



Australian Government

Department of Education, Employment and Workplace Relations

MEM05019C Weld using gas tungsten arc welding process

Release: 1

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Modification History

There are no notes for this unit.

Unit Descriptor

This unit covers preparing materials, selecting and setting up the welding equipment, carrying out the gas tungsten arc welding (GTAW) and inspecting for and correcting defects.

Application of the Unit

Welds are associated with heavy or light fabrication. Fillet and butt welds in all positions would typically be performed on a range of materials that may include carbon steel or stainless steel, aluminium. The weld quality would meet the Australian Standard 1554 General Purpose or equivalent.

Licensing/Regulatory Information

Pre-Requisites

Path 1	MEM05049B Perform routine gas tungsten arc welding
	MEM05051A Select welding processes
	MEM05052A Apply safe welding practices
	MEM12023A Perform engineering measurements
	MEM18001C Use hand tools
	MEM18002B Use power tools/hand held operations

Employability Skills Information

Elements and Performance Criteria Pre-Content

Elements are the essential outcomes of the unit of competency.

Together, performance criteria specify the requirements for competent performance. Text in *italics* is explained in the range statement following.

Elements and Performance Criteria

Elements and Performance Criteria

Element	Performance Criteria
1 Prepare materials for gas tungsten arc welding (GTAW)	1.1 Weld requirements are identified from specifications and/or drawings. 1.2 Material is correctly prepared. 1.3 Materials are assembled/aligned to specification, where required.
2 Select welding machine components	2.1 Welding machine settings, accessories and consumables are identified.
3 Assemble and set up welding equipment	3.1 Welding equipment is assembled and set up.
4 Minimise and rectify distortion	4.1 Appropriate distortion prevention measures are selected for weld and material type. 4.2 Distortion is rectified.
5 Weld to job specification using GTAW	5.1 Weld deposit is to specifications. 5.2 Joints are cleaned to specifications.
6 Ensure weld conformance	6.1 Defects are removed with minimum loss of sound metal using techniques and tools appropriate to the defect, material and process. 6.2 Weld joints are visually inspected for conformance to specifications.
7 Maintain weld records as required	7.1 Weld records are completed correctly.

Required Skills and Knowledge

Evidence Guide

The evidence guide specifies the evidence required to demonstrate achievement in the unit of competency as a whole. It must be read in conjunction with the Unit Descriptor, Performance Criteria, Range Statement and the Assessment Guidelines for the Metal and Engineering Training Package

Overview of assessment requirements

A person who demonstrates competency in this unit must be able to prepare materials, select and set up the welding equipment, carry out the GTAW welding and inspect for and correct defects. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

Context of assessment

This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Interdependent assessment

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with welding using gas tungsten arc welding process (GTAW) or other units requiring the exercise of the skills and knowledge covered by this unit.

Method of assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have

access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

Consistency of performance

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.

Required skills

Look for evidence that confirms skills in:

identifying and interpreting appropriate standards e.g. Australian Standard 1554 General Purpose, American Bureau of Shipping (ABS) or equivalent

selecting and using appropriate tools and equipment

using a variety of welding machines and electrodes

identifying and rectifying weld defects

applying techniques for distortion prevention and rectification

cleaning welds

reading and interpreting information on written job instructions, specifications, standard operating procedures and drawings

recording routine information related to GTAW onto proformas and standard workplace forms

following oral instructions

measurement skills relating to joint preparation and GTAW

Required knowledge

Look for evidence that confirms knowledge of:

correct welding machine, leads, hand pieces and electrodes

material preparation

joint preparations

electrode classification

causes of distortion for materials within the scope of this unit

causes of defects and methods of rectification

the relationships between amperage, electrode and material

types of gases and their uses

types of electrodes, current settings, high frequency voltage

filler materials and consumables

safe welding practices

use and application of personal protective equipment for GTAW

Range Statement

The range statement provides information about the context in which the unit of competency is carried out. The variables and scope cater for different work requirements, work practices and knowledge between States, Territories and the Commonwealth, and between organisations and workplaces. The range statement relates to the unit as a whole and provides a focus for assessment. Text in **italics** in the performance criteria is explained here.

The following variables may be present and may include, but are not limited to, the examples listed under the scope. All work is undertaken to relevant legislative requirements, where applicable

Variable	Scope
Prepared	Preheating, setting up of jigs, fixtures, clamps, etc., joint preparation e.g. bevelling
Materials	Carbon steel or stainless steel, aluminium
Welding equipment	AC or DC welding machines
Distortion prevention measures	Preheating, setting up of jigs, fixtures, clamps, etc.
Rectified	Oxy acetylene and air arc equipment, grinding devices
Defects	Porosity, slag inclusions, discontinuities, lack of penetration, undercut

Unit Sector(s)

Related units

Where thermal processes are required, the appropriate specialisation units should be selected.

Competency field

Fabrication

Band

A

Unit Weight

4