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IFC FIELD OF APPLICATION REPORT

PAR/12033/01 Revision B

Fire Resistance Standard: BS476: Part 22: 1987

Primary Sponsor:

Sauerland Spanplatte GmbH

Secondary Sponsor:

Acoustic and Fire Door Solutions Ltd

ASSESSED PRODUCT/SYSTEM:

Sauerland S3K FD30 Timber-Based Three Layer Door Leaves Installed in Timber Frames

ASSESSED PERFORMANCE:

30 minutes fire resistance – Integrity only

ISSUE DATE:	EXPIRY DATE:
January 2022	January 2027

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Prepared on behalf of:	Sauerland Spanplatte GmbH Spanplattenwerk GmbH Muehlhauser Strasse 9 D-99867 Gotha
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ISSUE RECORD

REV	DATE	AUTHOR	REVIEW	AMENDMENTS
-	July 2012	DC	DJI	-
A (#15735)	October 2016	WL	DC	Inclusion of additional test evidence and associated changes
B (#22517)	January 2022	SP	CPH	Change of report ownership* Addition of 23mm Pyrostop and associated glazing medium Alterations to approved leaf construction Removal of CGI glazing types Removal of concealed closer approval Reduction of approved glazing aperture size

**Sauerland Spanplatte have taken full ownership of this assessment and Acoustic and Fire Door Solutions are included as a co-sponsor in name only. Both companies have agreed that Sauerland retain full legal ownership and will have the final say in any decisions relating to future revisions of this assessment.*

CONTENTS

1. INTRODUCTION

This report has been prepared by International Fire Consultants Ltd (IFC), on the instruction of Sauerland Spanplatte, to define the Field of Application of Sauerland S3K timber-based three layer core door leaves installed in timber frames, that are required to provide 30 minutes fire resistance performance, when adjudged against BS 476: Part 22: 1987.

This assessment has been produced using the principles outlined in the Passive Fire Protection Forum (PFPF): 'Guide to undertaking technical assessments of fire performance of construction products based on fire test evidence, 2021, 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 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 the tests summarised herein.

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, that being with either face exposed to fire conditions.

2. TEST EVIDENCE

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

All 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.

The test standard BS EN 1634-1 has been revised several times since the original testing, and the current version is 2014 + A1: 2018; but the revisions to the test standard do not affect the opinions in the Assessment Report.

Comparison of EN 1634-1 and BS476: Part 22: 1987 test methods

The appropriate performance of fire resisting doorsets is defined in Approved Document B of the Building Regulations, the Scottish Building Standards Technical Handbook or the Building Regulations (Northern Ireland).

Table C1 in Appendix C of Approved Document B, which applies to England and Wales, identifies doorsets by their performance under test to BS EN 1634-1 or BS476: Part 22: 1987, in terms of integrity for a period of minutes, (e.g. E30/E60, if their performance is measured in terms of EN 1634-1, or FD30/FD60 for BS476: Part 22: 1987). It should be noted that a suffix (S) is added for doors where restricted smoke leakage at ambient temperatures is needed. The Scottish and Northern Ireland documents also refer to the British and European Standards in Section 2D and Section B3 respectively of these documents.

These guidance documents thus give a parity of performance between the two test methods, and although the EN 1634-1 and the BS476: Part 22: 1987 test procedures are both generally based upon the ISO 834 fire resistance test method, there are differences. The major ones are thus;

a. 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 BS476: Part 22: 1987 test, and therefore the heat input is higher than that given in BS476 at any given time during approximately the first 15 minutes of a fire resistance test.

b. The furnace pressure in the EN 1634-1 test is neutral at a position 500mm above the threshold, compared to a nominal 1 metre in the BS476: 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.

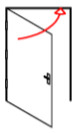
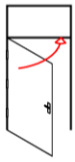
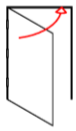
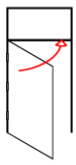
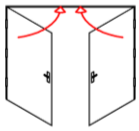
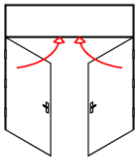
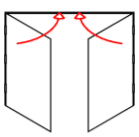
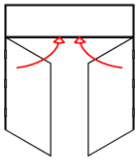
There are other minor procedural matters that also increase the severity of the EN method. These, combined with the issues identified in a) and b) above, mean that the EN 1634-1 test is generally accepted as being a more onerous test than BS476: Part 22: 1987. This is borne out by IFC's experience of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

As such, it is our opinion that any test results on doorsets tested to EN 1634-1 can be utilised in situations requiring a performance defined against the BS476: Part 22 test method, or when making assessments and judgements against the BS476 criteria, but not vice versa.

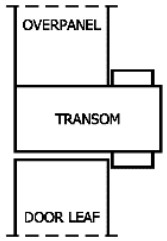
3. SCOPE OF APPROVAL

3.1 Door Assembly Configuration

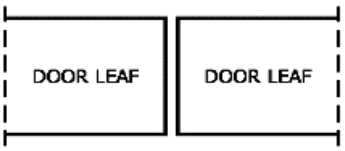
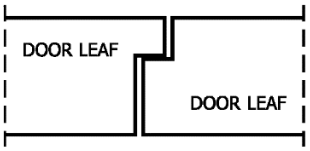
The approved leaf sizes and configurations of door assemblies comprising Sauerland S3K door leaves are outlined below:

CONFIGURATION		ENVELOPE OF APPROVED LEAF SIZES
	• Latched • Single Acting • Single Door • Without Overpanel	**Figure PAR/12033/01B:A01in Appendix A**
	• Latched • Single Acting • Single Door • With Transommed Overpanel Note 1	**Figure PAR/12033/01B:A01 in Appendix A**
	• Unlatched • Single Acting • Single Door • Without Overpanel	**Figure PAR/12033/01B:A01 in Appendix A**
	• Unlatched • Single Acting • Single Door • With Transommed Overpanel Note 1	**Figure PAR/12033/01B:A01 in Appendix A**
	• Latched • Single Acting • Double Doors Note 2 • Without Overpanel	**Figure PAR/12033/01B:A02 in Appendix A**
	• Latched • Single Acting • Double Doors Note 2 • With Transommed Overpanel Note 1	**Figure PAR/12033/01B:A02 in Appendix A**
	• Unlatched • Single Acting • Double Doors Note 2 • Without Overpanel	**Figure PAR/12033/01B:A02 in Appendix A**
	• Unlatched • Single Acting • Double Doors Note 2 • With Transommed Overpanel Note 1	**Figure PAR/12033/01B:A02 in Appendix A**

Note 1 Single acting door assemblies in timber frames which include transomed overpanels, must incorporate the following junction between leaf head and overpanel.

Leaf/overpanel interface separated by a transom member	

Note 2 Double leaf door assemblies within the scope of this Field of Application Report must have square edged or unequally rebated meeting stiles. Unequal rebated meeting edges to have a 35/18mm split.

Square edged meeting stiles		Unequally rebated meeting stiles
	Or	

3.2 Maximum Assessable Door Leaf Sizes

The calculated envelopes of assessed leaf dimensions for each door assembly configuration covered by this Field of Application Report are given in Appendix A, based upon using the intumescent seal specifications shown in Appendix A and Section 3.9.

Double door assemblies may comprise leaves of the same width, up to the maximum width indicated in Appendix A. For latched/bolted unequal pairs, there is no limit on the ratio of leaf widths, (although the large leaf must still be within the limitations outlined in Appendix A). For unlatched unequal pairs, the width of the small leaf shall not be more than 200mm smaller than that of the large leaf (although the large leaf must still be within the limitations in Appendix A). The width of the small leaf shall not be less than 250mm, since this will affect its vertical stability relative to that of the larger leaf.

3.3 Door Leaf and Overpanel Specification

The full constructional details of the Sauerland S3K timber door and overpanel design is outlined in the table below, based upon the details contained within the test evidence referenced in Appendix C, 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.

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.

Component		Species/Product	Dimensions		Minimum Density
Sauerland S3K Core– 3 layers of 13mm particleboard with 3mm cork facings		Extruded Particleboard Note 4	45mm	3no. 13mm thick layers	510kg/m^3
		Cork		2no. 3mm thick layers	200kg/m^3
Between sections of the core (if present)		Therm-A-Line	2mm thick x 45mm wide		–
Between the core and perimeter timber sections					
Perimeter timber (stiles and rails)		Softwood (solid or finger-jointed) **or** Hardwood (solid or finger-jointed)	2no. 45mm thick x 32 – 38mm wide		450kg/m^3
			2no. 45mm thick x 40mm wide		660kg/m^3
Facings		Chipboard	4mm thick		650kg/m^3
		MDF/HDF			730kg/m^3
Lippings Note 5	Hanging, closing and flush meeting edges	Hardwood	4 – 8mm thick		650kg/m^3 Note 6
	Rebated meeting edges		16.5 – 27.5mm thick, to accommodate a 12mm high unequal rebate (18mm/35-39mm split)		
Fixings	Between layers of core	Factory supplied clamps	–		–
	Between core and perimeter timber and fixing perimeter timber together on both sides	Staples (aluminium or steel)	Minimum 20 x 12mm		–
Adhesives	Facing to core	UF, PVA-D3 or Apollo A7561	–		–
	Lippings	PVA-D3, Apollo A3727, or Impact adhesive Apollo A9331	–		–
Optional additional decorative finishes		Timber veneer, decorative plastic based laminate, PVC or paint	Maximum 2mm thick		–

Note 4 Only 1 horizontal and 1 vertical butt joint of the 3-layer core is permissible.

Gaps between the core and stiles/rails shall be kept to a minimum, but shall not exceed 1.5mm at any edge.

Note 5 Lippings to be fitted to the vertical edges of each leaf and/or overpanel, but can be fitted to all four edges, if required. Lippings to be applied after the faces are bonded to the core elements.

Note 6 Lippings to be straight grained hardwood, 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.

3.4 Frames

Timber frames, to the specifications given below, may be used across the complete range of approved sizes and configurations outlined in Appendix A, utilising the intumescent seal specification outlined in Appendix A and Section 3.9.

MATERIAL	MINIMUM DENSITY	MINIMUM FACE WIDTH	MINIMUM FRAME DEPTH	MINIMUM STOP DEPTH
Softwood or Hardwood	490kg/m^3 Note 9	32mm, excluding stop Note 11	70mm	12mm Note 12
MDF	730kg/m^3 Note 10	30mm, excluding stop Note 11	70mm	12mm Note 12

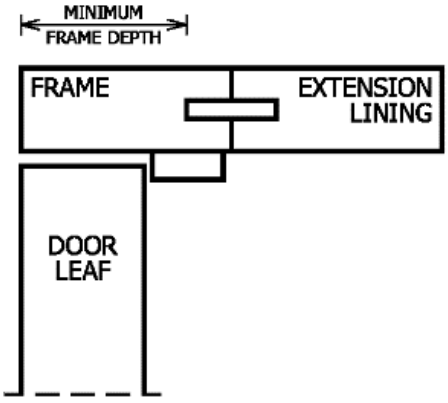
Note 9 Timber must have a minimum measured density at 12% moisture content. The timber must be straight grained and of appropriate quality in accordance with BS EN 942: 2007. The moisture content shall be 11 ± 2% for UK market, (or to suit internal joinery moisture content specification of export countries).

Note 10 MDF to have a minimum measured density at 12% moisture content.

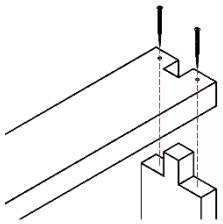
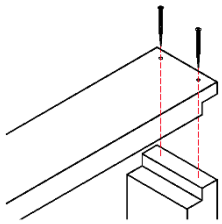
Note 11 These dimensions assume that the rear of the frame is protected by the adjacent wall, (and firestopping), and that the frame does not project out from the wall. See Section 3.8 regarding projecting frames and shadow gaps.

Note 12 The door stop is to comprise the same material as the door frame and may be either planted and pinned using 40mm steel pins at nominally 300mm centres, or integral with the main door frame, providing the minimum frame thickness remains as stated.

The overall frame depth may be increased by the use of extension linings, but the joint between the main frame and the extension lining must not intrude in the plane of the door thickness.

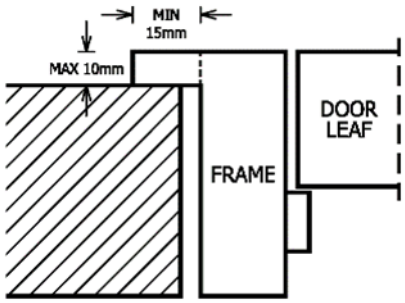


HEAD/JAMB JOINT: Mortice and tenon, or half-lapped joint, head twice screwed to each jamb.

MORTICE AND TENON JOINT		HALF-LAPPED JOINT
		

LOOSE 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).

INTEGRAL ARCHITRAVES: Integral architraves are permitted, providing the architrave is no greater than 10mm thick and extends at least 15mm beyond the rear face of the door frame. This assumes the that the face of the door leaf is flush with the face of the architrave.



TRANSOM MEMBERS	When a transom is used between a door and an overpanel in single acting door assemblies, the member shall be at least 70 x 32mm, and shall include minimum 12mm thick door stops on both sides (i.e. making a minimum 70 x 56mm thick overall section). In double acting door assemblies, the transom shall be at least 70 x 44mm. The transom must be fixed to the jambs with a mortice and tenon, or half-lapped joint. The overpanel must always be on the same plane as the door(s) below.

