ESL

مختبر الإمارات للسلامة
EMIRATES SAFETY LABORATORY

TEST REPORT

No. 0255-24-TR-02

Fire resistance of Latched, Palm strand board (PSB) single leaf door with PSB frame and Palm strand board (PSB) single leaf door with PSB frame with medium density fibre (MDF) board decking was made according to technical documentation No. J00006-STD-FR-PSB-109 & J2717-STD-FR-PSB-110.

according to:
- EN 1363-1:2020
- EN 1363-2:2001
- EN 1634-1:2014+A1:2018

Date of issue: 23 April 2024

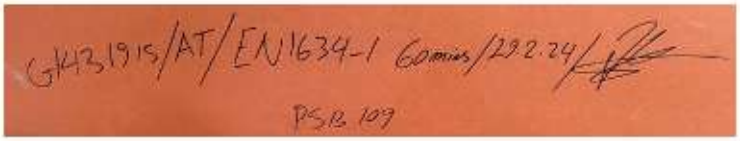
ilac-MRA

IAS ACCREDITED Testing Laboratory TL-1038

مختبر الإمـــارات للســـلامـــة
EMIRATES SAFETY LABORATORY

1 EXCLUSIVE SUMMARY

Test method:	EN 1363-1:2020 – *Fire resistance tests - Part 1: General requirements.* EN 1363-2:2001 – *Fire resistance tests - Part 2: Alternative and additional procedures.* EN 1634-1:2014+A1:2018 – *Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware – Part 1: Fire resistance test for door and shutter assemblies and openable windows.*
Name and address of the testing laboratory:	Emirates Safety Laboratory, Al Warsan III, Dubai, United Arab Emirates.
Date of specimen(s) delivery:	March 05, 2024
Date of specimen(s) installation:	March 05 -06, 2024
Date of testing:	March 07, 2024
Name and address of the test sponsor:	Abanos Furniture & Decoration Industry LLC P.O. Box 114480 Dubai Investment Park 1 Dubai United Arab Emirates
Name and address of the manufacturer/supplier:	Door and Frame Assembly – Abanos Furniture & Decoration Industry LLC P.O. Box 114480 Dubai Investment Park 1 Dubai United Arab Emirates Door and Frame Core – Al Talah Board Manufacturing Co. LTD Abu Dhabi Free Zone (KIZAD), Plot no KHIA4-05 Taweelah, Abu Dhabi, United Arab Emirates
identification of the test specimen:	Two wooden single leaf door was installed in a high-density rigid supporting construction with concealed hinges and locks. (opening towards the furnace)
ESL Identification of the test specimen(s):	0255-24-04 (Door 1) - PSB 110 0255-23-05 (Door 2) – PSB109
Description of sampling procedure including date if applicable:	The test specimens were selected, marked and signed by Mr. Alireza Tabatabaei from Intertek Middle East (Certification Body) on 29th February, 2024 as shown below and delivered to ESL by the test sponsor. The results apply to the specimens as received. The Laboratory was not involved in the sampling process.



Door 1

Door 2

2 TEST CONDITIONS

Heating temperature of the test element:	Standard temperature-time curve was maintained within its allowable limits according to EN 1363-1. Temperature inside the furnace during the test was measured at a distance of 100mm from the surface of the test element. Heating conditions are shown in Graphs 1 and 2.
Furnace pressure:	Differential pressure in the furnace measured at a height of 0.5m above the level of furnace floor was maintained according to EN 1363-1. A pressure of 0Pa is maintained at the neutral pressure plane, 0.5m above the notional floor level. The pressure level during the test is shown in Graph 3.
Ambient temperature:	Measured during the test at a distance of 2000mm away from the unexposed face of the specimen, at the commencement of the test was 27.1°C.

3 DESCRIPTION OF THE TEST SPECIMEN

Constructional details of the single leaf door set dimensions in below table are presented in the technical documentation enclosed to this report.

Table 1

Measurement	Nominal (mm)		Measured by ESL (mm)	
	Door 1	Door 2	Door 1	Door 2
Width of the door leaves	1150	1150	1151	1151
Height of the door leaves	2400	2400	2401	2400
Door frame opening (w x h)	1120 x 2390	1120 x 2390	1120 x 2390	1125 x 2390
Door leaf Thickness	54	54	56.3	55.7
Weight of the door leaf	131.1 kg	131.1 kg	146.3 kg	139.4 kg

3.1 Description of the door set

The door leaf of both test specimens was made of 54 mm thick palm strand board (PSB) of 880 kg/m^3 density, and is surrounded by 3mmx54mm (thk. x w) Mahogany hardwood lipping with a density of 640 kg/m^3, along its perimeter fixed using adhesive -Kleibrit PUR 501 glue from Kleibrit. The main difference between door 1 and 2, was that door 2 has a PSB core thickness of 49 mm and 2.5 mm thick medium density fibreboard (MDF) decking of density 720 kg/m^3 on both sides.

Both of the door samples were utilizing PSB of 880 kg/m^3 density as the material for the door frame. Except for door 2, where at the maximum cross-sectional thickness has a thickness of 51.5 mm of PSB and a layer of 2.5 mm MDF decking.

The architrave of 18x60mm dimension was made from PSB with a density of 880 kg/m^3 fixed onto the frame on both sides using ø1.5x34mm nails (measured by ESL) with 390mm spacing.

Doorset gaskets:

Both of the doorsets have the same hardware.

– 2 pcs of 15x6mm PVC encapsulated FP series Intumescent strip, produced by Athmer – see Photo 1 – door frame rebate.

– 1 pc of 15x4mm PVC encapsulated FP series Intumescent strip, produced by Athmer – see Photo 2 and 3 – vertical and the top horizontal edges of the door leaf.

– 1 pc of 11 x7mm Silicone compression seal (PS 0704 S - P10056), produced by Athmer – see Photo 1 – door frame rebate.

Photo 1. Door frame rebate of door 1 and door 2 respectively.

Photo 2. Vertical and top horizontal edge of door 1.

Photo 3. Vertical and top horizontal edge of door 2.

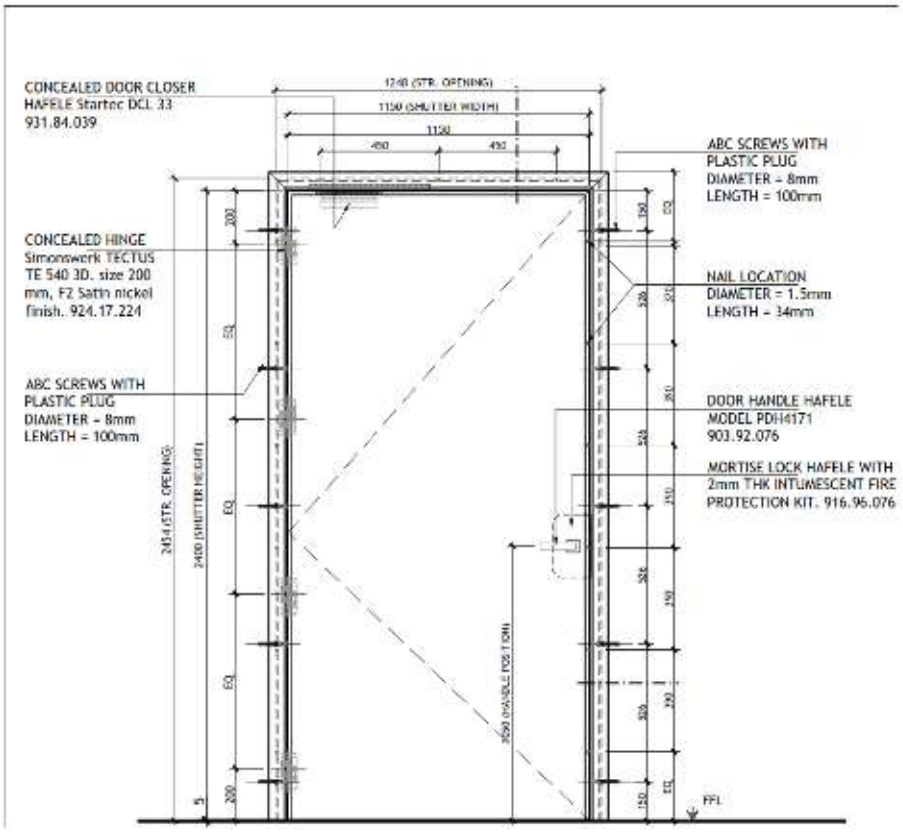


Figure 1. Specimen layout for door 1 and 2.

3.2 Door Hardware

Table 2

Lock		
	Door 1	**Door 2**
Manufacturer	**HAFELE**	**HAFELE**
Ref no.	911.02.145	911.02.145
Type	Stainless steel	Stainless steel
Quantity	1	1
Components	1	1
Latch throw	12.3 mm	11.7 mm
Fixing Method	Fixed 1045mm from the bottom edge of the door leaf (measured by ESL)	Fixed 1045mm from the bottom edge of the door leaf (measured by ESL)

Table 3

Handle		
	Door 1	**Door 2**
Manufacturer	**HAFELE**	**HAFELE**
Ref no.	903.92.076	903.92.076
Type	Stainless steel	Stainless steel
Quantity	2	2
Fixing Method	Fixed 1025mm from the bottom edge of the door leaf (measured by ESL)	Fixed 1030mm from the bottom edge of the door leaf (measured by ESL)

Table 4

Lock cylinder		
	Door 1	**Door 2**
Manufacturer	**HAFELE**	**HAFELE**
Ref no.	916.96.076	916.96.076
Type	Euro profile double cylinder	Euro profile double cylinder
Quantity	1	1
Components	Brass	Brass
Fixing Method	Fixed in the mortise lock, at 968 mm from the bottom edge of the door leaf. (measured by ESL)	Fixed in the mortise lock, at 965 mm from the bottom edge of the door leaf. (measured by ESL)

Table 5

Hinges		
	Door 1	**Door 2**
Manufacturer	**HAFELE**	**HAFELE**
Ref no.	924.17.224 TECTUS TE 540 3D	924.17.224 TECTUS TE 540 3D
Type	Concealed	Concealed
Quantity	4 pcs.	4 pcs.
Fixing Method	Hinges are fixed to the door and the frame using 8pcs. of screws fixed at 200mm, 865mm, 1534mm and 2205mm from the sill of the door. (measured by ESL)	Hinges are fixed to the door and the frame using 8pcs. of screws fixed at 200mm, 865mm, 1534mm and 2202mm from the sill of the door. (measured by ESL)

Table 6

Door closer		
	Door 1	**Door 2**
Manufacturer	**HAFELE**	**HAFELE**
Ref no.	931.84.039	931.84.039
Type	Concealed	Concealed
Quantity	1	1
Fixing Method	The door closer were fixed as per the manufacturer's instruction.	The door closer were fixed as per the manufacturer's instruction.

Table 7

Dropseal		
	Door 1	**Door 2**
Manufacturer	**Athmer**	**Athmer**
Ref no.	Schall-Ex L-14/35 EK	Schall-Ex L-14/35 EK
Dimensions	14x35mm	14x35mm
Quantity	1	1
Fixing Method	The dropseal was fixed on the bottom edge of the door leaf, with 2mm thick intumescent fire protection kit.	The dropseal was fixed on the bottom edge of the door leaf, with 2mm thick intumescent fire protection kit.

Note: The information provided has been compiled based on the information received from test sponsor unless stated differently.

3.3 Installation

The doorsets were installed in the supporting construction with 10 mm gap on the perimeter of the door frame filled with 813+ fire retardant foam from Boss products and fixed with 10 pcs of 8 x 120 mm (measured by ESL) screws with plastic plugs (5 pcs on each of the vertical sides). In addition, the frame was sealed to 10 mm depth using FS702 Intumastic fire resistant acrylic sealant from Nullifire, was then covered by the architrave with an adhesive from Ritver and secured by 1.5 mm x 34 mm nails (measured by ESL).
(Information based on ESL observation during the installation.)

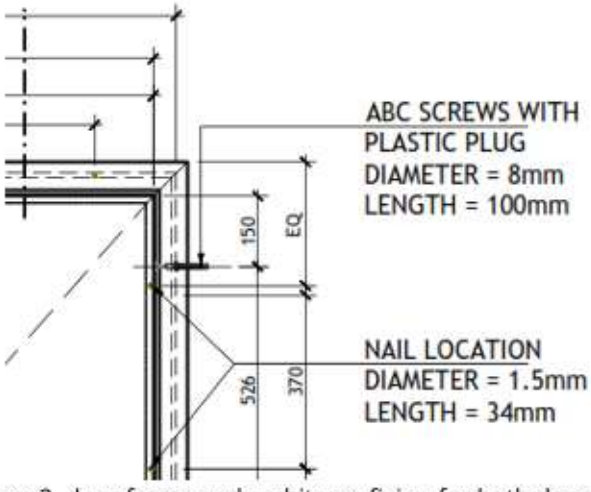


Figure 2. door frame and architrave fixing for both door 1 and door 2.

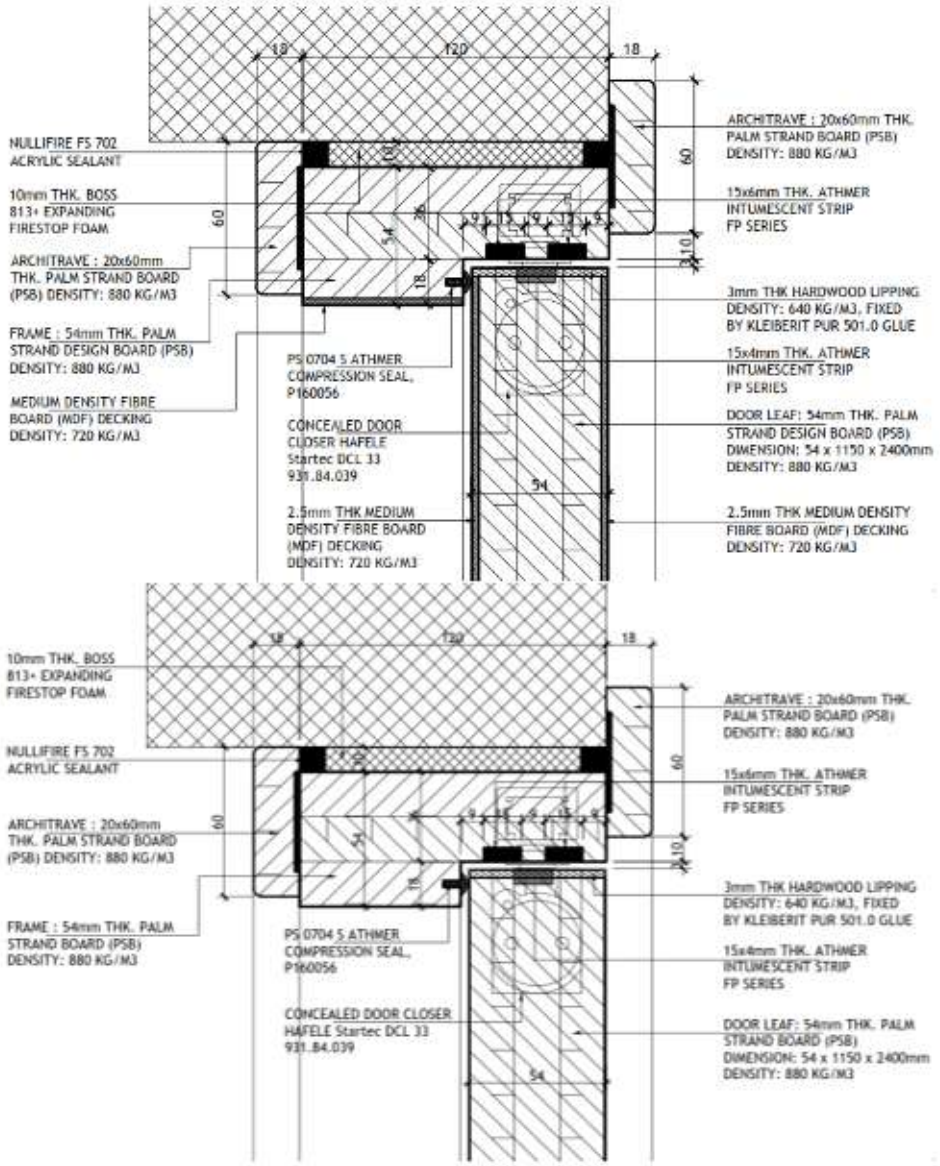


Figure 3. Top edge cross-section of door 1 and door 2 respectively.

3.4 Description of the supporting construction

The door set was installed in a high-density rigid standard supporting construction (according to EN 1363-1 standard) made of 150mm thick concrete blocks and two structural openings of size 1248mm x 2454mm (w x h). The supporting construction filled the test frame of dimensions 4240x4240mm, made of a steel H-profile. The whole construction was used to close the furnace.

3.5 Verification

Verification of the test element(s) was performed before the test, during the assembly and after the test. It included visual inspection of constructional details and its assembly method as well as assessment of dimensions' conformity with technical documentation.

4 PRE-TEST PREPARATION

4.1 Conditioning

The door set was installed by the manufacturer from 05th to 06th-March-2024 in the previously conditioned supporting construction. The test specimen was conditioned for 1 day afterwards under following conditions:
– relative humidity: min RH (%): 36.7, max RH (%): 67.4,
– temperature: min temp. (°C): 24.1, max temp. (°C): 28.1.

4.2 Operability test

The test element(s) prior to the fire resistance test and after conditioning were submitted to operability according to EN 16034:2014, by operating 25 cycles of opening to 90° and fully closed of the door leaf. The arm of the door closer is fixed to the door frame.

4.3 Closing force measurements

The maximum closing force of the door leaf 1 and 2, measured prior to the test, to an opening distance of 100mm, was 68N and 54N respectively.

4.4 Gaps measurements

Gaps measurements made in ESL laboratory are shown in Table 8.

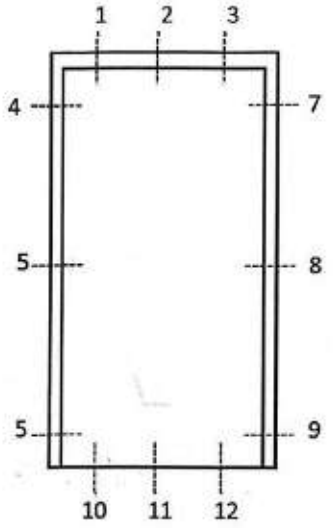


Figure 4. locations for gap measurement

Table 8

No.	Exposed side (mm)	
	Door 1	Door 2
1	2.8	2.9
2	2.4	2.7
3	3.2	2.4
4	2.8	2.0
5	2.2	1.9
6	2.1	2.2
7	2.7	2.3
8	2.5	3.2
9	2.1	2.0
10	1.2	2.4
11	5.2	4.1
12	5.5	2.8

Maximum Permitted Gaps

Maximum permitted gaps are shown in Table 9.

