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Testing. Advising. Assuring.

Title:

Indicative fire test

WF Report No:

401347

Prepared for:

Samuel Heath & Sons
Leopold Street
Birmingham B12 0UJ
United Kingdom

Date:

16th October 2018

Indicative Fire Resistance Test Letter Report

We have pleasure in enclosing the information of the indicative fire test conducted on your behalf on the 15th August 2018

The information enclosed relates to an investigation which utilised the heating and pressure conditions given in BS EN 1363-1: 2012 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.

The purpose of the test was to provide an indication of the performance of a Powermatic R108, concealed closer, under fire test conditions, when fitted to 30 and 60 minute fire rated timber based doorsets. The test assembly consisted of two small scale doorsets, which for the purposes of the test were reference as Doorset A and Doorset B

Doorset A had overall dimensions of 1488 mm high by 615 mm wide incorporating a door leaf with overall dimensions 1440 mm high by 548 mm wide by 44 mm thick. The door leaf was of a solid graduated density chipboard construction, with 8 mm hardwood lippings to the vertical edges and was mounted in a softwood frame. The Doorset was fitted with a Powermatic R108 concealed closer, which was installed nominally 740 mm above the notional floor lever.

Doorset B had overall dimensions of 1488 mm high by 615 mm wide incorporating a door leaf with overall dimensions 1440 mm high by 548 mm wide by 54 mm thick. The door leaf was of a solid graduated density chipboard construction, with 8 mm hardwood lippings to the vertical edges and was mounted in a hardwood frame. The Doorset was fitted with a Powermatic R108 concealed closer, which was installed nominally 740 mm above the notional floor lever.

The test assembly formed the front vertical face of a 1.5 metre wide by 1.5 metre high by 2 metre deep gas fired furnace chamber, the temperature rise of which was controlled to conform to the relationship given in BS EN 1363-1: 2012.

The following information relating to the test is enclosed:

- Table 1 - Specified and recorded furnace temperatures.
- Table 2 - Recorder furnace pressure 200 mm above the head of the doors.
- Table 3 - Door gaps measured prior to testing.
- Graph 1 - Specified and recorded furnace temperatures.
- Observations of the general behaviour of the specimen during the test.
- Test photographs from before, after and during the test.
- Test specimen drawings

We trust that the information enclosed is useful to you.

Responsible Officer
Anthony Green-Morris*
Technical Officer

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

Report Issued

Date: 16th October 2018

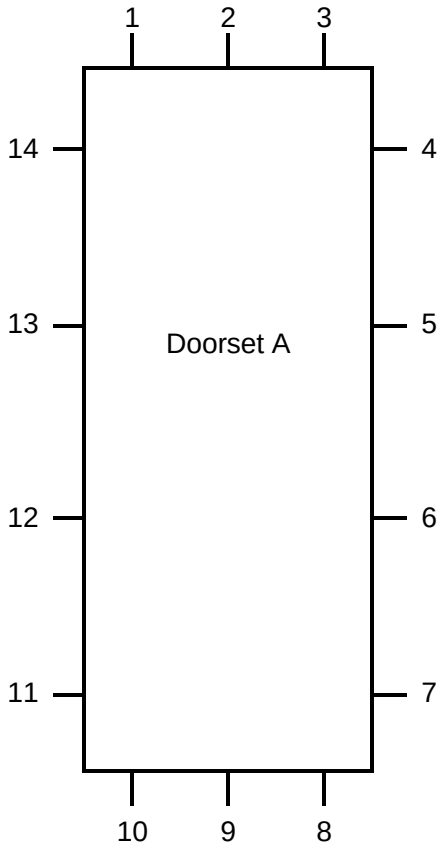
Table 1 – Furnace Temperature

Time Mins	Specified Furnace Temperature Deg. C	Actual Furnace Temperature Deg. C
0	20	20
2	445	455
4	544	629
6	603	569
8	645	598
10	678	629
12	705	695
14	728	708
16	748	746
18	766	767
20	781	784
22	796	790
24	809	798
26	820	824
28	831	838
30	842	846
32	851	857
34	860	867
36	869	877
38	877	888
40	885	887
42	892	899
44	899	916
46	906	913
48	912	916
50	918	923
52	924	932
54	930	942
56	935	956
58	940	941
60	945	961
62	950	953
64	955	939
66	960	950
67	962	958

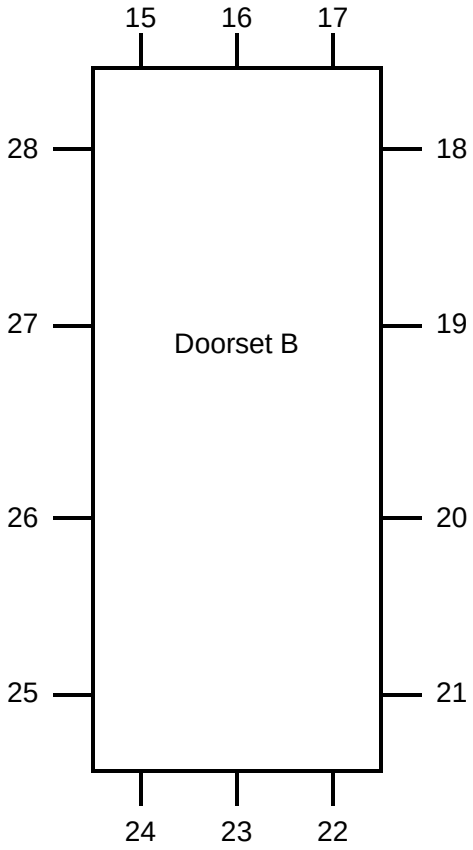
Table 2

Time Mins	Recorded Pressure Pascals
0	0
2	14
4	10
6	13
8	12
10	1
12	12
14	12
16	12
18	13
20	13
22	12
24	12
26	12
28	12
30	12
32	12
34	12
36	13
38	13
40	11
42	12
44	13
46	11
48	11
50	11
52	11
54	7
56	9
58	8
60	10
62	12
64	12
66	8
67	11

