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Testing. Advising. Assuring.

Title:

The fire resistance performance of two specimens of single-acting, single-leaf doorsets incorporating various items of building hardware when tested in accordance with BS EN 1634-1: 2008

Report No:

341521



Prepared for:

Securefast Plc
Unit 6
The Cedars Business
Centre
Avon Road
Cannock
Staffordshire
WS11 1QJ

Date:

29th August 2014

Notified Body No:

0833



0249

Summary

Objective	To determine the fire resistance performance of two specimens of single-acting, single-leaf timber based doorsets, incorporating various items of building hardware mounted within a low-density rigid supporting construction, when tested in accordance with BS EN 1634-1: 2014.
Test Sponsor	Securefast Plc , Unit 6, The Cedars Business Centre, Avon Road, Cannock, Staffordshire, WS11 1QJ.

Summary of Tested Specimens	For the purposes of the test the doorsets were referenced Doorset A and Doorset B.
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Doorset A – 30 Minute

The Doorset had an overall dimension of 2095 mm high by 995 mm wide and incorporated a door leaf of overall dimensions of 2055 mm high by 925 mm wide and 45 mm thick. The door leaf comprised of a Chipboard core with 7 mm thick hardwood lippings fixed on the vertical edges. The doorset was fitted with “Hoppe Paris AR361/60-SP-SSS” handles. The door leaf was hung within a softwood door frame on three “Royde & Tucker Hi-load 102” zinc plated steel hinges.

Doorset B – 60 Minute

The Doorset had an overall dimension of 2085 mm high by 1010 mm wide and incorporated a door leaf of overall dimensions of 2040 mm high by 935 mm wide and 55 mm thick. The door leaf comprised of a Chipboard core with 7 mm thick hardwood lippings fixed on the vertical edges. The doorset was fitted with a pair of “Arrone AR 461/10-SP-PVD” handles. The door leaf was hung within a hardwood door frame on three “Royde & Tucker Hi-load 102” zinc plated steel hinges.

Both doorsets were equipped with “Agrippa 3-80-0070 acoustic door closers” fixed on the exposed face, a “Securefast ASEL2460 electric escape sashlock” lockset connecting to an “ALP101” wiring loop at mid-height. At the head of both leaves a concealed “AEMSF300 Shear Magnet” was fitted. A magnetic lock plate was also fitted at mid-width and three quarter height of both leaves.

Test Results:		Doorset A	Doorset B
Integrity performance	Sustained flaming	31 minutes	66 minutes [#]
	Gap gauge	31 minutes	66 minutes [#]
	Cotton Pad	31 minutes	66 minutes [#]
Insulation performance		31 minutes	66 minutes [#]

[#]The test duration. The test was discontinued after a period of 66 minutes.

Date of Test 14th July 2014

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* For and on behalf of **Exova Warringtonfire**.

Report Issued

Date: 29th August 2014

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Test Procedure

Introduction

The doorsets are required to provide a fire separating function and were therefore tested in accordance with BS EN 1634-1: 2014 'Fire resistance and smoke control tests for door, shutter and openable window assemblies and elements of building hardware - Part 1: Fire resistance tests for doors, shutters and openable windows'. This test report should be read in conjunction with that Standard and with BS EN 1363-1: 2012, 'Fire resistance tests - Part 1: General requirements' and BS EN 1363-2: 1999, 'Fire resistance tests - Part 2: Alternative and additional procedures'.

The specimens were judged on their ability to comply with the performance criteria for integrity and insulation, as required by BS EN 1634-1: 2014.

The specific purpose of the test was to evaluate the effects of the inclusion of various items of building hardware with a previously tested doorset construction. Because of this, no direct field of application for the doorsets is included in this report.

Fire Test Study Group/EGOLF

Certain aspects of some fire test specifications are open to different interpretations. The Fire Test Study Group and EGOLF have identified a number of such areas and have agreed Resolutions, which define common agreement of interpretations between fire test laboratories, which are members of the Groups. Where such Resolutions are applicable to this test they have been followed.

Instruction To test

The test was conducted on the 14th July 2014 on behalf of **Securefast Plc**, the sponsor of the test.

Test Specimen Construction

A comprehensive description of the test construction is given in the Schedule of Components. The description is based on a detailed survey of the specimens and information supplied by the sponsor of the test.

The doorsets installation and test preparation took place in the test laboratory between the 10th July 2014 to the 14th July 2014.

Installation

The doorsets were mounted into apertures provided within a low-density rigid supporting construction. Representatives of **Exova Warringtonfire** conducted installation on the 14th July 2014.

Sampling

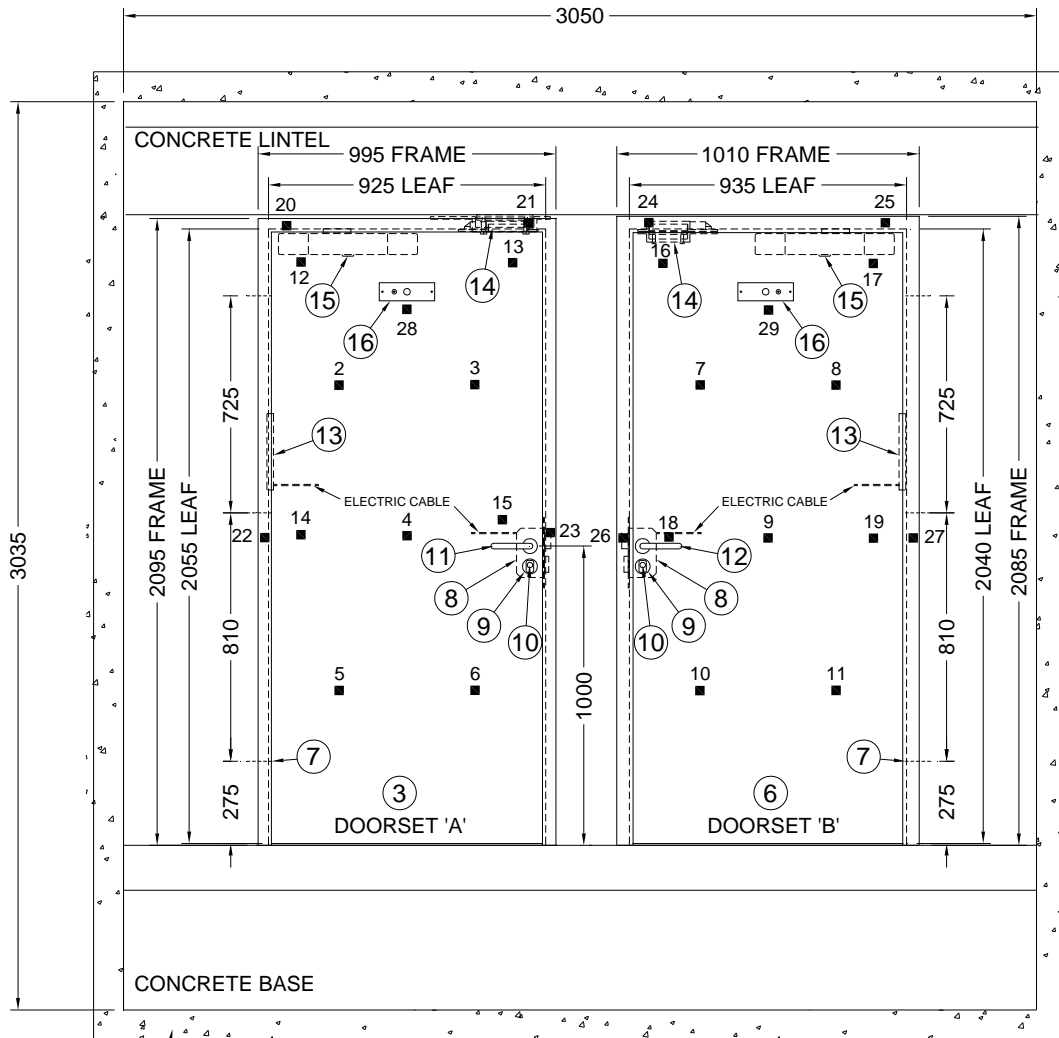
Exova Warringtonfire was not involved in any selection or sampling procedures of the specimens or any of their components.

Conditioning

The specimens' storage, construction, and test preparation took place in the test laboratory over a total, combined time of 6 days. Throughout this period of time both the temperature and the humidity of the laboratory were measured and recorded as being within a range of from 17°C to 24°C and 47.5% to 70% respectively.

Test Specimens

Figure 1 - Elevation of unexposed face of Doorsets built into a specimen restraint frame



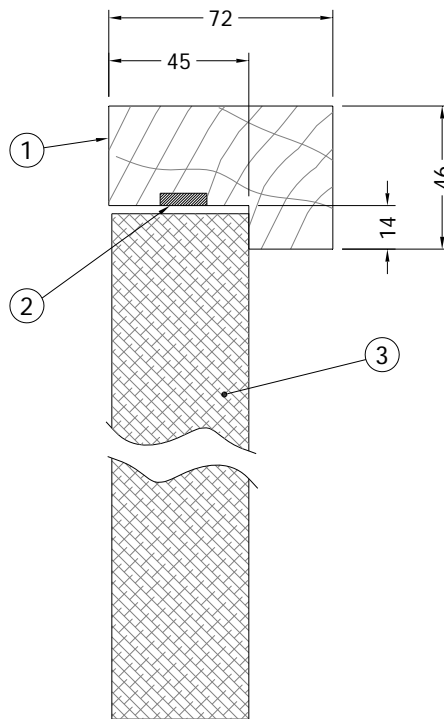
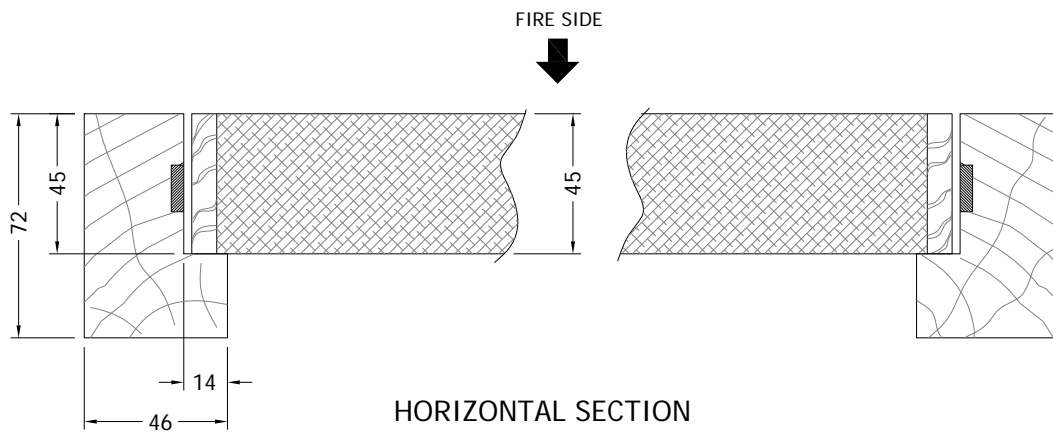
SPECIMEN RESTRAINT FRAME

■ POSITIONS OF UNEXPOSED FACE THERMOCOUPLES.

