AS/NZS 5149.1:2016
(Incorporating Amendment Nos 1 and 2)

Australian/New Zealand Standard™

Refrigerating systems and heat pumps—Safety and environmental requirements

Part 1: Definitions, classification and selection criteria (ISO 5149-1:2014, MOD)

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee ME-006, Refrigeration. It was approved on behalf of the Council of Standards Australia on 7 September 2016 and by the New Zealand Standards Approval Board on 28 September 2016.
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The following are represented on Committee ME-006:

Air Conditioning and Refrigeration Equipment Manufacturers Association of Australia
Air Conditioning and Refrigeration Wholesalers Association
Australian Industry Group
Australian Institute of Refrigeration, Air Conditioning and Heating
Australian National Retailers Association
Australian Refrigeration Council
Climate Control Companies Association, New Zealand
Consumer Electronics Suppliers Association
Department of Environment
Department of Natural Resources and Mines, Qld
Environmental Protection Authority, New Zealand
Green Cooling Association
Institute of Refrigeration Heating and Air Conditioning Engineers of New Zealand
Metropolitan Fire and Emergency Services Board, Vic.
Ministry of Business, Innovation and Employment, New Zealand
New Zealand Electrotechnical Committee
Refrigerants Australia
Workplace Health and Safety Queensland
WorkSafe New Zealand
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We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of Standards Australia or the New Zealand Standards Executive at the address shown on the back cover.

This Standard was issued in draft form for comment as DR AS/NZS 5149.1:2016.

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee ME-006 Refrigeration, to supersede, in part, AS/NZS 1677.2, *Refrigerating systems*, Part 2: *Safety requirements for fixed applications*.

This Standard incorporates Amendment No. 1 (March 2018) and No. 2 (July 2018). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

The objective of this Standard is to promote the safe design, construction, disposal, installation and operation of refrigerating systems.

This Standard does not address the hazards caused by products of combustion or decomposition of refrigerants. These products may include (but are not limited to) hydrogen fluoride. Exposure to these products can be harmful.

Lubricants and associated hazards are also not covered by this Standard. Lubricants can present significant health and environmental hazards.

AS/NZS 60079.14 is the current Australian/New Zealand Standard on electrical installations design, selection and erection in explosive atmospheres.

The AS/NZS 5149 series consists of the following parts under the general title, *Refrigerating systems and heat pumps—Safety and environmental requirements*:

Part 1: *Definitions, classification and selection criteria (ISO 5149-1:2014, MOD)* (this Standard)
Part 2: *Design, construction, testing, marking and documentation (ISO 5149-2:2014, MOD)*
Part 3: *Installation site (ISO 5149-3:2014, MOD)*
Part 4: *Operation, maintenance, repair and recovery (ISO 5149-4:2014, MOD)*

AMDT No. 1

This Standard is an adoption with national modifications and has been reproduced from ISO 5149-1:2014, *Refrigerating systems and heat pumps—Safety and environmental requirements*, Part 1: *Definitions, classification and selection criteria*, and its Amendment No. 1 (2015), *Correction of QLAV, QLMV*, which has been added at the end of the document. This has been varied as indicated to take account of Australian/New Zealand conditions. The modifications are specified in the normative Appendix ZZ following the source text.

These modifications to the ISO source text are essential for compliance with this Australian/New Zealand Standard.

Appendix ZA provides guidance and examples on refrigerant charge limit determination for information only.

This Standard is to be read in conjunction with relevant legislation, regulation and national Refrigeration Industry Codes of Practice.

As this Standard is reproduced from an International Standard, the following applies:

(a) In the source text ‘this International Standard’ should read ‘this Australian/New Zealand Standard’.

(b) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

Reference to International Standard		*Australian/New Zealand Standard*	
ISO 817	Refrigerants—Designation and safety classification	AS/NZS ISO 817	Refrigerants—Designation and safety classification

Only normative references that have an alternative Australian or Australian/New Zealand Standard have been listed.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the annex or appendix to which they apply. A ‘normative’ annex or appendix is an integral part of a Standard, whereas an ‘informative’ annex or appendix is only for information and guidance.

CONTENTS

INTRODUCTION

The purpose of this International Standard is to promote the safe design, construction, disposal, installation, and operation of refrigerating systems.

The industry response to the chlorofluorocarbon (CFC) issue has accelerated the introduction of alternative refrigerants. The entry of new refrigerants and blends in the market and the introduction of new safety classifications prompted the revision of this International Standard.

This International Standard is directed to the safety of persons and property on or near the premises where refrigeration facilities are located. It includes specifications for fabricating a tight system.

This International Standard is intended to minimize possible hazards to persons, property, and environment from refrigerating systems and refrigerants. These hazards are essentially associated with the physical and chemical characteristics of refrigerants as well as the pressures and temperatures occurring in the refrigeration cycles (see Annex A).

Attention is drawn to hazards common to all compression systems, such as high temperature at discharge, liquid slugging, erroneous operation, or reduction in mechanical strength caused by corrosion, erosion, thermal stress, fatigue stresses, liquid hammer, or vibration.

Corrosion, however, should have special consideration as specific conditions to refrigerating systems arise due to the alternate frosting and defrosting or the covering of equipment by insulation.

Commonly used refrigerants except R-717 are heavier than air. Care should be taken to avoid stagnant pockets of heavy refrigerant vapours by proper location of ventilation inlet and exhaust openings. All machinery rooms are required to have mechanical ventilation controlled by oxygen deficiency alarms or refrigerant vapour alarms.

NOTES

AUSTRALIAN/NEW ZEALAND STANDARD

Refrigerating systems and heat pumps—Safety and environmental requirements

Part 1:
Definitions, classification and selection criteria (ISO 5149-1:2014, MOD)

1 Scope

This International Standard specifies the requirements for the safety of persons and property, provides guidance for the protection of the environment, and establishes procedures for the operation, maintenance, and repair of refrigerating systems and the recovery of refrigerants.

This part of ISO 5149 specifies the classification and selection criteria applicable to the refrigerating systems and heat pumps. These classification and selection criteria are used in ISO 5149-2, ISO 5149-3, and ISO 5149-4.

This part of ISO 5149 applies to:

a) refrigerating systems, stationary or mobile, of all sizes including heat pumps;

b) secondary cooling or heating systems;

c) the location of the refrigerating systems;

d) replaced parts and added components after adoption of this part of ISO 5149 if they are not identical in function and in the capacity.

This part of ISO 5149 applies to fixed or mobile systems, except to vehicle air conditioning systems covered by a specific product standard, e.g. ISO 13043 and SAE J 639.

This part of ISO 5149 is applicable to new refrigerating systems, extensions or modifications of already existing systems, and for used systems, being transferred to and operated on another site.

This part of ISO 5149 also applies in the case of the conversion of a system to another refrigerant.

Annex A specifies the limits for the quantity of refrigerant charge permitted in systems in various locations and occupancy classes.

Annex B specifies the criteria for safety and environmental considerations of different refrigerants used in refrigeration and air conditioning.

Systems containing refrigerants which are not listed in ISO 817 are not covered in this part of ISO 5149.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 817:2014, *Refrigerants — Designation and safety classification*

ISO 5149-2:2014, *Refrigerating systems and heat pumps — Safety and environmental requirements — Part 2: Design, construction, testing, marking and documentation*