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**Refrigerating systems and heat
pumps — Safety and environmental
requirements —**

**Part 3:
Installation site**

**AMENDMENT 1: Update of the
requirements for machinery rooms and
emergency mechanical ventilation**

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

Partie 3: Site d'installation

*AMENDEMENT 1: Mise à jour des exigences relatives aux salles des
machines et à la ventilation mécanique d'urgence*



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Foreword

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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).

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This document was prepared by Technical Committee ISO/TC 86, *Refrigeration and air-conditioning*, Subcommittee SC 1, *Safety and environmental requirements for refrigerating systems*.

A list of all parts in the ISO 5149 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Refrigerating systems and heat pumps — Safety and environmental requirements —

Part 3: Installation site

AMENDMENT 1: Update of the requirements for machinery rooms and emergency mechanical ventilation

Clause 3

Replace the introductory paragraph with the following:

For the purposes of this document, the terms and definitions given in ISO 5149-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4.2, first paragraph

Replace the paragraph with the following:

Refrigerating systems sited in the open air shall be positioned to avoid refrigerant flowing from the system into the building or otherwise endangering people.

NOTE Possible methods to achieve this include one or more of the following:

- location of the refrigerant containing part of the refrigeration system (except piping) at least 6 m away from any opening to the building,
- use of barriers of at least 1 m height between the system location and the inlet ventilation opening to block the flow of leaked or vented refrigerant,
- location of the inlet ventilation opening at least 1 m above the level at which the system is installed.

The discharge opening from safety relief devices shall be positioned 6 m away from and oriented to direct vented refrigerant away from inlet ventilation openings.

4.6, last sentence

In the last sentence, replace the reference to "ISO 5149-1:2014, 5.2.17" with "ISO 5149-1:2014, Annex A".

5.13

Replace 5.13 with the following:

5.13 Ventilation

5.13.1 General

The ventilation of machinery rooms shall be sufficient for background ventilation (if required), temperature control under normal operating conditions, occupancy and emergencies.

NOTE Details of background ventilation are given in 5.14.1.3.

Air from machinery rooms shall be vented outdoors using mechanical ventilation in the event of a release of refrigerant due to leaks or rupture of components. This ventilation system shall be independent of any other ventilation system on the site.

Provision shall be made for a sufficient supply of outside replacement air and a good distribution of that air over the machinery room avoiding dead zones.

Openings for exhaust from the machinery room to the outside shall be positioned to avoid re-circulation into the room.

5.13.2 Ventilation for temperature control under normal operating conditions

Ventilation shall be designed to limit the temperature rise of air to 10 K above outdoor ambient temperature when the equipment is operating at maximum capacity. If the heat emission from the system is not known, it shall be taken to be 10 % of the connected compressor motor power.

NOTE The figure of 10 % allows for heat gain from air-cooled electric motors and heat radiation from hot surfaces. If the motors are water-cooled or cooled by the refrigerant flow, or if the hot surfaces are insulated then it may be appropriate to reduce this allowance.

5.13.3 Ventilation when machinery room is occupied

For ventilation purposes, there shall be a minimum of four air changes per hour when the machinery room is occupied.

5.13.4 Emergency mechanical ventilation

If gas detection is required in the machinery room, then emergency mechanical ventilation shall be provided. The emergency mechanical ventilation system shall be activated by a detector(s) located in the machinery room. The detector(s) shall be as specified in Clause 9.

There shall be at least two independent emergency controls, one or more located outside the machinery room and one or more inside the machinery room.

When the necessary ventilation rate cannot be achieved due to shutdown or failure of the equipment, an audible and/or visual alarm shall be initiated and, where relevant, electrical supplies shall also be terminated.

5.13.5 Required airflow for emergency mechanical ventilation

The emergency mechanical ventilation for the machinery room shall be sufficient to achieve an air change rate of at least 15 air changes per hour in the part of the room in which the refrigeration system is installed. If the room extends more than 5 m in any direction from the refrigeration equipment then the volume used in the air change calculation shall be the product length, width and height of the equipment plus 2 m in each direction, or the volume of the room, whichever is smaller. The emergency mechanical ventilation system shall be installed to ensure that effective air change in the location of the equipment is achieved, for example by positioning the extract duct close to the equipment and on the opposite side to the source of supply air.

5.13.6 Mechanical ventilation openings

Mechanical ventilation openings shall be made in the position and of sizes to permit sufficient airflow considering the characteristics of the refrigerant, the choice of intake or exhaust, and the performance