SPECIMENS BUILT INTO A MASONRY WALL CONSISTING OF AUTOCLAVED AERATED CONCRETE BLOCKWORK WALLS, LINTEL AND BASE, NOMINALLY 150 MM THICK. BOTH DOOR LEAVES OPEN TOWARDS THE HEATING CONDITIONS OF THE TEST.

Do not scale. All dimensions are in mm

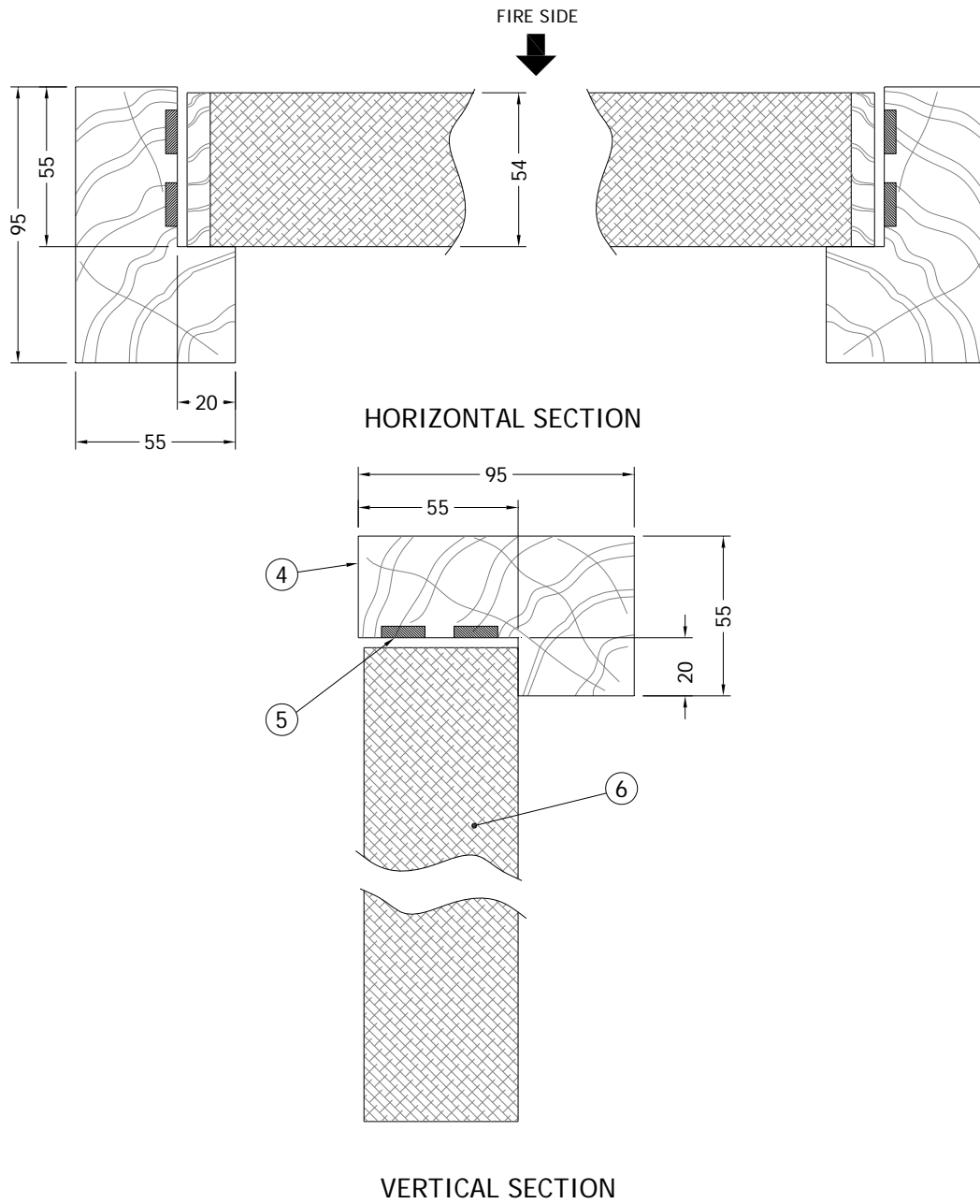
Figure 2 – Sections through Doorset 'A'



SECTIONS THROUGH DOORSET 'A'

Do not scale. All dimensions are in mm

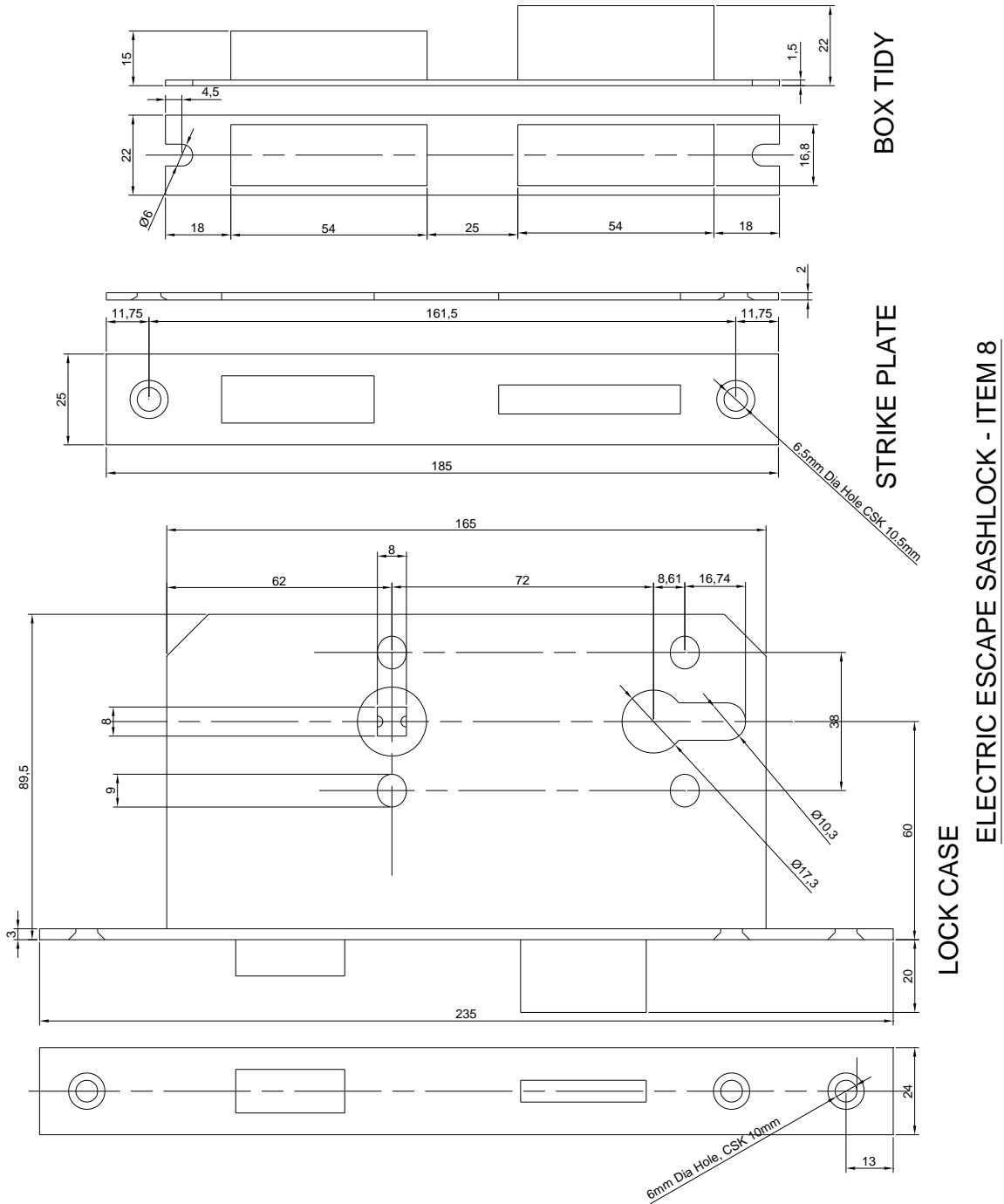
Figure 3 – Sections through Doorset 'B'



SECTIONS THROUGH DOORSET 'B'