Table 3



View from unexposed face



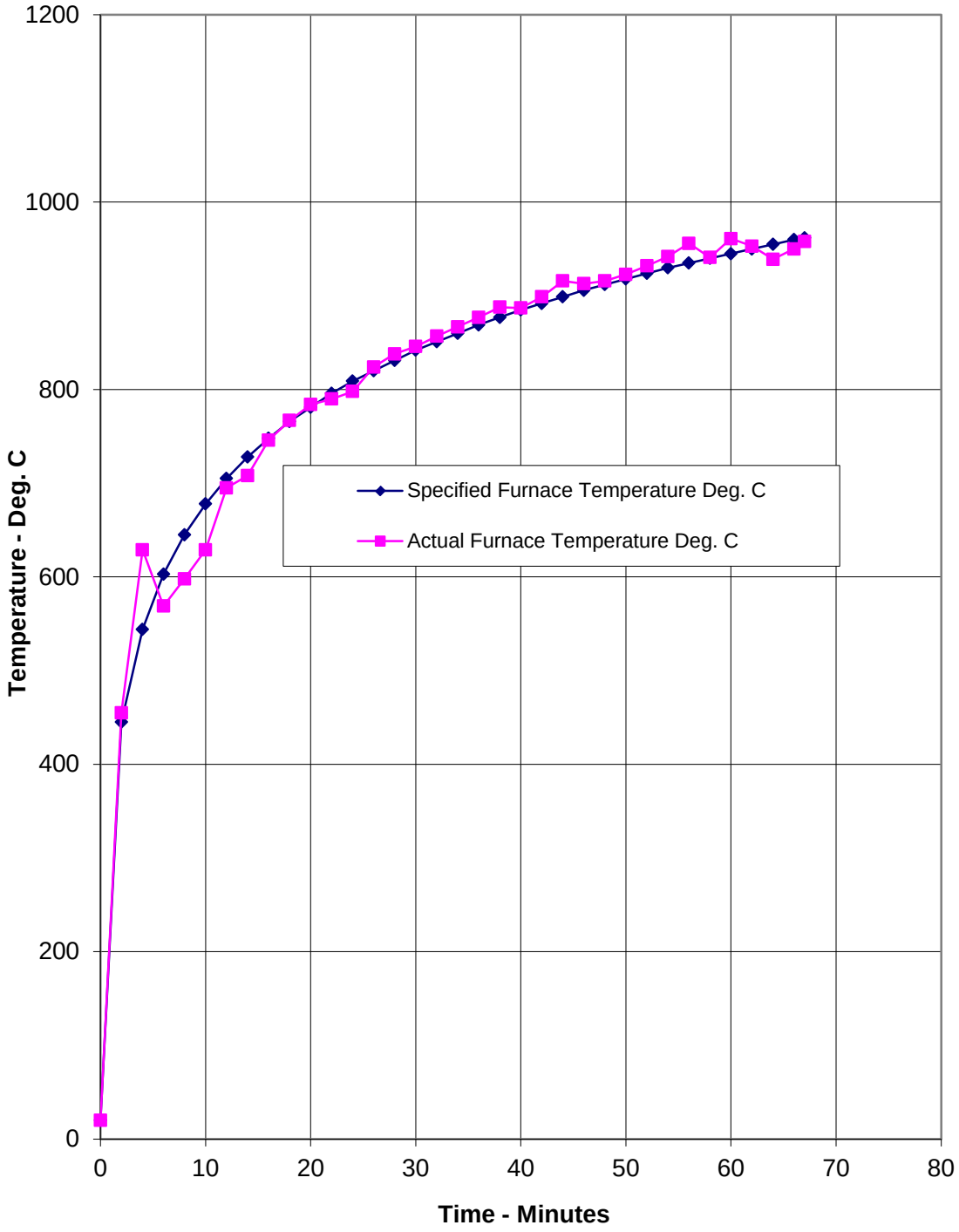
View from unexposed face

Door Ref	Gap Dimension in mm at Positions													
A	1	2	3	4	5	6	7	8*	9*	10*	11	12	13	14
	2.9	2.9	3	2.4	2.9	2.5	2.1	8	7.9	8.6	2.3	0.1	0.1	1.1
B	15	16	17	18	19	20	21	22*	23*	24*	25	26	27	28
	3.1	3.2	2.8	2.3	1.8	1.8	2	7.1	8.3	7.9	3.1	2.5	2.9	2.8
A	Mean		2		Maximum			3		Minimum			0.1	
B	Mean		2.6		Maximum			3.2		Minimum			1.8	

Door Ref	Gap Between Face of Leaf and Doorstop in mm at Position													
A	1	2	3	4	5	6	7	8*	9*	10*	11	12	13	14
	0.5	0.5	0.6	1.4	2.3	2.4	0.4	n/a	n/a	n/a	2.3	1.4	1.5	1.4
B	15	16	17	18	19	20	21	22*	23*	24*	25	26	27	28
	0.7	0.7	0.8	1.4	0.8	0.7	0.1	n/a	n/a	n/a	0.1	0.1	0.2	0.2

