CONFIDENTIAL

Report: Chilt/RF09105

A fire resistance test performed on two single leaf single acting doorsets with glazing

Test conducted in accordance with BSEN 1634-1: 2000 and BSEN 1363-1: 1999

Test date: 15th June 2009

committed to excellence

Prepared for: Pacific Rim Wood Ltd
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UKAS TESTING 1762

Contents

1 Introduction

The doorsets were installed into a flexible supporting construction. The doors were pre-cycled before the fire test. The doorsets were instrumented with the standard set of thermocouples and installed opening in towards the furnace.

2 Specimen verification

The doorsets were delivered to Chiltern International Fire Ltd (CIFL) on 10th June 2009, who subsequently further produced the specimens with respect to the following:

Hardwood lippings
Softwood door frames
Intumescent materials
Hardware
Overhead closers
Glazed apertures

The component parts of the doorsets were identified and, where appropriate, moisture content readings and density checks were performed on either the original specimen, or, samples provided by the sponsor. These details are outlined in the construction section of this report.

3 Description of supporting construction

The supporting construction comprised a British Gypsum steel stud partition built in accordance with Clause 7.2.2.4 of BSEN 1363: Part 1, for a flexible supporting construction. The vertical studs surrounding the apertures created for the doorsets incorporated a 67mm x 29mm softwood timber infill to facilitate the fixings for the specimens. The specimens tested are 30 minute products with an anticipated Category B performance, therefore intended fire resistance is 36 minutes and two layers of Gypsum plasterboard type F are required. The supporting construction was only fixed on the horizontal edges, the vertical edges remained free.

4 Description of specimen

Details of the specimens are shown in Figures 1 to 6 of Appendix 1.

4.1 Door leaves

Both leaves measured 2145mm high x 927mm wide x 44mm thick.

5 Pre-test measurements

5.1 Pre-cycling

Operability test of 25 manual cycles was completed on each doorset in accordance with BSEN 14600, section 5.1.1.1. Specimen self closing of doorset, in accordance with BSEN 14600, section 5.1.1.3 was completed prior to test.

5.2 Door perimeter gaps

The manufacturer did not declare a working range so the doors were installed to open and close freely, maintaining gaps, where possible, to a range of 2-4mm. The gaps between the edge of the leaves and frames were measured prior to test. A total of 24 readings were taken. The measurements (in mm) are given in Figure 5 of Appendix 1.

5.3 Closer forces

Measured in accordance with BSEN 1634-1: 2000 Section 10.1.3.

	Opening Force (Nm)
Doorset A	56 @ handle position
Doorset B	60 @ handle position

5.4 Method of installation

The doorsets were fixed into a pre-prepared opening. The details of the fixings and fire stopping between frame and supporting construction are outlined in the construction section and Figure 4 of Appendix 1. The exposed face of the doorset was flush with the exposed face of the supporting construction.

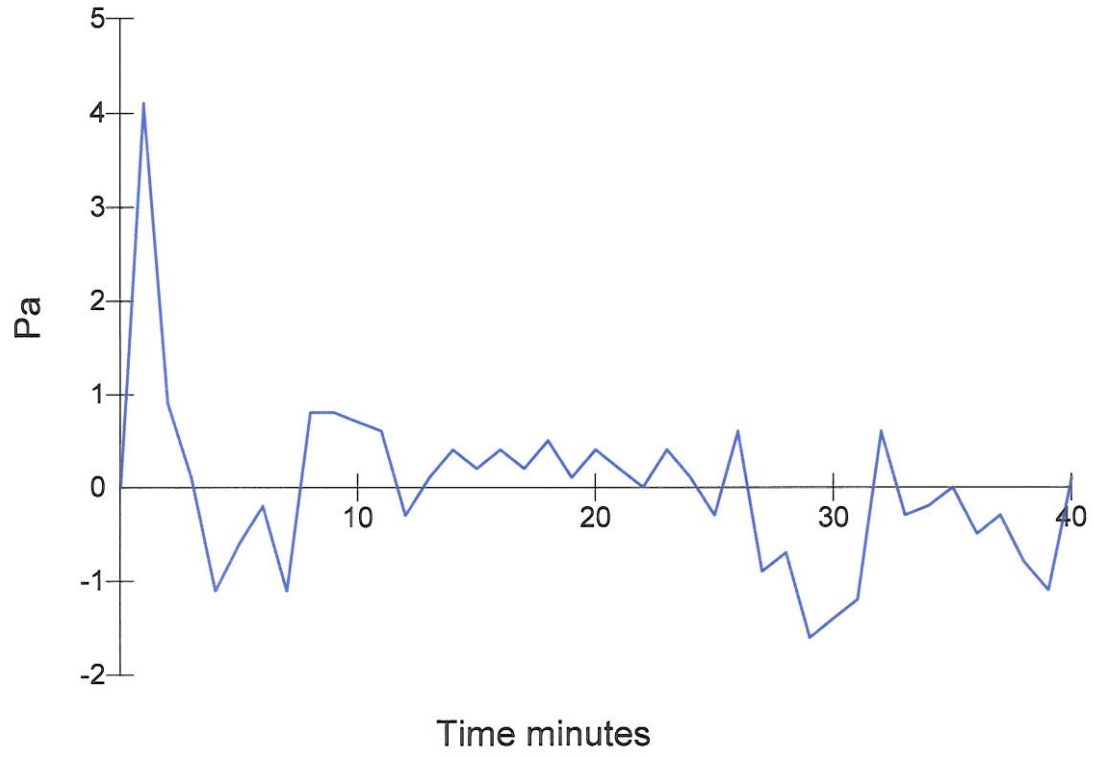
6 Test conditions

6.1 Ambient temperature

The ambient temperature of the test area at commencement of test was 20°C. The ambient temperature for the duration of the test has been recorded in Appendix 2.

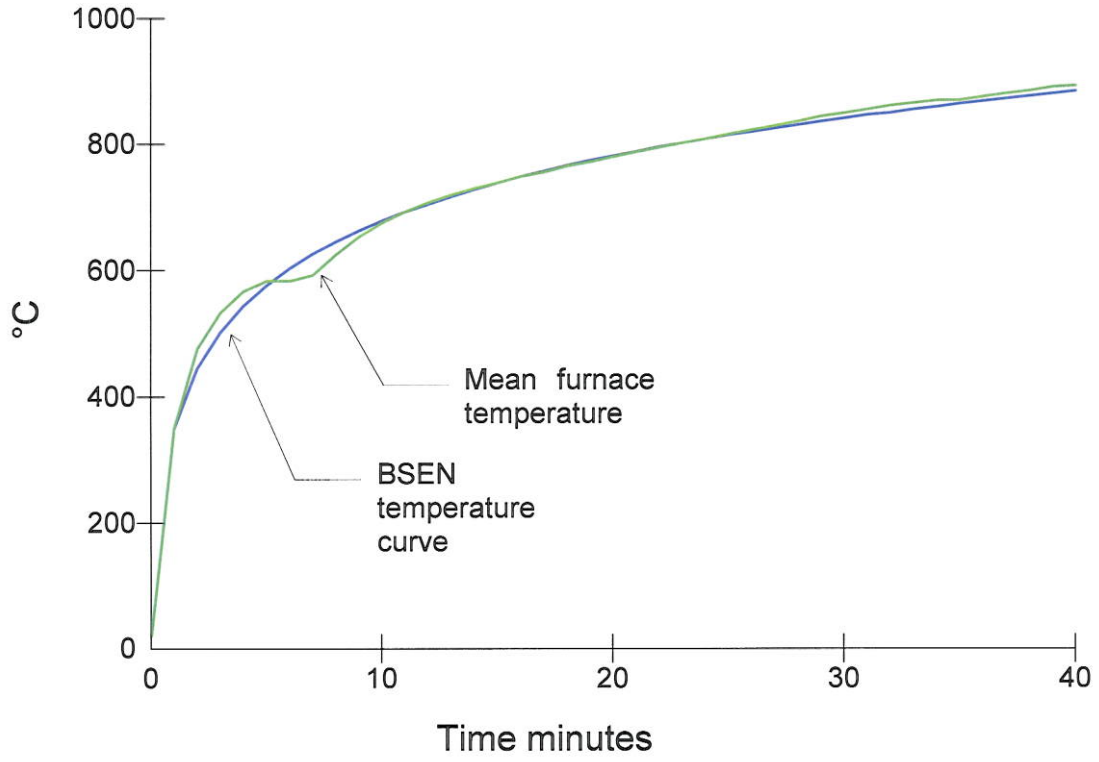
6.2 Pressure readings

After the first 5 minutes of the test, the furnace pressure was maintained at 0 ± 5 Pa and after 10 minutes was maintained at 0 ± 3 Pa with respect to atmosphere, at a point 0.5m from the notional floor level. The pressure readings have been tabulated in Appendix 2 and are shown graphically below:



6.3 Furnace temperature

The furnace was controlled to follow the temperature/time relationship specified in BSEN 1363: Part 1: 1999 Section 5.1.1 as closely as possible, using the average of six plate thermocouples suitably distributed within the furnace. The temperatures recorded have been tabulated in Appendix 2 and are shown graphically below:



6.4 Unexposed face temperatures

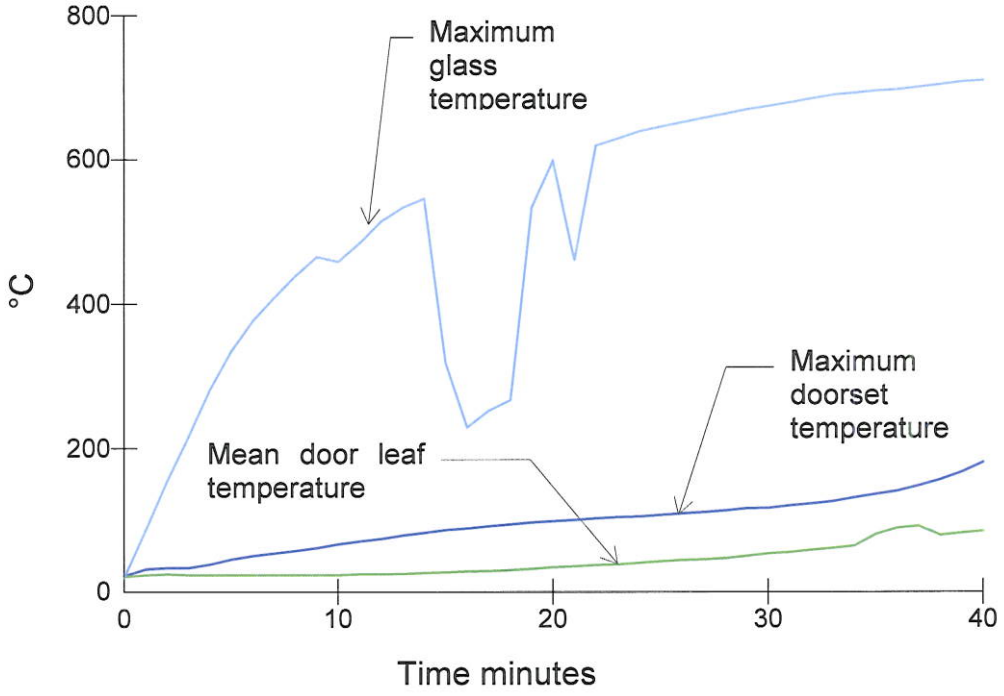
The temperature of the unexposed face was monitored by means of the following thermocouples:

Doorset A	*2* discrete areas	
Leaf	Discrete area 1 (timber)	5 measuring mean temperature rise. 5 measuring maximum temperature rise, standard set 100mm in from the door edge.
	Discrete area *2* (glass)	2 measuring mean and maximum temperature rise.
Frame		5 measuring maximum temperature rise.

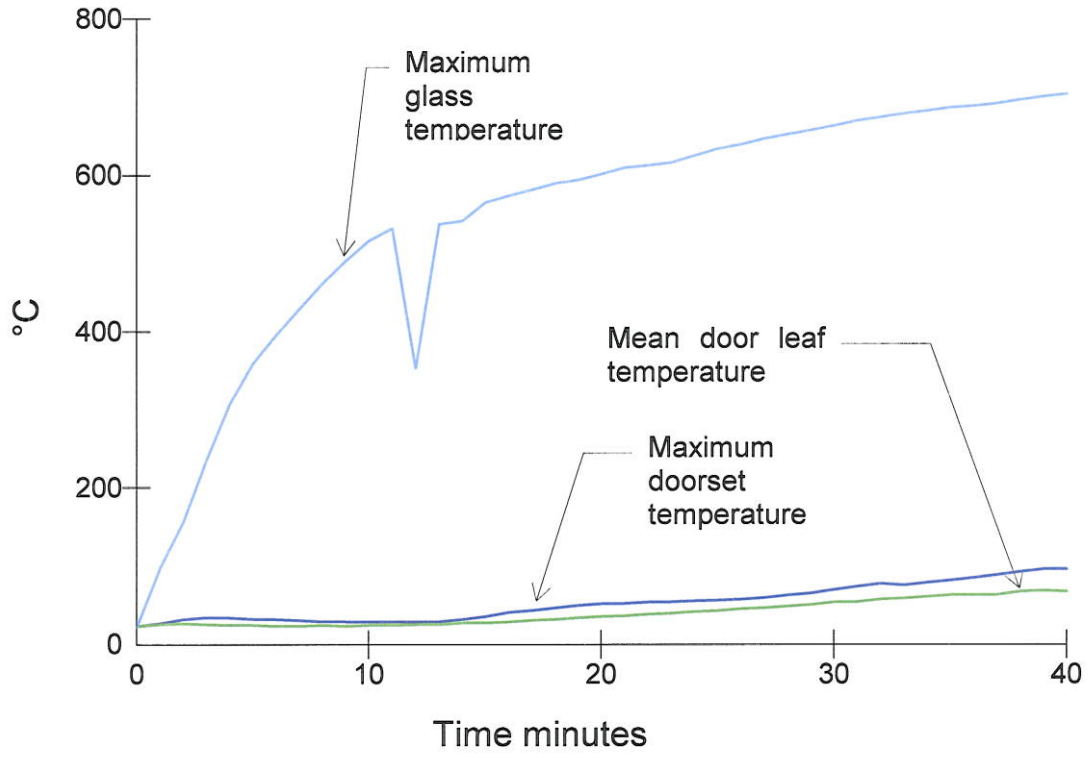
Doorset B	2 discrete areas	
Leaf	Discrete area 1 (timber)	5 measuring mean temperature rise. 5 measuring maximum temperature rise, standard set 100mm in from the door edge.
	Discrete area 2 (glass)	2 measuring mean and maximum temperature rise.
Frame		5 measuring maximum temperature rise.

The location of the thermocouples are shown in Figure 6 of Appendix 1. The temperatures recorded have been tabulated in Appendix 2 and are shown graphically below:

Doorset A



Doorset B



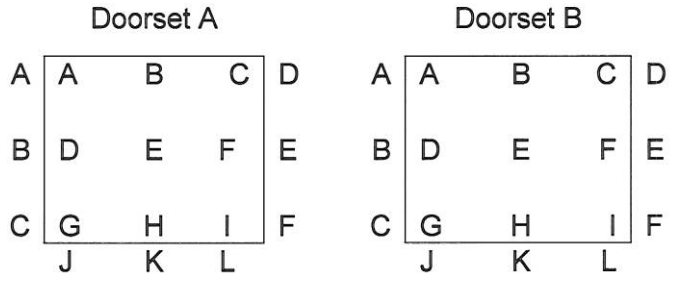
6.5 Radiation

A radiometer was used to measure the radiation 1m away from the centre of each specimen.