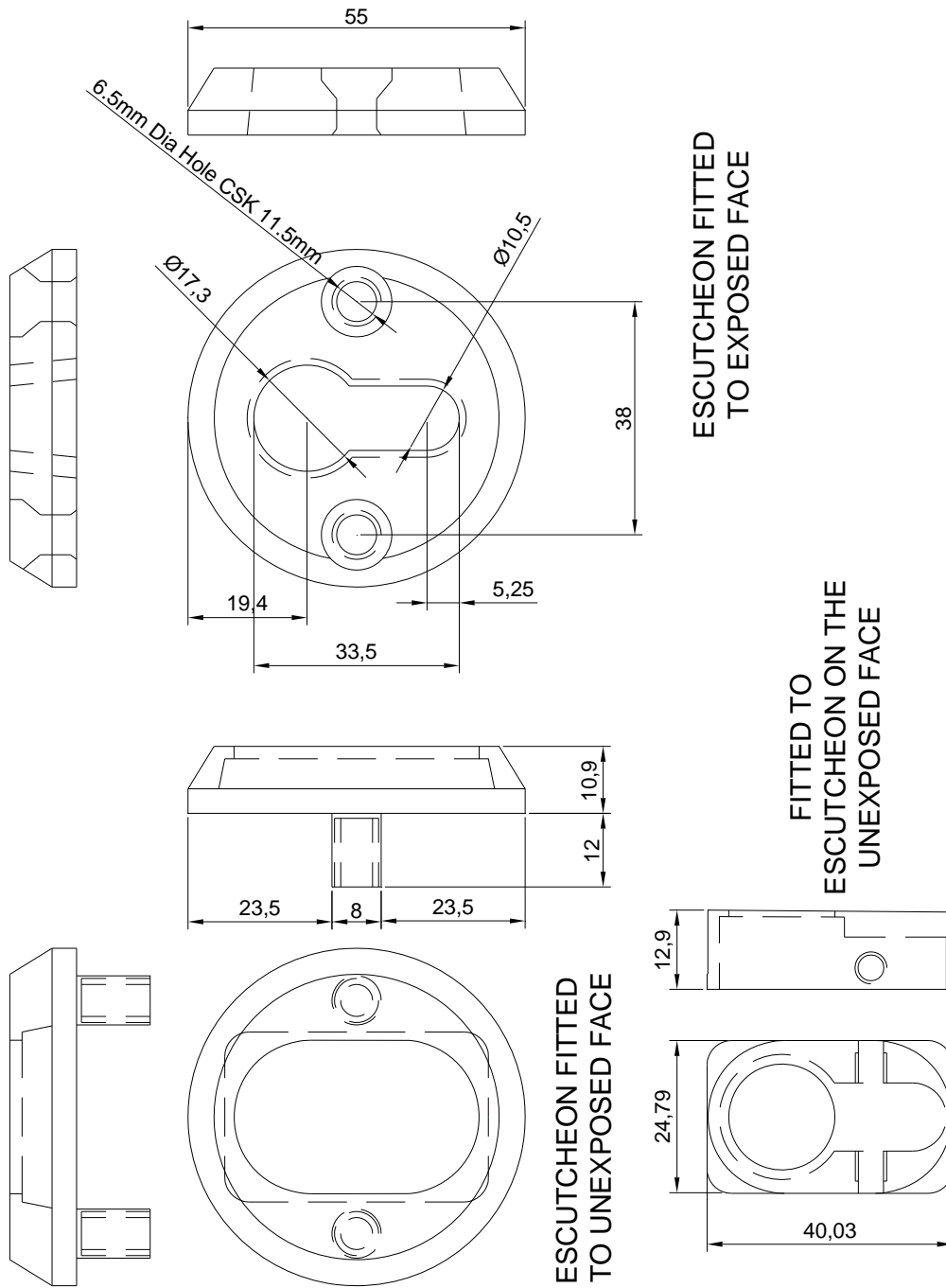
Do not scale. All dimensions are in mm

Figure 4 – Details of electric escape sashlock – item 8



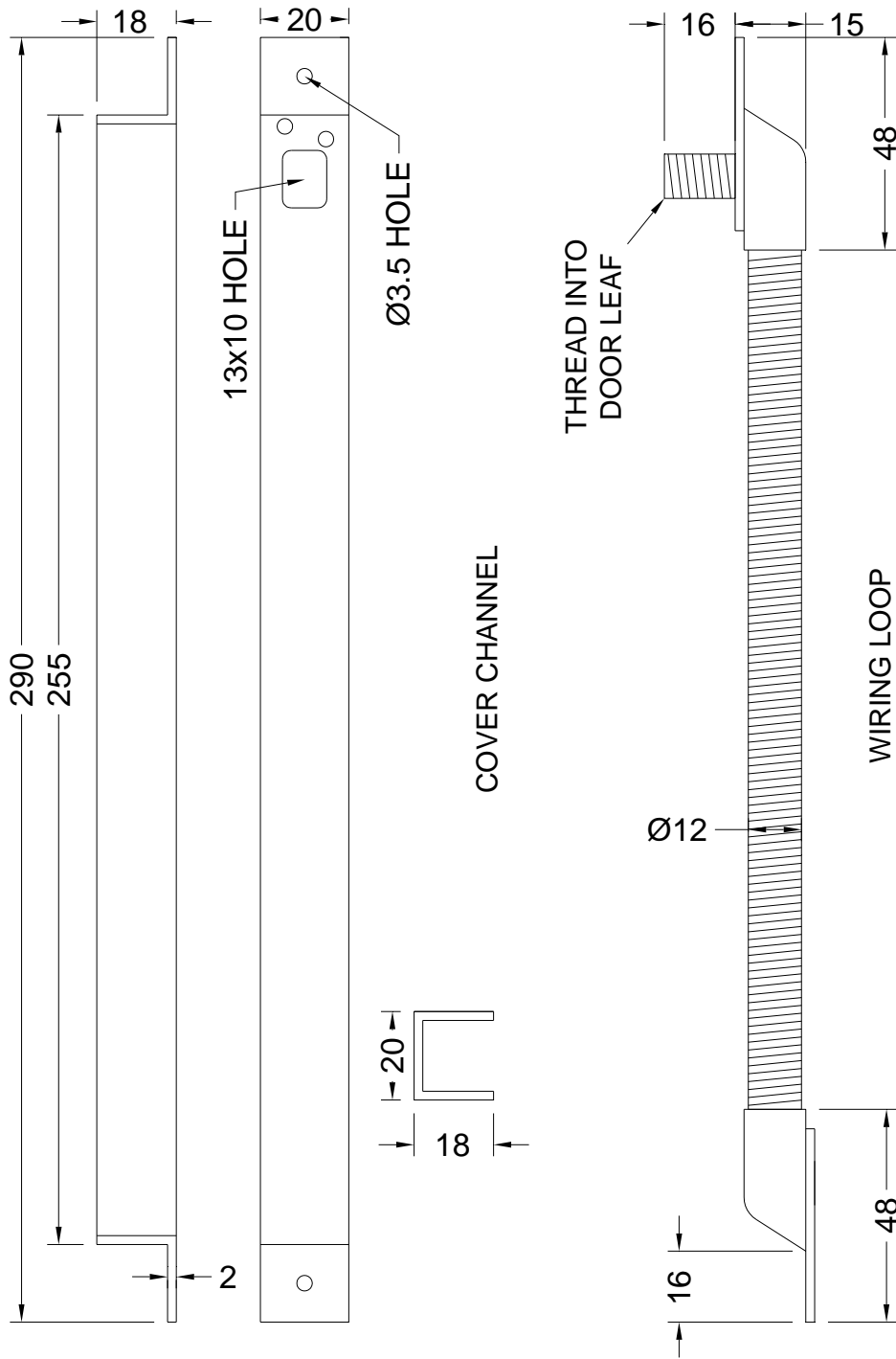
Do not scale. All dimensions are in mm

Figure 5 – Details of security escutcheons – item 9



Do not scale. All dimensions are in mm

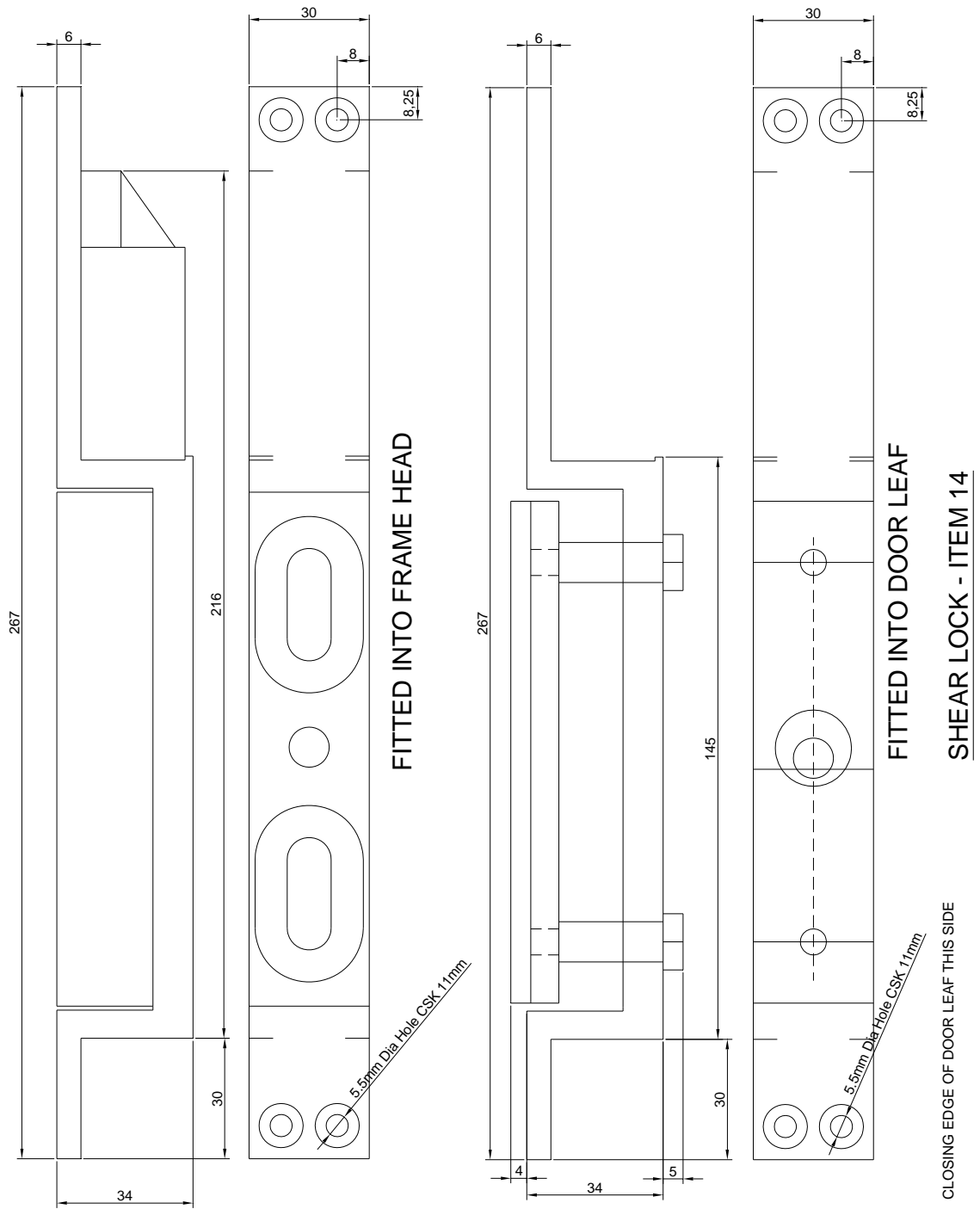
Figure 6 – Details of wiring door loop – item 13



