INTERNATIONAL FIRE CONSULTANTS LIMITED

PRIVATE & CONFIDENTIAL

IFC FIELD OF APPLICATION REPORT

Field of Application for 40mm Thick Flaxboard Core FD30 Door Leaves Hung Flush, or Over-Rebated, in Steel Frames; With or Without, Sidelights and/or Fanlights

Fire Resistance Standard: BS476: Part 22: 1987

IFC Report IFCA/05163 Revision E

Prepared on behalf of: Theuma NV
Zandstraat 10
3460 Bekkevoort
Belgium

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International Fire Consultants Ltd
Head & Registered Office: 20 Park Street, Princes Risborough, Buckinghamshire, England HP27 9AH
Tel: +44(0)1844 275500, Fax: +44(0)1844 274002, E-mail: info@ifcgroup.com
Registered No: 2194010 England
An International Fire Consultants Group Company

ISSUE AND AMENDMENT RECORD

Rev	Date	Author	Review	Section	Amendments
-	June 2005	DC	MB	-	On behalf of Fibelco NV
A	December 2005	DC	DJI	Various	On behalf of Fibelco NV
B	June 2007	DC	DJI	Various	On behalf of Fibelco NV
C	October 2007	DC	DJI	Various	On behalf of Fibelco NV
D	October 2012	MB	DC	Various	Change of client name. Review and revalidation with minor editorial revisions
E	August 2018	DC	CH	Various	Review and revalidation with updated report format and some technical changes

CONTENTS

1. INTRODUCTION

This report has been prepared by International Fire Consultants Ltd (IFC), on the instruction of Theuma NV, to define the Field of Application for 40mm thick flaxboard core door Leaves hung flush, or over-rebated, in steel frames; with or without, sidelights and/or fanlights, that are required to provide 30 minutes fire resistance performance, when adjudged against BS476: Part 22: 1987.

The methodologies used in preparing this document are based upon the guidance in BS ISO/TR 12470-2: 2017 *'Fire resistance tests - Guidance on the application and extension of results from tests conducted on fire containment assemblies and products. Part 2: Non-load bearing elements'*.

It is proposed that variations to the tested specifications, as described in the following sections, may be accommodated into door assemblies, without reducing their potential to achieve a 30 minute integrity rating, if tested in accordance with the method and criteria of BS476: Part 22: 1987. The omission of information on any components or manufacturing methods does not imply a lack of approval of those details, but these would need to be the subject of a separate analysis. Only variations specifically mentioned are supported by this assessment document, all other aspects must otherwise be as proven in tests summarised herein.

2. TEST EVIDENCE

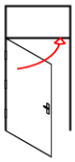
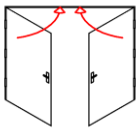
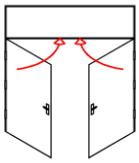
The test evidence used to support this Field of Application Report is summarised in Appendix D of this report.

3. SCOPE OF APPROVAL

3.1 Door Assembly Configuration

The approved leaf sizes and configurations of door assemblies comprising door leaves are outlined below:

Configuration	Envelope of Approved Leaf Size
 • **Latched** • **Single Acting** • **Single Door** *Note 1* • **Without Overpanel**	**Figure 05163E/C01 in Appendix C**

Configuration	Envelope of Approved Leaf Size
 • **Latched** • **Single Acting** • **Single Door** *Note 1* • **With Overpanel** *Note 2*	**Figure 05163E/C01 in Appendix C**
 • **Latched** • **Single Acting** • **Double Doors** *Note 3* • **Without Overpanel**	**Figure 05163E/C02 in Appendix C**
 • **Latched** • **Single Acting** • **Double Doors** *Note 3* • **With Transommed Overpanel** *Note 4*	**Figure 05163E/C02 in Appendix C**

Note 1 *In single leaf door assemblies the face of the leaf may be hung "flush" with the face of the frame, or, "over-rebated", where the face of the leaf projects 13-15mm beyond the face of the frame.*

Note 2 *Overpanels may either be installed directly against the top edge of the door, see below, or be fitted above a transom member.*

Overpanels above single leaf doors may be installed directly against the top edge of the door, with either a square junction, or at rebated junctions, where the overpanel rebates shall be 13-15mm wide x 8-15mm deep.

Note 3 *In double leaf doorsets, the face of the leaves should be hung 'flush' with the face of the frame.*

Meeting stile details may be flush, (i.e. square-edged), or with unequal rebates, 25mm wide x 12mm deep in one leaf and 14mm wide x 12mm deep in the other.

Note 4 *Overpanels above double leaf doors must be separated with a transom.*

The doors may be fitted with, or without, sidelights and/or fanlights.

3.2 Maximum Assessable Door Leaf Sizes

The calculated envelopes of assessed leaf dimensions for each mode and configuration covered by this field of application report are given in Appendix C, based upon use of the intumescent specification shown in Appendix B.

Leaves in double door assemblies may each be of the same width, up to the maximum width indicated in Appendix C.

Alternatively, leaves may be of unequal width, and there is no limit on the ratio of leaf widths, (although the large leaf must still be within the limitations outlined in Appendix C for double leaf doorsets).

In any case, the width of the small leaf shall not be less than 300mm, since this will affect its vertical stability relative to that of the larger leaf.

Note 5 *Although this report approves a range of door sizes, door leaves must be made to the required size, by the manufacturer. Doors must not be reduced in size after manufacture, since this will reduce the width of framing members, and interfere with intumescent strips; adversely affecting the fire resistance of the assembly.*

3.3 Overpanels

The size of overpanels is limited to the full width of the leaves contained within the door assembly with a maximum height of 600mm and in all cases, the overpanel must be a single piece panel across the frame width.

Intumescent seals at the panel/frame interface shall be as defined in Appendix B, and installation shall be as defined in Section 3.9.2.

3.4 Door Leaf and Overpanel Specification

The door leaf and overpanel construction comprise constructional specifications given below.

The leaf construction, below, is based upon the details contained within the test evidence referenced in Appendix D, and defines variations and tolerances, where it is considered that these will not adversely affect the intended fire resistance performance. The construction details are limited to the information available from the test reports.

Component		Material	Minimum Density	Dimensions
Core		Flaxboard	404kg/m³	33mm thick
Rails/ Stiles	Top rail	Hardwood *Note 6*	640kg/m³	32 x 33mm. To include at least one section, but may also include additional similar sections, up to a maximum of 3no total. To include 25-27mm x 8-15mm rebates in over-rebated leaf heads and when used with rebated overpanels
	Bottom rail (door)	Softwood or hardwood *Note 6*	510kg/m³	32 x 33mm
	Bottom rail (overpanel)	Hardwood *Note 6*	640kg/m³	32 x 33mm, to include 25-27mm x 8-15mm rebates in over-rebated overpanel base and when used with rebated leaves
	Stiles	Hardwood *Note 6*	640kg/m³	32 x 33mm. To include 25-27mm x 8-15mm rebates in over-rebated leaf edges

Component		Material	Minimum Density	Dimensions
Facings		Hardboard	1000kg/m^3	3mm thick
Optional Lippings	Square edges	Hardwood	640kg/m^3 *Note 6*	8-12mm thick
	Rebated edges			8-18mm thick
Adhesives		Urea formaldehyde, Resorcinol or cross-linked PVA	–	–
Minimum leaf thickness		–	–	39mm
Optional additional decorative finishes		Timber veneer or decorative plastic based laminate (to leaf faces only)	–	Maximum 2mm thick
		Paint or varnish	–	Maximum 0.5mm thick

Note 6 *Timber to be straight grained, with minimum measured density at 12% moisture content and of appropriate quality in accordance with BS EN 942: 2007. Moisture content to be 11 ± 2% for UK market in heated buildings between 12-21°C (or to suit internal joinery moisture content specification of export countries).*

The machining of the core/lipping, and bonding process, must be such to ensure that no gaps occur between core and lipping.

The construction of a door leaf is illustrated in **Figure 05163E/01** in Appendix A. The construction of an overpanel, installed flush within the frame reveal, is illustrated in **Figure 05163E/02** in Appendix A. These Figures are primarily included to show the door and panel constructions and the choice of "over-rebated" or "flush" edges may be equally applied to doors and overpanels. (The choice of edge detail in each door will be the same for both door and overpanel). The machining and assembly of all components, and the bonding processes, shall be such to ensure that no gaps occur within the construction.

Note 7 *Although variations and options may be approved herein, both doors (and overpanel, where applicable) of each door assembly shall use the same specification.*

3.5 Frames

Perimeter frame members should be constructed from 1-1.5mm thick steel, shaped to give minimum overall dimension 90 x 50mm. The frame includes a 45 x 15mm rebate for door leaves hung flush within the frames, or the frame includes a 25-27mm x 15mm rebate for the door leaf with over-rebated details. An example of the frame for over-rebated doors is shown in **Figure 05163E/03** in Appendix A. Where smoke sealing is to be incorporated the face of the frame stop section can be modified to accommodate a recess to house the seal.

Door frames for double doors must be infilled with gypsum.

Mullion and transom framing members are composite items, and should be constructed from 1-1.5mm thick steel and profiled to give minimum overall dimensions 67 x 65mm. They should include 45 x 15mm rebates for door leaves hung flush with the frames (and to accept the glazing in sidelights/fanlights), or 25-27mm x 15mm rebates for over-rebated door leaves (and to accept the glazing in sidelights/fanlights). An example of the mullion or transom with 25-27mm rebates is shown in **Figure 05163E/04** in Appendix A.

