SLOVENSKI STANDARD
SIST-TS CEN/TS 17606:2021

01-maj-2021

Vgradnja opreme za hlajenje, klimatizacijo in toplotno črpalko, ki vsebuje vnetljiva hladilna sredstva, za dopolnitev obstoječih standardov

Installation of refrigeration, air conditioning and heat pump equipment containing flammable refrigerants, complementing existing standards

Installation von Kälte-, Klima- und Wärmepumpenanlagen, die brennbare Kältemittel enthalten, zur Ergänzung bestehender Normen

Installation d'équipements de réfrigération, de climatisation et de pompes à chaleur contenant des réfrigérants inflammables, en complément des normes existantes

Ta slovenski standard je istoveten z: **CEN/TS 17606:2021**

ICS:

23.080	Črpalke	Pumps
27.200	Hladilna tehnologija	Refrigerating technology
91.140.30	Prezračevalni in klimatski sistemi	Ventilation and air-conditioning systems

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TECHNICAL SPECIFICATION

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English Version

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This Technical Specification (CEN/TS) was approved by CEN on 1 February 2021 for provisional application.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (CEN/TS 17606:2021) has been prepared by Technical Committee CEN/TC 182 “Refrigerating systems, safety and environmental requirements”, the secretariat of which is held by DIN.

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Introduction

The adoption of refrigerants with low Global Warming Potential, in response to concerns about the effect of some fluorocarbons on climate, has raised the profile of fluids which were previously limited in their use due to flammability. As the industry moves towards greater use of low GWP flammable refrigerants, in particular from flammability class A3, it is important to ensure that installation methods also change to support this technology transition.

The purpose of this document is to provide information to ensure acceptable risk levels applying flammable refrigerants.

This document therefore provides technical information to the companies and individuals directly involved in activities at the worksite; the owner of the system and the company and individuals that install equipment.

1 Scope

This document provides technical information for the installation of refrigeration, air conditioning and heat pump equipment containing flammable refrigerants, in particular from class A3, complementing existing standards. The term “refrigerating system” used in this document includes air conditioners and heat pumps.

Refrigerants from toxicity class B are excluded from this scope.

This document includes risk mitigation measures not yet addressed in existing standards for specific refrigerant classes, or not fully reflecting the state of the art, and establishes complementary technical specifications related to the installation of equipment.

The following aspects are considered:

— explosive atmosphere workplace and equipment;

NOTE Further information can be found in Directive 99/92/EC (ATEX Workplace Directive) and Directive 2014/34/EU (ATEX Equipment Directive).

— design and structural specifications for the installation site;

— marking and labelling of equipment parts and installation site;

— good practice for installing equipment, including tools and personal protection;

— risk mitigation methods and related refrigerant charge limits;

— risk assessments;

— competence of personnel;

— safety testing of systems and equipment.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. 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+A1:2020, *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*

EN ISO 22712:—[1], *Refrigerating systems and heat pumps - Competence of personnel (ISO/DIS 22712)*

ISO 31000 series, *Risk management*

[1] Under preparation. Stage at the time of publication: prEN ISO 22712:2018.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 378-1:2016+A1:2020, EN ISO 22712:—[1] and the following apply.

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

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
installation
<process> process of installing equipment in the location in which it will be operated

3.2
installation
<result> completed assembly of equipment, ready for operation

3.3
installer
company that performs the act of installing

3.4
equipment
single apparatus or set of devices or apparatuses, or the set of main devices of an installation, or all devices necessary to perform a specific task

[Source: IEV 151-11-25]

3.5
risk analysis
systematic use of available information to identify *hazards* and to estimate the *risk*

3.6
risk assessment
overall process comprising a *risk analysis* and a *risk evaluation*

3.7
risk evaluation
procedure based on the *risk analysis* to determine whether *tolerable risk* has been exceeded

3.8
risk mitigation measure
action or means to eliminate *hazards* or reduce *risks*

EXAMPLE: *Inherently safe design*; protective devices; personal protective equipment; information for use and installation; organization of work; training; application of equipment; supervision.

3.9
safety
freedom from *risk* which is not tolerable

3.10
tolerable risk
level of *risk* that is accepted in a given context based on the current values of society

Note 1 to entry: For the purposes of this document, the terms “acceptable risk” and “tolerable risk” are considered to be synonymous.

