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Hladilni sistemi in toplotne črpalke - Varnostnotehnične in okoljevarstvene zahteve - 3. del: Mesto postavitve in zaščita oseb

Refrigerating systems and heat pumps - Safety and environmental requirements - Part 3: Installation site and personal protectionn

Kälteanlagen und Wärmepumpen - Sicherheitstechnische und umweltrelevante Anforderungen - Teil 3: Aufstellungsort und Schutz von Personen

Systèmes frigorifiques et pompes à chaleur - Exigences de sécurité et d'environnement - Partie 3: Installation in situ et protection des personnes

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Refrigerating systems and heat pumps - Safety and environmental requirements - Part 3: Installation site and personal protection

Systèmes frigorifiques et pompes à chaleur - Exigences de sécurité et d'environnement - Partie 3: Installation in situ et protection des personnes

Kälteanlagen und Wärmepumpen - Sicherheitstechnische und umweltrelevante Anforderungen - Teil 3: Aufstellungsort und Schutz von Personen

This European Standard was approved by CEN on 3 September 2016.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Contents

Page

European foreword ... 5
Introduction ... 6
1 Scope ... 7
2 Normative references ... 7
3 Terms, definitions and abbreviated terms ... 8
4 Location of refrigerating equipment ... 8
4.1 General ... 8
4.2 Refrigerating equipment located in the open air ... 8
4.3 Refrigerating equipment located in a machinery room ... 9
4.4 Refrigerating equipment located in the occupied space ... 9
4.5 Refrigerating equipment located in an unoccupied space not designated a machinery room ... 9
4.6 Refrigerating equipment located in a ventilated enclosure within an occupied space ... 10
4.7 Piping duct or shaft ... 10
5 Machinery rooms ... 10
5.1 Access to machinery rooms ... 10
5.2 Venting from or through the machinery room ... 10
5.3 Combustion equipment and air compressors ... 10
5.4 Open flame ... 10
5.5 Storage ... 10
5.6 Remote emergency switch ... 11
5.7 Exterior openings of the machinery room ... 11
5.8 Piping and ducting ... 11
5.9 Normal lighting ... 11
5.10 Emergency lighting ... 11
5.11 Dimensions and accessibility ... 11
5.12 Doors, walls and ducts ... 12
5.12.1 Doors and openings ... 12
5.12.2 Emergency ... 12
5.12.3 Walls, floor and ceiling ... 12
5.12.4 Service ducts ... 12
5.12.5 Ventilation ducts ... 12
5.13 Ventilation ... 12
5.13.1 General ... 12
5.13.2 Ventilation for normal operating conditions or when machinery room is occupied ... 13
5.13.3 Emergency mechanical ventilation ... 13
5.13.4 Required airflow for emergency mechanical ventilation ... 13
5.13.5 Mechanical ventilation openings ... 13
5.14 Machinery rooms for groups A2L, A2, A3, B2L, B2 and B3 refrigerants ... 13
5.14.1 General ... 13
5.14.2 Location ... 13
5.14.3 Additional requirements for R-717 ... 14
5.14.4 Maximum surface temperature ... 15
5.14.5 Doors and openings ... 15

6 Requirements for alternative provisions 15
6.1 General 15
6.2 Occupied space 15
6.3 Ventilation 15
6.3.1 General 15
6.3.2 Dilution transfer openings (air transfer openings for dilution) for natural convection 15
6.3.3 Mechanical ventilation 16
6.4 Safety shut off valves 17
6.4.1 General 17
6.4.2 Location 17
6.4.3 Design 17

7 Electrical installations 17
7.1 General requirements 17
7.2 Main power supply 18
7.3 Electrical equipment in machinery rooms with refrigerating systems containing flammable refrigerants 18

8 Safety alarms 18
8.1 General 18
8.2 Alarm system power 18
8.3 Alarm system warning 18
8.4 Additional alarm system requirements for R-717 systems with charges above 3 000 kg 18

9 Detectors 19
9.1 General 19
9.2 Location of detectors 19
9.3 Type and performance of detectors 19
9.3.1 General 19
9.3.2 Refrigerant detectors for A2, A2L, B2L (except for R-717), B2, A3 and B3 refrigerants 19
9.3.3 R-717 detectors 20
9.4 Installation 20