Where sidelights are included in the door assembly, a steel cill should also be included in the glazed zone. This should be constructed from 1-1.5mm thick steel and profiled as for the mullion and transom framing, located in a steel channel which will blank off the rebate detail.

Perimeter framing should be mitre jointed at corners, except at the bottom corners where butt jointing is acceptable, with the tested fixing details installed to ensure the stability and integrity of the corner joints. The joints between perimeter and mullion/transoms, and between mullions and transoms, should utilise butt jointing, with the tested fixing details installed to ensure the stability and integrity of all joints.

3.6 Glazed Apertures

The proposed door leaves can include glazed apertures subject to the following limitations;

Maximum area of aperture(s) per leaf	-	0.3m²
Maximum vertical length of aperture	-	1440mm
Maximum horizontal width of aperture	-	250mm
Minimum distance from leaf edge (top)	-	160mm
Minimum distance from leaf edge (sides)	-	160mm
Minimum distance from bottom of leaf	-	160mm

The following glass types are approved, subject to the incorporation of expansion allowances recommended by the glass manufacturer;

6mm thick Pyroshield 2 (Pilkington)
7mm thick Pyran S (Schott)
7mm thick Pyrobelite (AGC Flat Glass)

The glazing materials to be utilised includes a 40 x 2mm Palusol or 40 x 1mm Interdens liner to the aperture and Lorient System 36/6 channel.

The approved bead size and profile, and relevant fixing details, are shown on the **Figure 05163E/05** in Appendix A.

Glazing beads must have a minimum measured density of 640kg/m^3 and of appropriate quality in accordance with BS EN 942: 2007. Moisture content to be 11 ± 2% for UK market in heated buildings between 12-21°C (or to suit internal joinery moisture content specification of export countries).at 12% moisture content.

3.7 Hardware

Some of the various items of hardware to be used with the proposed door assemblies 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 must have been subjected to fire resistance testing and/or assessed to support its use in doors of a similar construction, or third party certification shall be available to support its use on door assemblies of the proposed type.

The notes are given as general guidance. However, any hardware beyond the scope of this general guidance must have been subjected to fire resistance testing and/or assessed to support its use in doors of a similar construction, or third party certification shall be available to support its use on door assemblies 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 utilised in testing, the Scharnier 3½" (96-CVB-R0534 and 96-CVB-R0948) and Paumelle Plus lift off (99-CVB-R0486 and 1999-CVB-R1180) models, may be utilised in the assessed door assemblies. Fluence lift off models may also be utilised in the assessed door assemblies. A minimum of two hinges per leaf should be utilised. (See Section 3.9 for installation details.)

The hinges should be set 250 ±25mm from the head and the bottom of the leaf, with additional hinges positioned between these hinges, as required.

The perimeter framing is secured to the supporting construction with a proprietary two-part adjustable clamping system. These clamping systems must be employed at hinge positions, where the hinges are fixed into the perimeter framing. The hinge should be secured to the clamping system, within the frame, at these positions, as tested in 96-CVB-R0948.

In mullion sections, hinges are fixed with proprietary brackets, such that the hinge is secured into the section. There are two types of brackets, depending upon the hinge used; i.e. as tested in 96-CVB-R0534 with Paumelle Plus lift off hinges, (see **Figure 05163E/06** in Appendix A), which is also suitable for Fluence lift off hinges, or as tested in 99-CVB-R0486 and 1999-CVB-R1180 with Scharnier 3½" hinges.

Additional security of fixing can be given by the utilisation of hinge bolts, as tested, located 200mm from the head and base of the frame jamb. Details of the fixings required are given in **Figure 05163E/07** in Appendix A. Hinge bolts are not considered essential to the performance of door assemblies without overpanels or transomed overpanels, and so can be included as an option. Where rebated or square overpanels are included, hinge bolts must also be included.

3.7.2 Mortice latches/locks

The mortice latch/locks used in the tests were Nemef 649/5 KV, Lips Lock Art No 2040, but other mortice latches/locks may be used, subject to compliance with the specifications below.

Mortice latches or locks should be centred at 1050±100mm above the bottom of the door leaf and be positioned centrally with the rebate of over-rebated leaves, or centrally within the door thickness of leaves that fit flush into the frame.

Maximum dimensions:	Forend plate:	235mm long x 24mm wide
	Latch body:	165mm high x 100mm wide x 18mm thick
	Strikeplate:	235mm long x 24mm wide

Latches must have no essential part of their structure made from polymeric or other low melting point (<800°C) materials and should not contain any flammable materials. The mortice for the lock or latch must be lined on all fire faces, with low-pressure forming intumescent sheet (e.g. Interdens) at least 1mm thick.

Over-morticing is to be avoided and gaps around the case should not exceed 2mm at the side and 5mm at the top and bottom. Holes for spindles or cylinders should be kept as small as is compatible with the operation of the ironmongery.

Where glazing apertures are permitted/specified and are positioned such that locks/latches are included in the margin between aperture and 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 assessment that, except where tubular latches are employed, the margin between the back of the lock mortice and the aperture must be at least 135mm.

3.7.3 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 the BS5499 series of standards. 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 subject to third party certification on cellulosic door leaves in steel frames may be used. Any accessory that is located within the door reveal must have appropriate test or assessment evidence or third party certification. 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) Concealed jamb mounted closers (e.g. Perko/Perkomatic) may be used in single leaf door assemblies, subject to there being sufficient force to close the door against the action of the latch bolt, and smoke seals where fitted. The mortice in the door must be cut carefully to prevent voids within the construction. (Provision must be made to accept the anchor plate in the frame without adversely affecting the fire resistance).

It is essential that all closers are of the correct power rating for the width and weight of the doors (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.

3.7.4 Flush bolts

'Trumpf' flush bolts were used in test WARRES 11732, but other bolts may be used, subject to compliance with the specifications below.

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

- Flush bolts shall be edge-fixed. In door assemblies with rebated meeting stiles, bolts shall be installed so that they will be centrally aligned with the rebate in the leaf. Flush bolts in doors with square meeting stiles shall be installed so that they will be centrally aligned in the leaf thickness. Intumescent seals fitted into the meeting edges shall be fitted into the 'active' leaf edge so that they oppose the flush bolt.

- Maximum size of flush bolt is 150mm long x 17mm wide x 10mm deep.

- The recess for the flush bolts shall be lined with 1mm thick Interdens; as included in the test.

- 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.

3.7.5 Non-essential hardware items

Push plates, kick plates, etc: Plastic, pvc or metal plates may be surface-mounted to the doors, 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 doors, provided that the fixing points are no greater than 800mm apart. Pull handles that are fixed through the leaf should use clearance holes as close fitting as possible to the bolt

3.8 Sidelights and/or Fanlights

The door assemblies approved, herein, may include sidelights and/or fanlights. They can include a sidelight on one or both sides of the doors, (and overpanel, if included), and a fanlight over the doors, as required. The overall size of the assembly should not exceed 3 metres high x 2.4 metres wide. The arrangement and positioning of the mullion and transom members is limited by the maximum pane sizes outlined below.

Where the assembly includes mullions and/or transom members, it is assumed that each mullion will be the full height of the assembly, and that the transom(s) will be connected to one, or both sides of the mullion; as applicable.

The frame members separating the doors from the sidelights and/or fanlights will be formed utilising transom and mullion framing, as outlined in Section 3.5. The apertures formed by the perimeter, transom and mullion framing next to the doors will be glazed. Apertures above the doors may include glass or an overpanel.

Beading to retain the glass consists of the integral framing section on one side of the aperture and two options for the other bead.

The first option, shown as Option 1 in **Figure 05163E/04** in Appendix A, utilises a proprietary glazing clip system, as tested in 96-CVB-R0534, 99-CVB-R0486 and 1999-CVB-R1180. The glazing clips are formed such that they are secured into the framing, with PVC cover trim inserted over the glazing clips. All details, and dimensions of components shall be as tested.

The second option, shown as Option 2 in **Figure 05163E/04** in Appendix A utilises a snap on bead, either 14-17mm x 15mm, for over-rebated frame detail, or 34-35mm x 15mm, for flush frame detail; utilising Jansen steel glazing bead and Jansen glazing studs. All details and dimensions of components shall be as recommended by Jansen for use on fire resisting assemblies.

The following glass types are approved, subject to the incorporation of expansion allowances recommended by the glass manufacturer;

6mm thick Pyroshield 2 (Pilkington)
7mm thick Pyran S (Schott)
7mm Pyrobelite (AGC Flat Glass)

The maximum dimensions of glass panes, and therefore maximum aperture sizes which can be included within the overall construction, are as follows;

Maximum overall height:	2100mm	Associated maximum width:	1000mm
or			
Maximum overall width:	2000mm	Associated maximum height:	600mm

Note 8 *These proposed glass types only provide integrity under fire test conditions. It is the responsibility of others to liaise with the approving authorities, to establish that insulation is not required for sidelights/fanlights.*

3.9 Installation, Supporting Construction and Door Edge Gaps

3.9.1 Installation of door assemblies

The frames forming the perimeter of each door assembly must be fixed back to the supporting construction with the proprietary two-part adjustable clamping system fixed within the frame section; as utilised in the tests outlined in Appendix D. The clamping system should be employed at maximum 250mm from the top and bottom of the jambs and at maximum 800mm centres.

