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| <b>Title</b> | <b>Meet requirements for Approved Filler Test Certificate for refrigerants</b> |                |          |
| <b>Level</b> | <b>3</b>   | <b>Credits</b> | <b>3</b> |

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| <b>Purpose</b> | <p>This unit standard is for people working in the refrigeration and air conditioning industry who need to fill gas cylinders with refrigerants. It covers the knowledge and practical skills required to prepare candidates for an Approved Filler Test Certificate for Class 2 refrigerants as required by legislation.</p> <p>People credited with this unit standard are able to: identify legislation and regulations relating to the activities of Approved Fillers; demonstrate knowledge of compressed gases used as refrigerants; demonstrate knowledge of cylinders and valves used for refrigerants; and perform refrigerant recovery procedures.</p> |
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| <b>Classification</b> | Mechanical Engineering > Refrigeration and Air Conditioning |
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| <b>Available grade</b> | Achieved |
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## Guidance Information

- 1 Recommended skills and knowledge  
Unit 28952, *Demonstrate knowledge of refrigerants and their management*, or demonstrate equivalent knowledge and skills.
- 2 Approved Filler certification  
Technical personnel in the refrigeration and air conditioning industry are frequently required to fill gas cylinders with refrigerants in the course of their work. In order to do this, they are required to hold an Approved Filler Test Certificate, issued by a Test Certifier who has been approved by the Environmental Protection Authority (EPA) for this purpose. The Test Certificate covers refrigerants classified as Classes 2.1.1 A and B (flammable gases), and non-hazardous refrigeration gases; it specifically excludes ammonia refrigerant.

Section 82 of the *Hazardous Substance and New Organisms Act 1996* covers the issue of Test Certificates by Test Certifiers. Clause 60 of the *Hazardous Substances (Compressed Gases) Regulations 2017* describes the knowledge and skills required to satisfy the Test Certifier, and this unit standard closely reflects these requirements relevant to the refrigeration and air conditioning industry. Achievement of this unit standard may therefore be used as evidence towards Approved Filler Test Certification, but by itself does not replace the need for an Approved Filler Test Certificate.

### 3 Legislation and standards

Hazardous Substance and New Organisms Act 1996;  
Hazardous Substances and New Organisms Amendment Act 2015;  
Hazardous Substances (Compressed Gases) Regulations 2017;  
Health and Safety at Work Act 2015;  
Land Transport Rule: Dangerous Goods 2016;  
Land Transport Rule: Dangerous Goods Amendment 2010;  
Ozone Layer Protection Act 1996;  
AS 2030.1:2009, *Gas cylinders Part 1: General requirements*.  
AS/NZS 817:2016 *Refrigerants – Designation and safety Classification*;  
AS/NZS 5149:2016 *Parts 1:5 Refrigerating Systems and Heat pumps – Safety and environment requirements*;  
and any subsequent amendments.

### 4 References

Environmental Protection Authority. *Guide to Gas Cylinders*;  
The Institute of Refrigeration Heating & Air Conditioning Engineers of New Zealand, Inc. *Australia and New Zealand Refrigerant Handling Code of Practice 2007 – Parts 1 and 2*. Available from [www.irhace.org.nz](http://www.irhace.org.nz);  
The Institute of Refrigeration Heating & Air Conditioning Engineers of New Zealand, Inc. and Climate Control Companies Association New Zealand. *Code of Practice for the reduction of emissions of fluorocarbon refrigerants in refrigeration and air conditioning application 2001*. Available from [www.irhace.org.nz](http://www.irhace.org.nz);  
Material safety data sheets (for refrigerants). Available from refrigerant suppliers and must be available on the work site.

