



Australian Government

MEM05091 Weld using gas metal arc welding process

Release: 1

MEM05091 Weld using gas metal arc welding process

Modification History

Release 1. Supersedes and is equivalent to MEM05017 Weld using gas metal arc welding process.

Application

This unit of competency has been developed for Engineering Tradesperson – Fabrication apprenticeship training and the recognition of trade-level skills in gas metal arc welding (GMAW) on heavy or light metal fabrications. It may also apply to other trade occupations requiring higher level GMAW welding skills.

Weld quality would typically conform to Australian Standard 1554 General Purpose, and American Bureau of Shipping (ABS) or equivalent.

Where manual thermal processes associated with preparation, pre-heat and/or post-heat is required unit MEM05007 Perform manual heating and thermal cutting and unit MEM05071 Perform advanced manual thermal cutting, gouging and shaping, 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

MEM05050	Perform routine gas metal arc welding
MEM05052	Apply safe welding practices
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. Prepare materials for GMAW	2.1 Prepare materials to achieve the required weld requirements 2.2 Assemble and/or align materials to specification in accordance with SOPs
3. Select, assemble and set up welding equipment and consumables	3.1 Identify and select welding equipment and electrodes, accessories and consumables appropriate to material 3.2 Assemble and set up alternating current (AC) or direct current (DC) welding equipment
4. Minimise and rectify distortion	4.1 Apply appropriate distortion prevention measures 4.2 Rectify any distortion using appropriate techniques
5. Weld to job specification using GMAW	5.1 Ensure weld deposit is to specifications 5.2 Clean joints to specifications
6. Ensure weld conformance	6.1 Visually inspect weld joints for conformance to specifications 6.2 Rectify any weld defects with minimum loss of sound metal using correct techniques and tools 6.3 Complete weld records in accordance with SOPs

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 includes:	fillet and butt welds carried out in all positions.
Materials include one or more of the following:	• ferrous, including carbon or stainless steel • nonferrous metals • alloys suitable for GMAW.
Preparation includes one or more of the following:	• pre-heating • setting up of jigs • fixtures and clamps • joint preparation.
Distortion prevention measures include one or more of the following:	• pre-heating • setting up of jigs • fixtures and clamps.
Rectify includes the use of one or more of the following:	• oxy acetylene • air arc equipment • grinding devices.
Defects include one or more of the following:	• porosity • slag inclusions • discontinuities • lack of penetration • undercut.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM05017 Weld using gas metal 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 MEM05091 Weld using gas metal 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 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 gas metal arc welding process (GMAW) to the specified standard
- selecting appropriate weld and joint preparation methods
- consistently weld materials to the specified standard or equivalent using alternating current (AC) or direct current (DC) welding machines and electrodes while preventing distortion
- rectifying any defects
- completing weld records related to GMAW onto standard workplace forms.
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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)
- types of gases and their uses
- relationships between amperage/wire feed, voltage, gas flow, electrode and material
- application of weld metal transfer (short arc and spray)
- correct welding machine, leads, hand pieces and electrodes
- material preparation
- weld joint preparations
- filler wire classification
- causes of distortion for materials when welded
- causes of weld defects and methods of rectification
- standards for GMAW welding, including Australian Standard 1554 General Purpose (GP) and any other equivalent standards.
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Assessment Conditions

- Assessors must:
 - have vocational competency in welding using GMAW 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.
- 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.
- 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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