* Dimension not included in calculations
# Gap not measured

Graph 1 – Furnace Temperature



Test Observations

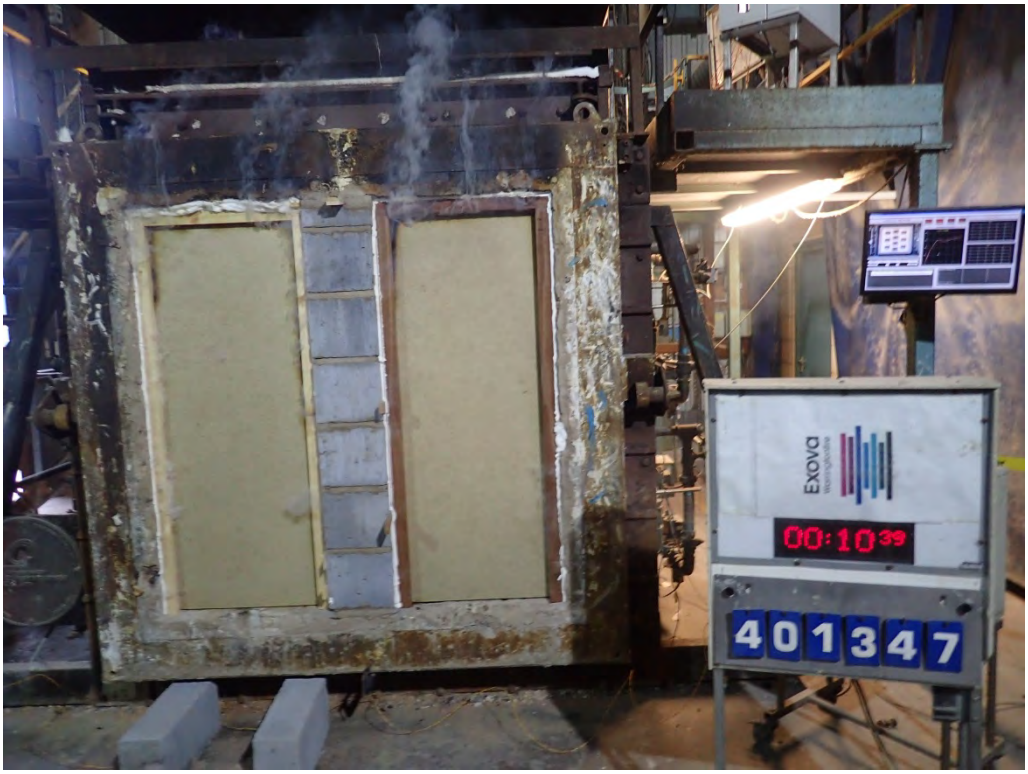
Time		All observations are from the unexposed face unless noted otherwise.
mins	**secs**	The ambient air temperature in the vicinity of the test construction was 14ºC at the start of the test with a maximum variation of +4ºC during the test.
00	**00**	**The test commences.**
01	**45**	Steam/smoke release along the jambs and head of both Doorsets.
03	**55**	Heavy steam/smoke release along the head of both Doorsets.
05	**11**	Dark black discoloration in the top corner of the leading edge and the top corner of the underside of the frame of Doorset B.
11	**10**	The centre of Doorset A can be seen to be bowing away from heating conditions.
15	**45**	Steam/Smoke release has rescinded and now only coming from the head of Doorset B and the top corner of the leading edge on Doorset A.
18	**57**	Flicker of flame at mid-height on the leading edge on Doorset A.
23	**08**	Flicker of flame reoccurs at mid-height on the leading edge of Doorset A. The bottom corner of the leading edge of Doorset A has bowed approximately 10 mm towards heating conditions.
24	**50**	Cotton pad applied at mid height of the leading edge of Doorset A, the pad ignites after 5 seconds.
27	**19**	The top corner of the leading edge on Doorset B can be seen to have bowed towards heating conditions.
29	**12**	Dark discolouration around top hinge position on Doorset A.
30	**00**	Moisture droplets forming at the head of the frame in corner positions on Doorset B.
30	**15**	Sustained flaming on Doorset A at the mid height of the leading edge.
33	**37**	The sustained flaming on Doorset A is put out with water to allow the test to continue.
34	**54**	Sustained flaming at mid height of the leading edge on Doorset A returns.
35	**31**	Dark discolouration around the body of the closer fitted to Doorset A.
36	**30**	Doorset A blanked off to allow the test to continue.
39	**51**	Dark black discolouration around the top corner of the leading edge of Doorset B.
40	**13**	Flicker of flame at base of door leaf B.

Time		
mins	**secs**	
41	**30**	Discolouration along the head of the frame of Doorset B.
46	**00**	Dark black discolouration all along the leading edge, moisture release and discolouration at the head of the frame of Doorset B.
49	**21**	Cotton pad applied at the top corner of leading edge of Doorset B, no discolouration of the pad.
51	**31**	Doorset B can be seen to be bowing away from heating conditions at the centre of the Doorset B.
55	**45**	The leading edge of Doorset B can be seen to have completely discoloured black.
60	**00**	Glowing can be seen at the top corner of the leading edge of Doorset B.
62	**50**	Cotton pad applied to the top corner of the leading edge of Doorset B, No discolouration of the pad.
63	**20**	Dark discolouration around all hardware positions on Doorset B.
67	**00**	The test is discontinued at client’s request.

