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IFC FIELD OF APPLICATION REPORT

PAR/14247/01

Field of Application of the Fire Resistance Moralt LAMINESSE Klassik and FireSmoke Minimum Thickness 44mm FD20, FD30 and EI30 Door Leaf Range Installed in Timber and Steel Door Frames with Side Panels and Overpanels

Prepared on behalf of:

Moralt AG
Lenggrieser Straβe 52
D-83646 Bad Tölz
Germany

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

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CONTENTS

1. INTRODUCTION

This report has been prepared by International Fire Consultants Ltd (IFC) to define the Field of Application for the minimum 44mm thick Moralt LAMINESSE Klassik and FireSmoke FD20, FD30 and EI30 door leaf range installed in timber and steel door frames with side panels and overpanels that are required to provide 20 or 30 minutes fire resistance performance, as appropriate, when adjudged against BS 476: Part 22: 1987 or EN 1634-1: 2014, as appropriate.

The methodologies used in preparing this document are based upon the guidance in 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 30 minutes performance, if tested in accordance with the method and criteria of BS 476: Part 22: 1987 or EN 1634-1:2014. 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.

This report defines the scope of approval for the range of doors summarised herein; including the clarification of specifications for other associated elements, such as frames, intumescent seals, hardware, glazing, and installation, that must be employed to create suitable door assemblies; if such assemblies are to provide the assessed levels of fire resistance. The report is published with regard to the standards and requirements in force at the time of issue.

International Fire Consultants Ltd (IFC) have a duty of care to advise users of this report that the Harmonised Product Standard for fire resisting doorsets (EN 16034) was published in October 2014, completing the group of EN documents which relate to the CE marking of doorsets within the scope of the Construction Products Regulations that apply to all Member States of the EU. However, the CE marking of doorsets is not permitted until the Harmonised Product Standard is formally published in the Official Journal of the European Union; this is expected to be in early 2015. Furthermore, although all relevant EN standards referenced in the CE marking process will then be in place, and voluntary CE marking can commence, there will be a transition period before CE marking of fire resisting doorsets becomes mandatory. The transition period will be confirmed at the time of publication in the Official Journal and it is possible that CE marking of fire resisting doorsets will become mandatory during the validity period of this report; hence the inclusion of this advice.

Further advice is included in Appendix J of this report, but it is recommended that anyone using this report after January 2015 should seek advice from IFC, or IFC Certification Ltd, as to the ongoing status of the CE marking process, and how it applies to door assemblies approved in this report.

2. TEST EVIDENCE

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

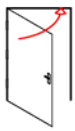
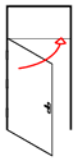
3. SCOPE OF APPROVAL

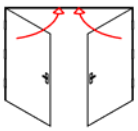
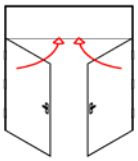
3.1 Doorset Configuration

The door leaves can be installed with either flush leaf edges or over rebated leaf edges. Flush leaf edges are installed with flush leaf edges fully within the frame reveal, giving a minimum 44mm interface between the leaf and frame reveal. Over rebated edges are installed with a projection from the face of the frame, with a rebate in the door leaf, resulting in a minimum 24mm interface between the leaf and frame reveal. See Appendix A for further details.

The following configurations are approved for the doorset construction within the scope of this report:

3.1.1 LAMINESSE Klassik (FD20)

Configuration	Envelope of Approved Leaf Size	
	Timber Frames	**Steel Frames**
 • **Latched** • **Single Acting** • **Single Door** • **Without non-transommed Overpanel** • **See Section 3.9 for Side Panels and Transommed Overpanels**	**Figure PAR/14247/01:C01 in Appendix C**	**Figure PAR/14247/01:F01 in Appendix F**
 • **Latched** • **Single Acting** • **Single Door** • **With non-transommed Overpanel** *Note 1* • **See Section 3.9 for Side Panels and Transommed Overpanels**	**Figure PAR/14247/01:C02 in Appendix C**	**Figure PAR/14247/01:F02 in Appendix F**

Configuration	Envelope of Approved Leaf Size	
	Timber Frames	Steel Frames
 • Latched • Single Acting • Double Doors *Note 2* • Without non-transommed Overpanel • See Section 3.9 for Side Panels and Transommed Overpanels	Figure PAR/14247/01:C03 in Appendix C	Figure PAR/14247/01:F03 in Appendix F
 • Latched • Single Acting • Double Doors *Notes 2 & 3* • With non-transommed Overpanel *Note 1* • See Section 3.9 for Side Panels and Transommed Overpanels	Figure PAR/14247/01:C04 in Appendix C	Figure PAR/14247/01:F04 in Appendix F

Note 1 *Door assemblies which include non-transommed overpanels may have one of the following configurations;*

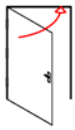
- *square meeting edges*
- *unequally rebated meeting edges*

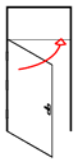
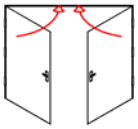
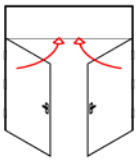
Note 2 *Double leaf door assemblies may have one of the following configurations;*

- *square edged (or slightly rounded) meeting stiles*
- *unequally rebated meeting stiles*

Note 3 *In double leaf doorsets with non-transommed overpanels where a rebated overpanel junction in included the meeting stile detail must be flush or have the same rebate configuration.*

3.1.2 LAMINESSE FireSmoke (FD30)

Configuration	Envelope of Approved Leaf Size	
	Timber Frames	Steel Frames
 • Latched • Single Acting • Single Door • Without non-transommed Overpanel • See Section 3.9 for Side Panels and Transommed Overpanels	Figure PAR/14247/01:D01 in Appendix D	Figure PAR/14247/01:G01 in Appendix G

Configuration	Envelope of Approved Leaf Size	
	Timber Frames	Steel Frames
 • Latched • Single Acting • Single Door • With non-transommed Overpanel *Note 4* • See Section 3.9 for Side Panels and Transommed Overpanels	Figure PAR/14247/01:D02 in Appendix D	Figure PAR/14247/01:G02 in Appendix G
 • Latched • Single Acting • Double Doors *Note 5* • Without non-transommed Overpanel • See Section 3.9 for Side Panels and Transommed Overpanels	Figure PAR/14247/01:D03 in Appendix D	Figure PAR/14247/01:G03 in Appendix G
 • Latched • Single Acting • Double Doors *Notes 5 & 6* • With non-transommed Overpanel *Note 4* • See Section 3.9 for Side Panels and Transommed Overpanels	Figure PAR/14247/01:D04 in Appendix D	Figure PAR/14247/01:G04 in Appendix G

Note 4 *Door assemblies which include non-transommed overpanels may have one of the following configurations;*

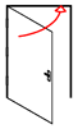
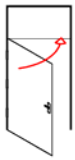
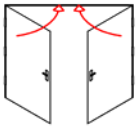
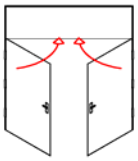
- *square meeting edges*
- *unequally rebated meeting edges*

Note 5 *Double leaf door assemblies may have one of the following configurations;*

- *square edged (or slightly rounded) meeting stiles*
- *unequally rebated meeting stiles*

Note 6 *In double leaf doorsets with non-transommed overpanels where a rebated overpanel junction in included the meeting stile detail must be flush or have the same rebate configuration.*

3.1.3 LAMINESSE FireSmoke (EI30)

Configuration	Envelope of Approved Leaf Size	
	Timber Frames	**Steel Frames**
 • **Latched** • **Single Acting** • **Single Door** • **Without non-transommed Overpanel** • **See Section 3.9 for Side Panels and Transommed Overpanels**	**Figure PAR/14247/01:E01 in Appendix E**	**Figure PAR/14247/01:H01 in Appendix H**
 • **Latched** • **Single Acting** • **Single Door** • **With non-transommed Overpanel** *Note 7* • **See Section 3.9 for Side Panels and Transommed Overpanels**	**Figure PAR/14247/01:E02 in Appendix E**	**Figure PAR/14247/01:H02 in Appendix H**
 • **Latched** • **Single Acting** • **Double Doors** *Note 8* • **Without non-transommed Overpanel** • **See Section 3.9 for Side Panels and Transommed Overpanels**	**Figure PAR/14247/01:E03 in Appendix E**	**Figure PAR/14247/01:H03 in Appendix H**
 • **Latched** • **Single Acting** • **Double Doors** *Notes 8 & 9* • **With non-transommed Overpanel** *Note 7* • **See Section 3.9 for Side Panels and Transommed Overpanels**	**Figure PAR/14247/01:E04 in Appendix E**	**Figure PAR/14247/01:H04 in Appendix H**

Note 7 *Door assemblies which include non-transommed overpanels may have one of the following configurations;*

- *square meeting edges*
- *unequally rebated meeting edges*

Note 8 *Double leaf door assemblies may have one of the following configurations;*

- *square edged (or slightly rounded) meeting stiles*
- *unequally rebated meeting stiles*

Note 9 *In double leaf doorsets with non-transommed overpanels where a rebated overpanel junction in included the meeting stile detail must be flush or have the same rebate configuration.*

3.2 Maximum Assessable Door Leaf Sizes

The calculated envelopes of assessed leaf dimensions for each mode and configuration covered by this Field of Application Report are given in Appendices C, D, E, F, G and H, based upon use of the intumescent seal specifications given in Appendix B.

Double door assemblies may each be of the same width, up to the maximum width indicated in Appendices C, D, E, F, G and H. 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 C, D, E, F, G and H). The width of the small leaf shall not be less than 300mm, since this will affect its vertical stability relative to that of the larger leaf.

3.3 Solid Rebated/Flush Non-Transommed Overpanels

Flush or rebated non-transommed overpanels are permissible as part of the range of configurations within this report [Note 10]. The intumescent seal specification around the overpanel perimeter shall be as defined in Appendix B. Lippings shall be in accordance with Section 3.4, transom members shall be in accordance with Section 3.5 and installation shall be as defined in Section 3.10.

[Note 10] *For glazed side panels and transommed overpanels see Section 3.9.*

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:	2500mm high
Double leaves:	2000mm high

In all cases, the overpanel must be a single piece panel across the frame width; i.e. a "double door" overpanel shall not be used above double door leaves. 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.

3.4 Door Leaf and Overpanel Specification

The Moralt LAMINESSE Klassik and FireSmoke door and overpanel construction is a minimum overall 44mm thick leaf (excluding any decorative facings) comprising a core constructed from Spruce/Pine ply veneers orientated perpendicular to the leaf faces which have been faced on either side with various facing materials. No stiles or rails are incorporated in the door leaf design with all four edges lipped with hardwood. Detailed constructional specifications are given below for the various leaf constructions included in this Field of Application Report.

The leaf construction, below, is based upon the test evidence detailed in Appendix K, and define 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).

3.4.1 LAMINESSE Klassik (FD20) Construction

Klassik Solid Core Construction

Component		Species / Material	Dimensions	Minimum Density
Core		Spruce/Pine ply veneers	36.5mm thick from 4.6mm (+/-1mm) wide lamels *Notes 11 & 12*	450kg/m³ *Note 13*
Stiles and rails		None fitted	–	–
Facings		Chipboard	3.8mm thick	700kg/m³ *Note 13*
		MDF		750kg/m³ *Note 13*
Lippings *Note 14*	Square edges	Softwood or Hardwood *Note 15*	8–20mm thick	450kg/m³ *Note 13*
	Over rebated edges		15–24mm thick, with 12–15mm deep rebate to leave a 12–20mm nib at the leaf edge	
	Rebated meeting edges (meeting stiles and overpanels)	Hardwood *Note 15*	15–24mm thick, with 12–15mm deep rebate to leave a 12–20mm nib in one leaf and a corresponding rebate in the other leaf	500kg/m³ *Note 13*
Other lippings		HPL	Maximum 1mm thick	–
		ABS	Maximum 2mm thick	–
		PVC	Maximum 2mm thick	–
		PU	Maximum 2mm thick	–
Optional additional decorative finishes installed after lippings *Note 16*		Timber finishes (with or without grooves), metal facings or decorative plastic based laminate, PVC, veneers or paint	Maximum 3mm thick	–

Component		Species / Material	Dimensions	Minimum Density
Adhesives	Core	Urea formaldehyde, melamine-urea formaldehyde, cross-linked PVA or cross-linked PU	–	–
	Facings		–	–
	Lippings		–	–
	Optional finishes		–	–

Note 11 *Where concealed overhead closers or certain glasses are included the core should be increased in thickness by 10mm to 46.5mm to give a minimum 54mm thick leaf.*

Note 12 *The core consists of two alternative configurations; with staggered butt joints for each veneer, or bundles of veneers with staggered butt joints. The veneers are bonded with PVAc or melamine-urea formaldehyde adhesive.*

Note 13 *Nominal stated density from test reports.*

Note 14 *Lippings to be installed at the head and vertical edges of each leaf or can be installed to all four edges, if required or if installed in four sided frames. Double leaf door assemblies within the scope of this Field of Application Report must have square edged (or slightly rounded) or unequally rebated meeting stiles.*

Note 15 *Lippings to be straight grained timber, with the minimum measured density stated (measured at 12% moisture content) of appropriate quality in accordance with EN 942: 1996. Moisture content to be 10 ± 2% or to suit internal joinery moisture content specification.*

Note 16 *See Section 3.4.4 for clad-on panel details.*

Klassik Rail and Stile Construction

Component	Species / Material	Dimensions	Minimum Density
Stiles	Spruce/Pine ply veneers	46.5mm thick from 4.6mm (+/-1mm) wide lamels *Note 17*	450kg/m³ *Note 18*
Rails			
Stile and rail fixings	2no dowels and 2no compound bars at each joint		–
Facings	Chipboard	3.8mm thick	700kg/m³ *Note 18*
	MDF		750kg/m³ *Note 18*

Component		Species / Material	Dimensions	Minimum Density
Timber lippings *Note 19*	Square edges	Softwood or Hardwood *Note 20*	8–20mm thick	450kg/m³ *Note 18*
	Over rebated edges		15–24mm thick, with 12–15mm deep rebate to leave a 12–20mm nib at the leaf edge	
	Rebated meeting edges (meeting stiles and overpanels)	Hardwood *Note 20*	15–24mm thick, with 12–15mm deep rebate to leave a 12–20mm nib in one leaf and a corresponding rebate in the other leaf	500kg/m³ *Note 18*
Alternative lipping options		HPL	Maximum 1mm thick	–
		ABS	Maximum 2mm thick	–
		PVC	Maximum 1mm thick	–
		PU	Maximum 2mm thick	–
Optional additional decorative finishes installed on leaf faces after lippings *Note 21*		Timber finishes (with or without grooves), metal facings or decorative plastic based laminate, PVC, veneers or paint	Maximum 3mm thick	–
Adhesives	Stile and rail construction	Urea formaldehyde, melamine-urea formaldehyde, cross-linked PVA or cross-linked PU	–	–
	Facings		–	–
	Lippings		–	–
	Optional finishes		–	–

Note 17 *The core consists of two alternative configurations; with staggered butt joints for each veneer, or bundles of veneers with staggered butt joints. The veneers are bonded with PVAc or melamine-urea formaldehyde adhesive.*

Note 18 *Nominal stated density from test reports.*

Note 19 *Lippings to be installed at the head and vertical edges of each leaf or can be installed to all four edges, if required or if installed in four sided frames. Double leaf door assemblies within the scope of this Field of Application Report must have square edged (or slightly rounded) or unequally rebated meeting stiles.*

Note 20 *Lippings to be straight grained timber, with the minimum measured density stated (measured at 12% moisture content) of appropriate quality in accordance with EN 942: 1996. Moisture content to be 10 ± 2% or to suit internal joinery moisture content specification.*

Note 21 *See Section 3.4.4 for clad-on panel details.*

3.4.2 LAMINESSE FireSmoke (FD30 and EI30) Construction

FireSmoke Solid Core Construction

Component		Species / Material	Dimensions	Minimum Density
Core		Spruce/Pine ply veneers	31.5mm thick from 4.6mm (+/-1mm) wide lamels *Notes 22 & 23*	450kg/m³ *Note 24*
Stiles and rails		None fitted	–	–
Facings		Chipboard	6.3mm thick	700kg/m³ *Note 24*
		MDF		750kg/m³ *Note 24*
Timber lippings *Note 25*	Square edges	Softwood or Hardwood *Note 26*	8–20mm thick	450kg/m³ *Note 24*
	Over rebated edges		15–24mm thick, with 12–15mm deep rebate to leave a 12–20mm nib at the leaf edge	
	Rebated meeting edges (meeting stiles and overpanels)	Hardwood *Note 26*	15–24mm thick, with 12–15mm deep rebate to leave a 12–20mm nib in one leaf and a corresponding rebate in the other leaf	500kg/m³ *Note 24*
Alternative lipping options		HPL	Maximum 1mm thick	–
		ABS	Maximum 2mm thick	–
		PVC	Maximum 1mm thick	–
		PU	Maximum 2mm thick	–
Optional additional decorative finishes installed on leaf faces after lippings *Note 27*		Timber finishes (with or without grooves), metal facings or decorative plastic based laminate, PVC, veneers or paint	Maximum 3mm thick	–

Component		Species / Material	Dimensions	Minimum Density
Adhesives	Core	Urea formaldehyde, melamine-urea formaldehyde, cross-linked PVA or cross-linked PU	–	–
	Facings		–	–
	Lippings		–	–
	Optional finishes		–	–

Note 22 *Where concealed overhead closers or certain glasses are included the core should be increased in thickness by 10mm to 41.5mm to give a minimum 54mm thick leaf.*

Note 23 *The core consists of two alternative configurations; with staggered butt joints for each veneer, or bundles of veneers with staggered butt joints. The veneers are bonded with PVAc or melamine-urea formaldehyde adhesive.*

Note 24 *Nominal stated density from test reports.*

Note 25 *Lippings to be installed at the head and vertical edges of each leaf or can be installed to all four edges, if required or if installed in four sided frames. Double leaf door assemblies within the scope of this Field of Application Report must have square edged (or slightly rounded) or unequally rebated meeting stiles.*

Note 26 *HPL lippings can only be included at the head and jambs of door leaves where the core is increased in thickness by 10mm to 41.5mm to give a minimum 54mm thick leaf. They must not be included at meeting stiles.*

Note 27 *See Section 3.4.4 for clad-on panel details.*

FireSmoke Rail and Stile Construction

Component	Species / Material	Dimensions	Minimum Density
Stiles	Spruce/Pine ply veneers	41.5mm thick from 4.6mm (+/-1mm) wide lamels *Note 28*	450kg/m³ *Note 29*
Rails			
Stile and rail fixings	2no dowels and 2no compound bars at each joint		–
Facings	Chipboard	6.3mm thick	700kg/m³ *Note 29*
	MDF		750kg/m³ *Note 29*

Component		Species / Material	Dimensions	Minimum Density
Timber lippings *Note 30*	Square edges	Softwood or Hardwood *Note 31*	8–20mm thick	450kg/m³ *Note 29*
	Over rebated edges		15–24mm thick, with 12–15mm deep rebate to leave a 12–20mm nib at the leaf edge	
	Rebated meeting edges (meeting stiles and overpanels)	Hardwood *Note 31*	15–24mm thick, with 12–15mm deep rebate to leave a 12–20mm nib in one leaf and a corresponding rebate in the other leaf	500kg/m³ *Note 29*
Alternative lipping options		HPL	Maximum 1mm thick	–
		ABS	Maximum 2mm thick	–
		PVC	Maximum 1mm thick	–
		PU	Maximum 2mm thick	–
Optional additional decorative finishes installed on leaf faces after lippings *Note 32*		Timber finishes (with or without grooves), metal facings or decorative plastic based laminate, PVC, veneers or paint	Maximum 3mm thick	–
Adhesives	Stile and rail construction	Urea formaldehyde, melamine-urea formaldehyde, cross-linked PVA or cross-linked PU	–	–
	Facings		–	–
	Lippings		–	–
	Optional finishes		–	–

Note 28 *The core consists of two alternative configurations; with staggered butt joints for each veneer, or bundles of veneers with staggered butt joints. The veneers are bonded with PVAc or melamine-urea formaldehyde adhesive.*

Note 29 *Nominal stated density from test reports.*

Note 30 *Lippings to be installed at the head and vertical edges of each leaf or can be installed to all four edges, if required or if installed in four sided frames. Double leaf door assemblies within the scope of this Field of Application Report must have square edged (or slightly rounded) or unequally rebated meeting stiles.*

Note 31 *Lippings to be straight grained timber, with the minimum measured density stated (measured at 12% moisture content) of appropriate quality in accordance with EN 942: 1996. Moisture content to be 10 ± 2% or to suit internal joinery moisture content specification.*

Note 32 *See Section 3.4.4 for clad-on panel details.*

3.4.4 Clad-On Panels

Doorsets may have 24mm thick clad-on panels attached to one or both sides of the leaves. The panels may be chipboard or MDF or 16mm thick spruce ply veneers or medium density core with 4mm thick MDF facings. Panels may be lipped or frames with timber, as required. They are attached to the leaf by means of Knapp suspension devices or long fixings. See Appendix A for further details.

3.4.5 Feature Grooves and Metal and Stone Inlays

Door leaves may include feature grooves of maximum depth 3mm and metal or stone inlays, subject to the following:

- Door leaves must be minimum 54mm thick.
- Feature grooves and inlays may be included subject to it being insured that their inclusion does not unbalance the door leaf in service.
- Maximum of 25% of door leaf face may be taken up by feature grooves.
- Maximum groove size of 20 x 2mm can include metal inlays.
- Maximum groove size of 100 x 3mm can include stone inlays.
- Inlays must be adhered with either PUR or PVAc.

3.5 Frames

3.5.1 Timber Frames

Timber frames, to the specifications given below may be used across the complete range of approved sizes and configurations described in Appendices C, D and E, utilising the intumescent seal specifications described in Appendix B. See Appendix A for further details.

Material	Minimum Density	Minimum Face Width	Minimum Frame Depth	Minimum Stop Depth
		Single Acting Only		
Hardwood	500kg/m³ *Note 33*	38mm, excluding stop *Note 34*	54mm	12mm *Note 35*

Note 33 *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: 1996. The moisture content shall be 10 ± 2% for UK market, (or to suit internal joinery moisture content specification of export countries).*

Note 34 *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 35 *The doorstop is to comprise the same material as the door frame and integral with the main door frame.*

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

Transom and mullion members	:	Minimum 83mm face width x 76mm deep with 15mm rebates to accommodate the door leaf and glazing (i.e. making minimum 53mm thick section with maximum 15mm integral glazing bead and stops). Glazing in the top and side lights must always be on the same plane as the door leaves.
Joint details	:	Mortice and tenon, or half-lapped joint, head twice screwed to each jamb, mitred joint which is glued with either a non-thermally softening adhesive or PVAc and the head twice screwed to each jamb or intimately fitted butt jointed glued with a non-thermally softening adhesive with dowel, screw or pin fixings. Two piece frame members can be used as transom and mullion members and may be jointed as shown in Appendix A.

3.5.2 Multi-Timber Frames

Multi-timber frames, to the specifications given below may be used with latched, single acting, single leaf doorsets without transom or mullion members. The intumescent seal specifications described in Appendix B with an additional 28 x 2mm Palusol intumescent seal fitted between the stile and top rail and respective lippings may be utilised.

