INTERNATIONAL FIRE CONSULTANTS LIMITED

PRIVATE & CONFIDENTIAL

IFC FIELD OF APPLICATION REPORT

IFC Report PAR/20449/01

Field of Application for 60, 90 and 120 Minute Fire Resisting Mineral Composite Door Leaves Installed in Timber and Composite Frames

Fire Resistance Standard: BS476: Part 22: 1987

Prepared on behalf of:

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1. INTRODUCTION

This report has been prepared by International Fire Consultants Ltd (IFC), on the instruction of Warm Springs Composite Products, to define the Field of Application for mineral composite based door assemblies, with mineral composite doors leaves installed in timber and mineral door frames, that are required to provide 60, 90 or 120 minute fire resistance performance, when adjudged against BS476: Part 22: 1987.

The methodologies used in preparing this document are based upon the guidance in BS ISO/TR 12470: 1998; *'Fire resistance tests - Guidance on the application and extension of results'*.

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, 90 or 120 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 proven in tests summarised herein.

2. TEST EVIDENCE

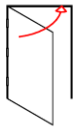
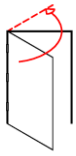
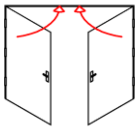
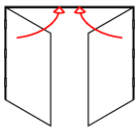
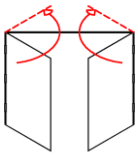
The test evidence used to support this Field of Application Report is summarised in Appendix G of this report.

3. SCOPE OF APPROVAL

3.1 Door Assembly Configuration

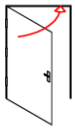
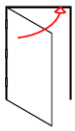
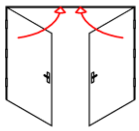
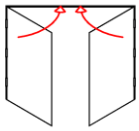
The approved leaf sizes and configurations of door assemblies comprising mineral composite door leaves are outlined below:

3.1.1 FD60 Door Assemblies

Configuration	Envelope of Approved Leaf Size	
	Timber Frames	**Composite Frames**
 • **Latched** • **Single Acting** • **Single Door** • **With Optional Transommed Overpanel**	**Figure PAR/20449/01:B01 in Appendix B**	**Figure PAR/20449/01:B07 in Appendix B**
 • **Unlatched** • **Single Acting** • **Single Door** • **With Optional Transommed Overpanel**	**Figure PAR/20449/01:B02 in Appendix B**	**Figure PAR/20449/01:B08 in Appendix B**
 • **Unlatched** • **Double Acting** • **Single Door** • **Without Overpanel**	**Figure PAR/20449/01:B03 in Appendix B**	**Not Approved**
 • **Latched** • **Single Acting** • **Double Doors** *Note 1* • **With Optional Transommed Overpanel**	**Figure PAR/20449/01:B04 in Appendix B**	**Figure PAR/20449/01:B09 in Appendix B**
 • **Unlatched** • **Single Acting** • **Double Doors** *Note 1* • **With Optional Transommed Overpanel**	**Figure PAR/20449/01:B05 in Appendix B**	**Figure PAR/20449/01:B10 in Appendix B**
 • **Unlatched** • **Double Acting** • **Double Doors** *Note 1* • **Without Overpanel**	**Figure PAR/20449/01:B06 in Appendix B**	**Not Approved**

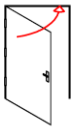
Note 1 *Single acting double leaf door assemblies must have square edged (or slightly rounded) meeting stiles.*

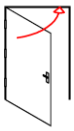
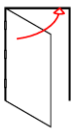
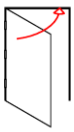
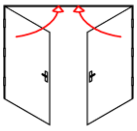
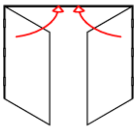
3.1.2 FD90 Door Assemblies

Configuration	Envelope of Approved Leaf Size	
	Timber Frames	Composite Frames
 • Latched • Single Acting • Single Door • With Optional Transommed Overpanel	Figure PAR/20449/01:C01 in Appendix C	Figure PAR/20449/01:C15 in Appendix C
 • Unlatched • Single Acting • Single Door • With Optional Transommed Overpanel	Figure PAR/20449/01:C02 in Appendix C	Figure PAR/20449/01:C06 in Appendix C
 • Latched • Single Acting • Double Doors *Note 2* • With Optional Transommed Overpanel	Figure PAR/20449/01:C03 in Appendix C	Figure PAR/20449/01:C07 in Appendix C
 • Unlatched • Single Acting • Double Doors *Note 2* • With Optional Transommed Overpanel	Figure PAR/20449/01:C04 in Appendix C	Figure PAR/20449/01:C08 in Appendix C

Note 2 *Single acting double leaf door assemblies must have square edged (or slightly rounded) meeting stiles.*

3.1.3 FD120 Door Assemblies

Configuration	Envelope of Approved Leaf Size	
	Timber Frames	Composite Frames
 • Latched • Single Acting • Single Door • Without Overpanel	Figure PAR/20449/01:D01 in Appendix D	Figure PAR/20449/01:D03 in Appendix D

Configuration	Envelope of Approved Leaf Size	
	Timber Frames	Composite Frames
 • Latched • Single Acting • Single Door • With Optional Transommed Overpanel	Not Approved	Figure PAR/20449/01:D03 in Appendix D
 • Unlatched • Single Acting • Single Door • Without Overpanel	Figure PAR/20449/01:D02 in Appendix D	Figure PAR/20449/01:D04 in Appendix D
 • Unlatched • Single Acting • Single Door • With Optional Transommed Overpanel	Not Approved	Figure PAR/20449/01:D04 in Appendix D
 • Latched • Single Acting • Double Doors *Note 3* • With Optional Transommed Overpanel	Not Approved	Figure PAR/20449/01:D05 in Appendix D
 • Unlatched • Single Acting • Double Doors *Note 3* • With Optional Transommed Overpanel	Not Approved	Figure PAR/20449/D06 in Appendix D

Note 3 *Single acting double leaf door assemblies must have square edged (or slightly rounded) meeting stiles.*

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 Appendices B, C and D based upon use of the intumescent seal specifications shown in Appendix E.

Double door assemblies may each be of the same width, up to the maximum width indicated in Appendices B, C and D. For unequal pairs there is no limit on the ratio of leaf widths, (although the large leaf must still be within the limitations in Appendices B, C and D). 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 Overpanels and Side Panels

3.3.1 Transommed Overpanels

Transommed overpanels are permitted with this door design at 60, 90 and 120 minutes performance for single acting, single and double leaf configurations only; subject to the limitations upon frame type, as defined in Section 3.1 herein.

The overpanel must be constructed using the same material as that approved for the door leaf (including the Tectonite stiles and rails as appropriate - see Section 3.4 for details) and must be a single piece of panel across the frame width (i.e. no panel joints). 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 be in the same plane as the door leaf. The stops either side of the transom are to run for the remaining full depth of the transom.

The transom must be constructed using one of the following materials:

Transom Material	Minimum Section Size of Transom	Fire Resistance (mins)
Door frame Hardwood (min density 640kg/m^3)	90 x 38mm (excluding the stops)	60 & 90
Door frame Tectonite hardwood composite	112 x 47mm (excluding the stops)	60, 90 & 120
Door frame Tectonite (2-4mm thick veneer)	94 x 47mm (excluding the stops)	60, 90 & 120

The transom must include 12mm thick door stops on both sides of the transom. The stops can be constructed using hardwood (minimum density 640kg/m^3) for up to 120 minutes fire resistance performance. For transoms constructed using hardwood, where approved herein, the stops can be planted or rebated from a solid timber section. For the Tectonite frames, the stops will need to be planted and mechanically fixed. The head and jambs of the overpanel are to be constructed using the same material as that used for the transom and are to be of the same section size as that approved for the door frames (see Section 3.5).

For a schematic diagram of the transom detail see **Figure PAR/20449/01:A01** in Appendix A.

The joint for hardwood transoms (60 and 90 minutes fire resistance) is to be mortice and tenon with the transom twice screwed to each jamb and additionally bonded with cross-linked PVA or urea/resorcinol formaldehyde.

The joint for Tectonite transoms (60, 90 and 120 minutes fire resistance) is to be butt jointed, with the transom mechanically fixed to each jamb using a minimum of 3 No. screw fixings, penetrating by a minimum of 40mm and additionally bonded with cross-linked PVA or urea/resorcinol formaldehyde.

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 that 100mm from each corner of the overpanel and at maximum 400mm centres, with a minimum of 2 no. screws per overpanel edge. The gap between the overpanel and the frame should not exceed 3mm.

Intumescent seals at the panel/frame interface shall be as defined in Appendix C.

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

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

3.3.2 Side Panels

Side panels of the same construction as the door leaves may be used with this door assembly providing the following specification is followed. The side panels must include the Tectonite stiles and rails as appropriate:

1. Side panels may only be used with single leaf, single acting door assemblies
2. The leaf must be hung from the door frame that is directly fixed back to the structural opening (i.e. it is not permitted to hang the leaf from the frame that separates the side panel from the leaf)
3. The maximum permitted dimensions of the side panel are the same as for the height of the leaf and no more than 500mm in width
4. The side panel must be located in the same plane as the door leaf

5. The side panel may be used in conjunction with an overpanel providing the overpanel is located above the side panel, includes a separating transom, and the overall assembly is no wider than 1500mm in total. Overpanels must not exceed 1500mm in height.

6. The frame member (mullion) separating the side panel and door leaf must be constructed using one of the following materials, as appropriate for the required level of fire resistance:

Mullion Material	Minimum Section Size of Mullion	Fire Resistance (mins)
Door frame Hardwood (min density 640kg/m^3)	90 x 38mm (excluding the stops)	60 & 90
Door frame Tectonite hardwood composite	112 x 47mm (excluding the stops)	60, 90 & 120
Door frame Tectonite (2-4mm thick veneer)	94 x 47mm (excluding the stops)	60, 90 & 120

7. A frame member (cill) must also be fitted underneath the side panel, employing the same principles and specification described for the mullion.
8. The joint for hardwood mullions (60 and 90 minutes fire resistance) is to be mortice and tenon with the head/cill twice screwed to the mullion and additionally bonded with cross-linked PVA or urea/resorcinol formaldehyde (see Section 3.5 for additional information on frame specification).
9. The joint for Tectonite mullions (60, 90 and 120 minutes fire resistance) is to be butt jointed, with the head/cill mechanically fixed to the mullion using a minimum of 3 No. screw fixings, penetrating by a minimum of 40mm and additionally bonded with cross-linked PVA or urea/resorcinol formaldehyde (see Section 3.5 for additional information on frame specification).
10. The side panel must be fixed by screwing through the rear of the frame (on all four edges) with coarsely threaded wood-type screws passing at least 40mm into the centreline of the side panel. Fixings must be no more than 100mm from each corner and a maximum of 250mm centres in between.
11. The intumescent seals specified for the jambs in Appendix E must be fitted to all four edges of the side panel. The seals may be fitted in the side panel edges, or alternatively, in the opposing frame reveal.

3.4 Door Leaf Specification

The door leaf comprises a mineral composite construction, with details of the constructional specifications given below.

The leaf construction is based upon the test evidence detailed in Appendix G, and defines variations and tolerances, where it is considered that these will not adversely affect overall fire resistance. The construction details are limited to the information available from the test reports.

Component		Material	Density (kg/m^3)	Dimensions (mm)	
Core *Note 5*		WSCP mineral core	288 *Note 4*	51 (t)	
Stiles *Note 6*		Tectonite	1000 *Note 4*	Min	25 (w) x 51 (t)
				Max	43 (w) x 51 (t)
Rails (top & bottom) *Note 7*		Tectonite	1000 *Note 4*	Min	51 (w) x 51 (t)
				Max	102 (w) x 51 (t)
Facings Note 9	Option 1	MDF *Note 12*	750 *Note 4*	3 – 4 (t)	
	Option 2	HDF	820 *Note 4*	3 – 4 (t)	
	Option 3	Plywood	640 *Note 4*	3 – 4 (t)	
	Option 4	Chipboard	640 *Note 4*	3 – 4 (t)	
Lippings *Note 10*		Hardwood	640 *Note 11*	3 – 4 (t)	
Adhesive	Facings	Cross-linked PVA	-	-	
	Lippings *Note 9*	Cross-linked PVA or hotmelt adhesive	-	-	
	Stiles and rails	Cross-linked PVA	-	-	
	Core (bonded to perimeter framework)	Cross-linked PVA	-	-	
Optional additional decorative finishes *Note 8*		Timber veneer, paint or varnish to faces or edges of door leaf but plastic based laminate only allowed to faces (i.e. must not wrap around leaf edges)	-	Maximum 2 (t)	

Note 4 *Average density with a ±10% variation permissible.*

Note 5 *Core can be constructed from up to seven pieces.*

Note 6 *For 60 and 90 minutes fire resistance, stiles can be constructed using multiple pieces of butt-jointed Tectonite, providing the sections are no shorter than 400mm and are glued together using cross-linked PVA. 120 minute fire resisting door designs must use continuous lengths of Tectonite for the stiles; jointed sections are not permitted.*

NB: For all periods of fire resistance - stiles can be reduced in width in order to accommodate size adjustment of leaves on site, providing their minimum width, once adjusted, is greater than the minimum width given in the table above (25mm), and lippings are applied in accordance with the specifications given in this section.

Note 7 *For 60 and 90 minutes fire resistance, rails can be constructed using multiple pieces of butt-jointed Tectonite, providing the sections are no shorter than 400mm and are glued together using cross-linked PVA. 120 minute fire resisting designs must use continuous lengths of Tectonite for the rails; jointed sections are not permitted.*

NB: For all periods of fire resistance - rails can be reduced in order to accommodate size adjustment of leaves on site, providing their minimum thickness, once adjusted, is greater than the minimum width given in the table above (51mm), and lippings are applied in accordance with the specifications given in this section.

Note 8 *Maximum 3mm deep decorative grooves, or recesses, are permitted on both faces of the door leaf, providing the amount of material removed from the face does not exceed 30% in total leaf area and the groove/recess does not coincide with any glazed apertures, i.e. the groove or recess must stop short of the beading for the glass. Decorative grooves can extend across the full width and height of the leaf.*

Note 9 *The adhesive spread rate recommendation for the facing of 200-300g/m^2 is within the tested tolerances declared by the manufacturer. The adhesive must be applied directly to the facing material and not the mineral core due to the porosity and absorption rate of the mineral core and for controlling the spread rate being used (as listed above).*

Note 10 *Lippings to be installed on the vertical edges of each leaf or can be installed on all four edges, if required.*

Note 11 *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 (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 the core and lipping.

The radius formed on the leading edge of double acting doors, or single acting double doors, shall not remove more than 2mm thickness of lippings on the door face.

The radius of pivot stiles shall suit the pivot/floor spring employed (double acting doors are only permitted for FD60 doorsets with timber frames, see Section 3.1.1.).

Note 12 *For enhanced acoustic performance it is permitted to alter the construction of the WSCP mineral core design, subject to the following provisos:*

a) *The outer facing may be increased to 6mm thick (MDF only)*
b) *Single leaf constructions only*
c) *All leaf dimensions (for single leaf configurations) given in the leaf envelopes contained in Appendix B are permitted at 60 and 90 minutes fire resistance*
d) *For 120 minutes performance, the maximum permitted single leaf dimensions are 2292mm (h) x 1068mm (w)*
e) *A Norseal NOR810S drop seal may be fitted in the bottom rail, subject to the intumescent gasket remaining in the bottom of the leaf as specified in Appendix E (although the intumescent seal will be interrupted by the fitting of the drop seal)*
f) *A Norseal NOR710 may be fitted around the perimeter of the leaf, providing the intumescent specification required in Appendix E is not altered*
g) *All other details are to remain as specified in this Field of Application for the WSCP mineral core door design*

The WSCP mineral core door leaf can be supplied by Warm Springs Composite Products as 'Banded Door Cores' (BDC) with the door core pre-fitted with compliant stiles and rails with the specification given in the table above, or as separate components to be constructed by the end user. In both cases, the door assemblies are to be constructed in strict accordance with the specification given in this Field of Application Report.

3.5 Frames

3.5.1 Timber Frames

Timber frames, to the specifications given below, may be used with the WSCP mineral core door designs:

60 Minute Fire Resistance					
Material	**Minimum Face Width**		**Minimum Frame Depth**	**Minimum Stop Depth**	**Leaf Configuration**
	Single Acting	**Double Acting**			
Hardwood (640kg/m³) *Note 13*	38mm, excluding stop *Note 14*	44mm *Note 16*	90mm	11mm *Note 15*	Single and Double

90 Minute Fire Resistance					
Material	**Minimum Face Width**		**Minimum Frame Depth**	**Minimum Stop Depth**	**Leaf Configuration**
	Single Acting	**Double Acting**			
Hardwood (640kg/m³) *Note 13*	38mm, excluding stop *Note 14*	N/A	90mm	11mm *Note 15*	Single and Double

120 Minute Fire Resistance					
Material	**Minimum Face Width**		**Minimum Frame Depth**	**Minimum Stop Depth**	**Leaf Configuration**
	Single Acting	**Double Acting**			
Hardwood (640kg/m³) *Note 13*	38mm, excluding stop *Note 14*	N/A	90mm	11mm *Note 15*	Single

Note 13 *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 14 *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 15 *The doorstop is to comprise the same material as the door frame and may be either planted and pinned using 40mm long coarsely threaded wood-type steel screws or pins, (this may include a 3mm tongue into the face of the frame) or integral with the main door frame, providing the minimum frame thickness remains as stated. (Screws or pins may also be fixed from the rear of the frame).*

Note 16 *Frames for double acting doors do not require a stop but must have stated minimum frame thickness at the scalloped edge which is to suit the radius of the pivot stile of the door and to facilitate fitment of top pivot.*

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 into the minimum frame section. See **Figure PAR/20449/01:A08** in Appendix A.

Head/jamb joint : Mortice and tenon, half-lapped joint (created using 10mm deep rebate), mitred joint, or butt joint. All joints to be glued with PVA adhesive with the head fixed to the jambs using a minimum of 2 No. 12 x 100mm long steel wood screws

Transom members : For 60 and 90 minute applications only – see Sections 3.1 and 3.3

Architraves : Architraves may be required for fire performance requirements, see Section 3.8 regarding wall/frame gaps.

*See **Figure PAR/20449/01:A06** in Appendix A for jointing methods of door frames.*

3.5.2 Composite Frames

Composite frames, to the specifications given below, may be used across the complete range of approved sizes and configurations outlined in Appendices B, C and D for the WSCP mineral core door design:

Product	Minimum Face Width	Minimum Frame Depth	Minimum Stop Depth
	Single Acting Only		
Tectonite (2 or 4mm thick veneer *Note 18*)	47mm (w) Tectonite including 2mm or 4mm thick facings, excluding stop *Note 19*	94mm	12mm
Tectonite (Hardwood composite *Note 17*)	47mm (w) Tectonite including 4mm thick hardwood facing at frame reveal and a minimum of 40mm x 47mm hardwood glued to Tectonite frame core *Note 19*	112mm, with additional hardwood	12mm

Note 17 *Timber must have a minimum measured density of 640kg/m³. 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 18 *The veneer may be hardwood (meeting the specification in note 17 above) or MDF, and may be applied to all faces of the door frame if required.*

Note 19 *The doorstop is to comprise either hardwood or Tectonite and may be either planted and fixed using 40mm long coarsely threaded wood-type steel screws or pins, or integral with the main door frame, providing the minimum frame thickness remains as stated. (Screws or pins may also be fixed from the rear of the frame). A diagram of the Tectonite (2 or 4mm veneer and hardwood composite) frame constructions are given in **Figure PAR/20449/A07** in Appendix A.*

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 into the minimum frame section.

Head/jamb joint	:	Half lapped (comprising a 10mm deep horizontal rebate), mitred joint, or butt joint, all glued using PVA adhesive and fixed with a minimum of three No. 12 x 100mm long vertical countersunk, coarsely threaded wood-type steel screws. An appropriately sized pilot hole is required prior to inserting screws into composite frames.
Transom members	:	See Section 3.1 and 3.3 for transom specification
Architraves	:	Architraves may be required for fire performance requirements, see Section 3.8 regarding wall/frame gaps.

*See **Figure PAR/20449/01:A06** in Appendix A for jointing methods of door frames.*

3.6 Glazed Apertures

The following glazing systems are approved for use with this WSCP mineral composite door design. Due to the nature of the door design and level of fire resistance, each glazing system has specific installation requirements and has been tested and approved for use with particular glass types. The components and glass types must not therefore be considered interchangeable.

3.6.1 Option 1 - Lorient Glazing System

Glazing System

The following glazing system is approved for up to 120 minutes fire resistance.

The method of glazing should be as in test WARRES 63295, i.e. Lorient LX5402 intumescent liner fitted around all four sides, Lorient System 90 Plus glazing channel retained with 1.6 mm thick Z profile mild steel beads through-fixed with sleeve bolts. The bead fixings should be located at a distance no greater than 50mm from each corner and at minimum 150mm centres thereafter. The only glass type that is justified for use with this door construction is 5mm thick Firelite by Southern Ceramics.

*See **Figure PAR/20449/A02** in Appendix A for constructional details.*

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

Assessed Aperture Sizes

Apertures are created by cutting directly into the door slab, with beads joined together through the use of sleeve bolts passing directly through the core material.

Based upon the limited test evidence available, it is the opinion of IFC that the following limitations apply to glazed apertures in the door leaves considered herein;

Maximum area of single aperture	-	0.1m²
Maximum vertical length of aperture	-	400mm
Maximum horizontal length of aperture	-	400mm

If the door assemblies are being specified for use in projects where Approved Document N of the Building Regulations is applicable, then further limitations apply to the pane size of 5mm thick Firelite, as it does not satisfy the requirements of BS6206. Panes are restricted to a smaller dimension not exceeding 250mm each measured between glazing beads, in accordance with the requirements of Approved Document N.

Minimum distance from leaf edge (top)	-	200mm
Minimum distance from leaf edge (sides)	-	200mm
Minimum distance from bottom of leaf	-	200mm
Minimum distance between apertures	-	100mm

More than one aperture may be included in each leaf subject to the individual limitations above, but the maximum total area of apertures must not exceed that stated for a single aperture.

3.6.2 Option 2- Norsound Universal 90

Glazing System

The following glazing system is approved for up to 90 minutes fire resistance.

