

3.4.3 Lippings

Door leaves and overpanels must be lipped on all edges with minimum 9mm thick, straight grained hardwood, with minimum measured density 650kg/m³ (measured at 12% moisture content) of appropriate quality in accordance with BS EN 942: 1996. Moisture content to be 10 ± 2% for UK market (or to suit internal joinery moisture content specification of export countries).

Lippings shall be bonded using urea formaldehyde or polyurethane (PU) type adhesives. The machining of the core/lipping, and bonding process, must be such to ensure that no gaps occur between core and lipping.

Double leaf door assemblies within the scope of this Field of Application Report must have square edged (or slightly rounded) meeting stiles as rebated meeting edges are not permitted. The radius formed on the leading edge of double acting doors, or single acting double doors, shall not remove more than 2mm thickness of lippings on the door face. The radius of pivot stiles shall suit the pivot/floor spring employed.

3.5 Door frames

Door frames must be constructed from either softwood or hardwood with a minimum measured density of 510kg/m³ (measured at 12% moisture content). Timber must be straight grained and of appropriate quality in accordance with BS EN 942: 1996. Moisture content to be 10 ± 2% for UK market (or to suit internal joinery moisture content specification of export countries).

Minimum dimensions: 32mm face width (excluding stop) by 70mm deep with a 12mm deep planted or integral door stop. ^{Note 2}

Note 2 These dimensions assume that the rear of the frame is protected by the adjacent wall, (and firestopping), and that the frame does not project out from the wall. For double acting doorsets the frame head must be increased to a minimum thickness of 38mm to accommodate the top pivot assembly with the minimum thickness of the frame jambs remaining at 32mm after scalloping.

The overall frame depth may be increased by the use of extension linings, but the joint between the main frame and the extension lining must not intrude in the plane of the door thickness. Where an integral architrave is used, the face of the door may protrude beyond the face of the wall, providing the thickness of the architrave is no greater than 10mm and it protrudes at least 15mm beyond the rear face of the door frame. This assumes that the face of the door leaf is flush with the face of the architrave.

Door stops may be machined from solid or planted and pinned using 40mm steel pins.

- Head/jamb joint: Mortice and tenon, or half-lapped joint, head twice screwed to each jamb or mitred joint which is glued with a non-thermally softening adhesive and the head twice screwed to each jamb.
- Transom members: When a transom is used between a door and an overpanel, the member shall be at least 70 x 38mm, and shall include minimum 12mm thick door stops on both sides (i.e. making a minimum 70 x 62mm thick overall section). The overpanel must always be on the same plane as the door(s) below.
- Architraves: Architraves are optional and have no fire performance requirements. (See Section 3.8 regarding wall/frame gaps.)

3.6 Glazed apertures

3.6.1 Glass types

The doorset design outlined in Section 3.4 of this report has been successfully tested with the inclusion of glazed apertures. The following glass types are approved for use in the doors considered herein, which are compatible with the identified approved glazing systems given in Section 3.6.2, although some restrictions on size may be given in subsequent sections. See also Section 3.6.5 regarding ladder glazing.

The codes used, below, for the glass types, glazing materials, and bead types, (e.g. G1, S1 and B1), are not those used by the respective manufacturers, and are attributed solely by IFC for the purpose of identification and cross-referencing within this assessment.

- G1 Pyroshield Fire and Safety (Pilkington) – 6mm
- G2 Pyran S (Schott Glass) – 7mm
- G3 Pyrobelite (Glaverbel) – 7mm
- G4 Firelight (Southern Ceramics) – 5mm ^{Note 3}
- G5 Pyrodur Plus (Pilkington) – 7.5mm
- G6 Pyrodur (Pilkington) – 10mm

Note 3 Limitations apply to the pane size of glass type G4, 5mm thick Firelite, as it does not satisfy the requirements of BS6206. Panes are restricted to a smaller dimension not exceeding 250mm and an area not exceeding 0.5m², each measured between glazing beads, in accordance with the requirements of Approved Document N.

For door assemblies that are to satisfy the insulation requirement, the following glass types are also approved;

- G7 Pyrostop (Pilkington) – 15mm
- G8 Pyrobel (Glaverbel) – 16mm

Expansion allowance for all glass types shall be as recommended by the glass manufacturer.

3.6.2 Glazing materials and systems

The following glazing materials are approved for use in the doors considered herein, which are compatible with the identified approved glass types listed above, although some restrictions on size may be given in subsequent sections.

S1	10 x 2mm Pyrostrip 300	(G1, G2, G3, G4, G5 & G6)
S2	10 x 2mm Interdens	(G1, G2, G3, G4, G5 & G6)
S3	10 x 2mm Therm-A-Strip	(G1, G2, G3, G4, G5 & G6)
S4	10 x 2mm G30	(G1, G2, G3, G4, G5 & G6)
S5	10 x 5mm Closed cell foam	(G7 & G8)
S6	10 x 4mm Ceramic fibre tape	(G7 & G8)
S7	15 x 4mm Fireglaze 30 mastic	(G1, G2, G3, G4, G5 & G6)
S8	Lorient System 36 to suit glass thickness	(G1, G2, G3, G4, G5, G6, G7 & G8)

3.6.3 Bead profiles and installation

The approved bead sizes and profiles, and relevant fixing details, are shown on the **Figures 07061/01 to 03** in Appendix A, which also define any limitations upon options of interchangeability with glass types, glazing systems and bead profiles.

Glazing beads shall be formed from good quality, straight grained, hardwood, with 640kg/m³ minimum density (measured at 12% moisture content). Timber must be free of splits, shakes and checks. Moisture content shall be 10 ± 2% for UK market (or to suit internal joinery moisture content specification of export countries).

The beads must be secured using minimum 38mm long steel pins or screws spaced 50mm from each corner and at minimum 150mm centres and nominally 30 degrees to the plane of the glass.

Expansion gaps suitable for the size and type of glass must be allowed for within the glazing system.

3.6.4 Assessed aperture sizes

Apertures are created by cutting directly into the door blank, with beads fitted directly to the door core. Alternatively, where a quirk bead (bead B2 or B3) is employed, a hardwood lipping must be applied to the aperture perimeter, using the specification for lippings defined in Section 3.4.3.

Based upon the size of apertures tested, it is the opinion of IFC that the following limitations apply to glazed apertures in the door leaves considered herein;

Maximum area of single aperture	-	0.4m ² <i>Note 4</i>
Minimum distance from leaf edge (top)	-	200mm
Minimum distance from leaf edge (sides)	-	200mm
Minimum distance from bottom of leaf	-	250mm
Minimum distance between apertures	-	100mm

More than one aperture may be included in each leaf subject to the individual limitations above.

Note 4 Any aperture(s) for intumescent air transfer grilles, (see Section 3.7.4), must also be included in the total area permitted for apertures given above. Margins between apertures apply whether for glazing or grilles.

3.6.5 Ladder glazing

To create the effect of narrow glazing bars separating multiple apertures within a door leaf, it is permitted to include a single aperture, with mock glazing bars applied to the faces of the pane of glass. In all cases, the sizes and margins of the aperture(s) must be in accordance with Section 3.6.4 above.

The mock beads may only be applied to fully insulating glass types G7 and G8, and may be bonded to the glass/seal using double sided adhesive tape and mechanical fixed to the perimeter bead. The profile/size of mock beads and perimeter bead, and the approved glazing seals, are shown in **Figure 07061/03** in Appendix A.

3.7 Hardware

Some of the various items of hardware to be used with the proposed doorsets will have a positive contribution to the overall performance ('essential hardware') and others are classed as 'non-essential'. However, in all cases it must be ensured that choice of items, or their installation within the assemblies, does not have a detrimental effect upon their achievement of the required period of fire resistance.

All hardware beyond the scope of the general guidance given below must have been subjected to fire resistance testing, and/or assessed by a notified body, to support its use in doors of a similar construction to that proposed, or third party certification shall be available to support its use on doorsets of the proposed type.

General guidance for all items of hardware is outlined below, based upon the range of items tested.

3.7.1 Hinges

The hinges used in the tests were Royde & Tucker H101 lift-off type with a blade size measuring 100mm high x 33mm wide, but other hinges may be used, subject to compliance with the specifications below.

Hinge types: Fixed pin, washered butt, ball bearing butt or journal supported hinges may be used.

Number of hinges: 3No. (1.5 pairs) per leaf. (4No. should be used on leaves greater than 2200mm high).

Positions:	Top hinges set 150mm (and 350mm down from the head if using 4 hinges) with the bottom hinge set 225mm up from the bottom of the leaf. The middle hinge must be equispaced between the top and bottom hinge. (All positions $\pm 25\text{mm}$.)
Fixings:	Steel screws, as recommended by the hinge manufacturers, but in no case smaller than No 8 (3.8mm diameter) by 32mm long, and having thread for the full length. Position of screws (in relation to the door face) in blades of alternative hinge shall be similar to hinges tested with the proposed door type.
Hinge blade sizes:	2.4 – 3.5mm thick by 89 – 110mm high by 32 – 37mm wide. (These dimensions refer to the blade size, i.e. the part of the hinges that are recessed into the edge of the leaves/frame.)
Hinge materials:	Steel or Stainless Steel. (Aluminium, Nylon or 'Mazac' are not permitted.) No combustible or thermally softening materials to be included.
Additional protection:	All hinge blades must be bedded on 1mm thick Intumescent Seals Ltd Therm-A-Strip or an alternative non-pressure forming intumescent material at least 1mm thick. A minimum 3mm width of intumescent seal shall be continuous alongside the hinge blades.

Rising butt, non-cranked butts and spring hinges are not suitable for use on doors approved within the scope of this generic assessment, although may be suitable to form the subject of an individual and specific evaluation.

3.7.2 Mortice latches/locks

The doorset was originally tested with a Legge tubular mortise latch but other mortice locks/latches may be used, subject to compliance with the specifications below.

Mortice latches or locks should be centred at 1000mm ($\pm 200\text{mm}$), above the bottom of the door leaf, and should comply with the following specifications:

Latch/lock types:	Mortice latches, tubular mortice latches, sashlocks, deadlocks.
Maximum dimensions:	Forend plate 235mm long by 20mm wide. Latch body 18mm wide (thick). Strikeplate 235mm long by 20mm wide.

Latches must have no essential part of their structure made from polymeric or other low melting point ($< 800^{\circ}\text{C}$) materials, and should not contain any flammable materials.

The lock/latch body does not require intumescent protection, however, the lock/latch forend and strike plates must be bedded on 1mm thick Intumescent Seals Ltd Therm-A-Strip or an alternative 1mm thick low-pressure forming intumescent sheet eg. Interdens.

Over-morticing is to be avoided; mortices should be as tight as possible to the latch. If gaps around the case exceed 2mm, then these must be made good with intumescent mastic or sheet material. Holes for spindles should be kept as small as is compatible with the operation of the hardware.

Where apertures are specified, and are positioned such that locks/latches are included in the margin between the aperture and the door edge, care must be taken to ensure that the effective door 'stile' is not weakened by the mortice. It is a condition of this Field of Application Report that, except where tubular latches are employed, the margin must be at least 75mm wider than the lock/latch mortice. If the mortice latch/lock is fitted in line with a 'rail' between two apertures, no part of the lock mortice shall be closer than 50mm to the edge of any aperture.

3.7.3 Bolts

Unless specific fire test evidence is available, all bolts shall be steel. The following limitations and protection apply;

- Maximum size of flush bolt is 250mm long by 20mm wide and 19mm deep.
- The body of the bolt should be bedded on non-pressure forming intumescent material at least 1mm thick.
- Edge fixed bolts shall be positioned centrally in leaf thickness (the intumescent seals defined in Appendix B shall be fitted in the active leaf).
- Where there is an interruption in the intumescent seal in the door leaf or frame at the head, additional 1mm thick non-pressure forming intumescent material should be included.
- Face fixed flush bolts shall be fixed so that there is a minimum of 50mm between the bolt and the door edge.
- Surface mounted barrel bolts shall not exceed 400mm in length, but there is no limitation on their width. They shall be fixed so that there is a minimum of 50mm between the bolt and the door edge. Screws for fixing bolts must be at least 25mm long, and have thread for the full screw length.

3.7.4 Door closers

Each hinged door leaf must be fitted with a self-closing device unless they are normally kept locked shut and labelled as such with an appropriate sign which complies with BS5499: Part 1: 1990. The closer used in the test was not specified but other closers may be used, subject to compliance with the specifications below.

- a) Face-fixed overhead door closer (and accessories such as soffit brackets) that have been tested, assessed or otherwise approved for use on unlatched FD30 cellulosic door leaves in timber frames may be used. Any accessory that is located within the door reveal must have appropriate test or assessment evidence. In addition, where areas of uninsulated glazing are adjacent to the closer, the selected closer type must have been tested on the unexposed face of an uninsulated steel door, or a fully glazed door fitted with uninsulating glass, to demonstrate that the closer does not emit flammable fluids onto the glass face that would otherwise cause integrity failure before the required period of fire resistance.
- b) This report does not approve the use of concealed overhead or jamb mounted closers.

It is essential that the closers are of the correct power rating for the width and weight of the doorsets (minimum power size 3). They must be fitted according to the manufacturer's instructions, and be adjusted so that they are capable of fully closing the door leaf, against any friction imposed by the latch, (and smoke seals, if fitted), from any position of opening.

3.7.5 Floor springs and accessories

Floor springs and accessories (straps and top pivots) are necessary for double acting assemblies. These items are approved, subject to having appropriate test or assessment evidence for use on timber door assemblies, and the following limitations;

- i) Incorporation of any intumescent gasketry used in the test;
- ii) Continuation of at least 10mm (total width) of the intumescent edge seals in the leaf or frame head (as applicable); either 5mm along both sides of the top strap/pivot for double acting straps, or 10mm on one side for single acting straps;
- iii) If intumescent edge seals are in the door frame, then 2mm thick intumescent sheet must also be included to the sides of the mortice for top straps in the door;
- vi) There should be no removal of timber or intumescent strip in the leaf stiles.

3.7.6 Non-essential hardware items

Letter plates:

These must be tested, assessed or otherwise approved for use in 44mm thick (or less) timber/cellulosic FD30 doors. They must be fitted in accordance with the manufacturer's instructions, including all intumescent liners and flaps. Plates must not be less than 100mm away from the leaf edge, or any other aperture.

Note 5 The installation of such items in a door leaf may compromise its performance as a smoke control doorset.

Push plates, kick plates, etc:

Plastic, pvc or metal plates may be surface-mounted to the doorsets, but, if more than 800mm in length by nominally 200mm wide, they must be attached in a way that would prevent them distorting the door leaf, e.g. glued with thermally softening adhesive or screwed with short aluminium screws and fitted in such a way so they will not be prevented from falling away by being trapped under door stops, glazing beads or handle escutcheons etc.

Pull handles:

These may be fixed to the doorsets, provided that the fixing points are no greater than 500mm apart. Pull handles that are fixed through the leaf should use clearance holes as close fitting as possible to the bolt.

Intumescent air transfer grilles:

These must be tested, assessed or otherwise approved for use with 44mm thick (or less) timber/cellulosic FD30 doors. They must be fitted fully in accordance with the manufacturer's instructions, including all intumescent liners and cloaking grilles/beads. They must be no larger than that for which test or assessment evidence exists. (See Section 3.6.4 for restrictions on maximum size and placement of any apertures). These restrictions also apply to grilles, which must also be included in the total area permitted for apertures given in Section 3.6.4.

Note 6 The installation of such items in a door leaf may compromise its performance as a smoke control doorset.

Security viewers:

These may be fixed into the proposed doors, subject to the following limitations, unless specific fire test evidence exists to the contrary;

- Viewers must not exceed 15mm outer diameter, and be made from brass or steel;
- Holes bored through the door must be no greater than 1mm larger than the bore of the viewer;
- The viewer must include an effective shutter/cover plate.

Dropseals:

Lorient IS8010 threshold dropseals can be fitted into the bottom edge of fire rated door leaves, providing that they are encased in 1mm thick Intumescent Seals Ltd Therm-A-Strip or an alternative 1mm thick low-pressure intumescent gasket and are positioned centrally within the door thickness.

3.8 Installation, supporting construction and door edge gaps

The frames must be fixed back to the supporting construction with steel fixings at centres not exceeding 600mm; this applies to jambs and head. Screws shall be of sufficient length to penetrate the wall by at least 40mm, and shall be positioned such that they are not exploited by charring of the frame, irrespective of the direction of test exposure; (this may necessitate a twin line of screws). Packers shall be used at all fixing positions, although if combustible packers are employed, these must be protected by a layer of firestopping (see below), aligned near to each face of the door frame.

The supporting construction may be either timber or steel stud plasterboard clad partition, blockwork, brickwork or concrete walls, but shall be of a type that has been tested or assessed to provide in excess of 30 minutes fire resistance at the required size when incorporating doorset openings. If fitted into timber or steel stud partitions, the method of forming the doorset aperture must be as tested by the partition and/or doorset manufacturer.

Note 7 Reference to steel stud partitions is in the context of permanent elements, such as those designed and proven by the plasterboard manufacturers – this report does not approve use of the proposed doorsets in proprietary 'demountable' partitions, which must be subject to a full and independent appraisal of the particular system and doorsets therein.

No part of the rear of the frame section shall be exposed once installed, (except for integral architraves) and the leaf must be flush with the face of the wall. There shall be no feature rebates or shadow gaps at the junction of the frame and wall.

The fire stopping between the supporting construction and timber frames should follow the recommendations of Table 2 in BS8214: 1990, "*Code of practice for fire door assemblies with non-metallic leaves*", using a product proven in such timber applications, and with reference to the correct depth of seal to suit the width of gap between wall and frame. The firestopping shall be positioned on the plane of the door leaf; (unless combustible packers are employed).

The gap between the door and the frame should be 2 – 4mm. Gaps under the door(s) should not exceed 6mm for fire performance, although, if smoke control is also required, these gaps should only be 3mm, or smoke seals should be included in accordance with BS8214 (see also Section 3.10 regarding suitability of smoke seals).

The doorset design should be such that the leaves are fully flush within the frame when in the closed position. They may however be set back from the exposed face of the frame if required.

Overpanels shall be secured into the frame using steel screws fixed through the rear of the frame members, passing at least 40mm into the centre line of the overpanel thickness. (Screws must not be fixed through the overpanel into the stops, or vice versa). Screws must be no more than 100mm from each corner of the overpanel, and at maximum 400mm centres, with a minimum of 2 screws per overpanel edge. The gap between overpanel and frame should be no greater than 1mm.

3.9 Intumescent seals

Therm-A-Seal graphite based seals manufactured by Intumescent Seals Ltd must be employed across the complete range of door sizes and configurations approved herein. Intumescent protection is required for specific items of building hardware and this has already been detailed in Section 3.7.

The intumescent seal specifications, widths, and positions are shown in Appendix B, based upon tested details.

3.10 Ambient temperature smoke seals

Smoke seals, or combined intumescent/smoke seals (using the intumescent products approved in Section 3.9), that have been tested to BS476: Part 31: Section 31.1: 1983 and shown not to leak by more than 3m³/m/hr at 25Pa may be used in conjunction with the proposed doorsets to provide smoke control.

The orientation of the seals, door edge gaps, degree of building hardware interruption, and leaf configuration, will need to be as tested to BS476: Part 31: Section 31.1: 1983 to achieve the desired level of smoke control, unless these conflict with the intumescent seal widths and positions as shown in Appendix B, in which case, the latter shall take precedence.

Test evidence to BS476: Part 22: 1987 shall be available to demonstrate that the smoke seals will not adversely affect the overall fire resistance of timber doorsets, when fitted in the proposed arrangements.

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4. CONCLUSION

It is the opinion of International Fire Consultants Ltd that, if the proposed 44mm thick Moralt Lamincore door leaves hung in timber frames were manufactured and installed in accordance with the requirements of this Field of Application Report, the leaf sizes are within the envelope of approved dimensions/sizes given for the configuration outlined in Appendix C, and the hardware, glazing details, and intumescent seal specification are in accordance with the recommendations of this report, then the assemblies, as described, would satisfy the integrity criteria for 30 minutes when tested for fire resistance to the conditions of BS476: Part 22: 1987.

5. LIMITATIONS

This assessment addresses itself solely to the ability of the proposed assemblies described to satisfy the criteria of the fire resistance test and does not imply any suitability for use with respect to other unspecified criteria.

This document only considers the proposed assemblies described herein, and assumes that the surrounding construction will provide no less restraint than the tested assembly, and that it will remain in place and be substantially intact for the full fire resistance period.

Where the constructional information in this report is taken from details provided to IFC and/or fire resistance test reports referenced herein, it is therefore limited to the information given in those documents. It is necessarily dependent upon the accuracy and completeness of that information. Where constructional or manufacturing details are not specified, or discussed herein, it should not, therefore, be taken to infer approval of variation in such details from those tested or otherwise approved.

Where the assessed constructions have not been subject to an on-site audit by IFC, it is the responsibility of anyone using this report to confirm that all aspects of the assemblies fully comply with the descriptions and limitations herein.

Any materials specified in this report have been selected and judged primarily on their fire performance. IFC do not claim expertise in areas other than fire safety. Whilst observing all possible care in the specification of solutions, we would draw the reader's attention to the fact that during the construction and procurement process, the materials used should be subjected to more general examination regarding the wider Health and Safety, and CoSHH Regulations.

This Report is provided to the sponsor on the basis that it is a professional independent engineering opinion as to what the fire performance of the construction/system would be should it to be tested to the named standard. It is IFC's experience that such an opinion is normally acceptable in support of an application for building approvals, certainly throughout the UK and in many parts of Europe and the rest of the world.

However, unless IFC have been commissioned to liaise with the Authorities that have jurisdiction for the building in question for the purpose of obtaining the necessary approvals, IFC cannot assure that the document will satisfy the requirements of the particular building regulations for any building being constructed.

It is, therefore, the responsibility of the sponsor to establish whether this evidence is appropriate for the application for which it is being supplied and IFC cannot take responsibility for any costs incurred as a result of any rejection of the document for reasons outside of our control. Early submittal of the Report to the Authorities will minimise any risks in this respect.

6. VALIDITY

This assessment has been prepared based on International Fire Consultants Ltd's present knowledge of the products described, the stated testing regime and the submitted test evidence. For this reason anyone using this document after April 2012 should confirm its ongoing validity.

Prepared by:



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Senior Engineer
International Fire Consultants Ltd (IFC)

Checked by:



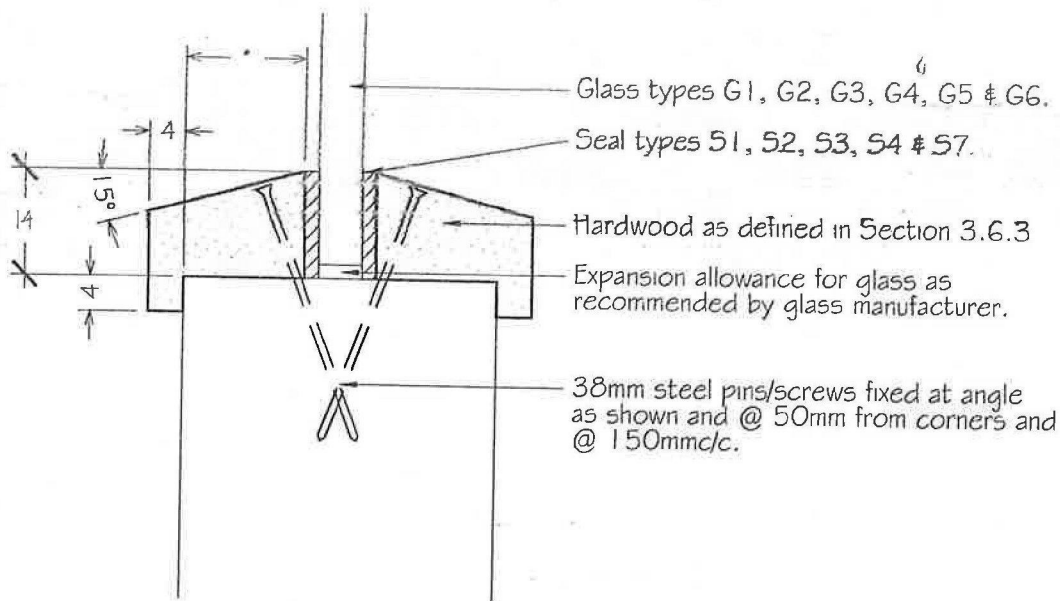
David Cooper BEng (Hons) AUS
Consultant
International Fire Consultants Ltd (IFC)

APPENDIX A

Figures 07061/01 to 03

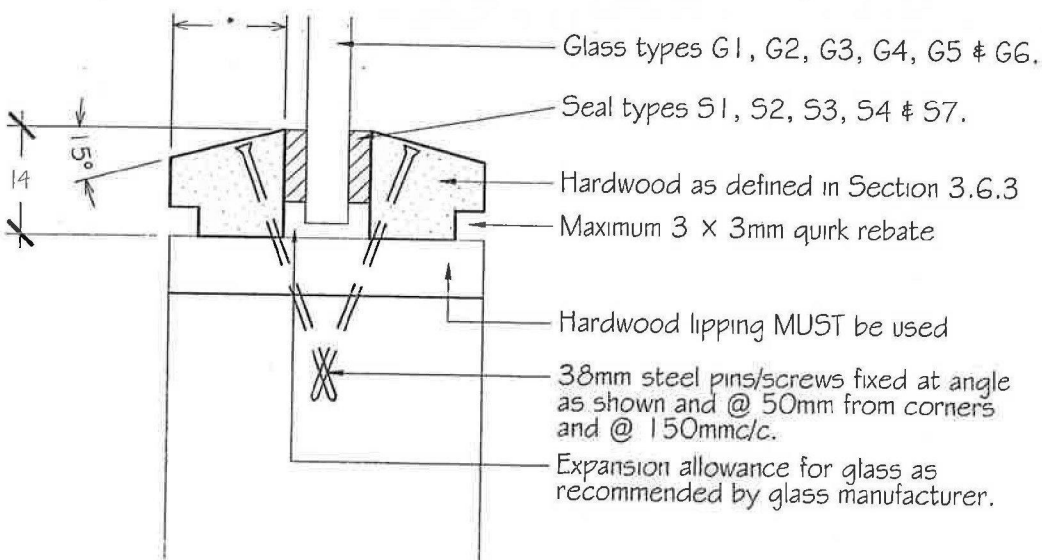
Glazing Details

*The figures in this Appendix are not included
in the sequential page numbering of this report*



BEAD DETAIL B1

*Bead size is dependant upon glass/seal thickness



BEAD DETAIL B2

*Bead size is dependant upon glass/seal thickness

Refer to text of Report
for details of glass and
seal types

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Contractors must check all dimensions.
Any discrepancies must be reported before
work proceeds.
Only work to dimensions stated on drawing.

