

Zulassungsunterlagen

T60-1-40

Feuerschutz-Türelement

Niederlande

1-flügeliges feuerbeständiges Türelement

Prüfzeugnis-Nummer

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TNO Building and
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**Determination of the fire resistance
according to NEN 6069:1997 of a Westag
T60-1-WST door assembly with a single
action hinged door leaf**

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1 CONSTRUCTIONS UNDER INVESTIGATION

Single action Westag T60-1-WST door assembly (timber door leaf in steel doorframe).

2 INVESTIGATION

Determination of the fire resistance according to the Dutch standard NEN 6069:1997, for

- A) door opening towards fire;
- B) door opening away from fire.

3 SPONSOR

Westag & Getalit AG
P.O. Box 2629
D-33375 Rheda-Wiedenbrück
Germany.

4 DATE AND LOCATION OF THE FIRE TEST

The fire test has been performed on 2nd December 1999 at the laboratory of the Centre for Fire Research of TNO Building and Construction Research in Rijswijk, the Netherlands.

5 DATE AND NUMBER OF THE TEST REPORT

Februari 2000; 2000-CVB-R00333

6 TEST CONSTRUCTION

6.1 General

Two single action Westag T60-1-WST timber doors in a steel doorframe, one with leaf opening towards the fire (test specimen A) and one away from the fire (test specimen B). The constructions were mounted in a wall, the so-called supporting construction.

6.2 Door leaf

6.2.1 General (figure 1)

Dimensions of the door leafs :

- Height : 2109 mm
- Width : 1111 mm
- Thickness : 43.3 mm

6.2.2 Framework of the door leaf (figures 2,3 and 4)

- Horizontal and vertical members of hardwood type Framire.
- Between the framework and the doorfilling (ref. to 6.2.3) a strip of intumescent material type "Palusol 100" with aluminium backing" was incorporated. The dimensions of the strips were width 26 mm, thickness 2 mm.

6.2.3 Filling

- Particle board type B1, manufactured by Spano.

6.2.4 Top layer

- On both sides of the door leaf a layer of HPL type "Getalit", thickness 0,6 mm.

6.3 Door hardware

Hinges:

- Type : Simons VX 7729/100
- C.t.c. distances from bottom of doorleaf : 435 and 1870 mm
- Fixing method to doorleaf : Spax screws 5 x 50 mm
- Fixing method to doorframe : element VX 7611 3D

Lock:

- Type : Kima 1306 nach DIN 18250
- Fixings : Spax screws 5 x 50 mm

Door handles:

- Type : Hoppe FS 138 F

Door closing mechanism

- Type : Geze TS 4000

6.4 Door frame

6.4.1 General

The free space between the door frame and the supporting construction (ref. to 6.5) was completely filled with a sand-cement mortar.

6.4.2 Steel profiles of the frame

- Two steel jambs with mitre ends, steelthickness 1.5 mm;
- Transom with mitre ends manufactured from the same profile as the jambs.

For the connection to the support construction steel anchors welded to the door frame were incorporated.

6.4.3 Seal

- Plastic seal type "K2550", PVC material, placed in a special groove in the doorframe, as shown in the figures 3 and 4.

6.5 Supporting construction

Test frame:

Steel with a concrete lining, internal dimensions 4000 x 3000 mm (b x h)

Wall in test frame:

- material : aerated concrete blocks (manufacture Hebel)
- thickness : 150 mm
- apertures in the wall : 1160 x 2180 mm (b x h)
- conditioning : 7 days at $20 \pm 5^\circ\text{C}$ and 50 % RH

At the test date the equilibrium moisture content in the wall was achieved.

7 INSTALLATION OF THE TEST SPECIMEN

The door frames were placed in the apertures and backfilled with the sand-cement mortar. After one week the door leafs were mounted in the frames.

8 SAMPLING AND PREPARATION OF THE TEST SPECIMEN

Centre for Fire Research TNO : - support construction
- mounting the door frames and backfilling them with the sand-cement mortar.

Westag & Getalit AG : - mounting of the door leafs in the door frames

9 METHOD OF INVESTIGATION

9.1 Examination of the test specimens

During preparation of the test specimens the materials and components used were checked against drawings and data supplied by the sponsor.

