



United Kingdom
Testing and
Certification

Test Report

The fire resistance performance of a timber, single acting single door and a fully insulated, timber, single acting double door assembly when tested in accordance with BS EN 1634-1:2014+A1:2018

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Revision A

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Prepared For Complete Fire Protection
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21542

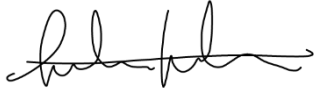
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Change History

Issue Date	Revision	Created by	Authorised by	Description of Change
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*For and on behalf of United Kingdom Testing and Certification.

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1 Executive Summary

1.1 Specimen Summary

Specimen A had overall nominal dimensions of 1000 mm wide by 2093 mm high, incorporating a single door leaf with overall dimensions of 928 mm wide by 2040 mm high by 44 mm thick. The door leaf was formed from graduated density chipboard with 6 mm thick hardwood lippings to all long edges. The leaf was hung in a softwood frame on three steel hinges, the doors assembly incorporated the following hardware:

Item No.	Description	Reference
12	Door Closer	TS72
13	Latch	Altro 78 tubular latch
14	Lever Handles	CH100.SSS

Specimen B had overall nominal dimensions of 1088 mm wide by 2092 mm high, incorporating an equal pair of door leaves each with overall dimensions of 500 mm wide by 2040 mm high by 54 mm thick. The door leaf was formed from graduated density chipboard with 6 mm thick hardwood lippings to all long edges. The leaves were hung in a hardwood frame each on three steel hinges, the doors assembly incorporated the following hardware:

Item No.	Description	Reference
26	Door Closer	TS72

1.2 Specimen Verification

United Kingdom Testing and Certification carried out a comprehensive survey to verify the information provided by the Test Sponsor. This included verifying the materials, dimensions, and manufacturing methodologies of the test specimens, wherever possible. Refer to page 15 for full details of this survey.

1.3 Specimen Installation and Fixity

Specimen A was installed into the test construction by United Kingdom Testing and Certification. The specimen was installed such that the door leaf opened towards the heating conditions at the request of the Test Sponsor. The specimen was unlatched and unbolted prior to the commencement of the test at the request of the test sponsor.

Specimen B was installed into the test construction by United Kingdom Testing and Certification. The specimen was installed such that the door leaf opened towards the heating conditions at the request of the Test Sponsor. The specimen was unlatched and unbolted prior to the commencement of the test at the request of the test sponsor.

1.4 Sampling

United Kingdom Testing and Certification were not involved in the sampling or selection of the test specimen or any of the components. The results obtained during the test apply to the specimens as received and test by United Kingdom Testing and Certification.

1.5 Expression of Results

1.5.1 Specimen A

Specimen A satisfied the performance criterion specified in BS EN 1634-1:2014+A1:2018 § 11 for the following intervals:

Integrity (E) ¹	Sustained Flaming	29 minutes	
	Gap Gauge	30 minutes	Area extinguished
	Cotton Pad	30 minutes	Area extinguished
Insulation (I ₁) ²	Specimen	29 minutes	
Insulation (I ₂) ³	Specimen	29 minutes	

*The test was discontinued after a period of 55 minutes.

¹ The time(s) in completed minutes for which the test specimen(s) continues to maintain its separating function without: a) causing ignition to the cotton pad applied in accordance with BS EN 1363-1:2020 § 10.4.5.2 b) permitting the penetration of a gap gauge as specified in EN 1363-1:2020 § 10.4.5.3 c) resulting in sustained flaming.

² The time(s) in completed minutes for which the test specimen(s) continues to maintain its separating function without developing temperatures on its unexposed surface which increase at the locations specified in BS EN 1634-1:2014+A1:2018 § 9.1.2.2, 9.1.2.3, 9.1.2.4 and the roving thermocouple above the initial average temperature by more than 180°C.

³ The time(s) in completed minutes for which the test specimen(s) continues to maintain its separating function without developing temperatures on its unexposed surface which: a) increase the average temperature above the initial average temperature by more than 140 °C; b) increase at any location (including the roving thermocouple) above the initial average temperature by more than 180°C with the exception that the limit for temperature rise for any frame member or transom member adjacent to the leaf/leaves of the doorset or openable window shall be 360°C.

1.5.2 Specimen B

Specimen B satisfied the performance criterion specified in BS EN 1634-1:2014+A1:2018 § 11 for the following intervals:

Integrity (E)⁴	Sustained Flaming	53 minutes	
	Gap Gauge	55 minutes	No failure*
	Cotton Pad	54 minutes	
Insulation (I₁)⁵	Specimen	53 minutes	Due to integrity failure
Insulation (I₂)⁶	Specimen	53 minutes	Due to integrity failure

*The test was discontinued after a period of 55 minutes.

⁴ The time(s) in completed minutes for which the test specimen(s) continues to maintain its separating function without: a) causing ignition to the cotton pad applied in accordance with BS EN 1363-1:2020 § 10.4.5.2 b) permitting the penetration of a gap gauge as specified in EN 1363-1:2020 § 10.4.5.3 c) resulting in sustained flaming.

⁵ The time(s) in completed minutes for which the test specimen(s) continues to maintain its separating function without developing temperatures on its unexposed surface which increase at the locations specified in BS EN 1634-1:2014+A1:2018 § 9.1.2.2, 9.1.2.3, 9.1.2.4 and the roving thermocouple above the initial average temperature by more than 180°C.

⁶ The time(s) in completed minutes for which the test specimen(s) continues to maintain its separating function without developing temperatures on its unexposed surface which: a) increase the average temperature above the initial average temperature by more than 140 °C; b) increase at any location (including the roving thermocouple) above the initial average temperature by more than 180°C with the exception that the limit for temperature rise for any frame member or transom member adjacent to the leaf/leaves of the doorset or openable window shall be 360°C.

2 Pre-test Examination

2.1 Closing Force Measurement

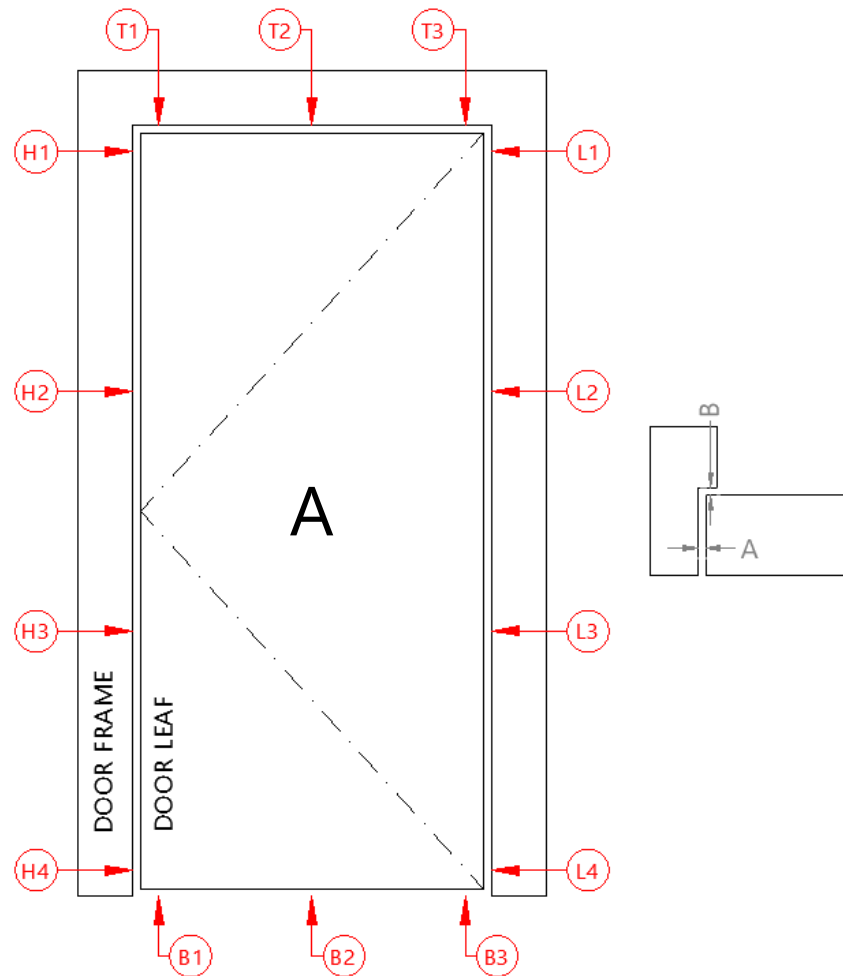
The door closing forces were measured and recorded three times. The results are presented below:

Measurement	Maximum Recorded Force (N)	Distance from Pivot to Measurement Location (m)	Moment (Nm)
Closing Force Specimen A	30.4	0.700	21.28
Opening Force Specimen A	65.2	0.700	45.64
Closing Force Specimen B1	54.6	0.400	21.84
Opening Force Specimen B1	105.0	0.400	42.00
Closing Force Specimen B2	52.5	0.400	21.00
Opening Force Specimen B2	107.0	0.400	42.8

