



United Kingdom  
Testing and  
Certification

# Test Report

The fire resistance performance of a timber,  
single acting single door when tested in  
accordance with BS EN 1634-1:2014+A1:2018

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## Change History

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|            |          |            |               |                       |
|            |          |            |               |                       |

## Signatories

|  |  |   |
|--|--|---|
|  |  |  |
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\*For and on behalf of United Kingdom Testing and Certification.

## Table of Contents

|  |           |
|--|-----------|
| <b>Change History .....</b>                | <b>1</b>  |
| <b>Signatories .....</b>                   | <b>1</b>  |
| <b>Table of Contents .....</b>             | <b>2</b>  |
| <b>1 Executive Summary .....</b>           | <b>4</b>  |
| 1.1 Specimen Summary .....                 | 4         |
| 1.2 Specimen Verification .....            | 4         |
| 1.3 Specimen Installation and Fixity ..... | 4         |
| 1.4 Sampling .....                         | 4         |
| 1.5 Expression of Results .....            | 5         |
| <b>2 Pre-test Examination.....</b>         | <b>6</b>  |
| 2.1 Closing Force Measurement .....        | 6         |
| 2.2 Specimen Conditioning .....            | 6         |
| 2.3 Gap Measurements .....                 | 7         |
| <b>3 Test Specimen Drawings.....</b>       | <b>8</b>  |
| <b>4 Technical Schedule .....</b>          | <b>13</b> |
| 4.1 Specimen.....                          | 13        |
| 4.2 Supporting Construction.....           | 22        |
| 4.3 Specimen Photographs .....             | 24        |
| <b>5 Test Procedure.....</b>               | <b>25</b> |
| 5.1 Heating Conditions .....               | 25        |
| 5.2 Pressure Conditions .....              | 25        |
| 5.3 Unexposed Surface Temperature .....    | 25        |
| 5.4 Radiation .....                        | 25        |
| 5.5 Deflection.....                        | 26        |
| 5.6 Observations.....                      | 27        |
| 5.7 Test Images.....                       | 28        |

|          |  |           |
|----------|--|-----------|
| <b>6</b> | <b>On-going Implications .....</b>                             | <b>33</b> |
| 6.1      | Limitations .....  | 33        |
| 6.2      | Accuracy of Results .....                                      | 33        |
| 6.3      | European Group of Organisations for Fire Testing (EGOLF) ..... | 33        |
| <b>7</b> | <b>Figures .....</b>   | <b>34</b> |
| <b>8</b> | <b>Tables .....</b>  | <b>38</b> |

# 1 Executive Summary

## 1.1 Specimen Summary

The Specimen had overall nominal dimensions of 1908 mm wide by 2080 mm high, incorporating an equal pair of leaves both with overall dimensions of 920 mm wide by 2041 mm high by 48 mm thick. The door leaf was formed from a 44 mm thick graduated density chipboard core with 8 mm thick hardwood lippings to all edges, the construction was then encapsulated on the face returning over the vertical edges with 2 mm thick PVC. The leaf was hung in a PVC encapsulated MDF frame on three steel hinges, the doors assembly incorporated the following hardware:

| Item No. | Description | Reference  |
|----------|-------------|------------|
| 13       | Door Closer | TS9205     |
| 14       | Drop Seal   | STS 422    |
| 15       | Lockset     | ZDL7255RSS |

## 1.2 Specimen Verification

United Kingdom Testing and Certification carried out a comprehensive survey to verify the information provided by the Test Sponsor. This included verifying the materials, dimensions, and manufacturing methodologies of the test specimen wherever possible. Refer to page 13 for full details of this survey.

## 1.3 Specimen Installation and Fixity

The specimen was installed into the test construction by United Kingdom Testing and Certification. The specimen was installed such that the door leaf opened towards the heating conditions at the request of the Test Sponsor. The specimen was unlatched and unbolted prior to the commencement of the test at the request of the test sponsor.

## 1.4 Sampling

United Kingdom Testing and Certification were not involved in the sampling or selection of the test specimen or any of the components. The results obtained during the test apply to the specimens as received and test by United Kingdom Testing and Certification.

## 1.5 Expression of Results

The specimen satisfied the performance criterion specified in BS EN 1634-1:2014+A1:2018 § 11 for the following intervals:

|   |                     |                      |                                       |                      |                      |
|---|---------------------|----------------------|---------------------------------------|----------------------|----------------------|
| <b>Integrity (E)<sup>1</sup></b>              | Sustained Flaming   | 36 minutes           |                                       |                      |                      |
|   | Gap Gauge           | 37 minutes           | No failure*                           |                      |                      |
|   | Cotton Pad          | 33 minutes           |                                       |                      |                      |
| <b>Insulation (I<sub>1</sub>)<sup>2</sup></b> | Specimen            | 29 minutes           | Exceeded maximum temperature criteria |                      | @ TC13               |
|   | Specimen            | 33 minutes           | Due to integrity failure              |                      |                      |
| <b>Insulation (I<sub>2</sub>)<sup>3</sup></b> | Discrete Area       | 33 minutes           | Due to integrity failure              |                      |                      |
|   |                     |                      |                                       |                      |                      |
| <b>Radiation<sup>4</sup></b>                  | 5 kW/m <sup>2</sup> | 10 kW/m <sup>2</sup> | 15 kW/m <sup>2</sup>                  | 20 kW/m <sup>2</sup> | 25 kW/m <sup>2</sup> |
|   | 37 minutes          | 37 minutes           | 37 minutes                            | 37 minutes           | 37 minutes           |

\*The test was discontinued after a period of 37 minutes.

<sup>1</sup> The time(s) in completed minutes for which the test specimen(s) continues to maintain its separating function without: a) causing ignition to the cotton pad applied in accordance with BS EN 1363-1:2020 § 10.4.5.2 b) permitting the penetration of a gap gauge as specified in EN 1363-1:2020 § 10.4.5.3 c) resulting in sustained flaming.

<sup>2</sup> The time(s) in completed minutes for which the test specimen(s) continues to maintain its separating function without developing temperatures on its unexposed surface which increase at the locations specified in BS EN 1634-1:2014+A1:2018 § 9.1.2.2, 9.1.2.3, 9.1.2.4 and the roving thermocouple above the initial average temperature by more than 180°C.

<sup>3</sup> The time(s) in completed minutes for which the test specimen(s) continues to maintain its separating function without developing temperatures on its unexposed surface which: a) increase the average temperature above the initial average temperature by more than 140 °C; b) increase at any location (including the roving thermocouple) above the initial average temperature by more than 180°C with the exception that the limit for temperature rise for any frame member or transom member adjacent to the leaf/leaves of the doorset or openable window shall be 360°C.

<sup>4</sup> BS EN 1363-2: 1999 requires that the time for the measured radiation to exceed 5, 10, 15, 20 and 25 kW/m<sup>2</sup> is reported.

## 2 Pre-test Examination

### 2.1 Closing Force Measurement

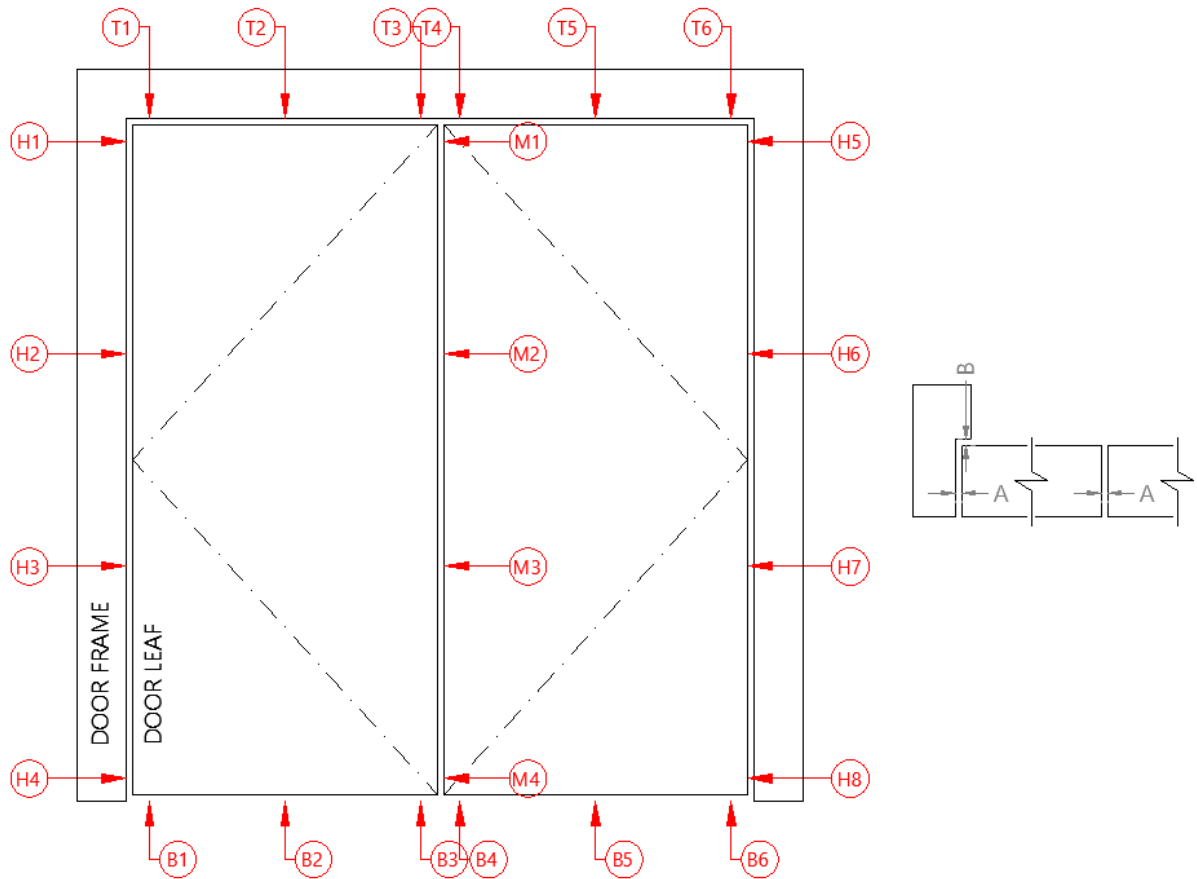
The door closing force was measured and recorded three times. The results are presented below:

| Measurement          | Maximum Recorded Force (N) | Distance from Pivot to Measurement Location (m) | Moment (Nm) |
|----------------------|----------------------------|---|-------------|
| Closing Force Leaf 1 | 40.0                       | 0.800   | 32.00       |
| Opening Force Leaf 1 | 61.2                       | 0.800   | 48.96       |
| Closing Force Leaf 2 | 33.2                       | 0.800   | 26.56       |
| Opening Force Leaf 2 | 54.0                       | 0.800   | 43.2        |

### 2.2 Specimen Conditioning

The specimen's storage, construction, and test preparation took place in the test laboratory over a total, combined time of seven days. Throughout this period, both the temperature and the humidity of the laboratory were measured and recorded as being within a range of from 13.2 °C to 17.2 °C and 54.4 % to 64.9 % respectively.

### 2.3 Gap Measurements



|             | A          | B   |             | A          | B   |             | A          | B           |            |
|-------------|------------|-----|-------------|------------|-----|-------------|------------|-------------|------------|
| H1          | 3.0        | 0.5 | X           | M1         | 2.5 | X           | H5         | 3.5         | 0.2        |
| H2          | 3.0        | 0.6 |             | M2         | 2.8 |             | H6         | 3.7         | 0.2        |
| H3          | 3.0        | 0.3 |             | M3         | 2.4 |             | H7         | 3.6         | 0.1        |
| H4          | 3.0        | 0.2 |             | M4         | 2.5 |             | H8         | 2.8         | 0.2        |
| <b>Mean</b> | <b>3.0</b> | X   | <b>Mean</b> | <b>2.6</b> | X   | <b>Mean</b> | <b>3.4</b> | X           |            |
| <b>Max</b>  | <b>3.0</b> |     | <b>Max</b>  | <b>2.8</b> |     | <b>Max</b>  | <b>3.7</b> |             |            |
| <b>Min</b>  | <b>3.0</b> |     | <b>Min</b>  | <b>2.4</b> |     | <b>Min</b>  | <b>2.8</b> |             |            |
|             | A          | B   |             | A          | B   |             | A          | B           |            |
| T1          | 3.0        | 0.8 | T4          | 3.1        | 0.4 | B1          | 3.4        | B4          | 3.2        |
| T2          | 3.3        | 0.2 | T5          | 3.0        | 0.4 | B2          | 3.6        | B5          | 3.4        |
| T3          | 3.3        | 0.6 | T6          | 3.6        | 0.5 | B3          | 2.9        | B6          | 3.9        |
| <b>Mean</b> | <b>3.2</b> | X   | <b>Mean</b> | <b>3.2</b> | X   | <b>Mean</b> | <b>3.3</b> | <b>Mean</b> | <b>3.5</b> |
| <b>Max</b>  | <b>3.3</b> |     | <b>Max</b>  | <b>3.6</b> |     | <b>Max</b>  | <b>3.6</b> | <b>Max</b>  | <b>3.9</b> |
| <b>Min</b>  | <b>3.0</b> |     | <b>Min</b>  | <b>3.0</b> |     | <b>Min</b>  | <b>2.9</b> | <b>Min</b>  | <b>3.2</b> |



### 3 Test Specimen Drawings

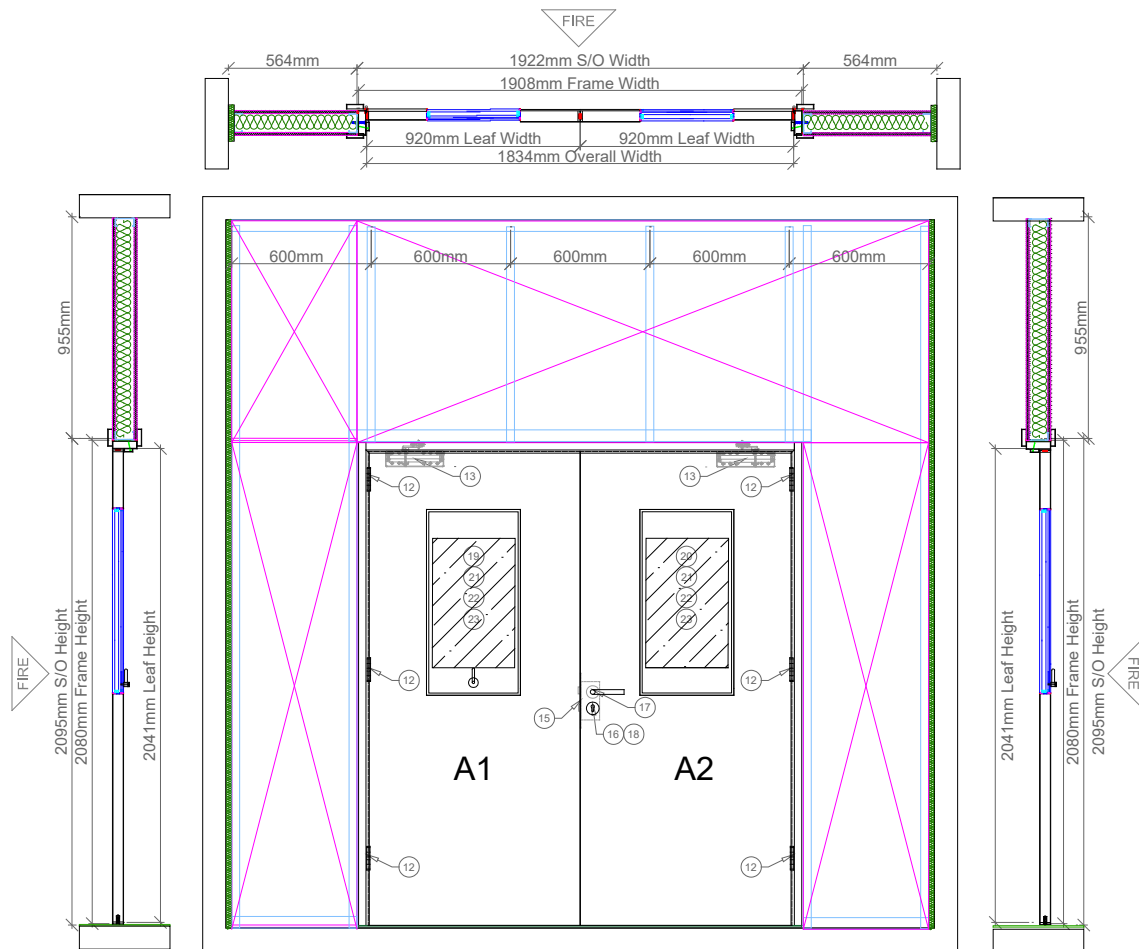


Figure 1 - General arrangement of test construction viewed from the unexposed surface

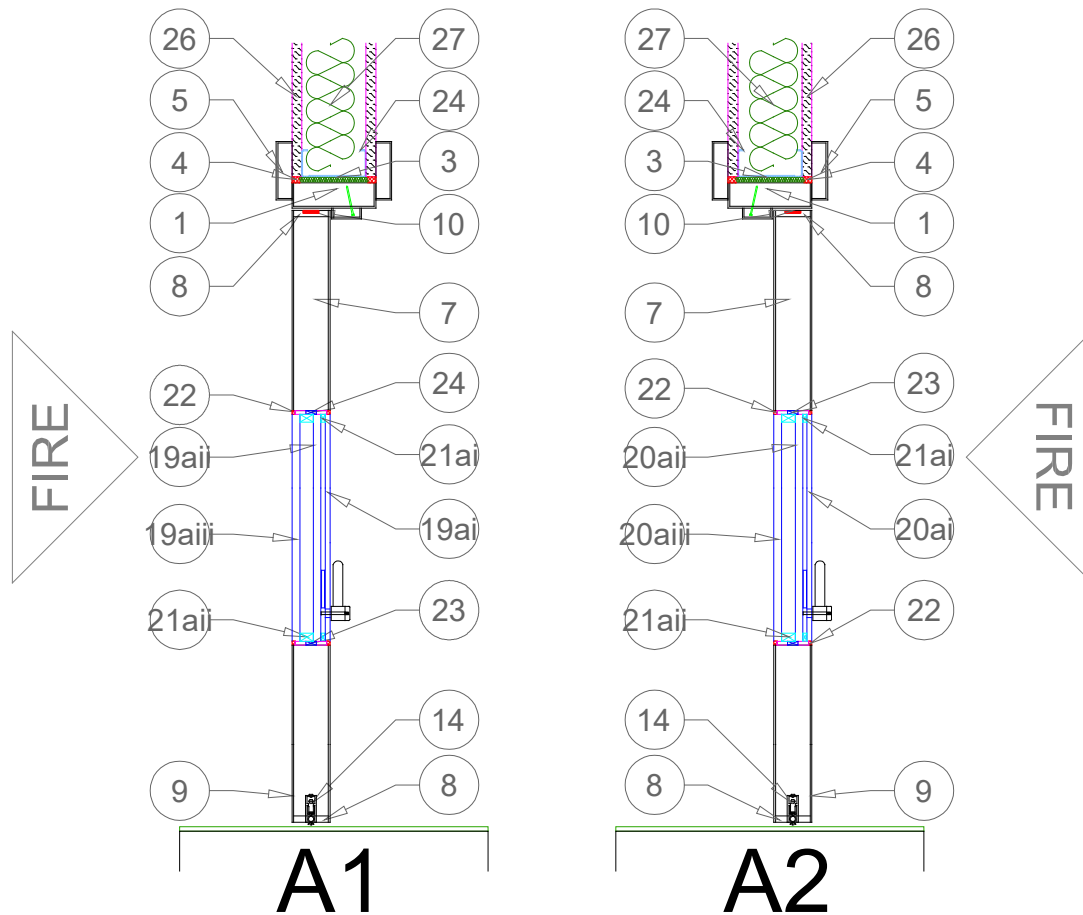


Figure 2 - Typical vertical section through the specimen

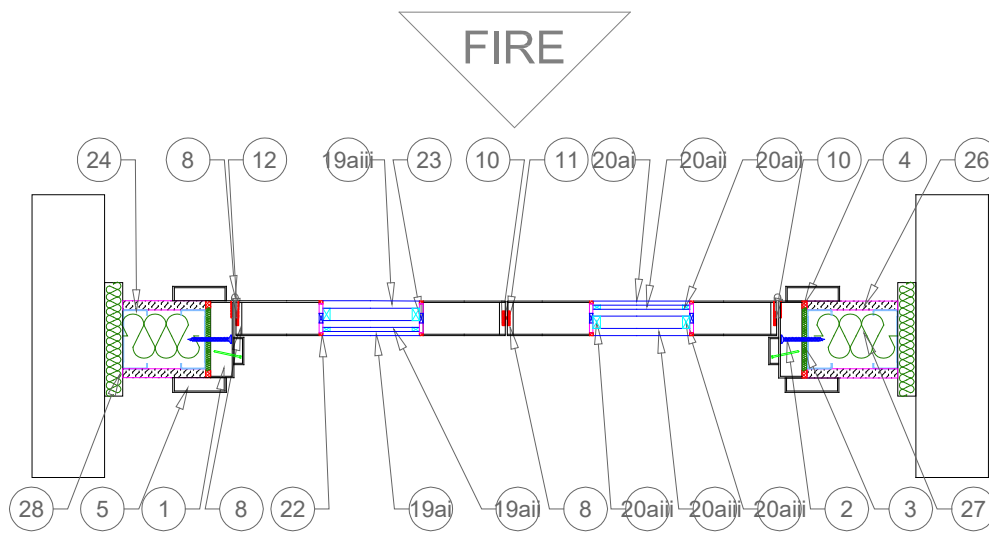
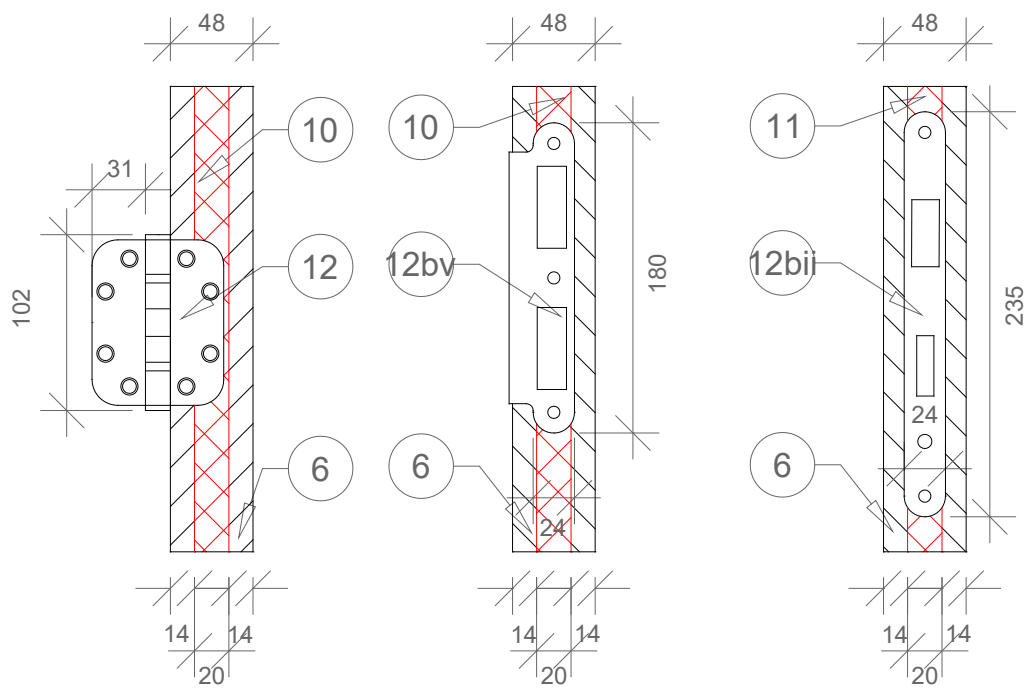


Figure 3 - Typical horizontal section through the specimen



Hinge Edge    A1 Meeting Stile    A2 Meeting Stile

Figure 4 - Hardware intumescent interruptions

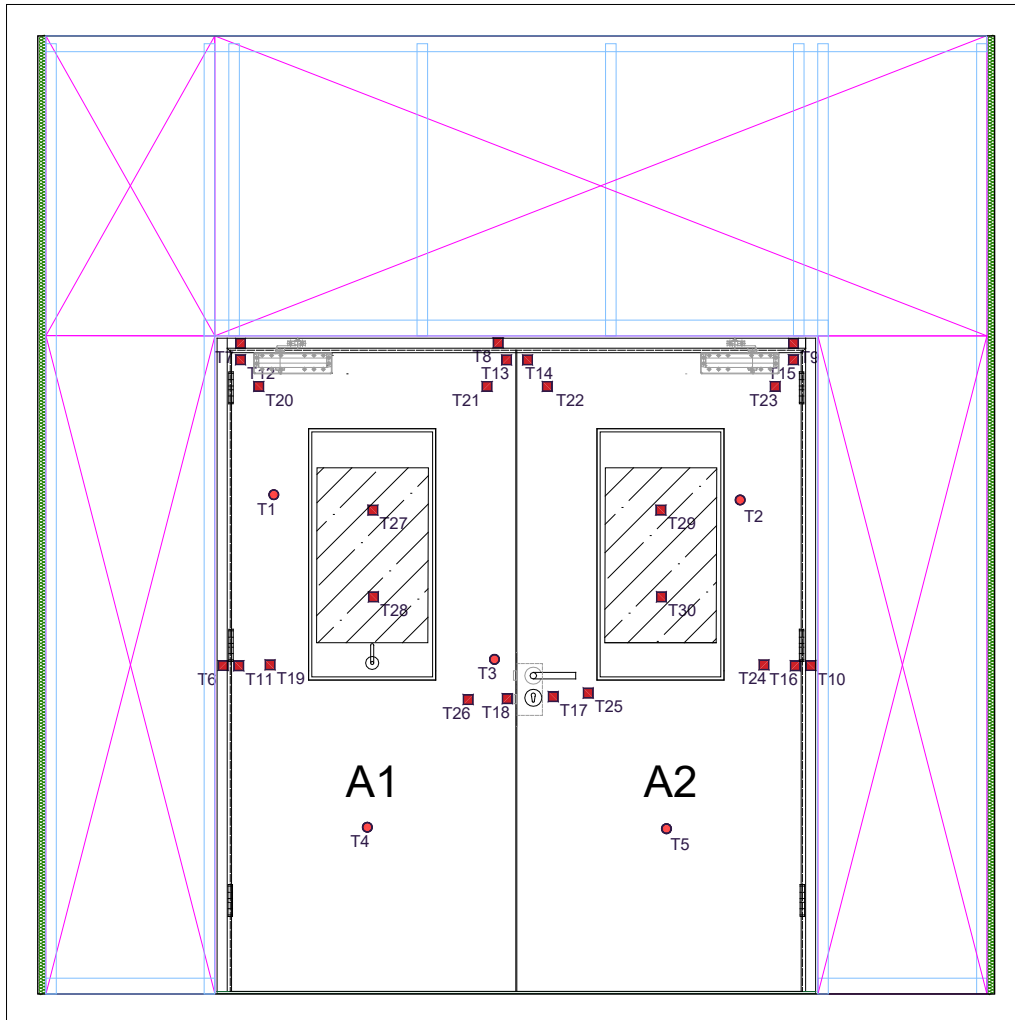


Figure 5 - Layout of instrumentation viewed from the unexposed surface of the test construction

## 4 Technical Schedule

All dimensions are in millimetres (mm) unless otherwise stated.

\* Information provided by the Test Sponsor. Not verified by United Kingdom Testing and Certification.

\*\* Nominal value.

\*\*\* Information is commercial in confidence. Full details retained on file by United Kingdom Testing and Certification.

### 4.1 Specimen

| 1. Frame  |   |
|---|---|
| Manufacturer  | Scotdor trading as DorSuite   |
| Reference   | Redwood PVC encapsulated frames   |
| a. Material   |   |
| i. Frame  | PVC Encapsulated Redwood  |
| ii. Stop  | PVC Encapsulated MDF  |
| Density   | 520 kg/m <sup>3</sup> *   |
| Moisture content  | Unable to read  |
| Orientation to heating conditions                         | Opening towards   |
| b. Overall size   | 1908 mm wide x 2080 mm high x 1006 mm deep  |
| i. Frame (Head)   | 106 mm wide x 32 mm thick   |
| ii. Frame (Jambs)   | 106 mm wide x 32 mm thick   |
| iii. Stop   | 38 mm wide x 14 mm deep   |
| Jamb to Head jointing method, fixing detail and location  | Housed butt joint with PVC & 2 no Ø 5 mm x 60mm Long wood screws.                               |
| Stop to Frame jointing method, fixing detail and location | Pinned with 1.8 mm gauge x 38 mm long steel pins @ 300 mm centres                               |
| c. Adhesive(s)  | PVC section has self-adhesive strips to the inside 2No. full lengths to stick to frame and stop |
| d. Sealant to frame                                       |   |
| i. Manufacturer   | Everbuild   |
| ii. Reference   | Pinkgrip SF   |
| iii. Material   | Direct Bond Adhesive  |
| iv. Location  | On the Encapsulated sections two beads down each side then placed onto the MDF frame sections   |

|   |  |
|---|--|
| v. Application Method   | Cartridge gunned   |
| <b>2. Frame Fixing Method to Supporting Construction</b>        |  |
| Manufacturer  | Spax   |
| Reference   | 797HT  |
| Type & material   | Double-Countersunk Head, stainless Steel   |
| Overall size  | Ø 5 mm x 80 mm long  |
| Spacing   | 150 mm from top corner of jamb, 150 mm from bottom corner of jamb and at no more than 600 mm centres |
| Does the fixing penetrate intumescent seal within frame reveal  | No   |
| Packing Material  | Certitek DP-01   |
| Packing Material Dimension                                      | 100 mm x long 30 mm Wide x Various thicknesses (1mm, 2mm, 3mm, 5mm)                                  |
| Packing Material Location                                       | At each fixing location up frame   |
| <b>3. Frame to supporting construction fire stopping detail</b> |  |
| Manufacturer  | Rockwool   |
| Reference   | RWA 45   |
| Material  | Mineral Fibre wool   |
| Overall dimension   | 7-12 mm wide x 75 mm deep  |
| Application method  | Friction fitted  |
| <b>4. Sealant to fire stopping detail</b>                       |  |
| Manufacturer  | Certitek   |
| Reference   | DM-01  |
| Material  | Acrylic Intumescent Mastic   |
| Overall section size  | 7-15 mm wide x 10 mm deep  |
| Application method  | Cartridge gunned   |
| Location  | Both Faces around the architraves  |
| <b>5. Architrave</b>  |  |
| Manufacturer  | Scotdor trading as DorSuite  |
| Reference   | PVC Encapsulated Architraves   |
| Material  | PVC Encapsulated MDF   |

|   |  |
|---|--|
| Overall section size                                      | 74 mm wide x 20 mm thick   |
| Location  | Both Faces of Doorset  |
| Application method, fixings and fixing frequency required | 15-gauge x 50 mm long pins @ 200 mm centres  |
| <b>6. Door Leaf</b>                                       |  |
| Manufacturer  | Scotdor trading as DorSuite  |
| Reference   | (PVC encapsulated) Epicore 44  |
| Quantity of leaves on doorset                             | 2  |
| Glazing 1 location relative to the head and closing edge  | 250 mm from the head of the leaf and 250 mm from the closing edge of the leaf            |
| Glazing 2 location relative to the head and closing edge  | 250 mm from the head of the leaf and 250 mm from the closing edge of the leaf            |
| a. Overall leaf size supplied for testing                 | 1834 mm wide x 2041 mm high x 48 mm thick  |
| i. Leaf A1  | 920 mm wide x 2041mm high x 48 mm thick  |
| ii. Leaf A2   | 920 mm wide x 2041mm high x 48 mm thick  |
| Door Undercut (Top of cill / bottom of frame)             | 3 mm / 4 mm  |
| Glazing orientation                                       | Glazing on Active leaf: Facing into the furnace<br>Glazing on Inactive leaf: Facing Away |
| <b>7. Core element</b>                                    |  |
| Manufacturer  | Halspan  |
| Reference   | Optima 44  |
| Material  | Chipboard  |
| Density   | 620 kg/m <sup>3</sup> *  |
| Overall thickness   | 44 mm thick  |
| Application method  | N/A  |
| <b>8. Lippings / Edge banding</b>                         |  |
| Manufacturer  | Scotdor tradins as DorSuite  |
| Reference   | LIP-0000   |
| Material  | Sapele   |
| Density   | 640 kg/m <sup>3</sup> *  |
| Moisture content  | Unable to read to PVC encapsulation  |



|                                    |   |
|------------------------------------|---|
| Overall size                       | 8 mm deep x 44 mm wide  |
| Fixing method                      | Edge bander   |
| Location                           | All edges of the door leaf  |
| a. Adhesives                       |   |
| i. Manufacturer                    | Henkel  |
| ii. Type                           | PUR   |
| iii. Reference                     | Technomelt PUR 270/7G   |
| iv. Curing method                  | Moisture Cured  |
| v. Application method              | Roller applied  |
| b. Presence of Mechanical Fixings  | No  |
| <b>9. Facings</b>                  |   |
| Manufacturer                       | Scotdor trading as DorSuite   |
| Reference                          | PVC Encapsulated  |
| Material                           | Polyvinyl Chloride  |
| Density                            | 1400 kg/m <sup>3</sup> *  |
| Location                           | Encapsulated to both faces of the doorset returning over the vertical edges |
| Overall thickness                  | 2 mm  |
| Application method                 | Spray   |
| a. Adhesives                       |   |
| i. Manufacturer                    | Tensogrip   |
| ii. Type                           | Fire Rated Contact Adhesive   |
| iii. Reference                     | L17   |
| iv. Curing method                  | Spray both surfaces then leave for up to 5 minutes before bonding together  |
| v. Application Method              | Spray   |
| <b>10. Intumescent Leaf Edge 1</b> |   |
| Quantity                           | 1   |
| Manufacturer                       | Man McGowan   |
| Reference                          | Pyrostrip 100P  |

|  |   |
|--|---|
| Material   | PVC encapsulated Palusol  |
| Overall section size                                     | 20 mm wide x 4 mm thick   |
| Application method                                       | Adhesive strip to back  |
| Location (relative to the opening face of the door leaf) | 14 mm centrally within the leaf on hanging edge, top and meeting stile on A1. On A2 it is on the hanging edge, top and meeting stile. |
| <b>11. Intumescent Leaf Edge 2</b>                       |   |
| Quantity   | 1   |
| Manufacturer   | Man McGowan   |
| Reference  | Pyrostrip 500 twin blade  |
| Material   | PVC encapsulated Palusol with twin blade  |
| Overall section size                                     | 20 mm wide x 4 mm thick   |
| Application method                                       | Adhesive strip to back  |
| Location (relative to the opening face of the door leaf) | 14 mm centrally on the leaf on the meeting edge A1 only   |
| <b>12. Hinges</b>  |   |
| Supplier   | ZOO   |
| Reference  | ZOO Hinge Stainless Steel   |
| Quantity   | 3   |
| Primary material   | Satin Stainless Steel   |
| Type   | Butt Hinge  |
| a. Size  |   |
| i. Knuckle   | Ø 14.5 mm x 102 mm high   |
| ii. Blades   | 102 mm high x 31 mm wide x 3 mm thick   |
| b. Fixings   |   |
| i. Type  | Countersunk Screws  |
| ii. Material   | Stainless Steel   |
| iii. Size  | Ø 4.7 mm x 31 mm long   |
| iv. Number off per blade                                 | 4   |
| Position of each hinge relative to the head of the leaf  | Top: 120mm<br>Middle: 934mm<br>Bottom: 1748   |

|  |   |
|--|---|
| Details of intumescent protection                    | 2 mm Graphite based intumescent   |
| Interruptions to Intumescent within the frame reveal | No  |
| Interruptions to Intumescent within the leaf         | Partly interrupted  |
| <b>13. Door Closer</b>                               |   |
| Manufacturer   | Rutland   |
| Reference  | TS9205  |
| a. Material  |   |
| i. Body  | Mild Steel  |
| ii. Closer arm                                       | Mild Steel  |
| iii. Cover   | Stainless Steel   |
| Configuration  | Figure 1  |
| b. Overall size                                      |   |
| i. Body  | 67 mm high x 220 mm wide x 44 mm deep   |
| ii. Cover  | 68 mm high x 225 mm wide x 45 mm deep   |
| Fixing method  | 4No. Ø 4.8 mm x 50 mm on body and 2No. Ø 4.8 mm x 50 mm on bracket into frame |
| <b>14. Drop Down Seal</b>                            |   |
| Manufacturer   | Seal Tight Solutions  |
| Reference  | STS 422   |
| a. Material  |   |
| i. Body  | Steel   |
| ii. Seal   | Neoprene/Butyl  |
| iii. Face plate                                      | Aluminium   |
| b. Overall size                                      |   |
| i. Body  | 20mm high x 908 mm wide x 12 mm thick   |
| Fixing method, type and locations                    | 3No. Ø 4.8 mm x 30 mm   |
| Location within leaf                                 | Bottom of both doors  |
| Maximum operating drop                               | 14 mm   |

| 15. Lockset  |  |
|--|--|
| Supplier   | Scotdor trading as DorSuite  |
| Supplier reference   | Euro Profile Sashlock  |
| Manufacturer   | Zoo Hardware   |
| Manufacturer Reference   | ZDL7255RSS   |
| a. Material  |  |
| i. Lockcase  | Stainless Steel  |
| ii. Forend plate   | Stainless Steel  |
| iii. Latch bolt  | Stainless Steel  |
| iv. Lock bolt  | Stainless Steel  |
| v. keeper  | Stainless Steel  |
| b. Overall sizes   |  |
| i. Central Lockcase  | 165 mm high x 15 mm wide x 80 mm deep                              |
| ii. Forend plate   | 235 mm high x 22 mm wide x 3 mm thick                              |
| iii. Latch bolt  | 30 mm high x 12 mm wide x 12 mm projection                         |
| iv. Lock bolt  | 35 mm high x 9 mm wide x 20 mm single projection                   |
| v. Keeper  | 180 mm high x 24 mm wide x 3 mm thick                              |
| Fixing method  | 5No. Ø 3.8 mm x 25 mm steel screws                                 |
| Operation of latch bolt  | Engaged  |
| Operation of lock bolt   | Disengaged   |
| c. Details of intumescent protection                                 |  |
| i. Central Lockcase  | 1mm interdens  |
| ii. Forend plate   | 1mm interdens  |
| iii. Keeper  | 1 mm interdens   |
| Interruptions to Intumescent within the frame reveal                 | N/a  |
| Interruptions to Intumescent at meeting stile / leading edge.        | Fully  |
| Location of centre of the spindle relative to the bottom of the leaf | Centre of the spindle measures 1000 mm from the bottom of the leaf |

| <b>16. Cylinder</b>               |   |
|-----------------------------------|---|
| Manufacturer                      | ARC   |
| Reference                         | 30/30   |
| Material                          | Stainless Steel   |
| Overall size                      | 33 mm high x 18 mm wide x 60 mm thick                                   |
| <b>17. Handle</b>                 |   |
| Supplier                          | Scotdor trading as DorSuite   |
| Reference                         | PP11030907 Distinct   |
| Material                          | Stainless Steel   |
| Overall size                      | Ø 19 mm x 52 mm x 8 mm & Spindle 80 mm x 8 mm x 8 mm                    |
| Location                          | 1000 mm from bottom of door   |
| Fixing method                     | 4No Ø 4 mm x 30 mm steel screws, 2 No 4 mm x 60 mm bolt through fixings |
| Details of intumescent protection | N'a   |
| <b>18. Escutcheon</b>             |   |
| Supplier                          | Scotdor trading as DorSuite   |
| Supplier reference                | PP13010907  |
| Material                          | Mild Steel  |
| Overall size                      | Ø 50 mm x 8 mm thick  |
| Location                          | Applied to both faces   |
| Fixing method                     | 2No. wood screws Ø 3.2 mm x 25 mm.                                      |
| Details of intumescent protection | N/a   |
| <b>19. Glazing System LH</b>      |   |
| Manufacturer                      | Vistamatic Ltd  |
| Reference                         | Vista Flush   |
| Overall size                      | 405 mm x 800 mm x 48 mm   |
| Location                          | 250 mm From Top of Door Leaf  |
| Aperture size                     | 413 mm x 809 mm   |
| Expansion Allowance               | 4 mm  |
| Presence of Aperture lining       | No  |

|   |   |
|---|---|
| Presence of Intumescent lining                        | No  |
| a. Glazing Configuration                              |   |
| i. Glazing Configuration – Layer 1                    | 6 mm toughened glass with lever handle operation (with 6mm cavity including 4mm annealed glass central moving pane) |
| ii. Glazing Configuration – Layer 2                   | 10 mm Pyrodur Laminated Fire Glass (plus 16mm hollow cavity)  |
| iii. Glazing Configuration – Layer 3                  | 10 mm Pyro-EX modified toughened glass  |
| <b>20. Glazing System RH</b>                          |   |
| Supplier  | Vistamatic Ltd  |
| Reference   | Vista Flush   |
| Overall size  | 405 mm x 800 mm x 48 mm   |
| Location  | 250 mm From Top of Door Leaf  |
| Aperture size   | 413 mm x 809 mm   |
| Expansion Allowance                                   | 4 mm  |
| Presence of Intumescent lining                        | No  |
| a. Glazing Configuration                              |   |
| i. Glazing Configuration – Layer 1                    | 6 mm toughened glass with lever handle operation (with 6mm cavity including 4mm annealed glass central moving pane) |
| ii. Glazing Configuration – Layer 2                   | 10 mm Pyrodur Laminated Fire Glass (plus 16 mm hollow cavity)   |
| iii. Glazing Configuration – Layer 3                  | 10 mm Pyro-EX modified toughened glass  |
| <b>21. Glazing Spacer</b>                             |   |
| Manufacturer  | Vistamatic Ltd  |
| Reference   | Vista Flush   |
| Material  | Aluminum spacer   |
| b. Overall size                                       |   |
| i. Between the 6 mm toughened glass and 10 mm Pyrodur | 6 mm  |
| ii. Between the Pyro- EX & 10 mm Pyrodur              | 16 mm   |
| <b>22. Glazing Sealant</b>                            |   |
| Manufacturer  | Everbuild   |
| Reference   | Firemate  |

|                          |                             |
|--------------------------|-----------------------------|
| Material                 | Acrylic sealant             |
| Overall size             | 4 mm x perimeter            |
| <b>23. Setting block</b> |                             |
| Manufacturer             | Scotdor trading as DorSuite |
| Reference                | 4 mm spacer                 |
| Material                 | Hardwood                    |
| Overall size             | 4 mm x 6 mm                 |

## 4.2 Supporting Construction

|                              |   |
|------------------------------|---|
| <b>24. Studs</b>             |   |
| Supplier/ Manufacturer       | United Kingdom Testing and Certification  |
| a. Type & Material           | Rolled steel C-Stud   |
| i. Dimensions                | 70 mm deep x 34 mm wide x 3000 mm long x 0.5 mm thick                           |
| ii. Stud centres             | 400-625 mm  |
| iii. Fixing(s)               | Friction fitted to the head/ floor track  |
| Timber Inserts to Studs      | No  |
| <b>25. Head/ Floor Track</b> |   |
| Supplier/ Manufacturer       | United Kingdom Testing and Certification  |
| Type & Material              | Rolled steel U-Track  |
| Dimensions                   | 72 mm deep x 25 mm wide x 3000 mm long x 0.5 mm thick                           |
| Centres                      | 600 mm Centres 20 mm Space between testing frame and wall frame for insulation. |
| Fixing(s)                    | Ø 7.5 x 50 mm long self-tapping screws staggered at max 600 mm centres          |
| <b>26. Lining(s)</b>         |   |
| Supplier/ Manufacturer       | United Kingdom Testing and Certification  |
| Type & Material              | Paper faced, gypsum plasterboard type F   |
| Density                      | 760 Kg/m <sup>3</sup>   |
| Layer Quantity               | 1   |

|  |  |
|--|--|
| Dimensions                                 | 12.5 mm thick x 1200 mm wide x 2400 mm high                              |
| Fixings                                    | Plasterboard Screw Fixings Ø 5 mm x 25 mm                                |
| Joints Filled & Taped With                 | No nonsense  |
| <b>27. Wall Insulation</b>                 |  |
| Supplier                                   | United Kingdom Testing and Certification                                 |
| Type & Material                            | Mineral Wool   |
| Density                                    | 33 Kg/m <sup>3</sup>   |
| Installation Method                        | Compression Fitted   |
| Thickness                                  | 50 mm  |
| Locations                                  | Centrally Located in the wall  |
| Additional Wall Construction Requests      | N/a  |
| <b>28. Free Edge Gasket</b>                |  |
| Manufacturer                               | Morgan Advanced Materials  |
| Reference                                  | Superwool  |
| Density                                    | 128 Kg/m <sup>3</sup>  |
| Dimensions                                 | 20 mm thick x 3025 mm long x 100 mm wide                                 |
| Fixing(s)                                  | Compression fitted between the supporting construction & restraint frame |
| <b>29. Board for Simulated Floor Level</b> |  |
| Manufacturer                               | British Gypsum   |
| Reference                                  | Glasroc F MultiBoard 6mm   |
| Density                                    | 833 Kg/m <sup>3</sup>  |
| Dimensions                                 | 6 mm thick x Opening width + 400 mm long x Wall Depth + 500 mm wide      |
| Fixing(s)                                  | Compression fitted between restraint frame and specimen.                 |



### 4.3 Specimen Photographs

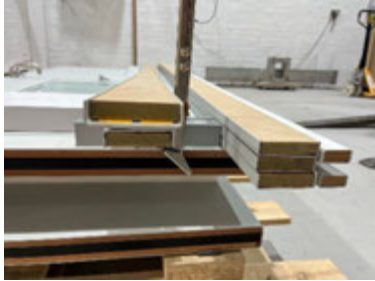


Figure 6 - Item 1 & 15



Figure 7 - Item 10 & 11



Figure 8 - Item 10 & 12

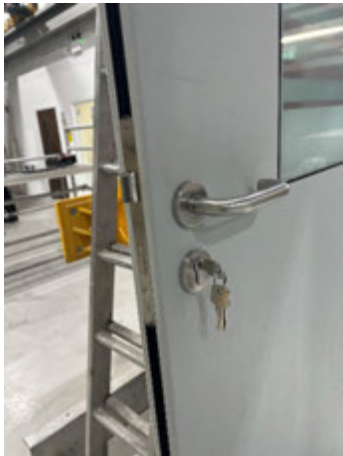


Figure 9 - Item 12bii, 16, 17 & 18



Figure 10 - Item 11 & 12bii

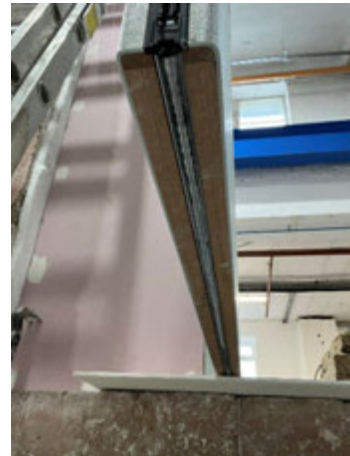


Figure 11 - Item 14

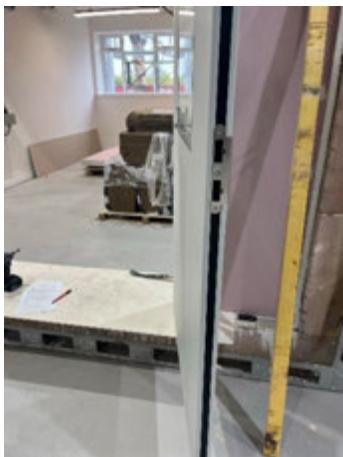


Figure 12 - Item 10 & 12bv



Figure 13 - Item 19- 24



Figure 14 - Item 1c

## 5 Test Procedure

### 5.1 Heating Conditions

The specimen was subject to heating conditions in accordance with BS EN 1363-1:2020 § 5.1. This was monitored and controlled for the duration of the test using type K thermocouples which were distributed across a vertical plane  $100 \pm 50$  mm from the exposed surface of the test construction. The resulting Time-Temperature distribution is presented in Figure 24.

### 5.2 Pressure Conditions

The specimen was subject to a pressure regime in accordance with BS EN 1363-1:2020 § 5.2. The calculated pressure differential relative to the laboratory atmospheric pressure at a height of 365, 1612 and 2850 mm from the furnace floor level was -1.1, 9.4 and 20.0 Pa respectively which equates to 0 Pa at a height of 500 mm from the furnace floor level. The furnace was maintained at these pressures within  $\pm 5$  Pa five minutes after the commencement of the test and  $\pm 3$  Pa ten minutes after the commencement of the test and for the remainder of the test duration. The Time-Pressure distribution is presented in Figure 25.

### 5.3 Unexposed Surface Temperature

A roving thermocouple was available for the evaluation of the maximum temperature rise of the unexposed surface of the specimens for the duration of the test. Any measurements using the roving thermocouple are presented on page 27.

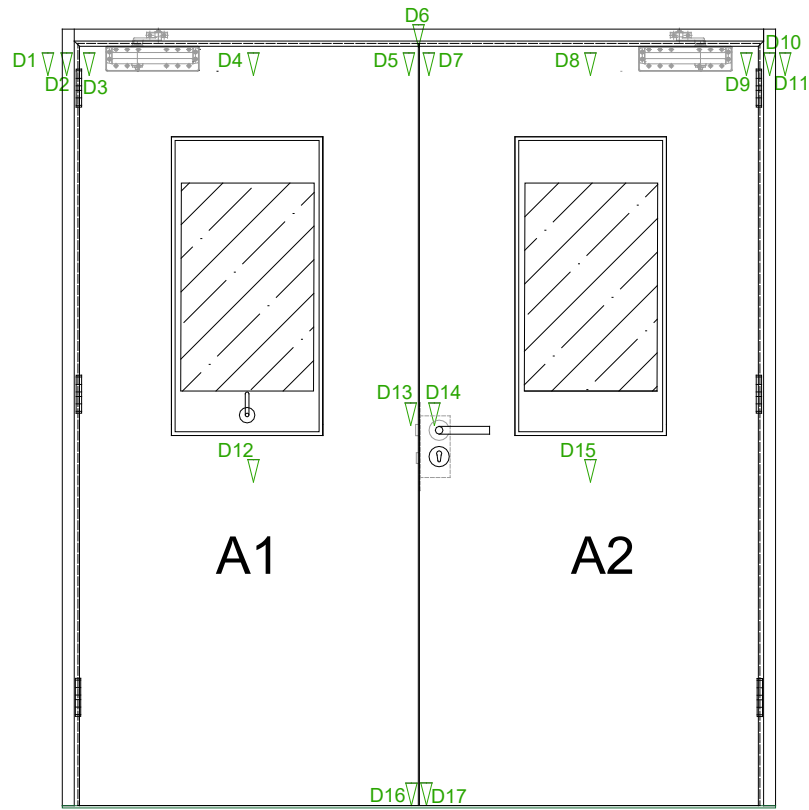
Disc thermocouples were affixed to the unexposed surface of the specimens in accordance with BS EN 1634-1:2014+A1:2018 § 9.1.2 to measure and monitor the maximum and the mean temperature rise of the unexposed surface of the specimens for the duration of the test. A summary of the measurements is presented in Figure 26 and the locations of these thermocouples is illustrated in Figure 5.

### 5.4 Radiation

The Radiant Heat of the specimens was measured using a  $180^\circ$  field of view, water cooled heat flux meter that was positioned at the geometric center of each specimen at a distance of 1000 mm from the unexposed surface. Measurements were recorded for the duration of the test and a summary of the recorded measurements is presented in Figure 27.

### 5.5 Deflection

All measurements are in millimeters (mm) unless stated otherwise. Positive values indicate movement towards the heating conditions.



| Time (mins) | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | D13 | D14 | D15 | D16 | D17 |
|-------------|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0           | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   |
| 10          | 1  | -3 | 0  | 2  | 0  | -1 | -2 | 6  | 6  | 0   | -1  | -1  | -3  | 0   | 3   | -9  | -3  |
| 20          | 13 | 11 | 10 | 10 | 17 | 8  | 15 | 11 | 13 | 8   | 13  | -5  | -2  | 2   | 4   | -13 | -4  |
| 25          | 23 | 18 | 19 | 21 | 27 | 15 | 22 | 15 | 43 | 17  | 21  | -4  | -1  | 0   | -2  | -12 | -3  |
| 30          | 25 | 22 | 25 | 23 | 43 | 31 | 37 | 23 | 28 | 24  | 29  | -13 | -6  | -3  | 5   | -10 | -7  |
| 35          | 33 | 35 | 46 | 37 | 58 | 35 | 47 | 26 | 39 | 32  | 28  | -21 | 0   | -4  | -56 | -8  | -13 |

## 5.6 Observations

| HH | MM | SS | E <sup>5</sup> | U <sup>6</sup> | Observation   |
|----|----|----|----------------|----------------|---|
| 00 | 00 | 00 |                |                | <b>The test commences.</b>  |
| 00 | 01 | 46 |                | X              | Steam/smoke releases at the meeting stile and door perimeter.   |
| 00 | 04 | 15 |                | X              | There is discolouring and moisture forming along the head of the doors and frame.   |
| 00 | 05 | 23 |                | X              | PVC on stop sagging down at middle of the frame head.   |
| 00 | 05 | 42 |                | X              | Parts of the right-hand doors vision panel fall into furnace.   |
| 00 | 11 | 00 |                | X              | There is discolouring and moisture forming up the jambs and at top corners.   |
| 00 | 18 | 14 | X              |                | PVC melted away and vision panel remnants at the base of the doors.   |
| 00 | 28 | 15 |                | X              | Faint glow at top of door meeting stile.  |
| 00 | 31 | 09 |                | X              | Cotton pad test top of door meeting stile – Cotton pad discoloured.   |
| 00 | 33 | 35 |                | X              | <b>Cotton pad test top of door meeting stile – Cotton pad ignites. Cotton pad failure and insulation failure is deemed to have occurred.</b>                              |
| 00 | 34 | 12 |                | X              | Door starting to distort and the vision panel and facing are moving/debonding.  |
| 00 | 36 | 15 |                | X              | Glass explodes and leaves a hole that flaming emits from.   |
| 00 | 36 | 30 |                | X              | <b>A flame emits from the head at the top of the meeting stile and sustains for a period greater than 10 seconds. Sustained flame failure is deemed to have occurred.</b> |
| 00 | 36 | 55 |                | X              | Cotton pad test at vision panel – Cotton pad ignites.   |
| 00 | 27 | 23 |                |                | <b>Test discontinued at the request of the test sponsor.</b>  |

<sup>5</sup> Viewed from exposed surface of the test construction.

<sup>6</sup> Viewed from unexposed surface of the test construction.

## 5.7 Test Images



Figure 15 – The exposed surface of the test construction prior to commencement of the test



Figure 16 - The unexposed surface of the test construction prior to the commencement of the test



Figure 17 - The unexposed surface of the test construction after a test duration of 10 minutes



Figure 18 - The unexposed surface of the test construction after a test duration of 20 minutes



Figure 19 - The unexposed surface of the test construction after a test duration of 25 minutes



Figure 20 - The unexposed surface of the test construction after a test duration of 30 minutes



Figure 21 - The unexposed surface of the test construction after a test duration of 35 minutes



Figure 22 - The unexposed surface of the test construction after a test duration of 37 minutes





Figure 23 - The exposed surface of the test construction after the test was discontinued

## 6 On-going Implications

### 6.1 Limitations

This report details the method of construction, the test conditions and the results obtained when the specific element of construction described herein was tested following the procedure outlined in BS EN 1363-1, and where appropriate BS EN 1363-2. Any significant deviation with respect to size, constructional details, loads, stresses, edge or end conditions other than those allowed under the field of direct application in the relevant test method is not covered by this report and should be the subject to design appraisal by a competent individual.

Guidance on the field of direct application of results is presented in Appendix A.

### 6.2 Accuracy of Results

Because of the nature of fire resistance testing and the consequent difficulty in quantifying the uncertainty of measurement of fire resistance, it is not possible to provide a stated degree of accuracy of the result.

No statement of conformity with the testing specifications is made or implied in this report. However, measurement results are reviewed, where applicable, to establish where measurement results exceed the control parameters established in the relevant resistance to fire test standard.

### 6.3 European Group of Organisations for Fire Testing (EGOLF)

Certain aspects of some fire test specifications are open to different interpretations. EGOLF have identified a number of such areas and have agreed Resolutions which define common agreement of interpretations between fire test laboratories which are members of the Groups. Where such Resolutions are applicable to this test they have been followed.

## 7 Figures

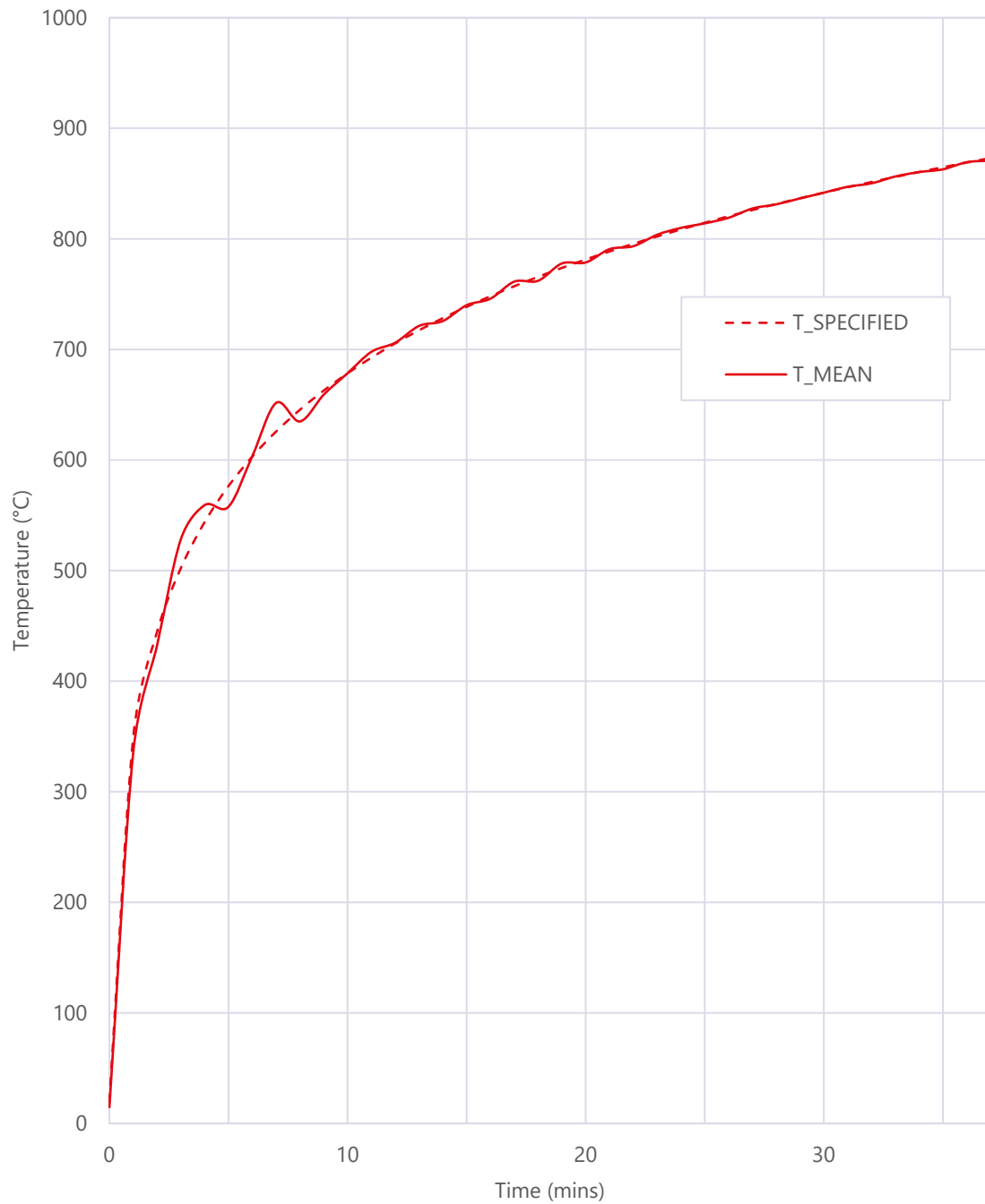


Figure 24 – Graph presenting the Time-Temperature distribution of the furnace

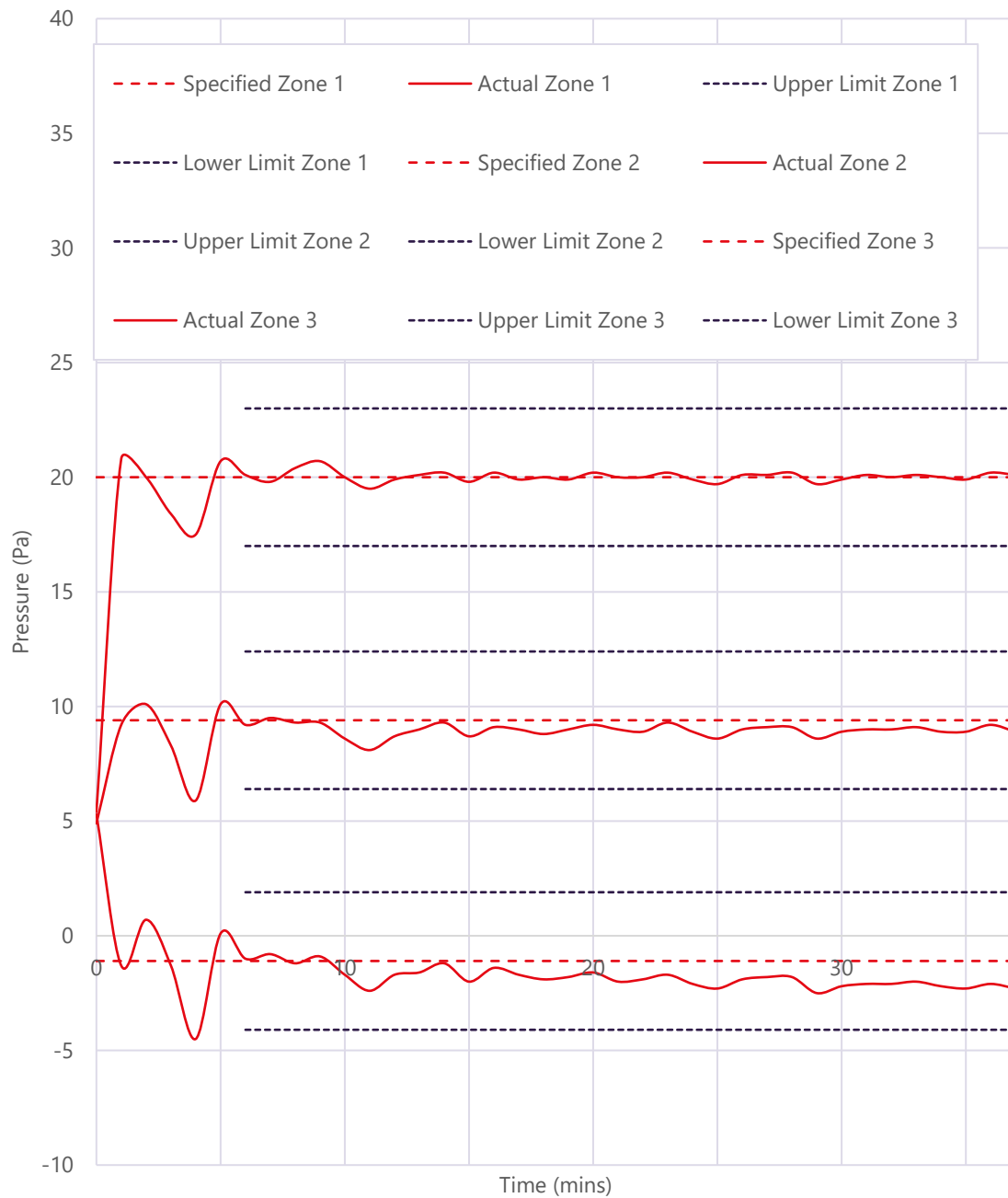


Figure 25 – Graph presenting the Time-Pressure distribution of the furnace

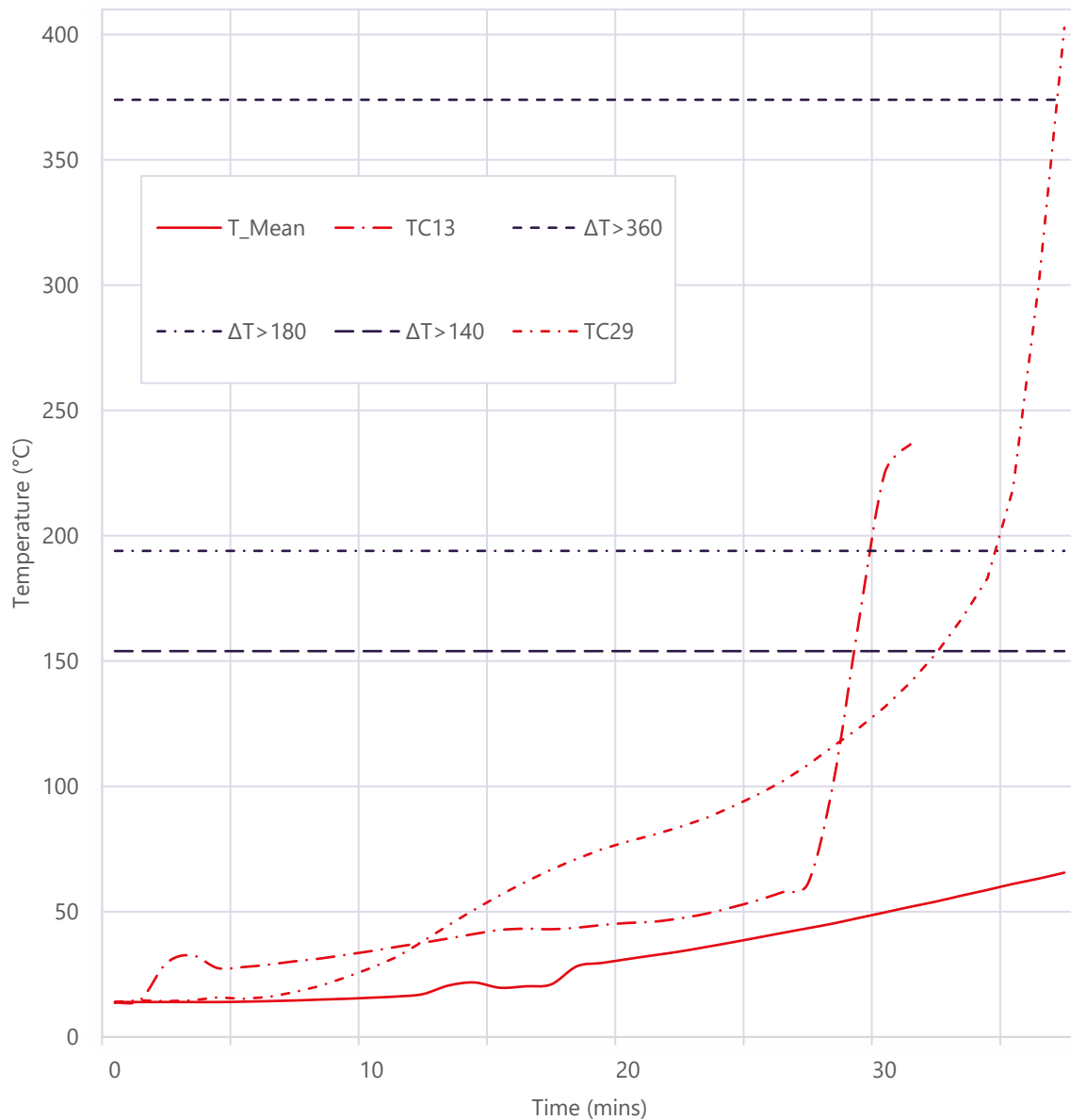


Figure 26 - Graph presenting the Time-Temperature distribution of the unexposed surface of The Specimen

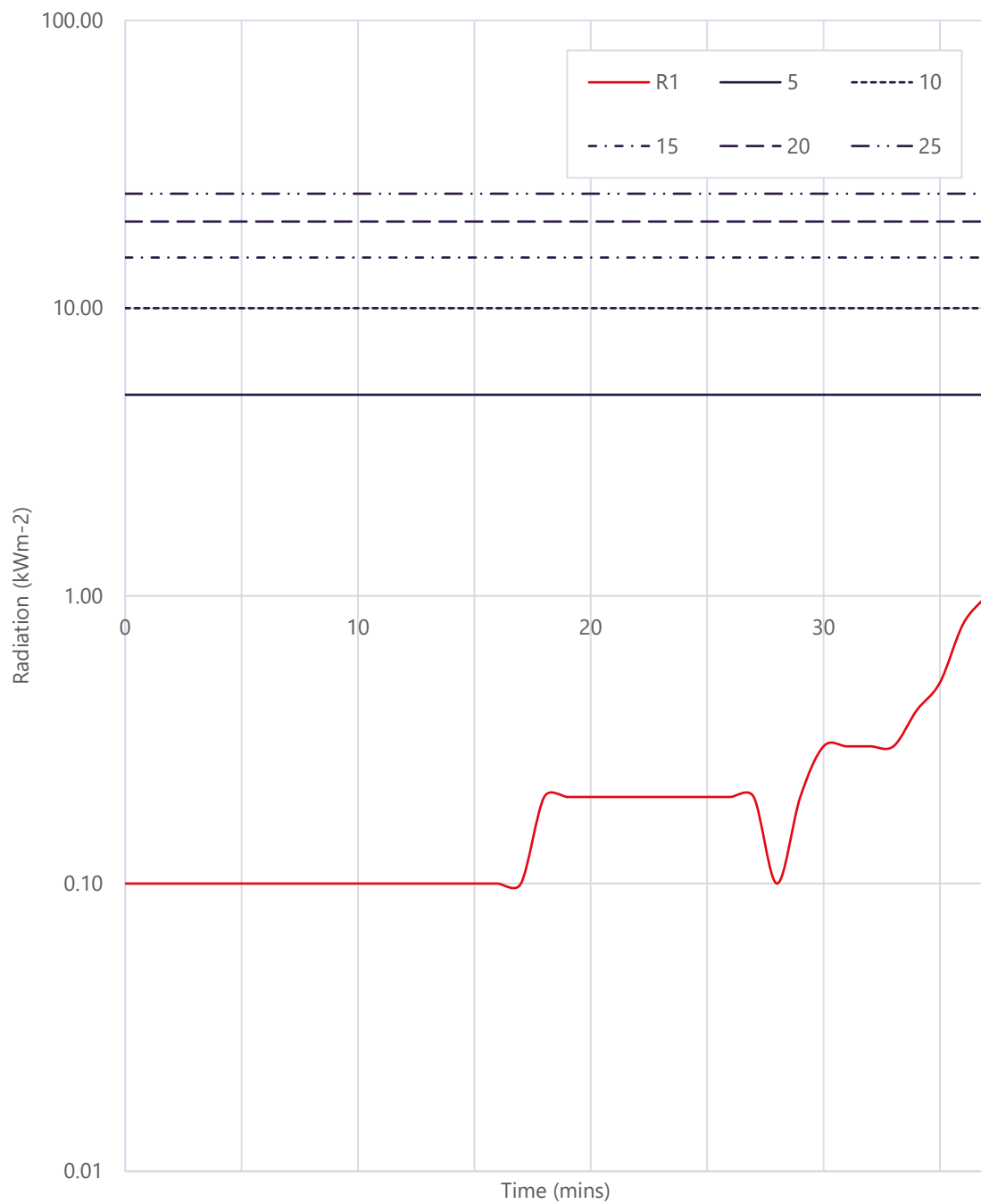


Figure 27 - Graph presenting Time-Radiation distribution of the unexposed surface of The Specimen

## 8 Tables

Table 1 – The temperatures recorded by the disc thermocouples used evaluate the mean and maximum temperature rise of the unexposed surface of The Specimen under the normal procedure (I<sub>2</sub>). Values are in Degrees Celsius (°C) unless otherwise stated.

| Time (mins) | TC1  | TC2  | TC3  | TC4  | TC5  |
|-------------|------|------|------|------|------|
| 0           | 13.6 | 14.2 | 14.1 | 14.0 | 13.9 |
| 2           | 13.5 | 14.1 | 14.3 | 14.0 | 13.9 |
| 4           | 13.3 | 14.1 | 14.2 | 14.1 | 14.0 |
| 6           | 12.5 | 14.6 | 14.9 | 15.3 | 14.2 |
| 8           | 10.4 | 15.5 | 16.7 | 17.1 | 14.9 |
| 10          | 7.9  | 16.8 | 18.7 | 19.1 | 15.9 |
| 12          | 7.2  | 18.6 | 21.5 | 21.0 | 17.2 |
| 14          | *    | 20.6 | 25.0 | 23.0 | 18.4 |
| 16          | 3.5  | 23.0 | 28.6 | 25.2 | 20.8 |
| 18          | 32.6 | 25.5 | 32.5 | 27.5 | 22.9 |
| 20          | 36.2 | 28.2 | 36.2 | 29.7 | 25.3 |
| 22          | 39.8 | 31.0 | 39.8 | 32.0 | 27.8 |
| 24          | 43.9 | 34.6 | 43.7 | 35.2 | 30.9 |
| 26          | 48.1 | 38.6 | 47.9 | 39.0 | 33.9 |
| 28          | 52.3 | 42.2 | 51.8 | 42.9 | 37.3 |
| 30          | 56.7 | 46.7 | 56.3 | 47.7 | 41.1 |
| 32          | 61.0 | 50.8 | 60.6 | 52.9 | 44.9 |
| 34          | 65.3 | 55.1 | 65.2 | 58.4 | 49.4 |
| 36          | 69.8 | 59.3 | 69.3 | 63.7 | 53.8 |
| 37          | 72.1 | 61.5 | 71.6 | 66.3 | 56.3 |

\* Thermocouple malfunction.

