Title	**Prepare and purge braze piping for refrigeration and air conditioning**		
Level	**3**	**Credits**	**4**

Purpose	This unit standard is for use in training of refrigeration and air conditioning technicians and covers preparation and purge brazing of copper piping up to 25 mm diameter for refrigeration and air conditioning systems. This standard is not intended for use in the appliance servicing industry. People credited with this unit standard are able to: demonstrate knowledge of welding safety relevant to brazing of piping; prepare for purge brazing of piping; and join piping using purge brazing.

Classification	Mechanical Engineering > Refrigeration and Air Conditioning

Available grade	Achieved

Guidance Information

1 Legislation
Health and Safety at Work Act 2015.

2 References
Althouse, Turnquist, Bracciano. *Modern Refrigeration and Air Conditioning.* 19th edition. Tinley Park, Illinois: The Goodhouse-Willcox Company Inc. ISBN 1-59070-280-8.
Heavy Engineering Research Association. *WTIA Technical Note No. 7: Health and Safety in Welding.* Silver water NSW: Welding Technology Institute of Australia, 2004.

3 Definitions
Brazing refers to the joining of metals using a non-ferrous filler metal with a melting point above 450°C, distributed between the closely fitting parts by capillary action.
Industry practices refer to approved codes of practice and standardised procedures accepted by the wider refrigeration and air conditioning industry sectors as examples of best practice.
MAPP gas refers to trade name for a mixture of liquefied petroleum gas and methylacetylene-propadiene, used in brazing and soldering.
Purge brazing refers to joining pipes by brazing whilst a flow of oxygen-free nitrogen is being maintained within the pipes.
Safe working practice refers to formal worksite or company safety policies, or the practices established by *WTIA Technical Note No. 7: Health and Safety in Welding*.
Torch refers to brazing equipment using oxyacetylene or MAPP gas.

4 Assessment information
This unit standard may be assessed in the workplace using naturally occurring evidence or in a simulated environment that demands performance equivalent to that required in the workplace.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of welding safety relevant to brazing of piping.

Performance criteria

1.1 The source and nature of hazards associated with brazing processes are identified.

Range burns, fumes, asphyxiation, hard or hot particles, chemicals, compressed gas, radiation (visible light, infrared), confined spaces.

1.2 Techniques of dealing with brazing hazards are outlined in accordance with safe working practice.

1.3 The component functions of oxyacetylene and MAPP gas torches are identified, together with relevant maintenance and safety requirements.

1.4 Safe lighting-up and extinguishing techniques for oxyacetylene and MAPP gas torches are demonstrated in accordance with safe working practice.

Outcome 2

Prepare for purge brazing of piping.

Performance criteria

2.1 Work area is assessed for hazards associated with brazing and all necessary precautions taken in accordance with safe working practice.

2.2 Torch equipment is assembled in accordance with manufacturer’s instructions.

2.3 Piping is cleaned, swaged, and aligned for brazing in accordance with industry practice.

2.4 Purging gas flow using oxygen-free nitrogen is established in the piping in accordance with industry practice.

Outcome 3

Join piping using purge brazing.

Range joints – evidence of five joints;
filler material – use of both Silfos and Easy-Flo;
torch – either oxyacetylene or MAPP gas.

Performance criteria

3.1 Safety procedures are followed and personal protective equipment is worn in accordance with safe working practice.

3.2 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.

3.3 Completed joints are cleaned of oxides and flux residue in accordance with industry practice.

3.4 Joints are pressure tested in accordance with industry practice.

Planned review date	31 December 2020

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	24 August 2007	31 December 2019
Review	2	18 June 2015	N/A
Revision	3	22 October 2020	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.