

Title	Weld aluminium in all positions using the gas tungsten arc welding process		
Level	4	Credits	10

Purpose	<p>This unit standard covers welding of aluminium structures in all positions to Category B of AS/NZS 1665 or equivalent standards or codes, using the gas tungsten arc welding process (GTAW).</p> <p>People credited with this unit standard are able to prepare to weld; and weld aluminium in all positions using the GTAW process; and inspect and repair GTAW aluminium welds.</p>
----------------	--

Classification	Mechanical Engineering > Welding
-----------------------	----------------------------------

Available grade	Achieved
------------------------	----------

Guidance Information

- 1 References
 - Health and Safety at Work Act 2015.
 - AS/NZS 1665:2004, *Welding of aluminium structures*.
 - Health and Safety in Welding*. Wellington: Department of Labour, 2006. Available from <http://www.worksafe.govt.nz/>.
- 2 Definitions
 - Accepted industry practice* – approved codes of practice and standardised procedures accepted by the wider mechanical engineering industry sectors as examples of best practice.
 - Aluminium* – weldable aluminium alloys.
 - GTAW* – Gas tungsten arc welding; also referred to as *Tungsten Inert Gas* (TIG) welding.
 - Industry standard* – Category B of AS/NZS 1665:2004, or equivalent.
 - Welding procedure* – written work instruction providing all the necessary technical details for a specific welding application.
 - Workplace procedures* – procedures used by the organisation carrying out the work and applicable to the tasks being carried out. Examples are – standard operating procedures, safety procedures, equipment operating procedures, codes of practice, quality management practices and standards, procedures to comply with legislative and local body requirements.
- 3 Recommended for entry
 - Unit 2677, *Weld aluminium to industry standard using the gas tungsten arc welding process*.

4 Related unit standards

This unit standard is one of an GTAW aluminium welding set:

- Unit 22907, *Demonstrate and apply knowledge of welding aluminium and stainless steel* (Level 3); an introductory standard to provide foundation awareness for aluminium and stainless steel, generally delivered off job.
- Unit 2677, *Weld aluminium to industry standard using the gas tungsten arc welding process* (Level 3); a progressive aluminium specific industry standard.
- Unit 2689, *Weld aluminium in all positions using the gas tungsten arc welding process* (Level 4); A trade level aluminium specific industry standard.

5 Timeframe

All activities are expected to be completed within commercially acceptable timeframes.

Outcomes and performance criteria

Outcome 1

Prepare to weld aluminium in all positions using the GTAW process.

Performance criteria

1.1 Equipment is selected to meet welding procedure requirements.

Range power source rating and duty cycle, torch, shielding gas supply, welding cables, work clamp.

1.2 Equipment is assembled and maintained ready for use in accordance with manufacturer's instructions.

Range torch, electrode, shielding gas supply; welding cables; work clamp.

1.3 Aluminium components are prepared and assembled in accordance with welding procedure.

Range edge preparation, cleaning, tack welding to correct alignment and preset.

1.4 Consumables are selected in accordance with welding procedure.

Range filler rods are identified by specification and classification, shielding gases are identified by brand name or composition.

Outcome 2

Weld aluminium in all positions using the GTAW process.

Range five welds or test pieces:
material thickness – 3.2 to 6 mm;
welding positions – 2G, 3G, 4G, 3F, 4F.

Performance criteria

2.1 Workplace safety procedures are followed.

Range examples are – use of personal protective equipment, checking of equipment for faults, use of fume extraction equipment, elimination of risk of fire or explosion, protection from arc radiation.

2.2 Measures to minimise welding distortion are applied in accordance with accepted industry practice.

Range examples are – weld sequence, restraint, backstepping.

2.3 Welds are deposited on aluminium to industry standard and in accordance with welding procedure.

2.4 Welds are cleaned in accordance with accepted industry practice.

Outcome 3

Inspect and repair aluminium GTAW welds.

Performance criteria

3.1 Weld imperfections are identified by visual examination and workshop tests.

Range examples of workshop tests are – nick break, fillet break-over, bend, macro examination. One workshop test is required for each weld from outcome 2.

3.2 Weld imperfections are compared to the permissible levels allowed by the industry standard.

3.3 A weld defect is repaired to industry standard.

Range one of the following positions – 2G, 3G, 4G, 3F, 4F.

Planned review date	31 December 2022
----------------------------	------------------

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	30 November 1994	31 December 2022
Revision	2	14 April 1997	31 December 2022
Revision	3	5 January 1999	31 December 2022
Review	4	4 April 2001	31 December 2022
Rollover and Revision	5	20 April 2006	31 December 2022
Review	6	22 May 2009	31 December 2022
Review	7	20 July 2017	N/A

Consent and Moderation Requirements (CMR) reference	0013
--	------

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Comments on this unit standard

Please contact Competenz qualifications@competenz.org.nz if you wish to suggest changes to the content of this unit standard.