3.5 Glazed Apertures

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. G30/1, S30/1 and B30/1), are not those used by the respective manufactures, and are attributed solely by IFC for the purpose of identification and cross-referencing within this assessment.

- G30/1 7mm thick Pyrobelite (AGC Flat Glass)
- G30/2 12mm thick Pyrobelite (AGC Flat Glass)
- G30/3 23mm thick Pyrostop (Pilkington)*

*This glazing type has been successfully tested in a Sauerland 45S3D door assembly in test ref: Chilt/RF 13011A. The door construction has been deemed similar enough to the Sauerland S3K assemblies detailed in this doorset to include G30/3 as an approved glazing option.

Expansion allowances 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.

- S30/1 10 x 2mm Therm-A-Glaze 45 by Intumescent Seals Ltd with the glass perimeter pointed with Sealmaster Fireglaze mastic
- S30/2 10 x 5mm Sealed Tight Solutions ST105GT glazing system
- S30/3 10 x 2mm Kerafix 2000 ceramic glazing tape by Kuhn [Note 14]

Note 14 Glazing system S30/3 can only be use with glass type G30/3.

3.5.3 Bead profiles and installation

The approved bead size and profile, and relevant fixing details, are shown in **Figure 1**, below.

- B30/1 24.5-26.5mm deep x 26mm high hardwood (minimum density 630kg/m^3) glazing bead with a 12-15^o chamfered top, including a 5mm thick x 11mm deep bolection moulding.

Glazing beads formed from timber with 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 11 ± 2% for UK market, (or to suit internal joinery moisture content specification of export countries).

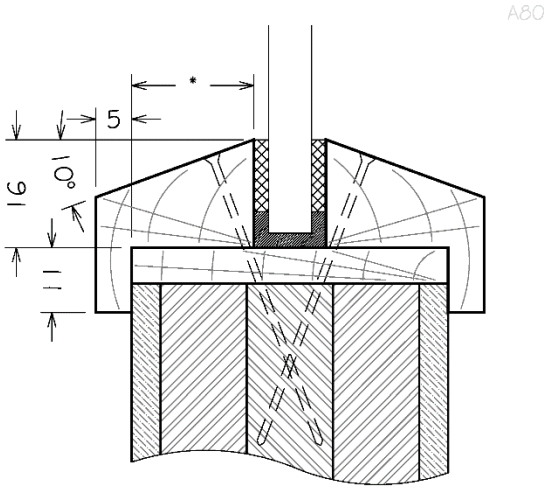


Figure 1

3.5.4 Assessed aperture sizes

Apertures are created by cutting directly into the door slab, which is subsequently lined with 6mm thick hardwood (minimum density 630kg/m^3) which is retained in position via the pinning of the beads directly to the S3K 'core'.

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

Maximum area of apertures	-	0.40m² Note 15
Maximum area of single aperture	-	0.27m² Note 15
Maximum vertical length of aperture	-	920mm
Maximum horizontal length of aperture	-	340mm
Minimum distance from leaf edge (top)	-	145mm
Minimum distance from leaf edge (sides)	-	145mm
Minimum distance between apertures	-	240mm
Minimum distance from bottom of leaf	-	145mm

Use of certain hardware items may impose further limits upon margins; refer to Appendix D.

Note 15 Any aperture(s) for intumescent air transfer grilles, (see Appendix B), must also be included in the total area permitted for apertures given above. Margins between apertures apply whether for glazing or grilles.

3.6 Overpanels

Overpanels must be separated from the leaf heads by a minimum 32mm thick transom member to the specification outlined in Section 3.4 with intumescent seals fitted around the overpanel perimeter as defined in Appendix A and Section 3.9. The installation shall be as defined in Section 3.8.

The size of overpanels is limited to the full width of the leaf/leaves contained within the door assembly and the following maximum height:

Single leaves:	-	2000mm high
Double leaves:	-	1500mm high

In all cases, the overpanel must be a single piece panel across the frame width. Approval of an overpanel size by IFC does not indicate that such a size can be fabricated, this should be checked with the manufacturer, and will be subject to the ability of the supporting construction providing adequate restraint/support. The overpanel must always be on the same plane as the door(s), below.

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.

General guidance for all items of hardware is outlined in Appendix B, based upon the range of items tested. All hardware beyond the scope of the general guidance must have been subjected to fire resistance testing, in accordance with BS:476: Part 22: 1987 or EN1634-1, and/or assessed by IFC to support its use in door assemblies where the leaf construction and thickness, and all details at the frame interface, are similar to those proposed herein.

3.8 Installation, Supporting Construction and Door Edge Gaps

The frames must be fixed back to the supporting construction with steel fixings at centres not exceeding 600mm on the vertical edges (minimum 200mm from the top and bottom), and a minimum of one fitted centrally across the width of the frame head of double doors. 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 may be timber or steel stud plasterboard partition, blockwork, brickwork or concrete walls, but shall be of a type that has been tested or assessed to provide in excess of 30 minutes fire resistance, at the required size, when incorporating door 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.

Note 16 Reference to steel stud partitions is in the context of permanent elements, such as those designed and proven by the plasterboard manufacturers, with plasterboard on both faces of the studs. 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.

No part of the rear of the frame section shall be exposed once installed, and leaves must not project beyond the exposed face of the door frame, unless an integral architrave is being used (see Section 3.4).

There shall be no feature rebates or shadow gaps at the junction of the frame and wall with timber frames (such features could, however, be assessed on an individual basis).

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 only exception to this would be in circumstances where a door frame with an integral architrave is being used (see Section 3.4).

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 (and between any doors and overpanel, where applicable) shall 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 3.10 regarding suitability of smoke seals).

The door assembly design shall be such that, when closed, single acting leaves are fully flush within the frame and double acting doors should be centred on the frame depth. The face of leaves in double door assemblies shall be flush with each other at meeting stiles, when closed.

Overpanels shall be secured into the frame using steel screws fixed through the rear of the frame members, passing at least 40mm into the centre line of the overpanel thickness. (Screws must not be fixed through the overpanel into the stops, or vice versa). Screws must be no more than 100mm from each corner of the overpanel, and at maximum 400mm centres, with a minimum of 2no. screws per overpanel edge. The gap between overpanel and frame should not exceed 3mm.

3.9 Intumescent Seals

Graphite based or Lorient 617, pvc encased seals manufactured by Mann McGowan Fabrications Ltd, Lorient Polyproducts Ltd, Intumescent Seals Ltd, Pyroplex or Sealed Tight Solutions may be employed across the complete range of door sizes and configurations approved herein. (Although options of product/manufacturer are approved, all seals in each door assembly must be the same brand.) It is recommended that the intumescent seals are manufactured or supplied by members of the Intumescent Fire Seals Association (IFSA) or that the product is included in a Third Party Certification scheme, such as that provided by IFC Certification, to ensure product quality and consistency.

