



# SLOVENSKI STANDARD

## SIST EN 14470-1:2004

01-september-2004

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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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**Ta slovenski standard je istoveten z: EN 14470-1:2004**

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### **ICS:**

13.220.40	Sposobnost vžiga in obnašanje materialov in proizvodov pri gorenju	Ignitability and burning behaviour of materials and products
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**en**

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ICS 13.220.40; 71.040.10

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 2 February 2004.

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.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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## Foreword

This document (EN 14470-1:2004) 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 October 2004, and conflicting national standards shall be withdrawn at the latest by October 2004.

Annexes A and B are normative.

This document includes a Bibliography.

EN 14470, *Fire safety storage cabinets*, consists of the following parts:

Part 1 — Safety storage cabinets for flammable liquids

Part 2 — Safety storage cabinets for pressurised gas cylinders (in preparation)

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

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## Introduction

This European Standard describes the design and testing criteria for safety cabinets to be used in laboratories to store flammable liquids in closed containers at normal room temperatures.

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

- a) minimising the fire risks associated with the storage of flammable substances and protection of the cabinet's contents in the event of fire for a known (tested) minimum length of time (fire rating);
- b) minimising the amount of vapour released into the working environment;
- c) retention of accidental spillage within the cabinet.

Testing of the cabinet [see a) above] under fire conditions is a normative part of the standard and the procedures and interpretation of the tests are described in detail.

The fire test [see a) above] provides for four categories of fire protection / ratings. In practice the degree of fire protection/rating allows the user to select, depending on individual circumstances, a cabinet which will allow sufficient time for personnel to leave, and fire fighters to enter the laboratory 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.

## 1 Scope

This European Standard is a product specification, giving performance requirements for fire safety cabinets to be used for the storage of flammable liquids in laboratories. It is applicable to cabinets with a total internal volume of not greater than 1 m<sup>3</sup>, which may be free standing, restrained to a wall or mounted on wheels or castors. It is not applicable to brick enclosures or walk-in storage rooms.

This European Standard is not applicable to cabinets which do not take their weight on their base.

Requirements are given in respect of the construction of the cabinet and its capacity to resist fire conditions on the outside. A classification of cabinets is given, according to the level of fire resistance offered, and a type test is included, which draws on already existing fire resistance tests, such as those given in ISO 834-1 [1] and EN 1363-1.

The tests described in this European Standard are type tests.

NOTE 1 This European Standard does not discriminate between different flammable liquids, which may have considerably different physical properties. The suitability of the standard in respect of any given flammable liquid should be ascertained by the user.

NOTE 2 Attention is drawn to national regulations which may apply with regard to the storage of flammable liquids.

## 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 (including amendments).

EN 1363-1:1999, *Fire resistance tests — Part 1: General requirements*.

EN ISO 4796-2, *Laboratory glassware — Bottles — Part 2: Conical neck bottles (ISO 4796-2:2000)*.

EN ISO 13943:2000, *Fire safety — Vocabulary (ISO 13943:2000)*.

ISO 3864 (all Parts), *Safety colours and safety signs*.

## 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN ISO 13943:2000 and the following apply.

### 3.1

#### **type**

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

### 3.2

#### **type testing**

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

## 4 Classification

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

**Table 1 — Fire safety storage cabinet Type classification**

Type	Time taken for T to rise by 180 K (min)	Test according to EN 1363-1	Ventilation connection facility required	Self-closing doors
15	≥ 15	!	!	!
30	≥ 30	!	!	!
60	≥ 60	!	!	!
90	≥ 90	!	!	!

## 5 Construction

### 5.1 Fire protection

In the case of a fire, the cabinet shall assure that, for at least 15 min, the contents of the cabinet do not contribute any additional risks or spread of fire.

### 5.2 Doors

**5.2.1** The doors of the cabinet shall be fully self-closing from any position.

The closing time of the doors, from the time of door release, shall not exceed 20 s. The time for closing doors from their completely open position or from the position given by a hold open feature shall be measured with a stopwatch, at a temperature of  $(20 \pm 5) ^\circ\text{C}$ .

If a hold-open feature is included, the doors shall close fully in the event of a temperature of  $(50 \pm 10) ^\circ\text{C}$  being reached in the vicinity of the front of the cabinet. The temperature release sensor for this shall be positioned in freely circulating air, so that it can heat up rapidly.

**5.2.2** The temperature release component of the closing device shall be confirmed as conforming to the requirements specified in 5.2.1, by the manufacturer's declaration of conformity.

**5.2.3** Doors and their surroundings shall be designed such that the risk of injuries by pinching is minimised. To minimise injuries by closure of the doors, the static force shall not exceed 100 N between the main closing edge and the counter closing edge.

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

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

### 5.3 Side and back walls

The side and back walls of the cabinet shall be of the same thickness and comparable construction.



## 5.4 Ventilation

**5.4.1** Cabinets shall be equipped with openings for inlet and exhaust air, enabling the connection of the cabinet to an exhaust air system.

NOTE 1 Attention is drawn to national regulations regarding the connection of safety storage cabinets to exhaust air systems.

In a cabinet in which ventilation is taking place, with the doors closed, air exchange at a rate of at least 10 times the volumetric capacity of the cabinet per hour shall take place, with a pressure drop not exceeding 150 Pa. The ventilation system shall maintain a lower pressure in the cabinet than that outside. The ventilation shall be effective immediately above the bottom tray of the cabinet.

This shall be tested by visual inspection of the openings and measurement of the air exchange and pressure drop with the cabinet empty of containers.

NOTE 2 An air exchange rate of greater than  $10 \text{ h}^{-1}$  can be necessary for the reduction of smell.

**5.4.2** The ventilation openings for inlet and exhaust air shall close automatically when subjected to a temperature of  $(70 \pm 10) \text{ }^\circ\text{C}$ .

## 5.5 Shelves

The shelves and their fastenings shall be of non-absorbent material and shall carry the load specified in the user information to be supplied (see clause 7) without any damaging distortion at the testing temperature according to annex A. The shelves shall not hinder the automatic closure of the doors. This shall be tested by visual inspection.

NOTE For better ventilation, perforated shelves can be useful.

The highest shelf shall be not higher than 1,75 m from the floor.

## 5.6 Spill containment sump

A spill containment sump shall be installed underneath the lowest storage level. The sump shall be designed such that liquids spilled from higher shelves are collected in the sump. The sump shall have a minimum capacity of 10 % of the volume of all the containers stored in the cabinet, or at least 110 % of the volume of the largest single container, whichever is the greater. All spillages or condensation up to this volume shall be retained. This shall be tested by comparison with user information and, in case of doubt, by measurement of the sump capacity.

NOTE National regulations can require higher capacities than are specified here, e.g. for environmental protection.

The sump shall perform its function after the fire resistance test described in clause 6. This shall be verified by visual inspection after filling the sump with water.

## 6 Fire resistance

The fire resistance capability of the cabinet shall be investigated by a type test. This test is performed by heating the cabinet in a furnace according to the temperature-time curve described in 5.1.1 of EN 1363-1:1999 and measuring the temperature increase inside the cabinet. The cabinet shall then be classified as Type 15, 30, 60 or 90, according to the time for which the interior does not rise by more than 180 K, at any point of measurement, from a starting temperature of  $(20 \pm 5) \text{ }^\circ\text{C}$ . The test is given in annex A.