

Refrigerating systems and heat pumps — Safety and environmental requirements —

Part 4: Operation, maintenance, repair and recovery

The European Standard EN 378-4:2000, with the incorporation of amendment A1:2003 has the status of a British Standard

ICS 27.080; 27.200

National foreword

This British Standard is the official English language version of EN 378-4:2000, including amendment A1:2003. Together with BS EN 378-1:2000, BS EN 378-2:2000 and BS EN 378-3:2000 it supersedes BS 4434:1995 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee RHE/18, Refrigeration safety, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the *BSI Catalogue* under the section entitled “International Standards Correspondence Index”, or by using the “Search” facility of the *BSI Electronic Catalogue* or of British Standards Online.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 19 and a back cover.

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Amendments issued since publication

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14929	30 January 2004	Modifications to contents and foreword page, deletion of original Annex ZA, and re-naming of Annex ZB to Annex ZA

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English version

**Refrigerating systems and heat pumps – Safety and
environmental requirements – Part 4: Operation, maintenance,
repair and recovery**
(includes amendment A1:2003)

Systèmes de réfrigération et pompes à chaleur – Exigences
de sécurité et d'environnement – Partie 4: Fonctionnement,
maintenance, réparation et récupération
(inclut l'amendement A1:2003)

Kälteanlagen und Wärmepumpen – Sicherheitstechnische
und umweltrelevante Anforderungen – Teil 4: Betrieb,
Instandhaltung, Instandsetzung und Rückgewinnung
(enthält Änderung A1:2003)

This European Standard was approved by CEN on 10 October 1999, and amendment A1 was approved by CEN on 20 November 2003.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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Foreword

This European Standard 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 July 2000, and conflicting national standards shall be withdrawn at the latest by July 2000.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

NOTE 1: This European Standard had also been proposed for inclusion in the mandate under the EU Directive 89/392/EEC (Machinery Directive). As the mandate has been given after the standard had been accepted by the Technical Committee for submission to formal vote and in order not to further delay its publication, it will be reviewed within the context of the latest version of the Machinery Directive directly after the publication.

This EN 378-4 is part of a standard consisting of a series of the following parts:

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.

For the 6-month enquiry, the draft standard was issued in 13 parts. After the discussion of the comments received during the enquiry it was decided to rearrange the content of 12 parts and to publish the final standard in the above 4 parts. The remaining Part 13 will be published as a separate standard.

Annex A of this European Standard is normative, the annexes B, C, D and ZA are informative.

Foreword to amendment A1

This document EN 378-4:2000/A1:2003 has been prepared by Technical Committee CEN/TC 182, Refrigerating systems, safety and environmental requirements, the Secretariat of which is held by DIN.

This Amendment to the European Standard EN 378-4:2000 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2004, and conflicting national standards shall be withdrawn at the latest by June 2004.

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Introduction

The introduction of EN 378-1 is applicable.

Gases containing chlorine are damaging the ozone layer. These and other gases which are used as refrigerant also contribute to the global warming (greenhouse) effect. Other refrigerants such as ammonia, although not contributing to environmental damage, should be treated with caution due to their toxic or flammable nature.

NOTE: Also see UNEP (United Nations Environment Program) Montreal Protocol on substances that deplete the ozone layer (latest revision)

All parties concerned (e.g. designers, manufacturers, erectors, instructors, owners, users) should take advantage of any opportunity for reducing or eliminating emissions of environmentally damaging refrigerants.

The elimination of emissions should be one of the principal objectives during recovery, reuse and disposal of refrigerants.

1 Scope

1.1 The scope of EN 378-1 is applicable.

1.2 This Part 4 of the European Standard specifies requirements for safety and environmental aspects in relation to operation, maintenance, repair of refrigerating systems and the recovery, reuse and disposal of all types of refrigerant.

1.3 These requirements are intended to minimize risks of injury to persons and damage to property and the environment resulting from improper handling of the refrigerants or from contaminants leading to system breakdown and resultant emission of the refrigerant.

1.4 Certain clauses and sub-clauses of this Part 4 are not applicable to unit systems, self contained systems and systems built on site which operate with charges of refrigerant up to:

2,5 kg of group L1 refrigerant;

1,5 kg of group L2 refrigerant; and

1,0 kg of group L3 refrigerant.

This clause is:

clause 5.

2 Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

EN 378-1

Refrigerating systems and heat pumps – Safety and environmental requirements – Part 1: Basic requirements, definitions, classification and selection criteria

EN 378-2

Refrigerating systems and heat pumps – Safety and environmental requirements – Part 2: Design, construction, testing, marking and documentation

EN 378-3

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

ISO/DIS 11650
Performance of refrigerant recovery and/or recycling equipment

ISO/DIS 12810
Fluorocarbon refrigerants – Specifications and test methods

3 Definitions

For the purposes of this European Standard the definitions given in EN 378-1 apply.

4 Operational instructions

4.1 General

4.1.1 Care shall be taken to ensure that the personnel charged with the operation, supervision and maintenance of the refrigerating system are adequately instructed and are competent with respect to their tasks. The installer of the refrigerating system shall draw attention to the necessity of adequate instruction of operating and supervision personnel.

4.1.2 Personnel in charge of the refrigerating system shall have knowledge and experience of the mode of functioning, operation and day-by-day monitoring of this system.

4.2 Instruction of operating personnel

Before a new refrigerating system is put into service, the person concerned shall ensure that the operating personnel are instructed on the basis of the instruction manual about the construction, supervision, operation and maintenance of the refrigerating system as well as the safety measures to be observed and the properties and handling of the refrigerant used.

NOTE: It is advisable that the operating personnel be present during evacuation, charging with refrigerant and adjustment of the refrigerating system as well as, if possible, during assembly on site.

5 Maintenance and repair

5.1 General

5.1.1 Each refrigerating system shall be subjected to preventive maintenance in accordance with the instruction manual, see EN 378-2.

NOTE 1: However, the frequency of such maintenance depends on the type, size, quality, age, use, etc. of the system. In many cases more than one maintenance service is required in the course of one year in accordance with legal requirements.

NOTE 2: For personal protective equipment against refrigerants see EN 378-3.

5.1.2 The parties concerned for the refrigerating system shall ensure that the system is inspected, regularly supervised and maintained in a satisfactory manner.

5.1.3 The parties concerned for the refrigerating system shall also be responsible when the refrigerating system is used by another person, unless another division of responsibility has been agreed upon.

5.1.4 Regular maintenance which does not include interference with, nor adjustment of, the refrigerating system and which requires no specialized knowledge of refrigeration engineering can be carried out by a person of appropriate competence employed by the person responsible.