INTERNATIONAL FIRE CONSULTANTS LIMITED

PRIVATE & CONFIDENTIAL

IFC FIELD OF APPLICATION REPORT

Field of Application of FD60 Solid Core (42VL & 42VT core) door leaves installed in Timber Frames

Fire Resistance Standard: BS476: Part 22: 1987

IFC Report PAR/13211/03 REVISION C

Prepared on behalf of:

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ISSUE AND AMENDMENT RECORD

Revision	Date	Author	Review	Section	Amendments
Draft	December 2013	PP	MB	-	-
-	January 2014	PP	MB	-	-
Revision A Draft 1	May 2019	MB	CPH	Various	Review and revalidation. Update to suit current IFC format. Update references to latest standards. Revisions to scope (intumescent seals and leaf sizes).
Revision A Draft 2	July 2019	MB	CPH	Various	Omission of 38VL core option, and related clauses. Update to suit new IFC format. Minor edits following clients' review of draft 1.
Revision A	July 2019	MB	CPH	-	No changes, following acceptance of draft 2 by client.
Revision B Draft	August 2020	WL	MB	Various	Incorporation of new 42VT core and test evidence; including concealed closer and Vingcard Classic lock
Revision B	October 2020	WL	MB	-	Minor changes, following comments on draft from client.
Revision C	November 2021	SP/WL	CH	Various	Clarification that only 1 vision panel per leaf is approved.

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1. INTRODUCTION

This report has been prepared by International Fire Consultants Ltd (IFC), on the instruction of Sauerland Spanplatte GmbH + Co. KG, to define the Field of Application for FD60 Solid Core door leaves installed in timber frames, that are required to provide 60 minutes fire resistance performance, when adjudged against BS476: Part 22: 1987.

NOTE: Product codes 42VL and 42VT, used throughout this report, refer to core products manufactured by Sauerland Spanplatte GmbH + Co KG; and this report only applies to door leaves fabricated using these core types.

This assessment has been produced using the principles outlined in the Passive Fire Protection Forum (PFPF): *'Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence, 2019, Industry Standard Procedure'* -.

When establishing the variations in the construction that can achieve the required fire resistance performance, IFC complies with the principles found in the following documents:

- 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'.*

- EN 15725: 2010: *'Extended application reports on the fire performance of construction products and building elements.'*

It is proposed that variations to the tested specifications, as described in the following sections, may be accommodated into assemblies, without reducing their potential to achieve a 60 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, and all other aspects must otherwise be as tested.

It is more onerous to test timber door assemblies, hinged or pivoted, with the specimen installed with the leaf opening in towards the furnace. Testing in this orientation is therefore incorporated into Field of Application Reports to cover doors opening in the opposite direction. The principle is only applicable when the door construction, and any features within the door leaf, such as glazing, are symmetrical.

Unless stated otherwise, herein, this Field of Application considers the scope of approval for door assemblies that may be installed in either orientation; i.e. with either face exposed to fire conditions. (If the door includes a Vingcard lock or a threshold drop seal, then the direction of fire risk must be known and the hardware orientated accordingly - see parameters in Appendix D; all subject to agreement with the Approving Authority.)

2. TEST EVIDENCE

The test evidence used to support this assessment is summarised in Appendix E of this report.

Some of the test evidence referenced in this Engineering Assessment Report is more than 5 years old. In accordance with industry practice, IFC have reviewed this test evidence, and have concluded that the evidence is still valid, and suitable to form the basis of this approval.

Guidance documents, that define the performance of fire resisting door assemblies, give a parity of performance between the two test methods of BS 476: Part 22: 1987 and EN 1634-1. Although the EN 1634-1 and the BS 476: Part 22: 1987 test procedures are both generally based upon the ISO 834 fire resistance test method, there are differences between them. The major ones are;

- The method of measuring the furnace (exposure) temperature in the EN 1634-1 test is by means of plate thermocouples. The 'plates' have a greater thermal inertia than the bead thermocouples used in the BS 476: Part 22: 1987 test, and therefore the heat input is higher than that given in BS 476 at any given time during approximately the first 15 minutes of a fire resistance test.

- The furnace pressure in the EN 1634-1 test is neutral at a position of 500mm above the threshold, compared to a nominal 1 metre in the BS 476: Part 22: 1987 test. As a consequence, the pressure over the upper part of the doorset is higher and, therefore, is more onerous in the EN test.

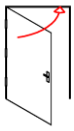
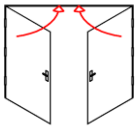
There are other minor procedural matters that also increase the severity of the EN method. These combined with the issues identified above mean that the EN 1634-1 test is generally accepted as being a more onerous test than BS476: Part 22: 1987. This is borne out by IFC's experience of fire resistance testing already performed since the introduction of the European test standard.

As such it is considered herein that any test results on door assemblies tested to EN 1634-1 can be utilised in situations requiring a performance defined against the BS 476: Part 22 test method, or when making assessments and judgements against the BS 476 criteria, but <u>not</u> vice versa.

3. SCOPE OF APPROVAL

3.1 Door Configuration

The following door configurations are approved within the scope of this report:

Configuration	Envelope of Approved Leaf Size	
	Glazed door assemblies	**Unglazed door assemblies**
 • **Latched** • **Single Acting** • **Single Door** • **Without Overpanel**	**Figure PAR/13211/03C:C01 in Appendix C** **SECTION 3.3.1 AND SECTION 3.3.3**	**Figure PAR/13211/03C:C01 in Appendix C** **SECTION 3.3.1**
 • **Latched** • **Single Acting** • **Double Doors** *Note 1* • **Without Overpanel**	**Figure PAR/13211/03C:C02 in Appendix C** **SECTION 3.3.2 & Section 3.3.3**	**Figure PAR/13211/03C:C02 in Appendix C** **SECTION 3.3.2**

Note 1 *Single acting double leaf door assemblies must have square edged (or slightly rounded) meeting stiles; or rebated meeting stiles (equal in leaf thickness, and 15mm wide). Double leaf doors ONLY approved with doors using 42VL core type and hardwood framing (see Section 3.3)*

3.2 Maximum Assessable Door Leaf Sizes

The calculated envelopes of assessed leaf dimensions for each door configuration covered by this Field of Application Report are given in Appendix C, based upon use of the intumescent seal specifications outlined in Appendix B.

Leaves in double door assemblies (42 VL only) may each be of the same width, up to the maximum width indicated in Appendix C. For unequal pairs, the large leaf must still be within the limitations in Appendix C, and the width of the small leaf shall be no less than 45% of the width for the large leaf; e.g. minimum 372mm wide small leaf with 826mm large leaf. The width of the small leaf shall not be less than 300mm, (even if a lesser dimension equates to 45% of the large leaf), since this will affect its vertical stability relative to that of the larger leaf.

For the sake of clarity, this report only approves doors that are rectilinear; i.e. adjacent door edges shall be straight, and at 90 degrees to each other, when viewed in elevation. In addition, doors shall be "flat"; i.e. not curved, when viewed in plan.

3.3 Door Leaf Specification

Detailed constructional specifications of the approved door constructions and configurations are given below. These are based upon the test evidence detailed in Appendix E, (and are, therefore, limited to the information available from these test reports), but also defines variations and tolerances, where it is considered that these will not adversely affect overall fire resistance. Additional notes and limitations are included after the following sections.

3.3.1 Single Leaf Door Assemblies

The following table details the approved door leaf specification for latched single leaf door assemblies. Either of the leaf framing options, 1 and 2, are permitted to be used in conjunction with either core option, 1 and 2.

