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Test report

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DMT-DO-52-317

Document no.	DMT-DO-52-317
Case worker	Kanjahn
Order no.	8115912708
Customer	Staalkozijn Nederland BV Postbus 8 7100 AA Winterswijk The Netherlands on behalf of Van Vuuren Grou B.V., 9001 ZE Grou Alprokon Aluminium, 2993 LJ Barendrecht
Content of order	Test of a double-leave wooden composite door in steel wrap around frame with a thickness of 54 mm, with designation „**15-ZBsd (54/UA) / PICO60-54 / 700-54**“ with an open clearance (W x H) of 2444 mm x 2493 mm, with side panel and top panel, embedded to a standard supporting construction as a lightweight construction with a thickness of 75 mm, for a smoke control test
Test method	EN 1634-3:2004 Further standards according to section 3.1

Test results	Maximum leakage rate S_a	Maximum leakage rate S_{200}
	1,44 m³/h/m	22,08 m³/h

Date of order	**Test specimen receipt**	**Date of test**	**Date of report**	**Period of validity**
14.06.2018	11.10.2018	17.10.2018	27.08.2020	unlimited

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egolf member

Notified Body:
NB 2509

DMT-Prüfstelle für Brandschutz DMT

This test report consists of 23 pages and 28 annexes.

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1 Size of order and cooperation of the test lab in choosing the test specimen

DMT GmbH & Co. KG was assigned by Staalkozijn Nederland BV as also on behalf of Van Vuuren Grou B.V. and Alprokon AluminiumStaalkozijn Nederland BV to carry out a smoke control test in accordance to EN 1634-3.

The design and construction of the test specimen was defined by Staalkozijn Nederland BV, Van Vuuren Grou B.V., Alprokon Aluminium and DMT GmbH & Co. KG.

2 Description of the test specimen

2.1 Test specimen receipt and mounting

The test specimen storage was done in a temperature-controlled, non-air-conditioned test laboratory of DMT GmbH & Co. KG . The temperature during this time was between 15 °C and 25 °C, the relative humidity between 40 % and 60 %.

Test specimen receipt:	11.10.2018

Qualified employees of the sponsor mounted the test specimen to the supporting construction. The test specimen was delivered in separate parts as the door leaves, the frame, side an top panel and the building hardware, and assembled in the test laboratory of DMT GmbH & Co. KG. An assembly instruction was not presented.

Mounting of the test specimen:	15. and 16.10.2018

2.2 Test specimen description

(all dimensions stated in mm)

Test specimen		
Module:	Hinged and pivoted door, double-leaved, wooden composite door with side glazing and flush top over panel	
Manufacturers designation:	Frame: Door leaf: Meeting edge profile:	15-ZBsd (54/UA) PICO60-54 700-54
Manufacturer:	Frame: Door leaf: Meeting edge profile:	Staalkozijn Nederland BV Van Vuuren Grou B.V. Alprokon Aluminium

Mounting:	
Fastening (entire construction):	
- Type and dimensions:	Weld-on anchor, welded to the frame profile with two spot-welding each, each anchor screwed with 1 piece of self-drilling hexagon screw 6,3 x 25. The anchors were partly backfilled with plastic spacer (see annexes 1.1, 1.3 and 1.4)
- Number:	23 pieces in total, each 8 pieces vertical, 5 pieces at the top and 2 pieces at the bottom
- Distance between fixings	See annex 1.1
- Filling of joints:	The frame was sealed permanently elastic with silicone on the closing and opening side running around four sides to the supporting construction
Frame:	See annexes 1.1 to 1.4
- Design, type:	2-part steel frame, single rebate. Outside frame profile at the top and lateral, type 15-ZBsd (54/UA), at the bottom at the side glazing, type 15-KBsd (54-OD), transom profile at the hinges side of inactive leaf and the side glazing, type 15-KEsd (54). The two parts of the outside frame, tansom and mullion profiles were connected in the grove of the gaskets with self-drilling hexagon screw PZ2 4,2 x 22 with max. 800 mm between, see annexes 1.02.1 to 1.02.5
- Manufacturer:	Staalkozijn Nederland BV
- Material:	Steel profiles, profile thickness 1,5
- Surface treatment:	Powder coated
- Threshold / bottom cross part:	Without
- Corner connections:	In the corners pushed-to-mitre and at the t-connection butttjoined, spot-welded and smoothed
- External frame dimensions (W x H):	4079 x 3831
- Frame rebate dimensions (W x H):	2504 / 4009 x 3796
- Clearance of opening (W x H):	2444 x 2493
- Frame shape dimensions (width front / back x depth):	15-ZBsd (54/UA): 35 / 50 x 105 15-KEsd (54): 35 / 65 x 101 15-KBsd (54-OD): 35 / 65 x 105

- Dimension of frame rebate (W x D):	15-ZBsd (54/UA): 15 x 61 15-KEsd (54): 15 x 61 15-KBsd (54-OD): 15 x 59
Backfilling of frame:	Without
Side glazing:	
- Frame:	See description of frame
- Clearance of opening (W x H):	1470 x 3731
- Filling:	See annexes 1.1 to 1.4
- Glazing type:	“type ESG” / t = 6
- Glazing dimension:	1485 x 3746
- Glazing beads:	Closing side: via frame resp. transom profile Opening side: Via aluminium glazing beads type 31, dimensions 15 x 12, t = 1,0, clicked on self-drilling (Ø3 mm) clamp-screw 3.9 x 10 mm, head Ø 5.5-6.5 with PH2 shaped cavity, distance between > 185 < 400, see annex 1.2.5. The glass panel was positioned on two hardwood glazing support blocks 80 x 15 x 5-7, position see annex 1.2.5
- Glazing gaskets:	Closing and opening side: Each glazing running around four side TPE glazing seal type, AADC 8029, 17 x 6, for gaps of 3-4 mm on each side of the pane, manufacturer BOS GmbH Best Of Steel. See annexes 1.2.2 to 1.2.5 and 1.13
Door leaf:	See annexes 1.1 and 1.5 to 1.7
Type:	“PICO60-54”
- Thickness:	54
- Material:	Wood, wooden composite
- Inlay / core material:	Mineral fibre board “BB200”, thickness 44, density approx. 260 kg/m³, manufacturer Thermal Ceramics de France SAS, max. gap between frame and inlay 1, non divided (see annex 1.5). Glued at both sides with the face plate with 90 g/m² D3 glue “NovaCol D3”, manufacturer Frencken
- Frame / stiffening elements:	One piece lateral top and bottom made of hardwood “Meranti”, density > 550 kg/m³, manufacturer WWP Woodproducts BV, dimensions lateral 44 x 35, dimensions top and bottom 44 x 65. Frame loosely arranged. Glued at both sides with the face plate with 90 g/m² D3 glue “NovaCol D3”, manufacturer Frencken

- Facing:	HDF (thickness 4,0), density approx. 860 kg/m³, manufacturer Homanit GmbH. Glued at both sides with the inlay and frame with 90 g/m² D3 glue “NovaCol D3”, manufacturer Frencken
- Decorative / protective finish:	HPL, thickness 0,8, density approx. 1350 kg/m², glued with the face plate with 90 g/m² D3 glue “NovaCol D3”, manufacturer Frencken
- Rebate geometry:	Unrebated, towards the flush over panel single rebated, at the lock side at each leaf an aluminium meeting edge profile
- Outside dimensions (W x H):	Active leaf: 1230 x 2500 Inactive leaf: 1230 x 2500
- Rebate dimensions (W x D):	Towards the flush over panel 15 x 15, at the lock side at each leaf an aluminium meeting edge profile were placed, see annexes 1.6 and 1.7
- Meeting edge profile:	See annex 1.8
- Design, type:	meeting edge profile / 700-54
- Manufacturer:	Alprokon Aluminium
- Material:	Aluminium
- Dimensions (W x H):	Active leaf: 40 x 60,5 Inactive leaf: 40 x 60,5 (see annexes 1.7 and 1.9)
- Mounting position:	Each leaf lateral at the middle gap over the whole height of the leaf. Fixed with each 9 pieces of chipboard screw 4,0 x 40, distance see annex 1.8. The areas of the face plate, strike plate, locks and the drop seal were milled out, dimensions and positions see annexes 1.7 to 1.9. For the top and bottom locking of the inactive leaf a cut out in the door leaf frame of 18 x 21 was made over the whole length
- Rubber seal:	Profile no. S6069, material TPE 60/93, manufacturer Deventer Profil GmbH, slid in the groove of the profile over the whole height of the door at the active leaf on the opening side, at the inactive leaf at the closing side. Additional at both sides a self adhesive “Noise reduction seal”, type “Vitoseal 100 PVC” of manufacturer “Vito Imen GmbH & Co.KG, was glued in the groove of the profile over the whole height of the door at the active leaf on the opening side, at the inactive leaf at the closing side. (see annex 1.7)
- Weight of door leaf:	Active leaf: 73 kg Inactive leaf: 72,5 kg
Flush over panel:	See annexes 1.1 and 1.5 to 1.7
Type:	“PICO60-54”
- Thickness:	54

- Material:	Wood, wooden composite
- Inlay / core material:	Mineral fibre board “BB200”, thickness 44, density approx. 260 kg/m³, manufacturer Thermal Ceramics de France SAS, max. gap between frame and inlay 1, non divided (see annex 1.5). Glued at both sides with the face plate with 90 g/m² D3 glue “NovaCol D3”, manufacturer Frencken
- Frame / stiffening elements:	One piece lateral top and bottom made of hardwood “Meranti”, density > 550 kg/m³, manufacturer WWP Woodproducts BV, dimensions laterally 44 x 35, dimensions top and bottom 44 x 65. Frame loosely arranged. Glued at both sides with the face plate with 90 g/m² D3 glue “NovaCol D3”, manufacturer Frencken
- Facing:	HDF (thickness 4,0), density approx. 860 kg/m³, manufacturer Homanit GmbH. Glued at both sides with the inlay and frame with 90 g/m² D3 glue “NovaCol D3”, manufacturer Frencken
- Decorative / protective finish:	HPL, thickness 0,8, density approx. 1350 kg/m², glued with the face plate with 90 g/m² D3 Glue “NovaCol D3”, manufacturer Frencken
- Rebate geometry:	Lateral and top unrebated, bottom single rebated
- Outside dimensions (W x H):	2469 x 1300
- Rebate dimensions (W x D):	43,6 x 15
- Weight:	65,3 kg
- Fixing:	Transwersal an lateral with continues weld-on angle 28 x 15 x 2. Each side 40 mm gap to the rebate and 20 mm interruption at the anchors. 3 interruption transversal and 2 at the left side. A continuous groove of 15 x 3 were milled lateral and top into the flush over panel. Position see annex 1.15. In the bottom edges of the flush over panel the panel was fixed each side with one “PANEL PROVISION UNIT” made of steel with the dimension of 80/90 x 13 5 / Ø 6 / 5 witch was locked into the hole of the frame / transom profile. The “PANEL PROVISION UNIT” was installed concealed inside the bottom frame profile of the plate and fixed with each 3 pieces of chipboard screws Ø 5,0 x 45, see Annex 1.15
Foaming seal or media:	Without
Hinges:	See annexes 1.1, 1.10 and 1.11
- Manufacturer’s designation:	3 D Hinge / „BSW 060-3/160”
- Manufacturer:	Breuer und Schmitz GmbH & Co.KG
- Fixing:	Door leaf: with 5 pieces of countersunk screws 4,5 x 45, mounted in a 4 mm cut out of the door leaf.

	Frame: The frame part is set into hinge pocket and fixed with 4 hexagon bolts M6 x 12 of the hinge pocket
- Dimensions of hinge:	160 x 45, t = 3 / Ø 20
- Number per door leaf:	3
Hinge pocket:	See annexes 1.1, 1.10 and 1.11
- Manufacturer's designation:	Hinge pocket / "BVN 11160"
- Manufacturer:	Staalkozijn Nederland BV / BOS GmbH Best Of Steel
- Fixings:	Spot-welded to the frame at 4 points
- Number per hinge:	1
- Hinges reference line:	241 / 591 / 2176 measured from top rebate corner, see annex 1.1 One additional, not active hinge pocket was installed in middle height of the door leaf
Safety bolts:	Without
Sealing system:	
Floor seal:	See annexes 1.6, 1.8 and 1.18
- Number:	One in each leaf
- Name / Material:	Automatic drop seal / EllenMatic Soundproof
- Manufacturer's designation:	Elton BV
- Dimensions (W x H):	15 x 30
- Mounting position:	Slid in the bottom groove of 15 x 30, fixed by two enclosed angles and two pieces of chip board screws ø 3,5 x 25
Frame seal:	See annexes 1.2, 1.3 and 1.13
- Name / Material:	AADC0038 / ATPK 4, art. no. 6405
- Manufacturer's designation:	BOS GmbH Best Of Steel
- Mounting position:	Jammed into rebate groove laterally at the door opening and the flush over panel and top transversal at the flush over panel, in the upper corners pushed-to-mitre
Leaf seal:	See annexes 1.6 and 1.13
- Name / Material:	S 6513 / TPE 05.60 Shore 60
- Manufacturer's designation:	Deventer Profil GmbH
- Mounting position:	Jammed into groove, 8 x 4, transversal at the flush over panel

Meeting edge profile:	See description “Meeting edge profile”
Locking / lock / lock plate:	
Lock of active leaf:	See annexes 1.1, 1.7, 1.9 and 1.14
- Manufacturer’s designation:	Mortise lock „SAG 17465”
- Manufacturer:	Schulte-Schlagbaum AG
- Type:	Mortise lock
- Fixing:	2 pieces of chipboard screws Ø 4,5 x 45
- Number of catch bolts / latches:	1/1
- Backset:	60
- Dimensions of face plate (W x H):	235 x 20, t=3
- Mounting position:	Recess in door leaf 16 x 165 x 95, flush face plate with the meeting profile
Main strike plate:	Latched in the opposite sided “meeting edge profile” of Alprokon, see annex 1.9
Latch bolt opening (W x H):	Latch opening (w x h) 17 / 14 x 48 and bolt opening (w x h) 11 x 54, distance from opening sided profile to latch 21,5
Door lock cylinder:	double cylinder
Lock of inactive leaf:	See annexes 1.1 and 1.7 to 1.9
- Manufacturers designation:	Alprokon 700-54
- Manufacturer:	Alprokon Aluminium
- Type:	Top and bottom flush bolt lock integrated in meeting edge profile, ø 13 / 6,5, lower flush bolt transiting through drop seal ø 6,5
Handles:	See annexes 1.1 and 1.17
- Manufacturer’s designation:	Hoppe Amsterdam at active leaf
- Manufacturer:	Hoppe AG
- Type:	Aluminium door handle with rosettes
- Fixing:	4 pieces of screws M4 x 55
- Handle height (distance bottom edge door leaf to centre of handle):	1050

Door closer:	See annexes 1.12 and 1.16
- Manufacturers designation:	Overhead door closer “TS 5000 ISM”
- Manufacturer:	GEZE GmbH
- Fixing:	Door closer: 4 pieces of screws Ø 4,5 x 60 directly to the door leaf Sliding rail: 2 pieces of screws Ø 5 x 50 into the flush over panel
Other fittings:	none

Further details on the design and construction of the test specimen can be found in annexes 1.1 to 1.18 of this test report.

2.3 Material parameters

Specific values, for example weight, bulk density and thickness as also the classification of the building materials used for manufacturing the test specimen, are given in annex 1.19.