The method of glazing should be as in test Chilt/IF12047 Revision A, summarised in the table below.

Element	Product	Dimensions (mm)	Location
Aperture liner	Tectonite	43 (w) x 51 (t)	Glued to all four edges of the aperture using PVAc adhesive
Glass type	Schott Pyran S	6 (t)	-
Expansion allowance	-	3 all round	-
Beading	Profiled aluminium cover trim	24 (h) x 26 (d) overall	Fitted around the glazing aperture on both faces
	Tectonite bead	12 (t) x 22 (d)	Fitted under the cover trim on both faces

Element	Product	Dimensions (mm)	Location
Tectonite bead fixings	PVA adhesive & steel screws	15 long	Fixed through the bead into the glazing fixing pads 50mm from the corners and central in height/width
Cover trim fixings	12 No. fixing pads/clips on each face – profiled aluminium	50 (w) x 20 (d) x 3 (t) with a 1 (w) x 8 (d) slot in the outer edge	3 No. fitted on each edge 50mm from the corners & 1 No. central in height/width, fixed with 2 No 15 (l) steel screws per clip
Cover trim fixings	12 No. fixing tabs on each face – profiled aluminium	30 (w) x 10 (d) x 1.9 (t) overall	Fitted through the cover trim into the slot in the outer face of the cover trims

*See **Figure PAR/20449/A03** in Appendix A for constructional details.*

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

Assessed Aperture Sizes

Apertures are created by cutting directly into the door slab, with a Tectonite aperture liner fitted to all four sides as described in the table above.

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

Maximum area of single aperture	-	0.18m²
Maximum vertical length of aperture	-	400mm
Maximum horizontal length of aperture	-	400mm
Minimum distance from leaf edge (top)	-	200mm
Minimum distance from leaf edge (sides)	-	200mm
Minimum distance from bottom of leaf	-	400mm
Minimum distance between apertures	-	100mm

More than one aperture may be included in each leaf subject to the individual limitations above, but the maximum total area of apertures must not exceed that stated for a single aperture.

3.6.3 Option 3 - ISL Therm-A-Glaze Steel Channel

Glazing System

The following glazing system is approved for up to 90 minutes fire resistance.

The method of glazing should be as in test CFR1504141, summarised in the table below.

Element	Product	Dimensions (mm)	Location
Glass type	Pyrostop 30-20	18 (t)	-
Expansion allowance	-	5 all round	-
Beading	Stainless steel mitred cassette with welded joints	See **Figure PAR/20449/01:A04** in Appendix A	Fitted on both faces around the perimeter of the glazed aperture & mitred at the corners
Bead fixings	Steel screws	4 diameter x 30 long	Screws located at maximum 140mm centres and at 20° to the plane of the glass
Glazing system	2 No. layers ISL Therm-A-Glaze	Each layer = 15 (w) x 2 (t)	Fitted between the glass & bead on both faces
Aperture liner	ISL Therm-A-Glaze	52 (w) x 2 (t)	Fitted lining the full width/height of the glazed aperture

*See **Figure PAR/20449/01:A04** in Appendix A for constructional details.*

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

Assessed Aperture Sizes

Apertures are created by cutting directly into the door slab.

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

Maximum area of single aperture	-	0.44m²
Maximum vertical length of aperture	-	2000mm
Maximum horizontal length of aperture	-	316mm
Minimum distance from leaf edge (top)	-	235mm
Minimum distance from leaf edge (sides)	-	106mm
Minimum distance from bottom of leaf	-	235mm
Minimum distance between apertures	-	100mm

More than one aperture may be included in each leaf subject to the individual limitations above, but the maximum total area of apertures must not exceed that stated for a single aperture.

3.6.4 Option 4 - ISL Therm-A-Bead Timber Glazing Cassette

Glazing System

The following glazing system is approved for up to 90 minutes fire resistance.

The method of glazing should be as in test CFR1408041_1, summarised in the table below.

Element	Product	Dimensions (mm)	Location
Glass type	Pyrodur EW60-10 10mm CS	10 (t)	-
Expansion allowance	-	5 all round	-
Beading	Hardwood 'saddle' glazing bead cassette	See **Figure PAR/20449/01:A05** in Appendix A	Fitted on both faces around the perimeter of the glazing aperture & mitred at the corners
Bead fixings	Steel screws	No. 8 x 75mm long	Screws located at maximum 150mm centres and at 25° to the plane of the glass
Glazing system	ISL Therm-A-Bead	Each layer = 25 (w) x 4 (t)	Fitted between the glass & bead on both faces
Aperture liner	ISL Therm-A-Line	54 (w) x 2 (t)	Lining the glazed aperture
Aperture liner jointing compound	Sealmaster Fireglaze compound	-	A bead of Fireglaze compound applied at the corners of the Therm-A-Line aperture liner

*See **Figure PAR/20449/01:A05** in Appendix A for constructional details.*

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

Assessed Aperture Sizes

Apertures are created by cutting directly into the door slab.

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

Maximum area of single aperture	-	0.44m²
Maximum vertical length of aperture	-	1848mm
Maximum horizontal length of aperture	-	313mm

Minimum distance from leaf edge (top)	-	156mm
Minimum distance from leaf edge (sides)	-	123mm
Minimum distance from bottom of leaf	-	466mm
Minimum distance between apertures	-	100mm

More than one aperture may be included in each leaf, subject to the individual limitations above, but the maximum total area of apertures must not exceed that stated for a single aperture.

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 F, based upon the range of items tested. All hardware beyond the scope of the general guidance must have been subjected to fire resistance testing, and/or assessed by a notified body to support its use in doors of a similar construction to that proposed.

3.8 Installation, Supporting Construction and Door Edge Gaps

3.8.1 Installation

Timber and composite frames must be fixed back to the supporting construction using a minimum of 5 No. steel fixings in each jamb, (1No. fixing 200mm below the head, 1No. fixing 200mm above the threshold and 3No. fixings equally spaced in between). 2No. fixings are required in the frame head, set 200mm from the jambs for single leaf doors and 500mm from the jambs for double doors.

The fixings must be of the appropriate type for the supporting construction. Screws shall be of sufficient length to penetrate the wall by at least 40mm, and shall be positioned such that they are not exploited by charring of the frame, irrespective of the direction of test exposure; (this may necessitate a twin line of screws). Packers shall be used at all fixing positions, although if combustible packers are employed, these must be protected by a layer of gap sealing (see below) aligned near to each face of the door frame.

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.

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

The gap sealing between the supporting construction for FD60 applications should follow the recommendations of Table 3 in BS8214: 2016, *"Code of practice for fire door assemblies"*, using a product proven in such timber or mineral composite applications, and with reference to the correct depth of seal to suit the width of gap between wall and frame. The gap sealing shall be positioned on the plane of the door leaf (unless combustible packers are employed).

The gap sealing between the supporting construction for FD90 and FD120 applications should use one of the following methods:

- Gaps up to 10mm must be sealed on both sides with 20mm depth of acrylic intumescent mastic and the joint must be fitted with 18mm thick architraves, overlapping the wall and frame by at least 15mm, and installed on each side of the wall.

- Gaps between 10 and 20mm must be tightly packed with mineral rock fibre and filled on both faces with a minimum of 20mm depth of intumescent mastic. The frame joint must be fitted with 18mm thick architraves overlapping the wall and frame by at least 15mm, and installed on each side of the wall

- Proprietary gap filling product that has been proven for the required level of fire resistance at the required depth and width. The joint must be fitted with 18mm thick architraves overlapping the wall and frame by at least 15mm, and installed on each side of the wall

For all of the gap sealing applications above, the intumescent mastic, and proprietary gap filling products such as expanding PU foams, should be approved linear gap joint seals, tested and approved between the required substrates to BS EN 1366-4 or BS 476: Part 20 or have been included within a fire test on a door assembly to BS 476: Part 22 or BS EN 1634-1. The manufacturer's instructions should be carefully followed.

It is permitted to install the door assembly without architraves providing:

- The gap sealing medium has been tested and approved to the relevant test standard criteria outlined above

- The gap sealing medium was tested without architraves or any other capping material

3.8.2 Supporting Construction

The supporting construction may be timber or steel stud plasterboard partition, blockwork, brickwork or concrete walls, appropriate for the level of fire resistance and must be of a type that has been tested or assessed for the required level of fire resistance, at the required size, when incorporating doorset openings. If fitted into timber or steel stud partitions, the method of forming the doorset aperture must be as tested by the partition and/or door assembly manufacturer.

Note 20 *Reference to steel stud partitions is in the context of permanent elements, such as those designed and proven by the plasterboard manufacturers – this report does not approve use of the proposed doorsets in proprietary 'demountable' partitions, which must be subject to a full and independent appraisal of the particular system and doorsets therein.*

3.8.3 Door Gaps and Alignment

The gap between the door and the frame or between meeting stiles of double doors (and between frame and overpanel, 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 in accordance with BS8214 (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.

3.9 Intumescent Seals

Warm Springs Composite Products WSCP PVC-Seals shall be employed across the complete range of door sizes and configurations approved herein. The intumescent seal specifications, widths, and positions are shown in Appendix E, based upon tested details.

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

3.10 Ambient Temperature Smoke Seals

Smoke seals, or combined intumescent/smoke seals (using the specification approved in Section 3.8), 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 shown in Appendix E, in which case, the latter shall take precedence. Test evidence to BS476: Part 22: 1987 shall be available to demonstrate that the smoke seals will not adversely affect the overall fire resistance of timber door assemblies, when fitted in the proposed arrangements.

4. CONCLUSION

It is the opinion of International Fire Consultants Ltd that if the proposed door assemblies utilising WSCP Mineral Composite door leaves installed in timber and composite 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 60, 90 or 120 minutes fire resistance as appropriate.

Doors containing less than 20% surface area of non-insulating features, such as glazing, are tested to the conditions of BS476: Part 22: 1987, Section 7. These assemblies are evaluated as insulating door assemblies on the basis that the "solid" part of the WSCP mineral composite design satisfies the temperature criteria for 90 minutes. 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.

The leaves may include small apertures, up to a maximum of 20% of the leaf size, and can be evaluated to Section 7 for insulation as well as integrity, up to 90 minutes performance for both criteria.

The doors can also be assessed to Section 6 of BS476: Part 22: 1987 for a 90 minute performance rating for both integrity and insulation, without apertures in the leaves.

5. LIMITATIONS

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

This document only considers the 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.

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 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.

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; and the requirements of any other local building codes/regulations.

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

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

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

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

6. VALIDITY

This Field of Application Report has been prepared based on International Fire Consultants Ltd's present knowledge of the products described, the stated testing regime and the submitted test evidence. For this reason, anyone using this document after September 2021 should confirm its ongoing validity.

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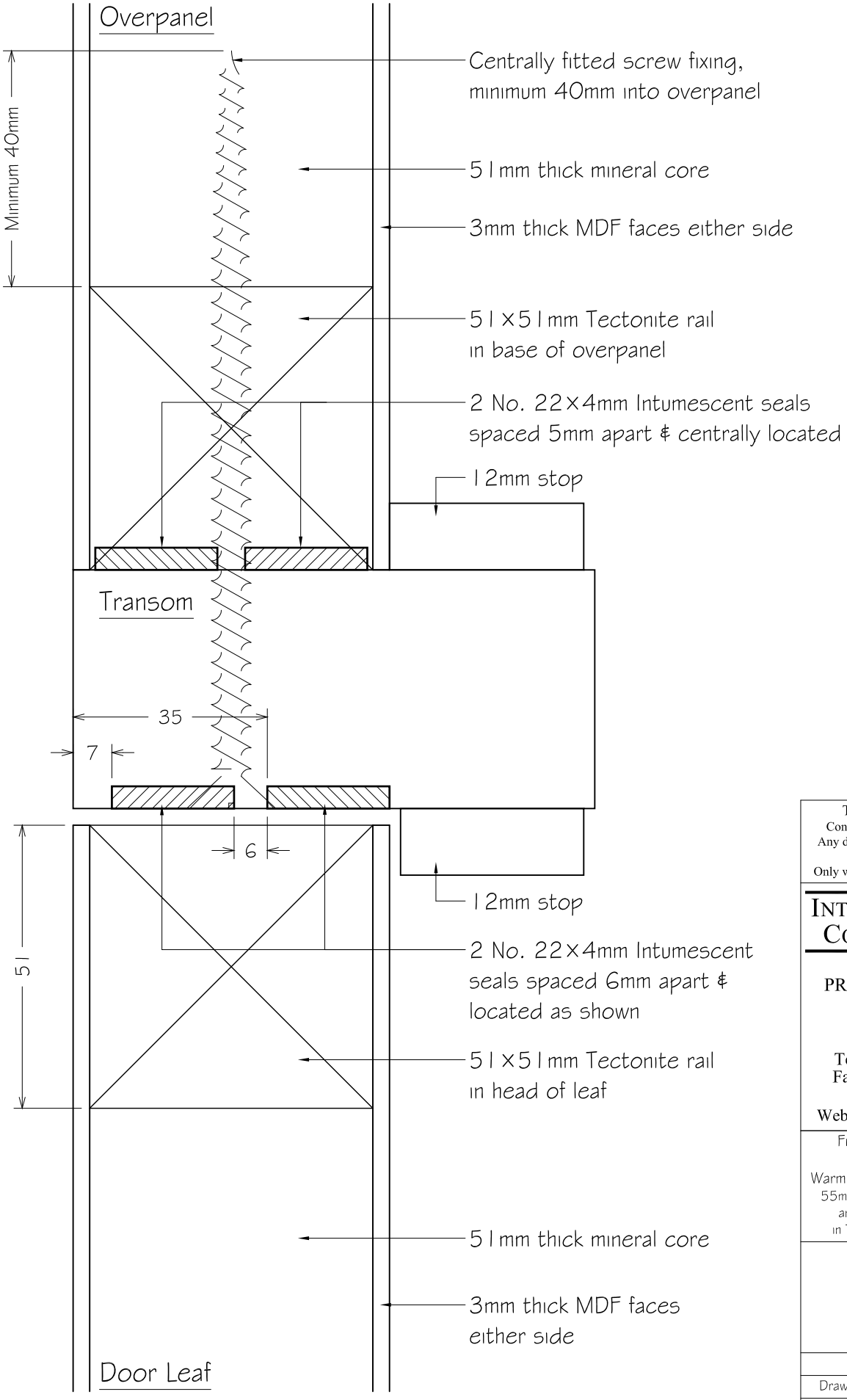
APPENDIX A

Figures PAR/20449/01:A01 to A08

Construction Details

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



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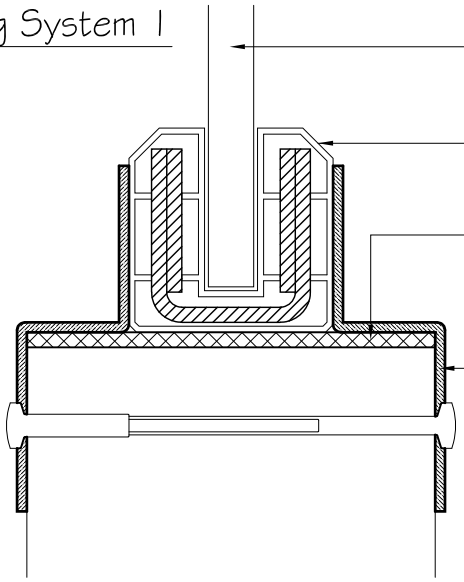
Field of Application Report
PAR/20449/01
Warm Springs Composite Products
55mm thick composite FD60, FD90
and FD120 Door Leaves Hung
in Timber and Composite Frames

Transome Detail

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

PAR/20449/01:A01

Glazing System 1



'Firelite' ceramic glass

Lorient System 90 Plus

Lorient 5402 intumescent liner

Cover beads in 1.2mm mild steel (may be powder coat or paint finished). Secured to door by steel bolt through grommet sleeve fixings. (minimum 150mm centres)

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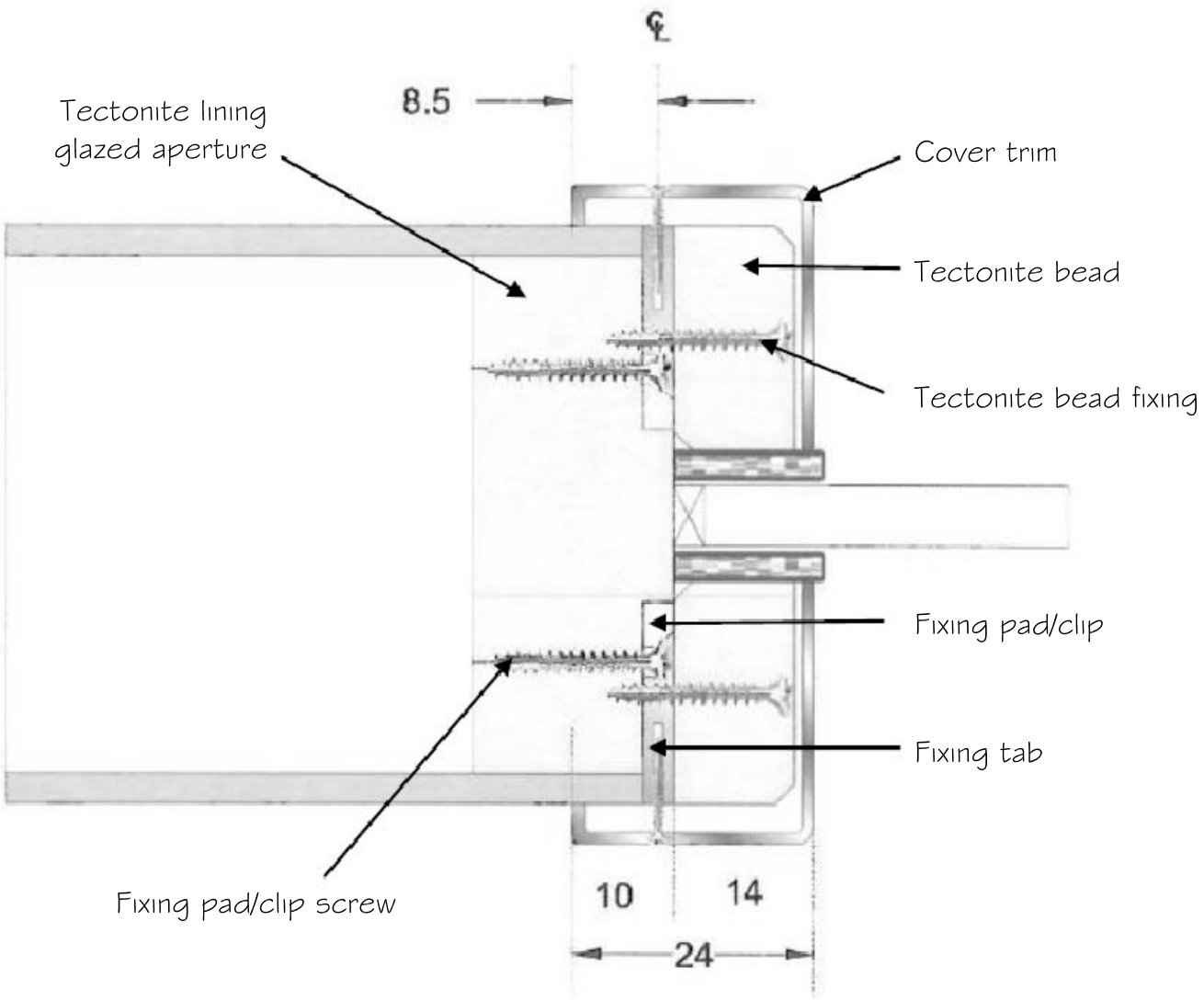
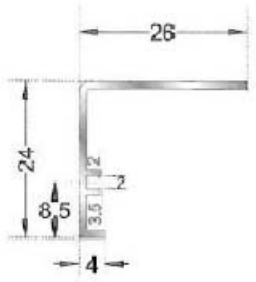
Field of Application Report
PAR/20449/01
Warm Springs Composite Products
55mm thick composite FD60, FD90 and FD120 Door Leaves Hung in Timber and Composite Frames

Glazing System
1 of 3

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

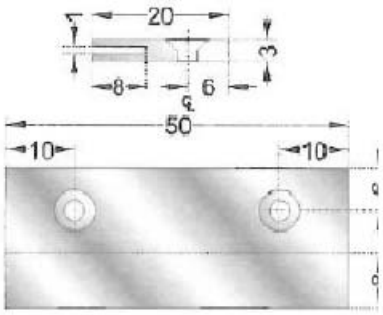
PAR/20449/01:A02



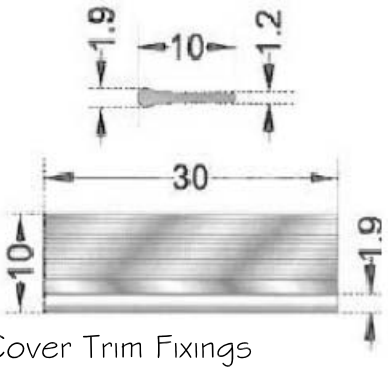


Profiled Aluminium Cover Trim

Tectonite Bead (12×22mm)



Cover Trim Fixings



Cover Trim Fixings

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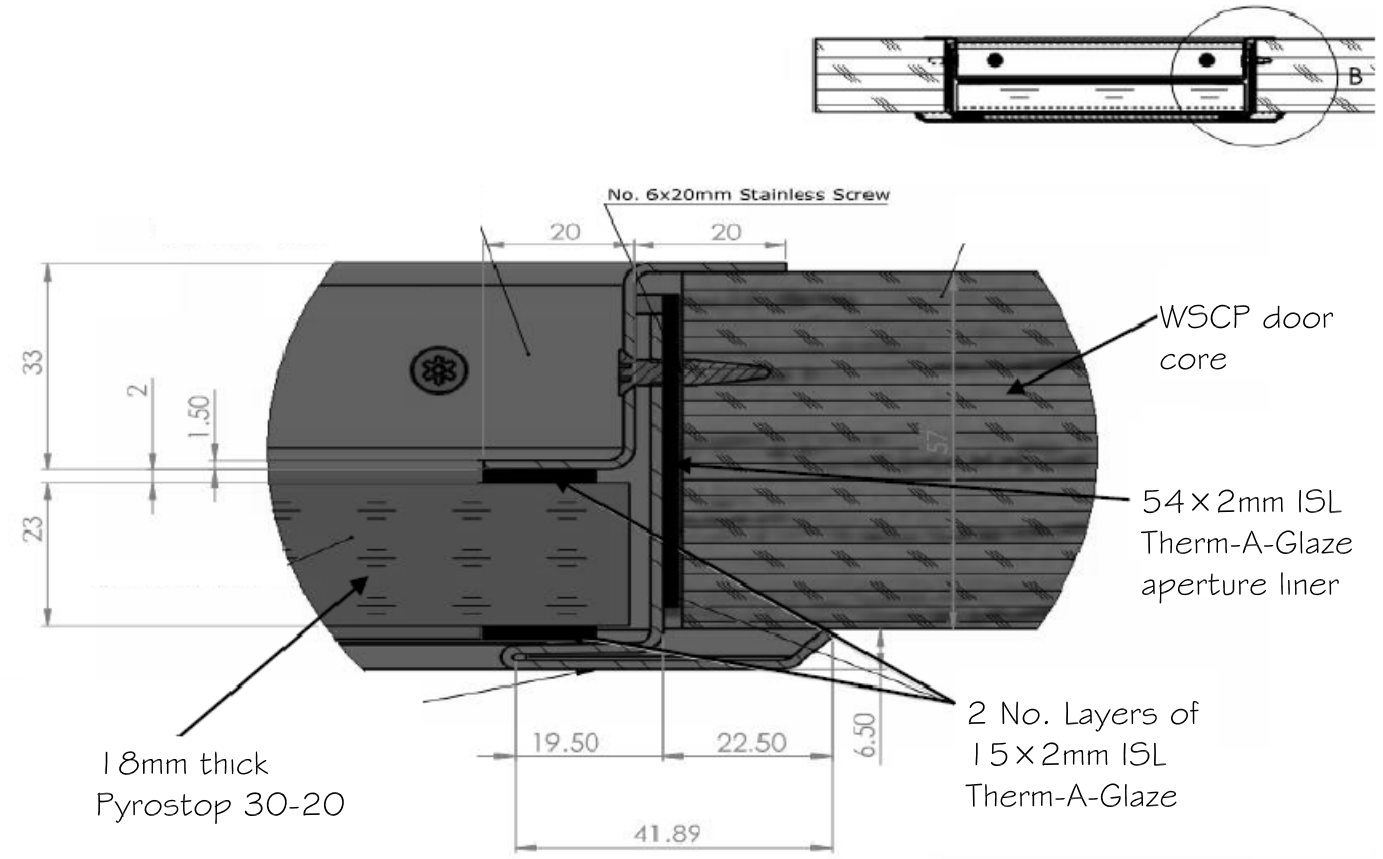
Glazing System
2 of 3

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

PAR/20449/01:A03



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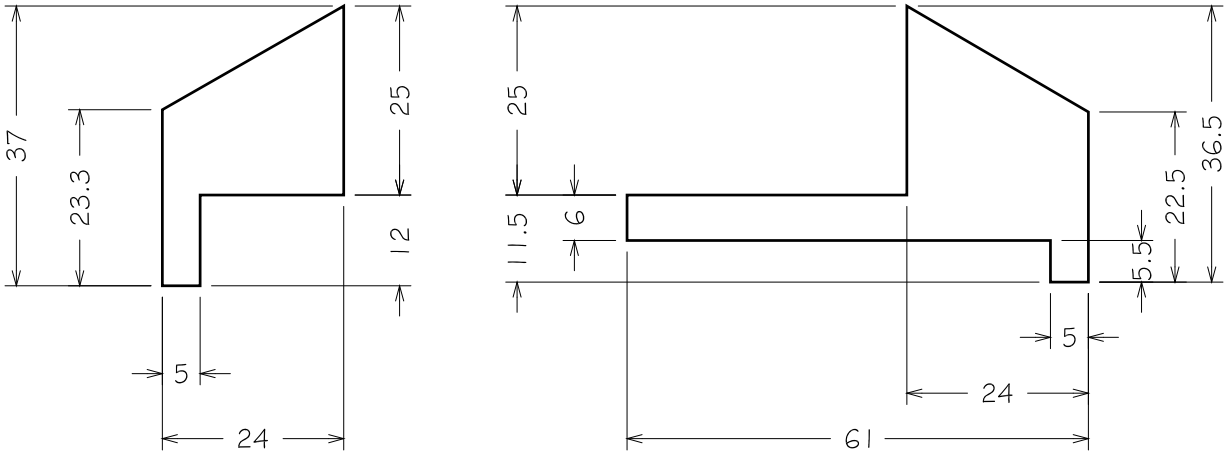
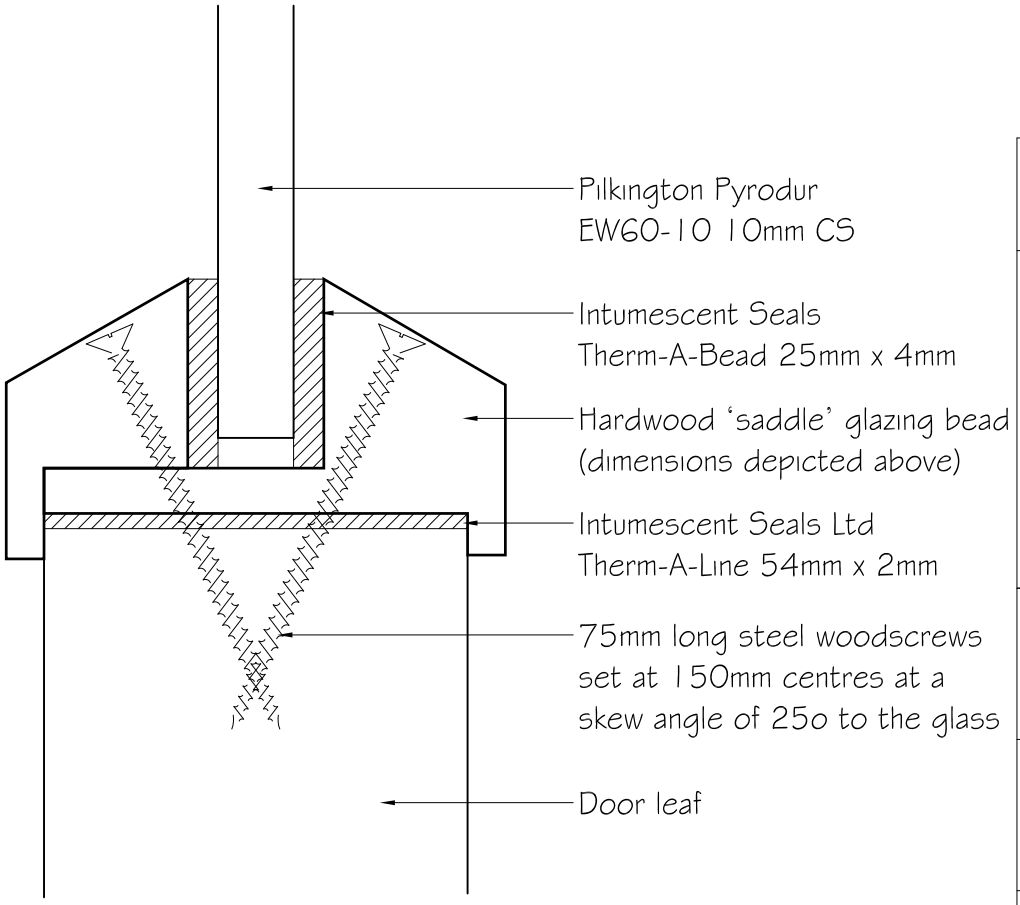
Glazing System
3 of 3

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

PAR/20449/01:A04





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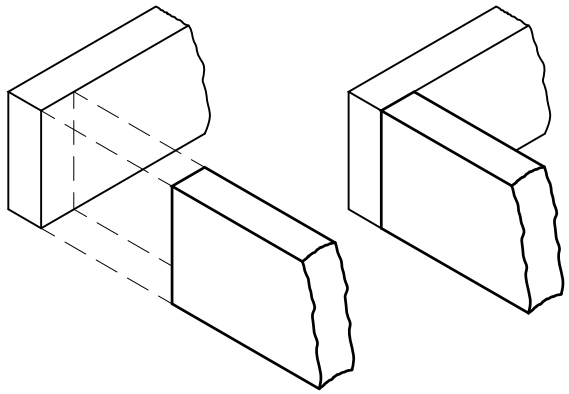
Bead Detail

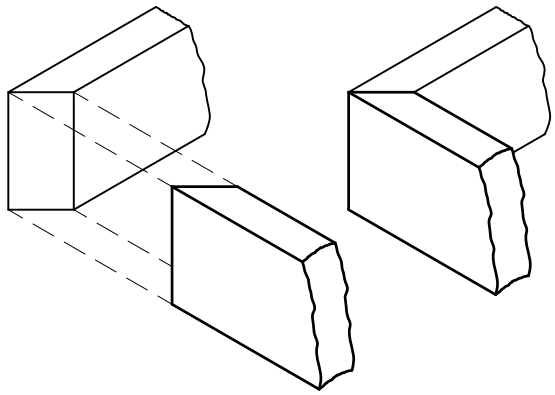
Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

PAR/20449/01:A05

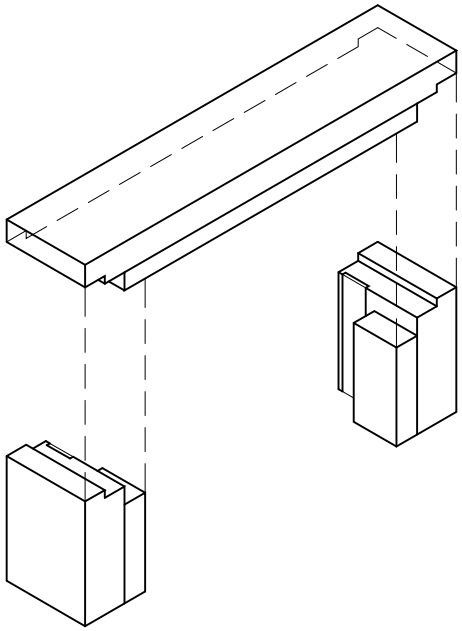
Butt Joint Detail



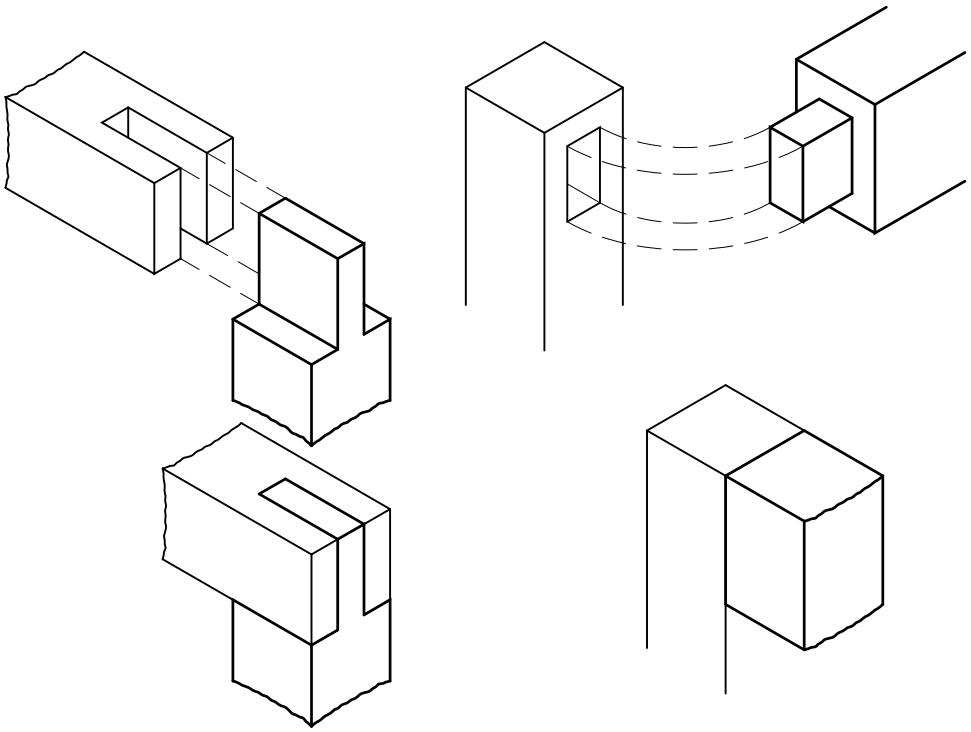
Mitred Joint



Half-Lapped Joint



Mortise & Tenon Joints



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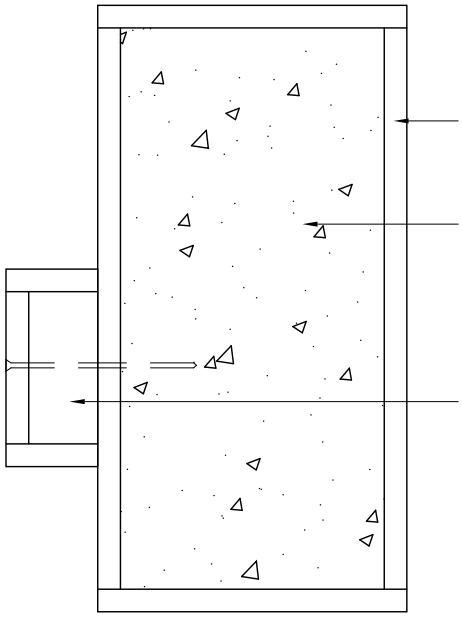
Field of Application Report
PAR/20449/01
Warm Springs Composite Products
55mm thick composite FD60, FD90
and FD120 Door Leaves Hung
in Timber and Composite Frames

Jointing Methods

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

PAR/20449/01:A06

Tectonite (2-4mm hardwood or MDF veneer)



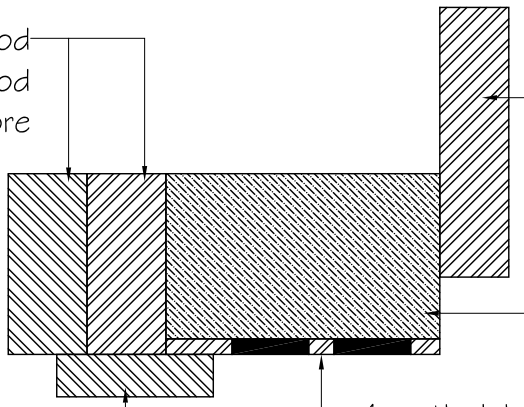
2 or 4mm hardwood or MDF veneer may be applied on all faces of the door frame

94×43mm section of Tectonite

12mm deep planted or rebated stop (Hardwood or Tectonite). The stop may be fixed by screwing through the rear of the frame. The fixing must penetrate the stop to a depth of 8mm

Tectonite (hardwood composite)

2 layers of 20×47 hardwood or 1 layer 40×47 hardwood glued to Tectonite frame core



18mm thick architrave

72 x 43mm Tectonite

4mm thick hardwood facing rebated to accommodate intumescent seals

12mm planted stop (hardwood)

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Field of Application Report
PAR/20449/01
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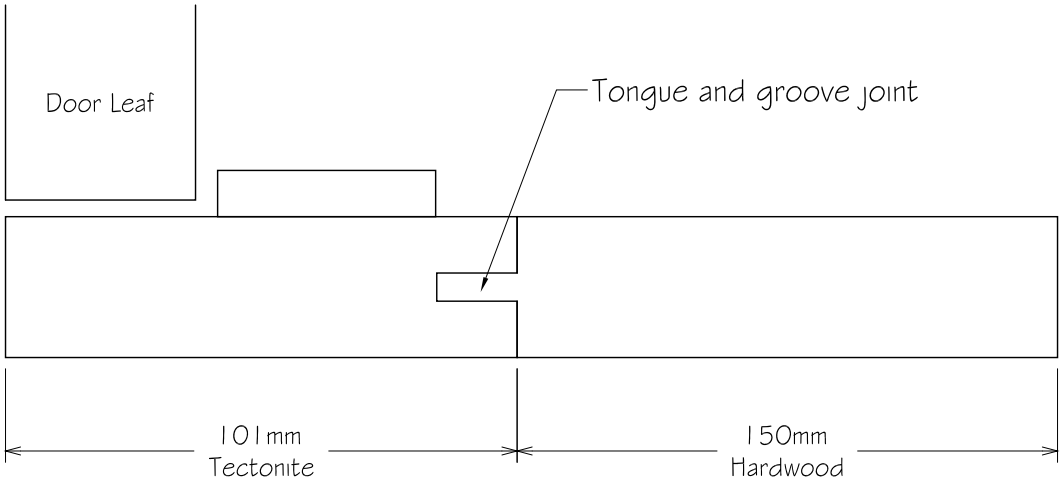
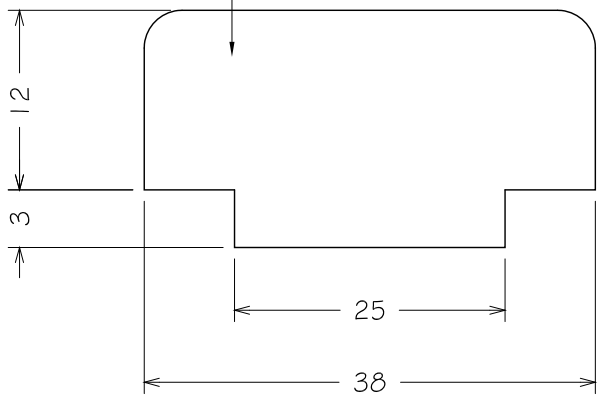
Tectonite Door Frame Details

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

PAR/20449/01:A07



T-Stop with a 25x3mm tongue to locate into a groove on the face of the frame. The stop is machined to have a slightly narrower end than the groove in the frame to give a snug fit. The stop is then mechanically fixed using pins or screws. The T-Stop may be constructed of hardwood or Tectonite meeting the appropriate fire resistance specification.



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PAR/20449/01
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Frame Width Extension & T-Stop Detail

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

PAR/20449/01:A08

APPENDIX B

Figures PAR/20449/01:B01 to B10

Assessed Leaf Size Envelopes for FD60 WSCP Mineral Composite Door Leaves Installed in Timber and Mineral Composite Frames

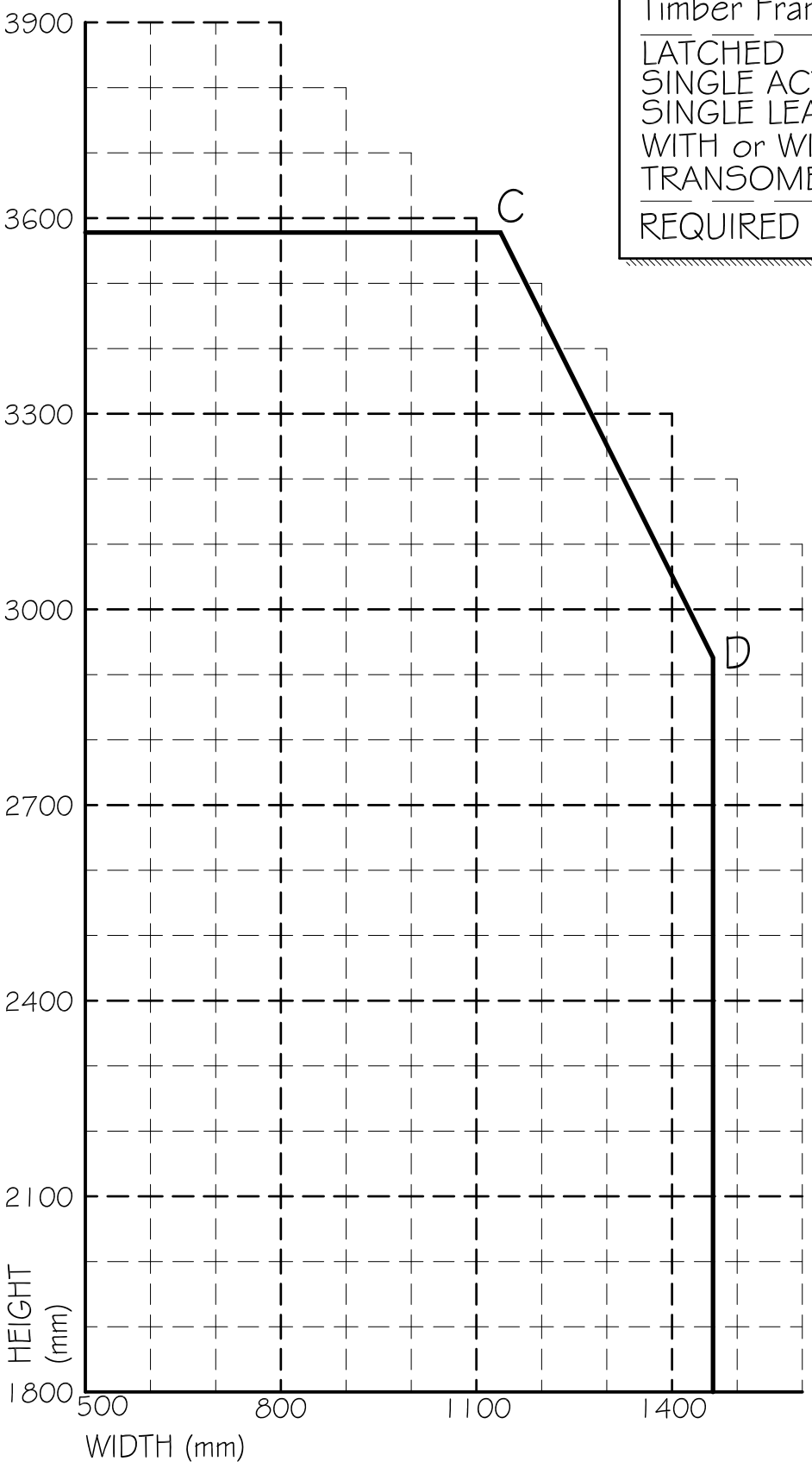
The figures in this Appendix are not included in the sequential page numbering of this report

Configuration

Timber Frames

LATCHED
SINGLE ACTING
SINGLE LEAF
WITH or WITHOUT
TRANSOMED OVERPANEL

REQUIRED INTEGRITY: 60 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1137	1463
Height	3578	2926

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/20449/01, which contains full details of the assessed doorset construction.