9.2 Conditioning

From the time of the erection of the supporting construction until the test date the test specimen was placed in the laboratory of the Centre for Fire Research with ambient conditions ($20 \pm 5^\circ\text{C}$ and $(50 \pm 10)\%$ relative humidity).

9.3 Determination of the density and equilibrium moisture contents ¹.

Aerated concrete

- density : 645 kg/m³
- moisture content : 4.1 % (m/m)

Sand-cement mortar

- density : 1887 kg/m³
- moisture content : 5.2 % (m/m)

Particle board (filling of doorleaf)

- density : 784 kg/m³
- moisture content : 8.2 % (m/m)

Framire hardwood (frame of doorleaf)

- density : 778 kg/m³
- moisture content : 9.4 % (m/m)

9.4 Fire test

9.4.1 Conditions

The test was carried out according to the Dutch standard, NEN 6069:1997.

9.4.2 Measurements

The following measurements were taken:

Before heating

~~The gaps between the door leaf and the door frame. The results are given in annex A.~~

During heating

- the gas temperatures in the furnace were measured with 8 thermocouples equally divided over the exposed surface of the test construction;
- the furnace overpressure;
- the surface temperatures of the unexposed side of the door leafs;
- the surface temperatures of the unexposed sides of the door frames;
- the radiation at 1 meter distance from the center of each door assembly;
- the ambient temperature and air velocity in the laboratory.

The positions of the thermocouples are given in figure 5

10 OBSERVATIONS DURING HEATING

¹) Both determined after conditioning at 20 °C and 50 % RV. For the determination of the moisture content the sample has been dried at 105 °C for 24 hours.

For a detailed description of the observations see annex B.

11 RESULTS OF THE FIRE TEST.

The results are given in the figures 6 up to 14.

12 MAIN TEST RESULTS

Table 1

Performance criterion	Failure time in minutes	
	Specimen A (door leaf opening towards the fire)	Specimen B (door leaf opening away from the fire)
a) Integrity	64	65
b) Radiation	> 65	> 65

13 CONCLUSION

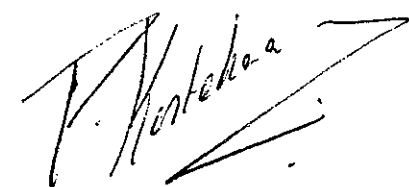
Fire resistance with respect to the separating function of the door assembly, determined according to NEN 6069:1997:

- Door leaf opening towards the fire : **64 minutes**
- Door leaf opening away from the fire : **65 minutes**

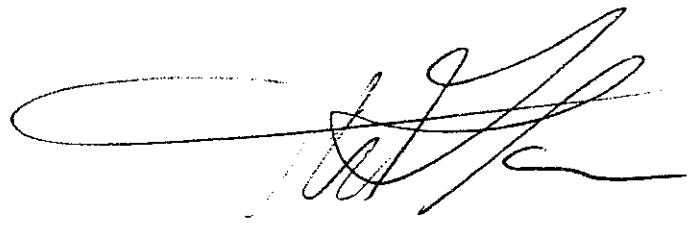
14 FIELD OF DIRECT APPLICATION

~~The conclusion is only valid for door assemblies identical, including materials, door hardware etc and with:~~

- The doorframe is mounted as described in a wall of stonelike material with a density of at least 620 kg/m³ and a thickness of at least 150 mm
- Maximum gap widths equal to or less than those specified in annex A, with a tolerance of +1 mm.
- The door leaf consist of a filling with a density of at least 784 kg/m³ surrounded along the sides by a timber frame with a density of at least 778 kg/m³
- Maximum dimensions of the door leaf 1111 x 2109 mm (w x h), minimum thickness 43.3 mm.



