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Title:

The Fire Resistance Performance of One Horizontal and Three Vertical Linear Joint Seals When Tested In Accordance With BS EN 1366-4: 2021

Date Of Test:

24 November 2023

Issue 3

04 June 2024

WF Report No:

538815B/R





Prepared for:

Diamorph UK Ltd

C/O Tenmat Ltd Frank Perkins Way Irlam Greater Manchester M44 5EW



This report Supersedes report referenced 538815B Issue 2, which was Issued 12 April 2024

Test Specimen

| Summary of Tested Specimen | For the purpose of the test the floor specimens were referenced A to D and the wall specimens were referenced E to G. Specimens D to G are the subject of this report. Specimens A to C are subjective to another report. |
|-------------------------------|--|
| | The section of wall had overall dimensions of 1510mm high by 1510mm wide by 600mm deep and was made up of autoclaved aerated concrete lintels and brickwork, with a fibre cement board and timber framing system arranged to provide three cavities. |
| | The section of floor had overall dimensions of 2250 mm long by 1750 mm wide by 600 mm thick and was made up of autoclaved aerated concrete lintels arranged to provide four 1100 mm long x 50 mm wide cavities, one subjective to this report. |
| | Specimen D had an overall aperture size of 50 mm wide by 1100 mm long by 600 mm deep. A 145 mm wide by 450 mm high SIP Panel was fixed to the supporting construction along one side of the aperture. The SIP Panel was clad on both sides with 12.5 mm thick OSB board layered with a 0.3 mm thick breather membrane on the aperture side. The SIP Panel cavity was insulated with PU Foam Insulation. A 60mm thick x 100mm wide "NVFB-WB" Cavity Fire Barrier was compression fit into the aperture, with 10 mm compression on the width and a butt joint 900 mm along the length. 0.3 mm thick "HDPE" Damp Proof Membrane was sandwiched between the barrier and blockwork along the length of the barrier. |
| | Specimen E was formed from a 450 mm deep vertically orientated AAC lintel, lined to one vertical face with a 145 mm wide by 450 mm long SIP Panel fixed to the supporting construction. The SIP Panel was clad on both sides with 12.5 mm thick OSB board and insulated with PU Foam Insulation. A 60 mm thick x 100 mm wide "NVFB-WB" Cavity Fire Barrier was compression fit into the aperture with 10 mm compression. The barrier was recessed from the exposed side by 100 mm. 0.3 mm thick "HDPE" Damp Proof Membrane was sandwiched between the barrier and blockwork along the length of the barrier. |
| | Specimen F was formed from a 450 mm deep vertically orientated AAC lintel, lined to one vertical face with a 145 mm wide by 450 mm long SIP Panel fixed to the supporting construction. The SIP Panel was clad on both sides with 12.5 mm thick OSB board and insulated with PU Foam Insulation. A 60 mm thick x 100 mm wide "NVFB-WB" Cavity Fire Barrier was compression fit into the aperture with 10 mm compression. The barrier was recessed from the exposed side by 100 mm. 3 No. 50 mm wide timber battens were fixed to the supporting construction, 90 mm long flush with the exposed face, 230 mm long flush with the unexposed face leaving 10-20 mm air gap between the barrier. |
| | |

Specimen G was formed from a 600 mm deep vertically orientated AAC lintel, lined to one vertical face with a 145 mm wide by 200 mm long SIP Panel and a 145 mm wide by 450 mm SIP Panel fixed to the supporting construction creating a party wall. The SIP Panel was clad on both sides with 12.5 mm thick OSB board layered with a 0.3 mm thick breather membrane on the aperture side and insulated with PU Foam Insulation. A 60 mm thick x 250 mm wide "NVFB-WB" Cavity Fire Barrier was compression fit into the aperture and 60 mm thick x 100 mm wide was compression fit into the stud wall gap, both with 10 mm compression. The barrier was recessed from the exposed side by 100 mm. 0.3 mm thick "HDPE" Damp Proof Membrane was sandwiched between the barrier and blockwork along the length of the barrier.

Detailed drawings of the test specimen(s) and a comprehensive description of the test construction based on a detailed survey of the specimen(s) and information supplied by the sponsor of the test are included in the Test Specimen and Schedule of Components sections of this report.

