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IS 14505 (1998): Fire resisting magnetic media protection cabinets [MED 24: Security Equipment]



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Indian Standard

**FIRE RESISTING MAGNETIC MEDIA
PROTECTION CABINETS — SPECIFICATION**

ICS 97.140; 13.220.20

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Security Equipment Sectional Committee had been approved by the Heavy Mechanical Engineering Division Council.

This standard for fire resisting magnetic media cabinet covers the requirements for proper protection of computer tapes, magnetic tapes and microfilms but it does not cover the specialised requirements of floppy discs, for which a separate standard is under preparation on account of the very critical protections required by floppy discs, both against temperature and humidity. The limits of temperature and relative humidity for magnetic media are 66°C and 85 percent respectively. If the temperature and relative humidity exceeds these limits the magnetic data will be destroyed.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

FIRE RESISTING MAGNETIC MEDIA PROTECTION CABINETS — SPECIFICATION

1 SCOPE

1.1 This Indian Standard lays down the requirements regarding materials, sizes and details of construction of fire resisting cabinets which afford security to computer data media, particularly magnetic tapes and microfilms against fire.

1.1.1 This standard does not cover protection to floppy discs.

2 REFERENCES

The Indian Standards listed in Annex A are necessary adjuncts to this standard.

3 NOMINAL SIZES

Nominal size of the cabinet shall be denoted by its internal height as specified in Table 1.

Table 1 Dimensions of Fire Resisting Computer Data Protection Cabinets
(Clauses 3 and 6)

All dimensions in millimetres.				
SI No.	Parameter	840	1 160	1 460
i)	Nominal size	840	1 160	1 460
ii)	Nominal inside dimensions	Height (± 35)	840	1 160
		Width (± 25)	525	525
		Depth (± 25)	450	450
iii)	Height of pedestal	(± 10)	100	100

4 TYPES

Magnetic media protection cabinets shall be of two types as follows:

- Type FR 60 — Cabinets having a fire resisting capacity of 60 minutes.
- Type FR 120 — Cabinets having a fire resisting capacity of 120 minutes.

5 MATERIALS

Different components of the magnetic media protection cabinets shall be manufactured from material as specified below:

- | | |
|---------------------|---------------------|
| 1) Steel components | a) IS 513 |
| | b) IS 1079 |
| | c) IS 1570 (Part 5) |
| | d) IS 1732 |
| | e) IS 2062 |
| | f) IS 9550 |

- 2) Brass/Bronze components

- a) IS 292
b) IS 306
c) IS 410
d) IS 713
e) IS 7608

6 DIMENSIONS AND TOLERANCES

The fire resisting magnetic media protection cabinets shall have dimensions and tolerances as given in Table 1.

7 DESIGNATION

The magnetic media cabinet shall generally be designated by type, nominal size and number of this Indian Standard.

Example:

A magnetic media protection cabinet of Type FR 60 and nominal size 1 160 shall be designated as:

Magnetic Media Protection Cabinet FR 60 \times 1 160 IS 14505.

8 CONSTRUCTION

8.1 The construction of magnetic media cabinet shall be 'Double Cabinet' type (i.e. cabinet inside cabinet type) comprising of an external cabinet and an internal cabinet for body as well as door. Alternatively a single cabinet type construction can also be accepted.

8.2 The door of the internal cabinet (main cabinet in case of single cabinet construction) shall clench against a resilient packing to avoid admission of steam/water/vapour and thus keep the required humidity in control.

9 ASSEMBLY

9.1 In case of double cabinet type construction the assembly of internal cabinet with the external cabinet shall be such that there is an annular gap of atleast 3 to 4 mm between them thus avoiding direct contact and conduction path for heat.

9.2 Fitment of inner cabinet door with its body shall have a resilient packing throughout the joint periphery to prevent direct passage of flame/heat and humidity.

