



**CONFIDENTIAL**

**Report: Chilt/RF11054 Revision A**

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

**Test conducted in accordance with  
BS 476: Part 20/22: 1987**

**Test date: 13<sup>th</sup> December 2011**

**Page 1 of 21**



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**Prepared for: Firestop Manufacturing  
Ltd  
4 Wyvern Buildings  
Grove Industrial Estate  
Dorchester  
Dorset  
DT1 1ST**



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## 1 Summary of performance

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

|                                                                                               |                          |                               |                           |
|-----------------------------------------------------------------------------------------------|--------------------------|-------------------------------|---------------------------|
| <b>Results:</b><br><br><b>Fire resistance test in accordance with BS476: Part 20/22: 1987</b> | <b>Times to failure:</b> |                               |                           |
|                                                                                               |                          | <b>Doorset A</b>              | <b>Doorset B</b>          |
|                                                                                               | <b>Integrity</b>         | <b>66 (sixty six) minutes</b> | <b>50 (fifty) minutes</b> |
|                                                                                               | <b>Insulation</b>        | <b>66 (sixty six) minutes</b> | <b>50 (fifty) minutes</b> |

|                                                                                     |                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>Summary of specimen:</b><br><br><b>2No single leaf single acting doorsets.</b><br><br>Doorset A – Leaf size:<br>2135mm high x 926mm wide x 54mm thick<br><br>Doorset B – Leaf size:<br>2135mm high x 926mm wide x 54mm thick |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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## 2 Introduction

The door blanks were identified as Falcon Panel Products Ltd Streborb 54 doorblanks and were sourced and purchased 'off the shelf' for test by Chiltern International Fire Ltd (CIFL) on the clients behalf, during November 2011. (CIFL) conducted further work to produce the doorsets as follows:

|           |                                                                                                 |           |                                                                                                  |
|-----------|-------------------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------|
| Doorset A | Hardwood door frame<br>Hardwood lipping<br>Intumescent materials<br>Hardware<br>Overhead closer | Doorset B | Hardwood door frame<br>Hardwood lippings<br>Intumescent materials<br>Hardware<br>Overhead closer |
|-----------|-------------------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------|

CIFL constructed a timber stud/plasterboard clad partition and installed the doorsets into the partition.

## 3 Specification

Details of the specimen are shown in the Appendix.

### 3.1 Door leaf

The leaf of both doorsets measured 2135mm high x 926mm wide x 54mm thick. Both leaves were hung opening towards the furnace, which is considered to be the most onerous direction based on experience of testing doors of similar construction. It is therefore the opinion of the laboratory that the test results can be applied to doors opening in either direction. The results of this test were obtained where doorset A was fitted with a disengaged latch and doorset B was fitted with disengaged deadlock.

### 3.2 Door perimeter gaps

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 4 of the Appendix.

### 3.3 Closer forces

Measured in accordance with FTSG Resolution No 63.

|           | Opening force (Nm) | Closing force (Nm) |
|-----------|--------------------|--------------------|
| Doorset A | 49                 | 9                  |
| Doorset B | 55                 | 28                 |

#### 4 Description of construction (refers to Figures 1 to 4 of the appendix)

**Door leaf – both doorsets – were identified as Falcon Panel Products Ltd Strebord 54 doorblanks**

|                                | Material                                        | Dimensions (mm) | Density (kg/m <sup>3</sup> ) | Moisture (% w/w) | Key to figures |
|--------------------------------|-------------------------------------------------|-----------------|------------------------------|------------------|----------------|
| Stiles and rails               | None fitted                                     | -               | -                            | -                | -              |
| Core                           | Falcon Panel Products Strebord 54 particleboard | 54 thick        | 630-635*                     | 6.8-7.9          | 1              |
| Adhesive                       | Lippings                                        | Polyurethane    | -                            | -                | -              |
| Lippings – vertical edges only | Sapele                                          | 8 thick         | 640**                        | 7.7-8.3          | 2              |

\* Door manufacturers stated density

\*\* Nominal density

#### Door frame – both doorsets

|                                                       | Species/type                                                                                | Dimensions (mm)                      | Density (kg/m <sup>3</sup> ) | Moisture (% w/w) | Key to figures |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------------------------|------------------------------|------------------|----------------|
| Head & jambs                                          | Sapele                                                                                      | 70 wide x 32 thick                   | 640**                        | 7.7-8.5          | 3              |
| Head to jamb jointing detail                          | Mortice and tenon – screwed                                                                 | -                                    | -                            | -                | -              |
| Stops – planted (pinned)                              | Sapele                                                                                      | 12 thick x 12 wide                   | 640**                        | 6.1-7.7          | 4              |
| Frame to supporting construction fire stopping detail | Tightly packed mineral fibre capped with Firestop acrylic intumescent sealant on both faces | Nominally 5-10mm wide x 30 - 40 deep | -                            | -                | -              |
| Frame to supporting construction fixing detail        | 4 No. steel wood screws per jamb                                                            | 100 long                             | -                            | -                | -              |
| Architrave                                            | Sapele                                                                                      | 18 thick                             | 640**                        | 8.1-9.5          | -              |
| Threshold                                             | Non combustible                                                                             | -                                    | -                            | -                | -              |

\*\* Nominal density

## Intumescent materials – doorset A

|                                | Make/type                                                                             | Size (mm) | Location                                              | Key to figures |
|--------------------------------|---------------------------------------------------------------------------------------|-----------|-------------------------------------------------------|----------------|
| Frame reveal – head and jambs* | Firestop Manufacturing Ltd<br>Plain Fire Seal<br>Product reference FS131              | 20 x 4    | Fitted 17mm from the exposed face in the frame reveal | 5              |
| Leaf edges                     | None fitted                                                                           | -         | -                                                     | -              |
| Smoke seal                     | Firestop Manufacturing Ltd<br>Acoustic Twin Blade 35 seal<br>Product reference FS1400 | 11 x 5    | Fitted in the frame reveal and upstand of the stop    | 6              |

\* All frame reveal seals were sampled and signed by Simon Beer of BM Trada Certification on 18/04/11. Sampling Sheets held on file by CIFL.