Table 9

GAPS			Measurements, mm		
			Average	Maximum	Permitted gap size
Door 1	Along the horizontal edges	At the top	2.8	3.2	5.0
		At the bottom	4.0	5.5	6.7

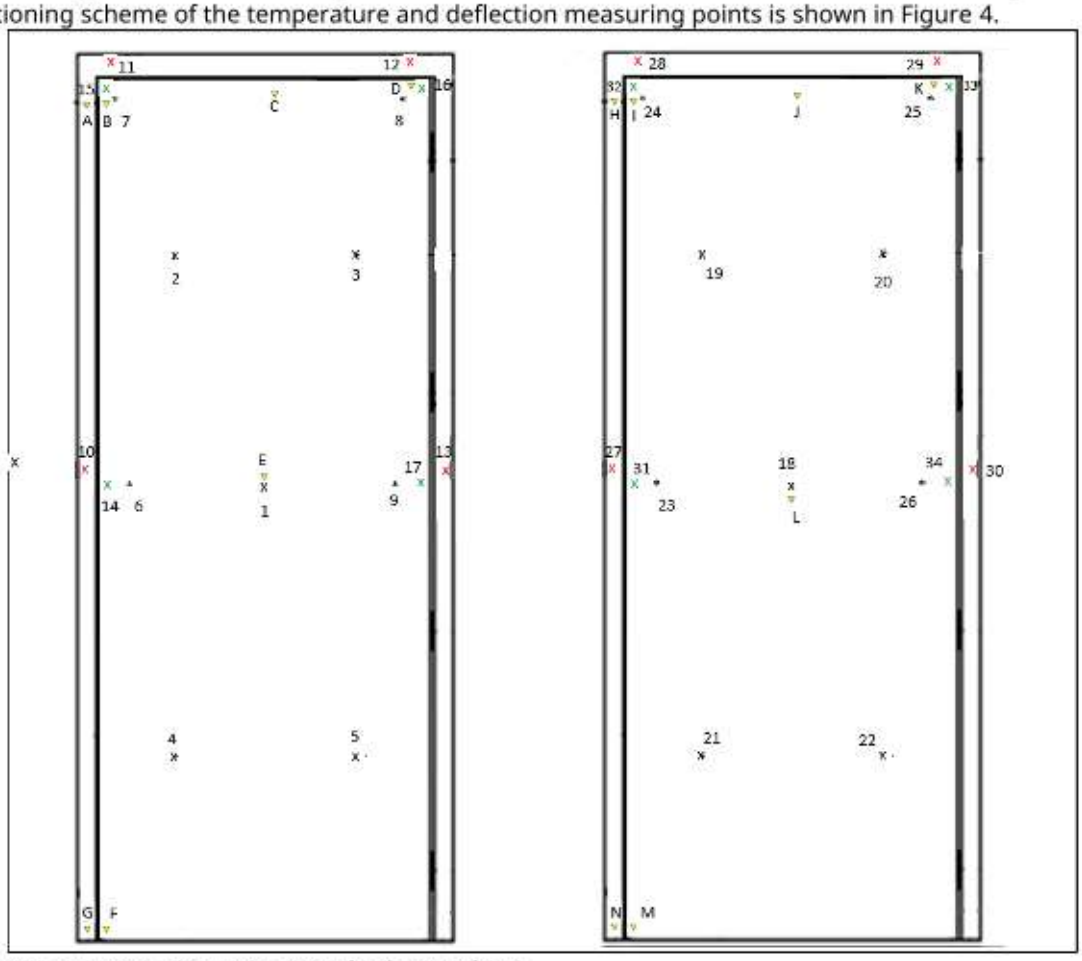
GAPS			Measurements, mm		
			Average	Maximum	Permitted gap size
Door 1	Along the vertical edges	Hinge side	2.3	2.7	4.5
		Lock side	2.4	2.7	4.6
Door 2	Along the horizontal edges	At the top	2.7	2.9	4.8
		At the bottom	3.1	4.1	5.6
	Along the vertical edges	Hinge side	2.0	2.2	4.1
		Lock side	2.5	3.2	4.9

4.5 Final settings

Prior to the fire resistance test, the test specimen(s) was subjected to a final closing involving opening the leaf to a distance of approximately 300 mm and returning it to the closed position. The door was latched but not locked and the key was removed from the lock. The door closer is as per normal application on site, connected and operational.

4.6 Arrangement of temperature and deflection measurement points

The positioning scheme of the temperature and deflection measuring points is shown in Figure 4.

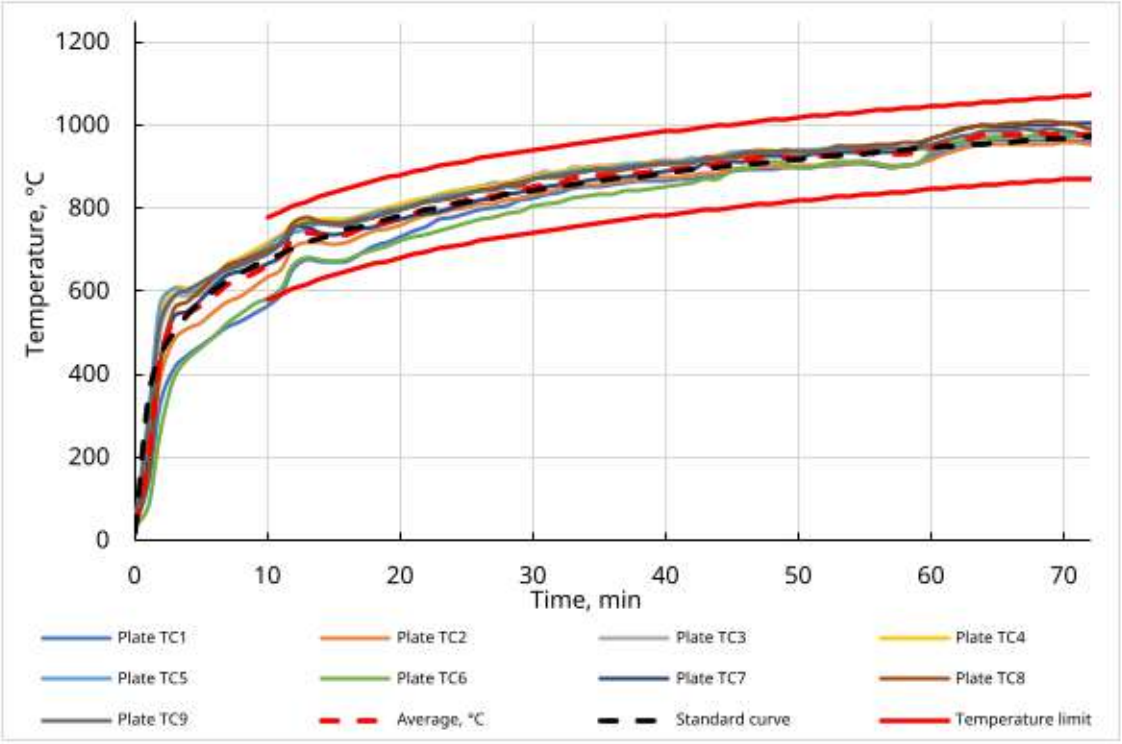


* – Temperature measuring point (standard procedure).
X – Temperature measuring point (frame).
X – Temperature measuring point (supplementary procedure).
▽ – Deflection measuring point.

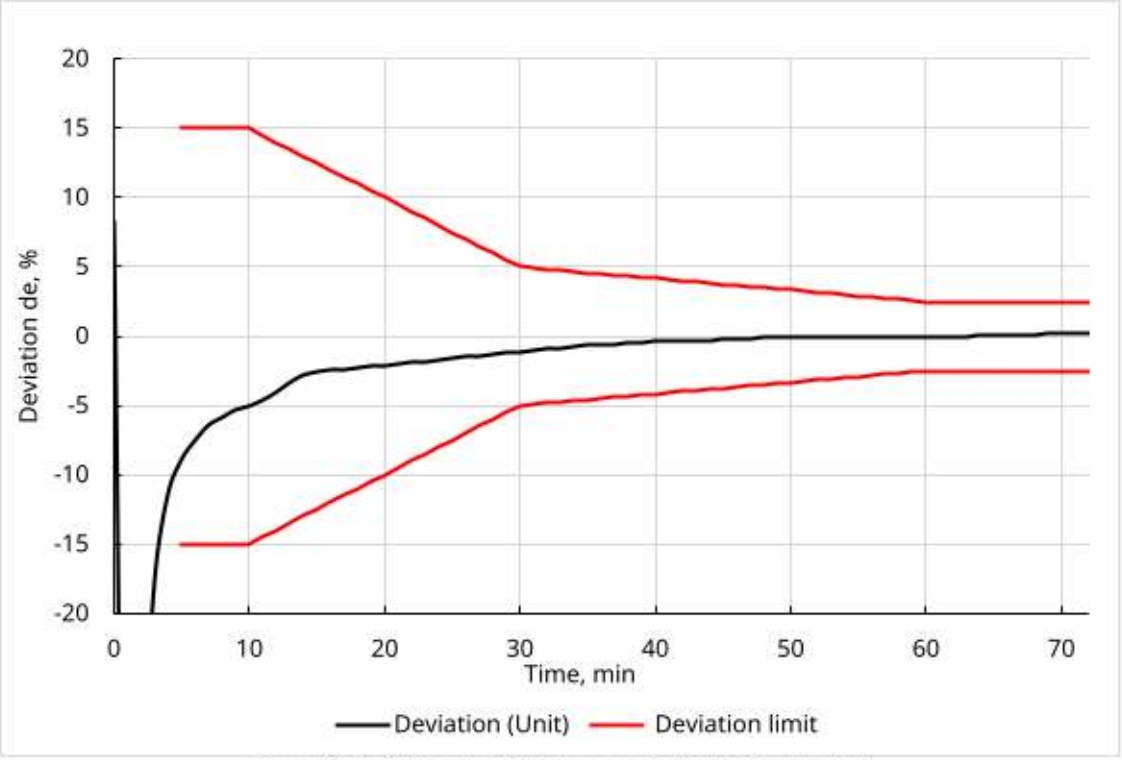
Figure 5. Scheme of the temperature and deflection measuring points on the unexposed side of the door set.

5 TEST RESULTS

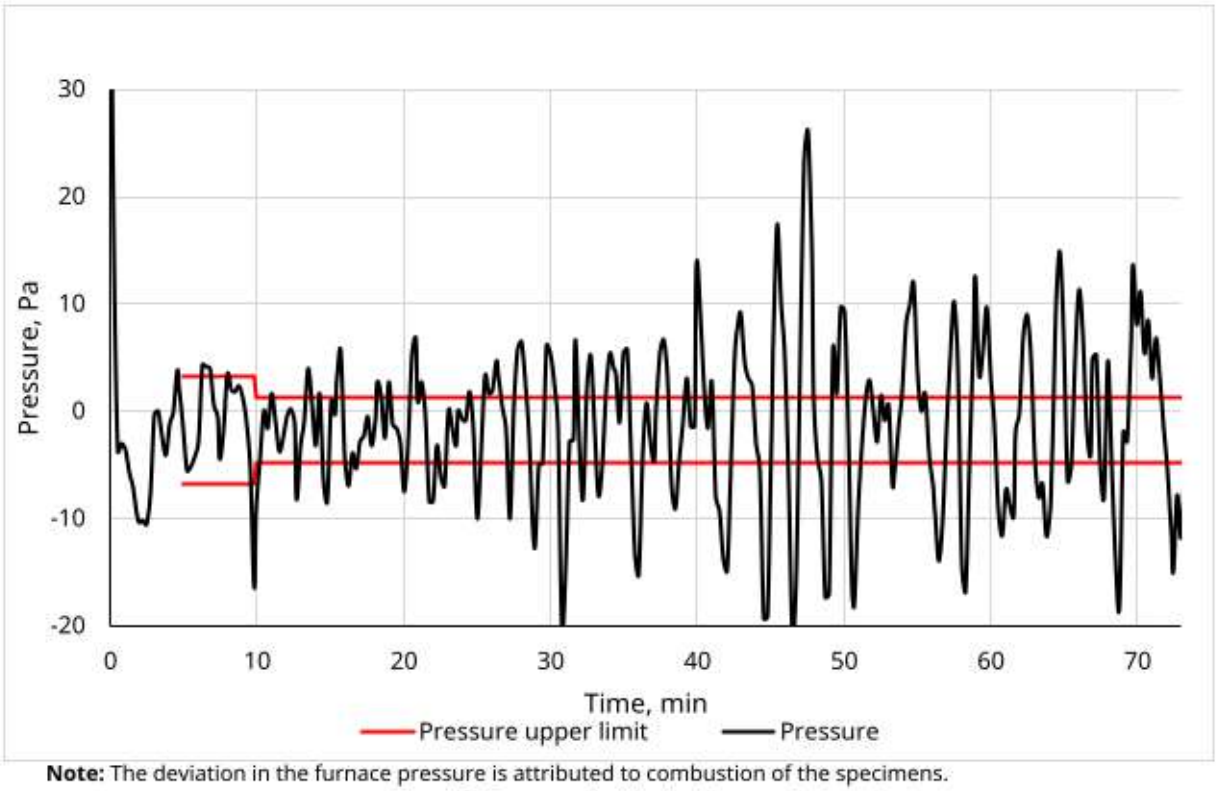
5.1 Furnace conditions



Graph 1. Temperature in the furnace during the test

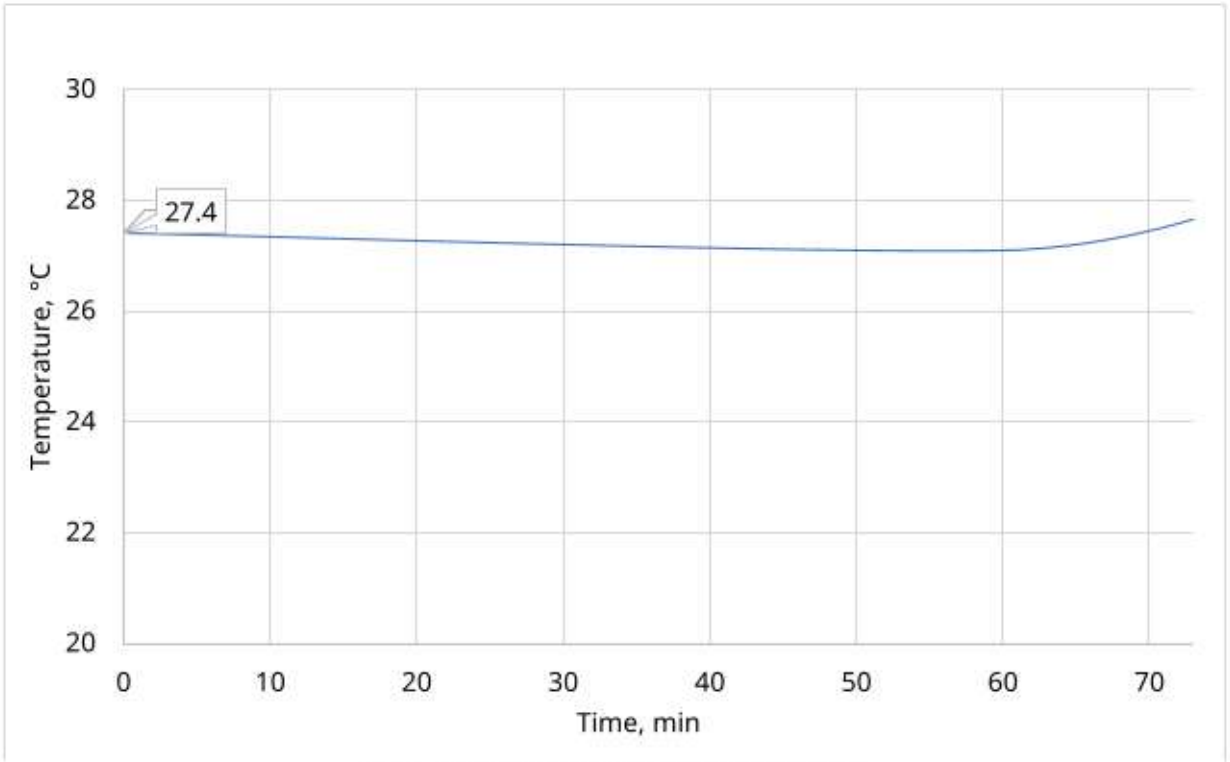


Graph 2. Deviation d_e with tolerance limits during the test



Note: The deviation in the furnace pressure is attributed to combustion of the specimens.

Graph 3. Pressure inside the furnace during the test



Graph 4. Ambient temperature during the test

EN 1363-1 describes that, should the conditions of the furnace temperature, furnace pressure or ambient temperature which are achieved during the test represent a more severe exposure to the test specimens, the test is still to be considered valid. (Clause 5.7, EN 1363-1:2020).

5.2 Fire test results

5.2.1 Observations

Table 10. Observation during the test.

Time, (min)	OBSERVATION
0	Start of the test.
4	Smoke from the sill of both doors.
5	Smoke from the top right corner of door 1.
6	Smoke from the sill of door 1.
14	Smoke from the sill of both doors.
	Smoke from the top right corner of door 1.
15	Both doors are stable.
16	Smoke from the top right and sill of door 1 and sill of door 2.
17	Smoke from the latch/lock of both doors.
18	Smoke from the top of door 1.
19	Smoke from top right corner and sill of door 1. Sill of door 2.
37	Smoke from the bottom right corner of door 1.
50	No change, both doors are stable.
59	Samples are stable. Strange fluid at the bottom left corner of door 1.
62	TC 33 fell off from door 2.
64	Intermittent flaming for less than 10 seconds noticed at the top right corner of door 1.
68[41]	Sustained flaming for more than 10 seconds at the top right corner of door 1. Integrity failure.
69[30]	Cotton pad application at top left of door 2, charring, no ignition.
72[44]	Sustained flaming for more than 10 seconds at the top right corner of door 2, Integrity failure.
73	End of test.

5.2.2 Deflection measurements

Deflection measurements are shown in Table 11.

Table 11.

	Time (min.)	***Deflection at the measuring point, mm***													
		Door 1							**Door 2**						
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**
„+" Deflection towards the furnace *„-" Deflection outwards the furnace*	10	+3	-	-	-	-	-	-	-	-	-	-	-	-	-
	20	+3	+2	+2	+1	+9	-3	0	+3	+2	+5	0	+5	-2	-2
	30	+1	+1	0	+1	+5	-2	-3	+3	+2	+3	+3	+3	-2	-2
	40	+2	0	0	+1	+1	-3	-2	+4	+4	+3	+1	0	0	-2
	50	+3	+3	0	+5	+10	-3	-1	+3	+6	+5	+6	-5	-1	-2
	55	+3	+7	0	+3	-9	0	-1	+4	+6	+5	+5	-4	+1	-2
	60	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1
	70	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1

/1 – measurements where not taken due to safety concerns on some deflection points and after 50+ minutes onwards

5.2.3 Temperature rise & radiation measurements on the unexposed side of the door

Temperature rise on the unexposed side of door set is shown in table 12 and table 13.