P.W.M. Kortekaas



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PARTS LIST

- 1) Lock, type Kima 1306, manufactured by Kima;
 - 2) Door handles, type FS 138 F, manufactured by Hoppe;
 - 3) Hinges, type VX 7729/100, manufactured by Simonswerk;
 - 4) Element for fixing hinges to doorframe, type VX 7611, manufactured by Simonswerk;
 - 5) Door closing mechanism, type TS 4000, manufactured by GEZE;
 - 6) B1, particle board, manufactured by Spano;
 - 7) "Getalit" HPL board, thickness 0.6 mm, manufactured by Westag & Getalit AG
 - 8) Hardwood for edges of doorleaf, type Framire;
 - 9) Intumescent strip, type Palusol 100 with aluminium backing, manufactured by BASF AG;
 - 10) Doorframe, steel, thickness 1.5 mm, manufactured by Westag & Getalit AG;
 - 11) Seal, type K2674, material PVC, manufactured by Stark-Profile GmbH.
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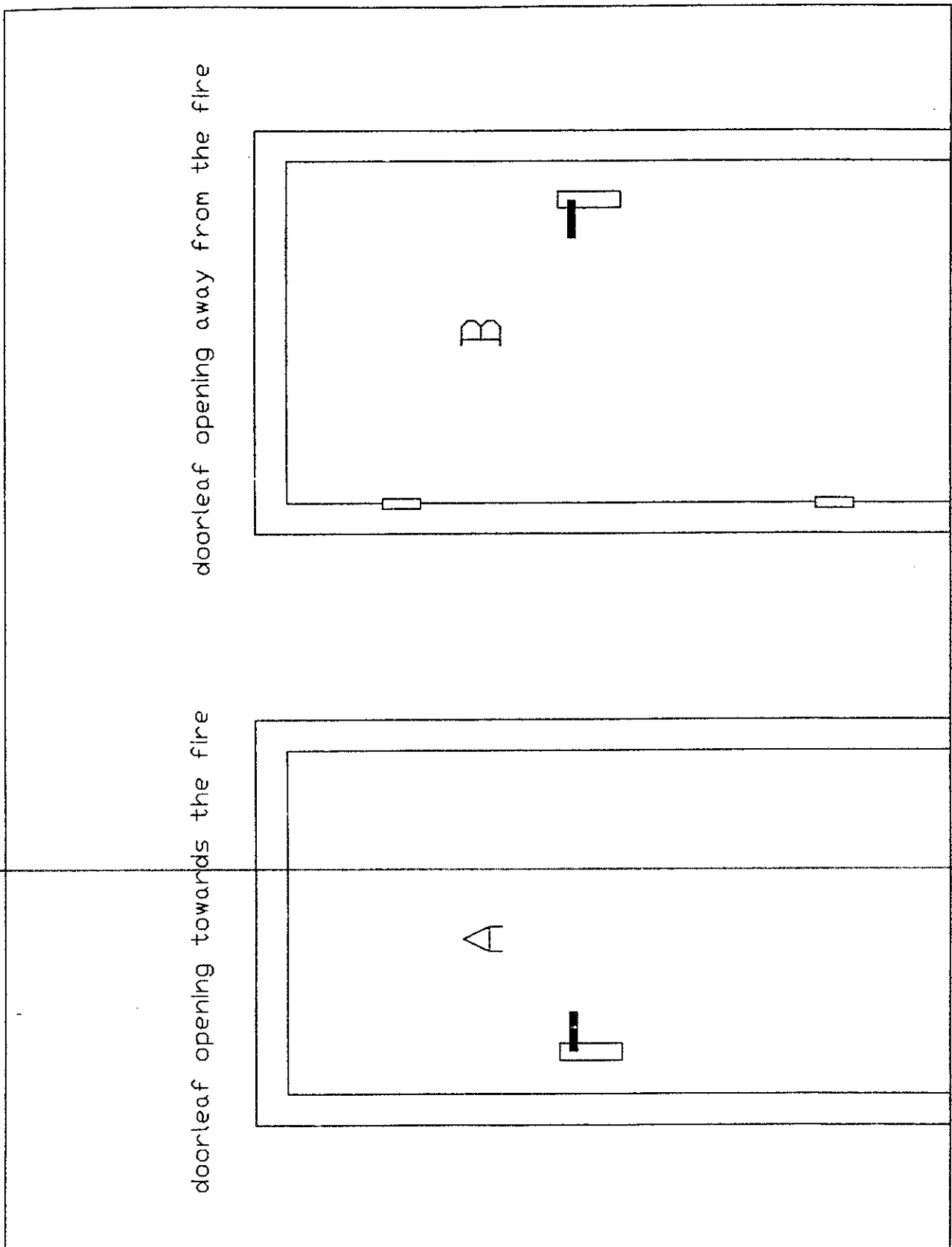
LIST OF FIGURES