Component		Material	Dimensions	Minimum Density *Note 2*
Leaf Framing (Stiles and Rails)	Option 1*	Hardwood (NOT BEECH)	38mm wide *Note 3* x 42mm thick	650kg/m^3
	Option 2*	LVL (Hardwood Including Beech) Orientation of LVL to be as tested	40mm wide x 42mm thick *Note 3*	730kg/m^3
Core - Option 1*	42 VL	Extruded solid board *Note 2 & 4*	42mm thick	490kg/m^3
Core - Option 2*	42 VT	Extruded solid particleboard *Note 2 & 4*	42mm thick	420kg/m^3
Facings		HDF	5.8mm thick	850kg/m^3
Lippings not required on top/bottom edges. Optional on vertical edges of single leaf doors.		Hardwood (NOT BEECH)	6-10mm thick for square edges	650kg/m^3
Adhesives	Leaf Framing	Staple fixed	–	–
	Facings	PVAC D3	–	–
	Lippings	Urea Formaldehyde	–	–
Optional additional decorative finishes (Only paint and lacquer approved on door edges)		Timber veneer, decorative plastic based laminate, PVC, to faces only; lacquer or paint	Maximum 2mm thick	–

* *Options 1 and 2, for leaf framing and cores, are interchangeable. Therefore, Option 1 for leaf framing may be used with either Option 1 or Option 2 for the core and vice versa.*

Note 2 *Density of hardwood and facings to be minimum stated; or greater. Density of core to be as stated, but with a -5%/+10% variation permissible.*

Note 3 *Refer to additional notes, below, regarding width of stiles/rails*

Note 4 *Sauerland advise that their maximum height of core is 1978mm. If the door height is <2040mm, the core shall be a single piece, without joints. Where doors are taller than 2040mm, (up to the maximum approved herein), the core layer must include a 1978mm high piece and another smaller piece to achieve the overall height. The horizontal core joint MUST be positioned nearer to the bottom edge of the leaf; and the door must be marked (after trimming) to indicate the top/bottom. The core pieces must be cut neatly, and closely fitted, to avoid any gap at the joint. No other core joints are permitted.*

The following additional notes and limitations also apply for single leaf door assemblies;

- The machining of the core/framing members, and the assembly process, must ensure that gaps comply with the following limitations;
    - Gaps between core and the stiles shall be 1-2mm
    - Gaps between core and the rails shall be <1mm

- Where lippings are used, (see Table above), they shall be applied after the bonding of facings. The machining of the framing members, and the bonding process, must ensure that no gaps occur between the lipping and stiles/rails.

- Core thickness and facings MUST be selected/constructed in such a way that the minimum thickness of the door leaf is 54mm; prior to the addition of optional decorative finishes.

- Facings must not be formed using multiple layers of thinner facings.

- The width of stiles/rails, described in the Table above, refers to the minimum size that must remain after trimming at the factory, to form a specific leaf size. See also text below, regarding adjustment of door sizes.

- Where doors include a concealed ITS96 door closer, and/or a drop seal, (See Appendix D herein), two rails must be included at the top and bottom of the door, respectively. These hardware items have been tested in doors with the 42VT core and LVL framing. Subject to the limitations herein, they may be used in doors with 42VL or 42VT core types and LVL or hardwood framing; but ONLY in latched, single acting, single leaves.

Adjustment of door sizes;

- The minimum width of stile and rails, stated in the Table above, is the minimum width after trimming DURING fabrication, and the 'original' section size should be wider than stated, to allow for fabrication tolerances. If it is intended to manufacture a batch of doors to suit a range of finished sizes, (i.e. to allow varying amounts to be trimmed from unlipped edges during or after final fabrication), the original width of stiles/rails may be increased by up to 30mm.
- Where door edges are lipped, and have square edges, a maximum of 4mm may be trimmed from each lipped edge; but the minimum lipping thickness (defined in the Table above) must be maintained. If a greater adjustment is required, after fabrication, new lippings must be applied, complying with details for timber and adhesive in the Table above.
- Where doors are not lipped, a maximum of 4mm may be trimmed from each edge, after fabrication.

3.3.2 Double Leaf Door Assemblies

Component		Material	Dimensions	Minimum Density *Note 4*
Leaf Framing	Stiles and Rails	Hardwood (NOT BEECH)	38mm wide *Note 6* x 42mm thick	650kg/m^3
Core 42 VL		Extruded solid board *Note 5 & 7*	42mm thick	490kg/m^3
Facings		HDF	5.8mm thick	750kg/m^3
Lippings MUST be fitted at meeting stiles of double leaf doors but are optional at hanging edges of double leaves.		Solid Hardwood (NOT Beech)	6-10mm thick square edges	650kg/m^3
			25mm thick to accept 15mm rebate at meeting stiles	
Adhesives	Leaf Framing	Staple fixed	–	–
	Facings	Urea Formaldehyde	–	–
	Lippings	Urea Formaldehyde	–	–
Optional additional decorative finishes (Only paint and lacquer approved on door edges)		Timber veneer, decorative plastic based laminate, PVC, to faces only; lacquer or paint	Maximum 2mm thick	–

Note 5 *Density of hardwood and facings to be minimum stated; or greater. Density of core to be as stated, but with a -5%/+10% variation permissible.*

Note 6 *Refer to additional notes, below, regarding width of stiles/rails*

Note 7 *Sauerland advise that their maximum height of core is 1978mm. If the door height is <2040mm, the core shall be a single piece, without joints. Where doors are taller than 2040mm, (up to the maximum approved herein), the core layer must include a 1978mm high piece and another smaller piece to achieve the overall height. The horizontal core joint MUST be positioned nearer to the bottom edge of the leaf; and the door must be marked (after trimming) to indicate the top/bottom. The core pieces must be cut neatly, and closely fitted, to avoid any gap at the joint. No other core joints are permitted.*

The following additional notes and limitations also apply for double door assemblies;

- The machining of the core/framing members, and the assembly process, must ensure that gaps comply with the following limitations;
    - Gaps between core and the stiles shall be 1-2mm
    - Gaps between core and the rails shall be <1mm

- Lippings , (see Table above), they shall be applied after the bonding of facings. The machining of the framing members, and the bonding process, must ensure that no gaps occur between the lipping and stiles/rails.

- Core thickness and facings MUST be selected/constructed in such a way that the minimum thickness of the door leaf is 54mm; prior to the addition of optional decorative finishes.

- Facings must not be formed using multiple layers of thinner facings.

- The width of stiles/rails, described in the Table above, refers to the minimum size that must remain after trimming at the factory, to form a specific leaf size. See also text below, regarding adjustment of door sizes.

Adjustment of door sizes;

- The minimum width of stile and rails, stated in the Table above, is the minimum width after trimming DURING fabrication, and the 'original' section size should be wider than stated, to allow for fabrication tolerances. If it is intended to manufacture a batch of doors to suit a range of finished sizes, (i.e. to allow varying amounts to be trimmed from unlipped edges during or after final fabrication), the original width of stiles/rails may be increased by up to 30mm.

- Where door edges are lipped, and have square edges, a maximum of 4mm may be trimmed from each lipped edge; but the minimum lipping thickness (defined in the Table above) must be maintained. If a greater adjustment is required, after fabrication, new lippings must be applied, complying with details for timber and adhesive in the Table above.

- Where doors are not lipped, a maximum of 4mm may be trimmed from each edge, after fabrication.

