Title	**Weld stainless steel tube using the gas tungsten arc welding process**		
Level	**4**	**Credits**	**12**

Purpose	This unit standard covers the welding in position of stainless steel tube to the standard required for the fabrication of equipment using the gas tungsten arc welding (GTAW) process. People credited with this unit standard are able to prepare to weld, and weld stainless steel tube in position using the GTAW process; and inspect and repair GTAW tube welds.

Classification	Mechanical Engineering > Welding

Available grade	Achieved

Guidance Information

1 References
AS/NZS 2980:2007, *Qualification of welders for fusion welding of steels*.
Health and Safety in Welding. Wellington: Department of Labour, 2006. Available from http://www.worksafe.govt.nz/.

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 – AS/NZS 2980, Appendix F, or equivalent.
Stainless steel – typically the austenitic stainless steel grades AISI 304L and 316L, but may also include other materials such as the duplex stainless steels.
Welding procedure – written work instruction providing the necessary technical details for a specific welding application.

3 Recommended for entry
Unit 2676, *Weld stainless steel sheet to industry standard using the gas tungsten arc welding process*.

4 Related unit standards
This unit standard is one of a GTAW stainless steel welding set:
– Unit 22907, *Demonstrate and apply knowledge of welding aluminium and stainless steel* (Level 3); an introductory standard to provide foundation awareness for aluminium and stainless steel welding, generally delivered off job.

– Unit 2676, *Weld stainless steel sheet to industry standard using the gas tungsten arc welding process* (Level 3); a progressive stainless steel specific industry standard.
– Unit 2688, *Weld stainless steel tube using the gas tungsten arc welding process* (Level 4); A trade level stainless steel specific industry standard.

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

Outcomes and performance criteria

Outcome 1

Prepare to weld stainless steel tube in position 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 and purge gas supplies; welding cables; work clamp.

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

Range cleaning, edge preparation, tack welding to correct alignment.

1.4 Consumables are selected in accordance with welding procedure.

Range filler metal specification and classification;
shielding and purge gases by brand name and composition.

Outcome 2

Weld stainless steel tube in position using the GTAW process.

Range tube – 100 mm diameter, 1.5 mm nominal wall thickness;
positions – butt welds in 2G and 5G positions, or in 6G position.

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 Welds are deposited on stainless steel tube to industry standard and in accordance with welding procedure.

2.3 Welds are cleaned in accordance with accepted industry practice.

Outcome 3

Inspect and repair stainless steel GTAW tube welds.

Performance criteria

3.1 Weld imperfections are identified by visual examination and workshop tests.

Range one face bend and one root bend test for each weld.

3.2 Weld imperfections are compared to the permissible levels allowed by industry standard.

3.3 A weld defect is repaired to industry standard.

Planned review date	31 December 2022

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	28 October 1999	31 December 2022
Review	5	4 April 2001	31 December 2022
Rollover and Revision	6	20 April 2006	31 December 2022
Review	7	22 May 2009	31 December 2022
Review	8	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.