- 1) Door assemblies (test specimens) in supporting construction;
- 2) Overview of the door assembly;
- 3) Vertical cross-section of a door leaf;
- 4) Horizontal cross-section of a door leaf;
- 5) Positions of the unexposed face thermocouples (Tk 1 up to Tk30);
- 6) Gas temperatures in the furnace;
- 7) Overpressure in the furnace
- 8) Surface temperatures of the unexposed face of the leaf of test specimen A;
- 9) Surface temperatures of the unexposed face of the leaf of test specimen A ;
- 10) Surface temperatures of the unexposed face of the frame of test specimen A;
- 11) Surface temperatures of the unexposed face of the leaf of test specimen B;
- 12) Surface temperatures of the unexposed face of the leaf of test specimen B;
- 13) Surface temperatures of the unexposed face of the frame of test specimen B;
- 14) Radiation measured at 1 meter distance from the center of the doorleaf.

PHOTOS

Photo 1 : View of the test specimen before the test;

Photo 2 : View of the test specimen at the moment the test was stopped.

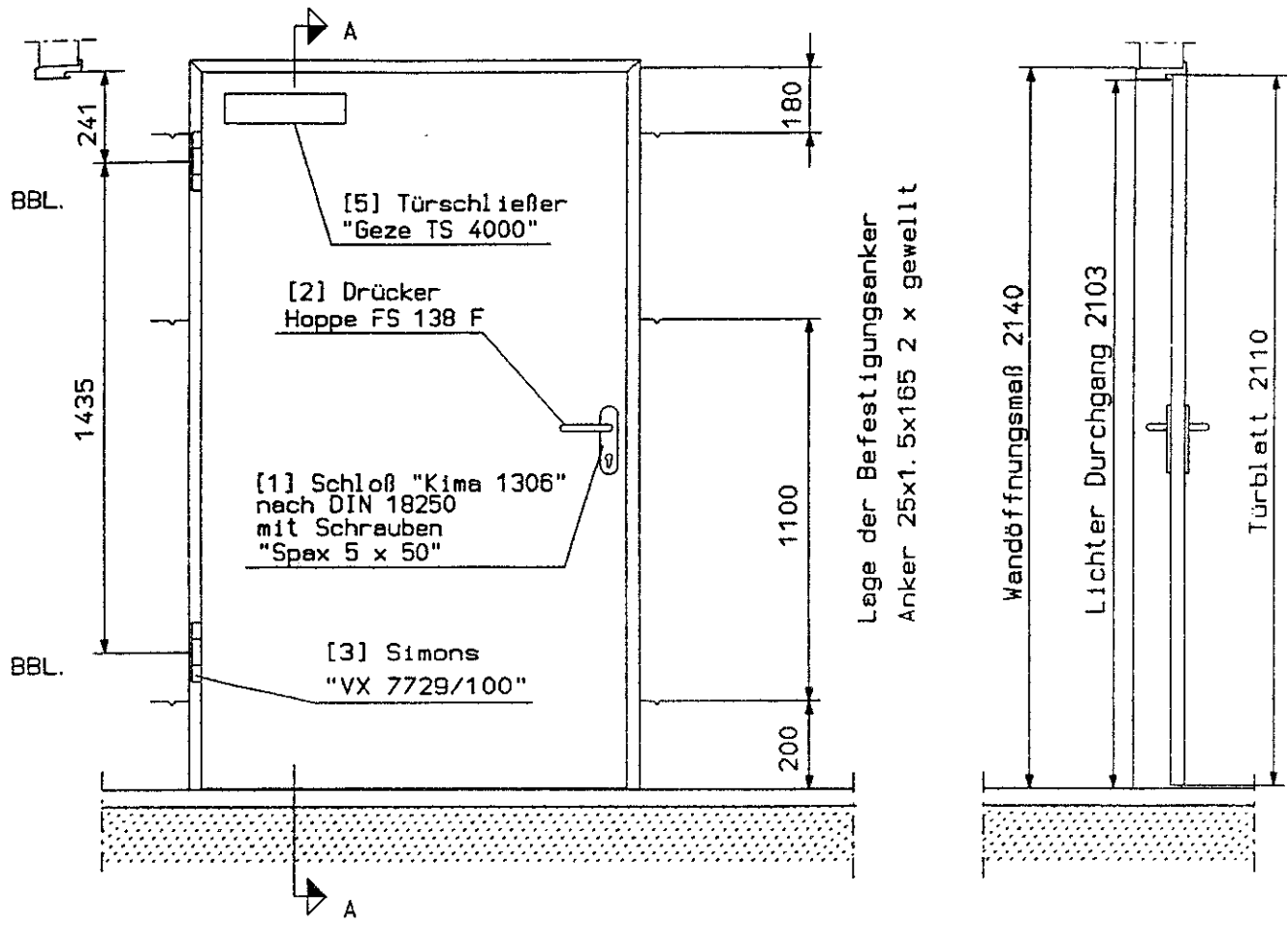


doorleaf opening towards the fire

doorleaf opening away from the fire

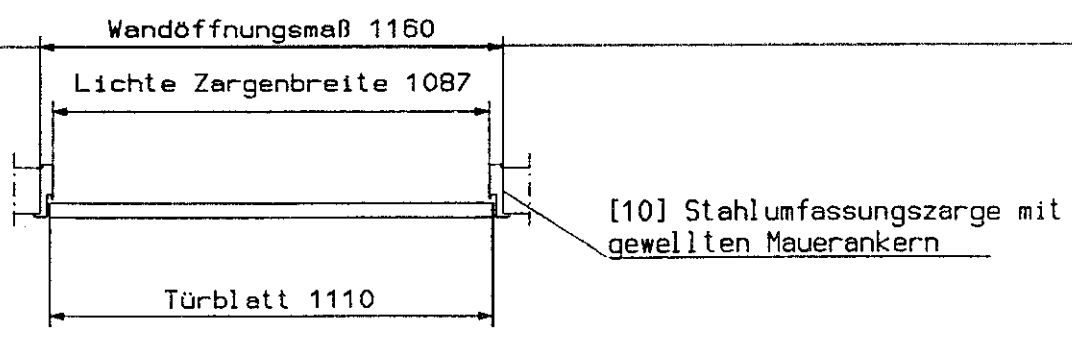
View of the unexposed side

Figuur 1




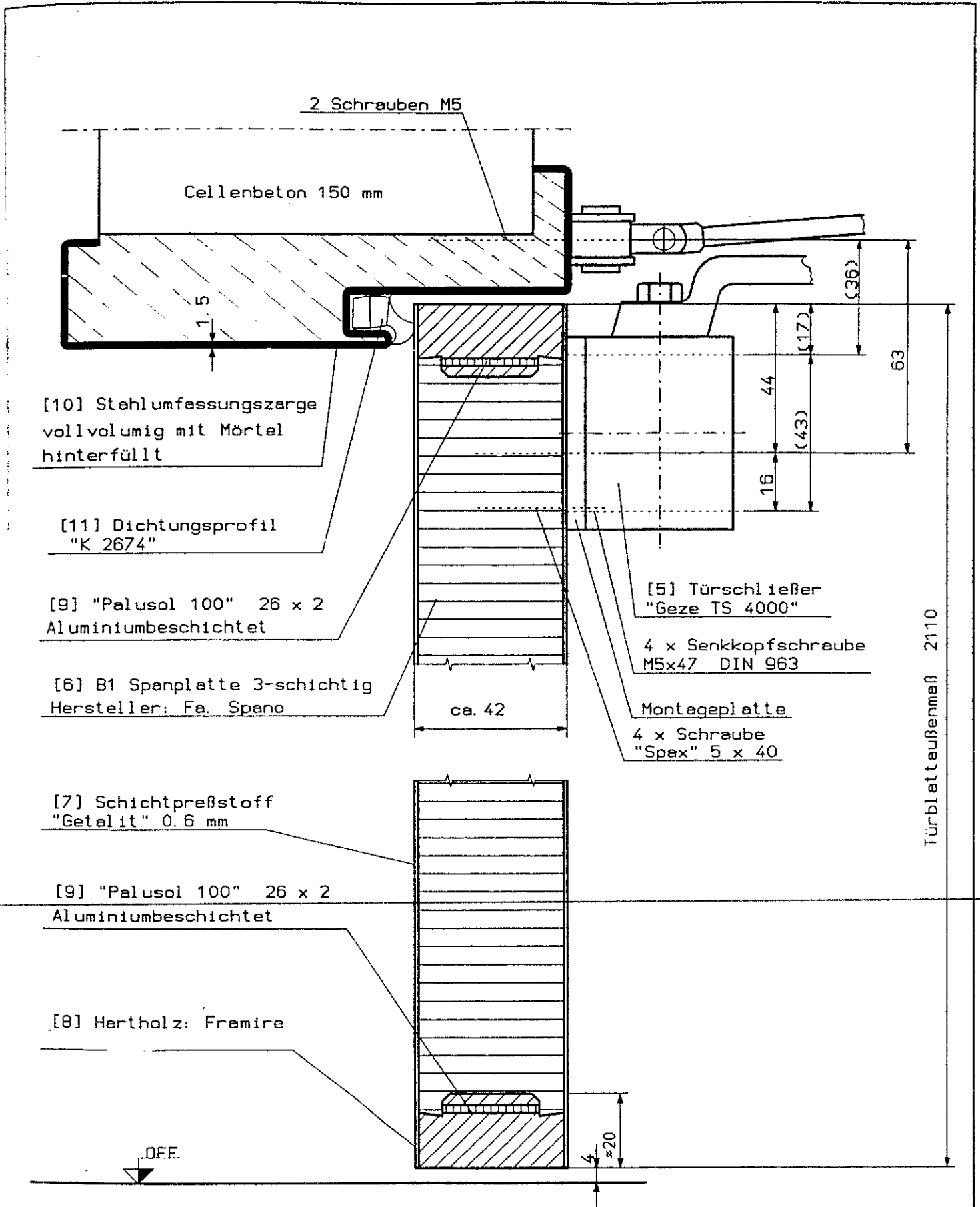
Lage der Befestigungsanker
Anker 25x1.5x165 2 x gewellt

Wandöffnungsmaß 2140
Lichter Durchgang 2103
Türblatt 2110



Maße in mm

T60 - 1 - Tür "WST" Übersicht Türblatt in Stahlzarge	 Westag & Getalit AG	Anlage 1 zum Prüfzeugnis Nr. vom:
	Türen + Zargen	
	Rheda-Wiedenbrück	