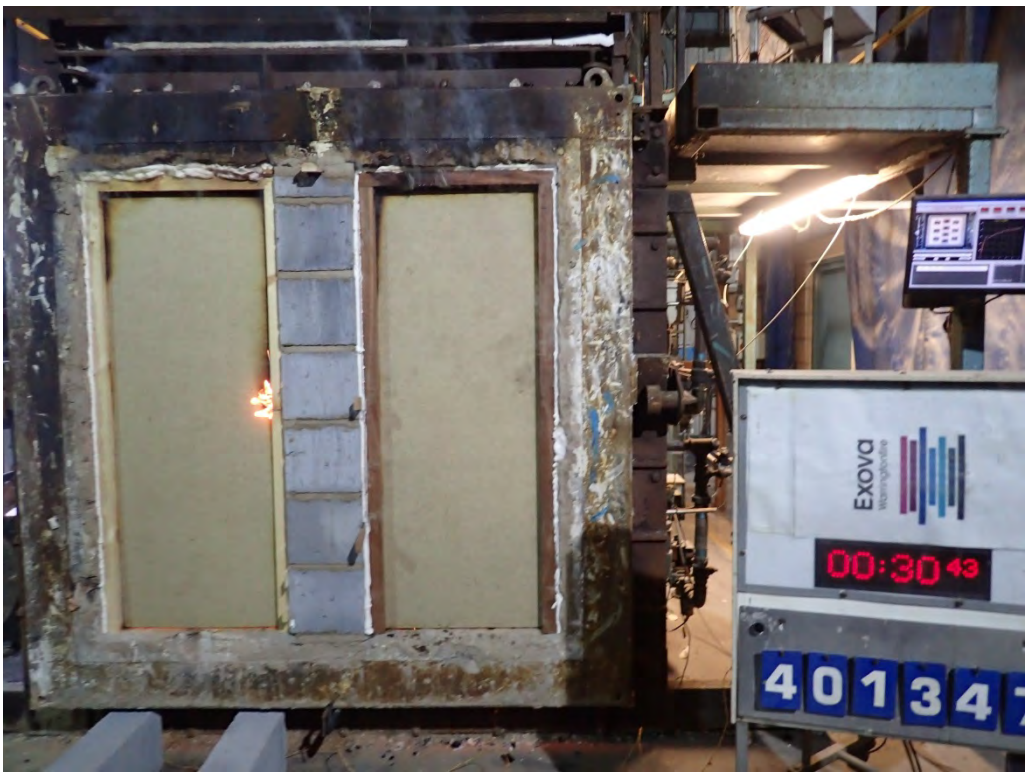
Test Photographs

The exposed face of the doorsets prior to the start of the test

The unexposed face of the doorsets after a test duration of 10 minutes



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

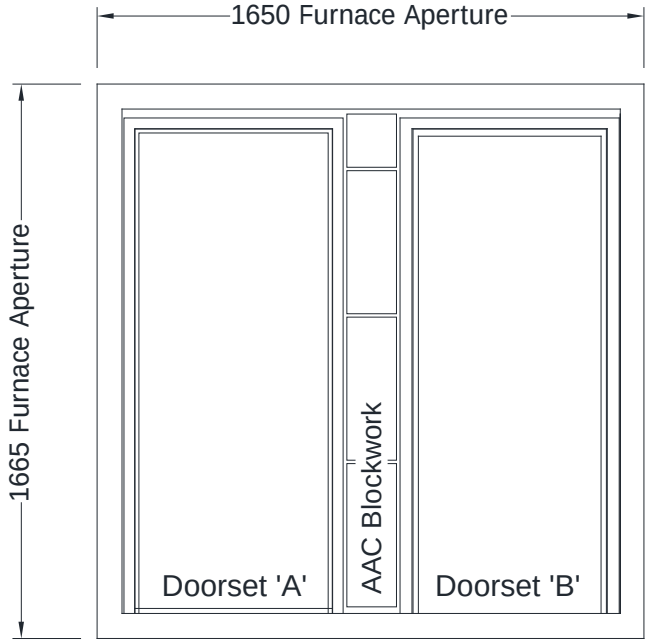


The unexposed face of the Doorset B after a test duration of 60 minutes

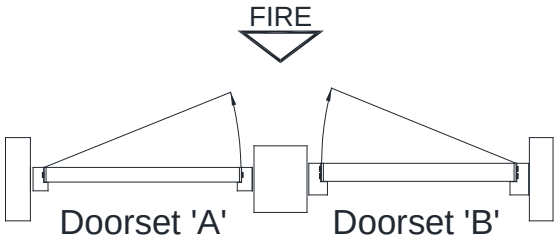
The unexposed face of Doorset B after a test duration of 66 minutes

Test Specimen

Figure 1: General Elevation of Test Construction



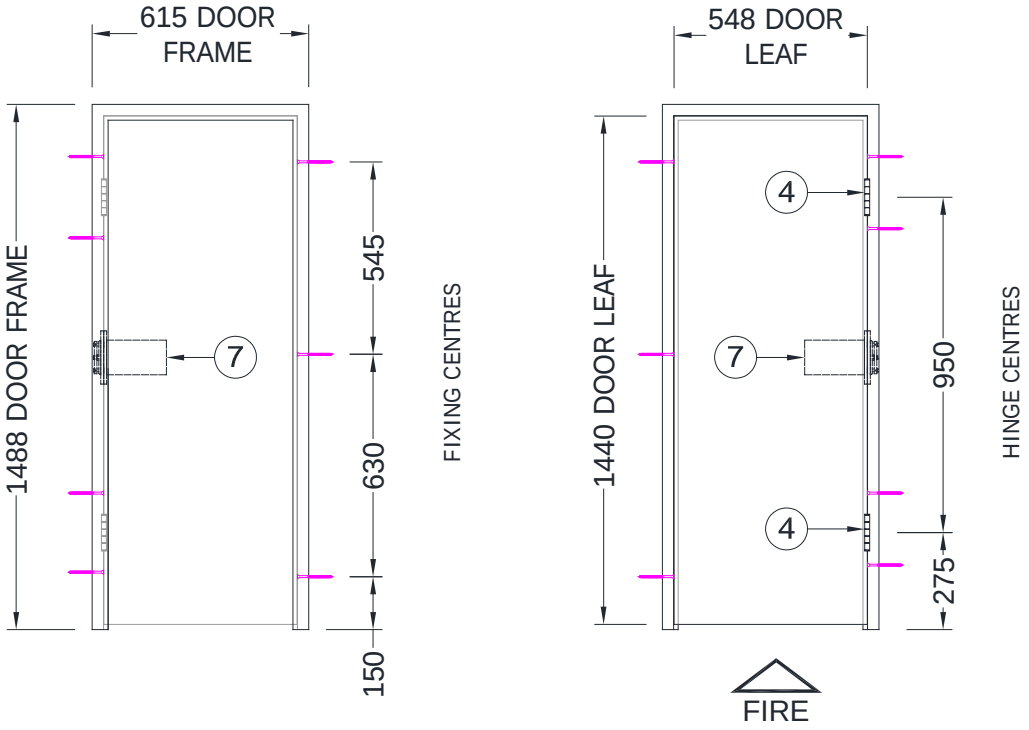
GENERAL ELEVATION OF TEST CONSTRUCTION
ON THE UNEXPOSED FACE



HORIZONTAL SECTION OF TEST CONSTRUCTION

Do not scale. All dimensions are in mm

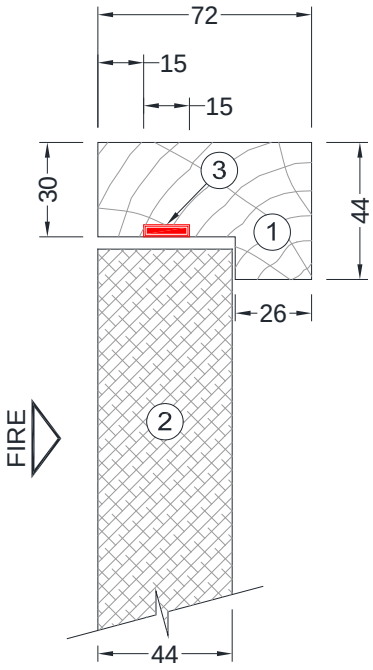
Figure 2: Doorset A - General Elevations



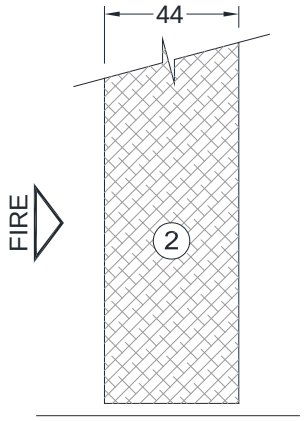
GENERAL ELEVATIONS OF DOORSET A

Do not scale. All dimensions are in mm

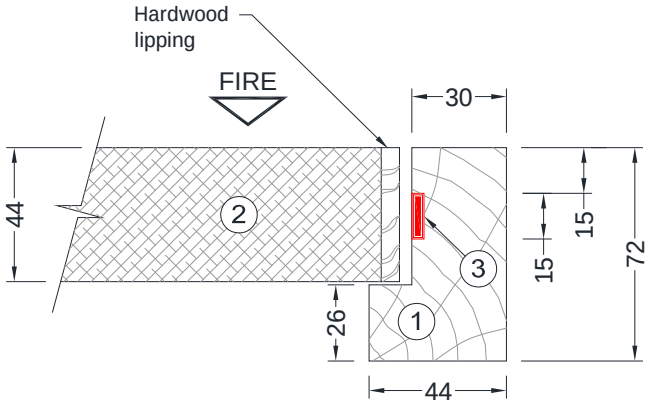
Figure 3: Doorset A - Details of Door Frame and Leaf



