

Handled by, department

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Fire test of a data cabinet and a filing cabinet

Test method

NT FIRE 017, edition 2, approved 1997-05

Product

Document cabinets

Product designations

BDS-C1200 (data cabinet)

BIF-300 (filing cabinet)

Sponsor

Booil Safes Co. Ltd.

SP Swedish National Testing and Research Institute

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SP
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SE-501 15 Borås
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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 28, 2005. Manufacturer of the test specimen was Booil Safes Co. Ltd.

2.1 Description of the construction

The test specimens consisted of a data cabinet designated BDS-C1200 and a filing cabinet designated BIF-300.

The dimensions of the **BDS-C1200** cabinet were:

- outer (width x height x depth) 700 x 1035 x 635 mm
- inner (width x height x depth) 400 x 815 x 321 mm

The nominal weight of the cabinet was 307 kg.

The dimensions of the **BIF-300** cabinet were:

- outer (width x height x depth) 540 x 1115 x 680 mm
- inner (width x height x depth) 387 x 241 x 520 mm (each drawer)

The nominal weight of the cabinet was 244 kg.

Drawings, description of the insulation material and technical specifications used in the cabinets are shown in enclosures 1 – 6.

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 56 % during this time.

2.4 Control

2.4.1 Weight of the cabinets

The weight of the BDS-C1200 cabinet before the test was measured to 330 kg.

The weight of the BIF-300 cabinet before the test was measured to 240 kg.

2.4.2 Properties of included materials

| <i>Test specimen</i> | <i>Moisture ratio P (%)</i> |
|---------------------------|--|
| Concrete filing cabinet | 36 |
| Concrete document cabinet | 36 |

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

The verification was performed on December 2, 2005 on material from the cabinets.

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 December 20, 2005. The test lasted 91 minutes.

3.1 Witness of test

The test was witnessed by Mr. Jay Park from Booil Safes Co. Ltd, Mr. Håkan Schönqvist and Mr. Ramak Seyedpour.

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 8 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 7.

The temperature rise at each thermocouple in relation to the standard time-temperature curve is shown in enclosure 8.

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 9.

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 10.

3.3 Measurements on the test specimen

3.3.1 Temperatures

The temperature rise inside the BDS-C1200 cabinet was measured with 6 thermocouples (C1 – C6).

The thermocouples were positioned as shown in enclosure 11.

The temperature rise inside the BIF-300 cabinet was measured with 11 thermocouples (C7 – C17).

The thermocouples were positioned as shown in enclosure 12.

The measured temperatures are shown in enclosures 13 - 14.

The average temperature of thermocouples C1 – C17 at beginning of the test was 16 °C.



3.4 Observations

3.4.1 Observations during the test

Photos taken during and after the test is shown in enclosures 15 - 17.

| <i>Time min:s</i> | <i>Observations (the observations refer to the exposed side if nothing else is stated)</i> |
|-----------------------|--|
| 00:00 | The test starts. |
| 06:00 | The paint starts to get discoloured around the cabinets. |
| 09:00 | Flames come from the outer surfaces of the cabinets when the decorative front plates are melting down and burning. |
| 54:00 | The lower drawer bends out a bit. |
| 91:00 | The test terminates. |

3.4.2 Observations after the tests

The top, side walls and back of the cabinets bellied out a bit. It was possible to open the upper drawer of the BIF-300 cabinet but not possible to open the BDS-C1200 cabinet.

4 Summary

Two cabinets, described under item No 2, have been fire tested according to NT FIRE 017, edition 2, approved 1997-05 during 91 minutes. The following result was obtained:

BDS-C1200:

The maximum temperature rise exceeded 30°C after 69 minutes and 50°C after 81 minutes (thermocouple C6).

BIF-300:

The maximum temperature rise exceeded 150°C after 73 minutes (thermocouple C15).

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 BDS-C1200 and BIF-300 the fire resistance classification of the cabinets are as follows:

BDS-C1200 **NT FIRE 017 – 60 Diskette**

BIF-300 **NT FIRE 017 – 60 Paper**

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.

SP Swedish National Testing and Research Institute
Fire Technology - Fire Resistance

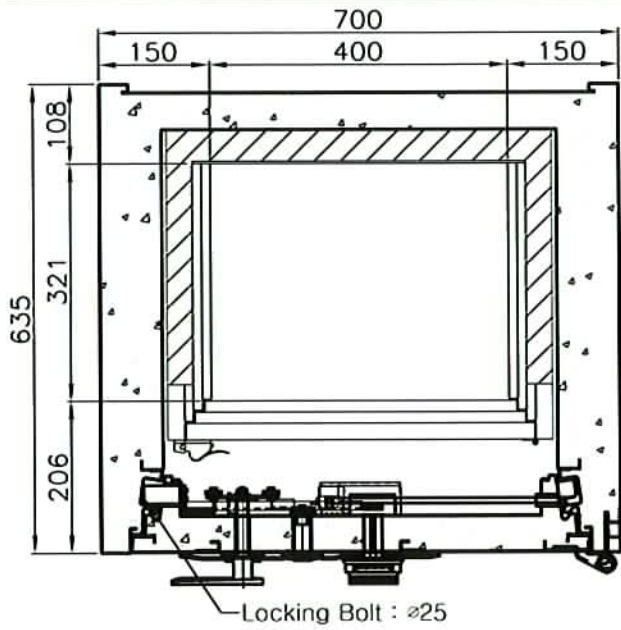


Lars Boström
Technical Manager

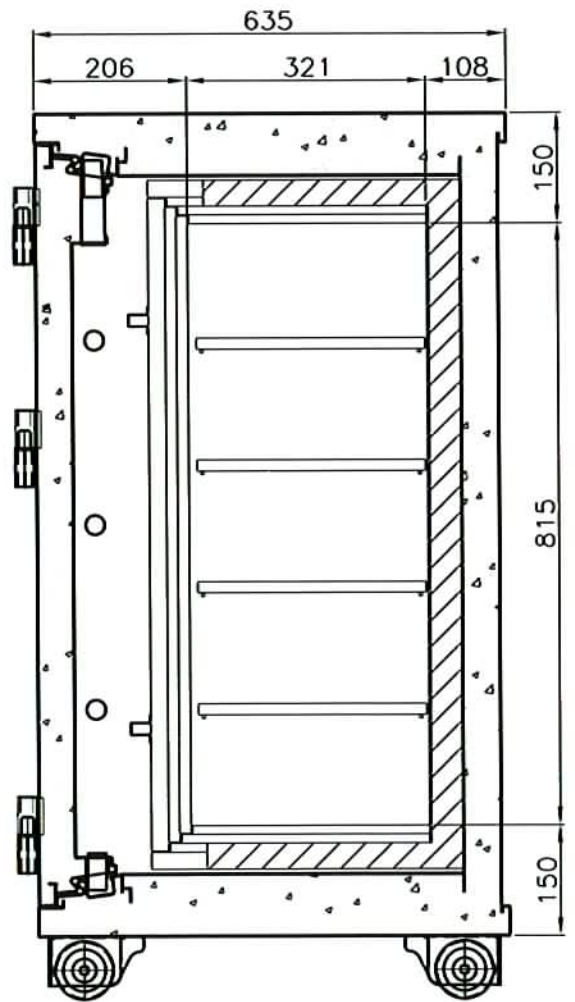
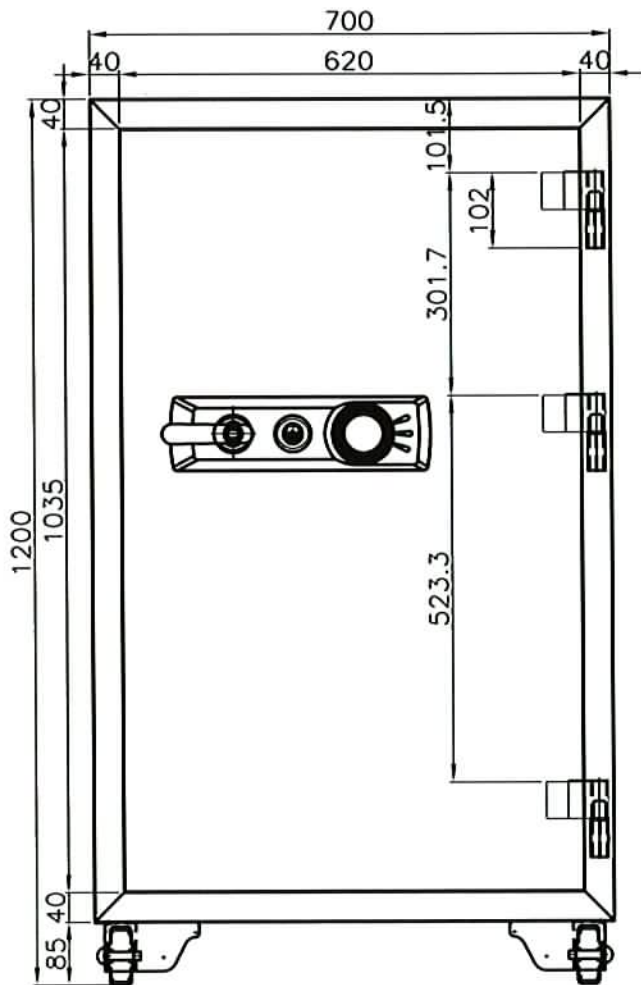



Fredrik Rosén
Technical Officer

Enclosures: 1 – 17 (one page per enclosure)

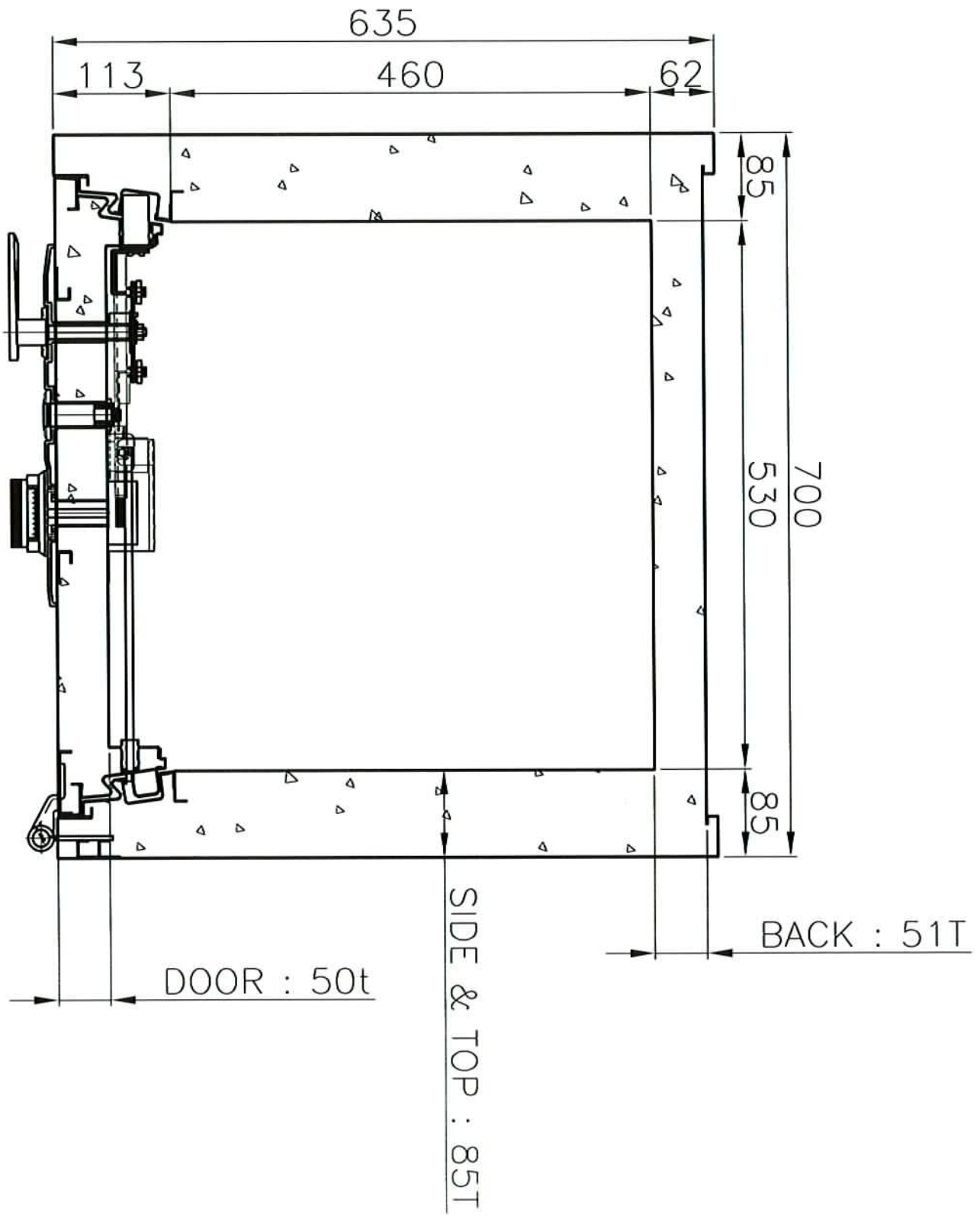



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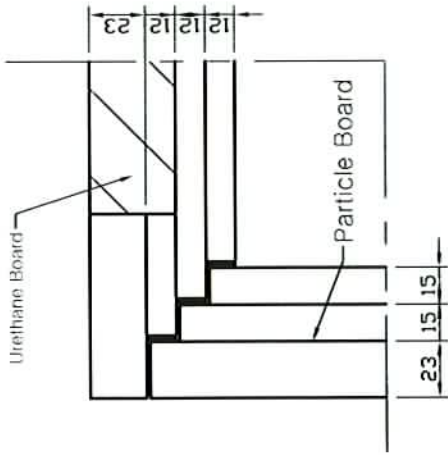


| | | | | | | | |
|--|--------|------------------|--|-------------------|-----|-------|-------|
| DATE | | 2005 . 10 . 26 . | | UNIT | m/m | SCALE | 1 : 1 |
| DRAWING | DESIGN | APPROVE | | ITEM BDS-C1200 | | | |
| CHO | | | | | | | |
| BOOIL  SAFE | | | | DRAWING NO | | | |

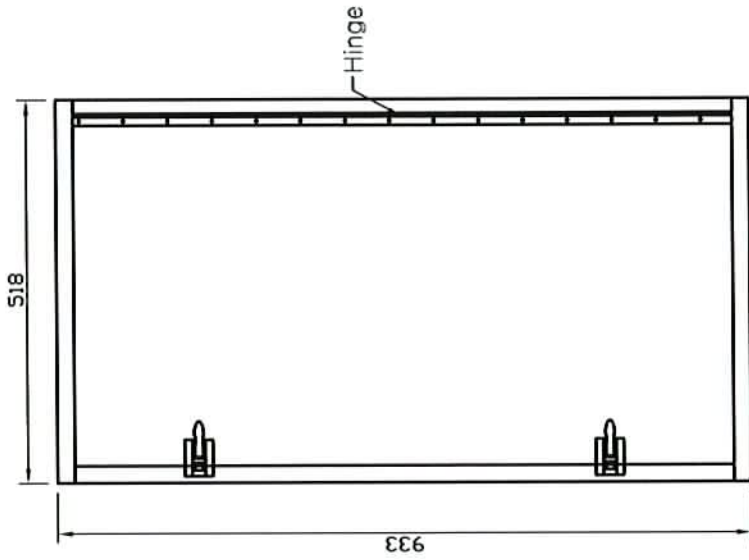
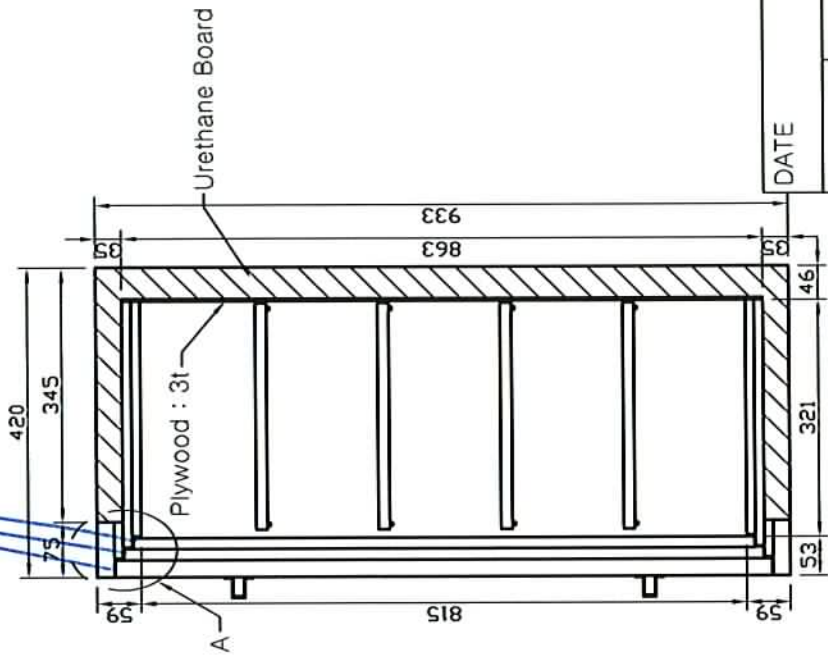
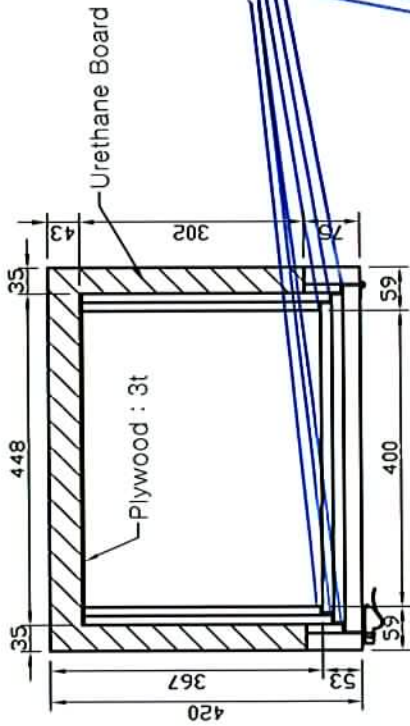
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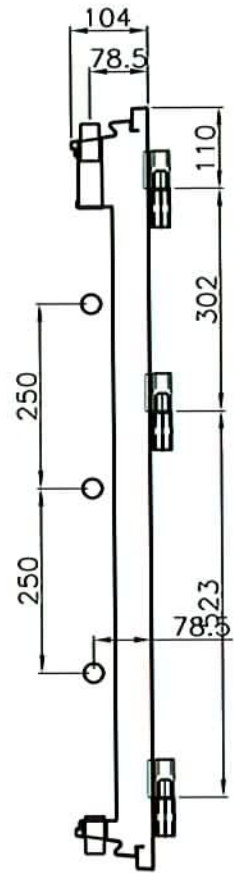
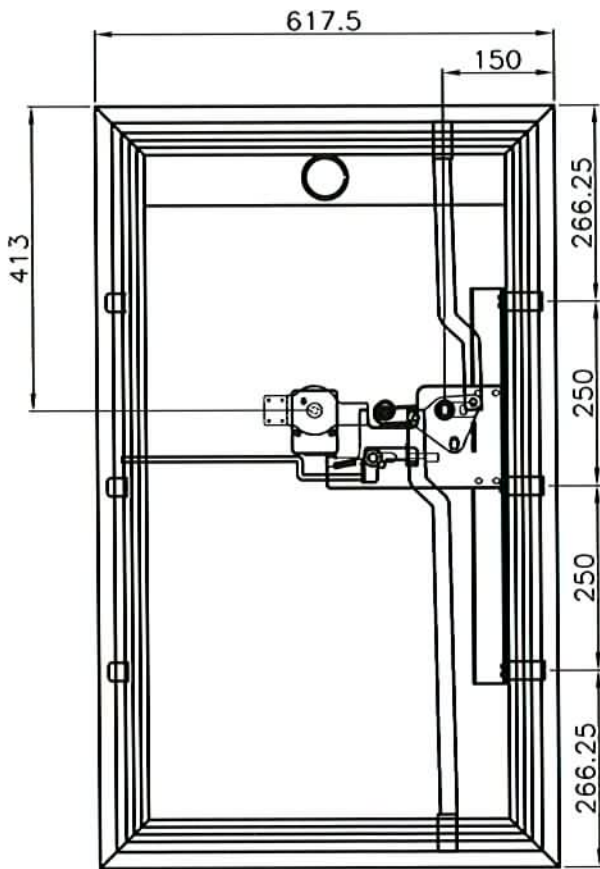
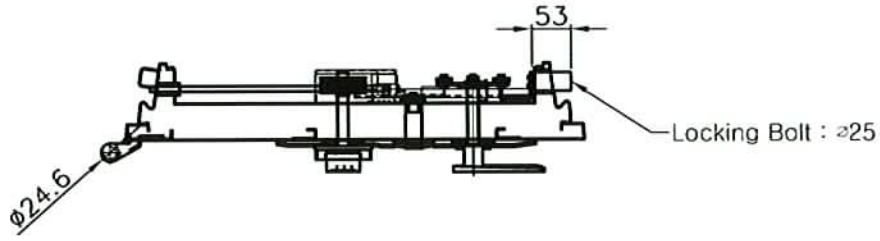


RUBBER SEAL / PR



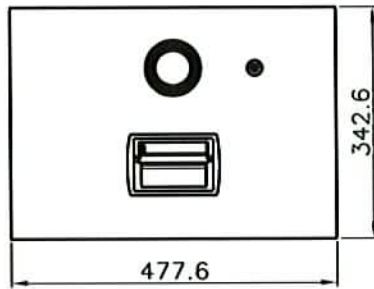
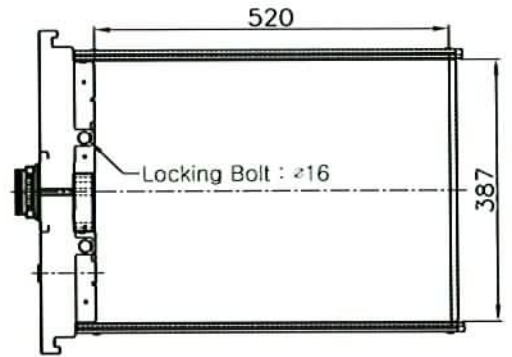
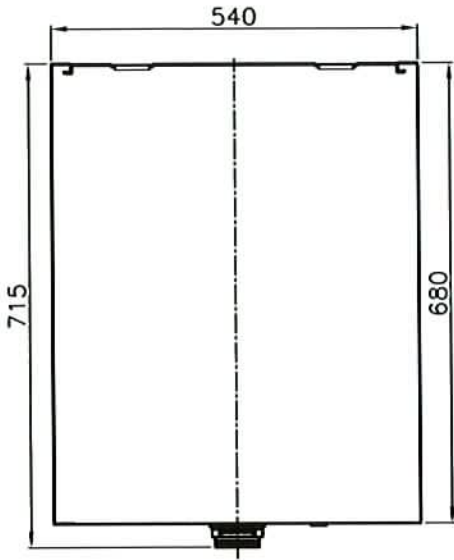
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|---|------------------|--------|---------|------------|-------|
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| DRAWING | CHO | DESIGN | APPROVE | DATA BOX | |
|  | | | | DRAWING NO | |

ENCL: 4
 RES: P503407
 SIGN: JR

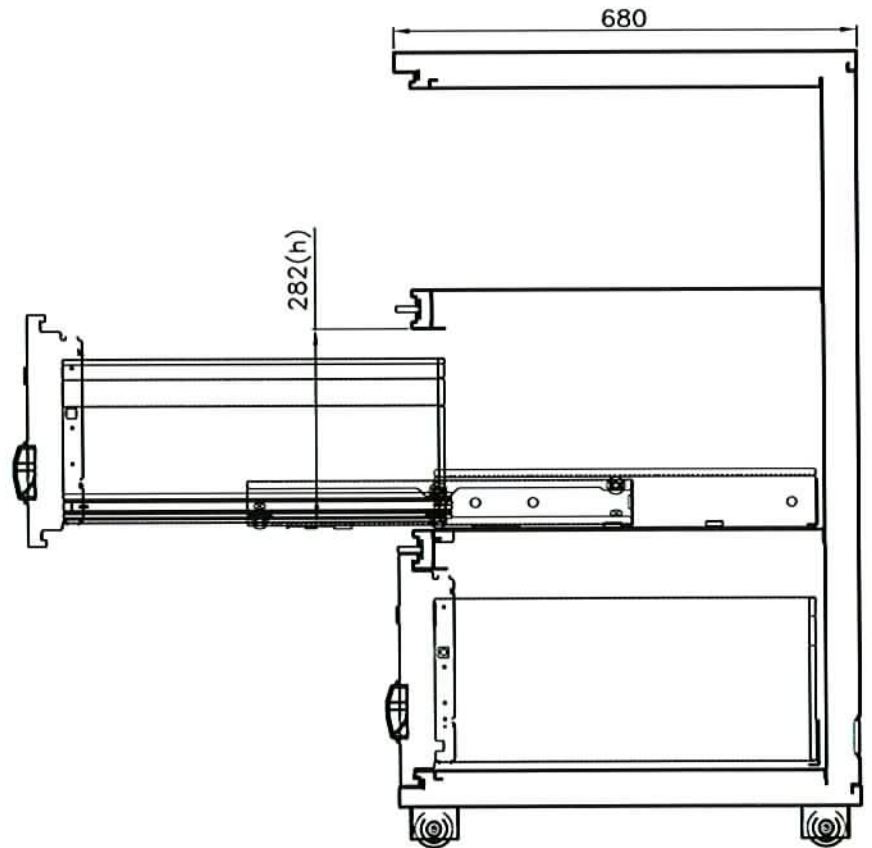
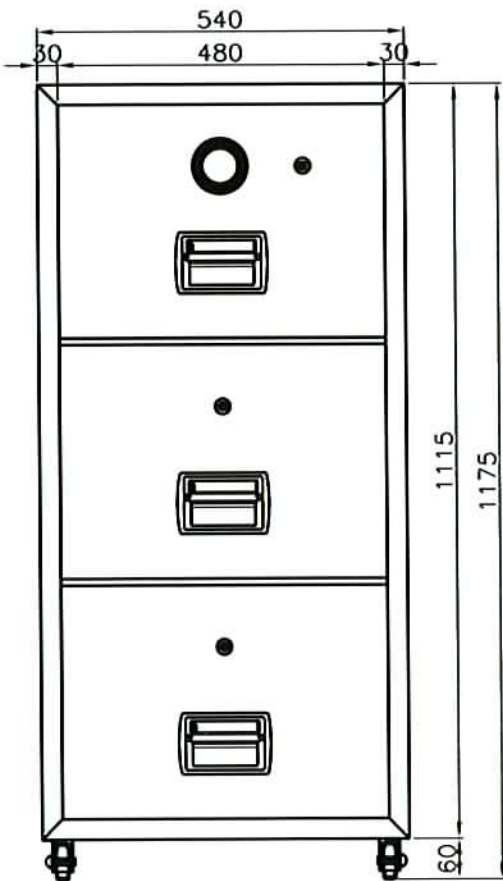


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| CHO | | | | BDS-D1200:DOOR | | | |
| BOOIL SAFE | | | | DRAWING NO | | | |

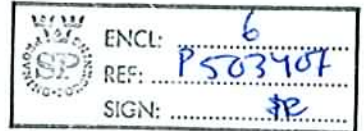
ENCL: 5
 REF: P503407
 SIGN: PR



DOOR



| | | | | | | | |
|-------------|--------|------------------|---------|------------|-----|-------|-------|
| DATE | | 2005 . 10 . 26 . | | UNIT | m/m | SCALE | 1 : 1 |
| DRAWING | DESIGN | APPROVE | ITEM | | | | |
| CHO | | | BIF-300 | | | | |
| BOOIL SAFE | | | | DRAWING NO | | | |

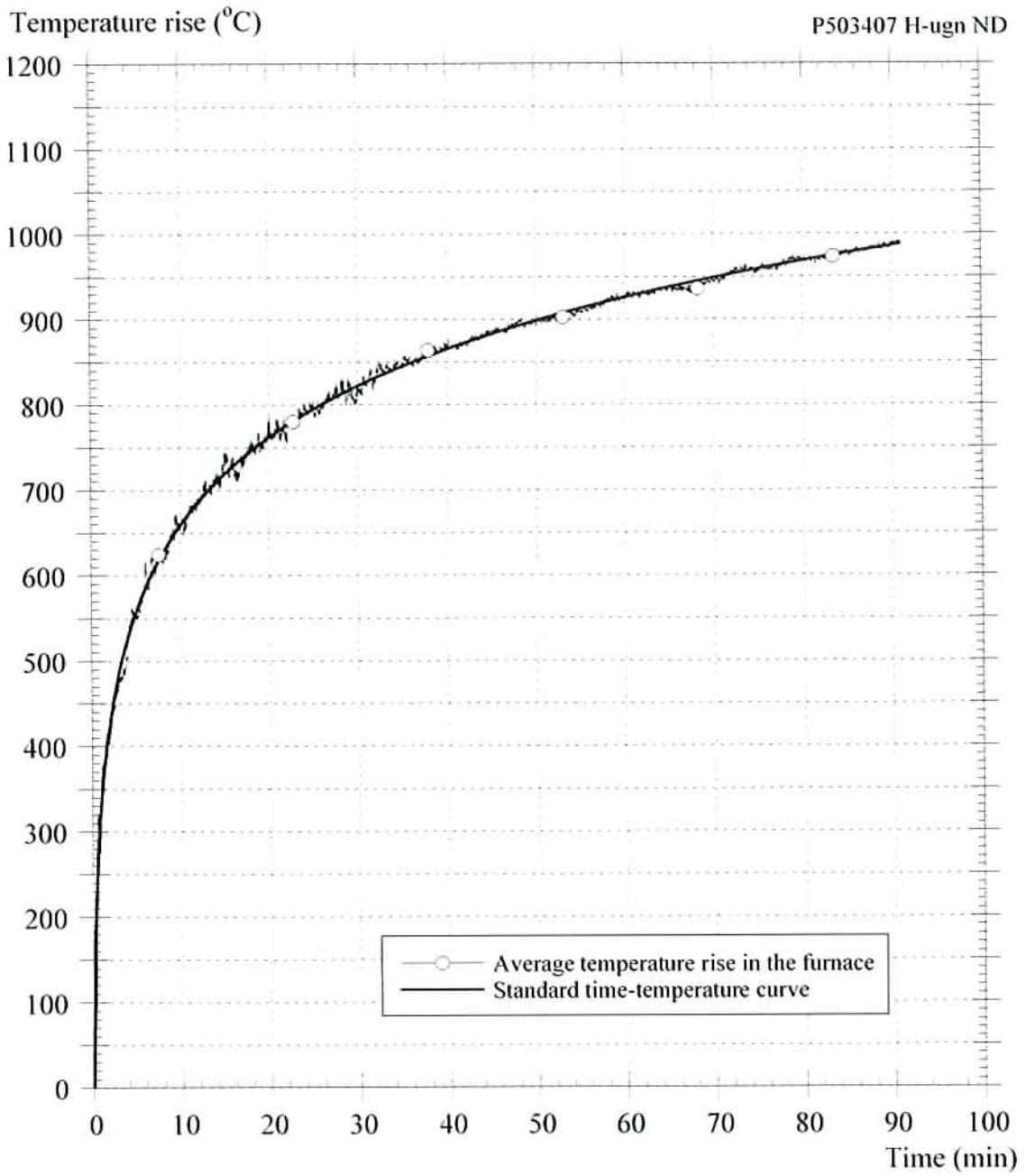


| PB BOARD | | | |
|-------------------|---------------------|-------|-------|
| Density | kg/m ³ | 9~15 | 15~23 |
| | | 720 | 700 |
| Bending strength | kgf/cm ² | > 133 | |
| Adhesive strength | kgf/cm ² | > 4 | |

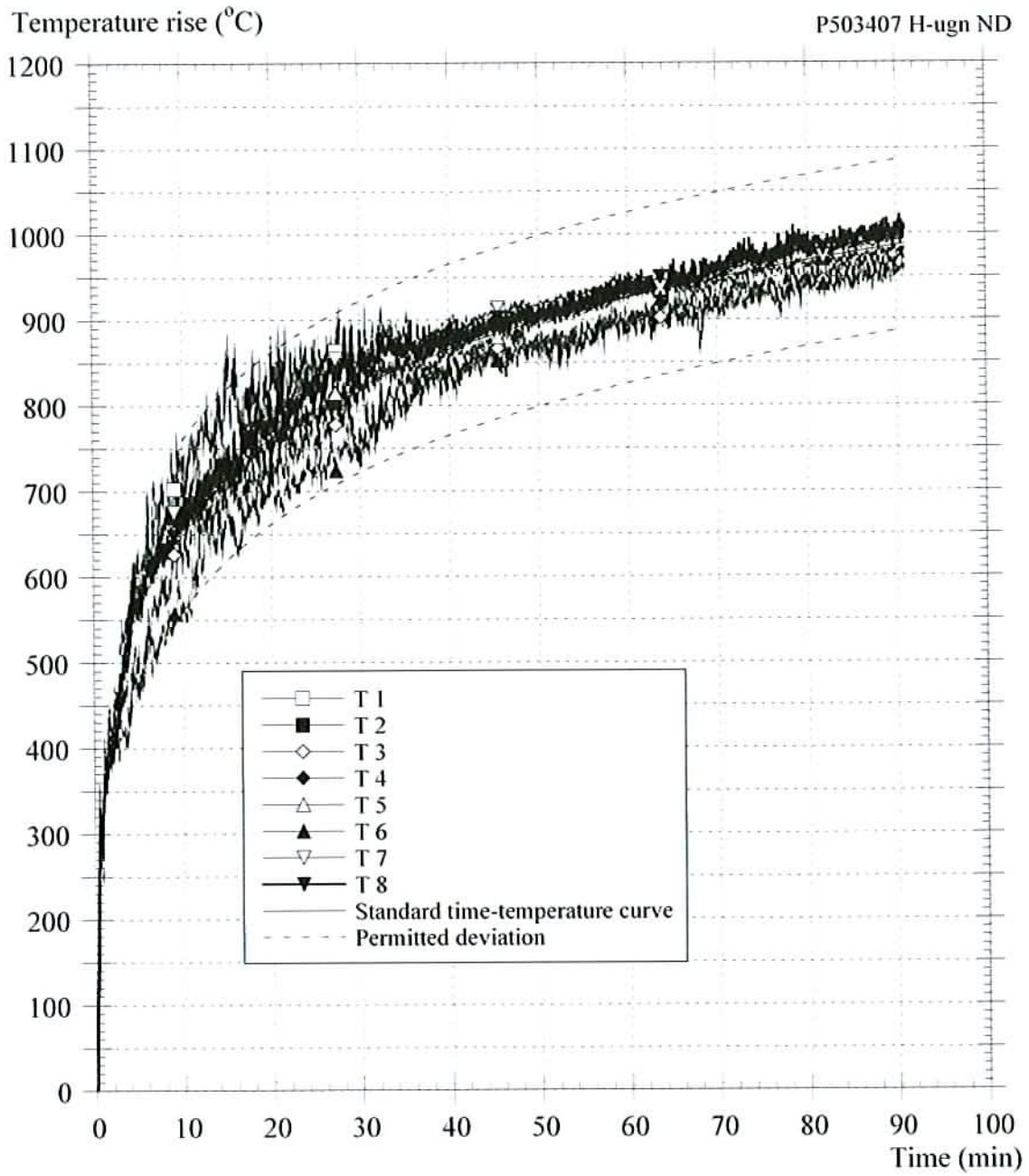
| URETHANE BOARD | | | |
|---|--|----------------------|------------|
| Density | | kg/m ³ | 37 |
| Thermal conductivity (Average temperature : 20±5°C) | | W/m.K | 0,023 |
| Compression strength | | N/cm ² | 19,7 |
| Bending strength | | N/cm ² | 22 |
| Combustibility | | . | No problem |
| Water absorption | | g/100cm ² | 2,3 |

| FIREPROOF MATERIAL | | |
|--------------------|-----------------|-------------|
| Water | 440kg | 44,51% |
| Cement | 520kg | 52,60% |
| Al powder | 0.52kg | 0,05% |
| Pearlite | 28kg | 2,83% |
| TOTAL | 988.52kg | 100% |

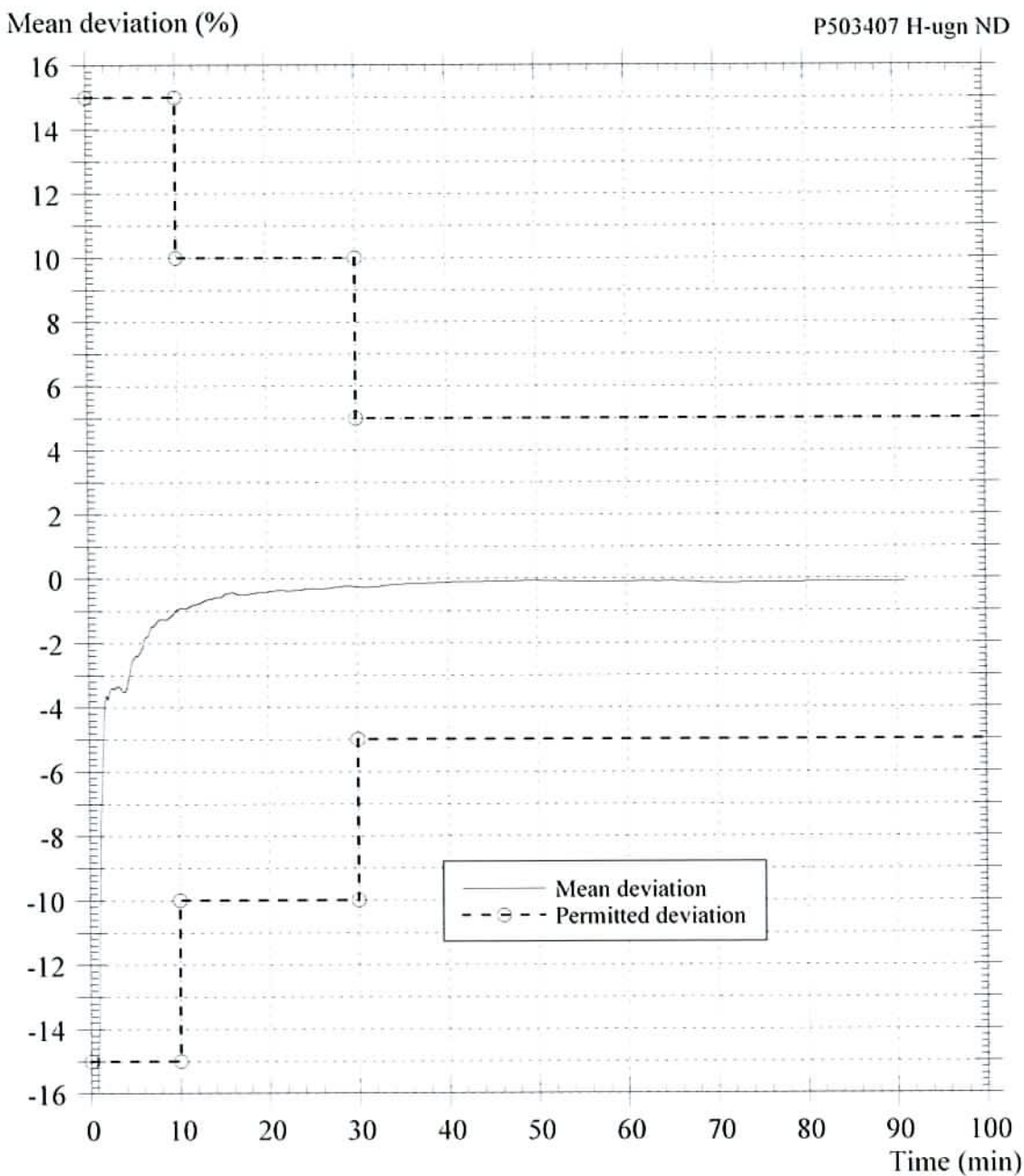
Average temperature rise in the furnace



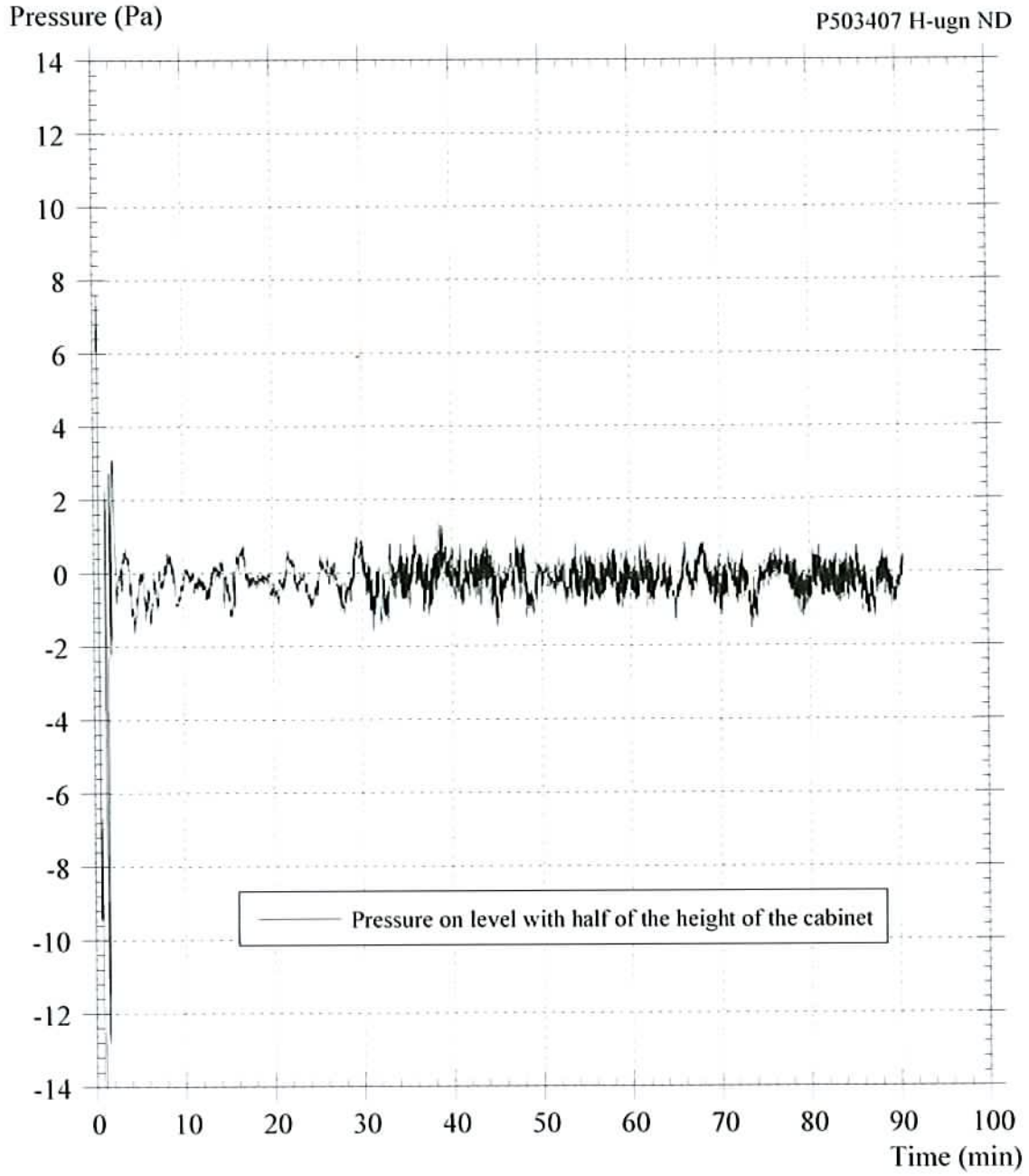
Temperature rise in the furnace



The mean deviation of the furnace temperature rise



Pressure in the furnace in relation to the ambient pressure in the laboratory



Schematic drawing of the cabinet

Enclosure No: 11

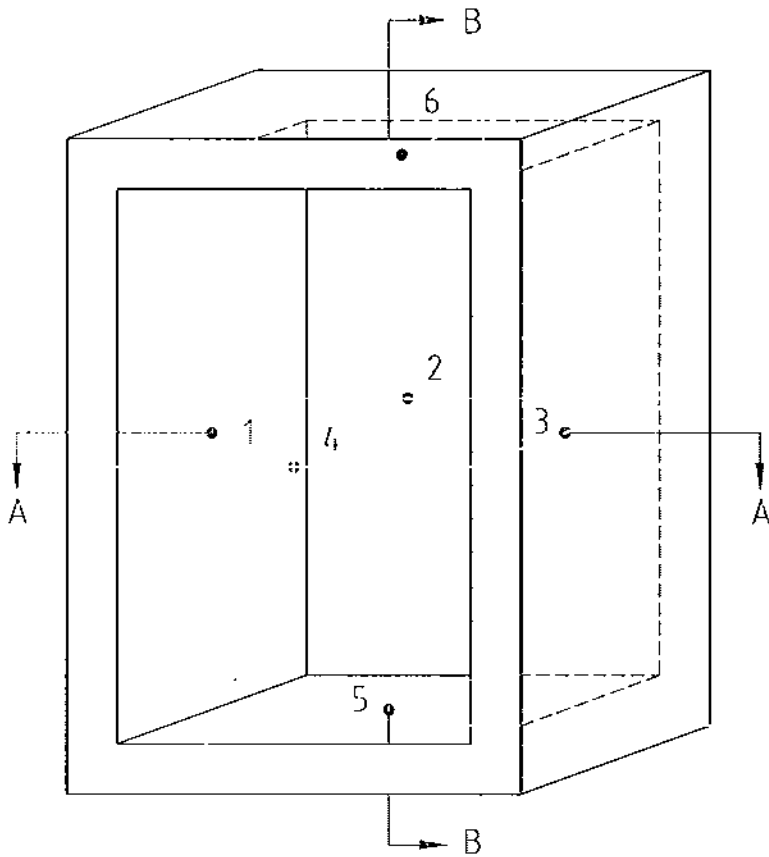
Report No: P503407

Date: 2005-12-05

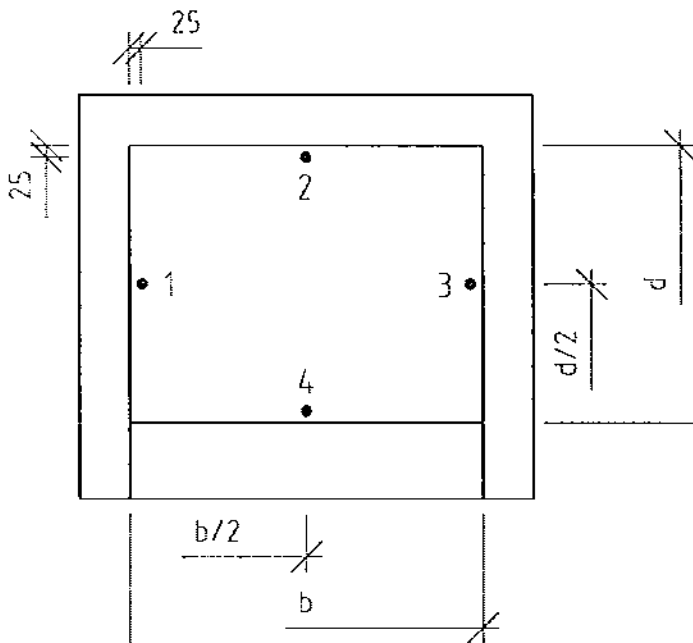
Rev. Date:

Scale: 1:15

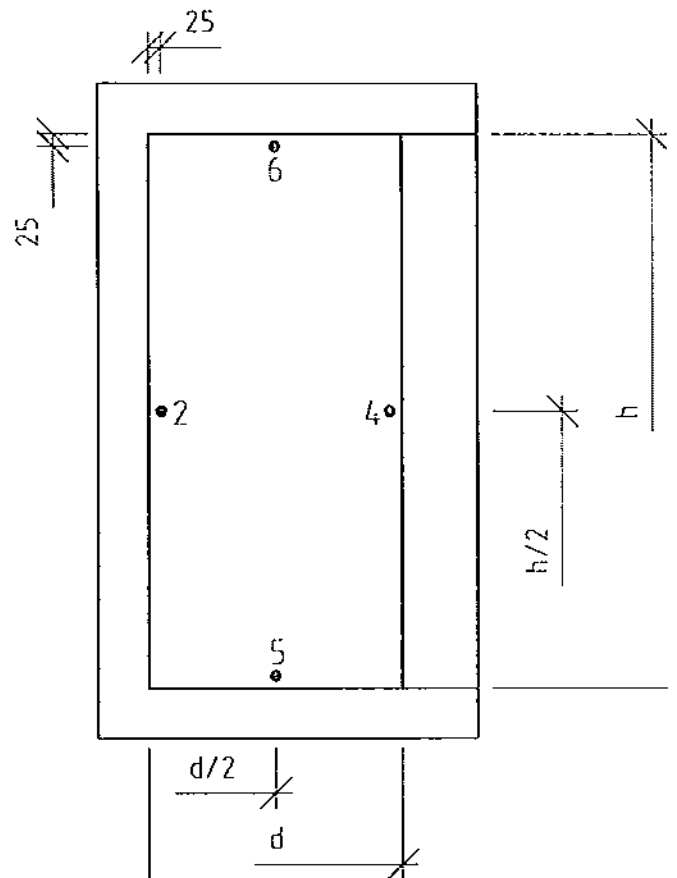
Sign:



- Thermocouple 1-6
Location:
Inside the cabinet, 25mm
from the surface

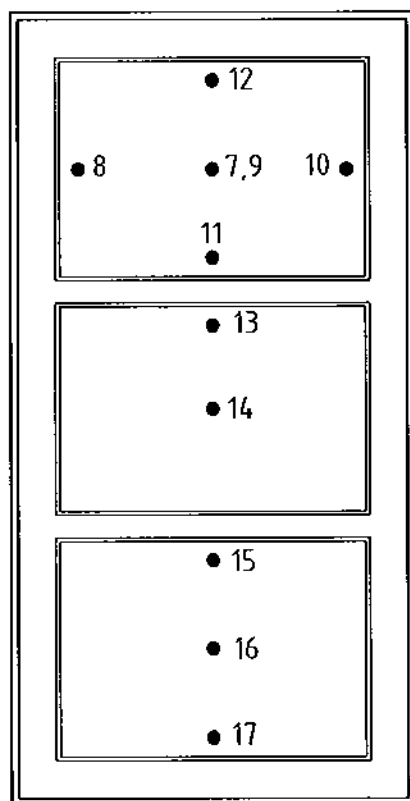


Section A-A

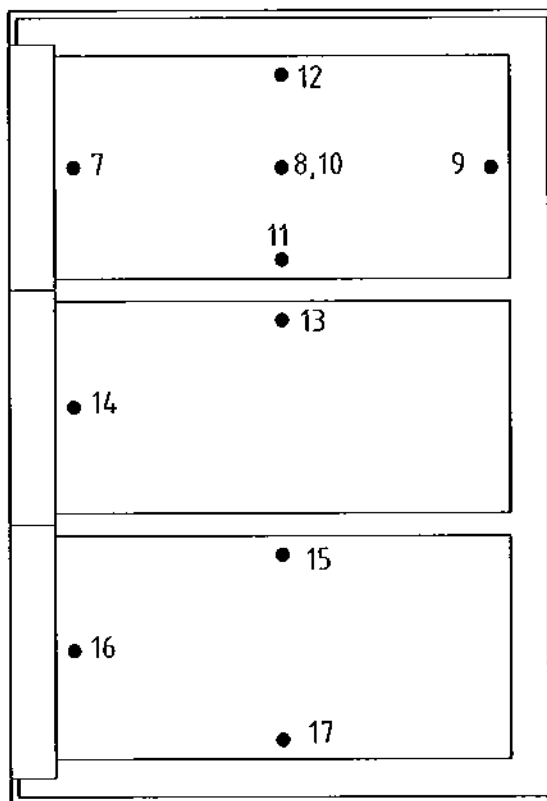


Section B-B

SEEN FROM FRONT



SEEN FROM SIDE



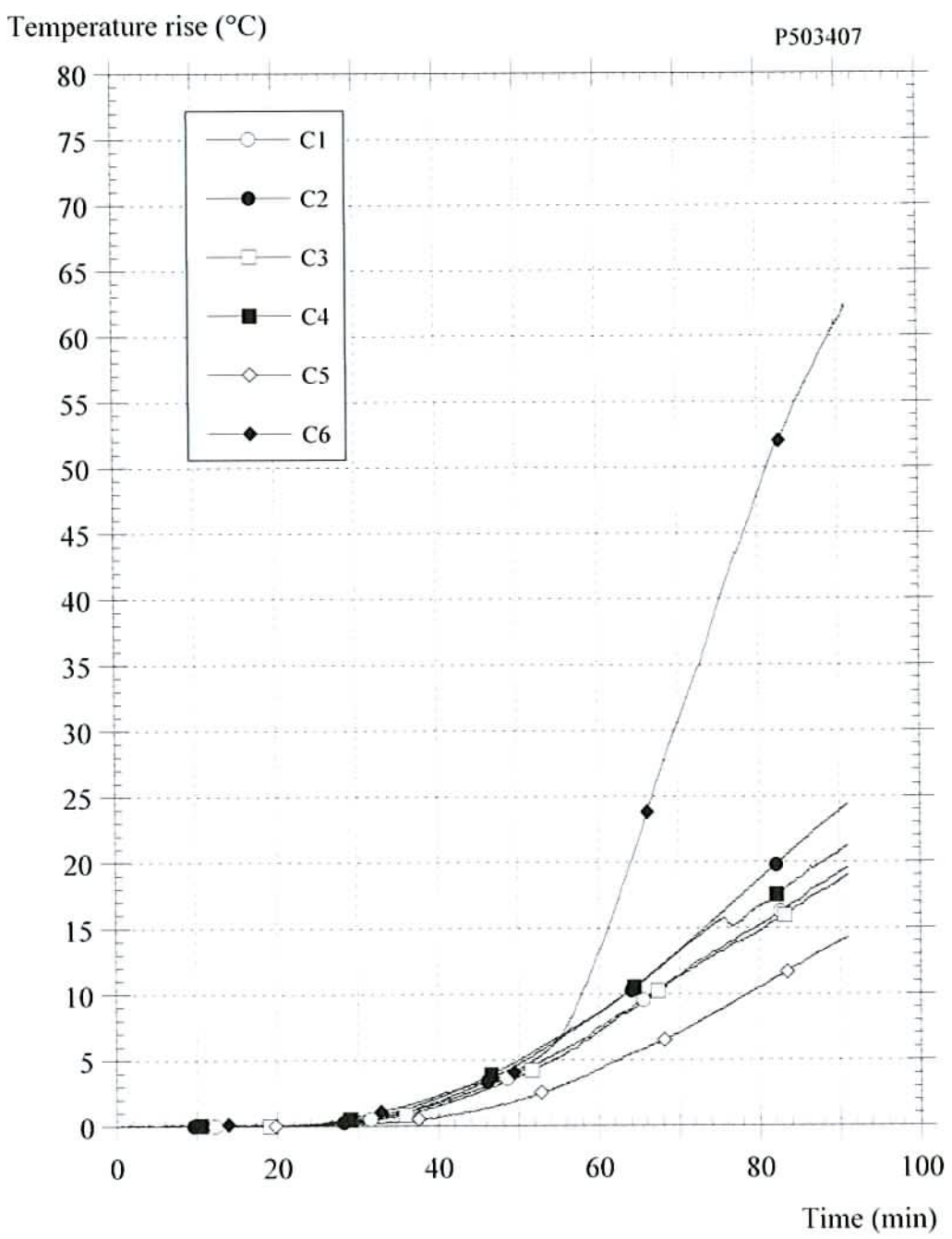
- Thermocouples, air

Thermocouples are placed inside the filing cabinet in the centre of each surface and at a distance of 25 mm from the internal surfaces:

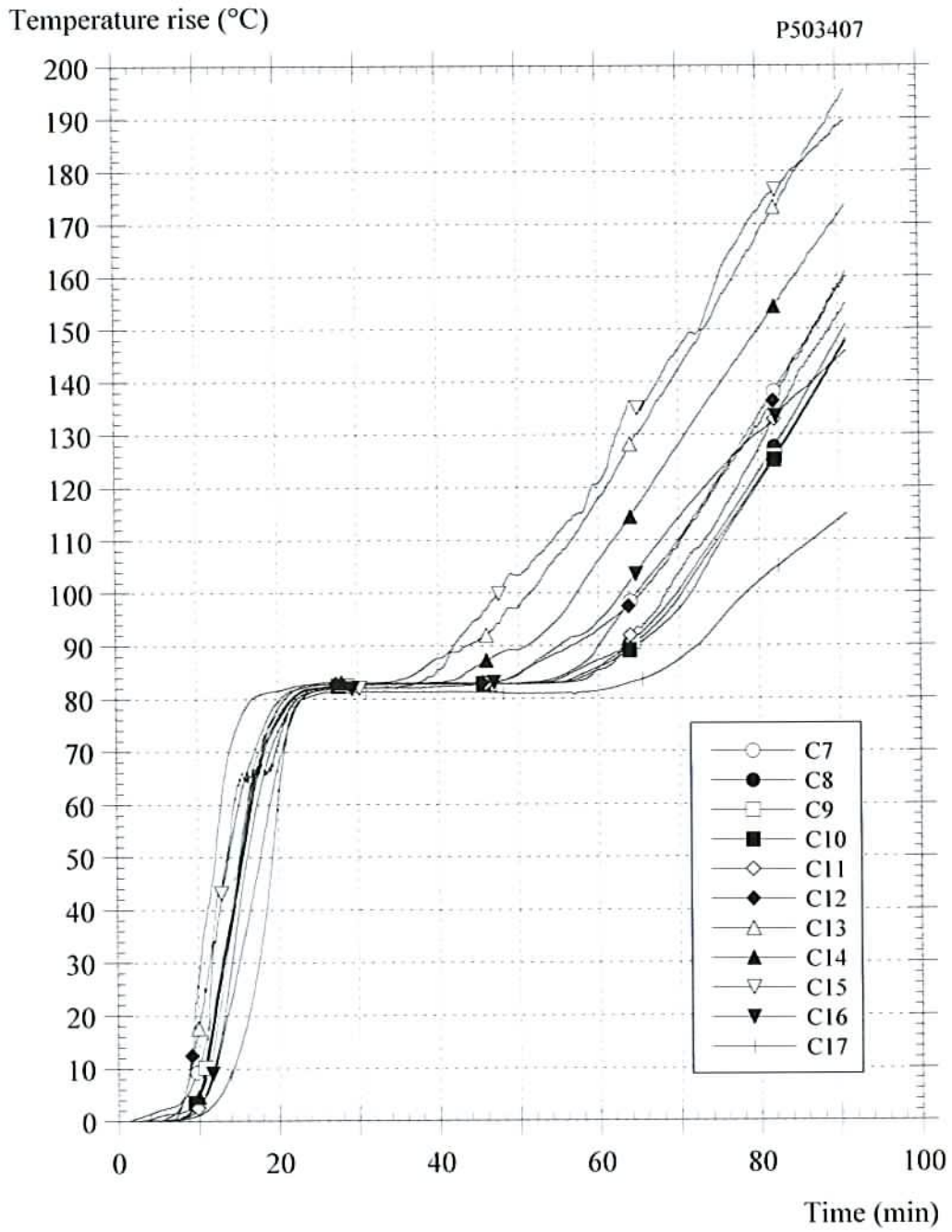
- 7 front, upper drawer
- 8 side wall, upper drawer
- 9 back wall, upper drawer
- 10 side wall, upper drawer
- 11 bottom, upper drawer
- 12 top, upper drawer
- 13 top, central drawer
- 14 front, central drawer
- 15 top, lower drawer
- 16 front, lower drawer
- 17 bottom, lower drawer