2.4 Supporting construction and conditioning

The door construction was embedded to a standard lightweight supporting construction according to EN 1363-1:2012 paragraph 7.2.2.4. The supporting construction was made for a requested fire resistance of EI 30.

Design of the supporting construction:

- Thickness 75 mm
- Stud depth 50 mm
- Stud thickness 0,6 mm
- To both sides covered with each one gypsum plaster boards, thickness 12,5 mm
- With 50 mm insulation, density 30 - 60 kg/m³
- Reveal not covered
- For the connection of the test specimen to the partition wall construction three-sided a door vertical door frame profile 50 mm x 40 mm x 2 mm was used, which was placed at the bottom and the top into a UW-Profile and connected by angles and screws with the upright profiles.
- The supporting construction was connected at the top and the bottom with the test frame, lateral without fixing with free edge.

The supporting construction with a thickness of 75 mm was mounted to a test frame.

The clear opening of the test frame was (W x H): 5000 mm x 5000 mm.

The supporting construction was made on 11.10.2018. The test specimen was installed on 15. and 16.10.2018. The supporting construction was sealed circumferential on both sides towards the test frame permanently elastically.

2.5 Verification and Sampling

The selection of the test specimen was done by the sponsor.

The test specimen was manufactured as prototype in single part production, so there was no sampling out of production.

Information of official sampling of the test specimen are not presented resp. are unknown. DMT GmbH & Co. KG was not involved in the selection of samplings out of production.

The construction to be tested was a construction which admits a detailed inspection during the installation of the test specimen and after the test. The sponsor provided DMT GmbH & Co. KG prior to the test a detailed description and construction drawings on which base an accurate examination of the test specimen before and after the test was made and the correctness of the given information is confirmed. An examination of the used materials has not been made.

3 Test requirements and preparation

3.1 Test standards

EN 1634-3:2004/AC:2006 "Fire resistance tests for door and shutter assemblies – Part 3: Smoke control doors and shutters"

EN 13501-2:2016 "Fire classification of construction products and building elements – Part 2: Classification using data from fire resistance tests, excluding ventilation services"

EN 16034:2014 "Pedestrian doorsets, industrial, commercial, garage doors and openable windows – Product standard, performance characteristics – Fire resistance and/or smoke control characteristics"

EN 15269-20:2009 "Extended application of test results for fire resistance and/or smoke control for door, shutters and openable window assemblies, including their elements of building

hardware - Part 20: Smoke control for hinged and pivoted steel, timber and metal framed glazed doorsets"

Please note: The above stated standards conform to the german standards DIN EN.

3.2 Used test equipment

The test equipment was used according to the list of testing instruments used at DMT Test Body for Fire Protection Lathen.

3.3 Condition of the test specimen prior to the test

Measurement no. 1 - 3:	new and unused
Measurement no. 4:	out of measurement no. 1 - 3 with new gaskets, new door leaves and new flush over panel

3.4 Conditioning moisture content

At the time of the tests, the specimen was approximately in the condition expected for normal use. The test specimen was manufactured in a closed and hateable production hall and was stored prior to the test in the hall of DMT GmbH & Co. KG for a sufficiently long time.

3.5 Shakedown conditioning
(according to EN 16034:2014, Annex A, paragraph A.2.3)

A test of the mechanical conditioning by filling material losing height was not performed, as the insulating material or heat-absorbing materials used were not of any friable or crumbly materials.

3.6 Operability test
(according to EN 16034:2014, Annex A, paragraph A.2.2)

Prior to being mounted on the test furnace, the sample to be fire tested was checked for operability in the fire restraint frame by operating the leaves from the fully closed position to an opening of minimum 90° and back to fully closed for 25 cycles. The opening process was done manually, the closing process by the closing device. The functionality was ensured.

3.7 Self-closing for samples fitted with door coordinating devices
(according to EN 16034:2014, Annex A, paragraph A.4.2)

Following the test according to 3.5 first the active leaf was opened to (10 ± 2)°; this state was maintained for (20 ± 2) s and released without push. Then both door leaves were opened to (30 ± 2)°, this state was maintained for (20 ± 2) s and released without push. It was ensured that the leaves returned to the closed position in both cases.

The self-closing of the inactive leave was not ensured because the inactive leaf was not self-locking / latching.

3.8 Ability to release
(according to EN 16034:2014, paragraph 5.3)

To verify the ability to release the door leaves were opened three consecutive times up to 90° and hold in the opened position by the mobile hold open device of DMT GmbH & Co. KG. The release happened by simulating a fire signal (cut off main powers). The closing via the closing device into the closed and latched position of the active leaf was ensured.

The ability to release was ensured for the active leaf.
The ability to release was not ensured for the inactive leaf.

3.9 Requirements and deviations

The requirements correspond to the standard requirements. There were no deviations to the test methods resp. test conditions.

4 Test execution and results

4.1 Annotations to the test

For the smoke control test one double leaved test specimen was tested. With the test specimen the measurements no. 1 to no. 3 "closing face to the test chamber" with over and under pressure at ambient temperature (S_a) and with over pressure at medium temperature were performed. Also the measurement no. 4 "opening face to the test chamber" with over pressure at medium temperature (Sm) was performed with the test specimen.

Test date:	Measurement no. 1 to no. 3: Measurement no. 4:	17.10.2018 19.10.2018
Test rig temperature in °C:	Measurement no. 1 to no. 3: Measurement no. 4:	19,6 16,9

Test rig moisture content in %:	Measurement no. 1 to no. 3: 57,8 Measurement no. 4: 49,5
Ambient air pressure in hPa:	Measurement no. 1 to no. 3: 1013,9 Measurement no. 4: 1021,9
Hold points of the door leaves:	Active leaf: 3 hinges, 1 latch locking Inactive leaf: 3 hinges, 1 top locking and 1 bottom locking
Prepared, not effective locks for testing:	Active leaf: one hinge at the middle height of door leaf Inactive leaf: one hinge at the middle height of door leaf
Sealing of the floor gap:	Sa: automatic door seal S_{200}: automatic door seal

4.2 Preparation for smoke control test

The numbers indicate the corresponding paragraphs of EN 1634-3:2004.

10.1.1 **Pre-test procedure / test of function (10 times opened to an angle of 30° and closed):**	Fulfilled
10.1.2 **Retention force measurements:**	Measurement no. 1 to no. 3: Active leaf: 47 N Inactive leaf: 44 N Measurement no. 4: Active leaf: 43 N Inactive leaf: 45 N Measured at the handle 75 mm from handle's axis, accordingly 1100 mm from the hinges axis, each maximum value in the opening range up to 100 mm
10.1.3 **Door not locked, key (if existing) removed:**	Fulfilled
10.2.2.1 **Length of the gap between the fixed and moving components of the doorset:**	length gap between door leaf / frame / middle seal: 9997 mm Length bottom gap: 2474 mm
10.2.2.2 **The stabilisation temperature of (200 ± 20) °C has to be reached within the permitted limits and within a time of (30 ± 5 minutes. The temperature distribution shall be controlled to (200 ± 40) °C as measured by each thermocouple:**	The requirements were fulfilled
Side facing the test rig:	Measurement no. 1: closing face over pressure / ambient temperature Measurement no. 2: closing face under pressure / ambient temperature Measurement no. 3: closing face over pressure / medium temperature Measurement no. 4: opening face over pressure / medium temperature

Maximum total leakage rate of the fix joints at ambient temperature and a pressure of 50 Pa:	1,8 m³/h at the side panel

4.3 Gap measurement

(according to EN 1634-1:2014+A1:2018, paragraph 10.1.2)

The primary gap width of the functional joints is given in annexes 3.1

The sponsor provided the following primary gap widths:

Hinges side / frame:	2,5 mm
Top door leaf edge / flush over panel:	3,0 mm
Middle gap:	4,4 mm / 9,0 mm
Bottom door leaf edge / floor:	5,0 mm

4.4 Test results

4.4.1 Leakage rate of the test specimen $Q_{spec} = Q_t - (Q_{app} + Q_{sup/assoc})$

No. of the test	Pressure exposed side	Temperature	Total leakage rate Q_{spec} (m³/h) at pressure difference of		
			10 Pa	25 Pa	50 Pa
1	Side A	Ambient temperature	8,72	14,4	**22,08**
2	Side B	Ambient temperature	8,01	13,31	19,62
3	Side A	Medium temperature	1,79	1,04	18,19
4	Side B	Medium temperature	6,86	6,18	11,49

Side A = closing face, side B = opening face

4.4.2 Linear leakage rate $Q_l = Q_{spec}$ / "length of the gap"

No. of the test	Pressure exposed side	Temperature	Linear leakage rate Q_l (m³/h/m) at pressure difference of	
			10 Pa	25 Pa
1	Side A	Ambient temperature	0,87	**1,44**
2	Side B	Ambient temperature	0,80	1,33

Side A = closing face, side B = opening face

4.5 Observations during and after the test

Has an obvious failure of the sealing gaskets occurred during the test?	No failure of the sealing gaskets occurred
Further observations of the reaction of the test specimen:	Measurement no. 3: 10 Pa S_{200}: Low smoke emission at in the bottom hinge sided door leaf edges 25 Pa S_{200}: Low smoke emission at the hinges and at the bottom middle gap 50 Pa S_{200}: The smoke emission at the bottom middle gap increases significantly, the smoke emission at the hinges increases slightly Measurement no. 4: 10 Pa S_{200}: Low smoke emission at the top and bottom of the middle gap 25 Pa S_{200}: The smoke emission at the top of the middle gap decreases, also low smoke emission in all four hinge sided door leaf corners 50 Pa S_{200}: The smoke emission at all four hinge sided door leaf corners increases
Damages because of the test:	Measurement no. 3: the door leaves and the flush over panel are thermally deformed Measurement no. 4: the door leaves and the flush over panel are thermally deformed
Failure of the fastening or locking parts or of the mounting?	None
Condition of the test specimen after the test:	Up to the above mentioned damages the test specimen was functioning properly
Could the test specimen be opened immediately after the test manually/by hand?	The test specimen could be opened immediately after the test by hand without tools

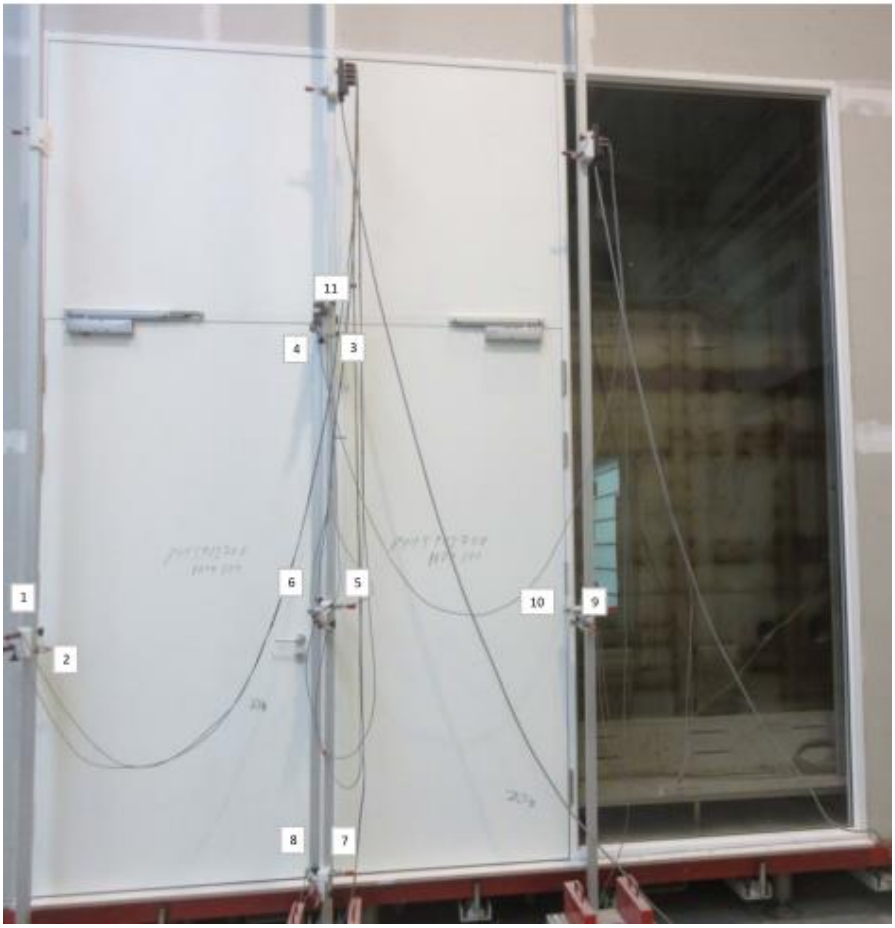
4.6 Indication of deflection

Pos. no.	Position	Max. deflection in mm during the test			
		No. 1 (Pressure applied at side A / ambient temperature)	No. 2 (Pressure applied at side B / ambient temperature)	No. 3 (Pressure applied at side A / medium temperature)	No. 4 (Pressure applied at side B / medium temperature)
		at 50 Pa	at 50 Pa	at 50 Pa	at 50 Pa
1	Frame active leaf hinges side middle	+ 2,9	- 2,0	- 3,3	- 3,4
2	active leaf hinges side middle	+ 2,8	- 2,1	- 1,8	- 2,6
3	Inactive leaf lock side top	+ 7,9	- 5,5	+ 1,3	+ 3,5
4	Active leaf lock side top	+ 7,4	- 5,2	+ 1,4	+ 2,7
5	Inactive leaf lock side middle	+ 5,7	- 4,5	+ 3,4	+ 4,8
6	Active leaf lock side middle	+ 5,5	- 4,3	+ 3,2	+ 4,8
7	Inactive leaf lock side bottom	+ 2,0	- 2,3	+ 1,0	+ 4,0
8	Active leaf lock side bottom	+ 3,2	- 2,7	+ 2,1	+ 5,7
9	Frame inactive leaf hinges side middle	+ 5,1	- 3,4	- 8,8	- 4,9
10	Inactive leaf hinges side middle	+ 5,0	- 3,3	- 7,0	- 3,9
11	Frame lock side top	+ 7,5	- 5,2	+ 1,3	+ 3,7

Note: - means deflection towards the test rig, + means deflection to the outside

(Side A = closing face, side B = opening face)

Location of deflection measuring points



5 Conclusions and recommendations

According to EN 13501-2:2016 paragraph 7.5.6.3.1 the limit value, tested at ambient temperature and medium temperature of 200 °C and a pressure up to 50 Pa, is 20 m³/h for single leaved doors and 30 m³/h for double leaved doors. Required is a complete test of both sides of the door.

Due to the test results (max. leakage rate Q_{spec} of 22,08 m³/h) it is recommended to classify the door construction to the class "S_{200}" [1)] according to EN 13501-2:2016.

The evaluation of the potential classes does not substitute the classification report according to EN 13501-2:2016.

[1)]Note: The product standard EN 16034 uses for the classification of smoke leakage at medium temperature against the current edition of EN 13051-2 the indication S_{200} instead of S_m.

6 Field of direct application of test results according to EN 1634-3:2004 paragraph 13

6.1 General

The field of direct application of test results is restricted to the allowable changes which a sponsor may make to the tested specimen following a successful smoke leakage test. These variations may be introduced automatically without the need for the sponsor to seek additional evaluation, calculation or approval.

