

<b>Title</b>	<b>Weld steel pressure pipe using the gas tungsten arc and manual metal arc welding processes</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>15</b>

<b>Purpose</b>	<p>This unit standard is for people who require welding proficiency in steel pressure pipe welding to the standard required by the ASME Boiler and pressure vessel code, or equivalent.</p> <p>People credited with this unit standard are able to prepare to weld; and weld steel pressure pipe using the GTAW and the MMAW processes; and inspect and repair GTAW and MMAW steel pressure pipe 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 2685, <i>Weld steel structures in all positions using the manual metal arc welding process</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>.

ASME BPVC-IX, *Boiler and Pressure Vessel Code, Section IX, Welding and brazing qualifications*. American Society of Mechanical Engineers, current version. Available from <https://www.asme.org/>.

### 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.

*GTAW* – Gas Tungsten Arc Welding, also referred to as *Tungsten Inert Gas* (TIG) welding.

*Industry standard* – ASME BPVC-IX or equivalent.

*MMAW* – Manual Metal Arc Welding.

*NDT* – Non-Destructive Testing.

*Steel* – weldable low-carbon unalloyed (carbon-manganese) steels or low alloyed steel for pressure pipe or pressure vessel applications.

*Welding procedure* – welding procedure specification (WPS) meeting the requirements of ASME BPVC-IX or equivalent.

*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 Timeframe

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

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## Outcomes and performance criteria

### Outcome 1

Prepare to weld steel pressure pipe using the GTAW and the MMAW processes.

#### 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, nozzle, collet, and cap; shielding gas supply; welding cables; work clamp.
- 1.3 Steel pipe is prepared and assembled in accordance with welding procedure.
- Range preparation and assembly – cleaning, verifying bevel angle, providing root face where required, tack welding to correct alignment.
- 1.4 Consumables are selected in accordance with welding procedure.

### Outcome 2

Weld steel pressure pipe using the GTAW and the MMAW processes.

Range either; the 2G and 5G positions, or the 6G position;  
size minimum – 150mm nominal bore, schedule 40.

#### Performance criteria

- 2.1 Workplace procedures relating to safety 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 Electrodes are stored and handled in accordance with manufacturer's specifications.
- 2.3 Preheat and interpass temperatures are measured to ensure compliance with welding procedure.
- 2.4 Root pass is welded using the GTAW process to industry standard and in accordance with welding procedure.
- 2.5 Fill and cap passes are welded using the MMAW process with hydrogen controlled electrodes to industry standard and in accordance with welding procedure.
- 2.6 Welds are cleaned in accordance with accepted industry practice.

### Outcome 3

Inspect and repair GTAW and MMAW steel pressure pipe welds.

#### Performance criteria

- 3.1 Weld imperfections are identified by visual examination or from a NDT report.
- 3.2 Weld imperfections are compared to the permissible levels allowed by the industry standard.
- 3.3 A weld defect is removed, rewelded and repaired to industry standard.

<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	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	17 August 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>.

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**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.