4 General

NOTE 1 The legal responsibilities of all parties apply as laid down in the ‘Blue Guide’ on the implementation of EU products rules 2016 and DECISION No 768/2008/EC on a common framework for the marketing of products.

Equipment shall be installed according to the manufacturer’s instructions or according to an alternative approach following Clause 5. In the latter case the installer assumes the responsibility as the manufacturer of the assembly. The installer of the equipment shall provide installation and operating instructions taking into account all specific aspects related to the installation site as appropriate.

NOTE 2 National regulations could apply.

Where the installer has not declared that an alternative approach has been adopted and does not provide a customised operating manual, the installer shall be responsible for ensuring that the requirements laid down by the equipment manufacturer are fulfilled. In this case the manufacturer remains responsible for the safe design of the installation, operation, and maintenance of the equipment, in particular with regards to respecting the charge size limits and associated risk mitigation measures.

The following documents contain useful information:

— EN 60335-2-40:2003 provides information on procedures additional to usual information for air conditioning and heat pump equipment installation procedures when an appliance with flammable refrigerants is affected;

— EN 378-3 provides information regarding the installation site and personal protection;

— EN 60079-14 contains the specific requirements for the design, selection, erection and initial inspection of electrical installations in, or associated with, explosive atmospheres;

— EN 60079-17 covers factors directly related to the inspection and maintenance of electrical installations within hazardous areas only, where the hazard could be caused by flammable gases, vapours, mists, dusts, fibres or flyings.

The employer of the installation personnel shall carry out a risk assessment.

NOTE 3 Further information can be found in Directive 99/92/EC.

It is the responsibility of the employer to ensure the safety and health of workers in every aspect related to the work. The employer shall provide instructions and training to enable workers to work safely with flammable refrigerants, in particular A3 refrigerants.

Persons working on refrigerating systems containing flammable refrigerants shall have competence in safety aspects of flammable refrigerant handling. The personnel installing the refrigerating system shall be adequately instructed and competent with respect to their tasks, as well as the safety measures to be observed, and the properties and handling of the refrigerant used.

NOTE 4 The parties involved are the companies and individuals directly involved in activities at the worksite; the owner of the system and the company and individuals providing installation services.

Examples for checklists can be found in Annex A of COM(2003)515 of 25 August 2003.

5 Extended charge size limits and associated risk mitigation measures

When the system to be installed is designed in accordance with an alternative safe system of work rather than following the requirements of EN 378 (all parts) or an applicable product standard, the design shall be undertaken by competent persons according to EN ISO 22712:—[1]. These persons may be employees of the company providing the installation services or a third party sub-contracted to either the owner or the installer.

The purpose of developing the alternative safe system of work shall be to enable equipment to be deployed which uses a larger charge of flammable refrigerant than would be permitted by the product standard or EN 378-1:2016+A1:2020, Annex C. The competent person developing the design shall conduct a risk assessment in accordance with the ISO 31000 series of standards. The risk assessment shall identify all relevant hazards and shall specify all measures which are required in order to ensure that a tolerable level of risk is achieved by design and is maintained throughout the operating life of the equipment. The tolerable level of risk and the risk assessment shall be documented.

NOTE It could be necessary for the owner to receive approval of his insurers or other stakeholders before adopting this approach.

Alternative risk mitigation measures considered under this approach may include, but are not limited to

— Means to reduce the rate of leakage in the event of a leak, for example by absorbing the refrigerant in an absorbent within the system when the pressure rises;

— Means to increase the integrity of the refrigeration circuit, for example using a fully welded hermetic system in corrosion resistant material;

— Means to reduce the extent of the flammable zone in the event of a leak;

— Means to prevent the ignition of flammable atmospheres.

6 Installation location

The equipment can be located in a room, either directly or in a ventilated enclosure, or can be in the open air.

The installer shall follow the manufacturer's instructions for installation in rooms, ventilated enclosures or outside locations as appropriate.

The room size shall not be smaller than the room size specified by the installation instructions supplied with the equipment unless the procedure described in Clause 5 has been implemented.

NOTE National laws and regulations take precedence.

7 Marking and documentation of refrigerating systems and installation sites

7.1 General

The installation site where equipment containing flammable refrigerants is located shall be marked with flammability warning signs that should last at least the expected lifetime of the equipment.

Any marking shall always be visible, durable, and non-removable. If the marking is permanently affixed to a panel or surface that can be removed for installation or service, the user shall ensure that the panel or surface is in its intended place during the operation of the equipment.