TYPICAL SECTION THROUGH
HEAD OF DOORSET A



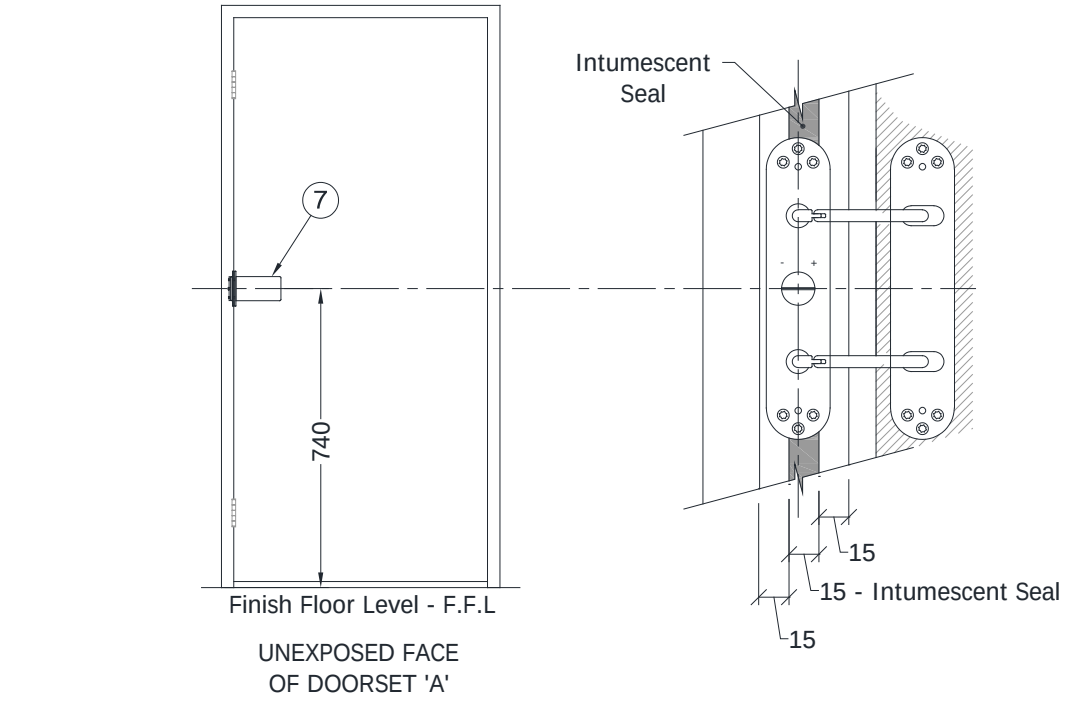
TYPICAL SECTION THROUGH
BASE OF DOOR LEAF
DOORSET A

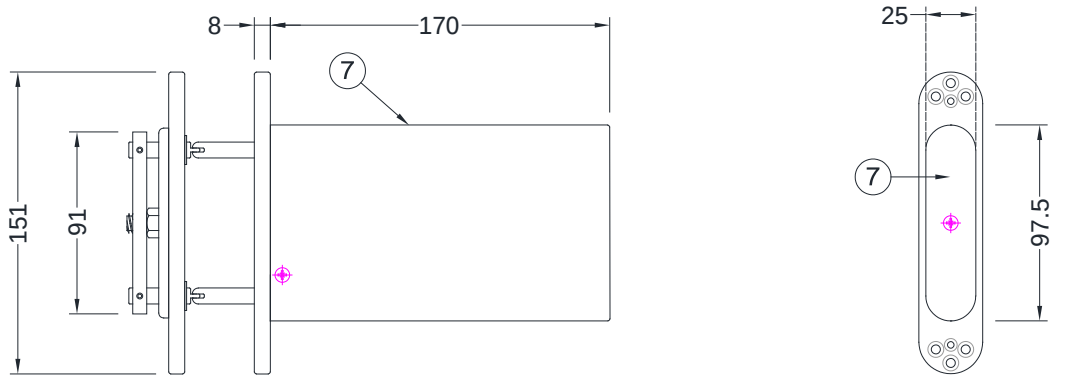


TYPICAL SECTION THROUGH
DOOR FRAME AND JAMB
OF DOORSET A

Do not scale. All dimensions are in mm

Figure 4: Doorset A - Location of Item 7

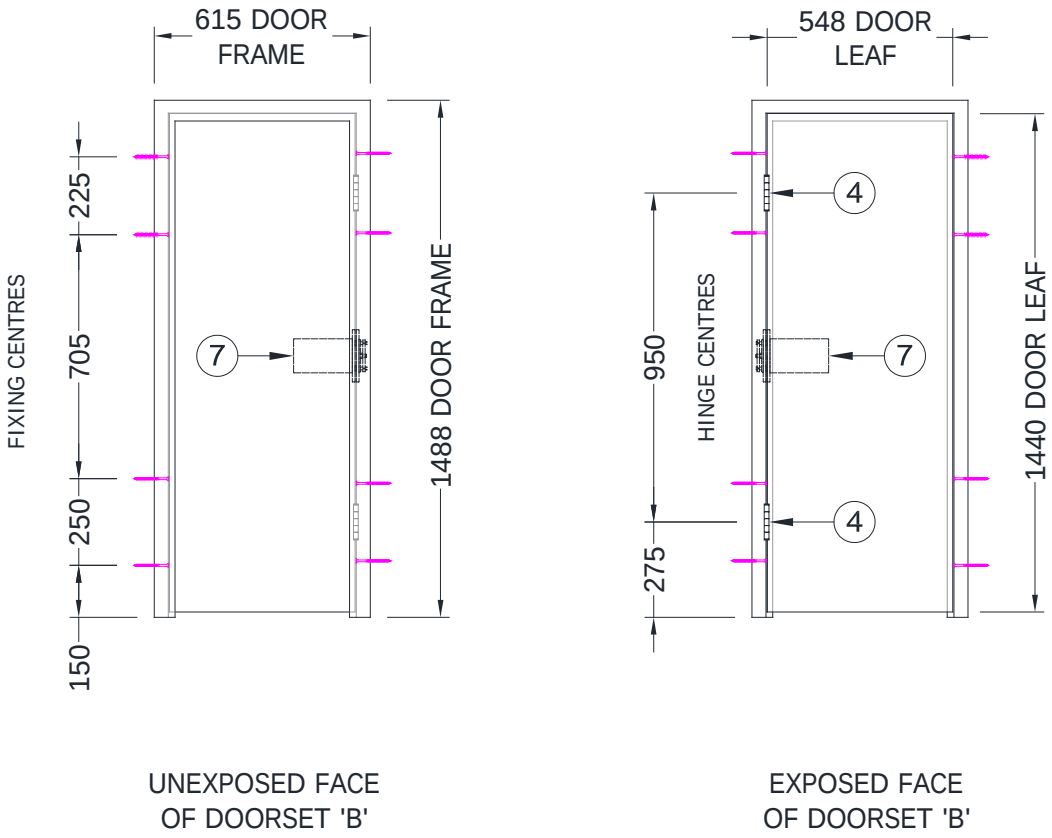




ITEM 7 - PERKO POWERMATIC
