



**Australian Government**

# **MEM48029 Interpret and produce complex binary phase diagrams**

**Release: 1**

# MEM48029 Interpret and produce complex binary phase diagrams

## Modification History

Release 1. Supersedes and is equivalent to MSATCM518A Interpret complex binary phase diagrams.

## Application

This unit defines the skills and knowledge required to interpret complex phase diagrams and so predict the microstructures of binary alloys and the behaviour of metals and alloys under quenching. It also includes the production of diagrams.

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

It applies where a metallurgy technician is 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.

## Pre-requisite Unit

MEM48004 Interpret basic binary phase diagrams.

## 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)<br>1.2 Comply with work health and safety (WHS) requirements at all times<br>1.3 Identify job requirements from specifications |
| 2. Interpret cooling phase diagrams              | 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>                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                  | <p>2.2 Review diagram and identify number, composition, proportion and structural arrangement of phases including intermediate phases in binary alloys</p> <p>2.3 Identify microstructures in terms of their structure, phase changes, intermetallic compounds and solid solutions</p> <p>2.4 Establish the final microstructures of binary alloys cooled under equilibrium conditions from the melt or during heat treatment and quenching operations</p> <p>2.5 Determine and accurately record workplace implications of diagram information</p> |
| 3. Produce cooling phase diagrams                | <p>3.1 Identify scope and nature of data required to produce diagram</p> <p>3.2 Identify and access data sources</p> <p>3.3 Use data from thermal analysis to create accurate and complete diagram</p>                                                                                                                                                                                                                                                                                                                                              |

## 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.

|                                                      |                                                                                                                  |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Specifications include one or more of the following: | <ul style="list-style-type: none"> <li>• drawings</li> <li>• job sheets</li> <li>• work instructions.</li> </ul> |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|

## Unit Mapping Information

Release 1. Supersedes and is equivalent to MSATCM518A Interpret complex 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>