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Field of Application IFCA07061
Moralt Tischlerplatten
FD30 Field of Application

Glazing Details
Sheet One of Three

Job number : 7984

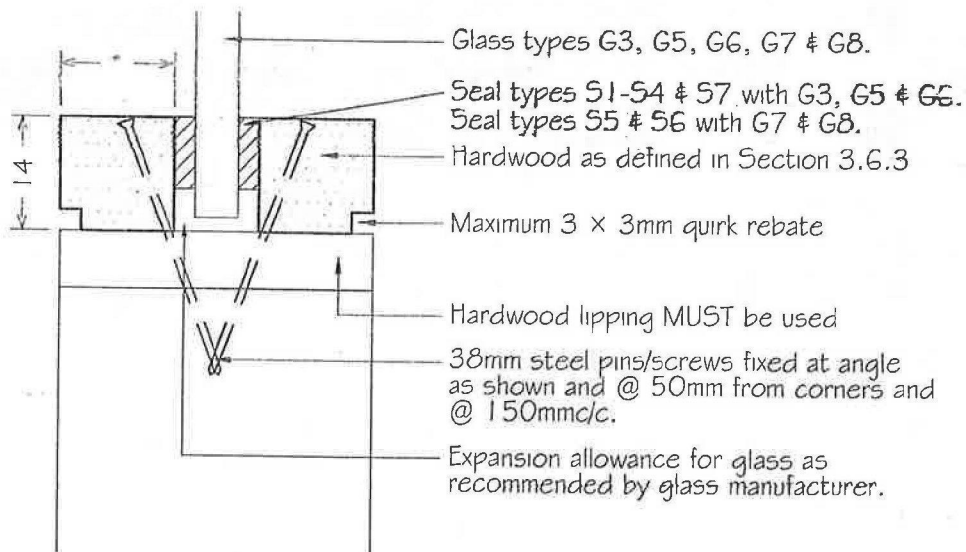
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Checked by : CH

Not To Scale

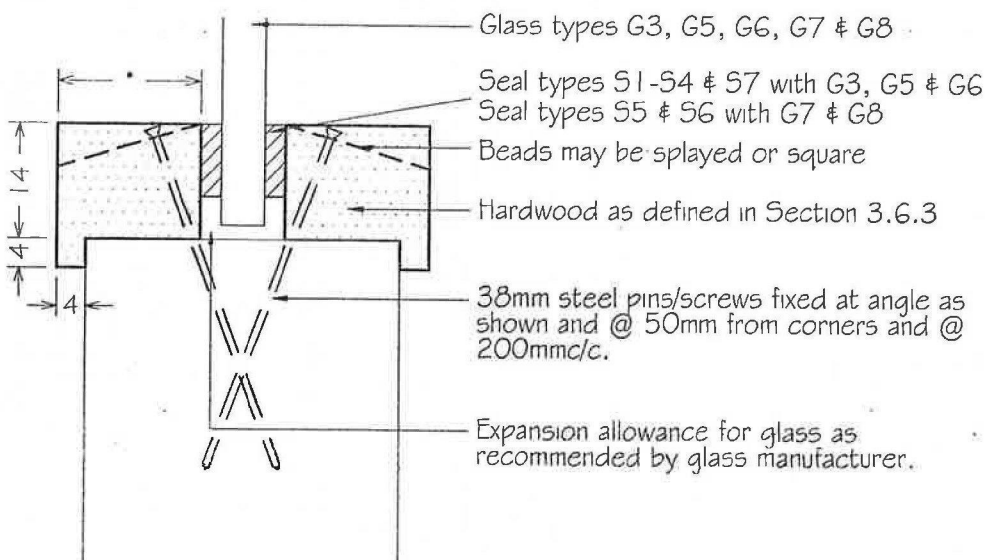
April 2007

07061/01



BEAD DETAIL B3

*Bead size is dependant upon glass/seal thickness



BEAD DETAIL B4

*Bead size is dependant upon glass/seal thickness

Refer to text of Report
for details of glass and
seal types

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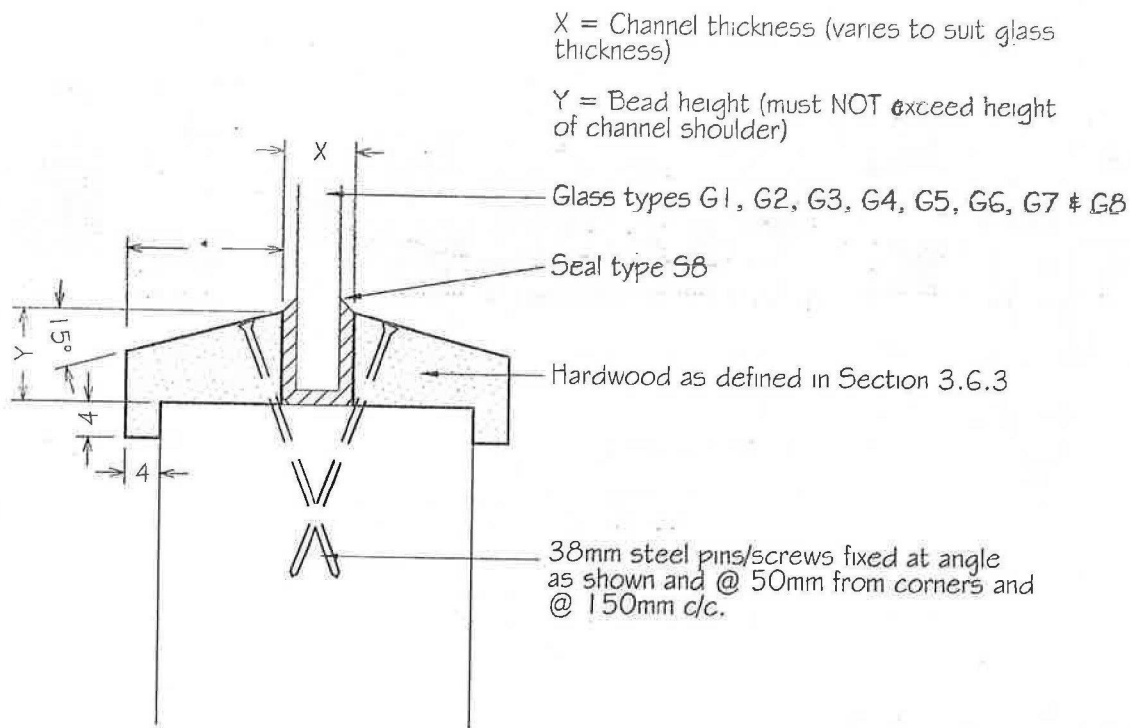
Field of Application IFCA07061
Moral: Tischlerplatten
FD30 Field of Application

Glazing Details
Sheet Two of Three

Job number : 7984

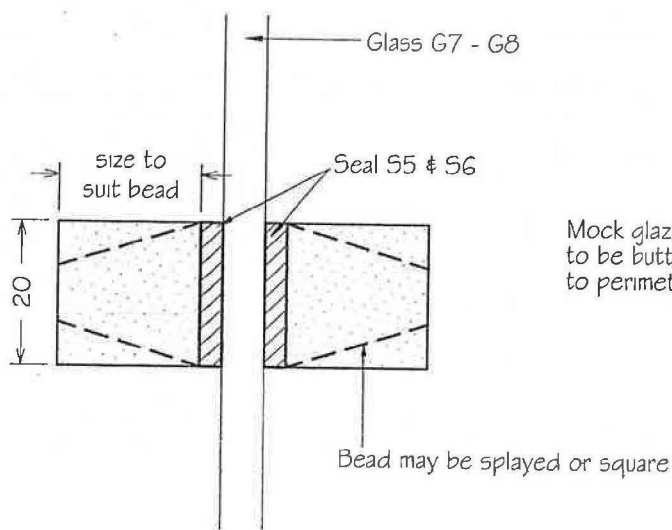
Drawn by : CSP Checked by : CH
Not To Scale April 2007

07061/02



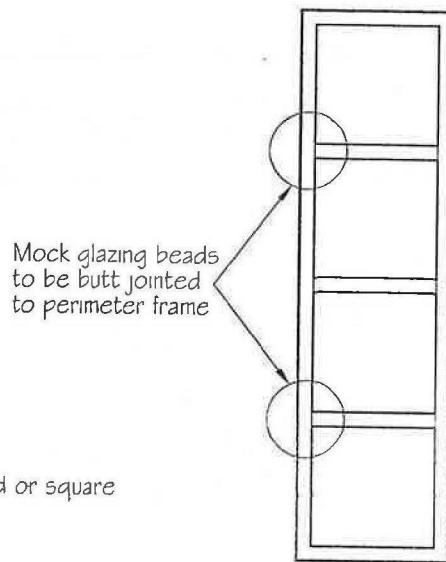
BEAD DETAIL B5

To be used in conjunction with Seal S8 only
 *Bead size is dependant upon glass thickness



MOCK GLAZING BEAD

LADDER DETAIL for use with bead detail B4



TYPICAL ELEVATION

Refer to text of Report for details of glass and seal types

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Field of Application IFCA/07061
 Moralt Tischlerplatten
 FD30 Field of Application

Glazing Details
 Sheet Three of Three

Job number : 7984

Drawn by : CSP Checked by : CH

Not To Scale April 2007

07061/03

APPENDIX B

Assessed Intumescent Seal Specifications

Intumescent Seal Specifications

LOCATION	REDUCED SPECIFICATION	STANDARD SPECIFICATION
Hanging and closing edge (single leaves) stiles/jambs	1 No. 15 x 4mm strip centrally fitted in the leaf edge or frame reveal	1 No. 20 x 4mm strip centrally fitted in the leaf edge or frame reveal
Head (single leaves)	1 No. 15 x 4mm strip centrally fitted in the leaf edge or frame reveal	1 No. 25 x 4mm strip centrally fitted in the leaf edge or frame reveal
Head (double leaves)	1 No. 20 x 4mm strip centrally fitted in the leaf edge or frame reveal	1 No. 25 x 4mm strip centrally fitted in the leaf edge or frame reveal
Meeting edges (double leaves)	1 No. 15 x 4mm strip centrally fitted in one leaf edge only	1 No. 20 x 4mm strip centrally fitted in one leaf edge only
Interface between overpanel and frame/transom	1 No. 15 x 4mm strip centrally fitted in the leaf edge or frame reveal	1 No. 20 x 4mm strip centrally fitted in the leaf edge or frame reveal

Notes:

- i) *Therm-A-Seal graphite based seals manufactured by Intumescent Seals Ltd are to be employed across the complete range of door sizes and configurations approved herein.*
- iii) *Intumescent seals may generally be fitted in door/overpanel edges, or, frame reveals.*

APPENDIX C

Figure 07061/04 to 07

Assessed Leaf Size Envelope

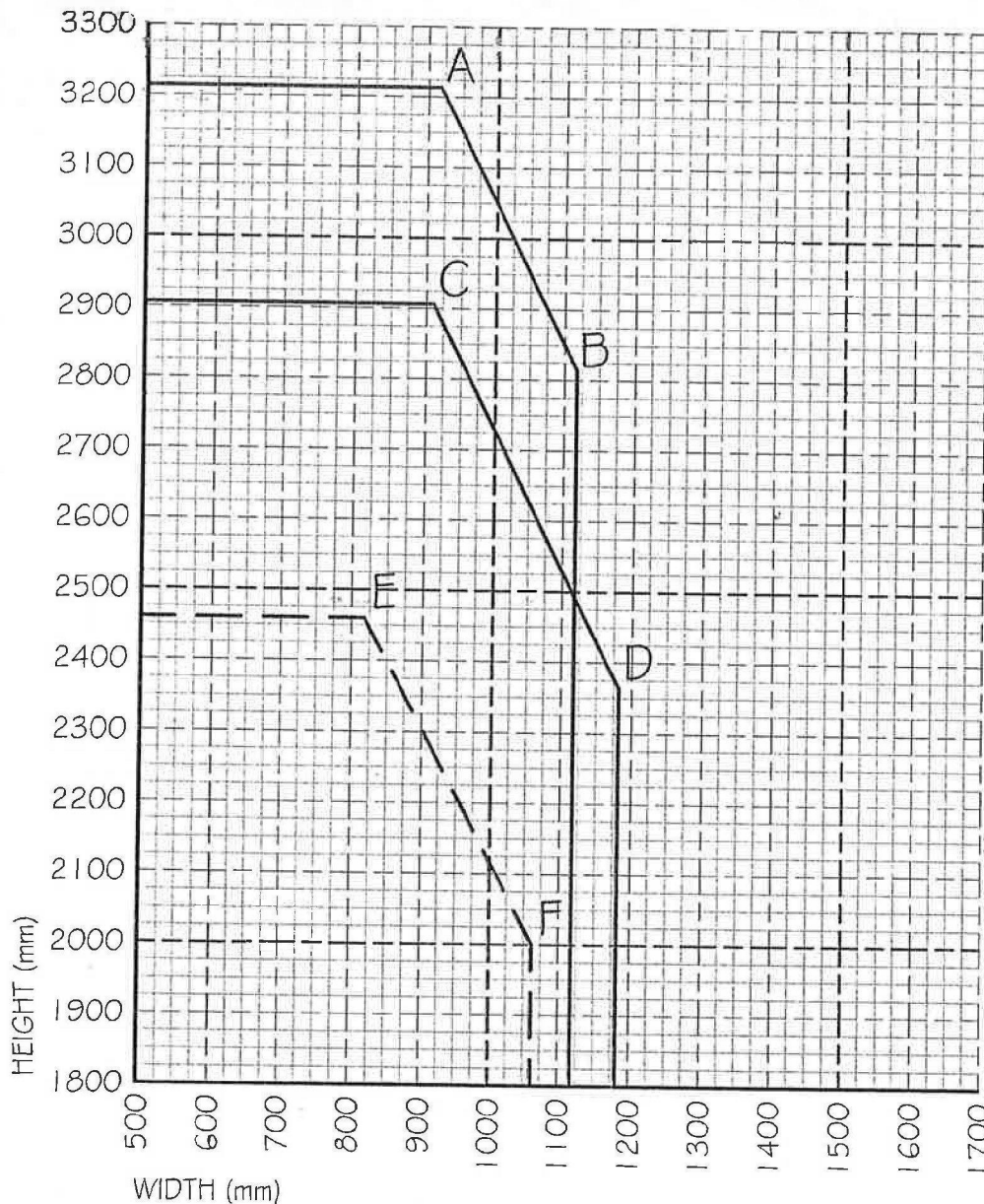
*The figures in this Appendix are not included
in the sequential page numbering of this report*

	Standard Intumescent Specification (Extended Height)		Standard Intumescent Specification (Extended Width)		Reduced Intumescent Specification	
	A	B	C	D	E	F
Width	918	1118	911	1182	817	1061
Height	3214	2814	2906	2364	2460	2001

PROPOSED CONFIGURATION:

LATCHED
SINGLE ACTING
SINGLE LEAF
TRANSOMED OVERPANEL ONLY

LEAF SIZE ENVELOPE POINTS



Note:
These sizes relate to the door leaf.
Sizes for overpanels are defined in Section 3.3 of the Report.

This figure must be read in conjunction with International Fire Consultants Ltd's. Field of Application Report IFCA/07061 which contains full details of the assessed doorset construction.

This drawing is Copyright©
Contractors must check all dimensions.
Any discrepancies must be reported before work proceeds.
Only work to dimensions stated on drawing.

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Field of Application IFCA/07061
Moralt Tischlerplatten
FD30 Field of Application

Envelope of Approved Leaf Sizes
Single Doors

Job number : 7984

Drawn by : CSP Checked by : CH
Not To Scale April 2007

07061/04

ENVELOPE OF APPROVED LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration.

Any combination of leaf width and height that falls within the graph axes and the solid line on the graph above are approved.

POINTS A, C & E represents the maximum leaf height and its associated width.

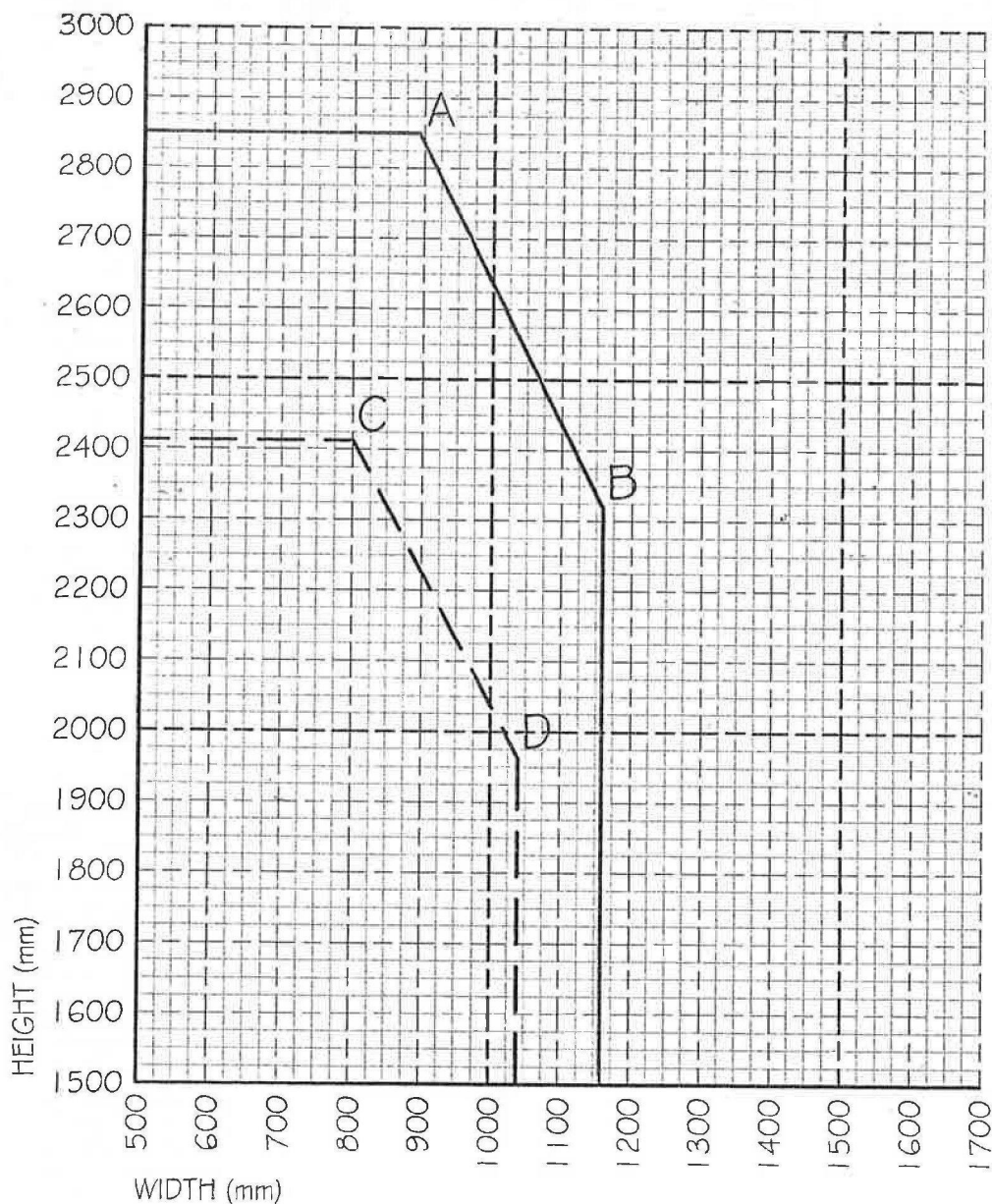
POINTS B, D & F represents the maximum leaf width and its associated height.

	Standard Intumescent Specification		Reduced Intumescent Specification	
	A	B	C	D
Width	893	1159	801	1040
Height	2850	2318	2412	1962

PROPOSED CONFIGURATION:

UNLATCHED
SINGLE or DOUBLE ACTING
SINGLE LEAF
TRANSOMED OVERPANEL ONLY

LEAF SIZE ENVELOPE POINTS



Note:
These sizes relate to the door leaf.
Sizes for overpanels are defined in Section 3.3 of the Report.

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Field of Application IFCA/07061
Moralt Tischlerplatten
FD30 Field of Application

Envelope of Approved Leaf Sizes
Single Doors With
Flush Overpanels

Job number + 7984

Drawn by : CSP Checked by : CH

Not To Scale April 2007

07061/05

ENVELOPE OF APPROVED LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration.

Any combination of leaf width and height that falls within the graph axes and the solid line on the graph above are approved.

POINTS A & C represents the maximum leaf height and its associated width.

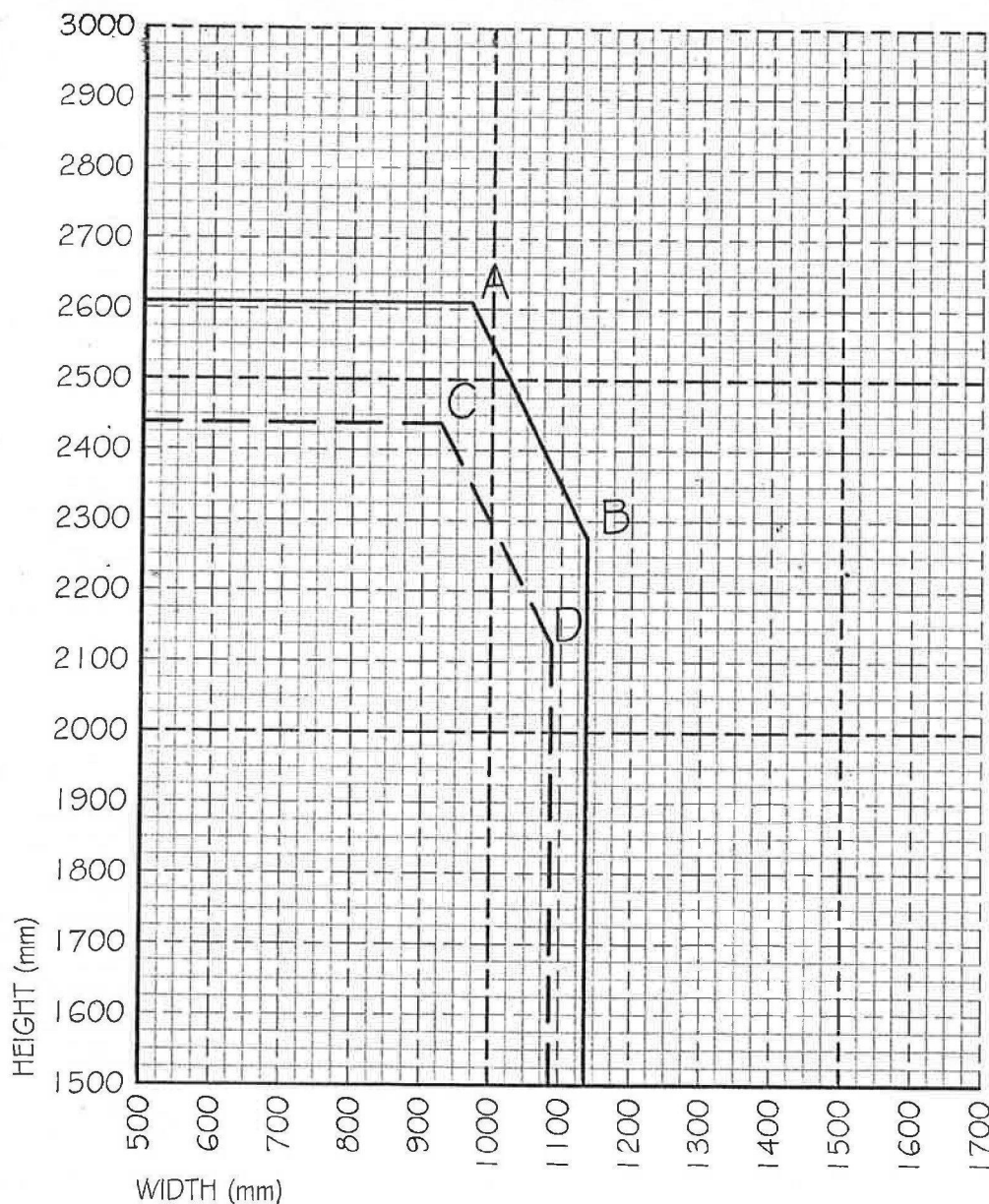
POINTS B & D represents the maximum leaf width and its associated height.

	Standard Intumescent Specification		Reduced Intumescent Specification	
	A	B	C	D
Width	970	1137	927	1087
Height	2610	2275	2438	2125

LEAF SIZE ENVELOPE POINTS

PROPOSED CONFIGURATION:

LATCHED
SINGLE ACTING
DOUBLE LEAF
TRANSOMED OVERPANEL ONLY
FLUSH MEETING STILES



Note:
These sizes relate to the door leaf.
Sizes for overpanels are defined in Section 3.3 of the Report.

This figure must be read in conjunction with International Fire Consultants Ltd's. Field of Application Report IFCA/07061 which contains full details of the assessed doorset construction.

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Field of Application IFCA/07061
Moralt Tischlerplatten
FD30 Field of Application

Envelope of Approved Leaf Sizes
Double Doors

Job number : 7984

Drawn by : CSF

Checked by : CH

Not To Scale

April 2007

07061/06

ENVELOPE OF APPROVED LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration.

Any combination of leaf width and height that falls within the graph axes and the solid line on the graph above are approved.

POINTS A & C represents the maximum leaf height and its associated width.