## Intumescent interruptions and hardware protection – doorset A

|                       | Make/type                                                                           | Size (mm)                           | Location                                          |
|-----------------------|-------------------------------------------------------------------------------------|-------------------------------------|---------------------------------------------------|
| Around hinges         | Fully interrupted                                                                   | -                                   | Hinge blade fully interrupts seal in frame reveal |
| Under hinge blade     | Firestop Manufacturing Ltd<br>intumescent sheet material<br>Product reference FS318 | 0.8 thick                           | Fitted under the hinge blade on frame and leaf    |
| Around latch body     | Firestop Manufacturing Ltd<br>intumescent sheet material<br>Product reference FS318 | 0.8 thick                           | Fitted around the body of the latch               |
| 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                       |
| Under drop down seal  | Firestop Manufacturing Ltd<br>intumescent sheet material<br>Product reference FS318 | 0.8 thick                           | Fitted lining the drop down seal rebate           |
| Around eye viewer     | Firestop Manufacturing Ltd<br>intumescent sheet material<br>Product reference FS318 | 0.8 thick                           | Fitted lining the eye viewer cut out aperture     |
| Letter plate aperture | Manufacturers supplied<br>intumescent kit                                           | 1225 long<br>x 40 wide<br>x 2 thick | Fitted as per the manufacturer's instructions     |

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## Intumescent materials – doorset B

|                                | Make/type                                                                      | Size (mm) | Location                                                                                         | Key to figures |
|--------------------------------|--------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------|----------------|
| Frame reveal – head and jambs* | 2No. Firestop Manufacturing Ltd Plain Fire Seals<br>Product reference FS116    | 15 x 4    | Fitted 10mm apart, with the 1 <sup>st</sup> seal 7.5mm from the exposed face in the frame reveal | 7              |
| Leaf edges                     | None fitted                                                                    | -         | -                                                                                                | -              |
| Smoke seal                     | Firestop Manufacturing Ltd Acoustic Corner Seal 39<br>Product reference FS1404 | 11 x 11   | Fitted in the frame reveal and upstand of the stop                                               | 8              |

\* All frame reveal seals were sampled and signed by Simon Beer of BM Trada Certification on 18/04/11. Sampling Sheets held on file by CIFL.

## Intumescent interruptions and hardware protection – doorset B

|                       | Make/type                                                                        | Size (mm)                     | Location                                                                                                                                                     |
|-----------------------|----------------------------------------------------------------------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Around hinges         | Partially interrupted                                                            | -                             | Hinge blade fully interrupts 1 <sup>st</sup> seal and partially interrupts 2 <sup>nd</sup> seal leaving 11mm continuous in the frame reveal                  |
| Under hinge blade     | Firestop Manufacturing Ltd intumescent sheet material<br>Product reference FS318 | 0.8 thick                     | Fitted under the hinge blade on frame and leaf                                                                                                               |
| Around latch body     | Firestop Manufacturing Ltd intumescent sheet material<br>Product reference FS318 | 0.8 thick                     | Fitted around the body of the latch                                                                                                                          |
| Under latch forend    | Interdens                                                                        | 1 thick                       | Fitted under the latch forend                                                                                                                                |
| Around dead bolt keep | Partially interrupted                                                            | -                             | Latch keep partially interrupts both seals in the frame reveal with 7mm of the 1 <sup>st</sup> seal and 8mm of the 2 <sup>nd</sup> seal remaining continuous |
| Under latch keep      | Interdens                                                                        | 1 thick                       | Fitted under the latch keep                                                                                                                                  |
| Under drop down seal  | Firestop Manufacturing Ltd intumescent sheet material<br>Product reference FS318 | 0.8 thick                     | Fitted lining the drop down seal rebate                                                                                                                      |
| Around eye viewer     | None fitted                                                                      | -                             | -                                                                                                                                                            |
| Letter plate aperture | Manufacturers supplied intumescent kit                                           | 1225 long x 40 wide x 2 thick | Fitted as per the manufactures instructions                                                                                                                  |

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## Hardware – doorset A

|                    | Make/type                                                                        | Size (mm)                                    | Location                                                                      | Key to figures |
|--------------------|----------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------|----------------|
| Hinges             | 3No EuroSpec Parliament type hinges<br>Product reference H2N1446/BSS             | 102 x 102 (blade size)                       | Fitted 150mm, 1090mm and 1855mm from the head of the leaf                     | 9              |
| Closer             | Rutland TS3204 Overhead type closer                                              | 220 x 59 (footprint size)                    | Fitted on the exposed face of the leaf as per the manufacturer's instructions | 10             |
| Latch - disengaged | EuroSpec tubular steel mortice latch<br>Product reference TLS 503 0SSS           | 57 x 26 (forend size)<br>57 x 26 (keep size) | Fitted 1000mm from the threshold of the leaf                                  | 11             |
| Furniture          | Aluminium lever type handle                                                      | 100 x 38 (footprint size)                    | Fitted appropriate to the latch                                               | 12             |
|                    | Firestop Manufacturing Ltd Elite letter plate<br>Product reference FS310         | 305 x 70 (overall size)                      | Fitted 1000mm from the threshold of the leaf                                  | 13             |
|                    | Firestop Manufacturing Ltd eye viewer 200°<br>Product reference FS316/SWE1010SSS | Ø22                                          | Fitted 600mm from the head of the leaf                                        | 14             |
|                    | Firestop Manufacturing Ltd 930 Acoustic Plus 51 automatic drop down seal         | 28 high x 15 wide                            | Fitted centrally in the threshold of the leaf                                 | 15             |
|                    | Firestop Manufacturing Ltd Applique 37 drop down seal                            | 40 high x 13 wide                            | Fitted on the unexposed face at the leaf threshold                            | 16             |