Table 12. Temperature rise on the unexposed side of door 1

Time (min)	Door 1																	ΔT_{avg} Avg.	ΔT_{max} pts.: Std.	ΔT_{max} pts.: supp	ΔT_{max} pts.: Frame	Radiation
	Standard Procedure									Door Frame				Supplementary Procedure				1-5,	1-9,	1-17	10 - 13	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	°C	°C	°C	°C	Kw/m²
0	0.2	0.7	0.7	0.6	-0.4	0.3	0.9	0.1	-0.3	-0.6	-0.3	-0.3	-0.6	-0.3	0.1	0.2	-0.4	0.4	0.9	0.9	-0.3	-0.02
1	0.2	0.7	0.8	0.6	-0.5	0.3	0.9	0.0	-0.2	-0.7	-0.4	-0.4	-0.7	-0.2	0.1	0.2	-0.5	0.4	0.9	0.9	-0.4	-0.02
2	0.3	0.8	0.8	0.6	-0.4	0.3	0.9	0.1	-0.2	-0.6	-0.3	-0.2	-0.5	-0.2	0.1	0.1	-0.4	0.4	0.9	0.9	-0.2	-0.02
3	0.3	0.9	0.8	0.7	-0.5	0.4	0.9	4.3	-0.2	-0.5	-0.3	-0.4	-0.6	-0.2	0.1	0.8	-0.4	0.5	4.3	4.3	-0.3	-0.02
4	0.3	0.8	0.8	0.7	-0.5	0.5	1.1	11.8	-0.2	-0.6	-0.4	0.1	-0.6	-0.1	0.3	3.1	-0.3	0.4	11.8	11.8	0.1	-0.02
5	0.4	0.9	0.9	0.8	-0.4	0.4	1.0	9.3	-0.1	-0.6	-0.3	0.1	-0.6	0.0	0.2	2.6	-0.2	0.5	9.3	9.3	0.1	-0.02
6	0.4	0.9	0.8	1.1	-0.4	0.6	1.0	15.4	-0.1	-0.5	-0.2	0.1	-0.6	0.1	0.3	4.1	-0.3	0.6	15.4	15.4	0.1	-0.02
7	0.4	0.9	0.9	1.0	-0.4	0.5	0.9	11.0	-0.1	-0.6	-0.2	0.2	-0.5	0.2	0.4	2.8	-0.2	0.6	11.0	11.0	0.2	-0.01
8	0.4	0.8	0.8	0.8	-0.4	0.4	1.0	7.4	-0.1	-0.6	-0.3	-0.2	-0.6	0.1	0.2	1.7	-0.3	0.5	7.4	7.4	-0.2	-0.01
9	0.4	0.8	0.9	0.9	-0.4	0.4	1.0	5.4	-0.1	-0.6	-0.3	-0.2	-0.6	0.2	0.2	1.4	-0.2	0.5	5.4	5.4	-0.2	0.00
10	0.3	0.9	0.9	0.9	-0.5	0.5	1.0	4.3	-0.1	-0.6	-0.4	-0.3	-0.6	0.4	0.4	1.3	-0.1	0.5	4.3	4.3	-0.3	0.00
11	1.0	1.1	1.3	1.1	0.0	0.6	1.1	8.4	0.1	-0.7	-0.2	0.3	-0.6	1.3	0.6	2.6	-0.1	0.9	8.4	8.4	0.3	0.01
12	1.1	1.3	1.3	1.5	-0.2	0.7	1.3	13.6	0.0	-0.5	0.0	0.5	-0.6	2.5	1.0	4.3	0.0	1.0	13.6	13.6	0.5	0.02
13	1.1	1.2	1.5	1.4	-0.1	1.0	1.3	14.8	0.2	-0.5	-0.1	0.7	-0.6	3.2	1.0	5.1	0.0	1.0	14.8	14.8	0.7	0.02
14	1.1	1.2	1.4	1.2	-0.1	0.9	1.3	11.2	0.2	-0.6	-0.2	0.5	-0.5	4.4	1.2	3.8	0.1	1.0	11.2	11.2	0.5	0.03
15	0.8	1.2	1.3	1.7	-0.1	1.6	1.5	15.8	0.1	-0.3	0.0	0.2	-0.6	4.3	1.5	5.0	0.3	1.0	15.8	15.8	0.2	0.05
16	0.8	1.3	1.1	1.7	-0.2	1.8	1.6	13.3	0.2	-0.4	0.0	0.1	-0.6	4.2	2.0	4.0	0.4	1.0	13.3	13.3	0.1	0.04
17	1.0	1.4	1.3	1.8	-0.2	2.3	1.7	16.7	0.2	-0.5	0.0	0.3	-0.7	5.8	2.2	5.3	0.7	1.1	16.7	16.7	0.3	0.07
18	1.7	1.5	1.8	1.5	0.2	1.9	1.8	21.9	0.6	-0.5	0.0	0.8	-0.6	8.1	2.7	6.2	1.0	1.4	21.9	21.9	0.8	0.07
19	1.3	1.5	1.6	1.9	0.1	1.6	1.9	17.3	0.6	-0.6	0.0	0.4	-0.6	8.1	3.0	5.7	1.3	1.3	17.3	17.3	0.4	0.08
20	1.2	1.6	1.6	1.6	0.3	1.6	2.0	11.7	0.7	-0.5	-0.1	0.2	-0.6	7.8	3.3	5.3	1.7	1.3	11.7	11.7	0.2	0.09
21	1.4	1.8	1.8	1.9	0.4	1.7	2.2	12.0	0.9	-0.6	0.0	0.2	-0.6	8.4	3.9	6.0	2.0	1.5	12.0	12.0	0.2	0.10
22	1.6	2.0	2.0	1.7	0.4	1.6	2.3	8.7	1.1	-0.6	-0.1	0.1	-0.6	8.7	4.0	6.1	2.4	1.6	8.7	8.7	0.1	0.10
23	1.8	2.3	2.2	2.2	0.7	2.0	2.8	8.9	1.4	-0.5	0.1	0.3	-0.5	9.4	4.8	6.9	2.9	1.9	8.9	9.4	0.3	0.11
24	2.2	2.6	2.5	2.6	0.9	2.4	3.1	10.7	1.8	-0.4	0.5	0.2	-0.6	10.8	5.8	7.4	3.5	2.2	10.7	10.8	0.5	0.13
25	2.4	2.9	2.7	2.8	1.2	2.7	3.5	9.4	2.0	-0.5	0.4	0.3	-0.5	11.1	6.3	8.1	4.0	2.4	9.4	11.1	0.4	0.13
26	2.9	3.2	3.2	2.9	1.6	2.8	3.7	8.4	2.4	-0.6	0.2	0.4	-0.5	11.8	6.8	8.9	4.7	2.8	8.4	11.8	0.4	0.15
27	2.9	3.5	3.5	3.2	1.7	3.2	4.0	7.2	2.8	-0.5	0.2	0.3	-0.5	11.9	7.2	9.7	5.2	3.0	7.2	11.9	0.3	0.16
28	3.4	3.9	3.8	3.4	1.8	3.7	4.5	6.5	3.1	-0.5	0.2	0.4	-0.5	12.1	7.6	10.7	5.9	3.3	6.5	12.1	0.4	0.17
29	3.8	4.3	4.2	3.8	2.1	4.1	5.0	6.0	3.4	-0.5	0.2	0.5	-0.6	12.6	8.2	11.8	6.6	3.7	6.0	12.6	0.5	0.17
30	4.2	4.8	4.6	4.2	2.4	4.7	5.5	5.9	3.8	-0.5	0.4	0.6	-0.5	13.5	9.0	12.6	7.4	4.1	5.9	13.5	0.6	0.19

Time (min)	Door 1																	ΔT_{avg} Avg.	ΔT_{max} pts.: Std.	ΔT_{max} pts.: supp	ΔT_{max} pts.: Frame	Radiation
	Standard Procedure									Door Frame				Supplementary Procedure				1-5,	1-9,	1-17	10 - 13	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	°C	°C	°C	°C	Kw/m²
31	4.7	5.3	5.3	4.8	2.8	5.0	6.1	6.3	4.4	-0.5	0.4	0.7	-0.6	15.1	9.8	13.3	8.2	4.6	6.3	15.1	0.7	0.20
32	5.6	5.9	5.9	5.2	3.2	5.6	6.8	6.6	5.0	-0.4	0.6	0.9	-0.6	16.4	10.9	14.6	9.3	5.2	6.8	16.4	0.9	0.21
33	5.9	6.4	6.7	5.5	3.9	6.2	7.5	7.2	5.8	-0.3	0.7	0.9	-0.5	17.6	11.8	15.9	10.3	5.7	7.5	17.6	0.9	0.21
34	6.7	7.3	7.4	6.1	4.1	7.1	8.5	7.9	6.5	-0.1	1.0	1.1	-0.3	19.3	13.1	17.5	11.5	6.3	8.5	19.3	1.1	0.21
35	7.6	8.1	8.3	6.8	4.7	8.1	9.7	8.6	7.3	-0.2	1.0	1.1	-0.3	19.1	14.4	18.1	12.9	7.1	9.7	19.1	1.1	0.24
36	8.5	8.8	9.2	7.3	5.7	8.7	10.7	9.6	8.4	-0.2	1.1	1.2	-0.2	20.4	15.7	20.2	14.1	7.9	10.7	20.4	1.2	0.24
37	9.7	10.0	10.3	8.3	6.2	9.7	11.9	10.6	9.6	-0.1	1.4	1.4	-0.2	22.2	17.1	21.1	15.8	8.9	11.9	22.2	1.4	0.14
38	10.7	11.1	11.2	9.1	6.8	10.6	13.0	11.2	10.4	-0.2	1.4	1.5	-0.2	23.1	18.5	22.6	17.0	9.8	13.0	23.1	1.5	0.25
39	11.6	12.2	12.3	9.7	7.5	11.8	14.5	11.9	11.4	-0.1	1.7	1.7	-0.1	24.1	19.9	24.2	18.6	10.7	14.5	24.2	1.7	0.25
40	12.8	13.2	13.1	10.6	8.2	12.9	15.6	12.9	12.4	0.0	1.9	1.8	0.0	25.5	21.2	25.8	19.8	11.6	15.6	25.8	1.9	0.28
41	13.8	14.4	14.3	11.7	9.2	14.2	16.7	13.6	13.4	0.0	2.0	2.0	0.1	26.9	22.4	27.2	21.2	12.7	16.7	27.2	2.0	0.26
42	14.8	15.4	15.3	12.7	10.1	15.4	17.9	14.4	14.4	0.1	2.3	2.2	0.2	28.3	23.6	30.6	22.6	13.7	17.9	30.6	2.3	0.10
43	15.8	16.4	16.2	13.8	11.1	16.6	19.0	15.1	15.3	0.4	2.6	2.6	0.3	29.8	25.2	31.6	24.1	14.7	19.0	31.6	2.6	0.27
44	16.8	17.4	17.2	14.9	12.0	17.7	20.1	16.1	16.2	0.3	2.7	2.7	0.3	31.0	26.5	34.5	25.3	15.7	20.1	34.5	2.7	0.30
45	17.8	18.5	18.1	15.8	12.9	18.9	21.1	16.9	17.2	0.3	3.0	3.1	0.5	32.9	28.1	37.4	26.5	16.6	21.1	37.4	3.1	0.32
46	18.6	19.3	19.0	16.7	14.0	20.1	21.9	18.0	18.2	0.5	3.2	3.4	0.5	34.3	29.1	41.5	28.0	17.5	21.9	41.5	3.4	0.32
47	19.4	20.3	20.0	17.8	14.8	21.3	22.8	18.8	19.0	0.6	3.4	3.4	0.6	35.5	30.4	42.9	29.2	18.4	22.8	42.9	3.4	0.34
48	20.3	21.1	20.8	18.5	15.2	22.1	23.6	19.7	19.9	0.6	3.6	3.7	0.8	36.2	32.2	44.9	30.8	19.1	23.6	44.9	3.7	0.33
49	21.1	21.9	21.6	19.4	16.0	22.8	24.4	21.0	20.6	0.8	3.9	4.0	0.8	37.5	35.2	46.6	32.5	20.0	24.4	46.6	4.0	0.31
50	22.0	22.8	22.3	20.2	16.8	23.8	25.4	22.0	21.5	1.0	4.2	4.3	0.9	39.8	39.8	47.6	34.4	20.8	25.4	47.6	4.3	0.30
51	22.8	23.6	23.1	21.1	17.0	24.3	26.3	22.8	22.2	1.1	4.5	4.7	1.1	42.1	45.4	49.7	36.8	21.5	26.3	49.7	4.7	0.36
52	23.6	24.4	24.2	21.8	17.7	25.1	27.1	24.0	22.9	1.4	5.0	4.9	1.3	45.4	51.5	50.3	40.2	22.3	27.1	51.5	5.0	0.35
53	24.4	25.1	24.9	22.6	19.1	26.2	28.0	24.9	23.7	1.4	5.2	5.3	1.5	49.4	57.3	49.7	43.9	23.2	28.0	57.3	5.3	0.37
54	25.1	25.9	25.8	23.6	19.7	27.2	28.8	26.1	24.4	1.6	5.8	5.8	1.8	55.5	61.9	50.2	47.5	24.0	28.8	61.9	5.8	0.35
55	25.9	26.8	26.8	24.5	20.5	28.4	29.7	27.5	25.2	1.7	6.2	6.1	2.3	60.4	63.5	50.6	51.1	24.9	29.7	63.5	6.2	0.39
56	26.9	27.7	27.8	25.6	21.3	29.7	30.8	29.4	26.3	1.9	6.8	6.6	2.6	64.6	65.2	56.6	54.0	25.8	30.8	65.2	6.8	0.39
57	27.7	28.6	28.8	27.3	21.9	34.2	33.3	32.6	27.3	2.4	7.7	7.3	3.0	67.5	66.3	54.3	57.0	26.8	34.2	67.5	7.7	0.38
58	28.8	29.9	30.0	29.4	22.3	64.2	49.3	39.2	28.1	2.5	8.8	7.7	3.5	68.8	67.0	54.7	59.9	28.1	64.2	68.8	8.8	0.43
59	30.0	31.8	31.6	33.2	23.1	66.6	62.0	48.3	29.3	2.7	9.8	8.5	3.9	69.4	67.5	57.6	62.3	29.9	66.6	69.4	9.8	0.44
60	31.6	33.8	33.6	38.5	23.9	67.5	66.8	55.4	30.6	3.0	11.0	8.9	4.2	69.5	67.8	57.9	64.0	32.3	67.5	69.5	11.0	0.44
61	33.9	36.1	36.3	44.0	24.7	67.6	68.9	59.9	32.4	3.1	12.0	9.7	4.7	70.8	68.2	61.9	64.7	35.0	68.9	70.8	12.0	0.44
62	37.4	40.3	40.1	48.9	25.7	67.6	69.7	63.2	35.2	3.3	12.8	11.9	5.1	71.3	70.6	67.6	65.4	38.5	69.7	71.3	12.8	0.34
63	41.5	46.2	47.4	53.0	26.6	67.2	69.2	65.1	41.7	3.7	13.8	11.6	5.5	71.3	71.3	64.9	65.4	42.9	69.2	71.3	13.8	0.42
64	47.5	53.1	54.7	56.1	28.2	66.9	68.6	66.8	55.7	3.8	14.6	15.9	5.8	71.8	72.3	232.2	65.1	47.9	68.6	**232.2**	15.9	0.44
65	55.1	58.3	58.5	57.4	30.5	66.7	68.0	69.3	62.5	4.1	14.3	15.4	6.2	72.5	74.6	194.2	65.3	52.0	69.3	194.2	15.4	0.49
66	60.1	62.4	60.2	59.4	33.1	66.7	67.9	70.9	64.9	4.3	13.9	17.6	6.7	73.0	74.1	294.2	65.7	55.0	70.9	294.2	17.6	0.47
67	61.3	62.7	60.9	60.8	25.0	66.0	67.9	70.5	65.4	4.6	13.8	15.9	7.2	73.9	74.1	215.7	66.0	54.1	70.5	215.7	15.9	0.49

Time (min)	Door 1																	ΔT_{avg} Avg.	ΔT_{max} pts.: Std.	ΔT_{max} pts.: supp	ΔT_{max} pts.: Frame	Radiation
	Standard Procedure									Door Frame				Supplementary Procedure				1-5,	1-9,	1-17	10 - 13	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	°C	°C	°C	°C	Kw/m²
68	61.8	64.8	61.5	61.4	31.6	65.7	67.4	74.3	64.8	4.7	13.7	17.4	7.5	74.4	75.5	259.0	65.7	56.2	74.3	259.0	17.4	0.50
69	62.1	65.1	61.5	62.0	38.7	64.9	67.6	193.8	66.0	5.1	16.8	22.2	7.9	75.7	82.6	914.9	65.7	57.8	193.8	914.9	22.2	0.53
70	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	0.52
71	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	0.53
72	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	0.54
73	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	/1	0.55

/1 - thermocouples have been removed due to the flaming of the doorset.

Table 13. Temperature rise on the unexposed side of door 2

Time (min)	Door 2																	ΔT_{avg} Avg.	ΔT_{max} pts.: Std.	ΔT_{max} pts.: supp	ΔT_{max} pts.: Frame	Radiation
	Standard Procedure									Door Frame				Supplementary Procedure				18-22,	18-26,	18-34	27 - 30	
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	°C	°C	°C	°C	Kw/m²
0	-0.1	0.1	0.1	0.0	-0.5	0.1	0.2	0.4	-0.1	-0.9	-0.4	-0.4	-1.0	0.0	-0.7	-1.4	-0.2	-0.1	0.4	0.4	-0.4	-0.1
1	-0.2	0.0	0.2	-0.1	-0.4	0.1	0.2	0.5	-0.1	-0.8	-0.5	-0.4	-0.9	0.0	-0.6	-1.3	-0.1	-0.1	0.5	0.5	-0.4	-0.1
2	0.0	0.1	0.2	0.1	-0.4	0.1	0.1	0.5	0.0	-0.8	-0.4	-0.4	-0.9	0.1	-0.5	-1.3	-0.1	0.0	0.5	0.5	-0.4	-0.1
3	-0.1	0.1	0.2	0.0	-0.4	0.1	0.2	0.7	0.0	-0.8	-0.4	-0.4	-0.9	0.1	-0.6	-1.2	-0.1	0.0	0.7	0.7	-0.4	-0.1
4	0.0	0.1	0.3	-0.1	-0.4	0.1	0.2	0.6	0.0	-0.7	-0.3	-0.4	-1.0	0.1	-0.7	-1.2	0.0	0.0	0.6	0.6	-0.3	-0.1
5	0.0	0.2	0.3	0.1	-0.3	0.2	0.4	0.7	0.0	-0.8	-0.4	-0.3	-0.9	0.2	-0.5	-1.1	0.0	0.1	0.7	0.7	-0.3	-0.1
6	0.1	0.2	0.3	0.2	-0.3	0.3	0.3	0.5	0.0	-0.8	-0.4	-0.4	-1.0	0.2	-0.6	-1.0	0.0	0.1	0.5	0.5	-0.4	0.0
7	0.0	0.2	0.3	0.1	-0.3	0.2	0.3	0.7	0.0	-0.8	-0.4	-0.4	-1.0	0.4	-0.5	-1.0	0.0	0.1	0.7	0.7	-0.4	0.0
8	0.0	0.2	0.3	0.0	-0.4	0.2	0.3	0.6	0.0	-0.8	-0.3	-0.3	-0.9	0.5	-0.3	-0.8	0.0	0.0	0.6	0.6	-0.3	0.0
9	0.0	0.3	0.3	0.1	-0.4	0.1	0.3	0.5	0.0	-0.8	-0.5	-0.4	-1.0	0.5	-0.3	-0.8	0.0	0.1	0.5	0.5	-0.4	0.0
10	-0.1	0.2	0.2	0.0	-0.3	0.2	0.3	0.7	-0.1	-0.8	-0.4	-0.5	-0.9	0.6	-0.1	-0.6	-0.1	0.0	0.7	0.7	-0.4	0.0
11	0.0	0.3	0.3	0.1	-0.4	0.2	0.3	0.7	0.0	-0.9	-0.4	-0.4	-1.0	1.5	0.1	-0.2	0.1	0.1	0.7	1.5	-0.4	0.0
12	0.0	0.2	0.3	0.0	-0.3	0.3	0.4	0.6	0.0	-0.8	-0.3	-0.4	-1.0	2.5	0.4	0.0	0.1	0.0	0.6	2.5	-0.3	0.0
13	0.0	0.3	0.4	0.1	-0.2	0.7	0.5	0.7	0.1	-0.9	-0.3	-0.4	-0.9	3.8	0.7	0.3	0.1	0.1	0.7	3.8	-0.3	0.0
14	0.1	0.4	0.4	0.1	-0.2	1.2	0.6	0.7	0.1	-0.8	-0.2	-0.3	-0.9	4.2	1.1	0.5	0.2	0.2	1.2	4.2	-0.2	0.0
15	0.0	0.3	0.3	0.1	-0.3	1.4	0.6	0.8	0.1	-0.7	-0.3	-0.4	-1.0	4.1	1.3	0.9	0.2	0.1	1.4	4.1	-0.3	0.0
16	0.1	0.4	0.6	0.2	-0.3	1.9	0.5	0.9	0.2	-0.8	-0.3	-0.4	-0.9	4.6	1.6	1.3	0.4	0.2	1.9	4.6	-0.3	0.0
17	0.1	0.5	0.5	0.2	-0.2	2.4	0.8	0.9	0.2	-0.8	-0.2	-0.4	-1.0	5.4	1.8	1.6	0.4	0.2	2.4	5.4	-0.2	0.0
18	0.1	0.8	0.5	0.2	-0.2	3.0	0.8	1.2	0.3	-0.8	-0.2	-0.3	-0.9	6.0	2.5	2.5	0.6	0.3	3.0	6.0	-0.2	0.0