WIRING DOOR LOOP - ITEM 13

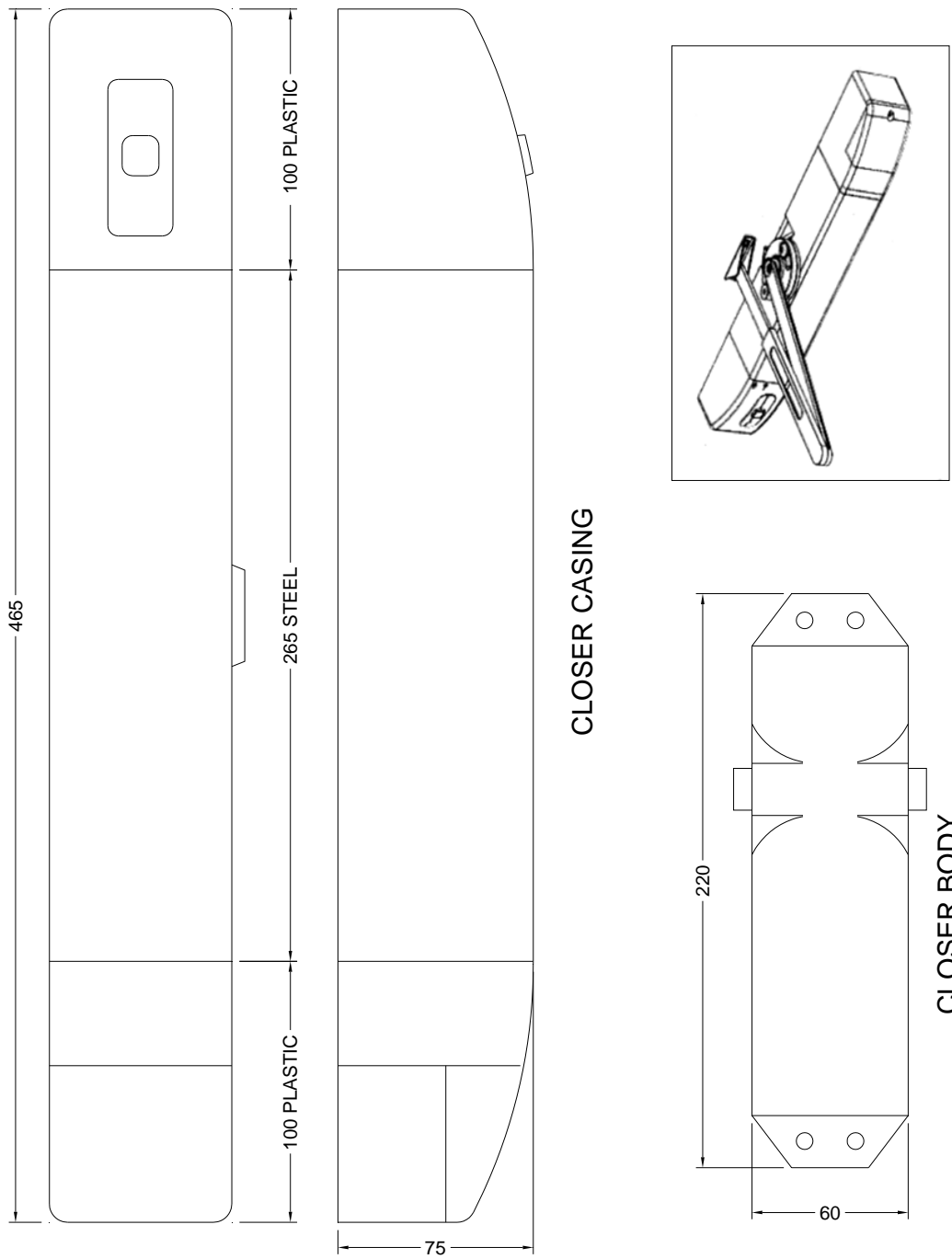
Do not scale. All dimensions are in mm

Figure 7 – Details of shear lock – item 14



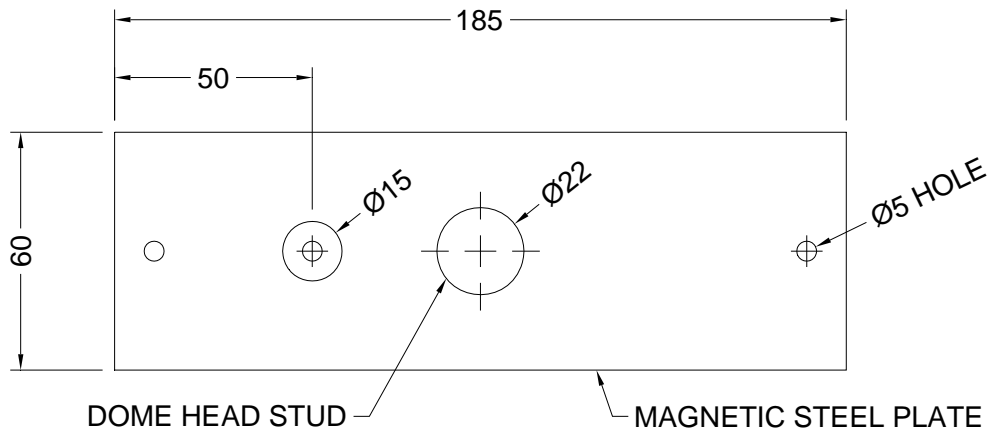
Do not scale. All dimensions are in mm

Figure 8 – Details of door closer – item 15

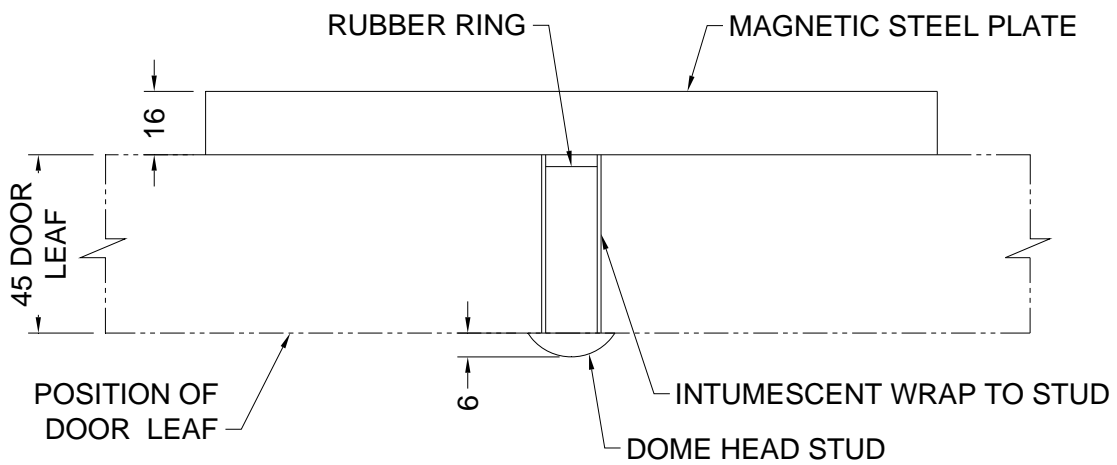


Do not scale. All dimensions are in mm

Figure 9 – Details of magnet – item 16



ELEVATION



PLAN

MAGNET - ITEM 16

Do not scale. All dimensions are in mm

Schedule of Components

(Refer to Figures 1 to 9)

(All values are nominal unless stated otherwise)

(All other details are as stated by the sponsor)

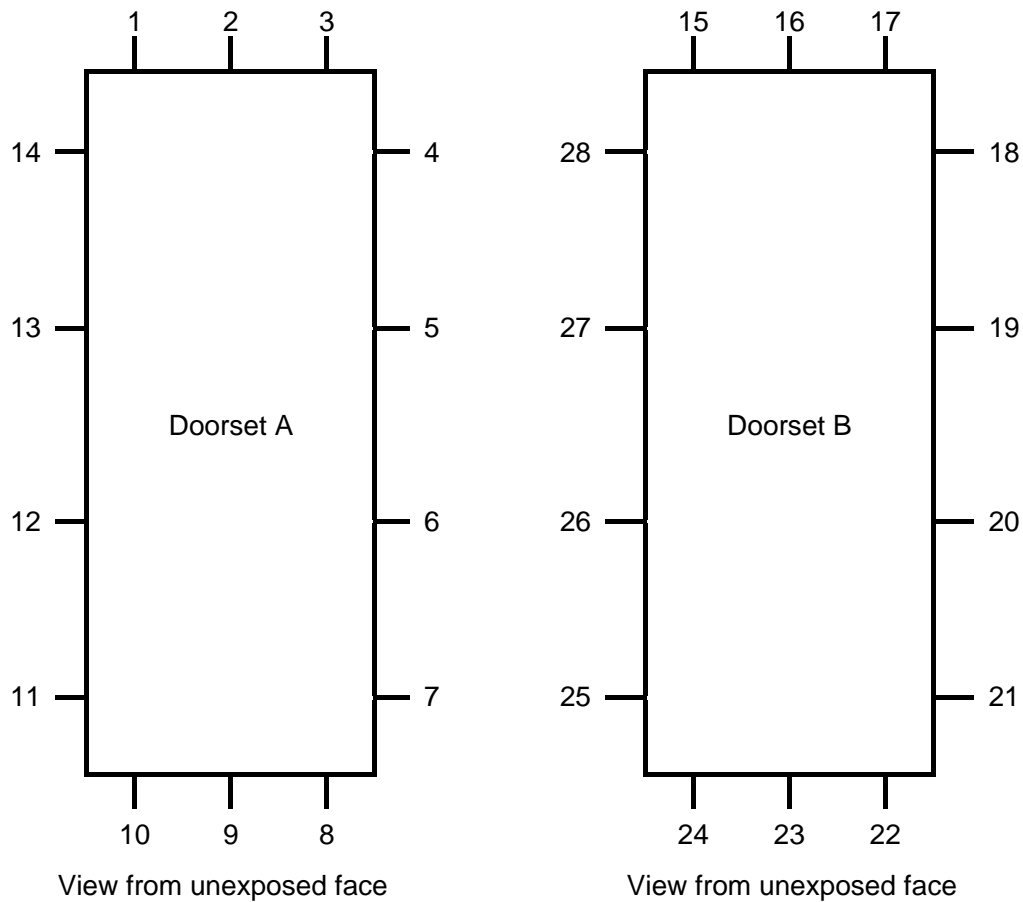
<u>Item</u>	<u>Description</u>
<u>DOORSET 'A'</u>	
1. Door frame	
Material	: General commercial softwood
Density	: 530 kg/m ³ nominal
Average moisture content	: 10.7%
Overall section size	: 72 mm x 46 mm
Jambs to head jointing method	: Stub mortice & screwed, using 75 mm long x 4.6 mm diameter countersunk head wood screws
Fixing method	: Through screwed and plugged
Fixings	
i. type	: Countersunk head wood screws
ii. material	: Steel screws with plastics plugs
iii. overall size	: 150 mm long x 5.8 mm diameter
iv. centres	: 3 off equally spaced along the latched jamb and nominally 100 mm above and below each hinge position in the other
2. Intumescent seal	
Manufacturer	: Pyroplex Ltd
Reference	: Rigid Box Seal
Material	: Graphite based intumescent strip within a polyvinyl chloride (PVC) carrier
Overall size	: 1 No. 15 mm x 4 mm
Fixing	: Self-adhered into a groove within the rebate of the frame and interrupted at the furniture positions
3. Door leaf	
Manufacturer	: Halspan
Reference	: Prima
Overall thickness	: 45 mm
Construction	
i. core	: Chipboard
ii. lippings	: Hardwood 7 mm thick, to vertical edges only
<u>DOORSET 'B'</u>	
4. Door frame	
Material	: General commercial hardwood
Density	: 750 kg/m ³ nominal
Average moisture content	: 8.7%
Overall section size	: 95 mm x 55 mm
Jambs to head jointing method	: Stub mortice & screwed, using 75 mm long x 4.6 mm diameter countersunk head wood screws
Fixing method	: Through screwed and plugged
Fixings	
i. type	: Countersunk head wood screws
ii. material	: Steel screws with plastics plugs
iii. overall size	: 150 mm long x 5.8 mm diameter
iv. centres	: 3 off equally spaced along the latched jamb and nominally 100 mm above and below each hinge position in the other