10 FABRICATION

10.1 Fabrication of external cabinet shall comply with 8 of IS 14203.

10.2 Fabrication of Internal Cabinet

10.2.1 The internal cabinet shall be manufactured from steel, plastic, fibre-glass, wood, etc. and can be of single or double wall construction. In case of steel, the sheet thickness used for internal cabinet shall be not more than 1mm thick. In case of other material suitable thickness may be used.

10.2.2 Shelf

Shelves shall be made from steel sheet of thickness not less than 1.25 mm and not more than 1.6 mm and shall be of adjustable type.

10.2.3 Door

The door shall be made from steel sheet not more than 1.0 mm thick without any burrs and dents and shall have provision for mounting racks on the inner face.

10.2.4 Clenching Mechanism

The mechanism for clenching the internal door with internal body shall be through a suitable mechanical device so as to clench the door against a resilient packing.

10.2.5 Handles

Handle shall be made from cast brass or zinc base alloy or mild steel and shall be nickel chrome plated or powder coated.

11 INTERNAL FIXTURES

11.1 The internal fixtures of the cabinet shall conform to the requirement of either **11.2**, **11.3**, **11.4**, **11.5** and **11.6** or a combination of these depending upon the requirements of the customer.

11.2 The cabinet shall be provided with suitable racks to store magnetic tapes and shall be of adjustable type.

11.3 The spacer fitting into the racks as separators should be made from Anodised Aluminium or enamel painted or chromium-plated powder coated mild steel rod/wire of 3 mm minimum diameter.

11.4 The cabinet may also be provided with ordinary shelves to store disc pack/hard disc pack or tape reel pack.

11.5 The cabinet may also be provided with a hanger bar for tape seal/tape reel, if required by customer.

11.6 The cabinet may also be provided with door mounting racks to store tape seals/tape reels.

12 PAINTING

12.1 All surfaces shall be thoroughly degreased and cleaned of rust before application of rust proof primer.

12.2 Putty conforming to IS 419 shall be applied to all surfaces requiring filling. Two coats of undercoat and final coat paint conforming to IS 2074 shall be applied.

12.3 Finish shall be smooth, uniformly applied and free from visible defects. It shall be smooth and shall not readily chip or flake. The dry film thickness shall not be less than 0.1 mm and shall be polished to bring out lustre or be in matt finish or stipple finish.

13 MARKING

13.1 A metal plate showing type of cabinet together with the manufacturer's name and the year of manufacture shall be fixed on the inner face of the door.

13.2 The keys shall be marked with an identification number which shall not be the same as the serial number of the cabinet.

13.3 BIS Certification Marking

13.3.1 The magnetic media protection cabinets may also be marked with Standard Mark.

13.3.2 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

14 INSPECTION

The purchaser or his authorised representative shall normally have access to the factory to inspect the fire resisting magnetic media protection cabinet at various stages of manufacture.

15 PACKING

Each cabinet shall be packed in accordance with the best trade practice with its door bolted but not locked. The keys shall be separately sealed in a box and placed inside the cabinet. The keys may also be packed and despatched separately or delivered in some other manner if the purchaser so requires.

16 TESTS AND CRITERIA FOR CONFORMITY

16.1 Two samples known to be fully representative of the lot of fire resisting magnetic media cabinets of similar design and construction shall be selected on the basis of random sampling by inspection agency. Out

of the selected samples, one sample shall be subjected to fire endurance test (*see B-3.1*) and other sample shall be subjected to fire end impact test (*see B-3.2*).

16.2 The fire resisting magnetic media cabinets shall be considered to be conforming to the requirements of this standard if they successfully complete the fire endurance test (*see B-3.1*) and fire and impact test (*see B-3.2*).

16.2.1 The fire resisting magnetic media cabinets shall be considered to have successfully completed the fire endurance tests (*see B-3.1*) and fire and impact test (*see B-3.2*) if the contents (*see B-1.1, B-3.1.1 and B-3.2.1*) kept in the cabinets during the tests are usable. The contents are considered to be usable after tests if they are able to withstand ordinary handling without crumbling or falling apart and able to reproduce the data stored in them without the use of supplemented devices or aids of any kind.

