

Testing, calibrating, advising.

Ref: WF 375192

15 March 2017

Titan Healthcare Products
375 Babbacombe Road
Torquay
TQ1 3TB

Test reference: WF 375192

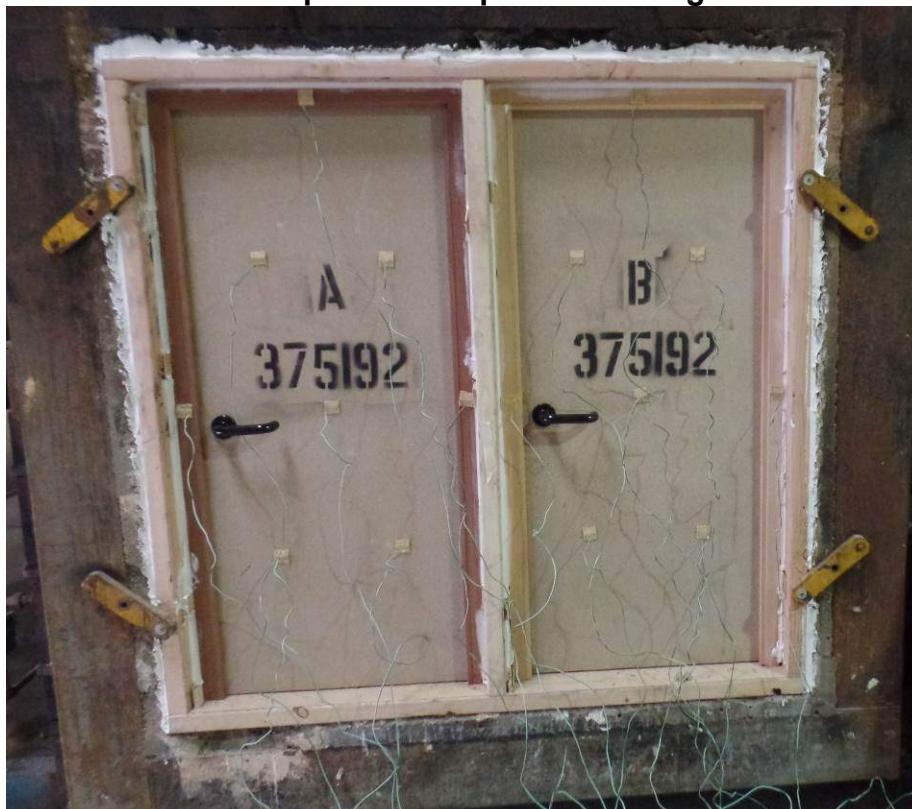
Re: Indicative Fire Resistance Test utilizing the temperature and pressure conditions of BS 476: Part 20: 1987 and the principles of BS 476: 22: 1987 (and current FTSG Resolutions where applicable)

This letter is to confirm the results of an indicative fire resistance test undertaken on 28th October 2016. The specimen consisted of two door leaf sections hung within timber frames.

Details of the test specimens

The left doorset was designated doorset A and the leaf measured 1360mm high x 592mm wide x 54mm thick. The right doorset was designated doorset B and the leaf measured 1360mm high x 592mm wide x 44mm thick.