At the head of door assemblies without sidelights, no clamping system fixing is required. Where a sidelight is included, one clamping system fixing is required centrally in the overall frame width.

Where the hinges are fixed into the perimeter framing, the hinge is fixed back to the clamping system, within the frame, as tested in 96-CVB-R0948.

Where hinges are included at mullions, proprietary fixing brackets are employed, such that the hinges are secured into the section. The brackets should be either as tested in 99-CVB-R0486 and 1999-CVB-R1180 with Scharnier 3½" hinges, or as tested in 96-CVB-R0534 with Paumelle Plus lift off hinges. Fluence lift off hinges should utilise the brackets tested with Paumelle Plus lift off hinges.

3.9.2 Installation of overpanels

Overpanels should be installed using the proprietary hinge bolt and carrier system utilised in tests 96-CVB-R0948 and 99-CVB-R0486. The fixing and installation details are outlined in **Figure 05163E/08** in Appendix A. This shows details for flush and over-rebated overpanels.

3.9.3 Supporting construction

The supporting construction may be either plasterboard clad partitions, (with timber or steel studs), or blockwork, brickwork or concrete walls, of minimum wall thickness 70mm. In all cases, the construction shall be of a type that has been tested or assessed to provide at least 40 minutes fire resistance, at the required size, when incorporating door assembly openings. If fitted into timber or steel stud partitions, the method of forming the door assembly aperture must be as tested by the partition and/or door assembly manufacturer.

The size of opening, the condition of the material forming the opening, and the alignment of frame within the opening, shall all be such that they will allow positive engagement of the proprietary clamping system for the frames, to ensure secure fixing and retention.

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 door assemblies in proprietary 'demountable' partitions, which must be subject to a full and independent appraisal of the particular system and door assemblies therein.

The fire test reports do not refer to firestopping, or sealing, at the frame perimeter. This assumes that the frame forms a close fit against both faces of the wall. If this is not the case, or if sealing against the passage of air/gases is required for aesthetic, or other purposes, then test evidence to BS476: Part 22: 1987 shall be available to demonstrate that the sealing materials will not adversely affect the overall fire resistance of timber door leaves in steel frames, when fitted in the proposed arrangements.

3.9.4 Door edge gaps

The gap between the door and the frame (and between door(s) and overpanel, where applicable) should be 1-3mm. Gaps between the doors at meeting stiles of double doors should be 1-3mm. 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 (see also Section 3.11 regarding suitability of smoke seals).

3.10 Intumescent Seals

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

3.11 Ambient Temperature Smoke Seals

Smoke seals, or combined intumescent/smoke seals (using the specification approved in Section 3.10), that have been tested in accordance with BS EN 1634-3: 2004 (ambient temperature) or BS476: Part 31: Section 31.1: 1983 and shown not to leak by more than $3m^3/m/hr$ at 25Pa may be used in conjunction with the proposed door assemblies to provide smoke control.

The orientation of the seals, door edge gaps, degree of hardware interruption, and leaf configuration, will need to be as tested in accordance with BS EN 1634-3: 2004 (ambient temperature) or 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 described in Appendix B, in which case, the latter shall take precedence.

Suitably tested seals to BS476: Part 31: Section 31.1: 1983 are produced by Polynorm Bruynzeel in TPE and PVC. Separate evidence should be sought to show that they have been tested to BS476: Part 22: 1987 to demonstrate that they will not adversely affect the required overall fire resistance performance.

Where smoke sealing is required for the doors approved, herein, it should be ensured that the perimeter framing/supporting construction and glass/framing interfaces, where necessary, are sealed using products proven in similar situations. Test evidence to BS476: Part 22: 1987 shall be available to demonstrate that the sealing will not adversely affect the required overall fire resistance of the construction, when fitted in the proposed arrangement.

4. CONCLUSION

It is the opinion of International Fire Consultants Ltd that if the proposed door assemblies utilising 40mm thick flaxboard core door leaves hung in steel frames, (with, or without, sidelights and/or fanlights) were manufactured and installed within the limitations of this Field of Application Report and tested for fire resistance, they would satisfy the integrity criteria of BS476: Part 22: 1987 for 30 minutes.

5. DECLARATION BY THE APPLICANT

We the undersigned, confirm that, except for that information declared to International Fire Consultants Ltd previously during the original engineering evaluation process, the components, products, and/or assemblies evaluated within IFC Field of Application Report IFCA/05163 Revision E have not been altered in any way; and have not subsequently, to our knowledge, been included in a fire test to BS 476: Part 22: 1987 in the form and/or configurations proposed.

We also confirm that we have supplied all information and assurances requested of us, for the purpose of writing this Field of Application Report and are not aware of any other information that would adversely influence or affect the conclusions of this report.

We agree that if fire test evidence or other information subsequently becomes available, to supply this to IFC in full and seek immediate review of the continuing validity of the original report from IFC. If after review IFC conclude that the original evaluation and report is no longer appropriate, we agree to withdraw it and any references to it from circulation and advise clients and agents accordingly.

Signature: _____

Position: _____

Company: **Theuma NV**

6. LIMITATIONS

This report 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 door 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.

This report is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available, IFC reserves the right to withdraw the report unconditionally but not retrospectively.

Where the constructional information in this report is taken from details provided to International Fire Consultants Ltd (IFC) and/or from 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.

The analysis and conclusions within this report are based upon the likely fire resisting performance of a complete door assembly that is manufactured and installed in accordance with this document, and offered for fire resistance testing in 'perfect' condition. In practice, management procedures must be in place in any building where the door assemblies are installed, to ensure that no parts of the assembly are damaged or faulty. Further, the doors must open and close without the use of undue force. The edge gaps/alignment of door leaves must be in accordance with the tolerances defined, herein, when the doors are closed. Any such shortfalls in respect to the condition of the assemblies will invalidate the approval by IFC, and may seriously affect the ability of the assemblies to provide the required level of fire resistance performance. Determination of what constitutes wear or damage, and any corrective actions in order to return assemblies to the required condition, should only be carried out following consultation with the manufacturer and IFC.

This report applies to fire door assemblies that are evaluated to BS476: Part 22: 1987; which is an applicable test method currently referenced within guidance to Building Regulations in the United Kingdom, and in building codes in some other countries. However, IFC have a duty of care to advise that introduction of CE Marking may become compulsory for fire resisting doorsets marketed in the EU, during the validity period of this report; in which case, users should contact IFC for further details/advice.

Where the assessed constructions have not been subject to an on-site audit by International Fire Consultants Ltd, 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. Designers, manufacturers and installers are reminded of their responsibilities under the CDM Regulations; but particularly with regard to installation and maintenance of heavy or inaccessible items.

This assessment considers the fire resistance performance of the door assemblies when tested with the leaves in the closed position, within the frame reveal; either retained by the latch, or self-closing device, or locked shut, as applicable. The door assemblies will only provide the assessed fire performance when in a similar configuration; and it is the responsibility of the building occupants/owner to ensure that this is the case.

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 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.

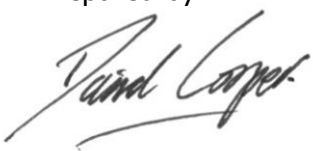
It is, therefore, the responsibility of the sponsor to establish whether this evidence is appropriate for the application for which it is being supplied and IFC cannot take responsibility for any costs incurred as a result of any rejection of the document for reasons outside of our control. Early submittal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

7. VALIDITY

This Field of Application Report 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 August 2023 should confirm its ongoing validity.

This Field of Application Report is not valid unless it incorporates the declaration by the applicant given in Section 5 duly signed by the applicant.

Prepared by:



David Cooper
BEng (Hons) AIMMM AIFireE
Fire Safety Engineering Manager
International Fire Consultants Ltd (IFC)

Checked by:

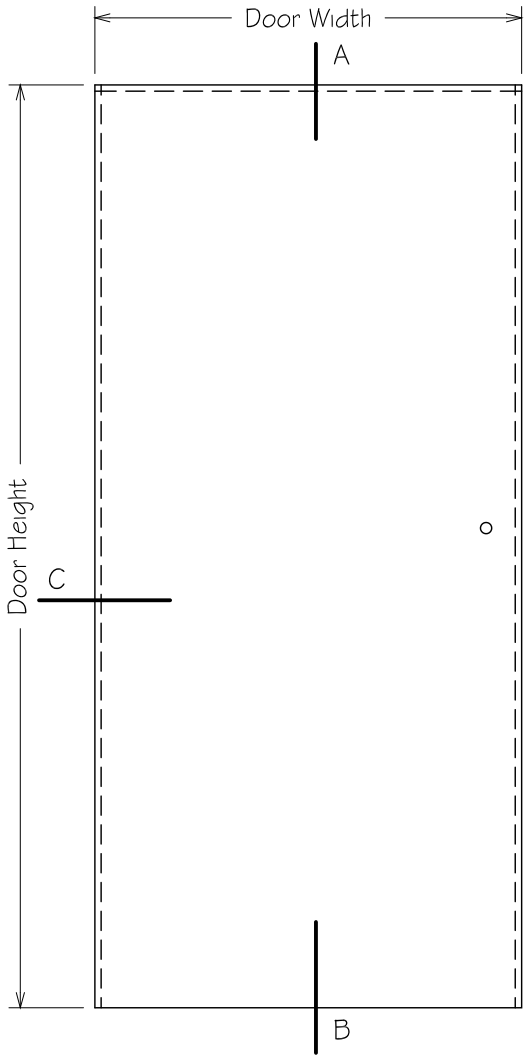
Chris Houchen
BSc AIFireE
Senior Technical Manager
International Fire Consultants Ltd (IFC)

