

<b>Title</b>	<b>Demonstrate knowledge of safety and health while welding and thermal cutting</b>		
<b>Level</b>	<b>3</b>	<b>Credits</b>	<b>3</b>

<b>Purpose</b>	<p>This unit standard is for people working with welding and thermal cutting equipment in the mechanical engineering, fabrication, or welding trades.</p> <p>People credited with this unit standard are able to describe immediate safety hazards and long term health hazards when welding or thermal cutting; explain personal protective equipment (PPE) used when welding or thermal cutting; describe the safe use of welding and thermal cutting equipment; demonstrate knowledge of the dangers and safety precautions when welding or thermal cutting in confined spaces; demonstrate knowledge of the dangers, control methods, and extraction of fumes when welding or thermal cutting.</p>
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<b>Classification</b>	Mechanical Engineering > Welding
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<b>Available grade</b>	Achieved
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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](#).

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.

### 2 Definitions

*Accepted industry practice* refers to approved codes of practice and standardised procedures accepted by the wider mechanical engineering industry sectors as examples of best practice.

- 3 Range  
Examples of welding and thermal cutting equipment – Metal Inert Gas (MIG), Tungsten Inert Gas (TIG), and Manual Metal Arc (MMA) welding equipment; plasma and oxyacetylene cutting equipment.
- 4 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 but is not limited to the knowledge, use and maintenance of relevant tools and equipment.

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## Outcomes and performance criteria

### Outcome 1

Describe immediate safety hazards and long term health hazards when welding or thermal cutting.

#### Performance criteria

- 1.1 Immediate safety hazards are identified and the effects they have on immediate health are described.
- Range hazards include but are not limited to – fumes, electric shock, suffocation, fire/explosion, burns to self or others.
- 1.2 Long term health hazards are identified and the effects they have on health over time are described.
- Range hazards include but are not limited to – fumes, noise, vibration, manual handling, radiation (arc flash).
- 1.3 Safety precautions taken to manage hazards are described.
- Range hazards include – fire and explosion, burns, fumes and toxic gases, electric shock, compressed gas, radiation (arc flash), noise, vibration, heat stress, fatigue.

### Outcome 2

Explain personal protective equipment (PPE) used when welding or thermal cutting.

#### Performance criteria

- 2.1 The protection given by items of PPE, and when it should be worn is explained.
- Range PPE – eye protection, hearing protection, footwear, gloves, aprons, skull caps, jacket or shoulder covers, respiratory protection equipment (RPE).

**Outcome 3**

Describe the safe use of welding and thermal cutting equipment.

**Performance criteria**

3.1 The safe use of compressed gas cylinders, regulators, valves, and hoses is described.

Range safe use includes but is not limited to – cylinder marking, storage and security against falls, use of regulators and valves, leaks, worn and burnt hoses, flash back arresters.

3.2 The safe use of electrical equipment is described.

Range safe use includes but is not limited to – isolation, frayed or cracked leads, connectors or fittings, broken switches or cover plates, presence of water.

**Outcome 4**

Demonstrate knowledge of the dangers and safety precautions when welding or thermal cutting in confined spaces.

**Performance criteria**

4.1 Confined spaces are defined.

4.2 Hazards of welding or thermal cutting in confined spaces are described.

Range hazards include but are not limited to – toxic gases, suffocation, explosion.

4.3 Safety precautions when welding or thermal cutting in confined spaces are described.

Range safety precautions including – permits to work/ confined spaces (hot work/confined spaces), ventilation, safety watch, harness, prepared rescue plan.

**Outcome 5**

Demonstrate knowledge of the dangers, control methods, and extraction of fumes when welding or thermal cutting.

**Performance criteria**

5.1 The constituents of fumes are described.

Range constituents – airborne particles, gases.

- 5.2 The effects of fumes given off by metals used in welding are stated.
- Range metals include but are not limited to – aluminium, cadmium, chromium, copper, iron, nickel, vanadium, zinc, manganese.
- 5.3 Factors that affect the generation of fumes are stated.
- Range evidence is required of a minimum of three factors.
- 5.4 Methods of exhaust ventilation are described and an example of their use stated.
- Range methods of exhaust ventilation include – natural, mechanical dilution, local exhaust ventilation.

<b>Replacement Information</b>	This unit standard replaced unit standard 29651.
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<b>Planned review date</b>	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	26 January 2023	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 Hanga-Aro-Rau Manufacturing, Engineering and Logistics Workforce Development Council [qualifications@hangaarorau.nz](mailto:qualifications@hangaarorau.nz) if you wish to suggest changes to the content of this unit standard.