CONCEALED DOOR CLOSER
LOCATION - DOORSET A

Do not scale. All dimensions are in mm

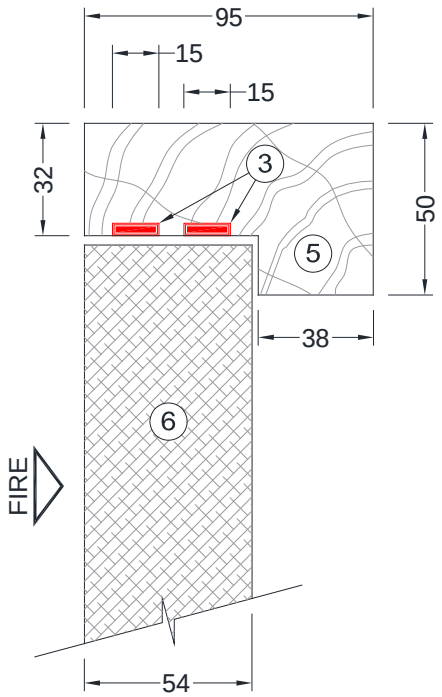
Figure 5: Doorset B – General Elevations



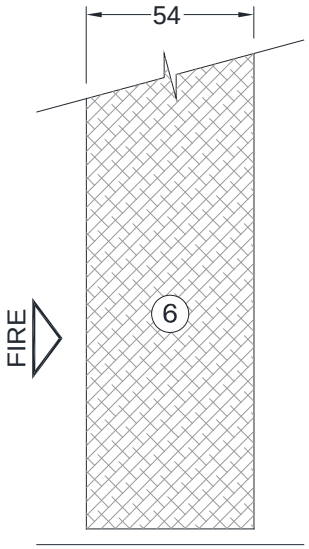
GENERAL ELEVATIONS OF DOORSET B

Do not scale. All dimensions are in mm

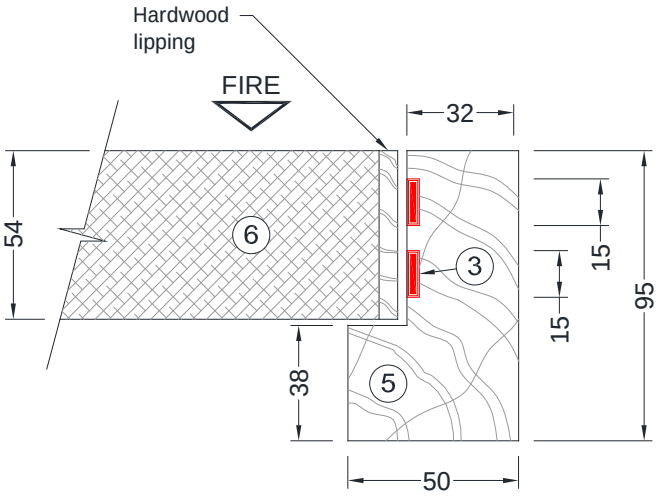
Figure 6: Doorset B - Details of Door Frame and Leaf



