

Title	Weld steel or stainless steel pressure pipe in all positions using the gas tungsten arc welding process		
Level	4	Credits	12

Purpose	<p>This unit standard is for people who require welding proficiency in steel or stainless steel pressure pipe welding in all positions 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 or stainless steel pressure pipe in all positions using the GTAW process; and inspect and repair GTAW pressure pipe welds.</p>
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Classification	Mechanical Engineering > Welding
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Available grade	Achieved
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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 2980:2007, *Qualification of welders for fusion welding of steels*. Available from <https://www.standards.govt.nz/>.

ASME BPVC-IX, *Boiler and Pressure Vessel Code, Section IX, Welding and brazing qualifications*. American Society of Mechanical Engineers, 2013. 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.

NDT – Non-Destructive Testing.

Stainless steel – typically, the austenitic stainless steel grades AISI 304L and 316L, but may also include other materials such as the duplex stainless steels.

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

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.

Outcomes and performance criteria

Outcome 1

Prepare to weld steel or stainless steel pressure pipe 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, nozzle, collet, and cap; shielding gas supply; welding cables; work clamp.

1.3 Pipe is prepared and assembled in accordance with welding procedure, and purging gas connected as required.

Range preparation and assembly are limited to – cleaning, edge preparation, tack welding to correct alignment.

1.4 Consumables are selected in accordance with welding procedure.

Range filler metal is identified by specification and classification; shielding gases are identified by brand name and composition.

Outcome 2

Weld steel or stainless steel pressure pipe in all positions using the GTAW process.

Range three welds:
pipe – 50 mm diameter schedule 40 pipe;
welding positions – 2G, 5G, and 6G positions.

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 Welds are deposited on pipe to industry standard and in accordance with welding procedure.
- 2.3 Preheat and interpass temperatures are measured to ensure compliance with welding procedure.
- 2.4 Welds are cleaned in accordance with accepted industry practice.

Outcome 3

Inspect and repair GTAW pressure pipe welds.

Performance criteria

- 3.1 Weld imperfections are identified by visual examination or from an NDT report.
- 3.2 Weld imperfections are compared to the permissible levels allowed by the industry standard.
- 3.3 A root weld defect is removed, rewelded and 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	17 August 2017	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.