

Waardeberging. Eisen en beproevings-  
methoden voor de brandwerendheid.  
Deel 1: Brandwerende kasten

Secure storage units. Classification and methods of test for  
resistance to fire. Part 1: Data cabinets

1e druk, november 1996  
ICS 35.020

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Normcommissie 341 101 "Safes"

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## Nederlands voorwoord

Voor de in deze norm vermelde andere normen bestaan in Nederland de volgende equivalenten:

<u>Vermelde norm:</u>	<u>Nederlandse norm:</u>	<u>Titel:</u>
prEN ISO 834-1	ontw.NEN-EN-ISO 834-1	Beproeving van de brandwerendheid. Bouwdelen. Deel 1: Algemene eisen

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ICS 35.020

Descriptors: fire protection, protection class, data media, diskette, classifications, fire endurance test, fire shock and impact test, marking

English version

**Secure storage units - Classification and methods of test for resistance to fire - Part 1: Data cabinets**

Unités de stockage en lieu sûr - Classification et méthodes d'essai de résistance au feu - Partie 1: Meubles réfractaires

Wertbehältnisse - Klassifizierung und Methoden zur Prüfung des Widerstandes gegen Brand - Teil 1: Datensicherungsschränke

Preview

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## Foreword

This European Standard has been prepared by Technical Committee TC 263 "Secure storage of cash, valuables and data media", the secretariat of which is held by BSI, as one of a series of standards for fire resistance of secure storage units.

A further Part is in preparation with the following title:

EN 1047-2 Secure storage units -  
Classification and methods of test for resistance to fire  
Part 2 : Data rooms and data containers

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of an identical text or by endorsement, at the latest by April 1997, and conflicting national standards shall be withdrawn at the latest by April 1997.

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

## Introduction

The testing conditions given in this standard provide a basis for simulating fires to determine, in a reproducible way, the fire resistance of data cabinets in various protection classes. The protection classes enable a comparison to be made of the resistance against fire provided by different constructions of cabinets.

The threshold values for the maximum temperature increase in protection classes S 60 P/S 120 P (150 °C), S 60 D/S 120 D (50 °C) and S 60 DIS/S 120 DIS (30 °C) from a starting temperature of  $(21 \pm 1) ^\circ\text{C}$ , and for the maximum relative humidity (85 %) for the D and DIS protection classes, as defined in this standard, refer to the relatively short time of high temperature exposure occurring during a fire test; they are not normally experienced by data media stored in data cabinets in the normal and correct way.

## 1 Scope

This European Standard specifies requirements for fire resisting data cabinets.

Two methods of test are specified to determine the ability of fire resisting data cabinets to protect temperature and humidity sensitive contents from the effects of fire: a fire endurance test and a fire shock and impact test.

Two levels of fire severity are specified based upon time of fire exposure; three levels of protection performance are specified using the maximum temperature increases and humidity values permitted within the storage space of the data cabinet.

Requirements are also specified for test specimens, documentation to accompany the test specimens, correlation of the test specimens with the documentation, preparation for testing and test procedures.

A scheme to classify the fire resisting data cabinets from the test results is given.

## 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.

prEN ISO 834 -1      Fire resistance tests - Elements of building construction -  
Part 1 : General requirements (ISO/DIS 834-1 : 1995)

## 3 Definitions

For the purposes of this standard the following definitions apply:

**3.1 data cabinet:** Cabinet designed to protect media and valuables against the effects of fire.

NOTE: A data cabinet can have doors, drawers, lids and fittings.

**3.2 media:** Material holding information including paper documents, magnetic tape, films, diskettes, cassettes, optical disks and video and audio cassettes.

#### 4 Requirements, classification and locking

4.1 Data cabinets shall provide protection against the effects of fire (see clause 6) and be classified as specified in table 1.

**Table 1: Protection class requirements**

Protection class		Maximum temperature increase	Maximum relative humidity
60 min	120 min		
S 60 P	S 120 P	150 °C	no requirement
S 60 D	S 120 D	50 °C	85 %
S 60 DIS	S 120 DIS	30 °C	85 %

Where S is the symbol applied to fire resistant data cabinets.

The numerical values in the protection class are the fire exposure times during the test in minutes and the letters characterise the types of media that can be protected in each class as follows:

- P Thermally sensitive paper documents, but excluding papers of grades which lose information below 170 °C.
- D Thermally and humidity sensitive media such as magnetic media and thermally sensitive paper, but excluding media which lose information below 70 °C.
- DIS Thermally and humidity sensitive media such as diskettes, but excluding media which lose information below 50 °C.

4.2 Data cabinets of all classes shall be fitted with a lock.

## 5 Test specimens, documents and correlation

### 5.1 Test specimens

Two identical data cabinets shall be available: one for the fire endurance test, the other for the fire shock and impact test. The data cabinet for the fire endurance test shall be modified at its base for installing the instrumentation (see 6.3 and figure 2) and may or need not have a plinth.

### 5.2 Documents to accompany the test specimens

Detailed construction engineering drawings shall be available prior to testing giving the height, width and depth of the test specimens, materials and their thicknesses, dimensions of rabbet edges, locking system, welds including the method of their execution, seals, etc. The mass of the plinth shall be given if one of the test specimens is supplied without a plinth.

