

Title	Braze refrigerator pipe work in electrical appliance servicing		
Level	3	Credits	3

Purpose	<p>This unit standard covers the techniques required to braze refrigerator pipe work in a safe manner and is intended for use in the training of electrical service technicians.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> • describe hazards in the workplace when servicing electrical appliances; • describe and demonstrate safe use of brazing equipment when servicing electrical appliances; and • braze refrigerator pipe work in electrical appliance servicing.
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Classification	Electrical Engineering > Electrical Appliance Servicing
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Available grade	Achieved
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Prerequisites	Unit 27911, <i>Demonstrate knowledge of workplace safety in an electrotechnology or telecommunications environment</i> , or demonstrate equivalent knowledge and skills.
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Guidance Information

- 1 This unit standard has been developed for learning and assessment on job or off job in a simulated workplace environment or combination under adequate supervision as defined in the Electricity Act 1992.
- 2 References
 BOC Gases New Zealand Limited, Material Safety Data Sheets, available at <http://www.boc.co.nz>;
 Electricity Act 1992;
 Electricity (Safety) Regulations 2010;
 Hazardous Substances and New Organisms Act 1996 October 2018 reprint;
 Health and Safety at Work (Hazardous Substances) Regulations 2017;
 Health and Safety at Work Act 2015 (HSWA);
 NZS 4781:1973 *Code of practice for safety in welding and cutting*, available at www.standards.govt.nz;
 and all subsequent amendments and replacements.
- 3 Definitions
Company practice – those practices and procedures that have been circulated by the company for use by their employees.

Industry acceptable time-frame – the length of time within which a competent person at this level could reasonably be expected to perform the task. In the appliance service industry, time is a significant factor in judging competence. Assessors must, therefore, ensure that the time taken is representative of industry expectations for the type of servicing undertaken.

Industry practice – those practices that competent practitioners within the industry recognise as current industry best practice.

4 Range

- a Brazing gasses may include but are not limited to – oxy-acetylene, oxy-liquefied petroleum gas (LPG), MAP, oxy-MAP.
- b All work must be performed within industry acceptable time-frames.
- c All activities and evidence presented for all outcomes and performance criteria in this unit standard must be in accordance with:
 - i legislation;
 - ii company policies and procedures;
 - iii ethical codes;
 - iv standards which may include but are not limited to those listed in Schedule 2 of the Electricity (Safety) Regulations 2010;
 - v applicable site, industry, and company practice,
 - vi where appropriate or applicable, environmental requirements, manufacturer instructions, specifications, data sheets and manufacturer, supplier and company health and safety procedures.

Outcomes and performance criteria

Outcome 1

Describe hazards in the workplace when servicing electrical appliances.

Performance criteria

1.1 Describe welding and/or brazing hazards and their sources.

Range may include – burns (radiation, body), fumes, asphyxiation, noise, hard and/or hot particles, chemical (cleaning, pickling and passivating agents), dust.

1.2 Describe other potential hazards in the workplace.

Range may include – confined space, presence of flammable and/or explosive materials or containers, defective equipment, hot metal, hard and/or hot particles.

1.3 Outline the obligations of employees under the HSWA.

Range responsibility for their own health and safety, responsibility for ensuring their actions do not harm anyone else.

- 1.4 Describe the responsibilities of employers under the HSWA as they pertain to welding and brazing.

Range all practicable steps to manage or eliminate welding or brazing hazards.

- 1.5 Identify personal protective equipment requirements for the hazards present in the workplace.

Range overalls, boots, gloves, apron, eye protection, ear protection, face masks.

Outcome 2

Describe and demonstrate safe use of brazing equipment when servicing electrical appliances.

Performance criteria

- 2.1 Describe the operation of brazing equipment.

Range equipment – cylinders, flashback arrestors, regulators, hoses, protective equipment, blow pipe.

- 2.2 Describe and demonstrate 'O' ring maintenance and tip cleaning procedures.

- 2.3 Describe and demonstrate set-up procedures in accordance with industry best practice and manufacturer instructions.

Range evidence of two is required.

- 2.4 Describe and demonstrate lighting up procedures in accordance with industry best practice.

Range evidence of two is required.

- 2.5 Describe flame types, their purpose, and precautions to be observed.

Range carburising, neutral, oxidising.

- 2.6 Describe and demonstrate shut-down and storage procedures in accordance with industry best practice.

- 2.7 Describe safety practices.

Range protection, ventilation, cleaning chemicals and equipment, caustic fumes, gas pressures.

Outcome 3

Braze refrigerator pipe work in electrical appliance servicing.

Range copper to copper, copper to steel, copper to brass; using Easyflo, Silfos, brass, and other appropriate fluxes.

Performance criteria

3.1 Prepare pipe ends for brazing.

Range may include but is not limited to – swage, ream, wire brush, emery cloth, chemically.

3.2 Select rods, flux, and tips to match the application.

3.3 Ensure joints are made using purge brazing in accordance with industry practice.

Range distribution of filler material by capillary action, fillet on outside to reinforce the joint.

3.4 Clean joints of oxides and flux residue in accordance with industry practice.

3.5 Ensure the completed joints are neat with minimal component distortion.

Range joint appearance, capillary action, finish, strength, ductility.

3.6 Flush and pressure test brazed pipe work in accordance with appliance manufacturer instructions and industry practice, and correct any defects.

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	27 January 2004	31 December 2021
Review	2	20 June 2006	31 December 2021
Review	3	28 March 2019	31 December 2025
Review	4	30 January 2025	31 December 2025

Consent and Moderation Requirements (CMR) reference

0003

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.