Material	Minimum Density	Minimum Face Width	Minimum Frame Depth	Minimum Stop Depth
		Single Acting Only		
23mm thick, 7no layers of Poplar ply with 3mm thick HDF facings and integral architrave of 9mm thick Poplar faced with 2mm thick Poplar and clad on 3no faces with 4mm thick mitred HDF	500kg/m³	23mm, excluding architrave	126mm, excluding architrave	12mm

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

Joint details	:	Mortice and tenon, or half-lapped joint, head twice screwed to each jamb, mitred joint which is glued with a non-thermally softening adhesive and the head twice screwed to each jamb or intimately fitted butt jointed glued with a non-thermally softening adhesive with dowel, screw or pin fixings.

3.5.3 Steel Frames

Steel frames, to the specifications given below, may be used across the complete range of approved sizes and configurations outlined in Appendices F, G and H, utilising the intumescent seal specification outlined in Appendix B. See Appendix A for further details.

Material	Grade	Minimum Face Width	Minimum Frame Depth	Minimum Stop Depth
		Single Acting Only		
1.5mm thick rolled mild steel or stainless steel	304 or 316	1.5mm, excluding stop	70mm	15mm

The frame may include integral architraves but must be formed against and protected by the adjacent wall.

Transom and mullion members	:	Minimum 60mm face width x 76mm deep with 15mm rebates to accommodate the door leaf and glazing (i.e. making minimum 30mm thick section with maximum 15mm integral glazing bead and stops). Glazing in the top and side lights must always be on the same plane as the door leaves.
Frame infill	:	Mineral rock fibre, sand cement mortar or gypsum plasterboard strips.
Head/jamb joint	:	Welded joints or mitred with screw fixings.

3.6 Glazed Apertures

3.6.1 Glass Types

The doorset design outlined in Section 3.4 of this report has been successfully tested with the inclusion of apertures. The following glass types are approved for use in the doors considered herein, which are compatible with the identified approved glazing systems given in Section 3.7.2, although some restrictions on size may be given in subsequent sections.

The codes used, below, for the glass types and glazing materials (e.g. GD1 and SD1), are not those used by the respective manufacturers, and are attributed solely by IFC for the purpose of identification and cross-referencing within this assessment.

GD1	15mm thick Schott Pyranova 30-S2.0
GD2	15mm thick Schott Pyranova 30-S2.1
GD3	15mm thick Pilkington Pyrostop
GD4	16mm thick AGC Flat Glass Pyrobel 16
GD5	16mm thick Vetrotech Contraflam 30
GD6	16mm thick Vetrotech Swissflam-N2
GD7	23mm thick Pilkington Pyrostop
GD8	28mm thick Schott Pyranova ISO 30 2.0
GD8	28mm thick Schott Pyranova ISO 30 2.1
GD10	27mm thick Schott Pyranova Secure
GD11	31mm thick Schott Pyranova Secure *Note 36*
GD12	47-54mm thick Schott Pyranova Planline *Note 37*

Note 36 *Door leaf must be minimum 54mm thick in order to accommodate the thickness of glass GD11.*

Note 37 *GD12 is to be used as part of the Glastec Planline 30 glazing system.*

Expansion allowance for all glass types shall be as tested (3mm to all edges; 5mm for GD12) or as recommended by the glass manufacturer and shall use either non-combustible or hardwood (minimum density 500kg/m^3) setting blocks.

3.6.2 Glazing Materials

The following glazing material is approved for use in the perimeter of door apertures considered herein, as shown in Appendix A.

SD1	14 x 2mm Ceramic fibre tape
SD2	15 x 2mm Superwool®
SD3	12 x 3mm Kerafix 2000
SD4	15 x 2mm Interdens
SD5	10 x 3mm Polyethylene (PE)

3.6.3 Bead Profiles and Installation

Apertures are created by cutting directly into the door blank, with beads fitted directly to the door core.

Glazing beads shall be formed from hardwood with a minimum measured density of 450kg/m³ (measured at 12% moisture content). Timber must be straight grained and of appropriate quality in accordance with EN 942: 1996. Moisture content shall be 10 ± 2% or to suit internal joinery moisture content specification.

Glazing beads are secured using minimum 50mm long steel screws fixed at maximum 200mm centres at an angle of 20-25° to the plane of the door leaf and secured through the glazing bead such that they pass close to the glazing pocket.

The approved bead size and profile, and relevant fixing details, are shown in Appendix A.

3.6.4 Assessed Aperture Sizes

Based upon the size of apertures tested, it is the opinion of IFC that the limitations given below apply to apertures in the 44mm thick door leaves considered.

- Maximum area of single aperture - 2.5m² *Note 38*
- Minimum distance from leaf edge (top) - 120mm
- Minimum distance from leaf edge (sides) - 120mm
- Minimum distance from bottom of leaf - 160mm
- Minimum distance between apertures - 40mm *Note 39*

Based upon the size of apertures tested, it is the opinion of IFC that the limitations given below apply to apertures in the 54mm thick door leaves considered.

- Maximum area of single aperture - 2.5m² *Note 38*
- Minimum distance from leaf edge (top) - 100mm
- Minimum distance from leaf edge (sides) - 100mm
- Minimum distance from bottom of leaf - 120mm
- Minimum distance between apertures - 40mm *Note 39*

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

Note 38 *Any aperture(s) for solid panels (see Section 3.7) and intumescent air transfer grilles (see Section F.7), must also be included in the total area permitted for apertures given above. Margins between apertures apply whatever the aperture infill.*

Note 39 *Where the distance between apertures is less than 100mm the rail/stile should be from solid hardwood of minimum density 500kg/m³, fixed in place with biscuit joints, as shown in Appendix A.*

3.6.5 Circular Glazing

The leaves are approved for the incorporation of circular glazing up to aperture dimensions of 500mm diameter, as tested, subject to the parameters for margins and total area of glazing per leaf, described in Section 3.6.4. The tested glazing bead detail is metal and full details are given in Appendix A. The method of forming the beads and the glazing details should be as tested, with the appropriate glazing system which can be suitably modified.

3.6.6 Ladder Glazing

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

The mock beads may be bonded to the glass/seal using double sided adhesive tape and mechanical fixed to the perimeter bead. The profile/size of mock beads and perimeter bead, and the approved glazing material, are shown in Appendix A.

3.7 Solid Panel Apertures

3.7.1 Solid Panel Types

The doorset design outlined in Section 3.4 of this report has been successfully tested with the inclusion of apertures. The following solid panel types are approved for use in the doors considered herein, which are compatible with the identified approved perimeter sealing materials given in Section 3.7.2.

The codes used, below, for the infill types and infill materials (e.g. ID1 and, SD2), are not those used by the respective manufacturers, and are attributed solely by IFC for the purpose of identification and cross-referencing within this assessment.

ID1 20mm thick Promatect 200 panel with minimum 2mm thick MDF outer facings. (Outer facings can have thickness increased locally to give a raised and fielded effect.)

ID2 19mm thick composite panel, consisting of a core of 15mm thick Rolf Kuhn Coolmax faced with 2mm thick HDF bonded with MUF adhesive

Expansion allowance for all infill types shall be as tested (3mm to all edges) or as recommended by the infill manufacturer and shall use non-combustible setting blocks.

3.7.2 Sealing Materials

The following sealing materials are approved for use in the perimeter of door apertures considered herein, as shown in Appendix A, which are compatible with the identified approved infill types listed.

SD5 2mm thick Acrylodice by Odice SAS or Promaseal by Promat GmbH sealant (use with infill type ID1)
SD6 16 x 1.5mm Roku Strip L110 intumescent strip (use with infill type ID2)

3.7.3 Bead Profiles and Installation

Apertures are created by cutting directly into the door blank, with beads fitted directly to the door core.

Infill type ID1 is secured by means of a bespoke steel angle system as outlined in Appendix A. The solid beads are additional to these fixings and are secured with secret fixings.

Solid panel beads for infill type ID2 are either bonded using polyurethane adhesive or secured using minimum 50mm long steel screws fixed at maximum 200mm centres at an angle of 30° to the plane of the door leaf and secured through the glazing bead such that they pass close to the glazing pocket.

Solid panel beads shall be formed from hardwood with a minimum measured density of 500kg/m³ (measured at 12% moisture content). Timber must be straight grained and of appropriate quality in accordance with EN 942: 1996. Moisture content shall be 10 ± 2% or to suit internal joinery moisture content specification.

The approved bead sizes and profiles, and relevant fixing details, are shown in Appendix A, which also define any limitations upon options of interchangeability with aperture infill types, sealing materials and bead profiles.

3.7.4 Assessed Aperture Sizes

Based upon the size of apertures tested, it is the opinion of IFC that the limitations given below apply to apertures in the 44mm thick door leaves considered.

- Maximum area of single aperture - 2.5m² *Note 40*
- Minimum distance from leaf edge (top) - 120mm
- Minimum distance from leaf edge (sides) - 120mm
- Minimum distance from bottom of leaf - 160mm
- Minimum distance between apertures - 40mm *Note 41*

Based upon the size of apertures tested, it is the opinion of IFC that the limitations given below apply to apertures in the 54mm thick door leaves considered.

- Maximum area of single aperture - 2.5m² *Note 40*
- Minimum distance from leaf edge (top) - 100mm
- Minimum distance from leaf edge (sides) - 100mm
- Minimum distance from bottom of leaf - 120mm
- Minimum distance between apertures - 40mm *Note 41*

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

Note 40 *Any aperture(s) for glazing (see Section 3.6) and intumescent air transfer grilles, (see Section F.7), must also be included in the total area permitted for apertures given above. Margins between apertures apply whatever the aperture infill.*

Note 41 *Where the distance between apertures is less than 100mm the rail/stile should be from solid hardwood of minimum density 500kg/m³, fixed in place with biscuit joints, as shown in Appendix A.*

3.8 Hardware

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

General guidance for all items of hardware is outlined in Appendix I, based upon the range of items tested. All hardware beyond the scope of the general guidance given below must have been subjected to fire resistance testing, and/or assessed by a notified body, to support its use in doors of a similar construction to that proposed, or third party certification shall be available to support its use on doorsets of the proposed type.

3.9 Glazed Side Panels and Transommed Overpanels

Side panels and transommed overpanels can be installed with the doorsets approved in this Field of Application Report. Side panels may be included on one or both sides of a doorset. Framing must be in accordance with the specifications in Section 3.6 and the apertures may include glazing, in accordance with the specification below, or fixed panels of the door leaf construction. They must be installed in accordance with the specifications given below.

3.9.1 Glass Types

The following glass types are approved for use in the side panels and transommed overpanels considered herein, which are compatible with the identified approved glazing sealing materials given in Section 3.9.2, although some restrictions on size may be given in subsequent sections.

The codes used, below, for the glass types and glazing materials (e.g. GL1 and SL1), are not those used by the respective manufacturers, and are attributed solely by IFC for the purpose of identification and cross-referencing within this assessment.

GL1 15mm thick Schott Pyranova 30-S2.0
GL2 15mm thick Schott Pyranova 30-S2.1
GL3 15mm thick Pilkington Pyrostop
GL4 16mm thick AGC Flat Glass Pyrobel 16
GL5 16mm thick Vetrotech Contraflam 30

GL6 16mm thick Vetrotech Swissflam-N2
GL7 23mm thick Pilkington Pyrostop
GL8 28mm thick Schott Pyranova ISO 30 2.0
GL9 28mm thick Schott Pyranova ISO 30 2.1
GL10 27mm thick Schott Pyranova Secure
GL11 28mm thick double glazed unit, consisting of Schott Pyranova 30-S2.0 an 8mm thick steel spacer and a 5mm thick toughened glass
GL12 31mm thick Schott Pyranova Secure
GL13 32mm thick double glazed unit, consisting of Schott Pyranova 30-S2.1 an 8mm thick steel spacer and a 5mm thick toughened glass
GL14 47mm thick Schott Pyranova Planline *Note 42*

Note 42 *GD12 is to be used as part of the Glastec Planline 30 glazing system.*

Expansion allowance for all glasses shall be as recommended by the glass manufacturer and shall use non-combustible setting blocks.

3.9.2 Glazing Materials

The following glazing material is approved for use in the perimeter of the glazing considered herein, as shown in Appendix A.

SL1 14 x 2mm Ceramic fibre tape
SL2 15 x 2mm Superwool®
SL3 12 x 3mm Kerafix 2000
SL4 15 x 2mm Interdens

3.9.3 Bead Profiles and Installation

The bead profiles will be dependant upon the frame system employed.

3.9.3.1 Timber Frames

Glazing beads shall be formed from hardwood with a minimum measured density of 500kg/m³ (measured at 12% moisture content). Timber must be straight grained and of appropriate quality in accordance with EN 942: 1996. Moisture content shall be 10 ± 2% or to suit internal joinery moisture content specification.

Beads are secured using minimum 50mm long steel screws fixed at maximum 200mm centres at an angle of 25-30° to the plane of the door leaf and secured through the glazing bead such that they pass close to the glazing pocket.

The approved bead size and profile, and relevant fixing details, are shown in Appendix A.

3.9.3.2 Steel Frames

The steel beading must be constructed from 1.5mm thick rolled mild steel or stainless steel of grade 304 or 316.

Beads are secured using minimum 30mm long self tapping steel screws fixed at maximum 100mm from corners and maximum 300mm centres secured through the glazing bead into the perimeter framing.

The approved bead size and profile, and relevant fixing details, are shown in Appendix A.

3.9.4 Assessed Aperture Sizes

Based upon the size of apertures tested, it is the opinion of IFC that the limitations given below apply to the glazed apertures considered, herein;

Transommed Overpanel

- Maximum area of transomed overpanel - 2.2m²
- Maximum horizontal dimension of transomed overpanel - 3330mm
- Maximum vertical dimension of transomed overpanel - 780mm

Side Panel

- Maximum area of each side panel - 4.0m²
- Maximum horizontal dimension of side panel - 1430mm
- Maximum vertical dimension of side panel - 3320mm

3.9.5 Glass Joints

Horizontal and vertical joints can be included using the Plainline glazing system, as outlined in Appendix A.

Vertical joints and vertical partition rails can be included in single glazed top lights.

Vertical butt joints can be included in single glazed top lights where the glass is minimum 19mm thick. They must have a 5mm gap between glass panes with a 10 x 2mm Kerafix Flexplan 200 seal fixed to one glass edge and the remaining gap infilled with a silicone sealant.

Glazing bars can be included in single glazed top lights where the glass is minimum 15mm thick. The glazing bar must be minimum 30mm wide x 68mm deep and be from hardwood of minimum density 480kg/m³ (measured at 12% moisture content). Timber must be straight grained and of appropriate quality in accordance with EN 942: 1996. Moisture content shall be 10 ± 2% or to suit internal joinery moisture content specification. Glazing beads are to be additional to the glazing bar and secured using minimum 50mm long steel screws fixed at maximum 200mm centres at an angle of 20-25° to the plane of the glass and secured through the glazing bead such that they pass close to the glazing pocket.

3.10 Installation, Supporting Construction and Door Edge Gaps

Timber perimeter frames must be fixed back to the supporting construction with steel fixings vertically at maximum 100mm from corners and maximum 750mm centres; horizontally at maximum 200mm from corners and maximum 750mm centres. Screws shall be of sufficient length to penetrate the wall by at least 40mm, and shall be positioned such that they are not exploited by charring of the frame, irrespective of the direction of test exposure; (this may necessitate a twin line of screws). Packers shall be used at all fixing positions, although if combustible packers are employed, these must be protected by a layer of firestopping (see below), aligned near to each face of the door frame.

Steel perimeter frames are to be installed using steel anchors, as tested, to be installed vertically at maximum 100mm from corners and maximum 750mm centres; horizontal at the top with fixings at maximum 750mm centres, and with steel fixings at the base at maximum 100mm from corners and maximum 750mm centres.

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

Note 43 *Reference to steel stud partitions is in the context of permanent elements, such as those designed and proven by the plasterboard manufacturers – this report does not approve use of the proposed doorsets in proprietary 'demountable' partitions, which must be subject to a full and independent appraisal of the particular system and doorsets therein.*

No part of the rear of the frame section shall be exposed once installed, except for integral architraves in steel frames. There shall be no feature rebates or shadow gaps at the junction of the frame and wall.

The fire stopping between the supporting construction and timber frames should follow the recommendations of Table 2 in BS8214: 2008, *"Code of practice for fire door assemblies"*, using a product proven in such timber applications, and with reference to the correct depth of seal to suit the width of gap between wall and frame. The firestopping shall be positioned on the plane of the door leaf; (unless combustible packers are employed).

The maximum permitted clearance between the door leaf and frame, at meeting stiles and leaf/overpanels interfaces should be 2 – 4mm. Gaps under doors should not exceed 6mm unless a dropseal is included at the base of the leaves.

No points of single acting leaves, except for the over rebated sections should be proud of the frame at the door edge/frame interface. Double leaves and leaves and overpanels must be flush with each other at meeting edges.

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

3.11 Intumescent Seals

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

3.12 Ambient Temperature Smoke Seals

Separate smoke seals, or combined intumescent/smoke seals (using one of the intumescent products approved in Section 3.11), that have been tested to 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 doorsets to provide smoke control.

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

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

4. CONCLUSION

It is the opinion of International Fire Consultants Ltd that, if the proposed minimum 44mm thick Moralt LAMINESSE Klassik and FireSmoke FD20, FD30 and EI30 door leaf range installed in timber and steel door frames with side panels and overpanels were manufactured and installed in accordance with the requirements of this Field of Application Report, the leaf sizes are within the envelope of approved dimensions/sizes given for the configuration outlined in Appendices D and E, and the hardware, glazing details, and intumescent seal specification are in accordance with the recommendations of this report, then the assemblies, as described, would satisfy the integrity and insulation criteria for 30 minutes when tested for fire resistance to the conditions of BS 476: Part 22: 1987 or EN 1634-1: 2014.

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 doorset constructions described herein, and assumes that the surrounding construction will provide no less restraint than the tested assembly, and that it will remain in place and be substantially intact for the full fire resistance period.

This Field of Application Report is based upon IFC's assessment of what the assemblies will achieve when tested in accordance with the referenced test standard (EN 1364), the conclusions have not be determined in accordance with any Extended Field of Application Standards. As such, the report is not suitable supporting documentation to form the basis of an application for assessment and verification of constancy of performance under the Construction Products Regulation (CPR).

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

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 doorsets are installed, to ensure that no parts of the assembly are damaged or faulty. Further, the doorsets 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 doorsets will invalidate the approval by IFC, and may seriously affect the ability of the assembly to provide the required level of fire resistance performance. Determination of what constitutes wear or damage, and any corrective actions in order to return doorsets 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 IFC, it is the responsibility of anyone using this report to confirm that all aspects of the assemblies fully comply with the descriptions and limitations herein.

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

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

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

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

6. VALIDITY

This assessment has been prepared based on International Fire Consultants Ltd's present knowledge of the products described, the stated testing regime and the submitted test evidence. For this reason anyone using this document after January 2020 should confirm its ongoing validity.

Prepared by:

Dr. Parina Patel
BSc (Hons) PhD MIFireE EngTech
Fire Safety Engineer
International Fire Consultants Ltd. (IFC)

Checked by:

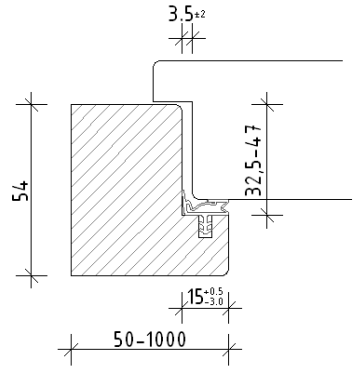
David Cooper
BEng (Hons) AIMMM
Senior Fire Safety Engineer
International Fire Consultants Ltd. (IFC)

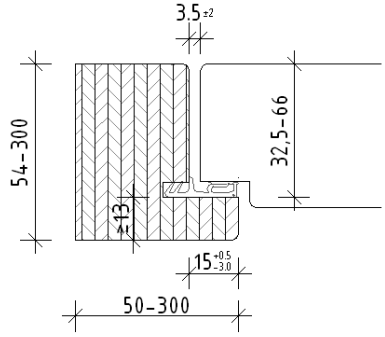
APPENDIX A

Moralt LAMINESSE Klassik and FireSmoke Constructional Details

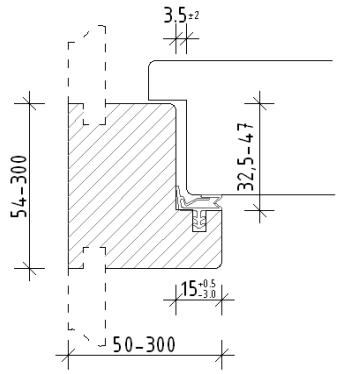
The construction detail drawings in this Appendix are not included in the sequential page numbering of this report

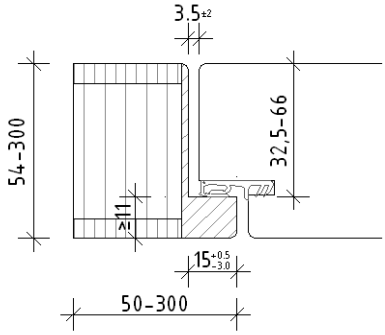
Door frame – Wooden frame wrapped on three / four sides

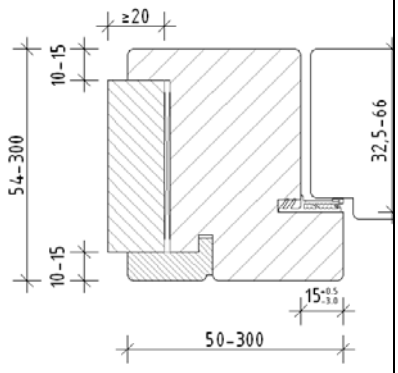


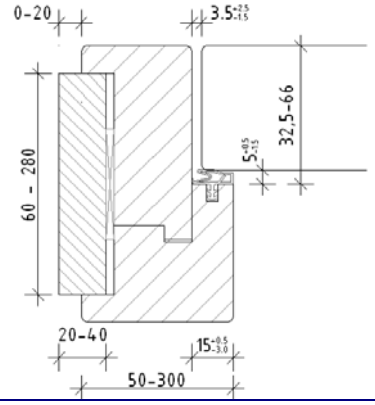


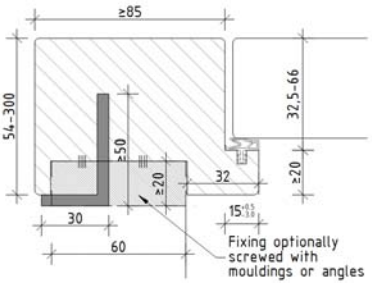
Laminated bendings



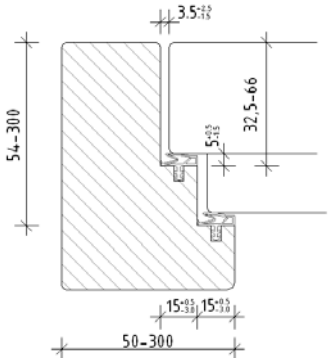








Further information:
Assembly instruction



Material

- Hardwood/Pinewood
  Density ≥500 kg/m³, also laminated and/or finger-jointed,
  Dimensions
  min. 50x54mm
  max. 300x300mm

- LAMINESSE FireSmoke 54
  Lipping Hardwood
  Density ≥500 kg/m³
  Thickness 18-22mm
  Dimensions
  min 50x54mm
  max. 1000x54mm
  flush, flush even

Glue: PUR-glue

Rebate geometry

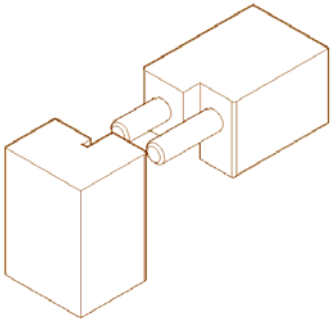
- flush doors
  32,5-66 x 12-15mm
  Attention!
  For integrated hinges!
  44-66 x 12-15mm
- rebated doors
  32,5-47 x 12-15mm

<u>Optional</u>

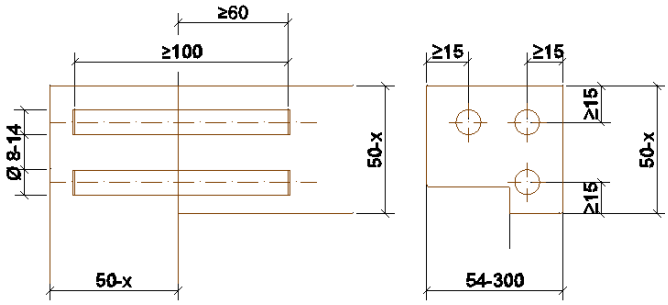
- as door frame
- with decorative facing
- with hidden subframe
- double rebate
- casing possible

Further constructions available on individual request!

