

Title	Weld steel structures using the submerged arc welding process		
Level	3	Credits	6

Purpose	<p>This unit standard is for people welding steel structures using the submerged arc welding (SAW) process.</p> <p>People credited with this unit standard are able to: prepare to weld steel using the SAW process; weld steel using the SAW process; and inspect SAW welds.</p>
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Classification	Mechanical Engineering > Welding
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Available grade	Achieved
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Prerequisites	Unit 33135, <i>Demonstrate knowledge of safety and health while welding and thermal cutting</i> , or demonstrate equivalent knowledge and skills.
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Guidance Information

1 Legislation and references

Legislation, regulations and/or industry standards relevant to this unit standard include but are not limited to the:

Health and Safety at Work Act 2015.

WorkSafe Good Practice Guide “Health and Safety in Welding”. Available at:

<https://www.worksafe.govt.nz/assets/dmsassets/WKS-13-Welding-GPG.pdf>.

Weld Australia (formerly Welding Technology Institute of Australia (WTIA) Technical Note 7 – Health and Safety in Welding. Available at: [Product Details Weld Australia Member Portal](#).

Industry Standard - AS/NZS 1554.1:2014, *Structural steel welding – Welding of steel structures*. Available at: www.standards.govt.nz.

ISO 6947:2019 Welding and allied processes – welding positions. Available at:

www.standards.govt.nz.

Any new, amended or replacement Acts, regulations, standards, codes of practice, guidelines, or authority requirements or conditions affecting this unit standard will take precedence for assessment purposes, pending review of this unit standard.

2 Definitions

Accepted industry practice – approved codes of practice and standardised procedures accepted by the engineering industry as examples of best practice.

Industry standard – Category SP AS/NZS 1554.1, or equivalent.

Manufacturer's instructions – instructions provided by manufacturers of substances, equipment, and machinery. These instructions may include details on safe and correct handling, use and storage of substances and/or details on substance properties. Examples are labels on substance containers, product data sheets, and operator's manuals.

SAW – Submerged Arc Welding.

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

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

Workplace procedures – organisation policies and procedures that are documented in memo, electronic, or manual format and available in the workplace, and are consistent with manufacturer's requirements. 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 Assessment information

Evidence presented for assessment against this unit standard must be consistent with safe working practices and be in accordance with legislative requirements and workplace procedures and meet accepted industry practice. This includes the knowledge, use and maintenance of relevant tools and equipment.

4 Recommended skills and knowledge

It is recommended that people seeking credit for this unit standard first hold credit for Unit 22906, Demonstrate knowledge of welding and weld low carbon steel, or equivalent skills and knowledge.

Outcomes and performance criteria

Outcome 1

Prepare to weld steel using the SAW process.

Performance criteria

- 1.1 Equipment is selected to meet welding procedure requirements.
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|-------|--|
| Range | power source – rating, duty cycle, open circuit voltage, current type;
wire feed system; flux feed system; welding cables; travel unit where appropriate. |
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- 1.2 Equipment is maintained ready for use in accordance with workplace procedures.
- 1.3 Steel is prepared and assembled in accordance with welding procedure.

- 1.4 Electrode and flux are selected in accordance with welding procedure.

Outcome 2

Weld steel using the SAW process.

Range 1 weld;
1F, 2F, or 1G position (ISO 6947 PA, PB, PA);
5-20 mm thickness.

Performance criteria

- 2.1 Workplace safety procedures are followed.

Range examples are – use of personal protective equipment, checking of equipment for faults, elimination of risk of fire or explosion, protection from arc radiation, protection from electrocution.

- 2.2 Electrodes and fluxes are stored and handled in accordance with manufacturer's instructions.

- 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 SAW 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 evaluated using acceptance levels in industry standard.

Planned review date	31 December 2027
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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	20 July 2017	31 December 2025
Review	8	26 January 2023	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 Hanga-Aro-Rau Manufacturing, Engineering and Logistics Workforce Development Council qualifications@hangaarorau.nz if you wish to suggest changes to the content of this unit standard.