The maximum radiation values were noted in the observations.

6.6 Door distortion data

The following tables show the distortion of the doors in mm with an accuracy of ±1mm.
A positive measurement indicates distortion towards the fire.
A negative measurement indicates distortion away from the fire.
J, K and L give vertical movement of the door; a negative reading indicates that the door has dropped.



Doorset A - leaf (hung on the left and opening towards the fire)

Time	A	B	C	D	E	F	G	H	I	J	K	L
10	0	1	3	-3	1	-3	0	7	12	-1	-2	-1
20	0	1	3	-3	-10	-4	2	1	10	-1	-2	-2
30	1	-1	5	-5	-28	-9	2	-4	18	-1	-2	-3

Doorset B - leaf (hung on the left and opening towards the fire)

Time	A	B	C	D	E	F	G	H	I	J	K	L
10	1	7	12	-2	-6	-2	0	1	4	-1	0	-2
20	1	2	9	-3	-16	-3	-3	5	3	-1	-1	-2
30	0	2	10	-4	-28	-3	-3	-11	3	-1	0	-3

Partition – doorset A

Time	A	B	C	D	E	F
10	-2	-2	-3	0	2	-1
20	-2	-2	-2	1	0	-3
30	-3	-3	-5	-2	0	-2

Partition – doorset B

Time	A	B	C	D	E	F
10	1	2	0	1	1	0
20	-3	-2	-1	1	1	-3
30	-2	-3	-2	0	0	-3

7 Observations

All comments relate to the unexposed face unless otherwise specified.

Time (minutes)	Comments
00.00	Test started.
00.23	Both doorsets, the glazing is starting to crack.
01.00	Both doorsets, there is smoke issuing from around the leaf/frame gaps.
13.34	Both doorsets, there is smoke issuing around the perimeter of the glazing. Doorset B, there is smoke issuing through a small crack in the glazing midway up where the left side of the glazing meets the bead.
16.50	Both doorsets, the intumescent around the glazing is reacting and starting to expand out from behind the bead.
20.47	Doorset B, there is an increase in the level of smoke issuing from around the glazing, there is discolouration above the left and right hand sides of the top glazing bead.
22.40	Doorset B, there is discolouration along the hanging edge of the leaf.
27.43	Doorset A, the bottom corner of the closing edge is starting to erode away.
30.25	Doorset A, there is intermittent flaming at the left and right hand side bottom corners of the door.
31.30	Doorset A, a cotton pad integrity test was performed at the bottom right hand side of the door, no failure.
35.35	Doorset A, a cotton pad integrity test was performed at the bottom left hand side of the door which resulted in ignition of the cotton pad thereby constituting **integrity failure.**
35.40	Doorset B, there is continuous flaming around the perimeter of the glazing thereby constituting **integrity failure.**
39.00	Doorset A, radiation 2.5kw (reading taken from data logger).
40.00	Doorset B, radiation 2.7kw (reading taken from data logger).
40.10	Doorset A, there is continuous flaming around the perimeter of the glazing thereby constituting **further integrity failure.**
40.30	Test terminated.

8 Expression of results

Doorset A	**Integrity**	
	Cotton pad	35 (thirty five) minutes
	Continuous flaming	40 (forty) minutes
	Gap gauges	* minutes
	Insulation	* minutes - average set
	Discrete area 1 - timber	* minutes - standard set (max)
		* minutes – door frame (max)
	Discrete area 2 - glass	3 (three) minutes (max)
	Radiation	* minutes to 15kW/m²

Doorset B	**Integrity**	
	Cotton pad	* minutes
	Continuous flaming	35 (thirty five) minutes
	Gap gauges	* minutes
	Insulation	* minutes - average set
	Discrete area 1 - timber	* minutes - standard set (max)
		* minutes – door frame (max)
	Discrete area 2 - glass	3 (three) minutes (max)
	Radiation	* minutes to 15kW/m²

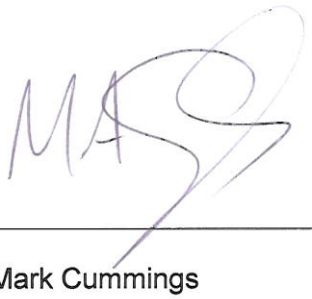
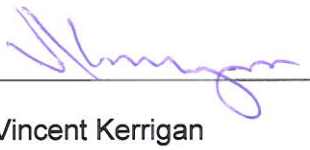
* Failure criteria was not achieved prior to initial failure.

9 Limitations

The results only relate to the behaviour of the element of construction under the particular conditions of test; they are not intended to be the sole criteria for assessing the potential fire performance of the element in use nor do they reflect the actual behaviour in fires.

The results of this test were obtained using the leaf to frame gaps recorded in Figure 5 of Appendix 1. The fire resistance performance of doors of this design may change if substantially different gaps are employed.

The specification and interpretation of fire test methods are the subject of ongoing development and refinement. Changes in associated legislation may also occur. For these reasons it is recommended that the relevance of test reports over 5 years old should be considered by the user. CIFL will be able to offer, on behalf of the legal owner, a review of the procedures adopted for a particular test to ensure that they are consistent with current practices, and if required may endorse the test report.

Signature:		
Name:	Mark Cummings	Vincent Kerrigan
Title:	Head of Section – Fire Resistance	Technical Manager
Date of issue:	1/9/09	01-09-2009

Photographs

Start of test

After 10 minutes

After 20 minutes

At 30 minutes

Description of construction (refers to Figures 1 to 6 of Appendix 1)

Doorset A

The door leaf was identified as an MDF faced Pacific Rim Wood 'Flamebreak 30'

		Species/type	Dimensions (mm)	Density (kg/m³)	Moisture (% w/w)	Key to figures
Stiles		None fitted	-	-	-	-
Rails	Top	Mixed tropical hardwood	70 wide x 36 thick incorporating a 9 x 9 tongue into the core	610*	-	1
	Bottom	None fitted	-	-	-	-
Core		Parasorianthes falcateria or Albisia falcata	36 thick overall in 3 layers of lamels, central layer horizontally orientated, outer layers vertically orientated – grooved to accept the top rail	280*	-	2
Facings		MDF	4 thick	710-760**	8.5	3
Adhesive	Lipping	PU	-	-	-	-
	Facings	PVA	-	-	-	-
	Core	PVA	-	-	-	-
Lippings - all edges		Sapele	6 thick	640**	9.5	4

* Information provided by the client and not verified by CIFL

** Nominal density

Doorset B

The door leaf was identified as a plywood faced Pacific Rim Wood 'Flamebreak 30'

		Species/type	Dimensions (mm)	Density (kg/m³)	Moisture (% w/w)	Key to figures
Stiles		None fitted	-	-	-	-
Rails	Top	Mixed tropical hardwood	70 wide x 36 thick incorporating a 9 x 9 tongue into the core	610*	-	5
	Bottom	None fitted	-	-	-	-
Core		Parasorianthes falcateria or Albisia falcata	36 thick overall in 3 layers of lamels, central layer horizontally orientated, outer layers vertically orientated – grooved to accept the top rail	280*	-	6
Facings		Plywood	4 thick	610**	10	7
Adhesive	Lipping	PU	-	-	-	-
	Facings	PVA	-	-	-	-
	Core	PVA	-	-	-	-
Lippings - all edges		Sapele	6 thick	640**	8.5	8

* Information provided by the client and not verified by CIFL ** Nominal density

Door frame – both doorsets

	Species/type	Dimensions (mm)	Density (kg/m³)	Moisture (% w/w)	Key to figures
Head & jambs	European redwood	32 thick x 70 deep	510**	9-10.5	9
Stops – planted (pinned)	European redwood	12 deep x 32 wide	510**	9.8-10.8	10
Architrave	European redwood	18 thick	510**	-	-
Threshold	Non combustible	-	-	-	-
Frame fixings	Steel wood screws @ 6-800 centres	No 10 x 80 long	-	-	-
Frame fire stopping	Mann McGowan Fabrications Ltd Pyromas intumescent acrylic mastic	Nominally 5-10mm wide x 10-15 deep	-	-	-

* Information provided by the client and not verified by CIFL ** Nominal density

Intumescent materials – doorset A

		Make/type	Size (mm)	Location	Key to figures
Leaf edge		None fitted	-	-	-
Frame reveal	Head and jambs	Pyroplex Rigid Box Seal 8600	20 x 4	Fitted centrally in the frame reveal	11
Around hinges		Fully interrupted	-	Hinge blade fully interrupts seal in frame reveal	-
Under hinge blade		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 forend of the latch	-
Around latch keep		Fully interrupted	-	Latch keep fully interrupts seal in frame reveal	-
Under latch keep		Interdens	1 thick	Fitted under the latch keep	-
Glazing perimeter		Intumescent Seals Ltd Therm – A – Glaze 30	15 x 4	Fitted between the glass and bead on both faces	12

Intumescent materials – doorset B

		Make/type	Size (mm)	Location	Key to figures
Leaf edge		None fitted	-	-	-
Frame reveal	Head and jambs	Pyroplex Rigid Box Seal 8700	15 x 4	Fitted centrally in the frame reveal	13
Around hinges		Fully interrupted	-	Hinge blade fully interrupts seal in frame reveal	-
Under hinge blade		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 forend of the latch	-
Around latch keep		Fully interrupted	-	Latch keep fully interrupts seal in frame reveal	-
Under latch keep		Interdens	1 thick	Fitted under the latch keep	-
Glazing perimeter		Pyroplex 8193 30 minute glazing channel	15 high x 2.5 thick	Fitted between the glass and bead on both faces	14

Hardware – both doorsets

	Make/type	Size (mm)	Location	Key to figures
Hinges	Royde and Tucker H105 Lift off type hinges	100 x 35 (blade size)	Fitted 150mm, 1010mm and 1868mm from the head of the leaf	15
Closer	Dorma UK Ltd TS71 overhead type closer	232 x 68 (footprint size)	Fitted on the exposed face as per the manufacturers instructions	16
Latch - engaged	E*S standard steel tubular mortise latch	88 x 26 (forend size)	Fitted 1090mm from the head of the leaf	17
Furniture	Aluminium lever type handle	100 x 38 (footprint side)	Fitted appropriate to the latch	18

Glazing – Doorset A

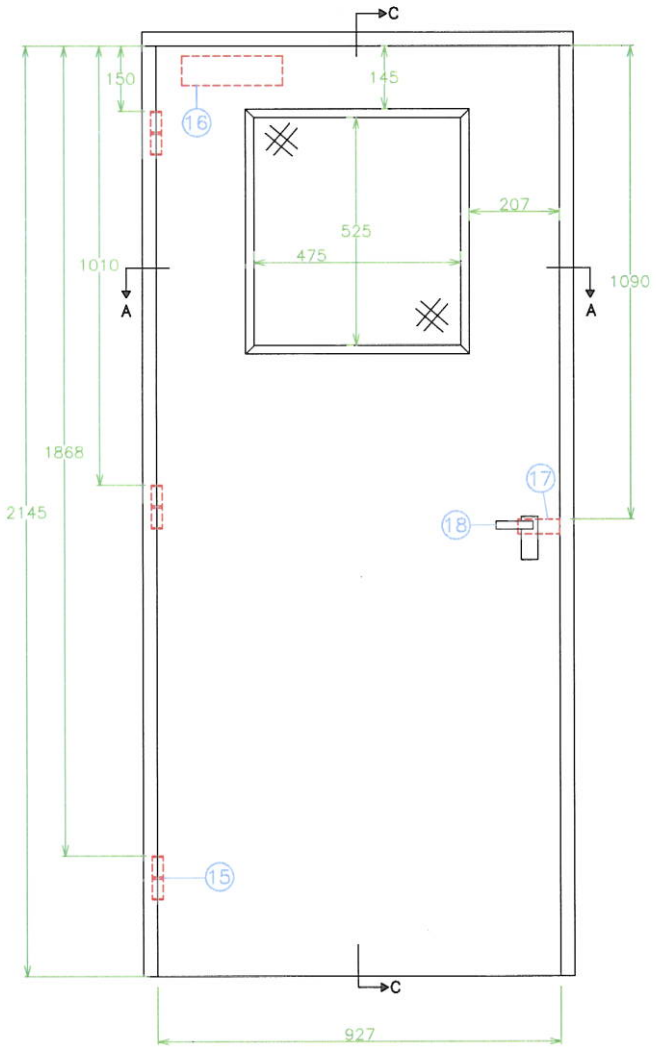
	Make/type	Size (mm)	Location	Key to figures
Glass type	Pilkington Pyroshield Georgian wired safety glass	7 thick	Fitted 145mm from the head, 207mm from the closing edge of the leaf,	19
Sight size	-	475 wide x 525 high	-	-
Overall aperture size	-	503 wide x 553 high	-	-
Expansion allowance	-	2-3 all round	-	-
Beading	Sapele – M.C 9%, density 640kg/m³	20 high x 20 deep including a 6mm x 6mm bolection return and a 17° chamfer	Fitted around the glazing aperture on both faces	20
Beading fixings	Steel pins	40 long	Fitted 50mm from corners, at 150mm centres at 30° to the face of the glass	21

Glazing – Doorset B

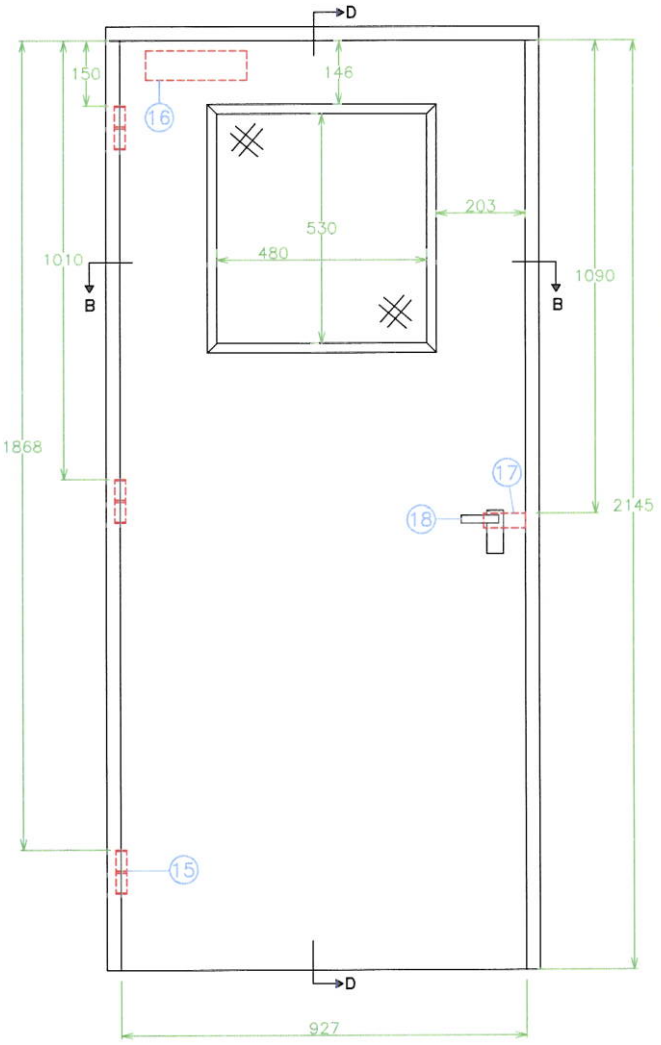
	Make/type	Size (mm)	Location	Key to figures
Glass type	Pilkington Pyroshield Georgian wired safety glass	7 thick	Fitted 146mm from the head, 203mm from the closing edge of the leaf,	22
Sight size	-	480 wide x 530 high	-	-
Overall aperture size	-	512 wide x 562 high	-	-
Expansion allowance	-	2-3 all round	-	-
Beading	Sapele – M.C 9%, density 640kg/m³	22 high x 22deep including a 6mm x 6mm bolection return and a 24° chamfer	Fitted around the glazing aperture on both faces	23
Beading fixings	Steel screws	40 long	Fitted 50mm from corners, at 150mm centres at 30° to the face of the glass	24

Appendix 1 - figures 1 to 6

Doorset A



Doorset B



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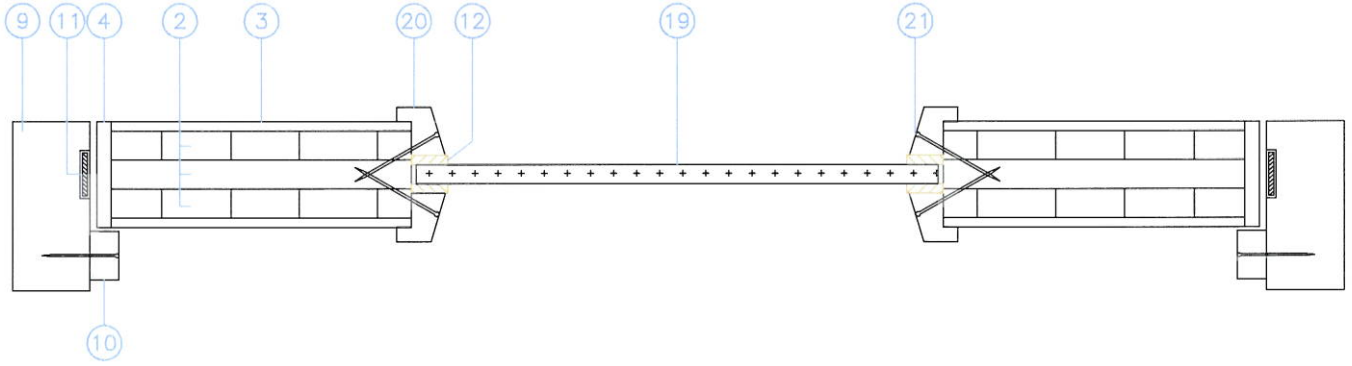
Title: Unexposed face elevation showing hardware positions
(All dimensions in mm)

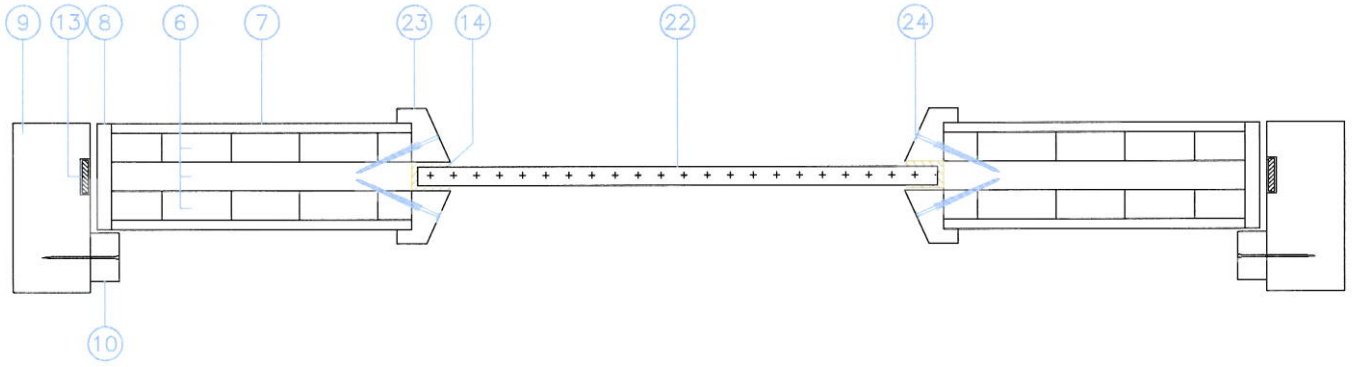
Date Drawn	Drawn By	Scale
25/06/09	ARD	NTS

Project No.	
Chilt/RF09105	Appendix 1

Section A–A



Section B–B



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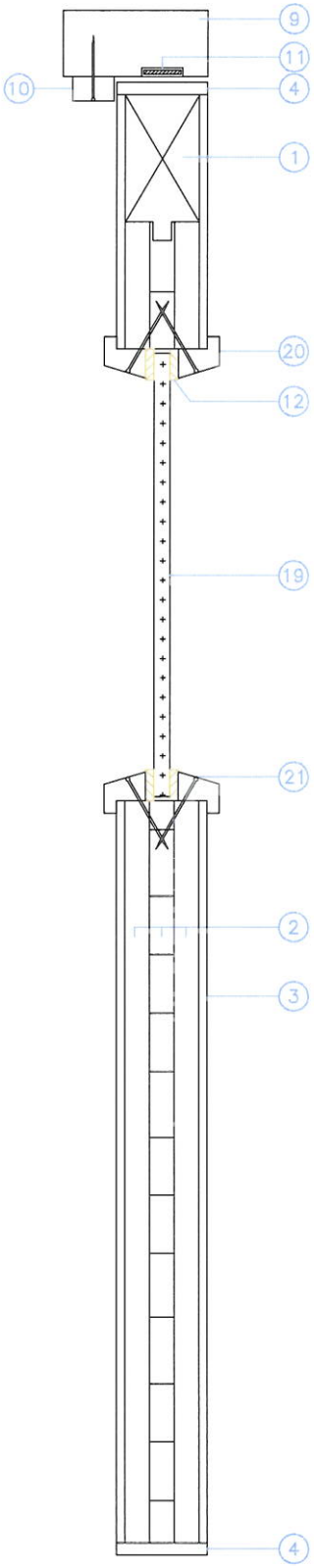
Title: Horizontal cross sections
(All dimensions in mm)

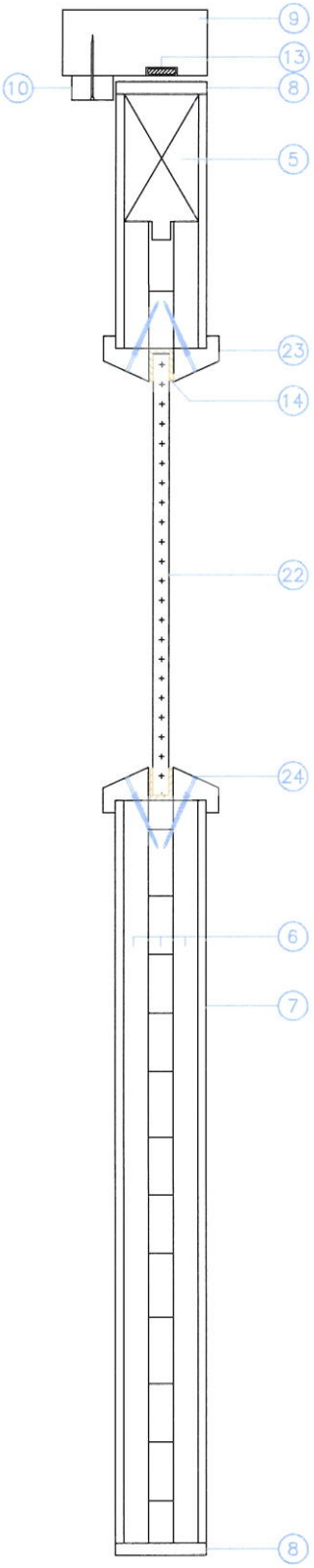
Date Drawn	Drawn By	Scale
25/06/09	ARD	NTS