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Performance Criteria and Test Results

| Integrity | It is required that the specimen retains its separating function, without either causing ignition of a cotton pad when applied as specified in BS EN 1363-1: 2020, or resulting in sustained flaming on the unexposed surface. | | | | | |
|---|--|--------------|--------------|--------------|--|--|
| Insulation | The requirements of the standard are that the maximum temperature rise shall not be greater than 180°C. Insulation failure also occurs simultaneously with integrity failure as specified in BS EN 1363-1: 2020. | | | | | |
| Test Results | Specimen D | Specimen E | Specimen F | Specimen G | | |
| Integrity | 129 Minutes* | 129 Minutes* | 129 Minutes* | 129 Minutes* | | |
| Cotton Pad | 129 Minutes* | 129 Minutes* | 129 Minutes* | 129 Minutes* | | |
| Sustained Flaming | 129 Minutes* | 129 Minutes* | 129 Minutes* | 129 Minutes* | | |
| Insulation (Surface T/C's) | 129 Minutes* | 68 Minutes | 106 Minutes | 129 Minutes* | | |
| *Test was discontinued after a period of 129 Minutes. | | | | | | |

Date of Test 24 November 2023

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Quality Management

| Issue No: 1 | Issue Date: 12 April 2024 | |
|--|--|--|
| Responsible Officer: N.Bradley* | Approved By: D.Whittle* | |
| Hattabert | TAN | |
| Issue No: 2 | Re-issue Date: 12 April 2024 | |
| Responsible Officer: N.Bradley* | Approved By: D.Whittle* | |
| Hattabut | TAA | |
| Reason for Revision: Removed Signatories and Management. Included Damp Proof Membrane after "HDPE" on pa | 3 Revision History Page. Replaced with Quality | |
| Issue No: 3 | Re-issue Date: 04 June 2024 | |
| Responsible Officer: N.Bradley* | Approved By: J Whalley | |
| Hattat | y Whalley | |
| Changed NVFB/LD to NVFB-WB in the schedule of components for Specimens D, E, F, G. | | |

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Test Conditions

| Standard | BS EN 1366-4: 2021 Fire resistance tests for service installations – Part 4: Linear joint seals. |
|------------------------|--|
| | The test was conducted under the requirements of Warringtonfire 's UKAS flexible scope of accreditation. |
| Sampling | Warringtonfire was not involved in the sampling or selection of the tested specimen or any of the components. |
| | The results obtained during the test only apply to the test samples as received and tested by Warringtonfire. |
| Installation | The aerated concrete floor was constructed by representatives of Warringtonfire between the 21 November 2023 to the 22 November 2023. The aerated concrete wall was constructed by representatives of Warringtonfire between the 21 November 2023 to the 22 November 2023. |
| | The cavity sealing systems were provided and installed by a representative of the test sponsor on the 22 November 2023. |
| Conditioning | The specimen's storage, construction, and test preparation took place in the test laboratory over a total, combined time of 4 days. Throughout this period of time both the temperature and the humidity of the laboratory were measured and recorded as being within a range of from 15° C to 20° C and 41% to 66% respectively. |
| Instruction to Test | The test was conducted on the 24 November 2023 at the request of Diamorph UK Ltd, the test sponsor. |
| | Mr. I Hainsworth a representative of the test sponsor witnessed the test. |
| Ambient Temperature | The ambient air temperature in the vicinity of the test construction was 17°C at the start of the test with a maximum variation of -2°C during the test. |
| Furnace | The furnace was controlled so that its mean temperature complied with the requirements of BS EN 1363-1: 2020 Clause 5.1 using four plate thermometers, distributed over a plane 100 mm from the surface of the vertical test construction and four plate thermometers, distributed over a plane 100 mm from the surface of the horizontal test construction. |
| Thermocouples | Thermocouples were provided to monitor the unexposed surface of the specimens. The output of all instrumentation was recorded at no less than one minute intervals. The locations and reference numbers of the various unexposed surface thermocouples are shown in Figures 1 to 6. |
| Furnace Pressure | After the first five minutes of testing and for the remainder of the test, the furnace atmospheric pressure was controlled so that it complied with the requirements of BS EN 1363-1: 2020, clause 5.2.1 The calculated pressure differential relative to the laboratory atmosphere at mid height of wall specimens was 15 (\pm 5) and at position 100 mm below the underside of the floor assembly the differential pressure was calculated to be 20 (\pm 5) Pa between 5 and 10 minutes and (\pm 3) Pa respectively thereafter. |

Test Construction

Figure 1 – General plan of unexposed face showing thermocouple positions.