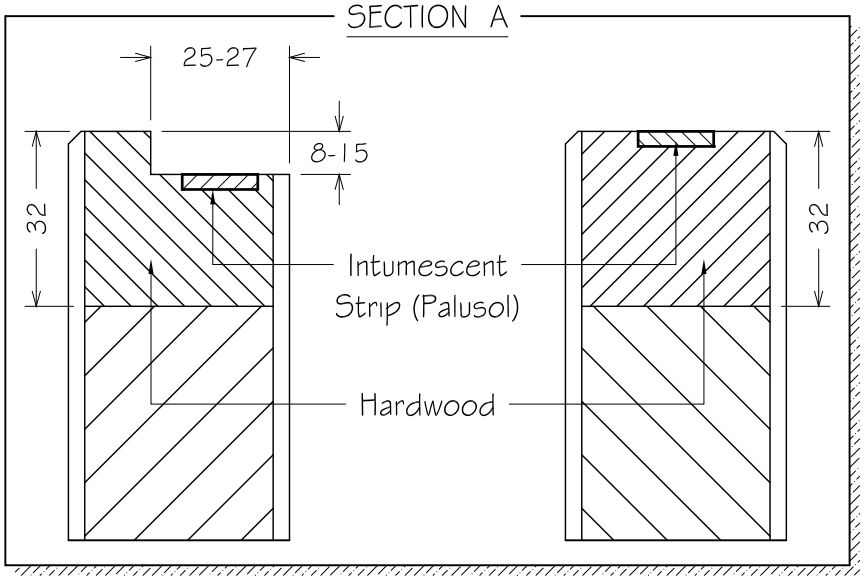
APPENDIX A

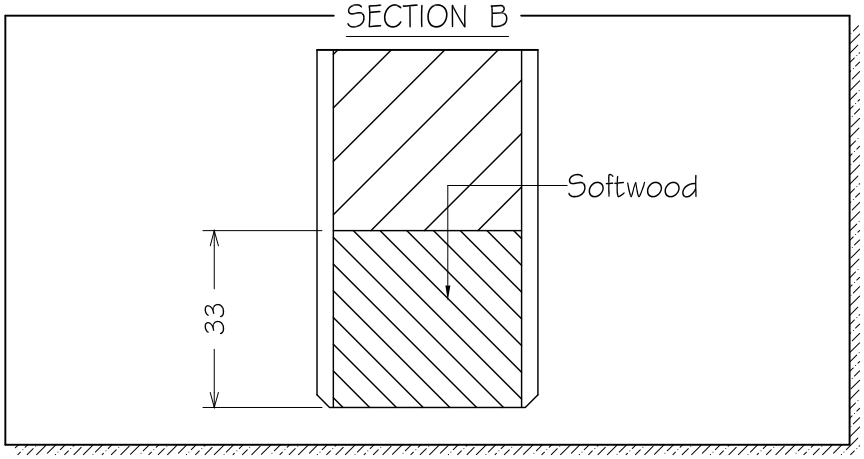
Figures 05163E/A01 to A08

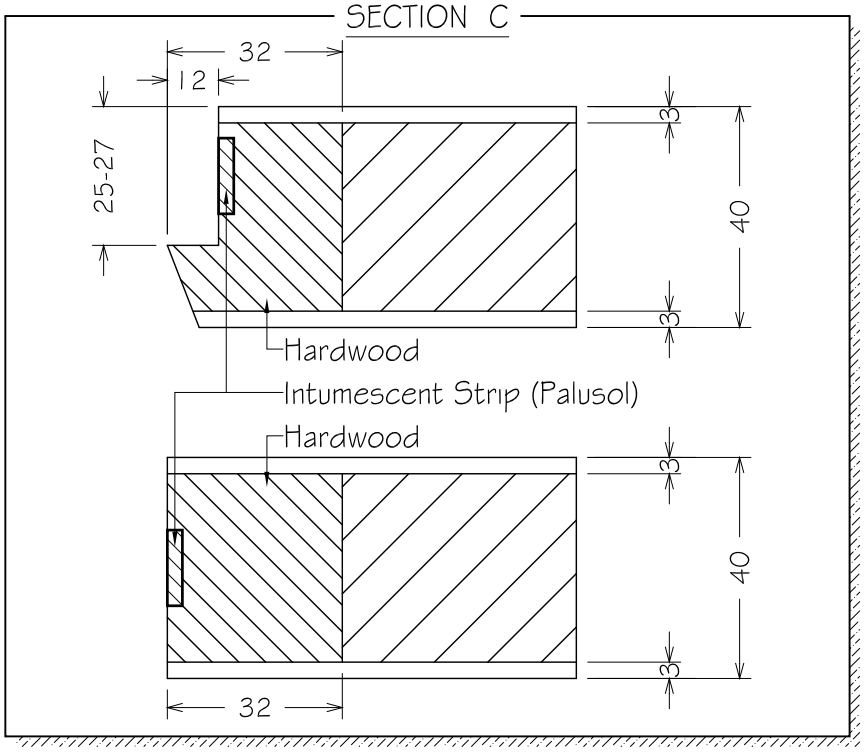
Construction Details

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









Full details of door leaf construction are given in Section 3.4 of Field of Application Report IFCA/05163 Revision E

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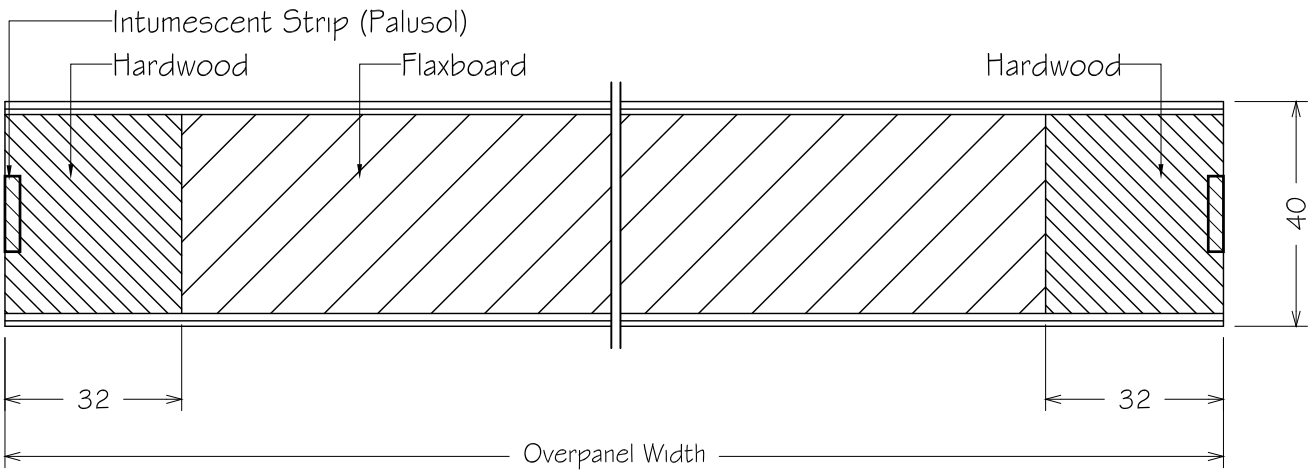
Tel: +44 (0) 1844 275500 Fax: +44 (0) 1844 274002 Email: ifc@intfire.com Website: http://www.intfire.com

Field of Application Report
IFCA/05163 Revision E
Theuma NV

Typical Door Leaf Construction

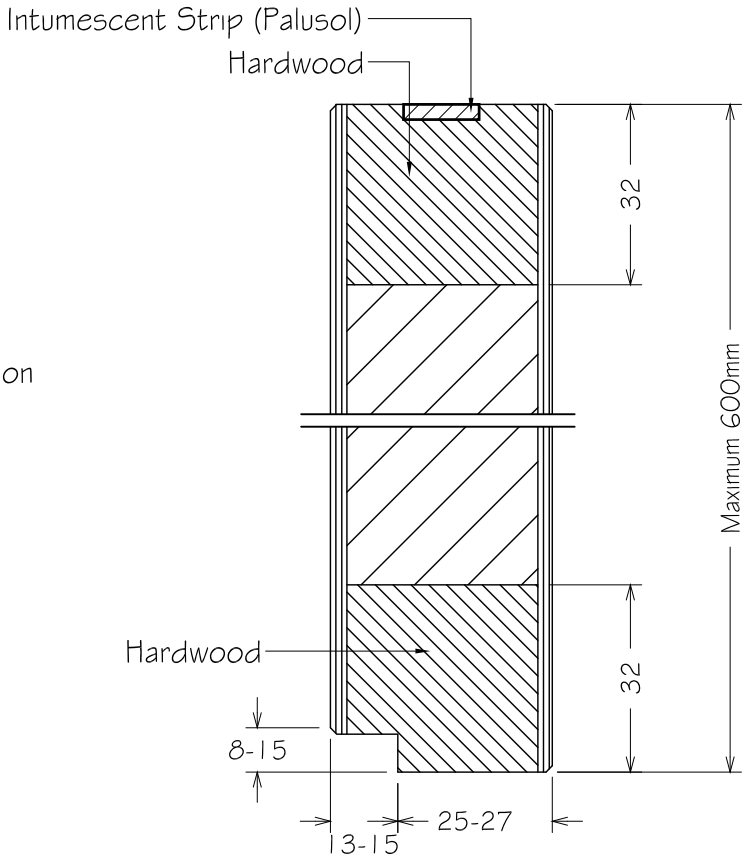
Job number: 17720	
Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Aug 2018