ENVELOPE OF APPROVED LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration.
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POINT C represents the maximum leaf height and its associated width.
POINT D represents the maximum leaf width and its associated height.

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Envelope of Approved Door Leaf Sizes
LSASD
In Timber Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

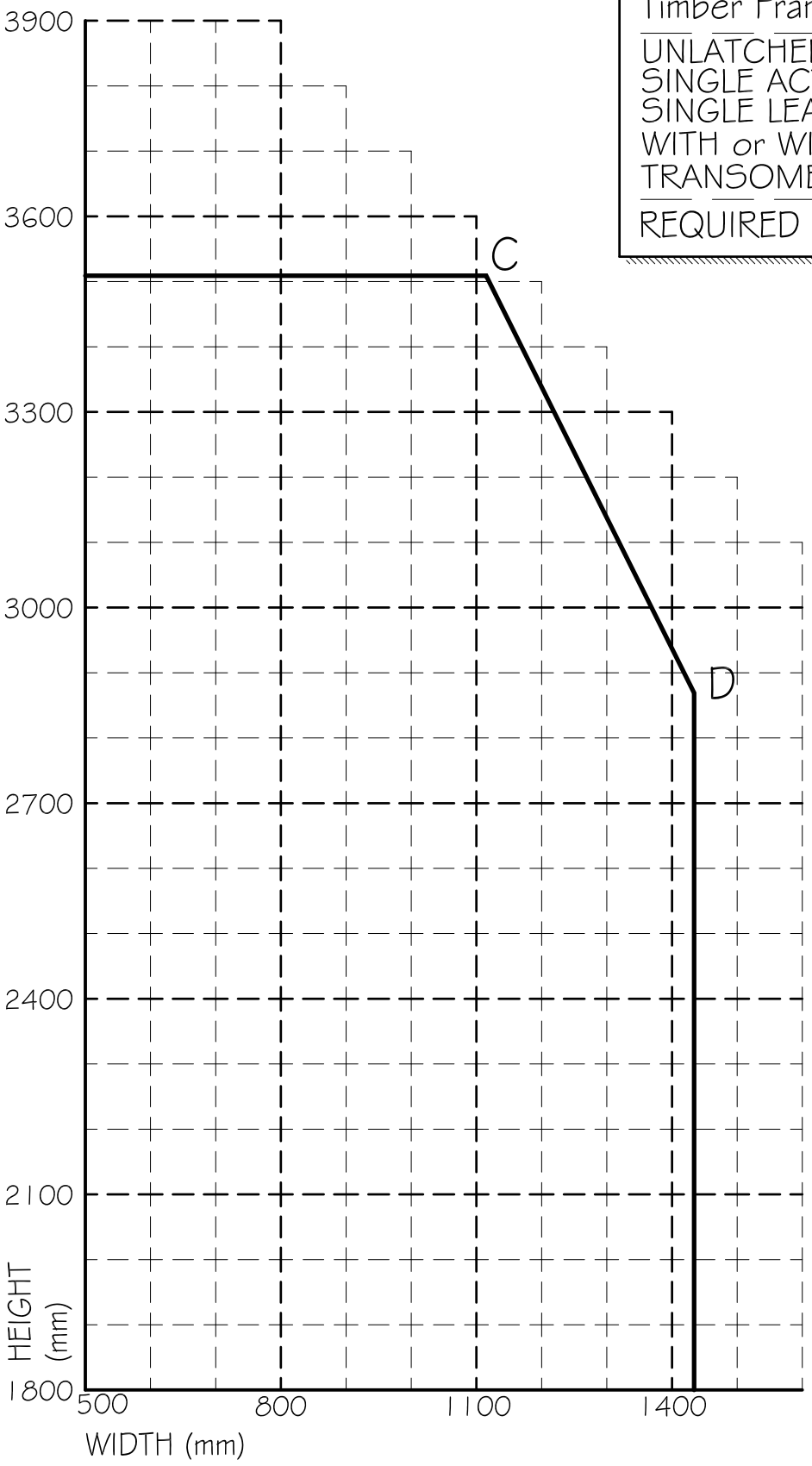
PAR/20449/01:B01

Configuration

Timber Frames

UNLATCHED
SINGLE ACTING
SINGLE LEAF
WITH or WITHOUT
TRANSOMED OVERPANEL

REQUIRED INTEGRITY: 60 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1115	1434
Height	3509	2869

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/20449/01, which contains full details of the assessed doorset construction.

ENVELOPE OF APPROVED LEAF SIZES

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Envelope of Approved Door Leaf Sizes
ULSASD
In Timber Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

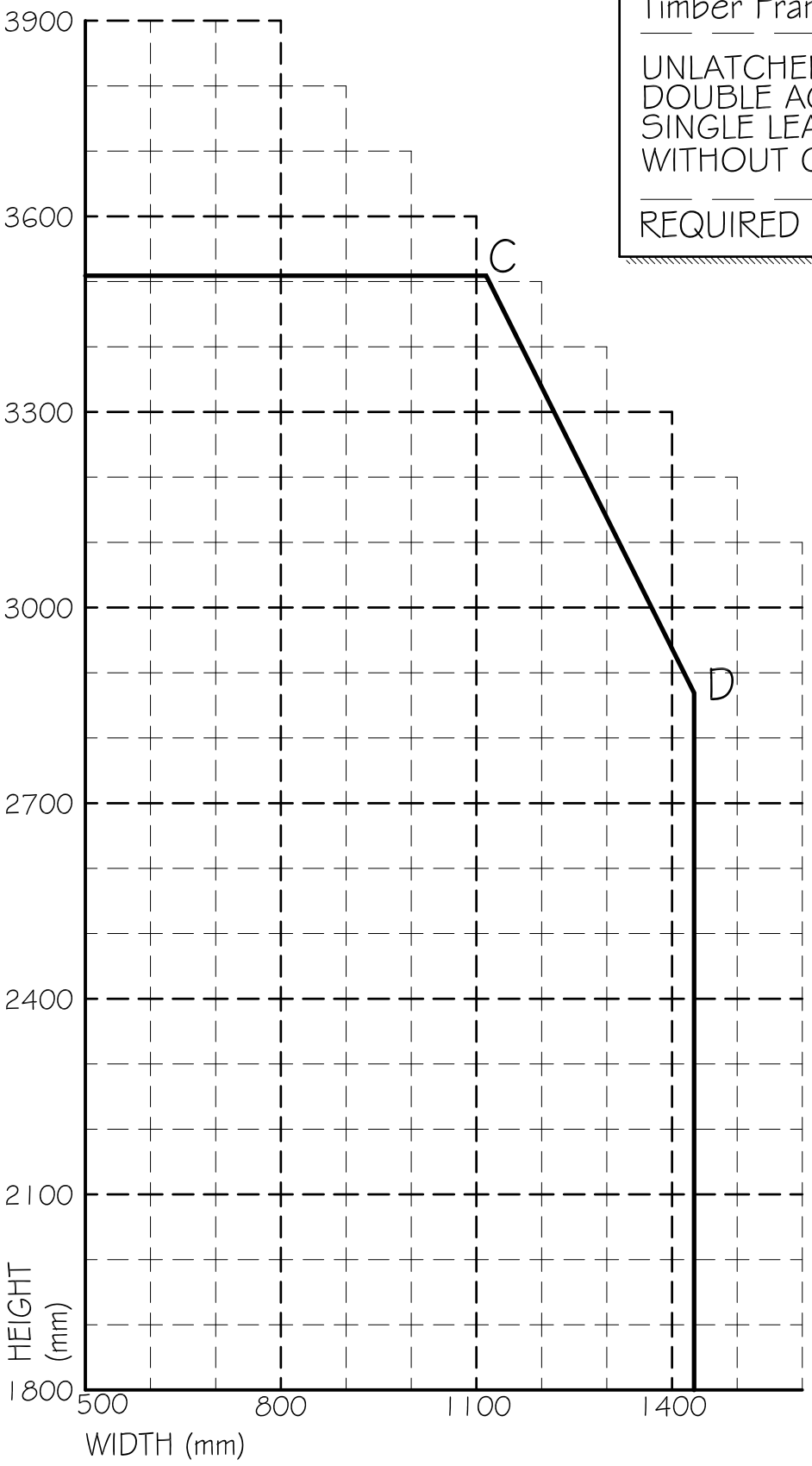
PAR/20449/01:B02

Configuration

Timber Frames

UNLATCHED
DOUBLE ACTING
SINGLE LEAF
WITHOUT OVERPANEL

REQUIRED INTEGRITY: 60 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1115	1434
Height	3509	2869

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ENVELOPE OF APPROVED LEAF SIZES

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Envelope of Approved Door Leaf Sizes
DASD
In Timber Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

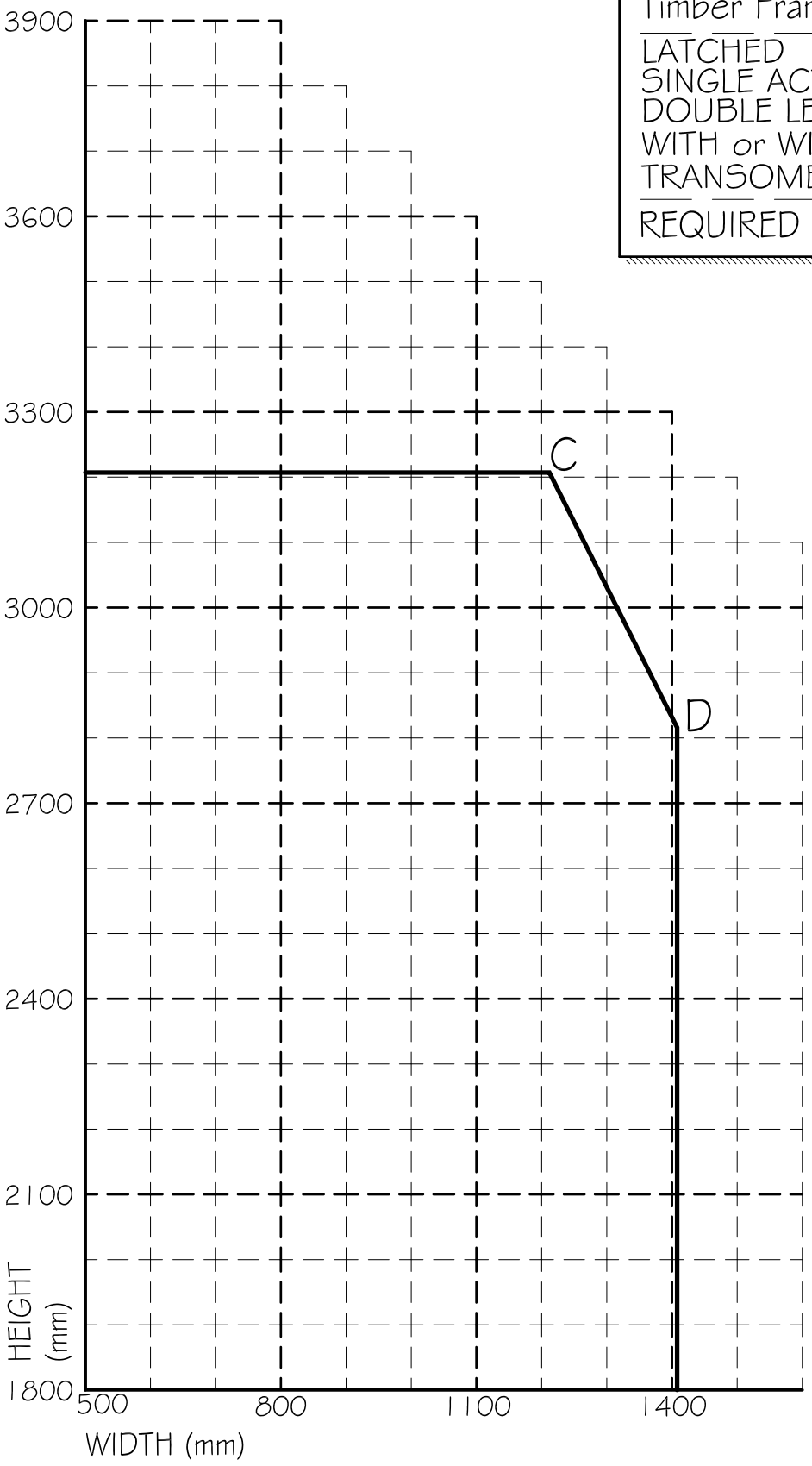
PAR/20449/01:B03

Configuration

Timber Frames

LATCHED
SINGLE ACTING
DOUBLE LEAF
WITH or WITHOUT
TRANSOMED OVERPANEL

REQUIRED INTEGRITY: 60 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1212	1408
Height	3207	2816

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/20449/01, which contains full details of the assessed doorset construction.

ENVELOPE OF APPROVED LEAF SIZES

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Field of Application Report
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Envelope of Approved Door Leaf Sizes
LSADD
In Timber Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

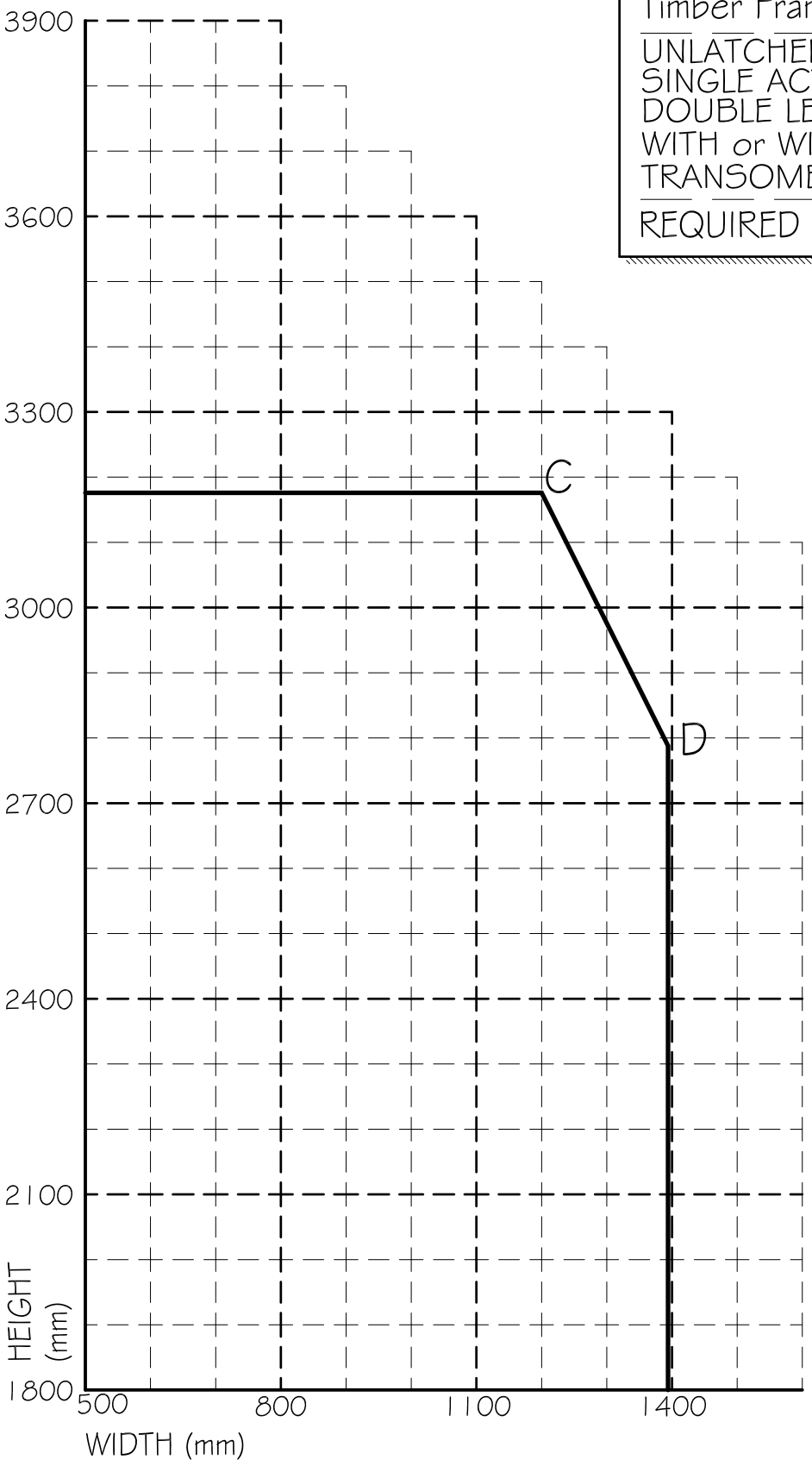
PAR/20449/01:B04

Configuration

Timber Frames

UNLATCHED
SINGLE ACTING
DOUBLE LEAF
WITH or WITHOUT
TRANSOMED OVERPANEL

REQUIRED INTEGRITY: 60 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1200	1394
Height	3176	2788

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/20449/01, which contains full details of the assessed doorset construction.

ENVELOPE OF APPROVED LEAF SIZES

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Field of Application Report
PAR/20449/01
Warm Springs Composite Products
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Envelope of Approved Door Leaf Sizes
ULSADD
In Timber Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

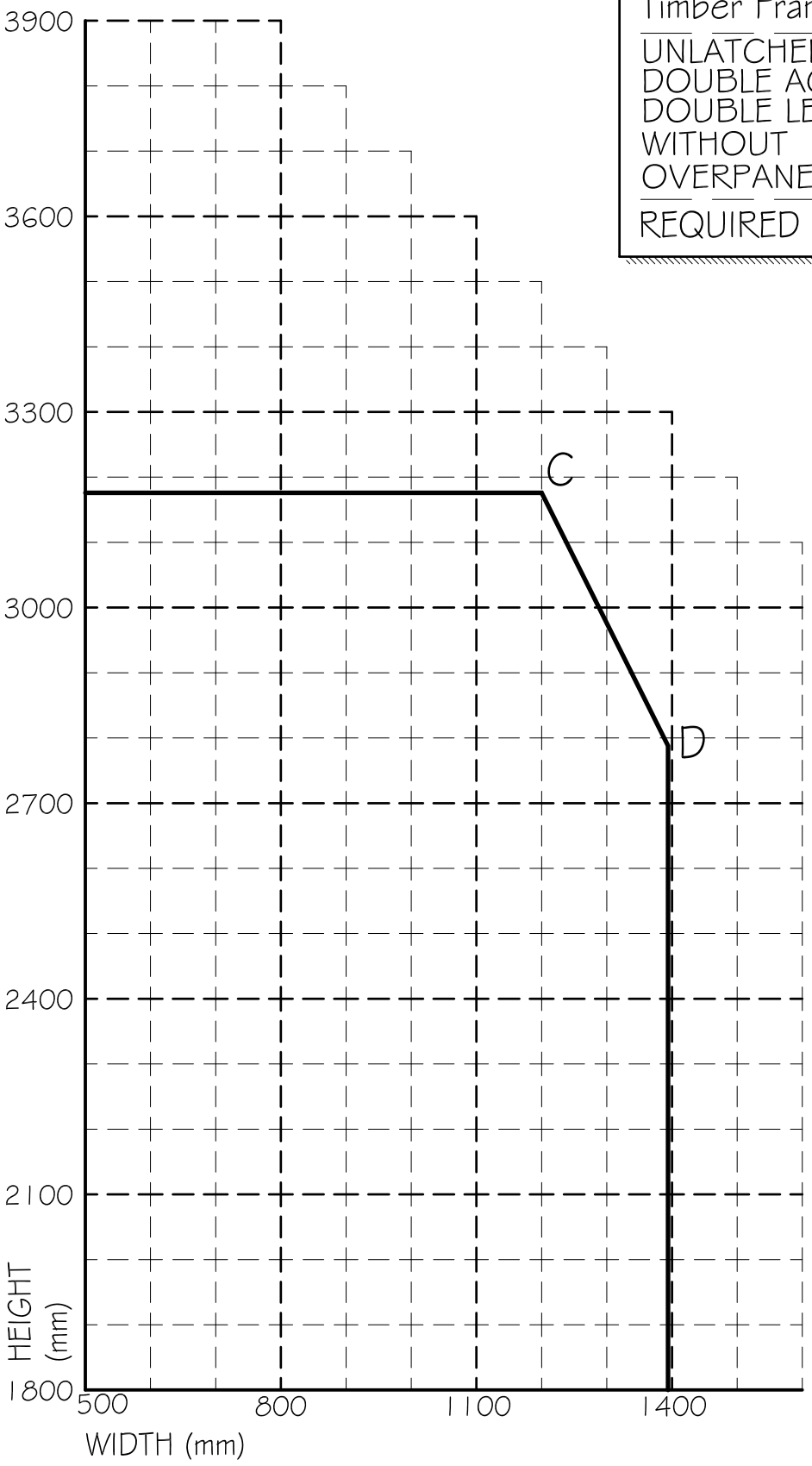
PAR/20449/01:B05

Configuration

Timber Frames

UNLATCHED
DOUBLE ACTING
DOUBLE LEAF
WITHOUT
OVERPANEL

REQUIRED INTEGRITY: 60 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1200	1394
Height	3176	2788

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ENVELOPE OF APPROVED LEAF SIZES

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Envelope of Approved Door Leaf Sizes
ULSASD
In Composite Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

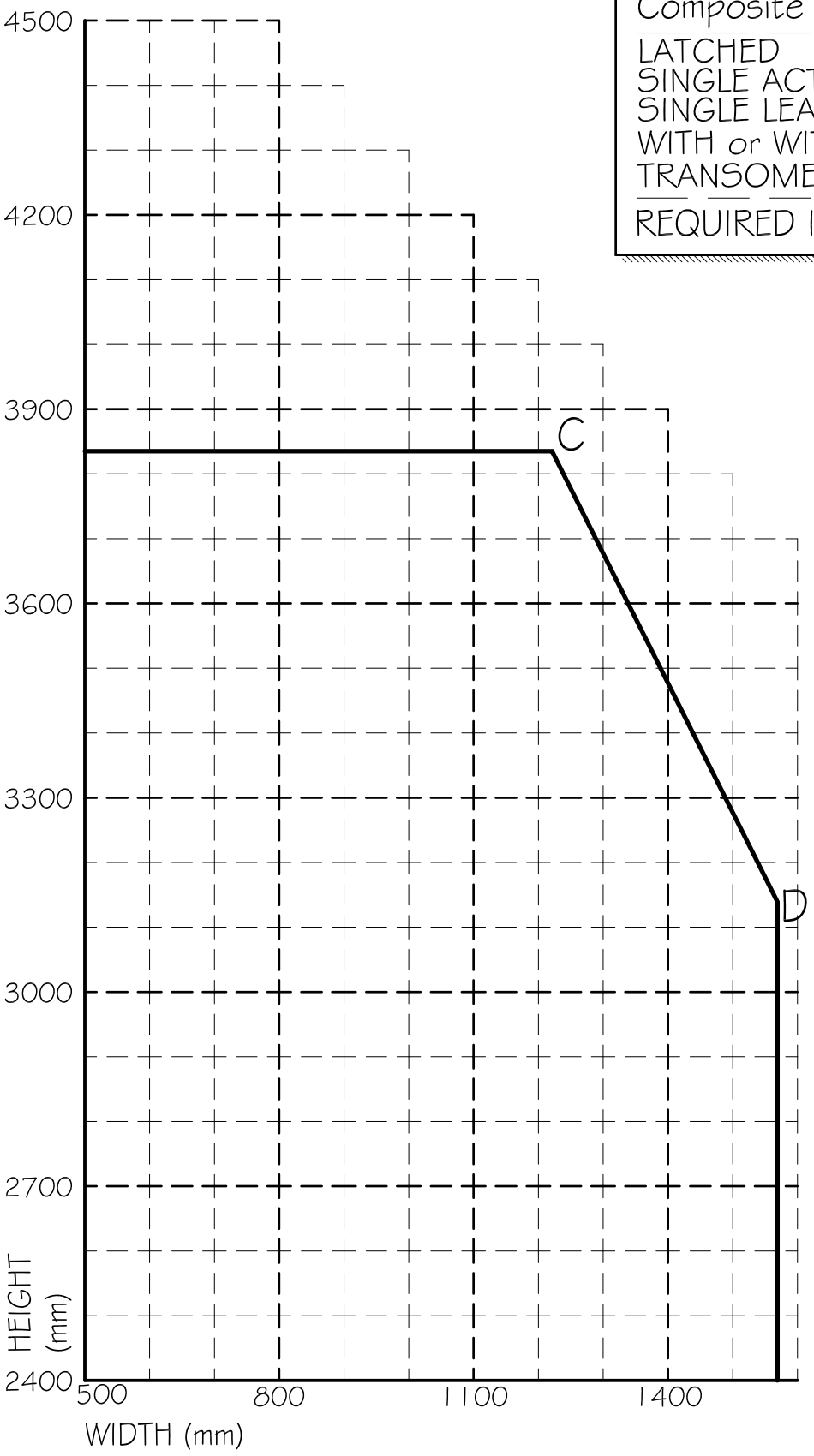
PAR/20449/01:B06

Configuration

Composite Frames

LATCHED
SINGLE ACTING
SINGLE LEAF
WITH or WITHOUT
TRANSOMED OVERPANEL

REQUIRED INTEGRITY: 60 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1221	1569
Height	3835	3139

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/20449/01, which contains full details of the assessed doorset construction.