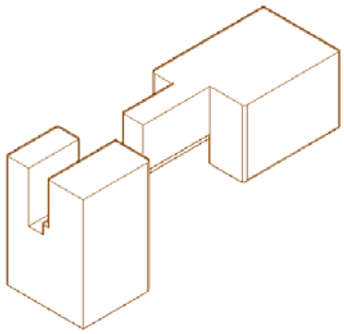
Edging



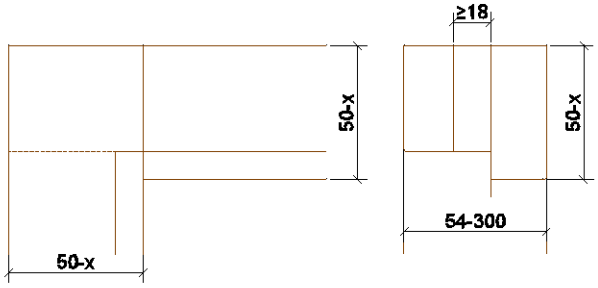
doweled and glued



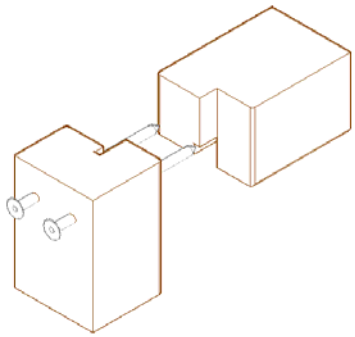
Hardwood dowels, density ≥ 450 kg/m³
Horizontal penetration depth ≥ 60mm
Min. 2 screws per connection, Ø 8-14mm x min. 100mm



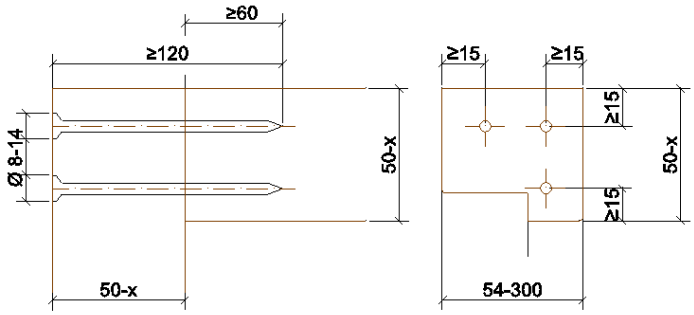
doweled and glued



According to state-of-the-art technics
Width of pivot min. 18 mm



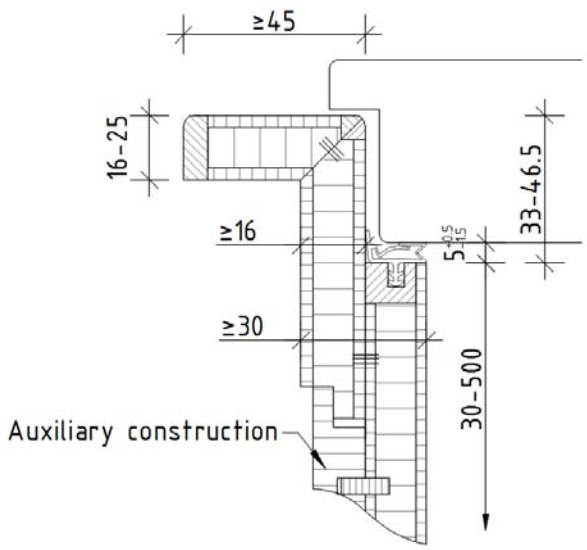
doweled and glued

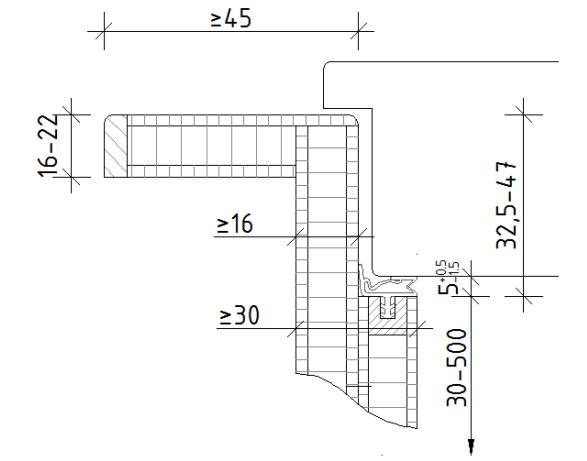


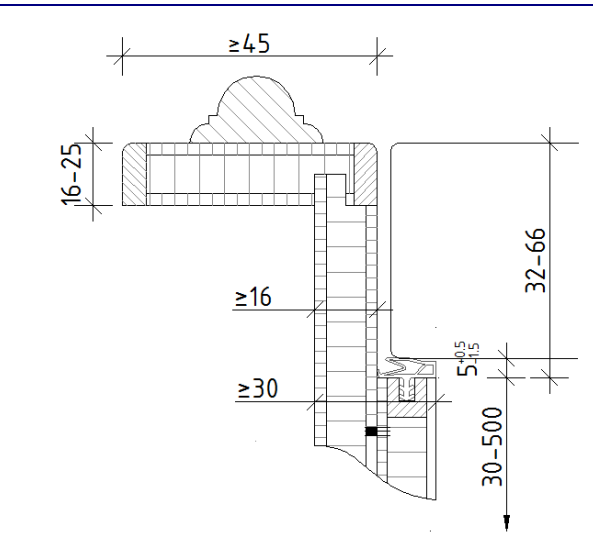
min. Ø6 x ≥120mm
Horizontal penetration depth ≥ 60mm
3 screws per connection

Glue: PUR or PVAC (D3) glue

Wrapped frame – Wooden frame wrapped on three / four sides







→All illustrated alternatives are available flush or rebated (rebate geometry must be considered)!

Moralt laminboard
- Cross-grain veneered 13mm
- MDF 16-38mm
- HDF 16-38mm
- stabil MDF 16-38mm
- MDF-Sandwich
- LAMINESSE FireSmoke

Rebates and decorative facing
- Moralt laminboard →as a/m
- solid wood density ≥500 kg/m³

Dimensions (wxd)
min. 45 x 16mm

Rebate geometry
flush 41,5-66mm x 15mm
(44-66mm x 15mm integrated hinges)
rebated 32,5-47mm x 15mm

Corner joints
→please see corner joints

Auxiliary construction
Multiplex plate Birch 16mm
Density ≥760 kg/m³

Lipping
Solid wood density ≥500 kg/m³
Dimensions thickness min. 3mm

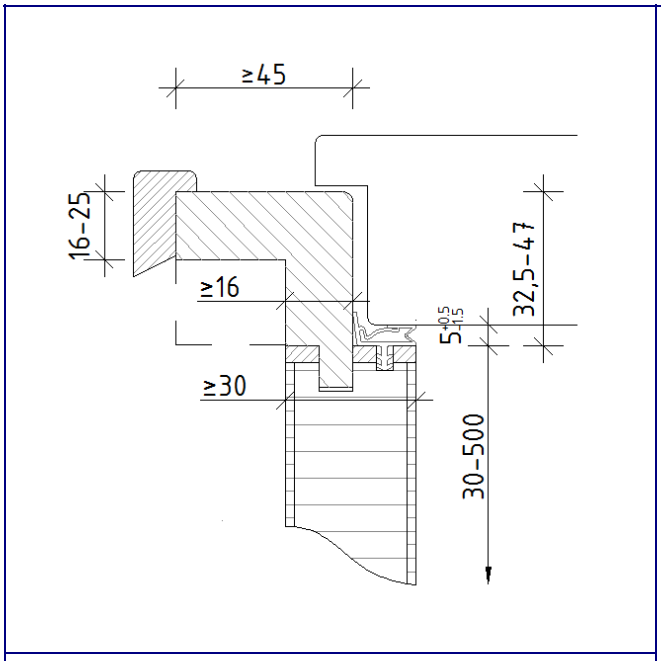
Connecting spring
- Solid wood density ≥440 kg/m³
- Laminated plywood density ≥440 kg/m³
- MDF/HDF density ≥600 kg/m³

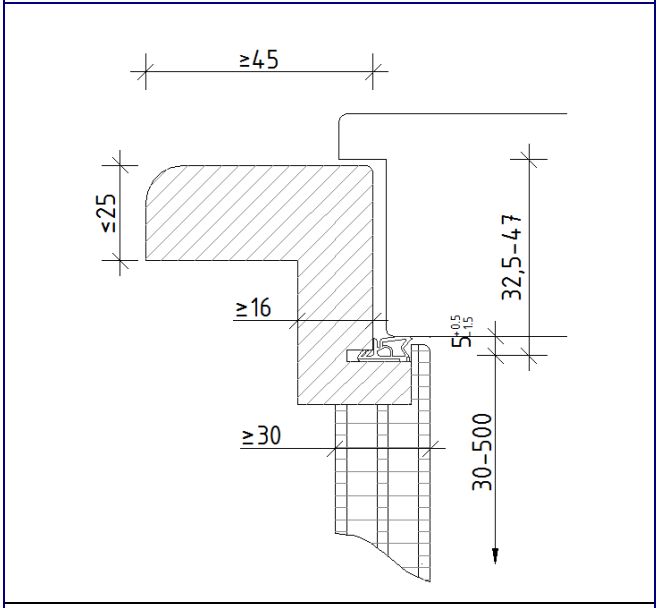
Dimensions min. 3 x 6mm
max. 6 x 15mm

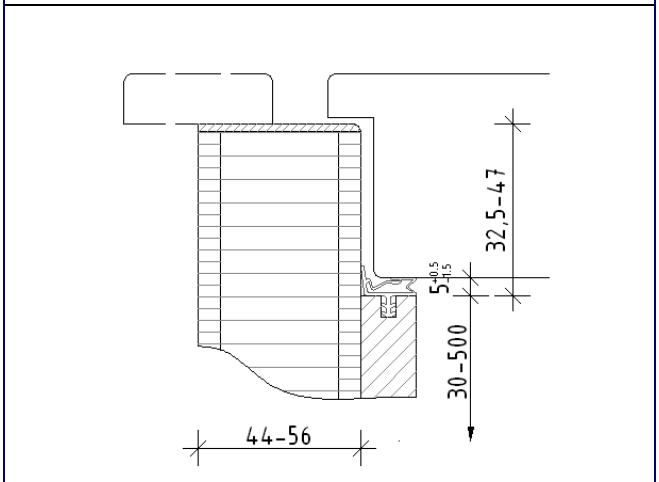
Gluing
PVAC glue, PUR

Optional
- width of frame optional with MDF 3mm
- with lead inlay 0,5mm and coated
- hinge pockets for integrated hinges

Further alternativess are pictured on the following pages!







→ All illustrated alternatives are available flush or rebated (rebate geometry must be considered)!
→Wall covering ≥15mm!

Moralt laminboard
- cross-grain veneered 13mm
- MDF 16-38mm
- HDF 16-38mm
- stabil MDF 16-38mm
- MDF-Sandwich
- LAMINESSE FireSmoke

Rebate and decorative facing
- laminboard → as a/m
- solid wood denisty ≥500 kg/m³

Dimensions (wxd)
min. 45 x 16mm

Rebate geometry
flush 41,5-66mm x 15mm
(44-66mm x 15mm integrated hinges)
rebated 32,5-47mm x 15mm

Corner joints
→pls see corner joints

Auxiliary constructions
Multiplex panels Birch 16mm
density ≥760 kg/m³

Lipping
Solid wood density ≥500 kg/m³
Dimensions thickness min. 3mm

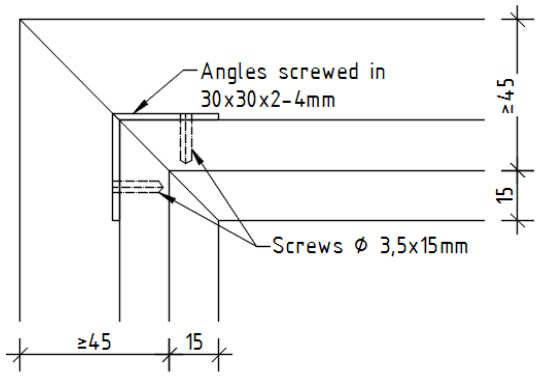
Connecting spring
- solid wood density ≥440 kg/m³
- plywood plates density ≥440 kg/m³
- MDF/HDF density ≥600 kg/m³

Dimensions min. 3 x 6mm
max. 6 x 15mm

Bonding
PVAC glue, PUR

Optional
- width of frame optionally with MDF 3mm
- with lead inlay 0,5mm and coated
- hinge pockets for integrated hinges

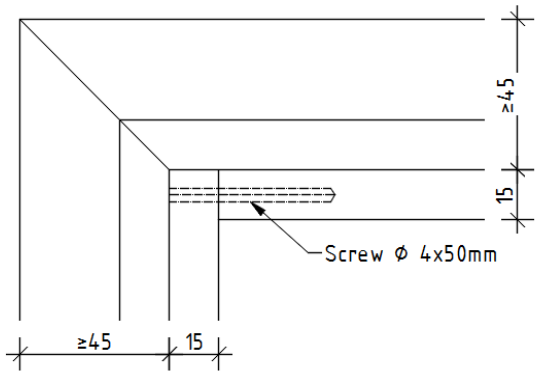
Corner joints



Screwed over angles

Angle
min.30 x 30 x 2-4mm

Screws
min. Ø3,5 x 15mm

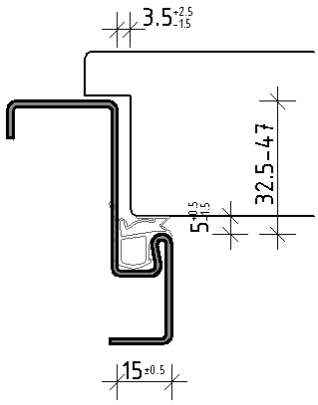


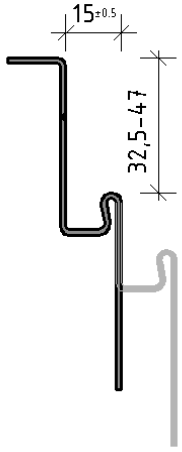
Screwed and glued

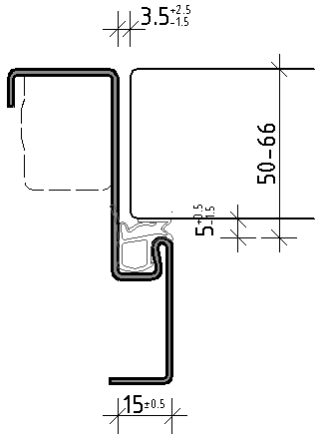
Screws
min. Ø4 x 50mm

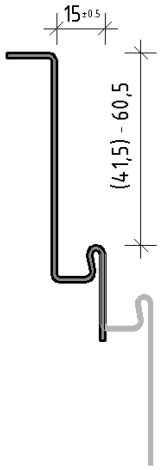
Glue
PVAC glue

Steelframe









Steel frame
material thickness 1,5 - 2mm
→no stainless steel

Reabate geometry
Flush 50-66mm x 15mm
rebated 32,5-47mm x 15mm

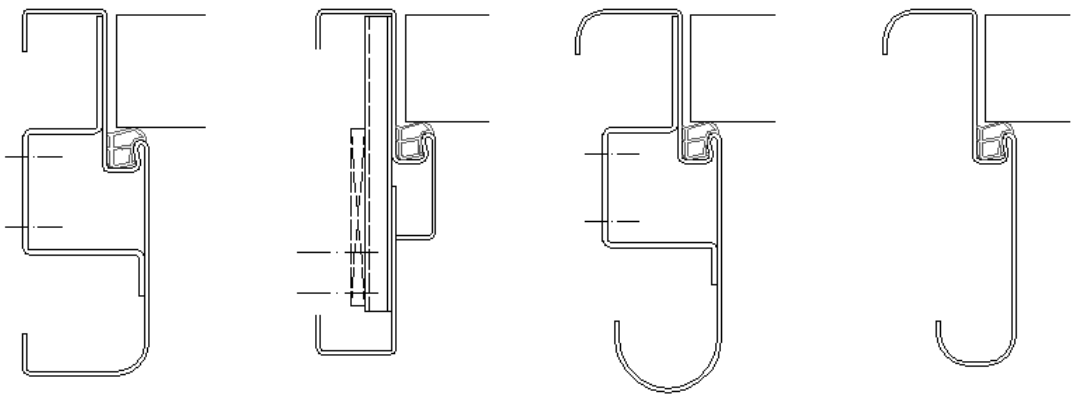
corner joints
→see corner joints

optional

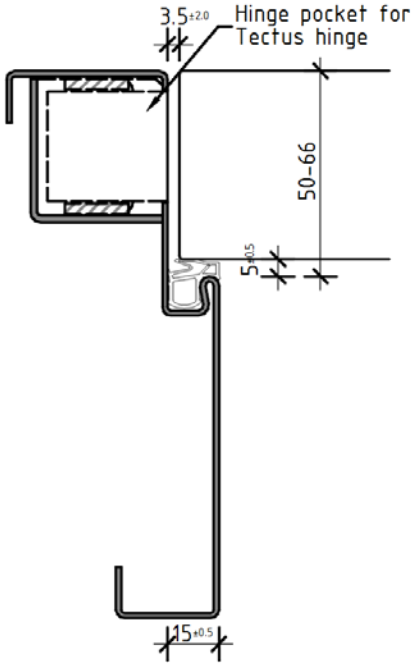
- hinge pockets for hinges
- double rebate

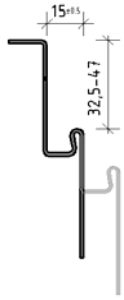
Steel frames only available for solid wall constructions!

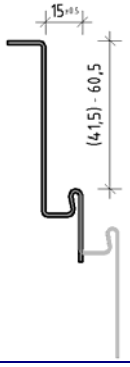
→ Available flush or rebated
(rabbet geometry must be considered)!

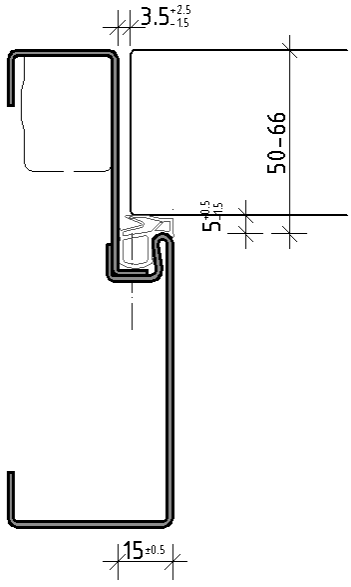


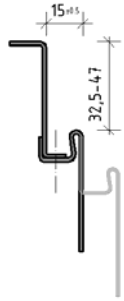
Wrapped steel frame ; wrapped on 3 / 4 sides

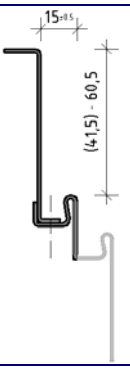












Wrapped steel frame
one piece or two pieces
Material thickness 1,5 - 2mm
one piece or two pieces
→no stainless steel

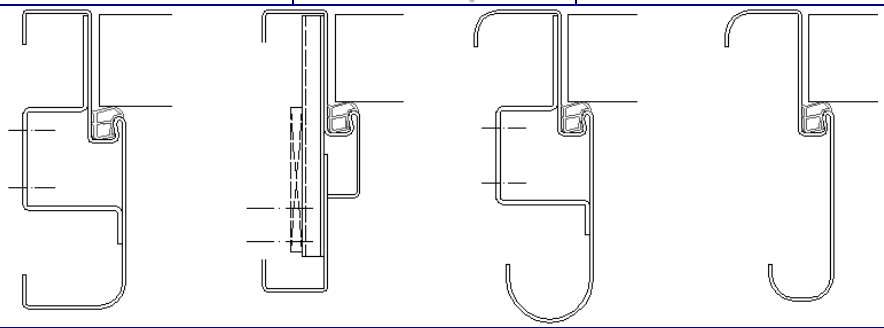
Rebate geometry
flush 50-66mm x 15mm
rebated 32,5-47mm x 15mm

Corner joints
→please see corner joints

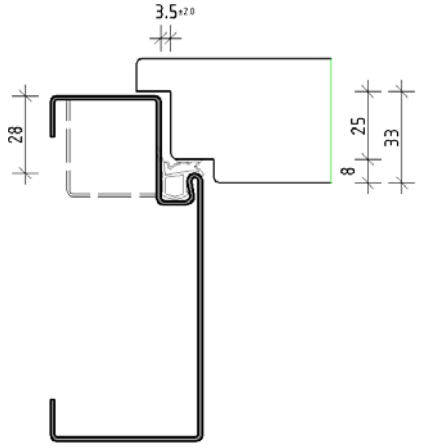
Optional

- hinge pockets for hinges
- double rebate

→ Available flush or rebated
(rebate geometry must be considered)!