Unexposed face prior to testing

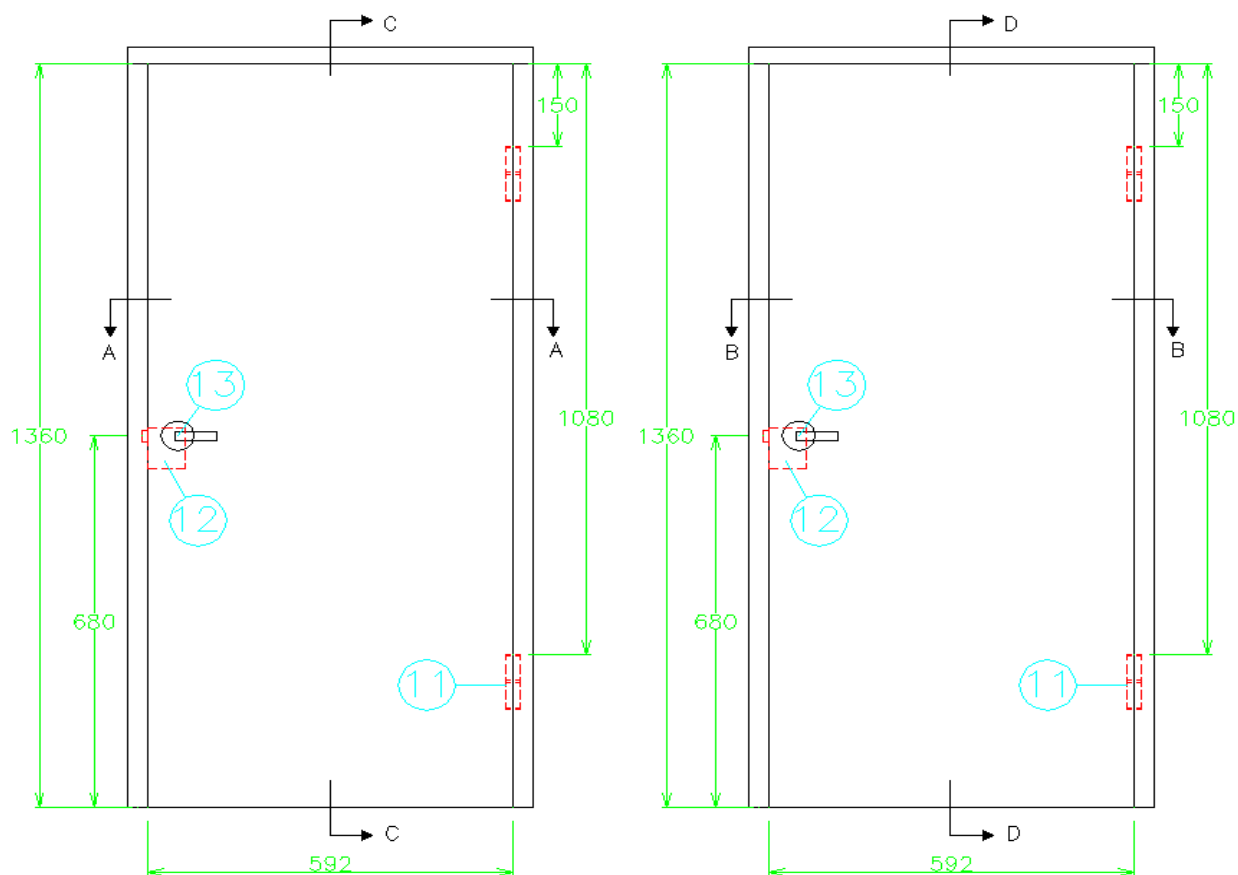


Introduction

The specimens were supplied for test by the client and delivered during October 2016. Exova Warringtonfire installed the specimens into a plasterboard clad timber stud supporting construction, built within a refractory lined steel restraint frame mounted on the front of a 1.5m x 1.5m vertical furnace.

Description of construction

Front elevation showing hardware positions. See page 10 for leaf/frame perimeter gaps.



Leaf – doorset A

		Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)	Key to figures
Core		Halspan Ltd 3-layer particleboard	54 thick	620±10*	9.9	1
Facings		None fitted	-	-	-	-
Lippings (vertical edges only)		Sapele	8 thick	640**	8.3	2
Adhesive	Lippings	PU	-	-	-	-

* Manufacturers stated density ** TRADA timber database nominal density

Leaf – doorset B

		Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)	Key to figures
Core		Halspan Ltd 3-layer particleboard	44 thick	620±10*	9.8	3
Facings		None fitted	-	-	-	-
Lippings (vertical edges only)		Sapele	8 thick	640**	7.8	4
Adhesive	Lippings	PU	-	-	-	-

* Manufacturers stated density ** TRADA timber database nominal density

Frame - doorset A

		Material	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)	Key to figures
Frame	Head and jambs	Sapele	70 deep x 32 thick	640*	7.8	5
	Threshold	Non combustible	-	-	-	-
Frame jointing detail		Mortice and tenon - screwed	-	-	-	-
Stop – planted (pinned)		Sapele	12 thick x 15 wide	640*	9.1	6
Frame to supporting construction fire stopping detail		Tightly packed rock mineral fibre capped with intumescent acrylic mastic on the exposed face	Nominally 5-10mm wide x 10-15 deep	-	-	-
Frame fixing method		Steel wood screws – 3No. per jamb	80 long	-	-	-

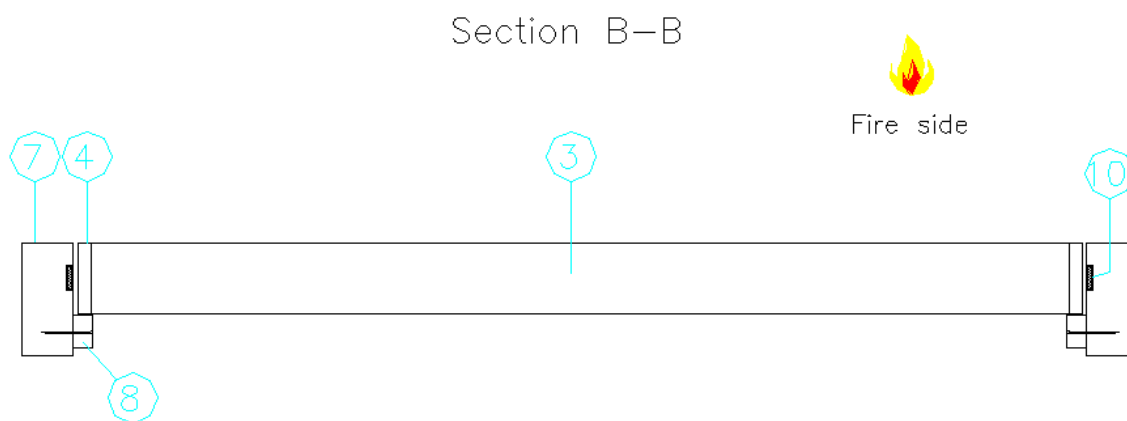
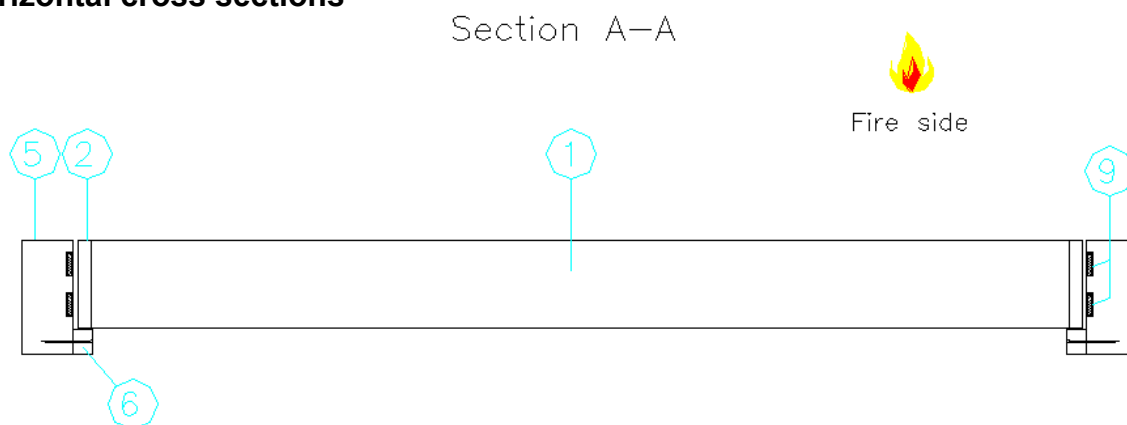
* TRADA timber database nominal density