05163E/A01



HORIZONTAL SECTION

Full details of door leaf construction are given in Section 3.4 of Field of Application Report IFCA/05163 Revision E



VERTICAL SECTION

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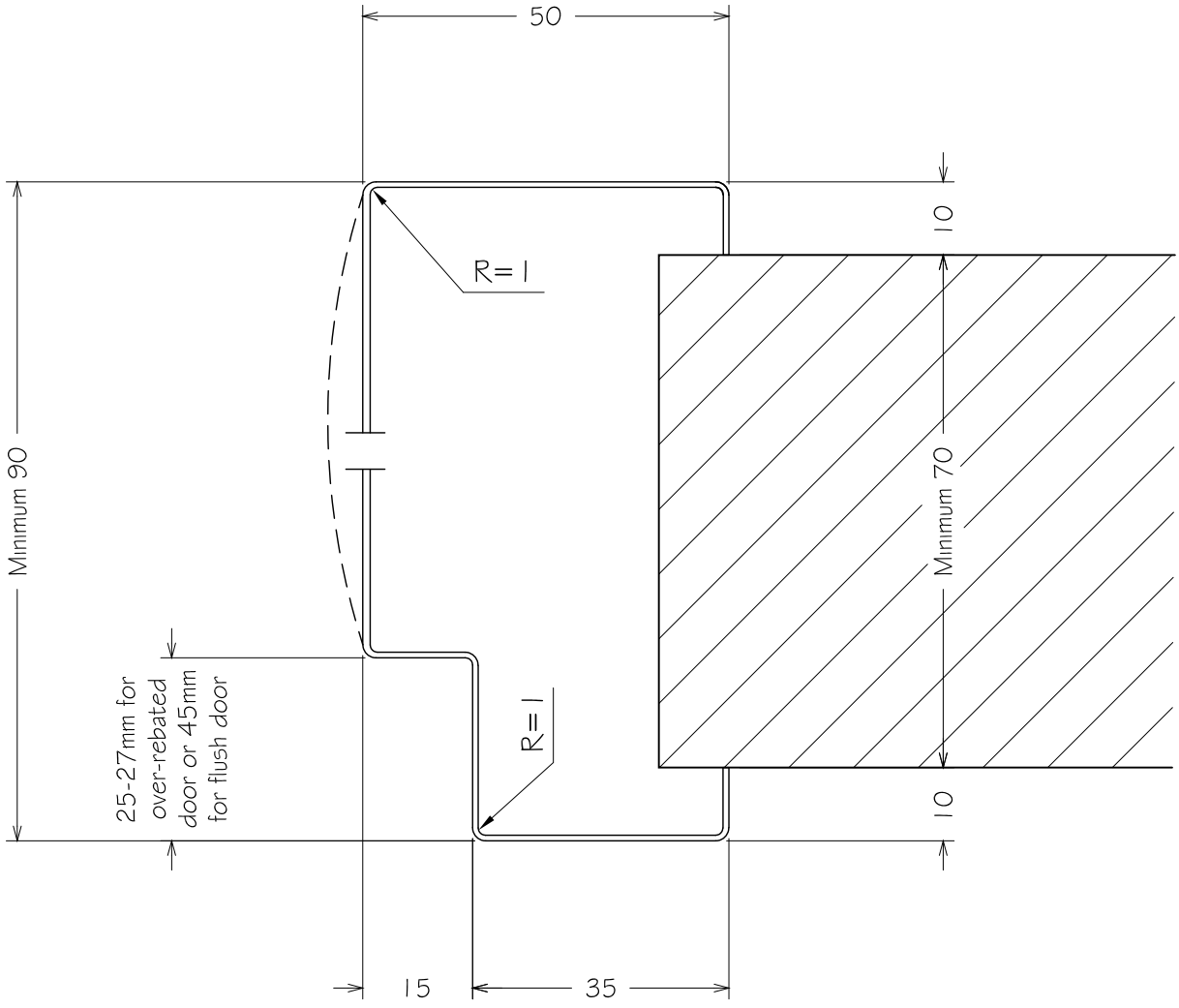
Typical Square Edged
Overpanel Construction

Job number: 17720
Drawn by: CSP | Checked by: DJC
Not To Scale | Drawn: Aug 2018

05163E/A02



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Field of Application Report
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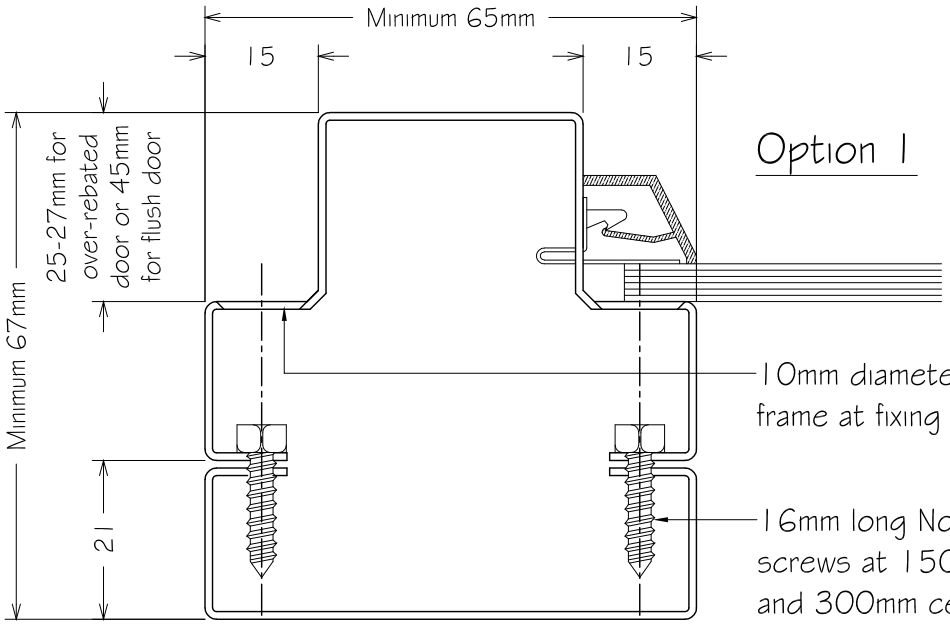
Perimeter Frame Section
for
over-rebated doors

Job number: 17720	
Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Aug 2018

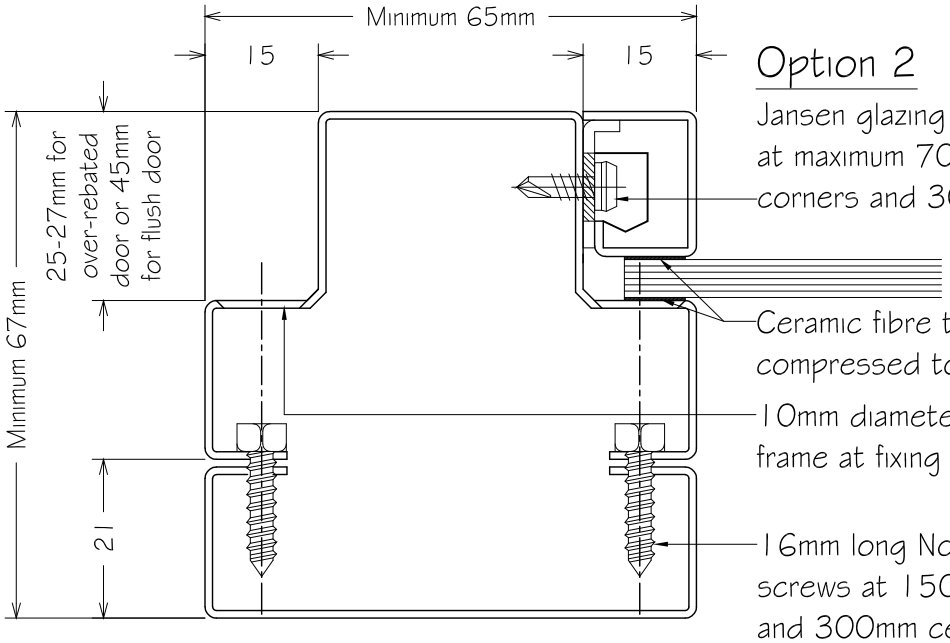
05163E/A03



Option 1

10mm diameter holes in frame at fixing positions

16mm long No 10 (4.8mm) steel screws at 150mm from corners and 300mm centres



Option 2

Jansen glazing studs at maximum 70mm from corners and 300mm centres

Ceramic fibre tape (4mm thick compressed to 2mm)

10mm diameter holes in frame at fixing positions

16mm long No 10 (4.8mm) steel screws at 150mm from corners and 300mm centres

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Field of Application Report
IFCA/05163 Revision E
Theuma NV

Mullion & Transom Frame Section Options
Showing Sidelight / Fanlight Glazing Details