<u>Item</u>	<u>Description</u>
5. Intumescent seal	
Manufacturer	: Pyroplex Ltd
Reference	: Rigid Box Seal
Material	: Graphite based intumescent strip within a polyvinyl chloride (PVC) carrier
Overall size	: 2 No. 15 mm x 4 mm
Fixing	: Self-adhered into two grooves within the rebate of the frame and interrupted at the furniture positions
6. Door leaf	
Manufacturer	: Halspan
Reference	: Prima
Overall thickness	: 54 mm
Construction	
i. core	: Chipboard
ii. lippings	: Hardwood 7 mm thick, to vertical edges only
<u>FURNITURE TO BOTH DOORSETS</u>	
7. Hinges	
Manufacturer	: Royde & Tucker Ltd
Reference	: Hi-load 102
Primary material	: Zinc plated steel
Size	
i. knuckle	: 104 mm long by 13.8 mm diameter
ii. blades	: 100 mm long by 35 mm wide by 3 mm thick
Fixings	
i. type	: Countersunk head wood screws
ii. material	: Steel
iii. sizes	: 29 mm long by 5.1 mm diameter
iv. number off per blade	: 5 off
v. maximum distance of fixing screws from face of door leaf	: 26 mm
Bedding material	
i. manufacturer	: Lorient Polyproducts Ltd
ii. material	: Interdens sheet
iii. overall size	: 100 mm long by 35 mm wide by 2 mm thick
iv. fixing method, Doorset 'A'	: None fitted
v. fixing method, Doorset 'B'	: Self-adhered to the back face of hinge blades
8. Mortice case electronic lockset	
Manufacturer	: Securefast PLC
Reference	: ASEL2460
Type	: Electric escape sashlock, 12/24 volt
Materials	
i. lock case	: Stainless steel
ii. strike plate	: Stainless steel
iii. box tidy	: Plastic moulding with a magnet inset into one chamber
iv. cable	: Three core electric cable 4 mm overall diameter
Sizes	: See Figure 4 for dimensions
Fixings	: 4.5 mm diameter x 25 mm long countersunk steel wood screws
Electric cable	: A 150 mm long tail of the electric cable was fitted into a 6 mm horizontally drilled hole in the door leaf
Operation of latch	: Unlatched (the box tidy was fitted upside down to prevent its magnet catching)

<u>Item</u>	<u>Description</u>
8. Mortice case electronic lockset (continued)	
Bedding material	: The lock case, forend and strike plate was wrapped with 2 mm thick Interdens intumescent
9. Security escutcheons	
Manufacturer	: Securefast PLC
Reference	: SEU1090.2
Type	: Security escutcheons
Material	: Stainless steel
Sizes	: See Figure 5 for dimensions
Fixings	: With 5.7 mm diameter countersunk steel wood screws
Bedding material	: None
10. Cylinder	
Manufacturer	: Securefast PLC
Reference	: SEU6702
Type	: 6-Pin euro cylinder lock, double keyed
Material	: Stainless steel
Size	: 60 mm long
11. Lever handle, Doorset 'A'	
Manufacturer	: Hoppe, Paris
Reference	: AR361/60-SP-SSS RTD Lever on 6 mm Rose – Sprung EX138Z/42
Type	: Sprung return lever handle
Material	: F69 Stainless steel brushed
Overall size	: 20 mm diameter x 140 mm long levers with 52 mm diameter x 6 mm deep rose
Fixings	: With 3.5 mm diameter countersunk head steel machine screws into threaded countersunk head cups
Bedding material	: None
12. Lever handle, Doorset 'B'	
Manufacturer	: Arrone
Reference	: AR461/0-SP-PVD Round Bar Return to Door Lever, 8 mm Sprung PVD
Type	: Sprung return lever handle
Material	: Steel with brass finish
Overall size	: 19 mm diameter x 140 mm long levers with 53 mm diameter x 6 mm deep rose
Fixings	: With 3.5 mm diameter countersunk head steel machine screws into threaded countersunk head cups
Bedding material	: None
13. Wiring door loop	
Manufacturer	: Securefast PLC
Reference	: ALP101
Type	: Steel outer channel covering a flexible coil spring with 90° end caps to receive an electric cable (normally fitted through the full width of the door leaf to protect it from chaffing)
Material	: Galvanised mild steel
Overall size	: See Figure 6 for dimensions
Electric cable	: A 150 mm long tail of the electric cable was fitted into a 6 mm horizontally drilled hole in the door leaf. The cable was fed into the coil and pulled through to the other end cap

Item	Description
13. Wiring door loop (continued)	
Positions	: The cover channel was fitted into a groove in the door leaf and the spring into a groove in the door frame
Fixings	: 3.5 mm diameter countersunk steel wood screws
Bedding material	: A 2 mm thick pad of Interdens intumescent was fitted below and behind the end cap in the frame with the threaded tube fitting into the door leaf. The outer channel was covered with 2 mm thick Interdens intumescent
14. Concealed magnetic lock	
Manufacturer	: Securefast PLC
Reference	: AEMSF300 Shear Lock 12/24V DC
Type	: Magnetic lock units fitted into the top of the door leaf and head of the door frame
Material	: Steel brackets fitted with polished magnets and a plastic cover with cable connector at one end of the unit fitted into the head of the door frame
Overall size	: See Figure 7 for dimensions
Fixings	: 5 mm diameter x 32 mm long countersunk steel wood screws
Bedding material	: The lock units were covered with 2 mm thick Interdens intumescent within the door leaf and frame head
15. Surface mounted door closer	
Supplier	: Securefast PLC
Reference	: Agrippa 3-80-0070 Acoustic Door Closer
Material	
i. outer casing	: Steel central cover and base plate with plastic end caps
ii. internal closer body	: Aluminium casting
iii. closer arms	: Steel
Overall size	: See Figure 8 for dimensions
Fixing method	: The door closers were fitted to the exposed face of the door leaf and the 90° arms were fitted to the door frame head
Maximum opening moments	
i. door leaf 'A'	: 58.4 Newton metre (Nm)
i. door leaf 'B'	: 46.8 Nm
Maximum closing moments	
i. door leaf 'A'	: 20.7 Nm
i. door leaf 'B'	: 15.1 Nm
16. Magnetic plate	
Manufacturer	: Securefast PLC
Reference	: Magnetic Lock
Type	: Plate with magnetic stud
Material	: Steel plate with a steel dome head stud and rubber ring between the plate and stud
Overall size	: See Figure 9 for dimensions
Fixings	: The plates were fixed to the unexposed face of the door leaves using the dome head studs fitted through a drilled hole in the door leaf and into a threaded hole in the plate
Bedding material	: 2 mm thick Interdens intumescent was wrapped around the stud within the door leaf.

Doorset clearance gaps



Door Ref	Gap Dimension in mm at Positions													
	1	2	3	4	5	6	7	8*	9*	10*	11	12	13	14
A	4.6	0.2	4.8	2.5	2.9	2.3	2.2	2.2	3.2	2.3	3.3	3.5	3.5	3.5
	15	16	17	18	19	20	21	22*	23*	24*	25	26	27	28
B	3.4	3.8	4.0	1.6	3.1	1.6	1.4	4.8	5.8	4.6	2.8	3.2	3.2	3.9
	Mean	3.0		Maximum			4.8		Minimum			0.2		
B	Mean	2.9		Maximum			4.0		Minimum			1.4		

Door Ref	Gap Between Face of Leaf and Doorstop in mm at Position													
	1	2	3	4	5	6	7	8*	9*	10*	11	12	13	14
A	0.0	0.3	2.6	1.5	1.3	3.4	3.4	n/a	n/a	n/a	0.7	0.6	0.4	1.3
	15	16	17	18	19	20	21	22*	23*	24*	25	26	27	28
B	0.3	1.7	2.6	2.1	2.8	3.5	3.5	n/a	n/a	n/a	0.0	0.5	1.7	1.8

* Dimension not included in calculations

Gap not measured

DO NOT SCALE
ALL DIMENSIONS ARE IN mm

Instrumentation

General	The instrumentation was provided in accordance with the requirements of the Standard.
Furnace	The furnace was controlled so that its mean temperature complied with the requirements of BS EN 1363-1: 1999 Clause 5.1 using six plate thermometers, distributed over a plane 100 mm from the surface of the test construction.
General	Thermocouples were provided to monitor the unexposed surface of the specimens and the output of all instrumentation was recorded at no less than one minute intervals as follows:
Thermocouples 2 to 6	At five positions on Doorset A, one approximately at the centre and one at the approximate centre of each quarter section of the doorset.
Thermocouples 7 to 11	At five positions on Doorset B, one approximately at the centre and one at the approximate centre of each quarter section of the doorset.
Thermocouples 12 to 15	At four positions on Doorset A, positioned at 100 mm in from the door leaf vertical edges, two at mid-height, and two at 100 mm below the top edge of the leaf.
Thermocouples 16 to 19	At four positions on Doorset B, positioned at 100 mm in from the door leaf vertical edges, two at mid-height, and two at 100 mm below the top edge of the leaf.
Thermocouples 20 to 23	At four positions on Doorset A, at two positions on the top horizontal frame, one positioned approximately 50 mm from each vertical edge and one positioned centrally on each vertical member.
Thermocouples 24 to 27	At four positions on Doorset B, at two positions on the top horizontal frame, one positioned approximately 50 mm from each vertical edge and one positioned centrally on each vertical member.
Thermocouple 28	Positioned approximately 50 mm below the magnetic plate fitted at mid-width and three quarter height on doorset A
Thermocouple 29	Positioned approximately 50 mm below the magnetic plate fitted at mid-width and three quarter height on doorset B
	The locations and reference numbers of the various unexposed surface thermocouples are shown in Figure 1.
Roving Thermocouple	A roving thermocouple was available to measure temperatures on the unexposed surface of the specimens at any position, which might appear to be hotter than the temperatures indicated by the fixed thermocouples.
Integrity Criteria	Cotton pads and gap gauges were available to evaluate the integrity of the specimens.