Frame - doorset B

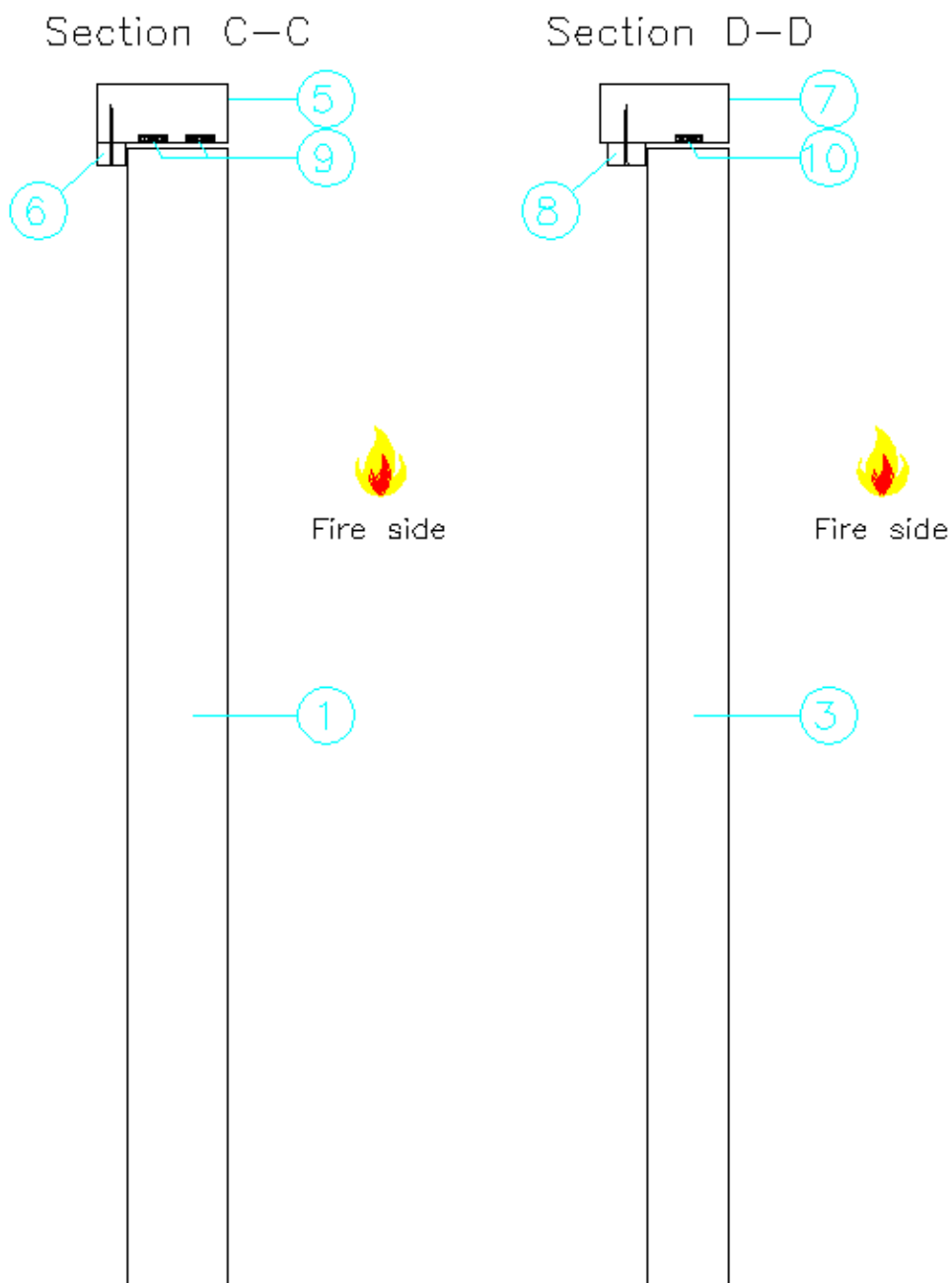
		Material	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)	Key to figures
Frame	Head and jambs	European Redwood	70 deep x 32 thick	510*	7.7	7
	Threshold	Non combustible	-	-	-	-
Frame jointing detail		Mortice and tenon - screwed	-	-	-	-
Stop – planted (pinned)		European Redwood	12 thick x 20 wide	510*	8.4	8
Frame to supporting construction fire stopping detail		Tightly packed rock mineral fibre capped with intumescent acrylic mastic on the exposed face	Nominally 5-10mm wide x 10-15 deep	-	-	-
Frame fixing method		Steel wood screws – 3No. per jamb	80 long	-	-	-

* TRADA timber database nominal density

Horizontal cross sections



Vertical cross sections



Intumescent and sealing materials – doorset A

	Make/type	Size (mm)	Location	Key to figures
Leaf edge	None fitted	-	-	-
Frame reveal – head and jambs	2No. Pyroplex Rigid Box Seals FO8700	15 x 4	Fitted 10mm apart, 7mm from the exposed face in the frame reveal	9