NOTE: Three sets of construction drawings should be authenticated by the testing laboratory with one set sent to the applicant, one set forming part of any monitoring documentation for certification and quality assurance, and one set kept in the testing files of the testing laboratory.

Samples and detailed specifications of all heat protection materials and seals used in the test specimens shall accompany the test specimens.

The date(s) on which the test specimens were filled with protection materials shall be given.

A statement of the protection class the test specimen shall be tested to shall be given.

### 5.3 Correlation of test specimens and documents

Examine the test specimens and the drawings for correlation before commencing the test. Establish that the dimensions, design, material types and type of construction of the two test specimens correspond to the drawings. Record all measurements and any deviations on the drawings.

Make a photographic record of construction details including the outside of the cabinet, the inside of the cabinet, rabbet edges, seals and plinth.

The mass of the lighter test specimen shall not deviate from the heavier by more than 10 %. For this comparison add the mass of the plinth specified (see 5.1) to the mass of the test specimen supplied for the fire endurance test if that test specimen was supplied with no plinth.

## 6 Test method

### 6.1 Principle

The fire endurance of the test specimen is assessed by heating in a furnace according to a standard time-temperature relationship and cooling according to a specified time-temperature relationship.

The performance of the test specimen against fire shock and impact is assessed by a heating/cooling regime combined with a drop test.

During these tests the temperature and, where appropriate, the relative humidity in the cabinet is measured.

### 6.2 Test apparatus

**6.2.1** Furnace, capable of providing the uniform heating and cooling conditions specified in this European Standard, and constructed so that the four vertical walls of the test specimen can each be exposed to the same heating conditions with no direct flame impingement onto the test specimen.

The distance between the interior walls of the furnace and the surface of the test specimen shall be  $\geq 750$  mm. The furnace conditions shall conform to prEN ISO 834 -1.

**6.2.2** Instrumentation for measuring furnace temperatures conforming to prEN ISO 834 -1.

**6.2.3** Thermocouples consisting of 0,5 mm diameter wires of chromel/alumel or iron/constantan capable of measuring the air temperature inside the test specimen during the test with an error limit of  $\pm 1$  °C. The outputs of these thermocouples shall be recorded at intervals not greater than 1 min.

**6.2.4** Irreversible thermal indicators, capable of measuring the temperature with an error limit of  $\pm 1$  % of the temperature value indicated.

NOTE: Conventional temperature measuring devices are regarded as being impractical to use in the fire shock and impact test because of potential damage due to the impact of the drop test. Devices other than irreversible thermal indicators can be used if it can be shown that no loss of accuracy will occur.

**6.2.5** Instrumentation for measuring humidity inside the test specimen during the fire endurance test in the range 45 % to 85 % relative humidity capable of operating over the temperature range 20 °C to 70 °C with an error limit of  $\pm 3$  % relative humidity. The relative humidity values shall be recorded at intervals not greater than 2 min.



**6.2.6** Timing device, capable of running continuously throughout the test period.

**6.2.7** Equipment for weighing test specimens, with an error limit of  $\pm 1\%$ .

**6.2.8** Lifting equipment, capable of lifting the test specimen to the required height in the drop test.

**6.2.9** Impact surface, bed of rounded pebbles 0,5 m thick, particle size  $(50 \pm 10)$  mm, of a hard ( $\geq 6$  Mohs) mineral such as quartzite, granite, basalt or flint laid on a concrete base at least 300 mm thick. The length and width of the impact surface shall be more than twice the width and depth of the test specimen.

NOTE: The testing laboratory should ensure that the bed of pebbles is not allowed to become too compacted by repeated tests.

### 6.3 Preparation for test

**6.3.1** Suitably modify the base (see 6.3.5) of the test specimen for the fire endurance test (see 6.4.2) to allow the entry of thermocouple cables and humidity sensors.

Add lifting attachments (see annex A) to the test specimen for the fire shock and impact test (see 6.4.3).

**6.3.2** For the fire endurance test (see 6.4.2) install thermocouples (see 6.2.3) at the following points in the test specimen to enable temperature measurement:

- a) Four air temperature measuring points in the upper corners each  $(26,5 \pm 1,5)$  mm from the walls, interior door surface and ceiling (see points 1, 2, 3 and 4 of figure 1).
- b) One surface temperature measuring point on each of the ceiling, side walls, rear wall, and door, approximately in the centre of each surface (see points 5, 6, 7, 8 and 9 of figure 1).
- c) For two-door cabinets only, two additional air temperature measuring points at  $(26,5 \pm 1,5)$  mm from the centre door joint, one  $(26,5 \pm 1,5)$  mm from the ceiling and the other approximately half-way up the cabinet (see points 10 and 11 of figure 1).
- d) For test specimens with self-contained drawers, additional measuring points in each drawer, as in a) and b).

**6.3.3** For the fire shock and impact test (see 6.4.3) install thermal indicators (see 6.2.4) at the points indicated in 6.3.2 a) and c) (see Annex A).

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