### 5 Definitions

*Approved Filler* – a person who has been approved by a test certifier to fill specified compressed gases into gas cylinders, e.g. refrigerant gases.  
CCCANZ – Climate Control Companies Association New Zealand.  
EPA – Environmental Protection Authority of New Zealand.  
*Filling* – the activities of an Approved Filler of specified gases.  
HSNO – Hazardous Substance and New Organisms Act 1996.  
IRHACE – Institute of Refrigeration, Heating and Air Conditioning Engineers New Zealand.  
*Test Certifier* – a person who has been authorised by the EPA to certify that the requirements of the HSNO Act have been met.

### 6 Assessment information

- a A current Approved Filler Test Certificate may be used as evidence for this unit standard.
- b Assessment of all elements is an 'open book'.
- c All activities in Outcome 3 must be assessed in accordance with Hazardous Substances (Compressed Gases) Regulations 2017; Guide to Gas Cylinders
- d All activities in Outcome 4 must be assessed in accordance with Australia and New Zealand Refrigerant Handling Code of Practice 2007; AS/NZS 5149:2016 Parts 1:5 Refrigerating Systems and Heat pumps – Safety and environment requirements.

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## Outcomes and performance criteria

### Outcome 1

Identify legislation and regulations relating to the activities of Approved Fillers.

#### Performance criteria

1.1 Legislation and regulations relating to the activities of Approved Fillers are identified.

Range prevention of adverse effects of hazardous substances;  
transport of dangerous goods;  
compliance issues relevant to compressed gases including requirements for Approved Fillers;  
responsibilities for health and safety;  
release of refrigerant gases into the atmosphere.

### Outcome 2

Demonstrate knowledge of compressed gases used as refrigerants.

#### Performance criteria

2.1 The term *refrigerant* is defined with reference to heat.

2.2 The term *liquefied gas* is explained with reference to temperature and pressure.

2.3 The different forms of refrigerant gases are defined in terms of temperature.

Range low pressure liquefied gas, high pressure liquefied gas, permanent gas, cryogenic gas.

2.4 The adverse effects of compressed refrigerant gases in relation to environment and health are described in accordance with Safety Data Sheets and AS/NZS 5149:2016 parts 1:5.

2.5 Personal Protective Equipment required for refrigerant filling operations is identified in accordance with Safety Data Sheets.

2.6 Information relevant to filling operations is extracted and interpreted from Safety Data Sheets for given refrigerants.

### Outcome 3

Demonstrate knowledge of cylinders and valves used for refrigerants.

#### Performance criteria

3.1 The factors that can trigger cylinder failure are identified.

- 3.2 Given a cylinder’s approval number and design standard, the refrigerant(s) with which it may be filled is/are identified.
- 3.3 Terms relating to the filling of cylinders are defined.  
 Range terms – tare weight, empty weight, ullage, fill ratio, water capacity, working pressure, test pressure.
- 3.4 The periodic testing and inspection intervals for cylinders are identified, given the cylinder’s purpose and age.
- 3.5 Over-pressure safety devices are identified.
- 3.6 Given cylinder and valve markings are interpreted.
- 3.7 The purpose of left and right-hand threads on valve outlets is explained with reference to flammable and non-flammable gases.
- 3.8 The items to be checked in a visual inspection of a gas cylinder are identified.
- 3.9 Parameters relating to a given filling scenario are calculated.  
 Range parameters – amount of residual refrigerant; maximum charge; maximum fill weight; refrigerant weight that may safely be recovered.

**Outcome 4**

Perform refrigerant recovery procedures.

**Performance criteria**

- 4.1 Pre-recovery procedure is carried out.
- 4.2 Recovery procedures are carried out.  
 Range recovery procedures – liquid, vapour, push-pull.
- 4.3 Post-filling tasks are carried out.  
 Range leak check; final weight does not exceed calculated maximum filled weight; cylinder labelled with refrigerant recovered.

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| <b>Planned review date</b> | 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       | 18 June 2015    | N/A                      |
| Revision     | 2       | 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](mailto:qualifications@competenz.org.nz) if you wish to suggest changes to the content of this unit standard.