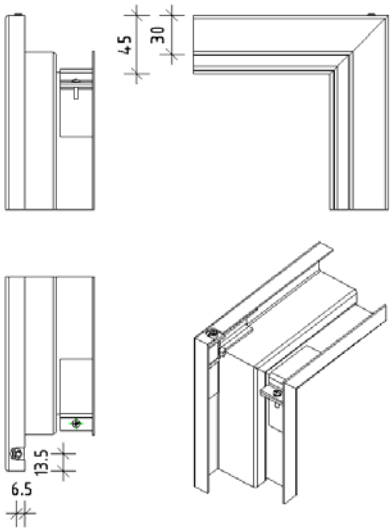


Steel frame with a rabbet-dimension of 28mm



Steel frame rebate 28mm

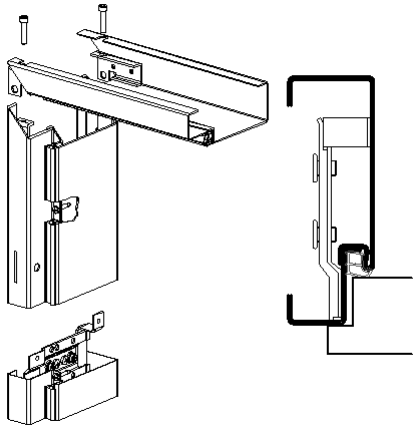
Only applicable for one-leaf und double-leaved models without top and side panels!



welded

screwed

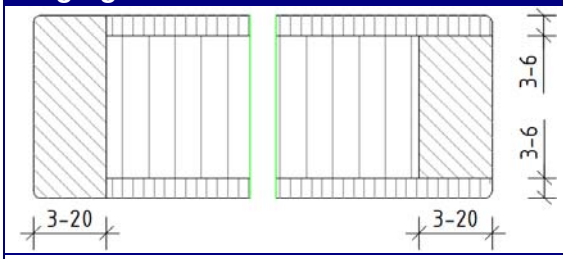
screws
M5 x 25mm
2 screws per connection



Mounting styles

Adjusting fixing
Steel frame fixing (angular and rounded)
Fixed double anchor

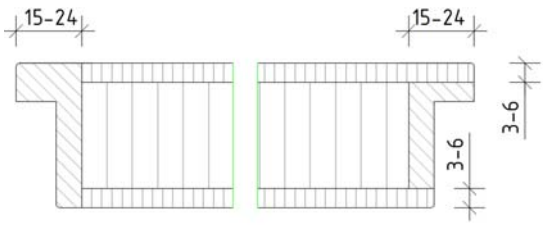
Edging



Lipping/edge bands for flush doors

Pine / Hardwood density 440 kg/m³
Thickness 8 – 20mm

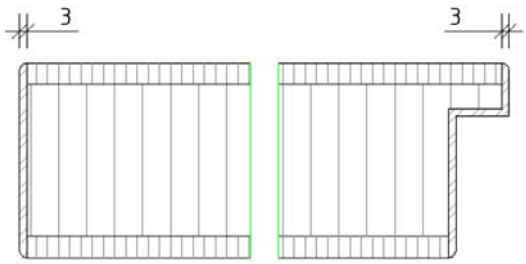
Glue: PVAC (D3), PUR, PUR-hotmelt, EVA



Lipping/edge bands for rebated doors

Pine / Hardwood density 440 kg/m³
Thickness 15 - 24mm

Glue: PVAC (D3), PUR, PUR-hotmelt, EVA

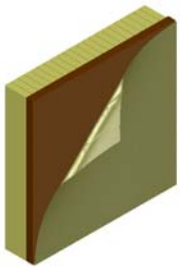


Edging

- Veneer up to 3mm
- ABS up to 2mm
- PU up to 3mm
- HPL up to 1mm
- Melamin-paper edge up to 1mm (postforming)

Glue: PVAC (D3), PUR, PUR-hotmelt, EVA

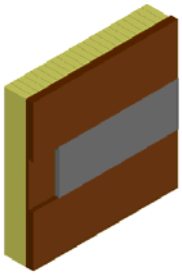
Cover layer



- MDF/HDF/ solid wood ≤ 20mm
- MDF/HDF ≤ 20mm mit 0,3mm lead / aluminum
- Veneer (wood/wooden materials) ≤ 2mm
- Stone veneer ≤ 2mm
- Direct coating ≤ 1mm
- Varnish / stain ≤ 1mm
- HPL / CPL ≤ 1mm
- HPL ≤ 1 mit 0,3mm lead/aluminum
- Acrylic coating ≤ 2mm

Glue: PVAC (D3), PUR

Feature grooves

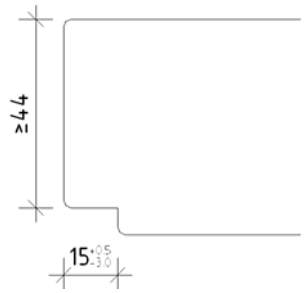


- Metall pilaster (V2A, aluminium, brass…) Dimensions ≤ 20 x 2mm, by using of a 54mm thick door leaf.
- Stone and artificial stone layers Dimensions ≤ 100 x3mm, by using of a 54mm thick door leaf.

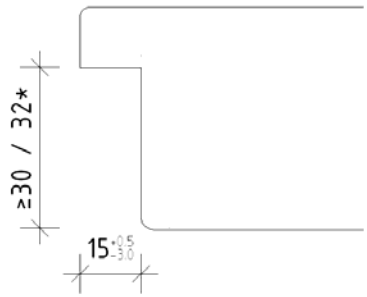
Milled into max. 25% of door blank area
Glue: PVAC (D3), PUR

Rebate geometry

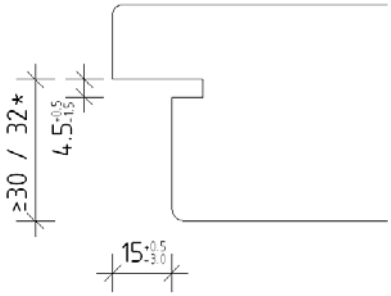
flush



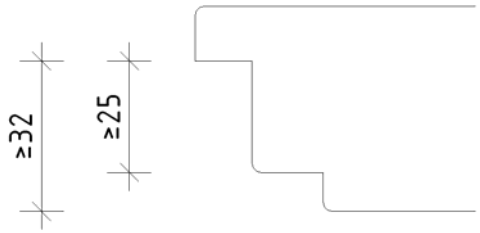
flush with auxiliary rebate to opening side



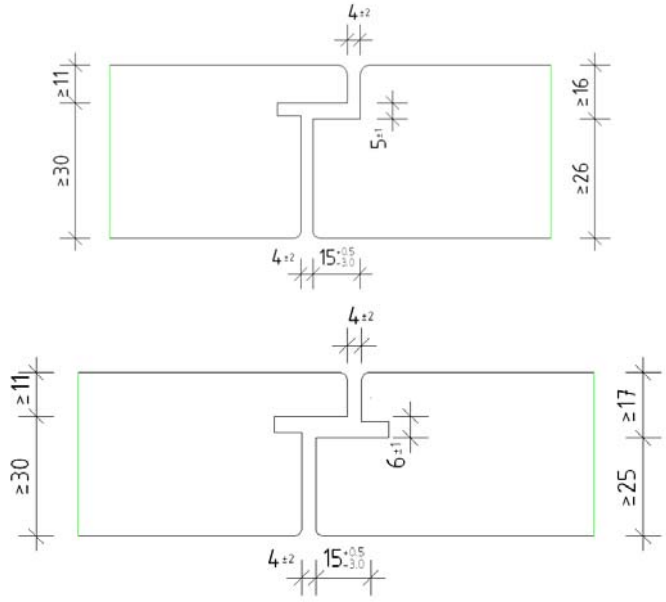
rebated
* in steel frame



rebated with leaf gasket
* in steel frame

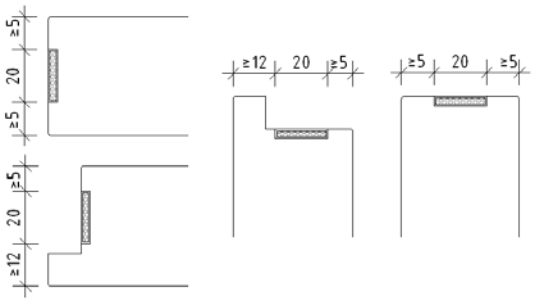
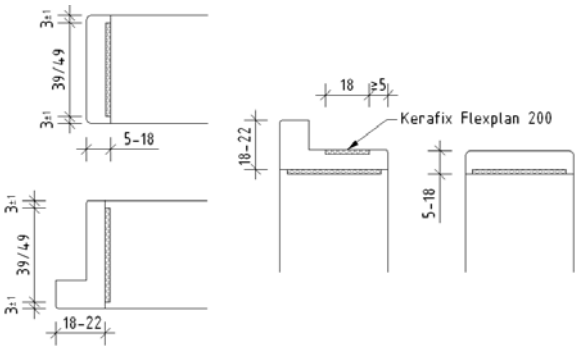
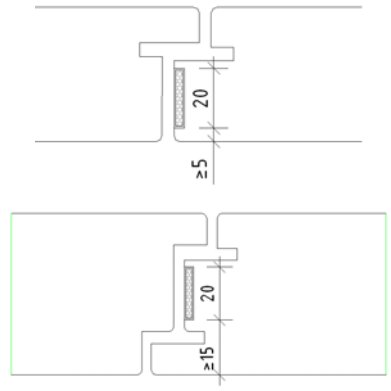
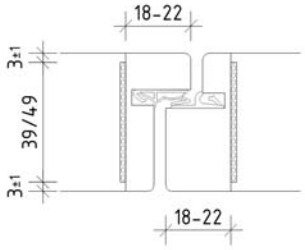
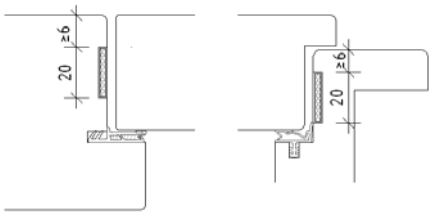
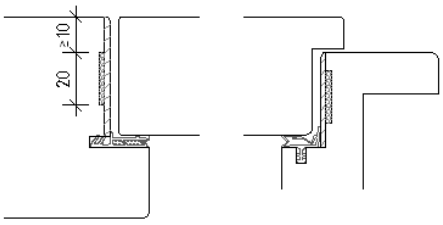


rebated/ rebated to opening side

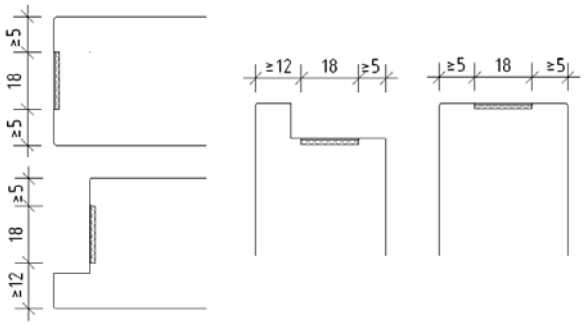
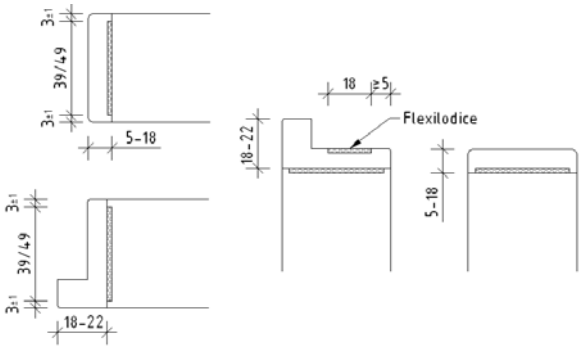
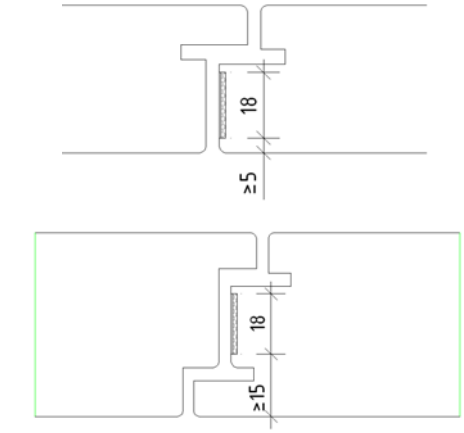
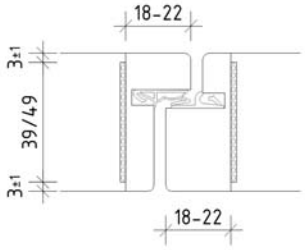
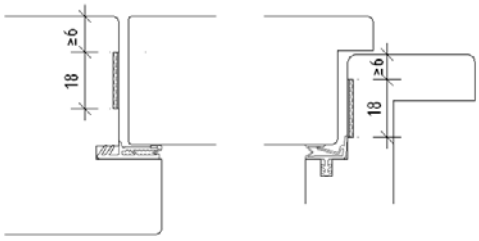
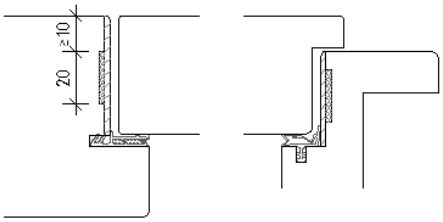


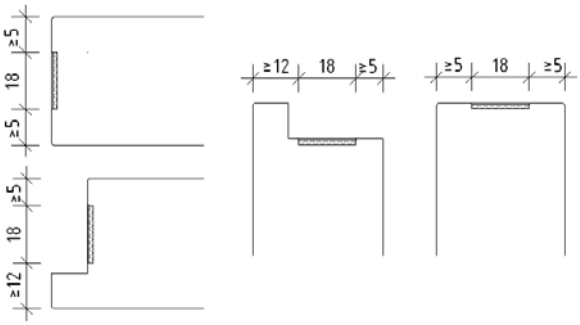
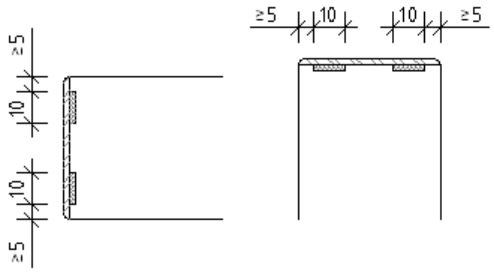
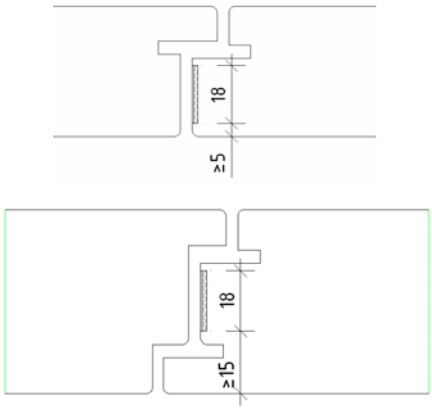
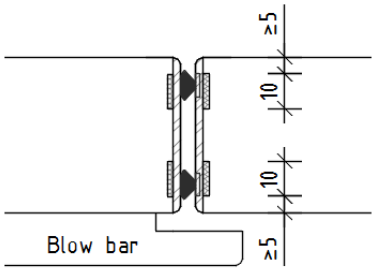
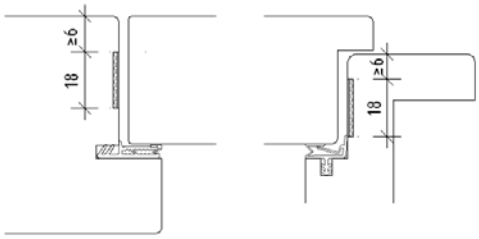
Meeting stiles for double-leaved doors

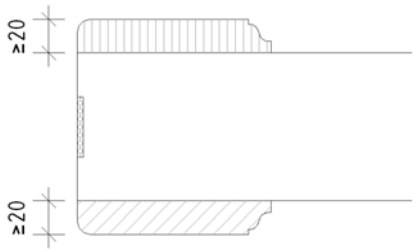
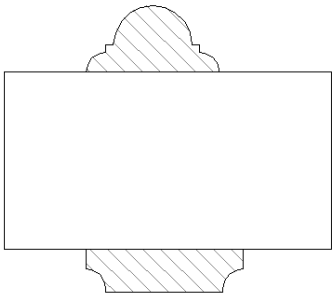
Intumescent strips
System Rolf Kuhn GmbH

- visible / framed on three sides - **Palusol E type 100** (PVC-coated) Dimensions: 20 x 3,5mm → With a minimum lipping/edge bands width of flush > 18 mm rebated > 22 mm intumescent strips need to be applied visibly!	- invisible / framed on three sides - **Palusol type 100** Dimensions: 32-39 x 1,9mm (in 44mm panel) 42-49 x 1,9mm (in 54mm panel) Full-surface gluing with PVAC- or PUR- glue →For rebated doors application of an additional intumescent strip (Kerafix Flexplan 200 / 18 x 1,8mm) at top edge of door leaf is required!
 within door panel	 within door panel
 Door panel meeting stiles / double rebate	 Door panel meeting stile
 in frames	 in frames veneered

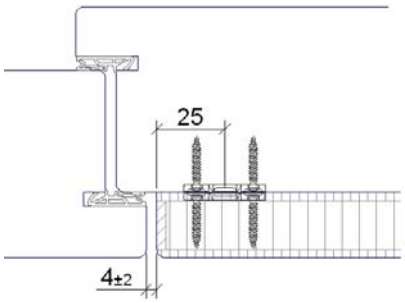
Intumescent strips
System Odice S.A.S.

- visible / framed on three sides - **Flexilodice** Dimensions: 18 x 1,5 mm →With a minimum lipping/edge bands width of flush > 18 mm rebated > 22 mm intumescent strips need to be applied visibly!	- invisible / framed on three sides - **Palusol type 100** Dimensions: 32-39 x 1,9mm (for 44mm panel) 42-49 x 1,9mm (for 54mm panel) Full-surface gluing with PVAC- or PUR- glue → For rebated doors application of an additional intumescent strip (Flexilodice / 18 x 1,5 mm) the top edge of door leaf is required!
 within door panel	 within door panel
 Door panel meeting stiles / double rebate	 Door panel meeting stile
 in frames	 in frames veneered

Intumescent strips System Promat (Intumex) GmbH	
- visible / framed on three sides - **Intumex LPSK** Dimensions: 18 x 1,8 mm → With a minimum lipping/edge bands width of flush > 18 mm rebated > 22 mm intumescent strips need to be applied visibly!	- invisible / framed on three sides - **Intumex LPSK** Dimensions: 2 pieces 10 x 1,8 mm → Application only for PVC edges
 within door panel	 within door panel (PVC edge)
 door panel meeting stile / double rebate	 door panel meeting stile (PVC edges)
 in frames	

Clad-on panels → Intumescent strips with visible application!	
	**MDF / HDF** Density ≥600 kg/m³ Thickness ≤ 20mm **Solid wood** Density ≥400 kg/m³ Thickness ≤ 20mm **Heritage-protected door leaves** frontally separated (heritage protection application) Thickness ≤ 20mm
	**MDF / HDF** Density ≥600 kg/m³ **Solid wood** Density ≥400 kg/m³
	**Glues** • PVAC (D3) • PUR • UF / MUF
→maximum weight of door leaf 200 kg **→for decorative frames visible fire protection strips are mandatory!**	

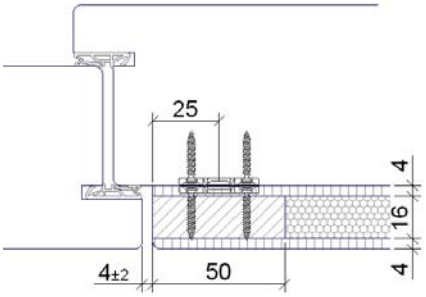
Clad-on panels



Clad-on panel of

- Moralt laminboard
- Moralt balsa board LIGHTWOOD
- Moralt balsa board FlamSafe
- Wood-based materials
- Solid wood frameworks optic with filling
- Hertiage-protected door leaves (Heritage protection application)

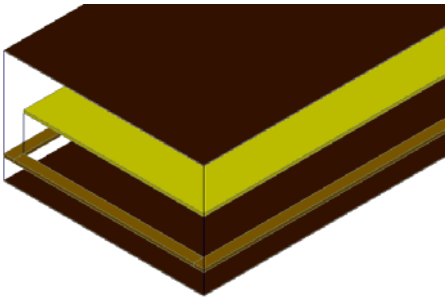
Dimensions (wxh)
max. 1359 x 2485mm
Thickness ≤ 25mm
Weight and restraint need to be considered!



Clad-on panes Thermo / Acoustic

Dimensions (wxh)
max. 1359 x 2485mm

Thickness 24mm

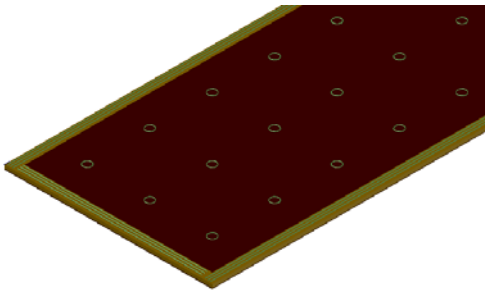


Structure Clad-on panel Thermo:

- 4mm MDF exterior
- 50x16mm frame solid wood / MDF
  16mm inner layer: wood fibreboard or PU-material
- 4mm MDF exterior

Bonding: full surface bonding

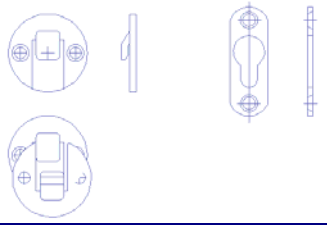
Glue: PUR / PVAC D3



Structure Clad-on panel Acoustic:

- 4mm MDF Exterior
- 50x16mm Rahmen Massivholz / MDF
  16mm Einlage Sonitus 193
- 4mm MDF exterior

Bonding: full frame bonding
Sonitus pointwise (please see image)
Glue: frame → PUR / PVAC D3
Sonitus → PUR

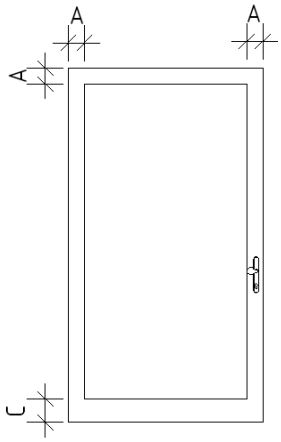


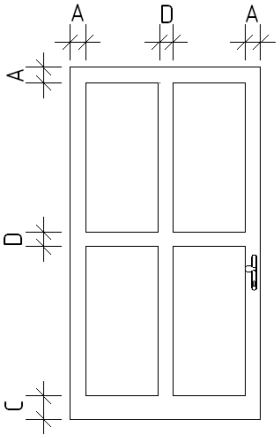
Assembly:

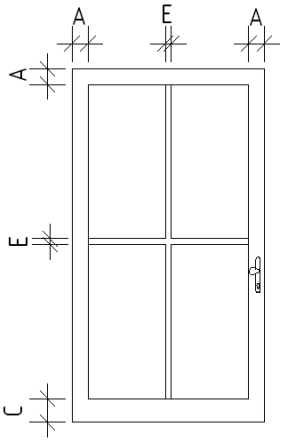
- Hook connector KNAPP DUO
- Hook connector KNAPP UNO
- Hook connector Troxi
- Bed fitting

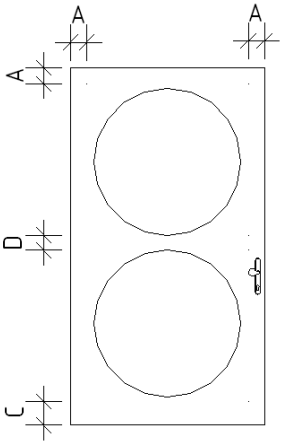
min. 6 anchoring supports per clad-on panel

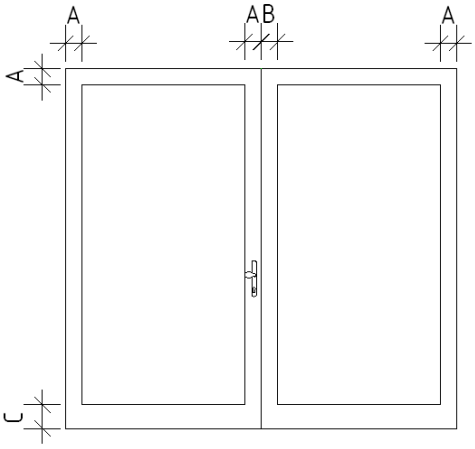
Frame width – Shapes freely selectable within frame width