3.3.3 Glazed Leaf Door Assemblies (Single or Double Leaf)

Component		Material	Dimensions	Minimum Density *Note 8*
Leaf Framing	Stiles and Rails	Hardwood (NOT BEECH)	38mm wide *Note 9* x 42mm thick	650kg/m^3
Core 42 VL		Extruded solid board *Note 8 & 10*	42mm thick	490kg/m^3
Facings		HDF	5.8mm thick	750kg/m^3
Lippings not required on top/bottom edges. Optional on vertical edges of single leaf doors. Lippings MUST be fitted at meeting stiles of double leaf doors but are optional at hanging edges of double leaves.		Solid Hardwood (NOT Beech)	6-10mm thick square edges 25mm thick to accept 15mm rebate at meeting stiles	650kg/m^3
Adhesives	Leaf Framing	Staple fixed	–	–
	Facings	Urea Formaldehyde	–	–
	Lippings	Urea Formaldehyde	–	–
Optional additional decorative finishes (Only paint and lacquer approved on door edges)		Timber veneer, decorative plastic based laminate, PVC, to faces only; lacquer or paint	Maximum 2mm thick	–

Note 8 *Density of hardwood and facings to be minimum stated; or greater. Density of core to be as stated, but with a -5%/+10% variation permissible.*

Note 9 *Refer to additional notes, below, regarding width of stiles/rails*

Note 10 *Sauerland advise that their maximum height of core is 1978mm. If the door height is <2040mm, the core shall be a single piece, without joints. Where doors are taller than 2040mm, (up to the maximum approved herein), the core layer must include a 1978mm high piece and another smaller piece to achieve the overall height. The horizontal core joint MUST be positioned nearer to the bottom edge of the leaf; and the door must be marked (after trimming) to indicate the top/bottom. The core pieces must be cut neatly, and closely fitted, to avoid any gap at the joint. No other core joints are permitted.*

The following additional notes and limitations also apply for glazed door assemblies;

- Subject to the specifications in the table above, glazed door assemblies may be provided in single or double leaf door configurations.
- The machining of the core/framing members, and the assembly process, must ensure that gaps comply with the following limitations;
  - Gaps between core and the stiles shall be 1-2mm
  - Gaps between core and the rails shall be <1mm

- Where lippings are used, (see Table above), they shall be applied after the bonding of facings. The machining of the framing members, and the bonding process, must ensure that no gaps occur between the lipping and stiles/rails.

- Core thickness and facings MUST be selected/constructed in such a way that the minimum thickness of the door leaf is 54mm; prior to the addition of optional decorative finishes.

- Facings must not be formed using multiple layers of thinner facings.

- The width of stiles/rails, described in the Table above, refers to the minimum size that must remain after trimming at the factory, to form a specific leaf size. See also text below, regarding adjustment of door sizes.

- Where SINGLE LEAF doors also include a concealed ITS96 door closer, and/or a drop seal, (See Appendix D herein), two rails must be included at the top and bottom of the door, respectively. These hardware items have been tested in doors with the 42VT core and LVL framing. Subject to the limitations herein, they may be used in glazed doors with 42VL core types and hardwood framing; but ONLY in latched, single acting, single leaves.

Adjustment of door sizes;

- The minimum width of stile and rails, stated in the Table above, is the minimum width after trimming DURING fabrication, and the 'original' section size should be wider than stated, to allow for fabrication tolerances. If it is intended to manufacture a batch of doors to suit a range of finished sizes, (i.e. to allow varying amounts to be trimmed from unlipped edges during or after final fabrication), the original width of stiles/rails may be increased by up to 30mm.

- Where door edges are lipped, and have square edges, a maximum of 4mm may be trimmed from each lipped edge; but the minimum lipping thickness (defined in the Table above) must be maintained. If a greater adjustment is required, after fabrication, new lippings must be applied, complying with details for timber and adhesive in the Table above.

- Where doors are not lipped, a maximum of 4mm may be trimmed from each edge, after fabrication.

3.4 Frames

Timber frames, to the specifications given below, may be used across the complete range of approved sizes outlined in Appendix C, utilising the intumescent seal specification outlined in Appendix B. Limitations on use of the frames, detailed below, are detailed herein.

Material	Density	Minimum Face Width	Minimum Frame Depth	Minimum Stop Depth
		Single Acting		
Hardwood (Excluding Beech)	650kg/m³ *Note 11*	32mm, excluding stop *Note 12*	80mm	12mm *Note 13*
LVL Beech *Note 14 & 15*	730kg/m³ *Note 11*	40mm, excluding stop *Note 12*	79mm	25mm *Note 13*

Note 11 *Timber must have a minimum measured density at 12% moisture content. The timber must be straight grained and of appropriate quality in accordance with BS EN 942: 2007. The moisture content shall be 10 ± 2% for UK market, (or to suit internal joinery moisture content specification of export countries).*

Note 12 *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. See Section 3.8 regarding projecting frames and shadow gaps.*

Note 13 *The door stop is to comprise the same material as the door frame and may be either planted and pinned using 40mm steel pins, or integral with the main door frame, providing the minimum frame thickness remains as stated.*

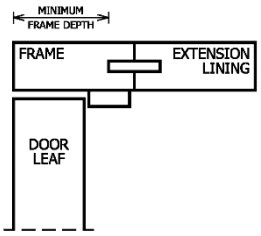
Note 14 *This framing option may ONLY be used for the following configuration; for which it has been tested and proven to provide a positive contribution to achieving 60 minutes fire resistance performance;*

- *LSASD (Latched Single Acting Single Door)*

Note 15 *This framing option may ONLY be used in conjunction with the twin seal arrangement as detailed in Appendix B.*

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 minimum frame depth outlined within this report.

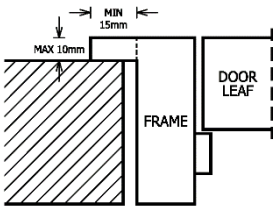
No joints permitted within the minimum frame depth section outlined within this report.



Head/jamb joint : Butt Jointed, 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.

Architraves : Where the face of the frame, and the door, are flush with the face of the wall, loose architraves are optional, and have no fire performance requirements, and so can be freely specified, subject to adequate fire stopping. (See Section 3.8 regarding wall/frame gaps).

As an option, an integral architrave may be used with doors that use a 42VL type core and hardwood framing; and ONLY with single leaf doors in frames formed from solid hardwood. The face of the door and frame may project beyond the face of the wall, providing the thickness of the architrave is no greater than 10mm and it projects at least 15mm beyond the rear face of the door frame. (This 15mm projection shall NOT be formed by machining into the minimum width of frame section, as defined in the Table, above, and the frame width shall be increased accordingly).



This assumes that the face of the door leaf is flush with the face of the architrave.

3.5 Glazed Apertures (Door construction as per Section 3.3.3)

The FD60 door design, (using the 42VL core only and hardwood framing), as described herein, has been tested with glazing and achieved 60 minutes fire resisting performance. Glazing and detailing shall comply with the following clauses.

3.5.1 Glass Types

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 3.5.2, although some restrictions on size may be given in subsequent sections.

The codes used, below, for the glass types, glazing materials, and bead types, (e.g. G60/1, S60/1 and B60/1), 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.

G60/1 7mm thick Pyroshield 2 (Pilkington)
G60/2 7mm thick Pyran S (Schott Glass)

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

3.5.2 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. (See also **Figure PAR/13211/03C:A01** in Appendix A for limitations).

S60/1 Lorient System 90 PLUS (use with glass G60/1 and G60/2)

3.5.3 Bead Profiles and Installation

The approved bead size and profile, and relevant fixing details, are shown on **Figure PAR/13211/03C:A01** in Appendix A.

The bead profile must extend so that it projects over the edge of the aperture. Beads must be secured within the aperture using screws as shown in **Figure PAR/13211/03C:A01** in Appendix A.