ENVELOPE OF APPROVED LEAF SIZES

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Envelope of Approved Door Leaf Sizes
LSASD
In Composite Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

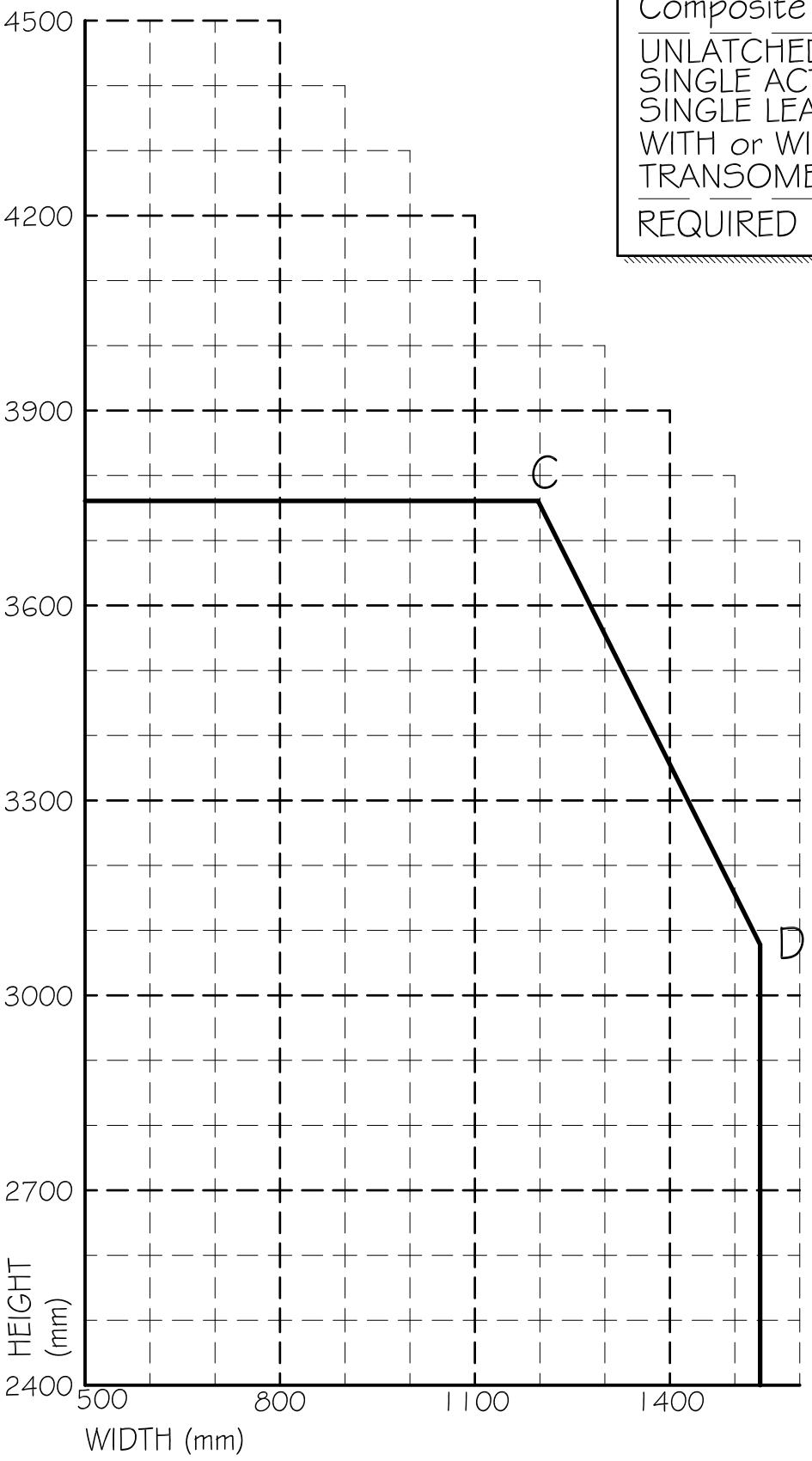
PAR/20449/01:B07

Configuration

Composite Frames

UNLATCHED
SINGLE ACTING
SINGLE LEAF
WITH or WITHOUT
TRANSOMED OVERPANEL

REQUIRED INTEGRITY: 60 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1197	1539
Height	3761	3078

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/20449/01, which contains full details of the assessed doorset construction.

ENVELOPE OF APPROVED LEAF SIZES

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Field of Application Report
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Warm Springs Composite Products
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Envelope of Approved Door Leaf Sizes
ULSASD
In Composite Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

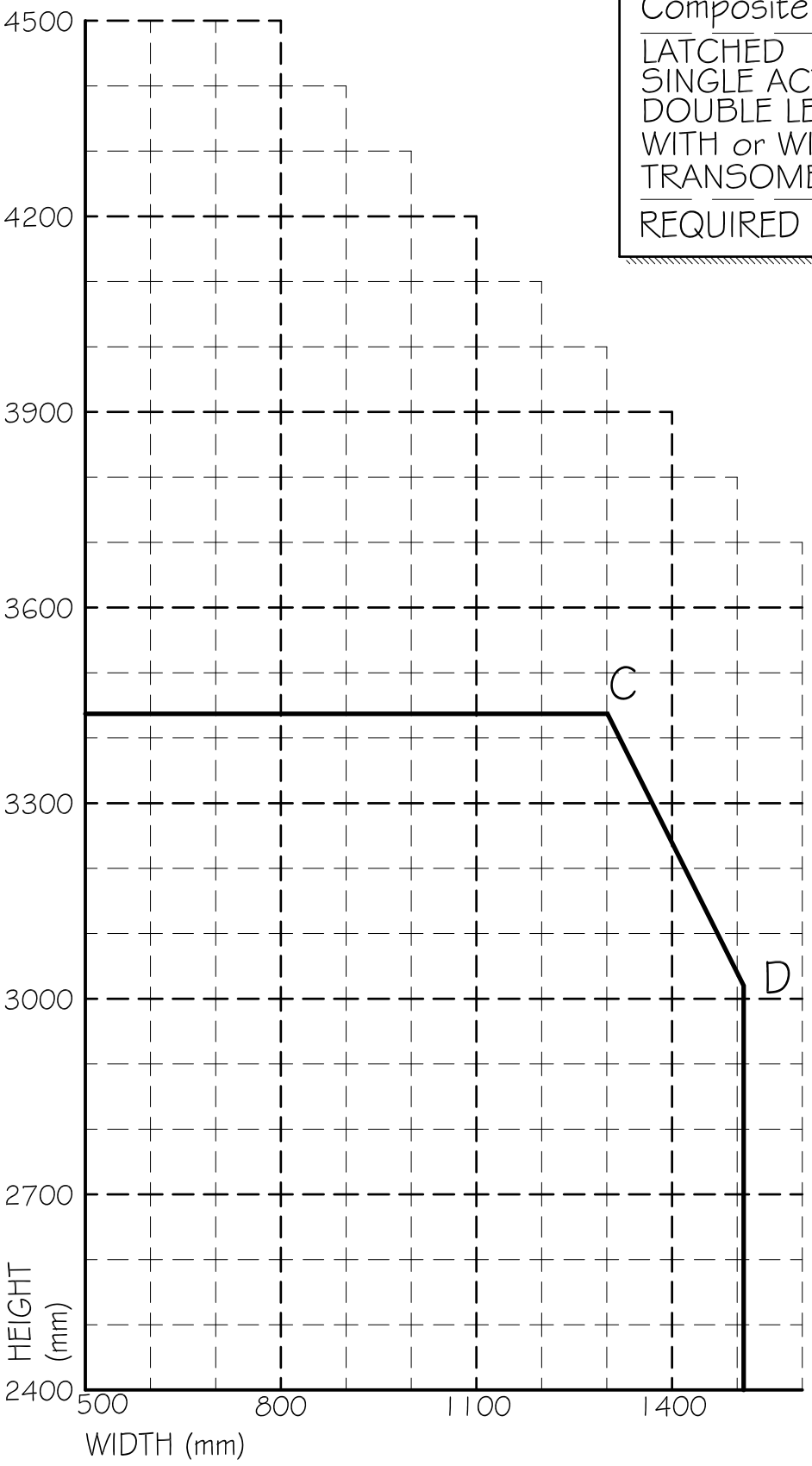
PAR/20449/01:B08

Configuration

Composite Frames

LATCHED
SINGLE ACTING
DOUBLE LEAF
WITH or WITHOUT
TRANSOMED OVERPANEL

REQUIRED INTEGRITY: 60 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1301	1510
Height	3437	3020

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/20449/01, which contains full details of the assessed doorset construction.

ENVELOPE OF APPROVED LEAF SIZES

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Field of Application Report
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Envelope of Approved Door Leaf Sizes
LSADD
In Composite Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

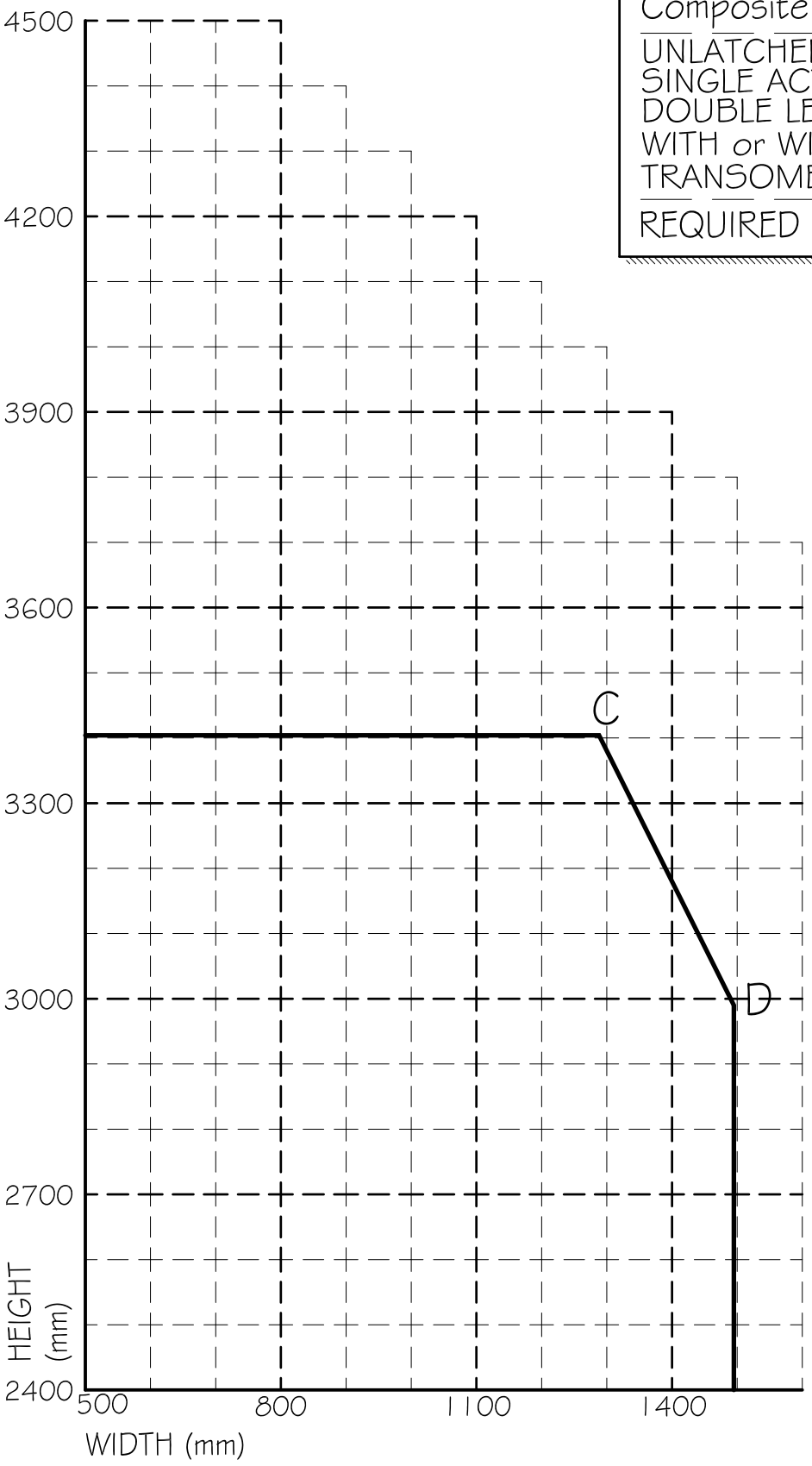
PAR/20449/01:B09

Configuration

Composite Frames

UNLATCHED
SINGLE ACTING
DOUBLE LEAF
WITH or WITHOUT
TRANSOMED OVERPANEL

REQUIRED INTEGRITY: 60 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1288	1495
Height	3404	2990

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ENVELOPE OF APPROVED LEAF SIZES

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Envelope of Approved Door Leaf Sizes
ULSADD
In Composite Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

PAR/20449/01:B10

APPENDIX C

Figures PAR/20449/01:C01 to C08

Assessed Leaf Size Envelopes for FD90 WSCP Mineral Composite Door Leaves Installed in Timber and Mineral Composite Frames

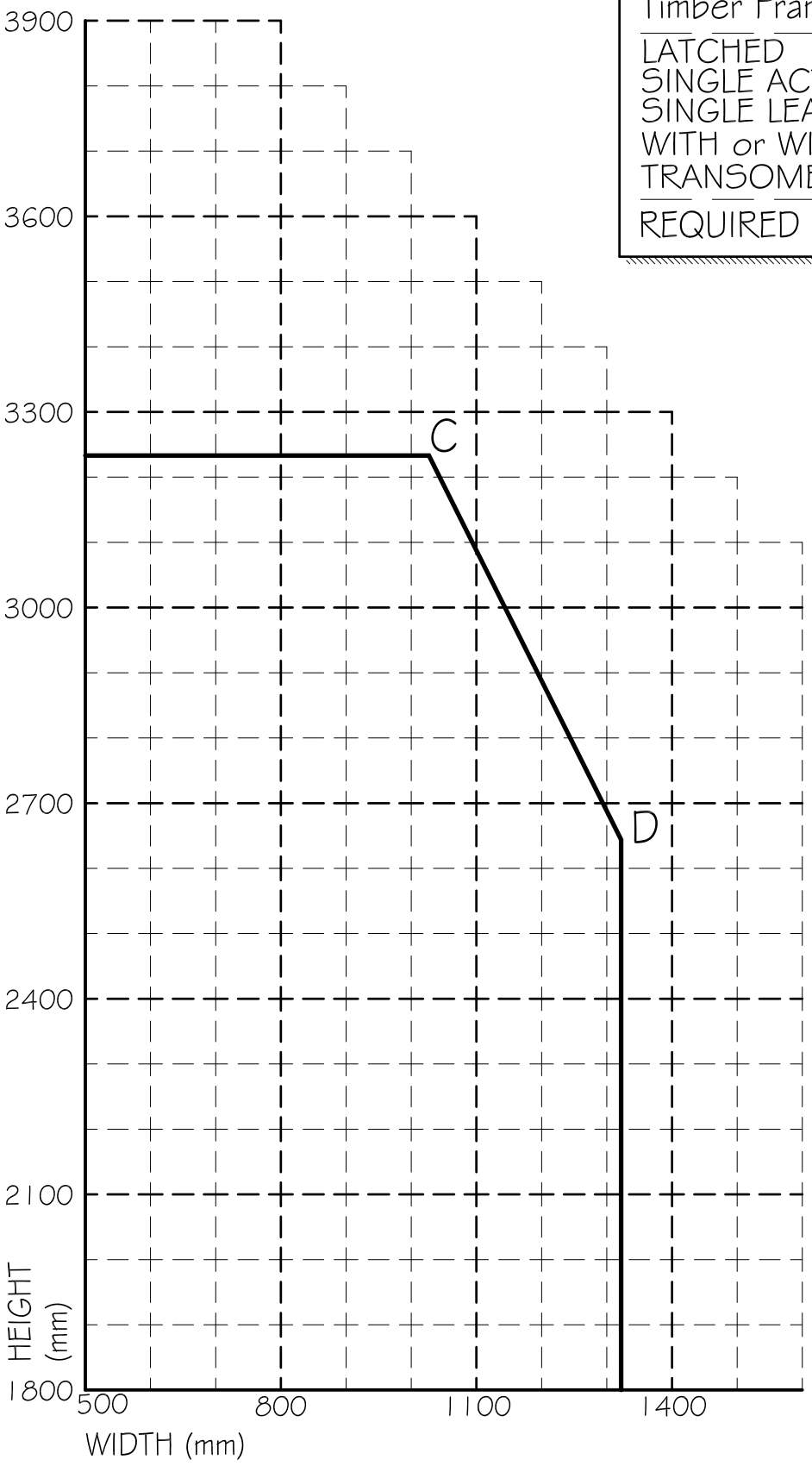
The figures in this Appendix are not included in the sequential page numbering of this report

Configuration

Timber Frames

LATCHED
SINGLE ACTING
SINGLE LEAF
WITH or WITHOUT
TRANSOMED OVERPANEL

REQUIRED INTEGRITY: 90 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1027	1322
Height	3233	2644

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/20449/01, which contains full details of the assessed doorset construction.