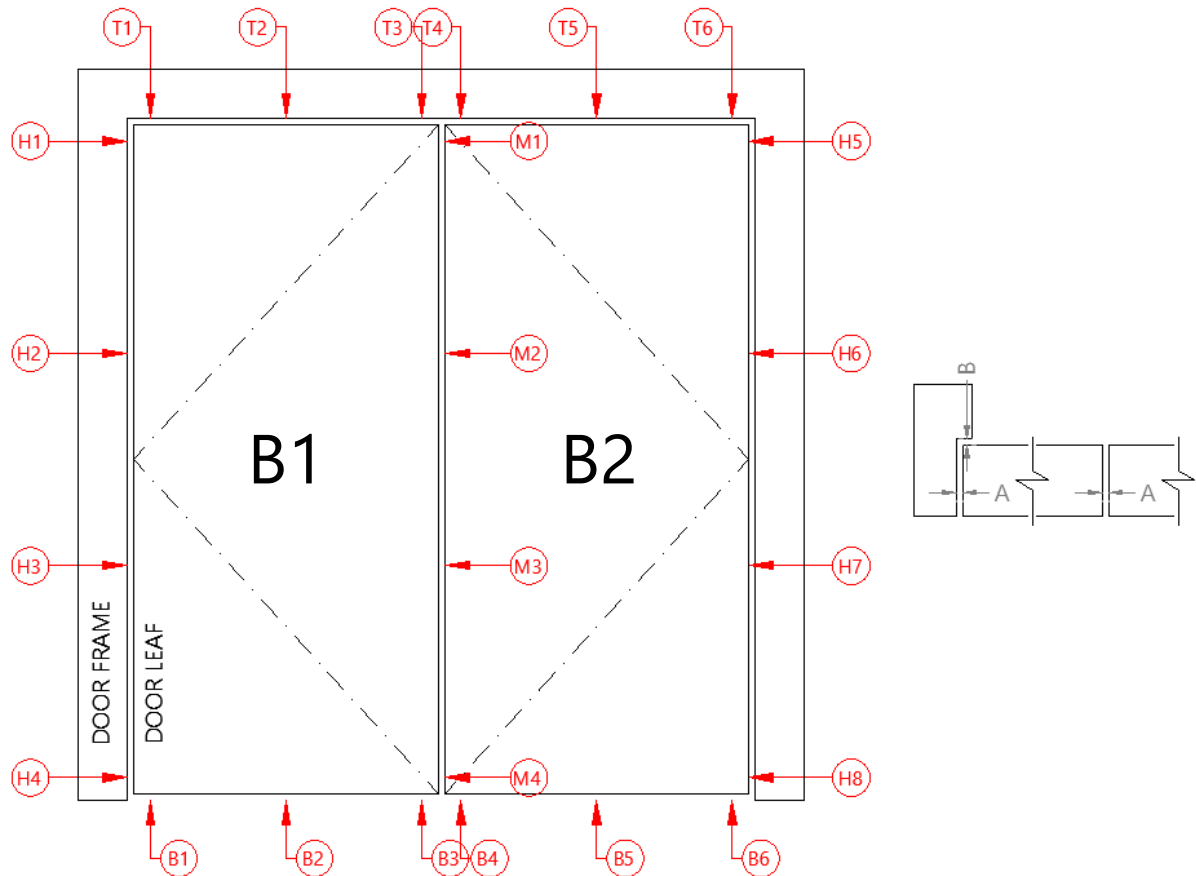
2.2 Specimen Conditioning

The specimen's storage, construction, and test preparation took place in the test laboratory over a total, combined time of seven days. Throughout this period, both the temperature and the humidity of the laboratory were measured and recorded as being within a range of from 13.2 °C to 15.9 °C and 50.5 % to 63.8 % respectively.

2.3 Gap Measurements



Hanging Stile	A	B	Closing Stile	A	B
H1	2.3	0.2	L1	2.9	1.2
H2	1.9	0.4	L2	2.9	1.3
H3	1.9	0.3	L3	3.6	1.2
H4	1.9	0.3	L4	3.3	0.8
Mean	2.0		Mean	3.2	
Max	2.3		Max	3.6	
Min	1.9		Min	2.9	
Max Permitted	4.2		Max Permitted	5.4	
Top Edge	A	B	Bottom Edge	A	
T1	2.8	0.3	B1	4.1	
T2	2.6	0.3	B2	3.6	
T3	2.6	0.2	B3	4.3	
Mean	2.7		Mean	4.0	
Max	2.8		Max	4.3	
Min	2.6		Min	3.6	
Max Permitted	4.8		Max Permitted	6.1	



	A	B			A			A	B
H1	1.5	0.2		M1	2.4		H5	2.3	0.1
H2	1.5	0.1		M2	3.0		H6	2.4	0.1
H3	1.6	0.3		M3	2.8		H7	1.8	0.1
H4	1.5	0.5		M4	2.8		H8	2.1	0.1
Mean	1.5			Mean	2.8		Mean	2.1	
Max	1.6			Max	3.0		Max	2.4	
Min	1.5			Min	2.4		Min	1.8	
Max Permitted	3.6			Max Permitted	4.9		Max Permitted	4.3	
	A	B		A	B		A		A
T1	2.9	0.1	T4	2.3	0.1	B1	4.4	B4	4.6
T2	3.6	0.1	T5	2.8	0.1	B2	4.9	B5	4.9
T3	2.8	0.1	T6	2.8	0.1	B3	4.2	B6	4.7
Mean	3.1		Mean	2.6		Mean	4.5	Mean	4.7
Max	3.6		Max	2.8		Max	4.9	Max	4.9
Min	2.8		Min	2.3		Min	4.2	Min	4.6
Max Permitted	5.3		Max Permitted	4.7		Max Permitted	6.7	Max Permitted	6.8

3 Test Specimen Drawings

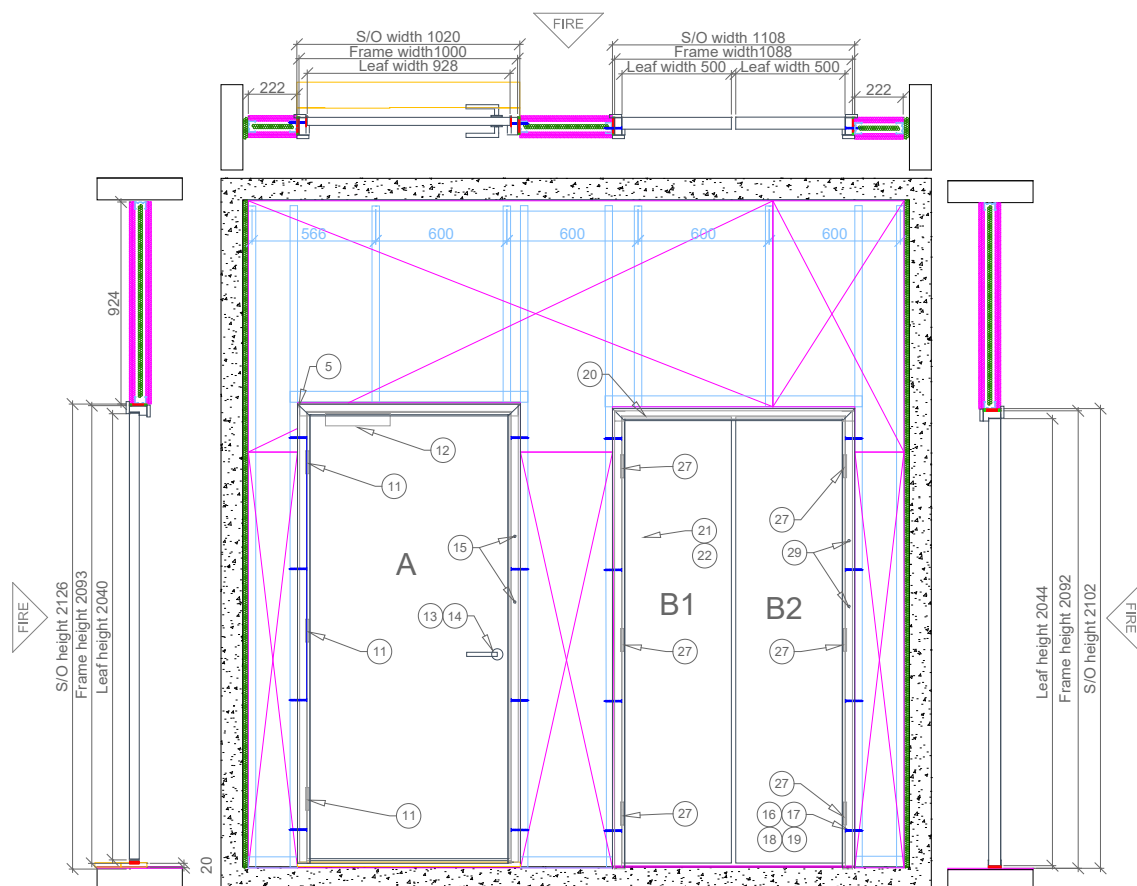
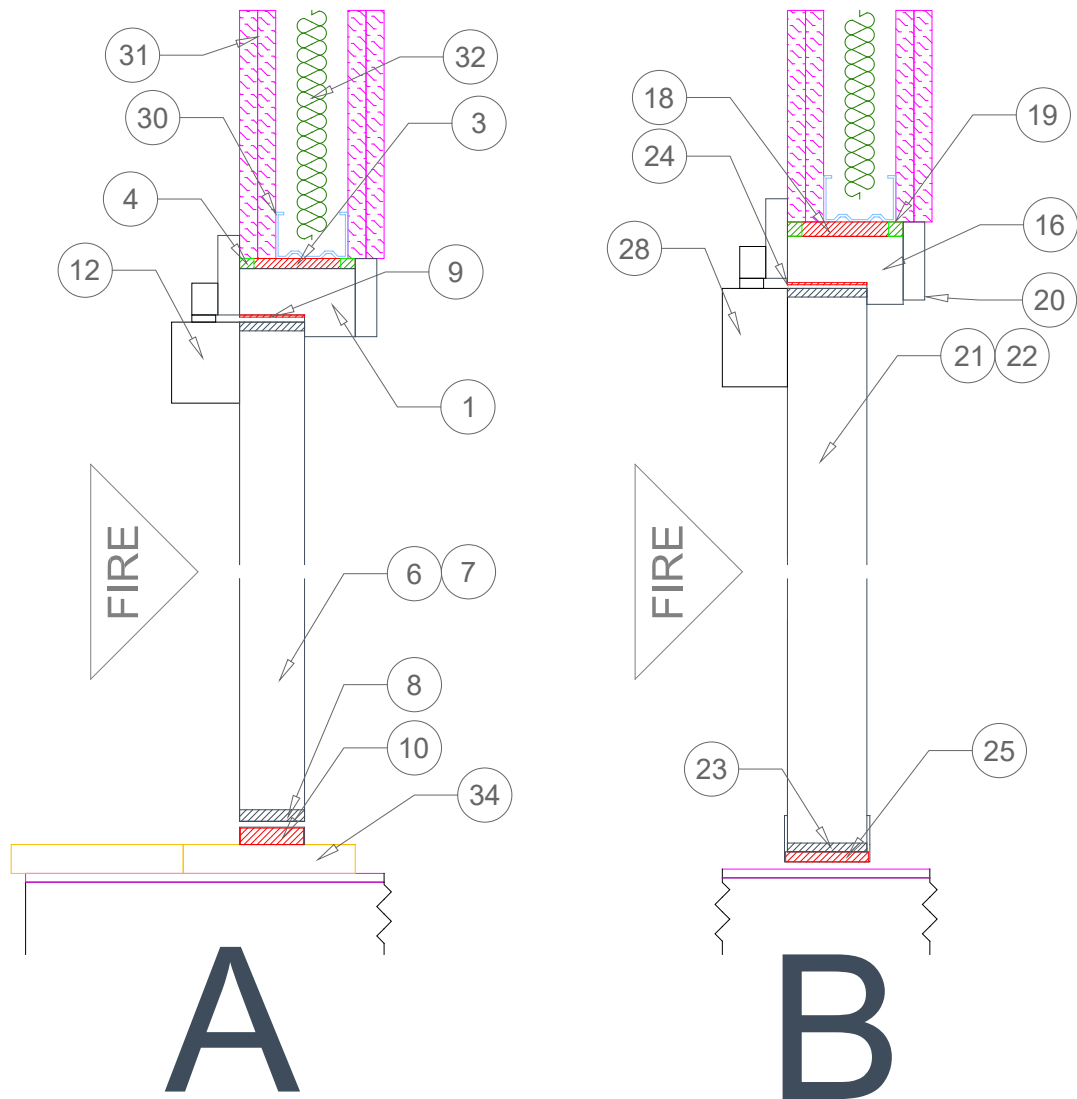


