



Australian Government

MEM05051 Select welding processes

Release: 2

MEM05051 Select welding processes

Modification History

Release 2. Quantum of hours of workplace practice removed. Supersedes and is equivalent to MEM05051 Select welding processes (Release 1).

Release 1. Supersedes and is equivalent to MEM05051A Select welding processes.

Application

This unit of competency defines the skills and knowledge required to identify material properties and select appropriate welding processes that would typically conform to AS 1554 General Purpose and American Bureau of Shipping (ABS) or equivalent, to achieve safe and effective welding outcomes.

This unit applies to all types of welding and includes the identification of properties and characteristics of all commonly used metals, and selection of appropriate welding techniques to ensure integrity of materials is maintained during welding processes.

This unit can only be selected in conjunction with one or more of the following units:

- MEM05015 Weld using manual metal arc welding process
- MEM05017 Weld using gas metal arc welding process
- MEM05019 Weld using gas tungsten arc welding process
- MEM05023 Weld using submerged arc welding process
- MEM05047 Weld using flux core arc welding process
- MEM05055 Weld using oxy fuel gas welding process

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

Band: A

Unit Weight: 2

Pre-requisite Unit

MEM13015 Work safely and effectively in manufacturing and engineering

MEM16006 Organise and communicate information

Competency Field

Fabrication

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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	Use appropriate personal protective equipment (PPE) in accordance with SOPs
		1.4	Identify job requirements from specifications, job sheets or work instructions
2	Identify properties of commonly used metals	2.1	Identify materials to be welded
		2.2	Identify characteristics and properties of commonly used materials
		2.3	Identify uses and purposes of commonly used materials
		2.4	Consider basic metallurgical characteristics
3	Identify and provide for welding contingencies	3.1	Source Information relevant to welding processes, as required
		3.2	Identify potential contingencies and consider solutions
4	Identify appropriate welding process	4.1	Identify and select welding processes to achieve specified outcomes with selected metals
		4.2	Identify effects of welding processes on materials
		4.3	Identify distortion prevention measures
		4.4	Identify alternative joining methods for job and assess for relevancy
5	Identify cleaning	5.1	Identify processes for cleaning and preparing metals

Elements describe the essential outcomes.

and preparation requirements

Performance criteria describe the performance needed to demonstrate achievement of the element.

- 5.2 Consider role of contaminants in welding flaws
- 5.3 Identify and utilise safety requirements for chemicals and other materials in accordance with manufacturers' specifications and legislative requirements

Foundation Skills

This section describes those required skills (reading, writing, oral communication and numeracy) that are essential to workplace performance in this unit of competency.

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.

Characteristics include the following:

- tensile strength, grade, heat resistance and density

Properties include the following:

- physical properties, flammable limits and melting point

Basic metallurgical characteristics include the following:

- alloys and grades of metals and different types of electrodes

Information includes one (1) or more of the following:

- steel suppliers' handbooks
- welding company materials
- SOPs
- safety documentation

Welding processes include one (1) or more of the following:

- fusion – electric arc welding, gas (oxy-fuel) welding and thermit welding
- pressure welding processes – resistance welding, fire or forge welding, friction welding and explosive welding
- low temperature processes – soldering and brazing

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.

- other – ultrasonic welding and electron beam welding

Effects include one (1) or more of the following:

- thermal expansion
- heat affected zones
- fume emissions
- altered density
- distortion

Distortion prevention measures include one (1) or more of the following:

- heat treatments
- consolidations

Processes for cleaning and weld preparation include one (1) or more of the following:

- etching
- grinding
- arc gouging
- thermal cutting
- chemical additives
- anti-corrosion treatments

Safety requirements include one (1) or more of the following:

- dry and ventilated areas
- in accordance with workplace procedures
- location away from heat risks
- location away from incompatible substances
- requirements for hazardous substances
- adequate signage and labelling
- appropriate sealing
- routine inspections
- emergency procedures
- regulatory notification requirements

Unit Mapping Information

Release 2. Supersedes and is equivalent to MEM05051 Select welding processes (Release 1).

Release 1. Supersedes and is equivalent to MEM05051A Select welding processes.

Links

Companion Volume implementation guides are found in VETNet -

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