Intumescent and sealing materials – doorset B

	Make/type	Size (mm)	Location	Key to figures
Leaf edge	None fitted	-	-	-
Frame reveal – head and jambs	Pyroplex Rigid Box Seal FO8700	15 x 4	Fitted 14mm from the exposed face in the frame reveal	10

Interruptions and hardware protection – doorset A

	Make/type	Size (mm)	Location
Around hinges	Partially interrupted	-	Hinge blade fully interrupts 1 st seal and partially interrupts 2 nd seal with 12mm remaining continuous
Under hinge blades	Interdens	1 thick	Fitted under the hinge blade on frame and leaf
Encasing latch body	Interdens	1 thick	Fitted around the body of the latch
Under latch forend	Interdens	1 thick	Fitted under the latch forend
Around latch keep	Partially interrupted	-	Latch keep fully interrupts 1 st seal and partially interrupts 2 nd seal leaving 8mm continuous
Under latch keep	Interdens	1 thick	Fitted under the latch keep

Interruptions and hardware protection – doorset B

	Make/type	Size (mm)	Location
Around hinges	Fully interrupted	-	Hinge blade fully interrupts seal in frame reveal
Under hinge blades	None fitted	-	-
Encasing latch body	None fitted	-	-
Under latch forend	None fitted	-	-
Around latch keep	Fully interrupted	-	Latch keep fully interrupts seal in frame reveal
Under latch keep	None fitted	-	-

Hardware – both doorsets

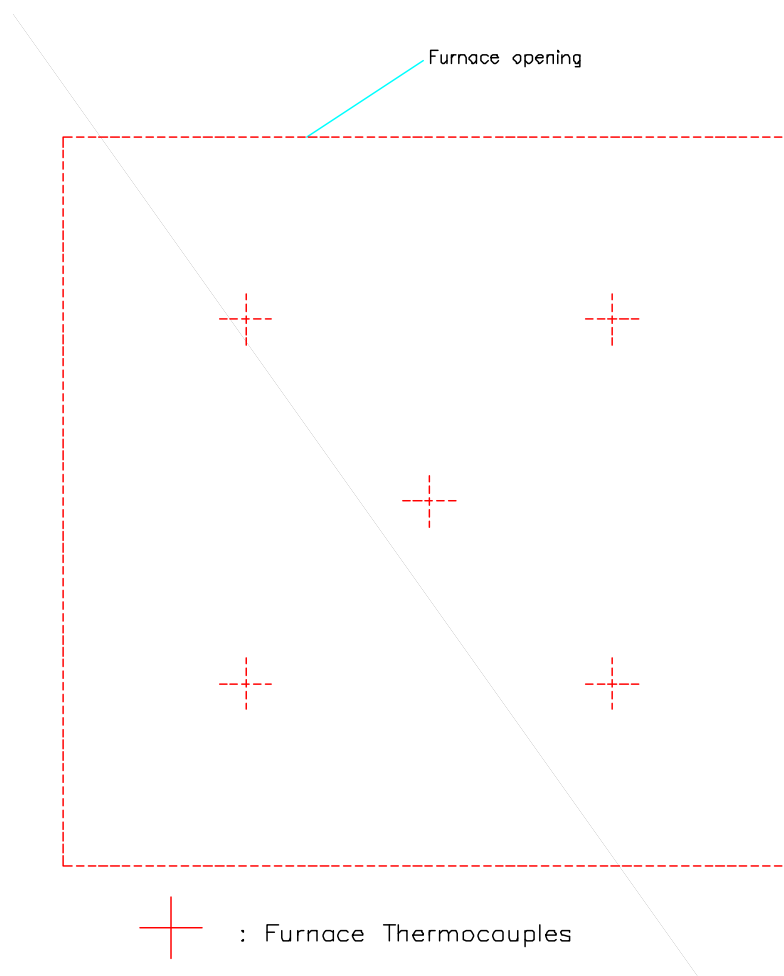
	Make/type	Size (mm)	Location	Key to figures
Hinges	2No. Royde and Tucker H101 lift off type hinge	101 x 35 (blade size)	Fitted 150mm and 1080mm from the head of the leaf	11
Closer	None fitted	-	-	-
Latch – engaged	Forte DIN Standard Latch Case	235 x 22 (forend size) 165 x 90 x 16 (case size) 235 x 22 (keep size)	Latch nib fitted 680mm from the threshold of the leaf	12
Furniture	Titan Healthcare antibacterial lever type handle	Ø56 (rose size)	Fitted appropriate to the latch	13

Test conditions

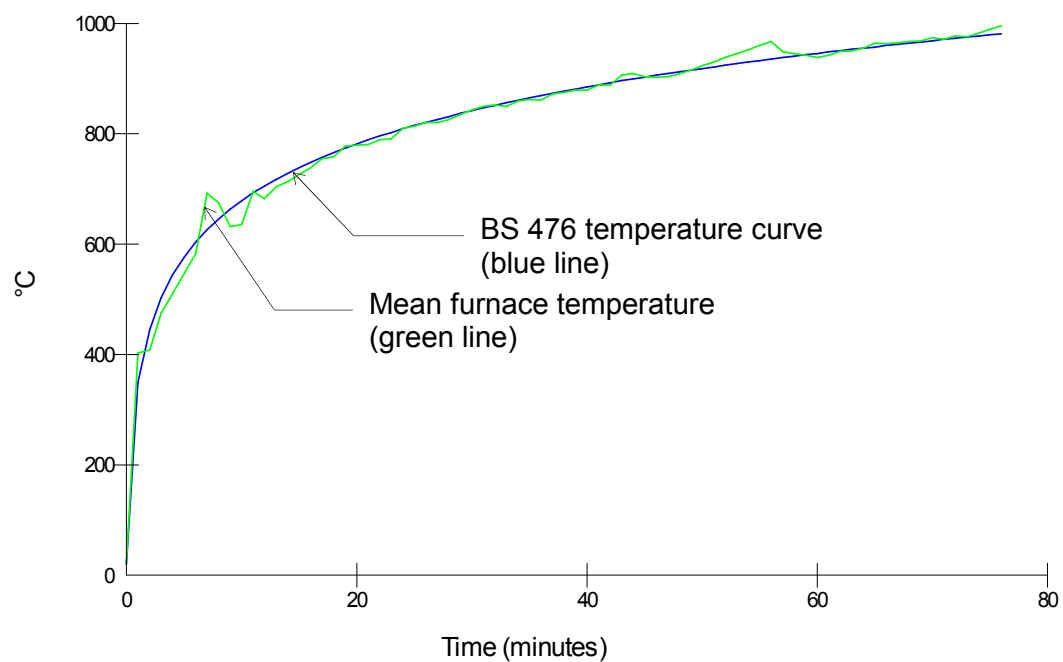
The furnace temperature was measured using the average of 5No furnace thermocouples. The temperature and pressure were controlled to the conditions outlined in BS 476: Part 20: 1987.

The furnace pressure was maintained at 2.55Pa with respect to atmosphere, to replicate a door handle height of 1000mm from the leaf threshold.

The ambient temperature of the laboratory at the start of the test was 18°C.



