



Australian Government

MEM05023 Weld using submerged arc welding process

Release: 1

MEM05023 Weld using submerged arc welding process

Modification History

Release 1. Supersedes and is equivalent to MEM05023C Weld using submerged arc welding process

Application

This unit of competency defines the skills and knowledge required to carry out submerged arc welding (SAW) where the welds are more likely to be associated with heavy rather than with light fabrication.

Weld quality would typically conform to AS 1554 General Purpose or equivalent.

Where the interpretation of technical drawings is required unit MEM09002 Interpret technical drawing should also be selected.

Where the selection and use of tools is required unit MEM18001 Use hand tools and unit MEM18002 Use power tools/hand held operations, should also be selected as appropriate.

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

Band: A

Unit Weight: 4

Pre-requisite Unit

MEM05051	Select welding processes
MEM05052	Apply safe welding practices
MEM05057	Perform routine submerged arc welding
MEM09002	Interpret technical drawing
MEM11011	Undertake manual handling
MEM12023	Perform engineering measurements
MEM12024	Perform computations
MEM13015	Work safely and effectively in manufacturing and engineering
MEM14006	Plan work activities
MEM16006	Organise and communicate information

MEM18001	Use hand tools
MEM18002	Use power tools/hand held operations

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	<table><tr><td>1.1</td><td>Follow standard operating procedures (SOPs)</td></tr><tr><td>1.2</td><td>Comply with work health and safety (WHS) requirements at all times</td></tr><tr><td>1.3</td><td>Use appropriate personal protective equipment (PPE) in accordance with SOPs</td></tr><tr><td>1.4</td><td>Identify job requirements from specifications, sketches, job sheets or work instructions</td></tr></table>	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, sketches, job sheets or work instructions
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2 Prepare materials for welding	<table><tr><td>2.1</td><td>Prepare materials to achieve the required weld requirements</td></tr><tr><td>2.2</td><td>Assemble/align materials to specifications, where required</td></tr></table>	2.1	Prepare materials to achieve the required weld requirements	2.2	Assemble/align materials to specifications, where required				
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3 Select, assemble and set up welding equipment and consumables	<table><tr><td>3.1</td><td>Identify and select welding machine settings and consumables from job requirements, welding procedures and specifications and/or technical drawings</td></tr><tr><td>3.2</td><td>Assemble and set up DC welding equipment</td></tr><tr><td>3.3</td><td>Undertake test runs and verify in accordance with specifications</td></tr></table>	3.1	Identify and select welding machine settings and consumables from job requirements, welding procedures and specifications and/or technical drawings	3.2	Assemble and set up DC welding equipment	3.3	Undertake test runs and verify in accordance with specifications		
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4 Minimise and	<table><tr><td>4.1</td><td>Apply appropriate distortion prevention measures</td></tr></table>	4.1	Apply appropriate distortion prevention measures						
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	rectify distortion	4.2	Rectify any distortion using appropriate techniques
5	Weld joints using submerged arc by correct process	5.1	Deposit pad, butt and fillet welds in flat, and fillet welds in horizontal position, to specification
		5.2	Clean joints to specifications using techniques and tools appropriate to the defect, material and process
6	Ensure weld conformance	6.1	Inspect weld joints visually for conformance to specifications
		6.2	Rectify any weld defects with minimum loss of sound metal using correct techniques and tools
		6.3	Maintain weld records, where required

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.

Welds include the following:

- fillet and butt in flat and horizontal positions

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

- carbon and stainless steel

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

- pre-heating
- setting up of jigs, fixtures and clamps
- joint preparation e.g. bevelling

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

- pre-heating
- setting up of jigs
- fixtures and clamps

Rectify includes the use of one (1) or more of the following:

- oxy acetylene
- air arc equipment
- grinding devices

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

- porosity
- slag inclusions
- discontinuities
- lack of penetration
- undercut

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM05023C Weld using submerged arc welding process

Links

Companion Volume implementation guides are found in VETNet -

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

Assessment Requirements for MEM05023 Weld using submerged arc welding process

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria on at least two (2) occasions and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- identifying and interpreting specifications from drawings, sketches and verbal or written job instructions for welding using submerged arc welding (SAW) process to AS 1554 General Purpose or equivalent
- selecting appropriate weld and joint preparation methods
- consistently weld materials to the specified standard or equivalent using DC welding machines and electrodes while preventing distortion
- rectifying any defects
- completing and maintaining weld records related to SAW welding onto standard workplace forms.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- safe welding practices and procedures and use of personal protective equipment (PPE)
- main types of fluxes and flux/wire combinations
- typical applications of SAW and common materials
- application of weld metal transfer (short arc and spray)
- material preparation
- joint preparations
- electrode classification
- causes of distortion for materials
- causes of defects and methods of rectification
- requirements of AS 1554 General Purpose or equivalent.

Assessment Conditions

- Assessors must:

- have vocational competency in welding using SAW process 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/territory 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. This must cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications
- 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.

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