■ thermocouple positions

GENERAL PLAN OF UNEXPOSED FACE SHOWING THERMOCOUPLE POSITIONS

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■ ▼ thermocouple positions



TYPICAL VERTICAL SECTION THROUGH TEST SPECIMEN

Do not scale. All dimensions are in mm

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Figure 3 – General elevation of unexposed face showing thermocouple positions



■ thermocouple positions

 \oplus internal thermocouples

GENERAL ELEVATION OF UNEXPOSED FACE SHOWING THERMOCOUPLE POSITIONS

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ullet thermocouple positions

TYPICAL HORIZONTAL SECTION THROUGH TEST SPECIMEN

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▼ thermocouple positions

TYPICAL HORIZONTAL SECTION THROUGH TEST SPECIMEN

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▼ thermocouple positions

Figure 6 – Typical horizontal section through specimen G

TYPICAL HORIZONTAL SECTION THROUGH TEST SPECIMEN

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Do not scale. All dimensions are in mm

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Schedule of Components

(Refer to Figures 1 to 7) (All values are nominal unless stated otherwise) (All other details are as stated by the sponsor)

| ltem | Description | |
|---|---|--|
| 1. High density blockwork (supplied by WarringtonFire) | Concrete blockwork | |
| Density | 1400 – 1500 kg/m ³ | |
| 20.000 | | |
| 2. SIP panel | | |
| Manufacturer : | SIPCo Ltd | |
| Reference : | Structural Insulated Panel (SIP) | |
| inalenal a timber framework | Softwood (Grade C24) | |
| b foam insulation | Polyurethane (PLI) foam insulation | |
| c OSB facings | OSB | |
| Overall size | | |
| a. timber framework : | 120 mm wide x 45 mm deep | |
| b. foam insulation : | 120 mm thick | |
| c. OSB facings : | 1100 mm long x 450 / 700 mm wide x 12.5 mm thick | |
| Fixing method : | Timber framework fixed together with 2no. nails per joint. OSB facings through fixed to timber framework with nails. PU Foam Insulation was pre-injected and cured into the framework, filling the void between the OSB facings, forming an exothermally formed connection between the foam and the timber components. Through fixed to the supporting construction with 1no. screw per side | |
| Fixings (framework) | | |
| i. type : | Steel ring shank nails | |
| ii. size : | 100 mm long x 4.5 mm diameter | |
| Fixings (OSB) | | |
| i. type : | Nails | |
| ii. size : | 50 mm long x 5 mm diameter | |
| iii. centres : | 250 mm | |
| Fixings (supporting construction) | | |
| i. type : | Yellow-passivated steel screws | |
| II. SIZE | 200 mm long x 6 mm diameter | |
| 3. Sheathing board | | |
| Manufacturer : | Knauf | |
| Reference : | Windliner Board | |
| Material : | Gypsum based external-grade sheathing board | |
| Density : | 800 kg/m ³ (stated) | |
| I hickness : | 12.5 mm | |
| Fixing method : | I hrough fixed to the timber battens with screws | |
| rixings | Plack phosphata coated steel screws | |
| і. цуре іі сіго | 38 mm long x 3.5 mm diameter | |
| iii centres | 500 mm | |
| | | |

<u>ltem</u>

4 D - - 4 h - 4 ------

Description

| 4. Breather membrane | | |
|----------------------|---|--|
| Manufacturer | : | Protect |
| Reference | : | TF200 Breather Membrane |
| Material | : | Nonwoven spunbond water resistant membrane |
| Thickness | : | 0.3 mm |
| Fixing method | : | Through fixed to OSB facing 8 mm Arrow T50 steel |
| | | staples at 300 mm centres |
| 5. Timber battens | | |
| Material | : | Softwood (grade C16) |
| Section size | : | 25 mm thick x 50 mm wide |
| Density | : | 370 kg/m ³ (typical) |
| Fixing method | : | Through fixed to SIP panel via breather membrane with 2no. screws per batten |
| Fixings | | • |
| i. type | : | Yellow-passivated steel screws |
| ii. size | : | 70 mm long x 5 mm diameter |
| 6. Cavity barrier D | | |
| Details of aperture | : | 50 mm wide x 1100 mm long |
| Details of barrier | | |
| Manufacturer | : | Tenmat |
| Reference | : | NVFB-WB |
| Material | : | Stone mineral wool |
| Density | : | 45 kg/m ³ (stated) |
| Overall size | : | 1100 mm long (butt-jointed at 900 mm) x 100 mm wide |
| | | x 60 mm thick (compressed to 50 mm) |
| Fixing method | : | Compression-fitted into the aperture with 10 mm |
| | | compression across the thickness. Retained to the SIP |
| | | panel with screws and 25 mm diameter penny washers |
| Fixings | | |
| i. type | : | Yellow-passivated steel screws |
| ii. size | : | 70 mm long x 5 mm diameter |
| iii. centres | : | 500 mm |
| Details of DPC | | |
| i. material | : | LDPE |
| ii. overall size | : | 100 mm x 0.3 mm |
| iii. fixing method | : | Sandwiched between the barrier and the blockwork |
| | | along the full length of the barrier |
| 7. Cavity barrier E | | |
| Details of aperture | : | 50 mm wide x 1100 mm long |
| Details of barrier | | |
| Manufacturer | : | Tenmat |
| Reference | : | NVFB-WB |
| Material | : | Stone mineral wool |
| Density | : | 45 kg/m ³ (stated) |
| Overall size | : | 1100 mm long (butt-jointed at 750 mm) x 100 mm wide |
| | | x 60 mm thick (compressed to 50 mm) |
| Fixing method | : | Compression-fitted into the aperture with 10 mm |
| - | | compression across the thickness. Retained to the SIP |
| | | panel with screws and 25 mm diameter penny washers |

<u>ltem</u>

Description

| 7. Cavity barrier E (continued) Fixings | | |
|--|---|-----|
| i. type | Yellow-passivated steel screws | |
| ii. size | 70 mm long x 5 mm diameter | |
| iii. centres | 500 mm | |
| Details of DPC | | |
| i. material | LDPE | |
| ii overall size | $100 \text{ mm} \ge 0.3 \text{ mm}$ | |
| iii fixing method | Sandwiched between the barrier and the blockwork | |
| | along the full length of the barrier | |
| 8. Cavity barrier F | | |
| Details of aperture | 50 mm wide x 1100 mm long | |
| Details of barrier | | |
| Manufacturer : | Tenmat | |
| Reference | NVFB-WB | |
| Material | Stone mineral wool | |
| Density | 45 kg/m ³ (stated) | |
| Overall size | 1100 mm long (butt-jointed at 750 mm) x 100 mm with x 60 mm thick (compressed to 50 mm) | de |
| Fixing method | Compression-fitted into the aperture with 10 mm | |
| 5 | compression across the thickness. Retained to the S | IP |
| | panel with screws and 25 mm diameter penny washe | ers |
| Fixings | | |
| i. type | Yellow-passivated steel screws | |
| ii. size | 70 mm long x 5 mm diameter | |
| iii. centres | 500 mm | |
| 9. Cavity barrier G | | |
| Details of aperture | 50 mm wide x 1100 mm long | |
| Details of barrier | | |
| Manufacturer : | Tenmat | |
| Reference | NVFB-WB | |
| Material | Stone mineral wool | |
| Density | 45 kg/m ³ (stated) | |
| Overall size | • • • | |
| a. cavity barrier | 1100 mm long (butt-jointed at 750 mm) x 250 mm wid | de |
| | x 60 mm thick (compressed to 50 mm) | |
| b. party wall detail | 1100 mm long (butt-jointed at 750 mm) x 100 mm wig | de |
| | x 60 mm thick (compressed to 50 mm) | |
| Fixing method | | |
| a. cavity barrier | Compression-fitted into the aperture with 10 mm | |
| | compression across the thickness. Retained to the S | IP |
| | panel with screws and 25 mm diameter penny washe | ers |
| b. party wall detail | Compression-fitted into the gap in the timber framew | ork |
| | with 10 mm compression across the thickness | |
| Fixings | | |
| i. type | Yellow-passivated steel screws | |
| ii. size | 70 mm long x 5 mm diameter | |
| iii. centres | 500 mm | |
| Details of DPC | | |
| i. material | LDPE | |
| ii. overall size | 300 mm x 0.3 mm | |
| iii. fixing method | Sandwiched between the barrier and the blockwork | |
| J. | along the full length of the barrier | |

Description

<u>ltem</u>

| 10. Closure boards (for test purposes | | |
|---|---|--|
| only) | | |
| Material | : | Calcium silicate board |
| Thickness | : | 15 mm |
| Fixing method | : | Through fixed to the supporting construction on the exposed face of the wall specimens with screws |
| Fixings | | |
| i. type | : | Zinc coated steel screws |
| ii. size | : | 100 mm long x 6 mm diameter |
| iii. centres | : | 450 mm |
| Supporting construction (comprising items 11 – 12) 11. Concrete lintels (supplied by Warringtonfire) | | |
| Material | | Autoclaved aerated concrete lintels |
| Density | | 670 kg/m ³ |
| Overall size | | 1680 mm long x 600 mm deen x 250 / 200 mm wide |
| | • | |
| 12. Masonry infill (supplied by WarringtonFire) | | |
| Material | | Aerated concrete blockwork |
| Density | : | 760 kg/m [°] |
| | | |

Test Observations

| Time | | All observations are from the unexposed face unless noted otherwise. |
|------|------|--|
| mins | secs | |
| 00 | 00 | Test Commences. |
| 25 | 10 | All TC's reattached. |
| 38 | 36 | Smoke and steam release from Specimens D to G |
| 72 | 10 | Specimen E charring on the mineral wool. |
| 101 | 38 | Increased smoke and steam release from Specimens D to G. |
| 129 | 00 | Test Discontinued at the request of the test sponsor. |

