



Australian Government

PMBTECH504 Determine heat transfer loads for processing equipment

Release: 1

PMBTECH504 Determine heat transfer loads for processing equipment

Modification History

Release 1. Supersedes and is equivalent to PMBTECH504B Determine heat transfer loads for processing equipment

Application

This unit of competency covers the skills and knowledge required to determine heat transfer loads for processing equipment.

This competency applies to senior technicians or similar roles who are required to apply in-depth knowledge of materials, process, equipment and problem solving in order to calculate heating/cooling loads of processing equipment/components, select appropriate heating and/or cooling mechanism for an application and determine heating requirements for process conditions.

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.

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|---|-----------------------------------|-----|--|
| 1 | Calculate heat transferred | 1.1 | Calculate conductive heat transfer to/from an object |
| | | 1.2 | Calculate convective heat transfer to/from an object |

	from/to items	1.3	Calculate radiative heat transfer to/from an object
		1.4	Calculate combined heat transfer to/from an object, including resistances in series and parallel
2	Calculate temperature change caused by a change in heat content	2.1	Calculate temperature change caused by heating/cooling of polymer compounds in typical examples of processing equipment
		2.2	Calculate change in heat content caused by shear on a polymer compound
		2.3	Calculate temperature rise caused by shear on a polymer.
3	Select appropriate heating and/or cooling mechanism for an application	3.1	Compare rates of heat transfer/overall heat transfer coefficients for major methods of heating and cooling
		3.2	Determine appropriate methods of varying/controlling rates of heat transfer
		3.3	Calculate heat transfer rates under a range of conditions
4	Determine heating required to suit process conditions	4.1	Determine heating requirements to obtain correct viscosity for processing
		4.2	Select appropriate heat transfer mechanism(s) to achieve desired conditions
5	Conduct energy balance over process components	5.1	Determine overall heating load for process components
		5.2	Determine overall cooling load for process components
		5.3	Determine the adequacy (or otherwise) of the process/plant heating/cooling system to cope with this

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:

- health, safety and environmental (HSE) legislation, regulations and codes of practice relevant to the workplace, materials and processes being used and products being made
- 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.

Procedures All operations must be performed in accordance with relevant procedures.

Procedures may be written, verbal, visual, computer-based or in some other form. They include one or any combination of:

- test procedures
- technical specifications
- technical drawings
- 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.

Unit Mapping Information

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Links

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