ANNEX A

(Clause 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	Title	IS No.	Title
196 : 1966	Atmospheric conditions for testing (<i>revised</i>)	1079 : 1994	Hot-rolled carbon steel sheet and strips (<i>fifth revision</i>)
292 : 1983	Leaded brass ingots and castings (<i>second revision</i>)	1570 (Part 5) : 1985	Schedules for wrought steels: Part 5 Stainless steel and heat resisting steels (<i>second revision</i>)
306 : 1983	Tin bronze ingots and castings (<i>third revision</i>)	1732 : 1989	Dimension for round and square steel bars for structural and general engineering purposes (<i>second revision</i>)
410 : 1977	Cold rolled brass sheet, strip and foil (<i>third revision</i>)	2062 : 1992	Steel for general structural purposes (<i>fourth revision</i>)
419 : 1967	Putty, for use on window frames (<i>first revision</i>)	2074 : 1992	Ready mixed paint, air drying, red oxide-zinc chrome, priming (<i>second revision</i>)
513 : 1994	Cold-rolled low carbon steel sheets and strips (<i>fourth revision</i>)	7608 : 1987	Phosphor bronze wire for general engineering purposes (<i>first revision</i>)
713 : 1981	Zinc base alloy ingots for die casting (<i>second revision</i>)	9550 : 1980	Bright bars
816 : 1969	Code of practice for use of metal arc welding for general construction in mild steel (<i>first revision</i>)	14203 : 1994	Fire resisting record protection cabinets — Specification
819 : 1957	Code of practice for resistance spot welding for light assemblies in mild steel		

ANNEX B

(Clauses 16.1, 16.2 and 16.2.1)

TESTS FOR FIRE RESISTING MAGNETIC MEDIA PROTECTION CABINETS

B-1 TEST EQUIPMENT

B-1.1 Contents

Contents of the fire resisting magnetic media cabinets subjected to these tests shall include non-paper records such as EDP media (magnetic tapes) and photographic records (microfilms) pre-loaded with data.

B-1.2 Thermocouple

Thermocouples enclosed in protection tube of suitable material and dimensions, shall have time constant of

the protected thermocouple assembly within the range from 5 min to 7.2 min.

B-1.2.1 A typical thermocouple assembly conforming to **B-1.2** may be fabricated by fusion welding the twisted ends of chromel-alumel wire not smaller than 0.52 mm^2 and not larger than 0.82 mm^2 in cross section and mounting the leads in porcelain insulators so that the thermocouple head is 12 mm from the sealed end of a standard weight, normal 12 mm diameter iron, steel or inconel pipe.

B-1.3 Furnace

B-1.3.1 The furnace fuel and air supplies shall be adjusted such that the fire is uniformly distributed over the exposed faces of the cabinet and regulated to temperatures in accordance with the Standard Time Temperature Curve.

B-1.3.2 The furnace temperature, corresponding to time elapsed as given in Table 2 shall follow the equation:

$$T - T_0 = 345 \text{ Log}_{10} (8t + 1)$$

where

T = furnace temperature in °C at any time, t in minutes; and

T_0 = ambient temperature in °C.

B-1.3.3 The accuracy of the furnace control shall be such that the area under the time temperature curve, obtained by averaging all the furnace thermocouple readings, shall be within 10 percent of the corresponding area under the Standard Time Temperature Curve for two hours.

Table 2 Relationship Between Time Elapsed and Furnace Temperature
(Clause B-1.3.2)

Time in Minutes	Furnace Temperature in °C
5	538
10	704
15	760
20	793
25	821
30	843
40	878
50	905
60	927
70	946
80	963
90	978
100	991
110	1 001
120	1 010

B-2 PREPARATIONS FOR TESTS

B-2.1 For Fire Endurance Tests

B-2.1.1 The sample to be subjected to fire endurance test shall have a 16 mm diameter through hole at the bottom. A pipe of the same external diameter shall be welded to outer and inner body sheets of the cabinet. This hole shall be used for insertion of thermocouple wires inside the cabinet. After insertion of the thermocouple wires through the hole it shall be sealed by proper insulating compound from both ends of the hole.