Time (min)	Door 2																	ΔT_{avg} Avg.	ΔT_{max} pts.: Std.	ΔT_{max} pts.: supp	ΔT_{max} pts.: Frame	Radiation
	Standard Procedure									Door Frame				Supplementary Procedure				18-22,	18-26,	18-34	27 - 30	
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	°C	°C	°C	°C	Kw/m²
19	0.3	0.8	0.8	0.4	0.0	3.5	0.9	1.3	0.4	-0.7	-0.1	-0.3	-0.9	5.9	2.8	2.9	0.9	0.5	3.5	5.9	-0.1	0.0
20	0.3	0.8	0.8	0.4	-0.1	2.4	0.9	1.4	0.5	-0.8	-0.4	-0.3	-0.9	5.3	3.2	3.4	1.1	0.4	2.4	5.3	-0.3	0.0
21	0.5	1.0	0.9	0.6	0.1	3.2	1.3	1.7	0.6	-0.8	-0.2	-0.3	-1.0	6.4	3.7	3.9	1.3	0.6	3.2	6.4	-0.2	0.0
22	0.6	1.1	1.1	0.7	0.2	2.2	1.3	1.8	0.7	-0.8	-0.2	-0.3	-1.0	6.5	4.2	4.4	1.7	0.8	2.2	6.5	-0.2	0.0
23	0.8	1.2	1.3	0.9	0.3	3.6	1.6	2.0	0.9	-0.8	-0.2	-0.2	-1.0	7.2	4.7	5.4	2.0	0.9	3.6	7.2	-0.2	0.0
24	1.0	1.5	1.5	1.0	0.6	6.0	2.0	2.3	1.2	-0.8	0.1	-0.1	-0.9	8.5	5.6	5.4	2.5	1.1	6.0	8.5	0.1	0.0
25	1.2	1.8	1.8	1.2	0.7	4.6	2.2	2.8	1.5	-0.7	0.1	0.0	-0.8	9.4	6.4	5.5	3.0	1.4	4.6	9.4	0.1	0.0
26	1.4	2.1	2.0	1.4	0.9	5.7	2.5	3.1	1.8	-0.7	0.1	0.0	-0.8	9.8	7.3	6.3	3.4	1.6	5.7	9.8	0.1	0.0
27	1.6	2.4	2.3	1.7	1.2	3.9	2.8	3.4	2.0	-0.7	0.1	0.0	-0.9	10.3	8.2	6.8	4.0	1.9	3.9	10.3	0.1	0.0
28	1.8	2.6	2.6	2.0	1.5	3.1	3.2	3.7	2.3	-0.7	0.1	0.0	-0.9	10.7	9.6	7.6	4.5	2.1	3.7	10.7	0.1	0.0
29	2.1	2.9	2.8	2.4	1.7	3.0	3.5	4.1	2.5	-0.7	0.0	0.0	-1.0	11.7	11.4	8.1	5.0	2.4	4.1	11.7	0.0	0.0
30	2.4	3.3	3.3	2.6	1.9	3.0	4.1	4.5	2.8	-0.7	0.3	0.1	-1.0	12.9	13.0	8.9	5.7	2.7	4.5	13.0	0.3	0.0
31	2.6	3.7	3.6	2.8	2.3	3.3	4.8	5.0	3.2	-0.7	0.3	0.2	-1.0	14.3	14.9	9.9	6.4	3.0	5.0	14.9	0.3	0.0
32	3.1	4.2	4.1	3.3	2.7	3.9	5.6	5.5	3.6	-0.6	0.5	0.4	-0.9	15.5	16.9	10.9	7.4	3.5	5.6	16.9	0.5	0.0
33	3.5	4.8	4.6	3.5	3.1	4.3	6.4	6.2	4.0	-0.6	0.6	0.6	-0.8	16.9	18.9	12.3	8.2	3.9	6.4	18.9	0.6	0.0
34	4.0	5.6	5.3	4.1	3.5	5.1	7.6	6.8	4.4	-0.4	0.9	0.6	-0.8	18.3	20.9	15.9	9.1	4.5	7.6	20.9	0.9	0.0
35	4.6	6.3	6.0	4.9	4.0	6.0	8.6	7.4	4.9	-0.4	1.0	0.8	-0.7	19.9	22.9	16.3	10.1	5.2	8.6	22.9	1.0	0.0
36	5.2	7.2	6.8	5.5	4.5	6.9	9.8	8.3	5.4	-0.4	1.2	0.9	-0.8	21.7	24.8	17.5	11.2	5.9	9.8	24.8	1.2	0.0
37	6.0	8.2	7.6	6.1	5.2	8.0	10.9	9.1	6.0	-0.3	1.4	1.1	-0.7	23.0	27.5	18.6	12.4	6.6	10.9	27.5	1.4	0.0
38	6.7	9.1	8.6	6.8	6.1	8.9	12.0	10.2	6.8	-0.4	1.6	1.1	-0.7	24.4	28.7	20.4	13.6	7.5	12.0	28.7	1.6	0.0
39	7.7	10.2	9.5	7.8	6.8	10.1	13.2	11.2	7.6	-0.3	1.7	1.3	-0.6	25.9	30.5	20.9	14.9	8.4	13.2	30.5	1.7	0.0
40	8.6	11.2	10.5	8.8	7.6	11.2	14.4	12.2	8.5	-0.2	2.0	1.5	-0.5	27.6	32.9	22.0	16.1	9.4	14.4	32.9	2.0	0.1
41	9.5	12.3	11.6	9.8	8.7	12.2	15.5	13.5	9.4	0.0	2.2	1.8	-0.5	29.0	35.2	23.7	17.3	10.4	15.5	35.2	2.2	0.1
42	10.6	13.3	12.6	10.8	9.7	13.4	16.7	14.6	10.4	0.1	2.5	2.0	-0.5	30.5	38.0	28.8	18.6	11.4	16.7	38.0	2.5	0.1
43	11.5	14.2	13.7	11.7	10.7	14.2	17.6	15.8	11.5	0.3	2.6	2.2	-0.4	32.0	40.3	26.0	19.9	12.4	17.6	40.3	2.6	0.1
44	12.5	15.1	14.8	12.7	12.0	15.1	18.5	16.8	12.5	0.5	2.9	2.5	-0.2	33.6	42.9	27.9	21.2	13.5	18.5	42.9	2.9	0.1
45	13.4	16.1	15.5	13.8	12.7	16.2	19.6	17.7	13.3	0.7	3.3	3.0	-0.3	35.0	47.7	30.2	22.3	14.3	19.6	47.7	3.3	0.1
46	14.5	17.0	16.7	14.7	13.7	17.1	20.5	18.9	14.5	0.9	3.7	3.2	-0.1	36.5	48.0	33.9	23.5	15.3	20.5	48.0	3.7	0.1
47	15.4	17.9	17.5	15.7	14.7	18.0	21.5	20.0	15.3	1.0	3.9	4.0	-0.1	38.0	49.9	34.6	24.6	16.2	21.5	49.9	4.0	0.1
48	16.1	18.7	18.6	16.6	15.8	18.9	22.4	21.2	16.3	1.3	4.4	3.9	0.0	39.7	51.6	44.5	25.8	17.1	22.4	51.6	4.4	0.1
49	16.9	19.6	19.3	17.5	14.9	19.8	23.4	22.1	17.2	1.4	4.7	3.9	0.1	41.4	52.7	44.4	27.0	17.6	23.4	52.7	4.7	0.1
50	17.8	20.4	20.2	18.5	15.4	20.6	24.2	23.0	18.1	1.7	5.1	4.1	0.2	43.8	54.1	38.7	28.1	18.4	24.2	54.1	5.1	0.1
51	18.4	21.2	21.1	19.2	16.1	21.4	25.1	24.0	19.2	1.9	5.4	4.5	0.4	46.6	55.5	40.0	29.2	19.2	25.1	55.5	5.4	0.1
52	19.4	22.0	21.9	20.1	16.6	22.5	26.3	25.0	19.9	2.2	5.9	4.8	0.4	49.9	56.7	40.9	30.4	20.0	26.3	56.7	5.9	0.1
53	20.3	22.9	22.8	21.1	17.3	23.5	27.2	26.0	20.7	2.3	6.1	5.1	0.4	54.2	58.0	40.0	31.7	20.8	27.2	58.0	6.1	0.1
54	21.2	23.8	23.6	22.0	18.1	24.6	28.3	27.0	21.4	2.6	6.6	5.6	0.6	58.1	59.2	41.8	33.5	21.7	28.3	59.2	6.6	0.1
55	22.0	24.6	24.6	22.8	18.9	25.5	29.5	28.5	22.4	2.8	6.9	5.9	0.9	61.4	60.2	43.6	35.7	22.5	29.5	61.4	6.9	0.1

Time (min)	Door 2																	ΔT_{avg} Avg.	ΔT_{max} pts.: Std.	ΔT_{max} pts.: supp	ΔT_{max} pts.: Frame	Radiation
	Standard Procedure									Door Frame				Supplementary Procedure				18-22,	18-26,	18-34	27 - 30	
	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	°C	°C	°C	°C	Kw/m²
56	22.9	25.5	25.6	23.5	19.9	26.7	30.9	31.3	23.1	3.2	7.5	6.3	1.0	63.7	61.0	45.1	37.8	23.4	31.3	63.7	7.5	0.2
57	24.0	26.4	26.5	24.4	20.6	27.9	32.4	38.2	23.8	3.4	8.1	6.7	1.1	65.6	62.4	46.4	40.3	24.3	38.2	65.6	8.1	0.2
58	25.2	27.5	27.5	25.4	21.4	31.4	34.9	46.0	24.7	3.6	8.7	7.0	1.3	67.1	63.4	47.3	42.9	25.4	46.0	67.1	8.7	0.2
59	26.2	28.7	28.8	26.5	22.3	37.7	38.2	51.9	25.6	3.9	9.5	7.6	1.4	68.4	68.4	49.1	45.5	26.5	51.9	68.4	9.5	0.2
60	28.0	30.2	30.4	27.4	23.4	43.2	41.8	55.9	26.5	4.2	9.9	7.8	1.5	69.8	70.4	50.5	48.4	27.9	55.9	70.4	9.9	0.2
61	30.0	32.2	32.3	28.5	24.4	47.7	46.0	58.3	27.6	4.1	10.1	8.6	1.8	70.8	72.2	51.7	51.2	29.5	58.3	72.2	10.1	0.2
62	33.1	35.0	34.9	29.8	25.7	50.8	49.6	60.3	30.7	4.8	11.0	9.9	2.1	71.8	79.4	55.1	53.9	31.7	60.3	79.4	11.0	0.2
63	37.3	39.0	38.5	31.5	27.2	53.0	52.9	61.3	40.0	4.8	11.6	9.8	2.4	72.3	79.4	52.2	56.9	34.7	61.3	79.4	11.6	0.2
64	41.5	44.2	42.9	33.5	28.7	54.5	56.0	61.9	47.1	5.3	12.5	10.6	2.5	72.4	80.0	28.4	60.2	38.2	61.9	80.0	12.5	0.3
65	45.7	49.4	47.4	35.7	30.6	55.4	58.0	62.6	52.4	5.9	12.9	11.1	2.7	72.5	83.7	15.2	63.2	41.8	62.6	83.7	12.9	0.3
66	49.5	54.0	51.2	38.4	31.8	56.3	59.6	63.1	56.0	5.7	13.3	11.6	3.0	72.5	84.2	8.3	65.4	45.0	63.1	84.2	13.3	0.3
67	52.3	57.2	54.6	41.2	35.5	56.8	60.6	63.7	58.2	6.5	13.6	12.1	3.4	72.9	83.2	4.4	66.9	48.2	63.7	83.2	13.6	0.3
68	54.3	59.4	57.5	44.3	40.9	56.8	61.2	64.4	59.5	6.9	14.4	12.7	3.7	73.3	81.6	2.4	68.5	51.3	64.4	81.6	14.4	0.3
69	55.4	60.4	59.6	48.3	45.6	57.0	62.3	65.9	60.6	7.4	20.1	20.5	4.3	73.3	170.2	1.3	70.2	53.9	65.9	170.2	20.5	0.4
70	55.9	60.7	61.1	52.7	50.2	56.9	64.1	70.8	61.1	7.5	18.4	27.0	4.5	73.2	**239.3**	0.7	70.3	56.1	70.8	**239.3**	27.0	0.4
71	56.0	60.7	61.5	55.6	53.5	56.7	64.2	69.0	61.5	7.2	16.6	19.5	4.8	73.1	150.9	0.3	69.6	57.4	69.0	150.9	19.5	0.4
72	55.7	60.2	61.8	57.7	56.1	56.4	63.7	67.1	61.7	7.7	15.9	17.1	5.5	73.1	112.1	0.1	69.8	58.3	67.1	112.1	17.1	0.4
73	55.8	60.0	61.6	59.2	58.0	56.7	76.4	144.4	61.5	8.1	27.7	25.8	6.3	73.2	288.9	-0.1	70.0	58.9	144.4	288.9	27.7	0.7

6 PHOTOGRAPHS

6.1 Unexposed side view of the test specimen

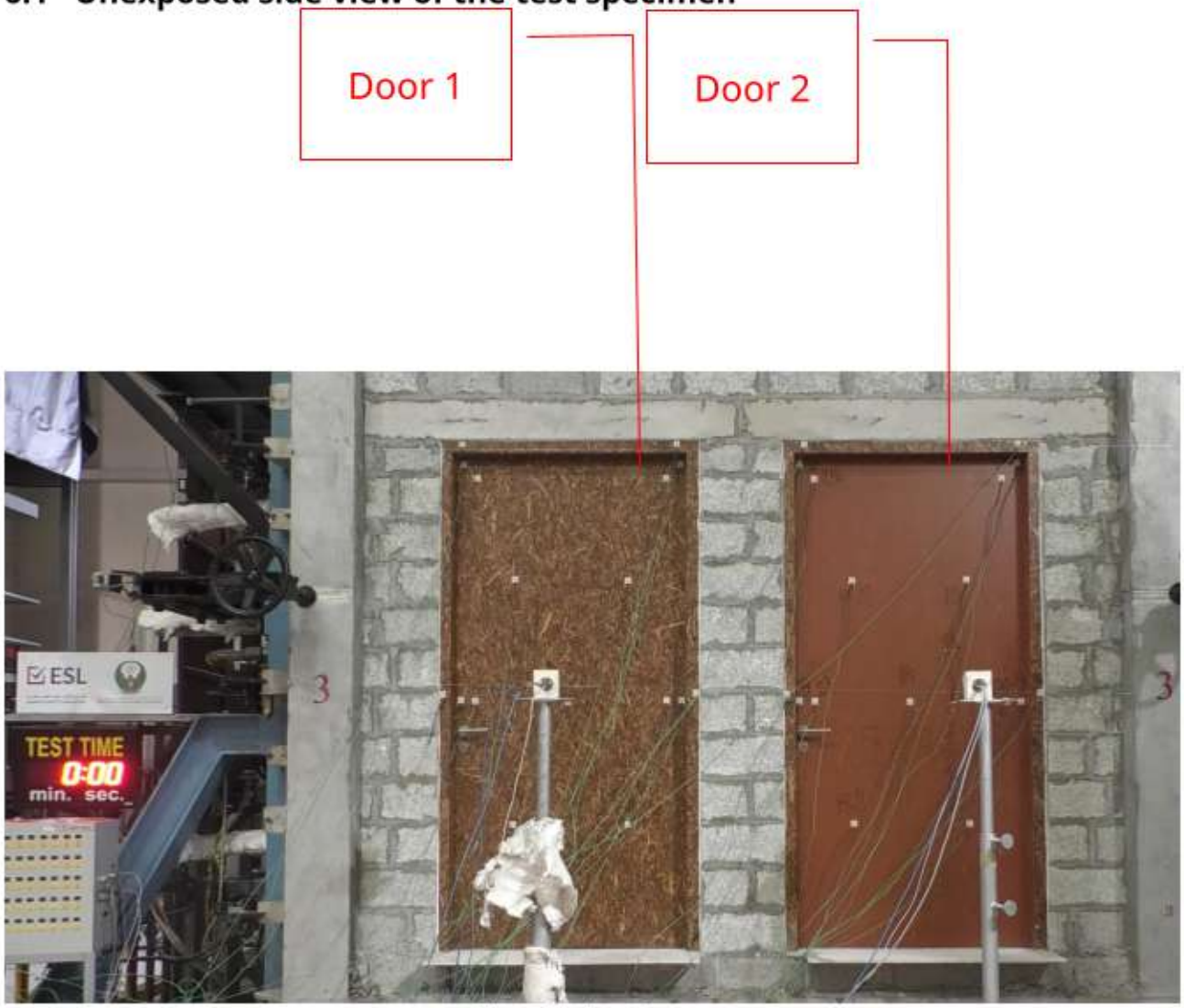


Photo 4. Before the test.

Photo 5. At 68:40 minutes after Door #1 has failed due to sustained flaming.

Photo 6. At 73:40 minutes after Door #2 has failed due to sustained flaming from top left corner

6.2 Exposed side view of the test specimen

Photo 7. Before the test.

Note: Due to the complete burning of both doorsets, it was not possible to retain them after the test. Extinguishment was exercised right after the test.

7 SUMMARY OF TEST RESULTS

Results of the fire resistance test of fire rated door detail single leaf door with MDF decking and (EN - 60 Min. Fire rated door) and fire rated door detail single leaf door with PSB frame (EN - 60 Min. Fire rated door) are presented in tables 1-15, graphs 1-12 and photos 1-4, refer only to the construction described in clause 3 of herein test report.

Table 14. Summary of the test results of door 1.

<table>
<tr><td rowspan="2">Performance criteria</td><td colspan="7">0255 – 24 - 04</td></tr>
<tr><td colspan="5">Description of the criterion requirements</td><td>Time and location of criterion failure</td><td>Test result</td></tr>
<tr><td rowspan="3">Integrity</td><td colspan="5">Sustained flaming</td><td>68 minutes
Top right corner of the door leaf</td><td rowspan="3">67 minutes</td></tr>
<tr><td colspan="5">Gaps disqualifying the product</td><td>No failure</td></tr>
<tr><td colspan="5">Ignition of the cotton pad</td><td>No failure</td></tr>
<tr><td rowspan="3">Insulation
(Standard procedure)</td><td colspan="5">Average temperature rise (≤140 °C)</td><td>No failure</td><td rowspan="4">63 minutes</td></tr>
<tr><td colspan="5">Maximum temperature rise (≤180°C)</td><td>No failure</td></tr>
<tr><td colspan="5">Maximum temperature rise at the door frame (≤360°C)</td><td>No failure</td></tr>
<tr><td>Insulation
(Supplementary procedure)</td><td colspan="5">Maximum temperature rise (≤180°C)</td><td>64 minutes
TC 16</td></tr>
<tr><td rowspan="3">Radiation</td><td>5 kW/m2</td><td>10 kW/m2</td><td>15 kW/m2</td><td>20 kW/m2</td><td>25 kW/m2</td><td rowspan="2">No failure</td><td rowspan="3">67 minutes</td></tr>
<tr><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td colspan="6">Note: As per clause 5.2.4 of EN 13501-2, the classification shall be given by the time for which the maximum value of radiation, measured as specified in the test standard, does not exceed a value of 15 kW/m2.</td></tr>
<tr><td colspan="7">Maximum Radiation</td><td>0.5 kW/m^2 at 68 minutes</td></tr>
<tr><td colspan="7">Maximum Deflection</td><td>+10 mm on Point E at 50 minutes and -9 on Point E at 55 minutes</td></tr>
<tr><td colspan="8">Duration of the test: 73 Minutes</td></tr>
</table>

Table 15. Summary of the test results of door 2.