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Test Photographs

The exposed face of the wall assembly prior to the start of the test



The exposed face of the floor assembly prior to the start of the test



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The unexposed face of the wall assembly after a test duration of 10 minutes



The unexposed face of the floor assembly after a test duration of 10 minutes



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The unexposed face of the wall assembly after a test duration of 30 minutes



The unexposed face of the floor assembly after a test duration of 30 minutes



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The unexposed face of the wall assembly after a test duration of 60 minutes



The unexposed face of the floor assembly after a test duration of 60 minutes



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The unexposed face of the wall assembly after a test duration of 90 minutes



The unexposed face of the floor assembly after a test duration of 90 minutes



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The unexposed face of the wall assembly after a test duration of 120 minutes



The unexposed face of the floor assembly after a test duration of 120 minutes



The exposed face of the wall assembly immediately after the test



The exposed face of the floor assembly immediately after the test



Temperature and Pressure Data

Mean furnace temperature, together with the temperature/time relationship specified in BS EN 1363-1: 2020

| Time | Specified | Actual | |
|------|-------------|-------------|--|
| | Furnace | Furnace | |
| Mins | Temperature | Temperature | |
| | Deg. C | Deg. C | |
| 0 | 20 | 45 | |
| 4 | 544 | 584 | |
| 8 | 645 | 605 | |
| 12 | 705 | 708 | |
| 16 | 748 | 749 | |
| 20 | 781 | 786 | |
| 24 | 809 | 822 | |
| 28 | 832 | 839 | |
| 32 | 851 | 858 | |
| 36 | 869 | 875 | |
| 40 | 885 | 891 | |
| 44 | 899 | 906 | |
| 48 | 912 | 917 | |
| 52 | 924 | 929 | |
| 56 | 935 | 940 | |
| 60 | 945 | 951 | |
| 64 | 955 | 960 | |
| 68 | 964 | 971 | |
| 72 | 973 | 981 | |
| 76 | 981 | 989 | |
| 80 | 988 | 992 | |
| 84 | 996 | 991 | |
| 88 | 1003 | 1000 | |
| 92 | 1009 | 1004 | |
| 96 | 1016 | 1009 | |
| 100 | 1022 | 1022 | |
| 104 | 1028 | 1028 | |
| 108 | 1033 | 1035 | |
| 112 | 1039 | 1041 | |
| 116 | 1044 | 1047 | |
| 120 | 1049 | 1045 | |
| 124 | 1054 | 1047 | |
| 128 | 1059 | 1056 | |
| 129 | 1060 | 1058 | |

| Individual temperatures recorded on the unexposed surface of Specimen D |
|---|
| and adjacent to Specimen D |

| Time | T/C | T/C | T/C | T/C | T/C | T/C | T/C | T/C |
|------|--------|--------|--------|--------------|--------|--------|--------|--------|
| | Number | Number | Number | Number | Number | Number | Number | Number |
| Mins | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 |
| | Deg. C | Deg. C | Deg. C | Deg. C | Deg. C | Deg. C | Deg. C | Deg. C |
| 0 | 17 | 18 | 16 | 17 | 17 | 18 | 18 | 18 |
| 4 | 20 | 20 | 33 | * | 36 | 19 | 21 | 21 |
| 8 | 34 | 25 | 59 | * | 59 | 25 | 23 | 23 |
| 12 | 40 | 28 | 67 | 70 | 67 | 32 | 26 | * |
| 16 | 39 | 34 | 70 | 77 | 67 | 38 | 24 | * |
| 20 | 44 | 37 | 72 | 78 | 70 | 41 | 27 | * |
| 24 | 46 | 39 | 74 | 80 | 74 | 43 | 28 | * |
| 28 | 46 | 40 | 74 | 82 | 72 | 45 | 28 | * |
| 32 | 49 | 42 | 74 | 85 | 75 | 47 | 30 | * |
| 36 | 50 | 41 | 75 | 90 | 71 | 48 | 31 | * |
| 40 | 50 | 42 | 74 | 92 | 70 | 49 | 32 | * |
| 44 | 50 | 42 | 75 | 95 | 72 | 50 | 33 | * |
| 48 | 52 | 42 | 75 | 99 | 71 | 52 | 35 | * |
| 52 | 54 | 42 | 75 | 103 | 69 | 53 | 36 | 24 |
| 56 | 53 | 42 | 75 | 106 | 72 | 53 | 37 | 26 |
| 60 | 53 | 42 | 75 | 108 | 70 | 53 | 37 | 26 |
| 64 | 55 | 43 | 76 | 108 | 71 | 54 | 38 | 27 |
| 68 | 57 | 42 | 78 | 110 | 70 | 55 | 41 | 27 |
| 72 | 56 | 43 | 79 | 9 112 70 5 | | 55 | 41 | 28 |
| 76 | 58 | 44 | 81 | 114 70 56 41 | | 41 | 28 | |
| 80 | 59 | 44 | 89 | 115 | 71 | 56 | 42 | 30 |
| 84 | 60 | 45 | 91 | 117 | 72 | 57 | 44 | 30 |
| 88 | 60 | 45 | 95 | 120 | 73 | 57 | 44 | 30 |
| 92 | 61 | 46 | 97 | 122 | 78 | 58 | 45 | 31 |
| 96 | 62 | 47 | 98 | 124 | 82 | 58 | 45 | 31 |
| 100 | 63 | 48 | 100 | 128 | 86 | 59 | 45 | 32 |
| 104 | 63 | 48 | 103 | 130 | 88 | 59 | 46 | 32 |
| 108 | 65 | 50 | 104 | 137 | 91 | 60 | 47 | 32 |
| 112 | 67 | 51 | 107 | 144 | 95 | 61 | 47 | 31 |
| 116 | 68 | 52 | 107 | 153 | 99 | 62 | 47 | 33 |
| 120 | 68 | 54 | 112 | 160 | 104 | 62 | 47 | 33 |
| 124 | 73 | 57 | 113 | 172 | 107 | 63 | 49 | 34 |
| 128 | 75 | 59 | 116 | 184 | 113 | 64 | 49 | 33 |
| 129 | 76 | 59 | 117 | 186 | 114 | 64 | 50 | 32 |

*Thermocouple Malfunction

| Individual temperatures recorded on the unexposed surface of Specimen E |
|---|
| and adjacent to Specimen E |

| Time | T/C | T/C | T/C | T/C | T/C | T/C | T/C | T/C |
|------|--------|--------|--------|---------------|--------|--------|--------|--------|
| | Number | Number | Number | Number | Number | Number | Number | Number |
| Mins | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 |
| | Deg. C | Deg. C | Deg. C | Deg. C | Deg. C | Deg. C | Deg. C | Deg. C |
| 0 | 12 | 12 | 12 | 10 | 11 | 10 | 12 | 12 |
| 4 | 12 | 13 | 13 | 11 | 13 | 11 | 13 | 13 |
| 8 | 12 | 13 | 46 | 46 36 33 14 1 | | 14 | 13 | |
| 12 | 14 | 11 | 63 | 53 | 46 | 21 | 15 | 14 |
| 16 | 15 | 11 | 67 | 59 | 49 | 26 | 16 | 14 |
| 20 | 16 | 11 | 72 | 65 | 51 | 28 | 18 | 15 |
| 24 | 17 | 11 | 74 | 69 | 50 | 31 | 19 | 16 |
| 28 | 19 | 11 | 76 | 72 | 54 | 33 | 20 | 16 |
| 32 | 19 | 11 | 80 | 76 | 54 | 36 | 22 | 17 |
| 36 | 21 | 11 | 82 | 78 | 55 | 36 | 23 | 18 |
| 40 | 23 | 19 | 88 | 79 | 56 | 37 | 25 | 19 |
| 44 | 25 | 22 | 102 | 83 | 58 | 34 | 26 | 20 |
| 48 | 14 | 23 | 125 | 82 | 59 | 36 | 27 | 20 |
| 52 | 16 | 25 | 145 | 81 | 61 | 36 | 29 | 21 |
| 56 | 19 | 27 | 156 | 83 | 61 | 37 | 30 | 22 |
| 60 | 18 | 28 | 165 | 165 86 63 38 | | 38 | 31 | 23 |
| 64 | 19 | 30 | 178 | 8 92 65 38 | | 32 | 24 | |
| 68 | 20 | 32 | 190 | 99 66 38 34 | | 34 | 24 | |
| 69 | 21 | 32 | 193 | 101 | 67 | 39 | 34 | 25 |
| 72 | 21 | 34 | 200 | 107 68 37 35 | | 35 | 25 | |
| 76 | 16 | 35 | 213 | 113 | 72 | 38 | 36 | 26 |
| 80 | 17 | 38 | 221 | 119 | 73 | 39 | 38 | 27 |
| 84 | 17 | 39 | 227 | 124 | 77 | 38 | 40 | 27 |
| 88 | 17 | 42 | 239 | 129 | 79 | 39 | 41 | 28 |
| 92 | 45 | 44 | 252 | 133 | 83 | 40 | 43 | 29 |
| 96 | 38 | 45 | 261 | 139 | 86 | 40 | 44 | 29 |
| 100 | 39 | 47 | 263 | 145 | 91 | 41 | 46 | 30 |
| 104 | 40 | 50 | 271 | 151 | 97 | 41 | 48 | 31 |
| 108 | 41 | 51 | 274 | 158 | 106 | 43 | 50 | 33 |
| 112 | 42 | 53 | 279 | 163 | 111 | 45 | 52 | 34 |
| 116 | 43 | 54 | 283 | 167 | 117 | 46 | 53 | 35 |
| 120 | 45 | 56 | 280 | 171 | 120 | 46 | 55 | 37 |
| 124 | 46 | 57 | 279 | 175 | 125 | 47 | 57 | 38 |
| 128 | 47 | 59 | 283 | 179 | 131 | 50 | 59 | 39 |
| 129 | 47 | 59 | 284 | 179 | 133 | 48 | 60 | 40 |

*Thermocouple Malfunction

| Individual temperatures recorded on the unexposed surface of Specimen F and adjacent to Specimen F | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Time | T/C | | |

| - | 1 | 1 | | | 1 | | 1 | |
|------|--------|--------|--------|--------|--------|--------|--------|--------|
| Time | T/C |
| | Number |
| Mins | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 |
| | Deg. C |
| 0 | 11 | 11 | 11 | 10 | 12 | 11 | 10 | 12 |
| 4 | 12 | 12 | 13 | 11 | * | * | 11 | 13 |
| 8 | 13 | 12 | 45 | 31 | * | * | 12 | 12 |
| 12 | 13 | 12 | 61 | 52 | 32 | * | 14 | 11 |
| 16 | 14 | 13 | 64 | 59 | 37 | 53 | 16 | 10 |
| 20 | 15 | 14 | 67 | 63 | 41 | 58 | 19 | 10 |
| 24 | 15 | 15 | 68 | 66 | 42 | 60 | 21 | 15 |
| 28 | 16 | 16 | 72 | 69 | 43 | 62 | 22 | 15 |
| 32 | 16 | 17 | 75 | 72 | 43 | 64 | 24 | 16 |
| 36 | 17 | 18 | 77 | 75 | 46 | 66 | 25 | 17 |
| 40 | 17 | 19 | 79 | 77 | 46 | 67 | 26 | 18 |
| 44 | 18 | 20 | 82 | 79 | 47 | 67 | 27 | 19 |
| 48 | 19 | 21 | 95 | 80 | 46 | 67 | 28 | 19 |
| 52 | 20 | 22 | 105 | 80 | 47 | 67 | 30 | 20 |
| 56 | 20 | 23 | 113 | 81 | 47 | 67 | 30 | 21 |
| 60 | 21 | 24 | 122 | 83 | 46 | 66 | 31 | 22 |
| 64 | 22 | 24 | 131 | 86 | 48 | 67 | 32 | 22 |
| 68 | 23 | 25 | 138 | 90 | 48 | 67 | 33 | 23 |
| 72 | 24 | 26 | 144 | 95 | 48 | 67 | 34 | 23 |
| 76 | 25 | 28 | 150 | 102 | 48 | 68 | 35 | 24 |
| 80 | 25 | 29 | 155 | 112 | 48 | 66 | 36 | 23 |
| 84 | 26 | 30 | 162 | 122 | 48 | 66 | 38 | 24 |
| 88 | 28 | 31 | 169 | 133 | 48 | 65 | 40 | 24 |
| 92 | 29 | 32 | 174 | 142 | 49 | 65 | 42 | 24 |
| 96 | 30 | 33 | 179 | 151 | 52 | 65 | 44 | 24 |
| 100 | 32 | 33 | 184 | 159 | 53 | 65 | 48 | 24 |
| 104 | 33 | 35 | 187 | 166 | 56 | 64 | 51 | 23 |
| 106 | 33 | 35 | 191 | 170 | 57 | 66 | 54 | 24 |
| 107 | 34 | 35 | 192 | 171 | 58 | 65 | 55 | 24 |
| 108 | 34 | 35 | 193 | 173 | 58 | 65 | 57 | 24 |
| 112 | 36 | 36 | 199 | 179 | 61 | 65 | 63 | 24 |
| 116 | 38 | 37 | 205 | 186 | 64 | 67 | 66 | 25 |
| 120 | 40 | 38 | 212 | 194 | 76 | 68 | 69 | 25 |
| 124 | 42 | 40 | 219 | 203 | 80 | 67 | 71 | 25 |
| 128 | 43 | 42 | 226 | 209 | 85 | 69 | 74 | 26 |
| 129 | 44 | 42 | 227 | 210 | 86 | 68 | 75 | 26 |

* Thermocouple Malfunction

| and adjacent to Specimen G (Party Wall) | | | | | | | | | |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--|
| Time | T/C | |
| Mins | Number | |
| | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | |
| | Deg. C | |
| 0 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | |
| 4 | 12 | 12 | 12 | 13 | 12 | 12 | 12 | 12 | |