The glazing beads shall be formed from straight grained hardwood (not Beech) with 650kg/m³ minimum density (measured at 12% moisture content). Timber must be of appropriate quality in accordance with BS EN 942: 2007. Moisture content shall be 11 ± 2% for UK market, (or to suit internal joinery moisture content specification of export countries). Glazed apertures must include a 2mm thick Palusol liner as shown in **Figure PAR/13211/03C:A01** in Appendix A.

3.5.4 Assessed Aperture Sizes

Based upon the size of apertures tested, the following limitations apply to glazed apertures in the door leaves considered herein;

Maximum area of aperture	-	0.16m²
Maximum aperture height	-	530mm
Maximum aperture width	-	350mm
Minimum margin from leaf edge	-	150mm *Note 13*
Minimum distance between apertures	-	150mm

Note 13 *Where door height is greater than 2090mm, apertures shall not be positioned in the area of the leaf with a core joint; and the top margin shall be increased to 250mm. Use of certain hardware items may impose further limits upon margins; refer to Appendix D.*

3.6 Intumescent Seals

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

3.7 Ambient Temperature Smoke Seals

Independent smoke seals, (or combined intumescent/smoke seals using the specification approved in Section 3.9), 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 Section 3.6, in which case, the latter shall take precedence; and smoke sealing may not be effective.

Test evidence to BS476: Part 22: 1987 (or EN 1634-1) shall be available to demonstrate that the smoke seals will not adversely affect the overall fire resistance of timber door assemblies, of similar thickness design and materials to those proposed, when fitted in the proposed arrangements.

3.8 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.

General guidance for all items of hardware is outlined in Appendix D, based upon the range of items tested. All hardware beyond the scope of the general guidance given in Appendix D must have been subjected to fire resistance testing, and/or assessed by IFC, to support its use on door assemblies of the proposed type.

3.9 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.

The supporting construction shall be either blockwork, brickwork or concrete walls, but shall be of a type that has been tested or assessed to provide in excess of 60 minutes fire resistance at the required size when incorporating doorset openings.

No part of the rear of the frame section shall be exposed once installed, (except for integral architraves, where approved herein); and the frame 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.

This report only applies to scenarios where the frame is fully aligned within the plane of the fire-resisting wall/partition. The approval in this report does not apply where the wall/partition includes decorative 'cladding' on the face of the fire-resisting construction, (e.g. timber panelling on battens, or plasterboard on studs/dabs), such that any part of the frame is aligned within the plane of this decorative cladding. This detail is likely to adversely affect the fire resistance of the door assembly, and IFC should be consulted for specific advice, to determine upgrading measures that will be required in such cases.

The gap sealing between the supporting construction and timber frames should follow the recommendations given in Section 9.4 of BS8214: 2016, '*Timber-based fire door assemblies – Code of practice*', using a product proven in such timber applications.

The gap between the door and the frame or between meeting stiles of double doors, where applicable) should be 1.5–4mm. Gaps under the door(s) shall not exceed 6mm for fire performance, although, if smoke control is also required, these gaps shall only be 3mm, or smoke seals shall be included (see also Section 3.7 regarding suitability of smoke seals).

The door assembly shall be set 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. Leaves in double leaf assemblies shall be aligned with each other at the meeting stiles, when in the closed position.

4. CONCLUSION

Based upon an analysis of the available test evidence, it is demonstrated that, if the proposed FD60 Solid Core door leaves, installed in timber frames, were manufactured and installed within the limitations of this assessment, and tested for fire resistance, they would satisfy the integrity criteria of BS476: Part 22: 1987 for 60 minutes.

This Field of Application generally considers the scope of approval for door assemblies that may be installed in either orientation; i.e. with either face exposed to fire conditions. However, if the door includes a Vingcard lock or a threshold drop seal, then the direction of fire risk must be known and the hardware orientated accordingly (see parameters in Appendix D); subject to agreement with the Approving Authority.

5. DECLARATION BY THE APPLICANT

Reference: IFC Field of Application Report **PAR/13211/03 Revision C**

We the undersigned confirm that we have read and complied with the obligations placed on us by the

Passive Fire Protection Forum (PFPF)

Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence

2019

Industry Standard Procedure

We confirm that the component or element of structure, which is the subject of this assessment has not to our knowledge been subjected to a fire test to the standard against which this assessment is being made.

We confirm that the change which is the subject of this assessment has not to our knowledge been tested to the standard against which this assessment has been made.

We agree to withdraw this assessment circulation should the component or element of structure be the subject of a fire test to the standard against which this assessment is being made.

We understand that this assessment is based on test evidence and will be withdrawn should evidence become available that causes the conclusion to be questioned. In that case, we accept that new test evidence may be required.

We are not aware of any information that could affect the conclusions of this assessment.

If we subsequently become aware of any such information, we agree to ask International Fire Consultants Ltd (IFC) to withdraw the assessment.

Signature: _____

Name: Steffen Donath

Company: Sauerland Spanplatte GmbH + Co. KG

Date: 27.10.2020

6. 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 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 assessment is issued on the basis of test data and information to hand at the time of issue. If contradictory evidence becomes available to International Fire Consultants Ltd (IFC) the assessment will be unconditionally withdrawn and the applicant will be notified in writing. Similarly, the assessment evaluation is invalidated if the assessed construction is subsequently tested since actual test data is deemed to take precedence.

As per the guidance outlined in the Passive Fire Protection Forum (PFPF): *'Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence, 2019, Industry Standard Practise',* appropriate action has been taken to mitigate the risk of a conflict of interest arising during the preparation of this report. All individuals involved in the production, or subsequent review, of this assessment have declared any perceived conflicts of interest, with regards to the sponsor or subject(s) of this report, prior to working on this project.

The assessor and reviewer have been deemed suitable for involvement in the production of this assessment in accordance with the guidance outlined in the Passive Fire Protection Forum (PFPF): *'Guide to undertaking technical assessments of the fire performance of construction products based on fire test evidence, 2019, Industry Standard Practise'.*

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 shall 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.

The analysis and conclusions within this report are based upon the likely fire resisting performance of a complete 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 assemblies are installed, to ensure that no parts of the assembly are damaged or faulty. Door leaves must open and close without the use of undue force. The edge gaps/alignment must remain in accordance with the tolerances defined, herein.

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 assembly 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, shall only be carried out following consultation with the manufacturer and IFC.

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 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 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.

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 shall 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 Report is provided to the sponsor on the basis that it is a professional independent engineering judgement 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 a report 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 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 July 2024 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:

Will Lightfoot BEng (Hons) AIFireE
Senior Fire Safety Engineer
International Fire Consultants Ltd. (IFC)

Checked by:

Stan Parker BEng (Hons) AIFireE AIMechE
Fire Safety Engineer
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Checked by:

Chris Houchen BSc. AIFireE
Associate Director
International Fire Consultants Ltd. (IFC)