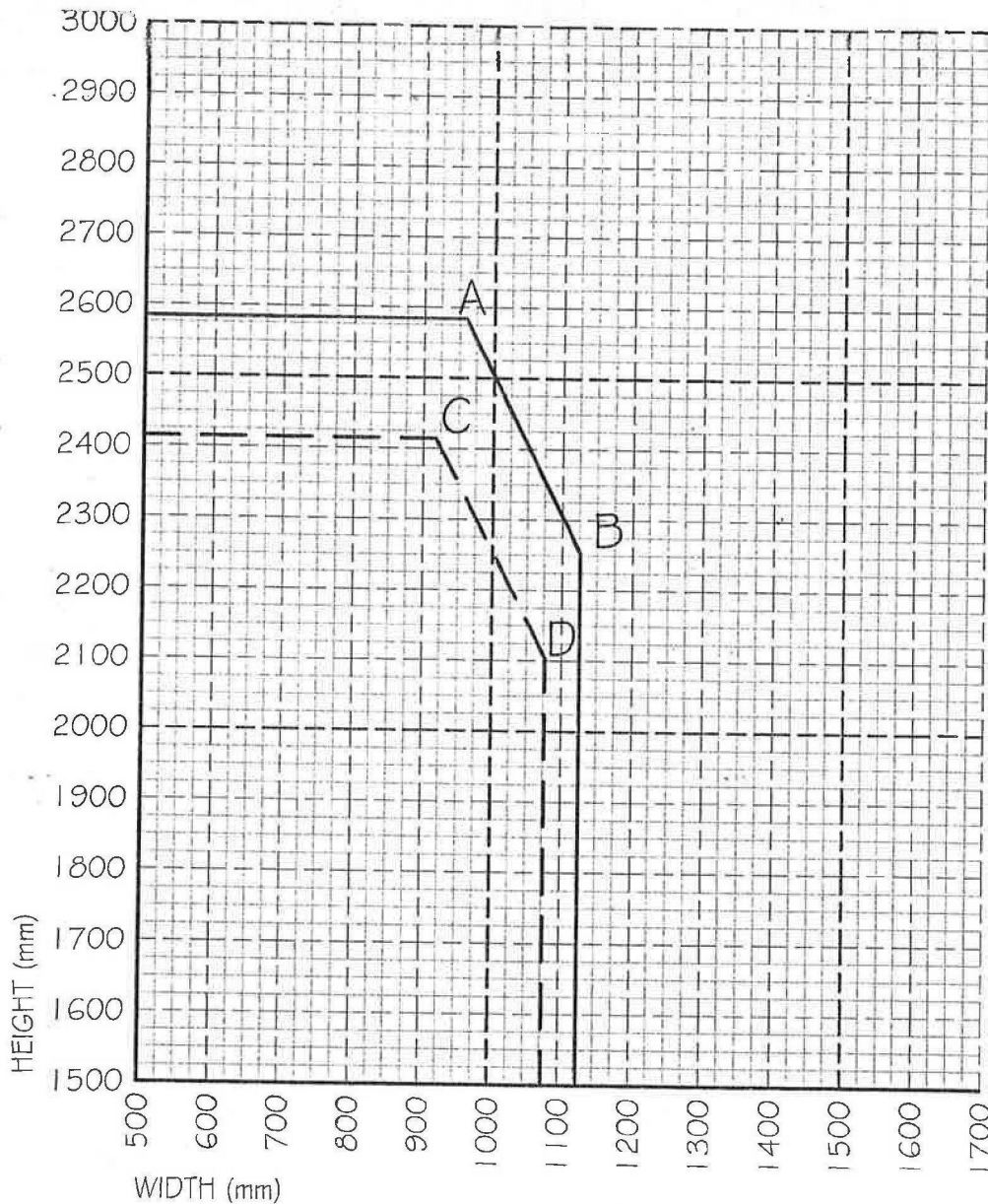
POINTS B & D represents the maximum leaf width and its associated height.

	Standard Intumescent Specification		Reduced Intumescent Specification	
	A	B	C	D
Width	960	1126	918	1077
Height	2584	2253	2414	2104

LEAF SIZE ENVELOPE POINTS

PROPOSED CONFIGURATION:

UNLATCHED
SINGLE or DOUBLE ACTING
DOUBLE LEAF
TRANSOMED OVERPANEL ONLY
FLUSH MEETING STILES



Note:
These sizes relate to the door leaf.
Sizes for overpanels are defined in Section 3.3 of the Report.

This figure must be read in conjunction with International Fire Consultants Ltd's. Field of Application Report IFCA/07061 which contains full details of the assessed doorset construction.

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Field of Application IFCA/07061
Moralt Tischlerplatten
FD30 Field of Application

Envelope of Approved Leaf Sizes
Double Doors

Job number : 7984

Drawn by : CSF Checked by : CH
Not To Scale April 2007

07061/07

ENVELOPE OF APPROVED LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration.

Any combination of leaf width and height that falls within the graph axes and the solid line on the graph above are approved.

POINTS A & C represents the maximum leaf height and its associated width.
POINTS B & D represents the maximum leaf width and its associated height.

APPENDIX D

Summary of Fire Test Evidence

Summary of Fire Test Evidence

Test Report	Configuration Tested	Leaf Sizes (mm)	Test Standard	Integrity
RF07028	ULSADD	2300h x 1050w x 44t	BS476: Part 22: 1987	33 minutes
J 84871/1	LSASD	2760h x 915w x 44t	BS476: Part 22: 1987	44 minutes

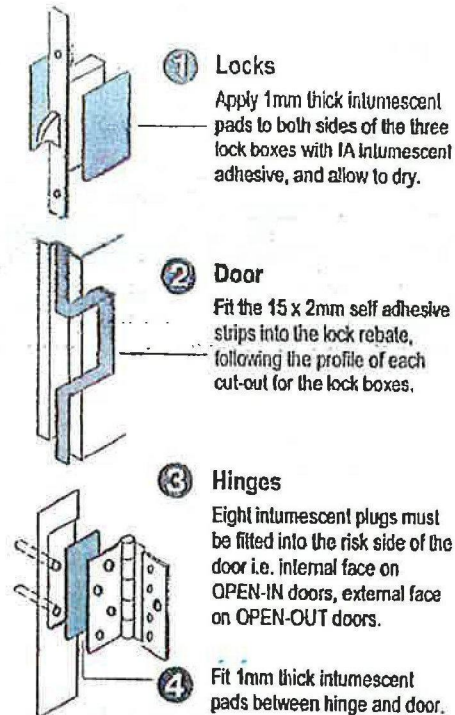
ULSADD = Unlatched, Single Acting, Double Doorset

LSASD = Latched, Single Acting, Single Doorset

Note:

Where appropriate, fire test evidence from glass, hardware, and intumescent seal manufacturers has also been considered when preparing this Field of Application Report.

How We Fit Intumescent Fire / Smoke Protection Into FD30 Door Sets



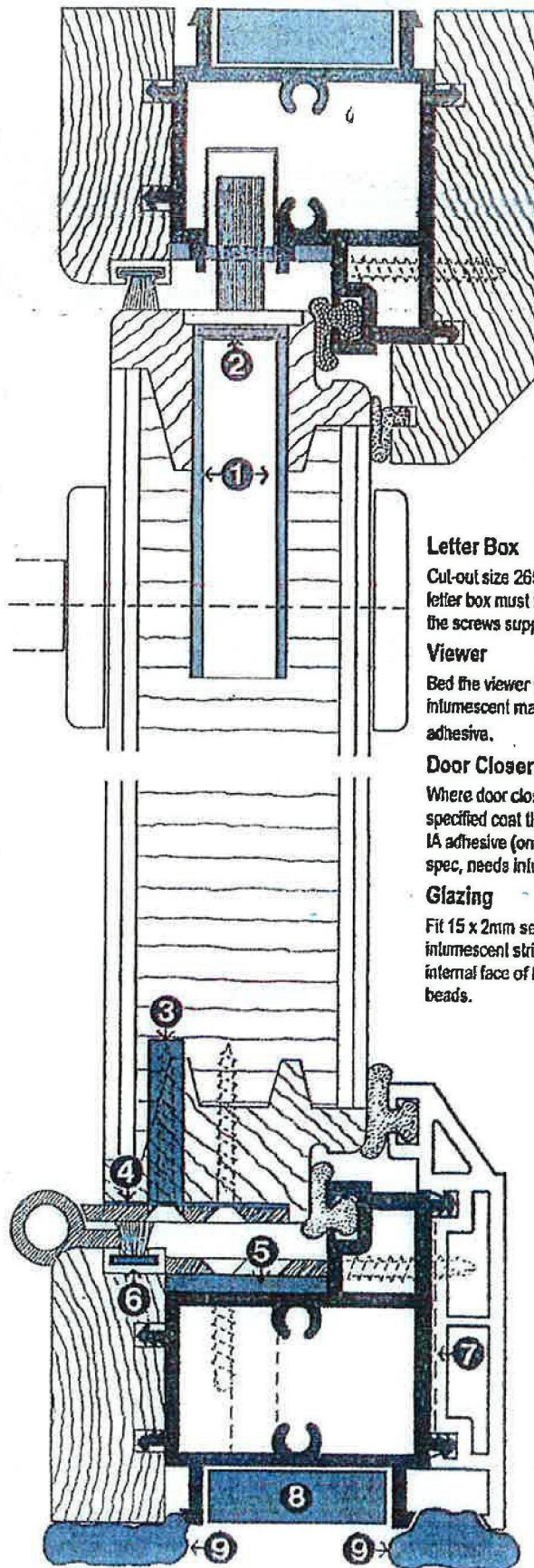
⑤ Frame
Self adhesive seals 25 x 3 x 1050mm long must be butt jointed all-round the internal rebate of the Aluminium frame before fixing hinges and keeps.

⑥ Fit 10 x 4mm fire and smoke brush seals into the rebate of the timber facing, making sure the seal butts up tight to each hinge.

⑦ PVCU facings
External PVCU facings must be coated on the back with a layer of IA intumescent adhesive, to protect against the transmission of heat.

⑧ Before installation
Strips of fireproof sponge 35 x 12mm must be fitted into the masonry groove to both head and stiles of the frame.

⑨ After installation
Make sure all cavities between the frame and the masonry are sealed with intumescent mastic before fitting the cover beads.



Letter Box

Cut-out size 265 x 50mm the letter box must be fitted with the screws supplied.

Viewer

Bed the viewer with either intumescent mastic or IA adhesive.

Door Closers

Where door closers are specified coat the screws with IA adhesive (only one hour spec, needs intumescent pads)

Glazing

Fit 15 x 2mm self adhesive intumescent stripes to the internal face of both glazing beads.

MASTERDOOR
THE PERFECT COMBINATION

Test Report

CONFIDENTIAL

Report: Chilt/RF13170

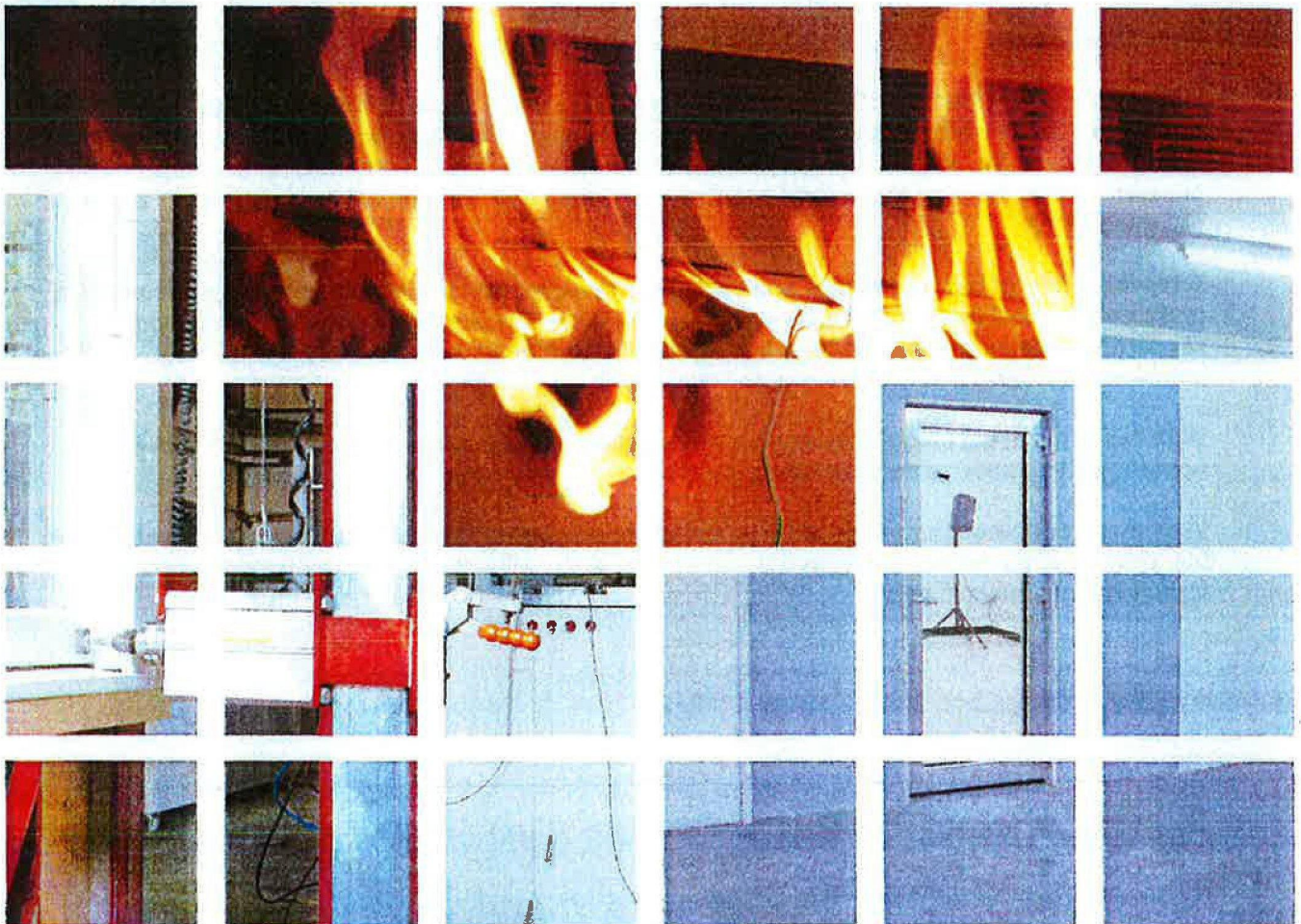
A fire resistance test performed on two single leaf single acting doorsets

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

Test date: 1st August 2013



Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. This document is confidential and remains the property of Chiltern International Fire Ltd. The legal validity of this report can only be claimed on the presentation of the complete report.



BM TRADA – the new name for Chiltern International Fire Ltd

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

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

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

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

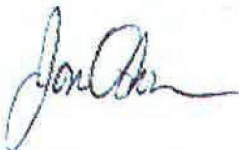
About BM TRADA.

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

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

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

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



Jon Osborn
Chief Operating Officer

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

1 Summary of performance

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

Results:

Fire resistance test in accordance with BSEN 1634-1: 2008 and BSEN 1363-1: 1999

Doorset A

Integrity	
Cotton pad	31 (thirty one) minutes
Continuous flaming	32 (thirty two) minutes
Gap gauges	32 (thirty two) minutes*
Insulation- 1 discrete area	
Average set	31 (thirty one) minutes**
Maximum $\geq 100\text{mm}$ in from leaf edge	31 (thirty one) minutes**
Maximum $\geq 25\text{mm}$ in from leaf edge	25 (twenty five) minutes
Door frame $\geq 180^\circ\text{C}$ temp rise	31 (thirty one) minutes**
Door frame $\geq 360^\circ\text{C}$ temp rise	31 (thirty one) minutes**
Radiation – time to 15kW/m^2	32 (thirty two) minutes*

* No failure of the test criteria had occurred at termination of the test on this specimen at 32 minutes

** Failure by virtue of integrity failure at 31 minutes

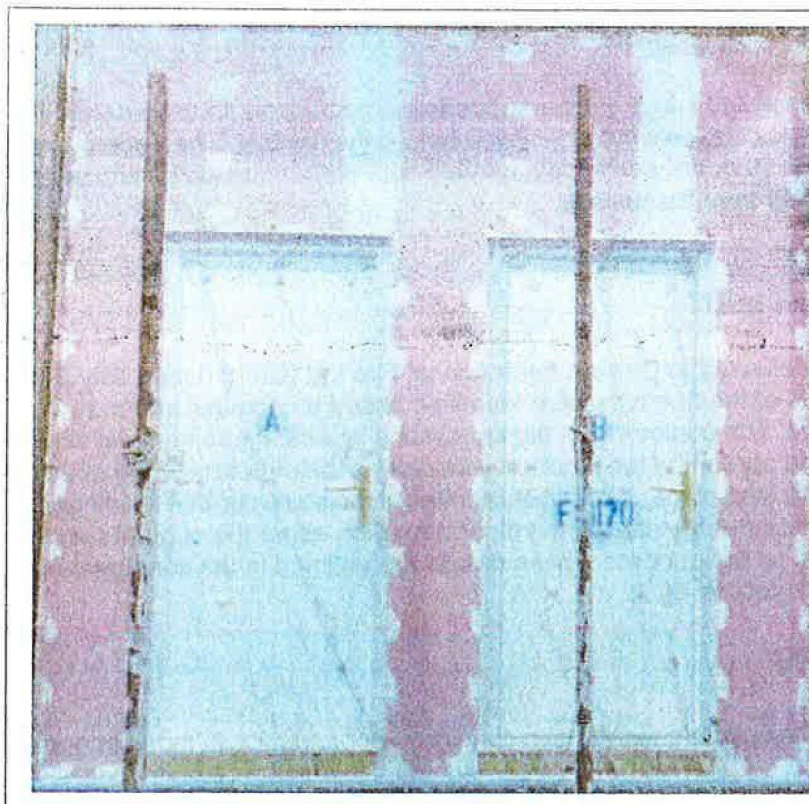
Doorset B

Integrity	
Cotton pad	32 (thirty two) minutes
Continuous flaming	35 (thirty five) minutes
Gap gauges	48 (forty eight) minutes*
Insulation – 1 discrete area	
Average set	32 (thirty two) minutes**
Maximum $\geq 100\text{mm}$ in from leaf edge	32 (thirty two) minutes
Maximum $\geq 25\text{mm}$ in from leaf edge	32 (thirty two) minutes**
Door frame $\geq 180^\circ\text{C}$ temp rise	32 (thirty two) minutes**
Door frame $\geq 360^\circ\text{C}$ temp rise	32 (thirty two) minutes**
Radiation – time to 15kW/m^2	48 (forty eight) minutes*

* No failure of the test criteria had occurred at termination of the test at 48 minutes

** Failure by virtue of integrity failure at 32 minutes

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



Summary of specimens:

(2No latched single leaf single acting doorsets

Doorset A - leaf size:
1950mm high x 800mm wide x
44mm thick

Doorset B - leaf size:
1950mm high x 800mm wide x
54mm thick

2 Introduction

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

3 Specimen verification

The doorsets were delivered to Chiltern International Fire Ltd (CIFL) during July 2013. The component parts of the doorsets were identified based on nominal information provided by the client. The conformity of the specimens against these nominal values has been verified and agreed by the laboratory insofar as the structure of the specimen allowed verification to take place. If possible, additional moisture content readings, species verification and density checks were performed on either the original specimen, or, samples provided by the sponsor. These details are outlined in the construction section of this report (section 6).

3.1 Conditioning

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

3.2 Sampling

BM TRADA were not involved in factory sampling of the components used for the specimen subject to this report.

4 Description of supporting construction

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

5 Description of specimen

5.1 Door leaves

The left doorset was designated doorset A and the leaf measured 1950mm high x 800mm wide x 44mm thick; the right doorset was designated doorset B and the leaf measured 1950mm high x 800mm wide x 54mm thick.

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

6 Description of construction (refers to clients drawings and Figures 1 to 6 of appendix 1)

Leaf – doorset A – identified as a Nan Ya FD30 doorblank

		Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)	Key to figures
Stiles	Outer	Mixed wood [#] finger jointed lamels	38 wide x 40 thick (70 wide x 40 thick untrimmed size)	490-600*	11.1	1
	Inner	Mixed wood [#] finger jointed lamels	30 wide x 40 thick	490-600*	-	2
Rails (top and bottom)	Outer	Mixed wood [#] lamels	70 wide x 40 thick	490-600*	11.1	3
	Inner	Mixed wood [#] lamels	30 wide x 40 thick	490-600*	-	4
Core*		Phenolic foam	41 thick reducing to nominally 15 thick at fielded areas	75*	-	5
Adhesive	Facings	Polyurethane	-	-	-	-
Facings		Moulded GRP	2 thick	-	-	6
Lippings – vertical edges only		Profiled steel	2 thick	-	-	7

* Stated by door blank manufacturer, accuracy agreed by the laboratory

Mixed wood consisting of pine, acacia and styrax

Leaf – doorset B – identified as a Masterdor 54mm thick doorblank

		Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)	Key to figures
Stiles and rails		None fitted	-	-	-	-
Core		Cross laminated plywood	42 thick	450*	-	8
Facings		Standard exterior plywood	5.9 thick	500*	-	9
Lippings – all edges		Profiled Sapele (see figure 3 of appendix 3)	34 thick overall, tongued into the core	674*	-	10
Adhesive	Lippings	PUR0890W - hotmelt	-	-	-	-
	Facings	PUR0890W - hotmelt	-	-	-	-

* Stated by door blank manufacturer, accuracy agreed by the laboratory

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

Door frame – both doorsets

	Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)	Key to figures
Head and jambs – door frame, side screen and fanlight	Warmseal extruded PVC Product reference SK77950	68 wide x 70 deep including a 20 high x 23 deep integral stop	-	-	11
Frame reinforcement	Steel box section Product reference S119	30 x 35 x 1.5 thick	-	-	12
Stops – integral	-	-	-	-	-
Frame corner jointing detail	Mitred – bracketed Product reference SW73174	125 x 125 bracket size screw fixed at each corner	-	-	-
Threshold	Extruded aluminium Masterguard 15 low mobility threshold	75 wide x 28 high	-	-	13
Frame fixings	4 No masonry fixings per jamb	No 10 x 80 long at nominally 600-800 centres	-	-	-
Frame fire stopping	Mineral fibre capped with intumescent acrylic mastic on both faces	Nominally 5-10mm wide x 20-30 deep	-	-	-

Intumescent and sealing materials – doorset A

		Make/type	Size (mm)	Location	Key to figures
Leaf edge		None fitted	-	-	-
Frame reveal	Head and jambs	Norsound NOR 930 graphite type intumescent	25 x 2.5	Fitted in the profile of the frame reveal	14
	Behind frame	Norsound NOR 940 graphite type intumescent	30 x 2.5	Fitted in the profile at the back of the frame	15
Smoke/acoustic seals		2No brush type seals and rubber buffer seal	-	Frame manufacturers standard fittings	-

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Intumescent and sealing materials – doorset B

		Make/type	Size (mm)	Location	Key to figures
Leaf edge – leaf head only		Norsound NOR15x4FO PVC encapsulated	15 x 4	Centrally fitted in leaf head only	16
Frame reveal	Head and jambs	Norsound NOR 930 graphite type intumescent	25 x 2.5	Fitted in the profile of the frame reveal	17
	Behind frame	Norsound NOR 940 graphite type intumescent	30 x 2.5	Fitted in the profile at the back of the frame	18
Around frame reinforcement		Norsound NOR905 graphite type intumescent	0.5 thick	Fitted around the steel frame reinforcement	19
Smoke/acoustic seals		2No brush type seals and rubber buffer seal	-	Frame manufacturers standard fittings	-

Intumescent interruptions and additional protection – both doorsets

	Make/type	Size (mm)	Location
Around hinges	Fully interrupted	-	Hinge blades fully interrupt seal in frame reveal
Under hinge blade	Norsound NOR 905 graphite type intumescent	0.5 thick	Fitted under the hinge blade on frame and leaf
Encasing latch body	Norsound graphite AV2 lock kit	0.5 thick	Fitted around the body of the lock/latch and hook bolts
Under latch forend	Intumescent Seals Ltd Therm-A-Flex	10 x 2	Fitted under the latch forend
Around latch keeps	Fully interrupted	-	Latch keeps fully interrupt seals in frame reveal
Under latch keep	Norsound graphite AV2 lock kit	0.5 thick	Fitted under the latch keeps
Under door handle	Norsound NOR 905 graphite type intumescent	0.5 thick	Fitted under the door handle

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Hardware – both doorsets

	Make/type	Size (mm)	Location	Key to figures
Hinges doorset A	3 No. Masterdor bearing butt type hinges Type HNG 1333	102 x 30 x 2 (blade size)	Fitted 120mm, 920mm, and 1720mm from the head of the leaves fixed with 4No. M4 x 25mm long screws per blade	20
Hinges – doorset B	4No. Masterdor bearing butt type hinges Type HNG 1333		Fitted 150mm, 365mm, 960mm and 1680mm from the head of the leaves fixed with 4No. M4 x 25mm long screws per blade	21
Closer	Rutland TS3204 overhead type closer	220 x 59 (footprint size)	Fitted on the exposed face as per the manufacturer's instructions	22
Lock/latch – engaged at all points	Winkhaus AV2 multi point lock/latch fitted with Eurocylinder	1770 x 20 x 3 x full leaf (forend size)	Fitted 1020mm from the threshold of the leaf, fixed with 12No. 55mm long screws	23
		340 x 20 x 3 (centre keep size)	Fitted appropriate to the centre latch fixed with 4No. 50mm long screws	24
		175 x 24 x 3 (top and bottom keep size)	Fitted 240mm and 1730mm from the head of the leaf	25
Furniture	Aluminium lever type handle	245 x 40 (footprint size)	Fitted appropriate to the centre lock/latch	26

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

7 Pre-test measurements

7.1 Pre-cycling

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

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

7.2 Door perimeter gaps

The manufacturer did not declare a working range so the doors were installed to open and close freely, maintaining gaps, where possible, to a range of 2-4mm along all edges except the threshold, and 3-8mm along the threshold. The gaps between the edge of the door leaves and frame / threshold were measured prior to test. A total of 24 readings were taken. The measurements (in mm) are given in Figure 5 of Appendix 1.