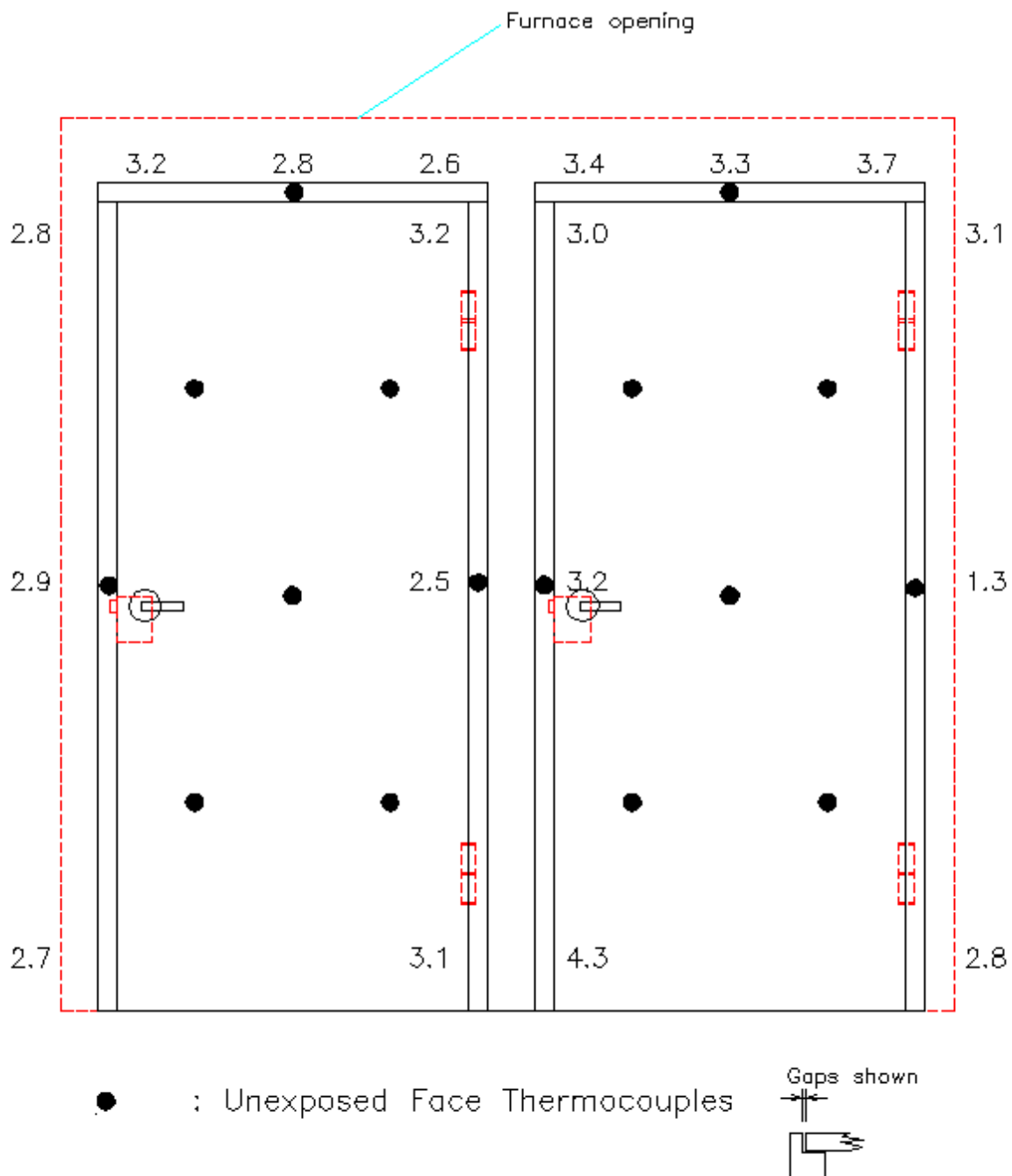
Furnace temperature curves



Unexposed face thermocouples and leaf edge perimeter gaps

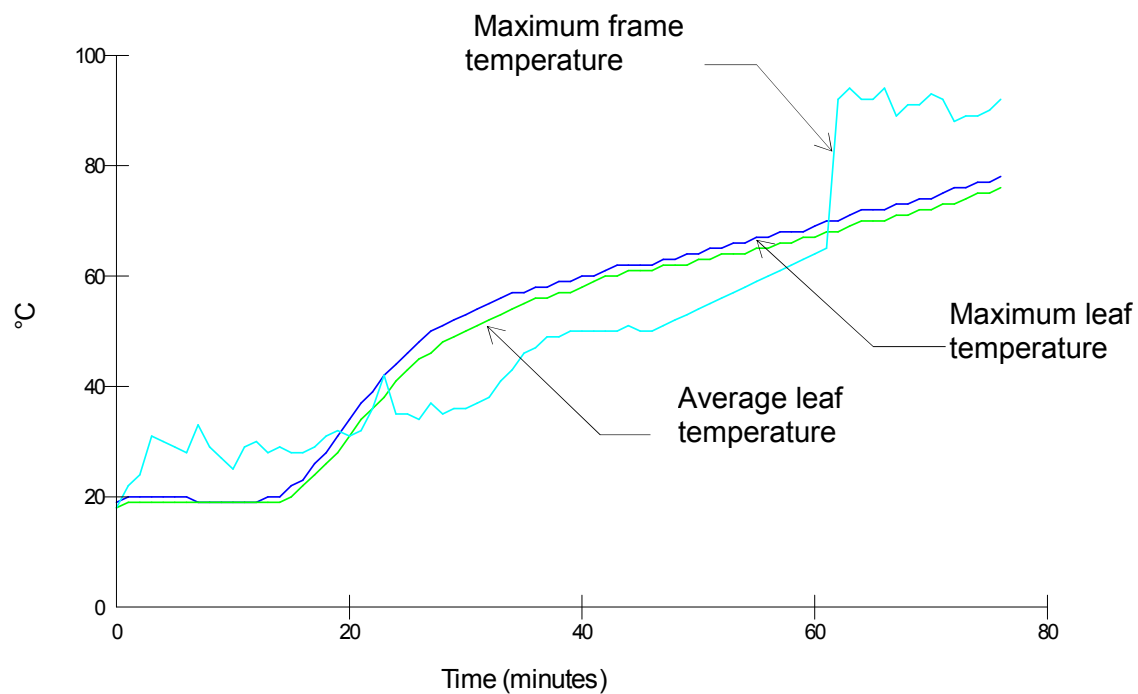
The temperature of the unexposed face of each doorset was monitored by means of five thermocouples fixed to the leaf face, and three thermocouples fitted to the frame, one at mid height on each frame jamb and one centrally located above the leaf on the frame head. The locations of the thermocouples are shown below. The temperatures recorded are shown graphically overleaf.

The door leaf edge perimeter gaps were measured prior to test. The recorded measurements are shown below.