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## Hardware – doorset B

|                        | Make/type                                                                   | Size (mm)                                      | Location                                                                      | Key to figures |
|------------------------|-----------------------------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------|----------------|
| Hinges                 | 3No EuroSpec lift off type hinges<br>Product reference H3N1107/13SZP        | 100 x 35 (blade size)                          | Fitted 150mm, 1090mm and 1855mm from the head of the leaf                     | 17             |
| Closer                 | Rutland TS3204<br>Overhead type closer                                      | 220 x 59 (footprint size)                      | Fitted on the exposed face of the leaf as per the manufacturer's instructions | 18             |
| Dead Lock - disengaged | Euro Spec BSEN Deadlock<br>Product reference LDS 5530 SSS                   | 139 x 23 (forend size)<br>150 x 30 (keep size) | Fitted 1000mm from the threshold of the leaf                                  | 19             |
| Furniture              | Firestop Manufacturing Ltd Standard letter plate<br>Product reference FS307 | 305 x 70 (overall size)                        | Fitted 1000mm from the threshold of the leaf                                  | 20             |
|                        | Firestop Manufacturing Ltd eye viewer<br>Product reference FS316/SWE1010SSS | Ø22                                            | Fitted 600mm from the head of the leaf                                        | 21             |
|                        | Firestop Manufacturing Ltd 930 TOP 37 automatic drop down seal              | 28 high x 13 wide                              | Fitted centrally in the threshold of the leaf                                 | 22             |

## 5 Test conditions

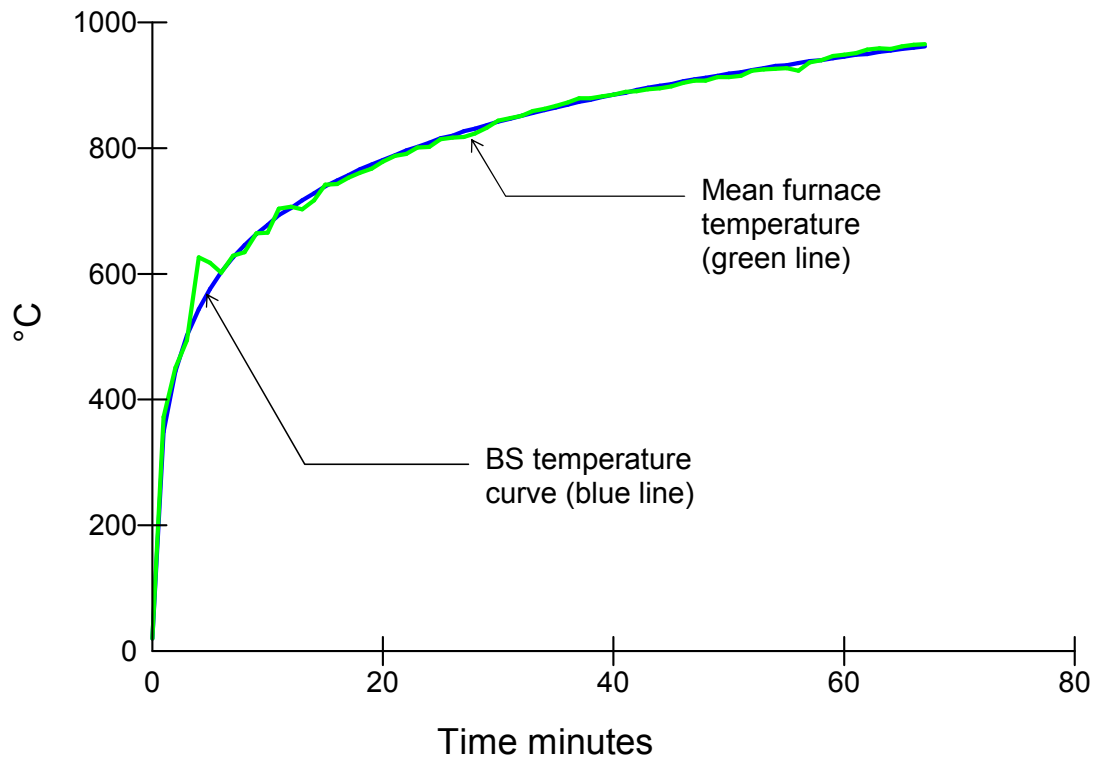
- 5.1 Where areas of the test specification are ambiguous or open to interpretation the Fire Test Study Group Resolutions No's 51, 63, 70, 71, 72 and 78 have been followed (further specific details are available on request). These Resolutions provide basis of common agreements between the fire test laboratories which are members of this Group.
- 5.2 The ambient temperature of the test area at commencement of test was 11°C.
- 5.3 After the first 5 minutes of the test, the furnace pressure was maintained at  $-4.25 \pm 3$  Pa with respect to atmosphere, at a point 0.5m from the notional floor level, equating to 0 Pa at a point 1m above the notional floor level.
- 5.4 The furnace was controlled to follow the temperature/time relationship specified in BS 476: Part 20: 1987 as closely as possible, using the average of nine thermocouples suitably distributed within the furnace. The temperatures recorded are shown graphically in Section 6.1.
- 5.5 The temperature of the unexposed face was monitored by means of 5 thermocouples fixed to the surface of each door leaf and 3 thermocouples attached to each door frame, one at midheight on each jamb and one centrally located above the leaf on the door frame head. An additional thermocouple was fixed to the letter plate of both leaves.

The thermocouple positions are shown in Figure 4 of the appendix. The average temperature of the door leaf and maximum temperature of the doorset are shown graphically in Section 6.2.

## 6 Test results

The following data and observations were recorded during the test.