7.3 Closer forces

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

	Opening force (Nm)
Doorset A	67
Doorset B	76

7.4 Method of installation

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

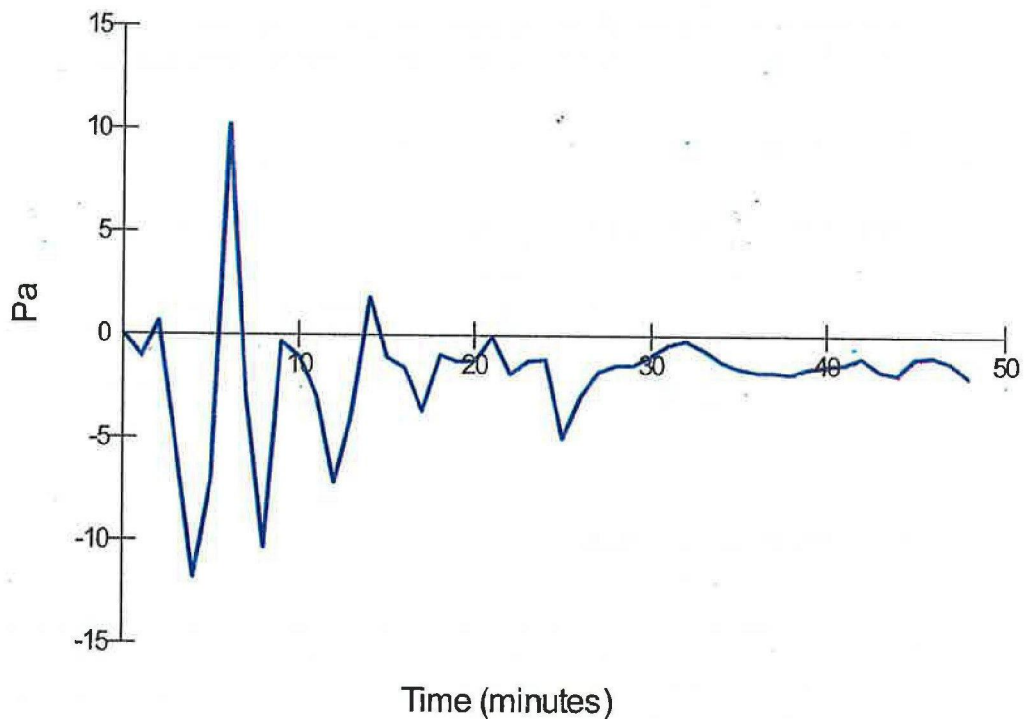
8 Test conditions

8.1 Ambient temperature

The ambient temperature of the test area at commencement of test was 29°C. The temperatures recorded are tabulated in Appendix 2.

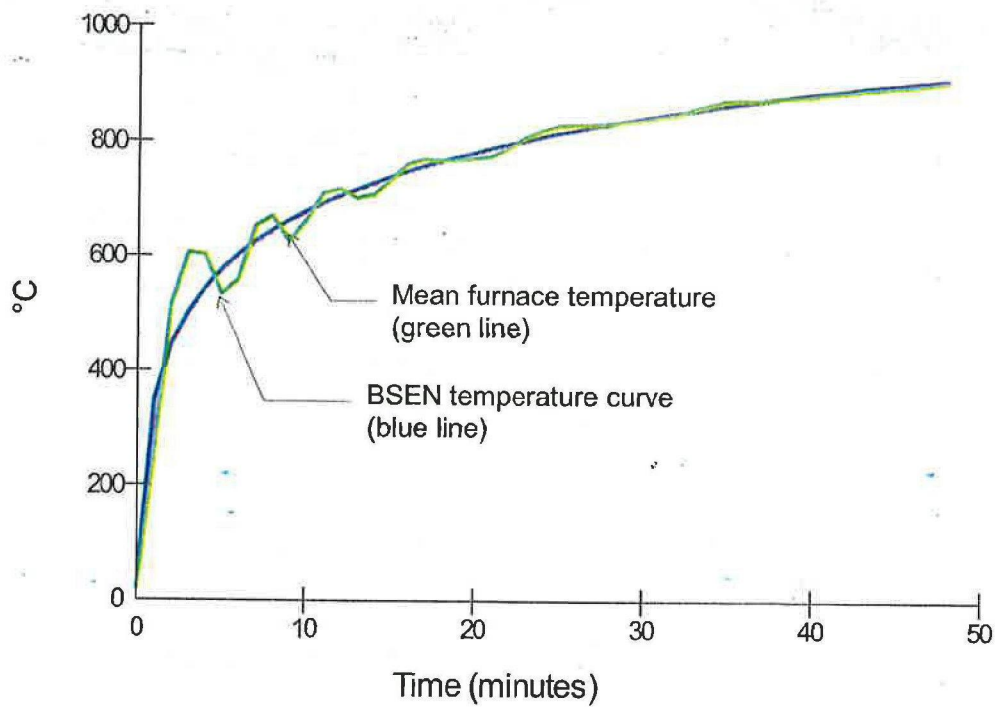
8.2 Pressure readings

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



8.3 Furnace temperature

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



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

8.4 Unexposed face temperatures

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

Doorset A

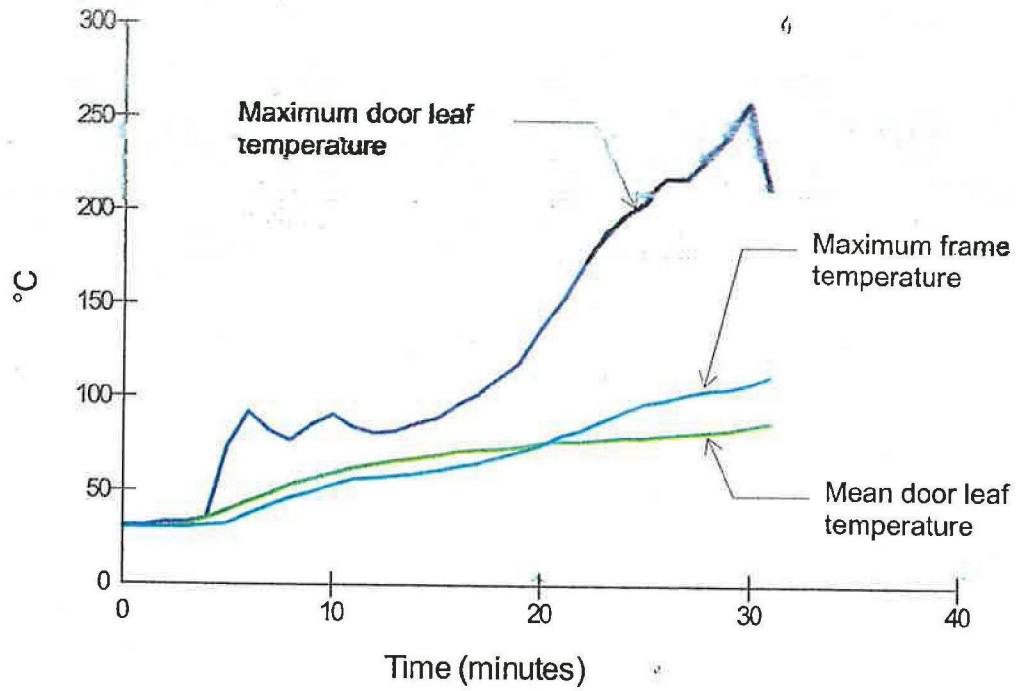
	1 discrete area	
Leaf	Discrete area (GRP)	5 measuring mean temperature rise. 5 measuring maximum temperature rise, standard set 100mm in from the door leaf edges. 5 measuring maximum temperature rise, supplementary set 25mm in from the door leaf edges.
Frame		5 measuring maximum temperature rise.

Doorset B

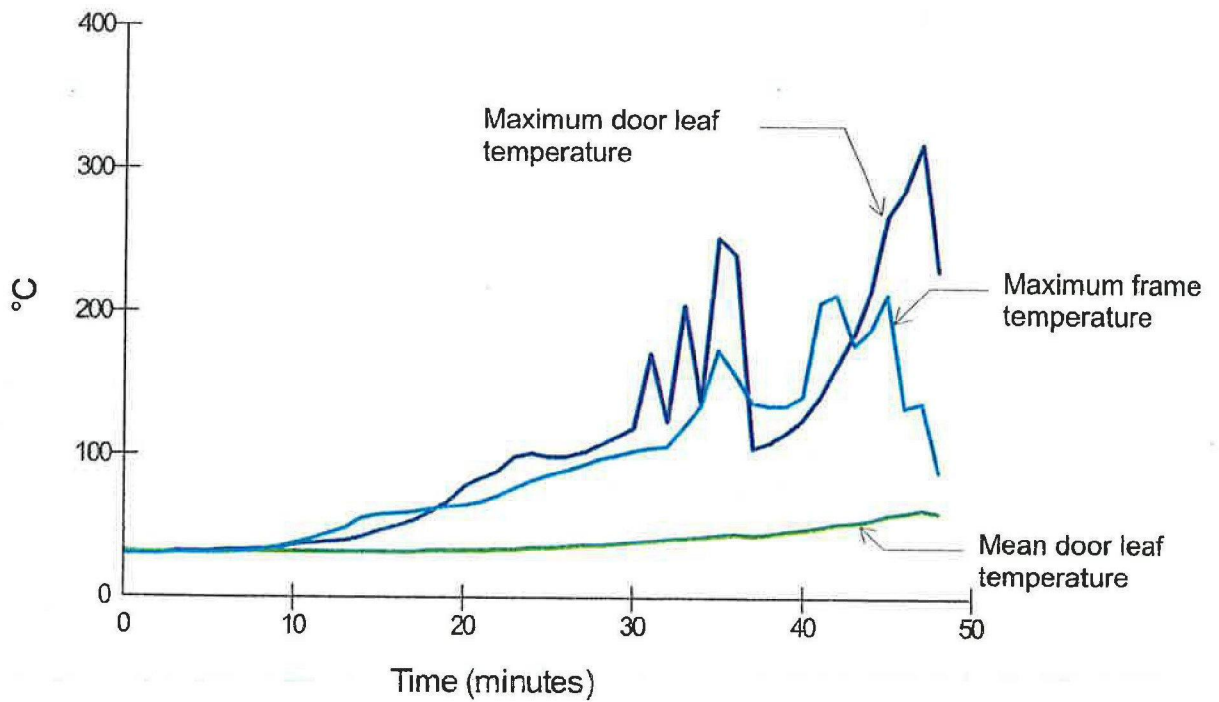
	1 discrete area	
Leaf	Discrete area (timber)	5 measuring mean temperature rise. 5 measuring maximum temperature rise, standard set 100mm in from the door leaf edges. 5 measuring maximum temperature rise, supplementary set 25mm in from the door leaf edges.
Frame		5 measuring maximum temperature rise.

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

Doorset A



Doorset B



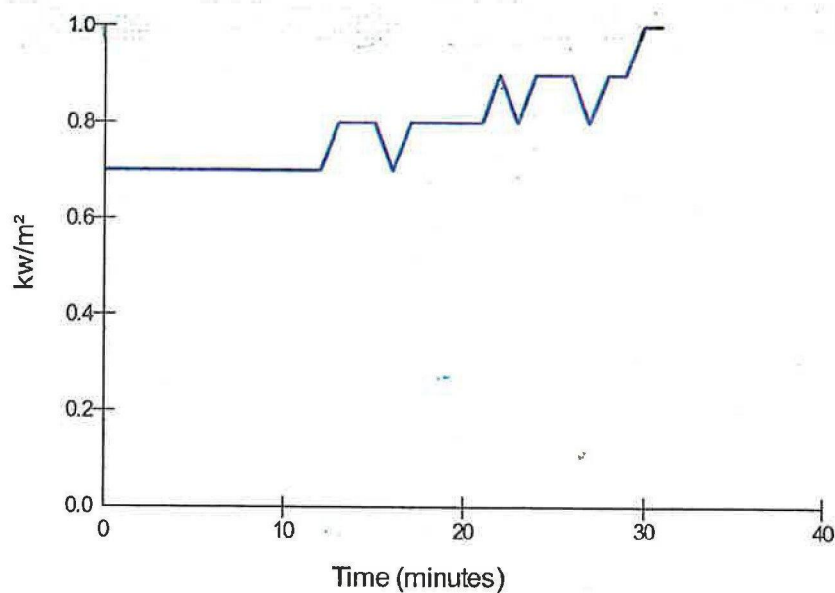
The legal validity of this report can only be claimed on presentation of the complete report.

8.5 Radiation

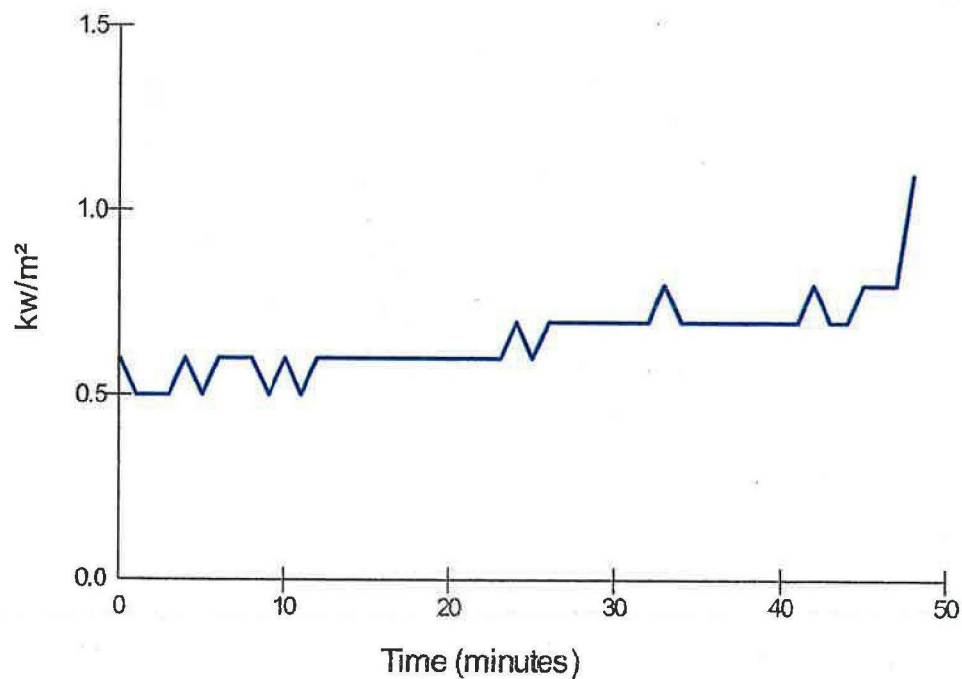
A radiometer was used to measure the radiation at mid height 1m away from each specimen.

The readings from the radiometers are tabulated in Appendix 2 and are shown graphically below

Doorset A



Doorset B



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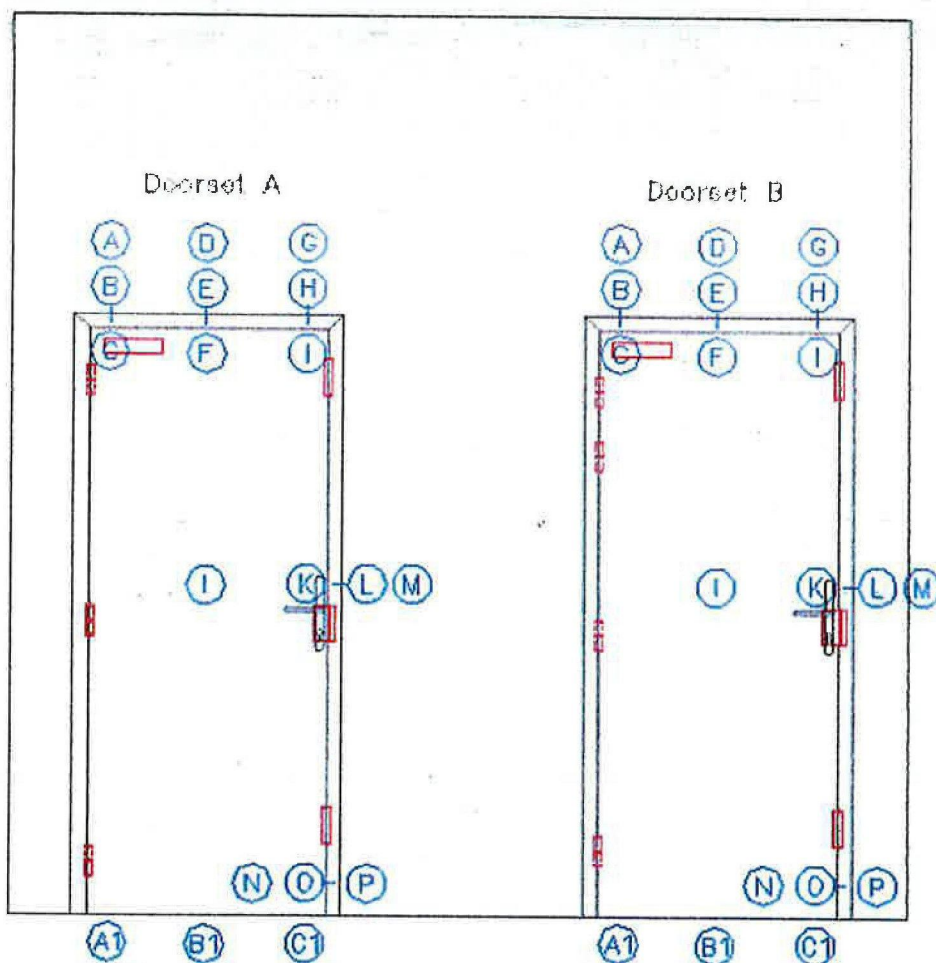
8.6 Leaf and frame distortion data

The following tables show the distortion in mm with an accuracy of ± 1 mm.

A positive measurement indicates distortion towards the furnace.

A negative measurement indicates distortion away from the furnace.

A1, B1 and C1 give vertical movement of the door; a negative reading indicates that the door has dropped.



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

Time	A	B	C	D	E	F	G	H	I	J	K	L
10	2	2	6	3	1	7	5	4	12	-11	9	5
20	1	-1	5	3	1	6	3	0	14	-19	-7	-1
30	-1	-10	3	1	-6	4	2	-9	15	-	-	-

Time	M	N	O	P	A1	B1	C1
10	4	2	0	1	1	-1	1
20	4	6	-1	0	1	0	2
30	-	-	-	-	-	-	-

Where a dash (-) applies, a distortion measurement could not be taken

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

- 31.35 Doorset A, a cotton pad integrity test was performed at the hanging edge of the leaf which resulted in ignition of the cotton pad thereby constituting **integrity failure**.
- 32.13 Doorset B, a cotton pad integrity test was performed at the top closing corner of the leaf which resulted in ignition of the cotton pad thereby constituting **integrity failure**.
- 32.30 Doorset A, there is continuous flaming at the hanging edge of the leaf thereby constituting **further integrity failure**. Doorset sealed off.
- 33.00 Doorset B, there is a glow visible at the top hinge position.
- 34.28 Doorset B, a cotton pad integrity test was performed at the top hinge position, no failure.
- 35.00 Doorset B, there is continuous flaming from the top closing corner thereby constituting **further integrity failure**.
- 37.15 Doorset B, a cotton pad integrity test was performed at the top hinge position, no failure.
- 38.45 Doorset B, a cotton pad integrity test was performed at the top hinge position, no failure.
- 40.00 Doorset B, a cotton pad integrity test was performed at the top hinge position, no failure.
- 41.15 Doorset B, a cotton pad integrity test was performed at the top hinge position, no failure.
- 42.45 Doorset B, a cotton pad integrity test was performed at the top hinge position, no failure.
- 43.00 Doorset B, there is a glow visible at the middle hinge position.
- 43.20 Doorset B, the frame is melting away at the top hinge position.
- 44.00 Doorset B, a cotton pad integrity test was performed at the top hinge position, no failure.
- 45.15 Doorset B, a cotton pad integrity test was performed at the top hinge position which resulted in ignition of the cotton pad thereby constituting **further integrity failure**.
- 46.00 Doorset B, there is intermittent flaming at the bottom hinge position.
- 47.07 Doorset B, there is continuous flaming at the top hanging corner of the leaf thereby constituting **further integrity failure**.
- 47.20 Doorset B, the head of the frame is falling away.
- 47.45 Doorset B, the unexposed face of the frame has fallen away.
- 48.00 Test terminated.

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10 Expression of results

Doorset A

Integrity	
Cotton pad	31 (thirty one) minutes
Continuous flaming	32 (thirty two) minutes
Gap gauges	32 (thirty two) minutes*
Insulation- 1 discrete area	
Average set	31 (thirty one) minutes**
Maximum $\geq 100\text{mm}$ in from leaf edge	31 (thirty one) minutes**
Maximum $\geq 25\text{mm}$ in from leaf edge	25 (twenty five) minutes
Door frame $\geq 180^\circ\text{C}$ temp rise	31 (thirty one) minutes**
Door frame $\geq 360^\circ\text{C}$ temp rise	31 (thirty one) minutes**
Radiation – time to 15kW/m^2	32 (thirty two) minutes*

* No failure of the test criteria had occurred at termination of the test on this specimen at 32 minutes

** Failure by virtue of integrity failure at 31 minutes

Doorset B

Integrity	
Cotton pad	32 (thirty two) minutes
Continuous flaming	35 (thirty five) minutes
Gap gauges	48 (forty eight) minutes*
Insulation – 1 discrete area	
Average set	32 (thirty two) minutes**
Maximum $\geq 100\text{mm}$ in from leaf edge	32 (thirty two) minutes
Maximum $\geq 25\text{mm}$ in from leaf edge	32 (thirty two) minutes**
Door frame $\geq 180^\circ\text{C}$ temp rise	32 (thirty two) minutes**
Door frame $\geq 360^\circ\text{C}$ temp rise	32 (thirty two) minutes**
Radiation – time to 15kW/m^2	48 (forty eight) minutes*

* No failure of the test criteria had occurred at termination of the test at 48 minutes

** Failure by virtue of integrity failure at 32 minutes

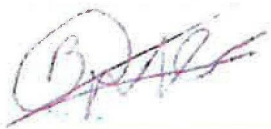

The legal validity of this report can only be claimed on presentation of the complete report.

11 Limitations

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

The results of this test were obtained using the door to frame gaps recorded in Figure 5 of appendix 2. 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:	Lead Technical Officer	Technical Manager
Date of issue:	30.08.2013	30-08-2013

12 Field of direct application of test results

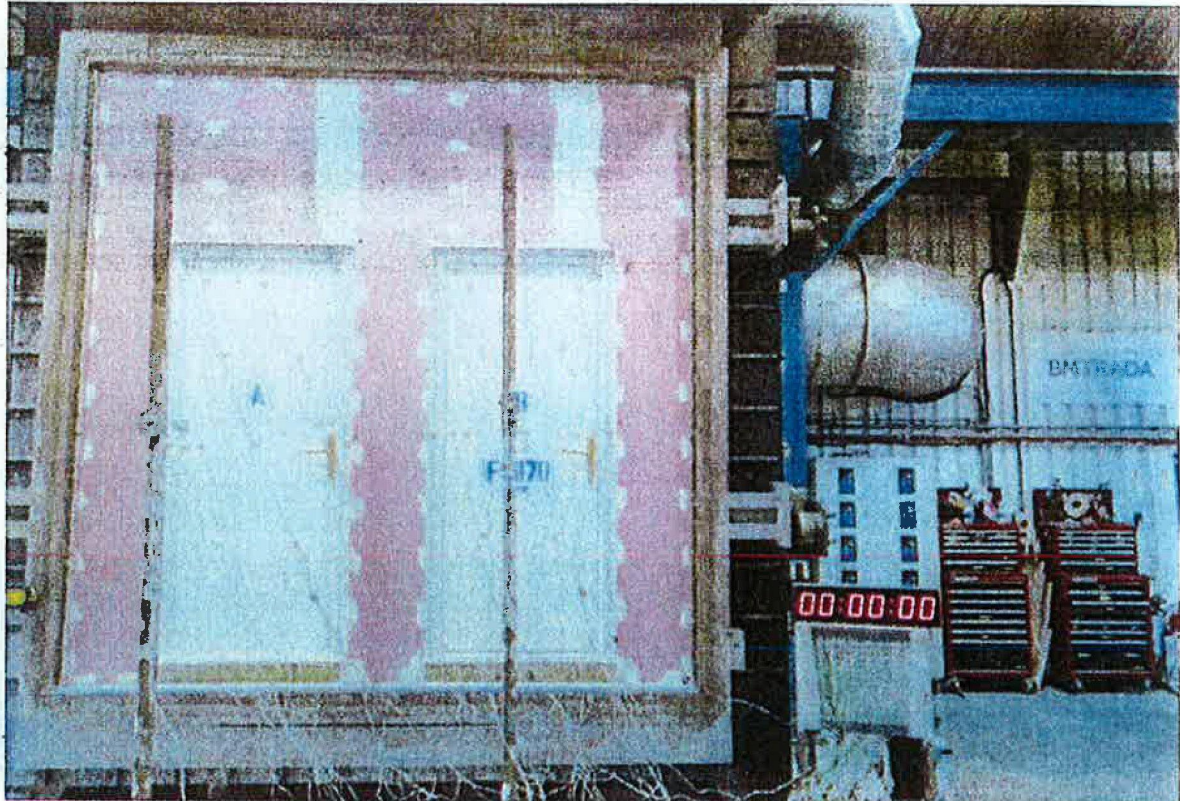
The results of the test are directly applicable to similar constructions where one or more of the changes listed in BSEN 1634-1: 2008, Clause 13, are made and the construction continues to comply with that appropriate design code for its stiffness and stability. Other changes are not permitted by the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

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

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

13 Photographs

At start of test



At 10 minutes



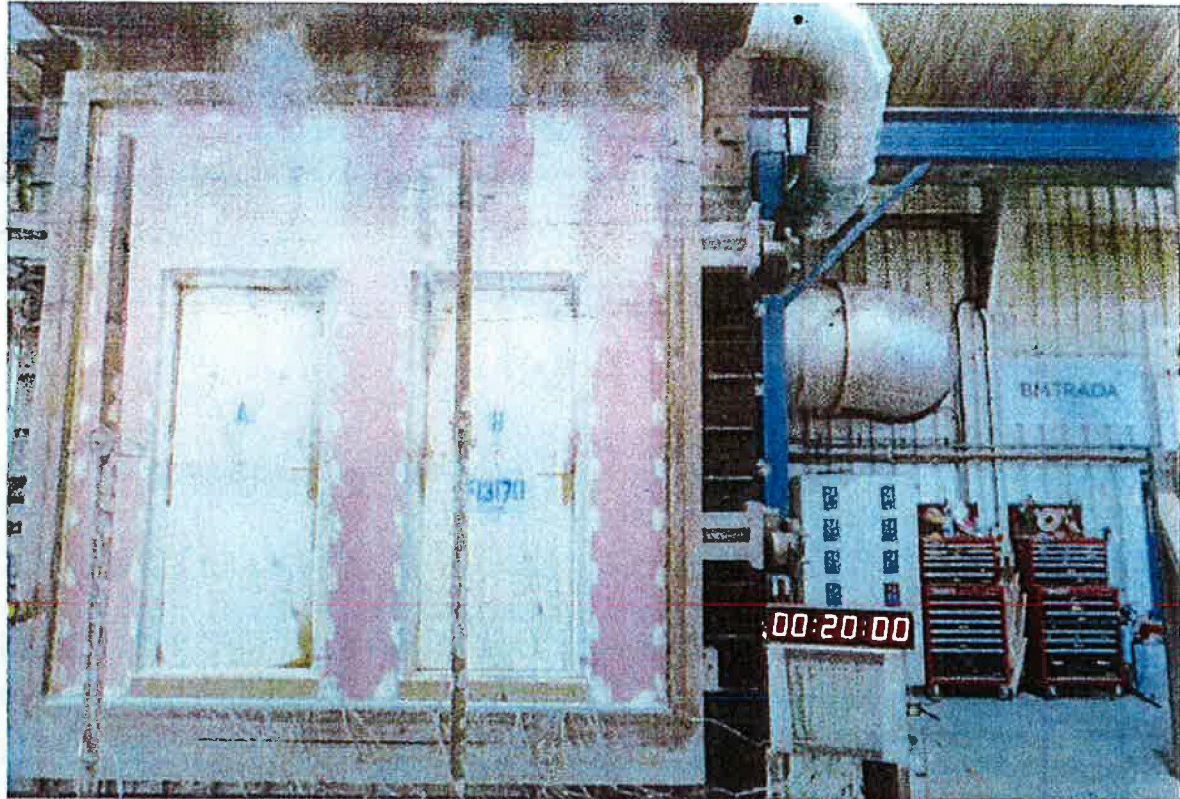
The legal validity of this report can only be claimed on presentation of the complete report.

