



efectis

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## TNO report

**2006-CVB-R0260**

# Determination of the fire resistance according to NEN-EN 1634-1:2001 of a glazed double door- /leaf construction in a glazed supporting construction

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Date June 2006

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Number of appendices 4 (A up to D)

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Project name Fire resistance  
Project number 034.67819/01.01

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### Appendices

- A Observations
- B Furnace and laboratory conditions
- C Measurements on specimen
- D Photo's

## 1 Introduction

A glazed double door-/leaf construction, mounted in a glazed supporting construction.

## 2 Investigation

Determination of the fire resistance according to NEN-EN 1634-1:2001

## 3 Sponsor

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Jansen AG  
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Switzerland

DORMA van Duin Nederland BV.  
Postbus 6164  
4000 HD Tiel

## 4 Place and date of the investigation

The investigation took place in the laboratory of the Centre of Fire Research of TNO Built Environment and Geosciences in Rijswijk, The Netherlands.

The specimen was mounted in the frame on March 6<sup>th</sup> 2006.  
The fire test was performed on March 23<sup>rd</sup> 2006.

## 5 Date and number of the report

June 2006; report number 2006-CVB-R0260

## 6 Test specimen

### 6.1 General

The double door-/leaf construction was assembled from:

- Jansen Economy 50 steel profiles;
- 25 mm thick Pyrobel EI60/25 glazing;
- Dorma intergrated door closer ITS 96.

In order to allow deflection, i.e. the supporting construction of the double leaf door construction was fixed to the concrete frame on two sides, on top and bottom.

### 6.2 Door leaves

#### 6.2.1 General

Dimensions of the door leaves:

- Height: 2387 mm;
- Width: 1074,5 mm;
- Depth: 50 mm.

The door leaves were assembled from:

- a frame construction of Jansen Economy 50 profiles, type 01.564, 30.114 and 30.416;
- fire resistance glazing, Pyrobel EI60/25, thickness 25 mm;
- glazing beads, type Jansen 402.112Z;
- Dorma intrgrated door closr ITS 96 EN 2-4 GSR.

Door weatherstrips were assembled on the door leaves, type 455.032.

#### 6.2.2 Glazing

The door leaves were filled with glazing, Pyrobel EI60/25, thickness 25 mm.  
Dimensions of the glazing 984,5 x 2297 mm (w x h).

In order te realize an edge cover of 15 mm of the panes in the door leaves, two setting blocks were used at the bottom with a thickness of 5 mm. Dimensions of the setting blocks 80 x 25 x 5 mm (l x w x d).

The panes were held into the door leaves using glazing beads, type Jansen 402.112Z, dimensions 12 x 20 mm (w x h).

The glazing beads were clamped into the door leaves using steel bolts, type Jansen 450.007. The c.t.c. distance was 200 mm.

The rim of the frame and the glazing beads of the secondary door leaf were covered with ceramic tape, type Jansen 451.023, on the exposed side and type 451.024 on the non-exposed side and finished with Sabaglass sealant.

The rim of the frame and the glazing beads of the access door leaf was covered only with door weatherstrips, type Jansen 455.037/038 on the side of the glazed beads and type Jansen 455.036 on the side of the rim.

## 6.3 Hinges and locks

### 6.3.1 Hinges

The access door leaf was hinged with two steel 3D weld-on hinges, dimensions  $\varnothing$  20 x 180 mm, type Jansen 550.276. The secondary door leaf was hinged with two steel Height-adjustable weld-on hinges, dimensions  $\varnothing$  20 x 180 mm, type Jansen 550.229. Position of the hinges: 180 mm and 2172 mm, measured from top of door leaf. Both door leaves were assembled with one steel rebate bolt, dimensions  $\varnothing$  10 x 17 mm, type Jansen 550.404. Position of the rebate bolts: 1195 mm, measured from top of door leaf.

### 6.3.2 Locks

The access door leaf was assembled with a latch and bolt lock with stainless steel faceplate, type Jansen 555.181. The secondary door leaf was assembled with a rebate lever bolt with stainless steel faceplate, type Jansen 555.380. This rebate lever bolt was connected to the switch latch, type Jansen 555.219, on the top of the door leaf with a shoot bolt (top) M6, type Jansen 555.387.

### 6.3.3 Door closing device

Both door leaves were assembled with an integrated door-closer, type Dorma ITS 96 2-4 GSR. The profile of the associated supporting construction, above the access door leaf, was assembled with a slide rail, type Dorma G 96 GSR. The secondary door leaf was assembled with a selector bar MK 397, type Dorma 47002900.

Measured closing force was 19 N.

### 6.3.4 Door handle

The access door leaf was assembled with a stainless steel handle set with oval clip-on rosette, type Jansen 550.349.

## 6.4 Associated supporting construction

### 6.4.1 General

Dimensions of the façade construction:

- Height: 2950 mm;
- Width: 3679 mm;
- Depth: 50 mm.

The construction was assembled from:

- a frame construction of Jansen Economy 50 profiles, type 30.013, 01.564, 02.534, 02.564, 01.534 and 30.416;
- fire resistance glazing, Pyrobel EI60/25, thickness 25 mm;
- glazing beads, type Jansen 402.112Z and angle contour steel glazing beads, type Jansen 62.507 GV+GC;
- Dorma intergrated door closer ITS 96 EN 2-4.

Door weather-strips were assembled around the door leaves, type Jansen 455.032.

#### 6.4.2 *Glazing*

The associated supporting construction was filled with glazing, Pyrobel EI60/25, thickness 25 mm.

Dimensions of the right pane: 1331 x 2890 mm (w x h).

Dimensions of two panes on top of the door leaves: 1094 x 440 mm (w x h).

In order to realize an edge cover of 15 mm of the panes in the door leaves, two setting blocks were used at the bottom with a thickness of 5 mm. Dimensions of the setting blocks 80 x 25 x 5 mm (l x w x d).

The right pane was held into the construction using glazing beads, type Jansen 62.507 GV+GC, dimensions 20 x 20 mm (w x h).

The glazing beads were fixed into the construction using steel bolts, dimensions  $\varnothing$  3.9 x 10 mm. The c.t.c. distance was 200 mm.

The two panes on top of the door leaves were held into the construction using glazing beads, type Jansen 402.112Z, dimensions 12 x 20 mm (w x h).

The glazing beads were clamped into the construction using steel bolts, type Jansen 450.007. The c.t.c. distance was 200 mm.

The rim of the construction and the glazing beads were covered with ceramic tape, type Jansen 451.023 on the exposed side and type 451.024 on the non-exposed side and finished with Sabaglass sealant.

#### 6.4.3 *Fixing*

The construction was screwed into the testing frame on top and bottom only, in order to allow deflections on both vertical sides, the so-called "free edges".

The construction was fixed with screw plugs, type Fischer FUR 10 x 150 mm and finished with Sabaglass sealant.

The maximum c.t.c. distance was 630 mm

For more information, see figure 1 up to 18.

### 6.5 **Gap width measurements**

According figure 9 of NEN-EN 1634-1:2001 gap widths were measured. Results are shown in figure 1.

### 6.6 **Testing frame**

The steel test frame has a free opening of 4000 x 3000 mm (w x h).

Inside the test frame there was an opening with dimensions 3740 x 3000 mm (w x h).

Underneath the door leaves there was simulated an incombustible floor with a thickness of 20 mm.

## 7 Production and mounting of the constructions

|  |   |
|--|---|
| TNO Built Environment and Geosciences: | - Testing frame;<br>- Mounting supporting construction. |
| Jansen AG                              | - Facade construction with door leaves;                 |
| Glaverbel Nederland BV.                | - Glazing;  |
| Dorma van Duin Nederland.              | - Door closing device.                                  |

## 8 Course of investigation

### 8.1 Verification specimen

During the mounting, used material and components were checked against provided drawings and data by sponsor.

### 8.2 Conditioning

From the moment of installation until the fire test, the specimen was stored in the laboratory of TNO, Center for Fire Research with the following conditions:

- Ambient temperature:  $20 \pm 5^{\circ}\text{C}$ ;
- Relative humidity:  $50 \pm 10\%$ .

### 8.3 Density and moisture content

There was no material for determination the density and moisture content. The construction was delivered complete with door leaves, hinges, closing device and lock.

### 8.4 Fire test

#### 8.4.1 Conditions

The fire test was conducted according to European standard NEN-EN 1634-1:2001.

The specimen was heated on one side according the standard fire curve. The door leaves were opening away from the fire. The access door was closed by day bolt and door-closing device. The secondary door was closed by switch latch on top of the door and door-closing device.

The glazing beads were fixed at the exposed side.

The desired pressure into the furnace was 0 Pa at 0,5 m and 20 Pa at 3,0 meter above floor level.

#### 8.4.2 *Measurements*

During heating the following was measured and registered:

Furnace conditions:

- The gas temperatures inside the furnace;
- The furnace pressure measured at 0,5 m and 2,7 m above floor level.

Specimens:

- The surface temperatures of the door leaves;
- The surface temperatures of the frame;
- The surface temperatures of the construction;
- The heat radiation measured at 1,0 meter distance of the geometrical centre of the specimen;
- The displacements of the frames and door leaves at 1,3 m above floor level.

Environment:

- Air speed in the laboratory;
- Environment temperature in the laboratory.

The positions of the thermocouples on the constructions are given in figure C1.

## 9 Observations

After 32 minutes of heating flames were visible for longer than 10 seconds, criteria "*end of integrity based on sealing*" was reached.

After 60 minutes of heating flames were visible for longer than 10 seconds again.

After 62 minutes end of heating.

More details can be found in the Appendix A.

## 10 Results and uncertainty of measurements

### 10.1 Results

The results are given in the appendices B and C.

During the heating the temperature and air speed in the laboratory complied with the European standard NEN-EN 1634-1:2001.



## 10.2 Uncertainty of measurements

Due to the nature of fire resistance testing, in which several non-linear effects are present in both the test configuration and the test specimen, which influence each other, it is at this moment not yet possible to give a stated degree of uncertainty of measurement.

## 11 Summary

The fire resistance of a glazed double door-/leaf construction in a glazed supporting construction has been determined.

The fire test was conducted according to the European standard NEN-EN 1634-1:2001. The most important results are given in Table 2.