ENVELOPE OF APPROVED LEAF SIZES

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Field of Application Report
PAR/20449/01
Warm Springs Composite Products
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Envelope of Approved Door Leaf Sizes
LSASD
In Timber Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

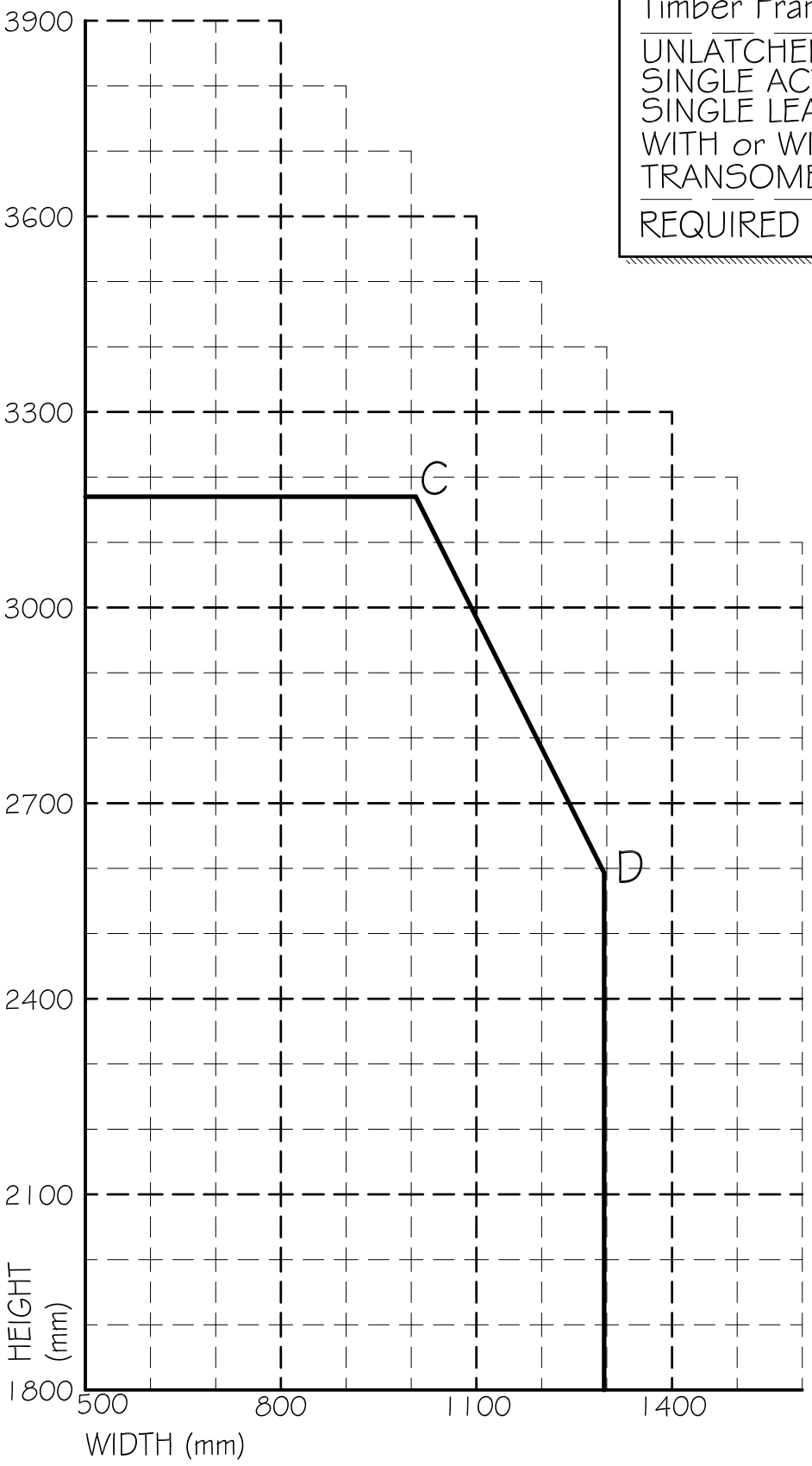
PAR/20449/01:C01

Configuration

Timber Frames

UNLATCHED
SINGLE ACTING
SINGLE LEAF
WITH or WITHOUT
TRANSOMED OVERPANEL

REQUIRED INTEGRITY: 90 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1007	1296
Height	3170	2593

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/20449/01, which contains full details of the assessed doorset construction.

ENVELOPE OF APPROVED LEAF SIZES

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Envelope of Approved Door Leaf Sizes
ULSASD
In Timber Frames

Job number: 20449

Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

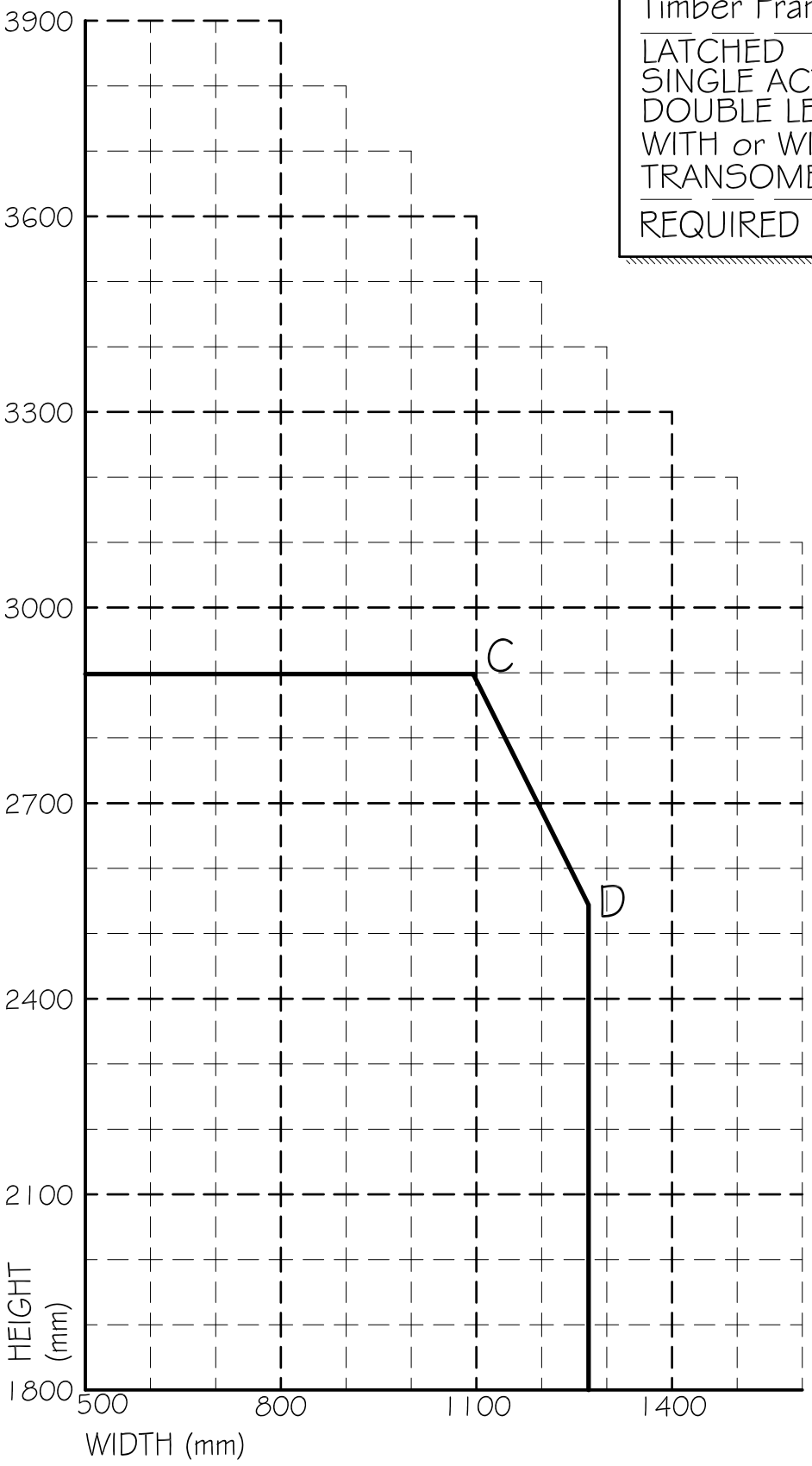
PAR/20449/01:C02

Configuration

Timber Frames

LATCHED
SINGLE ACTING
DOUBLE LEAF
WITH or WITHOUT
TRANSOMED OVERPANEL

REQUIRED INTEGRITY: 90 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1095	1272
Height	2898	2544

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/20449/01, which contains full details of the assessed doorset 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 C represents the maximum leaf height and its associated width.
POINT D represents the maximum leaf width and its associated height.

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Website: http://www.intfire.com

Field of Application Report
PAR/20449/01
Warm Springs Composite Products
55mm thick composite FD60, FD90 and FD120 Door Leaves Hung in Timber and Composite Frames

Envelope of Approved Door Leaf Sizes
LSADD
In Timber Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

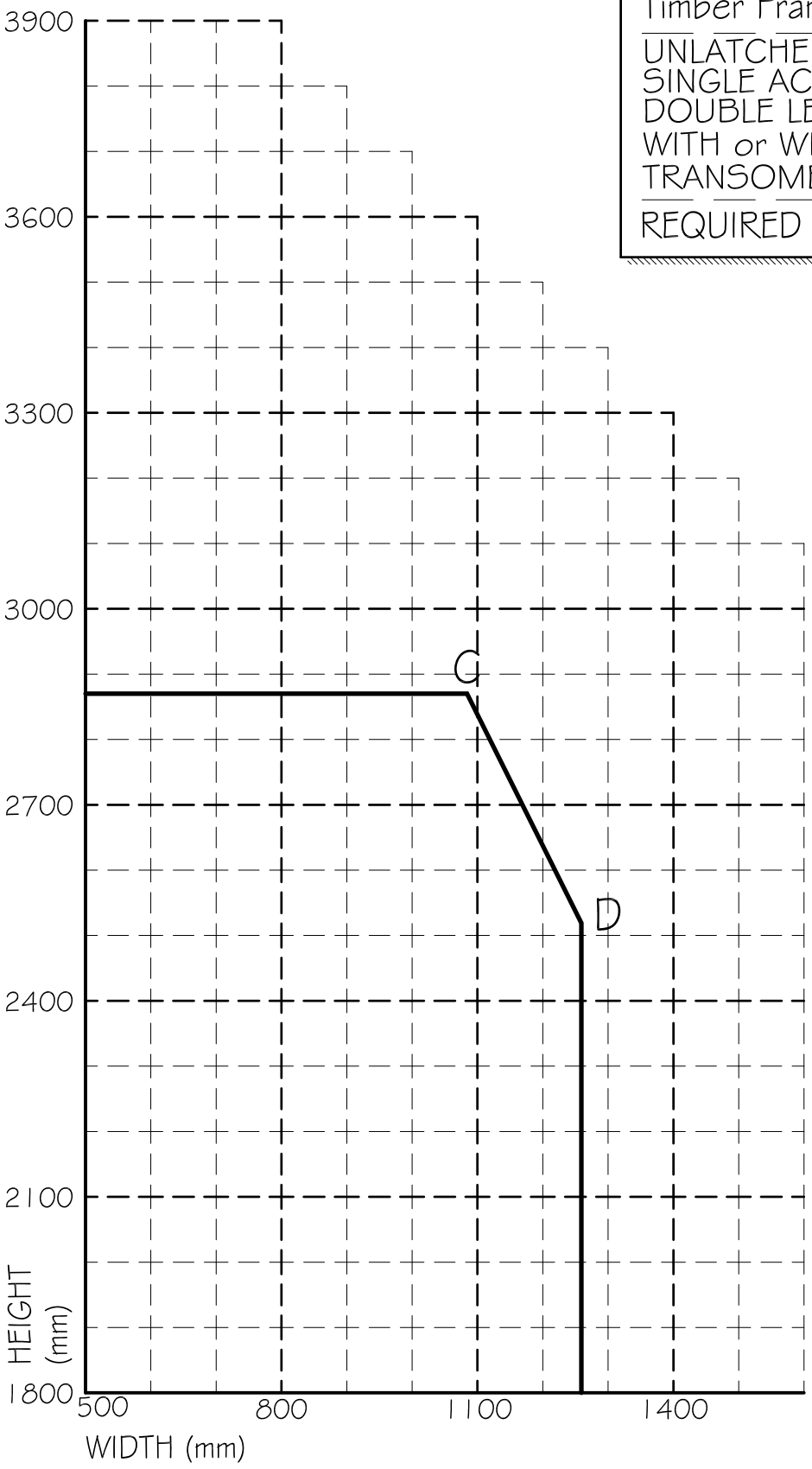
PAR/20449/01:C03

Configuration

Timber Frames

UNLATCHED
SINGLE ACTING
DOUBLE LEAF
WITH or WITHOUT
TRANSOMED OVERPANEL

REQUIRED INTEGRITY: 90 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1084	1259
Height	2870	2519

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/20449/01, which contains full details of the assessed doorset construction.

ENVELOPE OF APPROVED LEAF SIZES

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Envelope of Approved Door Leaf Sizes
ULSADD
In Timber Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

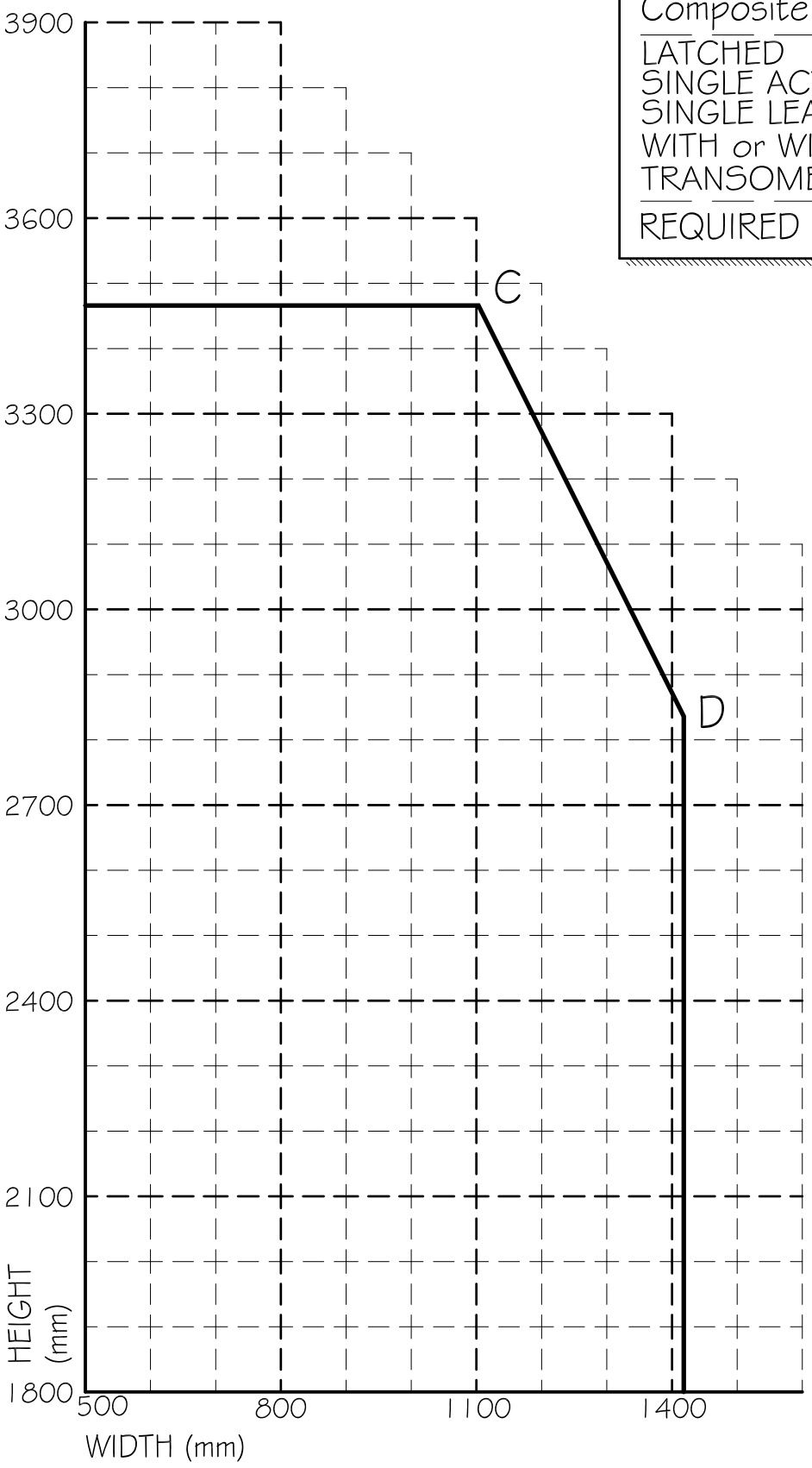
PAR/20449/01:C04

Configuration

Composite Frames

LATCHED
SINGLE ACTING
SINGLE LEAF
WITH or WITHOUT
TRANSOMED OVERPANEL

REQUIRED INTEGRITY: 90 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1103	1418
Height	3466	2836

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/20449/01, which contains full details of the assessed doorset construction.

ENVELOPE OF APPROVED LEAF SIZES

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Envelope of Approved Door Leaf Sizes
LSASD
In Composite Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

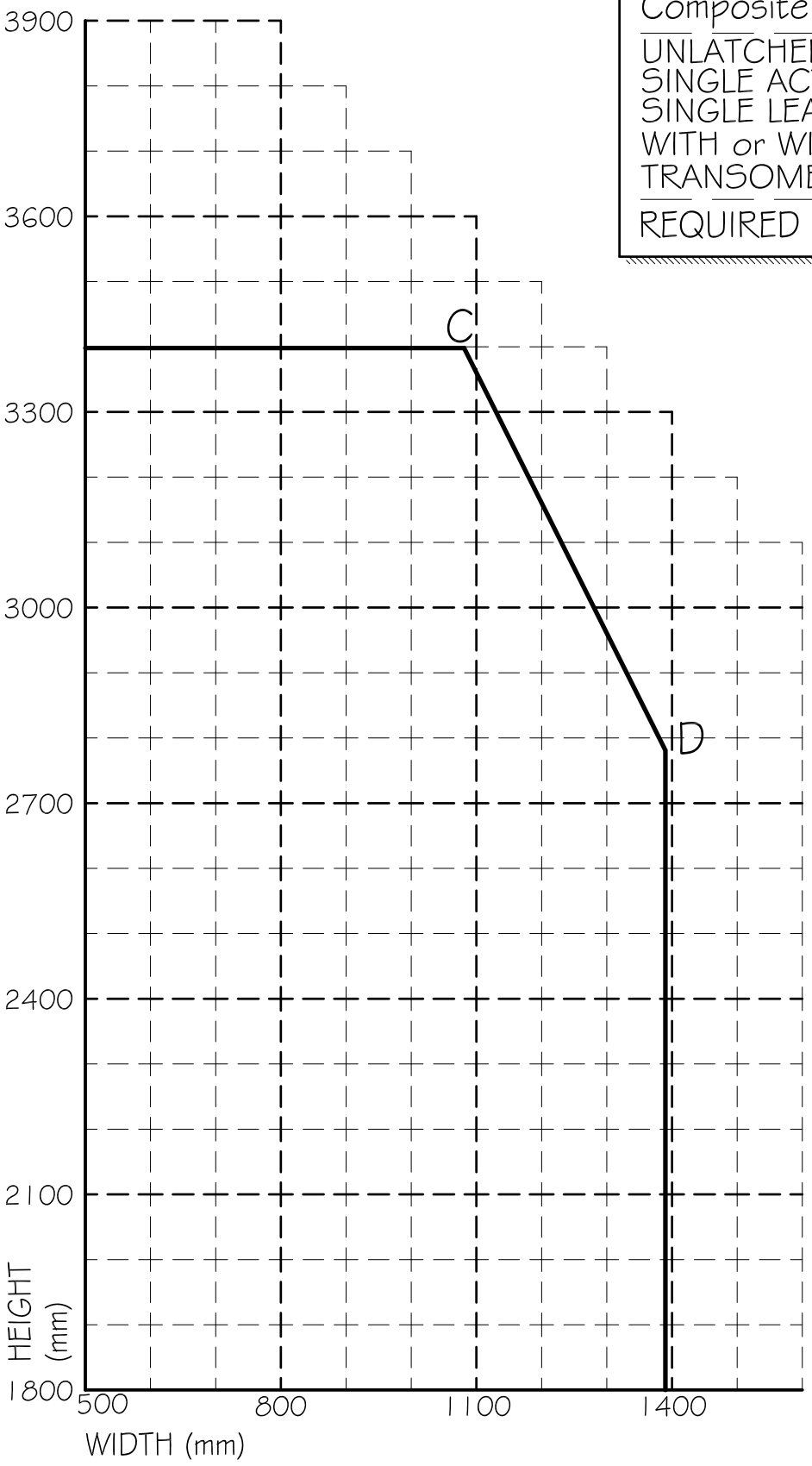
PAR/20449/01:C05

Configuration

Composite Frames

UNLATCHED
SINGLE ACTING
SINGLE LEAF
WITH or WITHOUT
TRANSOMED OVERPANEL

REQUIRED INTEGRITY: 90 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1081	1390
Height	3398	2781

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/20449/01, which contains full details of the assessed doorset construction.

ENVELOPE OF APPROVED LEAF SIZES

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Envelope of Approved Door Leaf Sizes
ULSASD
In Composite Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

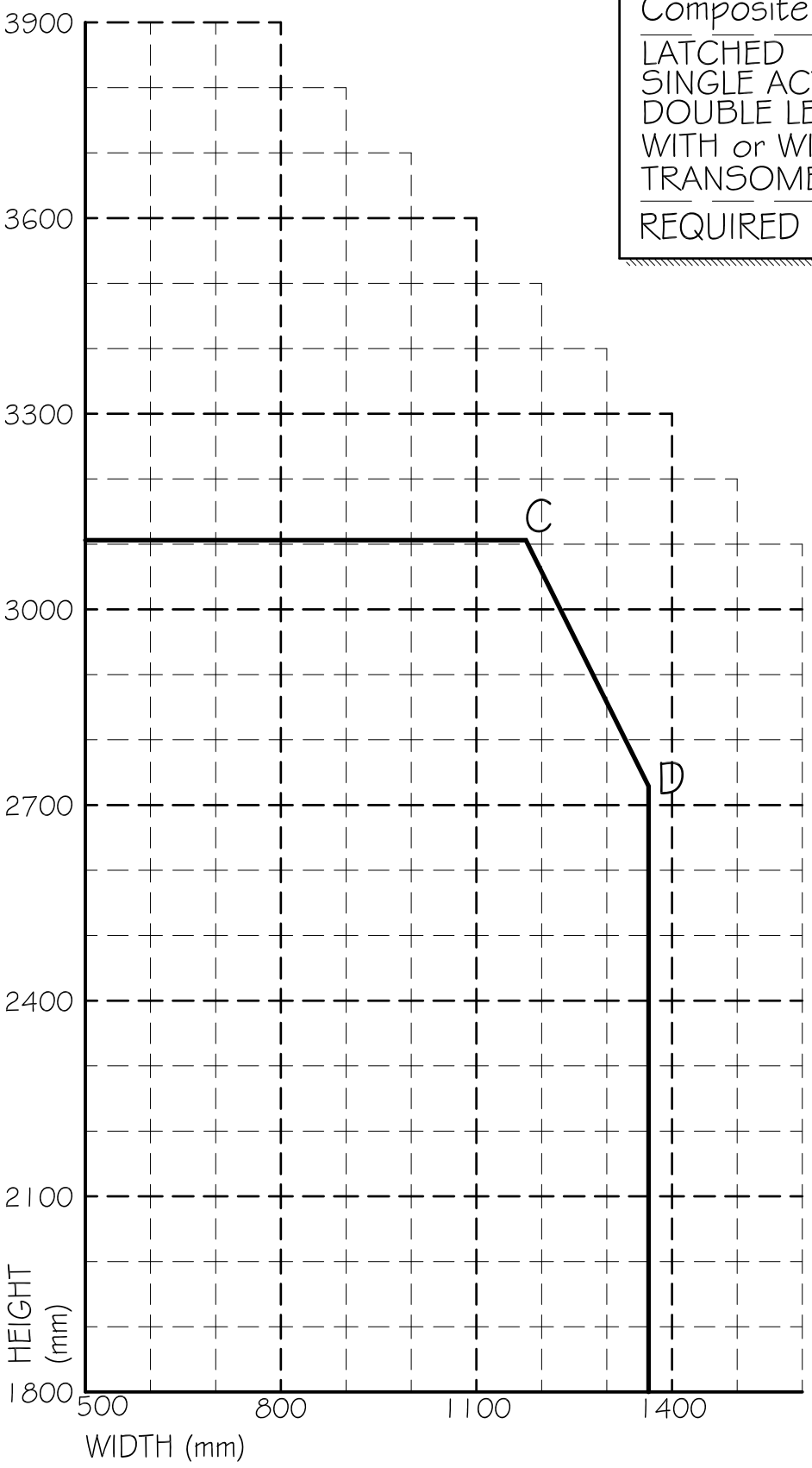
PAR/20449/01:C06

Configuration

Composite Frames

LATCHED
SINGLE ACTING
DOUBLE LEAF
WITH or WITHOUT
TRANSOMED OVERPANEL

REQUIRED INTEGRITY: 90 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1176	1364
Height	3106	2729

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/20449/01, which contains full details of the assessed doorset construction.

