NORDTEST Method

NT FIRE 017
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FILING CABINETS, DATA CABINETS AND DISKETTE CABINETS: FIRE RESISTANCE

Key words: Filing cabinets, data cabinets, diskette cabinets, fire resistance, fire protection, information media, test method

1 SCOPE

This Nordtest method specifies a classification system and a test procedure for determining the fire resistance of filing cabinets, data cabinets and diskette cabinets.

2 FIELD OF APPLICATION

The classification system and the test method described are intended for filing cabinets, data cabinets and diskette cabinets.

3 REFERENCES

ISO 834-1:1999. Fire resistance test – Elements of building construction. Part 1: General requirements.

4 DEFINITIONS

Filing cabinets, data cabinets and diskette cabinets are storage units designed for the protection of stored information media against damage caused by exposure to external fire.

Information media are materials holding information including paper documents, magnetic tapes, films, diskettes, cassettes, optical disks and video and audio cassettes.

Filing cabinets are cabinets intended for storage of information media, which do not lose information at temperatures below 170 °C (e.g. normal paper).

Data cabinets are cabinets intended for storage of information media, which do not lose information at temperatures below 70 °C (e.g. normal magnetic media).

Discette cabinets are cabinets intended for storage of information media, which do not lose information at temperatures below 50 °C (i.e. media which are more sensitive than normal magnetic media).

5 TEST SPECIMEN

The test specimen – designed below as the cabinet – shall be representative of the type produced.

The test is carried out on a fully equipped cabinet.

Detailed drawings specifying construction and materials used shall be available and it shall be checked that the specimen is in full accordance with the drawings.

During the test there shall be no information media in the cabinet.

If the cabinet contains a locking device that provides different locking settings, the setting that is considered to be most onerous with respect to fire resistance shall be chosen for the test. The normal case is that the cabinet door will be latched but not locked.

6 METHOD OF TEST

6.1 Principle

The cabinet is exposed to fire conditions as specified in ISO 834.

6.2 Apparatus

The test requires the use of a fire test furnace capable of subjecting the cabinet to the heating and pressure conditions specified in ISO 834.

6.3 Conditioning

6.3.1 Temperature

The cabinet shall be stored in such a way that its temperature at the start of the test corresponds with the temperature in the laboratory which accommodates the fire

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test furnace. The room used for storage shall have a temperature of 20 °C ± 10 °C.

The cabinet shall be stored with the cabinet door and storage units/drawers in the opened position.

6.3.2 Moisture content

6.3.2.1 Cabinets with water vapour impermeable encasements

Concrete and equivalent insulation materials, used in fire resistant cabinets, are likely to contain free water. It is not, however, possible to condition such materials to equilibrium with the surrounding environment when they are enclosed by water vapour impermeable encasements of for example metal sheets. Thus, for this kind of cabinets, no special conditioning measures regarding the moisture content have to be taken for the encased parts of the cabinet.

6.3.2.2 Cabinets with water vapour permeable encasements

Cabinets consisting of insulation materials enclosed by water vapour permeable encasements and/or non encased materials shall be conditioned at a temperature of 20 ± 10 °C and at relative humidity of 50 ± 10% for 4 weeks, or a shorter time if it can be stated that equilibrium with respect to the moisture content has been reached.

The cabinet shall be stored with the cabinet door and storage units/drawers in the opened position.

6.4 Measuring equipment

For the registration of temperatures inside the cabinet during the fire test at least 6 thermocouples shall be positioned at distances of 25 mm from the internal surfaces of the cabinet, preferably opposite the centre of each surface. If the cabinet contains a special storage unit, an additional thermocouple shall also be positioned 25 mm under the ceiling of this unit. If it is considered necessary, the testing laboratory may place extra thermocouples in the cabinet. Distance holders fixed to interior surfaces of the cabinet may be used in order to get the thermocouples in position. Measures shall, however, be taken to ensure that the influence on the temperature measurements due to the distance holders can be considered negligible.

The thermocouples shall be of type K with a wire diameter of 0,5 mm. At the measuring junction the thermocouple wires shall be spot welded or connected with a pressure connector of approximately 2 mm size (e.g. Quiktip type no 128543). The thermocouple wires may be protected with a shrinking tube if it is considered necessary by the laboratory due to the risk of vaporisation of aggressive substances that may cause damage to the thermocouples. A distance of at least 25 mm closest to the measuring junction shall however be left unprotected.

Where measuring equipment passes through the construction of the cabinet, careful sealing is required in order to prevent any resultant increase in heat transmission into the cabinet.

6.5 Procedure

6.5.1 Prior to fire test

6.5.1.1 Weight of cabinet

The weight of the cabinet shall be measured prior to the fire test. If the cabinet is conditioned according to 6.3.2.2 the weight before and after the conditioning period shall be measured.