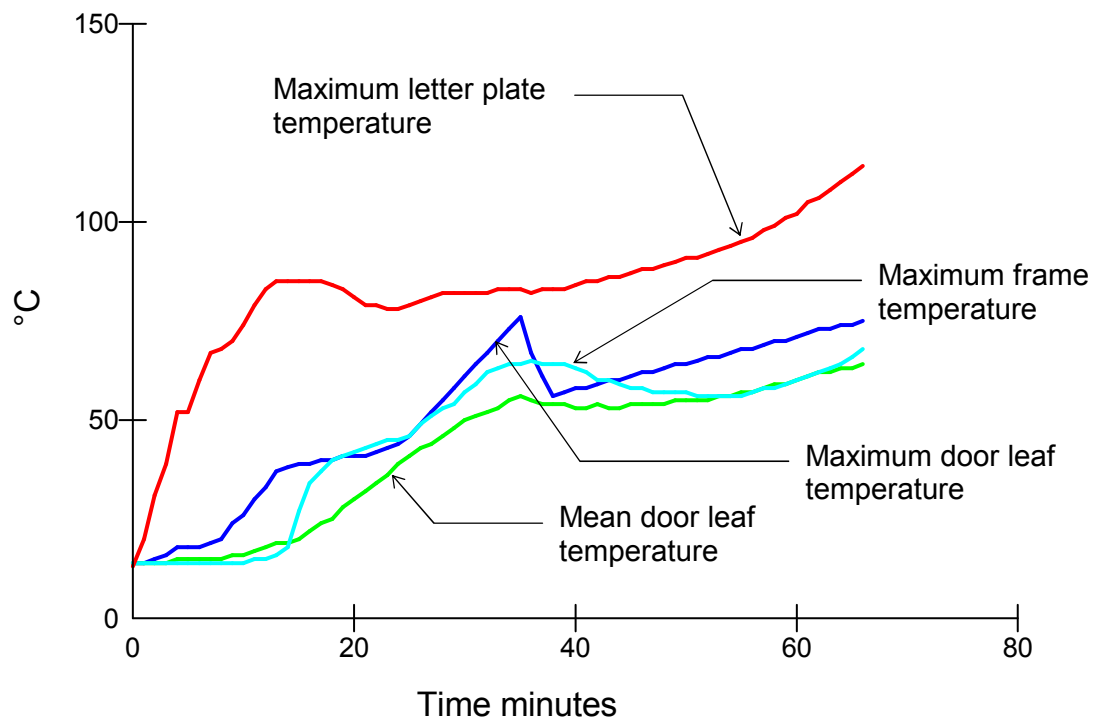
### 6.1 Furnace temperature curve



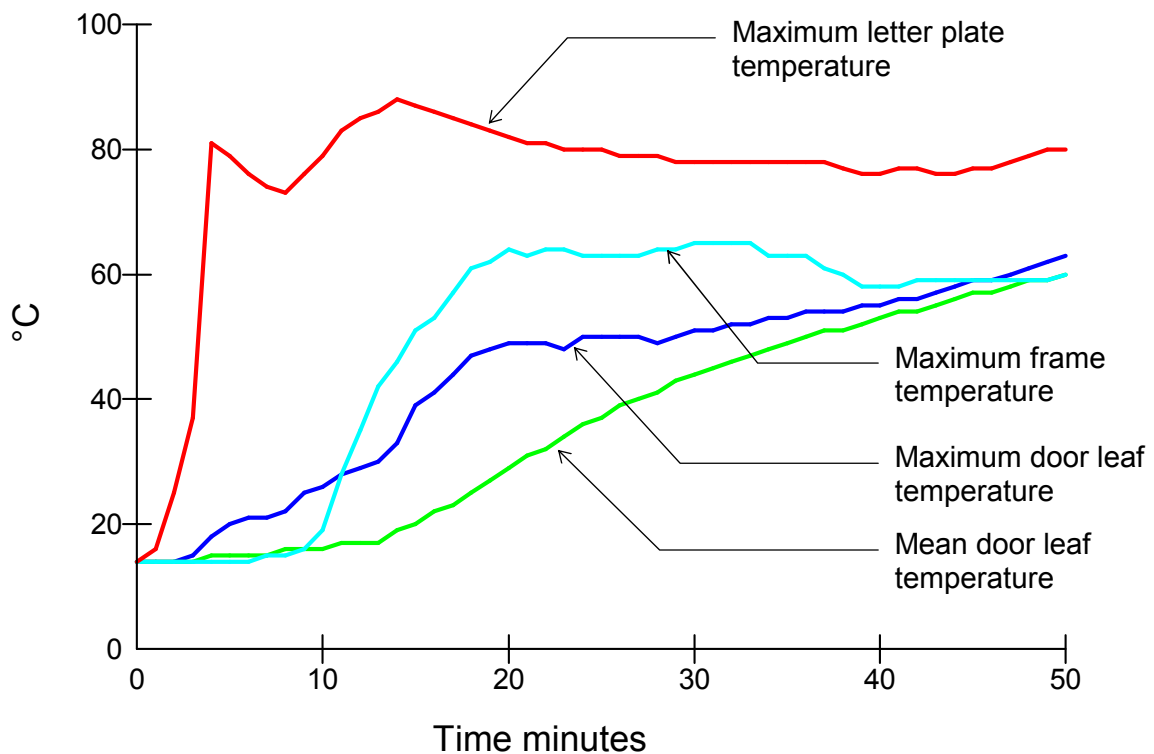
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## 6.2 Unexposed face temperature curves

Doorset A



Doorset B



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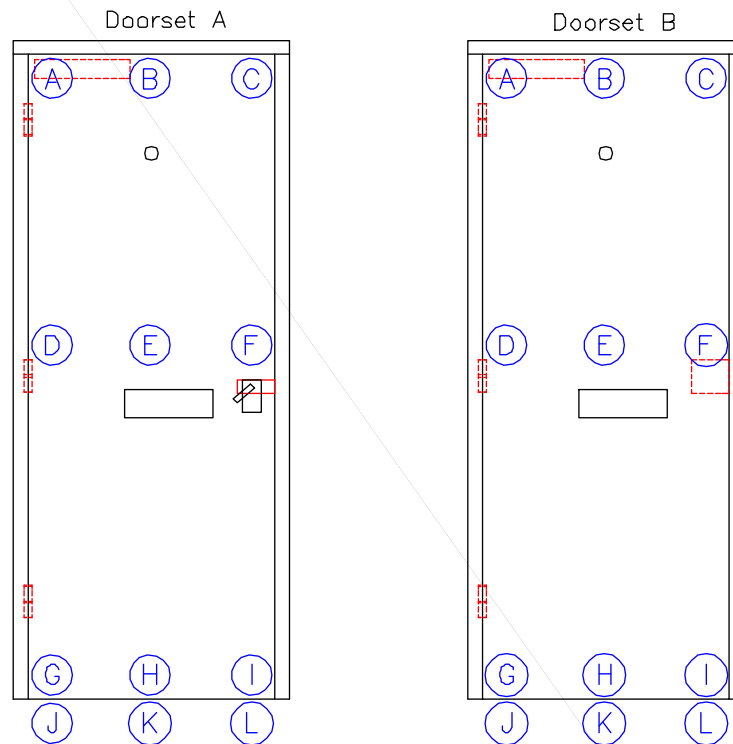
### 6.3 Door distortion data

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.