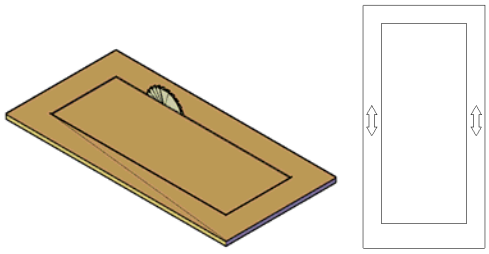




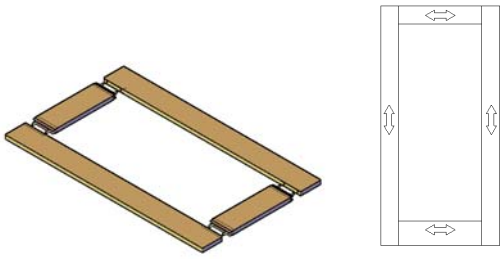
Minimum frame width / Minimum rail width (without glazing bead)

LAMINESSE FireSmoke 44	A	B	C	D	E
	Flush / rebated [mm]				
	120	100	120	100	40
LAMINESSE FireSmoke 54	A	B	C	D	E
	Flush / rebated [mm]				
	100	100	120	100	40

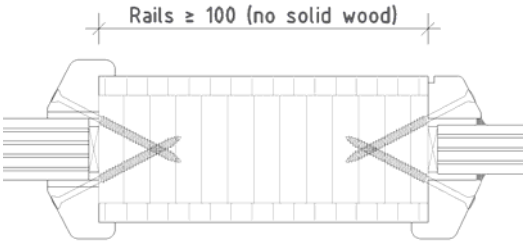
Frame type LAMINESSE FireSmoke



Glass apertures cut out / central core alignment



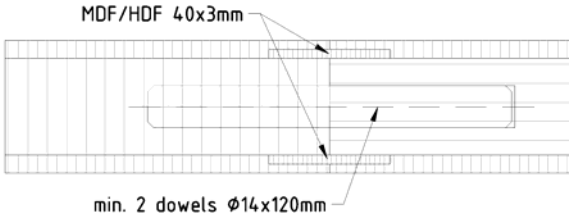
Frame doweled und glued / central core alignment



Glass partitioning rail ≥ 100mm

- Construction according to door panel
- Drawing cut-out or doweled (please see detail dowel connections)

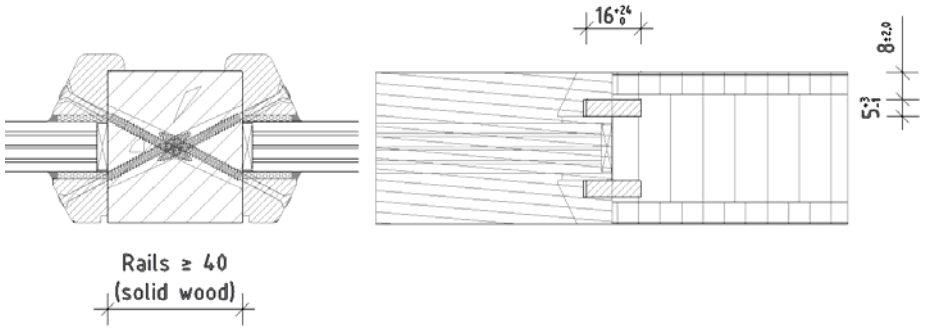
The number of horizontal and vertical rails is unlimited!



Detail dowel connections

- MDF/HDF springs 40x3mm slotted over the entire frame and fully glued
- min. 2 dowels Ø14x120mm per frame fully glued

Glue: PUR-Leim



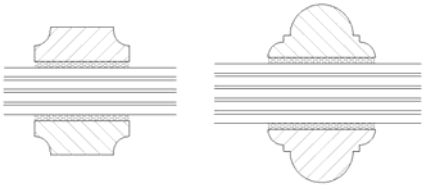
Glass partitioning rail ≥ 40mm

Solid wood density ≥ 500 kg/m³
→ no pine-wood / no Beech
Dimensions min. 40 x 44mm

The number of horizontal and vertical rails is unlimited!

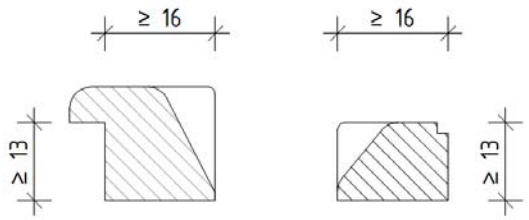
Connecting springs
Wood and wooden materials
Density ≥ 450 kg/m³

Glue: PUR-Leim



Rail glued
Profile can be freely selected
Bonding with mirror tape

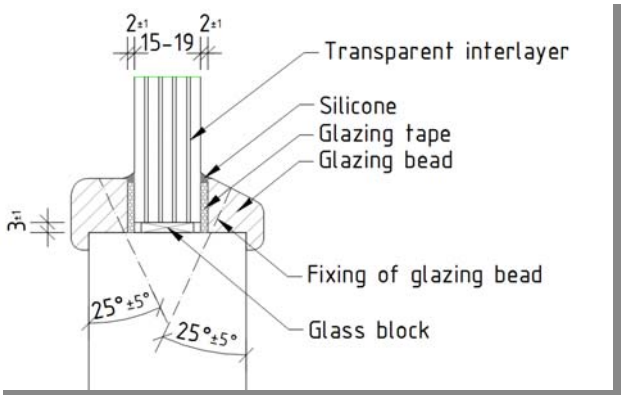
Glazing beads



Hardwood – and pine wood
density ≥ 440 kg/m³
Dimensions min. 13 x 16mm
Glass fitting ≥ 11mm

Profile freely selectable!
Glass bead can optionally be veneered!

Glazing – Shapes freely selectable



Fixing of glazing beads
- screws ≥ 3 x 40mm
- steel pin ≥ 1,5 x 40mm

Mounting distances
- out of the corners 40-60mm
- inbetween max. 345mm

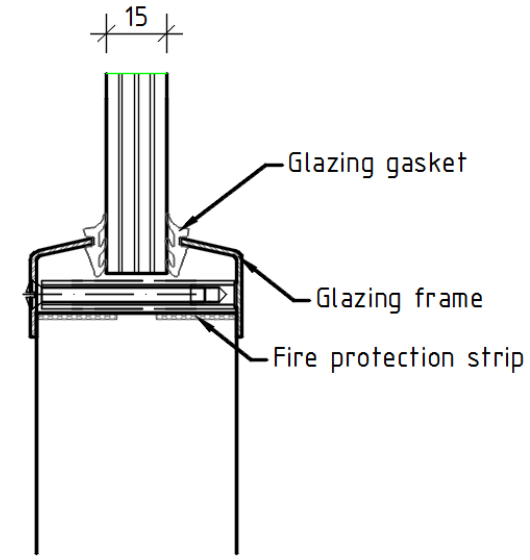
Glazing tape
- Kerafix 2000 (Rolf Kuhn GmbH), 14x2 / 3mm
- Superwool Paper X670 (Odice S.A.S.)
- PE

Silicone
- Fire protection silicone (Rolf Kuhn GmbH)
- Firestop 700 (Odice S.A.S.)
- customary

dry glazing
- Flexilodice BS(Odice S.A.S.), 5,5 or 7mm

Glass block
Dimensions min. 14x30, thickness 3-4mm
blocking diagonal, 40-80mm out of corners
(hinge-side below / lock-side above)
- Hardwood, density ≥ 500 kg/m³
- Promatect H (Promat GmbH)
- Flammi 12 (Rolf Kuhn GmbH)
- Flammi 22 (Rolf Kuhn GmbH)
- ROKU FIL (Rolf Kuhn GmbH)
- Morton (Odice S.A.S.)

Glazing – only portholes!



Glazing frame
Profile dimensions min. 25 x 15,5 x 1,5mm
Glass depth min. 9mm

- Stainless steel
- Steel galvanized and/or powder-coated

Fixing

- Screws min. M5 x 45mm
- Distances min. 245mm

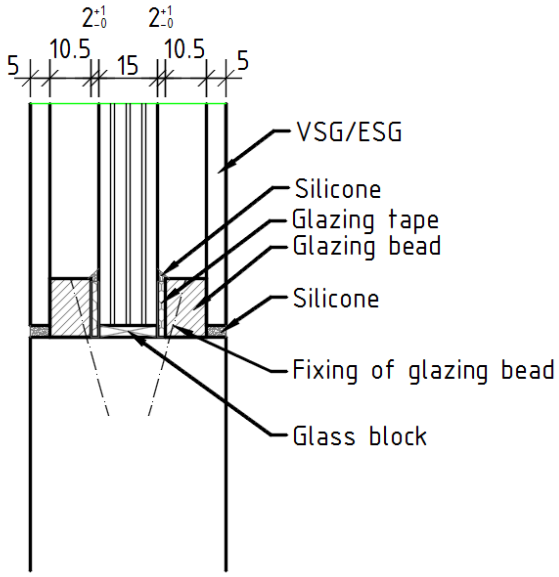
Glazing gasket

- TPE
- EPDM
- Silicone

Fire protection strips
Kerafix Flexpan 200 (ROKU Strip L110)
Rolf Kuhn GmbH
Dimensions 20 x 1,5mm
2 strips all-around the edge of the aperture

Glass block
Dimensions min. 14x30, thickness 3-12mm
Blocking below / left and right, fixed with silicone

- Hardwood, density ≥ 500 kg/m³
- Promatect H (Promat GmbH)
- Flammi 12 (Rolf Kuhn GmbH)
- Flammi 22 (Rolf Kuhn GmbH)
- ROKU FIL (Rolf Kuhn GmbH)
- Morton (Odice S.A.S.)



Flush join

Glass bar
Solid wood or wooden materials
Density ≥ 440kg/m³
Dimensions 10,5 x 15mm

Fixing of glazing beads

- Screws ≥ 3 x 40mm
- Steel pins ≥ 1,5 x 40mm

Fixing distances max. 245mm

Glazing tape

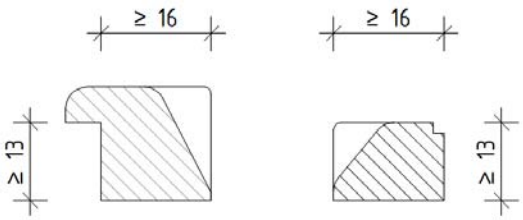
- Kerafix 2000 (Rolf Kuhn GmbH), 14x2 / 3mm
- Superwool Paper X670 (Odice S.A.S.)

Silicone

- Fire protection silicone (Rolf Kuhn GmbH)
- Firestop 700 (Odice S.A.S.)
- customary

Glass block please see glazing frame above.

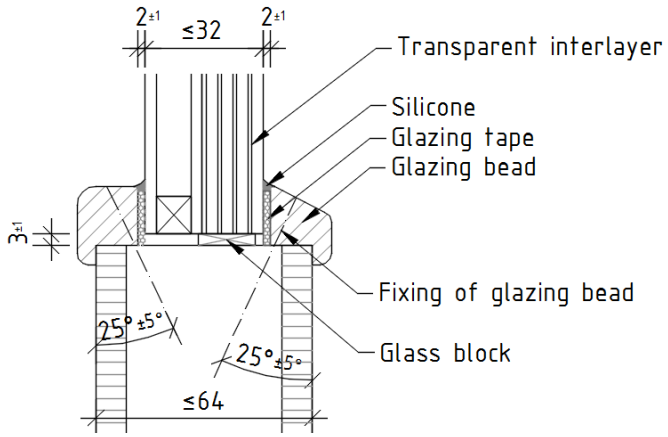
Glazing beads

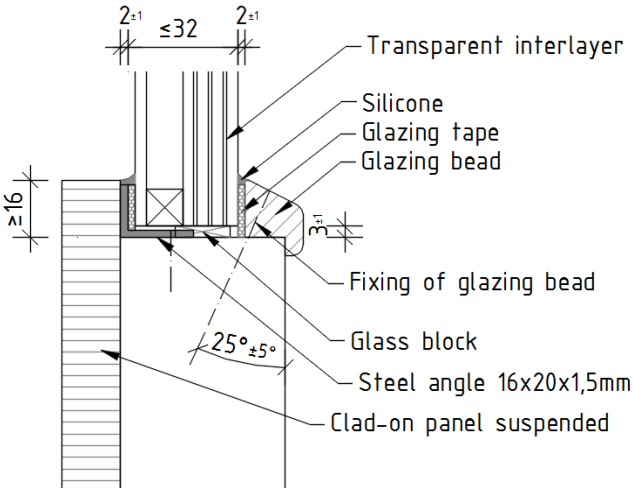


Hardwood and pinewood
Density ≥ 440kg/m³
Dimensions min. 13 x 16mm

Profile freely selectable!
Glass bar can optionally be laminated!

Glazing – shapes freely selectable





Fixing of glazing beads
- Screws ≥ 3 x 40mm
- Steel pins ≥ 1,5 x 40mm

Fixing Distance
- out of corner 40-60mm
- inbetween max. 345mm

Glazing tape
- Kerafix 2000 (Rolf Kuhn GmbH), 14x2 / 3mm
- Superwool Paper X670 (Odice S.A.S.)
- PE

Silicone
- Fire protection silicone (Rolf Kuhn GmbH)
- Firestop 700 (Odice S.A.S.)
- customary

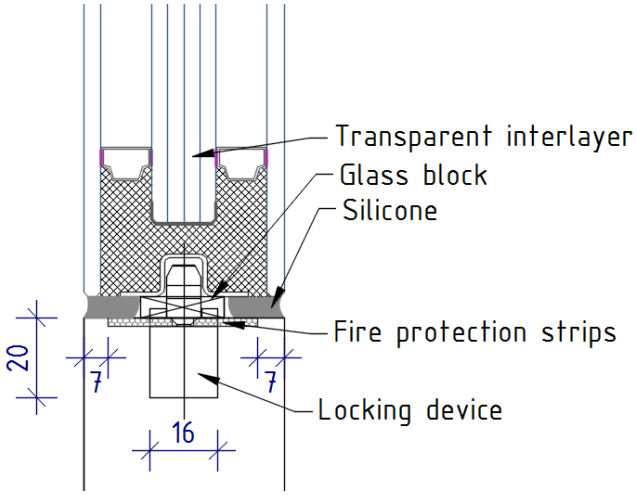
Steel angles 16x20x1,5mm, 20mm long screwed with min. 3x25mm screws

Glass block
Dimensions min. 14x30, thickness 3-4mm blocking diagonal, 40-80mm out of corners (hinge-side below / lock-side above)
- Hard wood, density ≥ 500 kg/m³
- Promatect H (Promat GmbH)
- Flammi 12 (Rolf Kuhn GmbH)
- Flammi 22 (Rolf Kuhn GmbH)
- ROKU FIL (Rolf Kuhn GmbH)
- Morton (Odice S.A.S.)

Glazing within door leaf - ISO

GLASTEC ROSENHEIM	• **Planline 30** Thickness ≥47mm	Max. dimensions within flush-even door leaf (wxh) 2,5m² Outer glazings optionally coloured, printed and/or laminated, satined, sand blasted, with adhesive foil or rails, possibly with integrated shading

Glazing – Shapes freely selectable



Locking device
60x16x20mm
Milled into the door frame and fixed with screws≥3x20mm

Distances
- out of corners ≤ 115mm
- inbetween ≤ 510mm

Glass blocks
Hard wood density ≥ 480 kg/m³

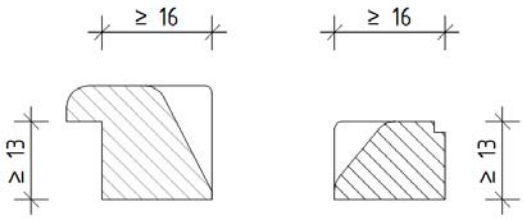
Fire proteciton strips Planline
Dimensions 15x1,5mm
2 strips located in parallel, each 7mm from the outer edge of the door leaf

Sealing
Silicone Planline

Filling within door leaf

Promat	• **Promatect 200** Thickness 20mm*	Max. dimensions within door leaf (wxh) 2,5m² * Panel is to be coated with 2mm MDF/HDF on each side→ thickness 24mm !  Glue: PUR or MUF-glue

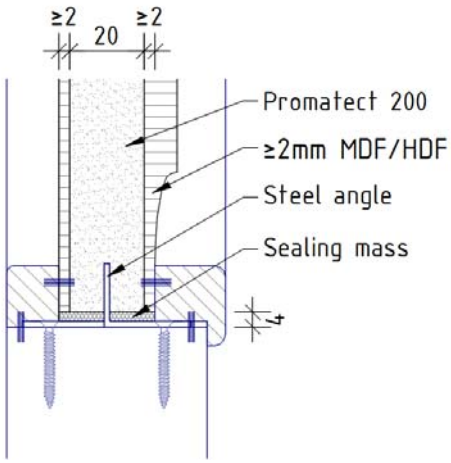
Glazing beads

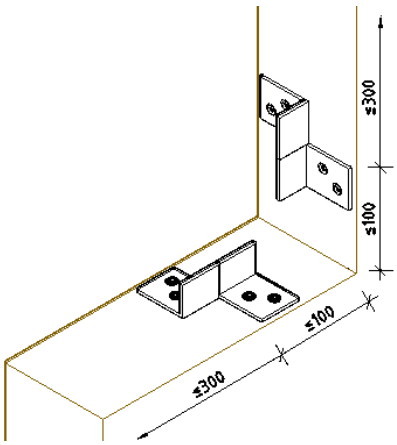


Hardwood and pinewood
density ≥ 440 kg/m³
dimensions min. 13 x 16mm

Profile freely selectable!
Glass bar can optionally be laminated!

Glazing – shapes freely selectable





Steel angle for fixing of the opaque filling
z.B. Häfele, 260.25.703

Dimensions:
Fitting edge 21-25mm
Guide angle 15-20mm
Length 20-35mm
Thickness 1,5-2mm

Screws
≥ 3x30 mm, min. 1 screw/angle

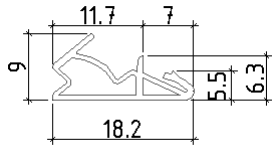
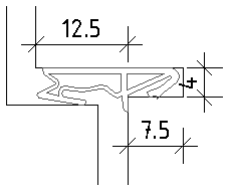
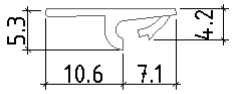
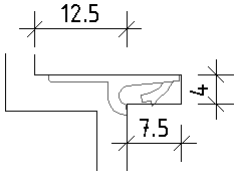
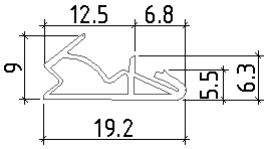
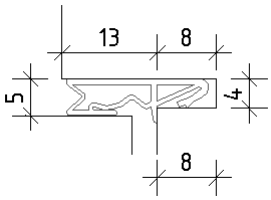
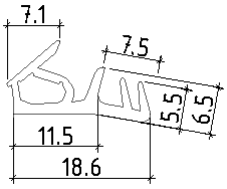
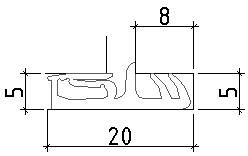
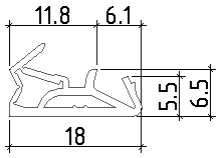
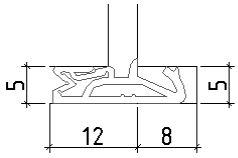
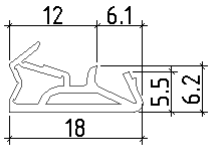
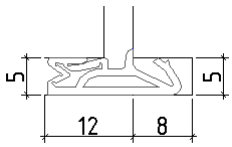
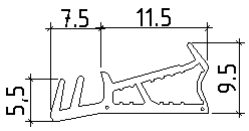
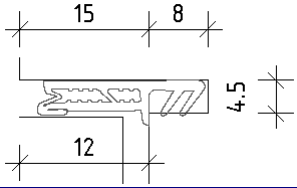
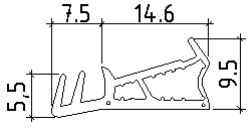
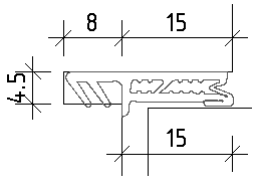
Distances
- out of corner ≥100 mm
- inbetween ≥300mm

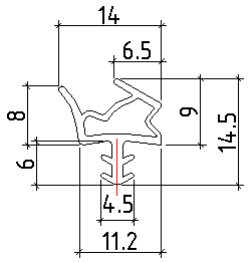
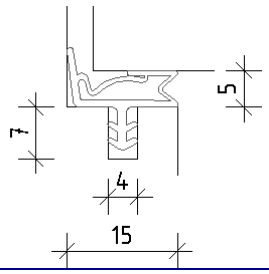
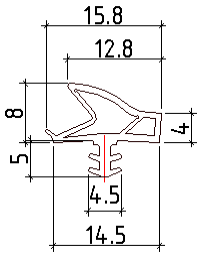
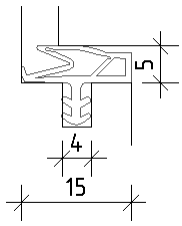
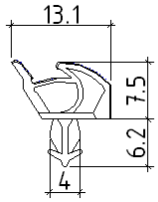
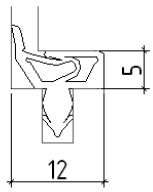
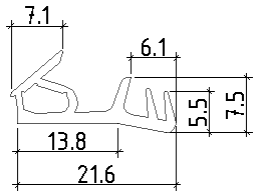
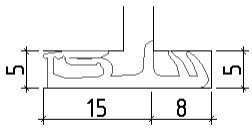
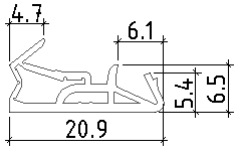
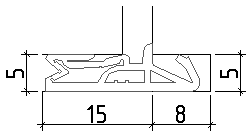
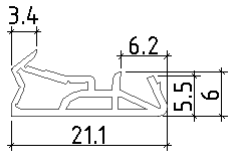
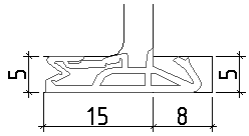
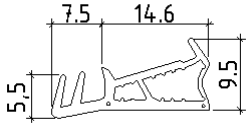
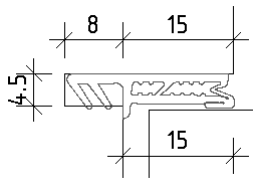
Alignment cenetered +/- 4mm

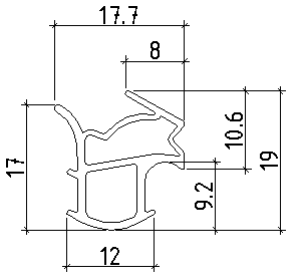
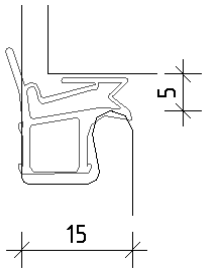
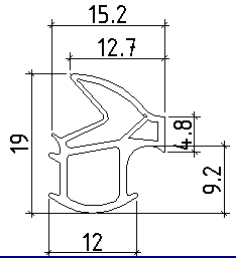
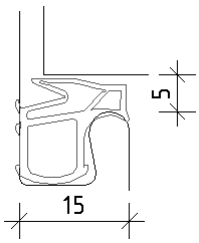
Filling with the connetion joints
- Promaseal Mastic (Promat GmbH)
- Acrylodice (Odice S.A.S.)

Filling edges bonded!

 Glue: PUR-glue

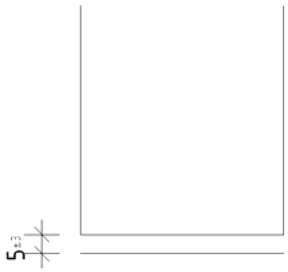
Seals – door panel →min. construction material class B2		
		Deventer S 6512 Deventer S 6512a fh
		Deventer S 6600a
		Deventer S 6513
		Deventer DS 6922
		Deventer DS 112a
		Deventer SV 112
		Goll SF 1016
		Goll SF 1017
		or similar →min. construction material class B2

Seals – wooden frames →min. construction material class B2		
		Deventer S 6615 Deventer S 6615 fh Deventer S 6612 Deventer S6612 fh
		Deventer S 6699
		Deventer SP7522 Deventer SP7544 Deventer SP7576
		Deventer S 6955
		Deventer DS 155a Deventer DS 112a
		Deventer SV 155
		Goll SF 1017 Goll SF 1016
		or similar →min. construction material class B2

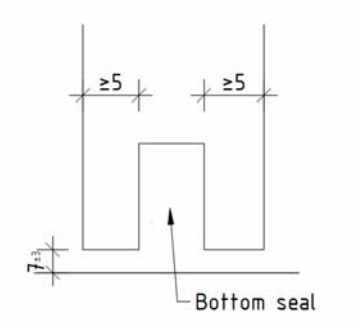
Seals – steel frame →min. construction material class B2		
		Deventer S 6741 Deventer S 6741 fh
		Deventer S 6793
		or similar →min. construction material class B2

Bottom seals

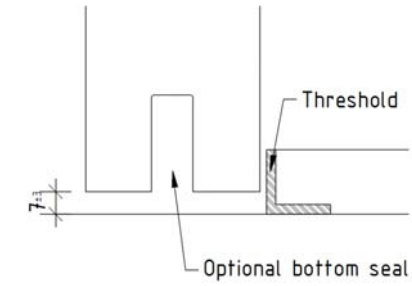
Bottom gap 5 ±3mm



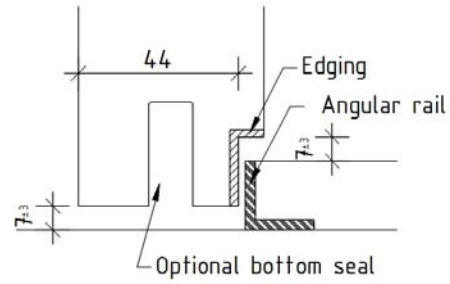
Bottom gap 7 ±3mm



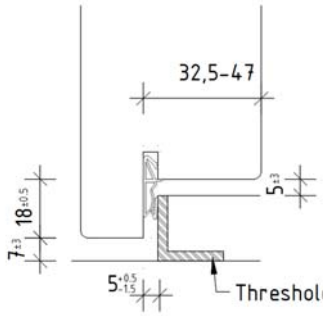
Bottom gap 7 ±3mm



Bottom gap 7 ±3mm



Bottom gap **7 ±3mm**



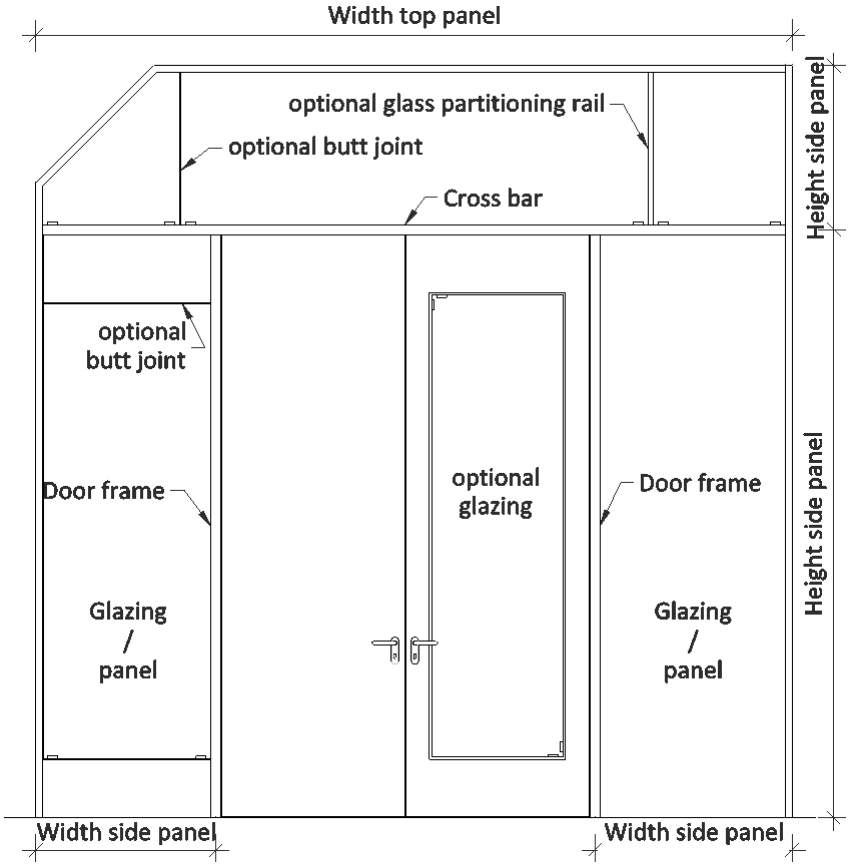
Angled stop
Threshold metal
Dimensions
min. 20 x 20 x 3mm

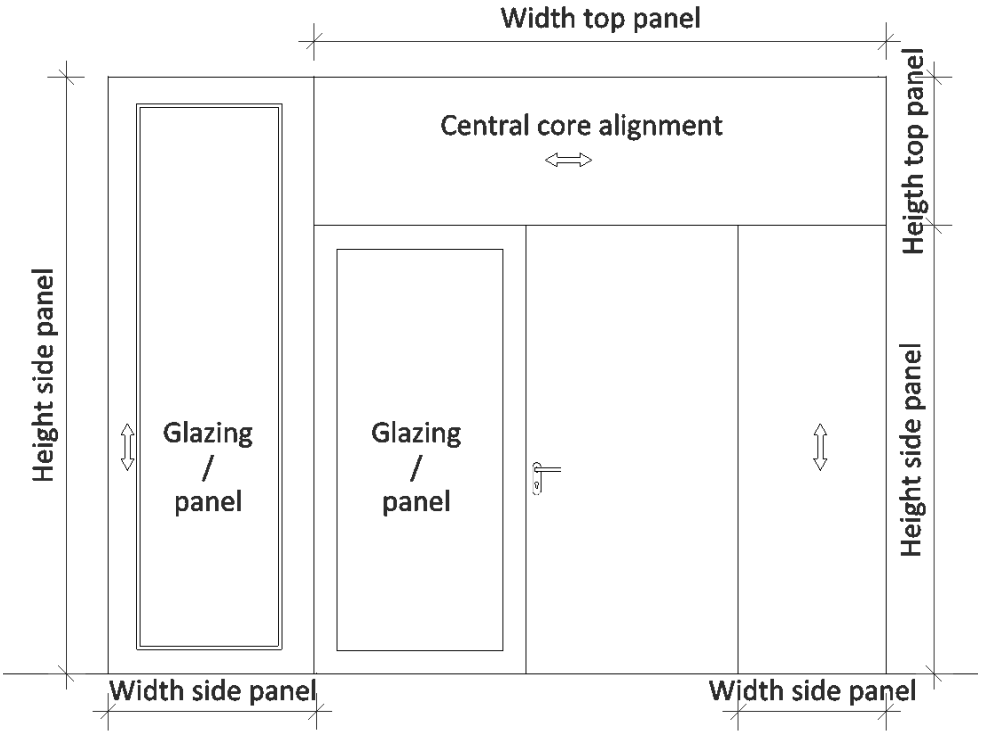
Edging
solid wood density ≥500 kg/m³

Bottom seals

- Planet US
- Planet MF
- Planet HS
- Planet RH
- Athmer Schall-Ex Ultra
- Athmer Schall-Ex L15
- Athmer Magnetomat
- Deventer DBB 1530
- Alumat-Frey magnet sealing
- Alumat-Frey angle brackets
- or identical construction with corresponding fire protection efficiency

Side and top panel - Dimensions please see data sheets

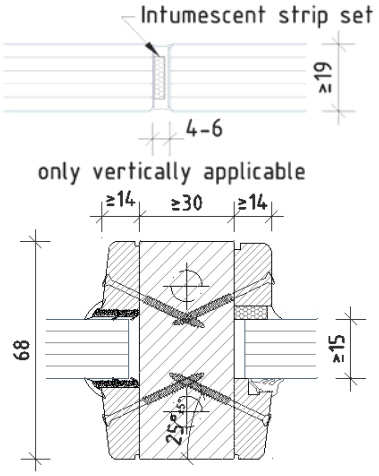




LAMINESSE side and top panels (thickness 54mm)

Butt joints / rails Planline 30 and Pyranova 30 in top and side panels

Attention: butt joints to be specified when glazing is being ordered!

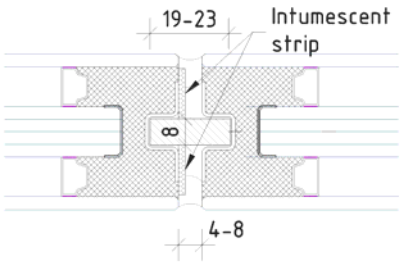


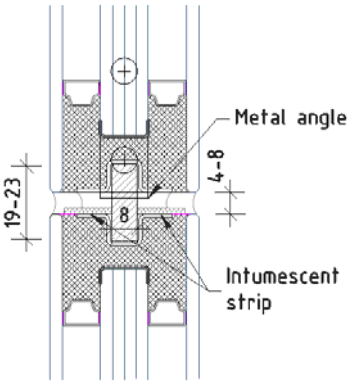
Butt joint Monoglas (only vertical)

- Joint sealing Silicone

Glazing bar

- Hard wood denisty ≥480 kg/m³
- For glazing please see next page

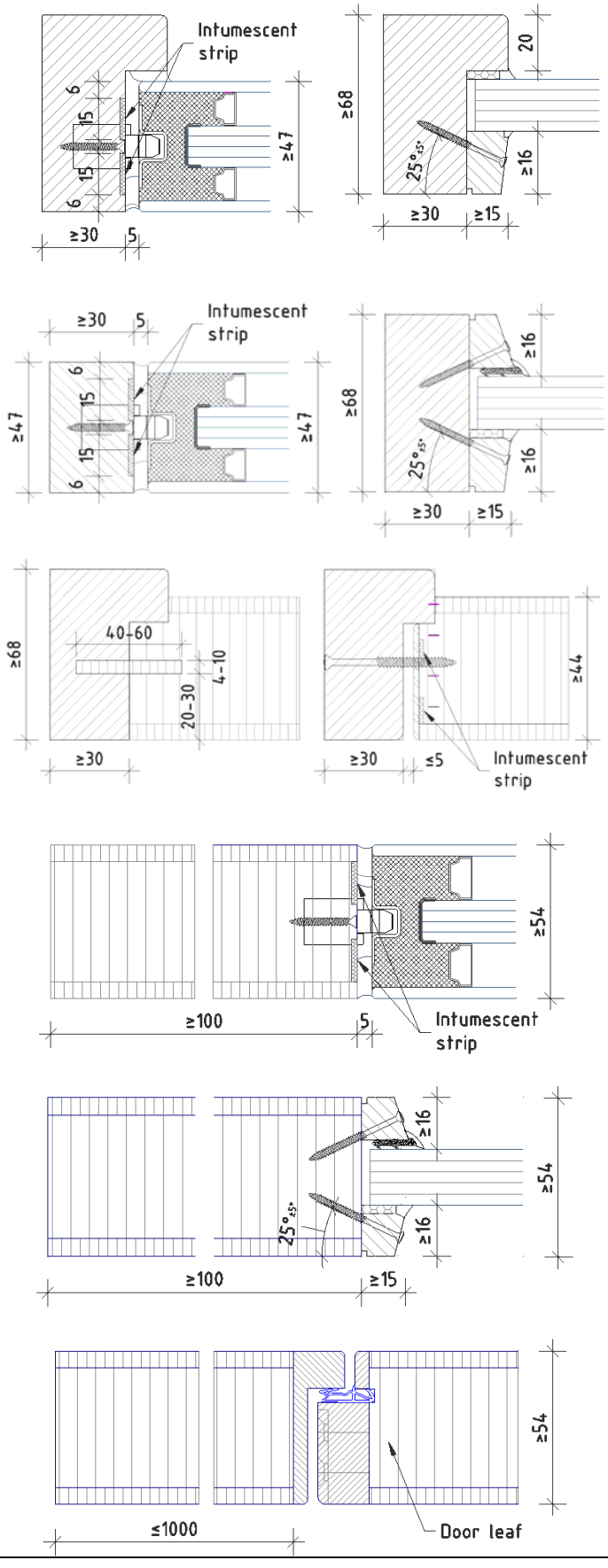




Butt joint Planline

- Spring out of wooden material
- Intumescent strip Kerafix® Flexplan 200
- Joint sealing silicone
- Load transfer for vertical alignment of glasses by steel angle min. 50x50x15mm

Side and top panels in wood - edgewise / above



Side- / top part door frame

Hardwood / Pinewood
also laminated and/or finger-jointed
density ≥ 410 kg/m³
Dimensions please see drawings!

- Coating possible

Glazing bead
Hardwood / Pinewood
density ≥ 410 kg/m³
Dimensions:
13x15mm
Glass fitting ≥11mm

- Optionally single/double-sided
- Profile freely selectable

Application of LAMINESSE FireSmoke- partial areas to the solid wood profiles

LAMINESSE FireSmoke 44mm counter-rebated with construction springs (timber products), alternatively connected by screws
.

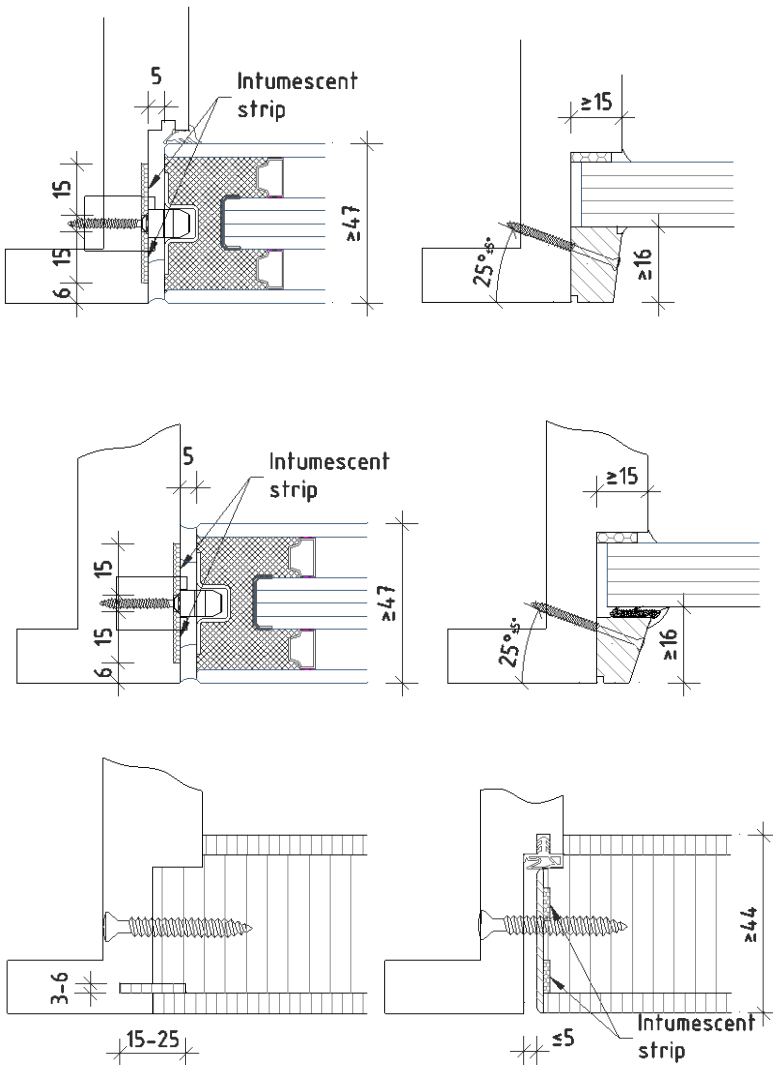
Attention: Shadow gaps require the application of intumescent strips, 2x Promat/Intumex L 10x1,8mm - as shown on drawing!

LAMINESSE – side and top parts

LAMINESSE FireSmoke 54mm
Frame width min. 100mm

For integration of glazing, please see door leaf

Side parts can be applied without glazing



Side & top parts wrapped frame

Glazing beads
Hardwood / Pinewood
Density ≥ 410 kg/m³
Dimensions:
13x15mm
Glass fitting ≥ 11mm

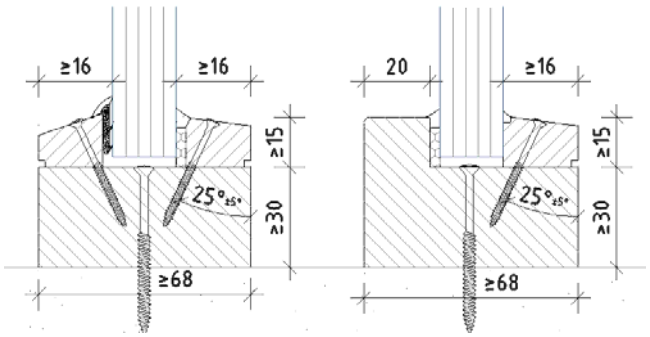
- Optionallv single or double-sided
- Profile freely selectable

Application of LAMINESSE FireSmoke- partial areas to the solid wood profiles

LAMINESSE FireSmoke 44mm counter-rebated with construction springs (timber products), alternatively connected by screws.

Attention: Shadow gaps require the application of intumescent strips, 2x Promat/Intumex L 10x1,8mm - as shown on drawing!

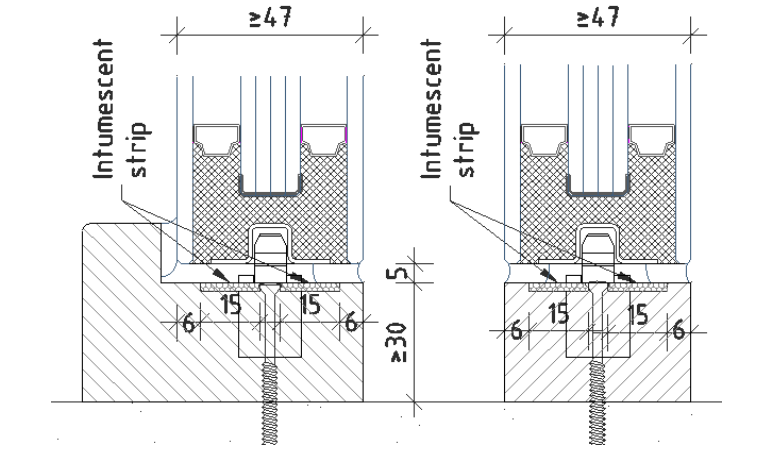
Side and top pars wooden - Application at bottom



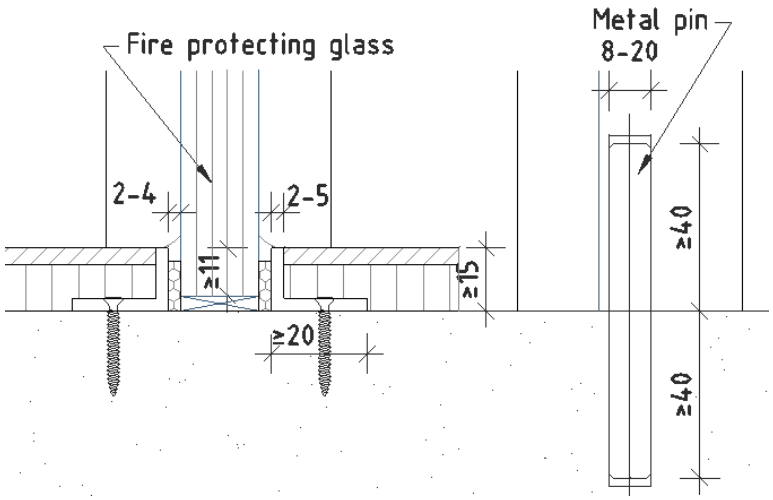
Solid profiles

Application at bottom

- screwed min. Ø5 x 80mm penetration depth ≥40mm
- with groove strip min. 20x20mm additionally permanently elastic sealing



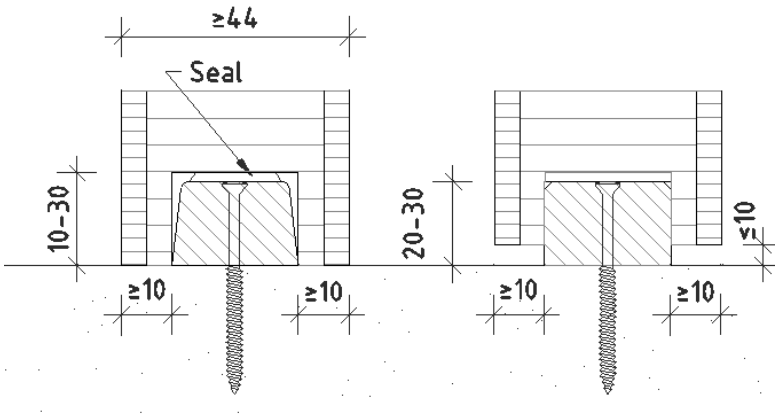
- Application at bottom screwed min. Ø5 x 80mm Penetration depth at bottom ≥40mm
- with groove strip min. 20x20mm additionally permanently elastic sealing



Alternatively direct application at parquet / laminate

- metal angle (min. 20x15x2mm) screwed to the ground
- Distance of individual screw joints ≤ 250mm
- direct application to parquet
- Glass fitting ≥11mm
- Glazing tape / glass block please see glazing

Attention: Frame must be anchored firmly in the floor with metal billets and assembly adhesive.

