SLOVENSKI STANDARD
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Ognjevarne omarice za shranjevanje kemikalij - 1. del: Ognjevarne omarice za shranjevanje vnetljivih tekočin

Fire safety storage cabinets - Part 1: Safety storage cabinets for flammable liquids

Feuerwiderstandsfähige Lagerschränke - Teil 1: Sicherheitsschränke für brennbare Flüssigkeiten

Armoires de stockage de sécurité incendie - Partie 1: Armoires de stockage de sécurité pour liquides inflammables

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EUROPEAN STANDARD

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English Version

Fire safety storage cabinets - Part 1: Safety storage cabinets for flammable liquids

Armoires de stockage de sécurité incendie - Partie 1 : Armoires de stockage de sécurité pour liquides inflammables

Feuerwiderstandsfähige Lagerschränke - Teil 1: Sicherheitsschränke für brennbare Flüssigkeiten

This European Standard was approved by CEN on 14 May 2023.

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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 CEN-CENELEC Management Centre has the same status as the official versions.

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

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European foreword

This document (EN 14470-1:2023) has been prepared by Technical Committee CEN/TC 332 “Laboratory equipment”, 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of an identical text or by endorsement, at the latest by January 2024, and conflicting national standards shall be withdrawn at the latest by January 2024.

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

This document supersedes EN 14470-1:2004.

The main changes compared to the previous edition are listed below:

a) Extension of the scope from an internal volume of not more than 1 m^3 to not more than 2 m^3;

b) Clause 3 “Terms and definitions” extended and clarified;

c) Deletion of the classification “Type 15”;

d) Clarifications in Clause 5 “Construction” by e.g. including the description for materials and surfaces, weight loads and the addition of openings for pipes, hoses and electrical cables;

e) Extension of Clause 7 “Information to be supplied”;

f) Extension of Clause 8 “Marking and labelling”;

g) Revision of the figures for temperature sensors in Annex A;

h) Annex B extended and clarified by including a small fire test;

i) Adding new Annex C “Mechanical and aerotechnical testing”.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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

Introduction

This document describes the design and testing criteria for fire safety storage cabinets (also referred to as “cabinets” in this document) to be used in rooms to store flammable liquids in closed containers at normal room temperatures.

Primarily, this document covers the three major safety requirements for storage of flammable liquids, which are:

a) minimizing the fire risk associated with the storage of flammable substances and protection of the fire safety storage cabinet’s content in the event of fire for a known (tested) minimum length of time (fire rating);

b) minimizing the amount of vapour released into the working environment;

c) retention of accidental spillage within the fire safety storage cabinet.

Testing of the fire safety storage cabinet (see a) above) under fire conditions is a normative part of this document and the procedures and interpretation of the tests are described in detail.

The fire test (see a) above) provides three categories of fire protection ratings. In practice the degree of fire protection/rating allows the user to select, depending on individual circumstances, a fire safety storage cabinet which will allow sufficient time for personnel to leave, and fire fighters to enter the room before it is likely to that the flammables stored turn a possible minor/extinguishable fire into an uncontrollable one. The methods of achieving b) and c) above are sufficiently flexible to allow for local/national needs.

Caution should be exercised when determining the appropriate cabinet fire rating when flammables having auto-ignition temperatures below 200 °C and/or having high vapour pressures at room temperature are involved. When such flammable materials are being stored, expert advice should be sought. Reference is made to national regulations concerning flammable liquids.

1 Scope

This document is a product specification, giving performance requirements for fire safety storage cabinets to be used for the storage of flammable liquids. It is applicable to cabinets with a total internal volume of not greater than 2 m^3, which can be free standing, restrained to a wall or mounted on plinth or castors.

This document does not apply to brick enclosures or walk-in storage rooms.

This document does not apply to any support frame or mechanism other than the base which is integral to the fire safety storage cabinet.

Requirements are given in respect of the construction of the fire safety storage cabinet and its capacity to resist fire conditions on the outside. A classification of fire safety storage cabinets is given, according to the level of fire resistance offered, and a type test is included, see Annex A.

The tests described in this document are type tests.

This document does not discriminate between different flammable liquids, which can have considerably different physical properties.

Attention is drawn to national regulations, which can apply with regard to the storage of flammable liquids.

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 1363-1:2020, *Fire resistance tests - Part 1: General requirements*

EN 13165, *Thermal insulation products for buildings - Factory made rigid polyurethane foam (PU) products - Specification*

EN 13501-1:2018, *Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests*

EN 16121, *Non-domestic storage furniture - Requirements for safety, strength, durability and stability*

EN 16122, *Domestic and non-domestic storage furniture - Test methods for the determination of strength, durability and stability*

EN ISO 5167-1, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full - Part 1: General principles and requirements (ISO 5167-1)*

EN ISO 7010, *Graphical symbols - Safety colours and safety signs - Registered safety signs (ISO 7010)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

3.1
type
specimen of a design manufactured with the characteristics intended for series production

3.2
type test
conformity testing on the basis of one or more specimens of product representative of the production

3.3
penetration
<fire safety storage cabinet> passage of a *media line* (3.13) through any orifice of the fire safety storage cabinet

3.4
access opening
<fire safety storage cabinet> opening through which user access to a fire safety storage cabinet interior is intended

3.5
door
<fire safety storage cabinet> component of the fire safety storage cabinet, which closes the access opening

Note 1 to entry: Example of a door would be a wing door, pull-out element with front part or cover.

