

Title	Weld steel to a general purpose industry standard using the gas metal arc welding process		
Level	3	Credits	6

Purpose	<p>This unit standard is for general purpose welding of steel to Category GP of AS/NZS 1554.1 or equivalent standards or codes, using the gas metal arc welding process (GMAW). It may be used by candidates working or intending to work in engineering fabrication related trades requiring welding competence to the AS/NZS 1554.1.</p> <p>People credited with this unit standard are able to prepare to weld steel; and weld steel to general purpose industry standard using the GMAW process; and inspect and repair GMAW steel welds.</p>
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Classification	Mechanical Engineering > Welding
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Available grade	Achieved
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Prerequisites	Unit 29651, <i>Demonstrate knowledge of health and safety when welding and thermal cutting</i> , or demonstrate equivalent knowledge and skills.
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Guidance Information

1 References

Health and Safety at Work Act 2015.

Health and Safety in Welding. Wellington: Department of Labour, 2006. Available from <http://www.worksafe.govt.nz>.

AS/NZS 1554.1:2014, *Structural steel welding – Welding of steel structures*.

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.

GMAW – Gas Metal Arc Welding, also known as *Metal Inert Gas* (MIG) welding.

Industry standard – AS/NZS 1554.1:2014 Category GP, or equivalent.

Steel – weldable low-carbon unalloyed (carbon-manganese) steel, also known as *mild steel*.

Welding procedure – written work instruction providing the necessary technical detail for a specific welding application.

3 Related unit standards

This unit standard is one of a gas metal arc welding set that is intended to be assessed in the following order:

- Unit 2672, *Weld steel to a general purpose industry standard using the gas metal arc welding process* (Level 3) – a general purpose unit standard suitable for all mechanical engineering trades.
- Unit 2673, *Weld steel structures in the downhand positions using the gas metal arc and flux cored arc welding processes* (Level 3) – a structural welding standard for steel fabricators who weld downhand to a certified structural standard.
- Unit 2684, *Weld steel structures in all positions using the gas metal arc or flux cored arc welding processes* (Level 4) – a structural welding standard for steel fabricators who weld in all positions to a certified structural standard.

Outcomes and performance criteria

Outcome 1

Prepare to weld steel using the GMAW process.

Performance criteria

1.1 Equipment is selected to meet welding procedure requirements, and assembled and maintained ready for use in accordance with manufacturer's instructions.

Range power source – rating and duty cycle;
wire feed system and gun; shielding gas supply; welding cables;
work clamp.

1.2 Steel is prepared and assembled in accordance with welding procedure.

Range cleaning, providing root face where required, tack welding to
correct alignment, preset.

1.3 Consumables are selected in accordance with welding procedure.

Range electrodes are identified by specification and classification;
shielding gases are identified by brand name and composition.

Outcome 2

Weld steel using the GMAW process to general purpose industry standard.

Range material thickness – 1 to 6 mm thickness range;

- using dip (short arc) transfer – 1G, 2F, 3G and 3F vertical down (3G and 3F limited to maximum thickness of 3mm) butt welds;
- fillet welds to include sheet or plate, fillet around a section (e.g. angle or channel) that includes an inside corner, and a right angle branch connection between RHS;
- pipe to plate;
- using spray or globular transfer – 2F fillet weld.

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 Welding parameters are verified by a trial weld run to ensure conformance to welding procedure.
- 2.3 Welds are deposited on steel to industry standard and in accordance with welding procedure.
- 2.4 Component damage is minimised and distortion is controlled during welding and handling in accordance with accepted industry practice.
- 2.5 Welds are cleaned in accordance with accepted industry practice.

Outcome 3

Inspect and repair GMAW steel 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.

Planned review date	31 December 2022
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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.