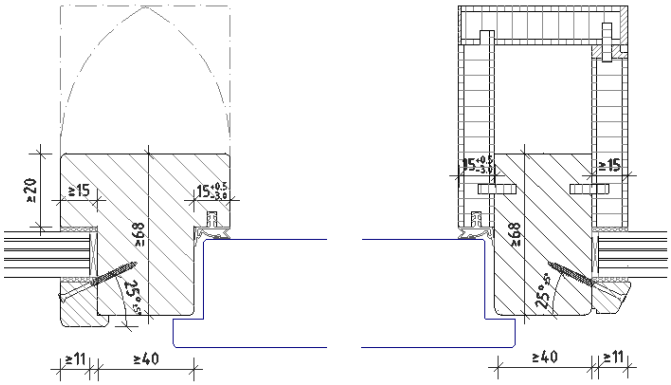


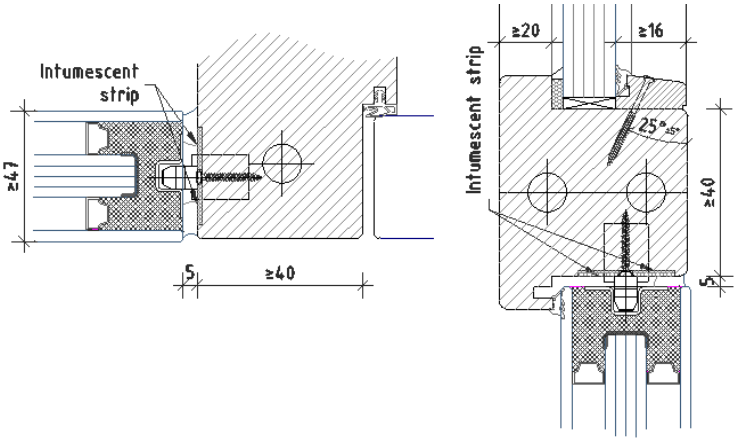
LAMINESSE FireSmoke
Side / top parts

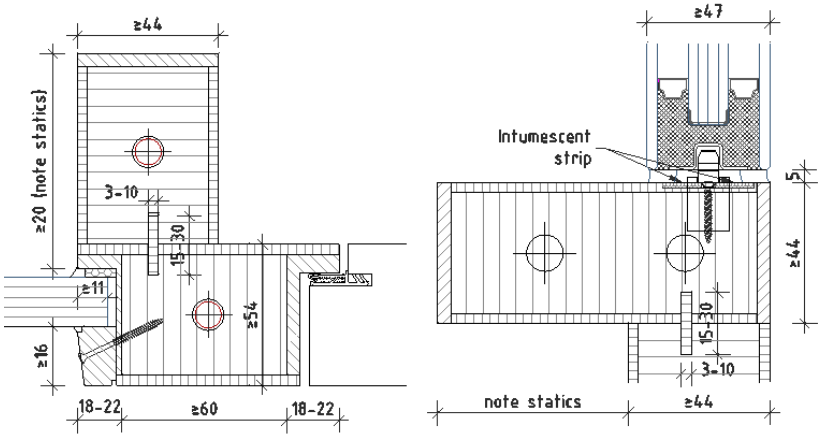
LAMINESSE FireSmoke ≥44mm

- Fixing to floor with groove strip
- Dimensions min. 10(20)x24mm
- fitting Ø5 x 80mm floor penetration depth ≥40mm
- silicone sealing, compriband ≤5mm

Side and top parts wooden - Frame/cross-bar profile







Frame- / cross-bar profile

Hardwood / Pinewood
laminated and/or finger-jointed
density ≥ 410 kg/m³
Dimensions see drawings!

- Coating possible

Glazing beads
Hardwood / Pinewood
Density ≥ 410 kg/m³
Dimensions:
13x15mm

- Optionally single or double-sided
- Profile freely selectable

Glass application see door leaf

Cladding
Moralt laminboard MDF
Moralt laminboard stabil HDF
Moralt laminboard cross-grain veneered
Moralt laminboard Span

Thickness range 13-32mm

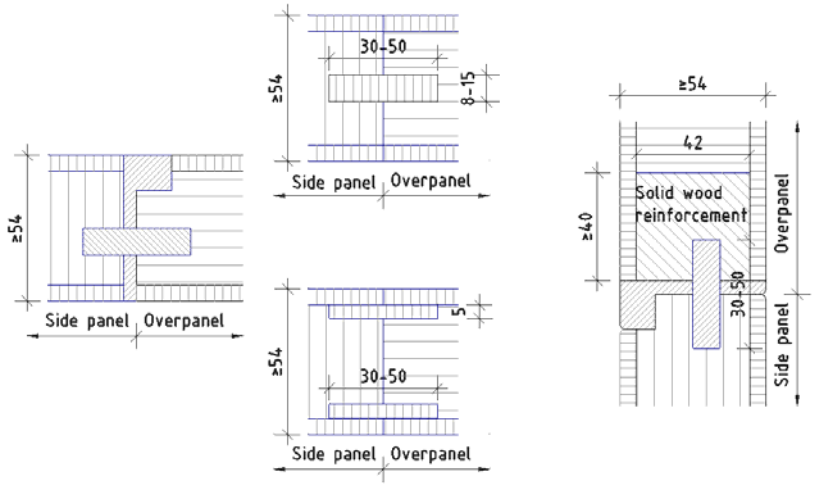
Frame- / cross-bar profile LAMINESSE FireSmoke

LAMINESSE FireSmoke thickness 44/54mm

Lipping see door leaf

For statical purposes, frame and cross-bars should be reinforced where necessary!

Joining with construction springs of wooden materials



LAMINESSE FireSmoke
Joining of side and top panel

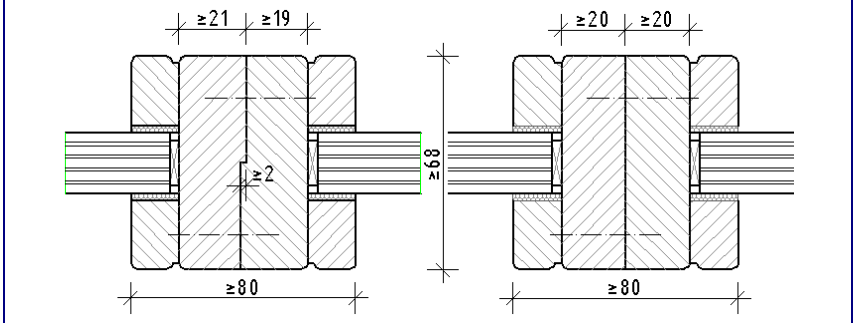
Joining by construction springs
Dimensions. 30-50mm
Thickness 5-15mm

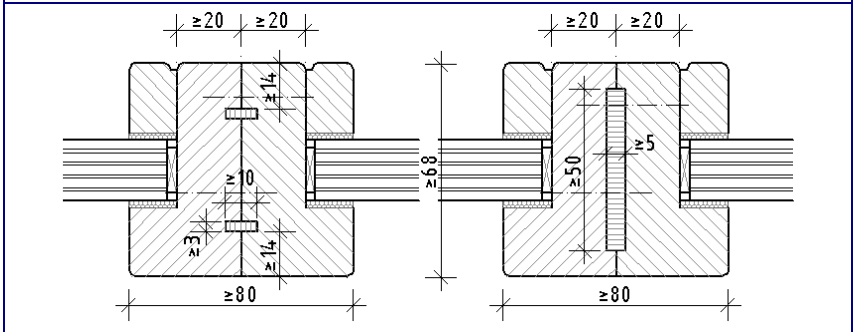
lipping, where applicable, see door leaf

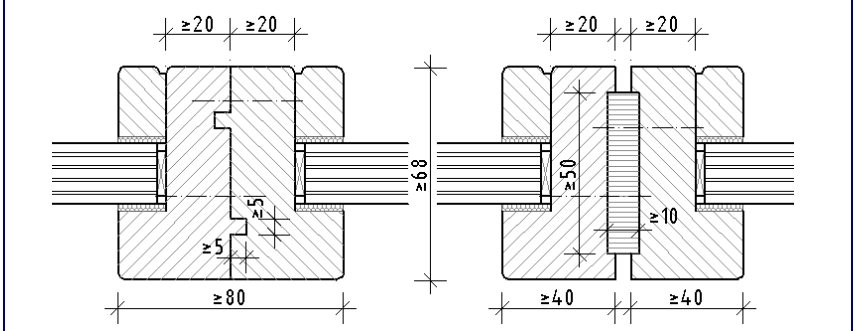
At top parts, free length cross-bars of solid wood with density ≥500kg/m³ need to be glued.

PUR

Side part and skylight – wood – element couplings/joints







Hardwood / Pinewood
Laminated and/or finger-jointed
Gross density ≥ 410 kg/m³
Dimensions (wxd)
min. 40 x 68mm
min. 20 x 68mm (2-sided)

- Coating possible

Connection type screwed

- Rebate
- Stub
- Transverse sping or dowel
- Flat spring
- Pivot
- Shadow groove

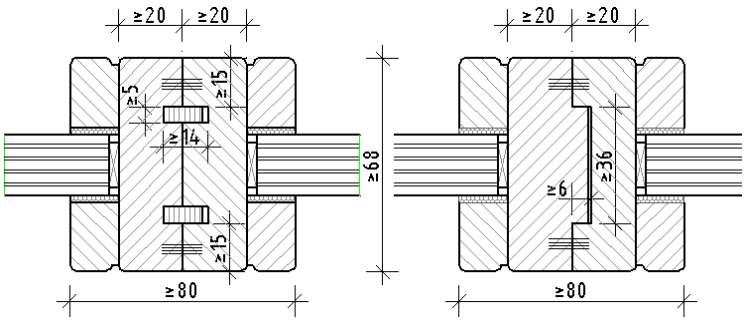
glued

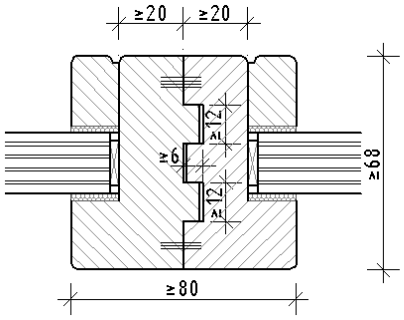
- Spring
- Pivot

Fitting
Screws ≥ Ø 4 x 35mm
Distance ≤ 500mm

Connection spring

- Solid wood
  Denisty ≥440 kg/m³





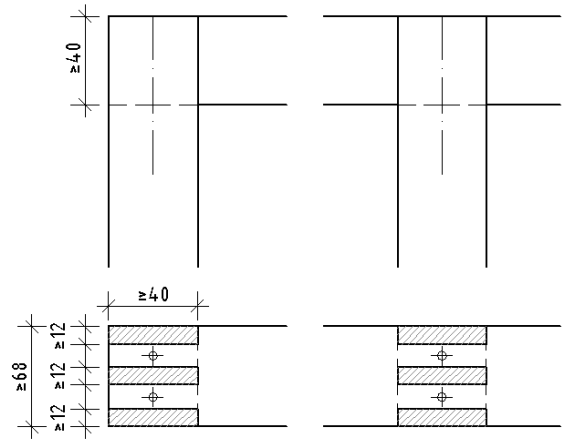
- Veneer plywood
  Density ≥440 kg/m³
- MDF/HDF
  Density ≥600 kg/m³

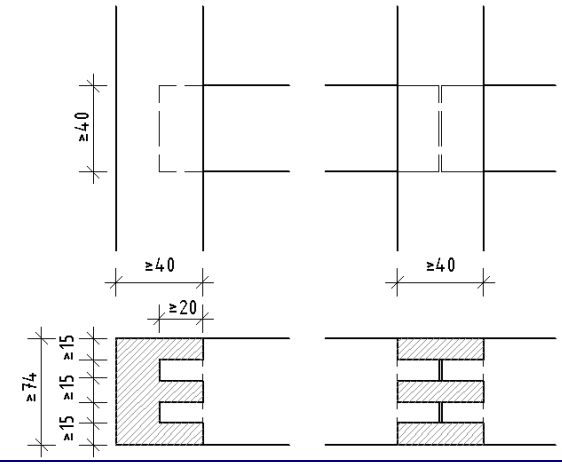
Dimensions
Thickness 3 x 10mm
Width min. 16mm

PVAC min. D3

PUR

Side part and skylight – wood – edging



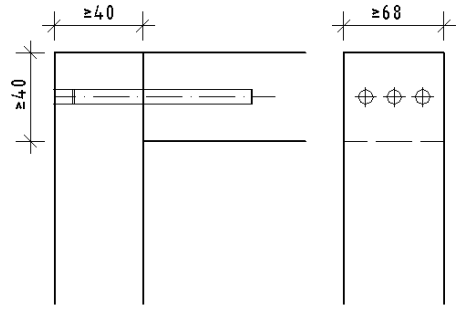


Mortice and pivot
Finish according to state of the art technology
→Please note minimum sizes

Screws →optionally
min. Ø6 x ≥100mm
penetration depth cross bar ≥60mm

PVAC min. D3

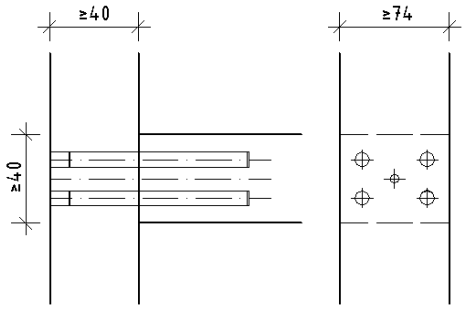
PUR



Dowel
Hard wood
Density ≥500 kg/m³
min. Ø10 x 90mm
Penetration depth cross bar ≥60mm
Tolerance dowel length ±3mm

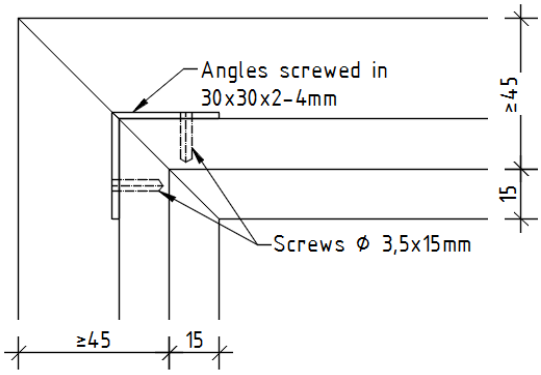
Screws →optional
min. Ø6 x ≥100mm
penetration depth cross bar ≥60mm

Please note:
Number, diameter,
length and alignment of the hardwood dowels in line with the static requirements!



PVAC min. D3

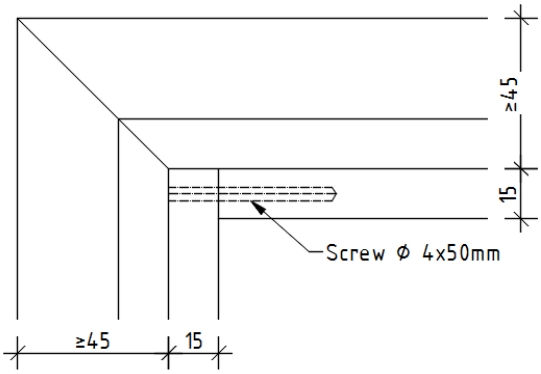
PUR



Screwed across angle

Angle
min.30 x 30 x 2-4mm

Screws
min. Ø3,5 x 15mm



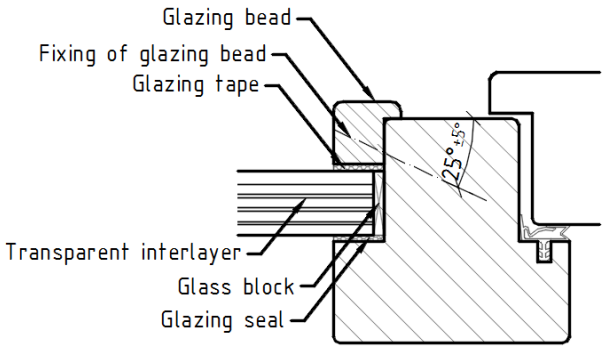
Screwed and glued

Screws
min. Ø4 x 50mm

PVAC min. D3

PUR

Side part and skylight – wood – glazing



Glazing beads
Hardwood / Pinewood
Density ≥ 410 kg/m³
also laminated and/or finger-jointed
Dimensions:
Min. 16x20mm

- Optionalle single or double-sided
- Profile freely selectable
- Coating possible

Fixing of glazing beads
Screws min. 3 x 40mm

Mounting distances
Out of corner max. 85mm
Inbetween max. 400mm

Glass sealing / glazing tape

- Kerafix® 2000 (Rolf Kuhn)
  14 x 2/3mm
  Optionally permanent elastic sealing
  Superwool paper X607 (Odice)
  14 x 2/3
- PE customary; 9 x 2/3mm
  + permanent elastic sealing
- Dry glazing Flexilodice (Odice) on both sides

Permanently elastic sealing compound

- Silikon customary
- Kerafix® fire protection silicone (Rolf Kuhn)
- Firestop 700 (Odice)

Glass block

- Silicate-based
- Hardwood, density ≥ 500 kg/m³

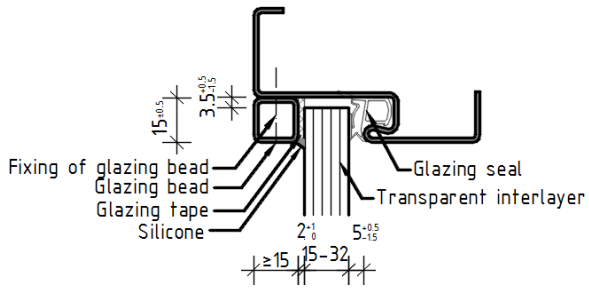
Dimensions (wxlxd)

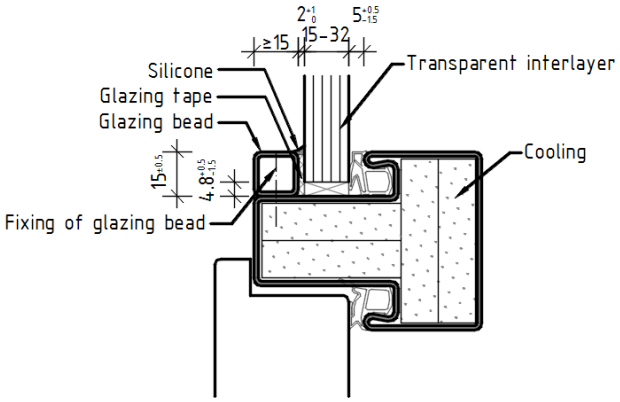
- Mono glass min. 15 x 30 x 3mm
- Insulating glass min. 15 x 50 x 3mm
- Planline min. 40 x 50 x 3mm

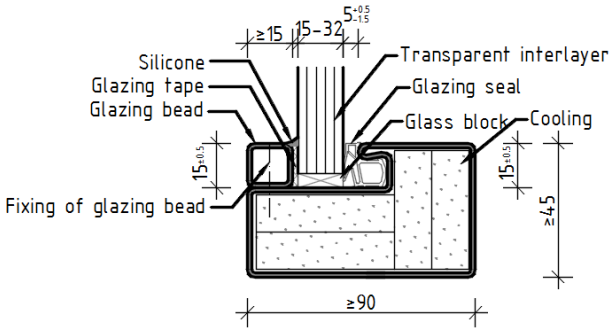
Glass fitting
min. 11mm

Filling
→see transparent fillings

Seitenteil und Oberteil – Verglasung







Glass beads
Steel, single-sided
Dimensions min. 15 x 15mm

Fixing of glass beads
Sheet metal screw min. 3,8 x 30mm

Moulding distance
Out of corner max. 85mm
Inbetween max. 280mm

Glass sealings / glazing tape
- Kerafix® 2000 (Rolf Kuhn)
  14 x 2/3mm
  Permanently elastic sealing optional
- Superwool paper X607 (Odice)
  14 x 2/3mm

Glazing gasket
- S 6793, Fa. Deventer, or similar
  min. construction material class B2

Glass block
- Silicate-based

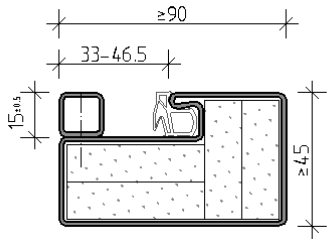
Dimensions (wxlxh)
- Mono glass min. 15 x 30 x 3mm
- Insulating glass min. 15 x 50 x 3mm

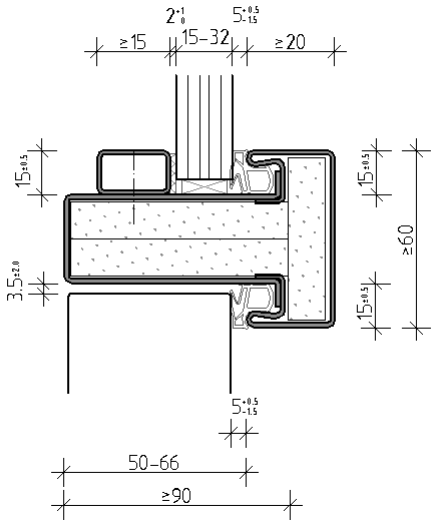
Filling
→see glass types

Cooling
- Plasterboard panel

Permanently elastic sealing compound
- Silicone customary
- Kerafix® fire protection silicone (Rolf Kuhn)
- Firestop 700 (Odice)

Side part and skylight – Steel posts and cross bars





Cross bar profile
Material thickness 1,5-1,75mm
Dimensions

- 60 x 90mm
- 45 x 90mm (below)

Rebate geometry

- Edgeless 50-66mm x 15mm
- Rebated 33-46,5mm x 15mm

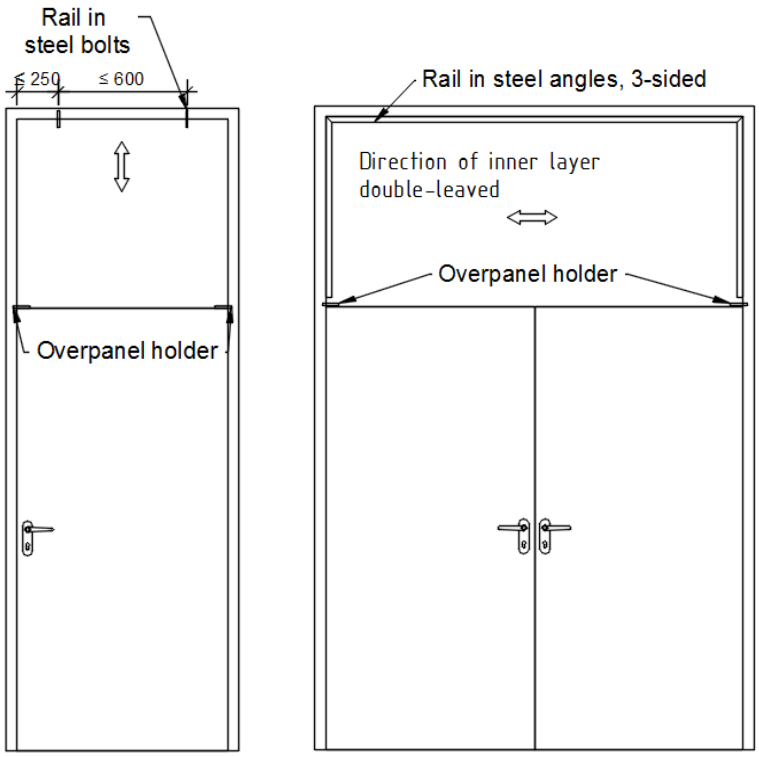
Cooling

- Pasterboard panel

Edging
→see edging

Wall fixture
→analogue steel frames

Overpanels counter-rebated



Overpanels

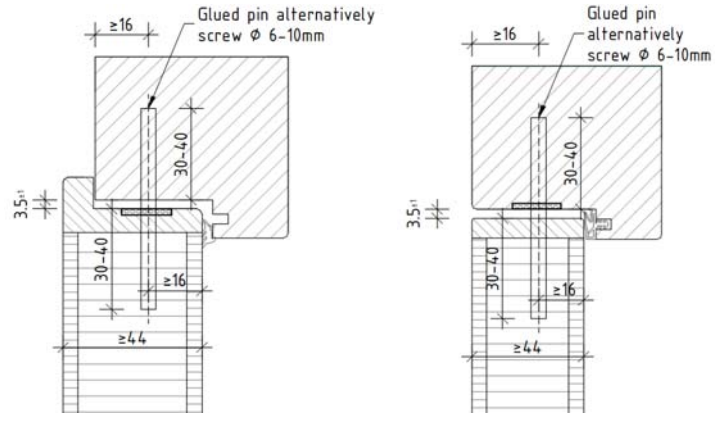
LAMINESSE FireSmoke
Thickness ≥44mm
analogue door leaf construction

- single-leaf
  Check rail in steel bolts or steel angles
  Distance out of corner ≤25mm, inbetween ≤ 600mm
- double-leaved
  rails only in steel angles

Fixing through upper panel holder (for example: BaSys)

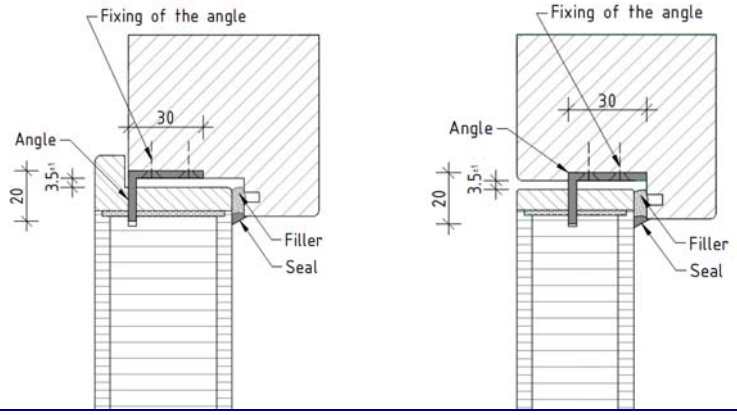
Please consider direction of inner layer!