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

Intumescent protection is required for specific items of building hardware, and this is detailed in Appendix B based upon details tested.

3.10 Ambient Temperature Smoke Seals

Smoke seals, or combined intumescent/smoke seals (using the specification approved in Appendix B), 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 A, in which case, the latter shall take precedence; and smoke sealing may not be effected.

Test evidence to BS476: Part 22: 1987 (or EN1634-1) shall be available to demonstrate that the smoke seals will not adversely affect the overall fire resistance of timber door assemblies, of similar design and thickness, when fitted in the proposed arrangements.

4. CONCLUSION

Based upon the available test evidence, and subsequent analysis performed by International Fire Consultants Ltd, if the proposed door assemblies utilising Sauerland S3K door leaves installed in timber frames 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.

Partially insulating door assemblies are determined using the criteria given in Section 7 of BS476: Part 22: 1987. These assemblies are evaluated as partially insulating door assemblies on the basis that the 'solid' part of the leaf satisfies the temperature criteria given in section 10.4 of BS 476: Part 20: 1987 and any non-insulating features, such as glazing, are less than 20% of the surface area of the leaf. The assemblies outlined, herein, are permitted to have glazed areas and air transfer grilles, and so could, therefore, be evaluated to this standard if the maximum total aperture area is less than 20% of the leaf size.

This Field of Application Report considers that the door assemblies within the scope approval, herein, may be installed in either orientation and so be exposed to fire conditions from either face.

5. DECLARATION BY THE APPLICANT

IFC Engineering Assessment Report	PAR/ 22517/01 Revision B
Client	Sauerland Spanplatte GmbH
Client Address	Spanplattenwerk GmbH Muehlhauser Strasse 9 D-99867 Gotha

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

Passive Fire Protection Forum (PFPF) - Industry Standard Procedure 2021

'Guide to Undertaking Technical Assessments of Fire Performance of Construction Products Based on Fire Test Evidence'

- 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 the assessing authority to withdraw the assessment.

Signature	
Name	
Position	
Company name	Sauerland Spanplatte GmbH
Date	

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.

It is the responsibility of others to establish whether the proposed product meets any other relevant requirements, including any other requirements for fire performance and life safety, as defined in documents such as the Building Regulations, and the Fire Strategy/Risk Assessment for the project.

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 fire performance of construction products based on fire test evidence, 2021, Industry Standard Procedure'*, 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 fire performance of construction products based on fire test evidence, 2021, Industry Standard Procedure'*.

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 is not intended to be a complete specification for the proposed assemblies and it is the responsibility of others to ensure that the assemblies are suitable for the intended purpose; whilst incorporating the requirements of this report. Further, the assemblies must be manufactured/installed by experienced/trained personnel using appropriate and established working practices/techniques.

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 evaluation as to what the fire performance of the construction/system would be should it to be tested to the named standard. It is IFC's experience that such an evaluation 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.

The assessment is valid initially for a period of five years after which time it is recommended that it be submitted to International Fire Consultants Ltd for re-evaluation. For this reason, anyone using this document after January 2027 should confirm its ongoing validity.

This assessment report is not valid unless it incorporates the declaration, in Section 5, duly signed by the applicant.

Prepared by:

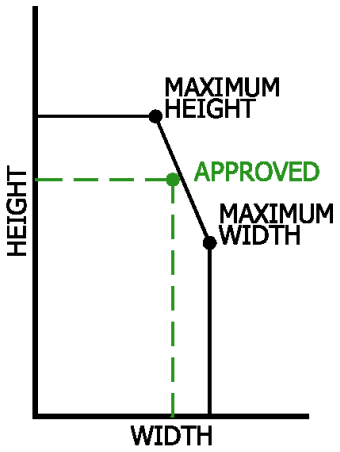
Stan Parker
BEng (Hons) AIFireE AIMechE
Fire Safety Engineer
International Fire Consultants Ltd. (IFC)

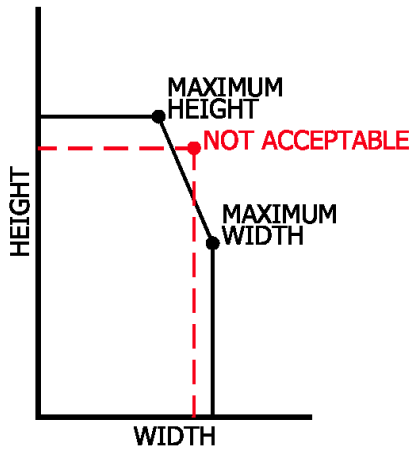
Reviewed by:

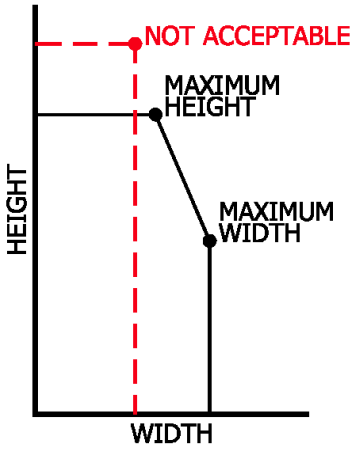
Chris Houchen
BSc AIFireE
Associate Director
International Fire Consultants Ltd. (IFC)

APPENDIX A - LEAF SIZE ENVELOPES AND INTUMESCENT SPECIFICATIONS

Description	Code
Latched, Single Acting, Single Leaf	LSASD
Latched, Single Acting, Single Leaf with Transommed Overpanel	LSASD+TOP
Unlatched, Single Acting, Single Leaf	ULSASD
Unlatched, Single Acting, Single Leaf with Transommed Overpanel	ULSASD+TOP
Latched, Single Acting, Double Leaf	LSADD
Latched, Single Acting, Double Leaf with Transommed Overpanel	LSADD+TOP
Unlatched, Single Acting, Double Leaf	ULSADD
Unlatched, Single Acting, Double Leaf with Transommed Overpanel	ULSADD+TOP







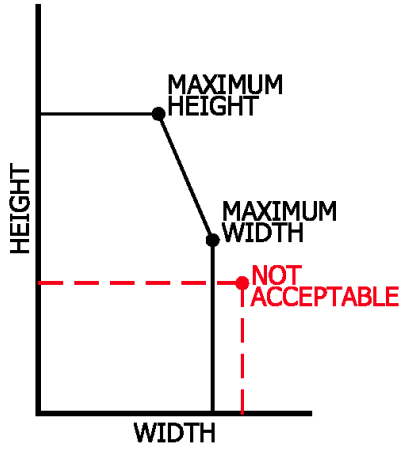
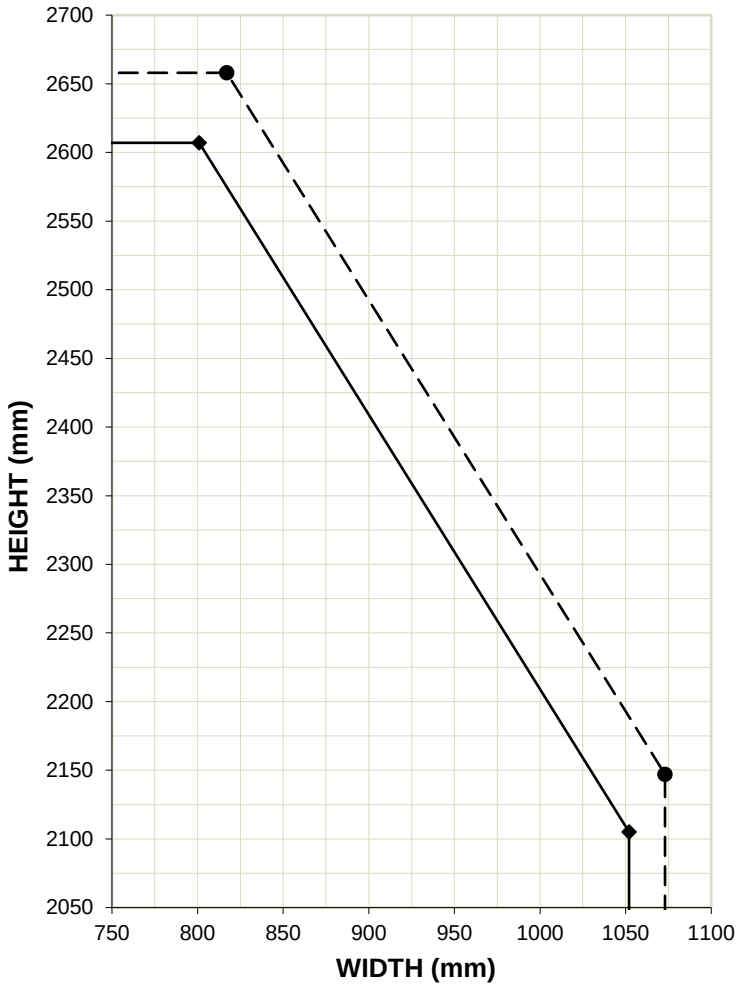


Figure A01	FD30	Latched and Unlatched Single Door Assemblies with optional Transommed Overpanel

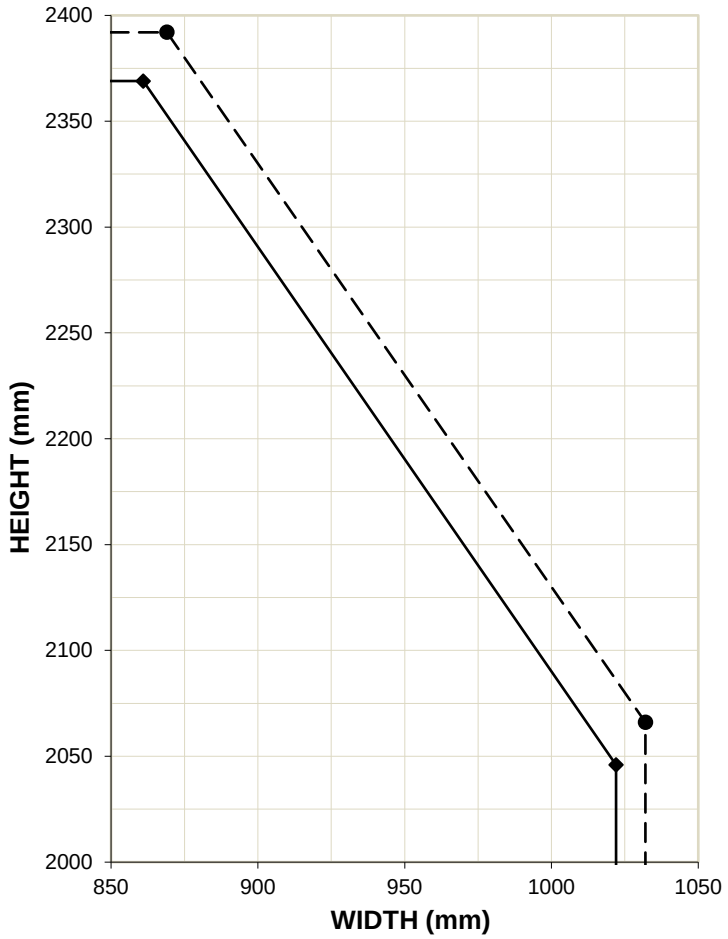


Leaf Configuration	Leaf Height	Leaf Width
LSASD (with optional transomed overpanel)	2658mm	817mm
	2147mm	1073mm
ULSASD (with optional transomed overpanel)	2607mm	801mm
	2105mm	1052mm

Flush Overpanel	Transomed Overpanel	Max Overpanel Height
×	✓	2000mm

Intumescent Specification	
Leaf Head	2no. 15 x 4mm thick intumescent seals, centrally fitted, spaced 10mm apart in either the frame reveal or leaf edge
Vertical Leaf Edges	1no. 15 x 4mm thick intumescent seal, centrally fitted in either the frame reveal or leaf edge

Figure A02	FD30	Latched and Unlatched Double Door Assemblies with optional Transommed Overpanel



Leaf Configuration	Leaf Height	Leaf Width
LSADD (with optional transomed overpanel)	2392mm	869mm
	2066mm	1032mm
ULSADD (with optional transomed overpanel)	2369mm	861mm
	2046mm	1022mm

Flush Overpanel	Transomed Overpanel	Max Overpanel Height
×	✓	1500mm

Intumescent Specification		
Leaf Head		2no. 15 x 4mm thick intumescent seals, centrally fitted, spaced 10mm apart in either the frame reveal or leaf edge
Vertical Leaf Edges		1no. 15 x 4mm thick intumescent seal, centrally fitted in either the frame reveal or leaf edge
Meeting Edges	Square	2no. 10 x 4mm seals centrally fitted in one leaf edge only spaced 10mm apart
	Rebated	2no. 10 x 4mm seals fitted in the 38mm wide rebate or upstand in one leaf edge only, first seal fitted 6mm in from the leaf face with the second seal fitted 5mm from the first seal

APPENDIX B – GENERAL GUIDANCE ON INSTALLATION OF HARDWARE

B.1 Hinges

The door assemblies have been tested with Royde & Tucker Hi-Load 105 hinges, but other hinges may be used subject to compliance with the specifications below:

ELEMENT		SPECIFICATION	
HINGE TYPE		Fixed pin, washered butt, ball bearing butt, lift-off type or journal supported.	
BLADE HEIGHT		89 - 110mm	
BLADE WIDTH		30 - 36mm	
BLADE THICKNESS		2.5 - 3.5mm	
MATERIAL		Brass, Phosphor Bronze, Steel or Stainless Steel. (No combustible or thermally softening materials to be included).	
FIXINGS		Steel screws, as recommended by the hinge manufacturer, but no smaller than 32mm long x 3.8mm diameter (No.8)	
MINIMUM NUMBER		3no. hinges per leaf for leaves up to 2400mm high 4no. hinges per leaf for leaves greater than 2400mm high	
POSITIONS	3NO.	TOP	120 - 200mm down from the leaf head to the top of the hinge
		MIDDLE	Either equally spaced between the top and bottom hinges or positioned 200 – 250mm below the top hinge
		BOTTOM	150 - 225mm up from the bottom of the leaf to the bottom of the hinge blade
	4NO.	TOP	120 - 200mm down from the leaf head to the top of the hinge
		2nd & 3rd	Either equi-spaced between the top and bottom hinges or 2nd hinge positioned 200 – 250mm below the top hinge and the 3rd hinge equi-spaced between the 2nd and bottom hinge
		BOTTOM	150 - 225mm up from the bottom of the leaf to the bottom of the hinge blade
INTUMESCENT PROTECTION		All hinge blades to be bedded on 1mm thick low pressure forming intumescent sheet material e.g. Interdens or Therm-A-Strip	

Rising butt, cranked butts and spring hinges (single or double action) are not suitable for use on doors approved within the scope of this Field of Application Report, although they may be suitable on the basis of an individual and specific fire engineering evaluation.

B.2 Mortice latches/locks

The door assemblies have been tested, separately, with a Zoo Hardware steel mortice latch fitted 1000mm from the threshold in the bottom of the rebate of unequally rebated edge meeting stiles and an Allgood 7186 mortice deadlock centrally fitted in the nib of unequally rebated meeting stiles. Other mortise locks/latches may be used subject to compliance with the specifications below:

ELEMENT	SPECIFICATION
LATCH/LOCK TYPE	Mortice latches, tubular mortice latches, sashlocks and deadlocks
MAXIMUM FOREND HEIGHT	235mm x 20mm wide or 200mm long x 25mm wide
MAXIMUM STRIKE PLATE HEIGHT	235mm x 24mm wide or 200mm long x 25mm wide
MAXIMUM LATCH/LOCK BODY DIMENSIONS	165mm high x 100mm wide x 20mm thick
MATERIAL	Steel based with no essential part of the lock/latch to comprise polymeric or other low melting point (<800°C) materials and should not contain any flammable materials
POSITIONS	Centred at 1000mm (± 200mm) above the bottom of the door leaf
INTUMESCENT PROTECTION	The lock/latch body must be encased in, and the strike plate and forend must be bedded on, 1mm thick low-pressure forming intumescent sheet material e.g. Interdens or Therm-A-Strip

Over-morticing is to be avoided; mortices shall be as tight as possible to the latch. If gaps occur around the case (not exceeding 2mm), then these must be made good with intumescent mastic or sheet material. Holes for spindles or cylinders should be kept as small as is compatible with the operation of the hardware.

Where glazing apertures are also incorporated, and are positioned such that locks/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 50mm to the edge of any aperture.

B.3 Door closers

Where required by regulatory guidance or specific fire strategy, 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 BS 5499 series of standards.

It is essential that all closers fulfil the requirements of BS EN 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.

Closers which have been successfully tested with Sauerland S3K doors maybe used as well as other closers which have not been tested, subject to compliance with the specifications below.

a. Face-fixed overhead door closers (and accessories such as soffit brackets) that have been tested, assessed by IFC or otherwise approved for use on unlatched FD30 cellulosic door leaves in timber frames may be used.

   Any accessory that is located within the door reveal must have appropriate test or assessment evidence.

   In addition, where areas of uninsulated glazing are adjacent to the closer, the selected closer type must have been tested on the unexposed face of an uninsulated steel door, or a fully glazed door fitted with uninsulating glass, to demonstrate that the closer does not emit flammable fluids onto the glass face that would otherwise cause integrity failure before the required period of fire resistance.

Concealed closers are not approved for use with the Sauerland S3K door assemblies approved in this report.

B.4 Bolts

Some of the tests referenced in this report included double leaf doors with flush bolts fitted, but disengaged; bolts are not, therefore, necessary for the doors to achieve 30 minutes fire resistance (subject to an appropriate self-closing device being fitted). The extra restraint provided by flush bolts, in association with latches, does, however, have a beneficial effect on leaf size envelopes (see Appendix A).

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

- Maximum size of flush bolt is 250mm long x 20mm wide and 19mm deep;
- The head of the leaf and/or frame must have a minimum 5mm width of intumescent seal running continuously past the keep plate;
- The body of the bolt should be encased in, and the keep plate bedded on, low-pressure forming intumescent material at least 1mm thick (e.g. Interdens or Therm-A-Strip);
- Edge fixed bolts shall be positioned centrally in the leaf thickness (the intumescent seals defined in Appendix A shall be fitted in the active leaf);

B.5 Non-Essential Hardware Items

B.5.1 Letter plates

These must be tested, assessed or otherwise approved for use in 54mm thick (or less) cellulosic FD30 doors. They must be fitted in accordance with the manufacturer's instructions, including all intumescent liners and flaps. Plates must not be fitted less than 100mm from any leaf edge or any other aperture. Positioning above floor level will depend upon the test evidence for the letter plate.

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

B.5.2 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 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.

B.5.3 Pull handles

These may be fixed to the face of door assemblies, 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; and fixings passing through the leaf shall be steel. Handles/fixings shall be at least 40mm away from the door edge, and from any aperture.

B.5.4 Intumescent air transfer grilles

These must be tested, assessed or otherwise approved for use with 54mm thick (or less) cellulosic FD30 doors. They must be fitted fully in accordance with the manufacturer's instructions, including all intumescent liners and cloaking grilles/beads. They must be no larger than that for which test or assessment evidence exists. See Section 3.5.4, for restrictions on maximum size and placement of any apertures; these apply to those for grilles, which must also be included in the total area permitted for apertures given in Section 3.5.4. Positioning above floor level will depend upon the test evidence for the intumescent grille

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

B.5.5 Security viewers

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

- Viewers must not exceed 15mm outer diameter, and be made from brass or steel;
- Holes bored through the door must be no greater than 1mm larger than the bore of the viewer and must be lined with minimum 1mm thick low-pressure forming intumescent sheet material e.g. Interdens or Therm-A-Strip;
- The viewer must include an effective shutter/cover plate.
- Viewers shall be at least 40mm away from the door edge, and from any aperture.

