

# Fire Resistance Test

Prepared for:  
Pyroplex Ltd  
The Furlong  
Droitwich  
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WR9 9BG

## CONFIDENTIAL

### Report: Chilt/RF13177

A fire resistance test performed on 2No. single leaf single acting doorsets

Test conducted in accordance with BSEN 1634-1: 2008 and BSEN 1363-1: 1999

Test date: 20<sup>th</sup> September 2013



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**BM TRADA – the new name for Chiltern International Fire Ltd**

From July 1st 2013, Chiltern International Fire Ltd commenced trading under the name of its parent company BM TRADA and at the same time adopted a brand new visual identity.

Historically, the group has delivered its services through a number of individual companies: BM TRADA Certification Ltd, TRADA Technology Ltd, Chiltern International Fire Ltd (including Chiltern Dynamics) and a network of international offices. Both BM TRADA Group and these individual companies will now trade under the same name - BM TRADA - and adopt the new visual identity.

To coincide with this change, our Technical Reports, Test Reports, Products Assessments, company stationery and marketing collateral have been re-designed to carry the new branding and visual identity.

The validity of all documents previously issued by the individual companies including certificates, test reports and product assessments is unaffected by this change and a letter to this effect will be available to download from our website [www.bmtradagroup.com](http://www.bmtradagroup.com).

About BM TRADA.

With origins dating back to 1934, we have a deep history and services which are highly valued by our customers. We offer independent certification, testing, inspection, training and technical services around the world. In all these areas we continue to use industry-leading experts in their chosen fields to develop and deliver services – an ethos that has been at the heart of our approach since we began.

In all these areas we use industry-leading experts in their chosen fields to develop and deliver services – an ethos that has been at the heart of our approach since we began.

A recent review of our businesses and customers revealed that the individual identities sometimes make communications confusing, and that in an already complex business area, clarity and simplicity in communications is rare, but valued. It also revealed that a single identity and combined offer would help us strengthen our appeal.

With this in mind, we brought the companies together under the name BM TRADA and took the opportunity to create a fresh new visual identity.

We have modernised our image and combined our strengths. However, our values, our people and the integrity of our services remain the same. I hope you will welcome these changes and the improvements they will bring.



Jon Osborn  
Chief Operating Officer

## Contents

	Page No
1 Summary of performance.....	4
2 Introduction.....	6
3 Specimen verification.....	6
3.1 Conditioning.....	6
3.2 Sampling.....	6
4 Description of supporting construction.....	7
5 Description of specimen.....	7
5.1 Door leaves.....	7
6 Description of construction (refers to Figures 1 to 6 of Appendix 1).....	8
7 Pre-test measurements.....	11
7.1 Pre-cycling.....	11
7.2 Door perimeter gaps.....	11
7.3 Closer forces.....	11
7.4 Method of installation.....	11
8 Test conditions.....	12
8.1 Ambient temperature.....	12
8.2 Pressure readings.....	12
8.3 Furnace temperature.....	13
8.4 Unexposed face temperatures.....	14
8.5 Door distortion data.....	17
9 Observations.....	19
10 Expression of results.....	21
11 Limitations.....	22
12 Field of direct application of test results.....	22
Photographs.....	23
Appendix 1 - figures 1 to 6.....	26
Appendix 2 - raw test data (6 pages)	
Appendix 3 – sampling sheets (2 pages)	

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# 1 Summary of performance

The following performance was achieved from the specimens tested. Full details of the testing and specimen construction are described in the report.

**Results:**

**Fire resistance test in accordance with BS EN 1634-1: 2008 and BS EN 1363-1: 1999**

Doorset A

<b>Integrity</b>	
Cotton pad	43 (forty three) minutes*
Continuous flaming	42 (forty two) minutes
Gap gauges	43 (forty three) minutes*
<b>Insulation</b>	
Average set	42 (forty two) minutes**
Maximum $\geq$ 100mm in from leaf edge	42 (forty two) minutes**
Maximum $\geq$ 25mm in from leaf edge	42 (forty two) minutes**
Door frame $\geq$ 180°C temp rise	42 (forty two) minutes**
Door frame $\geq$ 360°C temp rise	42 (forty two) minutes**
<b>Radiation</b>	
Time to reach 15kW/m <sup>2</sup>	43 (forty three) minutes*

\* No failure of the test criteria had occurred at termination of the test at 43 minutes

\*\* Failure by virtue of integrity failure at 42 minutes

Doorset B

<b>Integrity</b>	
Cotton pad	33 (thirty three) minutes
Continuous flaming	33 (thirty three) minutes
Gap gauges	43 (forty three) minutes*
<b>Insulation</b>	
Average set	20 (twenty) minutes
Maximum $\geq$ 100mm in from leaf edge	33 (thirty three) minutes**
Maximum $\geq$ 25mm in from leaf edge	20 (twenty) minutes
Door frame $\geq$ 180°C temp rise	33 (thirty three) minutes**
Door frame $\geq$ 360°C temp rise	33 (thirty three) minutes**
<b>Radiation</b>	
Time to reach 15kW/m <sup>2</sup>	43 (forty three) minutes*

\* No failure of the test criteria had occurred at termination of the test at 43 minutes

\*\* Failure by virtue of integrity failure at 33 minutes



## Summary of specimen:

### Two single leaf single acting doorsets

Doorset A leaf size:  
2148mm high x 935mm  
wide x 44mm thick

Doorset B leaf size:  
2148mm high x 928mm  
wide x 44mm thick

## 2 Introduction

The doorsets were installed into a flexible supporting construction. In accordance with BS EN 14600: 2005 the leaves were pre-cycled before the fire test. The doorsets were instrumented with the standard and supplementary sets of thermocouples and were installed opening in towards the furnace.

## 3 Specimen verification

The door blanks were delivered to BM TRADA during September 2013, who subsequently further produced the specimens with respect to the following:

- Hardwood lippings
- Softwood door frame
- Intumescent materials
- Hardware
- Overhead closers

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.

### 3.1 Conditioning

BM TRADA stored the specimens in climatic conditions approximate to those in normal service.

### 3.2 Sampling

The intumescent and sealing products were sampled by Ross Newman of BM TRADA Certification on 2<sup>nd</sup> July 2013 (see appendix 3). These products were then delivered to BM TRADA for use in the test.

The other elements used in the construction of the test specimen were bought by BM TRADA from distributor's group stock.

## **4 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 type F Gypsum plasterboard are required. The supporting construction was only fixed on the horizontal edges, the vertical edges remained free.

## **5 Description of specimen**

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

### **5.1 Door leaves**

The leaf of doorset A measured 2138mm high x 935mm wide x 44mm thick and the leaf of doorset B measured 2138mm high x 928mm wide x 44mm thick.



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

### Doorset A - leaf identified as being produced from a Blankfort 30+ doorblank

		Species/type	Dimensions (mm)	Density (kg/m <sup>3</sup> )	Moisture (% w/w)	Key to figures
Stiles and rails		None fitted	-	-	-	-
Core		Eastern white Pine, Grey Pine or Spruce vertically orientated lamels	30 wide x 21 thick (maximum lamel size)	400-500*	-	1
Facings	Outer	MDF	3 thick	700*	9.3	2
	Inner	Particleboard	9 thick	650*	-	3
Adhesive	Lipping	PU	-	-	-	-
	Core lamels	Type 1 x-linked PVA	-	-	-	-
	Facings	Type 1 x-linked PVA, PU	-	-	-	-
Lippings –all edges		Sapele	6 thick	640**	10.7	4

\* Manufacturers stated density, not checked by laboratory

\*\* Nominal density

### Doorset B - leaf identified as being produced from a Pacific Rim Wood Flamebreak FD30 doorblank

		Species/type	Dimensions (mm)	Density (kg/m <sup>3</sup> )	Moisture (% w/w)	Key to figures
Stiles		Mixed tropical hardwood	32 thick x 35 deep incorporating a 9 x 9 tongue into the core	610*	-	5
Top rail		Mixed tropical hardwood	32 thick x 70 deep incorporating a 9 x 9 tongue into the core	610*	-	6
Bottom rail		Mixed tropical hardwood	32 thick x 35 deep incorporating a 9 x 9 tongue into the core	610*	-	7
Core		Parasorianthes falacateria or Albisia falcata	3 layers of lamels laid in alternate directions – grooved to accept the stiles and rails.	230-360*	-	8
Facings		Plywood	6 thick	610*	10.8	9
Adhesive	Lipping	PU	-	-	-	-
	Core	PVA	-	-	-	-
	Facings	Melamine or PVA	-	-	-	-
Lippings –all edges		Sapele	6 thick	640**	10.7	10

\* Manufacturers stated density, not checked by laboratory

\*\* Nominal density

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**Door frame – both doorsets**

	Species/type	Dimensions (mm)	Density (kg/m <sup>3</sup> )	Moisture (% w/w)	Key to figures
Head & jambs	European Redwood	70 wide x 32 thick	572*	8.8-11.4	11
Stops – planted (pinned)	European Redwood	20 wide x 12 thick	572*	9.6-10	12
Frame jointing detail	Mortice and tenon (screwed with 2No. 80mm long screws per joint)	-	-	-	-
Architrave	European Redwood	45 wide x 18 thick	572**	10.5-10.9	-
Threshold	Non combustible	-	-	-	-
Frame fixings	4No. steel screws per jamb	80Ø x 100 long	-	-	-
Frame to supporting construction fire stopping	Rockwool mineral fibre capped with intumescent mastic	Nominally 10-15 wide x full depth of frame	-	-	-

\* Determined by laboratory at 15.4% mc

**Intumescent materials – both doorsets**

	Make/type	Size (mm)	Location	Key to figures
Door edges	None fitted	-	-	-
Frame reveal – head and jambs	Pyroplex Rigid Box Seal Ref. FO8700	15 x 4	Fitted centrally in the frame reveal	13

**Intumescent interruptions by hardware and additional protection – both doorsets**

	Make/type	Size (mm)	Location
Around hinges - frame	Fully interrupted	-	Hinge blade fully interrupts seal in frame reveal
Under hinge blade	Interdens	1 thick	Fitted under hinge blade on frame and leaf
Encasing latch body	None fitted	-	-
Under latch forend	Interdens	1 thick	Fitted under the latch forend
Around latch keep	Fully interrupted	-	Latch keep fully interrupts seal in frame reveal
Under latch keep	Interdens	1 thick	Fitted under the latch keep

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## Hardware – both doorsets

	Make/type	Size (mm)	Location	Key to figures
Hinges	3No. Royde and Tucker H101 lift off type hinge	101 x 34 x 2 (blade size)	Fitted 150mm, 1010mm and 1870mm from the head of the leaf, fixed with 4No. M5 x 32mm long wood screws per blade	14
Closer	Rutland TS3204 overhead type closer	220 x 58 (footprint size)	Fitted on the exposed face as per the manufacturer's instructions	15
Latch - disengaged	Easi-T Agosa steel mortice latch and Eurospec Eurocylinder lock	235 x 24 x 1.5 (forend size) 150 x 85 x 14 (case size) 58 backset	Fitted 1000mm from the threshold of the leaf, case fixed with 2No. M4 x 30mm long screws, forend fixed with 3No. M4 x 30mm long screws	16
		175 x 22 x 2 (keep size)	Fixed with 3No. M4 x 30mm long screws	
Furniture	Aluminium lever type handle	Ø52 (rose size)	Fitted appropriate to the latch through fixed with 2No. M4 x 52mm long machine screws	17
	Lock escutcheon	Ø52 (rose size)	Fitted appropriate to the latch through fixed with 2No. M4 x 52mm long machine screws	18

## 7 Pre-test measurements

### 7.1 Pre-cycling

Operability test of 25 manual cycles was completed on each leaf in accordance with BSEN 14600, section 5.1.1.1.