Figure 1 - General arrangement of test construction viewed from the unexposed surface



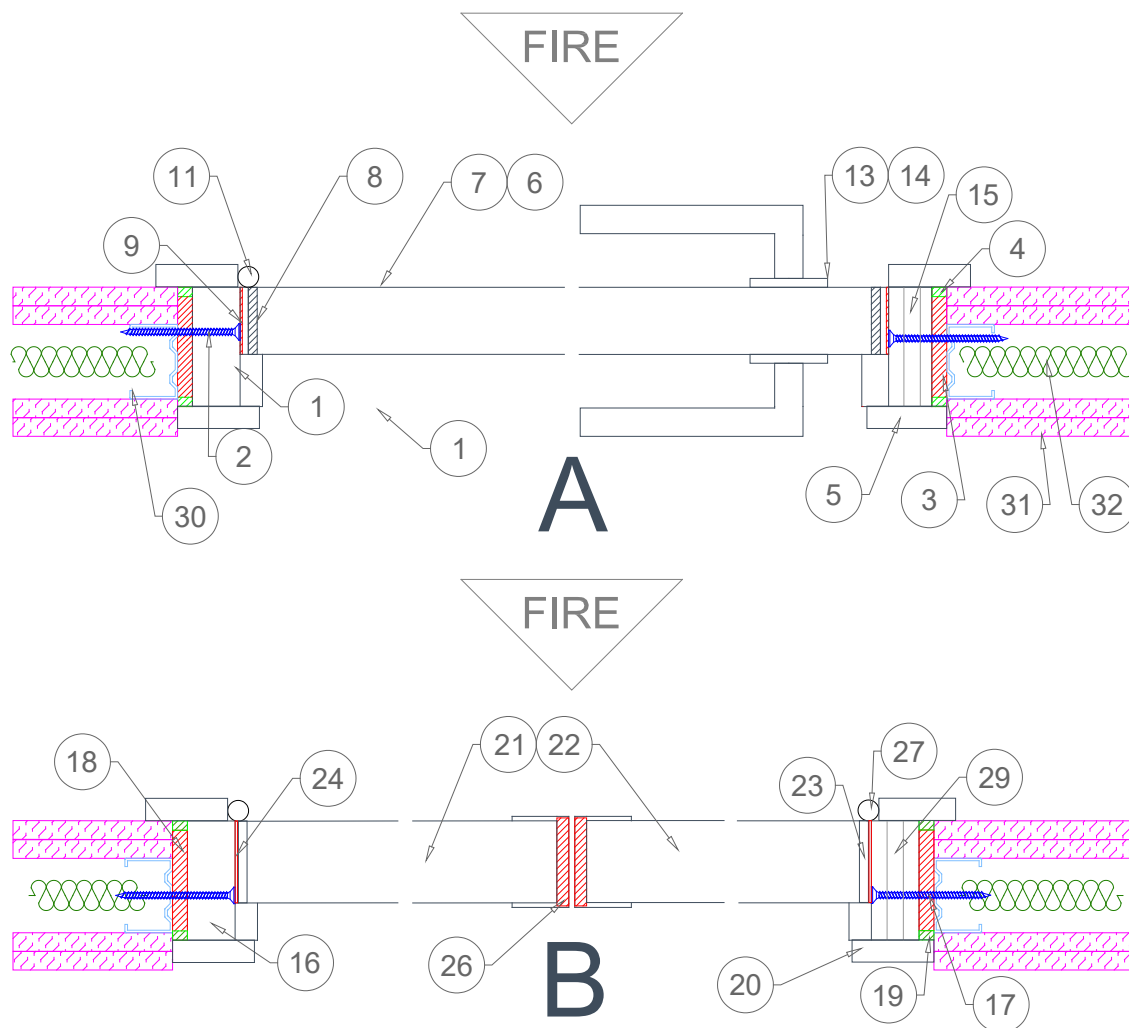


Figure 3 - Typical horizontal section through the specimens

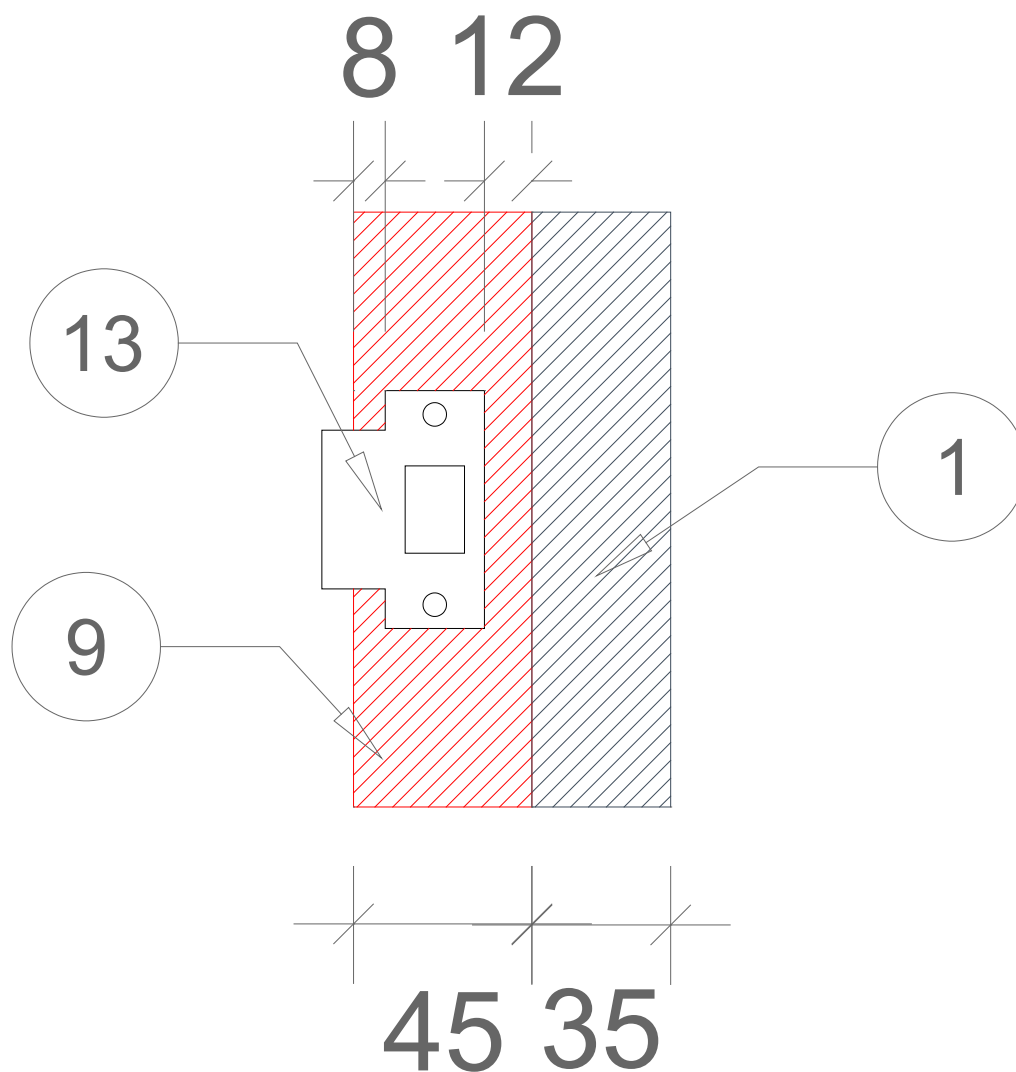


Figure 4 - Hardware intumescent interruptions

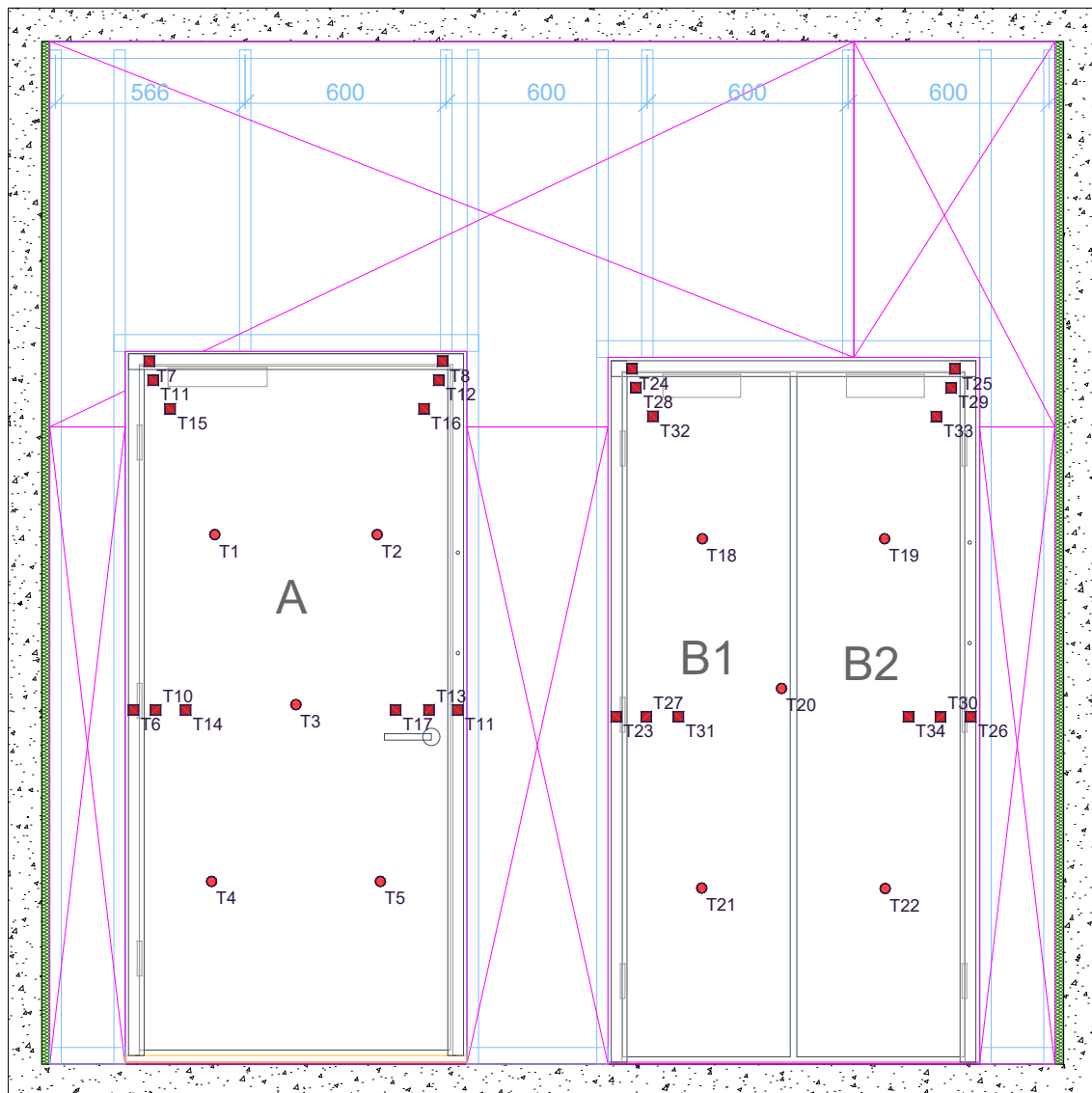


Figure 5 - Layout of instrumentation viewed from the unexposed surface of the test construction

4 Technical Schedule

All dimensions are in millimetres (mm) unless otherwise stated.