Job number: 17720	
Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Aug 2018

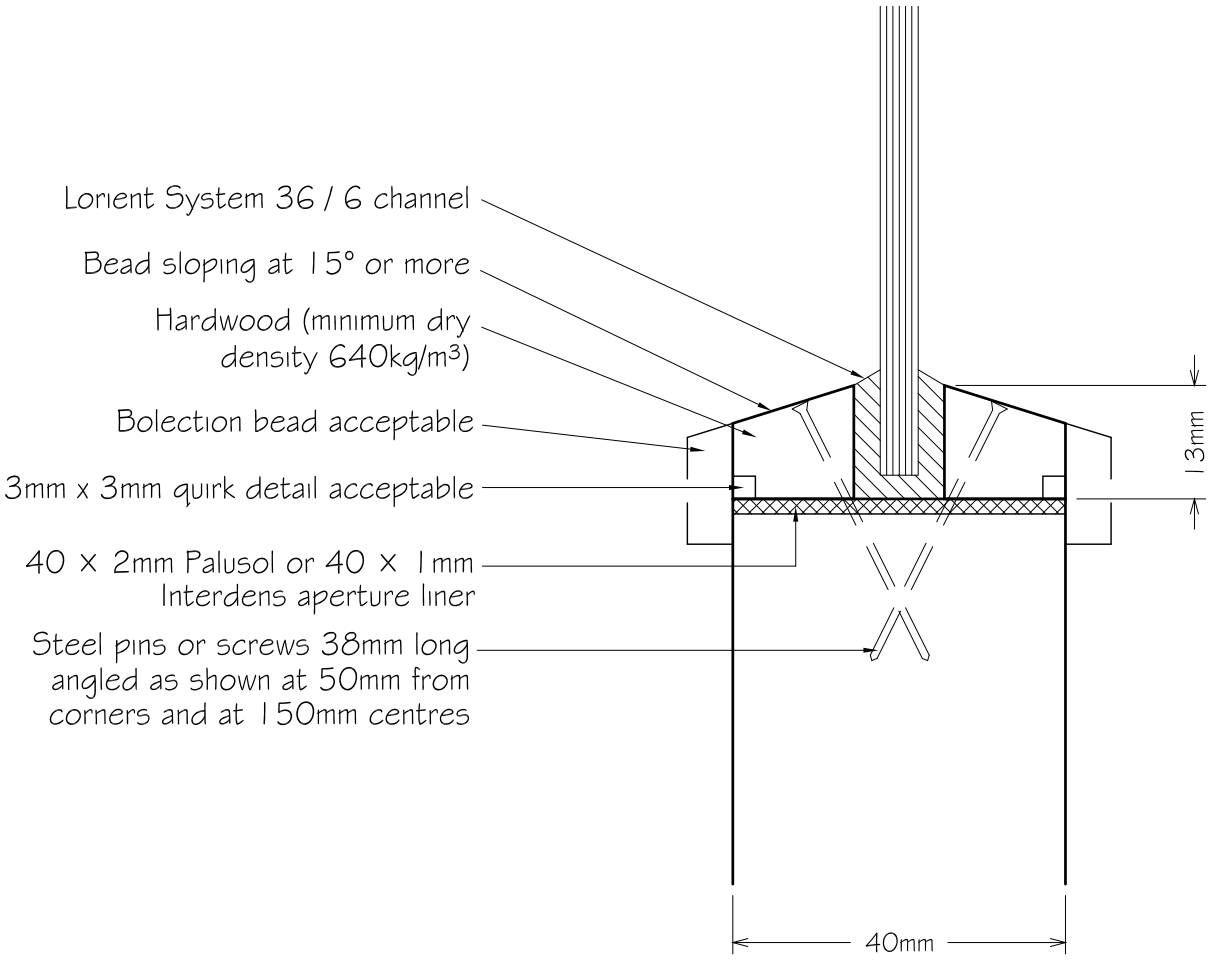
05163E/A04

GLASS TYPES

6mm thick Pyroshield 2 (Pilkington)

7mm thick Pyran S (Schott)

7mm thick Pyrobelite (AGC Flat Glass)



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Theuma NV

Door Leaf Glazing Details

Job number: 17720
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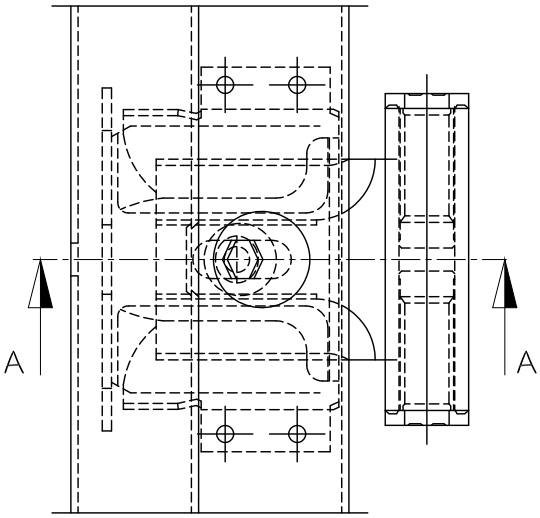
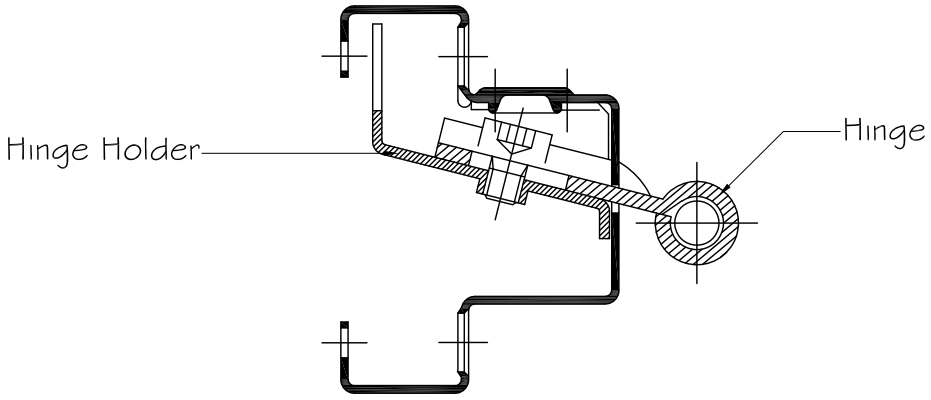
Not To Scale | Drawn: Aug 2018

05163E/A05





SECTION A - A

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Field of Application Report
IFCA/05163 Revision E
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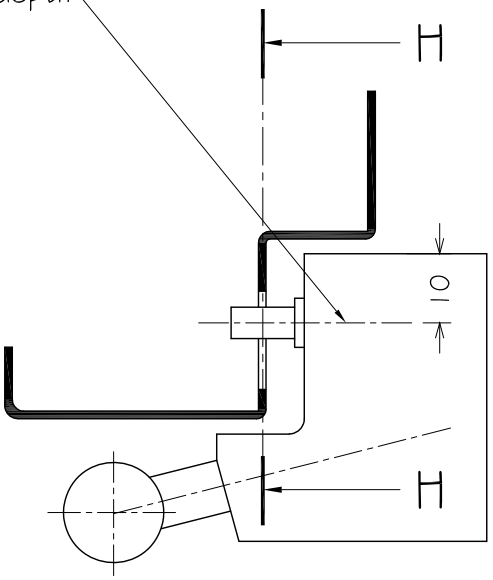
Hinge Holder for Paumelle Plus and Fluence Lift Off Hinges in Mullions

Job number: 17720	
Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Aug 2018

05163E/A06

4mm diameter predrilled hole in door leaf

30mm depth



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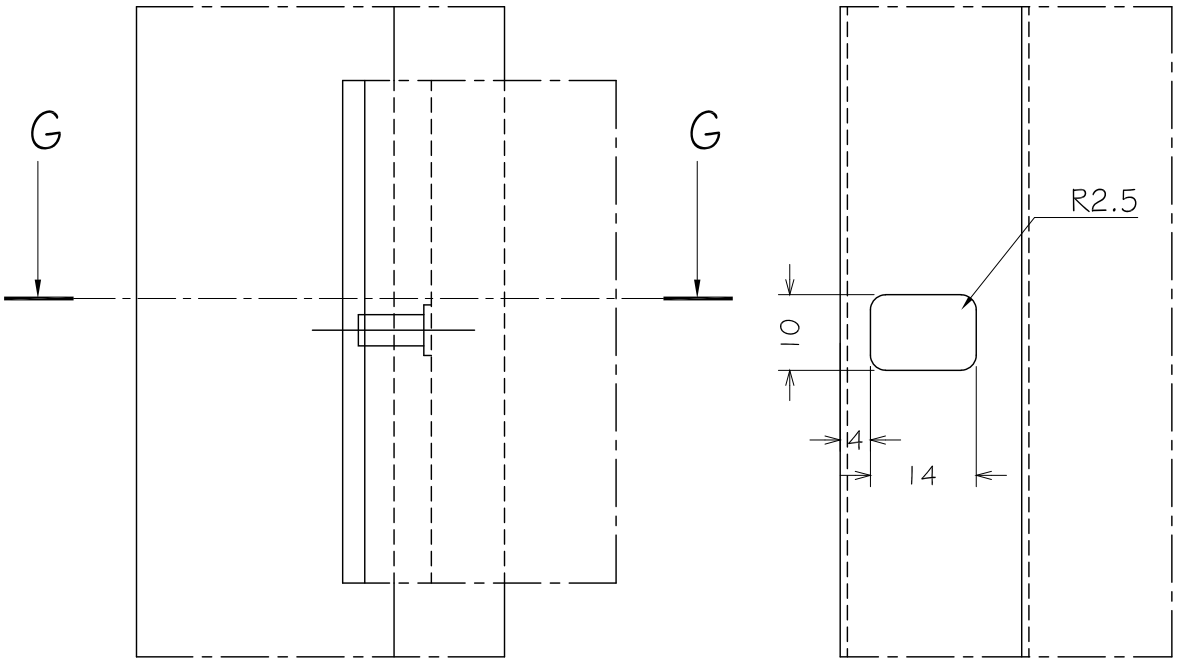