The results of the leakage test continue to apply to assemblies of a different construction subject to the following:

- The assembly is of a similar generic construction, e.g. a solid timber leaf in a timber frame or a folded sheet metal leaf in a steel frame.
- The mode of operation is identical, e.g. single swing, double swing, roller shutter or folding leaf.
- In the case of assemblies that only require a restriction in the leakage rate from one direction only then the direction does not vary from that tested.
- The stiffness of the supporting construction and the method of fixing and sealing the frame to the supporting or associated construction shall not be less than that of the tested construction (this may be the specimen frame in some furnaces).

Doors tested in a flexible construction may be installed into rigid constructions but not vice-versa. Doors tested in a flexible construction to achieve ambient temperature classification S_a may be installed in alternative flexible constructions. The use of alternative flexible constructions for doors with S_{200} classification will be the subject of extended application considerations.

6.2 Construction of assembly

6.2.1 General

- Decorative finishes such as paints may be varied.
- The clearance gaps between components may be varied but shall not be greater than those in the tested assembly and where gaps are smaller they shall not impair the ability of the leaf/leaves/curtain to close especially in cases where both leaves of hinged or pivoted door assemblies are opened or closed simultaneously.

- Threshold gaps protected by active drop seals may be varied within the movement range specified by the seal manufacturer.

6.2.2 Hinged or pivoted leaf assemblies

6.2.2.1 Timber leaves

The door leaf shall be constructed from similar materials (e.g. flaxboard, softwood) nd stiffness equal or greater than that tested. Equal or increased stiffness may be assumed for ambient temperature use if:

- the leaf is thicker than that tested;
- the facings to the leaf are thicker than those tested;
- the size and density of any framing member enclosing the leaf core is not reduced;
- the glues and jointing procedures are not changed;
- for ambient temperature only, openings for glazing are not greater in dimensions or aspect ratio than any incorporated in the construction tested.

Variations for medium temperature uses are the subject of extended application considerations.

6.3 Size and aspect ratio

6.3.1 Hinged and pivoted leaf assemblies

The leaf size shall not be increased but may be reduced providing that the number of any movement restrictors such as locks, latches and hinges is not decreased (but may be increased).

The aspect ratio of the leaf may be changed, subject to the restrictions in 6.2.2 and subject to the length of the leakage path not being extended.

6.4 Glazing

- The type of glass, providing that it has polished or floated surface finish, may be changed, e. g. toughened, laminated, wired or borosilicate, for ambient temperature

smoke control situations, subject to the edge sealing system being the same. The exchange of alternative textured surface finish glass is subject to extended application evaluation.

- The type of glass may only be changed for medium temperature smoke control applications by extended applications evaluation.
- The distance between the perimeter of the door and the perimeter of the glazing shall not be reduced.
- The size of glazed openings may be reduced from that tested and the aspect ratio may be changed providing that no perimeter dimension is increased, and providing that for medium temperature applications the glass type is not changed.

6.5 Hardware and fittings

Elements of hardware or ironmongery and/or their fixing technique may not be changed without extended application evaluation.

The positioning of elements of hardware or ironmongery may be modified for ambient temperature smoke application but shall not be changed for medium temperature applications.

6.6 Seals

As the sealing system is a critical part of the test, no modification may be made to the system tested.

7 General statement

This test report details the method of construction, the test conditions and the results obtained when the specific element of construction described herein was tested following the procedure outlined in EN 1634-3. Any significant deviation with respect to size, construction details, loads, stresses, edge or end conditions other than those allowed under the field of direct application in the relevant test method is not covered by this report.

Lathen, 27.08.2020

DMT-Prüfstelle für Brandschutz DMT

Herbers	Kanjahn
(deputy unit manager)	(case worker)

Annotations
Documents without stamp and sign have no validity. The cover page and the sign page of this document are signed with the stamp.

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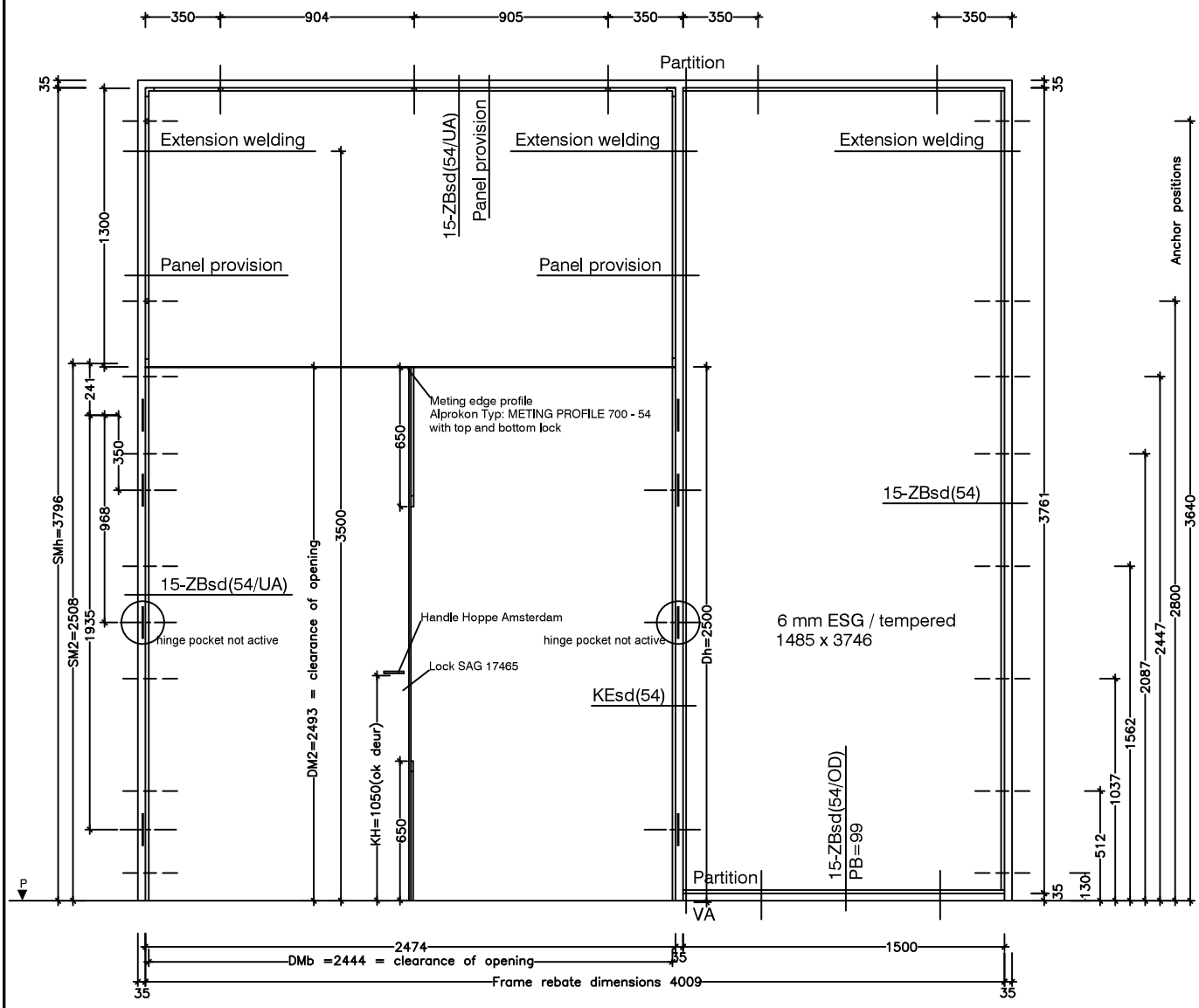
A publication requires the written approval of DMT GmbH & Co. KG, Test Body for Fire Protection.

Translations of this test report have to include the annotation „Translation of the english original version not proven by DMT GmbH & Co. KG, Test Body for Fire Protection“. In cases of doubt the english original version of the test report is valid.

The test material has been used up.

This test report cannot be used for rendering a general appraisal certificate (Allgemeines bauaufsichtliches Prüfzeugnis (AbP)).



Type of Frame:	15-ZUsd (54/UA)
Type of meeting edge profile:	700 / 54

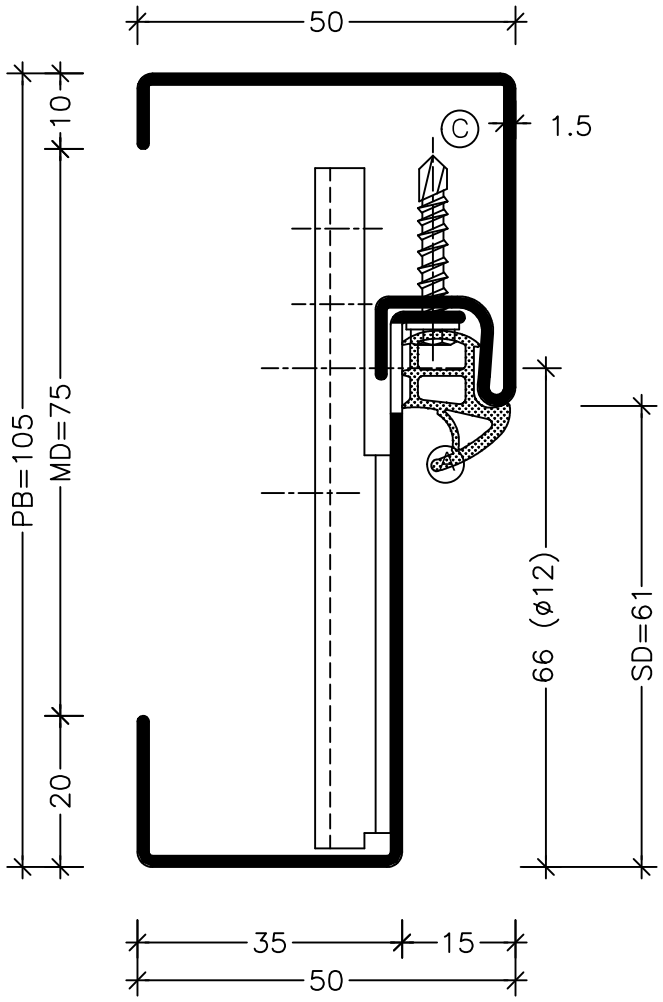
STAALKOZIJN

2-PART FRAME FOR DOUBLE DOOR LEAF

Annex 1.01 to

DMT GmbH & Co. KG
Plant and Product Safety
Expert body for fire protection

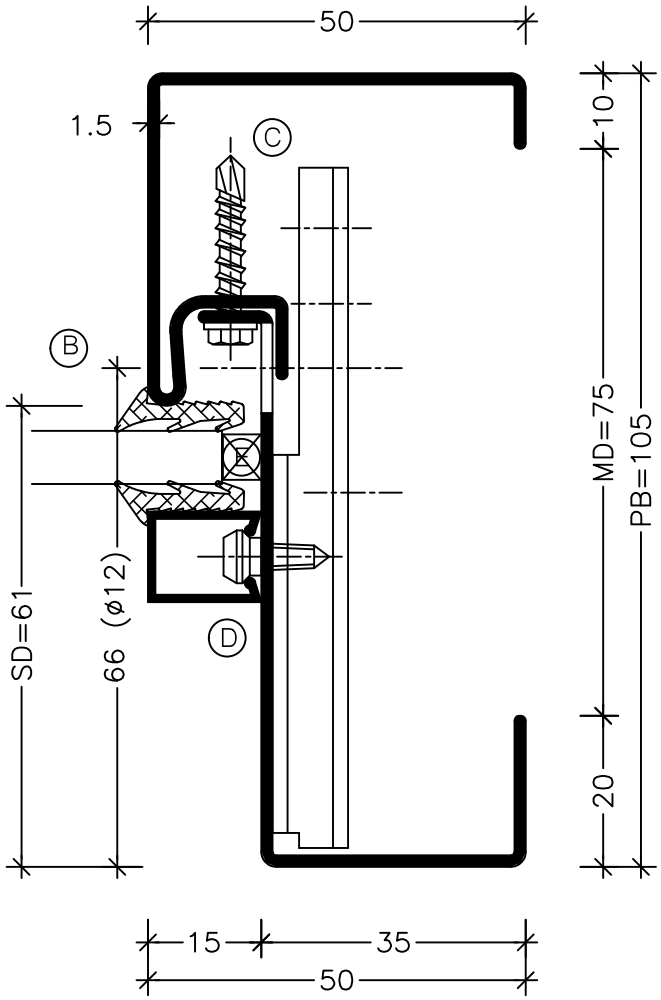
Test report no.
DMT-DO-52-317



A: Smoke seal, for typ see drawing "SMOKE SEAL"
C: Selfdrilling hexagon + PZ2 screw 4.2x22 galv. BOS-ENG-006088
max. 800 mm center to center distance

STAALKOZIJN

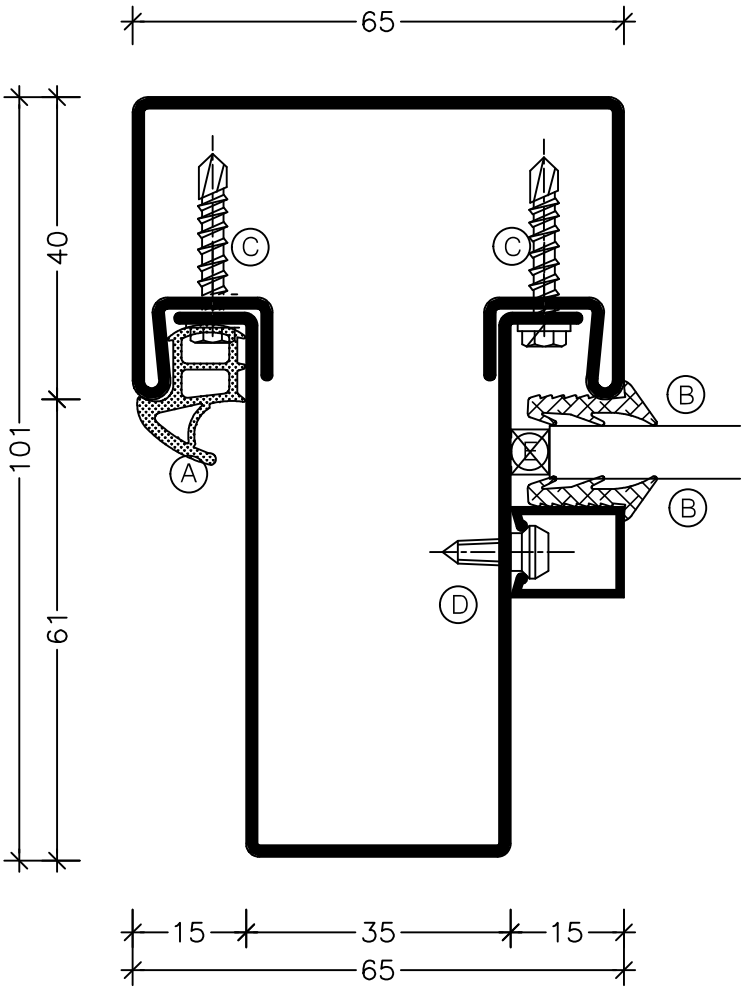
PROFILE TYPE: **15-ZBsd (54/UA)**



B: Glazing seal TPE AADC 8029
C: Selfdrilling hexagon + PZ2 screw 4.2x22 galv. BOS-ENG-006088
max. 800 mm center to center distance
D: Self-drilling (Ø3 mm) clamp-screw 3.9 x 10 mm, head Ø 5.5-6.5 with PH2 shaped cavity
E: Hardwood glazing support blocks 80 x 15 x 5-7