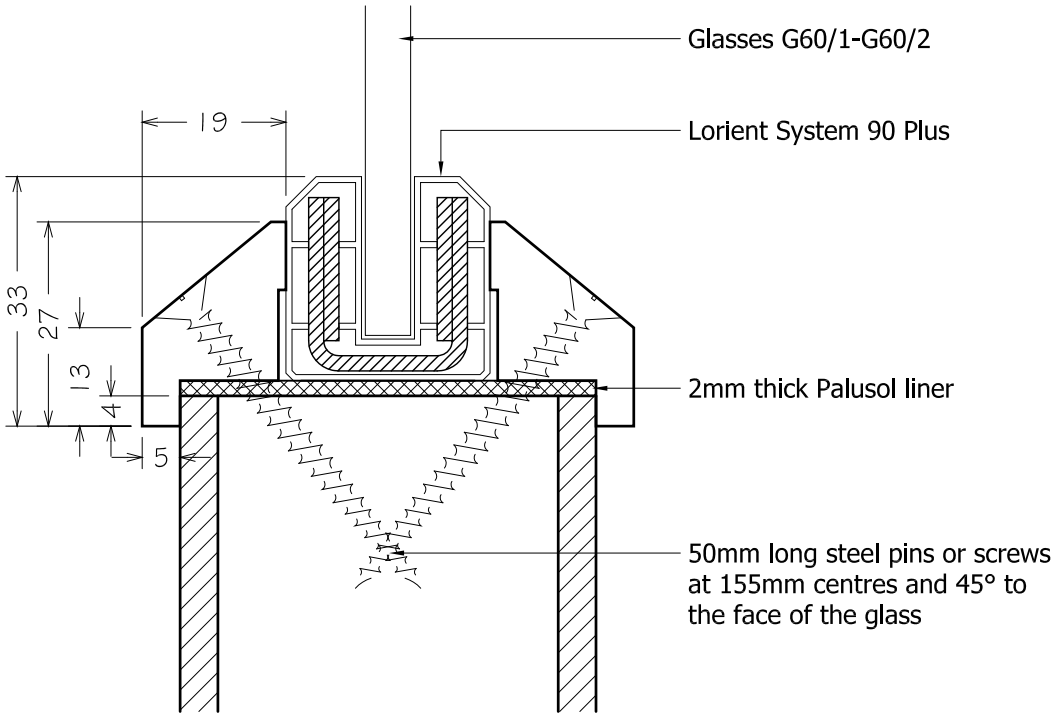
APPENDIX A

Glazing Details

(doors with 42VLcore and hardwood framing only)

Figure PAR/13211/03C:A01

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



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Field of Application Report
PAR/13211/03 Revision C
Sauerland Spanplatte GmbH & Co KG
FD60 Solid Core Installed in Timber Frames

Glazing Details

Job number: 21100	
Drawn by: PDB	Checked by: WL
Not To Scale	Drawn: Nov 2021

PAR/13211/03C:A01

APPENDIX B

Assessed Intumescent Seal Specifications
for Sauerland FD60 Solid Core Door Leaves
Installed in Timber Frames

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

Intumescent Seal Specifications for FD60 Solid Core Door Leaves Installed in Timber Frames

Single Leaves

Location	Size and Position	
	Specification A	**Specification B**
Stiles/jambs	1no 30 x 2mm seal fitted centrally in the frame reveal or leaf edge (see notes A and B below for intumescent specification)	2No. 15 x 2mm Kerafix Flexpan 200 seals fitted in the frame reveal, only, spaced 8mm apart and central to the thickness of leaf interface
Head	1no 30 x 2mm seal fitted centrally in the frame reveal or leaf edge (see notes A and B below)	2No. 15 x 2mm Kerafix Flexpan 200 seals fitted in the frame reveal, only, spaced 8mm apart and central to the thickness of leaf interface
Threshold	Not Applicable, unless a Planet automatic drop seal is fitted; in which case refer to Appendix D herein.	2No. 15 x 2mm Kerafix Flexpan 200 seals fitted in the door leaf, spaced 8mm apart and central to the thickness of leaf **or** Installation of Planet automatic drop seal as approved in Appendix D herein.

See next page for details of intumescent strips in double doors

Specification A:

The intumescent seals are generally to be Rokustrip graphite strips; being non-pvc encased seals at the sizes given above. As a further option, pvc encased graphite-based seals may be used, but they must be 4mm thick, rather than 2mm thick, and proportionally wider to accommodate the thickness of the pvc (i.e., 2mm wider per seal). Therefore, seals in pvc cases shall be a minimum of 32mm wide. Rokustrip seals shall be as tested, and all other graphite-based seals should be obtained from members of the Intumescent Fire Seals Association (IFSA). Combined intumescent/smoke seals may be used with the pvc-encased versions, maintaining the increased widths specified above (and subject to the conditions outlined in Section 3.7).

Specification A seals can be used with doors constructed as Section 3.3.1 and 3.3.3, but only when door framing is solid hardwood. However, if the doors also include a concealed closer and/or if the forend/strike of the latch is >60mm long, then Specification B seals must be used.

Continued overleaf

Specification B

Specification B seals must be used with doors constructed using door framing of LVL Beech, but otherwise as Section 3.3.1 and 3.3.3. Specification B must also be used whenever doors include a concealed closer and/or if the forend/strike of the latch is >60mm long, This is to provide the necessary 'protection' to the hardware. See also Appendix D, herein.

The intumescent seals are generally to be Kerafix Flexpan graphite strips; being non-pvc encased seals of the sizes given above. As a further option, pvc encased graphite-based seals may be used, but they must be 4mm thick, rather than 2mm thick, and proportionally wider to accommodate the thickness of the pvc (i.e., 2mm wider per seal). Therefore, seals in pvc cases shall be a minimum of 17mm wide. Kerafix Flexpan seals shall be as tested, and all other graphite-based seals should be obtained from members of the Intumescent Fire Seals Association (IFSA). Combined intumescent/smoke seals may be used with the pvc-encased versions, maintaining the increased widths specified above (and subject to the conditions outlined in Section 3.7).

Double Leaves

Location		Size and Position
Stiles/Jambs		1no 30 x 2mm seal fitted centrally in the frame reveal or leaf edge (see note A below for intumescent specification)
Head		1no 30 x 2mm seal fitted centrally in the frame reveal or leaf edge (see note A below)
Meeting stile	Square	2no. 10 x 2mm seals, centrally fitted, spaced 15mm apart in the active leaf edge (see note below) AND 1no. 10 x 2mm seal fitted 8mm from the push face so that it continues past the strike plate, and flush bolts, in the passive leaf (see note below)
	Rebated	1no 20 x 2mm seal fitted in the rebate of the lock/active leaf, abutting the upstand AND 1no 10 x 2mm seal fitted 10-12mm in from the leaf face in the rebate of the passive leaf
Threshold		Not Applicable

Specification C:

The intumescent seals are generally to be Rokustrip graphite strips; being non-pvc encased seals of the sizes given above. As a further option, pvc encased graphite-based seals may be used, but they must be 4mm thick, rather than 2mm thick, and proportionally wider to accommodate the thickness of the pvc (i.e. 2mm wider per seal). Rokustrip seals shall be as tested, and all other graphite-based seals should be obtained from members of the Intumescent Fire Seals Association (IFSA). Combined intumescent/smoke seals may be used with the pvc-encased versions, maintaining the increased widths specified above (and subject to the conditions outlined in Section 3.7).
Specification C seals can be used with doors constructed as Section 3.3.2 and 3.3.3. Double leaf doors are not approved with a concealed closer or if the forend/strike of the latch is >60mm long.