B.5.6 Dropseals

Dropseals may be fitted into the proposed door design but they must be positioned centrally within the door thickness, have appropriate test evidence to BS476: Part 22: 1987 or EN 1634-1 in a timber-based door design and have a cross-sectional size not exceeding 34mm high x 14mm thick.

Where a dropseal is fitted in the passive leaf of double leaf doors that also includes flush bolts, the drop seal must be truncated 'behind' the lower flush bolt. If the dropseal is included to contribute to smoke control, it is the responsibility of others to determine if effective smoke sealing is maintained.

B.5.7 Door selectors

These are used on double leaf door assemblies, 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.

APPENDIX C - SUMMARY OF FIRE TEST EVIDENCE

Primary Test Evidence

TEST LABORATORY AND REPORT NO	TEST DATE	CONFIGURATION TESTED	LEAF SIZE	TEST STANDARD	INTEGRITY
WF 164432A (Sauerland)	06/06/2007	LSASD	2078 x 992 x 44mm	BS 476-22: 1987	40 minutes
BMT/FEP/F16079 (Acoustic & Fire Door Solutions)	31/03/2016	ULSADD (unequal rebate – 35/18mm split)	2132 x 947 + 947 x 54mm	BS EN 1634-1: 2014	31 minutes

Secondary Test Evidence

TEST LABORATORY AND REPORT NO	TEST DATE	CONFIGURATION TESTED	LEAF SIZE TEST	TEST STANDARD	INTEGRITY
CFR1002031 *Note E1* (Sauerland)	03/02/2010	ULSADD	2100 x 927 + 926 x 54mm	BS 476-22: 1987	16 minutes *Note E1*
Chilt RF13011-A (Acoustic & Fire Door Solutions)	05/03/2013	ULSADD (unequal rebate – 39/18mm split)	2100 x 970 + 958 x 57mm	BS EN 1634-1: 2014	62 minutes

Note E1 This test report has been included to confirm the flush glazing bead detail as shown in Appendix B.

Note E2 Integrity failure occurred due to delayed intumescent seal activation at the head of the doorset. The intumescent seal specification has been revised in order to mitigate against this failure and maintain integrity for 30 minutes under the conditions of a BS476: Part 22: 1987 fire resistance test.

LSASD	=	Latched, Single Acting Single Leaf Door assembly
ULSASD	=	Unlatched, Single Acting. Single Leaf Door assembly
ULSADD	=	Unlatched, Single Acting, Double Leaf Door assembly
ULSADD.OP	=	Unlatched, Single Acting, Double Leaf Door assembly with Overpanel

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.

Some of the test evidence is not owned by Sauerland; but IFC have written permission from the test sponsor, to use the evidence in support of this assessment.

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

APPENDIX D – CONSTRUCTION METHOD STATEMENT

Acoustic & Fire Door Solutions
Tel: +44(0)7815 589447
Email: kshepherd@afdsl.com

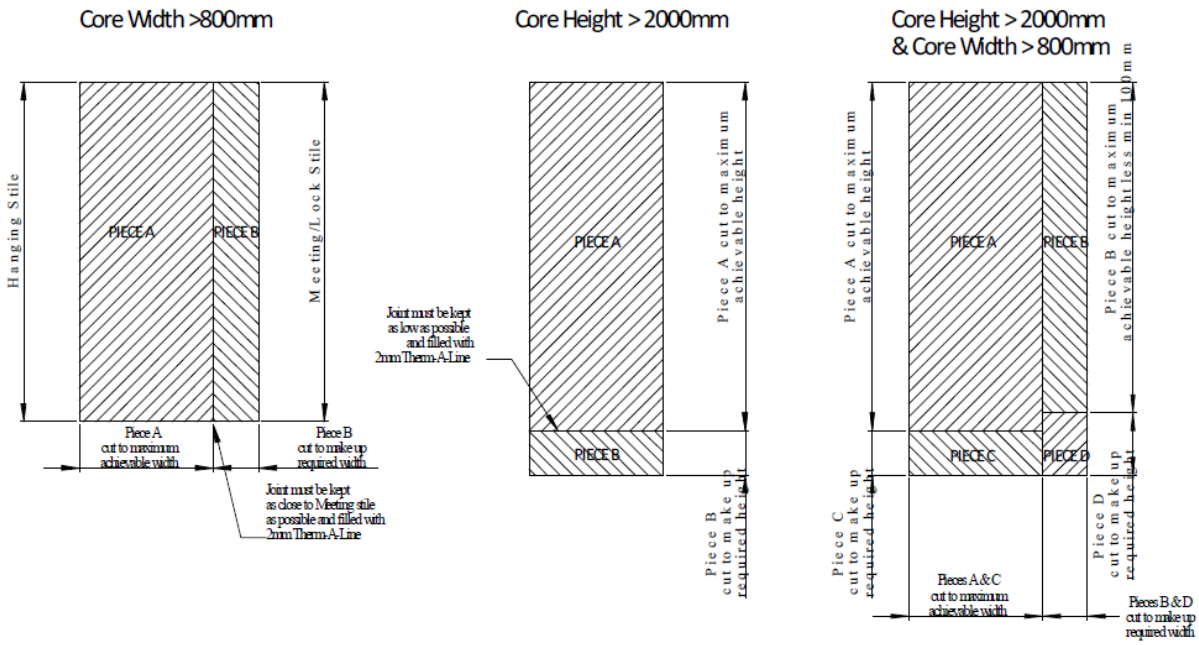
Sauerland S3K Acoustic Blank Construction Method Statement

Materials

- Sauerland S3K 45mm thick 3-Ply acoustic core with Cork outer layers (nom 2000x800mm)
- Redwood/Sitka Spruce (min density 450kg/m^3 at 12% mc) 45x38mm section perimeter timber
- 46x2mm Therm-A-Line Intumescent material
- 2no 4mm Chipboard/MDF sheets for substrates (alternatively 2 x 2no 2mm MDF sheets may be used as substrates with the outer substrates concealing the lippings - see sections 10 & 15)
- Min 20x12mm steel staples
- Apollo A7561 adhesive or PVA D3

Method

1. Cut Core to internal size:
   a. Core Height: Blank Height – 152mm – 4mm
   b. Core Width: Blank Width – 152mm – 4mm
   c. Where Fire performance is required the following conditions must be adhered to:
      i. the core must only be used in the "portrait" orientation
      ii. When cutting the core to width it is imperative to ensure that the required amount is only trimmed from one edge of the core. If the non-cut edge requires squaring-up this can be achieved by trimming a maximum of 6mm before the remainder is trimmed from the opposite edge.
      iii. The core is normally supplied at 2000x800mm dimensions. If a higher and/or wider core size is required then more than one piece of core can be used provided not more than one vertical joint and one horizontal joint are introduced. Horizontal joints should be kept as close to the bottom of the door as possible. Where both horizontal and vertical joints are present, the horizontal joint should be staggered by a minimum of 100mm to avoid a "+" shaped joint. All joints should be packed with 2mm Therm-A-Line. See detail below for allowable layouts:



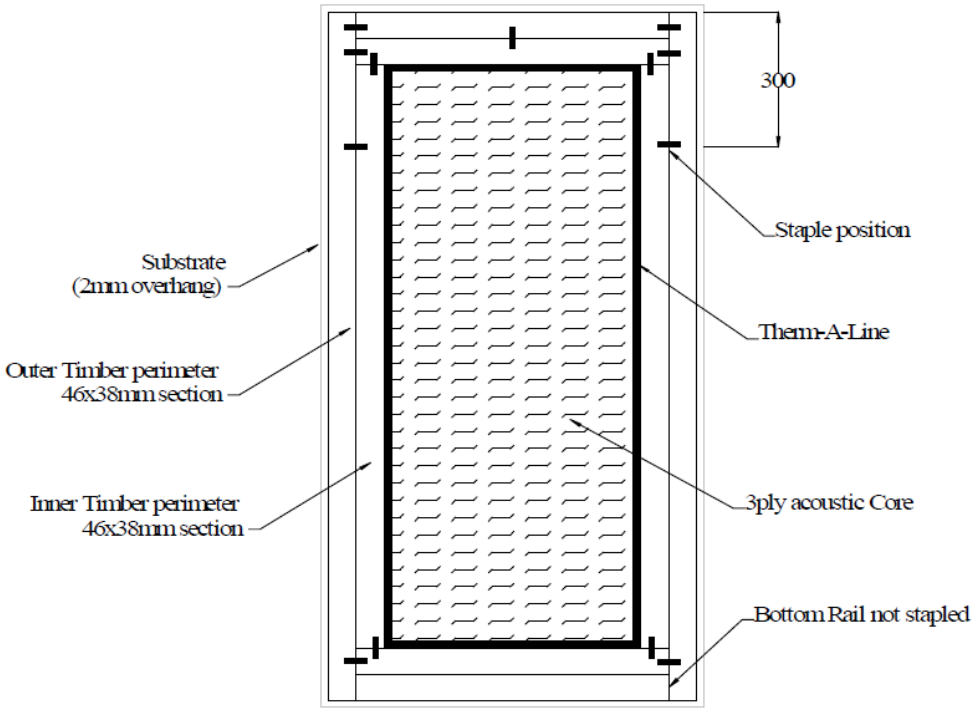
iv. Where multiple pieces of core are used, at least one vertical row of the internal metal clamps supplied within the core must be maintained within each piece of core used. If this is not possible (e.g. due to a very narrow width piece) then a vertical row of clamps must be re-instated into the core piece from both faces one 10mm either side of the centre line (i.e. 20mm apart), with clamp positions starting 50mm from the top of the piece and centred at between 150mm and 250mm down the core piece. For more information on clamping contact Acoustic & Fire Door Solutions Ltd.

v. In any event the overall leaf sizes should be limited to the permissible envelope provided with the fire performance evidence.

2. Cut Perimeter Timber:
   a. Outer stiles: Blank Height
   b. Inner stiles: Blank Height – 152mm
   c. All rails: Blank Width – 76mm

3. Cut substrate
   (2no 4mm substrates):
   a. Height: Blank Height + 4mm
   b. Width: Blank Width + 4mm
   OR (2 x 2no 2mm substrates)
   c. Height (1&2): Blank Height + 4mm
   d. Height (3&4): Leaf Height + 4mm
   e. Width (1&2): Blank Height + 4mm
   f. Width (3&4): Leaf Height + 4mm

4. Assemble Perimeter using steel staples from both faces, in locations shown below, ensuring tight fit of timber at joints and where butted up. Gaps of > 0.5mm are unacceptable. Note that the bottom rail is not stapled.



5. Coat one substrate with Apollo A7561 adhesive (140Kg/m^2) and over mist with water (5% of the adhesive weight used). Avoid excessive water. Alternatively PVA-D3 may be used in lieu of the Apollo adhesive. Place (adhesive side up) on pressing platform
6. Place perimeter onto substrate with 2mm overlap all round
7. Place the bottom rail ensuring tight fit
8. Attach Therm-A-Line to internal edge of perimeter
9. Place cut-to-size core material into the perimeter
10. Coat second substrate with Apollo A7561 adhesive, mist with water and place on top of core/perimeter. Again PVA-D3 may be used in lieu of the Apollo adhesive. Where 2 x 2no MDF sheets are being used the 3rd and 4th substrate sheets are added after lipping (see section 15)
11. Press in a hot press until adhesive is cured to the handling stage. Suggested time in a hot press would normally be around 20-30 minutes but the time required will vary due to press temperature and other conditions. It is possible to use a cold press although pressing time to reach the handling stage will be significantly increased, e.g. in a 21°C environment the handling stage would normally be reached in around 75 minutes, although again this will vary due to conditions. For more information see the adhesive manufacturers Technical Data Sheet
12. Once the handling stage of curing is reached the blank can be removed from the press but handling should be kept to a minimum until full cure has been achieved. Time required to achieve full cure varies with temperature and other conditions but as a guide a blank stored in normal conditions should achieve full cure after around 24 hours.
13. Mark "Top" on the top perimeter frame.
14. Once full cure has been reached the blank can be trimmed and lipped.
15. If using 2 x 2no MDF sheets the outer substrates are added once the blank has been trimmed and lipped:
    a. Coat the 3rd substrate sheet with Apollo A7561 adhesive and mist with water. PVA-D3 may be used in lieu of the Apollo adhesive.
    b. Place the blank onto substrate with equal overlap all round
    c. Coat 4th substrate sheet with Apollo A7561 adhesive, mist with water and place on top of the blank. Again PVA-D3 may be used in lieu of the Apollo adhesive.
    d. Press in a hot press until adhesive is cured to the handling stage. Suggested time in a hot press would normally be around 20-30 minutes but the time required will vary due to press temperature and other conditions. It is possible to use a cold press although pressing time to reach the handling stage will be significantly increased, e.g. in a 21°C environment the handling stage would normally be reached in around 75 minutes, although again this will vary due to conditions. For more information see the adhesive manufacturers Technical Data Sheet
    e. Once the handling stage of curing is reached the blank can be removed from the press but handling should be kept to a minimum until full cure has been achieved. Time required to achieve full cure varies with temperature and other conditions but as a guide a blank stored in normal conditions should achieve full cure after around 24 hours..
16. Once full cure has been reached the blank can be trimmed and/or veneered according to requirements. See the relevant Technical Manual for more information regarding use of the blank.