*Table 1: Summarized results*

| Criterion   | Time elapsed in minutes, calculated from the start of the test, which criterion was fulfilled according NEN 6069:2005 and NEN-EN 1634-1:2001. |                       |             |
|---|---|-----------------------|-------------|
|   | NEN<br>6069:2005  | NEN-EN<br>1634-1:2001 | Remarks     |
| <b>Integrity (E)</b>  |   |                       |             |
| Cotton pad  | 62  | 62                    | Not reached |
| 6 mm caliber  | 62  | 62                    | Not reached |
| 25 mm caliber   | 62  | 62                    | Not reached |
| Sustained flaming   | 32  | 32                    | Reached     |
| <b>Thermal insulation with relation to the temperature*</b> |   |                       |             |
| Average rise  | *   | 62                    | Not reached |
| Maximum rise (EI <sub>1</sub> )                             | *   | 5                     | Reached     |
| Maximum rise (EI <sub>2</sub> )<br>(suppl. Procedure)       | *   | 22                    | Reached     |
| <b>Thermal insulation with relation to the radiation</b>    |   |                       |             |
| Radiation   | 62  | 62                    | Not reached |

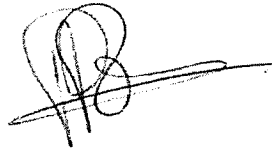
Heating was stopped after 62 minutes.

\* = No criterion in The Netherlands


## 12 Field of direct application of test results

The summary given in chapter 11 is only valid for constructions, which are in detail the same, including materials and door hardware, as the described construction in the report and as indicated in chapter 13 of EN 1634-1:2001. The following requirements will have to be satisfied:

- Dimensions of the door leaves are equal or smaller as investigated;
- Door opening towards or away from the fire;
- Thickness of the used materials may not be decreased;
- Maximum gap width equal to as given in figure 1;
- The doorframe is mounted as described in a glazed supporting construction.



P.A. Ram



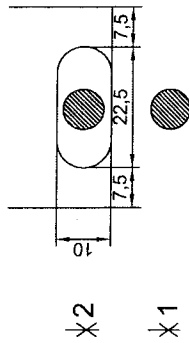
Dr. Ir. G. van den Berg

Integrated doorcloser Dorma ITS 96-2-4  
555 296

Selectorbar MK 397  
550 387

slide rail Dorma G 96 GSR6-2-4 Integrated doorcloser Dorma ITS 96-2-4  
550 665 555 296

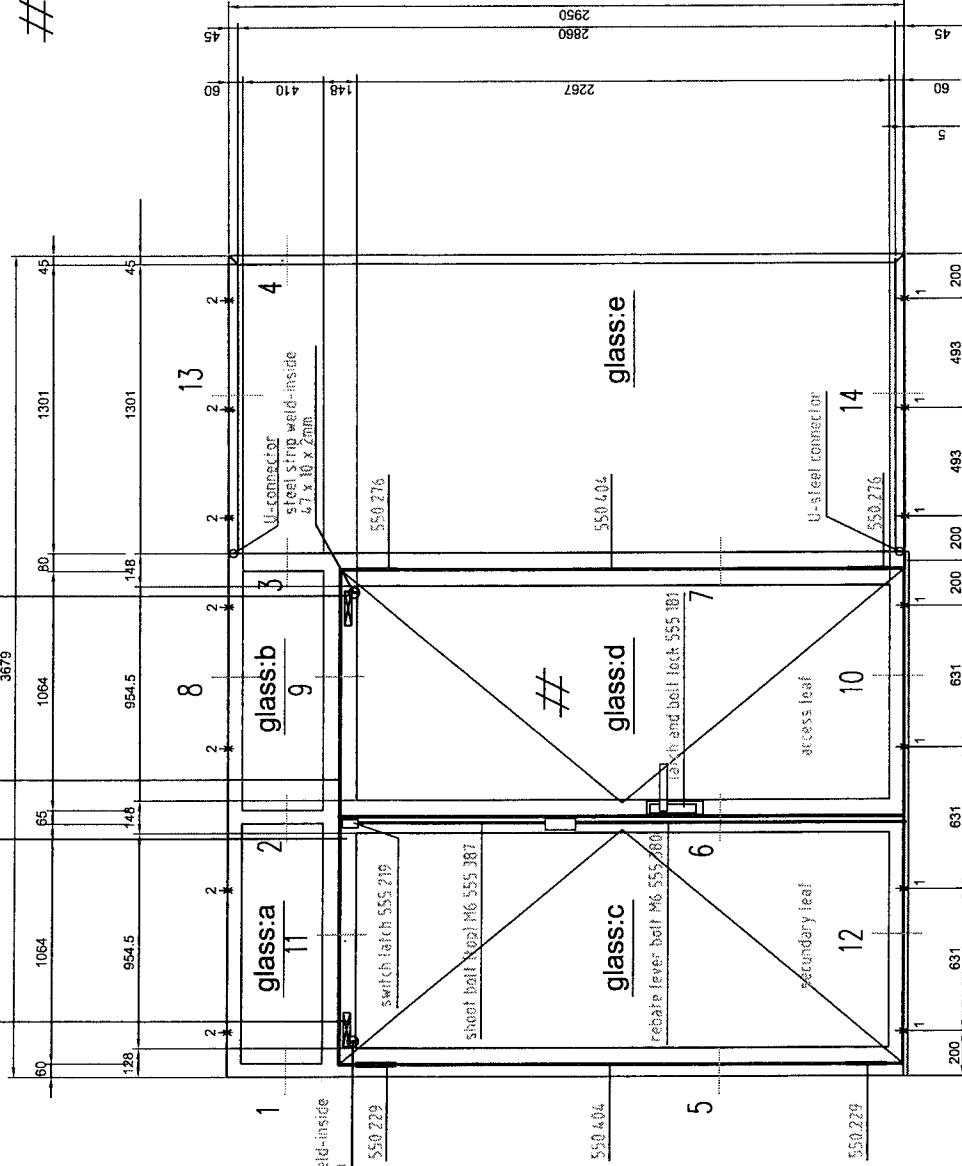
\* = assembly frame-ting



# dry glazing  
remaining remains fibre strips

| Glass  | width    | Height  |
|--------|----------|---------|
| Size a | 1094 mm  | 1410 mm |
| Size b | 1094 mm  | 1440 mm |
| Size c | 984.5 mm | 2797 mm |
| Size d | 984.5 mm | 2797 mm |
| Size e | 1331 mm  | 2890 mm |

Glazing beads max. 50mm screwed from the corner.  
r.o.b. max. 200mm



VIEW UNEXPOSED SIDE

Detail : Front view

Project : Fire resistant performance Jansen Economy 50, Glass Glaverbel and Dorma integrated door closer, 60 min. brandverend.

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|             |              |              |              |
|-------------|--------------|--------------|--------------|
| Drawing     | : n.v.t.     | Alteration 1 | : 21-06-2006 |
| date        | : 07-03-2006 | Alteration 2 | :            |
| scale       | : n.v.t.     | control      | :            |
| Draughtsman | : D.Leenheer | seen         | :            |

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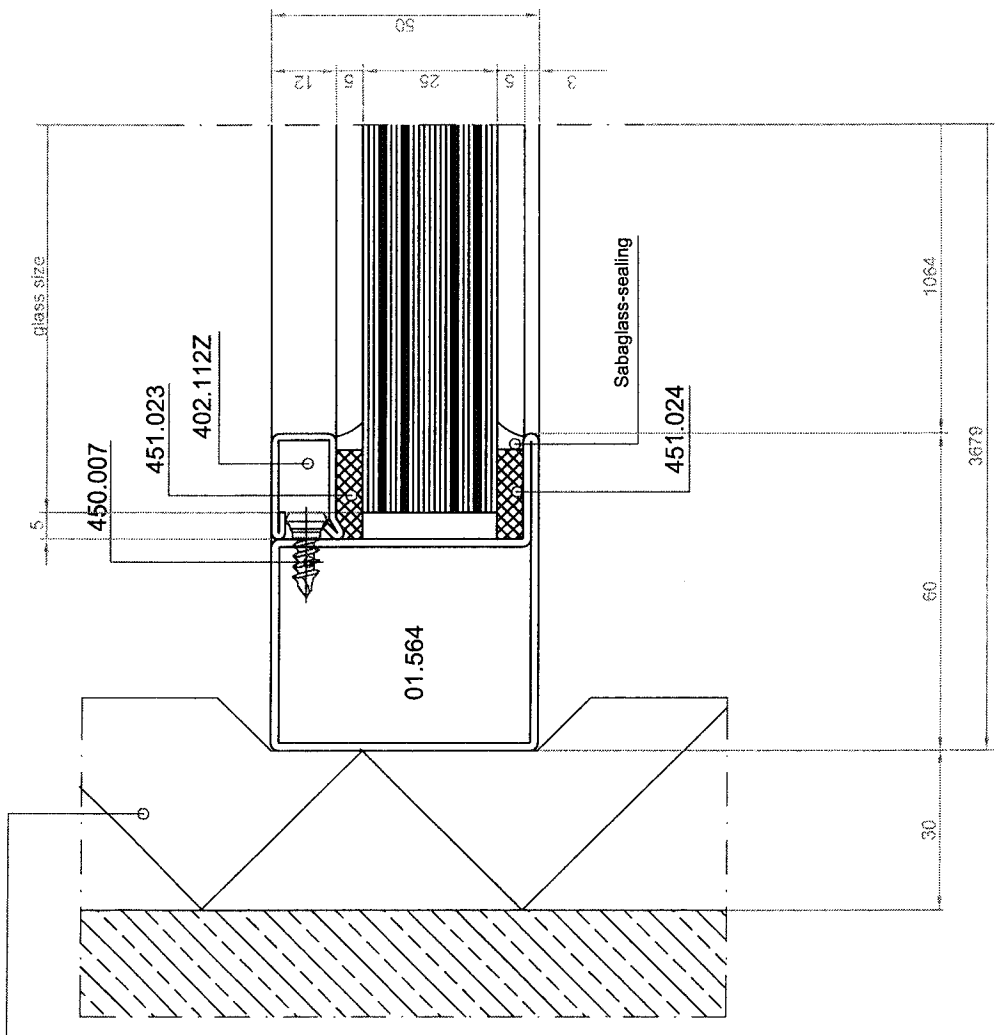
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EXPOSED SIDE

Rockwool 40mm



Detail : 1

Project : Fire resistant performance Jansen Economy 50, Glass Glaverbel and Dorma integrated door closer, 60 min. brandverend.