STAALKOZIJN

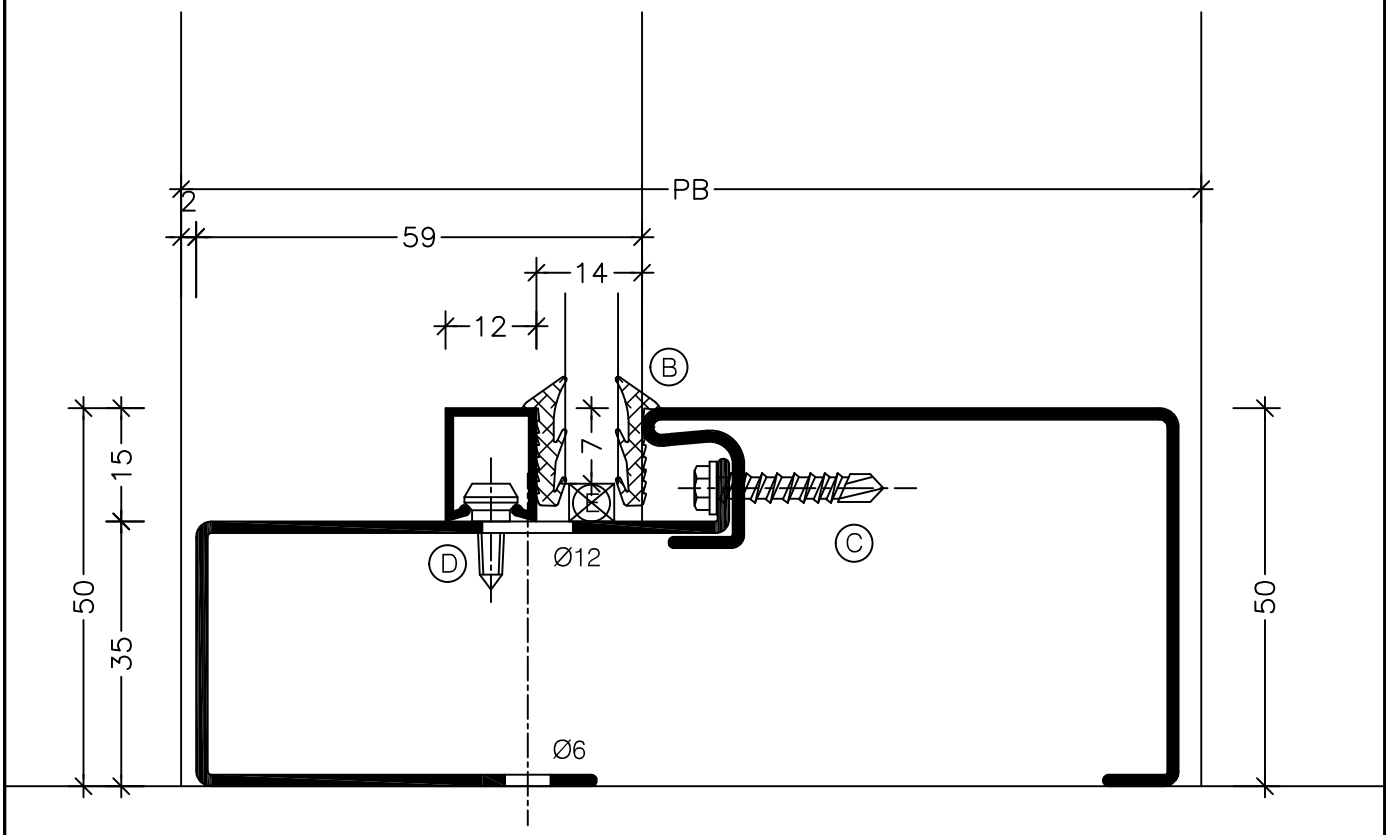
PROFILE TYPE: **15-ZBsd (54/UA)**



A: Smoke seal, for typ see drawing "SMOKE SEAL"
B: Glazing seal TPE AADC 8029
C: Selfdrilling hexagon + PZ2 screw 4.2x22 galv. BOS-ENG-006088
max. 800 mm center to center distance
D: Self-drilling (Ø3 mm) clamp-screw 3.9 x 10 mm, head Ø 5.5-6.5 with PH2 shaped cavity
E: Hardwood glazing support blocks 80 x 15 x 5-7

STAALKOZIJN

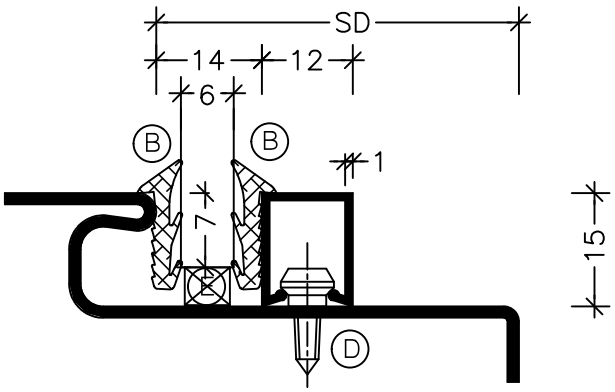
PROFILE TYPE: **KEsd (54)**



B: Glazing seal TPE AADC 8029
C: Selfdrilling hexagon + PZ2 screw 4.2x22 galv. BOS-ENG-006088
max. 800 mm center to center distance
D: Self-drilling (Ø3 mm) clamp-screw 3.9 x 10 mm, head Ø 5.5-6.5 with PH2 shaped cavity
E: Hardwood glazing support blocks 80 x 15 x 5-7

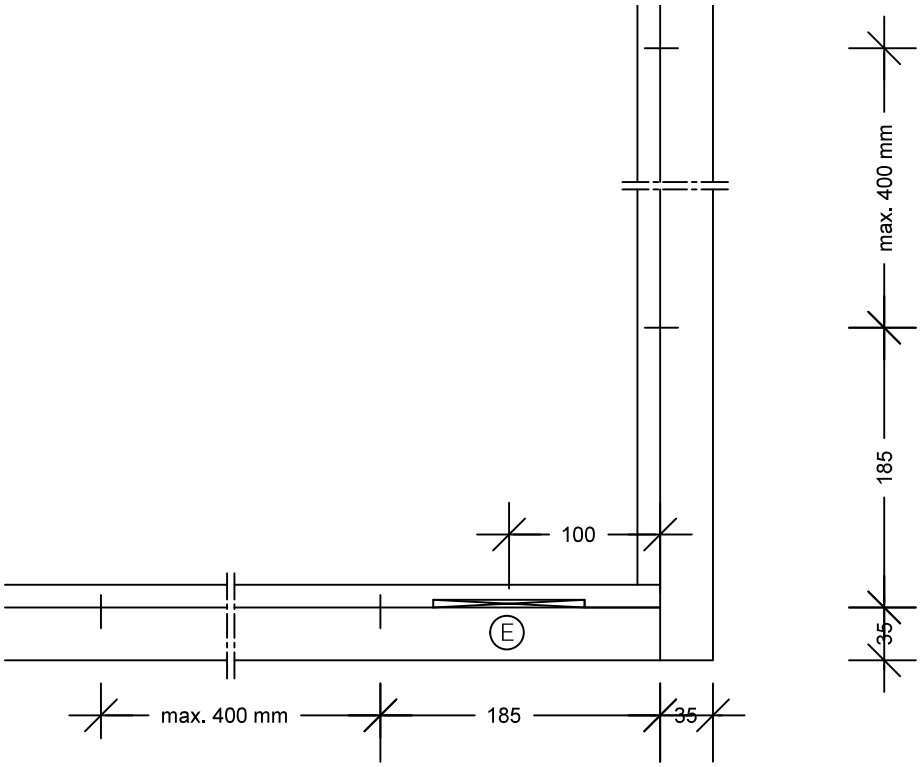
STAALKOZIJN

PROFILE TYPE: **15-ZBsd (54-OD)**



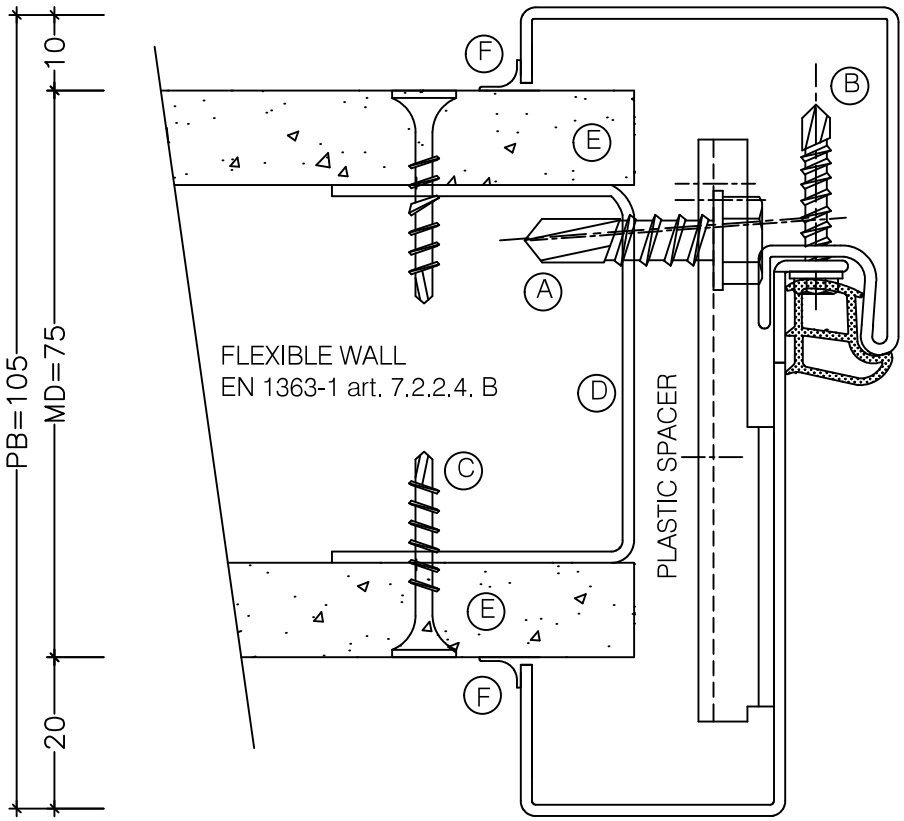
Aluminium clamp glazing bead (type: 31)

A: Smoke seal, for typ see drawing "SMOKE SEAL"
B: Glazing seal TPE AADC 8029
C: Selfdrilling hexagon + PZ2 screw 4.2x22 galv. BOS-ENG-006088
max. 800 mm center to center distance
D: Self-drilling (Ø3 mm) clamp-screw 3.9 x 10 mm, head Ø 5.5-6.5 with PH2 shaped cavity
E: Hardwood glazing support blocks 80 x 5 x 5-7



STAALKOZIJN

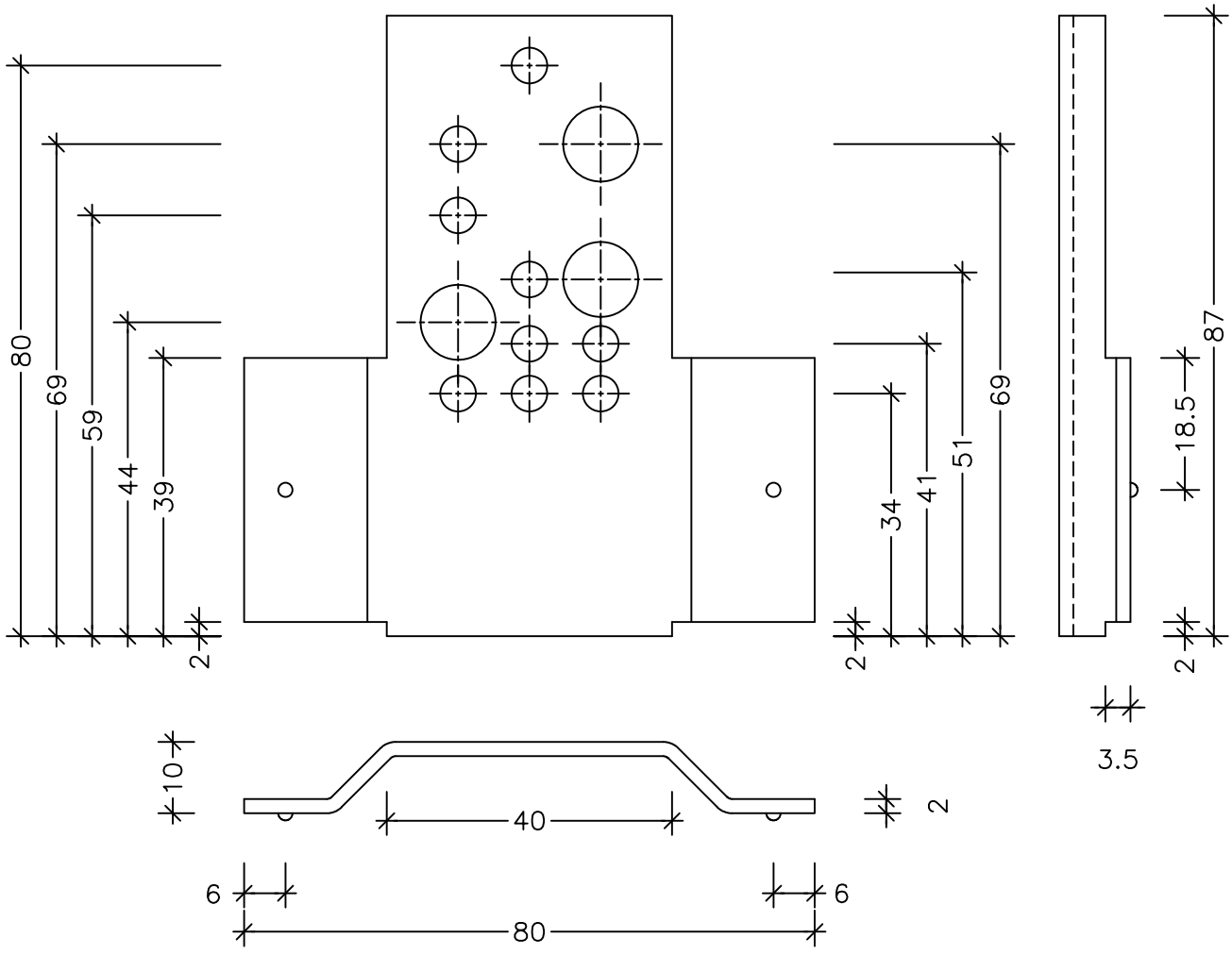
Glazing bead type: 31



A: Selfdrilling hexagon screw DIN 7504K 6,3x25 (1 for each anchor)
B: Selfdrilling hexagon + PZ2 screw 4.2x22 galv. BOS-ENG-006088
C: Selfdrilling drywall screw PH2 3.5x25 black
D: UA50 stud
E: Paper faced gypsium plasterboard type F (EN 520)
F: Silicone Sealant