Test Observations

Time		All observations are from the unexposed face unless noted otherwise.
mins	secs	
00	00	The test commences.
02	00	Heavy smoke release can now be seen along the leading edge of both doorsets.
05	00	Mid height on the leading edge of both leaves is now discolouring.
09	00	The head of the leading edge of leaf A is now discolouring.
10	00	The top corners of both leaves are now discolouring to a dark black colour.
13	00	Smoke release from both leaves has now decreased.
16	43	When viewed from the exposed side, the faces of both leaves have now ignited and the handle from leaf A has now fallen off.
19	17	A charred circular area has now formed at approximately mid height on the hinge edge of leaf A.
22	50	Cotton wool pad applied over the charred gap at approximately mid height on the hinge edge of leaf A, pad did not discolour or ignite.
24	46	Discolouring of the leaf around the hinges on Doorset A can now be seen.
27	00	When viewed from the exposed face, the closers from both doorsets have now fallen off.
29	46	A flicker of flame can now be seen on the bottom hinge of leaf A.
31	42	Flickers of flame around the hinge on leaf A has now been sealed over to allow the test to continue.
34	00	Doorset A has now been completely blanked off to allow the test to continue on doorset B.
40	00	Discolouring along the leading edge of doorset B continues.
46	45	Flicker of flame can be seen approximately mid width of the threshold of doorset B.
52	00	A small gap is now forming mid width of the threshold of doorset B,
55	00	Intermittent flicker of flame can now be seen from the same gap at the threshold of doorset B
66	00	Test discontinued.

Test Photographs

The exposed face of the doorsets prior to testing



The unexposed face of the doorsets prior to testing



The unexposed face of the doorsets after a test duration of 5 minutes



The unexposed face of the doorsets after a test duration of 15 minutes



The unexposed face of the doorsets after a test duration of 25 minutes



The unexposed face of the doorsets after a test duration of 30 minutes



The unexposed face of the doorsets after a test duration of 46 minutes



The unexposed face of the doorsets after a test duration of 50 minutes



The unexposed face of doorset B after a test duration of 60 minutes



The exposed face of the doorsets after the test.



Temperature Data

Mean furnace temperature, together with the temperature/time relationship specified in the Standard

Time Mins	Specified Furnace Temperature Deg. C	Actual Furnace Temperature Deg. C
0	20	25
2	445	459
4	544	597
6	603	624
8	646	652
10	678	659
12	706	720
14	728	731
16	748	766
18	766	761
20	781	764
22	796	780
24	809	795
26	820	805
28	832	813
30	842	825
32	852	842
34	860	853
36	869	858
38	877	861
40	885	866
42	892	878
44	899	898
46	906	902
48	912	917
50	918	929
52	924	940
54	930	933
56	935	980
58	940	977
60	945	928
62	950	942
64	955	954
66	960	956

Individual and mean temperatures recorded on the unexposed surface of Doorset A

Time Mins	T/C Number 2 Deg. C	T/C Number 3 Deg. C	T/C Number 4 Deg. C	T/C Number 5 Deg. C	T/C Number 6 Deg. C	Mean Temp Deg. C
0	19	20	20	20	20	20
1	18	20	20	20	20	20
2	18	20	20	20	20	20
3	18	20	20	20	20	20
4	18	20	20	20	20	20
5	18	20	20	20	20	20
6	18	20	20	20	20	20
7	18	20	20	20	20	20
8	18	20	20	21	21	20
9	*	21	21	21	21	20
10	*	22	22	22	22	21
11	*	23	23	23	23	21
12	*	25	24	25	25	22
13	*	27	26	26	26	23
14	*	28	27	28	28	24
15	*	30	29	30	30	30
16	31	32	31	31	32	31
17	34	33	32	33	34	33
18	35	35	34	35	35	35
19	37	37	36	37	38	37
20	39	39	38	39	39	39
21	41	41	40	41	41	41
22	44	43	41	43	43	43
23	46	44	43	45	45	45
24	48	46	45	47	47	47
25	50	48	47	49	49	49
26	52	50	49	51	51	51
27	54	52	51	53	53	53
28	56	54	53	54	54	54
29	58	56	55	56	56	56
30	60	57	57	58	58	58
31	62	59	59	60	60	60
32	64	61	60	61	61	61
33	66	63	62	63	63	63
34	67	65	64	64	64	65

*Thermocouple Malfunction

Individual and mean temperatures recorded on the unexposed surface of Doorset B

Time Mins	T/C Number 7 Deg. C	T/C Number 8 Deg. C	T/C Number 9 Deg. C	T/C Number 10 Deg. C	T/C Number 11 Deg. C	Mean Temp Deg. C
0	20	21	20	21	21	21
2	20	21	20	21	21	21
4	20	21	20	21	21	21
6	21	21	20	21	21	21
8	21	21	20	21	21	21
10	21	21	20	21	21	21
12	21	22	20	22	22	21
14	22	22	*	22	23	22
16	23	23	*	24	23	22
18	24	24	*	25	25	25
20	26	26	26	27	25	26
22	28	27	28	29	27	28
24	30	29	29	31	28	29
26	32	31	31	33	30	31
28	35	33	34	35	31	34
30	37	36	36	37	33	36
32	40	38	39	39	35	38
34	42	41	41	42	38	41
36	45	44	44	44	40	43
38	47	46	47	46	42	46
40	50	49	50	49	45	49
42	53	52	53	51	47	51
44	55	54	56	53	50	54
46	58	57	59	55	53	56
48	61	60	62	58	55	59
50	63	62	65	60	58	62
52	66	65	67	62	60	64
54	69	67	70	65	63	67
56	71	70	72	67	66	69
58	73	72	74	70	69	72
60	76	74	76	72	71	74
62	79	77	78	74	73	76
64	81	79	81	76	76	79
66	83	82	83	78	78	81

*Thermocouple Malfunction

Individual temperatures recorded on the unexposed surface of Doorset A

Time Mins	T/C Number 12 Deg. C	T/C Number 13 Deg. C	T/C Number 14 Deg. C	T/C Number 15 Deg. C	T/C Number 28 Deg. C
0	21	21	21	18	20
1	21	21	21	18	20
2	21	21	21	18	20
3	22	23	21	18	20
4	22	23	21	18	20
5	23	29	21	18	20
6	26	35	22	19	20
7	26	35	22	20	20
8	26	35	23	22	21
9	27	34	23	25	22
10	32	34	25	28	23
11	39	35	26	30	25
12	46	37	28	34	26
13	53	39	30	37	28
14	59	42	32	40	30
15	64	44	34	43	32
16	69	46	36	45	34
17	73	48	38	48	36
18	74	50	40	50	39
19	77	52	42	52	41
20	79	54	44	55	43
21	81	56	46	57	44
22	82	58	48	58	46
23	84	59	50	60	48
24	86	61	52	63	50
25	88	62	53	65	52
26	89	64	55	67	54
27	88	65	57	68	55
28	89	66	59	69	57
29	90	68	61	70	58
30	89	69	63	71	60
31	87	70	64	71	62
32	87	71	66	72	63
33	90	72	68	73	65
34	104	74	69	74	67

Individual temperatures recorded on the unexposed surface of Doorset B

Time Mins	T/C Number 16 Deg. C	T/C Number 17 Deg. C	T/C Number 18 Deg. C	T/C Number 19 Deg. C	T/C Number 29 Deg. C
0	18	18	18	18	20
2	18	18	18	18	20
4	18	20	18	*	20
6	19	21	22	*	20
8	20	20	21	*	20
10	20	20	21	*	20
12	21	21	22	*	20
14	23	23	24	*	21
16	26	26	27	*	23
18	29	29	31	*	24
20	32	32	34	*	26
22	36	35	38	*	28
24	39	37	41	*	31
26	42	39	45	*	33
28	45	41	48	*	36
30	48	43	51	32	38
32	50	46	54	35	41
34	52	48	57	38	43
36	54	50	60	40	45
38	56	53	63	43	48
40	58	55	64	46	50
42	59	57	66	48	52
44	61	59	67	51	55
46	63	61	68	53	57
48	65	63	69	56	59
50	66	65	71	58	62
52	68	67	72	61	64
54	70	69	73	63	66
56	71	70	75	65	67
58	73	72	76	68	70
60	75	74	78	70	71
62	76	77	80	72	73
64	78	79	82	74	75
66	80	83	83	77	77

*Thermocouple Malfunction

Individual temperatures recorded on the unexposed frame of Doorset A

Time Mins	T/C Number 20 Deg. C	T/C Number 21 Deg. C	T/C Number 22 Deg. C	T/C Number 23 Deg. C
0	18	18	19	21
1	18	18	19	21
2	18	18	19	21
3	23	29	19	21
4	24	29	19	21
5	30	38	19	21
6	36	42	20	21
7	39	44	20	21
8	43	46	21	20
9	46	50	20	20
10	46	51	20	20
11	44	54	21	20
12	44	56	21	20
13	45	56	21	20
14	46	55	22	20
15	48	55	23	20
16	50	55	24	*
17	52	55	24	*
18	55	55	25	*
19	57	55	26	*
20	61	56	27	*
21	64	56	29	23
22	67	56	30	25
23	70	57	31	25
24	74	58	33	26
25	78	58	35	27
26	82	58	37	28
27	86	59	38	28
28	91	60	40	29
29	95	61	42	30
30	100	63	44	31
31	107	66	46	31
32	116	69	48	32
33	160	72	51	33
34	158	74	46	34