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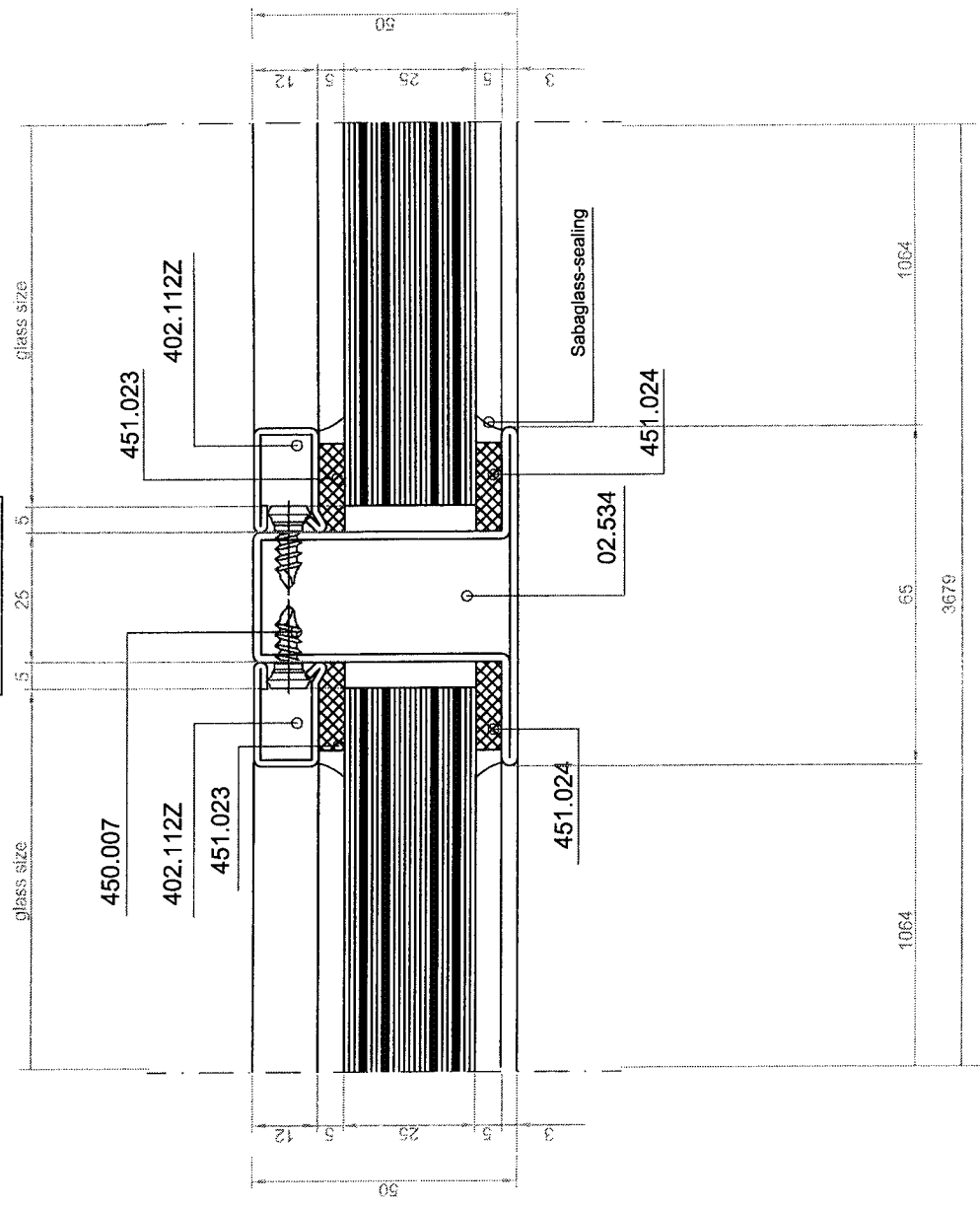
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| Scale       | : n.v.t.     | Control      | :            |
| Draughtsman | : D.Leenheer | Seen         | :            |

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**EXPOSED SIDE**



Detail : 2

Project : Fire resistant performance Jansen Economy 50, Glas Glaverbel and Doma integrated door closer, 60 min.brandverend.

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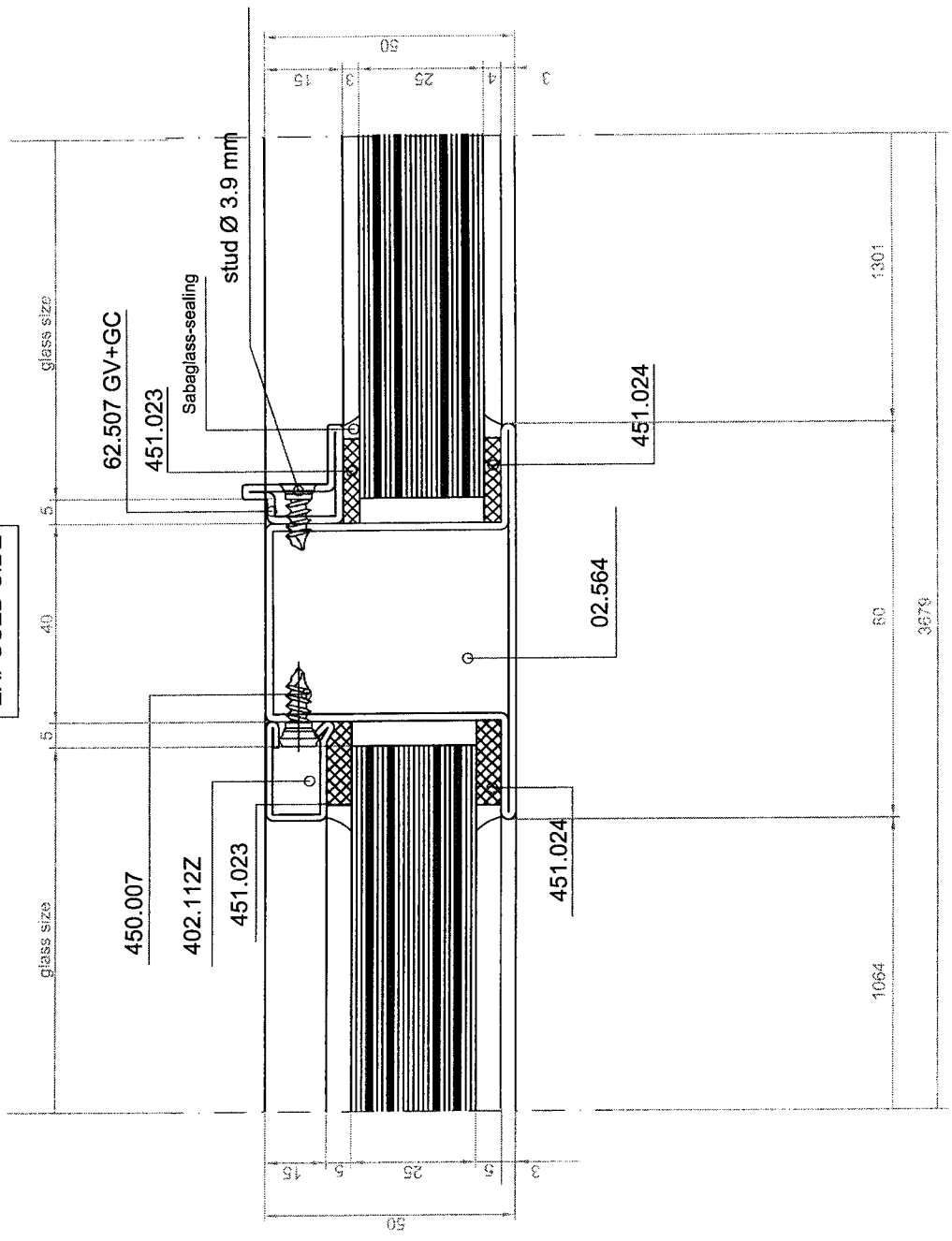
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| Scale       | : n.v.t.     | Control      | :            |
| Draughtsman | : D.Leeheer  | Seen         | :            |

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Detail : 3

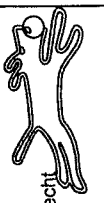
Projekt : Fire resistant performance Jansen Economy 50, Glass Glaverbel and Doma integrated door closer, 60 min. brandwerend.

TNO rapport: 2006-CVB-R0260/RMP

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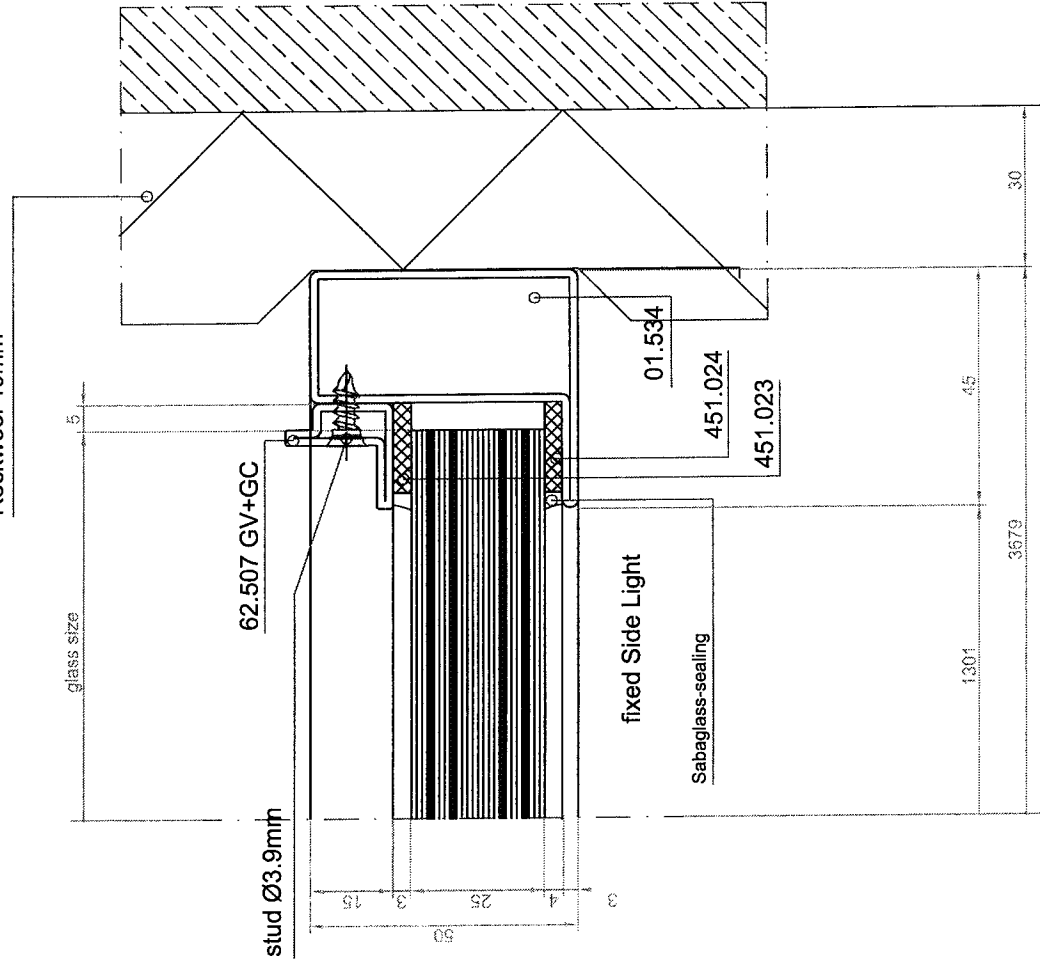
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EXPOSED SIDE

Rockwool 40mm



Detail : 4

Project : Fire resistant performance Jansen Economy 50, Glass Glavelbel and Dorma integrated door Glaser, 60 min. brandwerend.

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|             |               |              |              |
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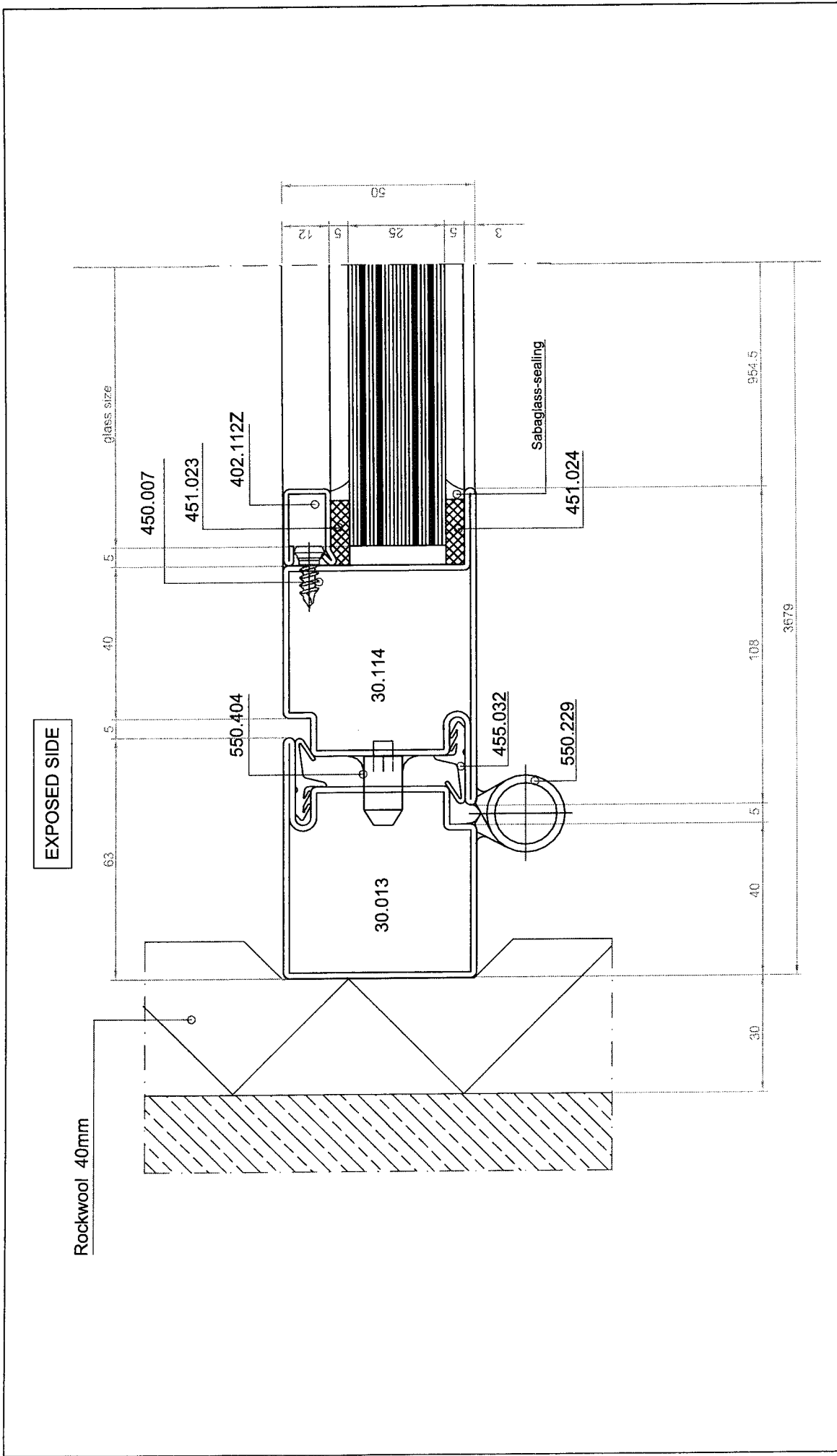
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Detail : 5

Project : Fire resistance Jansen Economy 50, Glass Glaverbel and Dorma integrated door closer, 60 min. brandwerend.

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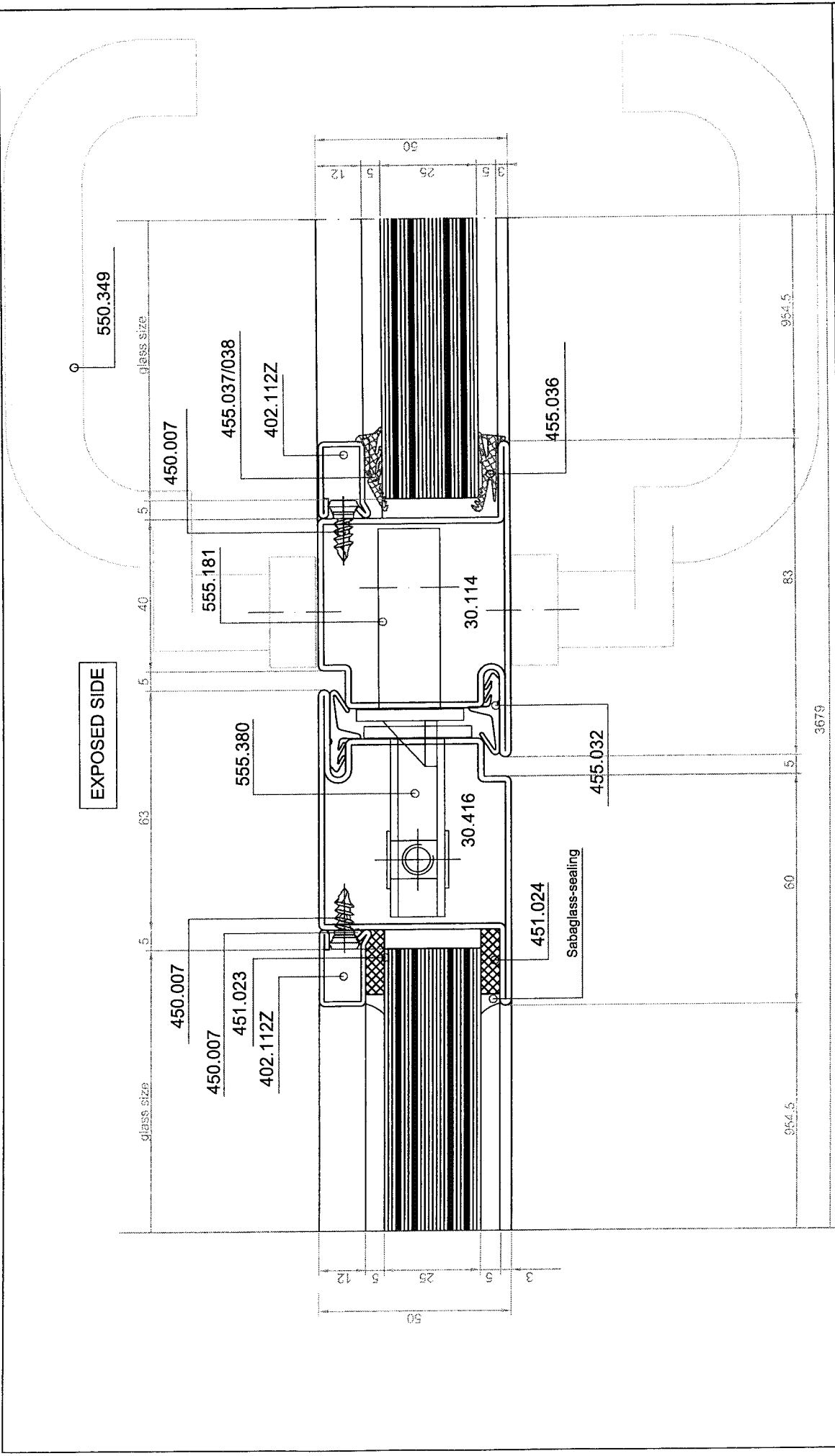
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| Date        | : 07-03-2006 | Alteration 2 | :            |
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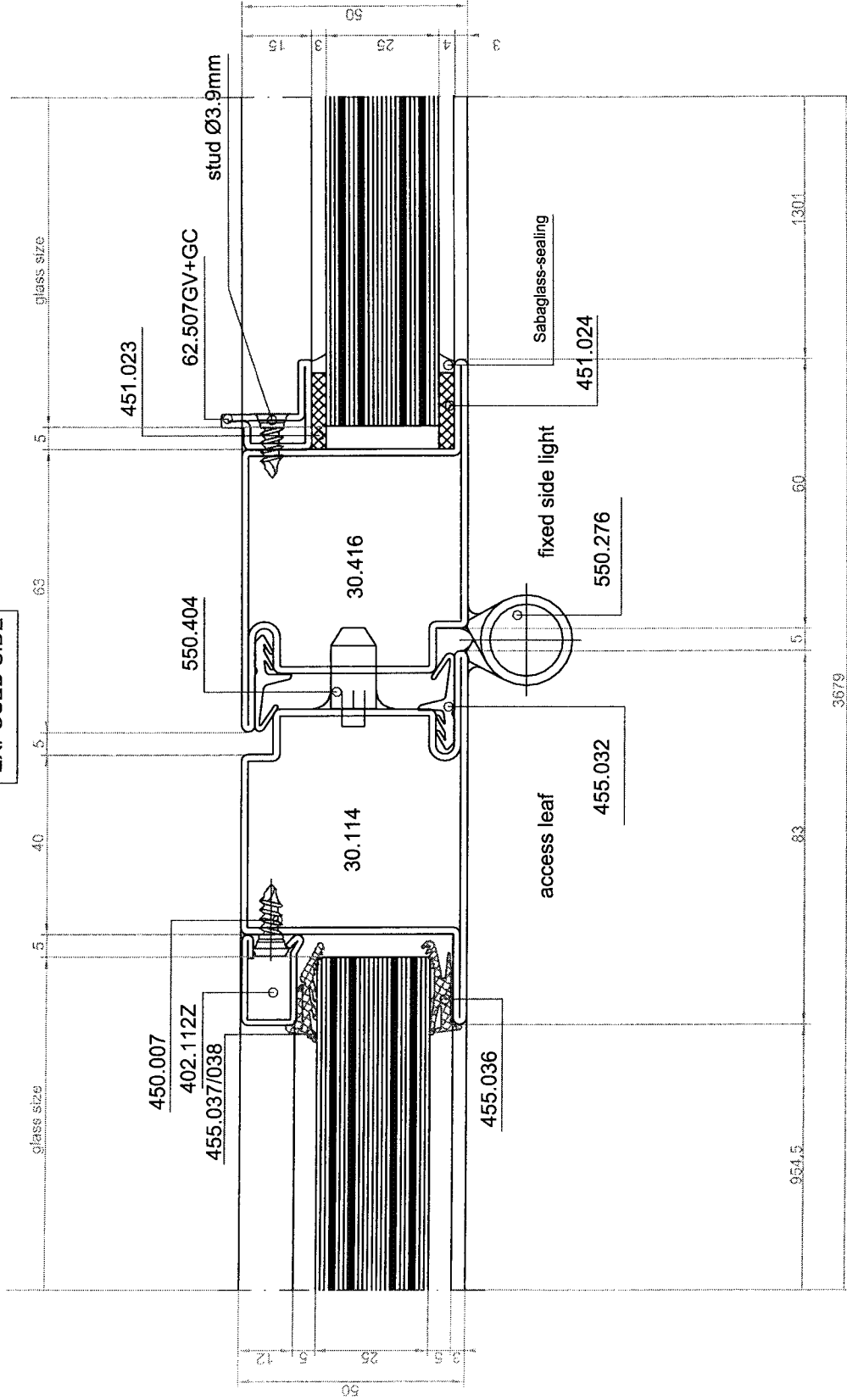
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| <b>Detail</b> : 6                      | <b>Project</b> : Fire resistant performance Jansen Economy 50, Glass Glaverbel and Dorma integrated door closer, 60 min. brandwerend. |
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| Draughtsman : D.Leenheer               | Seen :  |

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3679

**EXPOSED SIDE**



Detail : 7

Project : Fire resistant performance Jansen Economy 50, Glass Glaverbel and Dorma integrated door closer, 60 min. brandverend.

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| Date        | : 07-03-2006 | Date       | :            |
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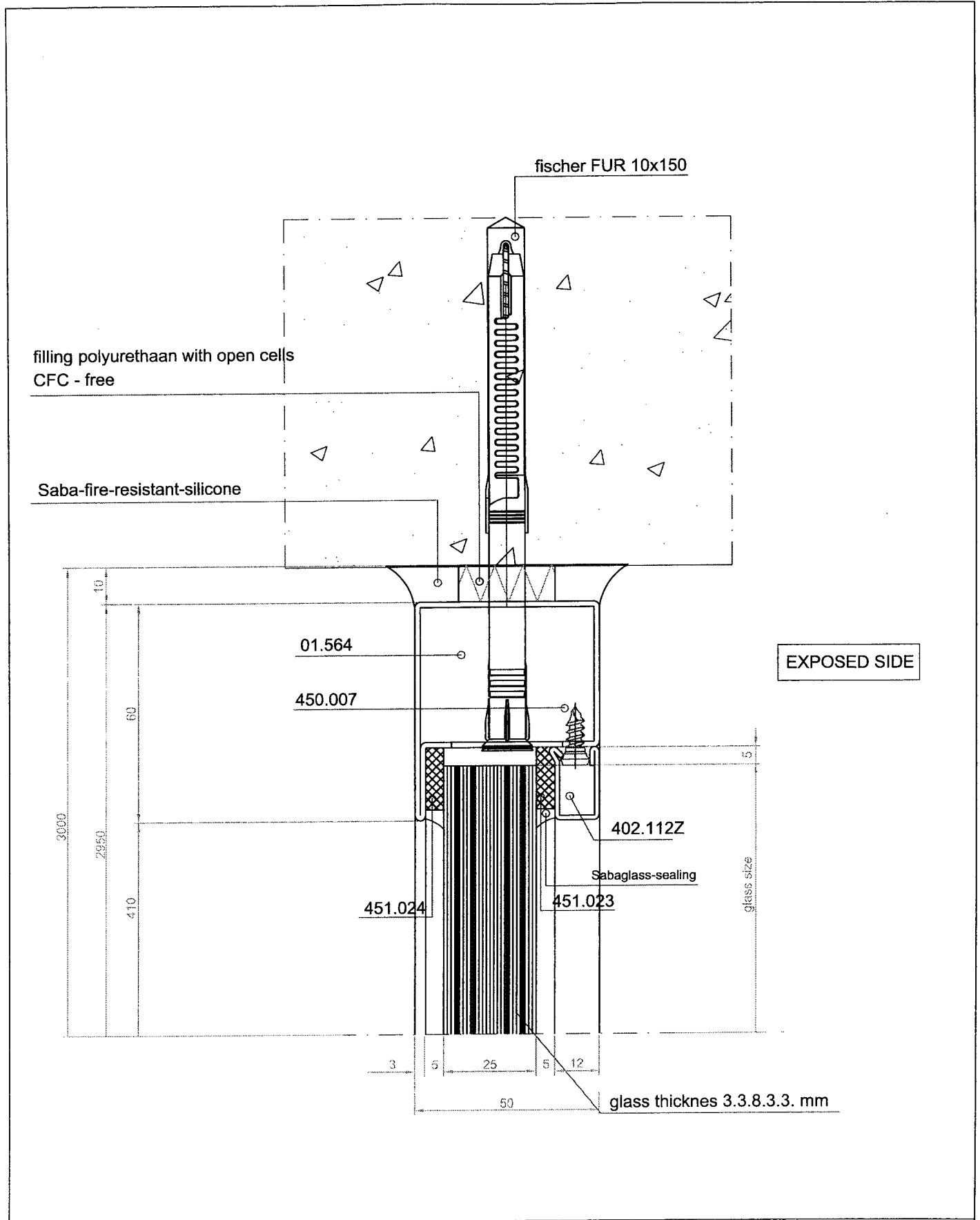
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Detail : 8

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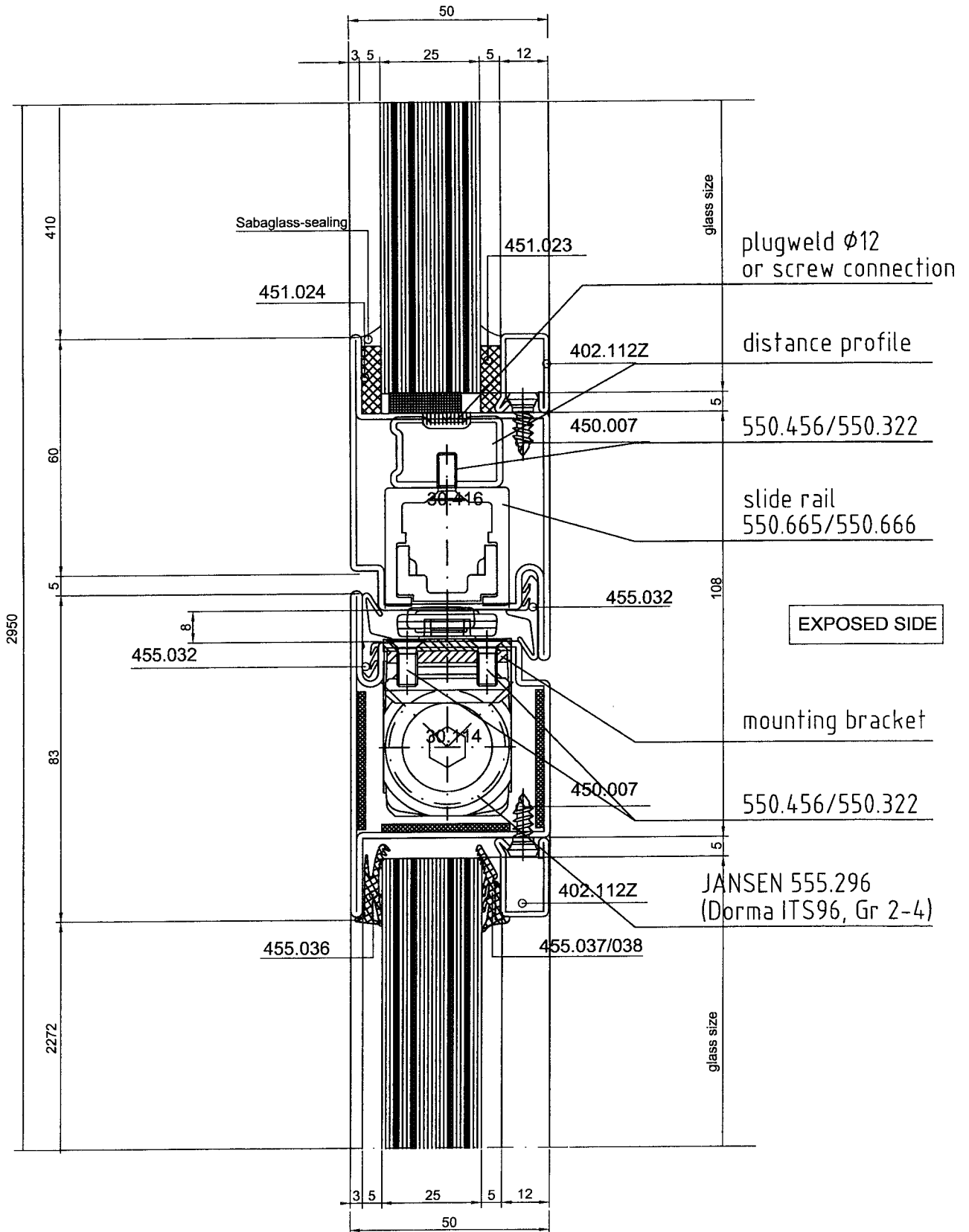
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Drawing : 9

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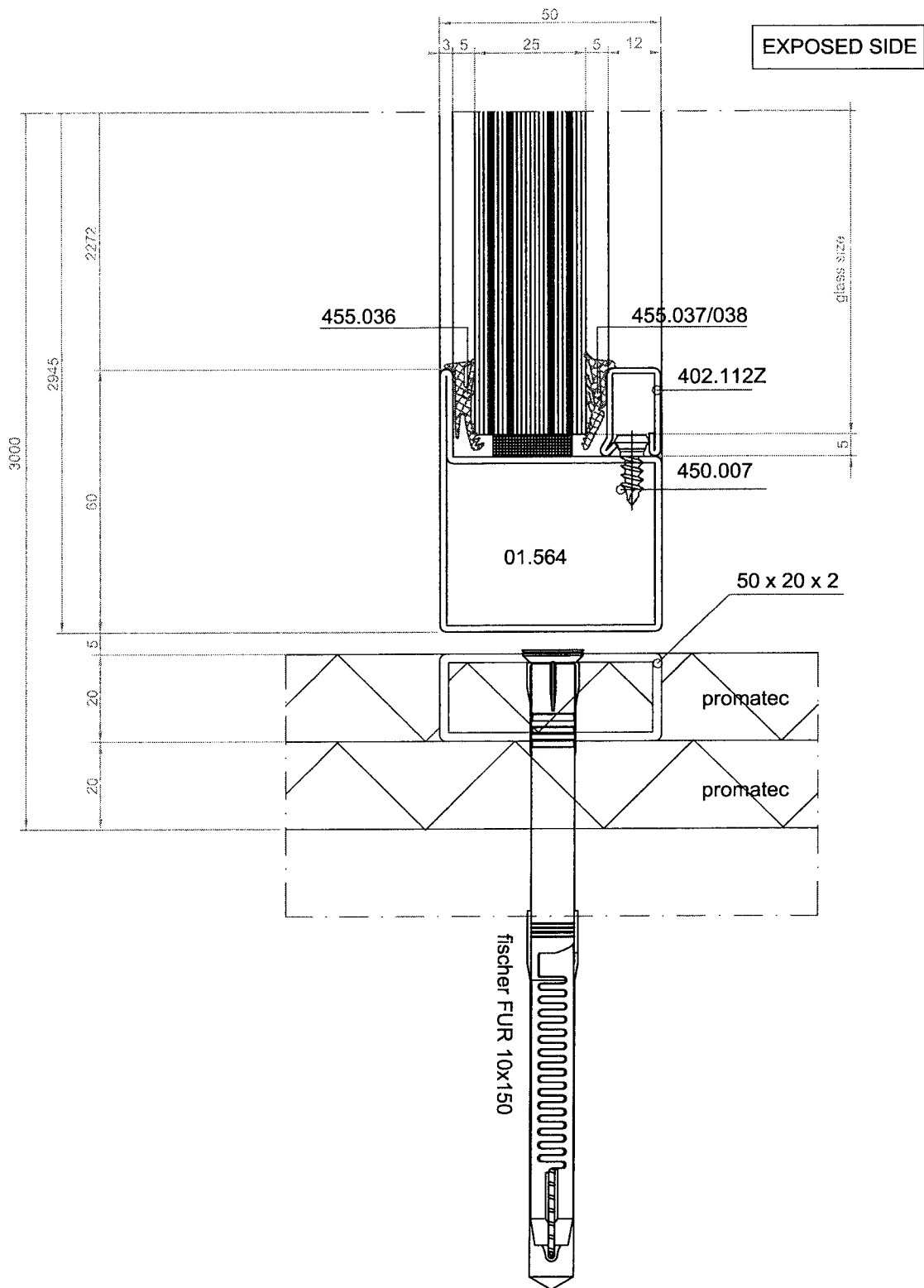
**JANSEN**

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| Drawing : n.v.t.         | Alteration 1 : 21-06-2006 |
| Date : 07-03-2006        | Alteration 2 :            |
| Scale : n.v.t.           | Control                   |
| Draughtsman : D.Leenheer | Seen :                    |

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Detail : 10

Project : Fire resistant performance Jansen Economy 50, Glass Glaverbel and Dorma integrated door closer, 60 min. brandwerend.

TNO Report : 2006-CVB-R0260/RMP

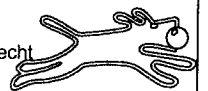
Our free expert advice is taking place in all conscience. However we cannot take responsibility for either immediate or future consequences.

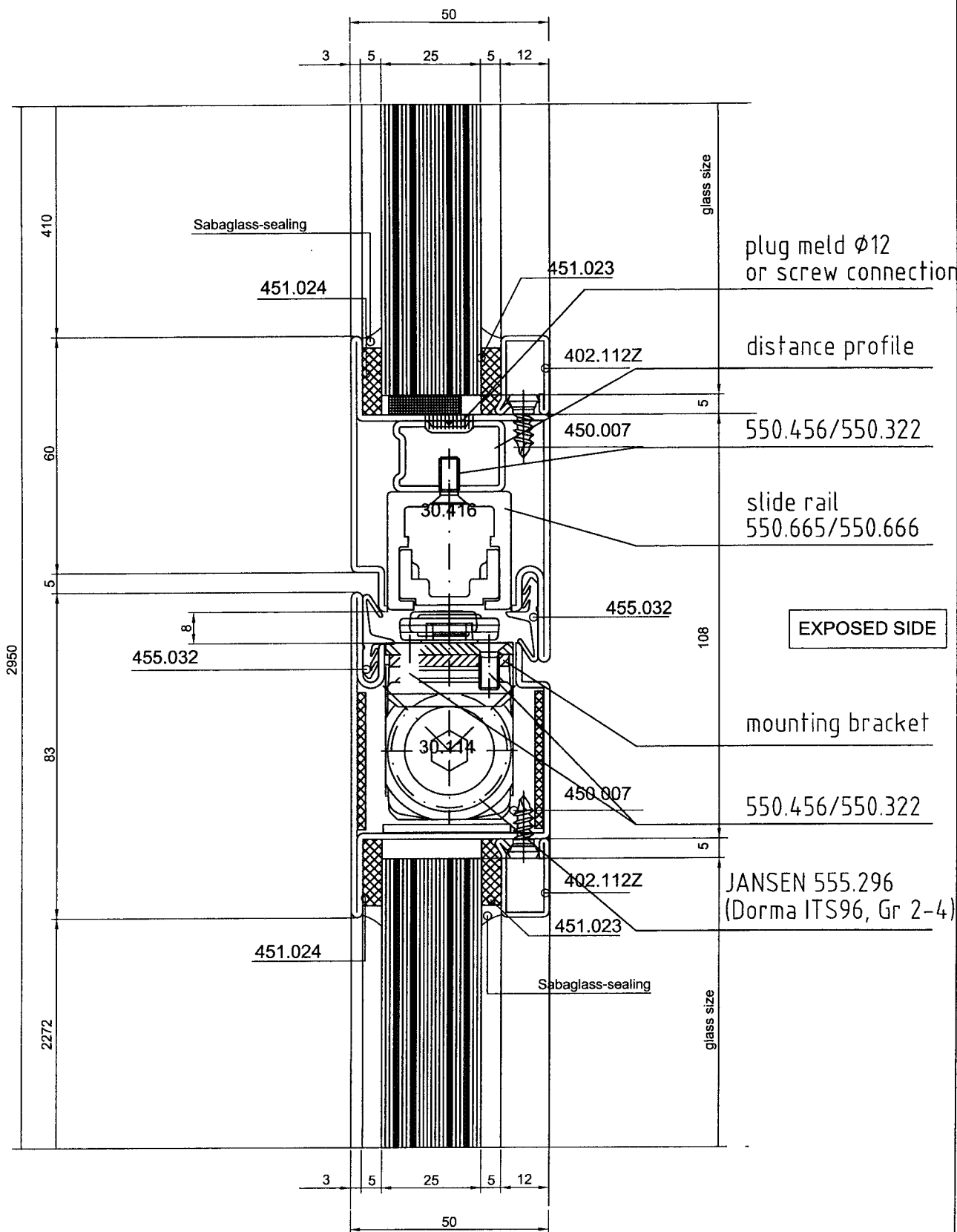
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| Draughtsman | : D.Leenheer | Seen         | :            |

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Detail : 11

Project : Fire resistant performance Jansen Economy 50, Glass Glaverbel and Dorma integrated door closer, 60 min. brandwerend.

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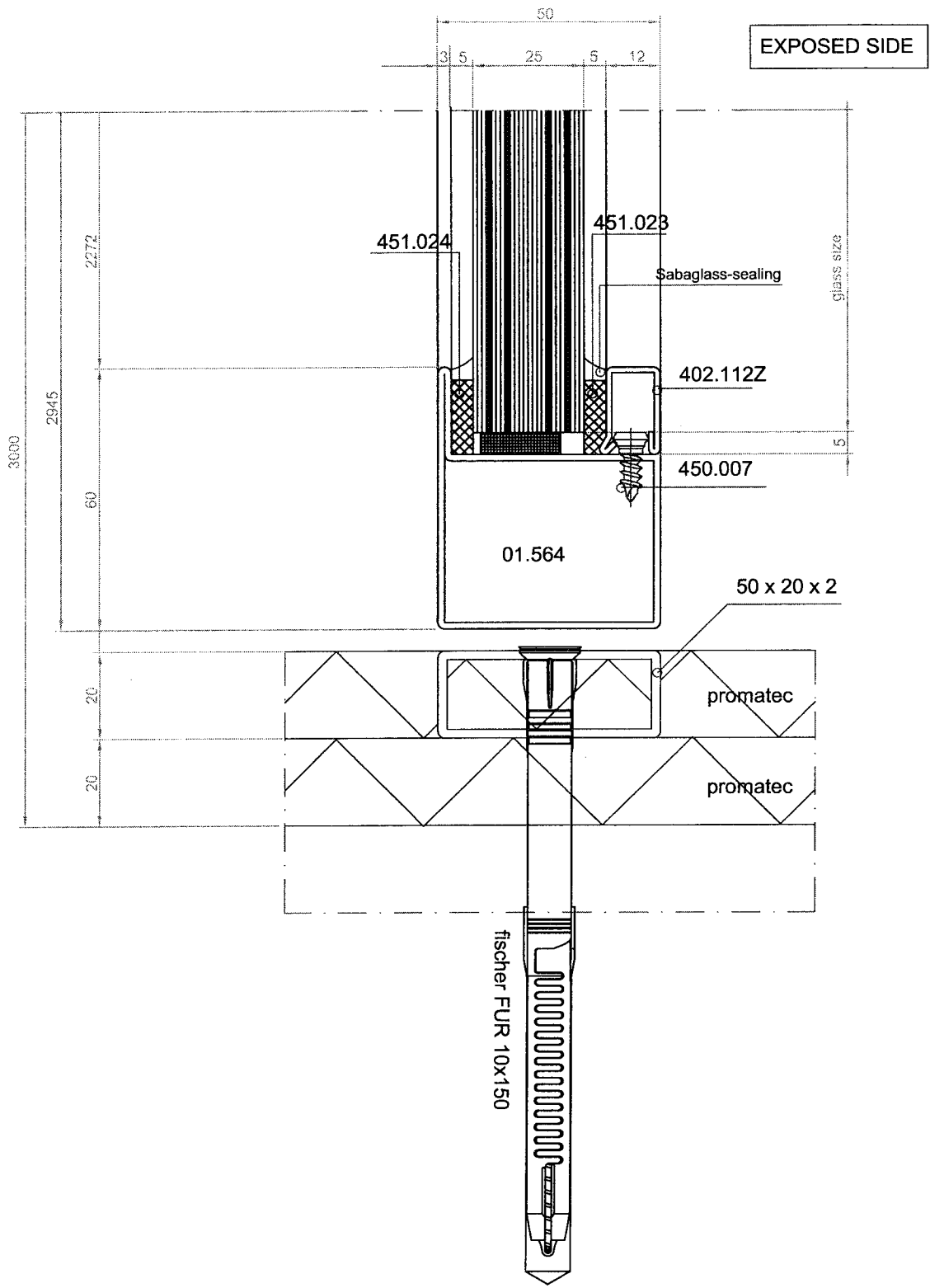
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| Draughtsman | : D.Leenheer | Seen         | :            |

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Detail : 12

Project : Fire resistant performance Jansen Economy 50, Glass Glaverbel and Dorma integrated door closer, 60 min. brandwerend.