STAALKOZIJN

WALL



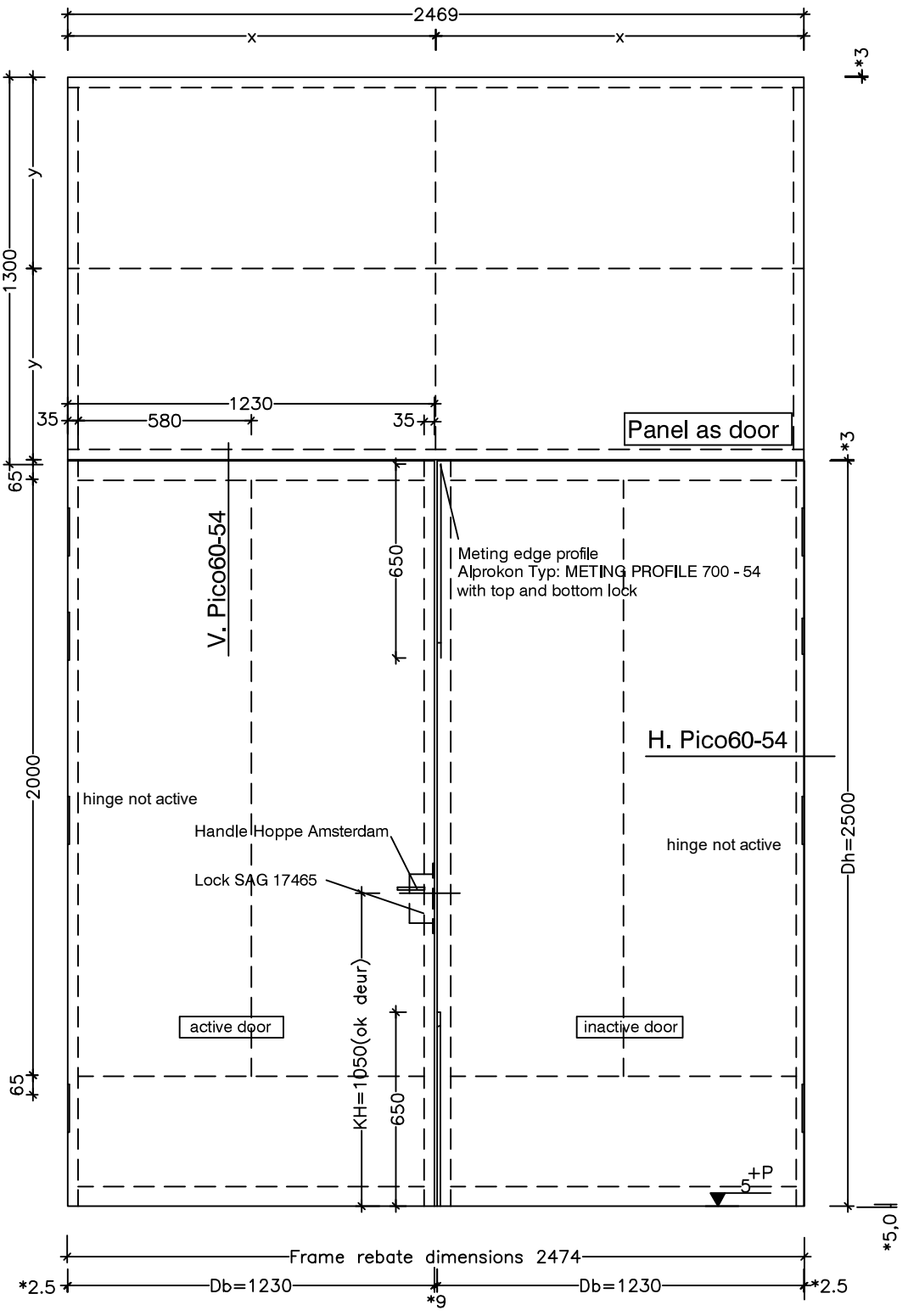
for each anchor 2 spotweldings

Artikel	PB	Length	
AAAN0040	100-117	87	1
AAAN0041	118-142	106	2
AAAN0042	143-168	131	3
AAAN0043	169-192	156	4
AAAN0044	193-217	181	5
AAAN0045	218-242	206	6
AAAN0048	243-267	231	7
AAAN0049	268-299	256	8
AAAN0050	300-330	288	9

STAALKOZIJN

UA ANCHOR

Annex 1.04 to

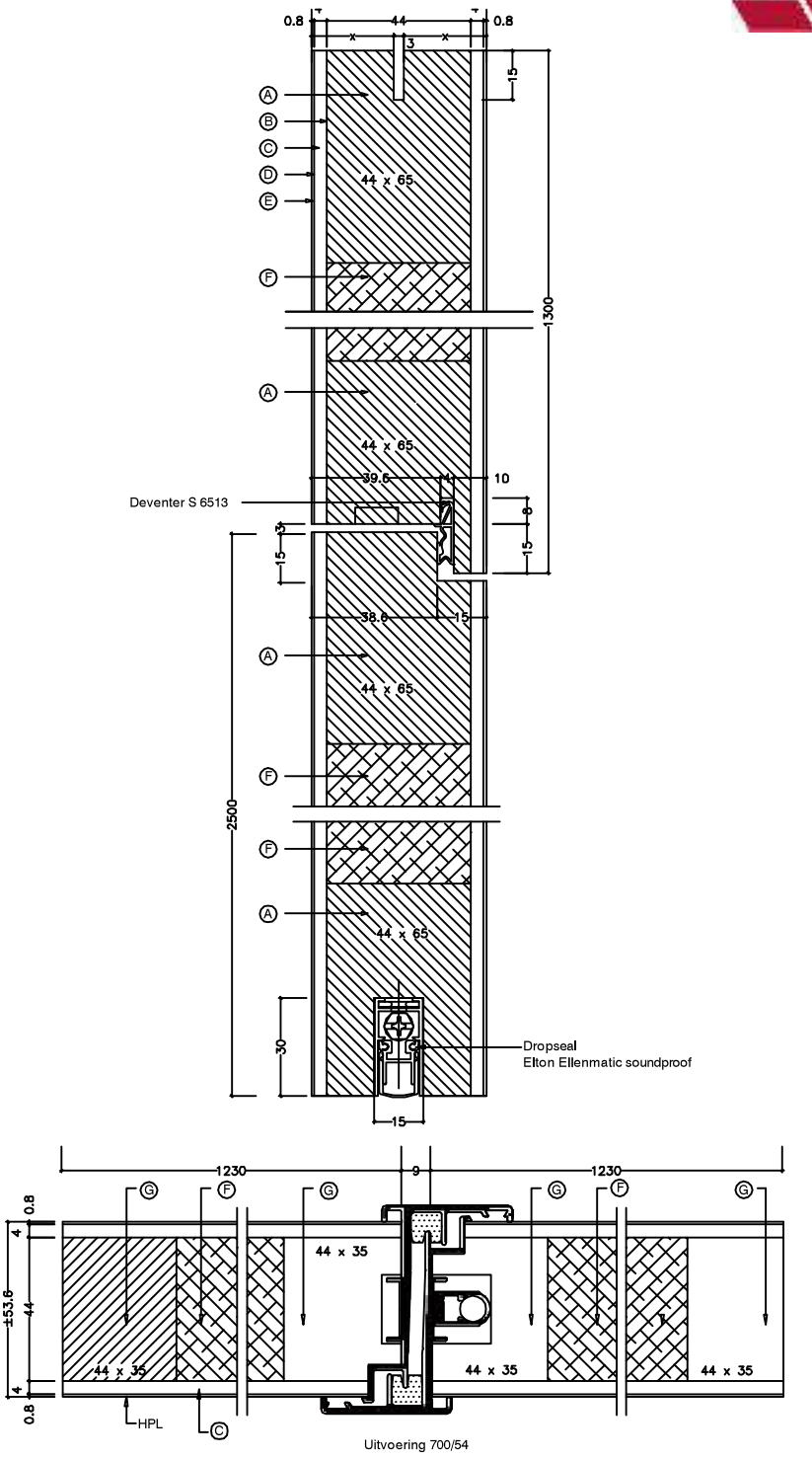


Type of ACTIVE door leaf:	PICO60-54	Weight of leaf 73,0 kg
Type of INACTIVE door leaf:	PICO60-54	Weight of leaf 72,5 kg
Type of meeting edge profile:	700 / 54	

* = Nominal gap in mm

Van Vuuren.

DOUBLE DOOR LEAF WITHOUT VISION PANEL

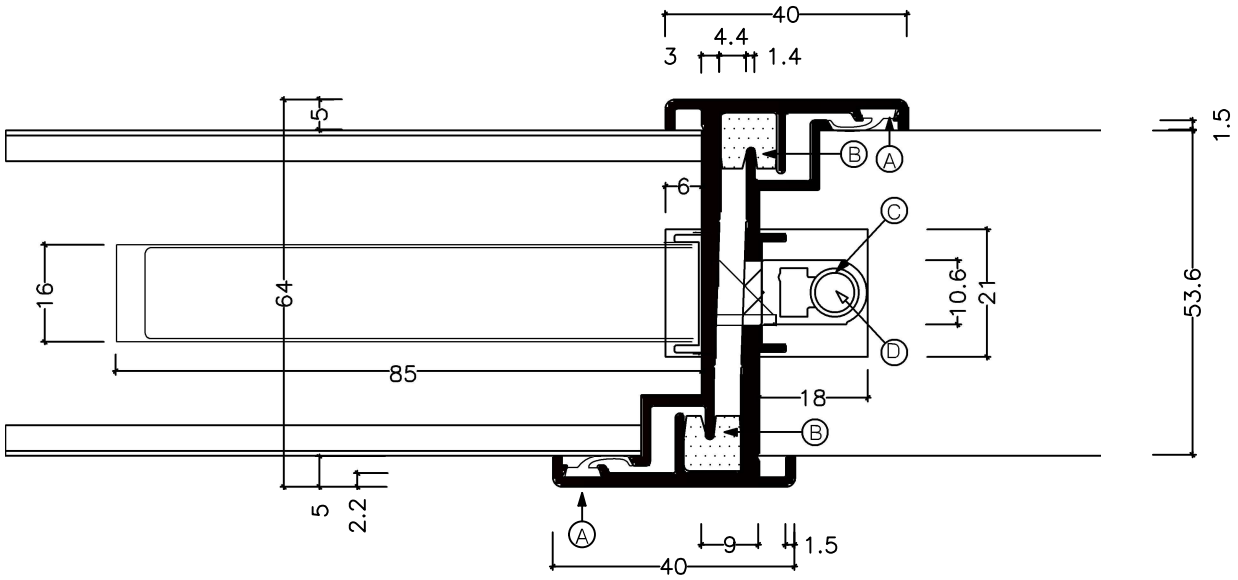


H. Pico60-54

A:	Meranti	44 x 65 mm	550 kg/m³	WWP Woodproducts BV
B:	Glue	NovaCol D3	90 gr/m²	Frencken
C:	HDF	4 mm	860 kg/m³	Homanit GmgH & Co
D:	Glue	NovaCol D3	90 gr/m²	Frencken
E:	High Pressure Laminate	0.8 mm	1350 kg/m³	Formica
F:	Mineral fiber BB200	44 mm	260 kg/m³	Thermal Ceramics de France SAS
G:	Meranti	44x35 mm	550 kg/m³	WWP Woodproducts BV

Van Vuuren.

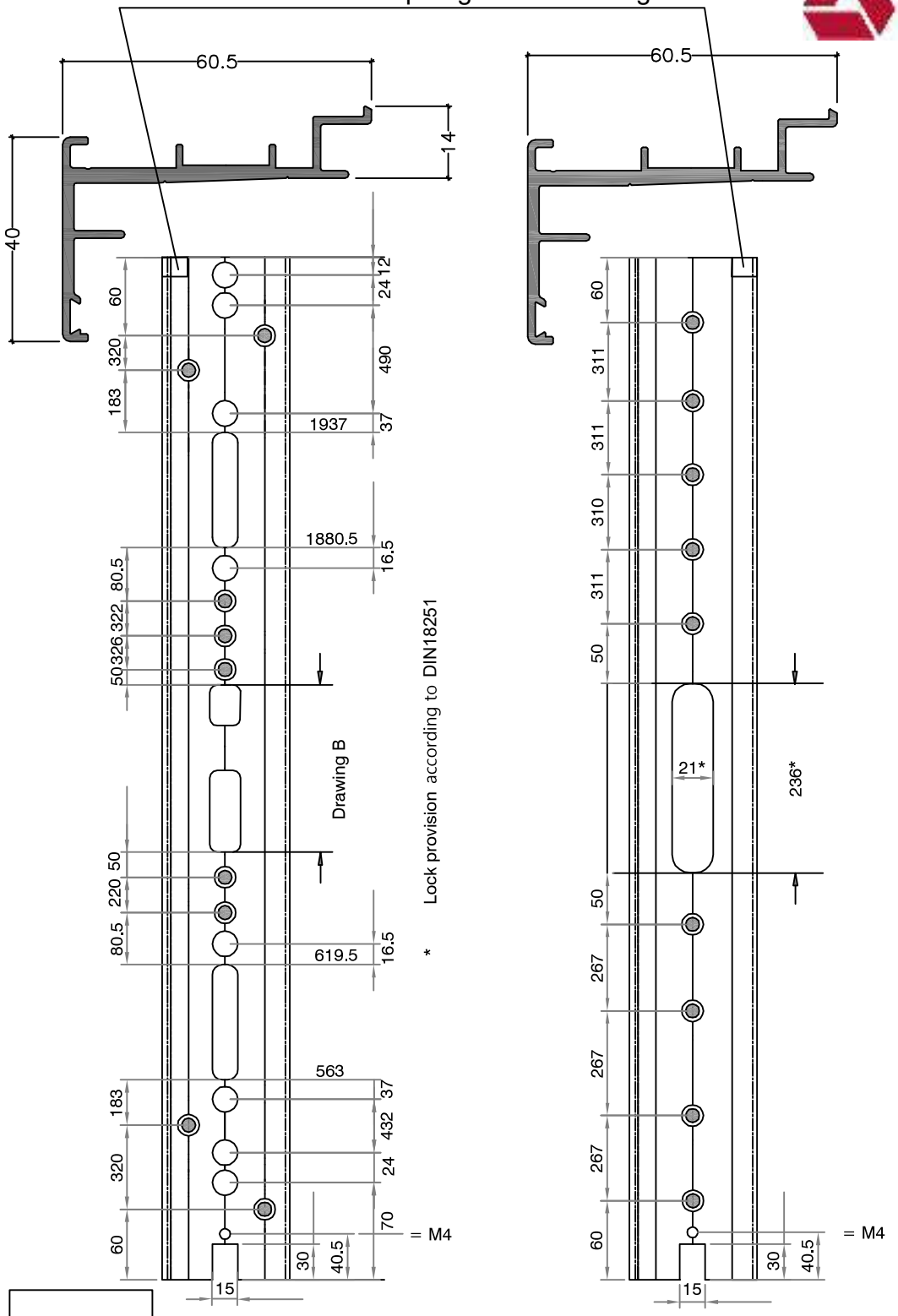
DOUBLE DOOR LEAF TYPE PICO60-54



A: Rubber seal Deventer TPE 60/93 - black -profile no. S6069
B: Noise reduction seal: Vitoseal 100 PVC self adhesive 9 x 6 mm
C: Upper / Lower flush bolt aluminium Ø 8 mm
D: Lower flush bolt aluminium Ø 8 mm - with steel tail-end Ø 6.5 mm
for transit through the dropseal (Ellenmatic Soundproof).