B-2.1.2 All thermocouples shall be located 30 mm from the top of the cabinet interior. Four ther-

mocouples shall be located 30 mm from the side walls, two of these being 30 mm from back and the other two 30 mm from the inner face of the doors.

B-2.2 For Fire and Impact Tests

No special preparation is required for conducting this test. This test shall be conducted without any thermocouple inside the sample.

B-2.3 Furnace Temperature

The furnace temperature shall be recorded by thermocouples symmetrically distributed. At least four thermocouples shall be used, placed 50 mm from the exposed faces of the test sample including the door face.

B-2.4 Conditioning

The inside temperature of the samples at the start of the tests shall be in accordance with IS 196. If the conditions inside the samples are not within the range then the sample shall be conditioned for at least 12 hours prior to the tests on the inside conditions.

B-3 TESTS

B-3.1 Fire Endurance Test

B-3.1.1 The sample of fire resisting record protection cabinet prepared in manner specified in B-2.1.1 and B-2.1.2 shall be placed in the furnace. The storage area shall then be evenly filled with contents (see B-1.1) occupying volume equal to 25 to 50 percent of the volume of cabinet. The cabinet shall then be locked.

B-3.1.2 The furnace shall then be put on and the temperatures shall be read at intervals not exceeding 5 minutes during the test. Average of all the thermocouples inside and outside the sample shall be recorded and shall be taken as the required value.

B-3.1.3 The pressure in the furnace chamber during the test shall be maintained as close as possible to atmospheric pressure.

B-3.1.4 The furnace fire shall be continued for 60 or 120 minutes depending upon the type of the cabinets. During the fire endurance test, it is essential that at no time the internal temperature of the cabinet, as shown by the thermocouples placed inside the cabinet, shall exceed 66°C irrespective of ambient temperature.

Hygrometers (humidity measuring equipment) that are accurate to within ±1.5 percent shall be used. Moreover only those hygrometers shall be used which allow a continuous recording to be taken. Each compartment within the test object shall be equipped with a humidity feeler (sensing element). These are to be located between the interior surface and mid way between the interior surface of the door and the back.

B-3.1.5 After the specified period, the furnace is switched off. The cabinet is continued to be kept in the

furnace and temperature of the interior of the sample cabinet is to be continuously recorded until a definite drop is noted.

B-3.1.6 After the cabinet, inside the furnace, has cooled to about 47°C temperature, it shall be taken out from the furnace and its door shall be opened. The contents shall be examined to determine their usability.

B-3.1.7 At no point of time during the test, the relative humidity shall exceed 85 percent.

B-3.2 Fire and Impact Test

B-3.2.1 The sample to be subjected to this test shall have contents as specified in **B-3.1.1** and shall be subjected to test without any thermocouple inside the cabinet.

B-3.2.2 The cabinet shall be subjected to a standard fire exposure in a manner similar to the fire endurance test for the period of 30 or 45 minutes.

B-3.2.3 After the fire exposure time, the furnace shall be switched off. The cabinet shall then be hoisted so that its bottom is 4 m above a layer of brick rubble (30 cm depth) on a heavy concrete base, and then dropped. Twenty minutes shall be elapsed from the time the furnace fire is extinguished until the cabinet is dropped.

B-3.2.4 After the impact, the cabinet shall be examined for deformation/damage.

B-3.2.5 Immediately after impact, the cabinet, shall be inverted, put back in the test furnace and again subjected to a standard fire exposure for the period of reheat time of 30 minutes for cabinets of 60 minutes rating and 45 minutes for cabinets of 120 minutes rating and shall be allowed to cool to less than 47°C without opening the furnace.

B-3.2.6 After cabinet has cooled to less than 47°C, the door shall be opened to examine its heat insulating properties as evident by the usability of the contents.

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