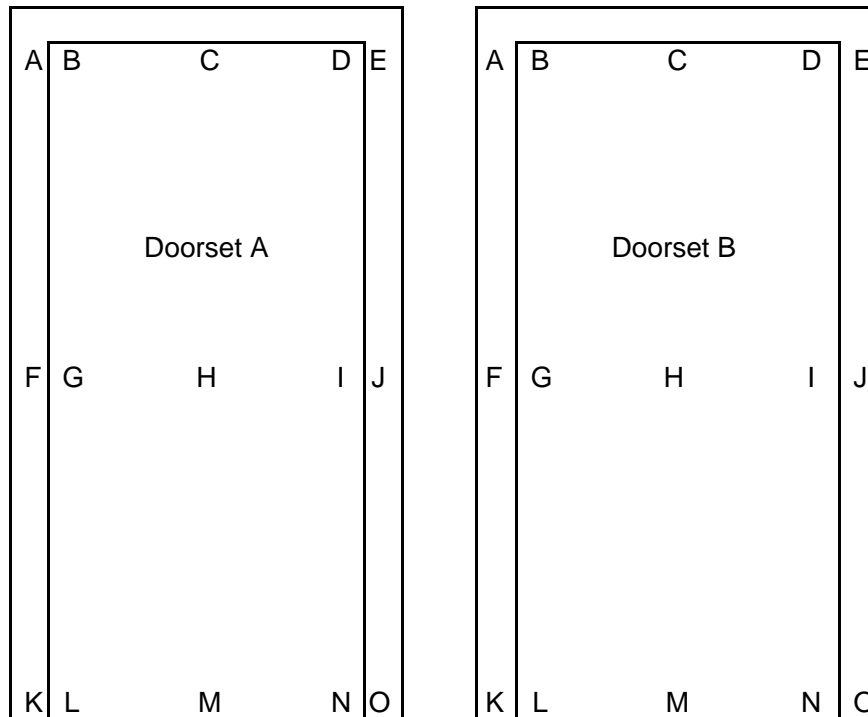
*Thermocouple Malfunction

Individual temperatures recorded on the unexposed frame of Doorset B

Time Mins	T/C Number 24 Deg. C	T/C Number 25 Deg. C	T/C Number 26 Deg. C	T/C Number 27 Deg. C
0	20	20	20	20
2	20	20	20	20
4	20	29	20	20
6	23	36	21	20
8	24	40	21	20
10	25	40	21	20
12	27	40	21	20
14	30	40	21	20
16	31	40	21	20
18	30	39	21	21
20	29	38	22	21
22	30	40	22	21
24	30	37	23	22
26	32	37	23	23
28	33	38	24	23
30	35	39	25	24
32	36	40	25	25
34	37	39	26	26
36	38	40	27	27
38	39	40	28	28
40	40	41	29	29
42	41	42	30	31
44	42	43	31	32
46	44	45	32	33
48	45	47	33	34
50	*	49	33	35
52	48	50	34	36
54	50	51	35	37
56	51	53	36	38
58	52	54	37	39
60	55	56	38	40
62	57	58	39	41
64	58	64	40	43
66	60	93	41	44

*Thermocouple Malfunction

Deflections Of The Door Leaves And Door Frames During The Test



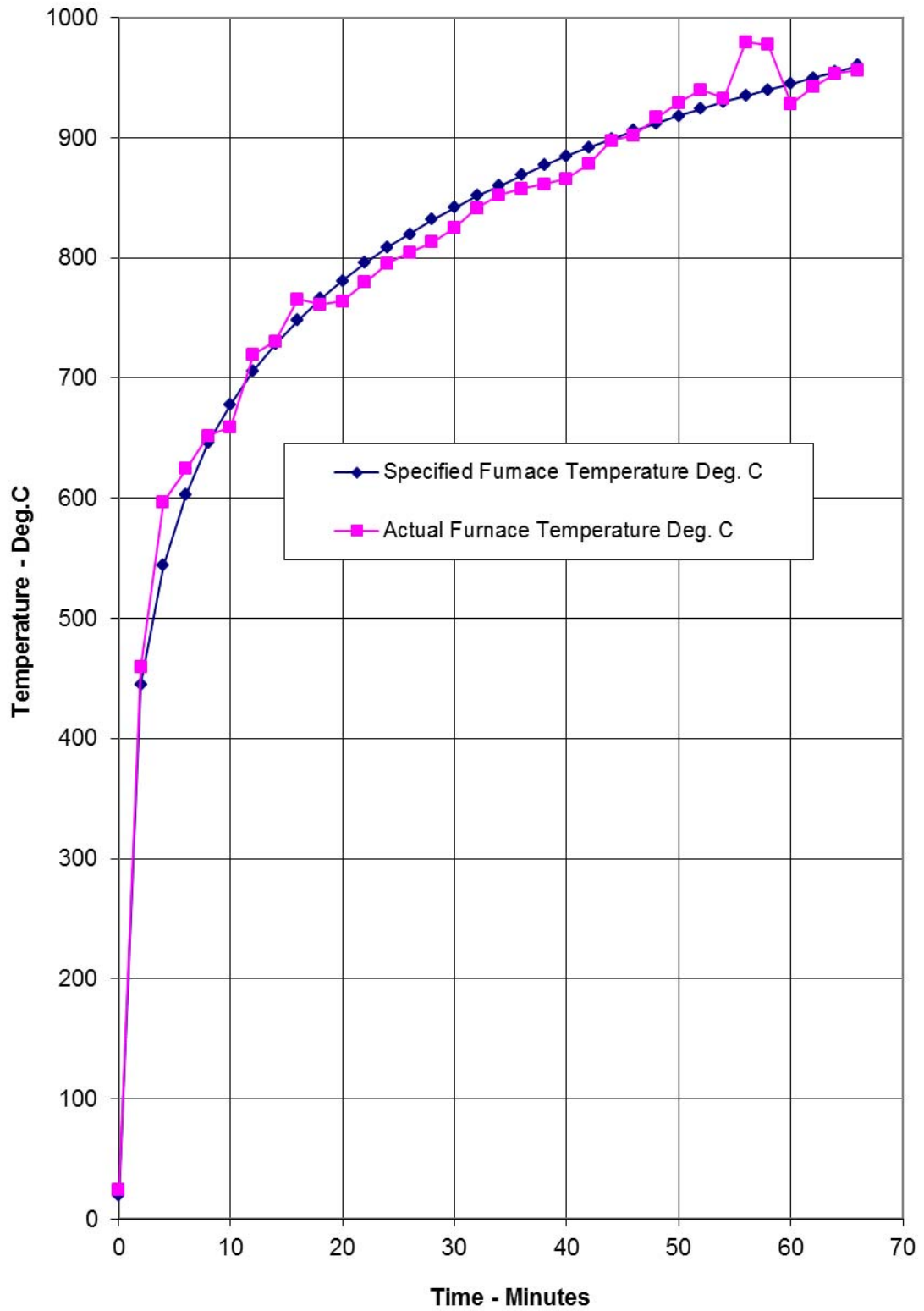
Doorset A															
Deflections – mm															
TIME mins	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	-5	0	0
10	0	-2	0	0	0	-5	0	0	0	0	5	0	-10	2	0
15	0	0	0	0	0	-5	0	-5	0	0	0	5	10	2	0
20	0	0	0	10	0	-3	0	-5	3	0	5	5	-10	2	0
25	0	0	2	2	0	-3	0	-10	10	0	0	5	-10	2	0
30	*	*	10	10	5	-3	0	-15	0	0	0	5	-10	2	0

Doorset B															
Deflections – mm															
TIME mins	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	-5	0	0	0	-5	0	0	-10	0
20	0	0	0	0	0	0	-5	-5	0	0	-5	0	0	0	0
30	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
40	5	0	0	5	0	0	-10	0	0	0	0	8	10	8	0
50	0	5	0	5	0	0	5	-15	0	0	-5	5	0	10	0
60	7	10	-5	5	0	0	2	-25	-3	2	-5	10	-10	10	0