Alprokon aluminium

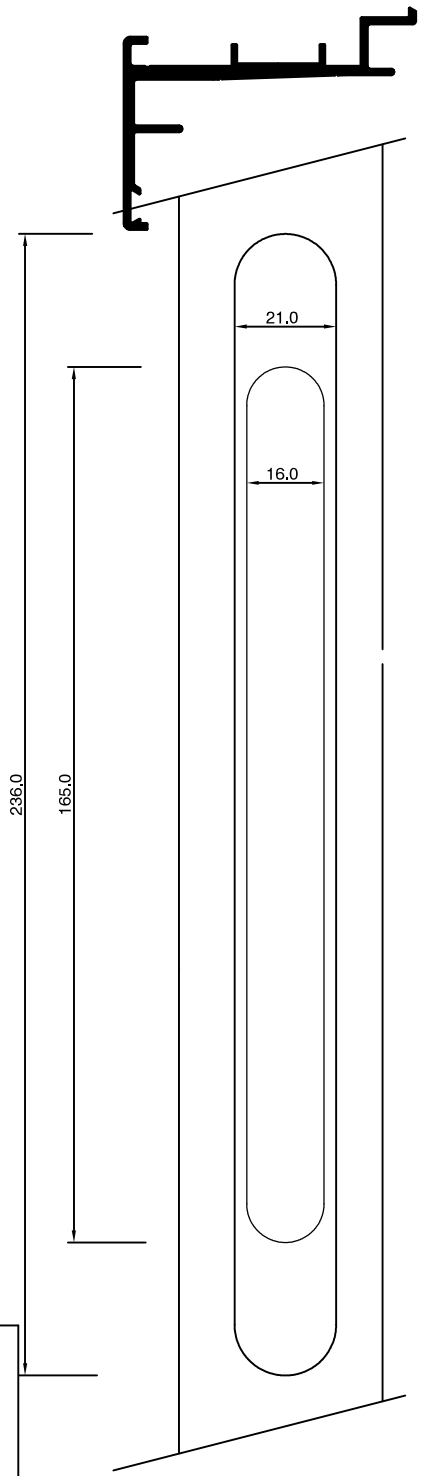
ALPROKON DOOR METING PROFILE 700 - 54

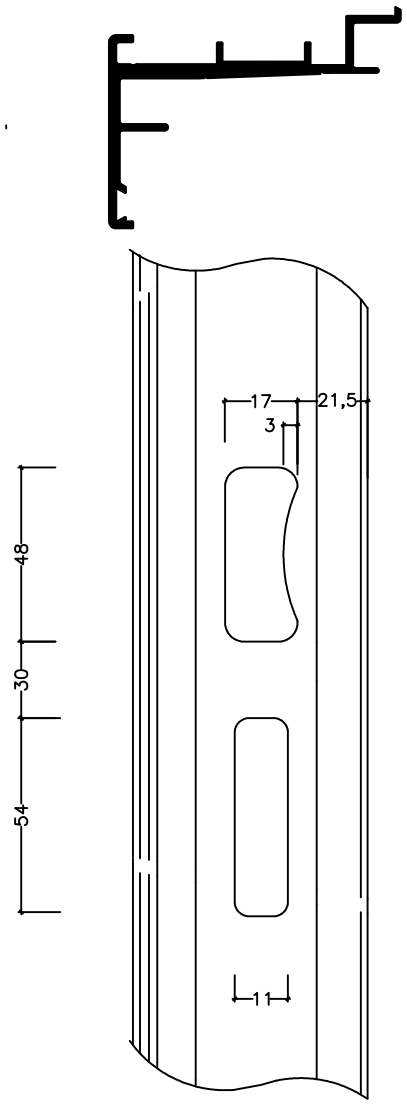


9 fixings (4.2 / 6.0 mm) each profile, spacing depending on length of profile
Chipboard screw PZ2 CSK head 4.0 x 40 Stainles steel waxed (SPAA-204025VPE16)

Alprokon aluminium

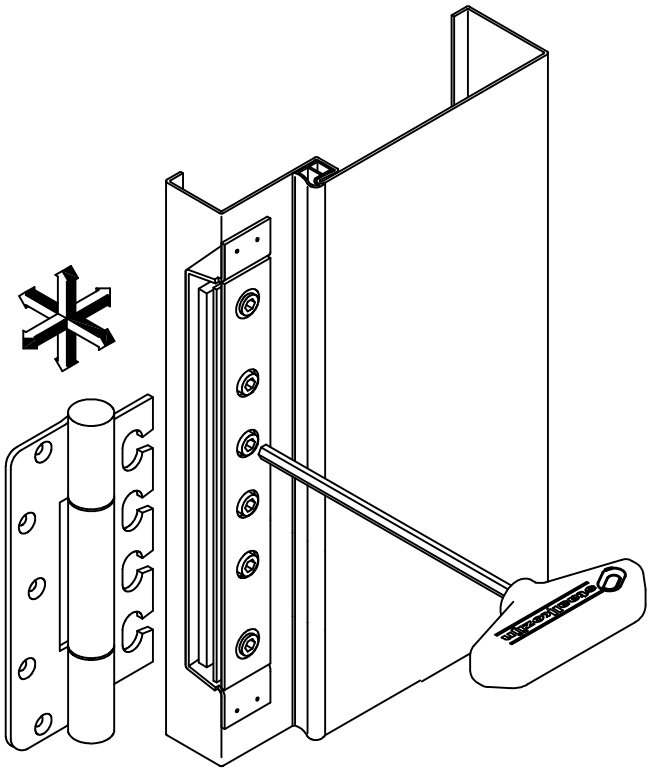
ALPROKON DOOR METING PROFILE 700 - 54

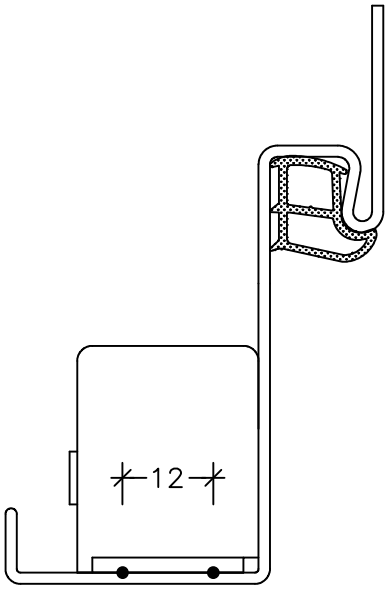




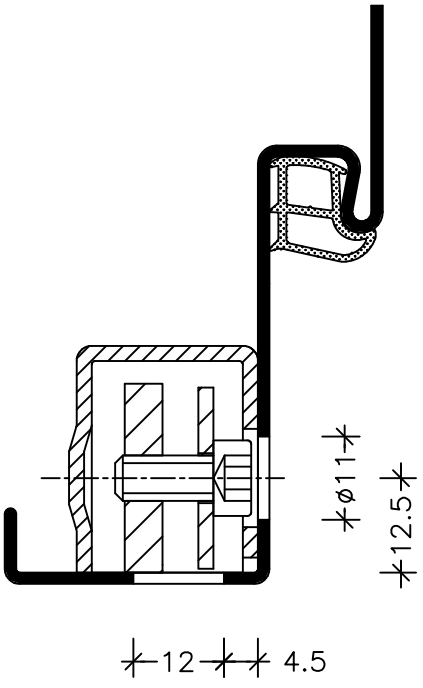
Alprokon
aluminium

ALPROKON DOOR METING PROFILE 700 - 54





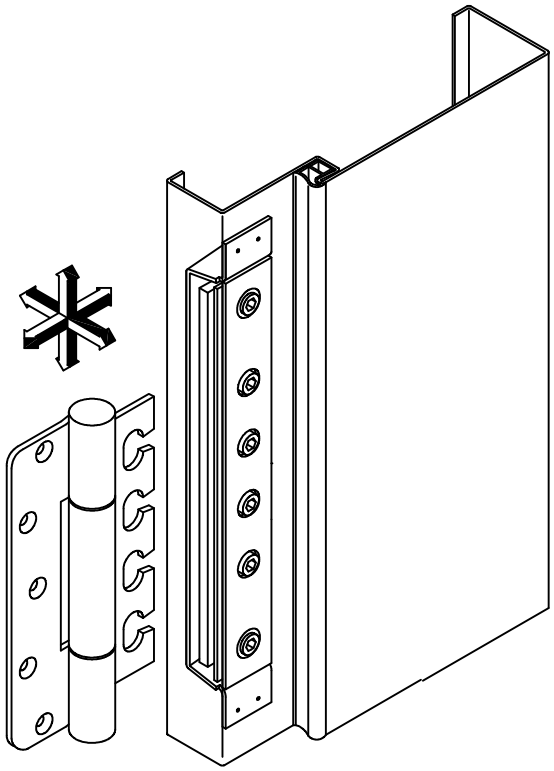
for each pocket 4 spotweldings

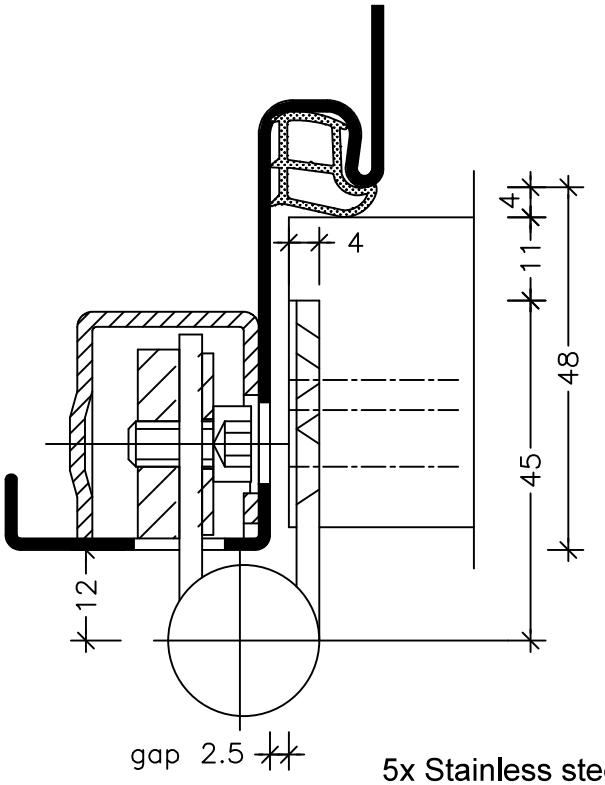


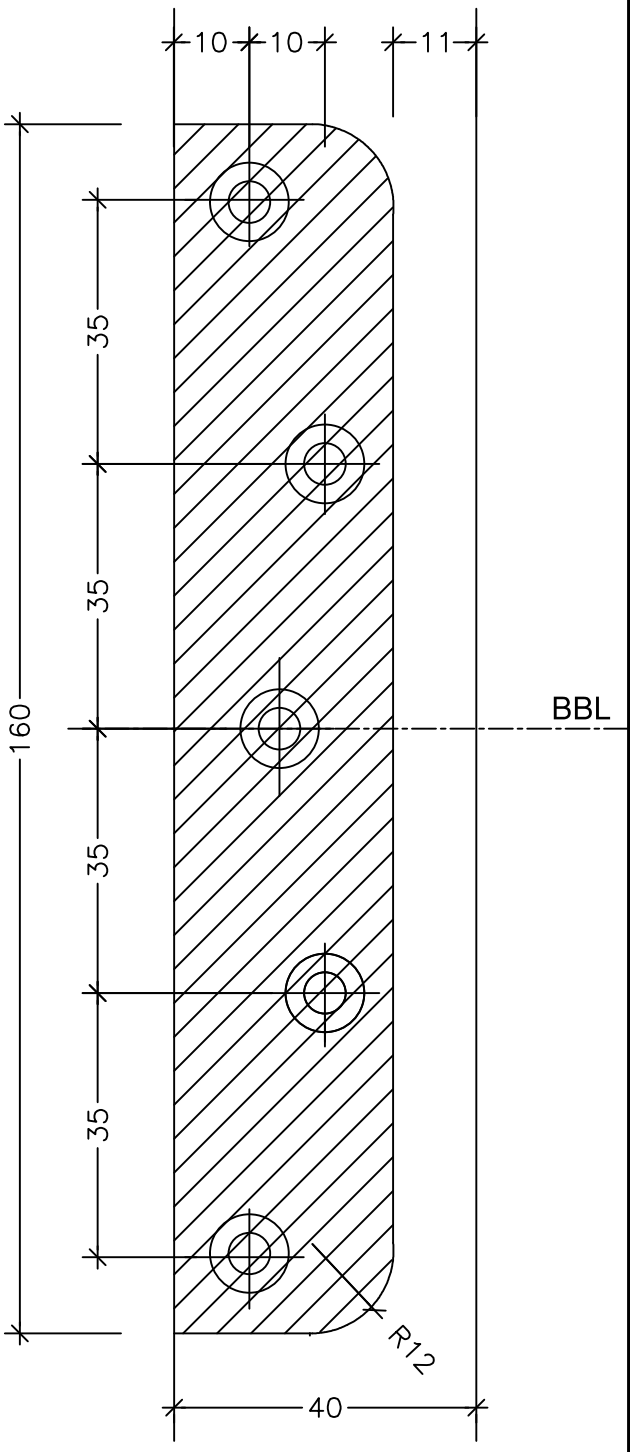
inbus bolt M6x12 DIN 912 (4x)

STAALKOZIJN

HINGE POCKET TYPE: **BVN 11160**
HINGE TYPE: BSW 060-3/160







5x Stainless steel screw, full thread,
flat countersunk head 4.5 x 45 mm

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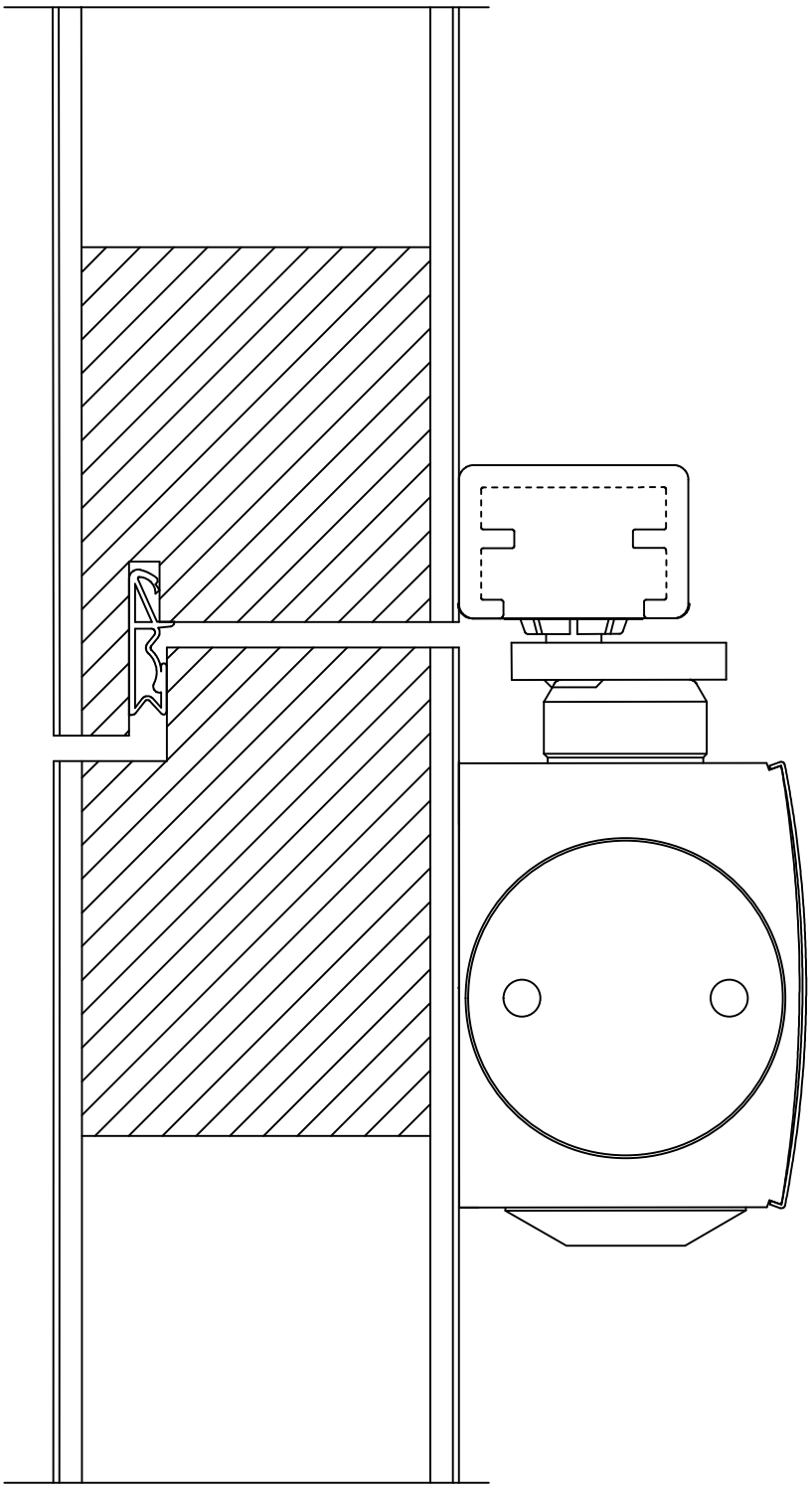
HINGE PROVISION IN DOOR
HINGE TYPE: BSW 060-3/160