J, K and L give vertical movement of the door, a negative reading indicates that the door has dropped.



**Doorset A (hung on the left and opening towards the furnace)**

| Time | A | B  | C  | D  | E   | F  | G  | H  | I | J  | K  | L  |
|------|---|----|----|----|-----|----|----|----|---|----|----|----|
| 15   | 2 | 2  | 4  | -1 | -4  | 0  | 0  | 0  | 2 | 0  | -2 | -1 |
| 30   | 5 | 0  | 8  | -4 | -9  | -6 | 0  | -2 | 2 | -2 | -4 | -2 |
| 45   | 5 | -1 | 9  | -3 | -12 | -2 | -2 | -7 | 0 | -3 | -4 | -3 |
| 60   | 6 | -6 | 12 | -8 | -28 | -4 | -3 | -8 | 1 | -3 | -7 | -4 |

**Doorset B (hung on the left and opening towards the furnace)**

| Time | A | B  | C  | D  | E   | F  | G | H  | I  | J  | K   | L  |
|------|---|----|----|----|-----|----|---|----|----|----|-----|----|
| 15   | 3 | 2  | 5  | -2 | -5  | -1 | 1 | 3  | 7  | -1 | -6  | 3  |
| 30   | 4 | 2  | 8  | -4 | -10 | -1 | 2 | 2  | 11 | -3 | -9  | 1  |
| 45   | 7 | 0  | 11 | -4 | -14 | -1 | 0 | 0  | 10 | -4 | -10 | 1  |
| 60   | 7 | -5 | 15 | -8 | -29 | -2 | 0 | -7 | 10 | -6 | -12 | -1 |

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## 6.4 Observations

All comments relate to the unexposed face unless otherwise specified.

| Time<br>(minutes) | Comments                                                                                                                                                                                              |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 00.00             | Test started.                                                                                                                                                                                         |
| 04.43             | Doorset A, there is smoke issuing from the letter plate.                                                                                                                                              |
| 05.00             | Doorset B, there is smoke issuing from the letter plate.                                                                                                                                              |
| 08.20             | Both doorsets, there is smoke issuing from the perimeter of the eye viewer.                                                                                                                           |
| 11.31             | Both doorsets, there is smoke issuing from the top closing corners of the leaves.                                                                                                                     |
| 12.21             | Doorset A, there is discolouration of the leaf above the letter plate.<br>Doorset B, there is discolouration of the leaf above the letter plate and of the leaf above the eye viewer.                 |
| 15.30             | Both doorsets, there is a decrease in the level of smoke issuing from the letter plates.                                                                                                              |
| 18.48             | Doorset A, there is discolouration and smoke issuing from the top closing corner and the top hanging corner of the leaf.<br>Doorset B, there is discolouration at the top closing corner of the leaf. |
| 21.47             | Doorset B, there is smoke issuing from the top hanging corner of the leaf.                                                                                                                            |
| 30.31             | Doorset B, there is discolouration of the seal on the stop at the top closing corner off the leaf. It is starting to fall out due to distortion at the top closing corner.                            |
| 37.00             | Both doorsets, there is smoke issuing from the top hinge position.                                                                                                                                    |
| 39.40             | Both doorsets, there is discolouration at the top hinge position and the top hanging corners of the leaves.                                                                                           |
| 40.43             | Doorset B, there is smoke issuing from approximately 150mm up from the bottom closing corner of the leaf.                                                                                             |
| 42.34             | Both doorsets, the letter plates have opened slightly due to intumescent expanding.<br>Doorset B, there is an increase in the level of discolouration and smoke issuing from the eye viewer.          |
| 44.14             | Doorset B, there is smoke issuing from the bottom hanging corner of the leaf.                                                                                                                         |

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- 48.28 Doorset A, the outer cover on the unexposed face drop down seal has fallen off.
- 49.17 Doorset B, the letter plate has moved away from the leaf by approximately 15mm.
- 50.09 Doorset B, the letter plate has fallen off causing continuous flaming thereby constituting **integrity failure**.
- 53.58 Doorset A, there is a glow visible at the top hanging corner approximately 100mm down.
- 56.34 Doorset A, there is discolouration and smoke issuing from the middle hinge position.
- 57.16 Doorset A, a cotton pad integrity test was performed at the top hanging corner of the leaf, no failure.
- 57.47 Doorset B, there is a glow visible at the top of the eye viewer.
- 58.25 Doorset A, a cotton pad integrity test was performed at the top hanging corner of the leaf, no failure.  
The glow has spread down to the top hinge position.
- 59.20 Doorset B, there is a glow visible at the top closing corner of the leaf.
- 59.45 Doorset A, a cotton pad integrity test was performed at the top hinge position, no failure.
- 61.45 Doorset B, a cotton pad integrity test was performed at the top closing corner of the leaf, no failure.  
There is a glow visible at the top hinge position.
- 63.30 Doorset B, there is continuous flaming at the eye viewer thereby constituting **further integrity failure**.
- 65.20 Doorset A, a cotton pad integrity test was performed at the top hinge position, no failure.  
There is a glow visible at the top closing corner of the leaf.
- 66.00 Doorset B, there is continuous flaming at the top hinge position thereby constituting **further integrity failure**.
- 66.20 Doorset A, there is continuous flaming at the top hinge position thereby constituting **integrity failure**.
- 67.30 Test terminated.

## 6.5 Times to failure

When tested in accordance with BS 476: Part 22: 1987, Method 6, determination of fire resistance of fully insulated doorsets and shutter assemblies, the requirements of the standards were satisfied for the following periods:

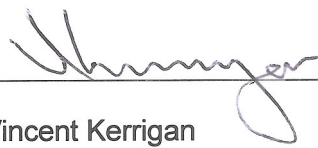
|            | Doorset A              | Doorset B          |
|------------|------------------------|--------------------|
| Integrity  | 66 (sixty six) minutes | 50 (fifty) minutes |
| Insulation | 66 (sixty six) minutes | 50 (fifty) minutes |

## 7 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 4 of the appendix. 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:          | Robert Axe                                                                          | Vincent Kerrigan                                                                      |
| Title:         | Deputy Head Of Section – Fire Resistance                                            | Technical Manager                                                                     |
| Date of issue: |                                                                                     | 13.04.2012                                                                            |

Revision A – changes and additional product references.