Report for: Norsound Ltd
Ref: Chil/RF13170

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MET00040105/47
MET00040105/47

At 20 minutes



After 30 minutes



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After 40 minutes



After 47 minutes



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Report for: Norsound Ltd
Ref: Chil/RF13170

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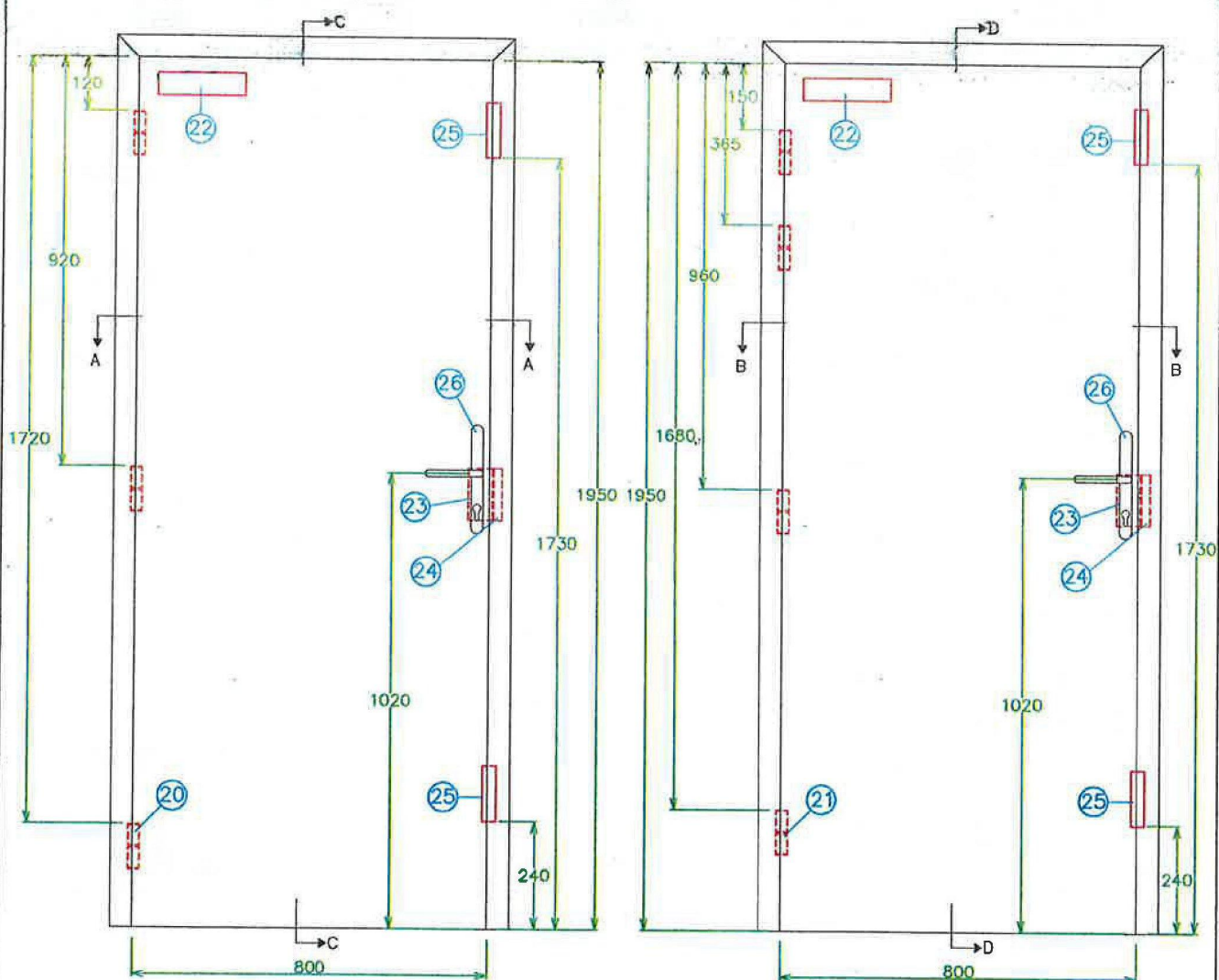
MET00040105/49
MET00040105/49

Appendix 1 - figures 1 to 6

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

Doorset A

Doorset B



BM TRADA

Chiltern House, Stocking Lane, Hughenden Valley
High Wycombe, Buckinghamshire, HP14 4ND, UK.

Tel: Fax:

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

Date Drawn
08/08/13

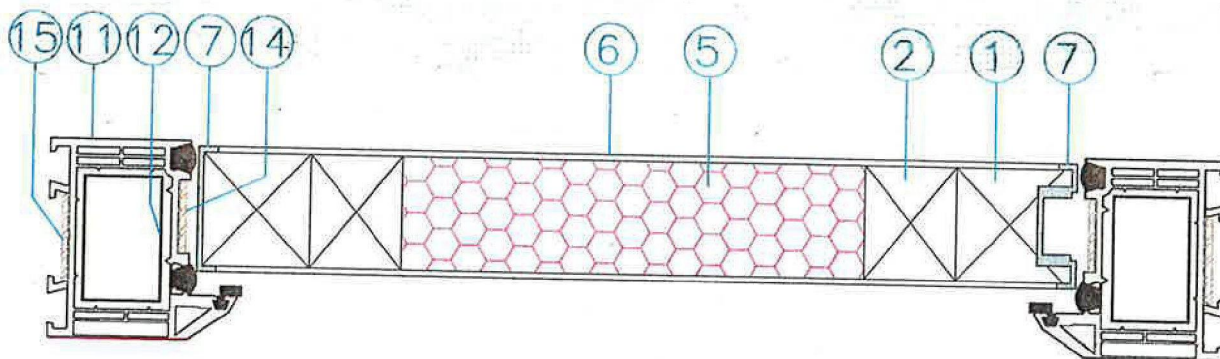
Drawn By
ANM

Scale
NTS

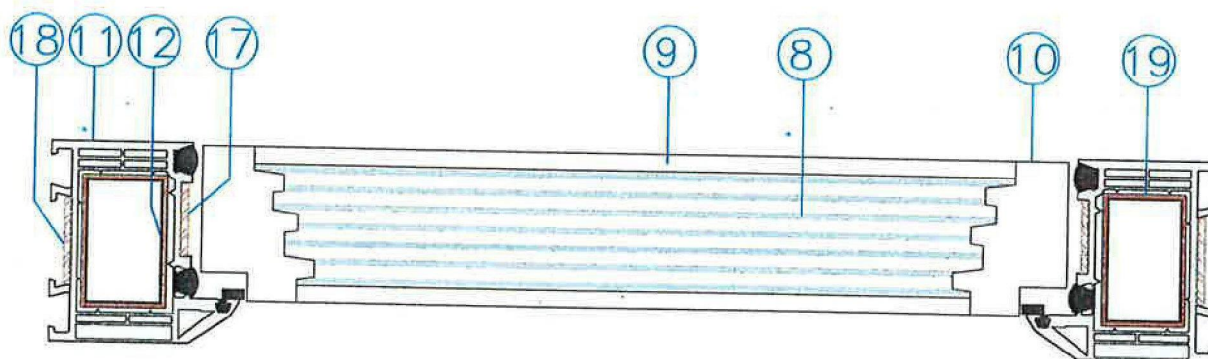
Project No.
Chilt/RF13170

Appendix 1

Section A-A



Section B-B



BMTRADA

Chiltern House, Stocking Lane, Hughenden Valley
High Wycombe, Buckinghamshire, HP14 4ND, UK.

Tel: [REDACTED]

Fax: [REDACTED]

Title

Horizontal cross sections
(All dimensions in mm)

Date Drawn

08/08/13

Drawn By

ANM

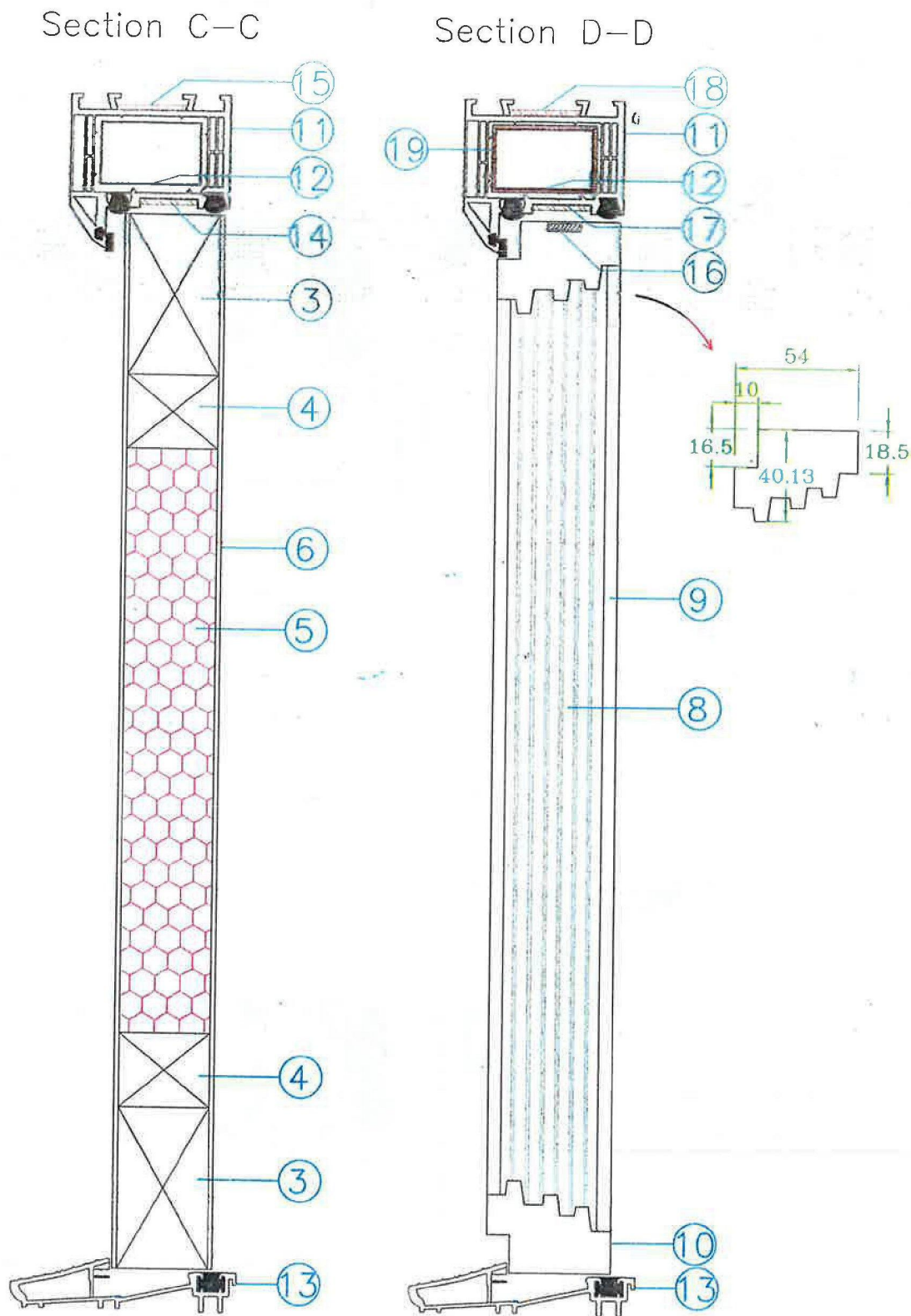
Scale

NTS

Project No.

Chilt/RF13170

Appendix 1



BMTRADA

Chiltern House, Stocking Lane, Hughenden Valley
High Wycombe, Buckinghamshire, HP14 4ND, UK.

Tel: [REDACTED]

Fax: [REDACTED]

Title

Vertical cross sections
(All dimensions in mm)

Date Drawn

08/08/13

Drawn By

ANM

Scale

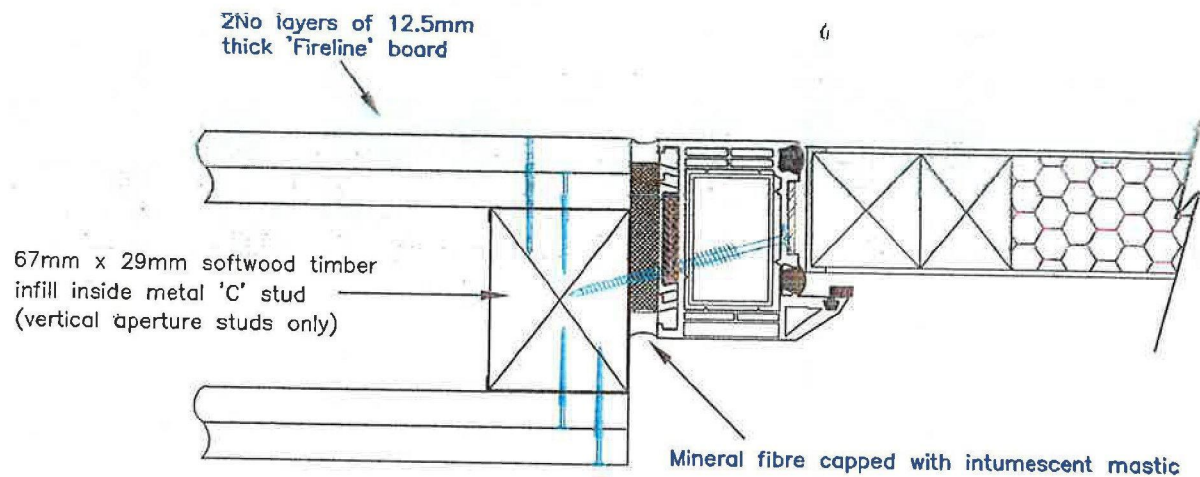
NTS

Project No.

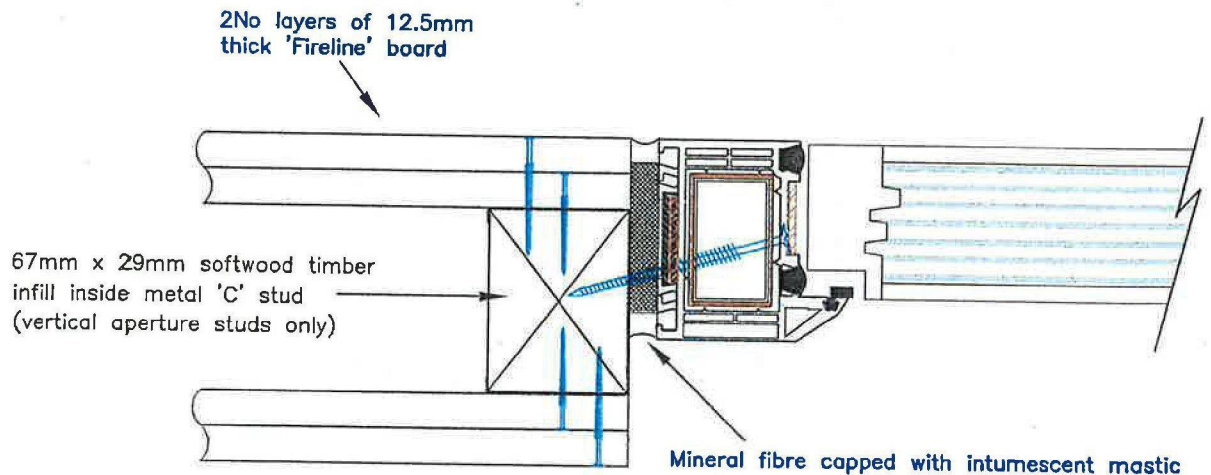
Chilt/RF13170

Appendix 1

Doorset A



Doorset B



BMTRADA

Chiltern House, Stocking Lane, Hughenden Valley
High Wycombe, Buckinghamshire, HP14 4ND, UK.

Tel: [REDACTED]

Fax: [REDACTED]

Title

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

Date Drawn

08/08/13

Drawn By

ANM

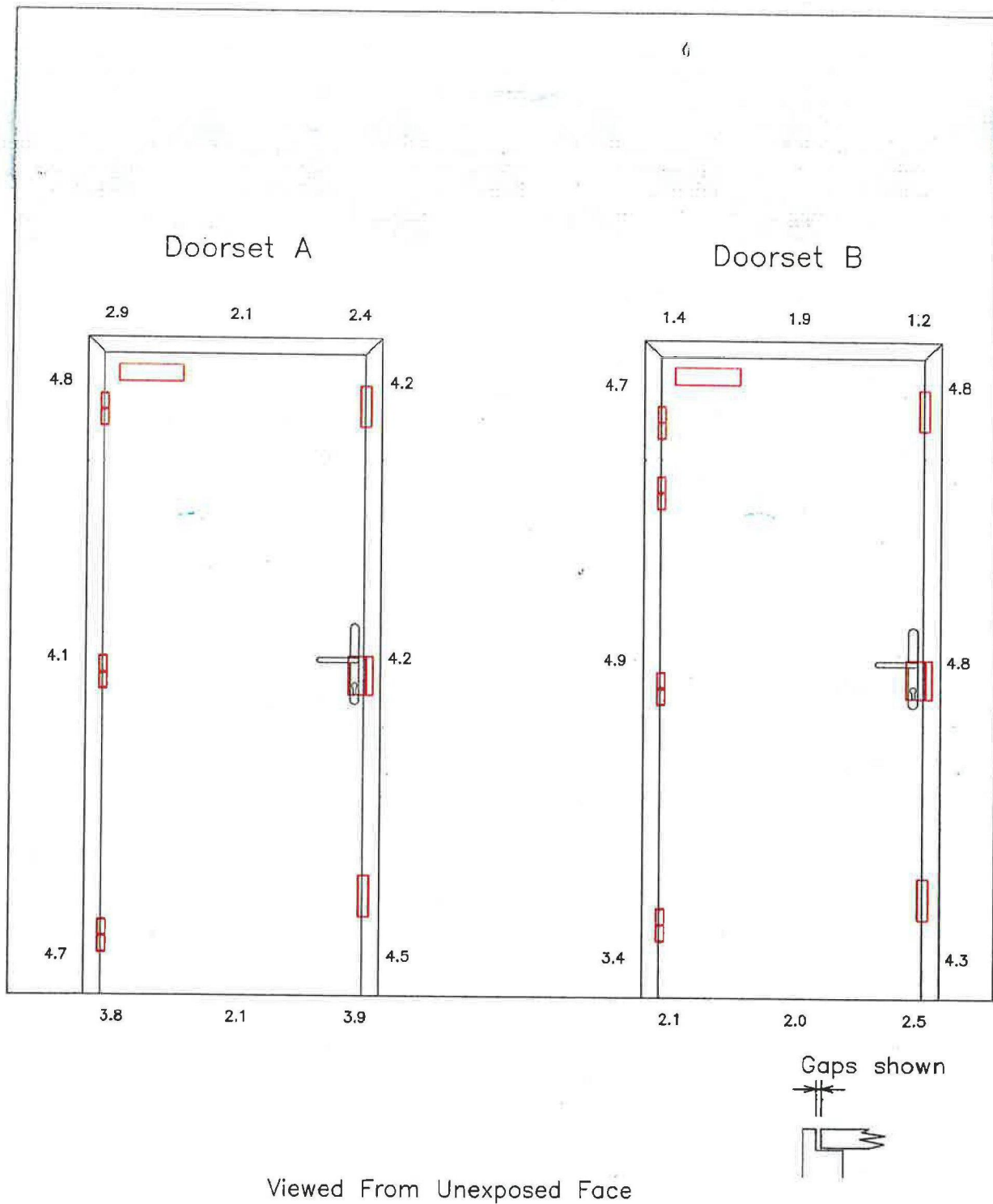
Scale

NTS

Project No.

Chilt/RF13170

Appendix 1



BM TRADA

Chiltern House, Stocking Lane, Hughenden Valley
High Wycombe, Buckinghamshire, HP14 4ND, UK.

Tel: [REDACTED] Fax: [REDACTED]

Title

Door leaf/frame gaps
(All dimensions in mm)

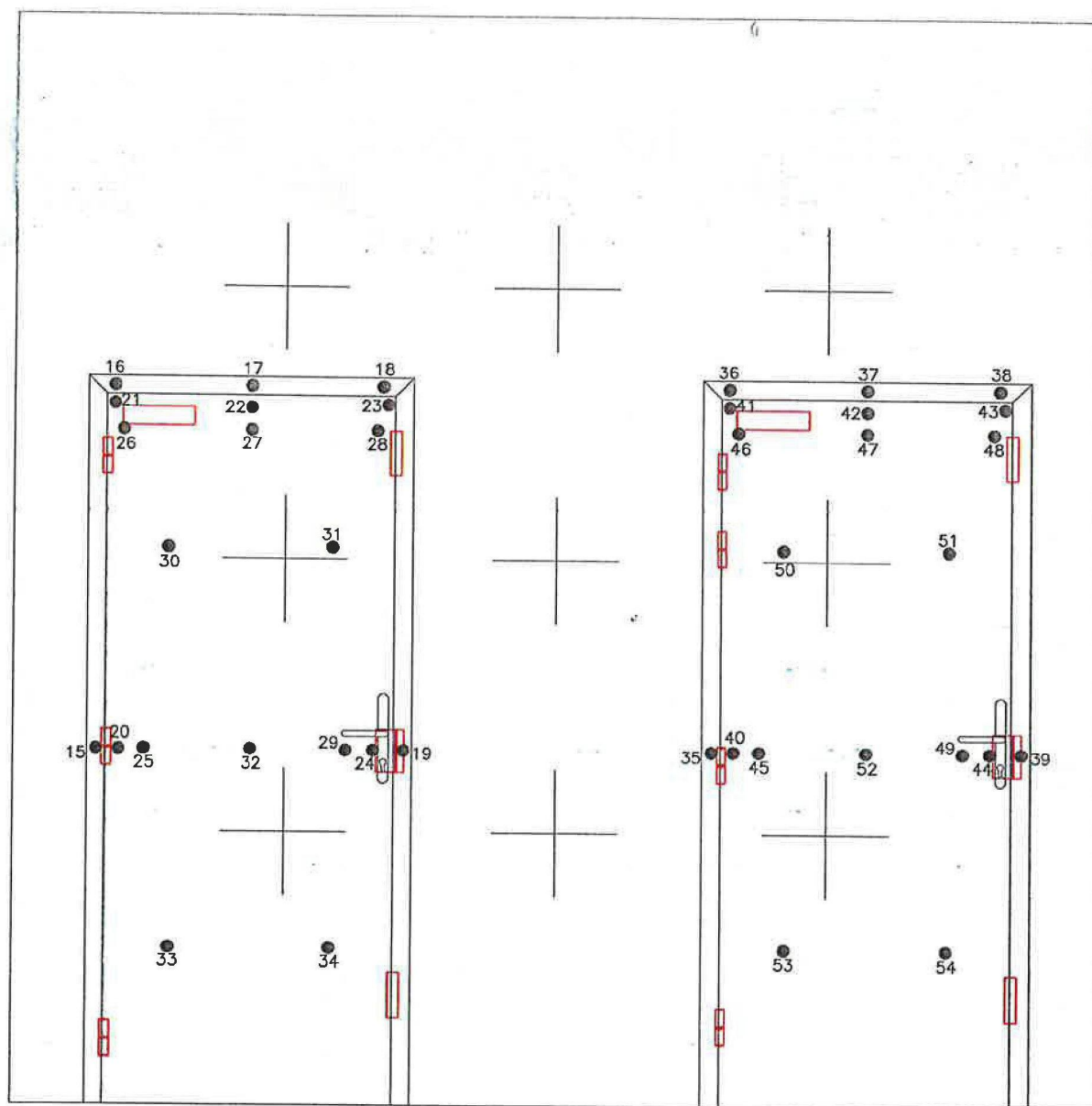
Date Drawn
08/08/13

Drawn By
ANM

Scale
NTS

Project No.
Chilt/RF13170

Appendix 1



+ : Furnace Thermocouples
 • : Unexposed Face Thermocouples

Viewed From Unexposed Face

BMTRADA

Chiltern House, Stocking Lane, Hughenden Valley
High Wycombe, Buckinghamshire, HP14 4ND, UK.

Tel: [REDACTED]

Fax: [REDACTED]

Title

Thermocouple positions
(All dimensions in mm)

Date Drawn

08/08/13

Drawn By

ANM

Scale

NTS

Project No.

Chilt/RF13170

Appendix 1

Appendix 2 - raw test data (6 pages)

(see figure 6 of appendix 1 for channel locations)

☐ Furnace thermocouples ☐ Failure time and corresponding thermocouple

Time	Chan 0	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5	Chan 6	Chan 7	Chan 8	Chan 9	Chan 11	Chan 15	Chan 16	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22
min	Pa	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
0	0	44	44	44	45	45	43	45	45	45	29	30	30	30	30	30	30	31	30
1	-1.1	257	165	209	254	293	261	241	322	323	29	30	30	30	30	30	30	30	30
2	0.6	480	453	440	509	556	527	504	579	574	29	29	30	30	30	30	30	31	30
3	-5.4	550	546	545	613	626	620	622	666	657	29	30	30	30	30	30	30	31	30
4	-11.8	569	555	551	604	626	629	614	636	634	29	30	30	30	30	30	30	31	30
5	-7	509	478	487	545	542	561	557	566	563	29	30	30	30	31	30	30	31	30
6	10.2	547	491	500	580	581	581	573	596	587	29	30	30	30	31	31	30	31	31
7	-2.9	627	606	593	667	676	675	655	688	688	29	30	31	31	42	33	30	32	32
8	-10.3	647	626	639	672	676	692	673	697	700	29	31	31	31	46	35	30	32	32
9	-0.4	597	568	580	628	624	662	639	649	671	29	32	32	32	49	36	31	33	33
10	-1.1	638	615	624	671	670	708	662	687	687	29	33	33	34	53	39	31	34	34
11	-3	686	685	687	717	725	747	694	725	725	29	35	34	35	56	41	32	36	35
12	-7.2	692	695	684	716	720	765	710	735	736	29	37	36	37	57	43	32	37	36
13	-3.9	682	682	659	701	699	739	703	716	732	29	39	39	38	58	44	33	39	38
14	1.8	691	688	662	708	707	744	705	721	732	29	42	43	40	59	48	34	44	41
15	-1.1	721	724	699	735	738	780	723	746	752	29	44	47	41	61	49	35	48	43
16	-1.6	746	757	732	757	762	798	745	770	774	29	46	49	43	63	51	36	52	44
17	-3.7	759	771	740	764	769	803	753	776	783	29	48	52	45	65	52	38	55	45
18	-1	762	772	737	762	765	797	753	772	785	29	50	54	46	68	57	41	58	45
19	-1.3	767	772	737	763	767	799	754	772	783	29	52	58	49	71	61	44	61	46
20	-1.3	772	772	741	767	769	797	758	773	783	29	54	61	50	75	65	47	65	47
21	-0.1	778	775	747	772	776	804	761	776	783	29	58	64	53	80	67	48	69	48

Test for: Norsound
Ref: Chilt/RF13170

BMTRADA

Time	Chan 0	Chan 1	Chan 2	Chan 3	Chan 4	Chan 5	Chan 6	Chan 7	Chan 8	Chan 9	Chan 11	Chan 15	Chan 16	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22
min	Pa	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
22	-1.9	796	794	767	788	791	824	770	790	797	29	61	67	55	83	69	50	72	49
23	-1.3	815	812	788	801	808	838	785	805	811	29	64	71	57	88	72	52	76	50
24	-1.2	824	824	799	813	818	851	799	821	829	29	68	74	59	93	75	54	81	52
25	-5	832	830	809	820	830	860	807	829	838	29	71	77	61	97	76	56	86	53
26	-3	833	827	809	822	830	858	816	833	845	29	74	80	64	99	78	59	90	55
27	-1.8	833	827	805	823	828	856	819	835	847	29	77	84	66	102	81	62	94	58
28	-1.5	835	829	810	823	830	859	820	836	850	29	81	87	69	104	83	67	98	63
29	-1.5	839	833	812	827	833	861	827	840	855	29	84	90	72	105	85	71	101	68
30	-1	842	836	814	831	838	865	830	844	856	29	87	94	74	108	87	74	104	77
31	-0.5	846	841	821	834	841	870	836	848	861	29	91	99	77	112	90	77	108	86
32	-0.3	850	854	823	843	851	879	835	849	860	29	94	108	80	117	92	87	116	89
33	-0.7	861	864	829	857	863	885	841	858	867	29	67	72	67	114	82	67	151	70
34	-1.3	867	870	838	866	871	893	849	866	874	29	35	35	39	65	41	31	40	35
35	-1.6	875	882	847	872	876	903	857	875	881	29	31	31	32	43	32	29	30	30
36	-1.8	876	884	847	872	877	903	860	874	886	29	31	30	30	36	31	29	29	30
37	-1.8	877	883	846	873	876	900	861	873	884	29	30	30	30	33	30	29	29	30
38	-1.9	880	886	851	874	878	905	864	877	888	29	30	30	30	32	30	29	29	30
39	-1.6	882	887	852	877	879	906	865	877	889	29	30	30	29	31	30	29	29	29
40	-1.5	884	891	851	879	882	908	869	880	890	29	30	30	29	31	30	29	29	29
41	-1.4	889	894	863	882	885	909	873	885	894	30	30	30	29	31	30	30	29	30
42	-1.1	891	897	866	885	888	911	875	886	897	30	26	30	29	31	30	22	28	29
43	-1.7	894	900	869	890	892	918	878	889	898	30	27	30	29	31	30	23	29	28
44	-1.9	897	903	869	892	894	920	882	892	901	30	28	30	29	31	30	27	29	28
45	-1.1	899	905	877	895	897	921	885	895	902	30	29	30	29	31	30	29	29	29
46	-1	902	909	878	898	900	922	888	897	905	30	29	30	29	30	30	29	29	29
47	-1.3	907	913	882	902	904	924	891	900	908	30	29	30	29	31	30	29	29	29
48	-2	910	916	887	905	907	929	892	902	907	30	29	30	30	31	30	30	29	29

BMTRADA

Time	Chan 23	Chan 24	Chan 25	Chan 26	Chan 27	Chan 28	Chan 29	Chan 30	Chan 31	Chan 32	Chan 33	Chan 34	Chan 35	Chan 36	Chan 37	Chan 38	Chan 39
min	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
0	31	31	30	31	31	32	31	30	31	31	30	30	30	30	30	30	30
1	31	31	30	31	31	31	31	30	31	30	30	30	29	30	30	30	30
2	31	33	30	31	31	32	31	30	31	31	30	30	29	30	30	30	30
3	33	33	31	34	32	34	34	32	32	31	30	31	29	30	30	30	31
4	35	33	33	38	35	38	39	36	36	35	33	35	30	30	30	30	31
5	74	34	35	42	40	44	44	40	41	39	38	39	30	30	30	30	31
6	92	36	38	46	45	49	49	45	47	44	43	44	30	30	30	30	32
7	82	38	40	49	49	54	53	49	51	48	47	48	31	30	30	30	32
8	77	39	43	52	53	58	58	53	56	52	52	52	31	30	30	31	33
9	85	41	45	54	57	62	61	56	59	56	56	56	32	31	31	32	35
10	91	44	48	56	60	67	64	59	61	59	60	59	34	31	31	34	38
11	84	46	51	57	63	69	66	61	63	62	63	62	36	32	32	37	41
12	81	49	53	59	65	70	68	63	65	64	65	64	38	33	33	42	45
13	82	51	55	60	67	71	69	65	67	66	67	66	40	35	35	49	48
14	86	55	57	62	69	72	71	66	68	67	69	68	42	37	36	56	50
15	89	59	59	63	71	73	72	68	69	69	70	69	46	41	38	58	53
16	96	74	61	64	72	74	74	70	71	71	72	71	49	47	40	59	55
17	102	84	63	66	74	76	75	71	72	72	74	73	50	51	42	60	56
18	111	91	66	67	75	77	77	72	73	74	75	74	52	55	44	62	58
19	119	95	68	68	76	79	78	73	74	75	76	76	54	59	46	64	60
20	137	98	70	70	76	80	79	74	75	77	77	77	56	64	49	65	62
21	152	104	71	71	77	81	80	75	76	78	78	78	58	67	51	67	65
22	170	107	73	72	78	81	80	76	76	78	79	78	60	71	53	68	68
23	187	115	74	74	78	81	81	77	77	79	79	79	63	77	55	72	71
24	198	130	76	75	79	82	81	78	77	80	80	80	65	82	58	78	74
25	205	144	77	76	80	82	82	79	78	81	80	80	68	86	60	81	78
26	218	155	78	77	81	83	82	80	79	82	81	80	71	89	62	84	81
27	218	167	79	78	82	84	83	81	80	83	82	81	75	93	65	86	85

Test for: Norsound
Ref: Chil/RF13170

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BMTRADA

Time	Chan 23	Chan 24	Chan 25	Chan 26	Chan 27	Chan 28	Chan 29	Chan 30	Chan 31	Chan 32	Chan 33	Chan 34	Chan 35	Chan 36	Chan 37	Chan 38	Chan 39
min	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
28	229	181	80	79	83	86	84	83	81	85	83	82	78	97	68	89	88
29	241	194	81	80	85	86	85	84	83	86	84	82	82	100	70	92	91
30	259	206	82	81	87	87	86	86	85	89	85	83	84	103	73	96	93
31	205	213	83	83	91	88	87	88	88	92	86	84	86	105	76	100	95
32	118	224	84	85	96	90	89	93	93	96	87	86	89	106	79	104	98
33	73	223	79	74	87	85	85	75	74	85	80	81	93	107	82	120	100
34	44	122	59	42	53	56	55	40	39	45	56	52	97	110	85	135	102
35	34	62	46	33	38	44	42	34	32	35	43	40	102	113	88	174	105
36	32	42	39	31	33	37	36	32	30	32	36	34	98	116	91	157	78
37	30	34	34	30	32	34	33	31	30	31	33	32	105	120	94	137	74
38	30	32	32	30	31	32	32	31	29	30	31	31	106	125	97	135	73
39	30	31	31	29	31	31	31	30	29	30	30	30	110	132	101	135	74
40	30	31	30	29	30	30	31	30	29	30	30	30	113	142	105	137	75
41	30	31	29	29	30	30	30	30	29	30	29	30	116	207	108	136	75
42	30	26	28	29	30	30	30	30	29	29	29	30	118	213	113	143	78
43	30	25	27	29	30	30	30	30	29	29	28	29	122	178	115	140	78
44	30	26	27	29	30	29	30	30	29	29	28	29	127	189	119	142	80
45	30	27	27	29	30	29	30	30	29	29	28	29	131	213	123	148	83
46	30	28	27	29	30	29	30	30	29	29	28	29	134	54	127	129	85
47	30	29	27	29	30	29	30	30	29	29	28	29	137	32	136	130	88
48	30	29	27	29	30	29	30	30	29	29	30	29	89	43	34	61	62

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Time	Chan 40	Chan 41	Chan 42	Chan 43	Chan 44	Chan 45	Chan 46	Chan 47	Chan 48	Chan 49	Chan 50	Chan 51	Chan 52	Chan 53	Chan 54	Chan 55	Chan 56
min	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	kw/m²	kw/m²
0	30	30	30	30	30	30	31	31	32	32	32	32	32	32	32	0.7	0.6
1	29	30	30	30	30	30	30	30	32	32	31	31	31	31	31	0.7	0.5
2	29	30	30	30	30	30	30	30	32	32	31	31	31	31	31	0.7	0.5
3	29	30	30	30	32	30	30	30	32	32	31	31	31	31	31	0.7	0.5
4	29	30	30	30	32	30	30	30	32	32	31	32	32	31	31	0.7	0.6
5	29	30	30	30	32	30	31	31	32	32	31	31	32	31	31	0.7	0.5
6	29	31	30	30	33	30	31	30	32	32	31	31	32	31	31	0.7	0.6
7	30	31	30	31	33	30	31	31	32	32	32	32	32	32	32	0.7	0.6
8	30	31	30	31	34	30	31	31	32	32	32	32	32	32	32	0.7	0.6
9	30	32	30	33	34	30	31	31	32	32	32	32	32	32	32	0.7	0.5
10	30	32	30	34	37	30	31	31	33	33	32	32	32	32	32	0.7	0.6
11	30	32	30	34	38	30	31	31	33	33	32	32	32	32	32	0.7	0.5
12	30	32	30	35	39	30	31	31	33	33	32	32	32	32	32	0.7	0.6
13	30	33	31	36	40	30	31	31	33	33	32	32	32	32	32	0.8	0.6
14	30	34	30	39	43	30	31	31	33	33	32	32	32	32	32	0.8	0.6
15	31	37	31	39	47	30	32	31	33	33	32	32	32	32	32	0.8	0.6
16	33	42	31	42	50	31	33	31	34	33	32	32	32	32	32	0.7	0.6
17	36	47	31	45	54	31	35	31	34	33	33	33	33	32	33	0.8	0.6
18	38	51	32	53	60	31	37	32	34	34	33	33	33	33	33	0.8	0.6
19	38	56	32	57	67	31	38	32	35	34	33	33	33	33	33	0.8	0.6
20	39	61	32	58	78	32	42	32	36	35	34	33	33	33	33	0.8	0.6
21	40	65	33	59	83	32	43	33	36	35	34	34	33	34	33	0.8	0.6
22	40	69	33	59	88	32	44	33	37	35	35	34	34	34	34	0.9	0.6
23	41	75	34	67	99	33	45	34	38	36	36	35	34	34	34	0.8	0.6
24	43	80	35	72	101	33	47	34	39	36	36	35	35	35	35	0.9	0.7
25	44	84	35	73	99	34	47	35	39	37	37	36	35	35	35	0.9	0.6
26	44	86	36	75	99	35	46	35	40	38	38	37	36	36	36	0.9	0.7
27	45	90	37	74	102	35	49	36	41	38	39	37	37	37	36	0.8	0.7

BMTRADA

Time	Chan 40	Chan 41	Chan 42	Chan 43	Chan 44	Chan 45	Chan 46	Chan 47	Chan 48	Chan 49	Chan 50	Chan 51	Chan 52	Chan 53	Chan 54	Chan 55	Chan 56
min	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	kw/m²	kw/m²
28	48	93	38	76	107	36	50	37	42	39	40	38	37	37	37	0.9	0.7
29	51	95	39	78	113	37	50	38	44	40	41	39	38	38	37	0.9	0.7
30	56	99	40	82	119	39	52	38	46	41	42	40	39	39	38	1	0.7
31	60	171	41	84	122	41	54	39	47	42	44	40	40	39	39	1	0.7
32	63	110	42	87	124	41	56	41	48	43	45	41	41	40	40	1	0.7
33	63	205	43	98	131	43	57	42	50	44	46	42	42	41	41	1.1	0.8
34	67	101	45	114	137	44	61	43	54	45	47	43	43	42	42	0.7	0.7
35	70	238	46	252	149	45	65	45	60	47	49	45	44	43	43	0.8	0.7
36	72	241	47	65	95	46	66	46	60	49	51	45	44	43	43	0.8	0.7
37	75	105	48	73	84	46	68	46	54	44	52	43	44	43	41	0.8	0.7
38	81	109	49	87	87	48	72	47	52	43	55	42	46	45	40	0.9	0.7
39	83	115	51	111	83	50	76	49	51	41	57	43	48	47	40	0.9	0.7
40	90	125	53	84	82	52	82	50	52	43	59	44	50	49	40	0.9	0.7
41	94	142	55	108	82	54	86	52	51	42	62	45	52	51	40	0.5	0.7
42	99	163	57	86	83	56	92	54	53	42	65	47	54	53	41	0.6	0.8
43	104	186	60	114	88	58	100	56	54	42	68	48	56	55	42	0.5	0.7
44	107	218	63	103	81	60	104	57	54	43	71	50	58	58	42	0.5	0.7
45	109	252	66	268	83	63	106	59	55	44	74	52	60	63	43	0.6	0.8
46	111	287	69	76	88	67	108	61	59	47	78	54	61	67	44	0.6	0.8
47	114	319	73	149	90	69	105	63	61	47	80	54	61	72	45	0.6	0.8
48	98	230	64	77	86	71	82	62	64	47	74	53	59	73	45	0.5	1.1

~~NANVA~~ - FD30 JUL 2013
CAPSTONE BLADE
ODL CASSETTE

Ref: Chilt/IF13067 Rev A

20 August 2013

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Test reference: Chilt/IF13067 Revision A

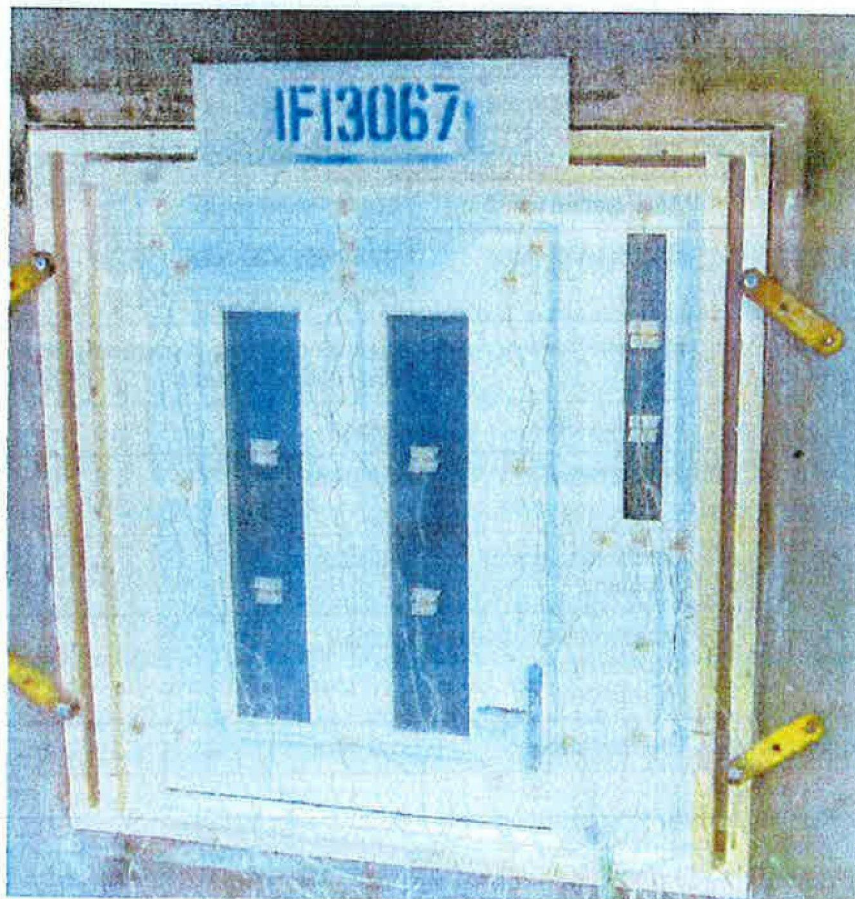
**Re: Indicative Fire Resistance Test to the temperature and pressure conditions of
BSEN 1363-1: 1999 and to the principles of BSEN 1634-1: 2008**

This letter is to confirm the results of an indicative fire resistance test undertaken on 10th July 2013. The specimen consisted of a glazed door leaf section hung within a PVC frame, with a glazed and panelled side screen.

Details of the test specimen

The leaf measured 1263mm high x 915mm wide x nominally 44mm thick

Unexposed face prior to testing



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

MET00040105/63
MET00040105/63

Introduction

The specimen was supplied for test by the client and delivered during July 2013. BM TRADA installed the specimen into a timber stud plasterboard clad supporting construction within a refractory lined steel restraint frame mounted on the front of a 1.5m x 1.5m vertical furnace.

Supporting construction

The supporting construction consisted of a C16 grade softwood timber stud frame, nominally 95mm deep x 45mm wide, clad on the furnace side only with 2No layers of nominally 15mm thick type F plasterboard. Drywall screws were used to fix the plasterboard at a maximum 300mm centres. The screw length was selected to achieve a minimum of 10mm penetration into the timber studs / track.

Description of construction (refers to Figures 1 to 3 of Appendix 1)

Leaf – identified as being produced from a Capstone Engineering T914 FD 30 phenolic core door blank

		Species/type	Dimensions (mm)	Density (kg/m ³)	Key to figures
Stiles	Inner	3No. LVL	111 wide (overall) x 40 thick	570*	1
	Outer	Engineering wood	47 wide x 40 thick	530*	2
Top rail	Inner	LVL	30 wide x 40 thick	570*	3
	Outer	Engineering wood	50 wide x 40 thick	530*	4
Bottom rail		Engineering wood	96.8 wide x 40 thick (2No. 48.4 wide x 40 thick)	530*	5
Core		Phenolic foam	40 thick reducing to nominally 16 thick at fielded areas	50*	6
Facings		Moulded GRP	2 thick	-	7
Lippings – vertical edges only		Profiled steel	1.5 thick	-	8
Side screen panel – 24mm thick overall	Core	Graduated density chipboard	18 thick	630*	9a
	Inner layer	Norsound NOR 910 graphite type intumescent	1 thick	-	9b
	Facing	Thermoplastic	1.6 thick	-	9c

* Stated by door blank manufacturer, accuracy agreed by the laboratory

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

Door frame and side screen frame

	Species/type	Dimensions (mm)	Key to figures
Head and jambs – door frame, side screen and fanlight	LB Plastics Ltd extruded PVC Product reference SK77950	68 wide x 70 deep including a 20 high x 23 deep integral stop / integral bead	10
Frame reinforcement	Steel box section Product reference S119	30 x 35 x 1.5 thick	11
Sidescreen transom	LB Plastics Ltd extruded PVC Product reference SW7743	70 wide x 70 deep including 14 high x 15 wide integral beads	12
Transom reinforcement	Steel box section Product reference S101	1.5 thick	13
Stops – integral	-	-	-
Frame corner jointing detail	Mitred – bracketed Product reference SW73174	125 x 125 bracket size screw fixed at each corner	-
Door frame to side screen jointing method	Profiled aluminium coupler Product reference A204	-	14
Aluminium coupler cover trim	Product reference SK70981	-	
Threshold	Exitex MDS80 low mobility threshold	-	15
Frame fire stopping	Mineral fibre capped with intumescent acrylic mastic on both faces	Nominally 5-10mm wide x 20-30 deep	-

Intumescent and sealing materials

		Make/type	Size (mm)	Location	Key to figures
Leaf edge		None fitted	-	-	-
Frame reveal	Head and jambs	Norsound NOR 930 graphite type intumescent	25 x 2.5	Fitted in the profile of the frame reveal	16
	Behind frame, including side screen	Norsound NOR 940 graphite type intumescent	30 x 2.5	Fitted in the profile at the back of the frame	17
Glazing aperture – door leaf and upper side screen aperture		Norsound NOR 930 graphite type intumescent	25 x 2.5	Fitted lining the glazing apertures	18
Side screen lower panel aperture		Norsound NOR 930 graphite type intumescent	25 x 2.5	Fitted lining the panel aperture	19

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Intumescent interruptions and additional protection

	Make/type	Size (mm)	Location
Around hinges	Continuous	-	Hinge blades planted on seal in frame reveal
Under hinge blade	Norsound NOR 910 graphite type intumescent	1 thick	Fitted under the hinge blade on frame and leaf
Encasing latch body	Norsound graphite AV2 lock kit	1 thick	Fitted around the body of the lock/latch
Under latch forend	None fitted	-	-
Around latch keep	Continuous	-	Latch keep planted on seal in frame reveal
Under latch keep	None fitted	-	-

Hardware

	Make/type	Size (mm)	Location	Key to figures
Hinges	2 No. Eurospec bearing butt type hinges Product reference 5315R10	101 x 30 x 3 (blade size)	Fitted 160mm and 960mm from the head of the leaf fixed with 4No. 30mm long screws per blade	20
Closer	None fitted	-	-	-
Lock/latch – engaged at all points	Winkhaus AV2 multi point lock/latch fitted with 70mm long Yale Eurocylinder	16 x 3 x full leaf height (forend size)	Fitted 310mm from the threshold of the leaf, fixed with 55mm long screws	21
		340 x 20 x 3 (bottom keep size)	Fitted appropriate to the latch fixed with 4No. 50mm long screws	22
		175 x 24 x 3 (top keep size)	Fitted 1025mm from the threshold of the leaf fixed with 4No. 50mm long screws	23
Furniture	HOPPE Atlanta lever type handle	240 x 32 (footprint size)	Fitted appropriate to the lock/latch	24

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

Glazing

		Make/type	Size (mm)	Location	Key to figures
Glass type	Double glazed units - 24mm thick overall for sidescreen / fanlight	Pilkington Pyroshield 2 textured	7 thick	Fitted on the unexposed face	25
	- 26mm thick overall for leaf	Steel spacer	10 thick – sidescreen 12 thick – door leaf	Fitted between the glass	26
		Laminated clear	6.8 thick	Fitted on the exposed face	27
Sight size	Leaf – both apertures	-	170 wide x 880 high	-	-
	Side screen – upper aperture	-	80 wide x 560 high	-	-
Glass size	Leaf – both apertures	-	202 wide x 912 high	-	-
	Side screen – upper aperture	-	112 wide x 592 high	-	-
Expansion allowance		-	2 -3 all edges	-	-
Beading – side screen (glazed and solid panel)		LB Plastics Ltd extruded PVC clip in type bead product reference SK7792	21 high x 24 deep	Fitted around the perimeter of the glass and solid panel on the exposed face	28
Beading – leaf		ODL TriSys cassette system	25 high x 44 wide (overall outer bead footprint size)	Fitted and fixed as per door blank manufacturer's instructions	29
Glazing clips - Door leaf		Capstone Doors Ltd Capstone glazing clip	Product reference FDGCLIP 2 part steel retaining clips. Each fixed with 2No. 4.3 x 40mm long steel screws	See Figure 1 for fixing positions	30
Glazing retention – side screen		LB Plastics Ltd steel glazing clip secured with steel screws	15 x 15 x 50 x 1 thick - Clip M4 x 25mm long - Screws	See Figure 1 for fixing positions	31

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

Pre-test measurements

Door perimeter gaps

The manufacturer did not declare a working range so the door was installed to open and close freely, maintaining gaps, where possible, to a range of 2-4mm along all edges except the threshold, and 3-8mm along the threshold. The gaps between the edge of the door leaf and frame / threshold were measured prior to test. A total of 12 readings were taken. The measurements (in mm) are given in Figure 3 of Appendix 1.

Closer forces

No closer was fitted.

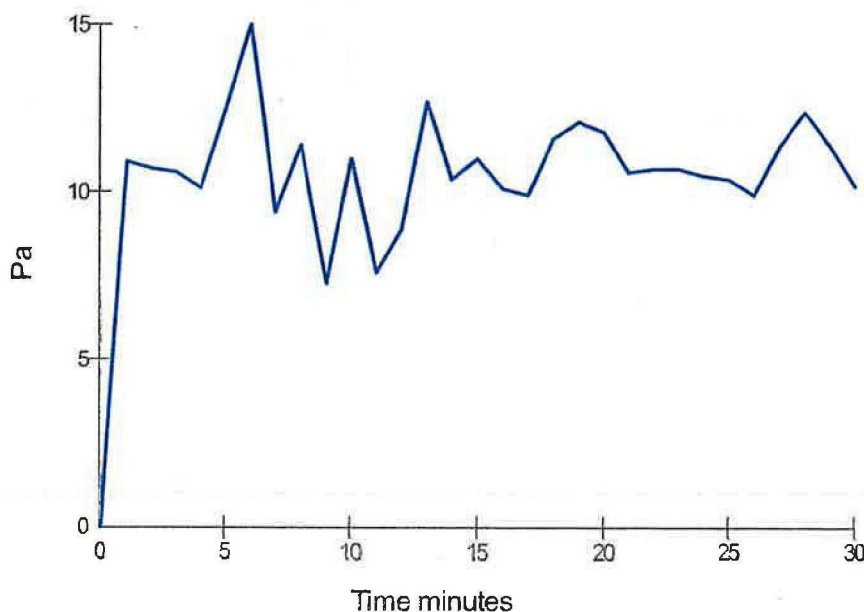
Test conditions

Ambient temperature

The ambient temperature of the test area at commencement of test was 20°C. The temperatures recorded are tabulated in Appendix 2.