* Information provided by the Test Sponsor. Not verified by United Kingdom Testing and Certification.

** Nominal value.

*** Information is commercial in confidence. Full details are retained on file by United Kingdom Testing and Certification.

4.1 Specimen A

1. Frame	
Manufacturer	S A joinery
Reference	FD30 doorframe
Material	softwood Head and softwood Jambs
Density	540 kg/m ³
Moisture content	9.8-10.5 % (laboratory measurement)
a. Overall size	2093 mm high x 1000 mm wide x 80 mm deep
i. Frame (Head)	80mm wide x 47 mm thick with 45 mm wide x 15 mm deep rebate
ii. Frame (Jambs)	80 mm wide x 47 mm thick with 45 mm wide x 15 mm deep rebate
Jamb to Head jointing method, fixing detail and location	Stub mortice and tenon and 2x 5x100mm woodscrews in each jamb
Stop to Frame jointing method, fixing detail and location	n/a
b. Adhesive(s)	
i. Manufacturer	ureka
ii. Type	Arobond 947
iii. Reference	Batch 102044
iv. Curing method	moisture
v. Application method	Glue spreader
2. Frame Fixing Method to Supporting Construction	
Manufacturer	Spax
Reference	3917X
Type & material	Yellow PZ Countersunk Woodscrews

Overall size	Ø 5 mm x 80 mm long
Spacing	150 mm from top corner of jamb, 150 mm from bottom corner of jamb and at no more than 600 mm centres
Does the fixing penetrate intumescent seal within frame reveal	N/a
Packing Material	Blue 60 Packers
Packing Material Dimension	100 mm long x 20 mm wide x assorted thicknesses
Packing Material Location	At each fixing location
3. Frame to supporting construction fire stopping detail	
Manufacturer	Door Pro
Reference	Blue 60 Foam
Material	PU Expanding Foam
Overall dimension	5 – 15 mm wide x 60 mm deep
Application method	Foam Applicator Gun
4. Sealant to fire stopping detail	
Manufacturer	Door Pro
Reference	Orange 240
Material	Acrylic Sealant
Overall section size	10 mm deep x 5 mm to 13 mm wide
Application method	Using a cartridge gunned
Location	Gaps between the head and jambs and supporting construction
5. Architrave	
Manufacturer	S A joinery
Material	Softwood
Overall section size	55 mm wide x 15 mm deep
Location	To both faces
Application method, fixings and fixing frequency required	Pinned at 200/300 centres using 50 mm Ø 1.6 mm straight brads
6. Door Leaf	
Supplier	S A Joinery
Reference	Prima 30

Quantity of leaves on doorset	1
Glazing location relative to the head and closing edge	N/A
Overall leaf size supplied for testing	2040 mm high x 928 mm wide x 44 mm thick
7. Core element	
Manufacturer	Halspan
Reference	Prima 30
Material	Multi-Layered Particleboard
Density	620 kg/m ³ *
Overall thickness and reduced thickness if door leaf incorporates fielded areas	44 mm thick
Application method	Bonded
c. Adhesives	Not declared
d. Presence of Mechanical Fixings	Not declared
8. Lippings / Edge banding	
Manufacturer	S A Joinery
Material	Sapele
Density	640 kg/m ³ *
Moisture content	9-9.5 % (laboratory measurement)
Overall size	6 mm x 44 mm x length of door
Fixing method	Glued
Location	All Edges
a. Adhesives	
i. Manufacturer	UREKA
ii. Type	PU
iii. Reference	AREO BOND 947
iv. Curing method	Moisture
v. Application method	Roller
b. Presence of Mechanical Fixings	N/A
9. Framefit System Details	

Manufacturer	Complete Fire Protection Ltd
Reference	FrameFit System for 30-minute fire doors - Ref FF30
Material	Low modulus fire retardant graphite intumescent
a. System Components	
i. Gap spacers (LM Range for 30-minute doors)	Low Modulus (LM) fire retardant intumescent Ref: LM1.5/44, LM3/44, LM5/44
ii. Hinge Side (HE44 for 30-minute doors)	High expansion intumescent Ref: HE44
b. Overall Size	
i. LM/44 Range	44 mm wide x 2100 mm long x 1.5/3/5 mm thick
ii. HE44	44 mm wide x 2100 mm long x 1.5 mm thick
iii. Application Method	Fix required LM profiles to the door frame opposite the door edges by using the double-sided adhesive tape found on the reverse side of each profile. Once the correct number of LM profiles are in place, pin fix through all layers into the door frame using a minimum of 20 mm long panel pins at seal ends. The HE44 is generally used on the hinged side only. It is fitted using the double-sided adhesive tape found on the reverse side of each profile.
c. Door Edge Gap sizes	FrameFit Configuration
i. Hinge (2.09-2.90 mm Gap)	HE 1.5 x1
ii. Leading edge (4.14-4.92 mm gap)	HE 1.5 x1
iii. Top Edge (4.75-5 mm)	HE 1.5 x1
10. Framefit threshold seal	
Manufacturer	Complete Fire Protection Ltd
Reference	Framefit FTS30
Material	Low modulus fire retardant graphite intumescent w/ PVC
Overall section size	As LM Range
Location (relative to the opening face of the door leaf)	On floor between jambs & centered on the door frame.
Application Method	Using the s/adh tape on the back of each profile, fix the Framefit LM profiles to reduce the gap at the bottom of the door to attain the desired measurement. Once the Framefit profiles are correct, cover with the Framefit Threshold cover strip. Place between door jambs across the bottom of the door, centered on the door frame, and screw/pin fix through the cover strip & LM profiles into the timber floor. 4 No 25/30 mm long wood screws or pins, 1No 50

	mm from each end & 2 No equidistant within the threshold length.
Door Edge Gaps	FrameFit configuration
Bottom of leaf (10.5 mm)	Various LM Range between 1.5 & 3 mm due to the difference in gap at the bottom of the specimen in relation to the restraint frame
11. Hinges	
Supplier	Royde and Tucker Manufacturing
Reference	H102
Quantity	3 no.
Primary material	Steel
Type	Ball Butt Bearing
a. Size	
i. Knuckle	Ø 14 mm x 104 mm high
ii. Blades	100 mm high x 35 mm wide x 3 mm thick
b. Fixings	
i. Type	Countersunk wood screws
ii. Material	Stainless Steel
iii. Size	Ø 5 mm x 32 mm long
iv. Number off per blade	5 no.
Position of each hinge relative to the head of the leaf	1 st - 176 mm, 2 nd – 946 mm, 3 rd – 1715 mm
Details of intumescent protection	None
Interruptions to Intumescent within the frame reveal	Fully interrupts.
12. Door Closer	
Manufacturer	DORMA
Reference	TS92B
a. Material	
i. Body	Mild Steel
ii. Closer arm	Stainless Steel
iii. Cover	Stainless Steel

Configuration	Cam. Action Slide Arm
b. Overall size	
i. Slide arm	524 mm wide x 22 mm thick x 33 mm deep
ii. Body	281 mm high x 65 mm wide x 47 mm deep
iii. Cover	56 mm high x 296 mm wide x 0.5 mm deep
Fixing method	Screwed with 4 no Ø 5 mm x 50 mm stainless steel screws
13. Latch	
Manufacturer	Eurospec
Reference	Altro 78 tubular latch
a. Material	
i. Lockcase	Mild Steel
ii. Forend plate	Stainless Steel
iii. Lock bolt	Stainless Steel
iv. Keeper	Stainless Steel
b. Overall sizes	
i. Central Lockcase	17 mm high x 24 mm wide x 78 mm deep
ii. Forend plate	60 mm high x 25 mm wide x 1.5 mm thick
iii. Latch bolt	19 mm high x 12.5 mm wide x 11 mm projection
iv. Keeper	65 mm high x 25 mm wide x 1.5 mm thick with a 40 mm high x 16 mm wide Tongue
Fixing method	2 No. Ø 4 mm x 25 mm CSK woodscrews in keeper and 2 No. in forend plate
Operation of lock bolt	Unlatched
c. Details of intumescent protection	
i. Central Lockcase	1 mm Flexi Fire (VANQUISH)
ii. Forend plate	1 mm Flexi Fire (VANQUISH)
iii. Keeper	1 mm Flexi Fire (VANQUISH)
Location of centre of the spindle relative to the bottom of the leaf	Centre of the spindle measures 950 mm from the bottom of the leaf
14. Lever handles	
Manufacturer	Consort

Reference	CH100.SSS
Material	Satin Stainless steel
a. Overall size	
i. Rose	Ø 52 mm x 8 mm thick
ii. Handle	Ø 19 mm x 140 mm long x 55 mm projection
Fixing method, fixing material, sizes, quantity and location	4no. Ø 3.5 mm x 25 mm long wood screws & 2no. Ø 4 mm bolt through fixings.
15. Cableways	
Manufacturer	Ram Extrusions Ltd
Reference	Intumescent Cable Sleeve (ICS 9.5/2 & ICS 11/1)
a. Material	
i. Intumescent wrap	Graphite
ii. Cable/wire	PVC/Copper
b. Sizes	
i. Intumescent wrap	Top – outside Ø 9.5 mm x 2 mm thick x depth of frame Bottom – outside Ø 11 mm x 1 mm thick x depth of frame
ii. Cable/wire	Ø 3 mm / Ø 1 mm
iii. Through hole	Ø 11 mm
Location	1200 mm and 1500 mm from bottom of frame leg and centred to width of leg
Special notes	Small cable inside graphite intumescent wrap. Wrapped until snug fit inside hole.

4.2 Specimen B

16. Frame	
Manufacturer	S A Joinery
Reference	Sapele fd60 frame
Material	Sapele Head and Sapele Jambs
Density	640 kg/m ³ *
Moisture content	8.9-10 % (laboratory measurement)

a. Overall size	2092 mm high x 1088 mm wide x 80 mm wide
i. Frame (Head)	80 mm wide x 47 mm thick with 55mm wide x 15mm deep rebate
ii. Frame (Jambs)	80 mm wide x 47 mm thick with 55 mm wide x 15 mm deep rebate
Jamb to Head jointing method, fixing detail and location	Stub Tenon 16 mm 2 no. off Ø 5 mm x 100 mm long wood screw
b. Adhesive(s)	
i. Manufacturer	Ever build
ii. Type	D4 PVA
iii. Reference	EN204
iv. Curing method	Air
v. Application method	Squeezed & brushed
17. Frame Fixing Method to Supporting Construction	
Manufacturer	Spax
Reference	3917X
Type & material	Yellow PZ Countersunk Woodscrews
Overall size	Ø 5 mm x 80 mm long
Spacing	150 mm from top corner of jamb, 150 mm from bottom corner of jamb and at no more than 600 mm centres
Does the fixing penetrate intumescent seal within frame reveal	N/a
Packing Material	Blue 60 Packers
Packing Material Dimension	100 mm long x 20 mm wide x assorted thicknesses
Packing Material Location	At each fixing location
18. Frame to supporting construction fire stopping detail	
Manufacturer	Door Pro
Reference	Blue 60 Foam
Material	PU Expanding Foam
Overall dimension	5 – 15 mm wide x 60 mm deep
Application method	Foam Applicator Gun
19. Sealant to fire stopping detail	
Manufacturer	Door Pro

Reference	Orange 240
Material	Acrylic Sealant
Overall section size	5 – 15 mm wide x 10 mm deep
Application method	Using a cartridge gunned
Location	Gaps between the head and jambs and supporting construction
20. Architrave	
Manufacturer	S A joinery
Material	Sapele
Overall section size	55 mm wide x 15 mm deep
Location	To both faces
Application method, fixings and fixing frequency required	Pinned at 200/300 centres using 50 mm Ø 1.6 mm straight brads
21. Door Leaf	
Supplier	S A Joinery
Reference	Prima 60
Quantity of leaves on doorset	2
Glazing location relative to the head and closing edge	N/a
Overall leaf size supplied for testing	2040 mm high x 500 mm wide x 54 mm thick
22. Core element	
Manufacturer	Halspan
Reference	Prima 60
Material	Multi Layered Particleboard
Density	630 kg/m ³ *
Overall thickness	54 mm thick
Application method	Bonded
a. Adhesives	Not declared
b. Presence of Mechanical Fixings	Not declared
23. Lippings / Edge banding	
Manufacturer	S A Joinery

Reference	Lipping
Material	Sapele
Density	640 kg/m ³ *
Moisture content	8.9-9.7 % (laboratory measurement)
Overall size	6 mm x 54 mm x length of door
Fixing method	Glued
Location	All Edges
c. Adhesives	
i. Manufacturer	UREKA
ii. Type	PU
iii. Reference	AREO BOND 947
iv. Curing method	Moisture
v. Application method	Roller
d. Presence of Mechanical Fixings	No
24. Framefit System Details	
Manufacturer	Complete Fire Protection Ltd
Reference	FrameFit System for 60-minute fire doors - Ref FF60
Material	Low modulus fire retardant graphite intumescent
a. System Components	
i. Gap spacers (LM Range for 60-minute doors)	Low Modulus (LM) fire retardant intumescent Ref: LM1.5/54, LM3/54, LM5/54
ii. Hinge Side (HE44 for 60-minute doors)	High expansion intumescent Ref: HE54
b. Overall Size	
i. LM/54 Range	54 mm wide x 2100 mm long x 1.5/3/15 mm thick
ii. HE54	54 mm wide x 2100 mm long x 1.5 mm thick
Application Method	Fix required LM profiles to the door frame opposite the door edges by using the double-sided adhesive tape found on the reverse side of each profile. Once the correct number of LM profiles are in place, pin fix through all layers into the door frame using a minimum of 20 mm long panel pins at seal ends. The HE44 is generally used on the hinged side only. It is fitted using the double-sided adhesive tape found on the reverse side of each profile.
c. Door Edge Gap sizes	<u>FrameFit Configuration</u>

i. Hinge B1 (2.5-2.9 mm Gap)	HE 1.5 x1
ii. Hinge B2 (3.2-4 mm gap)	HE 1.5 x1
iii. Top Edge (4.5-5 mm)	HE 1.5 x1
25. Bottom Door Edge Seal	
Manufacturer	Complete Fire Protection Ltd
Reference	Framefit BDS60
Material	Low modulus fire retardant graphite intumescent
Overall section size	As LM Range
Location (relative to the opening face of the door leaf)	Located on the bottom door edge
Application Method	Fix required LM profiles to the bottom door edge by using the double-sided adhesive tape found on the reverse side of each profile. Once the correct number of LM profiles are in place, encase the profiles with the appropriate BDS cover strip. Then screw/pin fix through all layers into the bottom of the door edge using a minimum of 40 mm long screws/panel pins @ 200 mm centres ensuring screws/pins penetrate door edge by minimum of 10 mm.
a. Door Edge Gaps	FrameFit configurationment
i. Bottom of leaf B1 (15.5-16.18 mm)	3 x LM 54 x 3 mm due to the difference in gap at the bottom of the specimen in relation to the restraint frame
ii. Bottom of leaf B2 (14.8-15.7 mm)	3 x LM 54 x 3 mm due to the difference in gap at the bottom of the specimen in relation to the restraint frame
26. Meeting Edge Seal	
Manufacturer	Complete Fire Protection Ltd
Reference	Framefit MES60
Material	Low modulus fire retardant graphite intumescent
Overall section size	58 mm wide x 19 mm upstand x 2.5 mm thick
Location	1 no attached to each leaf.
Application Method	Pin fixed at 3 locations – 45 mm down from top, 35 mm up from bottom and one 1000 mm up from bottom.
a. Door Edge Gaps	FrameFit configurationment
i. Leading edge leaf B1 (14.3-14.6mm)	1 No LM 54 (3 mm) + 1 No HE/54 (1.5 mm)
ii. Leading edge leaf B2	1 No HE/54 (1.5 mm)
27. Hinges	

Supplier	Royde and Tucker Manufacturing
Reference	H102
Quantity	3 no.
Primary material	Steel
Type	Ball Butt Bearing
a. Size	
i. Knuckle	Ø 14 mm x 104 mm high
ii. Blades	100 mm high x 35 mm wide x 3 mm thick
b. Fixings	
i. Type	Countersunk wood screws
ii. Material	Stainless Steel
iii. Size	Ø 5 mm x 32 mm long
iv. Number off per blade	5 no.
Position of each hinge relative to the head of the leaf	1 st - 175 mm, 2 nd – 945 mm, 3 rd – 1715 mm
Details of intumescent protection	1 mm Interdens (VANQUISH)
Interruptions to Intumescent within the frame reveal	Framefit fireplug sits over the hinges.
28. Door Closer	
Manufacturer	DORMA
Reference	TS72
a. Material	
i. Body	Mild Steel
ii. Closer arm	Stainless Steel
iii. Cover	Plastic
Configuration	Cam. Action Slide Arm
b. Overall size	
i. Slide arm	275 mm wide x 22 mm thick x 21 mm deep
ii. Body	57 mm high x 230 mm wide x 40 mm deep
iii. Cover	68 mm high x 232 mm wide x 45 mm deep
Fixing method	Screwed with 4 no Ø 5 mm x 50 mm stainless steel screws

29. Cableways	
Manufacturer	Ram Extrusions Ltd
Reference	Intumescent Cable Sleeve (ICS 9.5/2 & ICS 11/1)
a. Material	
i. Intumescent wrap	Graphite
ii. Cable/wire	PVC/Copper
b. Sizes	
i. Intumescent wrap	Top – outside Ø 9.5 mm x 2 mm thick x depth of frame Bottom – outside Ø 11 mm x 1 mm thick x depth of frame
ii. Cable/wire	Ø 3 mm / Ø 1 mm
iii. Through hole	Ø 11 mm
Location	1200 mm and 1500 mm from bottom of frame leg and centred to width of leg
Special notes	Small cable inside graphite intumescent wrap. Wrapped until snug fit inside hole.

4.3 Supporting Construction

30. Metal Frame	
Supplier	UKTC Provided
a. Supporting Structure	
i. Type & Material	Steel C Stud
ii. Thickness & Size	52 mm wide x 34 mm thick x 3000 mm long
iii. Centres	600 mm Centres 20 mm Space between testing frame and wall frame for insulation.
Timber Supports inside studs	No
31. Plasterboard	
Supplier	UKTC Provided
Type & Material	Gypsum Plasterboard Tapered Edge
Layer Quantity	2
Thickness & Size	12.5 mm per layer 25 mm total x 2400 mm x 1200 mm Per Sheet

Fixings	Plasterboard Screw Fixings Ø 5 mm x 25 mm Long Screw
Joints Filled & Taped With	Limestone filler & Butyl rubber
32. Wall Insulation	
Supplier	UKTC Provided
Type & Material	Mineral Wool
Installation Method	Compression Fitted
Thickness	50 mm
Locations	Centrally Located in the wall & at the free edges of the testing frame to the wall.
Additional Wall Construction Requests	N/a
33. Free Edge Gasket	
Manufacturer	Morgan Advanced Materials
Reference	Superwool
Density	128 Kg/m ³
Dimensions	20 mm thick x 3025 mm long x 100 mm wide
Fixing(s)	Compression fitted between the supporting construction & restraint frame
34. Board for Simulated Floor Level	
Manufacturer	British Gypsum and B&Q
a. Reference	
i. Simulated floor	Glasroc F MultiBoard 6mm
ii. Threshold.	18mm tongue and groove spruce floorboard
Density	833 Kg/m ³
Dimensions	6 mm thick x Opening width + 400 mm long x Wall Depth + 500 mm wide
Fixing(s)	Compression fitted between restraint frame and specimen.

5 Specimen Photographs



Figure 6 - Item 1, 12



Figure 7 - Item 2



Figure 8 - Item 3

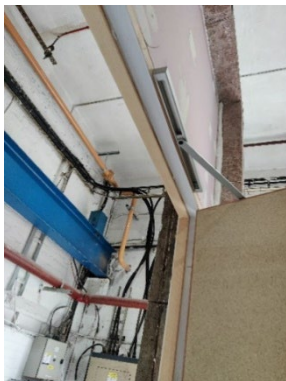


Figure 9 - Item 1, 9



Figure 10 - Item 1, 10



Figure 11 - Item 1, 9, 13



Figure 12- Item 13, 14



Figure 13- Item 1, 15



Figure 14- Item 16, 29



Figure 15- Item 16, 28



Figure 16- Item 16, 21, 23, 26

Figure 17- Item 16, 18, 21, 25, 26,
27, 28

6 Test Procedure

6.1 Heating Conditions

The specimens were subject to heating conditions in accordance with BS EN 1363-1:2020 § 5.1. This was monitored and controlled for the duration of the test using type K thermocouples which were distributed across a vertical plane 100 ± 50 mm from the exposed surface of the test construction. The resulting Time-Temperature distribution is presented in Figure 26.

