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Refrigerating systems and heat pumps — Safety and environmental requirements —

Part 1: Definitions, classification and selection criteria

Systèmes frigorifiques et pompes à chaleur — Exigences de sécurité et d'environnement —

Partie 1: Définitions, classification et critères de choix



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 86, *Refrigeration and air-conditioning*, Subcommittee SC 1, *Safety and environmental requirements for refrigerating systems*.

ISO 5149-1, together with ISO 5149-2, ISO 5149-3, and ISO 5149-4, cancels and replaces ISO 5149:1993, which has been technically revised.

ISO 5149 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*
- *Part 2: Design, construction, testing, marking and documentation*
- *Part 3: Installation site*
- *Part 4: Operation, maintenance, repair and recovery*

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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.