Project No.	
Chilt/RF09105	Appendix 1

Section C–C



Section D–D



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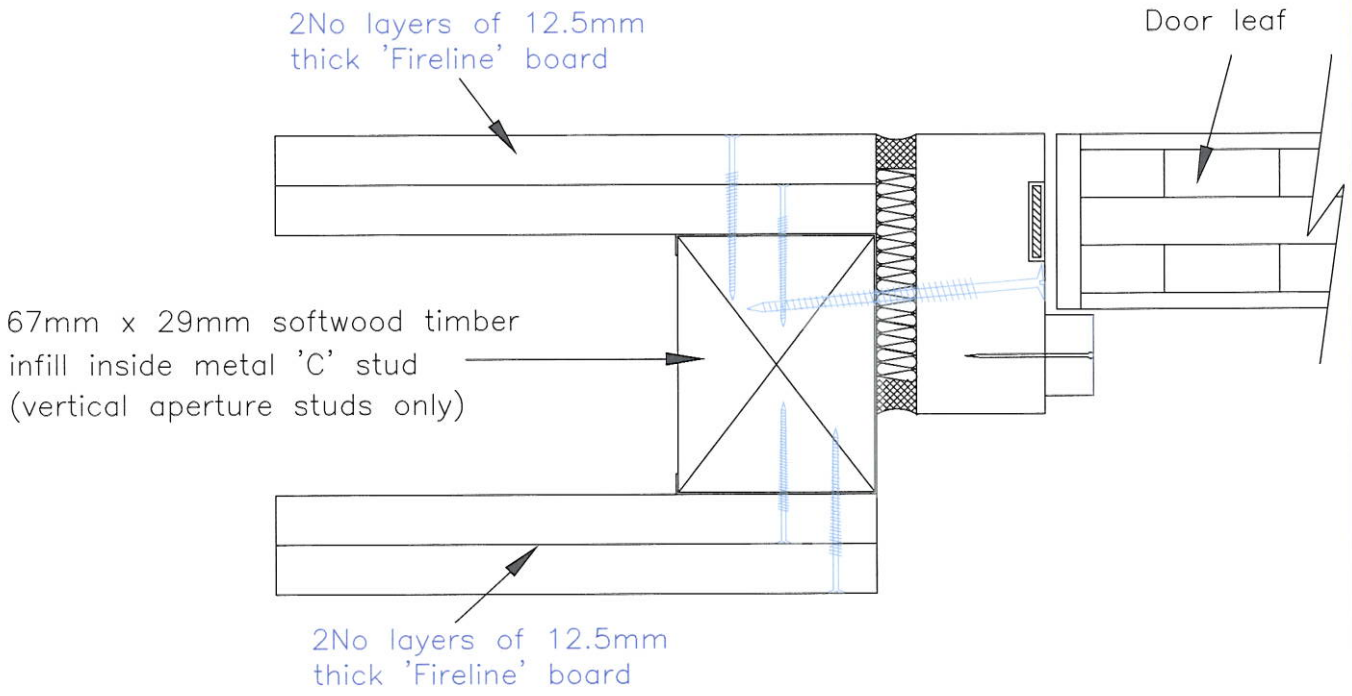
Title

Vertical cross section

Date Drawn	Drawn By	Scale
25/06/09	ARD	NTS

Project No.	
Chilt/RF09105	Appendix 1



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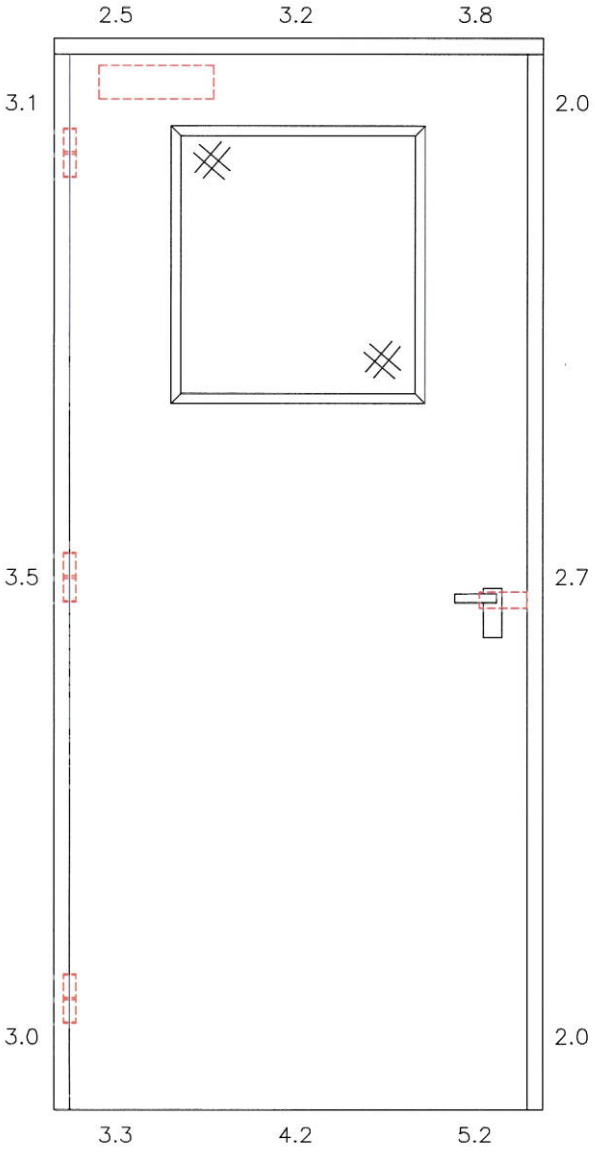
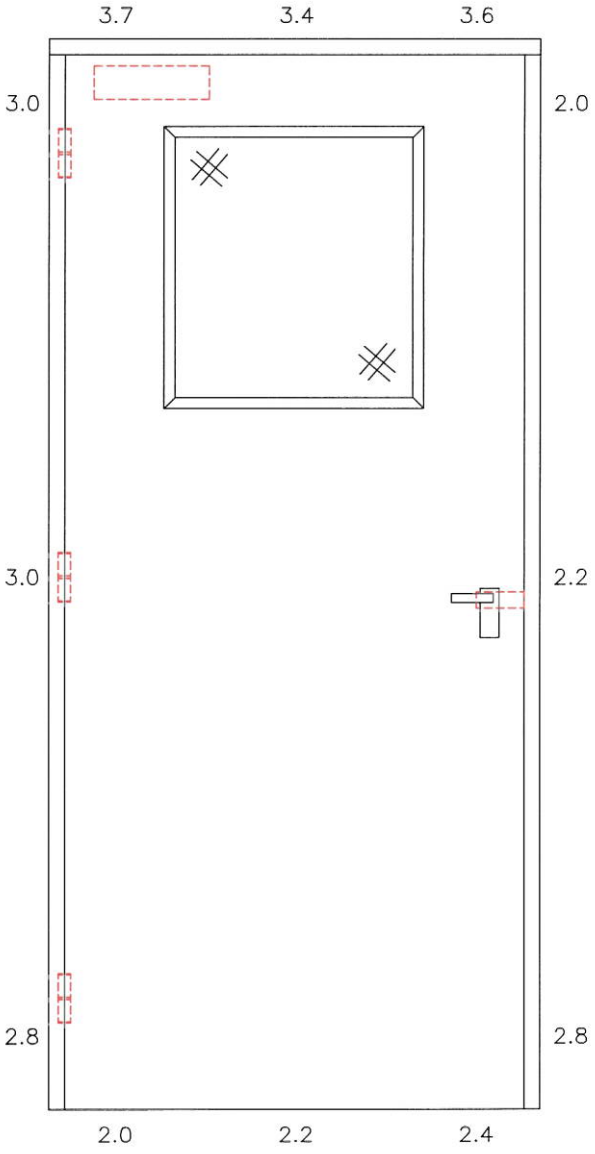
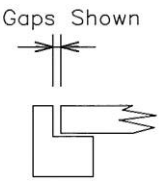
Title		
30 minute flexible support		
Date Drawn: 25/06/09	Drawn By: ARD	Scale: NTS
Project No.: Chilt/RF09105		Appendix 1