6.2 Pressure Conditions

The specimens were subject to a pressure regime in accordance with BS EN 1363-1:2020 § 5.2. The calculated pressure differential relative to the laboratory atmospheric pressure at a height of 365, 1612 and 2850 mm from the furnace floor level was -1.1, 9.4 and 20.0 Pa respectively which equates to 0 Pa at a height of 500 mm from the furnace floor level. The furnace was maintained at these pressures within ± 5 Pa five minutes after the commencement of the test and ± 3 Pa ten minutes after the commencement of the test and for the remainder of the test duration. The Time-Pressure distribution is presented in Figure 27.

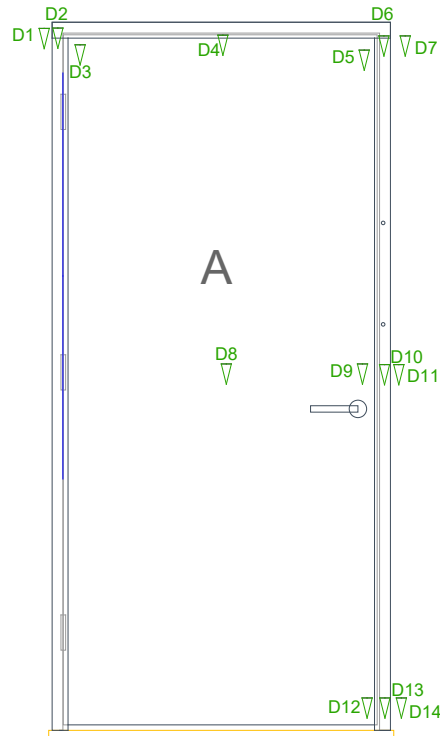
6.3 Unexposed Surface Temperature

A roving thermocouple was available for the evaluation of the maximum temperature rise of the unexposed surface of the specimens for the duration of the test. Any measurements using the roving thermocouple are presented on page 34.

Disc thermocouples were affixed to the unexposed surface of the specimens in accordance with BS EN 1634-1:2014+A1:2018 § 9.1.2 to measure and monitor the maximum and the mean temperature rise of the unexposed surface of the specimens for the duration of the test. A summary of the measurements is presented in Figure 28 and Figure 29 and the locations of these thermocouples is illustrated in Figure 5.

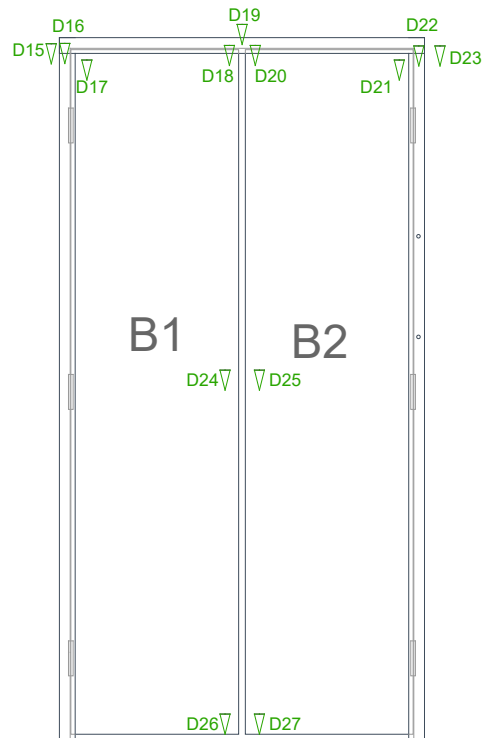
6.4 Deflection

All measurements are in millimeters (mm) unless stated otherwise. Positive values indicate movement towards the heating conditions.



Time (mins)	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	-5	0	5	9	10	9	6	6	6	8	6	2	2
20	-2	-5	*	5	13	6	5	3	3	3	6	9	2	1
25	11	5	*	16	24	16	14	11	11	12	15	22	13	11

* Measurement Obscured.



Time (mins)	D15	D16	D17	D18	D19	D20	D21	D22	D23	D24	D25	D26	D27
0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	-1	7	5	2	8	30	0	15	0	2	0	-9	1
20	-4	2	5	4	3	30	-3	9	4	-1	1	-4	3
25	7	17	12	13	16	43	9	14	11	8	9	-2	14
30	10	18	17	20	14	40	15	18	11	6	11	5	14
40	12	20	21	23	13	46	13	17	12	7	9	8	14
50	20	31	34	35	24	59	20	23	11	8	9	11	16

6.5 Observations

Specimen	HH	MM	SS	E ⁷	U ⁸	Observation
	00	00	00			The test commences.
B	00	00	15		X	Steam/smoke releases from the meeting stile of the door leaves.
A + B	00	00	35		X	Steam/smoke releases out from the cableways through the frames.
A	00	00	55		X	Steam/smoke releases down the leading edge of the door.
A	00	021	30		X	Steam/smoke releases along the head of the door.
B	00	03	34		X	The edge guards down the leading edges are bulging out intermittently down the length.
A + B	00	05	00			Door unrestrained.
B1	00	08	25		X	Meeting stile discoloring down the middle.
A	00	14	45	X		Closer has detached from the door and the architraves are starting to crack and break up.
B	00	15	24	X		Face of the door can be seen cracking up.
A + B	00	20	00		X	No significant visible changes.
A	00	24	32		X	Faint glowing can be seen from the top leading corner.
A	00	25	47		X	Flicker of flame at the top centre of the door.
A	00	28	53		X	Cotton pad test applied at top leading corner – the pad is discoloured but no signs of embers.
A	00	29	28		X	A flame emits from the top leading corner to the centre of the door and sustains for a period greater than 10 seconds - sustained flame integrity and by virtue insulation failed deemed to have occurred.

⁷ Viewed from exposed surface of the test construction.

⁸ Viewed from unexposed surface of the test construction.

Specimen	HH	MM	SS	E ⁹	U ¹⁰	Observation
A	00	30	00		X	Specimen extinguished and blanked over so that observations continue on Specimen B. Gap gauge and cotton pad criteria can no longer be performed. No gaps, emissions of hot gasses or sustained flaming were witnessed at the bottom of the specimen prior to blanking off.
B	00	40	00		X	No significant visible changes.
B	00	42	35		X	Steam/smoke release along the head of the specimen increases.
B	00	45	15	X		Architraves have fully burnt/fallen away, gaps can be seen along the length of intumescent between the frame and head of the doors as the head moves towards heating conditions.
B1	00	52	51		X	A faint glowing can be seen from the top leading corner just behind the edge guard location.
B1 + B2	00	53	24		X	A flame emits and sustains for a period greater than 10 seconds sustained flame failure and by virtue insulation failed deemed to have occurred.
B1	00	54	35		X	Cotton pad test applied at the head of the door leaf – Cotton pad ignites, cotton pad failure is deemed to have occurred.
	00	55	54			The test is discontinued at the request of the Test Sponsor.

⁹ Viewed from exposed surface of the test construction.

¹⁰ Viewed from unexposed surface of the test construction.

6.6 Test Images



Figure 18 – The exposed surface of the test construction prior to commencement of the test



Figure 19 - The unexposed surface of the test construction prior to the commencement of the test



Figure 20 - The unexposed surface of the test construction after a test duration of 10 minutes



Figure 21 - The unexposed surface of the test construction after a test duration of 25 minutes



Figure 22 - The unexposed surface of the test construction after a test duration of 40 minutes



Figure 23 - The unexposed surface of the test construction after a test duration of 50 minutes



Figure 24 - The unexposed surface of the test construction after a test duration of 54 minutes



Figure 25 - The exposed surface of the test construction after the test was discontinued

7 On-going Implications

7.1 Limitations

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 BS EN 1363-1, and where appropriate BS EN 1363-2. 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 in the relevant test method is not covered by this report and should be the subject to design appraisal by a competent individual.

Guidance on the field of direct application of results is presented in Appendix A.

7.2 Accuracy of Results

Due to 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.

No statement of conformity with the testing specifications is made or implied in this report. However, measurement results are reviewed, where applicable, to establish where measurement results exceed the control parameters established in the relevant resistance to fire test standard.

7.3 European Group of Organisations for Fire Testing (EGOLF)

Certain aspects of some fire test specifications are open to different interpretations. EGOLF have identified several such areas and have agreed Resolutions which define common agreement of interpretations between fire test laboratories which are members of the Group. Where such Resolutions are applicable to this test then they have been followed.

