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| Title | Demonstrate knowledge of flammable refrigerants used in refrigeration and air conditioning industries | | |
| Level | 3 | Credits | 2 |

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| Purpose | <p>This unit standard is for people who work with flammable refrigerants in refrigeration and air conditioning (RAC) industries.</p> <p>People credited with this unit standard are able to demonstrate knowledge of: legislation, standards and codes relating to flammable refrigerants; flammable refrigerants; the health and safety risk factors to be managed when working with flammable refrigerants; procedures when working with flammable refrigerants; and, emergency and first aid procedures associated with flammable refrigerants.</p> |
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| Classification | Mechanical Engineering > Refrigeration and Air Conditioning |
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| Available grade | Achieved |
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Guidance Information

- 1 Recommended skills and knowledge
Unit 28950, *Meet requirements for Approved Filler Test Certificate for refrigerants*, or demonstrate equivalent knowledge and skills.
- 2 Legislation and standards
Health and Safety at Work Act 2015;
Climate Change Response Act 2002;
Hazardous Substances (Compressed Gas) Regulations 2004.
Hazardous Substances and New Organisms Amendment Act 2015.
Land Transport Rule: Dangerous Goods 2005.
Land Transport Rule: Dangerous Goods Amendment 2010.
Resource Management Act 1991.
AS/NZS 5149:2016 *Parts 1:5 Refrigerating Systems and Heat pumps – Safety and environment requirements*;
AS/NZS 817:2016 *Refrigerants – Designation and safety classification*;
and any subsequent amendments.
- 3 References
Althouse, Turnquist, Bracciano. *Modern Refrigeration and Air Conditioning*. 19th edition. Tinley Park, Illinois: The Goodhouse-Willcox Company Inc. ISBN 1-59070-280-8.
Institute of Refrigeration, *Australia and New Zealand Refrigerant Handling Code of Practice 2007*. AIRAH and IRHACE. Available from <http://www.irhace.org.nz>.

Refrigerant License New Zealand (RLNZ). *Flammable Refrigerant Safety Workbook*. This is the reference text for this unit standard.
Safety Data Sheets (for refrigerants). Available from refrigerant suppliers and must be available to the candidate.

- 4 Definitions
ASHRAE refers to American Society of Heating, Refrigerating and Air-Conditioning Engineers.
PPE refers to personal protective equipment.
- 5 The assessment standard for all performance criteria in this unit standard is in accordance with the reference text.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of legislation, standards and codes relating to flammable refrigerants.

Performance criteria

- 1.1 Legislation, standards, and codes relating to flammable refrigerants are identified.
- 1.2 Operator responsibilities to ensure compliance with legislation, standards, and codes are explained.

Outcome 2

Demonstrate knowledge of flammable refrigerants.

Performance criteria

- 2.1 The properties of flammable refrigerants are described.
- 2.2 The term *flammability* is explained in relation to refrigerants.
- 2.3 Refrigerant categories and their properties are explained in terms of the ASHRAE classification system.
- 2.4 The amount of refrigerant that can be used in refrigeration and air conditioning systems is explained in terms of equipment location, occupancy of area, and type of system.
- 2.5 The flammable gas practical limit is calculated for a given situation.
- 2.6 The suitability of different systems for use with flammable refrigerants is explained and examples given of suitable and unsuitable systems.

Outcome 3

Demonstrate knowledge of the health and safety risk factors to be managed when working with flammable refrigerants.

Performance criteria

- 3.1 Safety risks and hazards associated with flammable refrigerants are identified and described.
- 3.2 Safety warning identifiers are described.
- 3.3 Sources of ignition likely to be found on a worksite are identified and described.

Outcome 4

Demonstrate knowledge of procedures when working with flammable refrigerants.

Performance criteria

- 4.1 Safety data sheets are described in terms of their content and requirements for use when working with flammable refrigerants.
- 4.2 PPE is identified, and its use described.
- 4.3 Specialist tools and equipment for working with flammable refrigerants are listed and their use described.

Range flammable gas detector, ventilation equipment, fire extinguisher, leak detectors, scales, refrigerant recovery machines, storage facilities, transport equipment, disposal equipment.
- 4.4 Procedures to manage sources of ignition are explained.
- 4.5 Steps required to create a safe work area are explained.

Outcome 5

Demonstrate knowledge of emergency and first aid procedures associated with flammable refrigerants.

Performance criteria

- 5.1 Procedures to detect leaks and leaked refrigerant are explained.
- 5.2 Procedures to manage leaked refrigerant are explained.
- 5.3 First aid procedures to manage people who have been affected by refrigerants are explained.
- 5.4 The requirements for an emergency response plan are stated and contents of a typical plan are described.

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| Planned review date | 31 December 2020 |
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Status information and last date for assessment for superseded versions

| Process | Version | Date | Last Date for Assessment |
|----------------|----------------|-----------------|---------------------------------|
| Registration | 1 | 21 July 2016 | N/A |
| Revision | 2 | 22 October 2020 | N/A |

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| 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 Competenz qualifications@competenz.org.nz if you wish to suggest changes to the content of this unit standard.