
Ognjevarne omare - 2. del: Ognjevarne omare za shranjevanje plinskih jeklenk pod tlakom

Fire safety storage cabinets - Part 2: Safety cabinets for pressurised gas cylinders

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Fire safety storage cabinets - Part 2: Safety cabinets for pressurised gas cylinders

Armoires de stockage de sécurité incendie - Partie 2 :
Armoires de stockage de sécurité pour bouteilles de gaz
comprimé

Feuerwiderstandsfähige Lagerschränke - Teil 2:
Sicherheitsschränke für Druckgasflaschen

This European Standard was approved by CEN on 21 July 2006.

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

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Foreword

This document (EN 14470-2:2006) 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of an identical text or by endorsement, at the latest by February 2007, and conflicting national standards shall be withdrawn at the latest by February 2007.

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

- Part 1: Safety storage cabinets for flammable liquids
- Part 2: Safety cabinets for pressurised gas cylinders

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Introduction

This European standard describes the design and test criteria for safety cabinets used by laboratories to store pressurised gas cylinders at normal room temperature.

The cabinet is designed and constructed to ensure that in the event of fire, the contents of the cabinet do not contribute any additional risks or spread the fire for at least 15 minutes.

The cabinet is also designed and constructed to ventilate minor gas leakage within the cabinet.

Testing the cabinet under fire conditions is a normative part of this standard and the procedures and interpretation of the tests are described in detail.

The fire rating allows time for personnel to leave and fire fighters to enter the area before the pressurised gas cylinders become unstable.

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1 Scope

This European standard is a product specification, giving performance requirements for fire safety cabinets used for storing pressurised gas cylinders. It is applicable to cabinets with a total internal volume suitable to store pressurised gas cylinders with a total volume not exceeding 220 l, including cylinders of purging gases.

NOTE 1 This means that up to four gas cylinders of 50 l or up to three gas cylinders of 70 l can be stored in a single cabinet.

NOTE 2 It is intended that the pressurised gas cylinders can be in use while in the cabinet.

NOTE 3 Attention is drawn to national regulations which can apply with regard to the storage and use of pressurised gas cylinders.

NOTE 4 The safety cabinet can be free standing, restrained to a wall or mounted on wheels or castors.

This standard is not applicable to brick enclosures, walk-in storage rooms or cabinets which do not take their weight on their base.

Requirements are given in respect to the construction of the cabinet and its capacity to resist fire conditions on the outside. A type test is included, which is based on the already existing fire resistance (heating curve) tests given in EN 14470-1.

The tests described in this European Standard are type tests (for the storage of flammable liquids EN 14470-1 is applicable – the criteria for failure are different – see Annex A).

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2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

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

ISO 3864 (all parts), *Graphical symbols - Safety colours and safety signs*

3 Terms and Definitions

For the purposes of this document, 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 serial production

3.2

type testing

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

4 Classification

A gas cylinder cabinet shall be classified as one of the Types listed in Table 1.

Table 1 — Fire safety cabinet for pressurised gas cylinder Type classification

Type	Time taken for T ^a to rise by 50 K min	Test according to EN 1363-1:1999	Ventilation connection facility required
G15	≥ 15	Yes	Yes
G30	≥ 30	Yes	Yes
G60	≥ 60	Yes	Yes
G90	≥ 90	Yes	Yes

^a T is the temperature taken on the surface of the gas cylinder valve spanner flat.

5 Construction

5.1 Fire protection

The cabinet shall be designed and constructed to ensure that, in the event of a fire, the contents of the cabinet do not contribute any additional risks or spread the fire for at least 15 minutes.

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5.2 Ventilation

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5.2.1 Cabinets shall be equipped with openings for inlet and exhaust air, which allows for connection of an exhaust air system to the cabinet.

In a ventilated cabinet in which ventilation is taking place, with the doors closed, latched and locked, the following extraction rates shall apply:

- when using flammable and fire supporting gas, at least 10 air changes of the cabinet's volume per hour;
- when using toxic gas, at least 120 air changes of the cabinet's volume per hour.

Under the above conditions the pressure drop shall not exceed 150 Pa. The ventilation system shall maintain a lower pressure in the cabinet than in the surrounding atmosphere. Ventilation shall take place on the top and bottom of the cabinet. Design of the air circulation system within the cabinet shall ensure adequate purging from minor leakage.

This shall be tested by visual inspection and by measuring the air flow and pressure drop while the cabinet is empty.

NOTE The inlet pressure drop and the number of air changes have been chosen to provide purging efficiency.

5.2.2 In the event of a fire, the inlet and exhaust vents shall close automatically. The vents' closing system shall be tested as part of the fire-resistance test in Annex A.

5.3 Gas cylinder restraining

Within the cabinet a suitable system shall be installed to prevent gas cylinders from falling over. The system shall be suitable for the quantity and dimensions of cylinders, which can be used in accordance with the user's instruction manual.

5.4 Insertion and removal of pressurised gas cylinders

The cabinet shall be constructed so that cylinders can be inserted and removed as safely as possible with minimum manual effort.

For example, when cabinet bases are above floor level a ramp and/or mechanical lifting equipment can be employed, however, these shall not be made of aluminium.

5.5 Installation of gas pipelines (for gas cylinders in use)

The number of pipe penetrations through the wall or roof of the cabinet shall be restricted to the minimum necessary and a maximum of 3 for each cylinder. Unused holes/penetrations shall be sealed in accordance with the user's instruction manual. The three holes should have a maximum diameter of 10 mm each.

NOTE In order to maintain the fire resistance as tested and specified in accordance with Annex A (see A.4.1), it is recommended that the pipes are made from stainless steel or from a material of similar thermal conductivity.

5.6 Installation of electric cables (where appropriate)

The number of penetrations through the wall or roof of the cabinet shall be restricted to the minimum necessary and a maximum of 2 for each cylinder. Unused holes/penetrations shall be sealed in accordance with the user's instruction manual. The two holes should be a maximum diameter of 20 mm each.

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6 Fire resistance

The fire resistance of the cabinet for storing pressurised gas cylinders shall be determined by a type test. This type test is performed by heating the cabinet in a furnace according to the time-temperature curve described in clause 5.1.1 of EN 1363-1:1999 and measuring the temperature increase on the surface of an empty gas cylinder within the cabinet. The temperature increase on the surface of the cylinder valve spanner flat (see Figure A.1) shall not exceed 50 K. Test details are given in Annex A.

7 Information to be supplied

The cabinet manufacturer shall supply with the cabinet a user information manual, which includes at least the following:

- a) instructions for correct cabinet installation;
- b) maximum combined volumetric capacity of the gas cylinders stored within the cabinet;
- c) safety procedure instructions in the event of fire, particularly the minimum time, when after a fire, the doors can be safely opened;
- d) instructions concerning the effect of gas pipes passing through (penetration of) the walls and roof of the cabinet, particularly the potential of reduced fire resistance;
- e) instructions to correctly seal the unused gas pipe feeds through the cabinet (penetration to the cabinet's walls and roof);
- f) warning that storing corrosive gases will adversely affect the effectiveness of the inlet and exhaust closing mechanisms;