Minimum angle of opening	90°
Number of operation cycles completed	25

### 7.2 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 along all edges except the threshold, and 3-8mm along the threshold. The gaps between the edge of the doors and frame were measured prior to test. A total of 24 readings were taken. The measurements (in mm) are given in Figure 5 of Appendix 1.

### 7.3 Closer forces

Measured in accordance with BSEN 1634-1: 2008 Section 10.1.3.

	Opening Force (Nm)
Doorset A	74.3 @ handle position
Doorset B	72.1 @ handle position

### 7.4 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 doorsets were flush with the exposed face of the supporting construction.

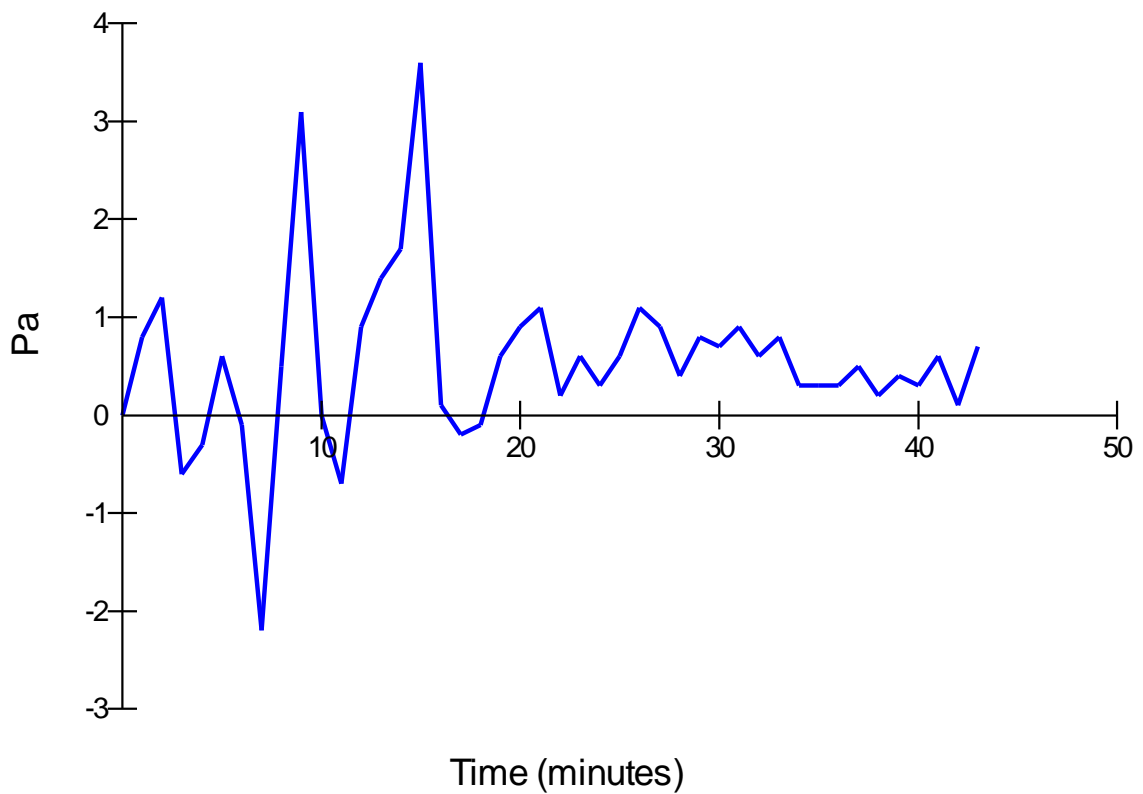
**8 Test conditions**

**8.1 Ambient temperature**

The ambient temperature of the test area at commencement of test was 16°C. The ambient temperature for the duration of the test has been recorded in Appendix 2.

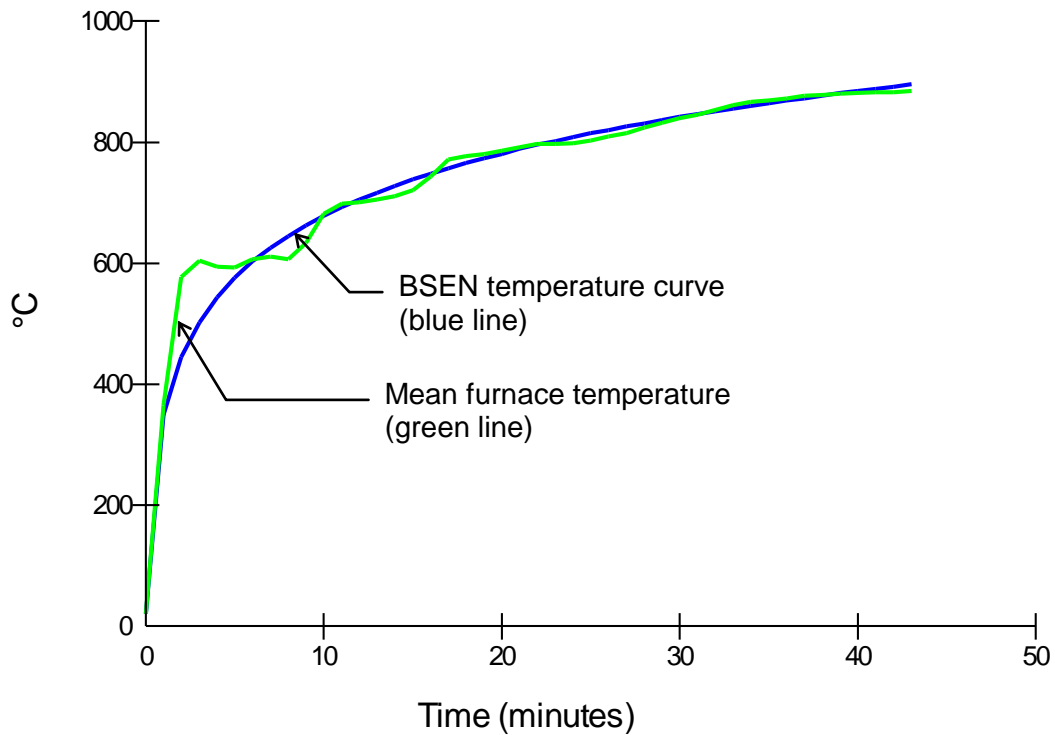
**8.2 Pressure readings**

After the first 5 minutes of the test, it was attempted to maintain the furnace pressure at  $0 \pm 5$  Pa and after 10 minutes was maintained at  $0 \pm 3$  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:



### 8.3 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 nine plate thermometers suitably distributed within the furnace. The temperatures recorded have been tabulated in Appendix 2 and are shown graphically below:



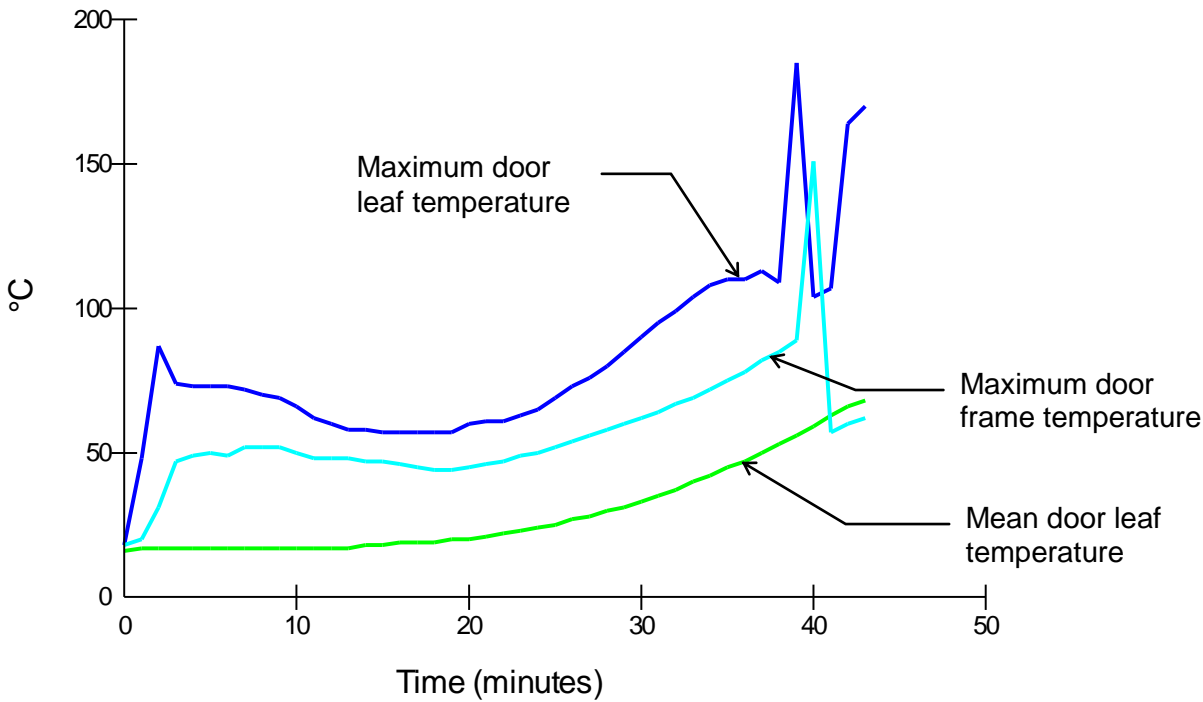
## 8.4 Unexposed face temperatures

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

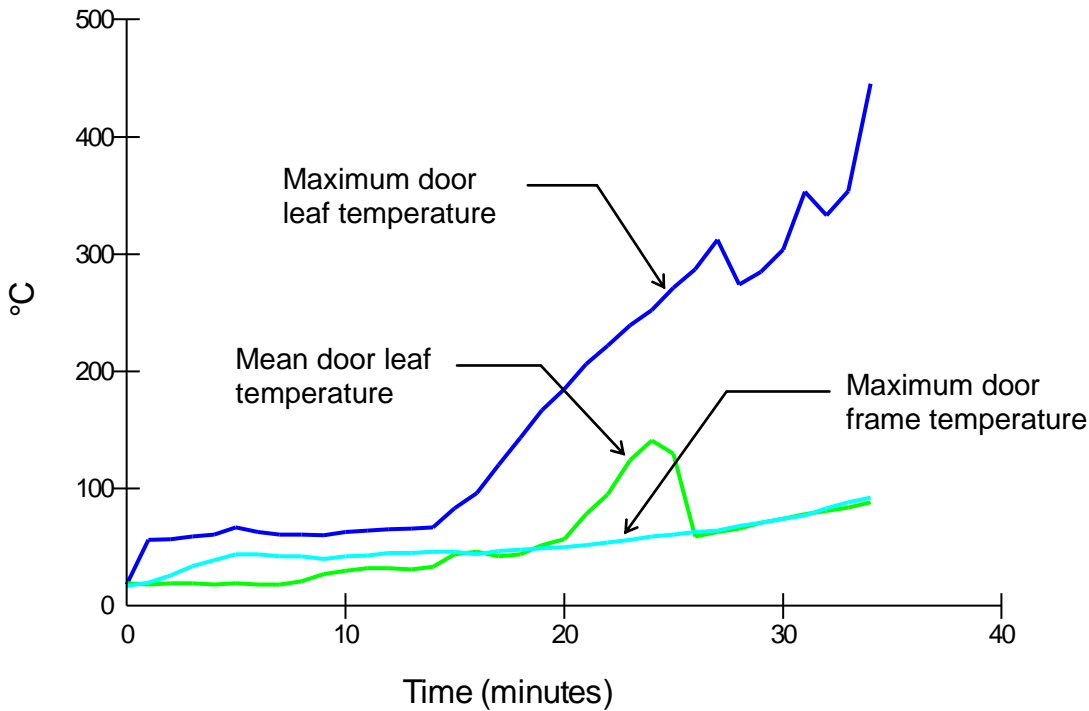
Doorset A	1 discrete area	
Leaves	Discrete area (timber)	5 measuring mean temperature rise. 5 measuring maximum temperature rise, standard set 100mm in from the door leaf edges. 5 measuring maximum temperature rise, supplementary set 25mm in from the door leaf edges.
Frame		5 measuring maximum temperature rise.
Doorset B	1 discrete area	
Leaves	Discrete area (timber)	5 measuring mean temperature rise. 5 measuring maximum temperature rise, standard set 100mm in from the door leaf edges. 5 measuring maximum temperature rise, supplementary set 25mm in from the door leaf edges.
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



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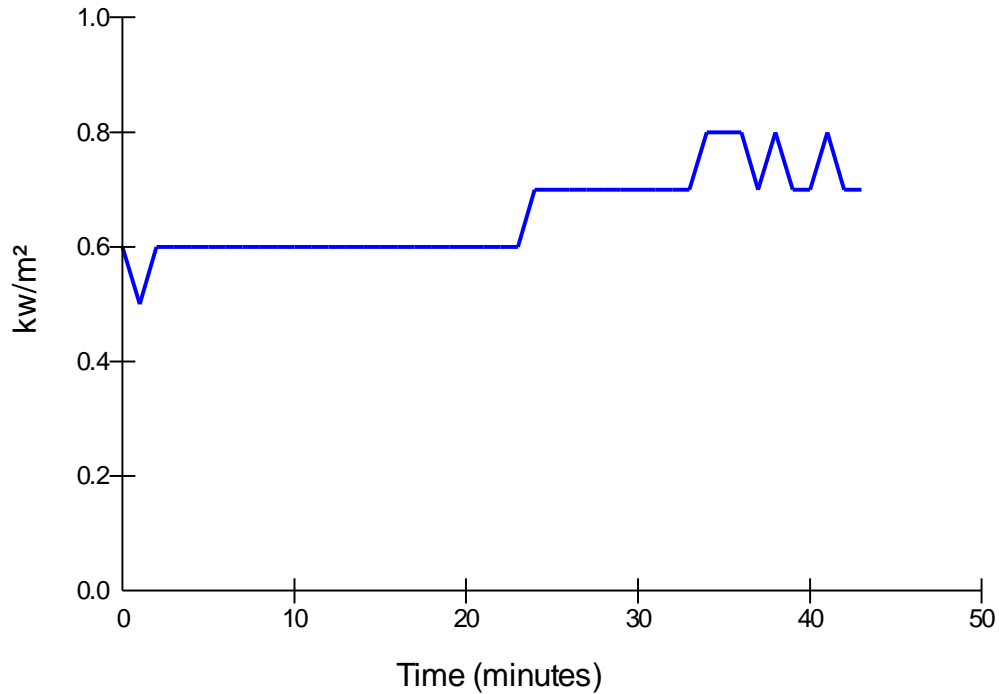


## Radiation

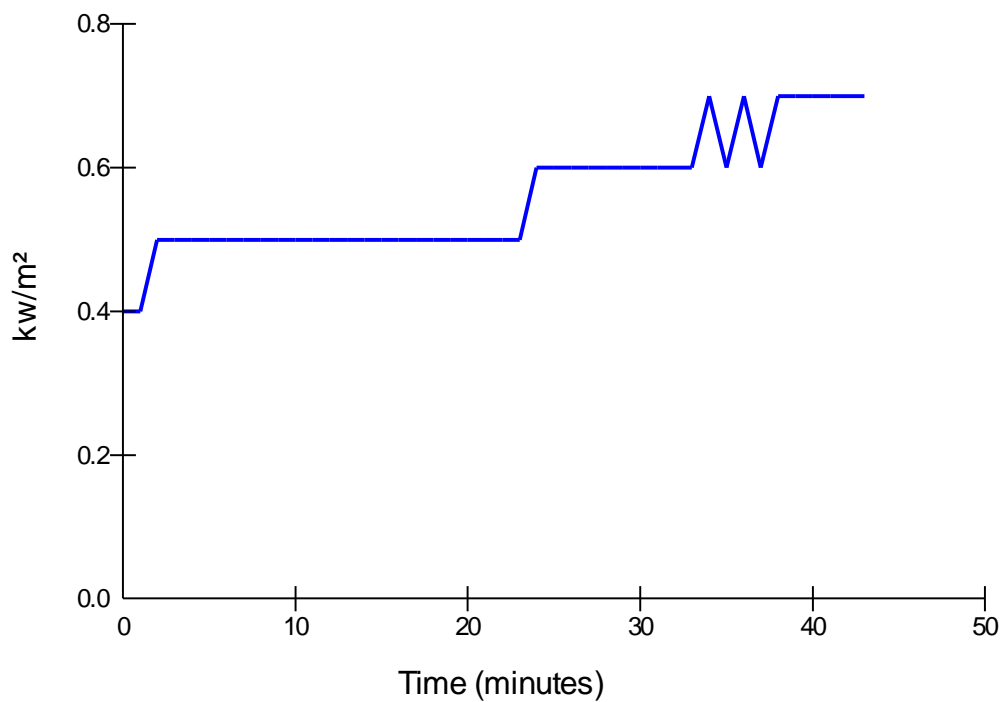
A radiometer was used to measure the radiation 1m away from the doorsets.

The results of the radiometer have been tabulated and included in Appendix 2 and are shown graphically below:

Doorset A



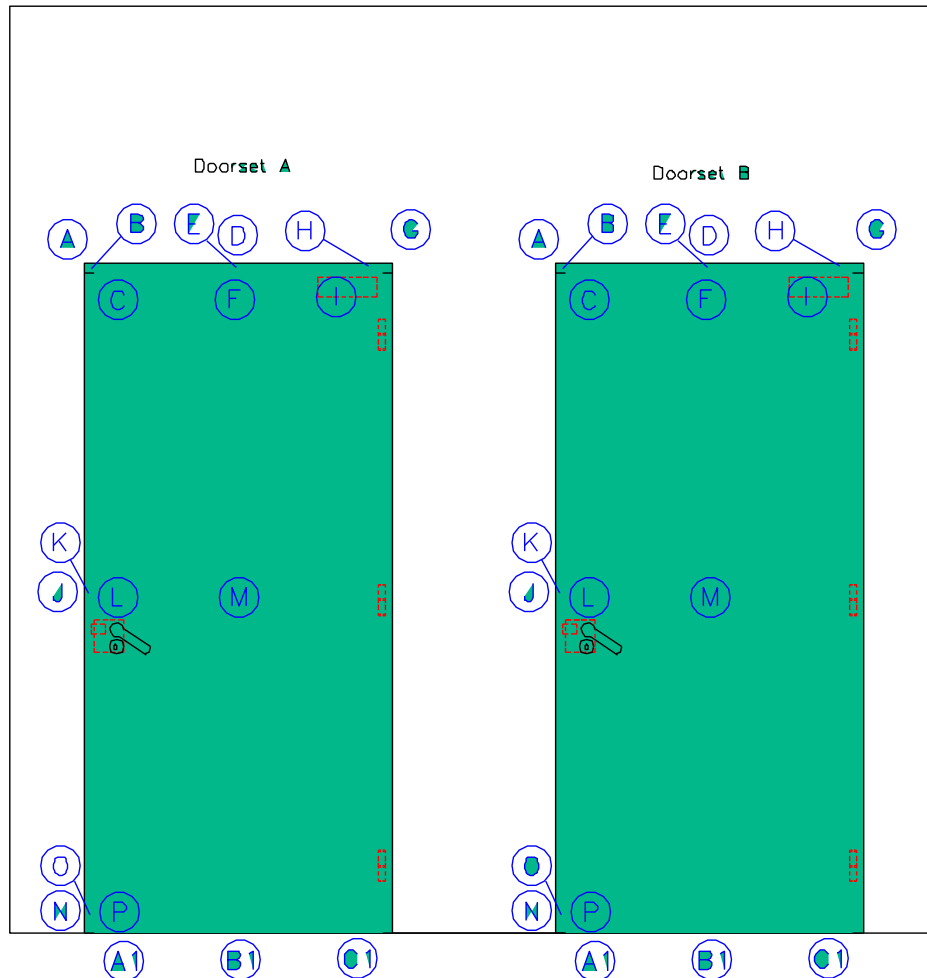
Doorset B



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## 8.5 Door distortion data

The following tables show the distortion of the doors in mm with an accuracy of  $\pm 1$ mm. A positive measurement indicates distortion towards the furnace. A negative measurement indicates distortion away from the furnace. A1, B1 and C1 give vertical movement of the door, a negative reading indicates that the door has dropped.