Doorset A



Doorset B





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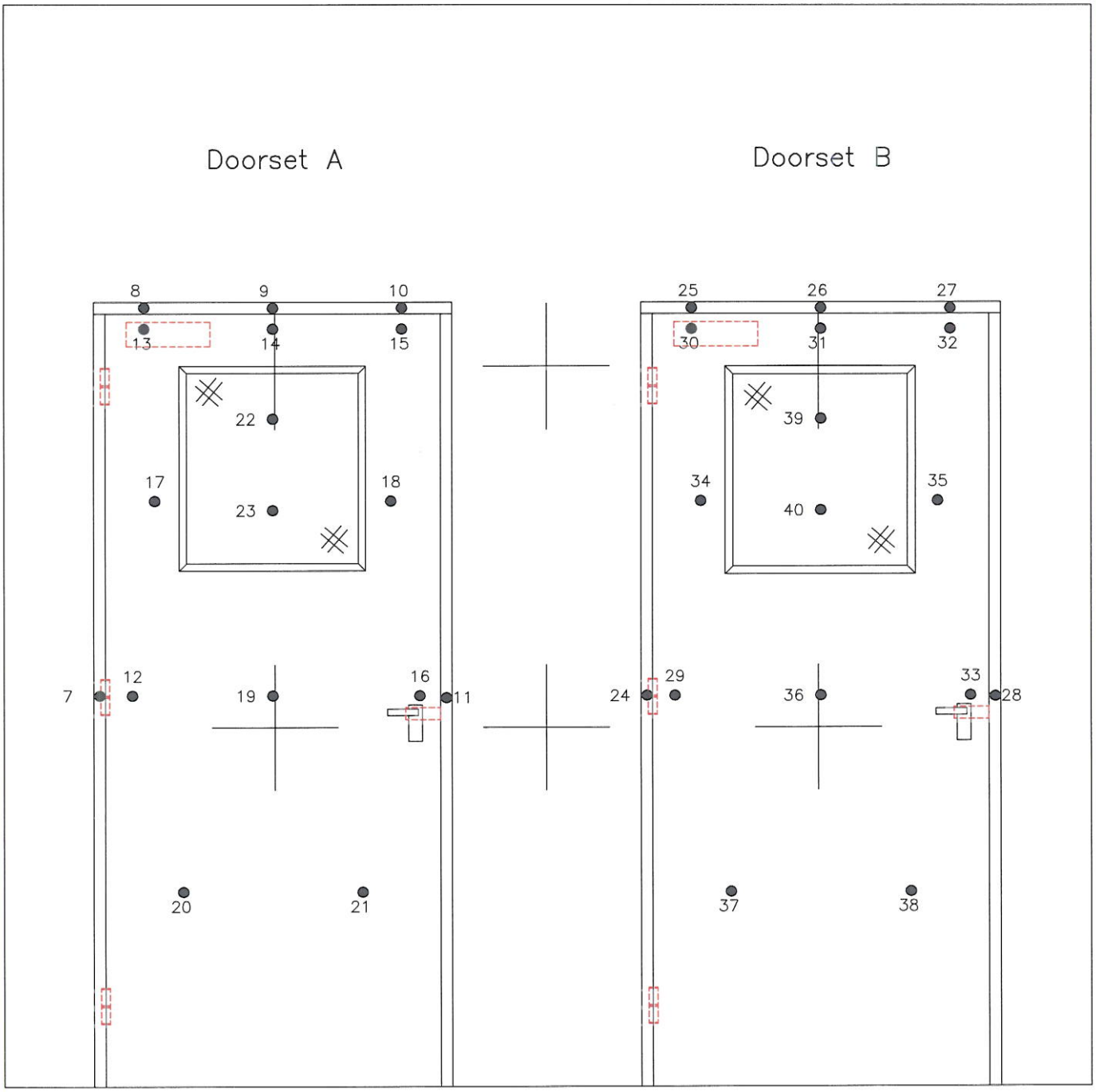
Title

Door gaps

(All dimensions in mm)

Date Drawn	Drawn By	Scale
25/06/09	ARD	NTS

Project No.	
Chilt/RF09105	Appendix 1



: Furnace Thermocouples

: Unexposed Face Thermocouples

Viewed From Unexposed Face

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Title: Thermocouple positions

(All dimensions in mm)

Date Drawn	Drawn By	Scale
25/06/09	ARD	NTS

Project No.	
Chilt/RF09105	Appendix 1

Appendix 2 - raw test data

(see Figure 6 of Appendix 1 for channel locations)

Time	Chan 0	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5	Chan 6	Chan 7	Chan 8	Chan 9	Chan 10	Chan 11	Chan 12	Chan 13	Chan 14	Chan 15	Chan 16	Chan 17	Chan 18
min	Pa	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
0	0	21	22	22	22	22	22	22	22	22	21	21	22	22	22	22	22	22	22
1	4.1	244	385	425	313	374	359	23	25	23	22	22	31	28	23	23	23	28	23
2	0.9	432	441	508	457	519	501	23	30	24	23	23	33	31	27	23	23	29	23
3	0.1	502	511	564	521	559	543	24	35	26	27	23	32	33	32	24	24	27	23
4	-1.1	531	503	597	580	583	613	25	36	27	28	24	30	31	38	24	25	26	24
5	-0.6	548	508	613	603	598	632	25	35	30	28	24	28	29	45	24	25	25	24
6	-0.2	552	519	607	615	586	623	24	38	32	29	24	26	28	50	25	25	25	24
7	-1.1	559	545	610	626	594	620	24	38	35	31	24	26	27	53	25	25	24	24
8	0.8	585	569	648	646	629	669	24	38	37	33	25	25	26	57	25	25	24	24
9	0.8	611	602	685	668	661	693	24	38	37	36	25	25	26	61	25	25	24	24
10	0.7	632	632	706	688	686	710	25	42	37	38	26	25	26	66	25	25	25	25
11	0.6	655	654	717	704	703	727	25	46	37	37	27	25	27	70	25	25	26	25
12	-0.3	671	675	733	715	712	736	26	44	40	40	29	26	27	74	26	25	27	26
13	0.1	685	692	745	726	726	743	29	45	39	41	31	27	27	78	26	26	28	26
14	0.4	696	707	753	736	738	753	32	44	40	41	33	28	28	82	27	26	29	27
15	0.2	705	720	761	745	746	759	35	44	42	43	35	29	30	86	28	27	30	28
16	0.4	715	726	770	754	754	770	38	43	44	46	37	30	31	88	30	28	31	29
17	0.2	726	734	778	762	760	776	39	43	46	49	38	32	32	91	31	29	32	30
18	0.5	733	745	787	770	772	784	41	43	48	49	40	33	34	94	33	30	33	32
19	0.1	739	753	793	775	783	793	45	43	49	50	41	34	35	96	35	31	35	33
20	0.4	747	760	802	784	787	800	46	43	50	50	43	36	37	98	37	33	36	35
21	0.2	756	770	810	791	796	808	47	43	52	52	44	37	39	100	39	34	37	37
22	0	765	774	814	796	805	816	46	43	54	54	45	39	40	102	41	36	38	38
23	0.4	773	784	823	802	811	820	45	43	56	55	47	42	42	104	43	37	40	40
24	0.1	782	793	827	810	818	826	46	44	57	56	48	44	43	105	45	39	41	42
25	-0.3	790	799	833	816	826	834	46	44	59	58	49	45	45	107	47	41	42	44
26	0.6	797	807	839	822	834	840	48	44	60	57	50	47	47	109	49	43	44	47