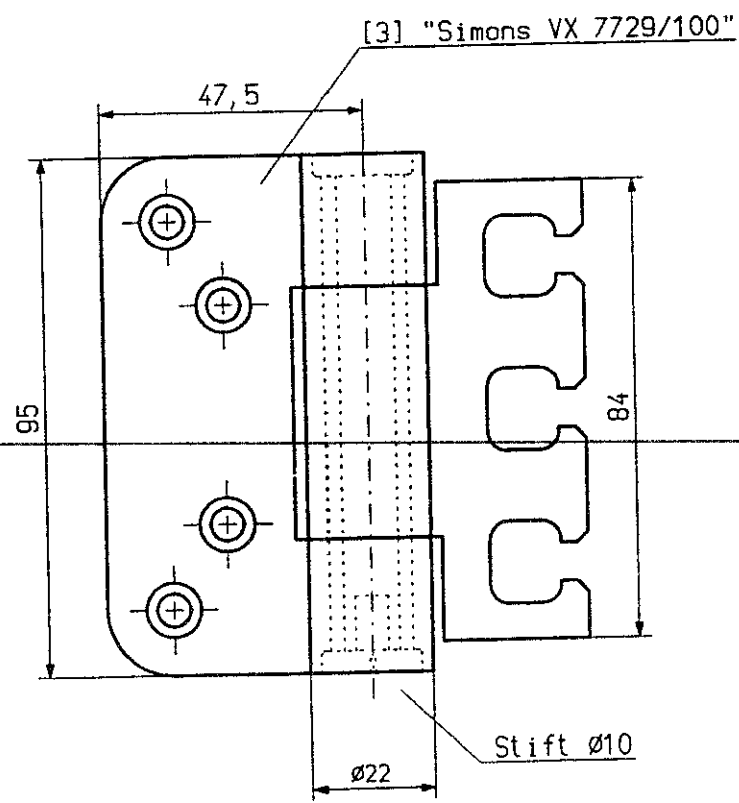
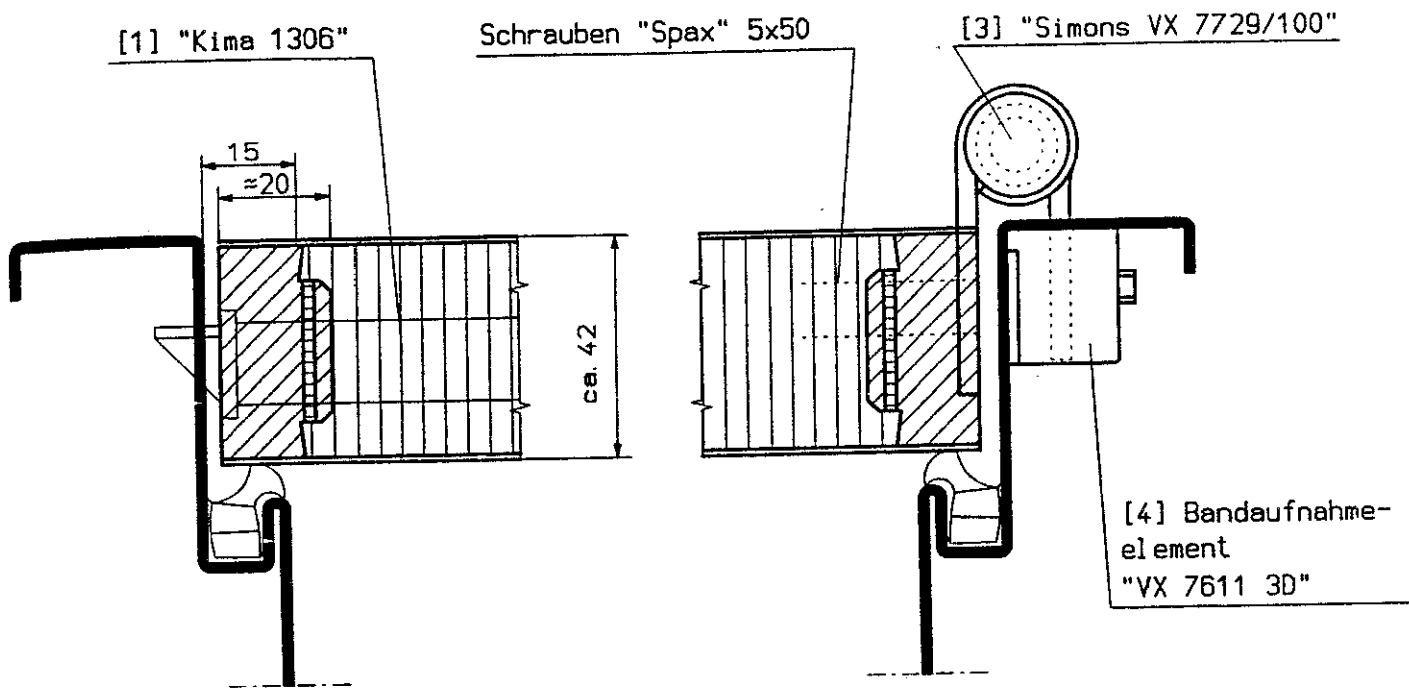
Maße in mm

T60 - 1 - Tür "WST"

Vertilalschnitt
Türblatt in Stahlzarge

Westag & Getalit AG
Türen + Zargen
Rheda-Wiedenbrück

Anlage 2
zum Prüfzeugnis
Nr.
VOM:



Maße in mm

T60 - 1 -Tür "WST"

Horizontalschnitt, Tür in Stahlzarge
Band "Simons" VX 7729/100

	Westag & Getalit AG
	Türen + Zargen
	Rheda-Wiedenbrück

Anlage 3
zum Prüfzeugnis
Nr.
vom: