Australian Government

PMC557093 Design a refractory/ceramic component

Release: 1

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

PMC557093 Design a refractory/ceramic component

Modification History

Release 1. Supersedes and is equivalent to PMC557093A Design a refractory/ceramic component

Application

This unit of competency covers the skills and knowledge required to design a refractory/ceramic component. It applies to design of refractory components such as:

- shafts
- bearing plates/rings
- nozzles and tips
- valves and valve seats
- crucibles and crucible linings
- shelving.

This unit of competency applies to operators who are required to negotiate agreed requirements for the refractory component and identify and develop optimum refractory component design to meet the requirements.

This unit of competency applies to senior technicians or those in similar roles who are required to analyse and synthesise advanced theoretical and technical knowledge and apply independent judgement to high-level technical issues and complex problems. The individual may work in liaison with other refractory specialists or they may be the sole refractory specialist for this job or in their organisation.

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

Pre-requisite Unit

Nil

Competency Field

Technical

Unit Sector

Not applicable

Elements and Performance Criteria

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
1	**Confirm required end use**	1.1	Liaise with relevant stakeholders
		1.2	Confirm the end use conditions for the refractory
		1.3	Define interface requirements with the product
		1.4	Identify discrepancies or conflicts in requirements
		1.5	Negotiate a consistent set of requirements for the refractory component
2	**Undertake preliminary design**	2.1	Undertake required mechanical design calculations
		2.2	Undertake the required heat transfer calculations
		2.3	Undertake relevant thermal expansion calculations
		2.4	Determine implications for refractory material selection
		2.5	Liaise with refractory material selector
		2.6	Prepare preliminary designs of component
3	**Compare possible design solutions**	3.1	Compare the preliminary designs with the set of requirements
		3.2	Rank possible design solutions
		3.3	Identify health, safety and environmental (HSE) risks of top ranked possible refractory designs
		3.4	Estimate the cost of top ranked possible refractory designs
4	**Design refractory component**	4.1	Liaise with relevant stakeholders
		4.2	Determine customer issues of relevance to the refractory designs
		4.3	Determine manufacturing issues of relevance to the

			refractory designs
		4.4	Review shortlist ranking
		4.5	Recommend optimum refractory component design for the end use
5	**Develop design and technical specification for recommended refractory component**	5.1	Determine suitable format for design and specification
		5.2	Prepare design and specification
		5.3	Review specification with refractory material selector, production and customer
		5.4	Modify design and specification if required
		5.5	Publish design and specification in required format to required people/organisations

Foundation Skills

This section describes those required skills (language, literacy and numeracy) 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.

Applicable legislation, regulations, standards and codes of practice include:

- HSE legislation, regulations and codes of practice relevant to the workplace, equipment and production processes and hazardous materials
- Australian/international standards relevant to the materials being used and products being made
- any relevant licence and certification requirements.

All operations to which this unit applies are subject to stringent 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 such requirements the legislative requirements take precedence.

HSE and other risks

Identification of HSE and other risks includes consideration of:

- health and safety risks
- sustainability risks
- regulatory risks
- business risks.

Unit Mapping Information

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Links

MSA Training Package Implementation Guides - http://mskills.org.au/training-packages/info/