Annex 1.11 to

DMT GmbH & Co. KG
Plant and Product Safety
Expert body for fire protection

Test report no.
DMT-DO-52-317

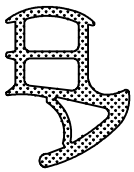
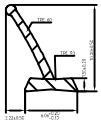


STAALKOZIJN

PROVISION DOOR CLOSER GEZE TS 5000 ISM

Annex 1.12 to

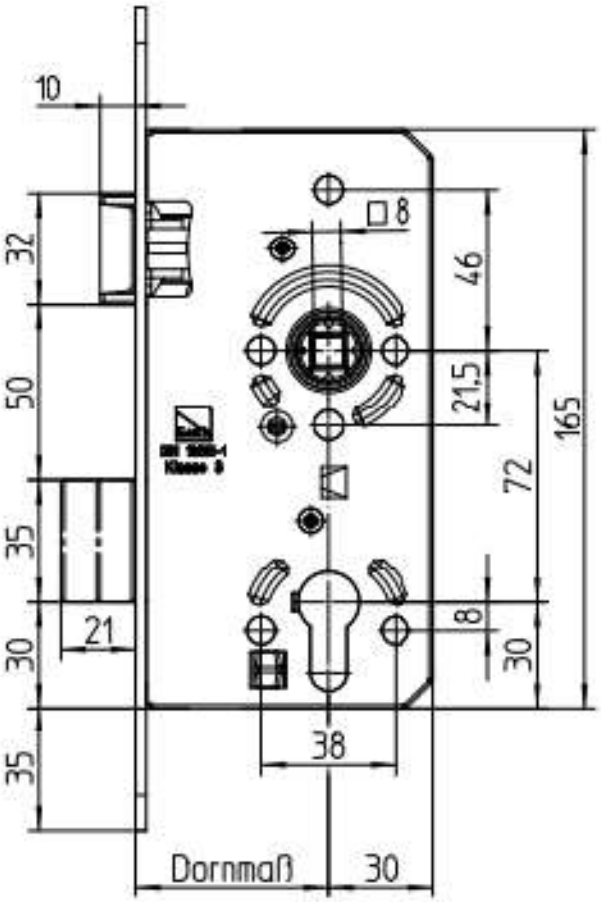
DMT GmbH & Co. KG
Plant and Product Safety
Expert body for fire protection

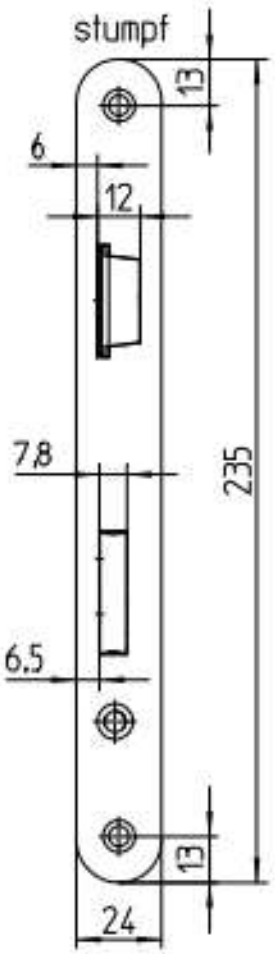
	AADC0038 APTK 4 6405 BOS GmbH Best Of Steel
	DEVENTER Datum: Naam: Get.: 17-05-2018 JSc Schaal: 10:1 (1:1) Maattoleranties vlg. DIN 16941-2B Rev.: Rev.: Rev.: Rev.: a JSc 05-10-2018 Wijziging voetbreedte naar 6,1 mm (van 5,9mm) Materiaal: TPE 60/93 Profiel nr.: S 6069 Teknr: S 6069_a
	Noise reduction seal: PVC self adhesive 9 x 6 mm Vitoseal 100
	AADC 8029 TPE BOS GmbH Best Of Steel
	S 6513 TPE 05.60 Shore 60 Deventer Profil GmbH

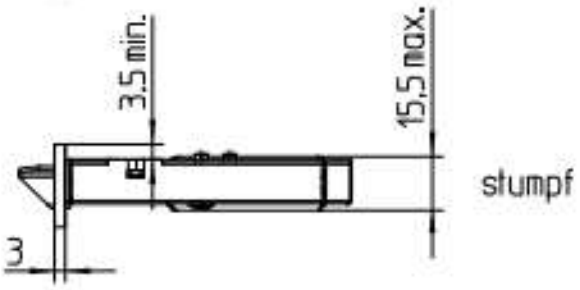
STAALKOZIJN

SMOKE SEAL

17565W0/WK



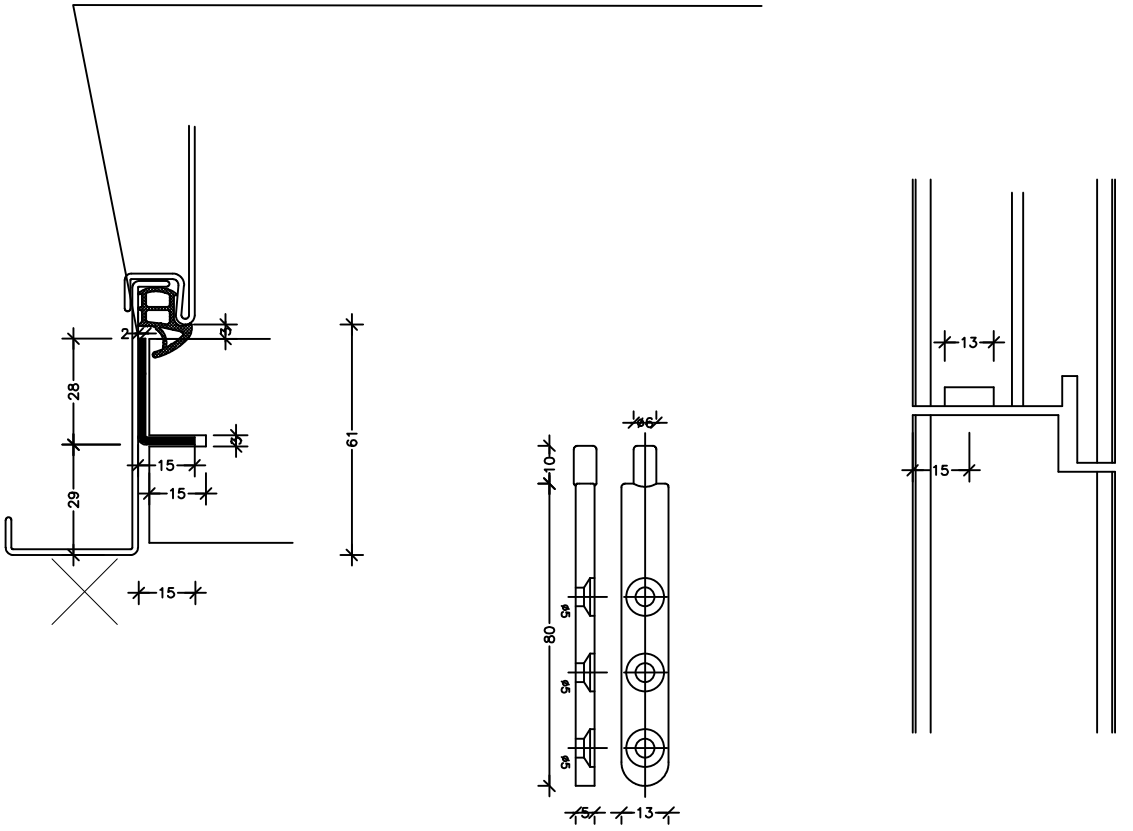


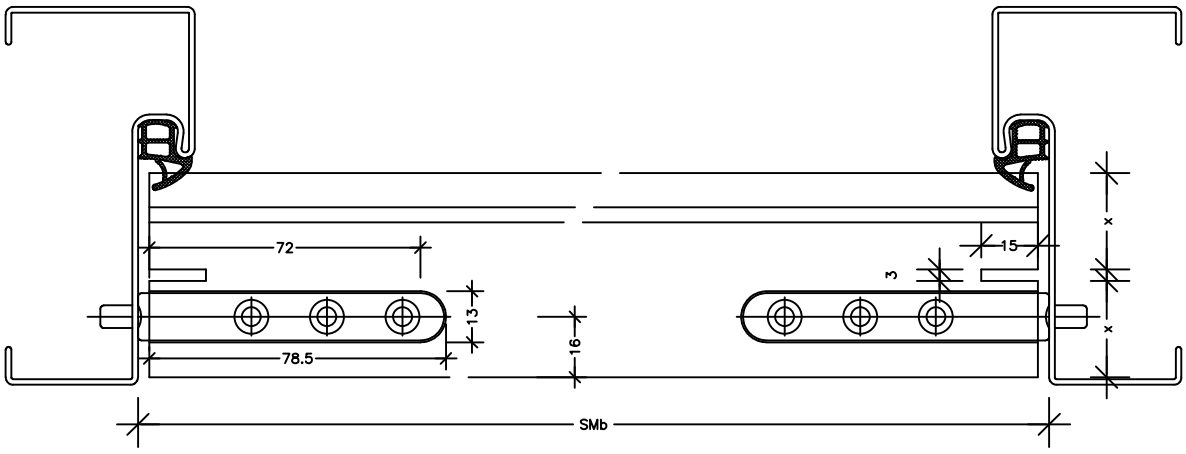


Fix with 2 pieces of chipboard screws Ø 4,5 x 45

Lock: . SAG 17465

Top fixing with 5 pieces of weld on angle 28 x 15 x 2
Distributed evenly over the width





Bottom fixing each with 3 pieces of chipboard screws Ø 5,0 x 45

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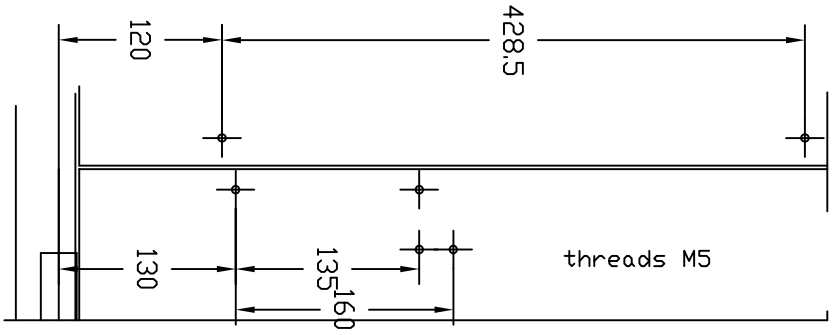
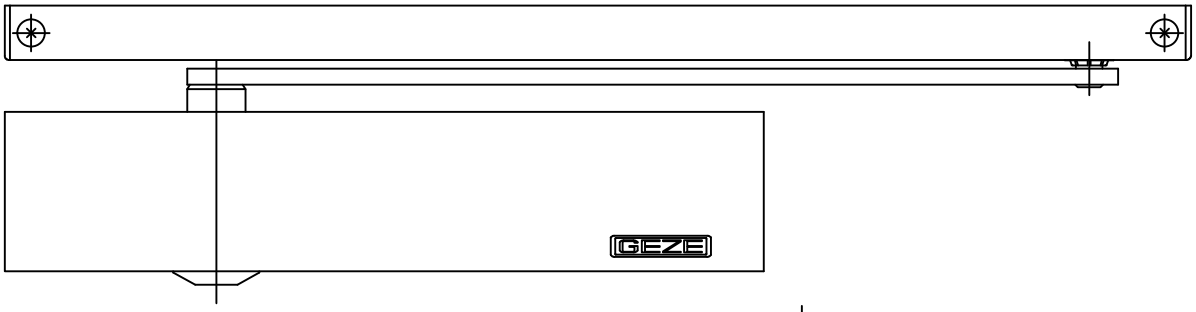
PANEL PROVISION