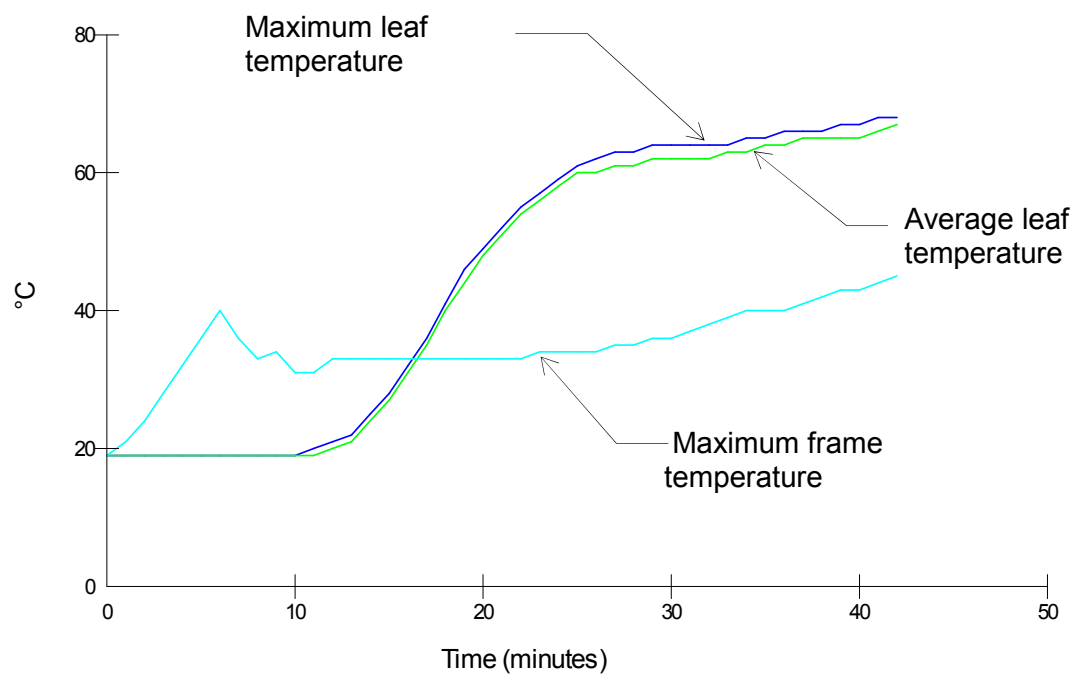


Unexposed face temperature curves

Doorset A



Doorset B



Photographs

Titan Healthcare Products antibacterial handle – exposed face



At start of test



At 10 minutes



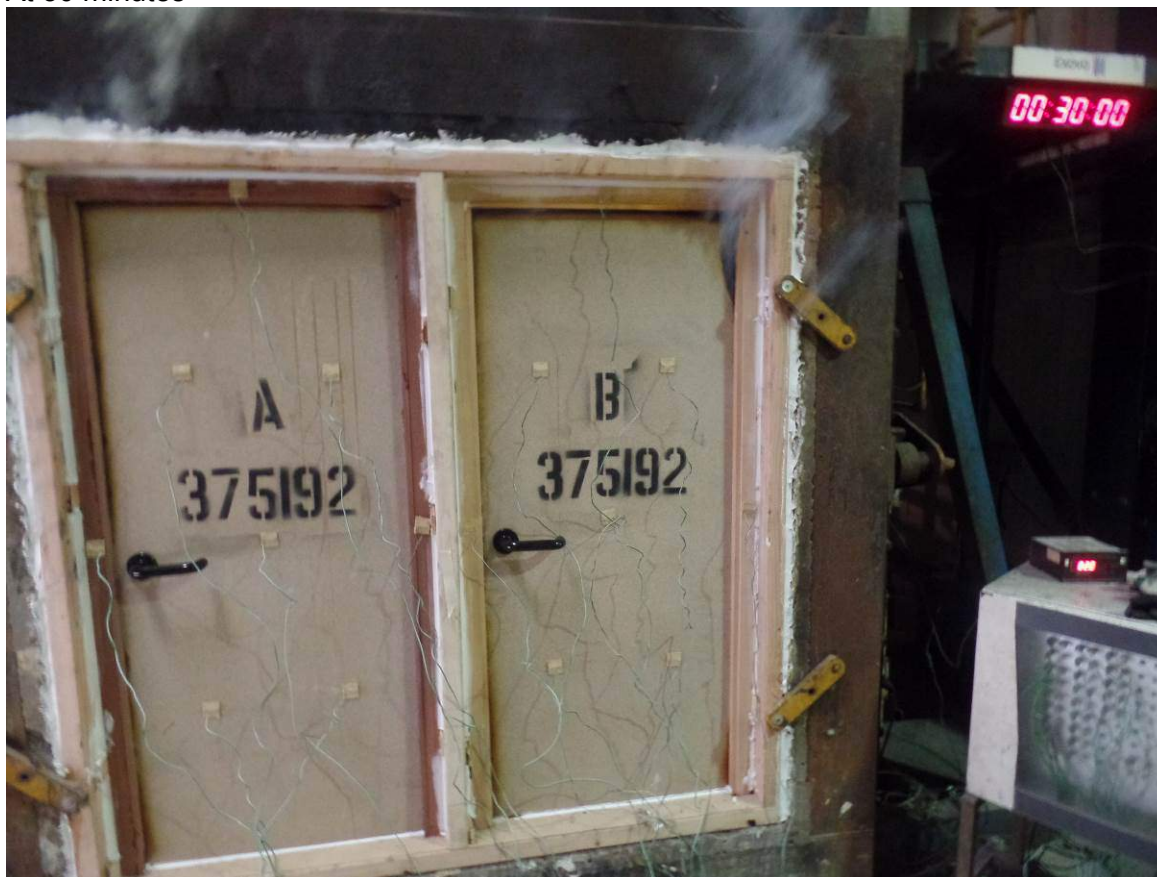
At 15 minutes



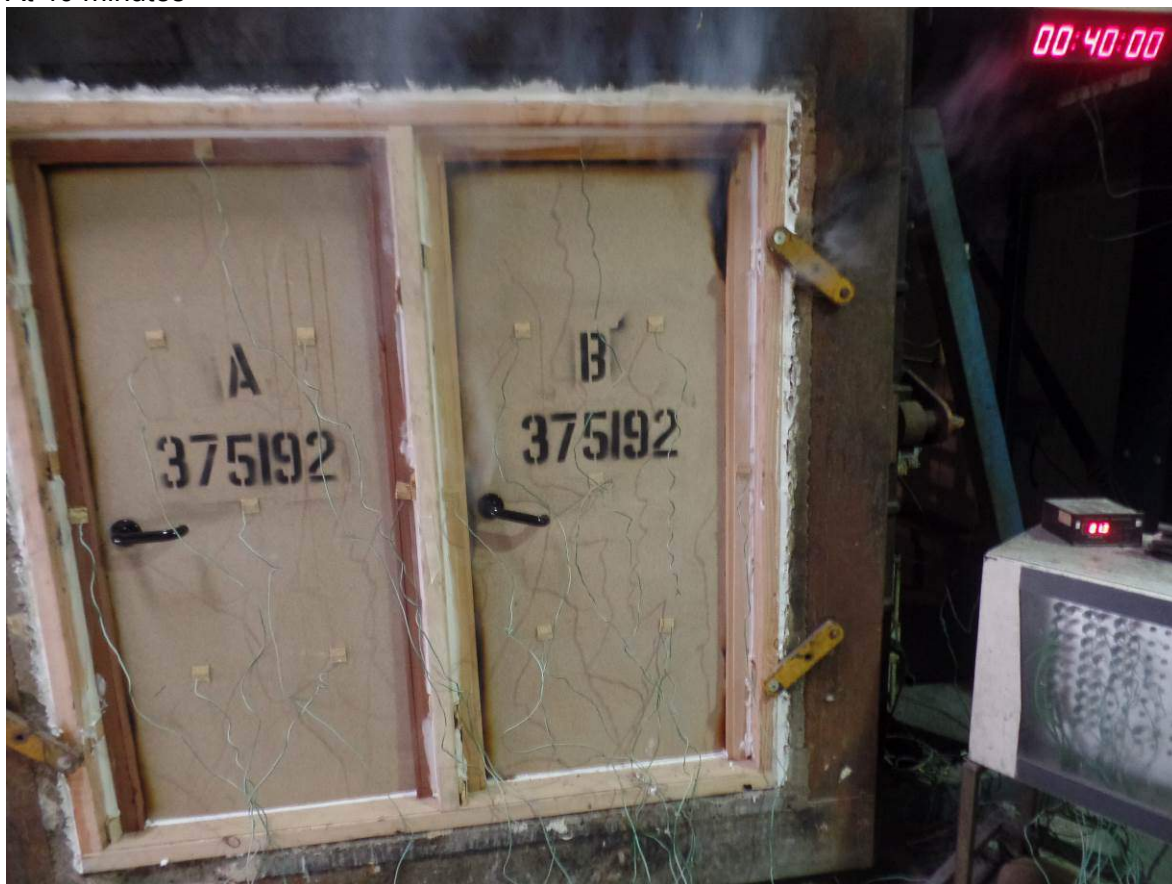
At 20 minutes



At 30 minutes



At 40 minutes



After 45 minutes



After 60 minutes



Observations

All comments refer to the unexposed face unless stated otherwise.

Time (minutes)	Comments
00.00	Test started.
03.18	Both doorsets, here is smoke issuing at the top half perimeter gaps.
04.03	Both doorsets, there is smoke issuing at the closing edge above the handle.
06.31	Doorset B, there is smoke issuing at the top hanging edge.
07.08	Doorset B, there is discoloration at the top closing edge.
07.20	Exposed face, both doorsets, the plastic coating on the handles has melted away leaving steel exposed.
11.20	There is discoloration on the closing edge of both doorsets.
11.56	Both doorsets, there is discoloration across the head.
14.01	Both leaves, the top closing corners and bottom closing corners are distorting in towards the furnace by approximately 3-5mm.
16.00	Doorset B, there is an increase in smoke issuing at the top hinge position and at the top hanging corner.
18.12	Doorset B, there is an increase in discoloration at the top hanging corner.
18.43	Doorset B, there is a decrease in smoke issuing from all previous areas.
19.55	Doorset B, there is discoloration at the bottom hanging corner.
22.40	A roving thermocouple measurement at the handles recorded 21°C from doorset A, and 26°C from doorset B.
23.00	Doorsets A and B, exposed face, the latch spindles have distorted towards the leaf.
25.40	Doorset A, there is discoloration at the bottom of the closing edge.
26.30	Doorset B, there is an increase in smoke issuing.
26.40	Doorset B, there is an increase in discoloration at the bottom of closing edge.
29.41	Doorset B, the bottom hanging edge is distorting into the furnace by approximately 2-3mm.
31.25	Doorset A, the bottom hanging edge is distorting into the furnace by approximately 2-3mm.

- 32.16 Doorset B, there is an increase in smoke issuing at the top hanging corner and an increase in discoloration.
- 33.14 Doorset B, the handle is sagging.
- 36.17 Doorset B, there is an increase in smoke issuing at the closing edge next to the door handle.
- 38.07 Doorset B, there is glow at the top hinge position.
- 41.51 Doorset B, there is an increase in smoke issuing at the closing edge.
- 42.30 Doorset B, there is intermittent flaming at the top hinge position. A cotton pad integrity test was performed which resulted in ignition of the cotton pad.