**Doorset A - (leaf hung on the right and opening in towards the furnace)**

Time	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
10	2	3	12	4	4	8	4	2	8	3	3	4	0	1	1	0
20	1	2	8	1	3	15	1	2	11	5	3	3	4	1	1	19
30	1	2	18	0	3	25	1	0	13	-5	3	5	14	1	1	25
40	1	3	21	0	3	24	0	-1	12	3	3	4	0	0	2	28

Time	A1	B1	C1
10	-3	-3	-2
20	-5	-4	-3
30	-7	-6	-5

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## Doorset B – (leaf hung on the right and opening in towards the furnace)

Time	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
10	4	4	19	3	3	9	0	1	4	-1	2	1	1	1	1	19
20	2	1	15	2	2	5	-1	-1	3	2	1	0	-22	-1	1	20
30	0	1	18	1	0	6	-1	0	3	2	0	0	-17	-1	2	34

Time	A1	B1	C1
10	-2	-2	-1
20	-2	-3	-2
30	-4	-5	-4

## 9 Observations

All comments relate to the unexposed face unless otherwise specified.

### Time (minutes)

00.00	Test started.
01.00	Both doorsets, there is smoke issuing from the top half leaf/frame perimeter gaps.
02.34	There is discolouration at the closing edge of doorset B.
04.03	At the bottom closing corner of doorset B, an 18mm gap has opened up, causing half of the intumescent strip to be visible.
06.33	There is discolouration at the head of doorset A.
06.41	There is intermittent flaming at the bottom closing corner of doorset B.
08.30	A cotton pad integrity test was carried out at the bottom closing corner of doorset B. No failure.
19.54	There is a glow visible at the door handle of doorset B.
24.55	A cotton pad integrity test was carried out at the bottom closing corner of doorset B. No failure observed.
25.46	There is a gap of approximately 20-30mm at the bottom closing corner of doorset A.
27.00	A cotton pad integrity test was carried out at the latch position on doorset A. No failure observed.
28.28	There is a visible glow at the top hinge position of doorset A.
31.10	A cotton pad integrity test was carried out at the bottom closing corner of doorset B. No failure observed.
32.40	There is intermittent flaming from the bottom closing corner of doorset B.
33.44	A cotton pad integrity test was carried out on doorset B, at the bottom closing corner, which resulted in ignition of the cotton pad, thereby constituting <b>integrity failure</b> .
33.57	There is continuous flaming from doorset B at the closing edge latch position, thereby constituting <b>further integrity failure</b> .
35.36	There is a visible glow at the top hinge position of doorset B.
36.40	A cotton pad integrity test was carried out on doorset A at the top hinge position. No failure.

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- 37.49 There is charring on doorset B at the middle hinge position.
- 39.00 A cotton pad integrity test was carried out on doorset A at the top hinge position, no failure.
- 39.24 There is charring at the bottom hinge position of doorset A
- 40.33 A glow is visible across the head of both doorsets.
- 40.40 A cotton pad integrity test was carried out on specimen A at the top hinge position, no failure.
- 41.09 The threshold is starting to burn away from doorset A.
- 42.10 There is a glow visible at the top closing corner of doorset B
- 42.38 There is continuous flaming from the top-hanging corner and top hinge position of doorset A, thereby constituting **integrity failure**.
- 43.00 Testing terminated.

## 10 Expression of results

### Doorset A

<b>Integrity</b>	
Cotton pad	43 (forty three) minutes*
Continuous flaming	42 (forty two) minutes
Gap gauges	43 (forty three) minutes*
<b>Insulation</b>	
Average set	42 (forty two) minutes **
Maximum $\geq$ 100mm in from leaf edge	42 (forty two) minutes **
Maximum $\geq$ 25mm in from leaf edge	42 (forty two) minutes **
Door frame $\geq$ 180°C temp rise	42 (forty two) minutes **
Door frame $\geq$ 360°C temp rise	42 (forty two) minutes **
<b>Radiation</b>	
Time to reach 15kW/m <sup>2</sup>	43 (forty three) minutes*

\* No failure of the test criteria had occurred at termination of the test at 43 minutes

\*\* Failure by virtue of integrity failure at 42 minutes

### Doorset B

<b>Integrity</b>	
Cotton pad	33 (thirty three) minutes
Continuous flaming	33 (thirty three) minutes
Gap gauges	43 (forty three) minutes*
<b>Insulation</b>	
Average set	20 (twenty) minutes
Maximum $\geq$ 100mm in from leaf edge	33 (thirty three) minutes **
Maximum $\geq$ 25mm in from leaf edge	20 (twenty) minutes
Door frame $\geq$ 180°C temp rise	33 (thirty three) minutes **
Door frame $\geq$ 360°C temp rise	33 (thirty three) minutes **
<b>Radiation</b>	
Time to reach 15kW/m <sup>2</sup>	43 (forty three) minutes*

\* No failure of the test criteria had occurred at termination of the test at 43 minutes

\*\* Failure by virtue of integrity failure at 33 minutes

## 11 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 door 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. BM TRADA 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:	Robert Axe	Vincent Kerrigan
Title:	Lead Technical Officer	Technical Manager
Date of issue:	12-01-2014	12-01-2014

## 12 Field of direct application of test results

The results of the test are directly applicable to similar constructions where one or more of the changes listed in BSEN 1634-1: 2008, Clause 13, are made and the construction continues to comply with that appropriate design code for its stiffness and stability. Other changes are not permitted by the document.

A copy of the field of direct application is available from BM TRADA upon request.



**Photographs**

**Intumescent interruptions by hardware**

Latch keep – both doorsets



Hinge blade – both doorsets



At start of test



At 10 minutes



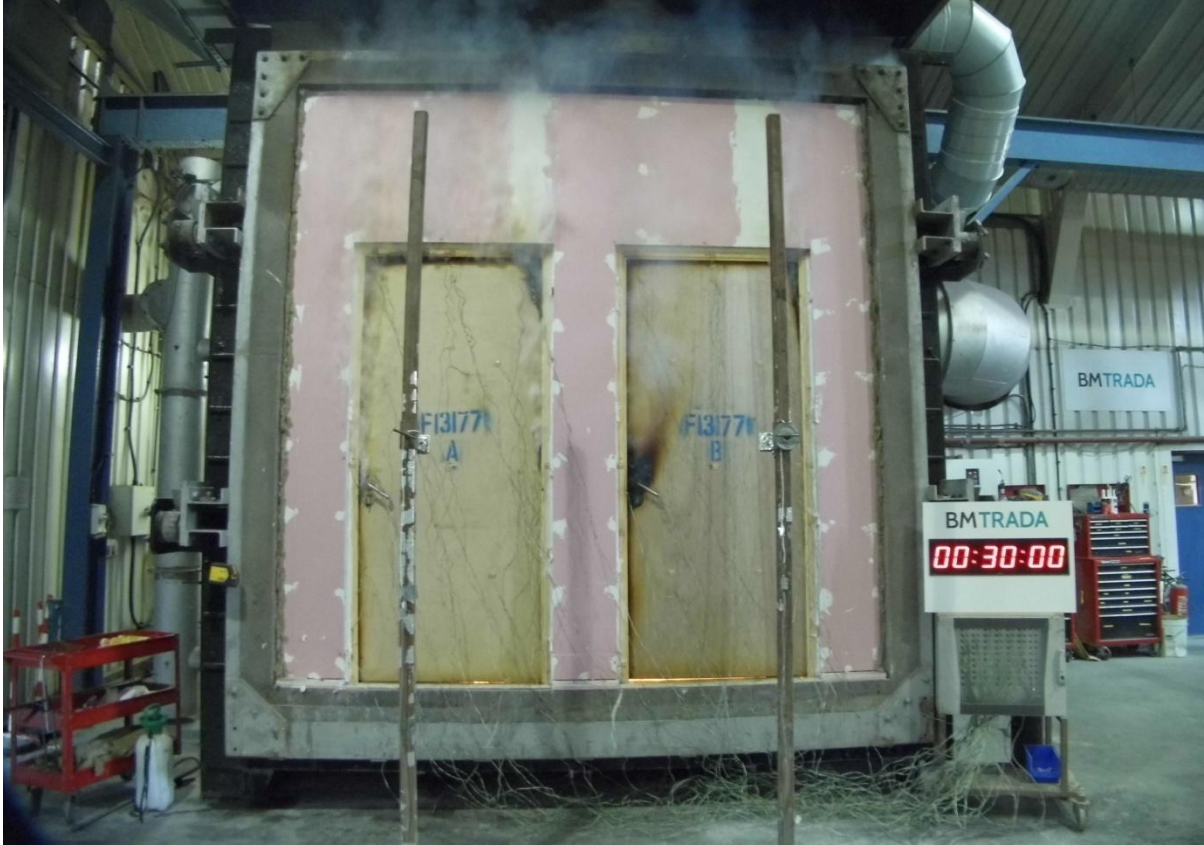
At 20 minutes



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At 30 minutes



After 40 minutes

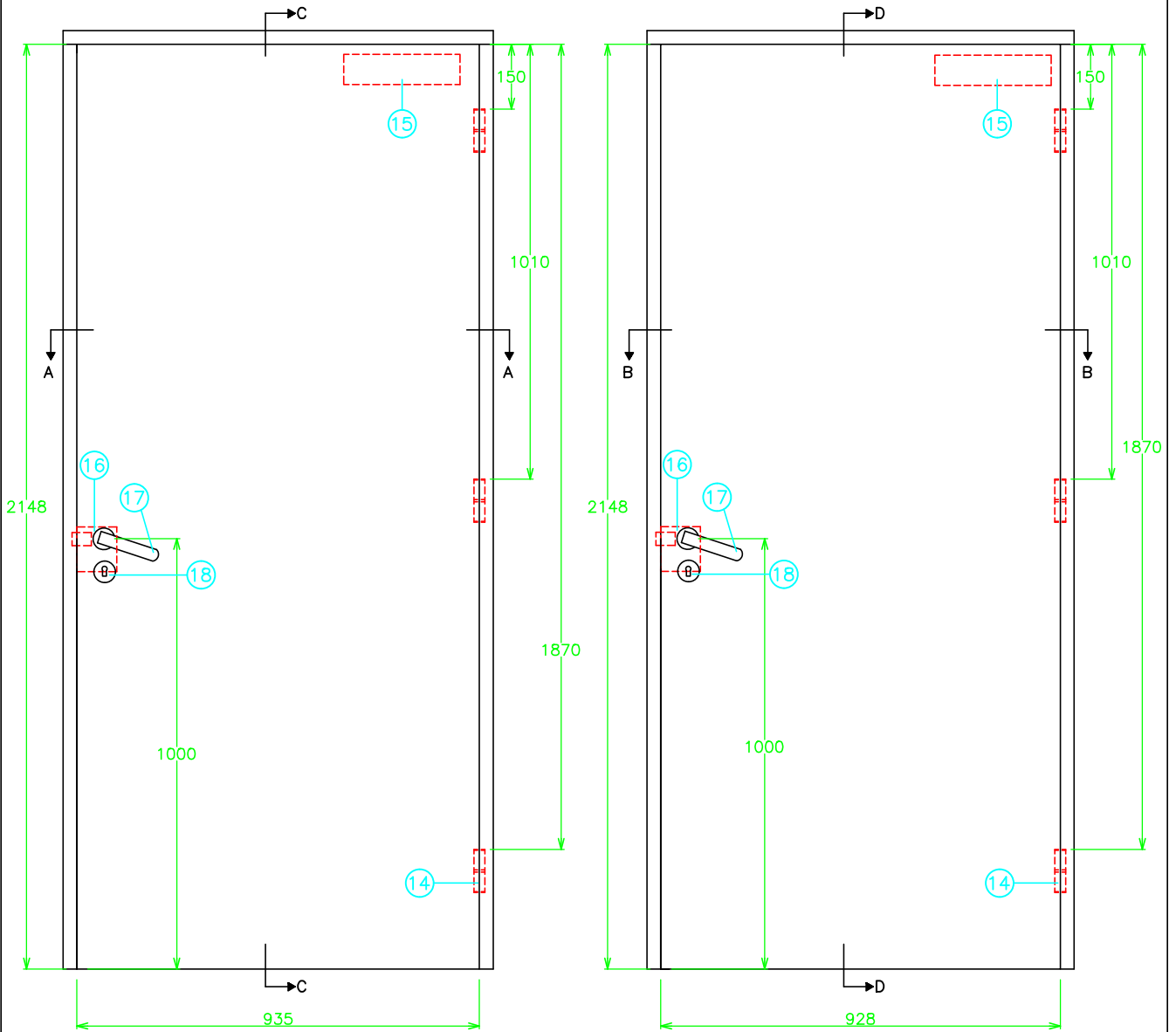


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**Appendix 1 - figures 1 to 6**

Doorset A

Doorset B



**BMTRADA**

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 High Wycombe, Buckinghamshire, HP14 4ND, UK.  
 Tel: +44 (0)1494 569800 Fax: +44 (0)1494 564895

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

Date Drawn 01/10/13

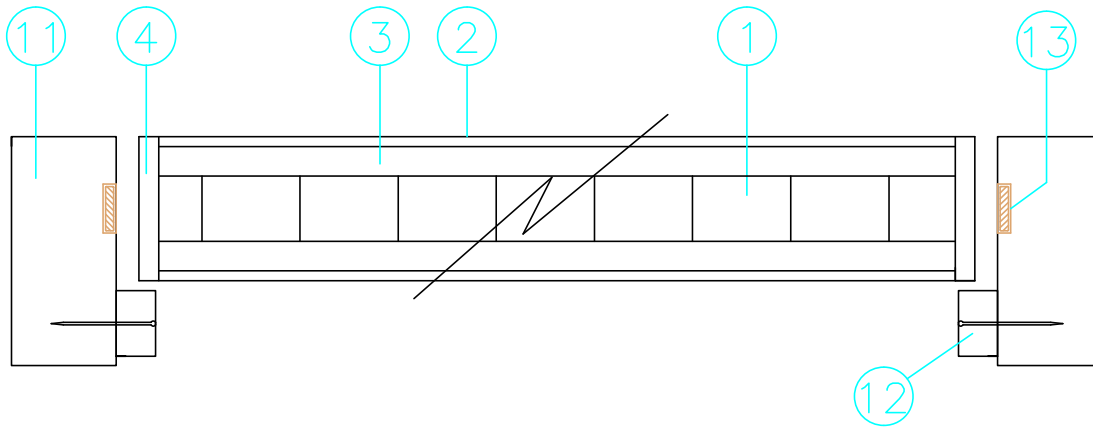
Drawn By ANM

Scale NTS

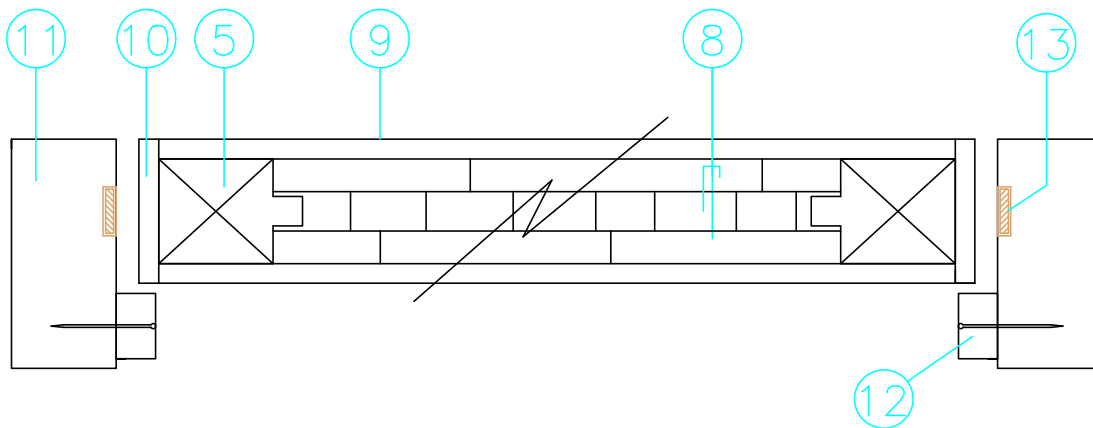
Project No. Chilt/RF13177

Appendix 1

Section A-A



Section A-A



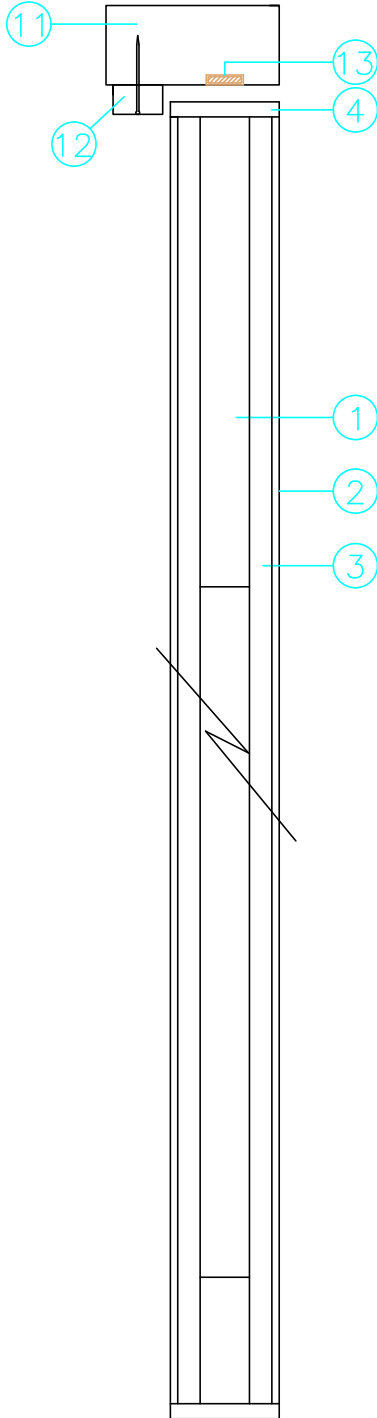
**BMTRADA**

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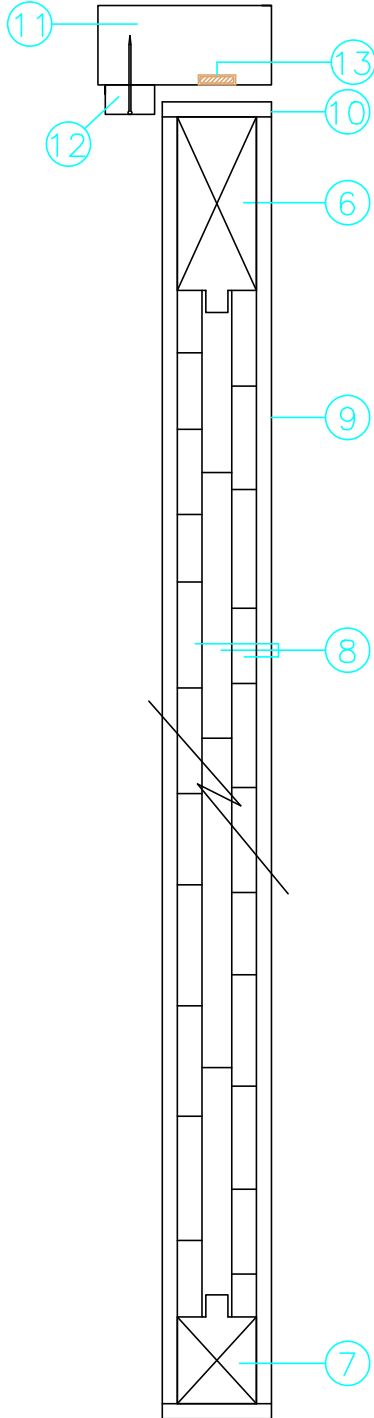
Title  
 Horizontal cross sections  
 (All dimensions in mm)

Date Drawn 01/10/13	Drawn By ANM	Scale NTS
Project No. Chilt/RF13177		Appendix 1

Section C-C



Section D-D



**BMTRADA**

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Title

Vertical cross sections  
 (All dimensions in mm)

Date Drawn  
 01/10/13

Drawn By  
 ANM

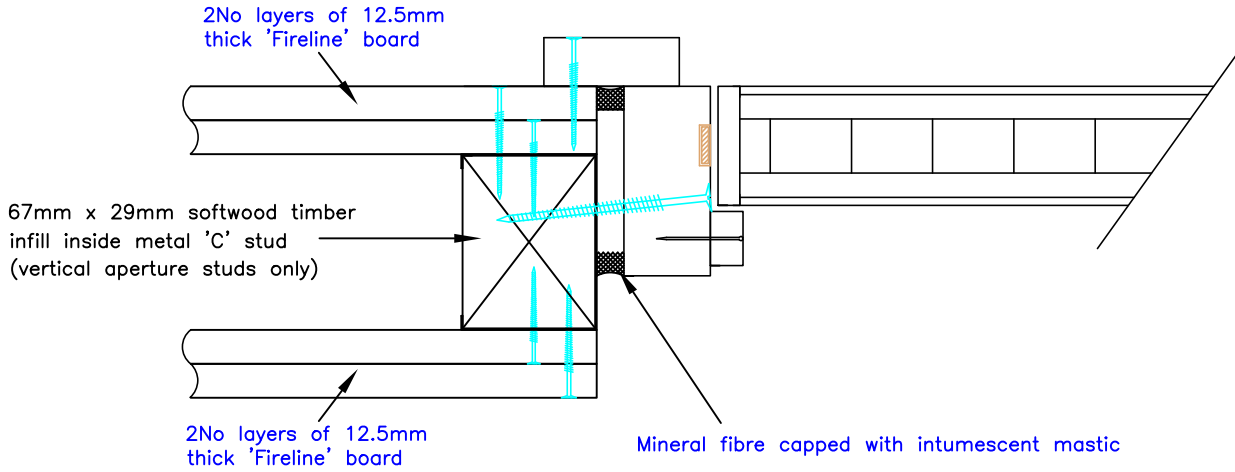
Scale  
 NTS

Project No.  
 Chilt/RF13177

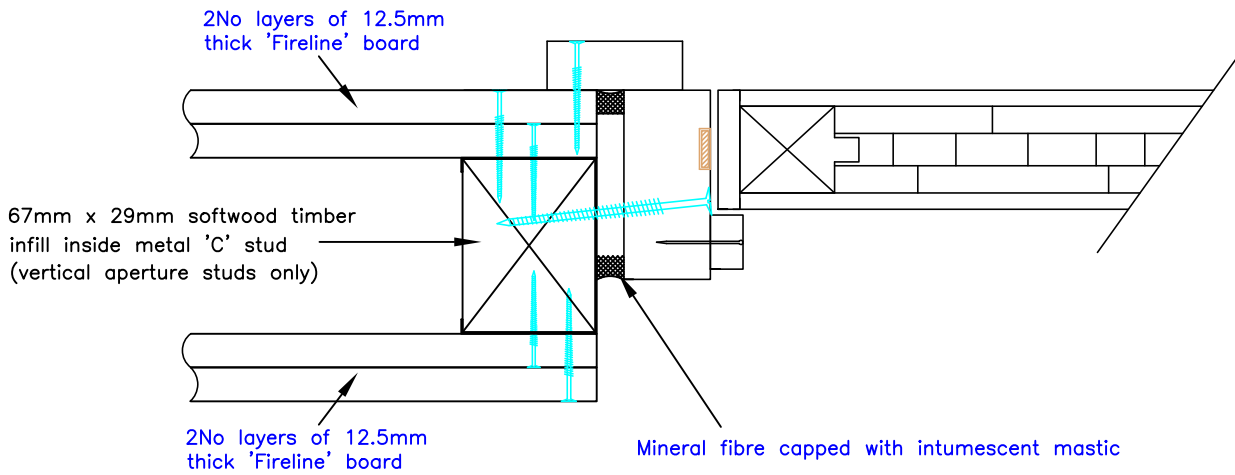
Appendix 1



Doorset A



Doorset B

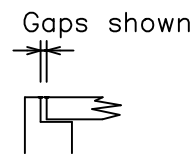
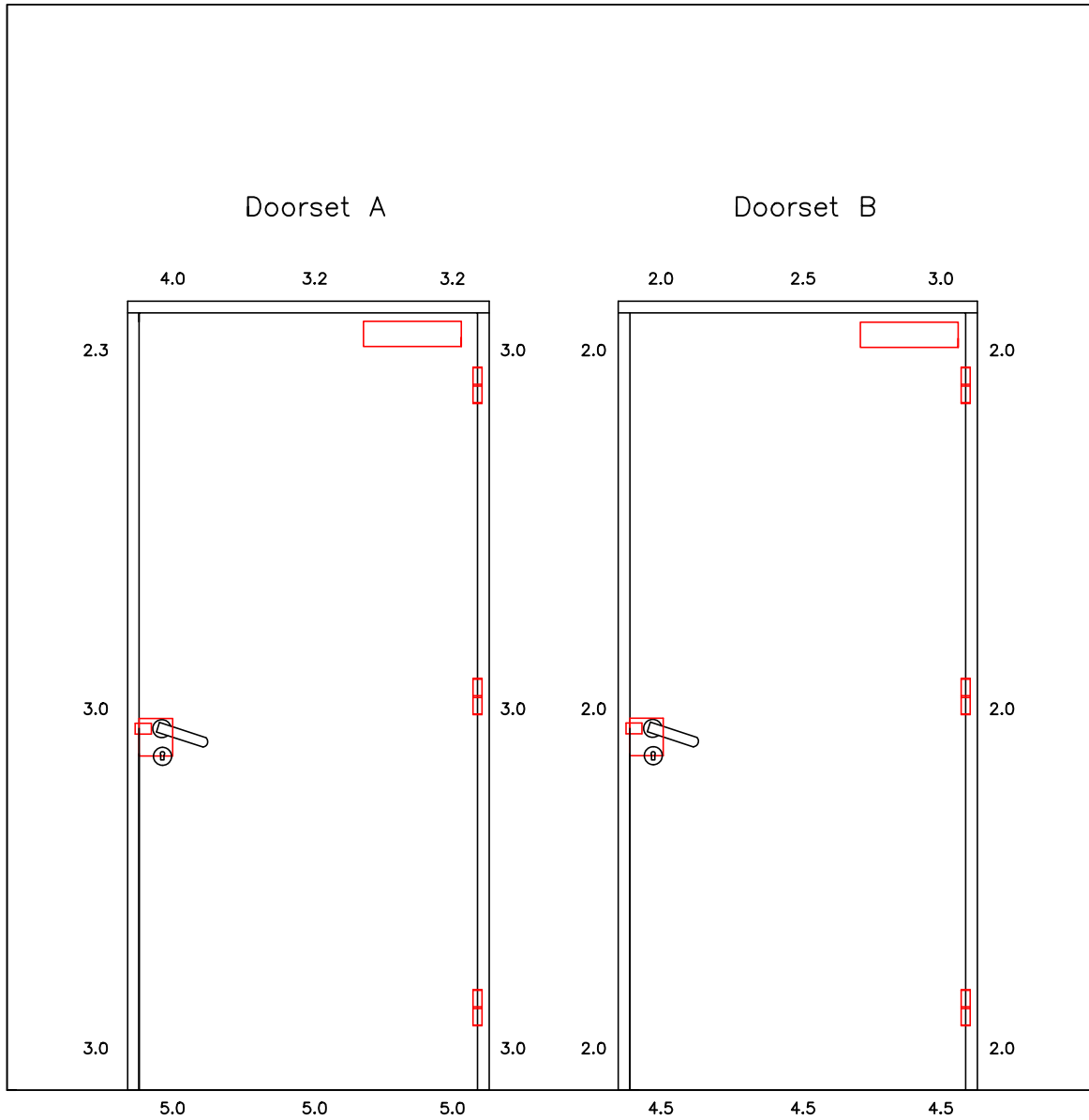


**BMTRADA**

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 High Wycombe, Buckinghamshire, HP14 4ND, UK.  
 Tel: +44 (0)1494 569800 Fax: +44 (0)1494 564895

Title  
 Frame to supporting construction  
 fixing detail  
 (All dimensions in mm)

Date Drawn 01/10/13	Drawn By ANM	Scale NTS
Project No. Chilt/RF13177		Appendix 1



Viewed From Unexposed Face

**BMTRADA**

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Title

Door leaf/frame gaps  
 (All dimensions in mm)