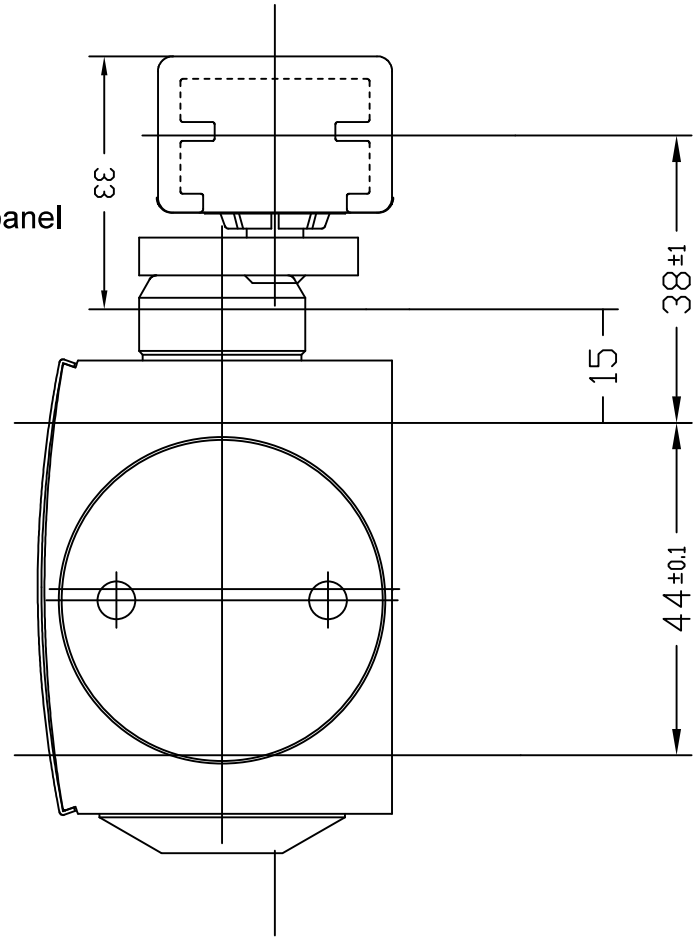
direct installation



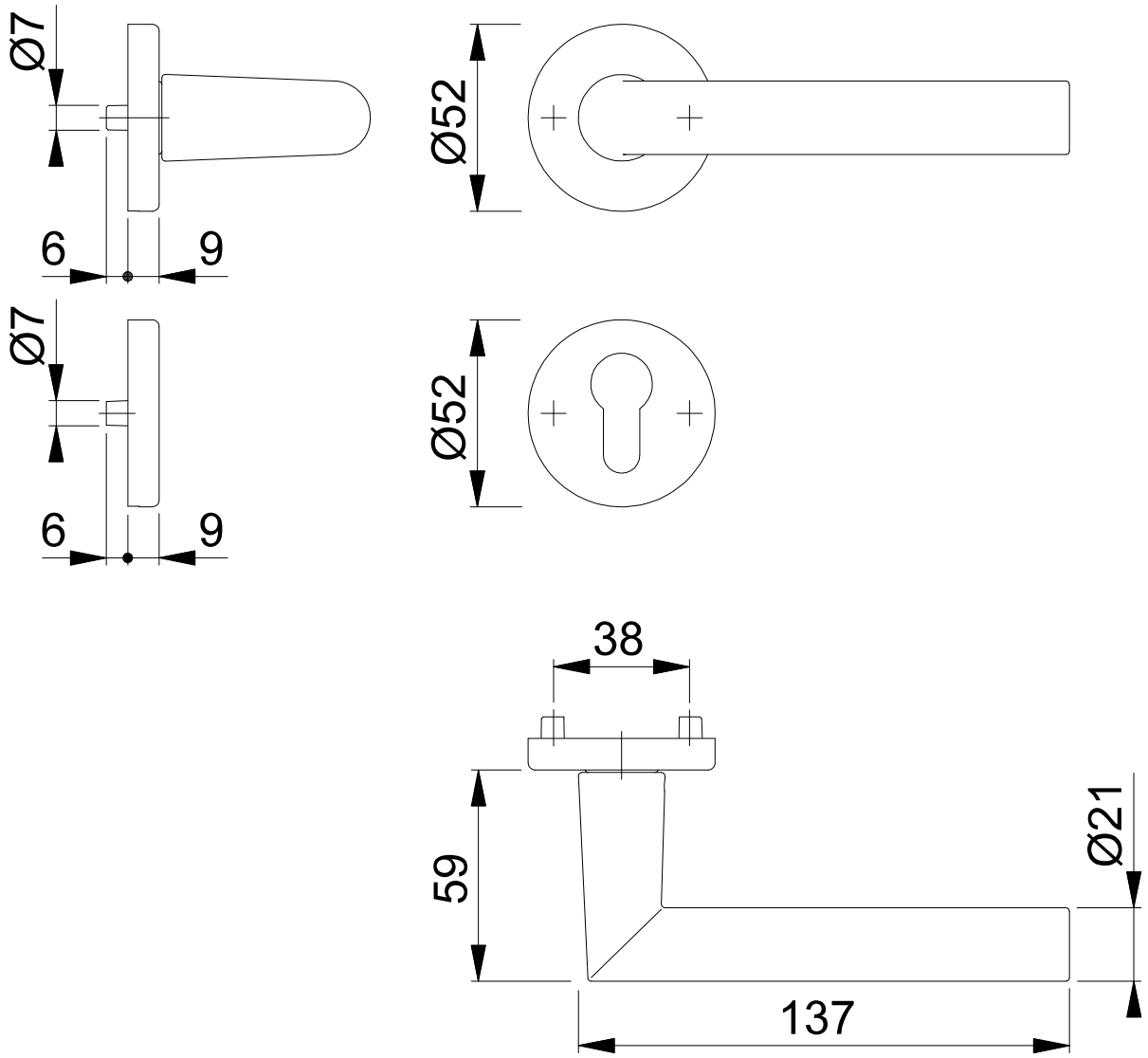
marking dimensions DIN left



fixed with:
4 pc. chip board screw 4,5x60mm to leaf
and 2 pc. chip board screw 5,0x50mm to panel

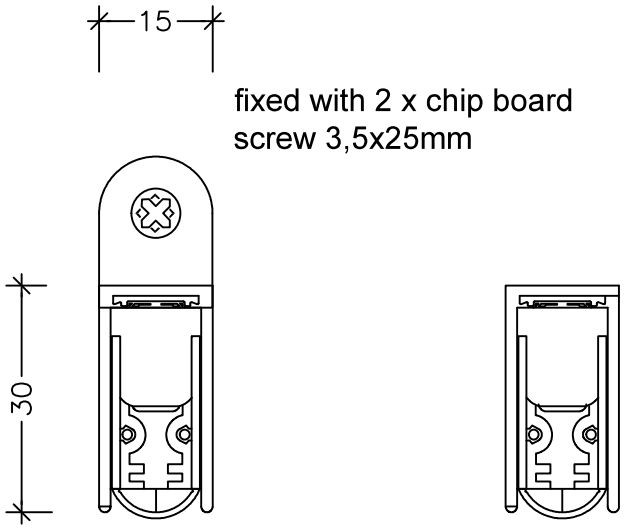


Overhead door closer “TS 5000” with mechanical closing sequence control "ISM"



Material: Aluminum
fix with 2 x 2 pieces M4 x 55

Handle Hoppe Amsterdam



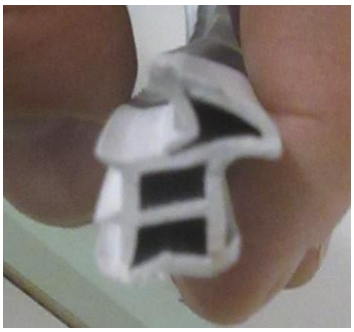
Automatic drop seal / EllenMatic Soundproof

Name of material	Manufacturer	Thick-ness	Surface weight	Density	Moisture content	Classification
		mm	kg/m²	kg/m³	%	
Meranti	WWP Woodproducts BV	44	-	> 550[1)]	[3)]	[2)]
Mineral fiber BB200	Thermal Ceramics de France SAS	44	-	> 260[1)]	[3)]	[2)]
NovaCol PVAc- D3, 90gr/ m²	Frencken Houtstraat 25 6001 SJ Weert	-	-	-	-	[2)]
HDF	Homanit GmbH & Co. KG	3,0	-	> 860[1)]	[3)]	[2)]
HPL	Formica	0,8	-	> 1350[1)]	[3)]	[2)]
Flush over panel seal “S 6513” TPE 05.60 Shore 60	Deventer Profil GmbH	[3)]	-	-	-	[2)]
Frame gasket " AADC0038" ATPK 4	BOS GmbH Best Of Steel	[3)]	-	-	-	[2)]
Glazing seal AADC 8029 / TPE	BOS GmbH Best Of Steel	[3)]	-	-	-	[2)]
Middle edge gasket "S6069 " TPE 60/93	Deventer Profil GmbH	[3)]	-	-	-	[2)]
Nois reduction seal Vitoseal 100 PVC	Vito Irmen GmbH & Co.KG	[3)]	-	-	-	[2)]
Tempered safety glass TSG 6 mm	Pilkington	6,0	15	-	-	-

[1)] according to clients information
[2)] evidence not provided
[3)] not investigated

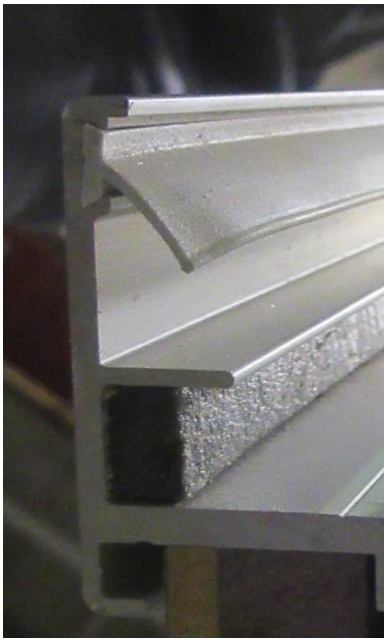
Overall view closing side (left) and opening side (right)

Detailed view hinge



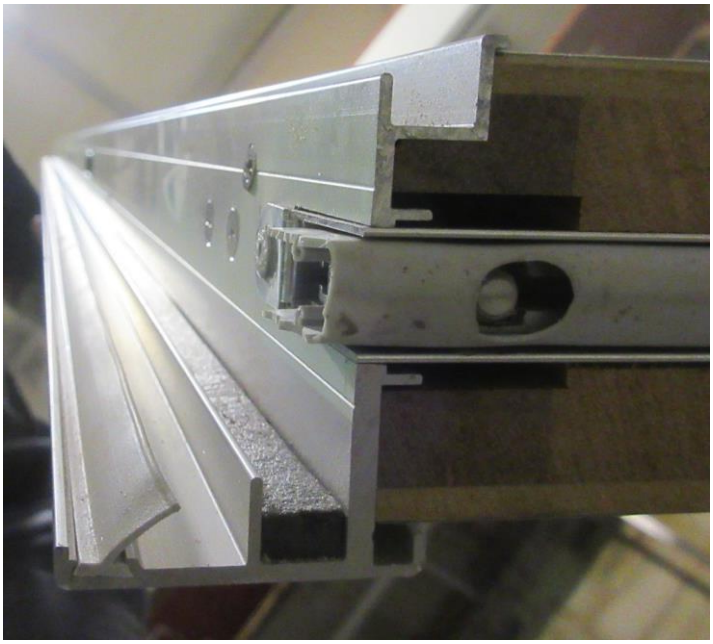
Detailed view frame seal

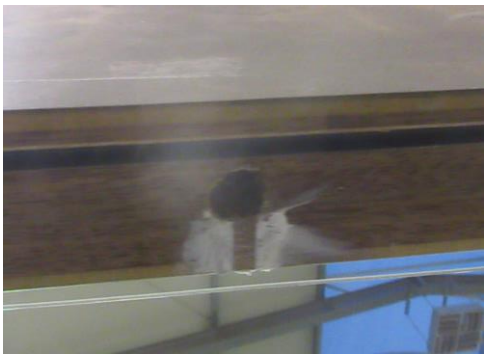
Detailed view seal top panel

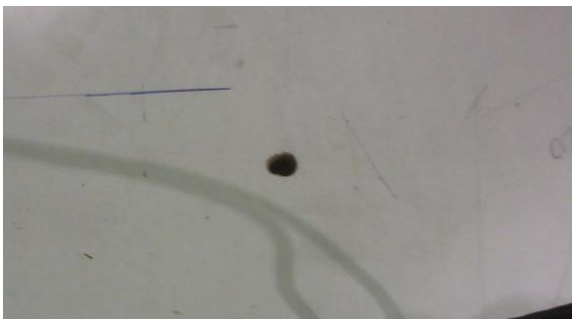


Detailed view middle seals inactive and active leaf profile

Detailed view lock and strike plate







Detailed view additional lock of inactive leaf at the bottom (left) and the lock holes top and bottom (right)

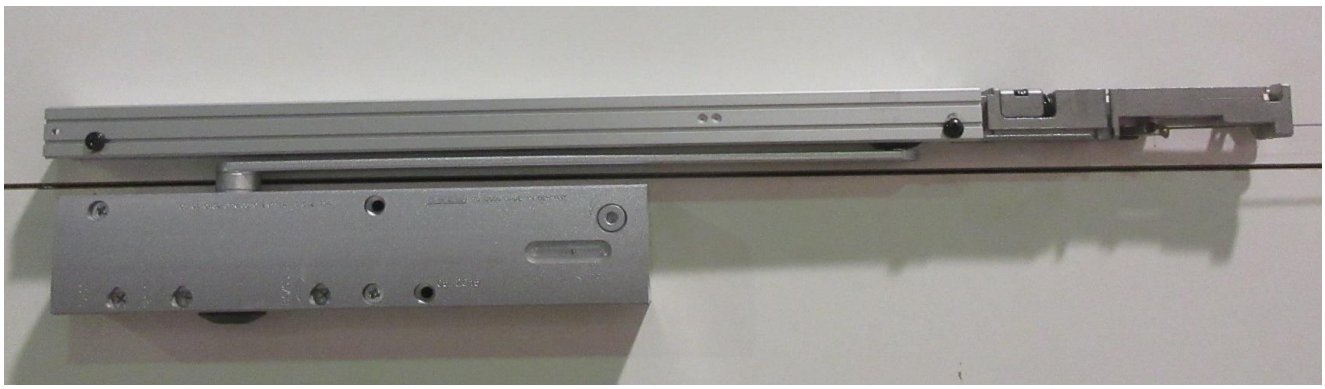
Photodocumentation	annex 2.2 to
DMT GmbH & Co. KG Plant and product safety Test body for fire protection	test report no. DMT-DO-52-317

Detailed view meeting edge profile at the top

Detailed view automatic drop seal inactive leaf

Detailed view door handle

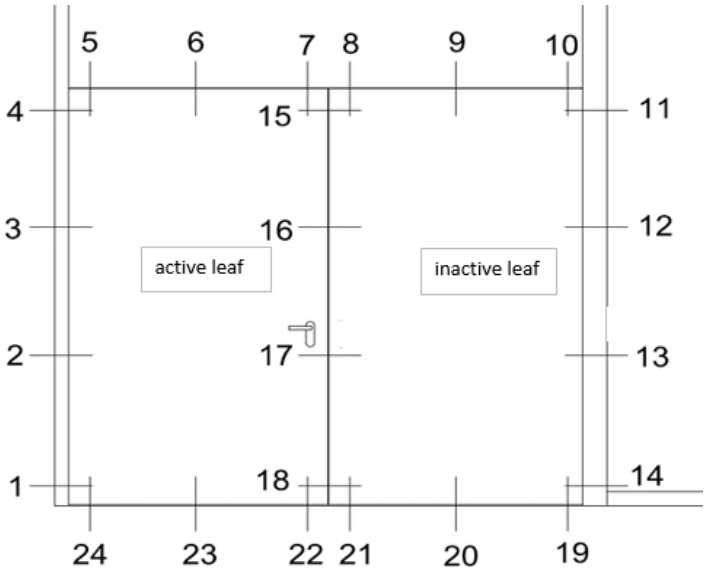
Detailed view actuation automatic drop seal



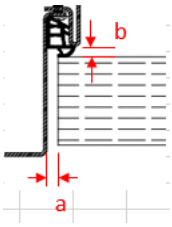
Detailed view door closer and sliding rail with door coordinator

Detailed view glazing beads and sealing of side panel, at the opening side

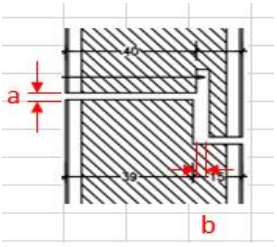
Detailed view glazing sealing of side panel, at the closing side



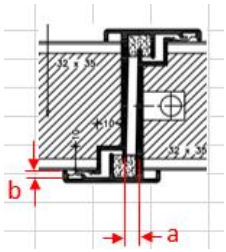
View opening side



Side gap



Top gap



Middle gap

Measurement no. 1 to no. 4

no.		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Gap in mm	a	2,4	3,5	3,6	3,3	2,5	2,0	1,6	2,6	2,2	1,9	1,6	2,0	2,6	2,9
	b	5,9	6,0	5,5	5,2	6,2	6,1	6,4	4,3	5,3	5,9	5,5	5,4	5,6	5,2
Nominal gap in mm (customer)	a	2,5				3						2,5			

no.		15	16	17	18	19	20	21	22	23	24
Gap in mm	a	4,8	4,9	4,2	4,1	5,9	6,0	6,2	6,9	6,1	5,7
	b	2,4	2,6	2,6	2,8	-	-	-	-	-	-
Nominal gap in mm (customer)	a	4				5					