APPENDIX C

Assessed Leaf Size Envelopes

Figures PAR/13211/03C:C01 to C02

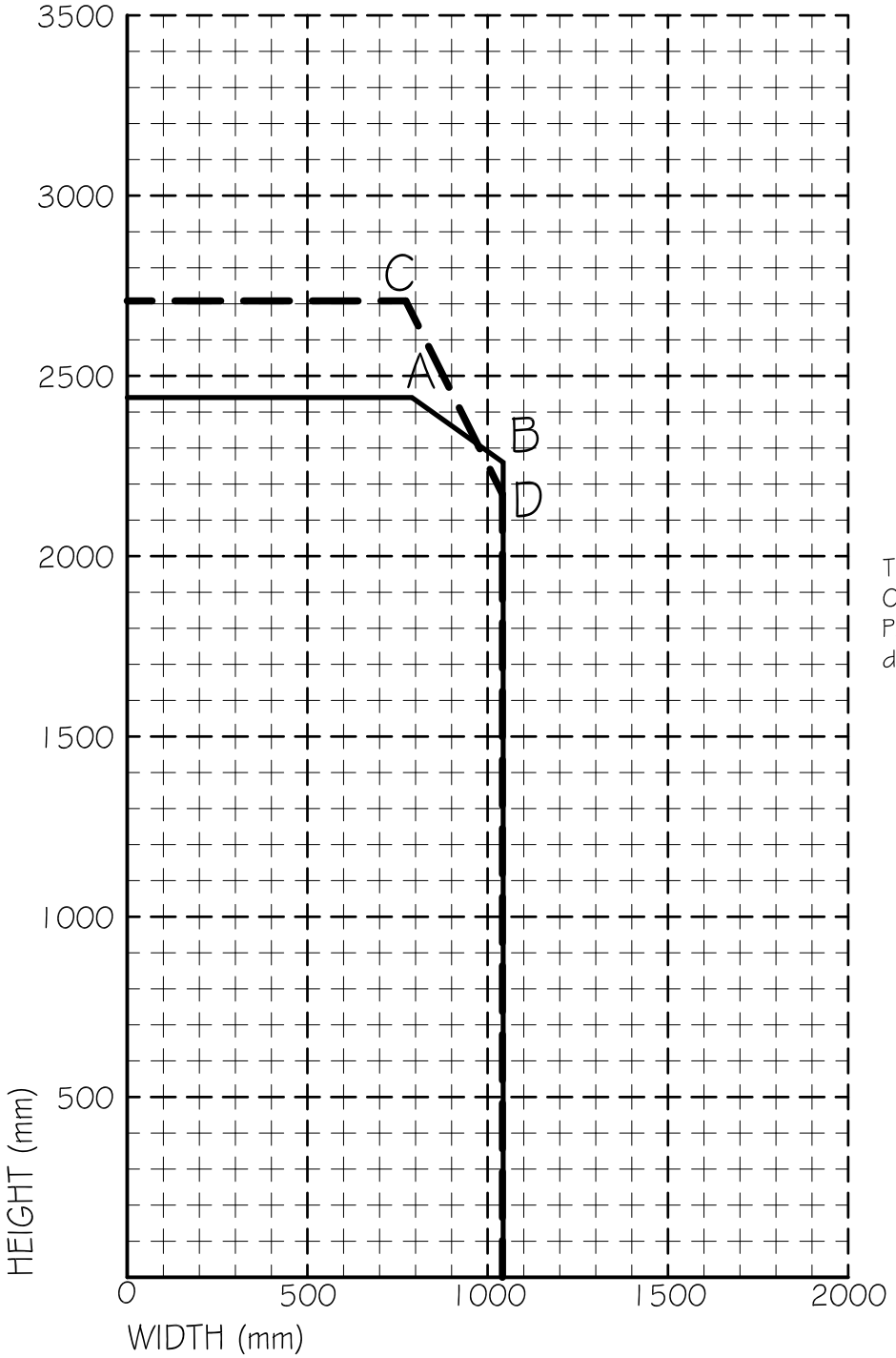
The figures in this Appendix are not included in the sequential page numbering of this report

	A	B
Width	790	1043
Height	2440	2260

Unglazed (Section 3.3.1) or Glazed (Section 3.3.3) Door Assemblies

	C	D
Width	773	1041
Height	2708	2172

Unglazed (Section 3.3.1) Door Assemblies



Configuration

Timber Frames

LATCHED
SINGLE ACTING
SINGLE LEAF
WITHOUT
OVERPANEL

REQUIRED INTEGRITY : 60 Minutes

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/13211/03 Revision C, which contains full details of the assessed door construction.

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 connecting line on the graph above are approved.

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

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

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Field of Application Report
PAR/13211/03 Revision C
Sauerland Spanplatte GmbH & Co KG
FD60 Solid Core Installed in Timber Frames

Envelope of Approved Door Leaf Sizes
LSASD
In Timber Frames

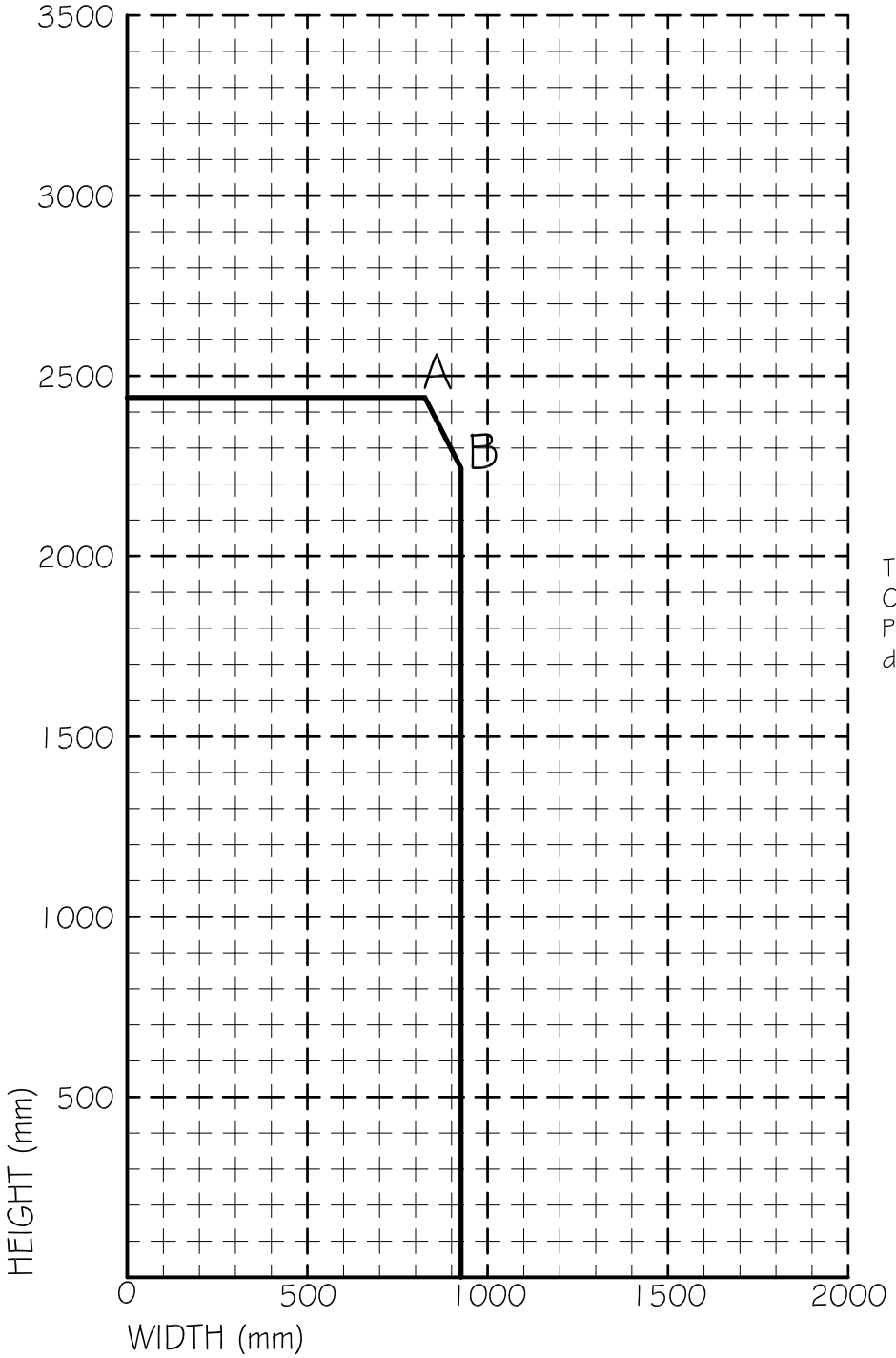
Job number: 21100

Drawn by: PDB	Checked by: WL
Not To Scale	Drawn: Nov 2021

PAR/13211/03C:C01

	A	B
Width	826	926
Height	2440	2240

Unglazed (Section 3.3.2) or Glazed (Section 3.3.3) Door Assemblies



Configuration

Timber Frames

LATCHED
SINGLE ACTING
DOUBLE LEAF
WITHOUT
OVERPANEL

REQUIRED INTEGRITY : 60 Minutes

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/13211/03 Revision C, which contains full details of the assessed door construction.