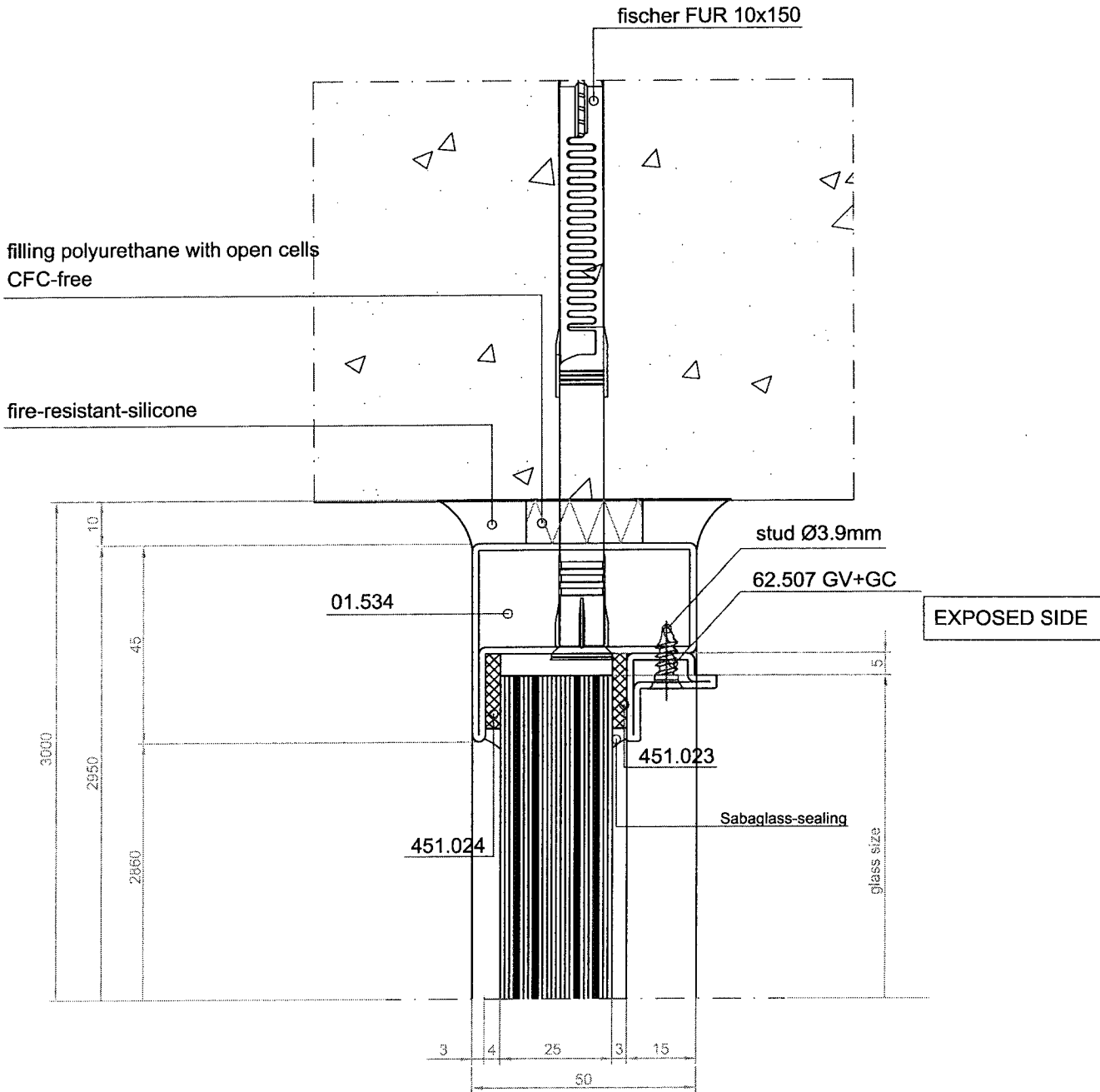
TNO Report : 2006-CVB-R0260/RMP

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| <b>JANSEN</b> | Drawing : n.v.t.         | Alteration 1 : 21-06-2006 |
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|               | Scale : n.v.t.           | Control :                 |
|               | Draughtsman : D.Leenheer | Seen :                    |

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Detail : 13

Project : Fire resistant performance Jansen Economy 50, Glass Glaverbel and Dorma integrated door closer, 60 min. brandwerend.

TNO Report : 2006-CVB-R0260/RMP

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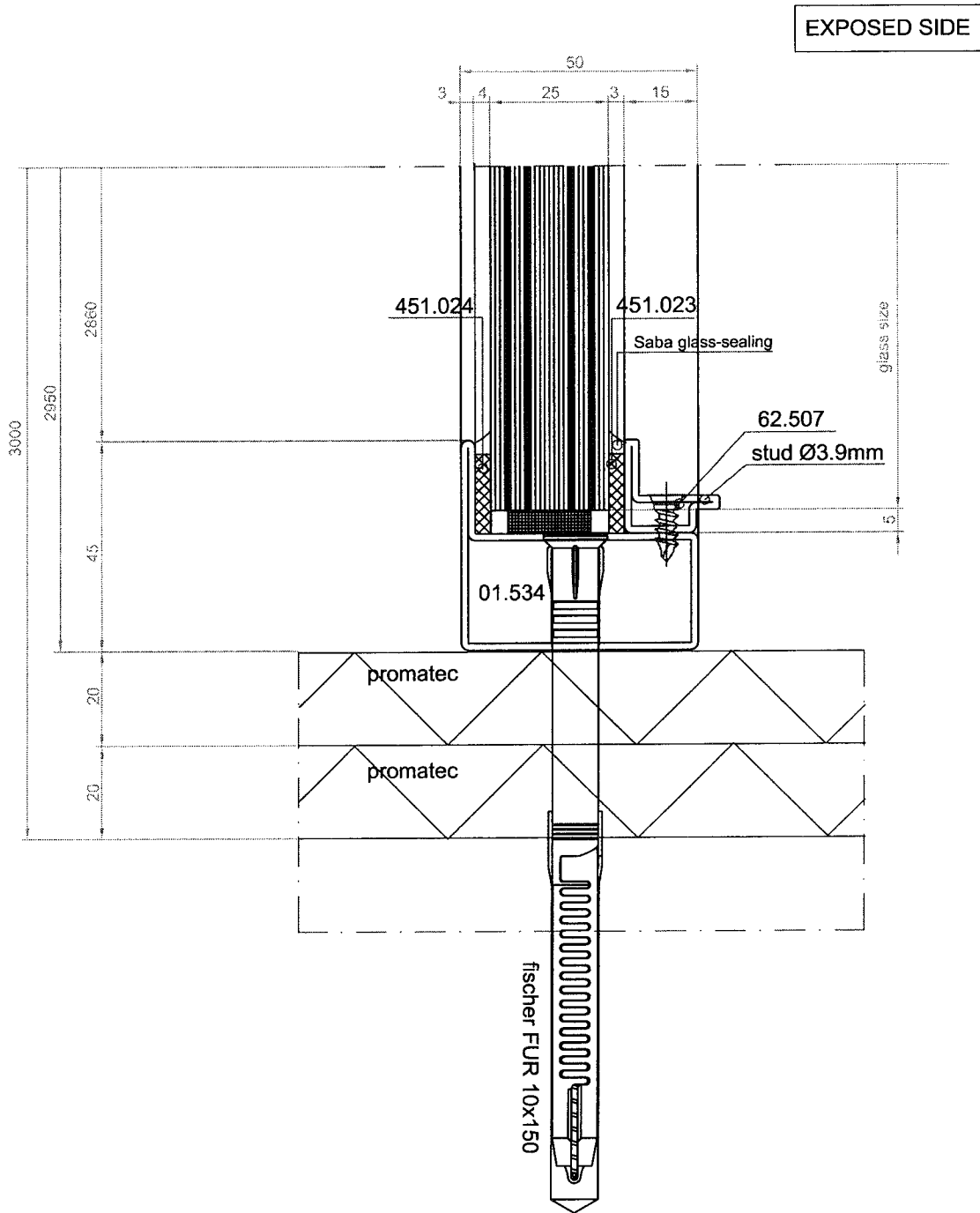
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| Date        | : 07-03-2006 | Alteration 2 | :            |
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| Draughtsman | : D.Leenheer | Seen         | :            |

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Detail : 14

Project : Fire resistant performance Jansen Economy 50, Glass Glaverbel and Dorma integrated door closer, 60 min. brandwerend.

