



# REPORT

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## Fire test of document cabinets

### Test method

NT FIRE 017, edition 2, approved 1997-05

### Product

Document cabinets

### Product designations

PK-420 (single door)  
PK-480 (double door)

### Sponsor

Kaso Oy

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## 1 Purpose of the test

The purpose of the test was to determine the fire resistance of the test specimens described under item no. 2.

## 2 Test specimen

The test specimens were selected and delivered to SP by the sponsor. The test specimens arrived at SP on November 14, 2005. Manufacturer of the test specimen was Kaso Oy.

### 2.1 Description of the construction

The test specimens consisted of a single door document cabinet designated PK-420 and a double door cabinet designated PK-480.

The dimensions of the PK-420 cabinet were:

- outer (width x height x depth) 666 x 1023 x 574 mm
- inner (width x height x depth) 486 x 843 x 364 mm

The nominal weight of the cabinet was 205 kg.

The dimensions of the PK-480 cabinet were:

- outer (width x height x depth) 975 x 1023 x 574 mm
- inner (width x height x depth) 795 x 843 x 364 mm

The nominal weight of the cabinet was 269 kg.

Drawings, description of the insulation material and technical specifications used in the cabinets are shown in enclosures 1 – 56.

### 2.2 Mounting of the test specimen

The cabinets were placed on 50 mm ceramic fibre insulation in SP's horizontal furnace.

### 2.3 Conditioning

The test specimens were stored in SP's furnace hall before the test. The temperature in the furnace hall was in average 20 °C and the relative humidity was in average 62 % during this time.



## 2.4 Control

### 2.4.1 Weight of the cabinets

The weight of the PK-420 cabinet before the test was measured to 199 kg.

The weight of the PK-480 cabinet before the test was measured to 265 kg.

### 2.4.2 Properties of included materials

| <i>Test specimen</i> | <i>Density<br/>(kg/m<sup>3</sup>)</i> | <i>Moisture<br/>ratio 1)<br/>(%)</i> |
|----------------------|---------------------------------------|--------------------------------------|
| Concrete             | 520                                   | 11,2                                 |

1) Moisture ratio calculated from weight loss after being heated at 105 °C.

The verification was performed on December 12, 2005 on material delivered separately.

The purpose of the control is to verify and/or determine material data and dimensions of materials and components included in the test specimen. The extent of performed measurements and applied methodology can deviate from standardized method. The results shall therefore not be considered as formal material data.

## 3 Test procedure and test results

The test was performed on November 25, 2005. The burners were shut down after 131 minutes but the temperature registration continued for 192 minutes.

### 3.1 Witness of test

The test was witnessed by Mr. Risto Palkama from Kaso Oy.

### 3.2 Furnace control

The furnace was controlled in accordance with SIS 02 48 20, edition 2, dated 1977-07-01 (ISO 834-1975).

#### 3.2.1 Temperatures

The furnace temperature was measured with 7 thermocouples positioned at a level of half of the height of the cabinets and with a distance of 100 mm from the vertical surfaces of the cabinets.

The average temperature in the furnace in relation to the standard time-temperature curve is shown in enclosure 57.

The temperature rise at each thermocouple in relation to the standard time-temperature curve is shown in enclosure 58.



The percent deviation of the area under the average furnace time-temperature curve from the area under the standard time-temperature curve and permitted deviation, is shown in enclosure 59.

### **3.2.2 Pressure**

The pressure in the furnace in relation to the ambient pressure in SP's furnace hall was measured at a point located 340 mm above the top of the cabinets.

The furnace pressure was controlled so that a zero pressure was kept at a level of half the height of the cabinets.

The measured furnace pressure is shown in enclosure 60.

## **3.3 Measurements on the test specimen**

### **3.3.1 Temperatures**

The temperature rise inside the PK-420 cabinet was measured with 6 thermocouples (C1 – C6).

The thermocouples were positioned as shown in enclosure 61.

The temperature rise inside the PK-480 cabinet was measured with 7 thermocouples (C7 – C13).

The thermocouples were positioned as shown in enclosure 62.

The measured temperatures are shown in enclosures 63 - 65.

The average temperature of thermocouples C1 – C13 at beginning of the test was 20 °C.



### 3.4 Observations

#### 3.4.1 Observations during the test

Photos taken during and after the test is shown in enclosures 66 - 69.

| <i>Time<br/>min:s</i> | <i>Observations (the observations refer to the exposed side if nothing else is stated)</i>                    |
|-----------------------|---------------------------------------------------------------------------------------------------------------|
| 00:00                 | The test starts.                                                                                              |
| 03:30                 | The paint starts to get discoloured around the cabinets. The decorative front plates are melting down.        |
| 06:00                 | Flames come from the outer surfaces of the cabinets when the paint is burning.                                |
| 110:00                | Flames come out between the back and the left side of the PK-420 cabinet at 1/3 of the height of the cabinet. |
| 131:00                | The burners are shut down.                                                                                    |
| 192:00                | The test terminates.                                                                                          |

#### 3.4.2 Observations after the tests

The top, side walls and back of the cabinets bellied out. It was possible to open the right door of cabinet PK-480 and the door of cabinet PK-420. The intumescent strips around opening of the cabinets had expanded.



## 4 Summary

Two document cabinets, described under item No 2, have been fire tested according to NT FIRE 017, edition 2, approved 1997-05 during 131 minutes. The following result was obtained:

### PK-420:

The maximum temperature rise exceeded 150°C after 129 minutes (thermocouple C6).

### PK-480:

The maximum temperature rise exceeded 150°C after 126 minutes (thermocouple C13).

The test results relate only to the behaviour of the test specimen during the conditions of the test. At other conditions, for instance another fire curve, the behaviour of the construction may differ from the presented test results.

## 5 Classification

Based on the test results of the tested cabinets PK-420 and PK-480 the fire resistance classification of the cabinets are as follows:

PK-420            NT FIRE 017 – 120 Paper

PK-480            NT FIRE 017 – 120 Paper

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Enclosures: 1 – 69 (one page per enclosure)