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Individual temperatures recorded on the unexposed surface of Specimen G and adjacent to Specimen G (Party Wall)

* Thermocouple Malfunction

Individual temperatures recorded on the unexposed surface of Specimen G and adjacent to Specimen G

| Time | T/C |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | Number |
| Mins | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 69 |
| | Deg. C |
| 0 | 13 | 12 | 13 | 12 | 13 | 12 | 9 | 12 | 15 |
| 4 | 14 | 12 | 14 | 13 | 13 | 12 | 10 | 13 | 79 |
| 8 | 14 | 12 | 15 | 14 | 14 | 13 | 10 | 13 | 45 |
| 12 | 14 | 12 | 15 | 15 | 14 | 13 | 12 | 13 | 31 |
| 16 | 14 | 12 | 16 | 15 | 14 | 13 | 13 | 13 | 14 |
| 20 | 15 | 12 | 16 | 15 | 15 | 13 | 15 | 13 | 13 |
| 24 | 15 | 12 | 16 | 16 | 15 | 13 | 16 | 13 | 13 |
| 28 | 15 | 12 | 16 | 17 | 15 | 14 | 18 | 13 | 13 |
| 32 | 15 | 12 | 17 | 17 | 16 | 14 | 19 | 13 | 13 |
| 36 | 15 | 12 | 18 | 18 | 18 | 15 | 20 | 13 | 13 |
| 40 | 16 | 12 | 19 | 18 | 19 | 15 | 24 | 13 | 13 |
| 44 | 16 | 12 | 20 | 19 | 20 | 16 | 26 | 13 | 14 |
| 48 | 16 | 12 | 22 | 19 | 22 | 16 | 27 | 13 | 14 |
| 52 | 17 | 12 | 24 | 21 | 23 | 18 | 30 | 13 | 14 |
| 56 | 18 | 13 | 27 | 22 | 26 | 19 | 31 | 14 | 14 |
| 60 | 18 | 13 | 30 | 24 | 29 | 21 | 34 | 14 | 14 |
| 64 | 19 | 13 | 33 | 26 | 33 | 22 | 37 | 14 | 15 |
| 68 | 19 | 13 | 36 | 28 | 36 | 25 | 39 | 15 | 15 |
| 72 | 20 | 14 | 39 | 28 | 38 | 27 | 39 | 16 | 15 |
| 76 | 20 | 14 | 42 | 30 | 41 | 30 | 41 | 16 | 15 |
| 80 | 21 | 14 | 44 | 31 | 43 | 34 | 41 | 17 | 15 |
| 84 | 22 | 15 | 48 | 33 | 45 | 37 | 44 | 19 | 15 |
| 88 | 22 | 16 | 50 | 34 | 49 | 39 | 43 | 20 | 15 |
| 92 | 23 | 16 | 51 | 34 | 50 | 41 | 43 | 21 | 15 |
| 96 | 24 | 17 | 53 | 36 | 52 | 42 | 43 | 21 | 15 |
| 100 | 24 | 18 | 53 | 37 | 54 | 44 | 44 | 23 | 16 |
| 104 | 25 | 19 | 54 | 37 | 55 | 44 | 42 | 25 | 16 |
| 108 | 26 | 20 | 55 | 38 | 56 | 46 | 39 | 24 | 17 |
| 112 | 26 | 20 | 56 | 38 | 58 | 47 | 43 | 25 | 17 |
| 116 | 26 | 21 | 57 | 40 | 59 | 49 | 44 | 27 | 17 |
| 120 | 27 | 22 | 60 | 41 | 62 | 54 | 45 | 29 | 17 |
| 124 | 28 | 24 | 63 | 44 | 66 | 59 | 46 | 20 | 19 |
| 128 | 29 | 25 | 67 | 47 | 70 | 64 | 49 | 20 | 19 |
| 129 | 30 | 25 | 68 | 48 | 70 | 64 | 49 | 21 | 20 |





Pressure - Pa

Graph showing recorded furnace pressure 250 mm above the head of the wall specimens

Time - Minutes

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On-going Implications

Limitations

This report details the method of construction, the test conditions and the results obtained when the specific elements of construction described herein was tested following the procedure outlined in BS EN 1366-4: 2021. 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. Annex A of BS EN 1363-1: 2020, provides guidance information on the application of fire resistance tests and the interpretation of test data.

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.

This report Supersedes report referenced 538815B Issue 2, which was Issued 12 April 2024.

EGOLF Certain aspects of some fire test specifications are open to different interpretations. EGOLF has 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

Note: The field of direct application may only be defined following the identification of classification(s). The field of direct and, where applicable, extended application will be included in the classification report.