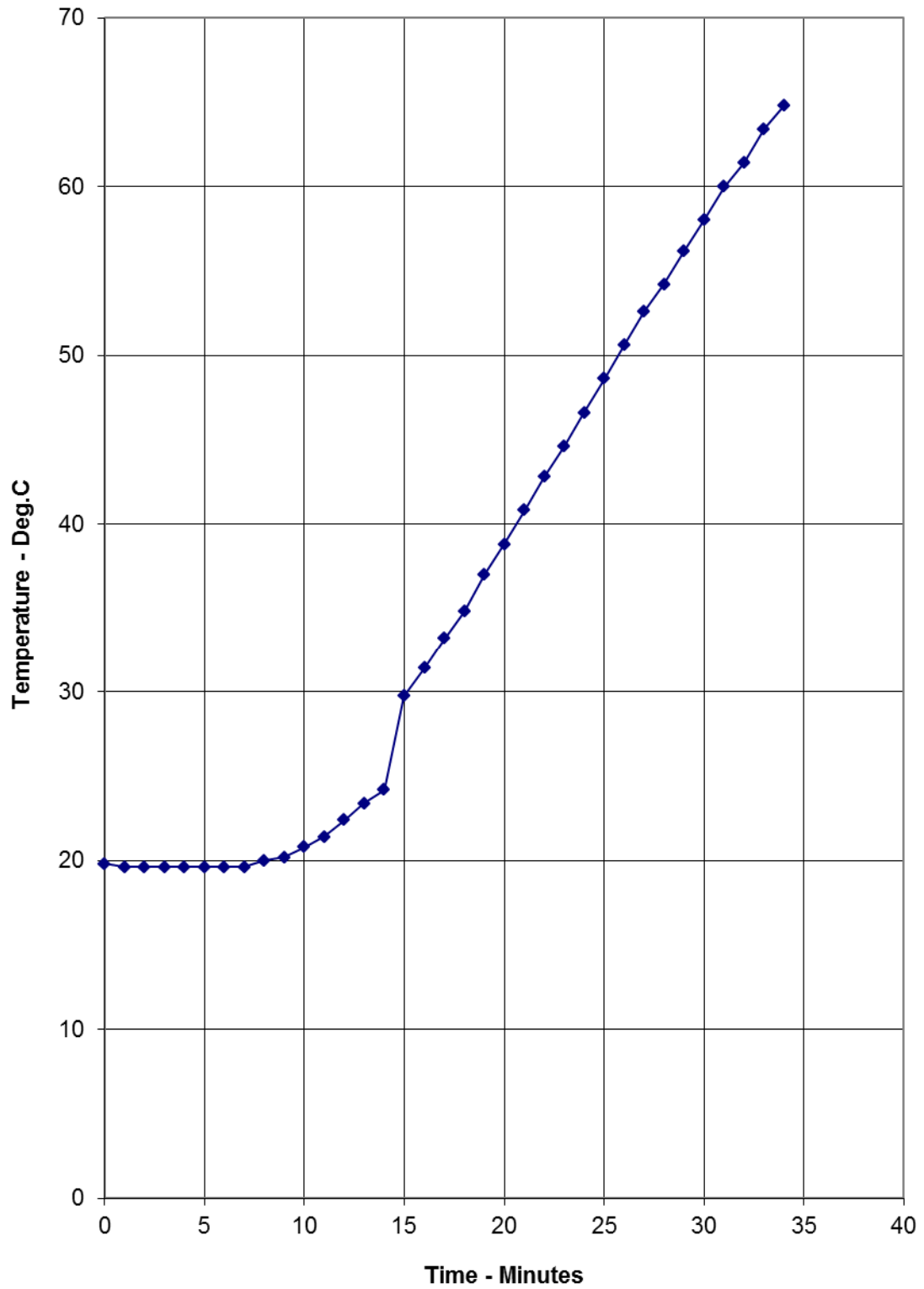
* Doorset A blanked off

Positive values indicate a deflection towards the heating condition of the test

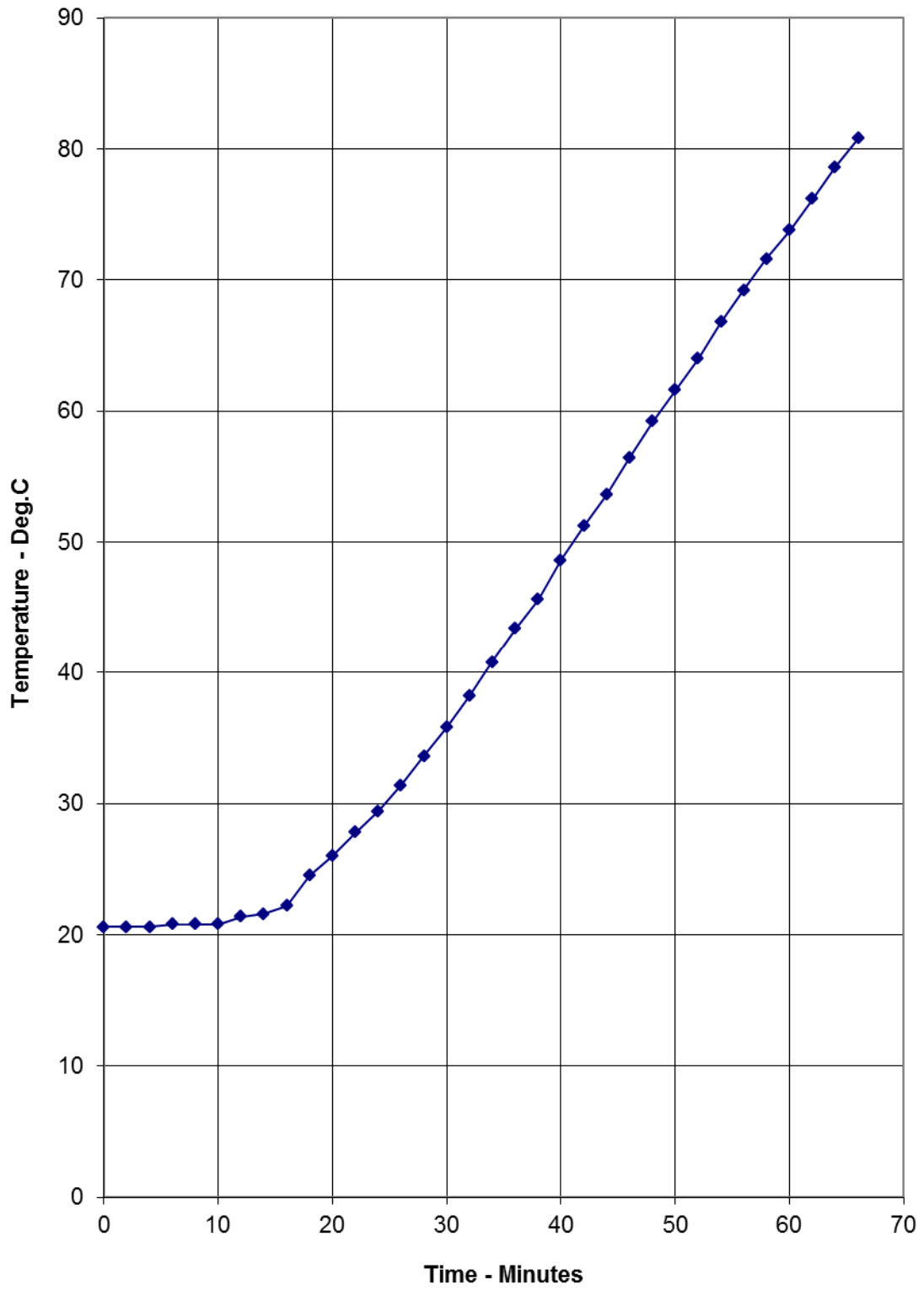
Graph showing mean furnace temperature, together with the temperature/time relationship specified in the Standard



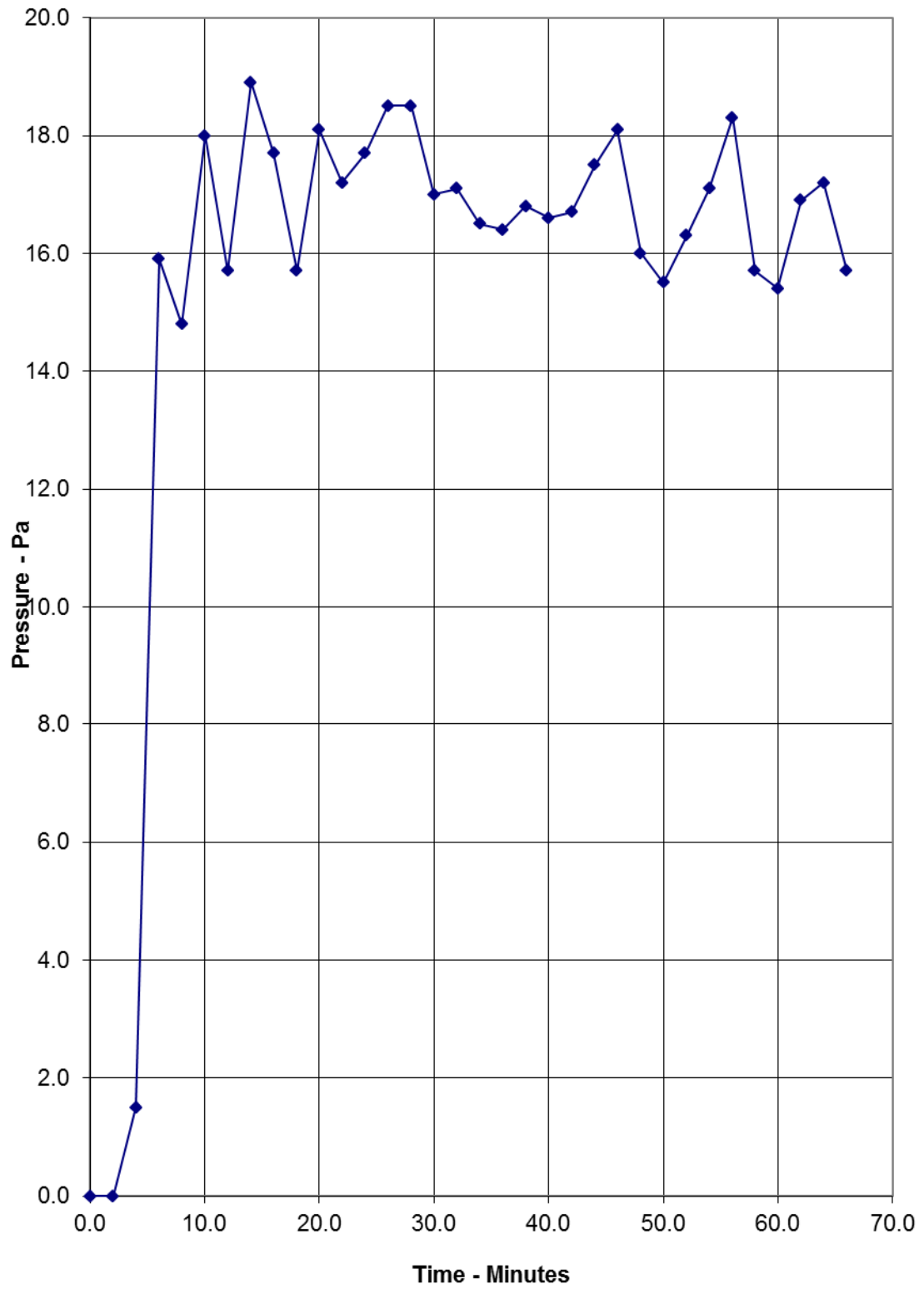
Graph showing mean temperatures recorded on the unexposed surface of Doorset A



Graph showing mean temperatures recorded on the unexposed surface of Doorset B



Graph showing the furnace pressure recorded during the test



Performance Criteria and Test Results

Integrity

It is required that the specimen retains its separating function, without either causing ignition of a cotton pad when applied, or permitting the penetration of a gap gauge as specified in BS EN 1634-1: 2014, or resulting in sustained flaming on the unexposed surface.

These requirements were satisfied for the periods shown below:

	Doorset A	Doorset B
Sustained flaming	31 minutes	66 minutes [#]
Gap gauge	31 minutes	66 minutes [#]
Cotton pad	31 minutes	66 minutes [#]

Insulation

The mean temperature rise of the unexposed surface shall not be greater than 140°C and that the maximum temperature rise shall not be greater than 180°C (except on the door frame, where the maximum temperature rise shall not exceed 360°C). Insulation failure also occurs simultaneously with integrity failure as specified in BS EN 1634-1: 2014.

These requirements were satisfied for the periods shown below:

	Doorset A	Doorset B
Insulation	31 minutes	66 minutes [#]

[#]The test duration. The test was discontinued after a period of 66 minutes.

Ongoing Implications

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: 2012, and where appropriate BS EN 1363-2: 2012. 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. Annex A of BS EN 1363-1: 2012, provides guidance information on the application of fire resistance tests and the interpretation of test data.

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.

Conclusions

Evaluation against objective Two specimens of single-acting, single-leaf timber based doorsets, incorporating various items of building hardware have been subjected to a fire resistance test in accordance with BS EN 1634-1: 2014, Fire resistance and smoke control tests for door, shutter and openable window assemblies and elements of building hardware, BS EN 1363-1: 2012, General requirements and BS EN 1363-2: 1999, Alternative and additional procedures.

The evaluation of the doorsets against the requirements of BS EN 1634-1: 2014 showed that they satisfied the requirements for the following periods.

Test Results:		Doorset A	Doorset B
Integrity performance	Sustained flaming	31 minutes	66 minutes [#]
	Gap gauge	31 minutes	66 minutes [#]
	Cotton Pad	31 minutes	66 minutes
Insulation performance		31 minutes	66 minutes [#]

[#]The test duration. The test was discontinued after a period of 66 minutes.