TYPICAL SECTION THROUGH
HEAD OF DOORSET B



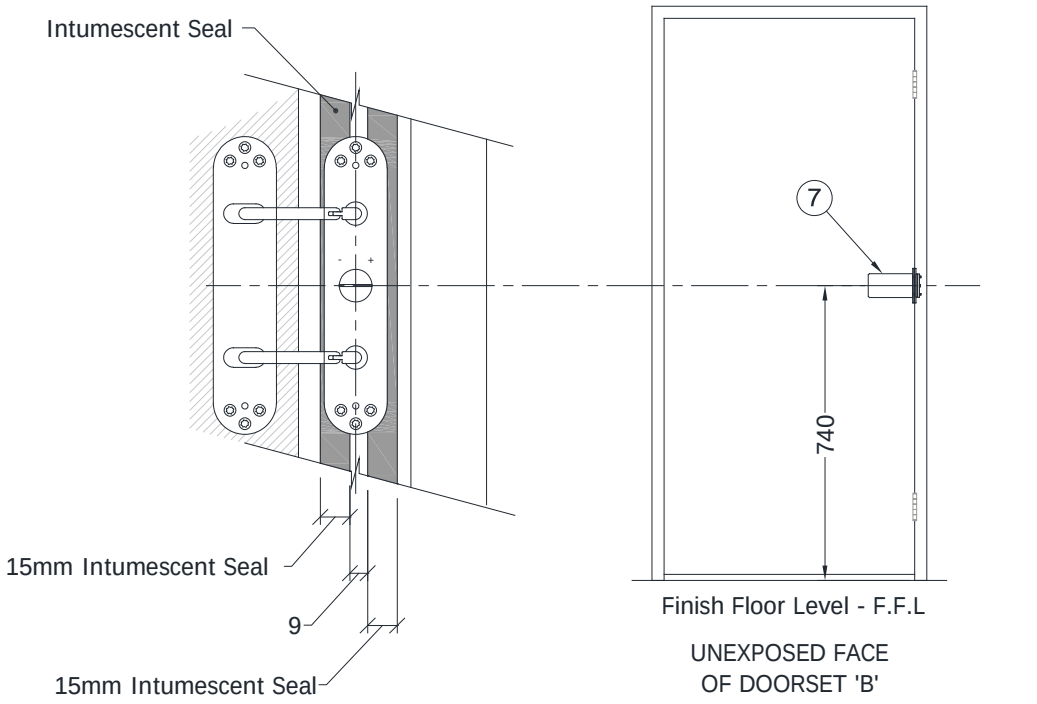
TYPICAL SECTION THROUGH
BASE OF DOOR LEAF
DOORSET B

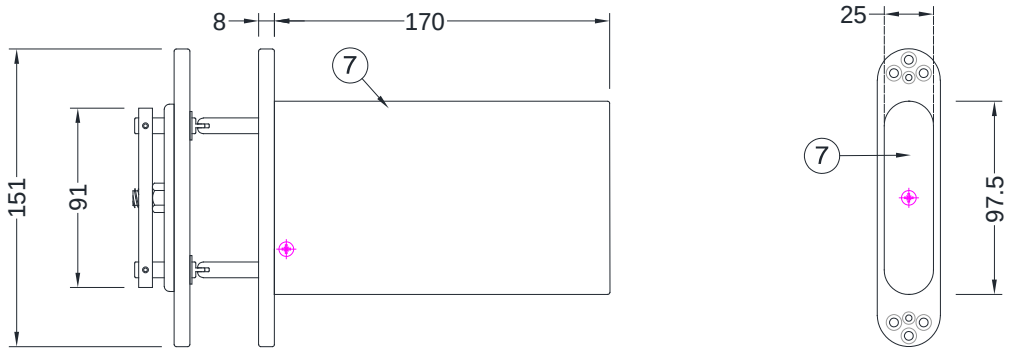


TYPICAL SECTION THROUGH
DOOR FRAME AND JAMB
OF DOORSET B

Do not scale. All dimensions are in mm

Figure 7: Doorset B - Location of Item 7

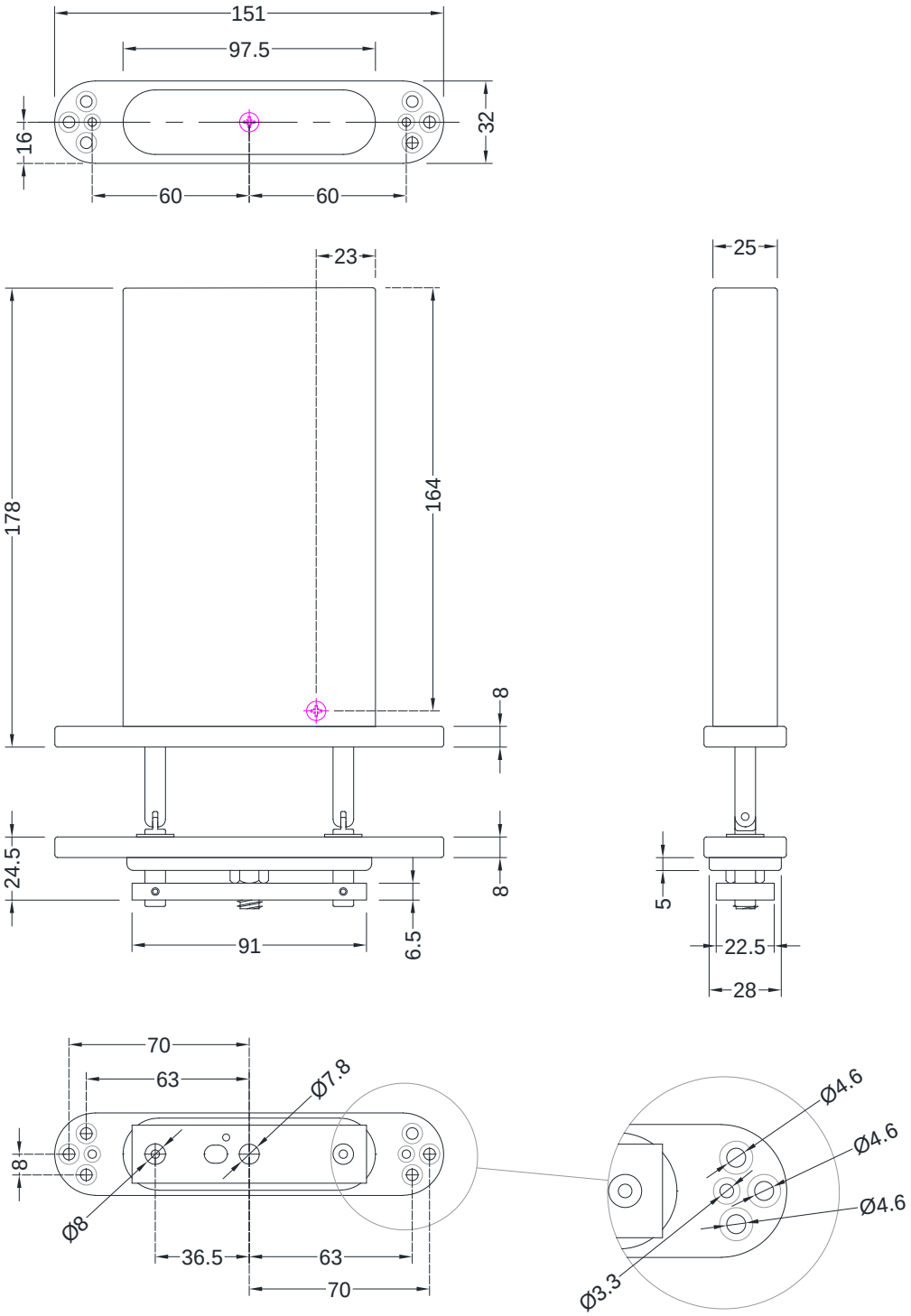




ITEM 7 - PERKO POWERMATIC
CONCEALED DOOR CLOSER
LOCATION - DOORSET B

Do not scale. All dimensions are in mm

Figure 8: Details of Item 7 – Powermatic Concealed Door Closer



DETAIL OF ITEM 7
PERKO POWERMATIC CONCEALED DOOR CLOSER

Do not scale. All dimensions are in mm

Figure 9 – Photographs

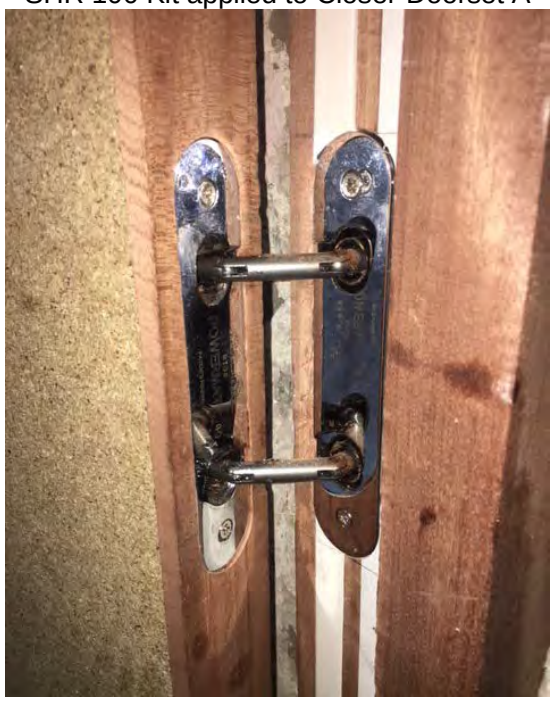
Mortice to Door Leaf A

Closer Intumescent Kit – SHR 100

Closer Intumescent Kit – SHR 100

SHR 100 Kit applied to Closer-Doorset A

Concealed closer installed – Doorset A



Concealed closer installed – Doorset B

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)

Item		Description
1. Door Frame - Doorset A		
Material	:	Pine, softwood
Density	:	510 ~ 550 kg/m^3, nominal
Average moisture content	:	10.1%
Overall section size	:	72 mm x 44 mm, with 45 mm wide x 14 mm deep rebate
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 to timber inserts within studs of partition
Door Frame Fixings		
i. type	:	Countersunk head wood screws
ii. material	:	Steel
iii. overall size	:	100 mm long by 5 mm diameter
iv. centres	:	3 off along the latched jamb and nominally 100 mm above or below each hinge position in hinged jamb. Plastic packers at required thickness for void at fixing points.
2. Door Leaf - Doorset A		
Manufacturer	:	Halspan
Reference	:	Prima
Overall size	:	1440 mm high x 548 mm wide
Overall thickness	:	44 mm
Total weight	:	
Construction		
Core	:	Chipboard.
Lippings	:	Hardwood 8 mm thick, to vertical edges only.
i. species	:	Sapele.
ii. density	:	620 ~ 660 kg/m3, nominal.
Adhesive to lipping		
iii. manufacturer	:	Polyvine.
iv. type	:	Formaldehyde.
v. reference	:	Cascamite.
vi. curing Method	:	Cold press.
vii. application method	:	Brushed.
3. Door Frame Intumescent Seal – Doorsets A & B		
Manufacturer	:	Pyroplex Ltd
Reference	:	Rigid Box Seal (CF355)
Material	:	Graphite intumescent seal within a polyvinyl chloride, PVC, carrier
Overall size	:	15 mm x 4 mm
Fixing method	:	Self-adhered into groove within rebate of the door frame along sides and at top, the seal was interrupted at the closer and at each hinge position.

Item		Description
4. Hinges – Doorsets A & B		
Manufacturer	:	Royde & Tucker Ltd
Reference	:	Hi-Load 102
Primary material	:	Zinc plated steel
Overall size	:	104 mm long by 13.8 mm diameter knuckle with100 mm long by 35 mm wide by 3 mm thick blades