SECTION HH

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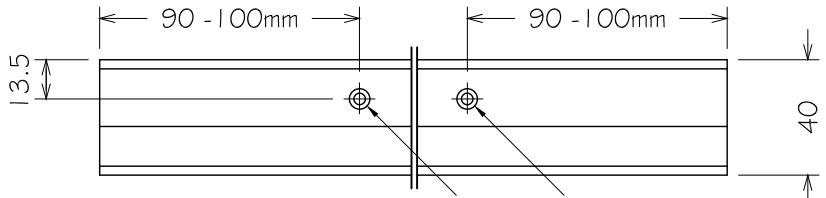
Hinge Bolt Detail

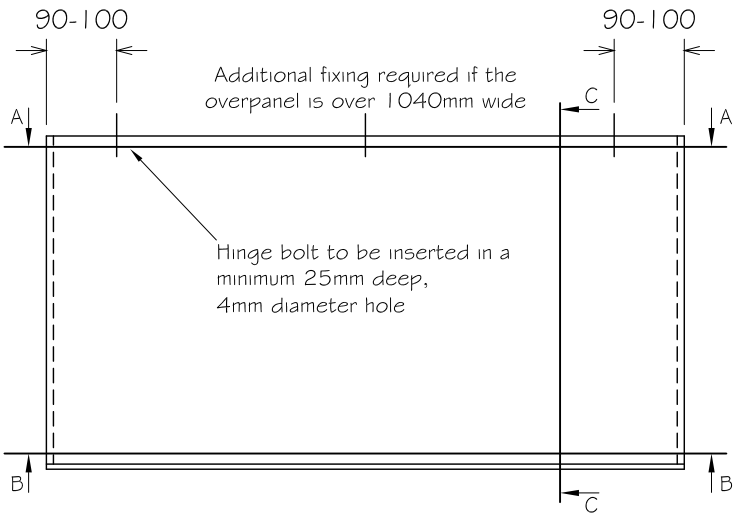
Job number: 17720	
Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Aug 2018

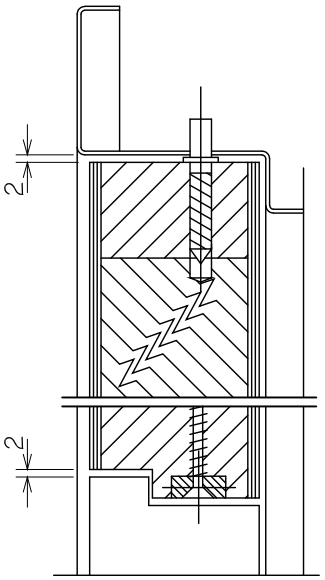
05163E/A07



Drill 4mm diameter hole, minimum 25mm depth

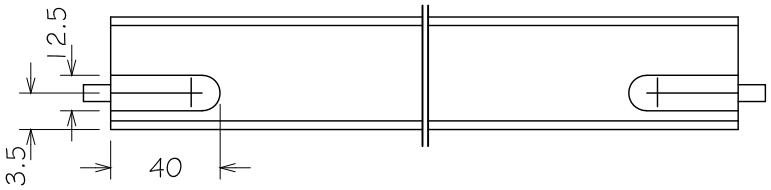
SECTION AA





SECTION CC

Typical Section for overpanel fitted flush in frame



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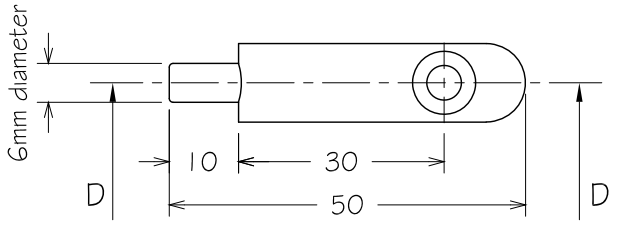
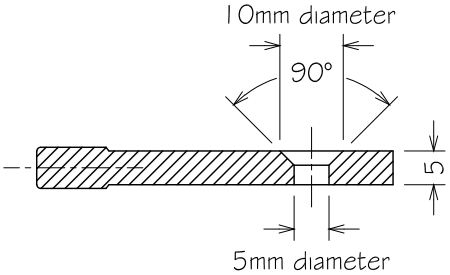


Overpanel Carrier



SECTION DD

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Field of Application Report
IFCA/05163 Revision E
Theuma NV

Typical Overpanel Fixings

Job number: 17720
Drawn by: CSP | Checked by: DJC
Not To Scale | Drawn: Aug 2018

05163E/A08

APPENDIX B

Assessed Intumescent Seal Specifications

Single doors

LOCATION	STANDARD SEAL SPECIFICATION	ENHANCED SEAL SPECIFICATION
Stiles/jambs	1no. 10mm wide Palusol	1no. 20mm wide Palusol
Head	1no. 10mm wide Palusol	1no. 20mm wide Palusol
Interface between overpanel and frame	1no. 10mm wide Palusol	1no. 20mm wide Palusol
Overpanel/leaf head junction	1no. 10mm wide Palusol	1no. 20mm wide Palusol

Double doors

LOCATION	ENHANCED SEAL SPECIFICATION
Stiles/jambs	1no. 20mm wide Palusol
Head	1no. 20mm wide Palusol
Meeting stiles	4no. 10mm wide Palusol

Note:

- *Palusol seals can be 2mm thick non-PVC encased or 4mm thick PVC encased.*
- *Single seals to be fitted centrally within the leaf edge of doors hung flush within the frame, and fitted centrally within the leaf rebate in doors hung over-rebated with the frame.*
- *At the meeting stiles where 4no. seals are specified, they should be installed as follows:*

Square meeting stiles: *2no. seals centrally fitted in each leaf edge spaced 10mm apart*

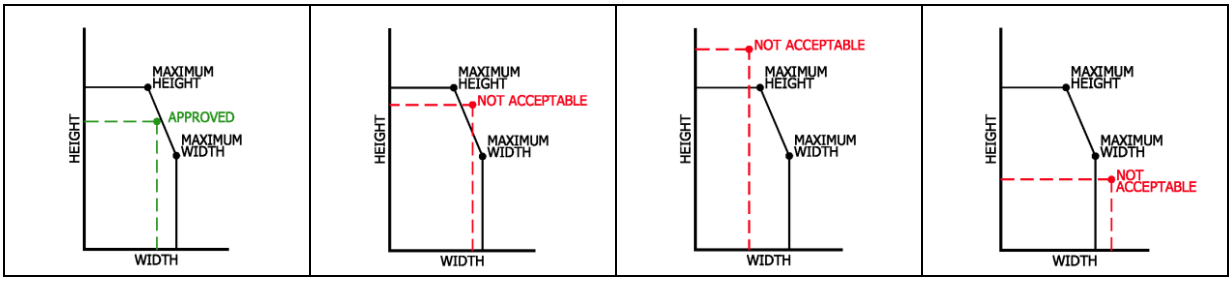
Rebated meeting stiles: *1no. seal centrally fitted in the rebate and the nib of each leaf edge*

APPENDIX C

Figures 05163E/C01 and C02

Assessed Leaf Size Envelopes

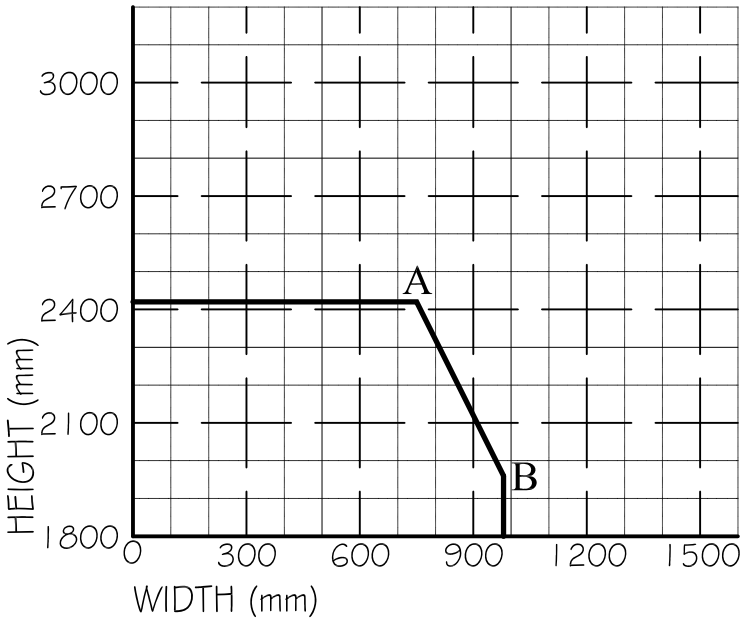
The figures in this Appendix are not included in the sequential page numbering of this report



Leaf Size Envelope

	Standard Intumescent	
	A	B
Width	750	980
Height	2420	1960

PROPOSED CONFIGURATION
LATCHED
SINGLE ACTING
SINGLE LEAF
NO OVERPANEL or WITH TRANSOMED OVERPANEL
or REBATED or SQUARE, OVERPANEL



Leaf sizes apply to doors
when hung flush in frame
and over-rebated

ENVELOPE OF APPROVED LEAF SIZES

These graphs represent the envelope of approved leaf sizes for the proposed door leaf configurations. Any combination of leaf width and height that falls within the graph axes and the solid/dotted line on the graphs are approved.

