



Australian Government

MEM48004 Interpret basic binary phase diagrams

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MSATCM304A Interpret basic binary phase diagrams.

Application

This unit of competency defines the knowledge and skills required to interpret phase diagrams and so predict the microstructures of binary alloys.

It applies to the interpretation of cooling phase diagrams as used in metallurgy. The application will primarily be to phase diagrams of metals and alloys showing temperature and composition variables.

It applies where a technician will be required to recommend a phase transition process in order to obtain a required microstructure, or to predict a microstructure from a known phase transition process.

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

Unit Weight: 4

Pre-requisite Unit

Nil

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 Identify job requirements from work information
2. Identify the microstructures from an equilibrium cooling	2.1 Obtain phase diagram for metal or alloy from internal or external sources

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
phase diagram	2.2 Identify number, composition, proportion and structural arrangement of phases in binary alloys 2.3 Identify structural changes due to varying proportion of alloying elements and temperature 2.4 Identify the phase changes and final microstructures of binary alloys cooled under equilibrium conditions from the melt or during heat treatment operations
3. Identify the microstructures from a non-equilibrium cooling phase diagram	3.1 Identify number, composition, proportion and structural arrangement of phases in binary alloys 3.2 Identify structural changes due to varying proportion of alloying elements and temperature 3.3 Identify the phase changes and final microstructures of binary alloys cooled under equilibrium conditions from the melt or during heat treatment operations
4. Recognise characteristic microstructures of binary alloys	4.1 Recognise characteristic structures of dendrites (homogeneous and cored) columnar and equiaxed grains 4.2 Recognise characteristic structures resulting from eutectic, eutectoid and peritectic reactions 4.3 Recognise characteristic structures resulting from solid state precipitation

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.

Scientific techniques and principles of cooling phase	• equilibrium phase diagrams • non-equilibrium phase diagrams
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diagrams relate to one or more of the following:	• effect of temperature and alloying elements on structural changes • structures of homogenous and cored dendrites • structures of columnar and equiaxed grains • eutectic, eutectoid and peritectic reactions.
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Unit Mapping Information

Release 1. Supersedes and is equivalent to MSATCM304A Interpret basic binary phase diagrams.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>