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| Title | Demonstrate knowledge of refrigerants and their effect on the environment | | |
| Level | 3 | Credits | 4 |

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| Purpose | <p>This unit standard is for people who work in the Refrigeration and Air Conditioning (RAC) industry, installing, servicing, modifying, or dismantling equipment containing Ozone Depleting Refrigerants (ODRs) or Synthetic Greenhouse Gases (SGGs).</p> <p>People credited with this unit standard are able to: demonstrate knowledge of stratospheric ozone and its role in the atmosphere; demonstrate knowledge of the effect of refrigerants on the atmosphere., demonstrate knowledge of ozone layer protection legislation and codes of practice; identify OD substances and SGGs used as refrigerants and describe safe methods of identification; and demonstrate knowledge of procedures to reduce ODR and SGG emissions in refrigeration and air conditioning practice.</p> |
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| Classification | Mechanical Engineering > Refrigeration and Air Conditioning |
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| Available grade | Achieved |
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Explanatory notes

- References
 - Ozone Layer Protection Act 1996.
 - Ozone Layer Protection Regulations 1996.
 - AIRAH and IRHACE. *Australia and New Zealand Refrigerant handling code of practice 2007, Parts 1 and 2*. Available from www.irhace.org.nz.
- Definitions
 - AIRAH – Australian Institute of Refrigeration, Air Conditioning and Heating.
 - CH₃Cl– Methyl Chloride (R40)
 - Code of Practice – the *Australia and New Zealand Refrigerant handling code of practice 2007*.
 - HC – Hydrocarbon.
 - HCFC – Hydrochlorofluorocarbon.
 - HFC – Hydrofluorocarbon.
 - IRHACE – Institute of Refrigeration, Heating and Air Conditioning Engineers New Zealand.
 - SDS – Safety Data Sheet.
 - OD – Ozone Depleting.
 - ODR – Ozone Depleting Refrigerant.

Regulations – the Ozone Layer Protection Regulations 1996.

SGG – Synthetic Greenhouse Gas.

Standard industry practices – standard and proven industry practices accepted by the refrigeration and air conditioning industry.

Systems – refrigeration and air conditioning systems.

Outcomes and evidence requirements

Outcome 1

Demonstrate knowledge of stratospheric ozone and its role in the atmosphere.

Evidence requirements

- 1.1 The composition of stratospheric ozone and its role in filtering ultraviolet radiation are described.
- 1.2 The process of ozone depletion is described in terms of causes and time.
- 1.3 The impact of ozone depletion is described.

Range impact on – the earth's atmosphere, land and marine environments, human beings.

Outcome 2

Demonstrate knowledge of the effect of refrigerants on the atmosphere.

Evidence requirements

- 2.1 ODRs are described in terms of their contribution to stratospheric ozone depletion.
- 2.2 The Global Warming Potential of gases and its relevance to refrigeration and air conditioning is described.

Outcome 3

Demonstrate knowledge of ozone layer protection legislation and codes of practice.

Evidence requirements

- 3.1 The origins of NZ ozone protection legislation are described.

Range Montreal Protocol on Substances that Deplete the Ozone Layer, Vienna Convention for the Protection of the Ozone Layer.

- 3.2 The purpose of the Ozone Layer Protection Act 1996 and the Ozone Layer Protection Regulations 1996 are described.

3.3 The requirements of the Act and the Regulations in relation to restriction of controlled substances are described.

Range reduction timetable for consumption in industry, importation, sales, codes of practice, offences, penalties.

3.4 The scope and content of the Refrigerant Handling Code of Practice and its relationship to the Act are described.

Outcome 4

Identify OD substances and SGGs used as refrigerants and describe safe methods of identification.

Evidence requirements

4.1 The major refrigerants contributing to ozone depletion and global warming are identified in accordance with the Regulations and as recognised by industry practice.

4.2 Safe methods to identify common refrigerants in containers or vessels, and in systems are described in accordance with industry practice.

Range HCFCs (R0XX) – for example R22;
HFCs (R1XX) – for example R134a;
Zeotropes (R4XX) – for example R404A;
HC (R2XX) – for example R290.
Identification of one refrigerant from each group is required.

4.3 Safe methods to identify a harmful gas which is not commonly used as refrigerant are described with reference to SDS and manufacturer's or supplier's recommendations, and in accordance with industry practice.

Range CH_3Cl – Methyl Chloride (R40)

Outcome 5

Demonstrate knowledge of procedures to reduce ODR and SGG emissions in refrigeration and air conditioning practice.

Range procedures as specified in the Code of Practice.

Evidence requirements

5.1 Procedures for evacuation and pressurisation of a system are described.

Range connection of equipment, setting of valves, running of equipment.

5.2 Service procedures for detecting the loss of refrigerant from a system are described.

5.3 Procedures for the labelling of a system are described.

Range refrigerant type, lubricant type, date of service, name of service organisation.

5.4 Procedures for recovering refrigerant from a system are described.

Range connection of equipment, setting of valves, running of equipment.

5.5 Methods of handling and storing ODRs and SGGs 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 | 20 September 2002 | 31 December 2012 |
| Review | 2 | 27 February 2006 | 31 December 2013 |
| Review | 3 | 15 April 2011 | 31 December 2019 |
| Review | 4 | 18 June 2015 | 31 December 2019 |
| Revision | 5 | 17 September 2015 | 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>.

Please note

Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMRs). The CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

Comments on this unit standard

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