



Australian Government

**Assessment Requirements for MEM48033
Apply chemistry principles to materials
used in manufacturing and engineering
processes**

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Modification History

Release 1. New unit.

Performance Evidence

There must be evidence the candidate has demonstrated the ability to:

- write and use chemical formulae in relevant metallurgical and polymer processes on at least two occasions
- write and balance chemical equations
- calculate heat of reaction
- apply boyles and charles laws to determine the relationship between volume, temperature, and pressure for at least two selected gases
- determine the amounts of reactants consumed/products made using the stoichiometry of a reaction on at least two occasions.
- classify composite materials in terms of physical properties and component materials
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Knowledge Evidence

There must be evidence the candidate has knowledge of:

- identify the three states of matter and describe each state in terms of shape, volume, and compression
- nomenclature and properties of the main groups of organic compounds
- kinetic theory including:
 - boyles law and charles law
 - ideal gas equation $pV=nRT$
- ionic, covalent, and metallic bonding
- the relationship between temperature and the kinetic energy of particles
- latent and sensible heat
- molar volume of a gas
- gay-lussac's law, avogadro's law
- gas reaction calculations
- symbols of common elements including:
 - importance of valence in formulae and reactions
 - model of an atom including electron shells
- chemical reactions between elements and compounds in terms of atomic structures and periodicity

- chemical basis of energy transformations in chemical reactions
- properties of crystalline solids
- properties of non-crystalline solids and gels including:
 - structure including SiO_4 ceramics and SiO_2
 - short range order
 - vitreous/glassy state
 - viscosity
- periodic table organisation and use in determining properties of elements
- acids and bases
 - definitions
 - the relationship between an acid and its conjugate base and a base and its conjugate acid
- polymer types and classification including thermoplastics and thermosets
- stoichiometry.
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Assessment Conditions

Skills must have been demonstrated in the workplace or in a simulated environment that reflects workplace conditions and contingencies. The following conditions must be met for this unit:

- Assessors must:
 - have vocational competency in applying welding and related codes and standards at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015 or its replacement* and comply with the *National Vocational Education and Training Regulator Act 2011*, its replacement or equivalent legislation covering VET regulation in a non-referring State as the case requires.
- Where possible, assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions that cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- There must be suitable access to an operating plant or equipment that allows for appropriate and realistic simulation and documentation including relevant workplace procedures, industry codes and standards.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

Links

Companion Volume implementation guides are found in VETNet -

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