6.5.1.2 Moisture content

The moisture content of insulation materials shall be determined. Test samples for this purpose are to be taken from the bottom of the cabinet. If this is not possible, then two cabinets are to be delivered to the testing laboratory. One of the cabinets is chosen by the testing laboratory for fire testing and the other is used for material control.

The measurements shall be performed not more than two days before the fire test.

6.5.1.3 Density

If possible the density of the insulation materials shall be determined.

An example of cases when it is not considered possible to determine the density in a proper way is when the insulation material consists of steel fibre reinforced high strength concrete, which normally will disintegrate into very small pieces when efforts are made to take samples from the cabinet.

The reason for not determining density shall, however, be clearly stated in the test report.

6.5.1.4 Temperature of cabinet and furnace

Immediately before the start of the test, the temperature of the cabinet (including all materials of the cabinet construction) shall be equal to the furnace temperature, which at this point shall be 20 °C ± 10 °C.

6.5.2 Fire test

The cabinet is placed inside the furnace on a base of non-combustible material and in such a way that all the vertical sides and the top of the cabinet are exposed to fire as specified in ISO 834.

The distance between the interior walls of the furnace and the external surfaces of the cabinet shall not be less than 500 mm. The distance between the ceiling of the furnace and the external top surface of the cabinet shall not be less than 300 mm.

The temperature rise within the furnace shall be controlled in such a way that it follows the standard time-temperature curve at a level corresponding to half the height of the cabinet.

The pressure in the furnace shall be controlled in such a way that at a level corresponding to half the height of the cabinet it is equal to the pressure in the laboratory.

During the fire test the temperatures inside the cabinet shall be recorded continuously.

The fire test (the heating of the furnace) shall be terminated after a period determined by agreement between the client and the testing laboratory, or when the cabinet no longer complies with the requirements it has to fulfil.

The recording of temperatures inside the cabinet can be terminated at the same time as the fire test.

6.5.3 After fire test

After the conclusion of the fire test the cabinet shall be examined.

6.6 Expression of test results

During the test the following shall be observed and recorded.

a) The time-temperature relationship measured in the furnace.

b) The time-temperature relationship measured inside the cabinet.

c) Other observations of the behaviour of the cabinet during the test.

6.7 Test report

The test report shall include the following information:

a) Name and address of the testing laboratory

b) Identification number of the test report

c) Name and address of the client (the organisation or the person who ordered the test)

d) Purpose of the test

e) Method of sampling and other circumstances (date and person responsible for the sampling)

f) Name and address of manufacturer or supplier of the tested cabinet

g) Trade name and type or other identification marks of the tested cabinet

h) Description of the tested cabinet including details of the materials used in the construction of the cabinet together with detailed drawings of the cabinet

i) Date of supply of the tested cabinet

j) Date of the test

k) Test method

l) Conditioning of the cabinet, the measured weight(s) prior to the test, the moisture content and the density of the insulation materials used in the cabinet

m) Identification of the test equipment and instruments used

n) Any deviations from the test method

o) Test results as specified in 6.6

p) The fire classification of the cabinet on the basis of specified criteria

q) Date and signature.

CLASSIFICATION

The following criteria are recommended for classification of fire resistant cabinets.

To classify a filing cabinet as fire resistant the following requirement shall be fulfilled:

– The maximum temperature inside the cabinet shall not exceed the initial temperature by more than 150 °C.

To classify a data cabinet as fire resistant the following requirement shall be fulfilled:

– The maximum temperature inside the cabinet shall not exceed the initial temperature by more than 50 °C.

To classify a diskette cabinet as fire resistant the following requirement shall be fulfilled:

– The maximum temperature inside the cabinet shall not exceed the initial temperature by more than 30 °C.

The fire classification for cabinets shall be specified using the following designations:

For filing cabinets:

NT FIRE 017 - 60 Paper,
NT FIRE 017 - 90 Paper or
NT FIRE 017 - 120 Paper.

For data cabinets:

NT FIRE 017 - 60 Data,
NT FIRE 017 - 90 Data or
NT FIRE 017 - 120 Data.

For diskette cabinets:

NT FIRE 017 - 60 Diskette,
NT FIRE 017 - 90 Diskette or
NT FIRE 017 - 120 Diskette.

The numerical values 60, 90 and 120 represent the period of time in minutes for which the tested cabinet has fulfilled the requirements stated above.

The classification shall be expressed as follows (90 and 120 minutes respectively):

- Fire resistant filing cabinet NT FIRE 017 - 60 Paper.
- Fire resistant filing cabinet NT FIRE 017 - 60 Data.
- Fire resistant filing cabinet NT FIRE 017 - 60 Diskette.

The test data may be applied to other filing cabinets, data cabinets or diskette cabinets of identical construction provided that the external volume is not less than half of and not more than twice the volume of the tested cabinet.