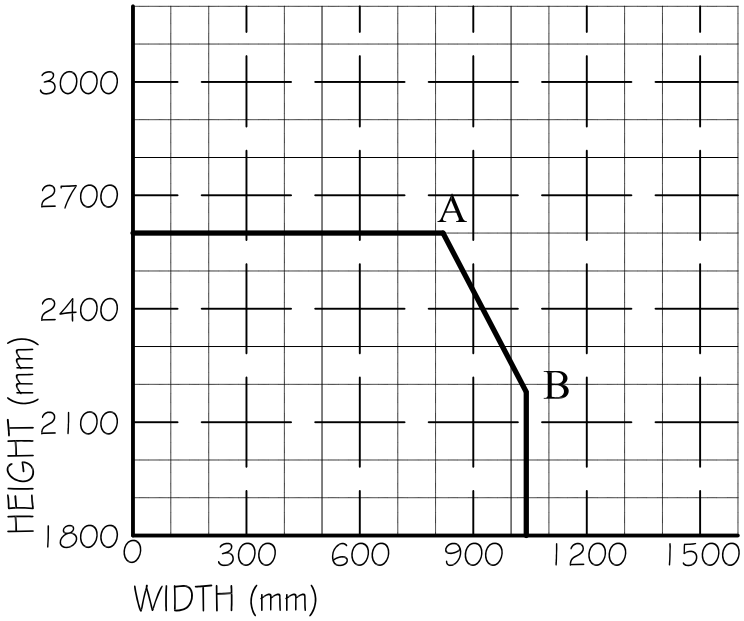
POINT A represents the maximum leaf height and its associated width.
POINT B represents the maximum leaf width and its associated height.

This figure forms part of International Fire Consultants Ltd's Field of Application Report IFCA/05163 Revision E, which contains full details of the assessed doorset construction.

Leaf Size Envelope

	Enhanced Intumescent	
	A	B
Width	820	1040
Height	2600	2180

PROPOSED CONFIGURATION
LATCHED
SINGLE ACTING
SINGLE LEAF
NO OVERPANEL or WITH TRANSOMED OVERPANEL
or REBATED or SQUARE, OVERPANEL



Leaf sizes apply to doors
when hung flush in frame
and over-rebated

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20 Park Street Princes Risborough Buckinghamshire HP27 9AH United Kingdom
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Field of Application Report
IFCA/05163 Revision E
Theuma NV

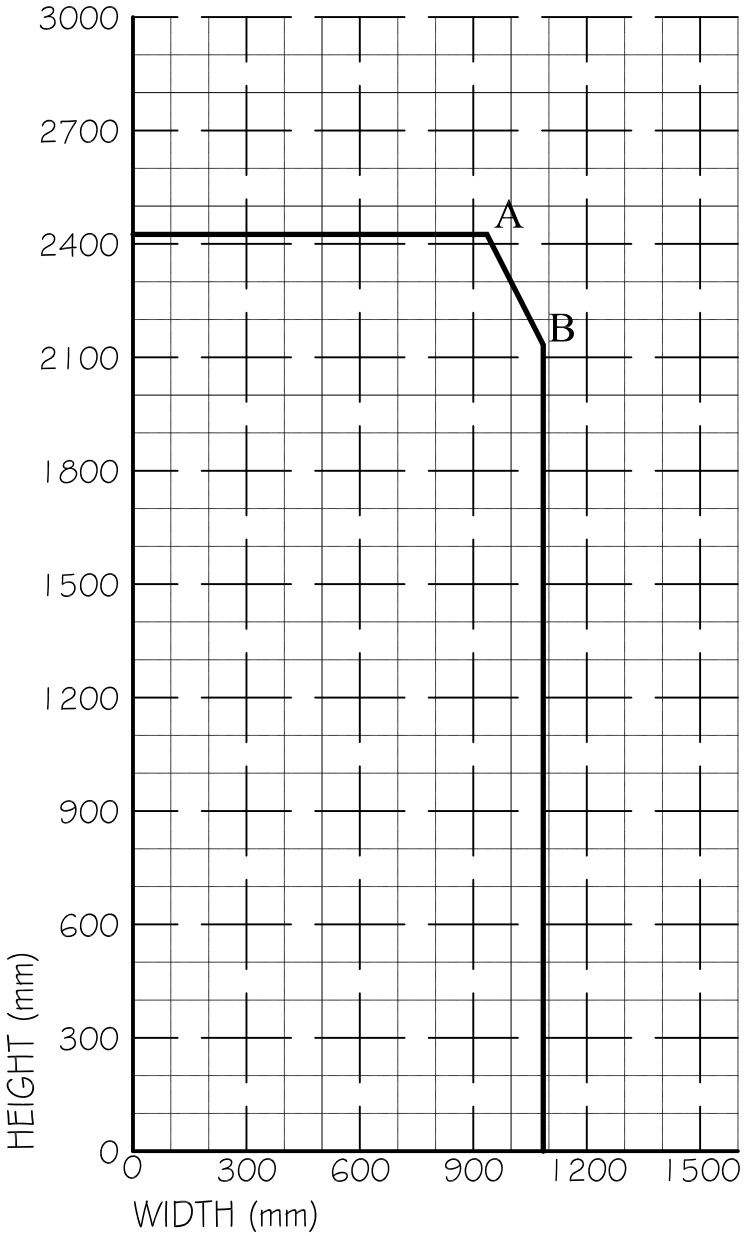
Envelopes of Approved Door Leaf Sizes
Latched, Single Acting, Single Leaf Doorset

Job number: 17720
Drawn by: CSP | Checked by: DJC
Not To Scale | Drawn: Aug 2018
05163E/C01

Leaf Size Envelope

	Enhanced Intumescent	
	A	B
Width	936	1085
Height	2425	2133

PROPOSED CONFIGURATION
LATCHED
SINGLE ACTING
DOUBLE LEAF
FLUSH or REBATED MEEING STILES
NO OVERPANEL or WITH TRANSOMED OVERPANEL



ENVELOPE OF APPROVED LEAF SIZES

These graphs represent the envelope of approved leaf sizes for the proposed door leaf configurations. Any combination of leaf width and height that falls within the graph axes and the solid/dotted line on the graphs are approved.

POINT A represents the maximum leaf height and its associated width.
POINT B represents the maximum leaf width and its associated height.

This figure forms part of International Fire Consultants Ltd's Field of Application Report IFCA/05163 Revision E, which contains full details of the assessed doorset construction.

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Field of Application Report
IFCA/05163 Revision E
Theuma NV

Envelope of Approved Door Leaf Sizes
Latched, Single Acting, Double Leaf Doorset

Job number: 17720
Drawn by: CSP | Checked by: DJC
Not To Scale | Drawn: Aug 2018

05163E/C02

APPENDIX D

Summary of Fire Test Evidence

Test Report	Configurations Tested	Tested Leaf Size (Overpanel Size)	Integrity Performance
96-CVB-R0534	Latched, single acting, single leaf doorset, with sidelights and fanlights	2115 x 959mm	32 minutes
96-CVB-R0948	Latched, single acting, single leaf doorset Latched, single acting, single leaf doorset, with rebated head overpanel	2600 x 935mm 2107 x 935mm (487 x 935mm)	26 minutes *Note iii* 30 minutes
99-CVB-R0486	Latched, single acting, single leaf doorset, with rebated head overpanel	2114 x 1026mm (510 x 1028mm)	37 minutes
1999-CVB-R1180	Latched, single acting, single leaf doorset, with sidelights and fanlights	2114 x 1026mm	34 minutes
WF 158455 Issue 2	Latched, single acting, single leaf doorset Latched, single acting, single leaf doorset	2070 x 926mm 2070 x 926mm	36 minutes 38 minutes
Warrington Fire 11732	Latched, single acting, double leaf doorset	2280 x 1068 + 1044mm	32 minutes

Notes:

Note i *Some of the tests referenced above were carried out to the Belgium test procedure as described in NBN 713.020 Addendum 1 (1982). Test method NBN 713.020 Addendum 1 (1982) is similar to International Standards Organisation (ISO) method 3008: 1976 which is based upon ISO 834 and incorporates the requirements needed for evaluating the fire resistance of doorsets. The ISO 834 procedure is also the basis of the British Standard test BS476: Part 20: 1987, as it uses identical temperature/time exposure conditions. The major difference between the British and Belgium test methods is to do with the positioning of the neutral pressure axis. In the British method this is set at approximately 1 metre from the bottom of the specimen, in Belgium it is set at the bottom of the specimen. As a consequence, the overpressure at the head of the specimen is greater in the Belgium method, which could make tests carried out to this method more onerous. As a consequence, tests to NBN 713.020 Addendum 1 (1982) can be used as a basis for assessments to BS476: Parts 20 & 22 due to the use of similar furnace conditions, criteria and instrumentation.*

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

Note iii *The integrity failure in this specimen occurred due to design features that have subsequently been modified. The doorsets approved within this report include the enhanced design.*

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