## Photographs

### Pre test photographs including Intumescent interruptions due to hardware

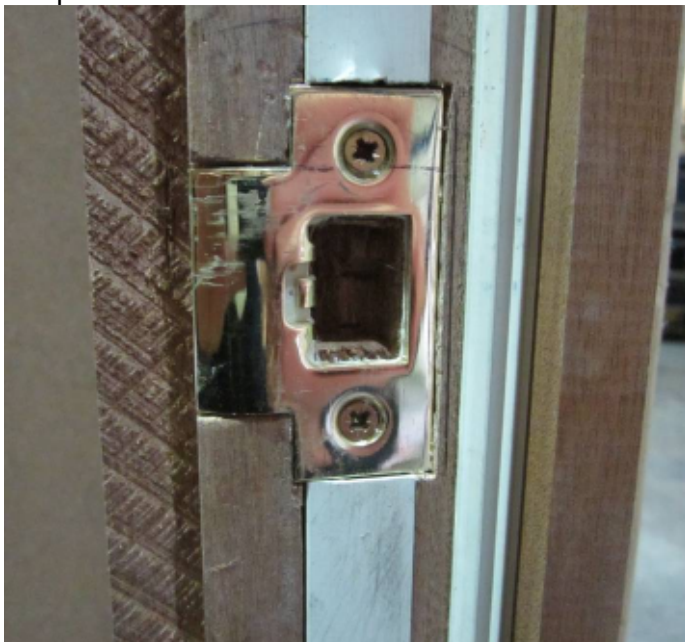
Hinge – doorset A



Hinge – doorset B



Keep – doorset A



Keep – doorset B



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At start of test



After 15 minutes



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After 30 minutes



After 45 minutes



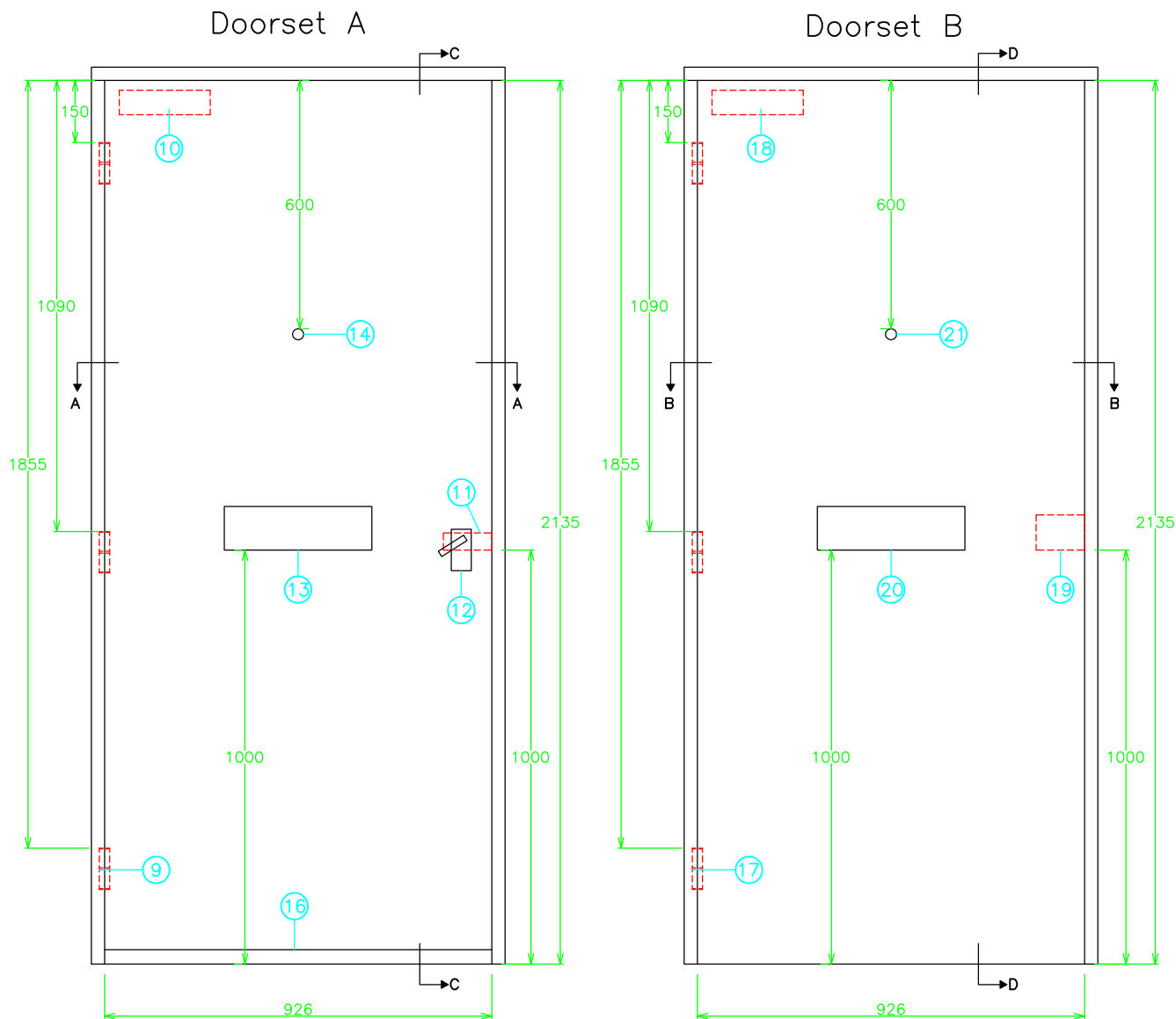
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After 61 minutes



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## Appendix – Figures 1 to 4



Chiltern House, Stocking Lane, Hughenden Valley  
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  
05/01/12

