



Australian Government

PMC70110 Graduate Certificate in Refractories Engineering

Release: 2

PMC70110 Vocational Graduate Certificate in Refractories Engineering

Modification History

Release 2 - Imported units updated to current versions. No change in outcomes.

Release 1 - Initial release

Description

The Vocational Graduate Certificate in Refractories Engineering has been developed as a technical qualification for people who come to the industry with a relevant qualification, such as a Degree in science or engineering (or equivalent) and need specialist refractory knowledge.

This qualification was developed in response to an industry need for specialist refractories skills which are not provided by existing qualifications. There is no current Australian qualification for this target group. It has strong industry support and the qualification and its units of competency reflect the industry requirements. This qualification was developed in liaison with the Institute of Refractories Engineers Australian Branch.

Job roles/employment outcomes

Typical job roles for these people would be project engineer, maintenance engineer, purchasing engineer, area engineer, section manager, operations manager, project controller or project planner in a refractory area. Typically they will have some management/executive responsibility, but require technical competence in refractory related areas to complete this role.

Graduates from this Vocational Graduate Certificate in Refractories Engineering would be able to:

- design new refractory installations
- analyse refractory failures
- specify refractory repairs
- monitor and control new installations and repairs.

This requires knowledge of refractories and also structures.

Application

This qualification applies to recent graduates or graduates with recent refractories experience. It may also be used by those with significant industry experience who wish to upgrade their skills or seek recognition for skills they already possess. Refractories are used by many industry sectors including:

- power generation
- oil refining
- steel making
- aluminium smelting
- foundaries/casting
- glass making
- cement manufacture.
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Pathways Information

Not applicable.

Licensing/Regulatory Information

Licensing considerations

There are no specific licences that relate to this qualification. However, depending on the jurisdiction, licensing or regulatory requirements may apply to the use of some units of competency in this qualification. Local regulations should be checked for details.

Entry Requirements

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Entrants to the Vocational Graduate Certificate in Refractories Engineering are required to have one of the following:

- Bachelor Degree in Engineering or related discipline
- Bachelor Degree in Science or related discipline
- a relevant Diploma, such as the PMC60110 Advanced Diploma of Manufactured Mineral Products, together with significant relevant vocational practice
- relevant extensive vocational practice without formal qualification or with a different qualification to those mentioned above.

For the purposes of this qualification, the term 'vocational practice' is defined as experience of:

- designing of new refractory installations and/or repairs
- project managing refractory installations
- assisting in a significant way with the above.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification
Communication	• communicate technically with both technicians and customers • determine problems/issues • explain requirements and problem solutions • complete all reports • communicate with stakeholders • obtain 'sign off' from all relevant persons • ensure project records are complete
Teamwork	• work autonomously or as part of a team • liaise and cooperate with other team members • identify own role and responsibility within a team • undertake appropriate and effective communication with team members
Problem solving	• identify and define problems • apply knowledge of materials, product purpose and processes • suggest solutions to problems • clarify and address potential issues
Initiative and enterprise	• determine problems needing action • recommend required action • recognise problems in systems and documentation • critically analyse information • develop continuous improvement strategies • investigate, rectify and report non-conformance • use analytical and decision making skills • recommend corrective and/or optimisation actions
Planning and organising	• organise and prioritise required work • coordinate actions or various people • plan work activities • identify requirements for resources and organise their availability • analyse surface coating systems
Self-management	• operate within appropriate time constraints and work standards • select and use appropriate equipment, materials, processes and procedures • identify resource requirements, document and monitor
Learning	• research and evaluate surface coating systems • ask questions to gain information • identify sources of information to expand knowledge and understanding • recognise limits of own professional expertise and consult specialists

	as necessary • participate in improvement procedures • access technical manuals/specifications to expand knowledge
Technology	• use testing equipment • determine requirements for activities and projects • interpret test/trial results • interpret procedures and specifications • recommend a modified process

Packaging Rules

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To be awarded the Vocational Graduate Certificate in Refractories Engineering competency must be achieved in **ten (10)** units of competency:

- **three (3)** core units of competency
- **seven (7)** elective units of competency chosen from Groups A and B, as described below.

Note: Prerequisite units are listed and must be considered in the total number of units chosen.

Core units of competency

Select all **three (3)** units from this list.

Unit code	Title	Prerequisites
MSAPMOHS200A	Work safely	
PMC557090A	Select refractory materials for an application	
PMC557091A	Design a refractory lining	

Elective units of competency

Group A - Specialist electives

A minimum of **four (4)** units must be selected from the list below.

Unit code	Title	Prerequisites
PMC557092A	Specify and interpret refractory tests	
PMC557093A	Design a refractory/ceramic component	
PMC557094A	Investigate refractory failures	

Unit code	Title	Prerequisites
PMC557095A	Specify and monitor the installation of monolithic/castable refractories	
PMC557096A	Specify and monitor the installation of block/precast refractories	
PMC557097A	Specify and monitor repairs to refractory installations	
PMC557098A	Specify refractory installation systems	

Group B - Other electives

The balance of units, to a maximum of **three (3)**, may be chosen in any combination from:

- units not already chosen from Group A above
- Group B units listed below

Unit code	Title	Prerequisites
MSS407013A	Review continuous improvement processes	
MSS407002A	Review operations practice tools and techniques	
MSS407007A	Respond to a major non-conformance	
MSS407012A	Lead a problem solving process to determine and solve root cause	
MSAENV672B	Develop workplace policy and procedures for sustainability	
MSL916005A	Manage complex projects	
PMC557001A	Manage trials	
Up to two (2) relevant units may be chosen from this Training Package, other endorsed Training Packages and accredited courses where those units are available at Diploma and above.		