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 connecting line on the graph above are approved.
POINT A represents the maximum leaf height and its associated width.
POINT B represents the maximum leaf width and its associated height.

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Field of Application Report
PAR/13211/03 Revision C
Sauerland Spanplatte GmbH & Co KG
FD60 Solid Core Installed in Timber Frames

Envelope of Approved Door Leaf Sizes
LSADD
In Timber Frames

Job number: 21100

Drawn by: PDB	Checked by: WL
Not To Scale	Drawn: Nov 2021

PAR/13211/03C:C02

APPENDIX D

General Guidance on Installation of Hardware in Sauerland FD60 Solid Core Doors

General Guidance on Installation of Hardware

D.1 Hinges

The door design has been tested utilising steel butt hinges, and these are thus proven to make a positive contribution to the required 60 minutes integrity performance. Other types/makes of hinge may be used as alternatives, but ALL hinges must comply with the following specification:

Hinge types	:	Fixed pin, washered butt, ball bearing butt or journal supported hinges may be used. Hinges must be suitable for the weight and size of leaf.
Minimum number	:	3no per leaf on doors up to 2100mm high 4no per leaf on doors taller than 2100mm high
Positions	:	The top hinge must be positioned 150mm down from the head of the leaf to the top of the hinge and the bottom hinge positioned 225mm up from the foot of the leaf to the bottom of the hinge. The 3rd hinge may be equi-spaced between the top and bottom hinges, or 200mm below the top hinge. If 4 hinges are required, the middle two hinges are to be equispaced between the top and bottom hinge, or, if the second hinge is positioned 200mm down from the top hinge, the 4th hinge is to be equispaced between the 2nd and bottom hinge. (All positions ±25mm).
Fixings	:	Steel screws, as recommended by the hinge manufacturers, but in no case smaller than No 8 (3.8mm diameter) x 30mm long and having thread for the full length. Position of screws (in relation to the door face) in blades of alternative hinge types shall be similar to hinges tested with the proposed door type.
Hinge blade sizes	:	1.5–3.5mm thick x 89–110mm high x 32–38mm width. (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	:	Phosphor Bronze, Steel or Stainless Steel. (Aluminium, Nylon or 'Mazac' are not permitted.) No combustible or thermally softening materials to be included.
Additional protection	:	Hinge blades to be bedded on 1mm thick Interdens or 2mm thick Graphite. A 10mm width of the intumescent strip (in the frame or leaf edge) must be continuous alongside the hinge blades.

Rising butt, cranked butts, concealed hinges and spring hinges (single or double action) 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.

D.2 Mortice Latches

The door designs have only been tested with a mortice latch fitted. All doors within the scope of this report MUST include a latch, which shall be centred at 1000mm (± 200mm), above the bottom of the door leaf, and shall comply with the following specifications:

Latch types	:	Mortice tubular mortice latches (see clause D.5 for Vingcard Classic lock)	
Maximum dimensions (For use with single and double leaf door assemblies)	:	Forend plate:	60mm long x 25mm wide
		Latch body:	18mm thick x 60mm wide
		Strikeplate:	60mm long x 25mm wide
Maximum dimensions (For use with single leaf door assemblies using Specification B intumescent seals)		Forend plate:	235mm long x 20mm wide
		Latch body:	15mm thick x 95mm wide
		Strikeplate:	170mm long x 40mm wide

Materials : 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.

Additional protection : In single leaf assemblies using a **42VL** core and/or hardwood framing, the strikeplate shall be bedded on 2mm thick graphite-based intumescent material, and a 5mm width of the intumescent strip (in the frame) must be continuous alongside the edge of the strikeplate.

In single leaf assemblies using a **42VT** core and/or LVL framing, the strikeplate shall be bedded on 1mm thick Interdens type 15 sheet material, and an 8mm width of the intumescent strip (in the frame) must be continuous alongside the edge of the strikeplate. The lock body must also be wrapped in 1mm thick Interdens type 15 sheet material.

When installed in double leaf doors, (**42VL** core and hardwood framing only), the forend AND strikeplate shall be bedded on 2mm thick graphite-based intumescent material. A 10mm width of the intumescent strip in each leaf must be continuous alongside the forend and strikeplate, respectively.

Over-morticing is to be avoided; mortices should be as tight as possible to the latch. If gaps occur on either side of the case (but not exceeding 2mm), then these must be made good with intumescent mastic or sheet; (rounding to the top and bottom of the mortice is permitted). Holes for spindles should be kept as small as is compatible with the operation of the hardware.

Latches must be central in door thickness, ensuring that intumescent seals are continuous past the strikeplate and/or forend; as defined in the clauses, above, regarding "additional protection".

In rebated meeting stiles of double leaf doors, (**42VL** core and hardwood framing only) the latch and strikeplate are to be installed as in test WARRES 175295F, with minimal interruption/recessing to the rebated edge. Proprietary rebate conversion kits are not permitted unless further analysis is commissioned from IFC.

Where glazing apertures are also incorporated (in doors with **42VL** core and hardwood framing only) and are positioned such that latches are included in the margin between the 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 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 75mm to the edge of any aperture.

D.3 Overhead Door Closers

Where required by regulatory guidance, 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 series of standards.

Face-fixed overhead door closers (and accessories such as soffit brackets) that have been tested, assessed or otherwise approved for use on unlatched FD60 cellulosic door leaves 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.

Transom mounted or jamb mounted closers must not be incorporated into any of the door assemblies within the scope of this report.

It is essential that all closers fulfil the requirements of BSEN 1154:1997 and 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.

D.4 Concealed Door Closers

One type of concealed overhead closer has been considered for inclusion in the door assemblies approved herein. These are 'slide-arm' type closer, with the closer morticed into the head of the leaf and a single arm and roller acting in a slide channel morticed into the frame head. The closer is installed in a relatively deep mortice in the door head, with the slide channel in a mortice in the frame head. They are;

- Dorma ITS96 (size 2-4 model)

This closer has been tested in a door using the 42VT core and LVL framing. Subject to the limitations below, it may be used in doors using 42VL or 42VT core types, and with either LVL or hardwood framing; but ONLY in latched, single acting, single leaves.

The limitations are summarised thus;

- There shall be 2no rails at the head of the leaf. Material and density of rails shall be as defined in Section 3.3, herein.
- The door frame may be solid hardwood or LVL, as defined in Section 3.4 but the minimum stop depth shall be 25mm; as included in test evidence.
- Inclusion of intumescent gasket kit, around the closer body and under the top plate as tested in DMT-DO-50-776 and supplied by manufacturer.
- When using concealed closers in doors with glass openings, (doors with 42VL core only), the top margin between the door head and the aperture must be at least 200mm.
- In addition to the intumescent gasket kit a 155mm long x 35mm wide x 1.5mm thick Kerafix Flexpan 200 intumescent seal shall be included in the remainder of the recess in the door head, next to the closer, which is required for the arm of the closer; as tested in DMT-DO-50-776.
- 1mm thick Interdens lining the rebate of the slide rail, as tested in DMT-DO-50-776.
- Twin intumescent strips must be included, as defined in Appendix B. A minimum 8mm width of intumescent strips must be residual along both sides of the recess for the slide rail in the head of the frame.