8 Figures

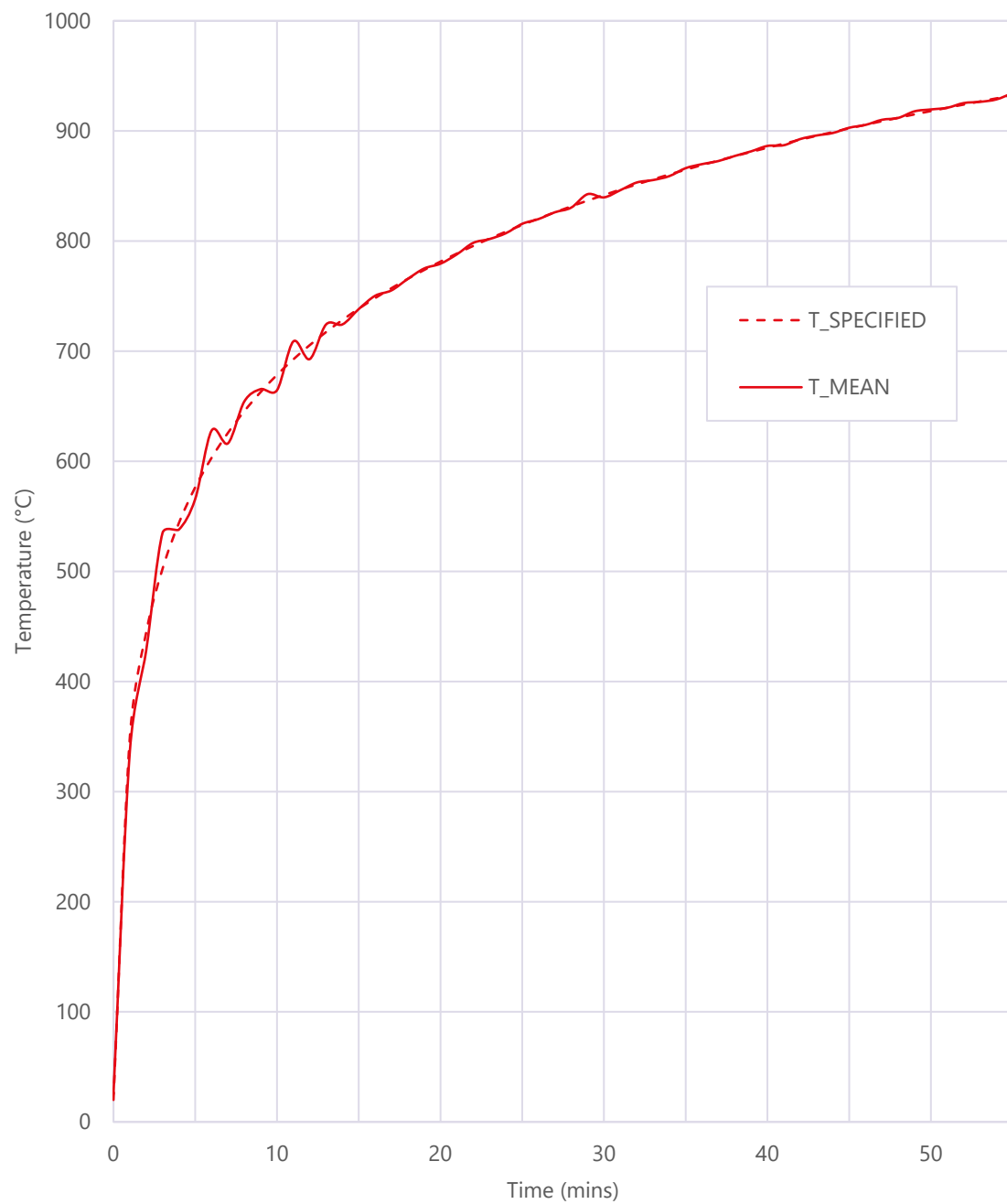


Figure 26 – Graph presenting the Time-Temperature distribution of the furnace

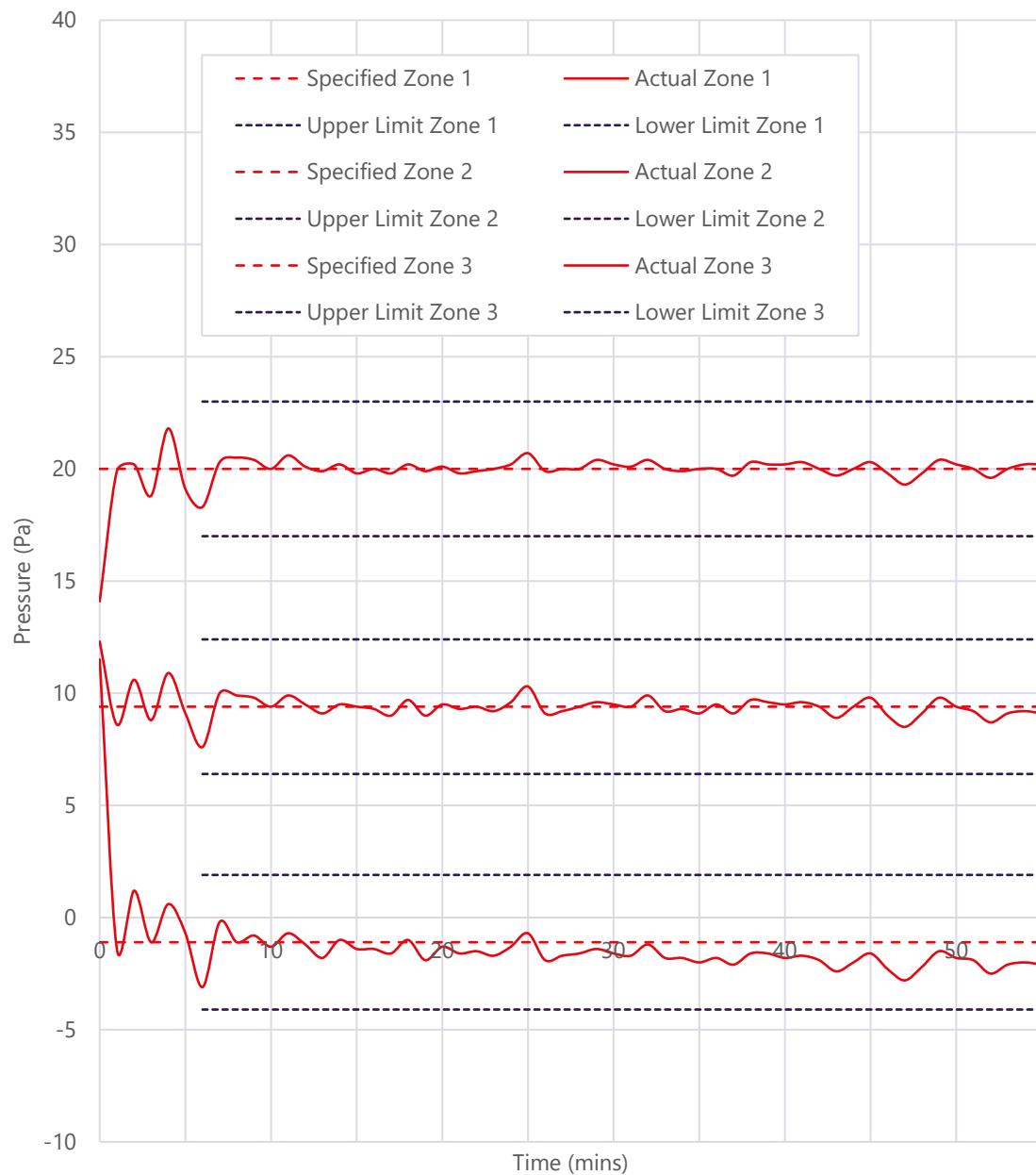


Figure 27 – Graph presenting the Time-Pressure distribution of the furnace

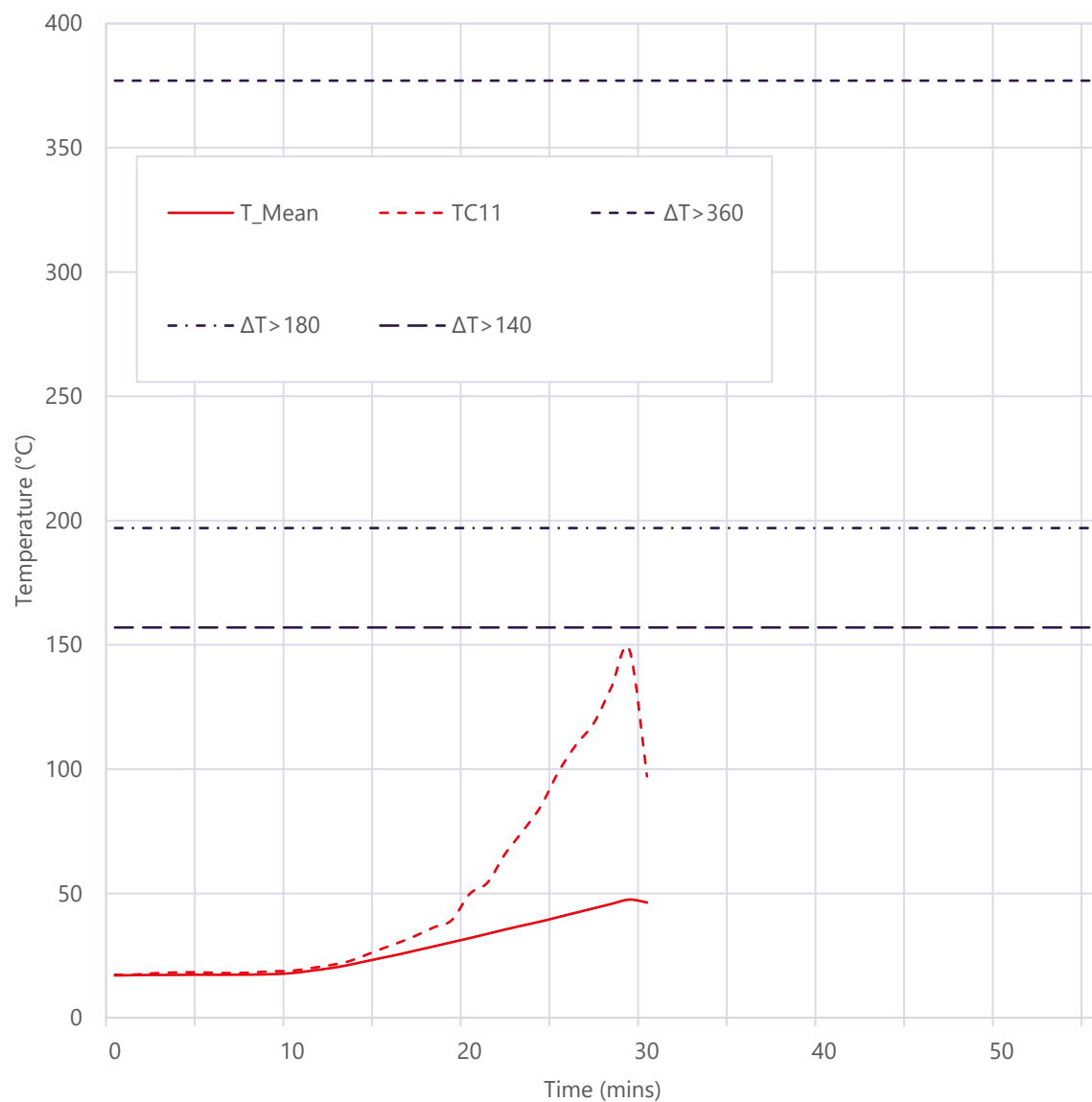


Figure 28 - Graph presenting the Time-Temperature distribution of the unexposed surface of Specimen A