3.6
usable space
<fire safety storage cabinet> designated area inside the fire safety storage cabinet that can be used for the storage of flammable liquids

3.7
bottom of the cabinet
lower fire integrity construction element of the fire safety storage cabinet

3.8
storage level
fitting element carrying the goods to be stored

3.9
spill containment sump
area intended to collect leakages and spilled liquids

3.10
superimposed load
<fire safety storage cabinet> load on top of the fire safety storage cabinet

3.11
weight load
total gross fire safety storage cabinet weight including the maximum load and the optional superimposed load as specified by the manufacturer

3.12
small fire test
comparative fire test where only a part of the penetrated wall, ceiling or bottom is tested

3.13
media line
cable, hose or pipe to distribute services such as gases, liquids, electricity and IT

3.14
EX zone
area where explosive atmosphere can occur

4 Classification

A fire safety storage cabinet shall be classified as one of the types given in Table 1.

Table 1 — Fire safety storage cabinet type classification

Type	Time taken for internal temperature *T* to rise by 180 K min
30	≥ 30
60	≥ 60
90	≥ 90

5 Construction

5.1 Fire protection

In the case of a fire, the fire safety storage cabinet shall ensure that, for at least 30 min, the contents of the cabinet do not contribute any additional risks or spread of fire.

5.2 Access opening

5.2.1 In case of fire, the access opening shall be closed off by the door/s automatically and completely.

The closing time of fully opened doors, from the time of door release, shall not exceed 20 s.

Tests shall be performed according to C.2 c) and e).

If a hold-open feature is included, the access opening shall be closed off fully in the event of a temperature of (50^{+0}_{-10}) °C being reached in the vicinity of the access opening of the cabinet. The temperature release sensor for this shall be positioned in freely circulating air of the access opening, so that it can heat up rapidly.

5.2.2 The temperature release component of the closing device shall conform to the temperature range specified in 5.2.1. This shall be confirmed in the manufacturer's declaration.

5.2.3 If the closing of the doors is actuated or triggered by an external power source, the mechanism shall be working even if the external power source fails.

5.2.4 Moving components of the closing mechanism shall not reach into the usable space of the cabinet.

5.2.5 Doors and their surroundings shall be designed such that the static force shall not exceed 100 N between the main closing edge and the counter closing edge to prevent injuries.

5.2.6 It shall be possible to operate each door single-handedly.

5.2.7 If the doors are lockable, the locking device shall not compromise the self-closing performance as required in 5.2.1.

5.2.8 The functioning of the closing mechanism shall be tested according to C.2.

5.3 Construction materials and surface areas

Coatings and/or decors inside the fire safety storage cabinet, which may be used to improve the durability/impact-resistance, shall be classified at least as class E according to EN 13501-1:2018. The surface areas of the cabinet interior shall be resistant to the flammable liquids that can correctly be stored inside the cabinet.

NOTE Where the surface coating or material of hinges for doors or hardware for drawers reduces the conductivity between the cabinet body and the doors or drawers, and a risk is identified by the user's risk assessment, it is advisable to take appropriate measures to establish a conductive connection between such components.

5.4 Weight load

The fire safety storage cabinet including supporting elements, e.g. castors, plinths, shall be constructed in such a way that it is capable of carrying the total cabinet weight including additional load given by the manufacture without any damaging distortion at the testing temperature according to Annex A.

5.5 Ventilation

5.5.1 Fire safety storage cabinets shall be equipped with openings for inlet and outlet air, enabling the connection of the cabinet to an extract air system. The openings for the inlet and outlet air shall be positioned to each other in such a way that a uniform ventilation of the entire cabinet interior is maintained. These openings should close in the event of fire. Tests shall be performed according to C.3.

NOTE Attention is drawn to national regulations regarding the connection of fire safety storage cabinets to extract air systems.

5.5.2 In a fire safety storage cabinet connected to a ventilation system, with the doors closed, air exchange at a rate of at least 10 times the volumetric capacity of the empty cabinet per hour shall take place. The differential pressure at the connection point to the ventilation system shall not exceed 150 Pa compared to the ambient pressure. The low pressure, which the ventilation system causes inside the cabinet, shall not significantly compromise the opening of the doors. The ventilation shall be effective immediately above the bottom tray of the cabinet. Tests shall be performed according to C.3.

NOTE An air exchange rate of greater than 10 h^{-1} can be necessary for other reasons and is not covered by this document.