10 Instruction manuals, notices and inspections 20
10.1 Instruction manual 20
10.2 Warning notice 21
10.3 Visual inspection of the site 21
10.4 Maintenance of the site 21

11 Heat sources and temporary high temperatures at the site 21

Anhang A (informative) Personal protective equipment 23

A.1 General requirements 23

A.1.1 Type of protective equipment 23

A.1.2 Accessibility 23

A.1.3 Location 23

A.1.4 Check and maintenance 23

A.1.5 Temperature 23

A.1.6 Respirators 23

A.2 Normal use 24

A.3 Emergency use 24
A.3.1 General 24
A.3.2 Respiratory protective devices 24
A.3.3 First aid equipment 24
Bibliography 25

European foreword

This document (EN 378-3:2016) has been prepared by Technical Committee CEN/TC 182 “Refrigerating systems, safety and environmental requirements”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2017, and conflicting national standards shall be withdrawn at the latest by May 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 378-3:2008+A1:2012.

EN 378 consists of the following parts under the general title “Refrigerating systems and heat pumps — Safety and environmental requirements”:

— *Part 1: Basic requirements, definitions, classification and selection criteria;*

— *Part 2: Design, construction, testing, marking and documentation;*

— *Part 3: Installation site and personal protection;*

— *Part 4: Operation, maintenance, repair and recovery.*

The main changes in part 3 with respect to the previous edition are listed below:

— harmonisation as far as possible with ISO 5149:2014 and ISO 817:2014;

— clarification of when to use of 'special machinery room', and modify to “separate refrigeration machinery room”;

— consideration of requirements for 2L refrigerants;

— inclusion of Clause 6 additional measures to support EN 378-1:2016, C.3;

— modification of requirements for sprinkler systems.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

The introduction of EN 378-1 is applicable.

1 Scope

This European 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.

The term “refrigerating system” used in this European Standard includes heat pumps.

This Part 3 of the European Standard is applicable to the installation site (plant space and services). It specifies requirements on the site for safety, which may be needed because of, but not directly connected with, the refrigerating system and its ancillary components.

This standard applies:

a) to refrigerating systems, stationary or mobile, of all sizes except to vehicle air conditioning systems covered by a specific product standard e.g. ISO 13043;

b) to secondary cooling or heating systems;

c) to the location of the refrigerating systems;

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

Systems using refrigerants other than those listed in of EN 378-1:2016, Annex E are not covered by this standard.

This standard does not apply to goods in storage.

This standard is not applicable to refrigerating systems which were manufactured before the date of its publication as a European Standard except for extensions and modifications to the system which were implemented after publication.

This standard is applicable to new refrigerating systems, extensions or modifications of already existing systems, and for existing stationary systems, being transferred to and operated on another site.

This standard also applies in the case of the conversion of a system for another refrigerant type, in which case conformity with the relevant clauses of parts 1 to 4 of the standard shall be assessed.

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.

EN 378-1:2016, *Refrigerating systems and heat pumps — Safety and environmental requirements — Part 1: Basic requirements, definitions, classification and selection criteria*

EN 378-2:2016, *Refrigerating systems and heat pumps — Safety and environmental requirements — Part 2: Design, construction, testing, marking and documentation*

EN 1363 (all parts), *Fire resistance tests*

EN 1364 (all parts), *Fire resistance tests for non-load bearing elements*

EN 1365 (all parts), *Fire resistance tests for load bearing elements*

EN 1366-1, *Fire resistance tests for service installations — Part 1: Ventilation ducts*

EN 1366-2, *Fire resistance tests for service installations — Part 2: Fire dampers*

EN 1507, *Ventilation for buildings — Sheet metal air ducts with rectangular section — Requirements for strength and leakage*

EN 1634 (all parts), *Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware*

EN 12236, *Ventilation for buildings — Ductwork hangers and supports — Requirements for strength*

EN 12845, *Fixed firefighting systems — Automatic sprinkler systems — Design, installation and maintenance*

EN 14624, *Performance of portable leak detectors and of room monitors for halogenated refrigerants*

