

Title	Demonstrate knowledge of and apply metal cutting and gouging processes		
Level	3	Credits	2

Purpose	<p>This unit standard is for people cutting and gouging metal</p> <p>People credited with this unit standard are able to: demonstrate knowledge of: steel gas cutting and gouging; plasma arc cutting and gouging; air carbon arc gouging for steel; and cut and gouge metal.</p>
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Classification	Mechanical Engineering > Welding
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Available grade	Achieved
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Prerequisites	<p>Unit 21912, <i>Apply safe working practices on an engineering worksite</i>; Unit 29651, <i>Demonstrate knowledge of health and safety when welding and thermal cutting</i>; Unit 29652, <i>Demonstrate knowledge of safety, health, risk assessment, and hazard ID and control on an engineering worksite</i>; or demonstrate equivalent skills and knowledge.</p>
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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 *Structural steel welding – Part 1: Welding of steel structures*, or equivalent. 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.

2 Definitions

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

Gas cutting – oxygen cutting using a fuel gas such as acetylene or liquid petroleum gas (LPG).

Industry Standard refers to AS/NZS 1554.1, or equivalent.

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 but is not limited to 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 21907, *Demonstrate and apply knowledge of safe welding principles and quality assurance under supervision*.

Outcomes and performance criteria**Outcome 1**

Demonstrate knowledge of steel gas cutting and gouging.

Performance criteria

1.1 The principles of gas cutting and gouging are explained with reference to the equipment used.

Range equipment – gas cylinders, regulators, flashback, arrestors, hoses, torch, tip, guides.

1.2 The applications, advantages, and disadvantages of gas cutting and gouging are compared with the plasma arc and air carbon arc processes.

1.3 Cutting and gouging parameters and consumables are described.

1.4 Typical gas cutting and gouging faults are described in terms of cause, significance, and corrective action.

Outcome 2

Demonstrate knowledge of plasma arc cutting and gouging.

Performance criteria

2.1 The principles of plasma arc cutting and gouging are explained with reference to the equipment used.

Range power source, gas supply, electrode, torch (tip, nozzle), guides.

- 2.2 The applications, advantages, and disadvantages of plasma arc cutting and gouging are compared with the gas and air carbon arc processes.
- 2.3 Cutting and gouging parameters and consumables are described for steel, stainless steel, and aluminium.
- 2.4 Typical plasma arc cutting and gouging faults are described in terms of cause, significance, and corrective action.

Outcome 3

Demonstrate knowledge of air carbon arc gouging for steel.

Performance criteria

- 3.1 The principles of air carbon arc gouging are explained with reference to the equipment used.
- Range power source, torch, compressed air, electrode.
- 3.2 The applications, advantages, and disadvantages of air carbon arc gouging are compared with gouging using the gas and plasma arc processes.
- 3.3 Air carbon arc gouging parameters and consumables are described.
- 3.4 Typical air carbon gouging faults are described in terms of cause, significance, and corrective action.
- 3.5 Post-gouging clean up processes are described.

Outcome 4

Cut and gouge metal.

Range metal material examples are – steel, stainless steel, aluminium. Evidence of cutting and gouging of at least one metal material is required.
equipment examples are – gas, plasma arc, air carbon arc. Evidence of use of two types of equipment is required.

Performance criteria

- 4.1 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, protection from electrocution.
- 4.2 Steel is gouged in accordance with accepted industry practice.

4.3 Gouges are visually inspected for conformance with parameters and corrective action taken to address any faults.

Range examples of faults are – gouges not of uniform depth or straightness, excessive adhering slag.

4.4 Equipment is checked, set-up, and used for cutting and gouging of metal.

4.5 Equipment is shut down.

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	22 May 2009	31 December 2021
Review	2	16 March 2017	31 December 2025
Review	3	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.