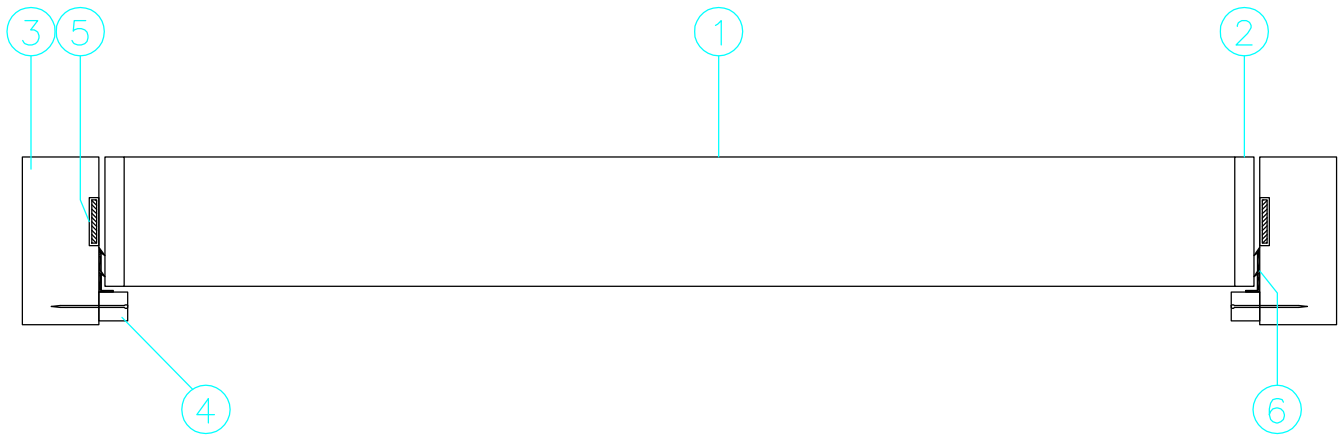
Drawn By  
ARD

Scale  
NTS

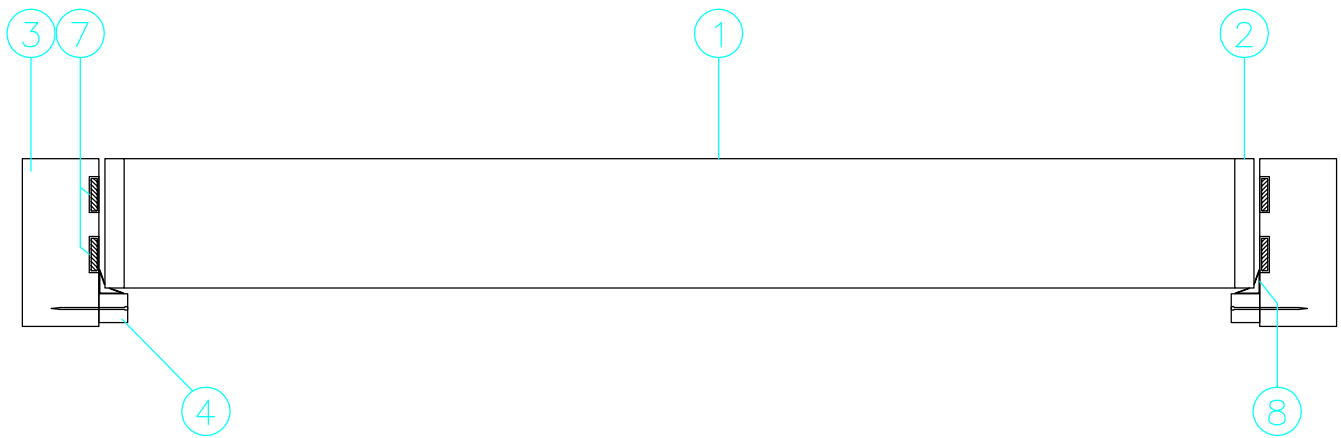
Project No.  
Chilt/RF11054 Rev A

Appendix

Section A-A



Section B-B



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

Title

Horizontal cross-sections

(All dimensions in mm)

Date Drawn

05/01/12

Drawn By

ARD

Scale

NTS

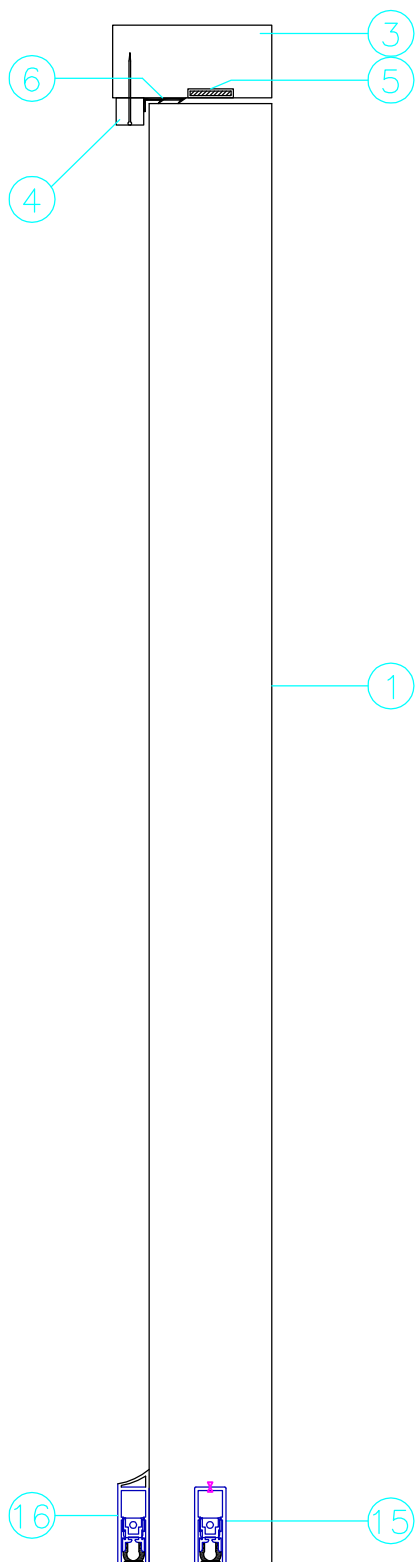
Project No.