EN 60079-10-1, *Explosive atmospheres — Part 10-1: Classification of areas — Explosive gas atmospheres (IEC 60079-10-1)*

EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2005)*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*

EN ISO 13850, *Safety of machinery — Emergency stop function — Principles for design (ISO 13850)*

EN ISO 14122-2, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways (ISO 14122-2)*

ISO 13043, *Road vehicles — Refrigerant systems used in mobile air conditioning systems (MAC) — Safety requirements*

ISO 817, *Refrigerants — Designation and safety classification*

IEC 60364, *Low-voltage electrical installations*

3 Terms, definitions and abbreviated terms

For the purposes of this document, the terms, definitions and abbreviated terms given in EN 378-1:2016 apply.

4 Location of refrigerating equipment

4.1 General

Refrigerating equipment may be sited outside the building in the open air or in a machinery room or in occupied areas or in unoccupied areas not designated as a machinery room.

NOTE The refrigerating equipment can be contained in a ventilated enclosure provided by the manufacturer. Requirements for this enclosure are given in EN 378–2:2016, 6.2.15.

4.2 Refrigerating equipment located in the open air

Refrigerating systems sited in the open air shall be positioned to avoid leaked refrigerant flowing into a building or otherwise endangering people and property. The refrigerant shall not be able to flow into any ventilation fresh air opening, doorway, trap door or similar opening in the event of a leak. Where a

shelter is provided for refrigerating equipment sited in the open air it shall have natural or forced ventilation.

A room, where at least one of the longer walls is open to the outside air by means of louvres with 75 % free area and covering at least 80 % of the wall area (or the equivalent if more than one wall is to outside), is considered as being in the open air.

For refrigeration systems installed outside in a location where a release of refrigerant can stagnate e.g. below ground, then the installation shall comply with the requirements for gas detection and ventilation of machinery rooms (see 5.13, Clauses 8 and 9). For refrigerants of class 2L, 2 and 3 requirements regarding ignition sources in EN 378-2:2016, 6.2.14 shall apply where appropriate.

4.3 Refrigerating equipment located in a machinery room

When a machinery room is chosen for the location of the refrigerating equipment it shall meet the requirements specified in 5.1 to 5.14.

A risk analysis based on the safety concept for the refrigerating system (as determined by the manufacturer and including the charge and safety classification of the refrigerant used) shall be conducted to determine whether it is necessary to place the refrigerating system in a separate refrigeration machinery room.

NOTE 1 National regulations may set specific requirements for the use of separate refrigeration machinery rooms.

For systems below ground using class 3 flammable refrigerants with a charge greater than 'm_2', an additional gas detector and audible/visual alarm shall be used and shall meet the requirements for detectors in this standard.

NOTE 2 Additional requirements may be needed for refrigerating systems containing B2L, B2, B3, A2L, A2, and A3 refrigerants as specified in 5.14.

NOTE 3 A housing which is sufficiently large for people to enter is a machinery room.

4.4 Refrigerating equipment located in the occupied space

The requirements shall be as specified in EN 378-1.

4.5 Refrigerating equipment located in an unoccupied space not designated a machinery room

Where compressors or pressure vessels are located in an unoccupied space which is sealed from any occupied space the location shall be treated as a machinery room in accordance with Clause 5.

Where equipment (not including compressors and pressure vessels) containing non-permanent joints is located in an unoccupied space which is sealed from any occupied space the requirements of Clause 5 shall be applied, but if mechanical ventilation is required according to 5.13, ventilation shall be from an extractor hood positioned adjacent to the equipment and the ventilation rate shall be more than 0,05 m^3/s per ventilator. In the case of equipment subject to adverse conditions, for example severe vibration or a corrosive atmosphere, the ventilation rate shall be more than 0,5 m^3/s per extractor hood. If mechanical ventilation is required, refrigerant detectors shall activate the ventilation at 50 % of the ATEL, except for refrigerants with a characteristic odour at concentrations below ATEL/ODL (such as R-717), or 25 % of the LFL, whichever is lower.

NOTE 1 Severe vibration could be caused by unbalanced dynamic loads or hydraulic shock during defrost operation.

NOTE 2 The ventilation rate is deemed sufficient to ventilate a volume of 18 m^3.