ENVELOPE OF APPROVED LEAF SIZES

The above graph represents the envelope of approved leaf sizes for the proposed door leaf configuration.
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PAR/20449/01
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55mm thick composite FD60, FD90 and FD120 Door Leaves Hung in Timber and Composite Frames

Envelope of Approved Door Leaf Sizes
LSADD
In Composite Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

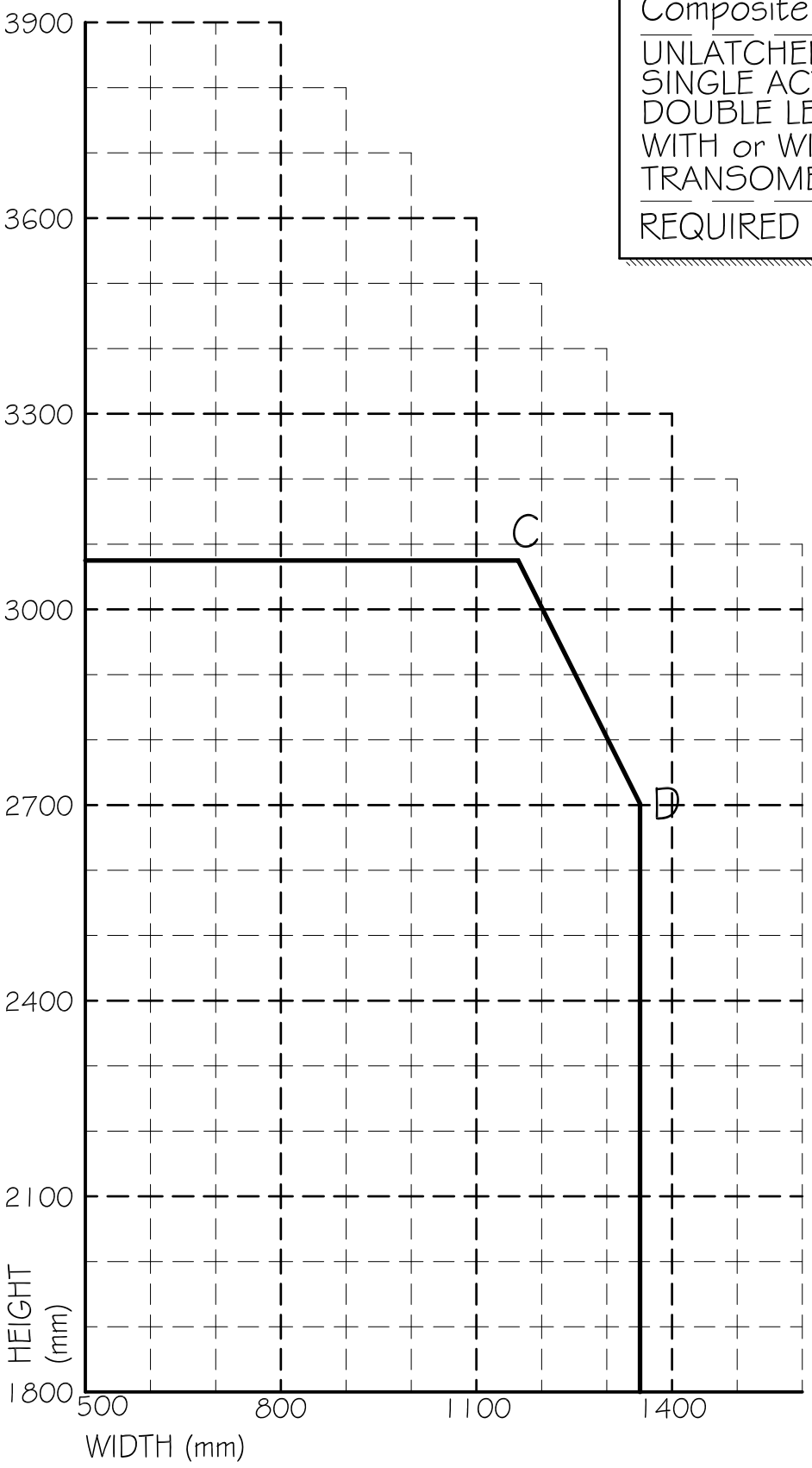
PAR/20449/01:C07

Configuration

Composite Frames

UNLATCHED
SINGLE ACTING
DOUBLE LEAF
WITH or WITHOUT
TRANSOMED OVERPANEL

REQUIRED INTEGRITY: 90 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1164	1351
Height	3075	2702

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/20449/01, which contains full details of the assessed doorset construction.

ENVELOPE OF APPROVED LEAF SIZES

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Envelope of Approved Door Leaf Sizes
ULSADD
In Composite Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

PAR/20449/01:C08

APPENDIX D

Figures PAR/20449/01:D01 to D06

Assessed Leaf Size Envelopes for FD120 WSCP Mineral Composite Door Leaves Installed in Timber and Mineral Composite Frames

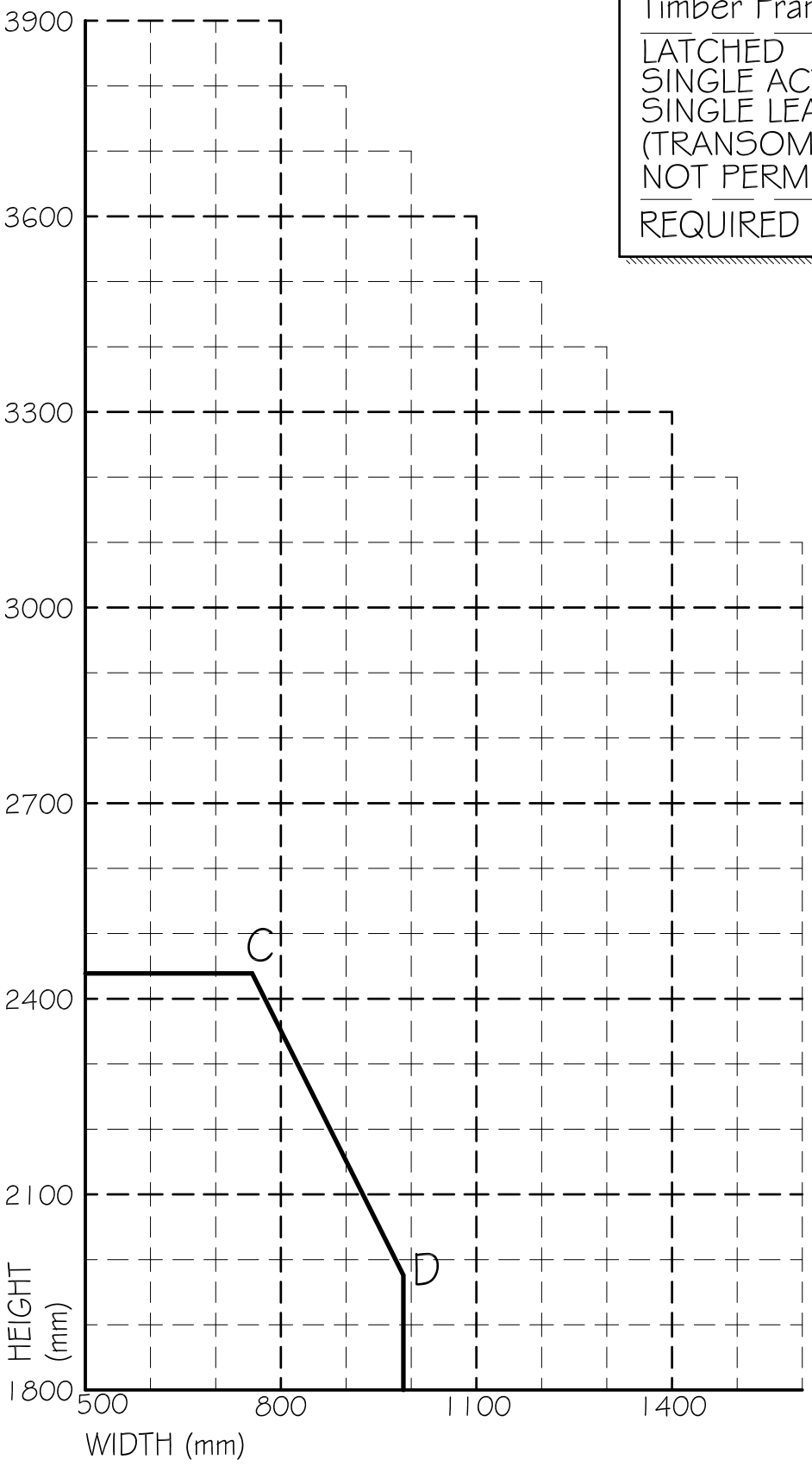
The figures in this Appendix are not included in the sequential page numbering of this report

Configuration

Timber Frames

LATCHED
SINGLE ACTING
SINGLE LEAF
(TRANSOMED OVERPANEL NOT PERMITTED)

REQUIRED INTEGRITY: 120 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	756	988
Height	2439	1976

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/20449/01, which contains full details of the assessed doorset construction.

ENVELOPE OF APPROVED LEAF SIZES

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Envelope of Approved Door Leaf Sizes
LSASD
In Timber Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

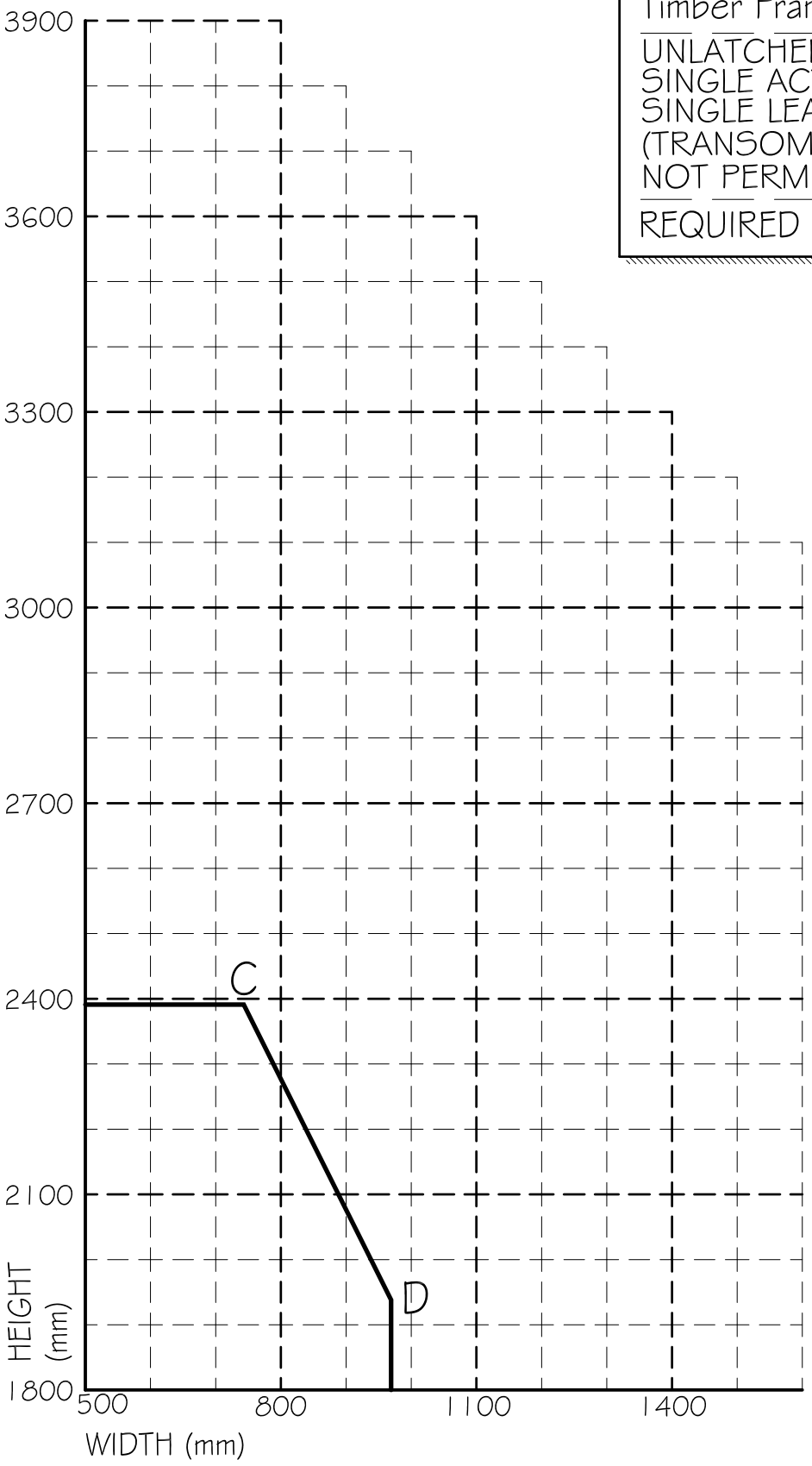
PAR/20449/01:D01

Configuration

Timber Frames

UNLATCHED
SINGLE ACTING
SINGLE LEAF
(TRANSOMED OVERPANEL NOT PERMITTED)

REQUIRED INTEGRITY: 120 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	743	969
Height	2391	1938

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ENVELOPE OF APPROVED LEAF SIZES

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Envelope of Approved Door Leaf Sizes
ULSASD
In Timber Frames

Job number: 20449

Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

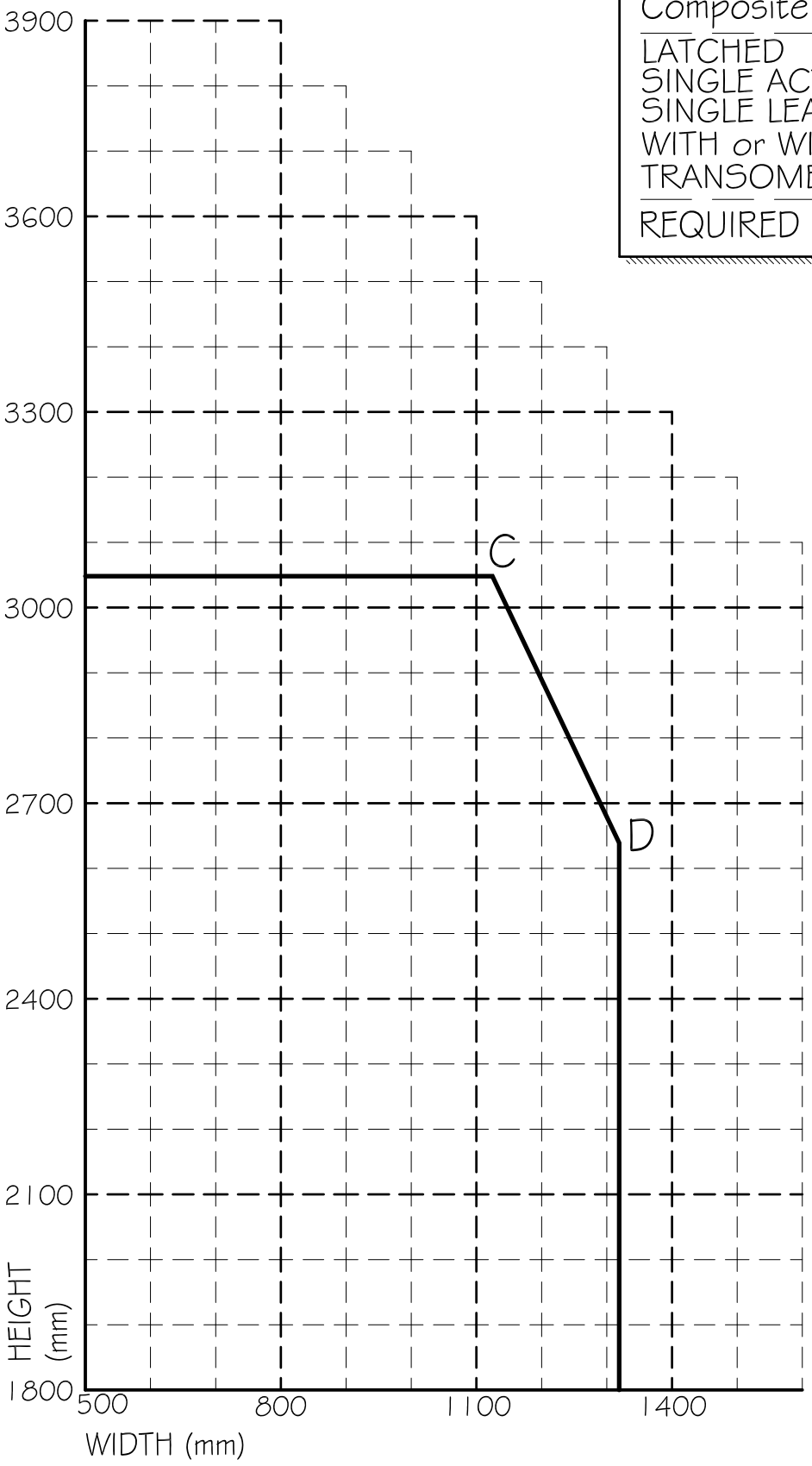
PAR/20449/01:D02

Configuration

Composite Frames

LATCHED
SINGLE ACTING
SINGLE LEAF
WITH or WITHOUT
TRANSOMED OVERPANEL

REQUIRED INTEGRITY: 120 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1124	1319
Height	3048	2639

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ENVELOPE OF APPROVED LEAF SIZES

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Envelope of Approved Door Leaf Sizes
LSASD
In Composite Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

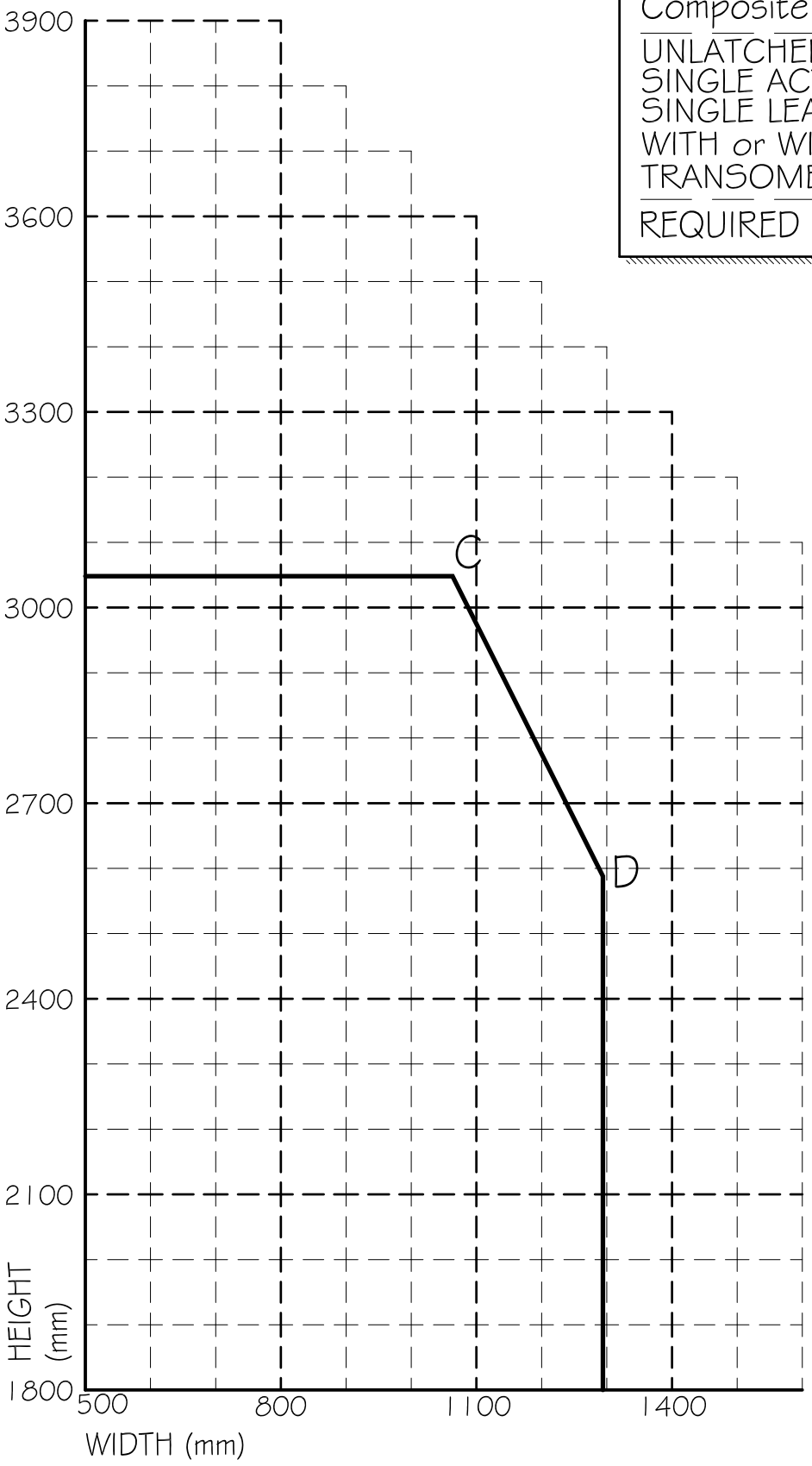
PAR/20449/01:D03

Configuration

Composite Frames

UNLATCHED
SINGLE ACTING
SINGLE LEAF
WITH or WITHOUT
TRANSOMED OVERPANEL

REQUIRED INTEGRITY: 120 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1063	1294
Height	3048	2588

