

Title	Weld steel structures in all positions using the gas metal arc welding process		
Level	4	Credits	10

Purpose	<p>This unit standard covers welding of steel structures in all positions to AS/NZS 2980, or equivalent, using the gas metal arc welding (GMAW) process.</p> <p>People credited with this unit standard are able to prepare to weld, and weld steel structures to industry standard in all positions 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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Guidance Information

- References and legislation

Health and Safety at Work Act 2015.

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

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

AS/NZS 2980:2018, *Qualification of welders for fusion welding of steels*.
- 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 2980:2018, or equivalent.

Steel – weldable low-carbon unalloyed (carbon-manganese) steel.

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

Workplace procedures – documented policies and procedures set by the organisation carrying out the work, and to documented or other directions provided to staff, and applicable to the tasks being carried out. They may include but are not limited to – standard operating procedures, site specific procedures, site safety procedures, equipment operating procedures, quality assurance procedures, product quality specifications, references, approved codes of practice, housekeeping standards, environmental considerations, on-site briefings, supervisor’s instructions, and procedures to comply with legislative and local body requirements relevant to the industry sector.

- 3 Recommended unit for entry
Unit 30283, *Weld steel structures in the downhand positions using the gas metal arc welding process*.
- 4 Related unit standards
This unit standard is one of a gas metal arc steel 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 30283, *Weld steel structures in the downhand positions using the gas metal arc welding process* (Level 3), a structural welding standard for steel fabricators who weld downhand to a certified structural standard.
Unit 30278, *Weld steel structures in all positions using the gas metal arc welding process* (Level 4), a structural welding standard for steel fabricators who weld in all positions to a certified structural standard.
- 5 Assessment information
- a All activities and evidence must meet workplace procedures and accepted industry practice.
 - b All activities are expected to be completed within commercially acceptable timeframes.

Outcomes and performance criteria

Outcome 1

Prepare to weld steel in all positions using the GMAW process.

Performance criteria

- 1.1 Equipment is selected to meet welding procedure requirements.
- Range power source rating and duty cycle; wire feed system and gun; shielding gas supply; welding cables; work clamp.
- 1.2 Equipment is assembled and maintained ready for use in accordance with manufacturer's instructions.
- Range wire feed system; gun liner, nozzle and contact tip; shielding gas supply; welding cables; work clamp.
- 1.3 Steel is prepared and assembled in accordance with welding procedure.
- Range cleaning, providing root face where required, tack welding to correct alignment, preset.

1.4 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 structures to industry standard in all positions using the GMAW process.

Range five welds;
material thickness – 8 to 16 mm;
welds – tee joints in 3F and 4F positions, butt joints in 2G, 3G, and 4G positions.

Performance criteria

2.1 Workplace safety procedures are followed.

Range 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 steel 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 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.

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

Replacement information	This unit standard and unit standard 30277 replaced unit standard 2684.
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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	20 July 2017	31 December 2020
Revision	2	27 February 2020	N/A

Consent and Moderation Requirements (CMR) reference	0013
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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.