<table>
<tr><td rowspan="2">Performance criteria</td><td colspan="5">0255 – 24 - 05</td></tr>
<tr><td colspan="3">Description of the criterion requirements</td><td>Time and location of criterion failure</td><td>Test result</td></tr>
<tr><td rowspan="3">Integrity</td><td colspan="3">Sustained flaming</td><td>72 minutes
The Top right corner of the door leaf</td><td rowspan="3">71 minutes</td></tr>
<tr><td colspan="3">Gaps disqualifying the product</td><td>No failure</td></tr>
<tr><td colspan="3">Ignition of the cotton pad</td><td>No failure</td></tr>
<tr><td rowspan="4">Insulation
(Standard procedure)
Insulation
(Supplementary procedure)</td><td colspan="3">Average temperature rise (≤140 °C)</td><td>No failure</td><td rowspan="4">69 minutes</td></tr>
<tr><td colspan="3">Maximum temperature rise (≤180°C)</td><td>No failure</td></tr>
<tr><td colspan="3">Maximum temperature rise at the door frame (≤360°C)</td><td>No failure</td></tr>
<tr><td colspan="3">Maximum temperature rise (≤180°C)</td><td>70 minutes
TC 32</td></tr>
<tr><td rowspan="3">Radiation</td><td>5 kW/m2</td><td>10 kW/m2</td><td>15 kW/m2</td><td>20 kW/m2</td><td>25 kW/m2</td><td rowspan="2">No Failure</td><td rowspan="3">71 minutes</td></tr>
<tr><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td colspan="5">Note: As per clause 5.2.4 of EN 13501-2, the classification shall be given by the time for which the maximum value of radiation, measured as specified in the test standard, does not exceed a value of 15 kW/m2.</td></tr>
<tr><td colspan="5">Maximum Radiation</td><td>0.5 kW/m^2 at 73 minutes</td></tr>
<tr><td colspan="5">Maximum Deflection</td><td>+6 mm on points I and K, -5 on point L at 50 minutes</td></tr>
<tr><td colspan="6">Duration of the test: 73Minutes</td></tr>
</table>

EN 1363-1 describes the privilege of the integrity failure against the insulation: insulation" shall automatically be assumed not to be satisfied when the "integrity" criterion ceases to be satisfied (EN 1363-1; Clause 11.4.2.). The same rule may be used to define the test results for the Radiation criterion, as the radiation classification cannot stand without integrity.

Because of the nature of fire resistance testing and the consequent difficulty in quantifying the uncertainty of measurement of fire resistance, it is not possible to provide a stated degree of accuracy of the result.
This 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 1363-1. Any significant deviation with respect to size, constructional details, loads, stresses, edge or end conditions other than those allowed under the field of direct application contained in the EN 1634-1 standard is not covered by this test report.

8 FIELD OF DIRECT APPLICATION OF TEST RESULTS

8.1 General

This is valid for the direct field of application of the test results of "Palm strand board (PSB) single leaf door with PSB frame" and "Palm strand board (PSB) single leaf door with PSB frame with medium density fibre (MDF) board decking", in which the following changes can be made, according to clause 13 of EN 1634-1:2024+A1:2018.

The field of direct application defines the allowable changes to the test specimen following a successful fire resistance test. These variations can be applied automatically without the need for the sponsor to seek additional evaluation, calculation or approval.

8.2 Materials and construction

8.2.1 General

Unless otherwise stated in the following text, the materials and construction of the doorset shall be the same as that tested. The number of leaves and the mode of operation (e.g. sliding, single action or double action) shall not be changed.

8.2.2 Specific restrictions on materials and construction

8.2.2.1 Timber construction

The thickness of the door panel(s) shall not be reduced but may be increased.

The door panel thickness and/or density may be increased provided the total increase in weight is not greater than 25 %.

For timber-based board products (e.g. particle board, blockboard, etc), the composition (e.g. type of resin) shall not change from that tested. The density shall not be reduced but may be increased.

The cross-sectional dimensions and/or the density of the timber frames (including rebates) shall not be reduced but may be increased.

8.2.3 Decorative finishes

8.2.3.1 Paint

As unfinished test specimens were tested then Where the paint finish is not expected to contribute to the fire resistance of the door, (alternative)paints are acceptable and may be added to door leaves or frames for which unfinished test specimens were tested. Where the paint finish contributes to the fire resistance of the door (e.g. intumescent paints) then no change shall be permitted

8.2.3.2 Decorative laminates

Decorative laminates and timber veneers up to 1,5 mm thickness may be added to the faces (but not the edges) of doors that satisfy the insulation criteria (normal or supplementary procedure).

Decorative laminates and timber in excess of 1,5 mm thickness shall not be added without additional test.

8.2.4 Fixings

The number of fixings per unit length used to attach doorsets to supporting constructions may be increased, but shall not be decreased and the distance between fixings may be reduced but shall not be increased.

8.2.5 Building hardware

The number of hinges and dog bolts may be increased but shall not be decreased.

NOTE 1 The number of movement restrictors such as locks and latches are not covered by direct application.

As the doorset has been tested with a door closing device fitted and with the retention force applied, then the doorset may be provided only with that closing device.

NOTE 2 Interchange of building hardware is not covered by the field of direct application.

8.3 Permissible size variations (Door 1 - Palm strand board (PSB) single leaf door with PSB frame)

8.3.1 General

Doorsets of sizes different from those of tested specimens are permitted within certain limitations, but the variations are dependent on product type and the length of time that the performance criteria are fulfilled.

The increase and decrease of dimensions permitted by the field of direct application are applicable to the overall size and to each door leaf, each side panel and each over panel independently.

8.3.2 Test periods

The amount of variation of size permitted is dependent on whether the classification time was just reached (Catergory 'A') or whether an extended time ('B') in accordance with the values shown fulfilled before the test was concluded. The test specimen fulfilled integrity criteria for 67 minutes only. **Therefore, Category 'B' is not achieved.**

Table 16

Classification time (min) *(Category 'A')*	All performance criteria fulfilled for at least minutes *(Category 'B')*
60	68

8.3.3 For size variations

No increase is allowed.

Unlimited reductions from the tested specimen are permitted, with the exception presented below in clause 8.3.4.

8.3.4 Other changes

For smaller doorset sizes the relative positioning of movement restrictors (e.g. hinges and latches) shall remain the same as tested or any change to the distances between them will be limited to the same percentage reduction as the decrease of test specimen size.

8.3.5 Timber constructions

The number, size, location and orientation of any joints in the timber framing shall not be changed.

8.3.6 Gaps

Table 17. Maximum allowable gaps

GAPS			Measurements, mm		
			Average	Maximum	Permitted gap size
Door 1	Along the horizontal edges	At the top	2.8	3.2	5.0
		At the bottom	4.0	5.5	6.7
	Along the vertical edges	Hinge side	2.3	2.7	4.5
		Lock side	2.5	2.7	4.6

The minimum size of the primary gaps may be reduced.

The permitted gap size may be different for different parts of the door

8.4 Permissible size variations (Door 2 - Palm strand board (PSB) single leaf door with PSB frame with medium density fibre (MDF) board decking)

8.4.1 General

Doorsets of sizes different from those of tested specimens are permitted within certain limitations, but the variations are dependent on product type and the length of time that the performance criteria are fulfilled.

The increase and decrease of dimensions permitted by the field of direct application are applicable to the overall size and to each door leaf, each side panel and each over panel independently.

8.4.2 Test periods

The amount of variation of size permitted is dependent on whether the classification time was just reached (Catergory 'A') or whether an extended time ('B') in accordance with the values shown fulfilled before the test was concluded.
The test specimen fulfilled integrity criteria for 71 minutes. **Therefore, Category 'B' is achieved or fulfilled**.

Table 18

Classification time (min) *(Category 'A')*	All performance criteria fulfilled for at least minutes *(Category 'B')*
60	68

8.4.3 For size variations

The test specimen has achieved the overrun requirements of Category "B".

Unlimited size reduction is permitted. Size increase is permitted, which satisfied integrity up to 71 mins and insulation up to 69 mins, the door set can be increased upto 15% height, 15% width and 20% area as shown in Table 19.

Table 19.

Door 2 leaf size variation - Palm strand board (PSB) single leaf door with PSB frame with medium density fibre (MDF) board decking (0255-24-05)		
	Individual door leaf	
	Tested size	Maximum extension in Size
Height (mm)	2400mm	2760mm
Width (mm)	1151mm	1323.7mm
Area (m^2)	2.76m^2	3.31m^2

8.4.4 Other changes

For smaller doorset sizes the relative positioning of movement restrictors (e.g. hinges and latches) shall remain the same as tested or any change to the distances between them will be limited to the same percentage reduction as the decrease of test specimen size.

For larger doorset sizes the following shall also apply:

a. The height of the latch above floor level shall be equal to or greater than the tested height, and such increase in height shall be at least proportional to the increase in door height;
b. The distance of the top hinge from the top of door leaf shall be equal to or less than that tested;
c. The distance of the bottom hinge from the top of the door leaf shall be equal o or less than that tested;
d. Where three hinges or distortion preventers are used, the distance between the bottom of the door leaf and centre restraint shall be equal to greater than that tested.

8.4.5 Timber constructions

The number, size, location and orientation of any joints in the timber framing shall not be changed.

8.4.6 Gaps

Table 20. Maximum allowable gaps

GAPS			Measurements, mm		
			Average	Maximum	Permitted gap size
Door 2	Along the horizontal edges	At the top	2.6	2.9	4.8
		At the bottom	3.1	4.1	5.6
	Along the vertical edges	Hinge side	2.0	2.2	4.1
		Lock side	2.5	3.2	4.8

The minimum size of the primary gaps may be reduced.

The permitted gap size may be different for different parts of the door

8.5 Supporting constructions

The Fire resistance of a doorset tested in 150mm thick high density rigid standard supporting construction (normal concrete blocks), as specified in EN 1363-1, can be applied to a doorset mounted in the same manner in a wall provided the density and the thickness of the wall are equal to or greater than that in which the door was tested.

Installation within the wall made of AAC blocks is **not permitted.**

8.5.1 Specific rules for hinged or pivoted doorsets.

For timber door leaves hung in timber frames, the result of the test in a rigid standard supporting construction is applicable to that door assembly mounted in a flexible construction of the minimum 150 mm total thickness with boards applied from both sides and having fire resistance established in a separate test.

NOTE: The rules above assume that the fixing methods used in each type of supporting construction are appropriate to that construction.

Further details of the field of direct application of test results are described in EN 1634-1:2014+A1:2018.

9 TEST WITNESSES

	Name	Company
Test sponsor representative(s) witnessing the test.	Mr.Anselmo Tabadero	Abanos Furniture and Decoration Industry
	Mr.Amitabh Sharma	
	Mr.Alireza Tabatabaei	Intertek Middle east
	Ms.Silcy Simon	

10 ATTACHMENTS

Technical documentation No.:

- J00006-STD-FR-PSB-109
- J00006-STD-FR-PSB-110

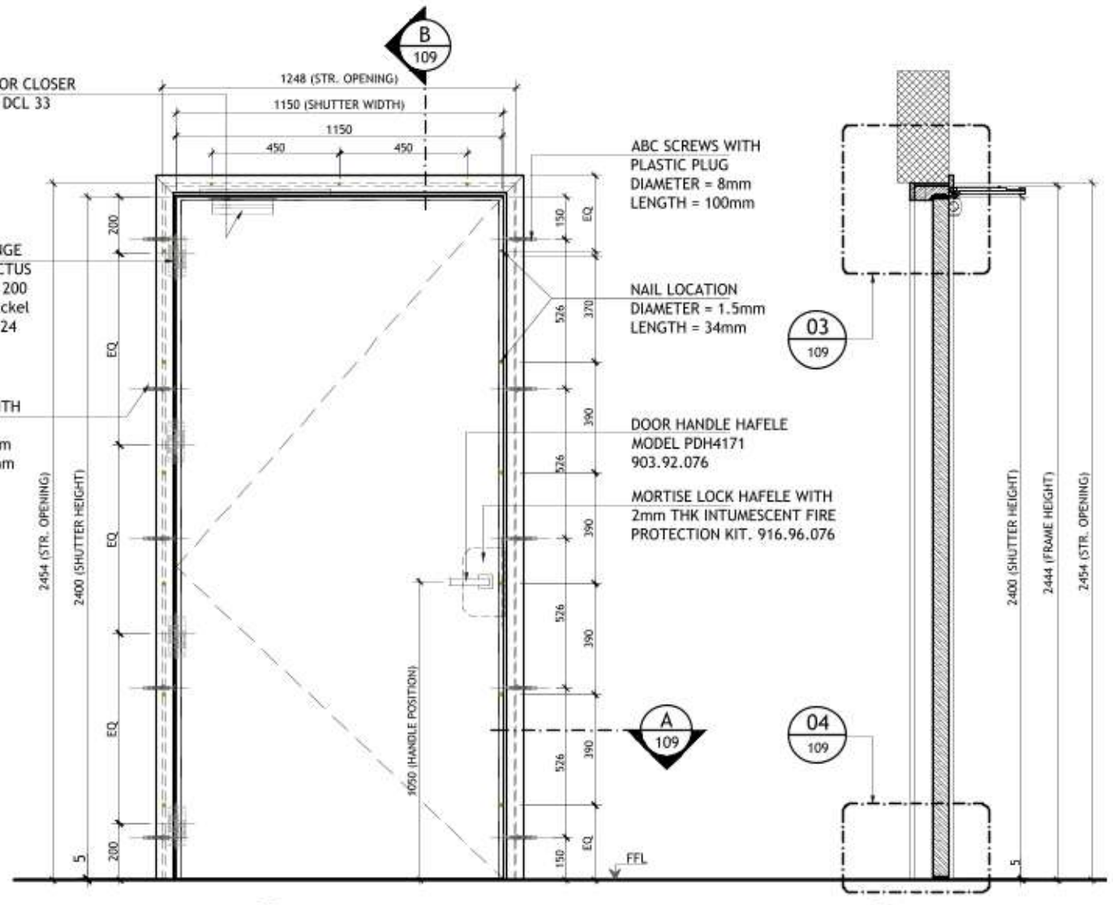
Other documents:

- Handle TDS - 903.92.076
- Mortice lock TDS – 911.02.145
- Athmer Dropseal – TDS
- Athmer intumescent strip TDS
- Athmer rebate gasket TDS
- Concealed door closer TDS – 931.84.039
- TECTUS TE 540 3D TDS
- Medium density board TDS
- Palm strand board TDS
- RAR Ritver PW1612 TDS
- Kleiberit 501 TDS
- Palm strand board TDS
- FS 702 sealant TDS
- Lock cylinder TDS – 916.96.076
- Mahogany Hardwood lipping TDS

11 SIGNATORIES

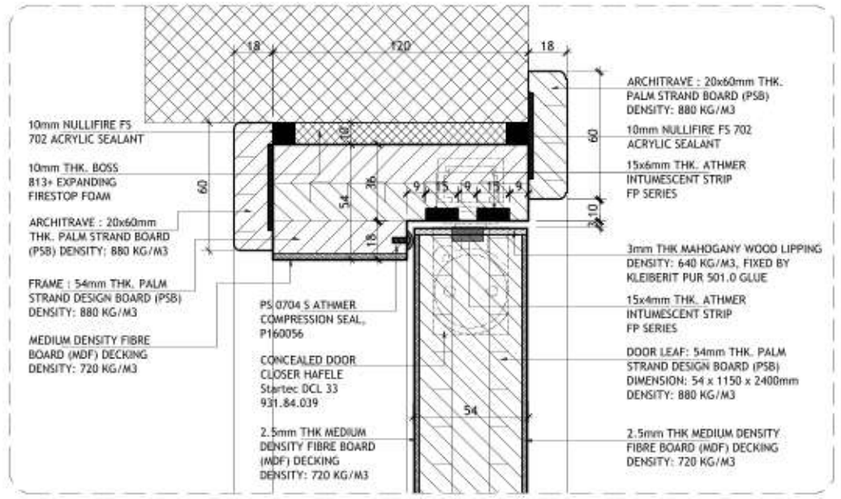
Prepared by	***Reviewed by***	***Authorized by***
Cedric Montecillo	Subramaniam Shivalingham	Sebastian Ukleja
Testing Technician	*Testing Engineer*	*Testing Manager*
Signature	Signature	Signature