Date Drawn

13/09/13

Drawn By

ANM

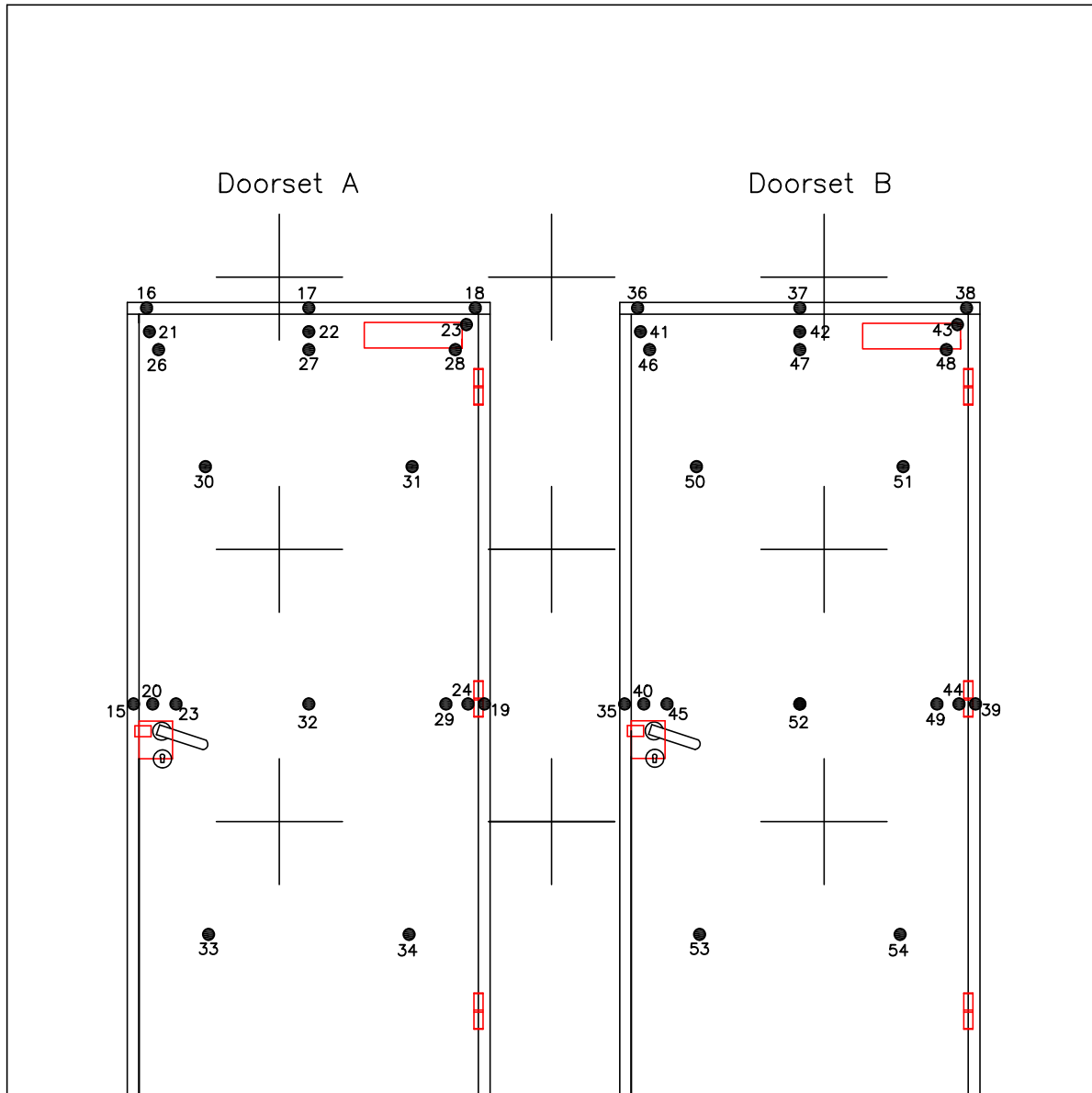
Scale

NTS

Project No.

Chilt/RF13177

Appendix 1



+ : Furnace Thermocouples  
 • : Unexposed Face Thermocouples

Viewed From Unexposed Face

**BMTRADA**

Chiltern House, Stocking Lane, Hughenden Valley  
 High Wycombe, Buckinghamshire, HP14 4ND, UK.  
 Tel: +44 (0)1494 569800 Fax: +44 (0)1494 564895

Title

Thermocouple positions  
 (All dimensions in mm)

Date Drawn

13/09/13

Drawn By

ANM

Scale

NTS

Project No.

Chilt/RF13177

Appendix 1

## Appendix 2 - raw test data (6 pages)

(see figure 6 of appendix 1 for channel locations)

Furnace thermocouples
  Failure time and corresponding thermocouple

Time	Chan 0	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5	Chan 6	Chan 7	Chan 8	Chan 9	Chan 11	Chan 15	Chan 16	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22
min	Pa	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
0	0	22	22	23	23	23	23	24	24	23	16	17	17	17	18	17	17	17	18
1	0.8	387	330	333	386	334	339	284	345	548	16	17	20	20	18	18	18	48	20
2	1.2	542	568	543	615	582	566	508	581	688	16	17	31	25	18	17	17	87	41
3	-0.6	570	547	554	630	608	621	588	620	699	16	17	47	37	22	17	17	74	31
4	-0.3	575	502	530	607	599	623	605	614	694	16	17	49	45	26	17	18	73	27
5	0.6	546	481	544	601	581	648	614	622	704	16	17	50	43	41	17	19	73	26
6	-0.1	568	523	559	611	600	652	624	634	685	16	18	49	41	49	17	22	73	25
7	-2.2	593	574	567	617	616	635	624	631	645	16	18	49	39	52	17	26	72	24
8	0.5	591	565	548	636	612	621	630	632	626	16	18	47	36	52	17	29	70	24
9	3.1	622	585	586	669	642	641	652	645	658	16	20	46	33	52	18	31	69	24
10	0	669	642	640	713	693	694	677	695	723	16	21	44	31	50	18	33	66	24
11	-0.7	690	668	676	709	703	714	694	707	738	16	21	42	30	48	19	34	62	24
12	0.9	699	681	683	704	712	718	689	705	724	16	22	40	29	48	19	36	60	24
13	1.4	709	686	676	701	719	724	689	713	731	16	22	38	29	48	20	36	58	24
14	1.7	717	693	682	707	727	729	695	719	733	16	23	37	28	47	20	37	58	24
15	3.6	723	702	688	724	733	739	706	728	746	16	24	36	29	47	21	38	57	25
16	0.1	733	719	709	768	758	756	724	749	771	16	25	35	29	46	23	39	57	26
17	-0.2	749	742	802	790	774	771	745	773	795	16	26	34	29	45	23	41	57	26
18	-0.1	757	752	806	789	776	777	755	780	803	16	26	34	29	44	24	41	57	27
19	0.6	764	758	807	784	780	784	759	784	803	16	27	34	30	44	24	42	57	28
20	0.9	776	770	817	785	784	793	762	785	804	16	28	34	31	45	25	43	58	29

Time	Chan 0	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5	Chan 6	Chan 7	Chan 8	Chan 9	Chan 11	Chan 15	Chan 16	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22
min	Pa	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
21	1.1	789	782	822	790	793	799	764	789	807	16	29	34	31	46	26	45	58	30
22	0.2	797	788	826	798	803	800	767	790	805	16	30	34	32	47	27	45	58	31
23	0.6	802	790	821	797	806	801	765	790	802	16	31	34	33	49	28	48	59	32
24	0.3	802	791	822	802	808	804	769	795	803	16	33	35	34	50	29	56	60	34
25	0.6	802	794	826	810	813	806	774	798	807	16	34	35	35	52	30	57	61	35
26	1.1	807	798	843	812	817	817	779	804	814	16	35	35	36	54	31	59	62	37
27	0.9	816	806	838	824	825	820	783	808	821	16	36	36	36	56	32	62	63	39
28	0.4	820	815	859	829	833	831	791	816	830	16	38	36	38	58	33	66	65	41
29	0.8	827	821	860	834	839	842	802	827	841	16	39	37	38	60	34	70	67	42
30	0.7	836	831	866	844	846	849	810	833	849	16	40	38	40	62	35	74	68	44
31	0.9	842	836	874	849	854	855	814	840	856	16	42	38	41	64	36	77	70	46
32	0.6	849	845	883	857	860	863	823	849	864	16	43	39	42	67	37	82	72	48
33	0.8	852	849	897	863	866	871	832	856	868	16	44	40	43	69	39	85	75	51
34	0.3	859	856	910	867	870	876	838	862	872	16	45	41	44	72	40	89	77	53
35	0.3	859	857	900	867	872	878	845	865	878	16	47	42	45	75	41	95	80	55
36	0.3	866	865	910	873	876	881	844	869	878	16	48	43	46	78	42	98	83	58
37	0.5	871	869	916	876	881	884	847	870	881	16	50	44	47	82	43	102	85	61
38	0.2	875	874	905	880	888	882	849	872	883	16	52	46	48	85	45	105	90	63
39	0.4	872	872	912	880	888	884	854	876	885	16	53	47	49	89	46	106	95	66
40	0.3	878	876	908	884	890	884	855	875	884	16	55	49	50	151	47	104	100	69
41	0.6	878	879	915	887	892	882	857	875	882	16	57	52	51	29	48	103	107	73
42	0.1	880	882	914	888	895	882	856	875	882	16	60	55	53	19	50	164	118	78
43	0.7	881	883	912	889	896	883	864	877	881	16	62	59	57	18	49	170	130	82

Time	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	Chan 36	Chan 37	Chan 38	Chan 39
min	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
0	18	17	17	18	18	18	18	17	17	17	16	17	17	17	17	17	17
1	18	18	18	25	18	18	18	18	17	17	17	18	18	18	18	20	17
2	19	17	18	40	19	19	18	18	17	17	17	17	18	26	19	25	17
3	34	17	18	32	18	19	18	18	17	17	17	17	18	34	19	33	17
4	50	17	18	29	18	18	18	18	17	17	17	17	20	39	20	38	17
5	53	17	18	27	18	18	18	18	17	17	17	17	21	43	25	44	17
6	57	17	19	26	18	18	18	18	17	17	17	17	22	42	24	44	17
7	59	18	19	25	18	19	18	18	17	17	17	17	22	41	24	42	17
8	59	18	19	24	18	19	18	18	17	17	17	17	22	40	24	42	17
9	56	18	22	24	19	19	18	18	17	18	18	18	24	38	24	40	18
10	58	18	23	23	19	19	18	18	17	18	18	17	24	37	25	42	18
11	55	19	22	23	19	19	18	18	17	18	17	17	23	36	26	43	18
12	53	19	22	23	19	20	18	18	17	18	17	17	23	35	26	45	19
13	51	20	22	23	19	20	18	18	18	18	17	18	24	35	26	45	20
14	50	21	22	23	19	21	19	19	18	18	18	18	24	34	26	46	21
15	50	21	23	23	20	22	19	19	19	19	18	18	24	34	27	46	23
16	52	23	23	23	20	22	20	20	19	19	19	20	25	33	28	44	25
17	53	23	23	23	20	23	20	20	19	19	18	20	25	33	29	47	25
18	53	24	23	24	21	27	21	20	20	20	19	20	26	33	30	48	27
19	56	25	23	24	21	37	21	21	20	20	19	20	27	32	31	49	28
20	60	26	24	25	22	46	22	22	21	21	20	20	28	32	33	50	29
21	61	28	25	26	23	50	23	23	22	22	20	21	30	33	34	52	30
22	61	29	26	27	24	51	23	24	22	23	21	21	31	33	35	54	31
23	63	30	27	28	25	52	24	26	23	24	22	22	33	34	37	56	32
24	65	32	27	29	26	53	26	28	24	25	23	23	35	36	38	59	34
25	69	34	29	30	27	52	27	29	25	26	24	24	36	37	39	61	35
26	73	35	30	32	28	52	28	32	26	27	25	25	38	38	40	63	36