This evaluation does not support the substitution of other concealed closers, including door jamb types, no matter how similar, nor does it support the use of the closer body fitted in the frame head.

D.5 Electro-mechanical Locks

A door using the 42VT core type and LVL framing has been tested with the following electronic mortise lock.

- Assa Abloy Vingcard Classic – Electronic Card Mortise Lock

This lock may be installed into the doors using the 42VL or 42VT core, and with LVL or hardwood framing; but ONLY in single leaf assemblies and must be installed in accordance with the following specifications.

- The components of the Assa Abloy Vingcard lock are arranged asymmetrically, and it is a requirement of this report that they are installed in the same orientation as that tested in test DMT-DO-50-776. This requires a single, known risk face of the assembly with the battery housing at the known exposed face of the assembly, as tested. (This concept must be agreed with the Approving Authority for each project).
- Over-morticing is to be avoided; mortices should be as tight as possible to the latch. If gaps occur on either side of the case (but not exceeding 2mm), then these must be made good with intumescent mastic or sheet; (rounding to the top and bottom of the mortice is permitted). Holes for spindles should be kept as small as is compatible with the operation of the hardware.
- Additional intumescent protection must be included, with 1mm thick Interdens encasing the latch body and fitted beneath the strike plate.
- Latches must be central in door thickness, ensuring that 8mm width of intumescent seals are continuous past the strike plate; as tested.

D.6 Bolts (passive leaf of double leaf assemblies)

Bolts MUST be fitted to the passive leaf of all double door assemblies. Unless specific fire test evidence is available, all bolts shall be steel. The following limitations and protection apply to all bolts;

- For use in 42VL core types only.
- Maximum size of flush bolt is 250mm long x 20mm wide and 21mm deep;
- A minimum 10mm width of intumescent strip shall be continuous alongside the keep plate, in the head of the frame;
- Where doors have rebated meeting edges, edge-fixed flush bolts shall be positioned centrally in the rebate in the passive leaf. The 10 x 2mm intumescent seal defined in Appendix B shall also be fitted in the rebate of the passive leaf, and it is acceptable for this to be interrupted.
- Where doors have square meeting stiles, edge-fixed flush bolts shall be positioned slightly offset in the leaf thickness and shall be positioned to ensure that the 10mm wide intumescent seal in the passive leaf is continuous past the bolt.
- Face fixed flush bolts shall be fixed so that there is a minimum of 50mm between the bolt and the door edge, and any glazed aperture;
- Surface mounted barrel bolts shall not exceed 400mm in length, but there is no limitation on their width. Screws for fixing barrel bolts must be at least 25mm long and have thread for the full screw length. Surface mounted barrel bolts shall only be used on the unexposed face of a door leaf.

D.7 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.

D.8 Door selectors

These are used on double leaf door assemblies, and therefore **42VL** core type only, to ensure that the leaves close in sequence. Only face fixed items are approved. Door selectors must not be recessed into the leaf or frame and must not intrude into the door edge interface or interrupt any intumescent strips. When fixing components to the face of doors, care must be taken to ensure that screws do not cause delamination of lippings and/or splitting of timber.

D.9 Lever Handles

Material	Metal/alloy – should not contain any flammable materials
Specific Installation Requirements	Holes through the leaf shall be as close fitting as possible to the spindles and/or fixing screws; which must be steel. When fitting lever handles to glazed doors, screws to fix handles to the door must be at least 35mm away from the visible edge of the glazing bead.
Intumescent protection	None required
Additional Notes	This generic approval only applies to traditional 'mechanical' lever handles and does not apply to electro-mechanical handle-sets (with security access functions), which must be the subject of independent fire testing, and further analysis by IFC; except for Vingcard locks in 42 VT doors, as approved herein.

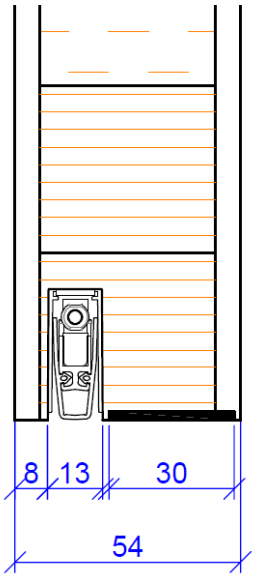
D.10 Automatic Drop Seals

The following drop seal has been tested in a door with the 42VT core and LVL framing. Subject to the limitations below, the drop seal may also be used in doors with either 42 VL or 42 VT core types, and with LVL or hardwood framing; but ONLY in latched, single acting, single leaves.

- Planet (Ref: HS)

Subject to the following limitations;

- The drop seal shall be installed in a groove 13mm wide x 31mm deep in the bottom edge of the leaf.
- The centre of the groove shall be located 39.5mm from the face of leaf exposed to the heating conditions.
- The drop seal may be used with either core type approved herein but only when installed with a double bottom rail. Material and density of rails shall be as defined in Section 3.3 herein.
- Additional intumescent protection is not necessary around the recess for the drop seal
- The drop seal in isolation may only be installed in door leaves when a single known direction of risk can be identified; (and agreed with the Approving Authority for each project). For instances where the direction of risk is unknown, the drop seal shall be installed adjacent to a 30mm x 2mm thick Kerafix Flexpan 200 intumescent seal. See figure below;



APPENDIX E

Summary of Primary Fire Test Evidence

Test Report	Configuration Tested	Leaf Size	Test Standard	Integrity
WF175295 Doorset A	**LSASD (with glazed aperture)**	**2040 x 928 x 54mm (42VL core and hardwood framing)**	**BS 476: Part 22: 1987**	**Integrity – 71 minutes Insulation – 71 minutes**
DMT-DO-50-776 Doorset A	**LSASD (with mechanical latch)**	**2400 x 928 x 54mm (42VT core, including core joint, and LVL framing)**	**EN 1634-1: 2014+A1: 2018**	**Integrity – 60 minutes Insulation – 55 minutes**
DMT-DO-50-776 Doorset B	**LSASD (with concealed closer, Vingcard latch; and drop seal)**	**2400 x 928 x 54mm (42VT core, including core joint, and LVL framing)**	**EN 1634-1: 2014+A1: 2018**	**Integrity – 65 minutes Insulation – 62 minutes**

Summary of Secondary Fire Test Evidence

Test Report	Configuration Tested	Leaf Size	Test Standard	Integrity
WF175295 Doorset B	**LSADD (with glazed aperture)**	**2400 x 900 + 450 x 54mm (42VL core, including core joint, and hardwood framing)**	**BS 476: Part 22: 1987**	**Integrity – 59 minutes Insulation – 59 minutes**

LSASD = Latched, Single Acting, Single Leaf Doorset
LSADD = Latched, Single Acting, Double Leaf Doorset

Note: *Fire test evidence from glass and intumescent seal manufacturers has also been considered when preparing this report.*

Note: *The cause of integrity failure in test 175295 (Doorset B) has been identified and resolved as part of the analysis for the approvals in this report.*

The test evidence referenced in this Engineering Assessment Report is more than 5 years old. In accordance with industry practice, IFC have reviewed this test evidence, and have concluded that the evidence is still valid, and suitable to form the basis of this approval.