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ENVELOPE OF APPROVED LEAF SIZES

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Envelope of Approved Door Leaf Sizes
ULSASD
In Composite Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

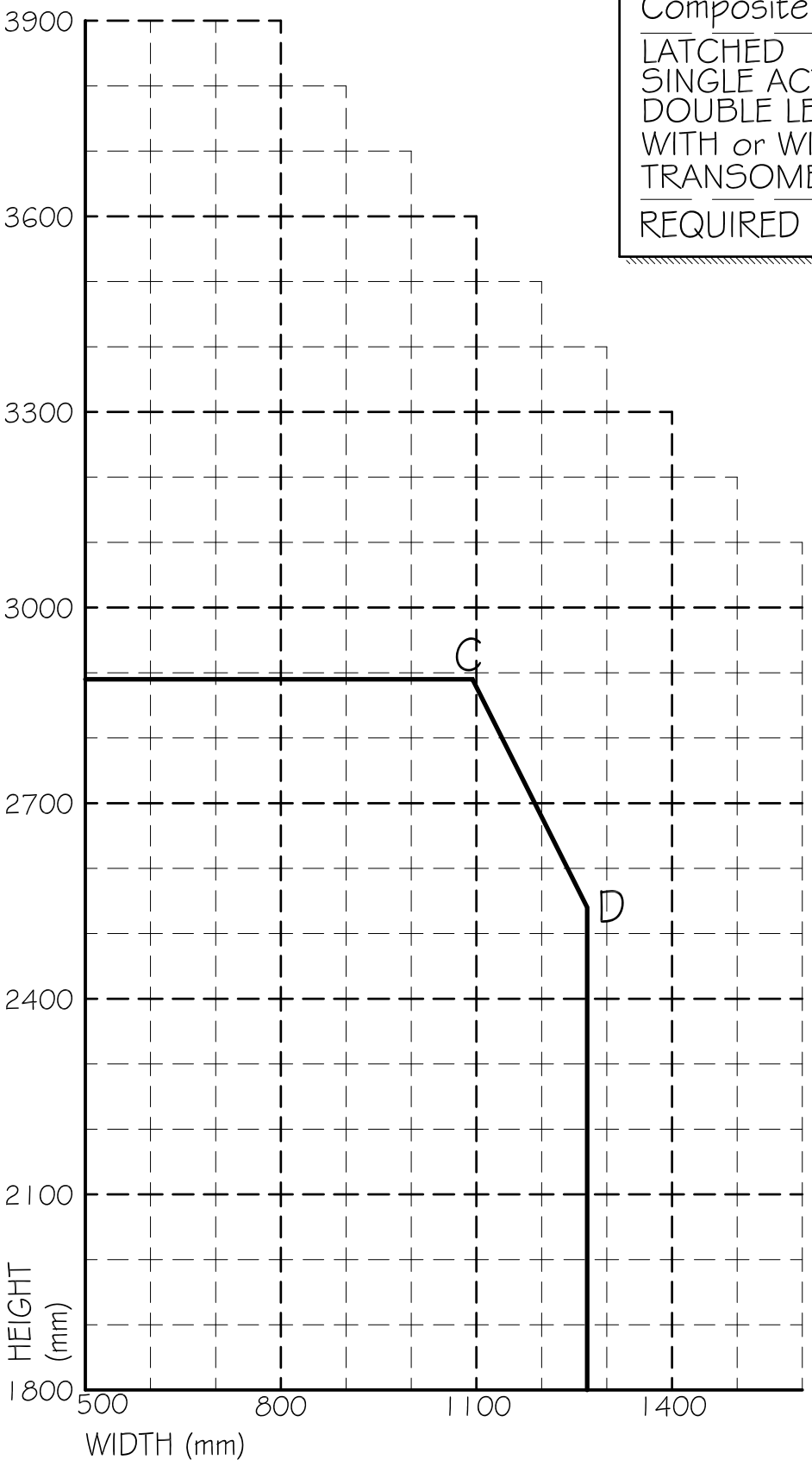
PAR/20449/01:D04

Configuration

Composite Frames

LATCHED
SINGLE ACTING
DOUBLE LEAF
WITH or WITHOUT
TRANSOMED OVERPANEL

REQUIRED INTEGRITY: 120 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1094	1270
Height	2890	2540

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ENVELOPE OF APPROVED LEAF SIZES

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Envelope of Approved Door Leaf Sizes
LSADD
In Composite Frames

Job number: 20449	
Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

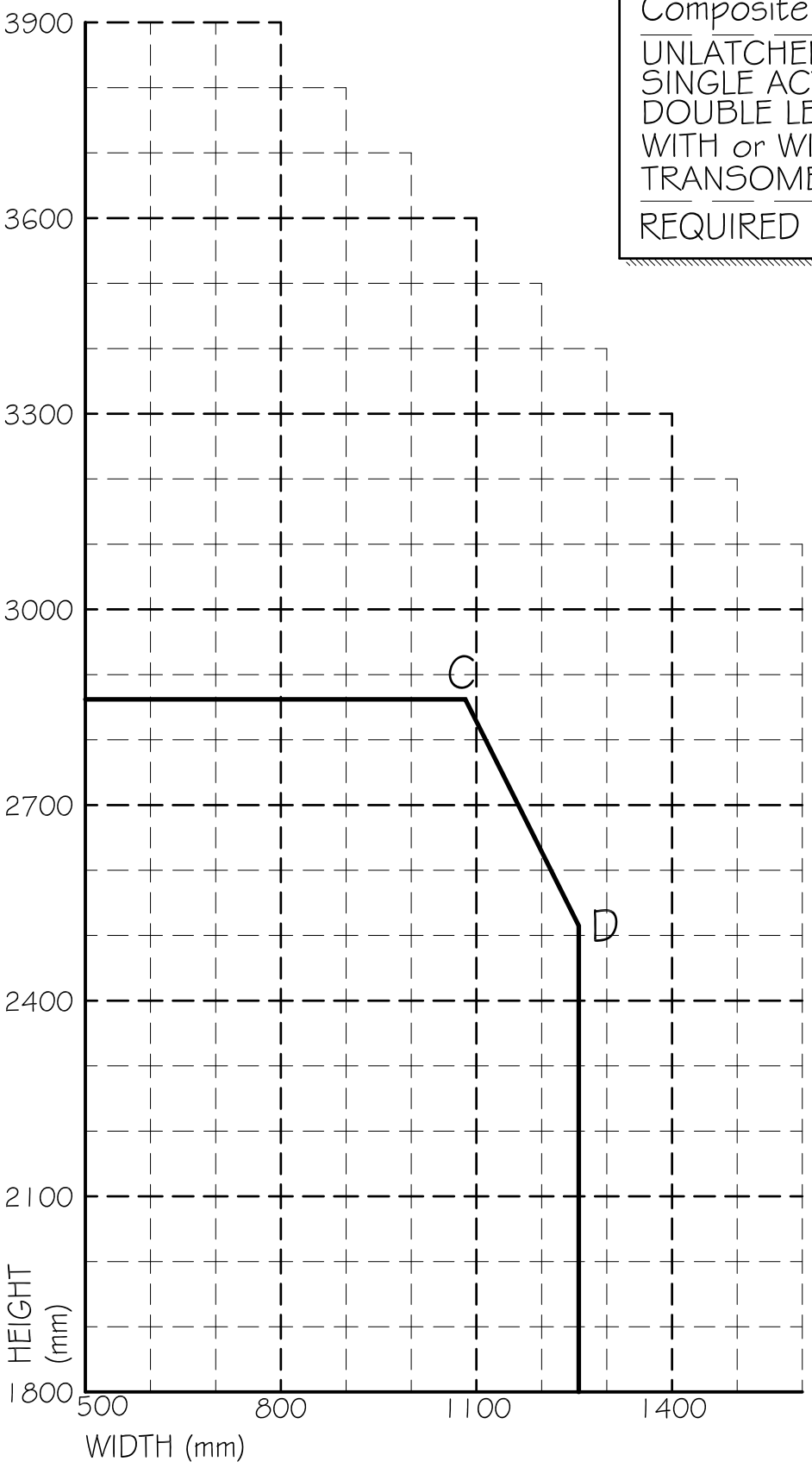
PAR/20449/01:D05

Configuration

Composite Frames

UNLATCHED
SINGLE ACTING
DOUBLE LEAF
WITH or WITHOUT
TRANSOMED OVERPANEL

REQUIRED INTEGRITY: 120 Minutes



LEAF SIZE ENVELOPE POINTS

	C	D
Width	1083	1257
Height	2862	2515

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/20449/01, which contains full details of the assessed doorset construction.

ENVELOPE OF APPROVED LEAF SIZES

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Envelope of Approved Door Leaf Sizes
ULSADD
In Composite Frames

Job number: 20449

Drawn by: CSP	Checked by: CH
Not To Scale	Drawn: Jan 2020

PAR/20449/01:D06

APPENDIX E

Assessed Intumescent Seal Specifications for WSCP Mineral Composite Door Leaves Installed in Timber and Mineral Composite Frames

Intumescent Seal Specifications for WSCP Mineral Composite Door Leaves Installed in Timber and Mineral Composite Frames

Location		Standard Specification – Single Action Door Assemblies		
		Make/Type	**Size (mm)**	**Location**
Frame reveal	Head	WSCP PVC-seal	22 x 4	1 No. seal against the stop set 35mm from the opening face and 1 No. seal set 7mm from the opening face (approx. 5mm spacing between seals)
	Jambs	WSCP PVC-seal	22 x 4	1 No. seal against the stop set 35mm from the opening face and 1 No. seal set 7mm from the opening face (approx. 5mm spacing between seals)
Leaf edges	Square meeting stiles	WSCP PVC-seal	22 x 4	2 No. seals with 1 seal set within a groove 5mm from the exposed face in one leaf edge and 1 seal set within a groove 5mm from the unexposed face in the opposing leaf edge
	Bottom of leaf	WSCP Flex-seal (uncased graphite)	47 x 1	Fitted centrally in a groove in the leaf and over sailing the lippings
	Head & Jambs	N/A	-	-
Interface between overpanel and frame/ transom		WSCP PVC-seal	22 x 4	2 No. seals spaced 5mm apart and centrally located within the frame reveal or panel edges
Interface between sidepanel and frame/mullion		WSCP PVC-seal	22 x 4	2 No. seals spaced 5mm apart and centrally located within the frame reveal or panel edges

Location		Standard Specification – FD60 Double Action Door Assemblies in Timber Frames		
		Make/Type	**Size (mm)**	**Location**
Frame reveal	Head	WSCP PVC-seal	22 x 4	2 No. seals spaced 5mm apart and centrally located within the frame reveal
	Jambs	WSCP PVC-seal	22 x 4	2 No. seals spaced 5mm apart and centrally located within the frame reveal
Leaf edges	Square meeting stiles	WSCP PVC-seal	22 x 4	2 No. seals with 1 seal set within a groove 5mm from the exposed face in one leaf edge and 1 seal set within a groove 5mm from the unexposed face in the opposing leaf edge
	Bottom of leaf	WSCP Flex-seal (uncased graphite)	47 x 1	Fitted centrally in a groove in the leaf and over sailing the lippings
	Head & Jambs	N/A	-	-

Notes:

i) The seals must be of the type specified above, substitution with alternative products at this level of fire resistance is not permitted

ii) Intumescent seals must be located as stated above. If the seals need to be reconfigured, it is recommended that IFC are contacted for advice as adjustment to the seal specification at this level of fire resistance may reduce the performance of the door assembly

APPENDIX F

General Guidance on Installation of Hardware

General Guidance on Installation of Hardware

F.1 Hinges

The following hinges have been tested with the WSCP mineral core design:

- Royde & Tucker Hi Load H105 and H207 lift-off type
- Hoppe UK Ltd Bearing-butt type hinges; Ref: AR8680
- Cooke Brothers Ltd bearing-butt type hinges; Ref: 7700

Alternative hinges may be used, subject to compliance with the specifications below:

Hinge types:	Fixed pin, washered butt, ball bearing butt or journal supported hinges may be used.
Number of hinges:	Minimum of 3 No. (1½ pairs) per leaf. Leaves > 2200mm high must fit 4 No. (2 pairs) per leaf Leaves > 2800mm high must fit 5 No. (2½ pairs) per leaf
Positions:	Top and second hinges to be set 200mm and 400mm down from the leaf head to the top of the hinges, respectively, with the bottom hinge set 200mm up from the bottom of the leaf to the bottom of the hinge. All other hinges to be spaced equidistant between the bottom and second hinge, as appropriate. (All positions ±25mm.)
Fixings:	An appropriately sized pilot hole is required prior to inserting screws into composite stiles and frames. Coarsely threaded wood-type steel screws, as recommended by the hinge manufacturers, but in no case smaller than No 8 (3.8mm diameter) x 32mm long, and having thread for the full length. Position of screws (in relation to the door face) in blades of alternative hinge shall be similar to hinges tested with the proposed door type.
Hinge blade sizes:	2.4 – 3.5mm thick x 89 – 110mm high x 30 – 32mm wide. (These dimensions refer to the blade size, i.e. the part of the hinges that are recessed into the edge of the leaves/frame.)
Hinge materials:	Steel or Stainless Steel. (Aluminium, Nylon or 'Mazac' are not permitted.) No combustible or thermally softening materials to be included.
Additional protection:	All hinge blades must be bedded on minimum 2mm thick low-pressure forming intumescent material.

Rising butt, cranked butts 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.

F.2 Mortice Latches/Locks

The following locks and latches have been tested with the WSCP mineral core design:

- Lever Legge lock/latch
- Dorma 752F sash lock & Dale NP30/10/30 double cylinder 7200
- Dale 97170 tubular mortice latch
- Hoppe UK Ltd mortice sashlock Ref: AR910
- Hoppe UK Ltd stainless steel eurocylinder Ref: E42S
- Hoppe UK Ltd lock escutcheon plate Ref AR361/27
- Zoo Architectural Hardware Ltd steel latch, Ref: ZDL CE1121

Alternative mortice locks/latches may be used, subject to compliance with the specifications below.

Where mortice latches or locks are fitted, they should be centred at 1000mm (± 200mm), above the bottom of the door leaf, and should comply with the following specifications:

Latch/lock types:	Mortice latches, tubular mortice latches, sashlocks, deadlocks.	
Maximum dimensions:	Forend plate	235mm long x 22mm wide.
	Latch body	18mm thick.
	Strikeplate	165mm long x 22mm wide.

Latches must have no essential part of their structure made from polymeric or other low melting point (<800°C) materials, and should not contain any flammable materials.

The latch keep must be bedded on minimum 1mm thick low-pressure forming intumescent material for all fire resistances. In 120 minute doorsets, the lock/latch body must be also be encased with minimum 1mm thick low-pressure forming intumescent material.

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

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

F.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 it is normally kept locked shut and labelled with an appropriate sign which complies with BS5499: Part 1: 1990.

The following closers have been successfully tested with the WSCP mineral core door design:

- Dorma TS83V overhead closer
- Briton 2003SES overhead closer
- Hoppe UK Ltd concealed overhead closer Ref: AR7883

Alternative closers may be used, subject to compliance with the specifications below.

a) Face-fixed overhead door closers (and accessories such as soffit brackets) that have been tested, assessed or otherwise approved for use on unlatched cellulosic or mineral core 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 un-insulating 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. Additionally the fixing position and type must be similar to the closers tested with the WSCP Mineral core design, as listed above, to ensure they remain secure and do not increase the potential for damage and delamination of the outer face.

b) The only concealed closer type approved by this report is the tested Hoppe UK Ltd concealed overhead closer Ref: AR7883. The closer may be used in timber and Tectonite door frames for up to 120 minutes fire resistance when the slide arm body and closer body are fully encased in 2mm thick Interdens from Lorient Polyproducts Ltd or Dufaylite Developments Ltd. No other type of concealed (head or jamb mounted) closer is permitted for use with this door design unless subjected to fire resistance testing on the WSCP mineral core door design and/or assessed for inclusion within this assessment by International Fire Consultants

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

F.4 Bolts

One of the tests referenced in this report included a double leaf door fitted with flush bolts where the primary leaf was unlatched but the flush bolts were engaged. However, the testing on the WSCP mineral core door design has demonstrated that flush bolts are not necessary to achieve the 120 minutes performance (subject to an appropriate self-closing device being fitted).

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 38mm wide and 20mm deep;
- The head of the leaf and/or frame should contain a minimum 10mm width of intumescent material either side of the bolt/keep plate;
- The body of the bolt should be bedded on low-pressure forming intumescent material at least 1mm thick;
- Edge fixed bolts shall be positioned centrally in the leaf thickness (the intumescent seals defined in Appendix C are fitted in the active and inactive leaf. The flush bolt interrupts the seal in the meeting edge of the inactive leaf by approximately 50%);
- There should be a minimum of 10mm width of intumescent strip in the door edge, past the body of the bolt. The strip in the active leaf is uninterrupted;
- Surface mounted barrel bolts shall not exceed 400mm in length, but there is no limitation on their width. Screws for fixing bolts must be at least 25mm long, and have thread for the full screw length.

F.5 Floor Springs and Accessories – 60 minute applications only

Floor springs and accessories (straps and top pivots) are necessary for double acting assemblies. Floor springs and accessories may be used, but only with FD60 doors in hardwood frames, subject to having appropriate fire test or assessment evidence for use on door assemblies of similar construction to that proposed, and the following limitations;

- Incorporation of any intumescent gasketry used in the test;
- Continuation of at least 20mm (total width) of the intumescent edge seals in leaf or frame head (as applicable) with 10mm along both sides of the top strap/pivot for double acting straps
- Minimum 1mm thick intumescent sheet must line the mortise of the top strap and pivot in both the door leaf and frame head (or as supplied by the floor spring manufacturer);
- No removal of the Tectonite or intumescent strip at the leaf stile (except for a 6-8mm diameter access hole for the top strap adjustment screw).

It is the responsibility of others to determine the suitability of the WSCP mineral core leaf to accept the top/bottom straps, and ensure that adequate fixings are employed.

F.6 Non-Essential Hardware Items

F.6.1 Push plates, kick plates, etc.

Metal plates may be surface-mounted to the door leaves, 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.

F.6.2 Pull handles

These may be fixed to the door leaves, 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 the hole should be lined with a 'sleeve' of 1mm thick Interdens, to prevent localised conduction and ignition of the door facings. Fixings through the leaf shall be non-combustible.

F.6.3 Intumescent air transfer grilles

These must be tested, assessed or otherwise approved for use with 54mm thick (or less) composite mineral doors with up to 120 minutes fire resistance as appropriate. They must be fitted fully in accordance with the manufacturer's instructions, including all intumescent liners and cloaking grilles/beads. They must be no larger than that for which test or assessment evidence exists. See Section 3.6, 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 3.6.

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

F.6.4 Drop seals

Lorient IS8010 or Norseal NOR810S threshold drop seals can be fitted into the bottom edge of fire rated door leaves providing that they are encased in 1mm thick low-pressure forming intumescent material and are positioned centrally within the door thickness. The intumescent strip specified in Appendix E, shall still be included in the bottom of the leaf; although it will be partially interrupted by the drop seal.

APPENDIX G

Summary of Fire Test Evidence

Summary of Fire Test Evidence

Test Report	Configuration Tested	Leaf Size Tested	Test Standard	Integrity
Chilt/RF03070	ULSADD	2100 x 900 + 900 x 55mm	BS476: Part 22: 1987	122 minutes
CFR 1103111	ULSADD	2292 x 1068 + 1068 x 57mm	BS476: Part 22: 1987	151 minutes
CFR 1009081	LSADD	2236 x 1036 + 1037 x 57mm	BS476: Part 22: 1987	131 minutes
CFR 1007081	LSASD	2341 x 1075 x 57mm	BS476: Part 22: 1987	105 minutes
	LSASD	2340 x 1075 x 57mm		91 minutes
CFR 1007071	LSADD	2265 x 1050 x 57mm	BS476: Part 22: 1987	115 minutes
WHI 495 PSV 1553 (multi-piece stiles and rails)	Indicative Specimen	1050 x 900 x 44mm	UBC Standard 7-2 indicative	90 minutes
WHI-495-1325	LSASD	2743 x 1219mm	ASTM E–152, NFPA 252 and UBC Standard 7–2 (1994)	90 minutes
WF63295 (Lorient Glazing)	ULSADD	2040 x 826/826 x 44mm	BS476: Part 22: 1987	149 minutes

Test Report	Configuration Tested	Leaf Size Tested	Test Standard	Integrity
IF12047 Revision A (Norsound Universal 90 and 6mm Schott Pyran S)	**ULSASD Sample**	**1040 x 996 x 58mm**	**BS476: Part 22: 1987**	**151 minutes**
RF12178 (Arrone hardware including timber door frames)	**A: ULSASD**	**2036 x 916 x 57mm**	**BS EN 1634-1 & BS EN 1363-1**	**121 minutes**
	B: ULSASD	**2036 x 918 x 57mm**		**148 minutes**
CFR 1504141 (Therm-A-Glaze steel glazing cassette with Pyrostop 30-20,)	**ULSASD**	**2284 x 1068 x 58mm**	**BS EN 1634-1**	**117 minutes**
CFR 1410311 (Large leaf sizes with hardwood/Tectonite door frame)	**ULSADD**	**2289 x 1068/1069 x 58mm**	**BS EN 1634-1**	**200 minutes**
CFR 1408041_1 (Timber saddle bead with Pyrodur 60-10)	**Fixed panel**	**2241 x 1015 x 56mm**	**Principles of BS 476: Part 22: 1987**	**93 minutes**

LSASD = Latched Single Acting Single leaf Door assembly
ULSASD = Unlatched, Single Acting. Single leaf Door assembly
LSADD = Latched Single Acting Double leaf Door assembly
ULSADD = Unlatched, Single Acting, Double leaf Door assembly

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