TNO Report : 2006-CVB-R0260/RMP

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**JANSEN**

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| Date        | : 07-03-2006 | Alteration 2 | :            |
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| Draughtsman | : D.Leenheer | Seen         | :            |

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## A Observations

N = unexposed site  
 V = exposed site

| Time [min] |   | Observations   |
|------------|---|--|
| 0          |   | Start heating.   |
| 1:15       | V | Inner panes of the door leaf and the right pane are cracking.  |
| 2:00       | N | Smoke production between both door leaves.   |
| 2:20       | N | Small top window at the left is complete covered with foam.  |
| 3:00       | N | Small top window in the middle is complete covered with foam.  |
| 3:45       | N | Top of the access door is bending 15 mm away from the fire.  |
| 5:20       | N | All panes are complete covered with foam.  |
| 8:00       | N | Top of the access door is bending 25 mm away from the fire.  |
| 11:30      | N | Pieces of rubber between the door leaves are falling down.   |
| 25:00      | V | Roller of sliding arm is falling down inside the furnace.  |
| 28:00      | N | Pieces of glass come out of the outer pane of the left door leaf.  |
| 32:20      | N | Flames are longer visible than 10 seconds. Flames come from melting sealant between lowest horizontal profile and left vertical profile of the right pane. End of criterion " <i>Integrity based on sealing</i> ". |
| 60:00      | N | Flames are longer visible than 10 seconds. Flames come from melting sealant between the right pane and the right vertical profile.   |
| 62:00      | N | End of heating   |



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**Subject**

Assessment fire resistance glazed double door-/frame construction

**Date**

July 10, 2006

**Our reference**

2006-CVB-B0134/RMP/DNA

**E-mail**

Piet.Ram@tno.nl

**Direct dialling**

(015) 27 63283

**Direct fax**

(015) 27 63479

**Project number**

034.67819/01.01

Dear Mr. De Ruijter,

You have asked TNO Centre of Fire Research to assess the fire resistance of a glazed double door-/frame construction in a glazed supporting construction.

**Basic principle of TNO report 2006-CVB-R0260**

A double door-/frame construction in a glazed supporting construction was investigated at the laboratory of TNO Centre of Fire Research in Rijswijk, The Netherlands. Date of the investigation was March 23<sup>rd</sup>, 2006. The investigation was performed according to NEN-EN 1634-1: 2001.

**Test specimen**

General:

Double door-/frame construction assembled from Jansen Economy 50 steel profiles with Pyrobel EI60/25 glazing, thickness 25 mm. The door leaves were equipped with an integrated door-closing device, type Dorma ITS 96 EN 2-4 GSR.

Door leaves:

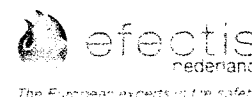
Dimensions of the door leaves: 2387 x 1074,5 mm (h x w).

Supporting construction:

A frame construction of Jansen Economy 50 steel profiles with Pyrobel EI60/25 glazing, thickness 25 mm. Dimensions of the construction: 2950 x 3679 mm (h x w).

In order to allow deflection, the supporting construction of the double door-/leaf construction was fixed to the concrete frame on only two sides, on top and bottom. The door leaves were opening away from the fire.

The Standard Conditions for Research Instructions given to TNO, as filed at the Registry of the District Court and the Chamber of Commerce in The Hague shall apply to all instructions given to TNO; the Standard Conditions will be sent on request.



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July 10, 2006

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### Test results:

After a heating time of 32 minutes flames were visible for longer than 10 seconds. criterion "integrity based on sealing" was reached.

After a heating time of 60 minutes flames were visible for longer than 10 seconds again. After 62 minutes the test was discontinued.

### Conclusion of the investigation was:

The fire test was constructed according to the European standard NEN-EN 1634-1:2001. The most important results are given in Table 1.

Table 1: Summarized results

| Criterion   | Time elapsed in minutes, calculated from the start of the test, which criterion was fulfilled according NEN 6069:2005 and NEN-EN 1634-1:2001. |                    |             |
|---|---|--------------------|-------------|
|   | NEN 6069:2005   | NEN-EN 1634-1:2001 | Remarks     |
| <b>Integrity (E)</b>  |   |                    |             |
| Cotton pad  | 62  | 62                 | Not reached |
| 6 mm caliber  | 62  | 62                 | Not reached |
| 25 mm caliber   | 62  | 62                 | Not reached |
| Sustained flaming   | 32  | 32                 | Reached     |
| <b>Thermal insulation with relation to the temperature*</b> |   |                    |             |
| Average rise  | *   | 62                 | Not reached |
| Maximum rise (EI <sub>1</sub> )                             | *   | 5                  | Reached     |
| Maximum rise (EI <sub>2</sub> )<br>(suppl. Procedure)       | *   | 22                 | Reached     |
| <b>Thermal insulation with relation to the radiation</b>    |   |                    |             |
| Radiation   | 62  | 62                 | Not reached |

Heating was stopped after 62 minutes.

\* = No criterion in The Netherlands

### Classification

A double door-/frame construction in a glazed supporting construction is classified according to the following combinations of performance parameters and classes as appropriate.

Fire resistance classification  
**E30 / EI<sub>20</sub> / EW30**



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## Proposals

The next options are proposed to the similar tested glazed door-/frame constructions in a glazed supporting construction in accordance with NEN 6069:2005 and/or prEN 15269-2:2005.

- a) To reach a fire resistance of 60 minutes when sealant are not used for glazing.
- b) The use of an integrated door-closing device in one door leaf.
- c) The use of another type of integrated door-closing device, type Dorma ITS 96 EN 3-6.
- d) The possibility of another layout of the door-/leaf construction with the supporting construction.

## Assessed proposals

### To reach a fire resistance of 60 minutes when sealant are not used for glazing

After a heating time of 32 minutes flames came from melting sealant out of the lowest horizontal steel profile. The flames were visible for longer than 10 seconds. Criterion "Integrity based on sealing" was reached while the test was continued.

After 60 minutes flames were visible for longer than 10 seconds again. Flames came from melting sealant again between the right pane and the right vertical steel profile of the supporting construction. The test was discontinued after 62 minutes.

Shown the test the glazed door-/frame construction with the glazed supporting construction was assembled without sealant but with door weather-strips, type Jansen 455.036 and 455.037/038, there were no flames visible after 32 minutes heating time. The door weather-strips were fixed inside the access door leaf, during the same test.

If the glazed door-/frame construction with the glazed supporting construction will be assembled only with door weather-strips, type Jansen 455.036 and 455.037/038, the fire resistance of the construction, as described in TNO report 2006-CVB-R0260 – in the sense of NEN 6069:2005 – will be **60 minutes**.

### The use of an integrated door-closing device in one door leaf

After a heating time of 62 minutes the integrated door-closing device was in position without deformation or any deflection.

If the door-closing device, type Dorma ITS 96 EN 2-4, is assembled in a single door-/frame construction build up from Jansen Economy 50 steel profiles, as described in TNO report 2006-CVB-R0260, the fire resistance – in the sense of NEN 6069:2005 – will be **60 minutes**.

### The use of another type integrated door-closing device. type Dorma ITS 96 EN 3-6

After a heating time of 62 minutes the integrated door-closing device was in position without deformation or any deflection.

The dimensions of the proposed integrated door-closing device are marginal increased, maximum 10 mm in width, length and height (see drawings).

If the integrated door-closing device, type Dorma ITS 96 EN 3-6 (GSR), is assembled in a double- or single door-/frame construction build up from Jansen Economy 50 steel



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profiles, as described in TNO report 2006-CVB-R0260, the fire resistance – in the sense of NEN 6069:2005 – will be **60 minutes**.

The possibility of another layout of the door-/frame construction with the supporting construction

According Construction Parameter A.1.1. of prEN 15269-2:2005 it is allowed to extend the double door-/frame construction to one single leaf if the absolute deflection at any of the measuring points on the leading edge of the active leaf is not greater than 25% of the thickness of the door leaf.

During the fire resistance test the deflection was more than 25 %, that means that it is not allowed – in the sense of NEN 6069:2005 - to extend the construction, as described in TNO report 2006-CVB-R0260, to one single leaf.

According Construction Parameter E.1.1 of prEN 15269-2:2005 it is allowed to extend the construction to another layout if the construction was tested as described in TNO report 2006-CVB-R0260. Annex 1 will give the possible arrangements.

Based on the modifications the fire resistance of the glazed double door-/frame construction in a glazed supporting construction, as described in TNO report 2006-CVB-R0260 – in the sense of NEN 6069:2005 – will be **60 minutes**.

The above-mentioned assessment is under the next condition valid:

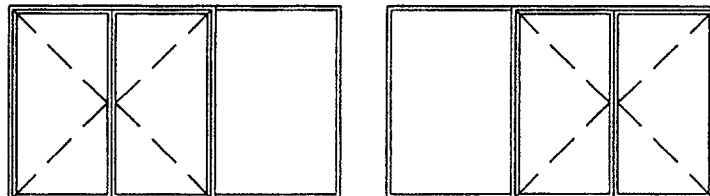
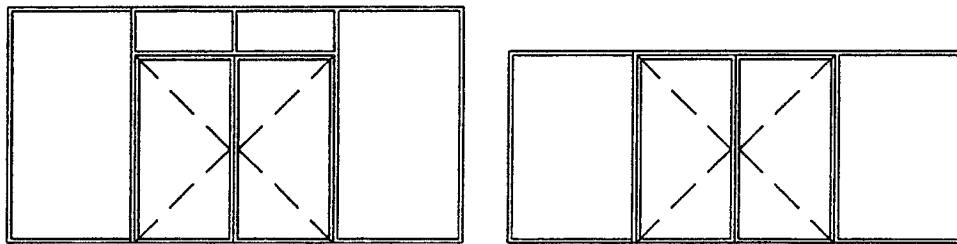
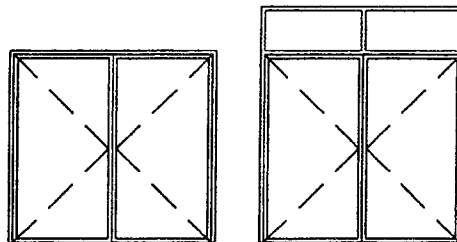
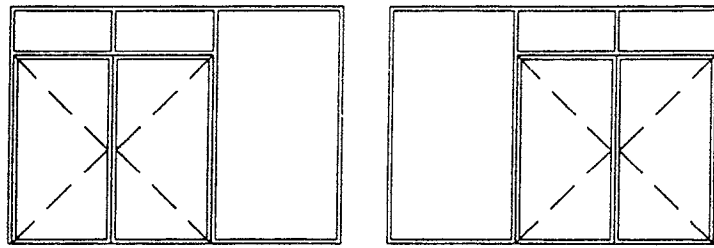
A glazed double door-/frame construction in a glazed supporting construction as described in TNO report 2006-CVB-R0260, with exception to the assessed modifications, the field of direct application should be valid as described in TNO report 2006-CVB-R0260.

Yours faithfully,

P.A. Ram

Dr. Ir. G. van den Berg

Centre for Fire Research



Annex : 01

Project : Fire resistant performance Jansen Economy 50, Glass Glaverbel and Dorma integrated door closer, 60 min. brandwerend.

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