Time	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	Chan 36	Chan 37	Chan 38	Chan 39
min	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
27	76	37	32	33	29	52	29	34	27	29	26	26	40	39	42	64	37
28	80	39	33	34	31	57	31	36	29	30	28	27	42	40	43	68	39
29	85	42	35	36	32	60	33	38	31	32	29	29	43	41	44	71	40
30	90	45	36	38	34	64	34	41	30	34	31	30	45	42	46	74	41
31	95	49	38	39	36	68	36	44	31	36	33	32	47	45	47	77	42
32	99	53	41	41	37	75	38	46	33	39	35	34	49	45	48	83	43
33	104	56	43	43	39	81	39	49	37	41	37	36	51	46	50	88	44
34	108	59	45	45	42	90	41	52	40	44	39	38	57	50	52	92	45
35	110	62	46	47	44	95	43	54	42	47	42	40	46	52	53	96	46
36	110	65	49	50	47	98	46	56	45	50	45	42	46	54	52	100	47
37	113	68	51	52	50	98	48	58	47	53	49	45	46	55	52	104	48
38	109	71	53	55	54	96	51	60	50	57	53	49	45	57	53	107	49
39	185	74	56	58	59	95	54	62	50	61	56	53	22	39	41	81	27
40	75	76	62	61	63	91	57	64	56	64	57	56	15	23	24	41	19
41	19	79	68	65	68	91	60	66	60	68	60	61	16	19	19	27	18
42	18	82	73	69	72	89	64	67	63	71	64	66	17	19	19	23	18
43	17	83	79	73	73	92	64	69	65	72	65	69	18	19	19	22	18



Time	Chan 40	Chan 41	Chan 42	Chan 43	Chan 44	Chan 45	Chan 46	Chan 47	Chan 48	Chan 49	Chan 50	Chan 51	Chan 52	Chan 53	Chan 54	Chan 55	Chan 56
min	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	kw/m <sup>2</sup>	kw/m <sup>2</sup>
0	17	17	18	17	17	17	18	17	19	19	19	19	19	19	19	0.6	0.4
1	18	18	18	56	18	18	19	19	27	19	19	19	20	19	15	0.5	0.4
2	24	35	19	57	18	22	28	19	29	19	20	19	20	19	17	0.6	0.5
3	24	49	19	59	18	24	25	18	28	19	20	19	20	19	17	0.6	0.5
4	32	59	22	61	18	27	23	19	26	19	21	19	20	21	12	0.6	0.5
5	36	60	27	67	18	29	23	19	24	20	21	19	20	21	17	0.6	0.5
6	41	59	29	63	18	31	22	18	23	20	21	19	20	21	13	0.6	0.5
7	43	59	28	61	19	30	22	18	23	20	21	19	20	21	9	0.6	0.5
8	44	58	29	61	19	30	22	18	23	21	21	19	20	21	24	0.6	0.5
9	45	56	30	60	21	33	23	19	23	22	22	20	22	23	51	0.6	0.5
10	47	52	31	63	22	33	24	19	24	22	22	20	22	23	63	0.6	0.5
11	47	51	31	64	23	32	24	18	24	23	23	21	23	23	71	0.6	0.5
12	49	52	32	65	25	34	25	19	25	24	24	22	25	23	69	0.6	0.5
13	53	52	32	66	27	37	26	20	26	26	26	23	26	24	58	0.6	0.5
14	59	50	32	67	29	44	27	21	28	27	29	24	28	25	63	0.6	0.5
15	83	49	33	66	31	53	29	24	30	29	33	26	30	27	106	0.6	0.5
16	96	50	34	66	33	59	30	27	32	31	36	28	33	29	108	0.6	0.5
17	120	50	34	66	35	63	32	25	34	33	38	30	34	31	77	0.6	0.5
18	143	50	35	68	37	69	33	26	36	34	40	31	36	32	82	0.6	0.5
19	167	50	36	72	39	79	35	27	38	36	43	33	38	34	112	0.6	0.5
20	185	51	38	74	41	95	36	31	40	38	47	34	40	36	131	0.6	0.5
21	206	53	40	76	44	106	38	32	42	39	51	36	42	39	223	0.6	0.5
22	222	55	43	78	46	114	40	33	44	41	54	38	44	42	300	0.6	0.5
23	239	58	47	81	48	120	42	42	46	43	58	41	47	45	431	0.6	0.5
24	252	60	49	83	50	126	45	39	49	46	62	44	51	49	502	0.7	0.6
25	271	61	51	86	53	134	48	38	52	49	66	47	54	55	431	0.7	0.6
26	287	62	53	89	55	141	52	40	57	52	70	50	58	60	58	0.7	0.6

Time	Chan 40	Chan 41	Chan 42	Chan 43	Chan 44	Chan 45	Chan 46	Chan 47	Chan 48	Chan 49	Chan 50	Chan 51	Chan 52	Chan 53	Chan 54	Chan 55	Chan 56
min	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	kw/m <sup>2</sup>	kw/m <sup>2</sup>
27	312	64	55	92	58	156	55	43	64	55	76	53	62	64	61	0.7	0.6
28	274	65	57	100	61	158	59	44	75	58	80	56	66	68	63	0.7	0.6
29	285	66	59	106	64	158	64	47	82	62	84	59	76	71	65	0.7	0.6
30	304	68	62	109	66	165	67	47	86	65	88	62	82	74	67	0.7	0.6
31	353	70	64	111	69	176	72	47	88	69	93	65	85	77	70	0.7	0.6
32	333	72	66	112	73	185	77	51	91	74	98	69	87	81	72	0.7	0.6
33	354	76	69	115	77	189	81	57	93	83	104	72	89	84	75	0.7	0.6
34	445	79	72	120	81	198	87	61	93	87	110	76	91	87	78	0.8	0.7
35	258	86	77	127	86	151	91	58	93	89	113	80	91	90	84	0.8	0.6
36	276	91	83	134	90	142	92	58	86	91	112	84	91	95	89	0.8	0.7
37	311	98	87	140	91	142	94	57	87	92	114	90	93	101	93	0.7	0.6
38	333	106	89	143	93	148	96	51	89	95	120	97	96	107	98	0.8	0.7
39	186	64	70	87	62	118	79	36	44	65	92	81	71	80	77	0.7	0.7
40	27	23	40	26	28	64	48	21	24	31	52	43	36	42	36	0.7	0.7
41	18	18	29	19	21	38	32	19	22	23	35	29	25	28	26	0.8	0.7
42	18	18	24	18	20	27	26	19	22	21	28	24	22	23	22	0.7	0.7
43	18	17	23	18	20	23	23	20	22	21	26	23	21	22	21	0.7	0.7

## Appendix 3 – Sampling sheet

### Protocol on Sampling

Manufacturer: *Pyroplex Ltd*

Product(s) to be sampled: *10x4 + 15x4 graphite door seals, 30049 glazing.*

Place of sampling: *Pyroplex, Droitwich, Worcestershire*  
*WR9 9BG*

Parties present: *Rob Newman, Andy Walsh*

Date of sampling: *2/7/13*

**BMTRADA**

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testing@bmtrada.com  
www.bmtradagroup.com

	Description of sample	Quantity and size of sample	Markings applied to the product
Ref	<i>15x4 Fire only 8700</i>	<i>150 No x 2.1m long samples</i>	<i>Box signed + dated + photos across seal.</i>
Ref	<i>15x4 triple fin 30141 seals</i>	<i>90 No x 2.1m long samples</i>	<i>Box signed + dated + photos across seal.</i>
Ref	<i>Pyroplex 4 hose market (white) 2 WT310PY Batch No 0305135652 Ex date 11/2014</i>	<i>25 x 310 ml cartridges 2 No boxes</i>	<i>box signed + dated + photos across seal.</i>
	<i>10074x</i>	<i>1 x 25 M coil</i>	<i>Batch No. 014 18/9/2012</i>
	<i>10148x</i>	<i>1 x 25 M coil</i>	<i>Batch No. 083 26/8/2010</i>
	<i>30049</i>	<i>2 x 100 M coil</i>	<i>Batch No 076 04/5/2013</i>

Signed: Prior witness

Position: *Business Developments - Fire*

Date: *2/7/13*

Notified Body ID: 1224

*Boxes tagged  
Signed  
across seals*

The legal validity of this report can only be claimed on presentation of the complete report.

## Protocol on Sampling

**Manufacturer:**

**Product(s) to be sampled:**

**Place of sampling:**

**Parties present:**

**Date of sampling:**

## BMTRADA

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Hughenden Valley, High Wycombe  
Buckinghamshire  
HP14 4ND, UK

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F: +44 (0) 1494 564895

Testing@bmtrada.com

www.bmtradagroup.com

Description of sample	Quantity and size of sample	Markings applied to the product
15X4 Ref 8712	90Ng 2.1m long seals Fire + smother	taped + signed across top + photoed
10X4 Ref 8500	70Ng 2.1m long seals Fire + smother	" "

**Signed: Prior witness**

**Position:** Business Development - Fire

**Date:** 2/7/13

**Notified Body ID: 1224**

**Chiltern International Fire Ltd**  
Registered Office: Chiltern House, Stocking Lane, Hughenden Valley,  
High Wycombe, Buckinghamshire, HP14 4ND, UK  
Registered in England No. 3125010

The legal validity of this report can only be claimed on presentation of the complete report.

**BM TRADA provides independent certification, testing, inspection, training and technical services around the world.** We help customers large and small to prove their business and product credentials and to improve performance and compliance. With an international presence across many industry sectors, we offer a special focus and long history of technical excellence in supply chain certification, product certification and testing, and technical services to the timber, building, fire and furniture industries.



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