--END OF REPORT--

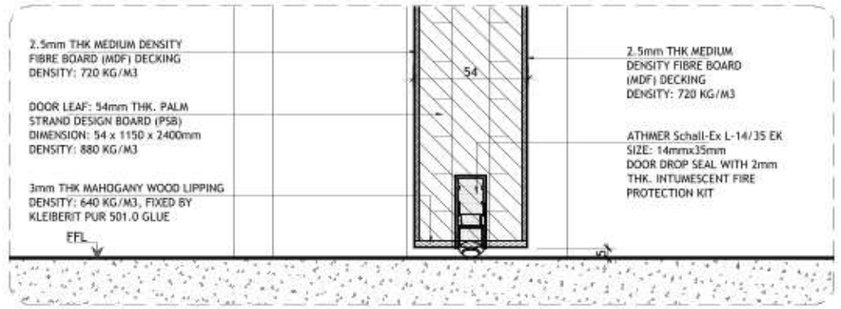


E1 109 ELEVATION SCALE 1:15

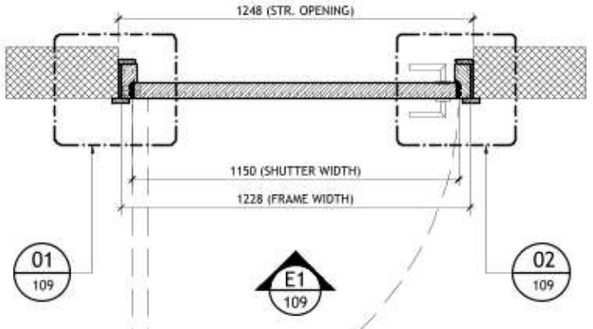
B 109 SECTION SCALE 1:15



03 109 SPOT DETAIL SCALE = 1:2

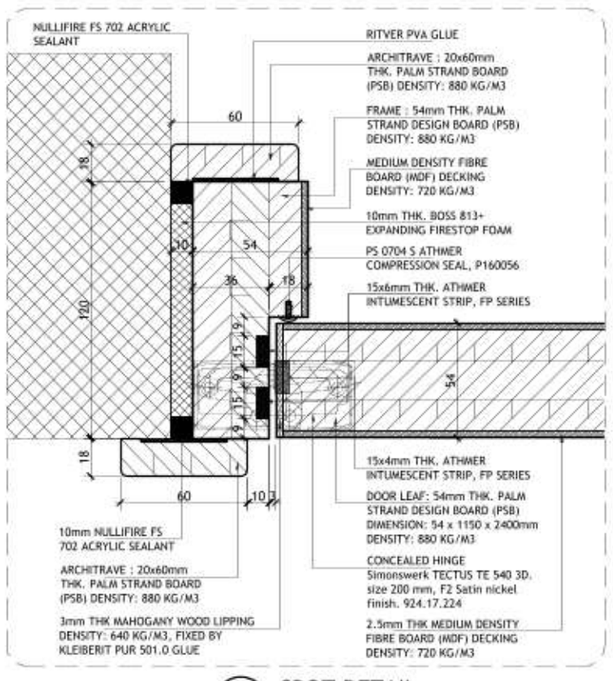


04 109 SPOT DETAIL SCALE = 1:2

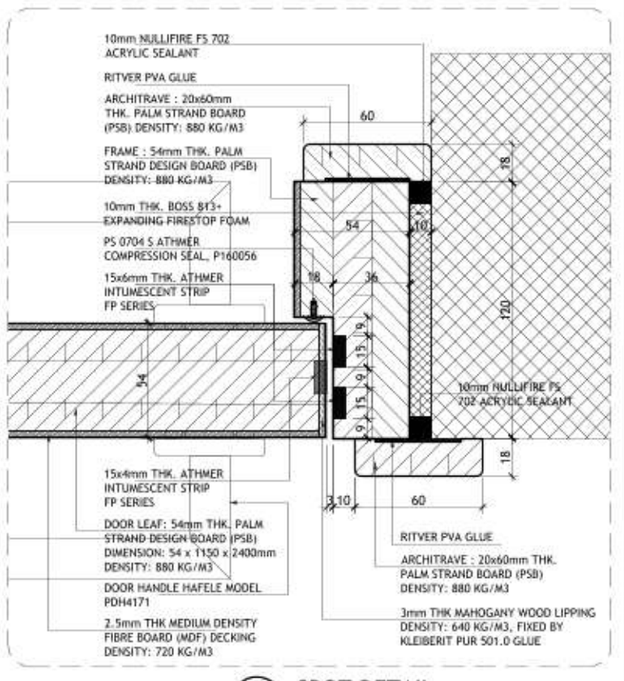


A 109 SECTION PLAN SCALE 1:15

Article No.	Hardware Description.	Image
924.17.224	Door hinge. Simonswerk TECTUS TE 540 3D. concealed. for flush doors up to 120 kg 3D adjustable, size 200 mm, F2 Satin nickel finish.	
931.84.039	Hafele Startec DCL 33 Overhead Concealed Door closer, EN 2—4 in accordance with EN 1154, with guide rail, Silver coloured, Certified in compliance with EN 1154:1996/A1:2002	
911.02.145	Mortise lock, for hinged doors, Startec, grade 3, profile cylinder, backset 55 mm for fire resistant/smoke control doors, Forend: 24 mm, square, satin stainless steel	
903.92.076	Door handle set, Stainless steel, Startec, model PDH4171, grade 4 Rose, PC set, door thickness 38—55 mm, Satin, Tested in accordance with DIN EN 1906:2010. 7mm thick Rose and Escutcheon.	
916.96.076	Euro profile double cylinder non master keyed, 70mm, nickel plated.	
950.05.493	"Automatic Schall ExwL-14/35 EK drop seal , full mortise fining single sidet release for sound proofing, smoke control fire resistant door, size 935 mm can be shortened to 835 mm, Aluminium silver.(Door width to b confirm prior to ordering)	



01 109 SPOT DETAIL SCALE = 1:2



02 109 SPOT DETAIL SCALE = 1:2

NOTES:-

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE NOTED.
2. FINISH AS PER APPROVED SAMPLE.

Rev.	Date	Description.	By

CLIENT

ABANOS

CONSULTANT

.

MAIN CONTRACTOR

.

PROJECT

CERTIFICATION/TEST REPORT FOR EN & UL

SUB- CONTRACTOR

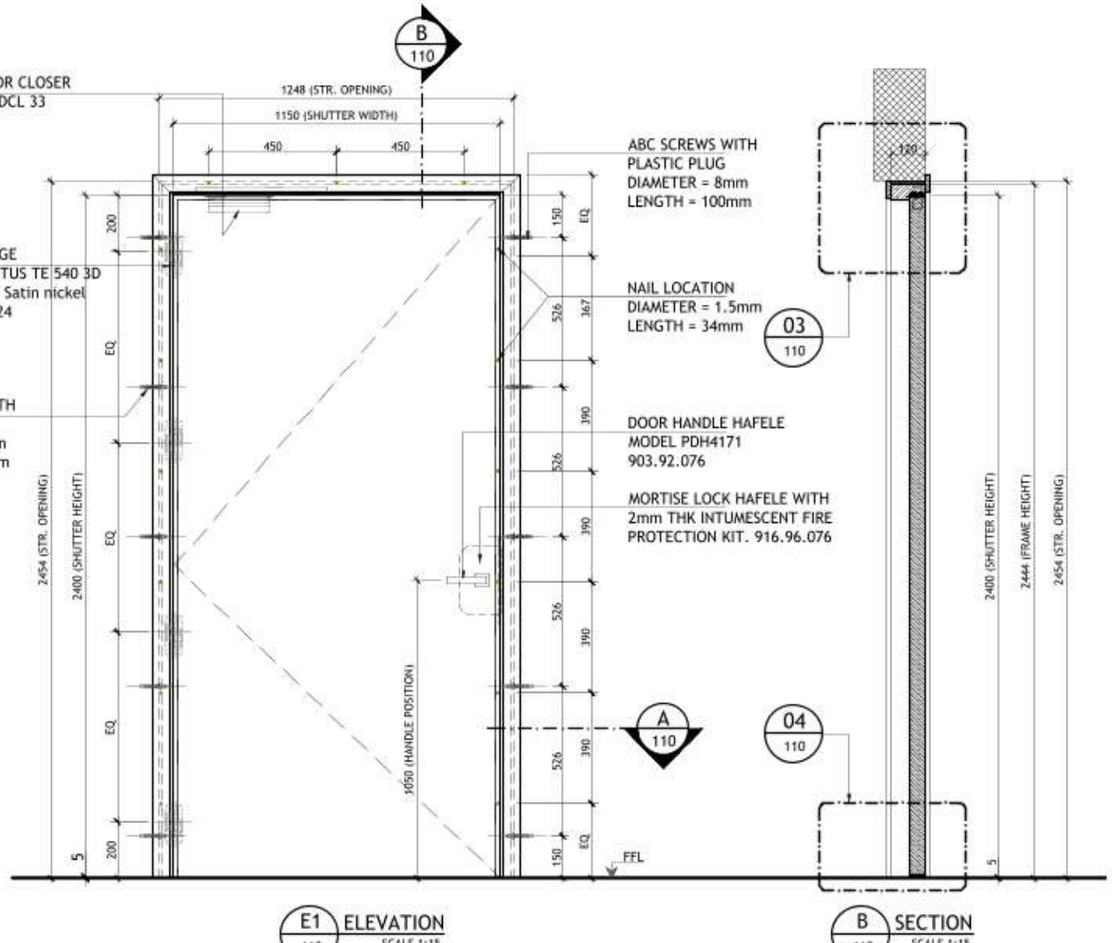
ABANOS
INTERIOR FIT-OUT & JOINERY
P.O. BOX 114480, DUBAI, TEL: +971 4 8996111, FAX : +971 4 8859966
E-mail: mail@abanos.ae, Web: www.abanos.ae

DRAWING TITLE

FIRE RATED DOOR DETAIL (PSB DESIGN BOARD)
SINGLE LEAF DOOR WITH PSB FRAME
(EN - 60 Min. FIRE RATED DOOR)

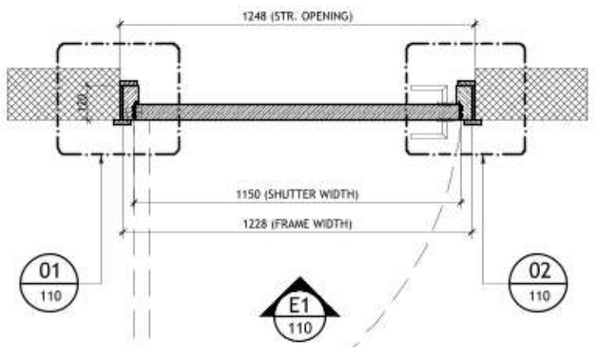
DRAWN BY	CHK.	APPD.	DATE
SJ	.	.	28.02.2024

SCALE	DRAWING NO.	REV.
1:15 @ A3	J00006-STD-FR-PSB-109	03



E1 / 110 ELEVATION SCALE 1:15

B / 110 SECTION SCALE 1:15



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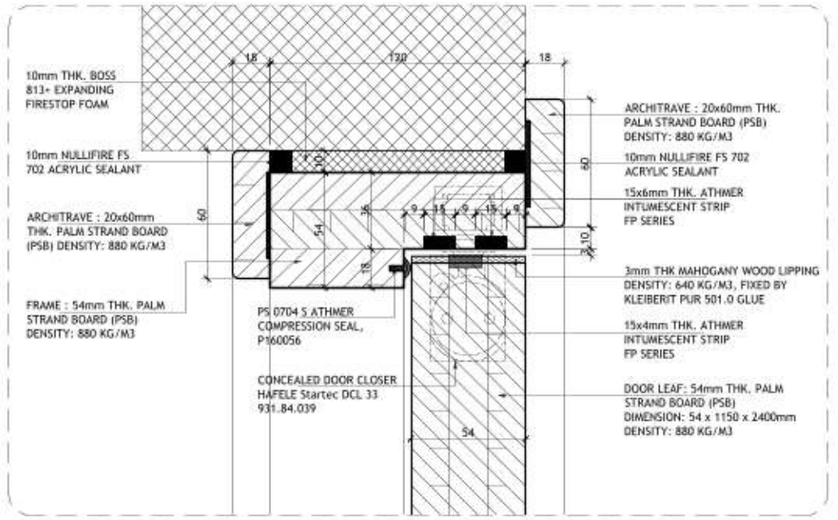
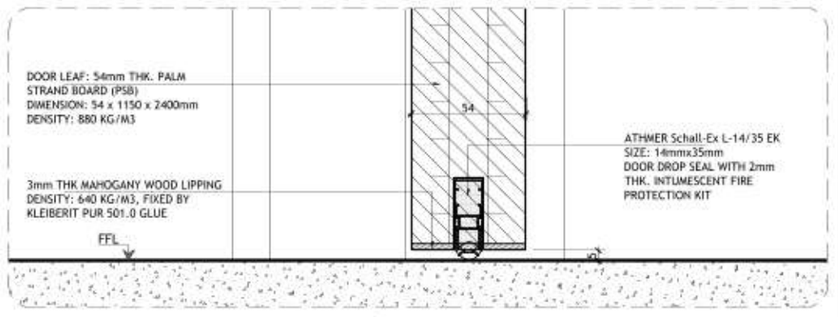
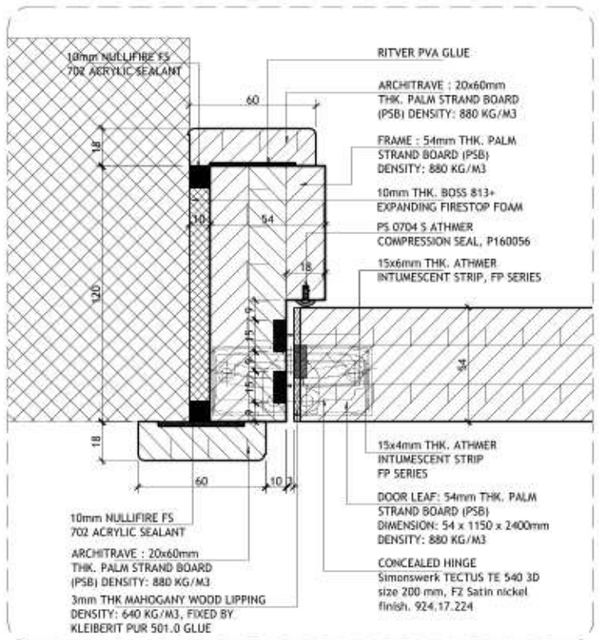


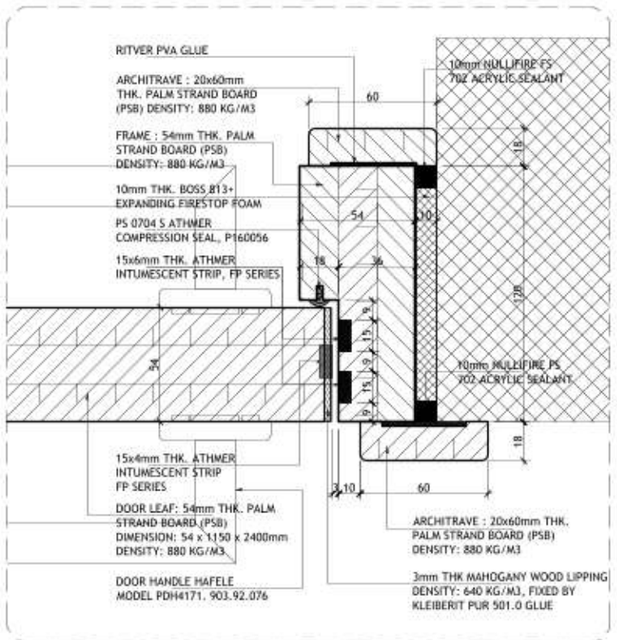
03 / 110 SPOT DETAIL SCALE = 1:2



04 / 110 SPOT DETAIL SCALE = 1:2



01 / 110 SPOT DETAIL SCALE = 1:2



02 / 110 SPOT DETAIL SCALE = 1:2

NOTES:-

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE NOTED.
2. FINISH AS PER APPROVED SAMPLE.

Rev.	Date	Description.	By

CLIENT

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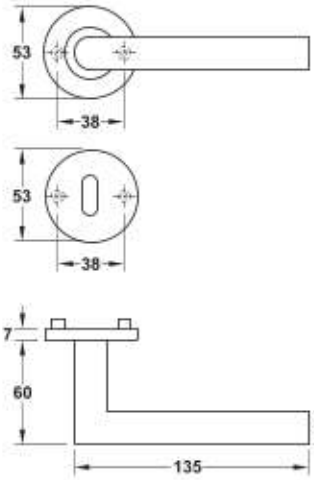
DRAWING TITLE

FIRE RATED DOOR DETAIL
SINGLE LEAF DOOR WITH PSB FRAME
(EN - 60 Min. FIRE RATED DOOR)

DRAWN BY	CHK.	APPD.	DATE
SJ	.	.	28.02.2024

SCALE	DRAWING NO.	REV.
1:15 @ A3	J00006-STD-FR-PSB-110	03

Model PDH4171



> Material: Stainless steel, substructure: Steel
> Bearing: Lever handle pivot-fitted in rose, sprung
> Standard: Certified in compliance with EN 1906:2010
> Class: 4 7 – B 1 4 0 B

	Supplied with		Door thick-ness mm	Satin	Polished	Polished brass coloured, PVD coated
CB set	2 Lever handle aperture parts with handle roses 1 Spindle 8 x 100 mm 1 Pair of CB escutcheons 4 Threaded screws M4 x 60 mm, can be shortened		38–55	903.91.076	903.91.077	903.91.078
PC set	2 Lever handle aperture parts with handle roses 1 Spindle 8 x 100 mm 1 Pair of PC escutcheons 4 Threaded screws M4 x 60 mm, can be shortened	F	38–55	903.92.076	903.92.077	903.92.078
WC set	2 Lever handle aperture parts with handle roses 1 Spindle 8 x 100 mm 1 Pair of WC escutcheons with red/green indicator disc 1 Locking pin 8 x 75 mm 4 Threaded screws M4 x 60 mm, can be shortened		38–55	903.93.076	903.93.077	903.93.078

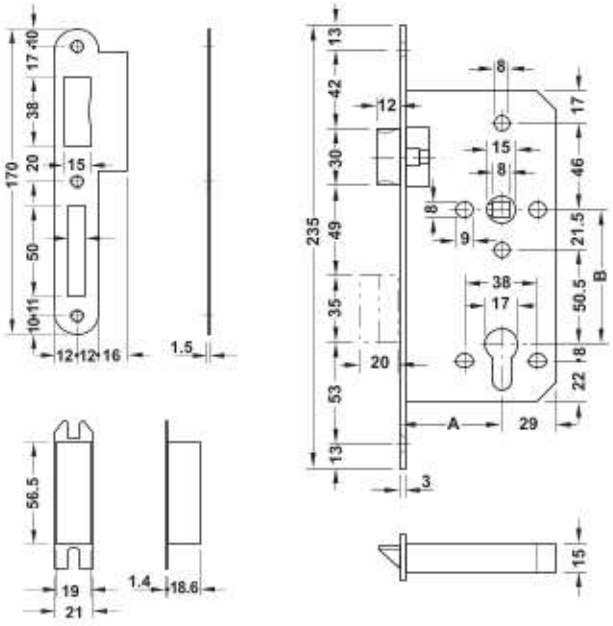
Individual components ►AH 1.68
Mounting accessories for other door thicknesses ►AH 1.69

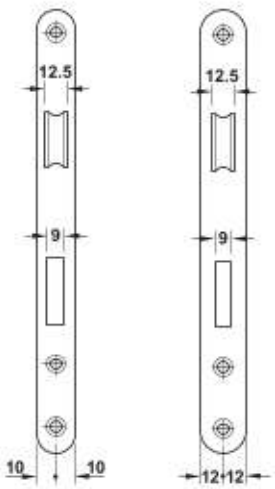
Mortice lock, profile cylinder

F

CAD

2





Forend width 20 mm for rebated doors

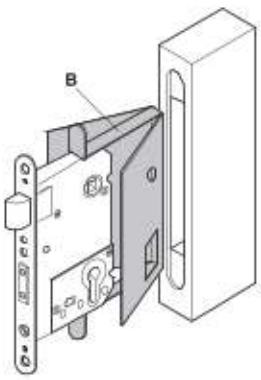
Forend width 24 mm for flush doors

> Area of application:	For rebated or flush doors
> Material:	Forend, latchbolt and deadbolt: Stainless steel, lock case: Steel, deadbolt pocket: Plastic
> Type of locking:	Prepared for profile cylinder
> Deadbolt:	2-turn
> Version:	With key action
> Forend:	Round or square
> Lever follower:	8 mm
> Distance B:	72 mm
> Mounting:	DIN left and DIN right, reversible
> Standard:	Certified in compliance with EN 12209:2003
> Class:	3 X 8 | 1 0 G | 3 B C | 2 0

Supplied with
1 mortice lock
1 flanged striking plate
2 deadbolt pockets

Forend width mm	Finish	Square	Round
Backset A 55 mm			
20	Matt brushed	911.02.143	911.02.151
	Brass coloured PVD coated	911.25.444	911.25.452
	Graphite black PVD coated	911.25.420	911.25.421
24	Matt brushed	911.02.145	911.02.153
	Brass coloured PVD coated	911.25.446	911.25.454
	Graphite black PVD coated	911.25.422	911.25.200
Backset A 60 mm			
24	Matt brushed	911.02.464	911.02.468
Backset A 65 mm			
24	Matt brushed	911.02.480	911.02.484

→ Intumescent fire protection kit for mortice locks



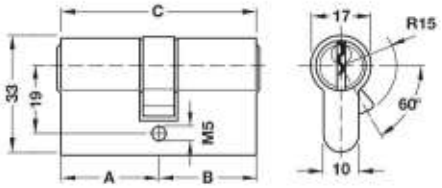
B = intumescent fire protection kit for mortice locks

Dim. (L x W) mm	Material thickness mm	Cat. No.
165 x 90	1	950.11.010
	2	950.11.011

Packing: 1 set

2

Double cylinder



- Material: Cylinder housing: Brass
- Closure: Keyed to differ
- Locking system: With 5 pin tumblers

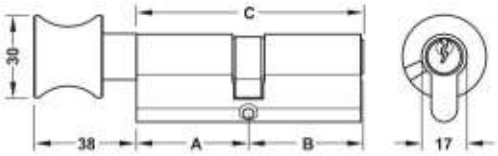
Note
No secured locking.