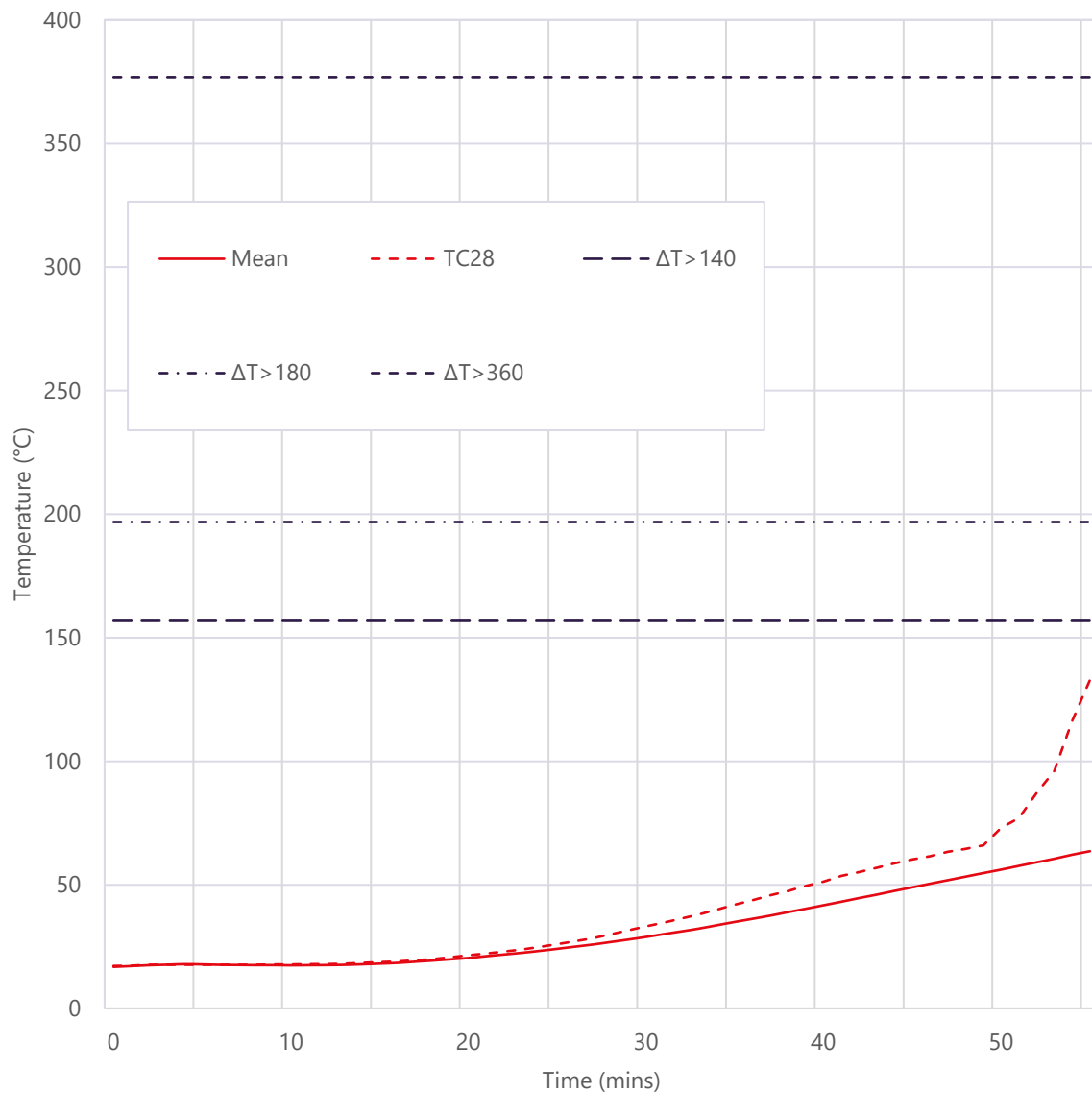


Figure 29 - Graph presenting the Time-Temperature distribution of the unexposed surface of Specimen B

9 Tables

Table 1 – The temperatures recorded by the disc thermocouples used evaluate the mean and maximum temperature rise of the unexposed surface of Specimen A under the normal procedure (I₂). Values are in Degrees Celsius (°C) unless otherwise stated.

Time (mins)	TC1	TC2	TC3	TC4	TC5
0	17.2	17.4	16.7	16.8	16.9
2	17.3	17.5	16.9	17.1	17.2
4	17.3	17.6	17.1	17.0	17.3
6	17.3	17.5	17.0	17.0	17.5
8	17.3	17.7	17.1	17.0	17.7
10	17.9	18.4	17.9	17.4	18.1
12	19.9	20.2	19.9	19.1	19.8
14	22.9	22.7	22.6	21.9	22.3
16	26.1	25.3	25.7	25.0	25.2
18	29.7	28.2	28.9	28.4	28.4
20	33.3	31.1	32.3	31.8	31.6
22	37.0	34.2	35.9	35.2	35.1
24	40.5	37.2	39.2	38.2	38.4
26	44.1	40.8	42.9	41.6	41.9
28	47.8	44.3	46.6	44.9	45.4
30	37.1	47.9	50.4	47.4	49.0

Table 2 – The temperatures recorded by the disc thermocouples used to evaluate the maximum temperature rise of the door leaf of Specimen A under the normal procedure (I₂). Values are in Degrees Celsius (°C) unless otherwise stated.

Time (mins)	TC14	TC15	TC16	TC17
0	16.8	16.9	17.1	17.2
3	16.9	16.9	17.7	17.6
6	16.9	16.9	17.6	18.0
9	16.9	16.9	17.6	18.0
12	16.9	16.9	17.7	18.6
15	17.7	17.4	18.4	20.0
18	19.8	18.9	20.0	23.0
21	22.7	21.5	22.7	26.7
24	25.7	24.5	25.6	30.4
27	29.0	27.3	29.0	33.9
30	32.0	30.1	32.5	37.1
33	35.2	32.8	35.9	40.0
36	37.8	35.5	39.5	42.8
39	40.9	38.8	43.2	45.1
42	43.9	42.4	47.1	47.6
45	46.9	29.8	50.7	50.0

Table 3 – The temperatures recorded by the disc thermocouples used evaluate the maximum temperature rise of the door leaf of Specimen A under the supplementary procedure (I₁). Values are in Degrees Celsius (°C) unless otherwise stated.

Time (mins)	TC10	TC11	TC12	TC13
0	17.3	17.3	17.7	17.3
2	17.4	17.8	19.9	17.6
4	17.4	18.3	27.0	18.0
6	17.4	18.0	24.9	18.9
8	17.7	18.3	25.3	24.2
10	19.1	18.9	26.2	28.9
12	22.9	21.0	33.0	33.1
14	29.2	24.8	37.8	38.1
16	36.1	30.2	49.6	42.7
18	42.9	36.4	57.9	47.9
20	48.9	49.8	65.9	52.9
22	54.1	65.9	77.1	58.1
24	58.4	84.9	90.0	61.4
26	61.7	109.8	113.2	65.4
28	64.1	133.1	128.7	68.5
30	51.4	97.1	94.7	71.0

Table 4 – The temperatures recorded by the disc thermocouples used to evaluate the maximum temperature rise of the frame members adjacent to the door leaf of Specimen A. Values are in Degrees Celsius (°C) unless otherwise stated.

Time (mins)	TC6	TC7	TC8	TC9
0	16.1	16.3	16.4	16.7
2	16.1	16.5	19.1	16.8
4	16.1	16.9	21.4	17.1
6	16.1	16.9	21.6	17.0
8	16.1	16.9	22.0	17.0
10	16.2	17.9	25.1	16.9
12	16.3	19.0	28.8	16.9
14	16.4	20.3	28.0	17.1
16	16.4	21.3	28.1	17.2
18	16.5	24.5	28.9	17.2
20	16.6	25.8	29.3	17.6
22	16.9	32.6	30.5	18.0
24	17.2	35.9	32.9	18.3
26	17.7	38.5	37.5	18.9
28	18.3	44.7	43.9	19.5
30	19.3	35.2	24.5	20.4

Table 5 – The temperatures recorded by the disc thermocouples used evaluate the mean and maximum temperature rise of the unexposed surface of Specimen B under the normal procedure (I₂). Values are in Degrees Celsius (°C) unless otherwise stated.

Time (mins)	TC18	TC19	TC20	TC21	TC22
0	17.3	17.0	16.8	16.7	16.3
3	18.1	17.2	19.8	17.0	16.3
6	17.8	17.3	19.8	17.0	16.3
9	17.9	17.4	19.0	17.0	16.3
12	18.0	17.5	18.9	17.1	16.2
15	18.6	18.1	19.9	17.5	16.5
18	19.8	19.3	21.6	18.4	17.7
21	21.4	21.0	24.1	19.8	19.4
24	23.4	23.0	27.0	21.6	21.4
27	25.9	25.4	30.5	23.9	23.6
30	28.7	28.3	34.5	26.6	26.5
33	32.2	31.6	38.9	29.4	29.6
36	36.2	35.5	43.4	33.0	33.2
39	40.5	39.4	47.9	36.8	37.1
42	45.3	43.7	52.4	40.8	41.1
45	50.3	48.1	56.8	44.8	45.0
48	55.4	52.8	61.0	48.5	49.0
51	60.5	57.5	65.0	52.2	53.2
54	65.3	62.0	68.8	57.8	57.1
55	67.1	63.2	69.9	59.7	58.2

Table 6 – The temperatures recorded by the disc thermocouples used to evaluate the maximum temperature rise of the door leaf of Specimen B under the normal procedure (I₂). Values are in Degrees Celsius (°C) unless otherwise stated.

Time (mins)	TC31	TC32	TC33	TC34
0	16.8	16.7	17.7	17.2
3	17.0	17.2	17.8	17.2
6	17.0	17.1	17.9	17.3
9	17.1	17.2	18.0	17.4
12	17.2	17.2	18.0	17.5
15	17.8	17.8	18.9	18.4
18	18.9	19.1	20.4	20.3
21	20.6	20.9	22.4	22.7
24	22.8	23.0	24.6	25.4
27	25.3	25.5	26.9	28.1
30	28.2	28.3	29.4	30.8
33	31.1	31.9	32.2	33.4
36	34.6	35.8	35.5	36.6
39	38.1	39.8	39.1	39.8
42	42.1	44.1	42.8	43.3
45	46.4	48.5	46.8	47.0
48	50.9	53.2	51.0	51.0
51	56.1	57.8	55.1	55.2
54	60.9	64.8	59.2	59.2
55	62.3	68.6	60.9	60.7

Table 7 – The temperatures recorded by the disc thermocouples used evaluate the maximum temperature rise of the door leaf of Specimen B under the supplementary procedure (I₁). Values are in Degrees Celsius (°C) unless otherwise stated.

Time (mins)	TC27	TC28	TC29	TC30
0	17.2	17.2	17.1	16.6
3	17.4	17.7	17.4	16.6
6	17.4	17.7	17.5	16.7
9	17.6	17.8	17.5	16.9
12	17.9	17.9	17.6	17.1
15	19.2	18.7	18.4	18.1
18	21.9	20.0	20.3	20.6
21	26.2	22.2	22.9	24.5
24	31.3	24.9	26.3	29.1
27	36.7	28.4	30.6	34.0
30	42.0	33.2	35.9	39.1
33	46.7	38.1	41.9	44.2
36	51.2	43.8	47.8	48.9
39	55.1	49.6	53.2	53.2
42	58.4	55.2	58.3	56.6
45	61.4	60.3	62.7	59.4
48	64.1	64.6	67.5	61.8
51	66.4	77.0	70.2	64.1
54	68.8	116.4	75.0	66.4
55	69.4	132.9	76.9	67.3

Table 8 – The temperatures recorded by the disc thermocouples used to evaluate the maximum temperature rise of the frame members adjacent to the door leaf of Specimen B. Values are in Degrees Celsius (°C) unless otherwise stated.

Time (mins)	TC23	TC24	TC25	TC26
0	16.0	15.9	16.9	16.1
3	16.1	16.5	17.2	16.0
6	16.1	16.3	17.3	16.0
9	16.1	16.3	17.2	16.1
12	16.1	16.3	17.2	16.0
15	16.2	16.6	17.4	16.2
18	16.3	17.0	17.6	16.4
21	16.5	17.6	18.1	16.8
24	17.1	18.8	18.7	17.5
27	17.5	20.3	19.4	18.4
30	18.3	22.2	20.5	19.7
33	19.3	24.1	21.7	21.6
36	19.8	26.3	23.0	23.5
39	20.7	28.4	24.8	25.3
42	21.4	30.2	26.7	27.1
45	22.6	31.8	28.7	28.7
48	24.1	33.8	30.7	30.3
51	25.1	40.6	32.7	31.8
54	26.5	61.2	35.3	33.2
55	27.6	77.4	36.8	33.7