Chilt/RF11054 Rev A

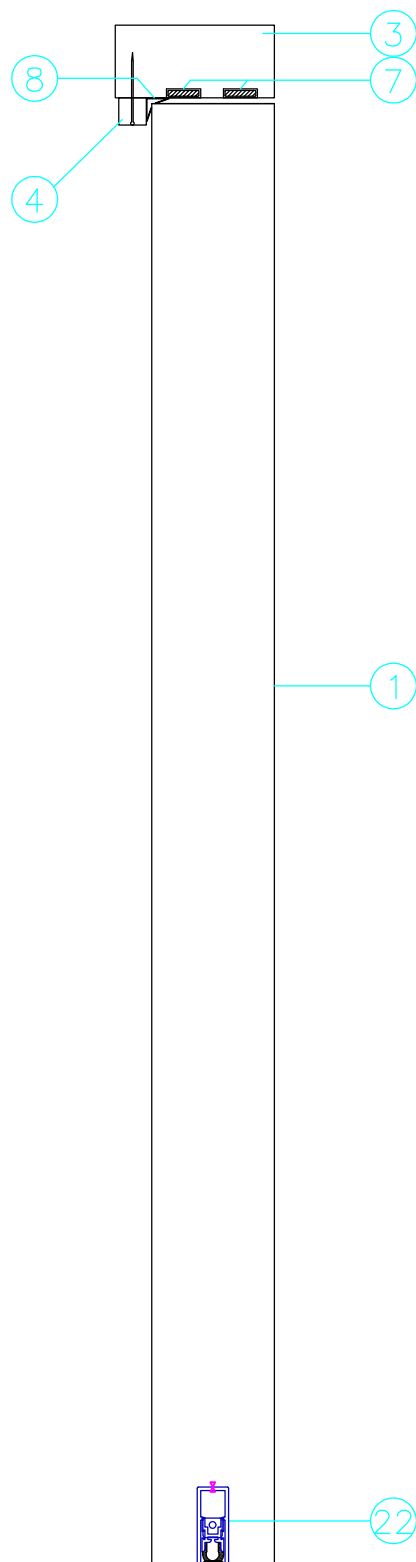
Appendix



Section C—C



Section D—D



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

Title

Vertical cross-sections  
(All dimensions in mm)

Date Drawn

05/01/12

Drawn By

ARD

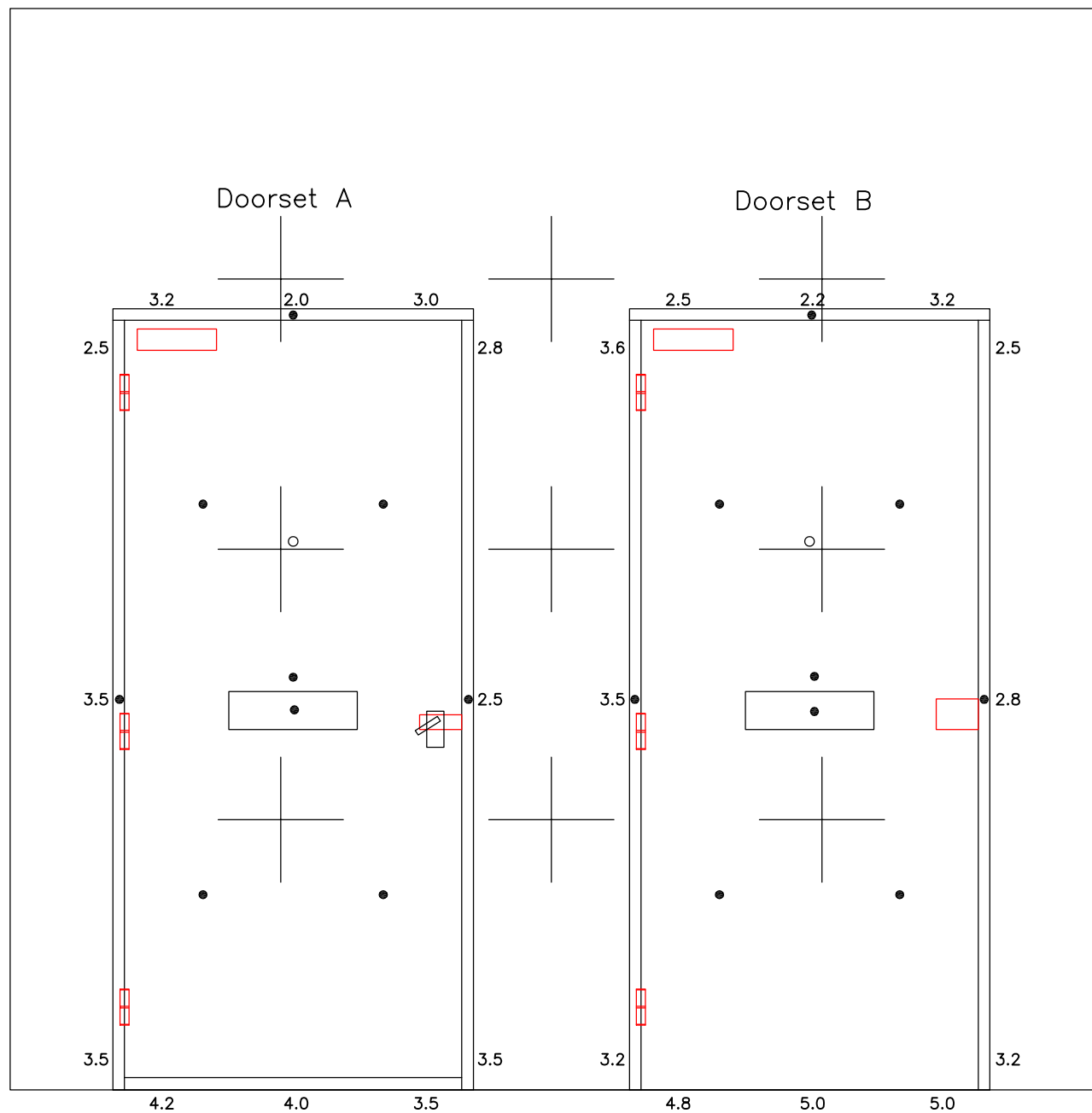
Scale

NTS

Project No.

Chilt/RF11054 Rev A

Appendix



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Title Thermocouple positions and  
door/frame gaps  
(All dimensions in mm)

Date Drawn  
05/01/12

Drawn By  
ARD

Scale  
NTS

Project No.  
Chilt/RF11054 Rev A

Appendix