- 43.00 Doorset B has been blanked off and observations on this specimen have been terminated.
- 51.09 Doorset A, the handle is sagging.
- 51.53 A roving thermocouple measurement was taken at the handle which recorded 101°C from doorset A by the spindle end and 42°C at the point furthest from the spindle.
- 54.36 Doorset A, there is discoloration at the top and bottom hinge positions.
- 55.50 Doorset A, there is glow at the top closing corner.
- 62.05 Doorset A, there is an increase in smoke issuing at top hinge position and an increase in discoloration.
- 62.47 A roving thermocouple measurement at the spindle location recorded 127°C on doorset A.
- 63.24 Doorset B, there is smoke issuing at the latch position.
- 63.39 A roving thermocouple measurement at the handle furthest from spindle recorded 47°C on doorset A.
- 64.55 Doorset A, there is an increase in discoloration along the head.
- 67.26 Doorset A, there is an increase in discoloration at the bottom hinge position.
- 68.05 Doorset A, there is an increase in smoke issuing.
- 68.40 Doorset A, there is a glow at the meeting edge.
- 69.10 Doorset A, a cotton pad integrity test was performed at the meeting edge near the handle, which resulted in ignition of the cotton pad.
- 71.20 Doorset A, the handle rose is starting to melt.
- 72.27 Doorset A, there is glow at the top hinge position.
- 76.05 Doorset A, there is flaming for in excess of 10 seconds at the top hinge

position. Test terminated.

Primary Observations

Time (minutes)	Comments
38.07	Doorset B, there is a glow visible at the top hinge position.
42.30	Doorset B, there is intermittent flaming. A cotton pad integrity test was performed which resulted in ignition of the cotton pad.
68.40	Doorset A, there is a glow at the meeting edge.
69.10	Doorset A, a cotton pad integrity test was performed at the meeting edge near the handle, which resulted in ignition of the cotton pad.
72.27	Doorset A, there is glow at the top hinge position.
76.05	Doorset A, there is flaming for in excess of 10 seconds at the top hinge position. Test terminated.

This test report relates to an investigation which utilised the test methodology given in BS 476: Part 22: 1987; the full requirements of the Standard were not, however, complied with. The information is provided for the test sponsor's information only and should not be used to demonstrate performance against the Standard nor compliance with a regulatory requirement. The test was not conducted under the requirements of UKAS accreditation.

Written and checked by:



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