Table 2 – The temperatures recorded by the disc thermocouples used to evaluate the maximum temperature rise of the door leaf of The Specimen under the normal procedure (I<sub>2</sub>). Values are in Degrees Celsius (°C) unless otherwise stated.

| Time | TC19 | TC20 | TC21 | TC22 | TC23 | TC24 | TC25 | TC26 |
|------|------|------|------|------|------|------|------|------|
| 0    | 14.3 | 13.3 | 14.2 | 13.9 | 13.8 | 13.6 | 14.8 | 13.9 |
| 2    | 14.3 | 13.3 | 15.5 | 15.1 | 13.8 | 13.5 | 15.4 | 13.9 |
| 4    | 14.5 | 13.2 | 15.4 | 15.0 | 13.9 | 13.5 | 15.9 | 14.1 |
| 6    | 15.5 | 13.1 | 15.8 | 15.1 | 14.0 | 14.2 | 20.3 | 14.0 |
| 8    | 17.1 | 12.1 | 16.7 | 16.1 | 14.4 | 15.5 | 25.4 | 13.9 |
| 10   | 18.7 | *    | 18.1 | 17.8 | 14.6 | 16.9 | 30.7 | 13.9 |
| 12   | 20.5 | *    | 20.7 | 19.9 | 15.6 | 18.7 | 34.9 | 13.9 |
| 14   | 22.8 | *    | 23.6 | 22.3 | 17.5 | 20.7 | 38.8 | 14.0 |
| 16   | 25.3 | *    | 26.5 | 25.2 | 20.4 | 23.0 | 42.5 | 14.1 |
| 18   | 28.0 | *    | 29.3 | 27.9 | 24.0 | 25.4 | 46.6 | 14.2 |
| 20   | 30.6 | *    | 32.0 | 30.5 | 27.6 | 27.9 | 50.2 | 14.1 |
| 22   | 33.6 | *    | 34.9 | 33.0 | 30.8 | 30.5 | 53.9 | 14.1 |
| 24   | 37.2 | *    | 37.3 | 36.0 | 33.7 | 33.7 | 58.1 | 14.1 |
| 26   | 41.3 | *    | 40.1 | 39.0 | 36.2 | 37.0 | 62.2 | 14.1 |
| 28   | 45.5 | *    | 43.0 | 42.4 | 38.4 | 40.2 | 66.9 | 14.0 |
| 30   | 50.0 | *    | 47.0 | 46.6 | 41.3 | 44.3 | 72.0 | 13.9 |
| 32   | 54.8 | *    | 51.6 | 52.2 | 44.5 | 48.2 | 77.8 | 13.9 |
| 34   | 59.9 | *    | 56.2 | 58.8 | 48.5 | 52.3 | 84.0 | 14.0 |
| 36   | 64.9 | *    | 61.5 | 67.8 | 52.8 | 56.2 | 90.0 | 14.3 |
| 37   | 67.5 | *    | 74.2 | 77.5 | 55.3 | 58.6 | 93.2 | 14.3 |

\* Thermocouple malfunction.



Table 3 – The temperatures recorded by the disc thermocouples used evaluate the maximum temperature rise of the door leaf of The Specimen under the supplementary procedure (I<sub>1</sub>). Values are in Degrees Celsius (°C) unless otherwise stated.

| Time      | TC11 | TC12  | TC13         | TC14  | TC15 | TC16 | TC17 | TC18 |
|-----------|------|-------|--------------|-------|------|------|------|------|
| 0         | 14.2 | 14.0  | 13.6         | 13.1  | 13.6 | 13.4 | 14.9 | 14.4 |
| 2         | 15.2 | 15.2  | 29.4         | 17.3  | 13.7 | 13.4 | 18.9 | 15.1 |
| 4         | 14.7 | 16.3  | 27.5         | 15.9  | 14.4 | 14.0 | 21.9 | 15.4 |
| 6         | 14.5 | 18.7  | 28.9         | 14.7  | 14.4 | 15.0 | 20.7 | 15.6 |
| 8         | 15.2 | 31.4  | 31.3         | 13.9  | 17.6 | 16.9 | 23.9 | 18.2 |
| 10        | 16.3 | 37.2  | 34.3         | 15.0  | 23.0 | 18.8 | 29.1 | 21.6 |
| 12        | 17.9 | 33.1  | 37.6         | 15.9  | 25.2 | 20.8 | 35.9 | 26.2 |
| 14        | 20.2 | 32.4  | 41.1         | 17.5  | 27.9 | 23.1 | 41.6 | 31.2 |
| 16        | 23.3 | 34.3  | 43.2         | 18.7  | 31.4 | 25.8 | 43.4 | 35.4 |
| 18        | 27.0 | 36.7  | 43.6         | 17.7  | 33.3 | 28.5 | 45.4 | 39.3 |
| 20        | 31.0 | 40.6  | 45.5         | 19.7  | 36.1 | 31.4 | 49.1 | 43.0 |
| 22        | 35.4 | 44.3  | 47.3         | 20.2  | 38.6 | 34.9 | 55.2 | 47.2 |
| 24        | 40.1 | 48.7  | 51.6         | 22.3  | 41.9 | 38.7 | 60.4 | 51.7 |
| 26        | 44.9 | 53.3  | 57.7         | 23.3  | 45.6 | 43.2 | 65.9 | 56.6 |
| 28        | 49.7 | 57.7  | 101.6        | 26.9  | 48.1 | 47.7 | 71.5 | 61.5 |
| 29        | 52.1 | 60.0  | 166.4        | 28.4  | 50.0 | 50.0 | 74.6 | 64.7 |
| <b>30</b> | 54.6 | 63.0  | <b>225.0</b> | 31.3  | 52.8 | 52.3 | 78.9 | 67.7 |
| 32        | 59.5 | 69.7  | *            | 156.2 | 59.6 | 57.4 | 86.0 | 73.0 |
| 34        | 64.5 | 77.4  | *            | 153.7 | 65.3 | 62.2 | 89.3 | 78.4 |
| 36        | 69.2 | 87.3  | *            | 157.3 | 73.6 | 67.5 | 91.8 | 83.3 |
| 37        | 71.3 | 105.3 | *            | 183.2 | 74.6 | 70.0 | 93.6 | 85.2 |

\* Thermocouple malfunction.

Table 4 – The temperatures recorded by the disc thermocouples used to evaluate the maximum temperature rise of the frame/ transom members adjacent to the door leaf of The Specimen. Values are in Degrees Celsius (°C) unless otherwise stated.

| Time (mins) | TC6  | TC7  | TC8  | TC9  | TC10 |
|-------------|------|------|------|------|------|
| 0           | 13.7 | 13.9 | 13.9 | 14.3 | 14.0 |
| 2           | 13.9 | 14.0 | 16.6 | 14.3 | 14.0 |
| 4           | 13.9 | 14.1 | 25.8 | 14.6 | 14.1 |
| 6           | 14.0 | 14.7 | 36.5 | 14.8 | 14.3 |
| 8           | 14.0 | 15.1 | 46.5 | 15.4 | 14.3 |
| 10          | 13.8 | 16.0 | 44.0 | 15.6 | 14.2 |
| 12          | 14.1 | 17.0 | 40.0 | 15.9 | 14.2 |
| 14          | 14.3 | 15.8 | 34.1 | 16.6 | 14.4 |
| 16          | 14.6 | 16.4 | 31.2 | 17.0 | 15.0 |
| 18          | 14.8 | 16.4 | 30.2 | 17.6 | 15.1 |
| 20          | 14.8 | 16.8 | 29.9 | 18.8 | 15.5 |
| 22          | 15.0 | 17.3 | 30.4 | 20.3 | 15.8 |
| 24          | 15.3 | 18.1 | 33.9 | 21.9 | 15.9 |
| 26          | 15.3 | 19.6 | 38.1 | 23.8 | 16.6 |
| 28          | 15.5 | 21.1 | 45.6 | 25.2 | 17.1 |
| 30          | 15.7 | 23.5 | 42.6 | 27.2 | 17.2 |
| 32          | 16.2 | 25.2 | *    | 30.4 | 17.9 |
| 34          | 17.1 | 32.3 | *    | 32.7 | 18.3 |
| 36          | 17.9 | 36.0 | *    | 35.3 | 19.1 |
| 37          | 18.3 | 37.0 | *    | 36.4 | 19.6 |

\* Thermocouple malfunction.

Table 5 – Table presenting the temperatures recorded by the disc thermocouples used to evaluate the maximum temperature rise of the vision panels incorporated into The Specimen. Values are in Degrees Celsius (°C) unless otherwise stated.

| Time (mins) | TC27  | TC28  | TC29         | TC30  |
|-------------|-------|-------|--------------|-------|
| 0           | 14.1  | 13.9  | 14.0         | 13.8  |
| 2           | 14.6  | 14.4  | 14.3         | 14.0  |
| 4           | 15.6  | 16.1  | 15.8         | 14.7  |
| 6           | 16.7  | 18.0  | 16.0         | 15.8  |
| 8           | 18.6  | 20.6  | 20.4         | 20.6  |
| 10          | 24.9  | 27.1  | 27.6         | 27.5  |
| 12          | 32.0  | 36.1  | 38.1         | 38.3  |
| 14          | 42.5  | 46.0  | 50.7         | 47.9  |
| 16          | 51.7  | 53.9  | 61.8         | 57.1  |
| 18          | 58.7  | 61.7  | 71.1         | 67.3  |
| 20          | 64.5  | 67.0  | 78.0         | 77.6  |
| 22          | 69.6  | 71.1  | 83.7         | 84.8  |
| 24          | 84.2  | 76.8  | 91.6         | 90.8  |
| 26          | 88.4  | 84.8  | 101.9        | 98.9  |
| 28          | 96.1  | 94.4  | 116.1        | 110.1 |
| 30          | 107.9 | 106.9 | 131.6        | 124.1 |
| 32          | 121.3 | 120.9 | 153.0        | 140.8 |
| 34          | 137.9 | 139.5 | 182.9        | 163.9 |
| <b>35</b>   | 146.8 | 149.5 | <b>218.6</b> | 182.4 |
| 36          | 156.0 | 159.2 | 300.4        | 233.6 |
| 37          | 165.0 | 169.5 | 402.7        | 321.5 |