

<b>Title</b>	<b>Weld steel structures in the downhand positions using the gas metal arc welding process</b>		
<b>Level</b>	<b>3</b>	<b>Credits</b>	<b>4</b>

<b>Purpose</b>	<p>This unit standard is for people welding steel structures in the downhand 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 to structural industry standard using GMAW in the downhand positions, and inspect and repair GMAW steel welds.</p>
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<b>Classification</b>	Mechanical Engineering > Welding
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<b>Available grade</b>	Achieved
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<b>Prerequisites</b>	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*.

AS/NZS 2980:2007, *Qualification of welders for fusion welding of steels*.

### 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 2980:2007, or equivalent.

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

*Welding procedure* – written work instruction providing all the necessary technical details 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 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.

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## Outcomes and performance criteria

### Outcome 1

Prepare to weld steel in the downhand 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 consumables are identified by specification and classification; shielding gases are identified by brand name and composition.

### Outcome 2

Weld steel in the downhand positions using the GMAW processes to structural industry standard.

**Range** material thickness – 8 to 16 mm;  
positions –1F, 2F, 1G.

#### 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 Consumables are handled in accordance with manufacturer's specifications.

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

2.4 Damage to structural components 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;  
evidence of one 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.

<b>Replacement information</b>	This unit standard and unit standard 30282 replaced unit standard 2673.
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<b>Planned review date</b>	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	N/A

<b>Consent and Moderation Requirements (CMR) reference</b>	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](mailto:qualifications@competenz.org.nz) if you wish to suggest changes to the content of this unit standard.