i. knuckle	:	104 mm long by 13.8 mm diameter.
ii. blades	:	100 mm long by 35 mm wide by 3 mm thick.
Hinge 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
vi. minimum distance of fixing screws from face of door leaf	:	15 mm.
vii. hinge bedding material	:	Interdens sheet 100 mm long by 35 mm wide by 1 mm thick, bedded underneath hinges
5. Door Frame - Doorset B		
Door Frame		
Material	:	Sapele, hardwood
Density	:	620 ~ 660 kg/m^3, nominal
Average moisture content	:	9.4%
Overall section size	:	95 mm x 50 mm, with 57 mm wide x 18 mm deep rebate
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 to timber inserts within studs of partition
Door Frame Fixings		
i. type	:	Countersunk head wood screws
ii. material	:	Steel
iii. overall size	:	100 mm long by 5 mm diameter
iv. centres	:	4 off along the latched jamb and nominally 100 mm above or below each hinge position in hinged jamb. Plastic packers at required thickness for void at fixing points.

Item		Description
6. Door Leaf - Doorset B		
Manufacturer	:	Halspan
Reference	:	Prima
Overall size	:	1440 mm high x 548 mm wide
Overall thickness	:	54 mm
Total weight	:	
Construction		
Core	:	Chipboard.
Lippings	:	Hardwood 8 mm thick, to vertical edges only.
i. species	:	Sapele.
ii. density	:	620 ~ 660 kg/m3, nominal.
Adhesive to lipping		
iii. manufacturer	:	Polyvine.
iv. type	:	Formaldehyde.
v. reference	:	Cascamite.
vi. curing Method	:	Cold press.
vii. application method	:	Brushed.
7. Door Closer – Doorsets A & B		
Manufacturer	:	Perko
Reference	:	Powermatic R108
Material	:	Die cast alloy body complete with stainless steel arms and aluminium extrusion.
Dimensions	:	Please see figure 8 drawing for details
Fixing method	:	The main body is concealed within a mortice in the door leaf. The frame plate is morticed into the hinge jamb of the door frame. Fixings supplied in kit.
Fixings	:	6 No. 4 mm x 25 mm screws per foreplate (supplied with the closer kit) & 2 No. 4 mm x 10 mm screws per cover plate.
Intumescent Kit		
i. reference	:	SHR 100
ii. closer body	:	Wrapped in 1 layer of 1.5 mm thick self-adhesive MAP (mono-ammonium phosphate) intumescent.
iii. closer body rear	:	1 layer of 1.5 mm thick self-adhesive MAP intumescent.
iv. closer foreplates	:	1 layer (2 pieces) of 1.5 mm thick self-adhesive MAP intumescent applied to the rear of closer foreplates.
v. frame plate body	:	2 No. strips (1 either side) of 1.5 mm thick self-adhesive MAP intumescent.
Closer forces		
i. doorset A - maximum opening moment	:	27.4 Newton metre (Nm)
ii. doorset A - maximum closer moment	:	10.9 Newton metre (Nm)
iii. doorset B - maximum opening moment	:	34.3 Newton metre (Nm)
iv. doorset B - maximum closer moment	:	8.6 Newton metre (Nm)