



Australian Government

MEM05068 Apply welding procedure specifications

Release: 1

MEM05068 Apply welding procedure specifications

Modification History

Release 1. New Unit.

Application

This unit of competency was developed for engineering fabrication trade training and the recognition of trade skills in applying welding procedure specifications (WPS) to welding and related tasks.

It defines the required welding and material knowledge and skills, relevant welding standards, welding terminology and welder qualification requirements to undertake welding to a WPS as defined in the unit in conjunction with its prerequisites.

This unit must be selected in combination with one or more of the MEM welding process units aligned to AS 1554 General Purpose (GP), or equivalent. Higher level MEM welding process units may also be used for the co-assessment. MEM AS 1554 GP or equivalent aligned units are:

MEM05090 Weld using manual metal arc welding process

MEM05091 Weld using gas metal arc welding process

MEM05092 Weld using gas tungsten arc welding process

MEM05097 Weld using oxy fuel gas welding process

MEM05093 Weld using submerged arc welding process

MEM05096 Weld using flux core arc welding process.

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

Band: B

Unit Weight: 4

Pre-requisite Unit

MEM05085 Select welding processes

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	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, drawings, job sheets or work instructions
2. Review WPS requirements for welding task	2.1 Identify and obtain relevant WPS 2.2 Identify relevant joints, welding parameters and requirements of any specified codes or standards 2.3 Confirm materials and welding consumables compliance with WPS specification 2.4 Identify WPS sampling and test requirements and implications for job plan, materials and consumables usage 2.5 Identify any job requirements for welding task that are additional to or may require variation to WPS and obtain approval from appropriate person
3. Apply WPS to welding task	3.1 Produce and document any pre-fabrication test pieces required for non-destructive tests (NDTs) and other tests specified in WPS 3.2 Perform fit up as specified in WPS 3.3 Perform joint preparation and any pre-heat specified in WPS 3.4 Perform required welds including any specified sample welds using welding parameters and ranges specified in WPS 3.5 Complete any post weld heat treatment specified in WPS 3.6 Record welds specified in WPS and enterprise requirements

Foundation Skills

This section describes those language, literacy, numeracy and employment skills 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.	
Welding procedure specifications (WPS):	the WPS is a mandatory document for welding used by some fabricators for welding against codes and standards and may also be required by fabricators for welding not carried out against codes and standards. It is the formal work instruction for a welder. The WPS can vary in format depending on fabricator and customer requirements.
Standards and codes include Australian or international standards and codes covering:	• welding processes • welding consumables • materials used in fabrication related projects or products • destructive and non-destructive testing of welds • qualifying of welders, welding inspectors and welding supervisors.
International welding standards development organisations includes at least one or more of the following:	• International Organization for Standardization (ISO) • American Society of Mechanical Engineers (ASME) • American Petroleum Institute (API) • American Welding Society (AWI) • British Standards (BS) • other recognised international standards setting organisations.
Welding parameters include one or more of the following:	• material specification and grade • material preparation • joint details • process type • position • run sequence and pass number • welding process • filler material • material diameter • current • voltage

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.

- polarity
- wire feed speed
- travel speed
- pre and post heat input.

Unit Mapping Information

No equivalent unit.

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 MEM05068 Apply welding procedure specifications

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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 and include the ability to:

- review approved weld procedure specifications (WPS) for at least three fabrication designs requiring welding to at least AS1554 General Purpose (GP) or equivalent including:
 - comparing WPS requirements to design requirements and enterprise procedures
 - identifying required welding parameters
 - identifying sampling and test requirements
- use procedures for seeking clarifications and variations to approved WPS
- produce at least three test pieces consistent with different WPS
- perform fit up, joint preparation and welding including any required pre and/or post weld heating for at least two fabrication designs and their approved WPS.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

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:

- welding symbols and abbreviations used in Australian or equivalent international standards
- welding parameters
- typical methods to store and access current copies of WPS in an enterprise
- standard WPS formats and content headings
- procedures for production of test pieces for destructive and non-destructive tests (NDTs)
- types of welding related NDTs and their application
- procedures for:
 - verifying/amending previously established weld test procedures
 - completing welding against a WPS
- welding parameters included in WPS and how they vary depending on the specified welding process.

Assessment Conditions

- Assessors must:
 - have vocational competency in developing and maintaining welding procedures 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.
- Assessment must occur in a functioning workplace. Where assessment in the workplace would be unsafe, impractical or threatens the environment, assessment must occur in a sufficiently rigorous simulated environment that reflects the circumstances that would be experienced in a functioning workplace. Assessment must cover all aspects of workplace performance, including task skills, task management skills, contingency management skills and job role environment skills.
- Knowledge assessment may be either verbal or written but must adequately reflect the knowledge requirements of the unit in a functioning workplace.
- 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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