- harnesses and slings
- materials handling equipment
- hand tools

**Procedures**

All operations must be performed in accordance with relevant procedures.

Procedures are written, verbal, visual, computer-based or in some other form, include one or more of the following:

- emergency procedures
- work instructions
- standard operating procedures (SOPs)
- safe work method statements (SWMS)
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant

**Hazards**

Hazards include one or more of the following:

- open furnace pits, ring main risers, fire shaft pit, riser shaft and natural gas
- heat (e.g. burns, dehydration and heat stress)
- energy sources (e.g. hydraulic, pneumatic and electric)
- high pressure piping and valves
- pinch and crush points
- moisture
- banned items
- mobile equipment and pedestrian interaction
- furnace emissions
- suspended loads and roller conveyors
- hazardous materials (e.g. reactive alumina, kaowool, tar and pitch)
- molten materials
- equipment failures
- industrial (machinery, equipment and product)
- equipment or product mass
- noise, rotational equipment or vibration
- other hazards that might arise

**Routine problems**

Routine problems must be resolved by applying known solutions.

Routine problems are predictable and include one or more of the

following:

- temperature and oxygen fluctuations
- production line speed variations
- variation of product specification on the input and output side
- electrical problems
- instruments and equipment requiring cleaning
- equipment mechanical problems
- flow path blockages
- out-of-parameter emissions
- unavailability of equipment, personnel or material

Known solutions are drawn from one or more of the following:

- procedures
- training
- remembered experience
- historical data and records of common faults
- troubleshooting lists and directives
- site procedures

Non-routine problems must be reported according to according to relevant procedures.

### **Instrument/electrical systems**

Instrument/electrical systems include one or more of the following:

- emergency shutdown systems (ESD)
- fire systems
- pressure and temperature control systems
- communications systems
- utility systems

### **Operate**

Operate is to monitor, adjust/make change to the production unit and/or its component items to meet specifications, by one or both of the following:

- manually in the plant
- using local controller in the plant

### **Pre-start checks**

Pre-start checks will conform to site procedures or equipment pre-start checklist. They must be completed before the equipment is operated unless stated in the procedures.

**Reports**

Reports and records include one or more of the following:

- routine inspections (daily readings and monthly checks)
- scheduled maintenance activities
- computer readouts locally or in the control room
- shift log sheet
- mandatory or statutory inspections
- hazard, accident and incident reports
- quality inspection reports of the product

**Shutdown procedures**

Shutdown procedure must follow equipment and site authorised checklist and will typically include the following:

- communication to supply and delivery areas
- communication to impacting areas
- obtaining appropriate authorisations
- rescheduling operations
- liaison with maintenance teams

**Start-up procedures**

Start-up procedure must conform to site procedures and will typically include the following:

- safety and pre-start checks
- accessing shift logs and equipment records
- pre-shift briefing information
- records and reports from the previous shift

**Work requirements**

Work requirements will be identified from one or more of the following:

- shift briefings
- shift logs
- supervisor or crew leader meetings
- toolbox talks
- handover details

## Unit Mapping Information

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## Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=9fc2cf53-e570-4e9f-ad6a-b228ffdb6875>