Time	Chan 0	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5	Chan 6	Chan 7	Chan 8	Chan 9	Chan 10	Chan 11	Chan 12	Chan 13	Chan 14	Chan 15	Chan 16	Chan 17	Chan 18
min	Pa	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
27	-0.9	806	819	848	830	838	844	49	45	62	59	51	49	48	111	52	45	45	49
28	-0.7	814	825	853	836	844	851	51	45	63	59	52	52	51	113	55	47	47	52
29	-1.6	821	836	862	843	852	857	52	45	65	60	53	55	53	116	58	50	49	55
30	-1.4	829	842	867	851	854	862	51	46	66	61	54	57	56	117	62	52	52	58
31	-1.2	834	847	871	856	862	868	51	46	68	61	55	60	59	120	66	55	54	62
32	0.6	842	854	879	860	867	872	51	47	70	62	56	62	63	123	70	58	56	65
33	-0.3	847	857	881	864	873	877	52	47	71	64	56	64	67	126	74	61	59	69
34	-0.2	854	861	882	869	878	880	52	48	73	65	57	66	71	131	79	63	62	73
35	0	855	865	884	871	875	880	53	50	76	66	58	69	74	136	84	66	126	77
36	-0.5	860	871	888	876	880	883	54	51	79	68	59	72	77	141	87	68	161	81
37	-0.3	865	878	894	880	882	887	56	52	101	68	60	75	79	148	89	72	159	84
38	-0.8	871	887	900	887	885	890	56	53	98	70	61	79	82	156	90	75	75	87
39	-1.1	878	896	904	894	890	893	57	54	98	71	62	81	85	167	90	78	77	89
40	0.1	880	898	903	898	891	894	59	55	107	72	62	83	87	181	91	80	79	93

Time	Chan 19	Chan 20	Chan 21	Chan 22	Chan 23	Chan 24	Chan 25	Chan 26	Chan 27	Chan 28	Chan 29	Chan 30	Chan 31	Chan 32	Chan 33	Chan 34	Chan 35
min	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
0	22	21	22	21	21	22	22	22	21	22	22	21	22	22	22	22	22
1	23	22	22	86	67	23	24	23	22	22	26	26	21	22	22	26	37
2	23	22	23	155	113	23	30	26	25	23	29	31	17	19	23	27	38
3	23	22	22	216	168	24	34	28	28	23	30	34	13	18	23	27	35
4	23	22	22	282	237	24	38	31	28	24	28	33	7	18	24	26	28
5	23	22	22	335	291	23	39	34	32	25	27	32	1	18	25	26	28
6	23	22	22	377	330	23	40	38	33	26	26	31	-5	17	27	25	28
7	23	22	22	409	359	23	41	41	35	27	25	30	-10	17	27	25	27
8	23	22	22	439	390	23	43	44	35	28	25	29	-15	17	27	24	28
9	23	22	22	465	426	24	45	46	35	28	25	29	-20	17	27	25	26
10	23	22	23	216	458	24	42	48	34	28	25	28	-24	17	27	25	26
11	23	23	23	294	484	25	42	50	34	27	26	28	-29	16	27	25	26
12	24	23	23	323	514	26	40	53	35	27	26	28	-33	16	28	26	27
13	24	24	24	232	533	28	41	56	36	28	27	29	-37	14	28	27	28
14	25	25	25	237	545	32	42	59	36	28	28	30	-41	13	31	28	29

Time	Chan 19	Chan 20	Chan 21	Chan 22	Chan 23	Chan 24	Chan 25	Chan 26	Chan 27	Chan 28	Chan 29	Chan 30	Chan 31	Chan 32	Chan 33	Chan 34	Chan 35
min	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
15	26	26	25	224	319	35	42	62	39	29	29	31	-44	12	35	29	29
16	26	27	27	229	225	37	42	65	40	30	31	32	-48	11	40	31	30
17	27	28	28	252	237	40	43	68	41	31	32	34	-52	9	43	32	32
18	29	30	29	267	242	42	43	71	43	33	34	35	-57	7	46	34	33
19	30	32	31	281	533	43	43	73	45	34	36	37	-61	6	49	36	33
20	32	34	33	287	599	45	44	75	47	35	38	38	-64	4	51	38	35
21	33	36	34	461	298	46	44	77	49	37	40	40	-66	2	52	40	36
22	35	38	36	619	241	47	45	80	50	38	41	42	-68	0	53	41	38
23	36	40	38	629	259	48	45	82	51	40	43	44	-71	-2	54	43	39
24	38	41	40	639	280	49	45	84	52	41	45	46	-72	-4	55	46	39
25	39	43	42	646	354	50	45	86	52	42	47	49	-74	-6	56	50	40
26	41	44	44	652	310	51	45	87	53	43	50	52	-75	-9	57	55	42
27	43	46	46	658	324	51	46	90	54	44	52	56	-77	-12	59	60	43
28	44	48	48	664	382	52	47	91	55	46	55	60	-79	-15	62	64	44
29	47	50	51	670	359	53	46	92	56	46	59	64	-81	-19	65	68	45
30	49	52	54	675	390	54	47	95	57	47	62	69	-83	-23	68	71	47
31	51	55	57	680	474	55	48	98	59	48	66	73	-86	-26	71	72	49
32	53	57	61	685	390	56	49	100	60	49	70	77	-88	-28	73	74	51
33	56	59	64	690	476	57	50	102	62	50	74	54	-91	-31	75	76	52
34	58	61	68	693	665	58	51	103	63	51	78	56	-95	-34	78	79	55
35	61	64	72	696	644	59	53	106	65	52	81	57	-100	-38	80	83	56
36	63	67	77	698	619	60	56	117	72	53	84	52	-192	-42	82	83	53
37	66	71	82	701	662	60	56	109	71	53	88	34	-135	-46	84	83	54
38	70	76	87	705	678	61	55	115	72	54	92	36	-133	-49	87	90	59
39	74	80	90	709	682	62	56	116	76	55	95	41	-128	-47	90	89	58
40	77	83	93	711	684	58	57	112	76	55	95	36	-148	-46	87	89	50

Time	Chan 36	Chan 37	Chan 38	Chan 39	Chan 40	Chan 41
min	°C	°C	°C	°C	°C	°C
0	22	22	22	22	21	20
1	22	22	22	97	83	20
2	22	22	22	155	138	20
3	22	22	22	235	207	20
4	22	22	22	307	280	20
5	22	22	22	359	341	20
6	22	22	22	396	390	20
7	22	22	23	424	429	21
8	23	22	23	451	462	20
9	23	22	23	477	491	21
10	23	23	23	286	517	20
11	24	23	24	287	533	21
12	24	23	25	326	354	21
13	25	23	26	538	337	21
14	27	24	27	542	339	21
15	28	24	28	315	566	21
16	29	24	29	333	574	21
17	32	24	30	339	582	21
18	36	24	32	345	590	21
19	39	25	34	376	595	21
20	42	25	36	378	602	21
21	45	25	38	373	610	21
22	47	25	40	347	613	21
23	48	25	42	288	617	21
24	50	26	44	296	626	21
25	51	26	47	323	634	21
26	53	26	49	323	640	21
27	54	26	51	329	647	21
28	56	27	53	394	653	21
29	58	27	56	403	658	21
30	61	27	60	410	664	21
31	63	27	63	392	670	21

Time	Chan 36	Chan 37	Chan 38	Chan 39	Chan 40	Chan 41
min	°C	°C	°C	°C	°C	°C
32	66	28	66	408	675	21
33	69	28	68	411	679	21
34	72	28	70	428	683	21
35	74	28	73	474	687	21
36	77	28	73	406	689	21
37	77	27	76	397	692	21
38	82	29	79	439	697	2
39	87	29	80	271	701	2
40	85	28	83	430	704	3