Pressure readings

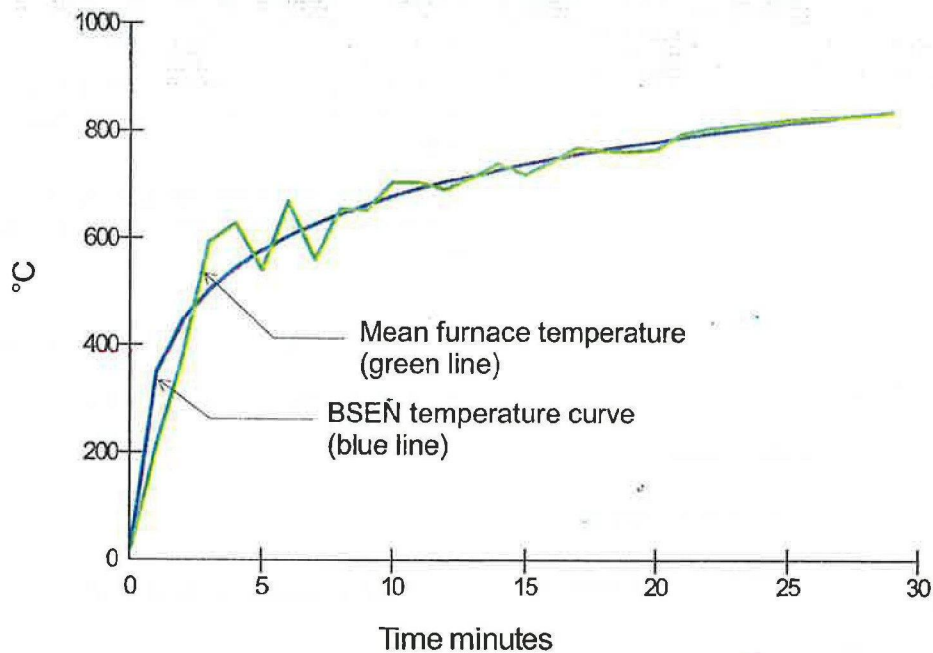
After the first 5 minutes of the test, the furnace pressure was maintained at 10 ± 5 Pa and after 10 minutes was maintained at 10 ± 3 Pa with respect to atmosphere, equating to 13.6Pa at the head of the leaf. Therefore replicating the height of a 2.1m high door leaf. The pressure readings recorded are shown in Appendix 2 and are shown graphically below:



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Furnace temperature

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



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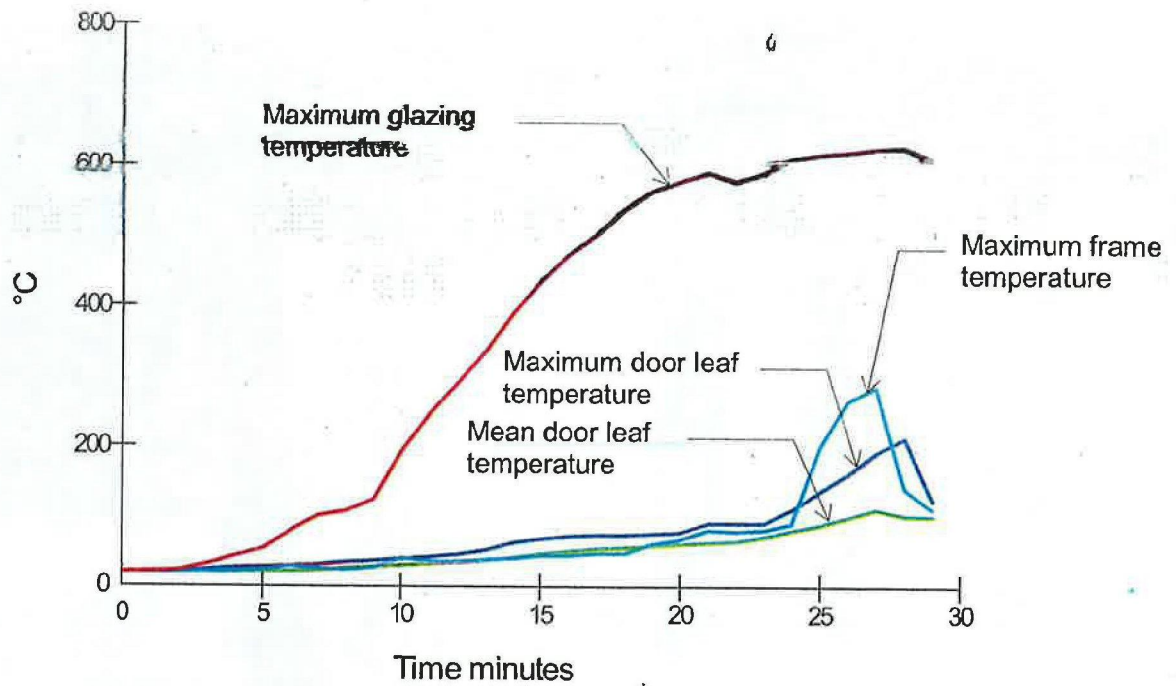
Unexposed face temperatures

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

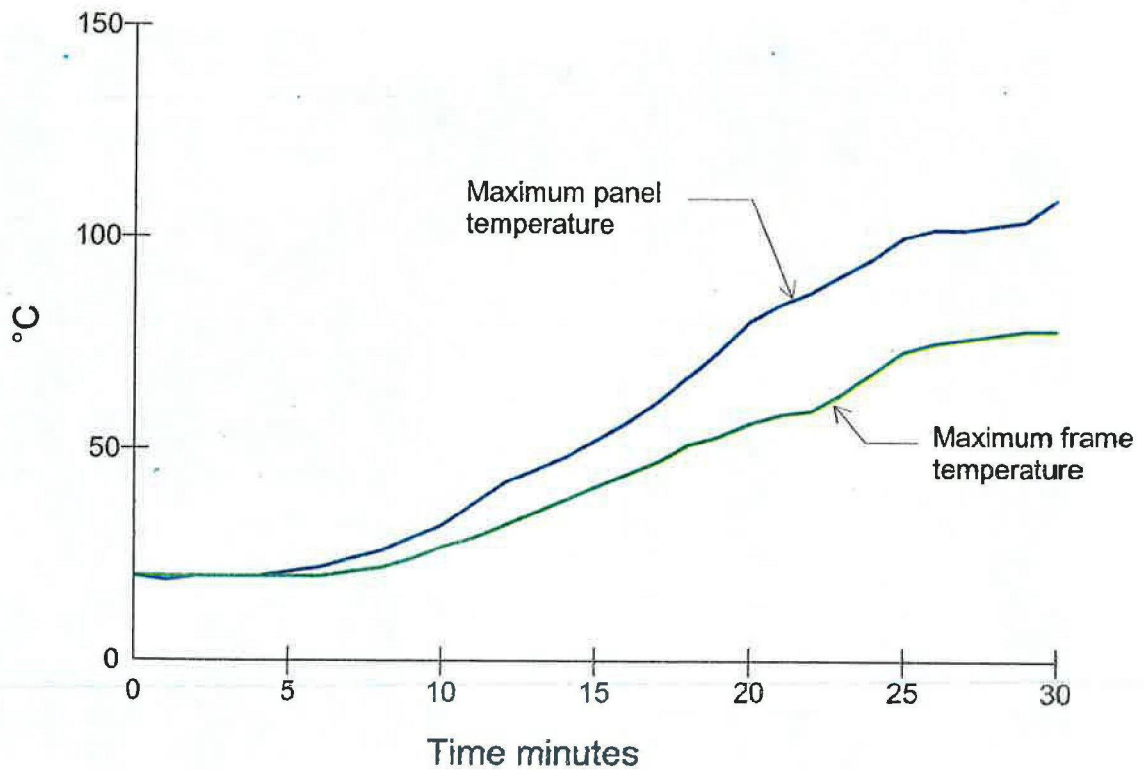
Doorset		
2 discrete areas		
Leaf	Discrete area 1 (GRP)	3 measuring mean temperature rise.
		5 measuring maximum temperature rise, standard set 100mm in from the door leaf edges.
		5 measuring maximum temperature rise, supplementary set 25mm in from the door leaf edges.
Frame	Discrete area 2 (glass)	4 measuring maximum temperature rise
		5 measuring maximum temperature rise.
Side screen		
2 discrete areas		
Upper panel	Discrete area 1 (glass)	2 measuring maximum temperature rise
Lower panel	Discrete area 1 (Composite panel)	2 measuring maximum temperature rise
Frame		4 measuring maximum temperature rise.

The locations of the thermocouples are shown in Figure 3 of Appendix 1. The temperatures recorded are tabulated in Appendix 2 and are shown graphically below:

Doorset



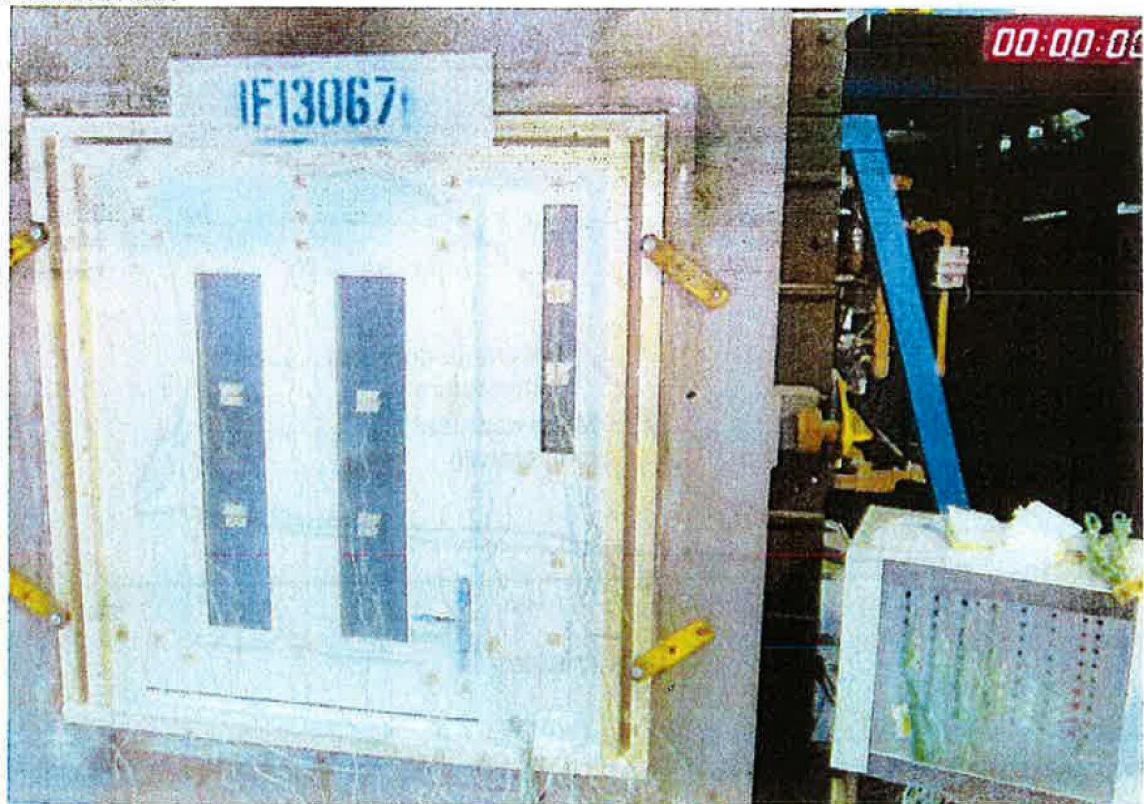
Side screen



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Photographs

At start of test



After 11 minutes



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After 30 minutes



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Observations

All comments refer to the unexposed face unless stated otherwise.

Time (minutes)	
00.00	Test started.
00.54	There is smoke issuing from the closing edge of the leaf approximately half way down.
01.15	The glazing is beginning to crack.
01.36	Melted glazing bead is visible through the glazing on the exposed face.
02.14	There is smoke issuing from the glazing bead and the lock position.
03.36	There is an increase in the level of smoke issuing from the glazing bead and discolouration at the top right corners.
05.10	There is an increase in discolouration at the glazing bead at the top right corner.
05.29	The exposed glazing layers are falling away.
09.08	There is an increase in the level of smoke issuing from the top glazing beads.
11.05	There is an increase in discolouration at the glazing bead perimeter and discolouration at the handle position.
12.14	There is smoke issuing from the bottom side panel.
13.16	There is discolouration at the top hanging and top closing corners of the leaf.
13.41	The glazing bead is beginning to fall away at the top.
15.50	There is an increase in discolouration at the glazing bead perimeter and the handle position.
17.43	There is an increase in the discolouration and level of smoke issuing from the closing edge approximately 200mm from the top closing corner of the leaf.
17.59	There is an increase in discolouration at the top half of the hanging edge of the leaf.
19.58	There is smoke issuing at the joint between the door and side panel at the top.
22.00	The glazing is pulling away.
22.51	The second glazing bead has fallen away.
25.40	A cotton pad integrity test was performed above the gap at the top of the glazing bead which resulted in ignition of the cotton pad.

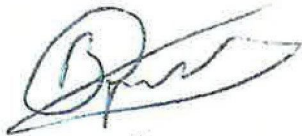
The legal validity of this report can only be claimed on presentation of the complete report.

- 27.45 A cotton pad integrity test was performed at the joint between the door and side panel approximately 200mm down, no failure.
- 28.55 A cotton pad integrity test was performed at the joint between the door and side panel approximately 200mm down, no failure.
- 30.20 There is flaming for in excess of 10 seconds from the glazing.
- 30.40 A cotton pad integrity test was performed at the joint between the door and side panel approximately 200mm down, no failure.
- 31.11 Test terminated.

Primary Observations

Time (minutes)	Comments
25.40	A cotton pad integrity test was performed above the gap at the top of the glazing bead which resulted in ignition of the cotton pad.
30.20	There is flaming for in excess of 10 seconds from the glazing.
31.11	Test terminated.

This test report relates to an investigation which utilised the test methodology given in BSEN 1634-1: 2008; the full requirements of the Standards were not, however, complied with. The information is provided for the test sponsor's information only and should not be used to demonstrate performance against the Standard nor compliance with a regulatory requirement. The test was not conducted under the requirements of UKAS accreditation.



Robert Axe
Lead Technical Officer

20/8/13

Revision A – August 2013: Various product reference changes in the description of construction section



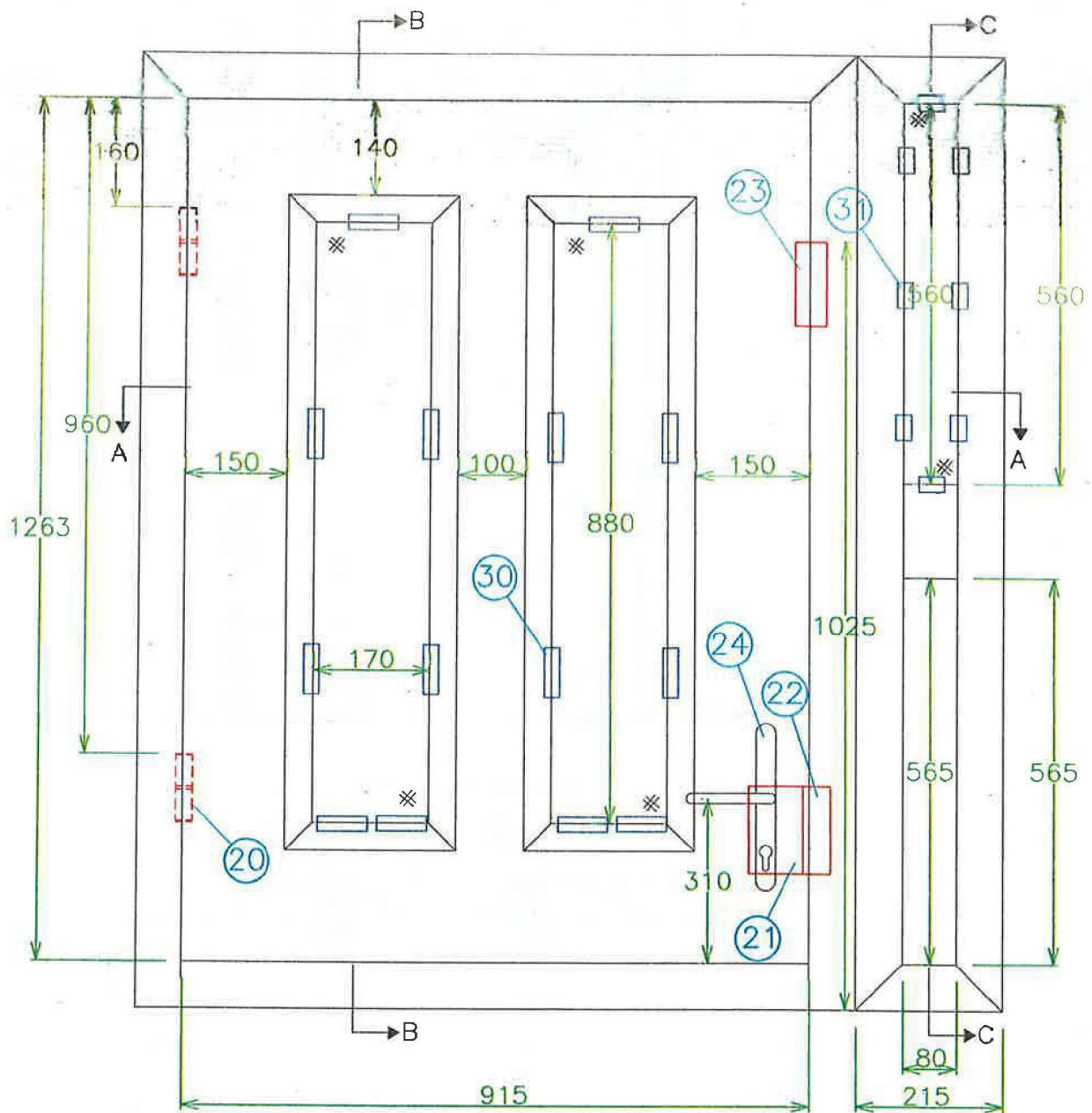
Mark Cummings
Deputy Technical Manager

20/8/13

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Appendix 1 – figures 1 to 3

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BM TRADA

Chiltern House, Stocking Lane, Hughenden Valley
High Wycombe, Buckinghamshire, HP14 4ND, UK.

Tel: [REDACTED]

Fax: [REDACTED]

Title

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

Date Drawn

30/07/13

Drawn By

ARD

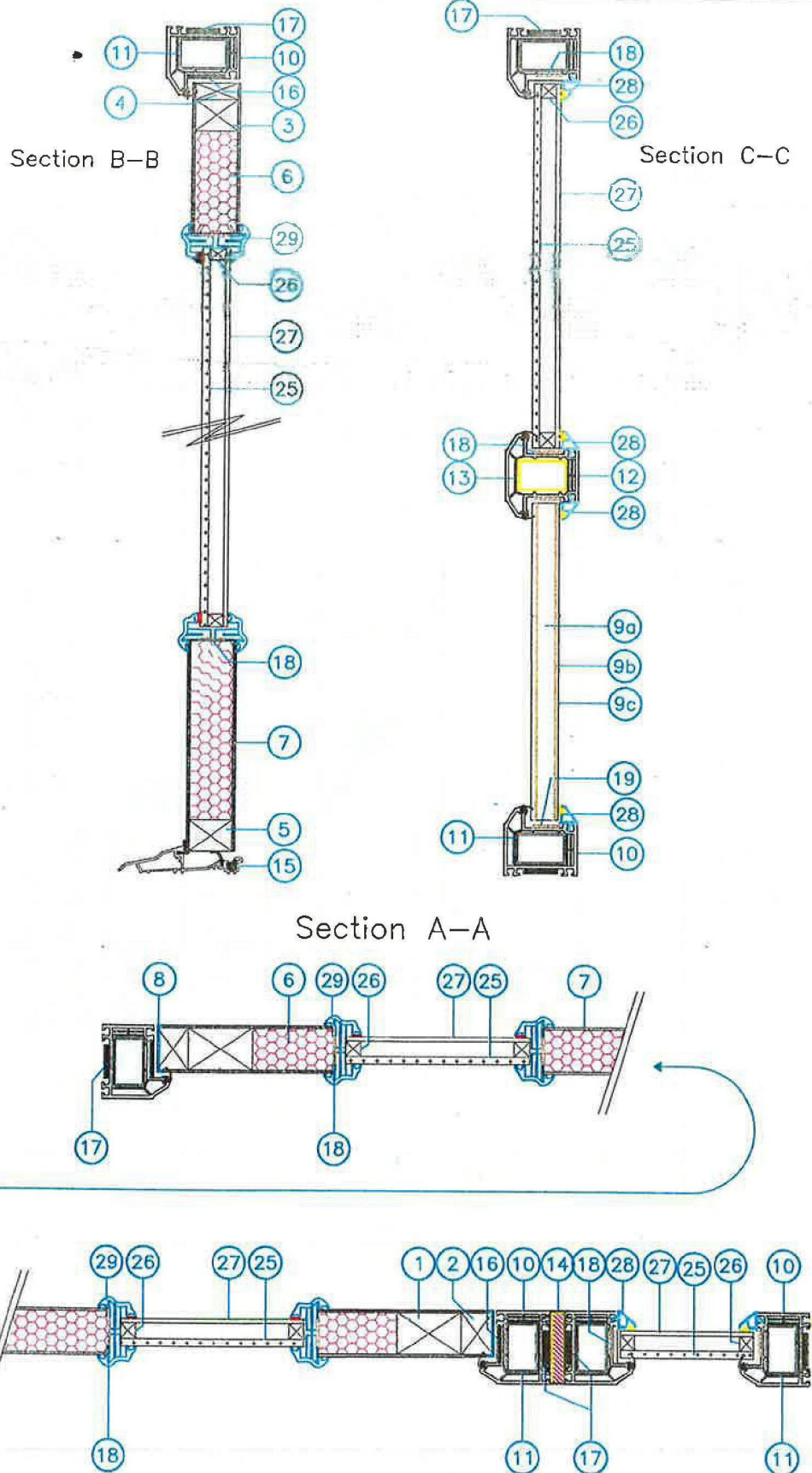
Scale

NTS

Project No.

Chilt/IF13067 Rev A

Appendix 1



BM TRADA

Chiltern House, Stocking Lane, Hughenden Valley
High Wycombe, Buckinghamshire, HP14 4ND, UK.

Tel: [REDACTED] Fax: [REDACTED]

Title

Cross sections
(All dimensions in mm)

Date Drawn

30/07/13

Drawn By

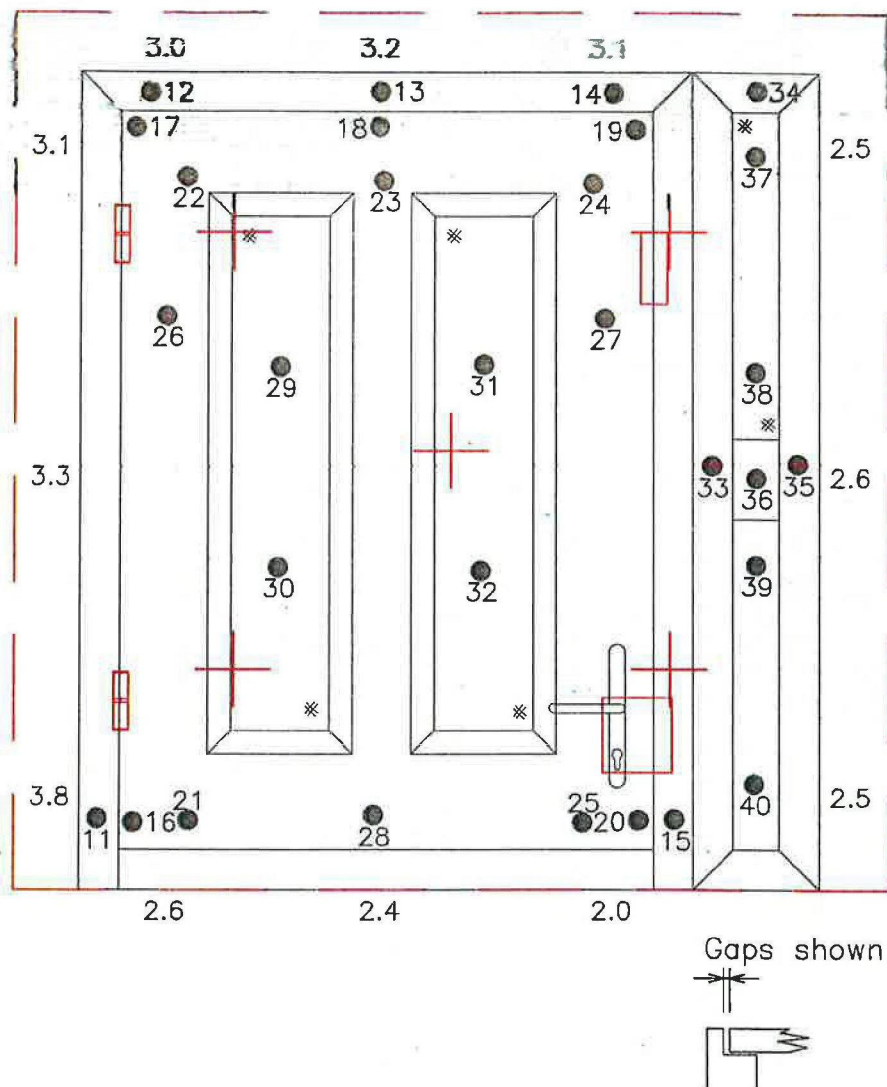
ARD

Scale

NTS

Project No.

Chilt/IF13067 Rev A Appendix 1



BMTRADA

Chiltern House, Stocking Lane, Hughenden Valley
High Wycombe, Buckinghamshire, HP14 4ND, UK.

Tel: [REDACTED]

Fax: [REDACTED]

Title Unexposed face thermocouple
positions and door leaf/frame gaps
(All dimensions in mm)

Date Drawn

30/07/13

Drawn By

ARD

Scale

NTS

Project No.

Chilt/IF13067 Rev A

Appendix 1

Appendix 2 - raw test data (3 pages)

(see figure 3 of appendix 1 for channel locations)

Furnace thermocouples

Time	Chan 0	Chan 2	Chan 3	Chan 4	Chan 5	Chan 6	Chan 11	Chan 12	Chan 13	Chan 14	Chan 15	Chan 16	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22
min	Pa	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
0	0	20	20	20	20	20	19	20	19	20	20	20	20	20	20	20	20	20
1	10.9	254	289	132	161	20	19	20	19	20	20	20	20	20	20	20	20	20
2	10.7	445	470	271	314	20	19	20	19	20	20	20	20	20	20	20	20	21
3	10.6	666	679	480	545	20	19	20	19	20	20	20	20	20	20	20	20	24
4	10.1	670	710	554	577	20	20	20	20	21	20	20	20	20	21	20	20	26
5	12.5	580	601	489	492	20	20	20	20	24	21	20	21	21	22	21	21	27
6	15	714	748	595	617	20	20	21	20	29	21	21	23	21	24	23	22	29
7	9.4	595	609	513	521	20	21	22	22	25	22	21	28	23	25	29	24	31
8	11.4	692	720	600	608	20	22	23	23	24	23	21	30	25	25	33	27	34
9	7.3	707	708	576	627	20	23	25	26	25	25	22	32	27	26	35	30	36
10	11	736	761	657	662	20	25	27	28	41	27	23	33	27	30	35	34	39
11	7.6	746	753	635	682	20	27	29	29	35	29	24	35	28	36	34	38	42
12	8.9	721	727	649	668	20	29	31	31	34	32	25	36	28	40	33	43	45
13	12.7	754	740	658	705	20	32	33	33	38	33	26	38	29	42	32	51	47
14	10.4	784	760	688	730	20	34	35	35	40	35	27	40	29	46	33	62	51
15	11	757	742	677	707	20	37	37	37	44	37	29	42	31	50	34	68	54
16	10.1	780	755	703	736	20	39	39	39	44	39	30	44	32	51	35	71	57
17	9.9	804	778	730	765	20	41	41	43	47	41	32	47	34	53	36	73	60
18	11.6	793	769	738	758	20	43	44	47	46	44	33	50	38	54	39	73	63
19	12.1	790	765	740	756	20	45	46	49	60	47	35	52	41	57	40	75	66

BMTRADA

Time	Chan 0	Chan 2	Chan 3	Chan 4	Chan 5	Chan 6	Chan 11	Chan 12	Chan 13	Chan 14	Chan 15	Chan 16	Chan 17	Chan 18	Chan 19	Chan 20	Chan 21	Chan 22
m/n	Pa	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
20	11.8	792	771	744	760	20	47	49	55	67	51	37	55	45	60	41	76	69
21	10.6	816	816	765	787	20	49	53	61	80	55	39	59	53	64	43	79	72
22	10.7	825	827	776	794	20	52	58	67	78	59	41	63	59	69	46	83	75
23	10.7	830	831	783	800	20	56	63	76	80	65	44	67	64	75	49	88	84
24	10.5	833	837	789	804	20	58	64	89	84	70	46	70	78	81	52	90	88
25	10.4	838	843	794	810	21	61	69	199	113	76	51	77	100	90	56	93	93
26	9.9	842	846	799	813	21	63	73	264	106	81	55	84	66	192	58	94	95
27	11.4	842	850	803	814	21	65	76	284	102	86	59	93	47	209	61	94	97
28	12.4	847	856	807	817	21	67	80	139	105	93	63	100	38	123	64	95	98
29	11.4	850	857	809	821	21	68	87	50	110	111	68	109	32	154	66	99	99
30	10.2	853	861	812	825	21	70	96	43	214	122	74	124	30	140	69	102	101
31	9.5	854	860	815	828	21	73	108	42	146	131	81	143	28	144	73	103	103

Time	Chan 23	Chan 24	Chan 25	Chan 26	Chan 27	Chan 28	Chan 29	Chan 30	Chan 31	Chan 32	Chan 33	Chan 34	Chan 35	Chan 36	Chan 37	Chan 38	Chan 39	Chan 40
m/n	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
0	20	20	20	20	20	20	20	20	20	20	20	20	20	20	12	20	20	20
1	20	20	20	20	20	20	21	20	20	21	20	19	19	20	12	20	20	19
2	20	20	20	20	20	20	23	22	23	22	20	20	20	20	10	20	20	20
3	20	21	20	20	20	20	32	28	32	30	20	20	20	20	11	20	20	19
4	20	21	20	20	20	20	43	37	45	40	20	20	20	20	12	21	20	20
5	21	21	21	21	21	21	54	45	56	49	20	21	20	20	34	21	20	20
6	23	21	22	21	22	22	79	57	76	64	20	22	20	21	214	21	20	20
7	30	21	24	22	24	24	101	70	93	79	21	24	21	22	-75	21	21	21
8	33	21	26	24	26	27	107	85	104	97	22	26	21	23	269	21	22	22
9	36	21	29	26	28	29	123	101	115	107	23	29	22	26	159	21	24	24
10	38	22	32	28	31	33	193	108	165	129	25	32	24	29	-207	21	27	27

BMTRADA

Time	Chan 23	Chan 24	Chan 25	Chan 26	Chan 27	Chan 28	Chan 29	Chan 30	Chan 31	Chan 32	Chan 33	Chan 34	Chan 35	Chan 36	Chan 37	Chan 38	Chan 39	Chan 40
min	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C	°C
11	39	22	35	30	33	35	246	134	226	181	29	37	26	34	-1206	22	29	29
12	40	22	38	32	35	38	291	193	280	230	32	42	28	39	-1206	22	32	32
13	42	22	40	34	36	43	337	239	328	269	34	45	31	43	-1206	22	35	35
14	44	22	43	36	38	51	392	281	373	310	36	48	33	48	-1076	22	38	38
15	47	23	46	38	40	61	437	318	415	351	38	52	36	54	1258	23	41	41
16	50	23	47	41	42	69	474	350	481	413	41	55	38	57	1258	23	44	44
17	54	23	49	43	44	73	502	381	540	478	45	61	41	62	1258	23	47	47
18	59	24	51	45	46	76	539	436	582	527	49	67	44	67	1258	24	51	50
19	64	24	53	48	48	78	564	495	595	556	52	73	48	70	1257	24	53	52
20	77	24	56	51	51	79	579	532	598	570	55	80	52	74	1258	24	56	55
21	90	25	59	54	54	78	590	560	605	520	59	84	56	78	1258	25	58	57
22	90	25	62	57	58	77	434	578	207	518	64	87	61	81	1258	25	59	58
23	90	28	67	61	61	90	362	589	237	605	68	91	65	84	1258	27	63	60
24	109	32	72	65	65	108	610	589	289	279	72	95	70	87	1258	29	68	63
25	136	34	77	70	70	122	616	593	115	-5	78	100	76	91	1259	31	73	69
26	160	31	80	74	73	147	620	598	42	-17	83	102	82	94	1260	31	75	72
27	191	32	83	77	76	177	624	602	35	7	87	102	91	97	1260	32	76	74
28	211	34	85	81	80	142	626	606	33	17	92	103	96	103	1260	33	77	75
29	123	33	87	83	82	136	224	610	28	108	96	104	99	103	1259	33	78	76
30	80	35	88	86	87	114	214	613	28	84	99	109	100	105	1259	33	78	77
31	59	38	89	89	91	70	199	615	28	78	101	122	100	108	1259	33	79	77



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Report: ChII/RF08031

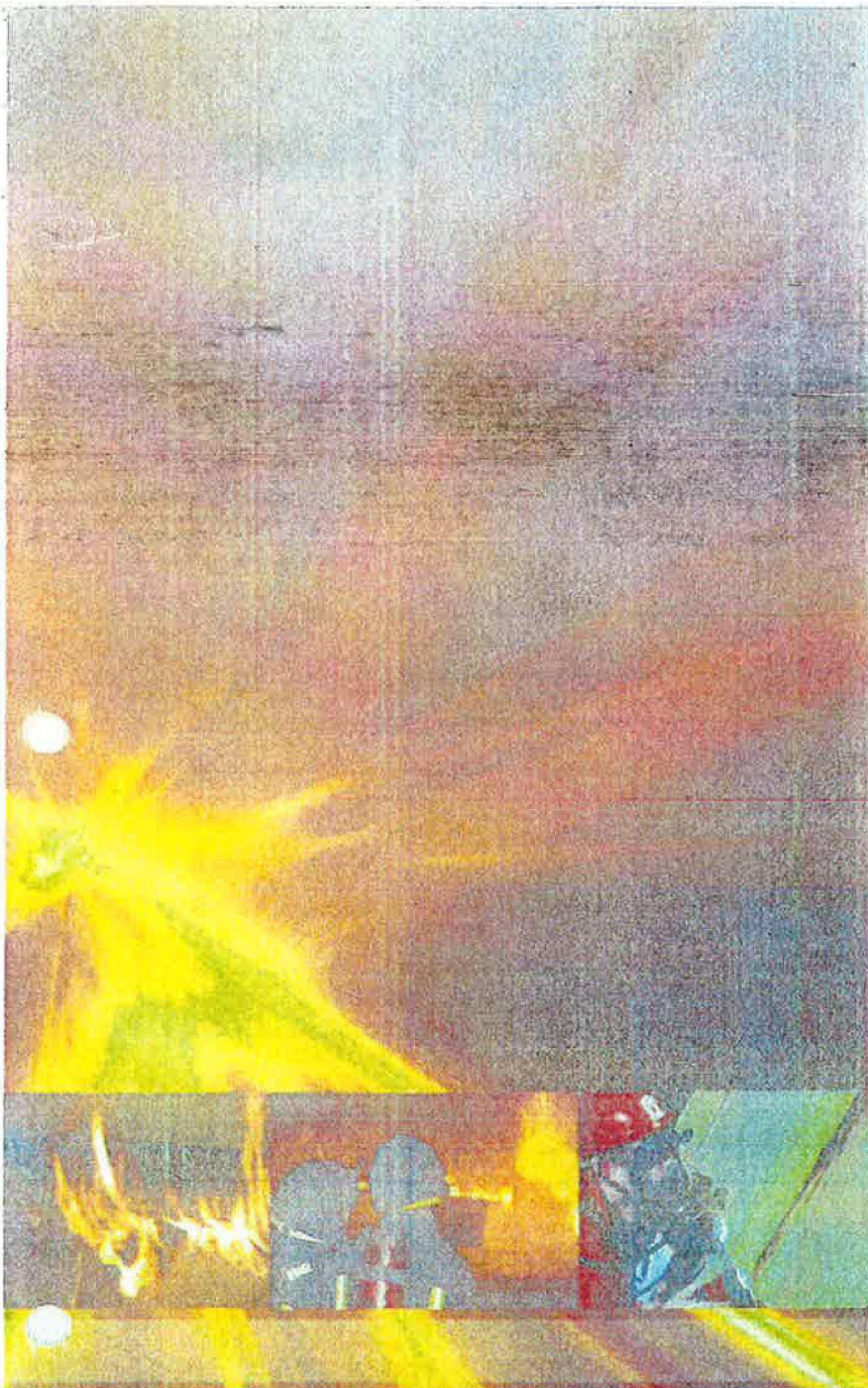
A fire resistance test performed on
two single leaf single acting doorsets,
one with glazing

Test conducted in accordance with BS
476: Part 22: 1987

Test date: 11 March 2008

16N50155

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committed to excellence

Primary sponsor:

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1 Introduction

The doorsets were manufactured and supplied for test by the client and delivered on 7 March 2008. Chiltern International Fire Limited (CIFL) constructed a timber stud/plasterboard clad partition and installed the doorsets into the partition.

2 Specification

Details of the specimen are shown in the Appendix.

2.1 Door leaves

The left leaf was designated doorset A, Product Ref. TR786/2, and measured 2005mm high x 905mm wide x 44mm thick. The right leaf was designated doorset B, Product Ref. TR786/1, and measured 2005mm high x 900mm wide x 44mm thick. Both leaves were hung to open 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 from doors each fitted with a 3 point locking system. Only the middle latch point was engaged for the test.

2.2 Door perimeter gaps

The gaps between the edge of the doors and frame were measured prior to test. A total of 24 readings were taken. The measurements (in mm) are given in Figure 4 of the Appendix.

2.3 Closer forces

Measured in accordance with FTSG Resolution No 63.

	Opening force (Nm)	Closing force (Nm)
Left leaf	38	23
Right leaf	57	27

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3 Test conditions

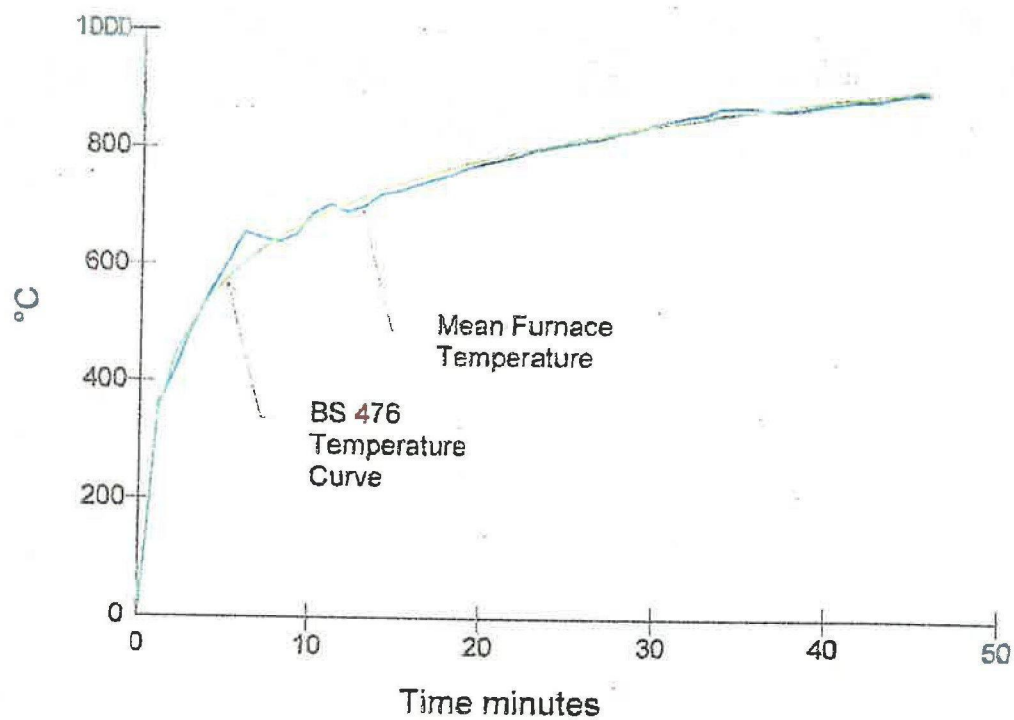
- 3.1 Where areas of the test specification are ambiguous or open to interpretation the Fire Test Study Group Resolutions No's 51, 63, 70, 71, 72 and 78 have been followed (further specific details are available on request). These Resolutions provide basis of common agreements between the fire test laboratories which are members of this Group.
- 3.2 The ambient temperature of the test area at commencement of test was 17°C.
- 3.3 After the first 5 minutes of the test, the furnace pressure was maintained at 0 ± 2 Pa with respect to atmosphere, at a point 1m from the notional floor level.
- 3.4 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 six thermocouples suitably distributed within the furnace. The temperatures recorded are shown graphically in Section 4.1.
- 3.5 The temperature of the unexposed face was monitored by means of five thermocouples fixed to the surface of each door leaf, and three thermocouples attached to each frame, one at midheight on each jamb and one centrally located above the leaf on the frame head. Two additional thermocouples were fixed to the glass of doorset A, and an additional thermocouple was fixed to the letterplate of doorset B. The thermocouple positions are shown in Figure 4 of the appendix. The average temperature of each door leaf and maximum temperature of each doorset are shown graphically in Section 4.2.

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4 Test results

The following data and observations were recorded during the test.

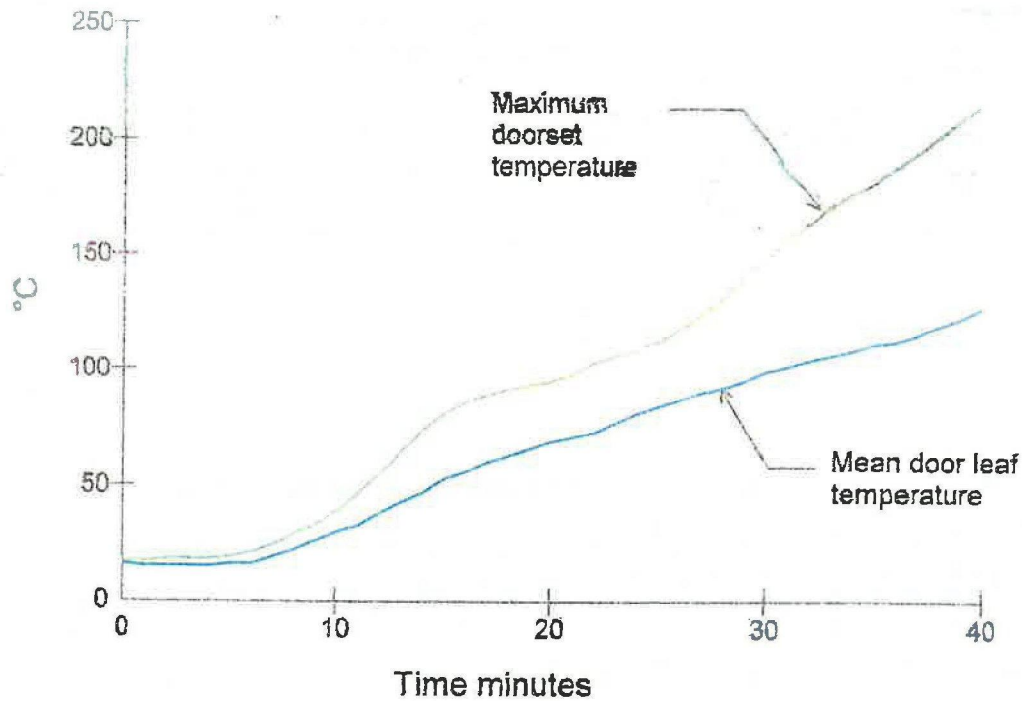
4.1 Furnace temperature curve



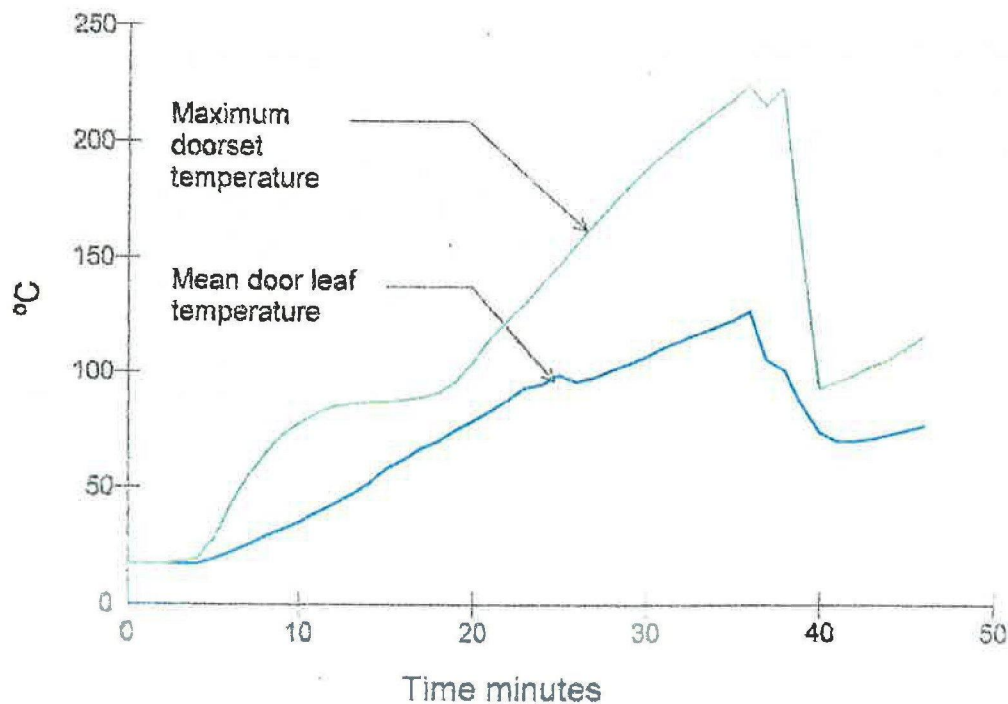
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4.2 Unexposed face temperature curves

Doorset A



Doorset B



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4.5 Door distortion data

The following tables show the distortion of the doors in mm with an accuracy of ± 1 mm. A positive measurement indicates distortion towards the fire.

A negative measurement indicates distortion away from the fire.

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

A	B	C
D	E	F
G	H	I
J	K	L

Left hand leaf (hung on the left and opening towards the fire)

Time	A	B	C	D	E	F	G	H	I	J	K	L
10	0	-2	2	-1.5	-	2	2	0.5	2	-1	-0.5	-1.5
20	3	2	13.5	-1	-	3	3	2	4	0	-1	-3
30	8.5	4	20.5	3	-	6.5	6.5	2.5	5	-1	-0.5	-1

Where a dash (-) applies, a distortion reading could not be taken

Right hand leaf (hung on the left and opening towards the fire)

Time	A	B	C	D	E	F	G	H	I	J	K	L
10	2.5	2	5	0	5	0.5	3	2	3	1	-1.5	-3
20	12	9.5	13	5.5	15.5	5	6	4	6.5	1	-0.5	-2
30	23	14.5	22	11.5	28.5	11	11	6.5	7	-1.5	-2	-2

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4.4 Observations

All comments relate to the unexposed face unless otherwise specified.

Time (minutes)	Comments
00.00	Test started.
02.42	Doorset B, there is smoke issuing from the top hanging corner of the leaf.
03.35	Doorset A, there is smoke issuing from around the glazing bead and the top closing corner of the leaf.
04.43	Doorset B, there is smoke issuing from the top closing corner of the leaf.
06.00	Doorset A, the inner glazing has shattered and the outer glazing has cracked.
10.18	Doorset B, there is smoke issuing from the letterplate.
11.13	Doorset A, the glazing bead cassette is pushing out.
14.18	Doorset B, there is an increase in the level of smoke issuing from the top closing corner of the leaf.
20.40	Doorset B, there is an increase in the level of smoke issuing from the top hanging corner of the leaf.
22.07	Doorset B, there is intermittent flaming from the letter plate, no failure.
24.10	Doorset B, there is continuous flaming from the letter plate thereby constituting integrity failure .
30.11	Doorset B, there is smoke issuing from the second and third hinge positions.
32.18	Doorset B, there is smoke issuing from all down the hanging edge of the leaf.
36.29	Doorset A, there is discolouration and smoke issuing all the down the closing edge of the leaf.
41.16	Doorset B, there is intermittent flaming at the third hinge position.
41.46	Doorset B, there is continuous flaming from the top hanging corner and the third hinge position thereby constituting further integrity failure .
42.38	Doorset A, there is intermittent flaming at the third hinge position, no failure.
43.30	Doorset A, a cotton pad integrity test was performed at the third hinge position thereby constituting integrity failure .
45.50	Doorset A, there is continuous flaming at the top closing corner of the leaf thereby constituting further integrity failure .
46.00	Test terminated.

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4.3 Times to failure

When doorset A was tested in accordance with BS 476: Part 22: 1987, Method 7, Determination of partially insulated doorsets and shutter assemblies, and doorset B was tested in accordance with BS 476: Part 22: Method 6, Determination of fire resistance of fully insulated doorsets and shutter assemblies, the requirements of the standard were satisfied for the following periods:

	Doorset A	Doorset B
Integrity	43 (forty three) minutes	24 (twenty four) minutes
Insulation	38 (thirty eight) minutes*	24 (twenty four) minutes

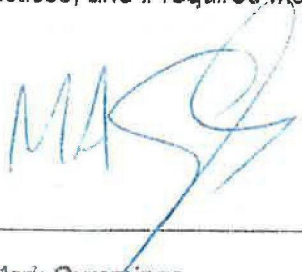
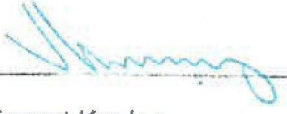
* In accordance with the note to clause 7.6.1.1 the glazing has not been evaluated for insulation.

5 Limitations

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

The results of this test were obtained using the door to frame gaps recorded in Figure 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. CIFI will be able to offer, on behalf of the legal owner, a review of the procedures adopted for a particular test to ensure that they are consistent with current practices, and if required may endorse the test report.

Signature:		
Name:	Mark Cummings	Vincent Kerrigan
Title:	Section Leader – Fire Resistance	Deputy Technical Manager
Date of issue:	18/6/08	18-06-2008

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Photographs

Start of test



After 10 minutes



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After 20 minutes



After 40 minutes



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At end of test



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Test for: Entrance ads and Warmseal Windows Ltd
Ref: ChiltRF08031

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

Leaf – both doorsets

		Species/type	Dimensions (mm)	Density (kg/m ³)	Moisture (% w/w)	Key to figures
Stiles	Outer	Douglas Fir	38 wide x 39 thick hinge side 44 wide x 39 thick lock side	530*	10-12	1
	Inner	LVL	25 wide x 39 thick	500**	-	1A
Rails	Top-outer	Douglas Fir	47 wide x 39 thick	530*	11	2
	Top-inner	LVL	12 wide x 39 thick	500**	-	2A
	Bottom-outer	Douglas Fir	47 wide x 39 thick	530*	-	3
	Bottom-inner	Douglas Fir	47 wide x 39 thick	530*	-	4
Core		Vermiculite	40 thick	456*	-	5
Facings		GRP	2 thick	-	-	6
Adhesive	Facings	Urethane Adhesive Resin*	-	-	-	-
Lippings – vertical edges only	Hanging edge	Aluminium Fast Fit	2 thick	-	-	7
	Closing edge	Aluminium Fast Fit Eurogroove to accept lock	2 thick	-	-	8

* Stated by client, not checked by laboratory

** Nominal density

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