→ Keyed to differ

Supplied with
1 Double profile cylinder
3 Keys, nickel plated steel
1 Fixing screw

Dim. A mm	Dim. B mm	Dim. C mm	Nickel plated	Polished
30	30	60	916.96.007	
30.5	30.5	61	916.91.000	916.91.020
33	33	66	916.91.040	916.91.070
35	35	70	916.96.076	916.96.081
35.5	35.5	71	916.91.800	916.91.830
40	40	80	916.96.026	916.96.082
43	43	86	916.91.850	

Thumbturn cylinder



- Material: Cylinder housing: Brass
- Closure: Keyed to differ
- Locking system: With 5 pin tumblers

Note
No secured locking.

→ Keyed to differ

Supplied with
1 Profile thumbturn cylinder
3 Keys, nickel plated steel
1 Fixing screw

Dim. A mm	Dim. B mm	Dim. C mm	Nickel plated	Polished
30.5	30.5	61	916.91.100	916.91.120
35	35	70	916.96.576	
35.5	35.5	71	916.91.180	916.91.190

Schall-Ex® L-14/35 EK

1-935

- / drop seal with common groove dimension
- / parallel drop minimises friction with the floor
- / tool-free actuator can be deactivated before building occupancy
- / actuator requires no protective press plate for the frame
- / end plates provide neat finish

TECHNICAL DATA

Application	hinged timber doors
Actuation	single
Gasket material	self-extinguishing silicone

DIMENSIONS

Width x height	14 x 35 mm
Standard lengths	635, 735, 835, 935, 1035, 1135, 1235 mm
Minimum lengths*	235 mm
Maximum lengths	1635 mm
Can be shortened by	100 mm from standard lengths
Travel	20 mm

FIXING/MONTAGE

Fixing	rebated into a groove in the door, screw fixed either side
Accessories included with delivery	5519

PERFORMANCE & CERTIFICATES

Fire	EN 1634-1**, UL10B & UL10C (R38166)
Acoustic	51dB over 7mm gap, 44dB over 12mm gap
Smoke	Certifire TS21 (CF 5675)

* min. lengths cannot be shortened

**The test value may differ according to the EN 1634-1 test, as the complete door system must be checked.

FP Series

- athmer's FP Series fire and smoke seals provide fire protection closing off the gap between the fire door and frame in the event of a fire. Extreme heat during fire activates the intumescent strip to expand and seal the gap preventing spread of fire and smoke to other parts of the building allowing enough time for people to evacuate, reducing the risk to life and protecting property.
- Encapsulated in a PVC sleeve with heavy duty self-adhesive tape backing.
- The high-performance intumescent core contains intercalated graphite that expands multi-directionally with a higher expansion ratio.
- Ideal for sealing perimeter of doors including meeting stiles/astragals on double doors.
- Available in a variety of sizes to cover 30, 60, 90 & 120 mins Fire door configurations.

FIELD OF APPLICATION

Rebates in timber door leaves or door frames
Approved for use on single or double action leaf doors
Can be used on latched and unlatched doors
New build and retrofit application

PRODUCT FEATURES

Rapid multi directional expansion
Activates from 180°C
Identification on each product ensures full traceability
Laboratory age testing indicates a life expectancy in excess of 100 years
Unaffected by moisture
Mineral based, safe to handle containing no fibrous materials

TEST STANDARDS & CERTIFICATES

BS476 Part 20, BS476 Part 22
BS EN 1634-1, BS EN 1634-3
Certifire Approved CF6057

COLORS*

White | Brown | Dark brown
Black | Grey | Red
Cream

PRODUCT DIMENSIONS

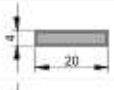
Standard lengths: 2100mm, 2200mm, 2400mm
other lengths available on request

Sizes

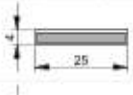
10 x 4 mm

15 x 4 mm

20 x 4 mm

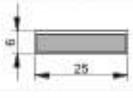


25 x 4 mm



15 x 6 mm

25 x 6 mm



* Actual product colour may vary from images shown

athmer oHG / Sophienhammer / 59757 Arnsberg / Germany
T +49 2932 477-500 / info@athmer.de / **athmer.com**

PS 0704 S

/ door stop-rebated bubble compression seal

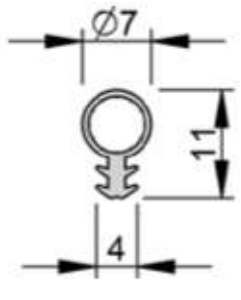
/ large tolerance compensation

/ suitable for sound insulation

/ suitable for smoke sealing

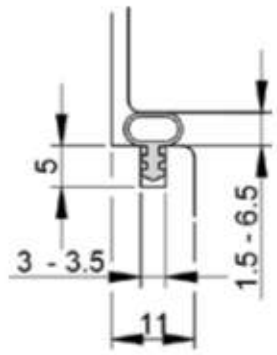
TECHNICAL DATA

Application	timber frame rebates
Gasket material	silicone, self-extinguishing
Working temperature range	-40°C to +180°C



DIMENSIONS

Width x height	7 x 11 mm
Fitting tolerance range	1.5 - 6.5 mm
Standard lengths	100m coil



FIXING

Fixing	into a groove in the door stop

PERFORMANCE & CERTIFICATES

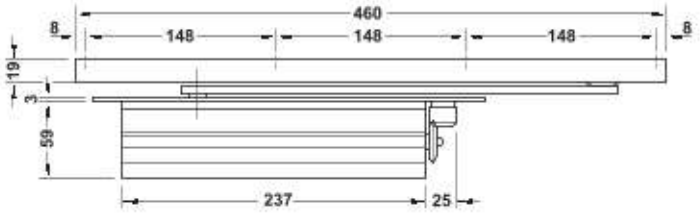
Fire	EN1634-1*

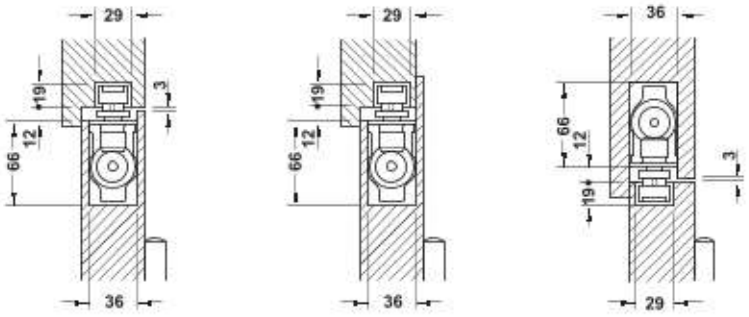
COLORS	ART.NO.
Black	P160057
Brown	P160056
White	P160065
Grey	P160080

*The test value may differ according to the EN 1634-1 test, as the complete door system must be checked.

athmer oHG / Sophienhammer / 59757 Arnsberg / Germany
T +49 2932 477-500 / info@athmer.de / **athmer.com**

DCL 33
EN 2–4





Fire resistance and smoke control

F Tested for fire resistant and smoke control doors.

> Area of application:	Door closer and guide rail for concealed installation
> Version:	With hold-open function (optional)
> Adjustment facility:	Closing speed continuously adjustable, latching action continuously adjustable
> Installation:	Suitable for standard installation on door or overhead installation on frame
> Closing force:	2–4 in compliance with EN 1154
> Door width:	≤1,100 mm
> For door thickness:	≥46 mm
> Opening angle:	≤115°
> Hold-open angle:	≤115°
> Mounting:	For DIN left and DIN right hand use
> Standard:	Certified in compliance with EN 1154:1996/A1:2002
> Class:	3 | 8 | 2–4 | 0/1 | 1 | 3

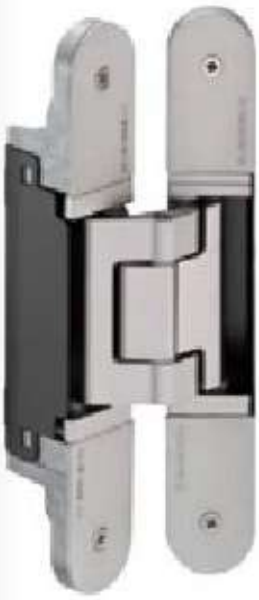
		Silver coloured	Gold coloured	Matt black
DCL 33 Set				
1 DCL 33 without hold-open function	F	931.84.039	931.84.035	931.84.033
1 DCL 33 with hold-open function	–	931.84.269	931.84.238	931.84.233

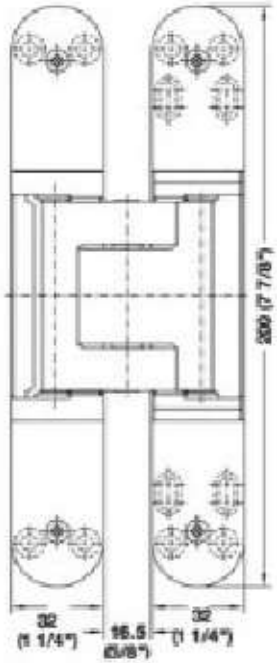
Intumescent fire protection kit	▶AH 5.35 A
Hold-open device set	▶AH 5.35 A

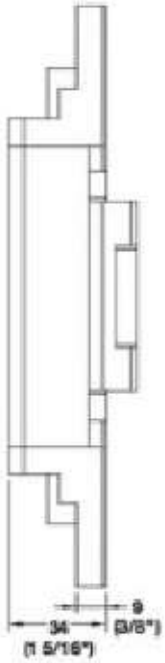
TECTUS

> Used in door frames made out of hollow metal or wood in flush interior doors
> Maintenance-free slide bearings
> Suitable for left and right hand applications
> UL listed for 20 minute rated fire doors (maximum door size: 4' x 8' for a single door, 8' x 8' for a pair of doors)

→ TE 540 3D



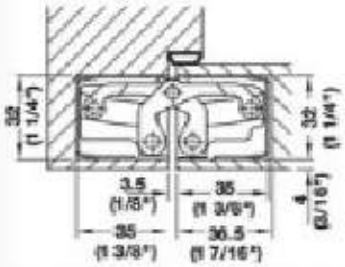




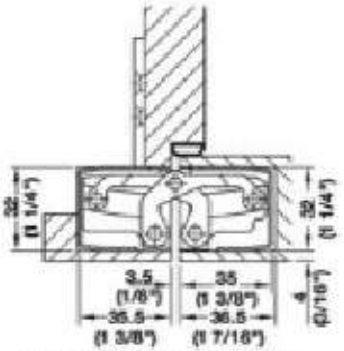
> Door weight: max. 120 kg (264 lbs.)
> Door thickness: min. 40 mm (1 9/16")
> Opening angle: max. 180°
> Router bit Ø: 24 mm (15/16")
> Router guide Ø: 30 mm (1 3/16")
> Adjustment: three-dimensionally adjustable:
Height and width: ± 3 mm (1/8")
Depth: ± 1.0 mm (1/16")
> Material: Aluminum die-cast

Finish	SW	Item No.
stainless steel look	126	924.17.225
satin chrome look	124	924.17.223
satin nickel look	125	924.17.224
matt deep black (RAL9005)	107	924.17.237
bronze metallic	166	924.19.250
rustic umber	156	924.19.216
satin nickel	144	924.19.271
polished nickel	038	924.19.269
polished brass	030	924.19.281
bronze finish dark	176	924.17.261
traffic white (RAL9016)	070	924.19.201
bronze finish	174	924.19.210
satin chrome	146	924.19.242
bronze finish light	175	924.19.274
satin brass	047	924.19.285

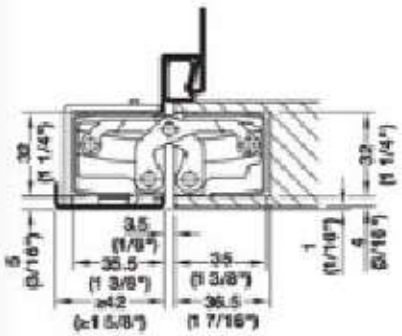
Mounting



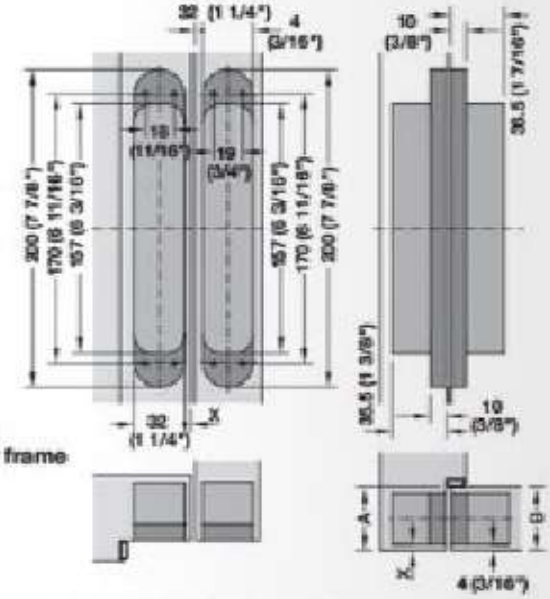
Mounted to a wood door frame



Mounted to a wood door jamb together with a mounting plate



Mounted to a hollow metal frame with a receiver element



Milling template for a wood door frame

Calculation of the milling dimensions:
A = Rabbet depth excluding seal clearance
B = Door thickness
A – B + 3 = Dimension X
The result has to fall between 3 mm (1/8") and maximum 5 mm (3/16").
For hollow metal frame applications X = 5 mm (3/16")

Mounting plates	page 4.51
Receiving elements	page 4.52

DesertBoard.
By Al Talah Board Manufacturing Co. LTD

WORLD'S FIRST WOODEN BOARD MADE FROM DATE PALM WASTE

ABOUT DESERTBOARD

ABOUT OUR LABS

Desert Board has effectively pledged its reputation as the market leader in the quality of Strand board manufacturing and product innovation. Our labs are equipped with State-of-the-art process control instrumentation, advanced automation, and quality control systems.

With constant strive for success, the Testing Laboratory works with our Research and Development laboratory endlessly to ensure the quality of our product is comparable to the best available in the market at all times.

With the efforts of our laboratories and our management's innovation, we have produced a board that complies with the European Standards EN30:2006 and certified by various local and global entities as a sustainable solution for a better future.

ABOUT OUR PLANT

With special functions and advanced technologies, our plant can be classified is as state-of-the-art. Being the first plant in the world that can transform palm waste into functional palm strand boards, we can ensure that we can lead the market and the industry with confidence.

Our plant is certified by ISO 9001:2015, ISO 14001:2015, and ISO 45001:2018, and our processes are certified by the Forest Stewardship Council, Emirates Green Building Council, and a United Nations signatory of the Global Compact initiative and Climate Neutral Now.

Our plant is equipped with high-efficiency wood dust filtration systems, which are installed for the main manufacturing process as well as at various transfer points to avoid dust emissions into the atmosphere. The plant is controlled by a Central Control Room with built-in software and the latest technologies to recycle up to 80% of wood dust generated during the board manufacturing process for energy production.

DesertBoard.
By Al Talah Board Manufacturing Co. LTD

WORLD'S FIRST WOODEN BOARD MADE FROM DATE PALM WASTE

PALM STRAND BOARD

PSB

Palm Strand Board

DESCRIPTION

PSB is an Environmentally-friendly wooden board made from palm waste materials, making it a 100% sustainable board suitable for a wide range of applications. PSB Design is made from PSB Structural boards sandwiched between high destiny fiberboards that provide a smooth finish and increase the board's durability.

These boards were developed to meet the exacting Al Sa'fat Green Building System and Japanese Industrial Standards (JIS) for formaldehyde emissions. This superior grade F also known as Super E0 (SE0) with Formaldehyde Emissions not exceeding 0.05 mg/kg, has formaldehyde levels similar to natural wood, giving you assurance in the best controls available.

FEATURES

- 100% Sustainable
- Environmentally Friendly
- Zero Emissions
- High-Strength & Durable
- Load-Bearing Capabilities
- Superior Screw Withdrawal
- Sutiable in Humid Areas
- Variation of Finishes

APPLICATIONS

PSB is a wood-based panel suitable for furnitures, kitchen cabinets and wooden structures such as wall decors, booths, floors and panelling and many more.

- Furnitures
- Kitchen Cabinets
- Booths & Stands
- Panelling

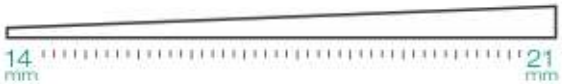
PSB

Palm Strand Board

MEASURMENTS

PSB comes in various sizes and thinkness, the standard size for the board is:

2438 mm x 1219 mm (8 ft. x 4 ft.)



TESTS

PSB has been tested by Internal and Third-Part Labratories to ensure the quality of the boards.

PROPERTY	TEST	UNIT	VALUE
Foremaldehyde release	EN 717-1	mg/kg	< 0.05
Moisture Content	EN 322	%	3.16
Density	EN 323	kg/m³	816.4
Modulus Elasticity	EN 310	N/mm²	3592.50
Tensile Strength Prependicular to the plane	EN 319	N/mm²	0.96
Bending Strength	EN 310	N/mm²	19.55
Thickness Swelling 2 hours	EN 317	%	3.2
Thickness Swelling 24 hours	EN 317	%	7.78
Screw Withdrawal	EN 320	N	1543
Tolerance on Nominal Dimensions (Thickness)	EN 324	mm	± 0.5
Tolerance on Nominal Dimensions (Length-Width)	EN 324	mm/m	± 0.2
Tolerance on Nominal Dimensions (Squareness)	EN 324	mm/m	± 0.2
Tolerance on Nominal Dimensions (Edge Straightness)	EN 324	mm/m	± 0.2

CERTIFICATIONS

PSB Design has been tested by Dubai Central Laboratory and other 3rd party laboratories. It has been certified by Dubai Municipality as per Al Sa'fat Green Building System and is in compliance with the European Standards EN300:2006, and BS EN 717-1:2004.

CI/SfB			
		(29)	(k2)
CAW P10 Uniclass JP10:L68114			

Nullifire
Smart Protection

Product Information

Description

FS702 Intumastic is a water-based acrylic sealant which cures to give a firm but flexible fire seal. Suitable for use in various construction joints offering up to 30% movement capability whilst providing an excellent acoustic and air seal.

FS702 is suited for use around non-combustible services, cables, rock fibre insulated non-combustible pipes, using a minimum depth of 25 mm. FS702 has excellent adhesive qualities and can also be used for the bonding and pointing of joints and service penetrations in conjunction with FB750 Intubatt system.

Usage / Purpose

FS702 is suitable for a variety of applications:

- Static & movement linear joints (masonry/flexible wall to masonry/ rigid wall/rigid floor/flexible wall)
- Window & door joints (masonry to timber/steel)
- FB750 to flexible wall/rigid wall/rigid floor
- Cold smoke seal
- Service penetrations sealing: copper & steel pipes, cable bundles / trays / ladders (with and without FI025 Intuflex Insulation Wrap)
- FS702 is also suitable for service movement joints (consult Technical Services).

Traceability & Product Identification

- Nullifire is bringing unique identification technologies to the market, offering architects, specifiers, main contractors, and applicators guaranteed traceability of product on-site. Our traceability technologies are not visible to the naked eye, and do not affect performance or product aesthetics.
- FS702 features Optifire technology, a unique UV technology, activated by exposing the products surface to a UV light source, which offers easy & instant product identification (white colour only).
- FS702 also features Optifire+, a unique pigment technology, visible only with a specific Nullifire detector ; Optifire+ offers lifetime identification, and remains traceable even after a fire.