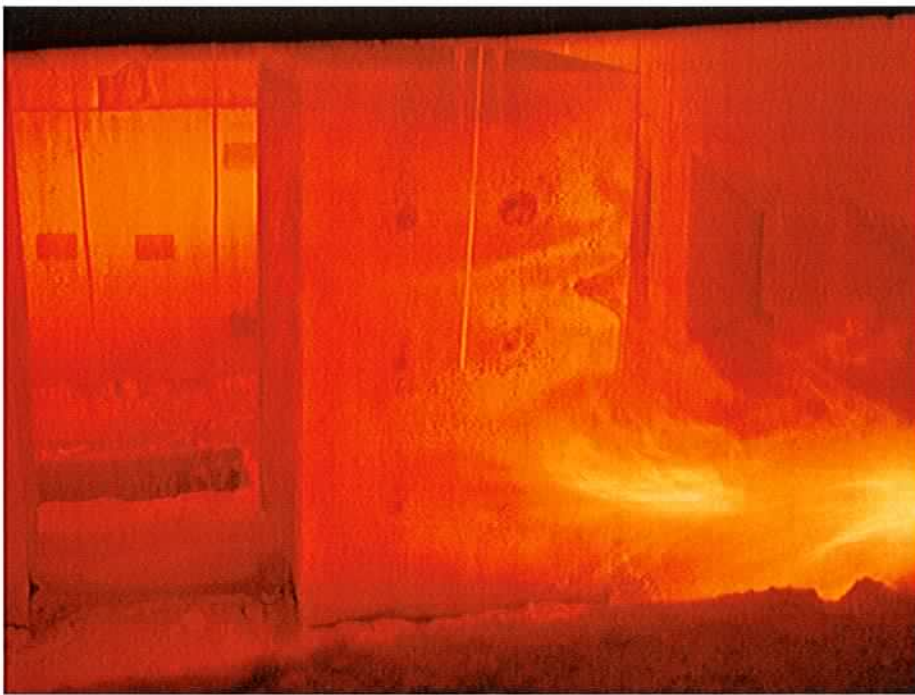


Temperature rise inside data cabinet



Temperature rise inside filing cabinet





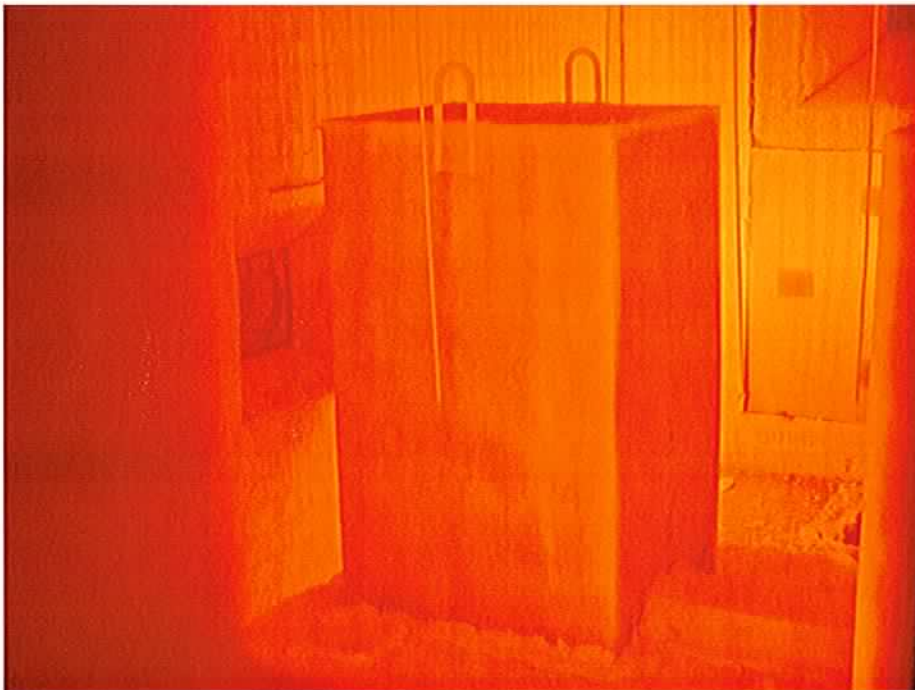
ENCLOSURE 15

Report no: P503407

Photo no: 1

28:40 (min:s):

The BDS-C1200 cabinet.

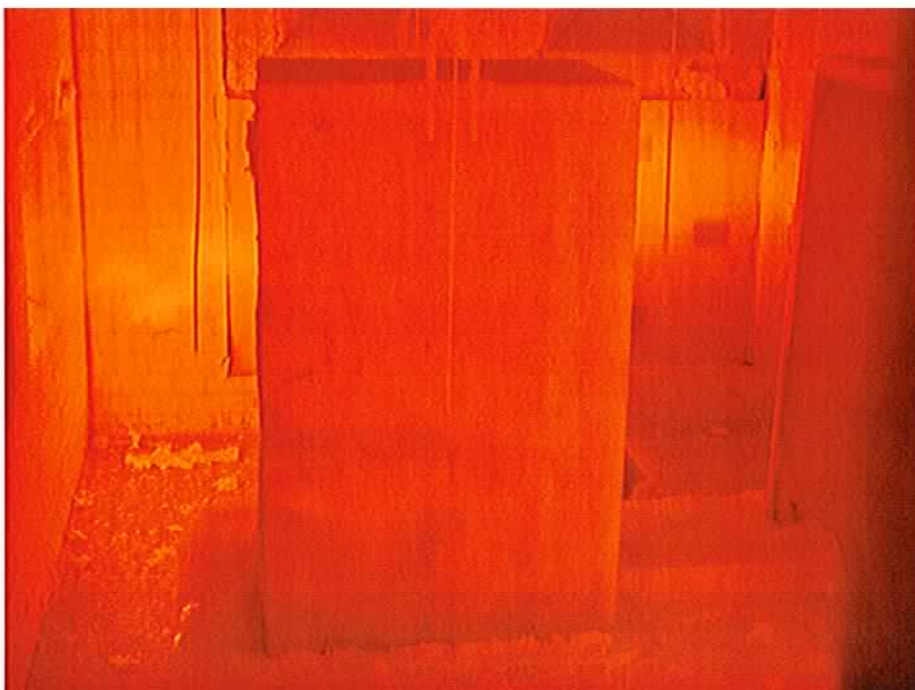


Report no: P503407

Photo no: 2

46:30 (min:s):

The BIF-300 cabinet.



Report no: P503407

Photo no: 3

47:00 (min:s):

The BIF-300 cabinet.



ENCLOSURE 16

Report no: P503407

Photo no: 4

After the test:

The BIF-300 cabinet.

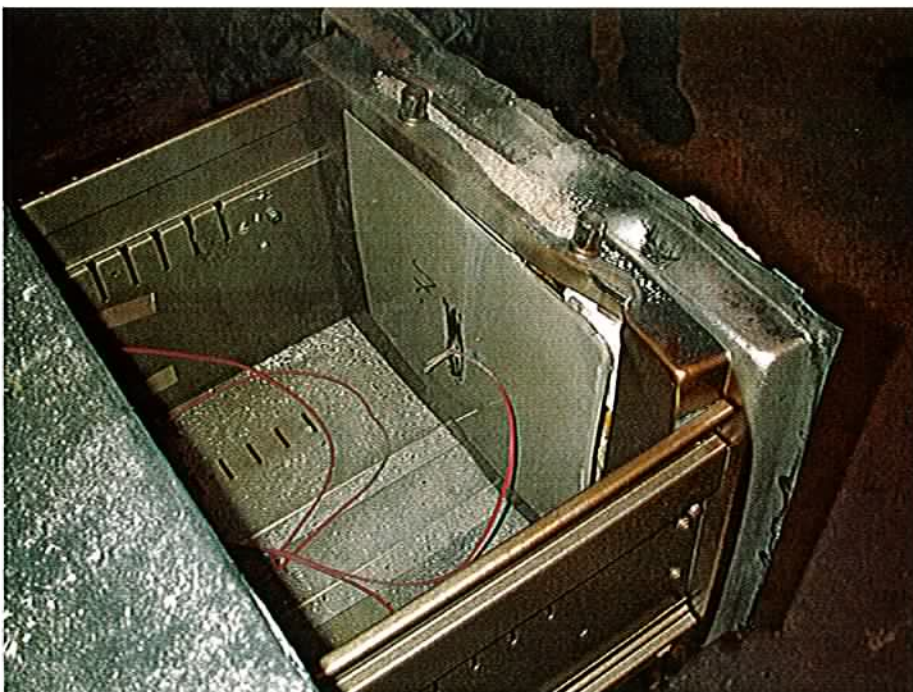


Report no: P503407

Photo no: 5

After the test:

The BIF-300 cabinet. The upper drawer.



Report no: P503407

Photo no: 6

After the test:

The BIF-300 cabinet. The upper drawer.



ENCLOSURE 17

Report no: P503407

Photo no: 7

After the test.

The BDS-C1200 cabinet.



Report no: P503407

Photo no: 8

After the test.

The BDS-C1200 cabinet.



Report no: P503407

Photo no: 9

After the test.

The BDS-C1200 cabinet.