Colours

White.
Grey is available on request (may be subject to minimum order quantities).

Packaging

Gun Grade:
310 ml cartridges (12 per box/25 per box)
600 ml sausages (12 per box)
400 ml sausages (15 per box)
Trowel Grade: 5 litre bucket

Availability

Direct from Tremco CPG UK Limited (see details on this TDS).

Usage Guidelines

Always read SDS, pre-application guidance and relevant application detail prior to application. Ensure the latest documents are downloaded prior to every project commencement.

Protective Equipment

Use in well ventilated conditions and ensure all recommended protective equipment is worn during handling & use of this product. For full recommendation, refer to safety data sheet.

Necessary Tools

- Sealant caulking gun
- Sealant profiling tool/spatula
- Masking tape (if decorative finish is required to surrounding substrates)

Preparation

- All surfaces must be clean and sound, free from dirt, grease and other contamination.
- Wood, plaster and brick may be damp but not running wet.
- Porous or high gloss surfaces require priming prior to application.
- If a clean line is required on adjoining substrates, masking tape should be used.
- Check specification is suitable for movement, fire rating and gap size required.

FS702

Intumastic Fire Resistant Acrylic Sealant

up to 240 mins

optifire

optifire+

Key Benefits Summary

- **Up to 4 hours fire resistance - Tested to EN 1366-4 and EN 1366-3**
- **Up to 30% movement capability (during fire test)**
- **Suitable for flexible walls and rigid walls & floors**
- **Used for sealing FB750 Intubatt**
- **Acoustics up to 55 dB**
- **Air seal up to 2,000 Pa**
- **Optifire & Optifire+ unique traceability identifiers**

This product is certified to applicable European (EN) standards and UL-EU Mark service requirements. *CERT. N° UL-EU- 01059-CPR*

UL EU

ETA CE
20/1315 Linear Joints
21/0010 Penetrations

UK TA UK CA
22/0062 Linear Joints
22/0064 Penetrations

up to 240 mins

FS702

Intumastic Fire Resistant Acrylic Sealant

Nullifire Smart Protection

Application

- Insert required backing material (refer to performance on backing materials), oversized to joint width to ensure stability, to provide correct depth of seal.
- A light water spray will aid adhesion if a rock mineral fibre backer has been applied.
- Using a sharp knife, cut nozzle of cartridge to bead size and angle required.
- Gun sealant into gap to required depth by applying an even pressure to the trigger.
- Work and tool to a smooth finish immediately with a wet profiling tool or spatula.

Important Information

- Do not use around CPVC pipes ; for this specific application, please use FS719 HP Blue for CPVC.
- If used around Pegler X-Press Carbon Steel pipes, the pipe manufacturer should be consulted, and their recommendations followed.

Coverage

To determine quantity of sealant required, calculate as following example:

$$\frac{\text{Gap Width (mm)} \times \text{Depth (mm)} \times \text{Total Length (m)}}{\text{Volume of Cartridge (ml)}} = \text{N° of cartridges}$$

For further guidance on application methods, and material requirements, please contact Tremco CPG UK Limited Technical Services Department.

Cleaning

Immediately remove all excess sealant and masking tape before cure. Clean tools in warm water. Cured sealant can only be removed mechanically.

Health & Safety Precautions

Safety data sheet must be read and understood before use.

Technical Service

Tremco CPG UK Limited has a team of experienced Technical Sales Representatives who provide assistance in the selection and specification of products. For more detailed information, service and advice, please call Customer Services on 01942 251400.

Guarantee / Warranty

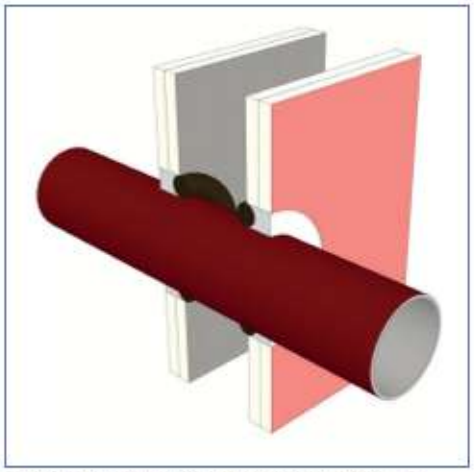
Tremco CPG UK Limited products are manufactured to rigid standards of quality. Any product which has been applied (a) in accordance with Tremco CPG UK Limited written instructions and (b) in any application recommended by Tremco CPG UK Limited, but which is proved to be defective, will be replaced free of charge.

No liability can be accepted for the information provided in this leaflet although it is published in good faith and believed to be correct.

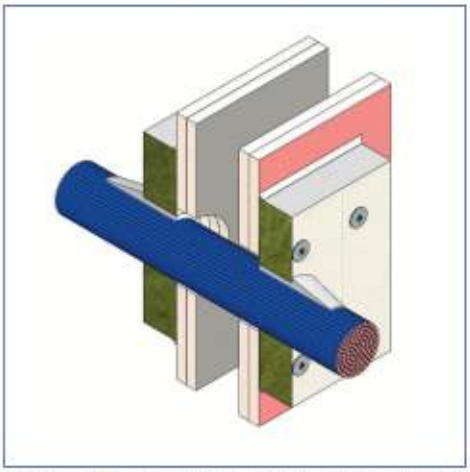
Tremco CPG UK Limited reserves the right to alter product specifications without prior notice, in line with Company policy of continuous development and improvement.

Typical Details

FS702 Intumastic plasterboard to concrete linear gap seal with PE backer rod: EI120



FS702 Intumastic seal for non-combustible pipe penetration through drywall: E120 EI30 (EI120 can be achieved with FI025 Intuflex)



FB750 Intubatt Pattress Fit + FS702 Intumastic seal & bond for cable penetration through drywall: EI120

up to 240 mins

FS702

Intumastic Fire Resistant Acrylic Sealant

Nullifire Smart Protection

Technical information

Property	Test Method	Result
Composition		Water based acrylic sealant
Acoustic Rating	BS EN ISO 10140:2-2010	up to 55 dB
Air Permeability	BS EN ISO 1023:2	Air tight up to 2,000 Pa
Solids Content		78% to 82%
pH Value		8.2 to 9.5
Specific Gravity		1.45 - 1.55
Viscosity		Thixotropic
Shore A Hardness		– 30
Touch Dry	at 20°C	30 minutes
Cure Rate	at 20°C	1 mm/day
Maximum Continuous Service Temperature		70°C - above this temperature discolouration may occur.
Storage	Store in dry conditions between +5°C and +40°C. Product may be left for short periods (not exceeding 72 hours) at temperatures as low as -5°C. Allow product to defrost for 24 hours at +10°C before use.	
Shelf Life	36 months when stored as recommended in original unopened containers.	

Backing Material

This section relates to the change of material used to back a seal or sealant as part of a sealing system for apertures for penetrations of multiple services and linear joint seals. Backing material may not be omitted unless full fill is achieved.

Backing Material	Effect	Comment
Polyethylene / Polyurethane Rod	= or +	May be replaced by mineral wool
Glass Wool	= or +	May be replaced by stone wool or ceramic wool
Stone Wool	= or +	May be replaced by ceramic wool
Ceramic Wool (including ceramic alternatives)	=	May only be replaced by alternative material of equivalent material properties, i.e. density, thermal conductivity, melting point, shrinking, reaction to fire classification - for example alkaline earth silicate fibres
Increase in backing material depth	+	Acceptable for class A1 and A2 materials.
Decrease in backing material depth	-	Not acceptable.

TREMCO Construction Products Group

Tremco CPG UK Limited
Coupland Rd, Hindley Green
Wigan WN2 4HT UK

www.tremcocpg.eu
Email: hello@tremcocpg.com
Tel: +44 (0)1942 251400

2023-08

WOOD GLUE

Product No. **PW1612**

A water based wood glue based on polyvinyl acetate polymer, designed with excellent high tack and bond strength ,developed for various wood carpentry application uses , such as :[bonding timber, MDF, doors, windows in high speed assembly lines at joineries]
Product is not suitable for perpetual wet areas like toilets, kitchen sink etc.,
Virtues: It is a nontoxic and non-flammable water based, environmental friendly single component product.

USE

Product is also useful for decorative bonding, cold and hot pressing of decorative laminates, wood veneers to ply, block boards, tiles in dry condition. Etc.

SPECIFICATIONS

Properties

Color	: milky white
Specific gravity	: 1.01 Kg/lit [± 0.025]
Viscosity 4/25°C	: 180 sec. [± 1]
Weight Solids	: 43% Kg/Kg [± 1]
PH	: 5-7
Drying Interval	
Open Tack	: 5-10 min.
Curing	: 60 hrs. [Temperature, humidity, air movement, film thickness and number of coats all affect the drying time.]

SURFACE PREPARATION

All timber species must be fully aged with a moisture content of less than 15%. Surface must be dry, clean and free from contaminations. Natural oil or gum must be removed by solvent cleaning.
Exclusions for successful application include perpetually wet surfaces and also large cavities on wood surfaces.

APPLICATION METHODS

RITVER Wood glue is generally recommended to be applied without any thinning and as such. During application use a mechanical glue spreader or a convenient spatula. Ensure that the surface is free from dust and oil moieties. Spread the adhesive evenly and leave it for 5 to 10 minutes as per the wood surfaces. Press the surface to be bonded and squeeze out the excess. Remove the non-dried portion with warm water or resort to mechanical removal when dry.
Do not apply when wet as there will be no bondage to the substrate.
Once used keep the container closed immediately. It is also important to see that the tools used for application is cleaned before the glue dries off.

WOOD GLUE

Product No. **PW1612**

PRODUCT PREPARATION

Stir well before use. Thin to the required viscosity ensuring the product is homogeneous.

Dilution
By brush, roller
Normally ready to use but we can dilute the product up to 15 % by water.

SUBSEQUENT TREATMENT

After drying this product, it does not need any subsequent treatment.

PACKING & STORING

Available in 1Lit, 4Lit ,20Lit and 200Lit .
Store in a cool and well ventilated place. Keep away from direct sunlight. Minimum one year in unopened container, stored in a cool and dry condition at 25°C.

SAFETY & FLAMMABLE

Do not expose product to direct sun light.

In case of contact with eyes rinse immediately with plenty of sweet water and seek medical
Keep away from sources of ignition. Keep out of reach of children.

Competence PUR

KLEIBERIT
ADHESIVES • COATINGS

KLEIBERIT 501

One component, polyurethane adhesive for very strong, gap-filling bonds with high temperature resistance and water resistance according to DIN/EN 204 stress group D4.

0736
KLEIBERIT PUR-Lein 501.0

Bonding in Shipbuilding (according to IMO FTPC Part 5 & Part 2/ Approval per SeeBG test certificate for international use according to Module B). Certified application quantity: 150 g/m²

Adhesive for water resistant bonding in accordance to **DIN/EN 204** **D4**

The handy bottle with the patented dispensing lid.
- self cleaning
- easy to dispense
- precise adhesive application

Competence PUR

KLEIBERIT ADHESIVES • COATINGS

TECHNICAL DATA

KLEIBERIT 501
1C PUR Adhesive

KLEIBERIT 501 is a single component PUR adhesive for strong, gap-filling bonds with high temperature resistance according to DIN/EN 14257 (WATT 91) and water resistance according to DIN/EN 204 stress group D4.

Fileds of Application
Bonding windows and doors, stairs, plywood to be used inside or outside (outside use with surface protection). Bonding mineral building boards, ceramic materials, concrete materials and hard foams.

Preparation
The surfaces to be bonded must be climatised, clean, dry and free from dust and grease. Release agents must be completely removed.

Application
- Single-sided application using a spatula or hand roller to the surface which is least porous
- Assemble the two pieces to be bonded
- The product cures to a water-resistant, solventresistant and semi-rigid adhesive film when subjected to the influence of humidity (air, material). The cross-linking process can be accelerated by means of a targeted moisture supply (fine water spray, approximately 20g/m²), or by higher temperatures (40°C up to max. 60°C).
- The cross-linking process should take place with a pressure that guarantees sufficient contact of the glued surfaces. In order to protect exposed surfaces from being contaminated with glue, apply e.g. a silicone paper to this area.
- The necessary pressure is dependent upon the type and size of materials. A good closed joint should be achieved. Minimum pressure for bonding laminated wood: **0.6 N/mm².** The more intensive the cross linking of the adhesive under pressure, the higher the subsequent load ability.

Properties of the Adhesive

Base	: polyurethane
Specific gravity	: approx. 1.13 g/cm³
Temperature	: +20 °C ideal, not below +5 °C
Wood moisture	: ideal for interior between 8-10% for exterior between 10-14%
Coat weight	: 100-200 g/m² Depending on the condition of the material
Colour	: yellowish-brown

Packaging

STOCK CODE	DESCRIPTION \ QUANTITY
KL50108101	0.5kg Plastic bottle
KL50100501	6.0kg Metal canister

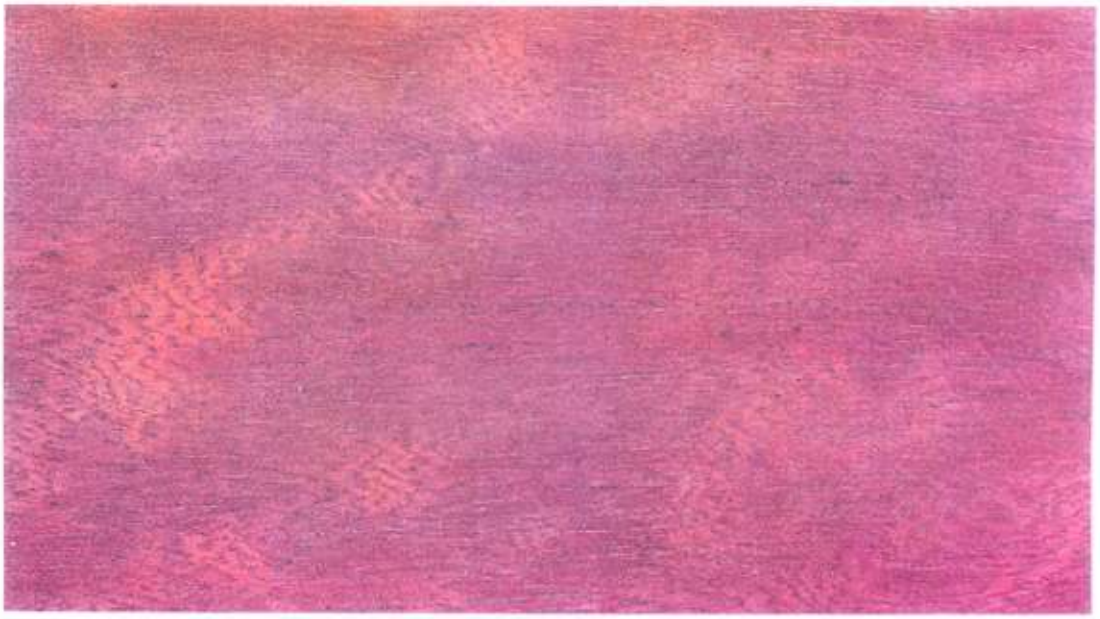
STORAGE
KLEIBERIT 501 can be stored in original factory sealed containers at 20 °C for approx. 9 months. Keep in cool and dry place and protect from humidity. Opened containers should be used as soon as possible. Product is not frost sensitive.

		KLEIBERIT 501.0
Viscosity at 20°C (mPa·s)		8000
Open time (20 °C)		approx. 25 min.
Minimum press time	**(20°C)**	60 min.
	(40°C)	30 min.
	(60°C)	10 min.
Curing time		2-3 hours

SERVICE
Our application department may be consulted at any time without obligation. The statements herein are based on our experience gained to date. They are to be considered as information without obligation. Please test and establish for yourself the suitability of our products for your particular purposes. No liability exceeding the value of our product can be derived from the foregoing statements. This also applies to the technical consultancy service, which is rendered free of charge and without obligation.

دانوب لمواد البناء ش. م. ح.
DANUBE
BUILDING MATERIALS FZCO

SPECIFICATION OF AFRICAN MAHOGANY WOOD



MAHOGANY, AFRICAN (H) (1) *Khaya ivorensis*, A. Chév., W. Africa
(2) *K. anthotheca*, Welw. C.DC., W. and E. Africa
(3) *K. nyasica*, Stapf. ex Baker.f., E. Africa
Family: *Meliaceae*

Other names: (1) Nigerian, Benin, Lagos or Degema mahogany; (1) and (2) Ghana, Ivory Coast, Takoradi or Grand Bassam mahogany; (2) krala (Ivory Coast), mangona (Cameroon), munyama (Uganda); mbaua (Mozambique), mbawa (Malawi), mkangazi (Tanzania).
Distribution: Tropical West, Central and East Africa.
General description: Heartwood varies from light to deep reddish-brown. Grain straight to interlocked, moderately coarse textured to medium. Logs may have brittleheart or softheart and cross fractures or heartbreaks. Weight 540–590 kg/m^3 (34–36 lb/ft^3); s.g. .54 to .59.
Mechanical properties: *K. anthotheca* has moderately good wood bending properties, the other types cannot be bent without severe buckling or fibre rupture. The bending strength is low, stiffness and resistance to shock loads is very low and the crushing strength is medium.
Seasoning: Dries rapidly with little degrade except where tension wood occurs, causing serious distortion. Small movement in service.
Working properties: There is a moderate blunting effect on tools, and tension wood or brittleheart and interlocked grain can cause woolliness. To avoid tearing the grain a reduced cutting angle of from 15° to 20° is desirable. Nailing, screwing and gluing properties are good and it may be stained and polished to an excellent finish.
Durability: Liable to insect attack. The heartwood is moderately durable but extremely resistant to preservative treatment and the sapwood is moderately resistant.
Uses: Widely used for furniture and cabinetmaking, office, shop and bank fitting, interior joinery, boatbuilding and vehicle bodies. It is extensively used for laminations especially in cold moulded processes. Rotary cut logs are used for plywood and sliced veneers for decorative work.
Note: Related spp. include *K. grandifoliola*, C.DC., and *K. senegalensis*, (Desr) A. Juss, both sold as **heavy African mahogany** and sometimes mixed with shipments of lighter species.

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TECHNICAL DATA REPORT

PLAIN MDF – 1220mm x 2440mm

Properties	Unit	Range of Thickness				
Thickness Tolerance (within panel)	mm	2.5-4 (+/-0.2)	>4-6 (+/-0.2)	>6-12 (+/-0.2)	>12-19 (+/-0.2)	>19-30 (+/-0.2)
Size Tolerance (within panel)	mm	+/-2mm max in length and width				
Squareness	mm	+/-2mm				
Density	Kg/m^3	770-800	750-800	710-760	690-720	680-710
Density Profile @ core	%	85	85	80	80	75
Internal Bond	N/mm^2	0.65	0.65	0.60	0.55	0.50
Modules of Rupture	N/mm^2	30	25	22	20	18
Modules of Elasticity	N/mm^2	n/a	2700	2500	2200	2000
Surface Soundness	N	2600	2600	2400	2400	2200
Screw Holding ➢ Face ➢ Edge	 N N	 n/a n/a	 n/a n/a	 n/a n/a	 1000 800	 900 600
Thickness Swelling (24hr)	%	35	30	15	12	10
Water Absorption (24hr)	%	60	50	30	25	20
Dimensional Stability (rh35-85%) ➢ Length/Width ➢ Thickness	 % %	 0.5 6	 0.5 6	 0.5 6	 0.4 5	 0.4 5

(ACCORDING TO EUROPEAN STANDARD EN622-5:1997)

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