Overpanel – fixed in door frame



Single-leaf doors

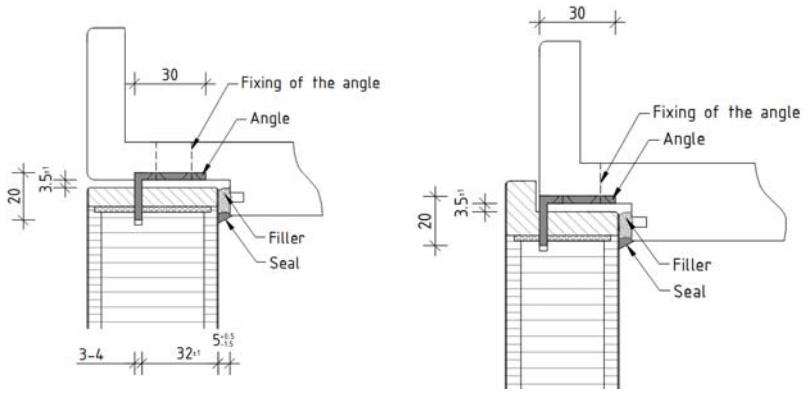
- To be fixed with steel pins or studs
  Ø 6-10mm
- Min. lenght 60mm



Single and double-leaved doors

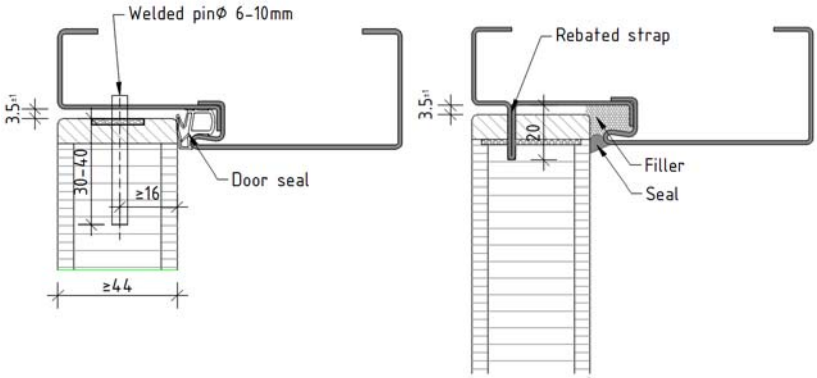
- To be fixed with steel angle wrapped on three sides and screwed with frame
- Ø of screws min.
  4 x 30 mm

Overpanel – fixed in wrapped frames



- To be fixed with steel angle wrapped on three sides and screwed with frame
- Ø of screws min. 4 x 30 mm

Overpanel - fixed in steel frame



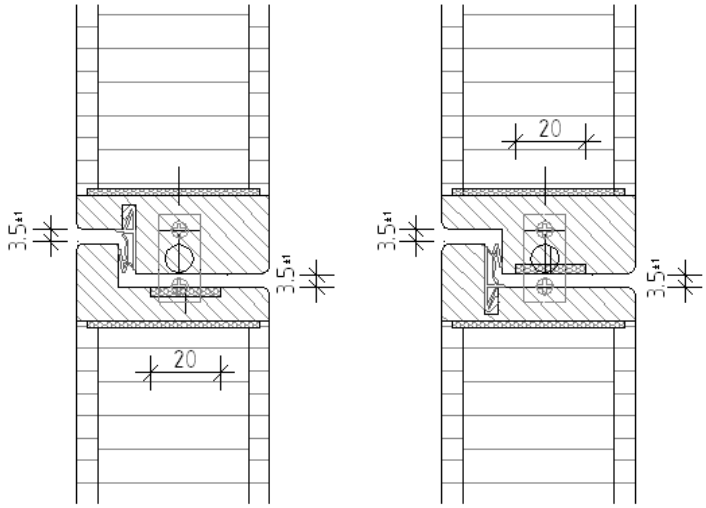
Single-leaf doors

- To be fixed with Steel pins or studs Ø 6-10mm
- Min. length 60mm

Single and double-leaved doors

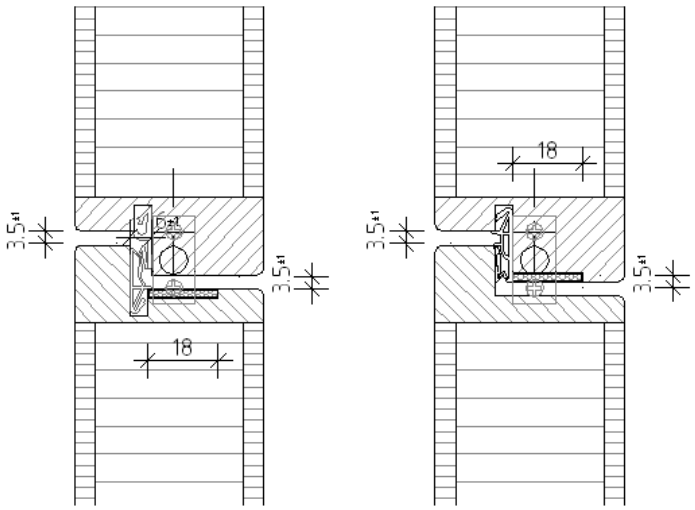
- To be fixed in rebates on three sides with frame

Overpanel – counter-rebated



Overpanel
- Construction analogue door leaf
- Glass aperture analogue door leaf
- Glazing analogue door leaf counter-rebated

Weight max. 130kg
Dimensions (wxh)
max. 2.466 x 2.004mm



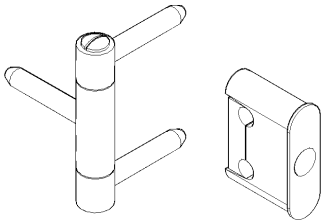
Fire protection strips need to be installed on all 4 sides, analogue to door leaf!

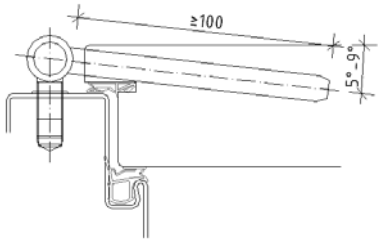
- System Rolf Kuhn
- System Promat / Intumex
- System Odice

Overpanel holder
(BaSys)

- Milled at the lower edge of the upper panel
- Screwing min. Ø4 x 50mm

Hinge systems – hinges and receiving elements EN1935





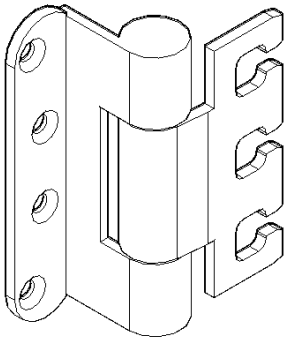
Bolt length in door panel min. 100mm!

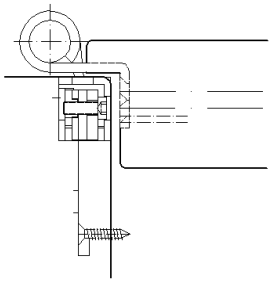
Boring hinges
e.g.
ANUBA
- Hercula HE 318 EI30

Simonswerk
- BAKA C 1-15

SFS intec
- 40H-18-00-08

Receiving elements
- Blind rivet nut / sleeve M10
- Block pocket (steel)



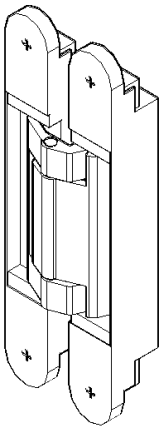


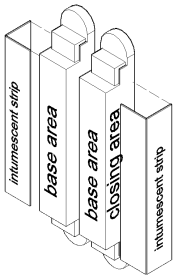
Building hinges
e.g.
Simonswerk
- VX
- VN
- VX / VN Compact

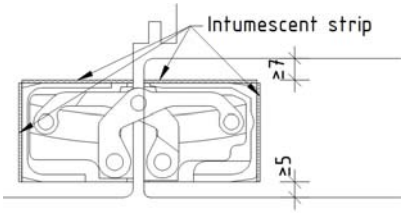
BaSys
- Objecta

Receiving elements
e.g.
Simonswerk
- VX 2501 3D
- VX 2502 3D

BaSys
- Objecta STV75
- Objecta STV82





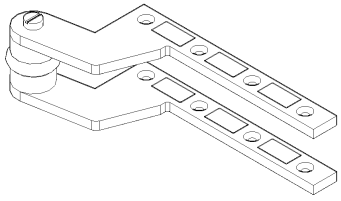


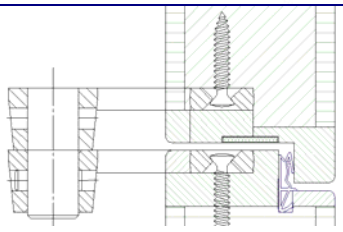
Integrated hinges

Simonswerk
- Tectus

BaSys
- PIVOTA

Integrated hinges must show intumescent strips at the base and closing area!
- Kerafix® FXL200 (Kuhn)
- Interdens (Odice)

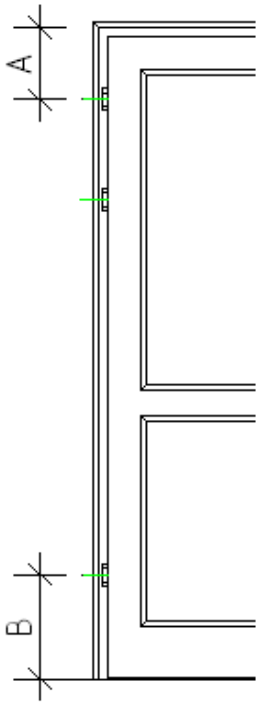




Pivot hinge

e.g.
Dorma
Geze

Hinge systems / hinge sizes



Min. 2 hinges
Door panels≥ 2500mm height → min. 3 hinges
Door panels≥ 2900mm height → min. 4 hinges

Please consider weight of door panel and carrying capacity of hinges (manufacturers' instructions)!

Hinge sizes
A = 241± 50 mm
B = max. 350mm

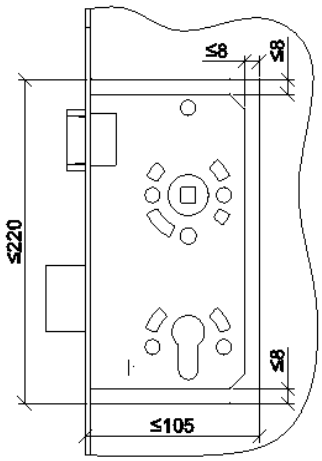
Hinge safety /wedge lock
optional

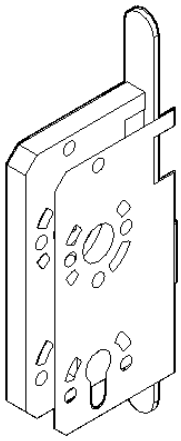
Hinge safety mechanism

Basys Bartels Systembeschläge GmbH
Hinge side security device door part 037555
Frame part rebated 037971
edgeless 039452

Karl Fliether GmbH & Co.KG
KFV BSS8042

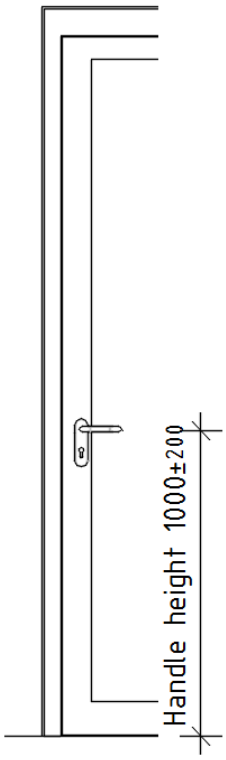
Locks





Tickness of door panel <54mm
Lock cases are to be laminated with an intumescent strip-stamping part on one side!

- Kerafix® FXL200 (Kuhn)
- Interdens (Odice)



For door panels ≥ 2500mm triple latch lock or locks with top locking are to be applied!

e.g.
Gretsch Unitas

- Serie B12..
- Serie B17..
- Serie B18..
- Serie B19..
- Serie B21..
- Serie B23..

(possibly with A-opener)

KFV

- Genius 2600
- Genius 2750

DORMA

- PHA 2500 SVP2

Sächsische Schlossfabrik SSF

- Serie 19..
- Serie 20..
- Serie 21..
- Serie 24..

GEGE

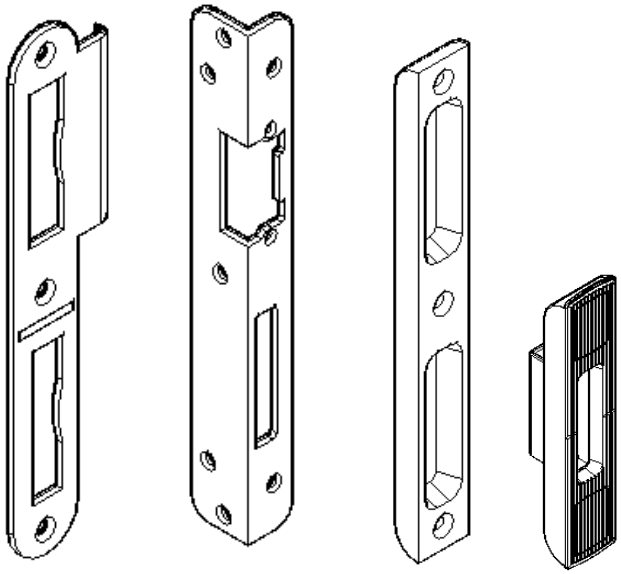
- Serie 121
- Serie 127
- Serie 128
- Serie 124MFV

Glutz

- Serie 11..
- Serie 12..
- Serie Treplane 18..

Leaf locking

- Espagnolette locks with latch/switch lock
- Counter lock case for panic door locks
- manual flush bolt



Rag and angled striking plate / strike plate Drehfix / additional locking

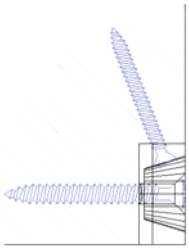
Strike plates of steel, V2A,
brass
Fixed with screws
≥ Ø3,5 x 30mm
e.g.

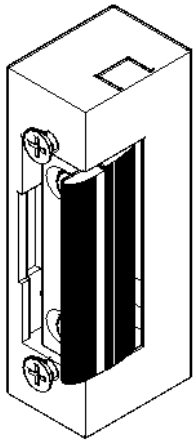
Gretsch Unitas
- B9000 …

KFV
- Genius

Drehfix
- strike plate brass

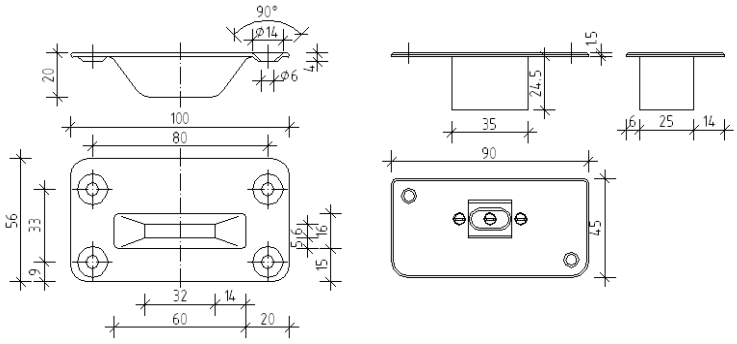
Strike plates (Drehfix) are to be fixed manually through the recesses in the frame (screw Ø3 x 25mm)!





E-opener
e.g.
Gretsch Unitas
- B92..

Assa Abloy Sicherheitstechnik (effeff)
- 143
- F118



Floor sleves

e.g.
Gretsch Unitas
- B90..

Athmer
- BM10

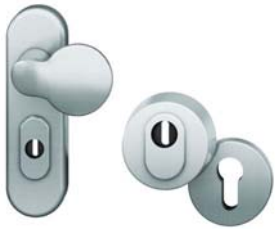
Leafs need to be locked upwards and downwards!

Iron mongery

Additionally steel push handles (laminated), stainless steel or brass.
Electronic locking system on request and after prior consultation!

Gym door fittings FSB
Milling depth ≤24mm
Thickness of door leaf ≥ 60mm
Surface needs to be covered with intumescent strips!

- Kerafix® FLX200 (Kuhn)
- Interdens (Odice)



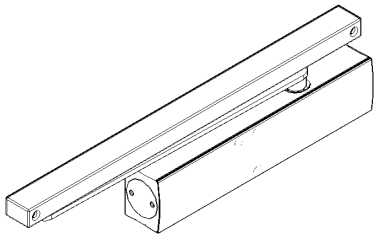
Door viewer

Door viewer

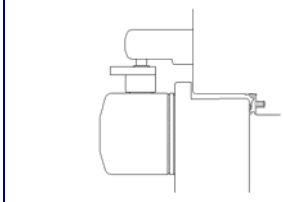
e.g.
Fa. Bäcker
drilling ≤15mm

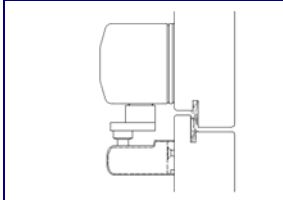
Lock systems

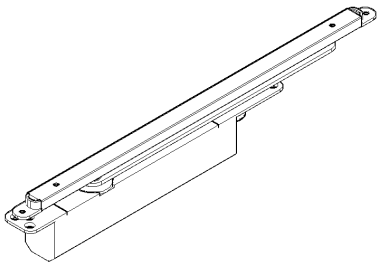
Without door closer only with approval by the bulding authority!



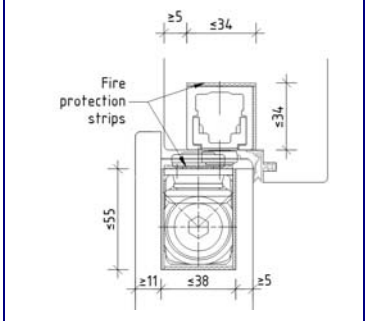
Top locking

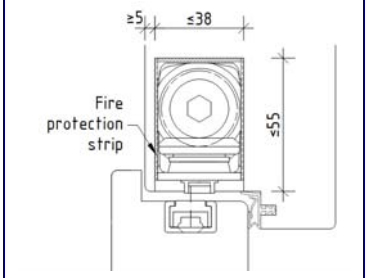


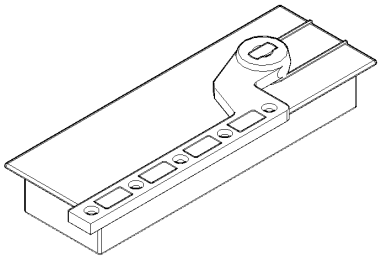




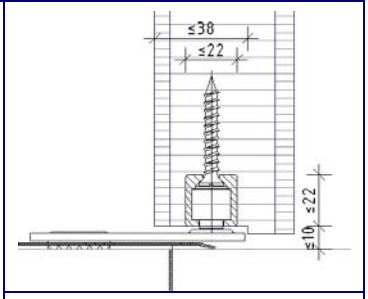
Concealed closer

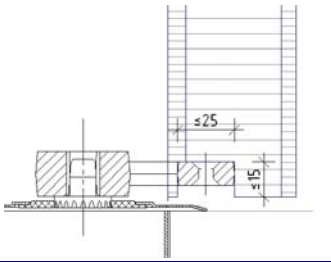






Door springs





<u>Top locking</u>

z.B.
Dorma

- TS93
- TS97
- TS99
- ED200
- ED250

GEZE

- TS5000

Gretsch Unitas

- OTS730

Assa Abloy Sicherheitstechnik

- DC500
- DC700

<u>Integrated</u>

z.B.
DORMA

- ITS96

GEZE

- Boxer

Assa Abloy Sicherheitstechnik

- DC840
- DC860 ggf. mit G881

size 2-4 → tickness of door leaf min. 54mm
size 3-6 → thickness of door leaf min. 60mm

Fire protection strips

- Isolierset ITS (Kuhn)
- Altern. Kerafix Flexplan 200 (Kuhn)
- Isolierset ITS (Odice)
- Altern. Flexilodice (Odice)

<u>Door springs</u>

e.g.
DORMA

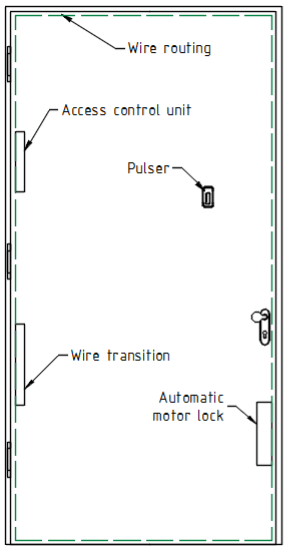
- BTS80

GEZE

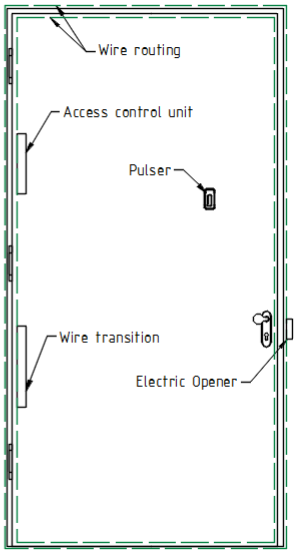
- TS550 F

All types available with closing sequence regulator and and pushing flap.

Electronic access systems



Scheme Motor-lock



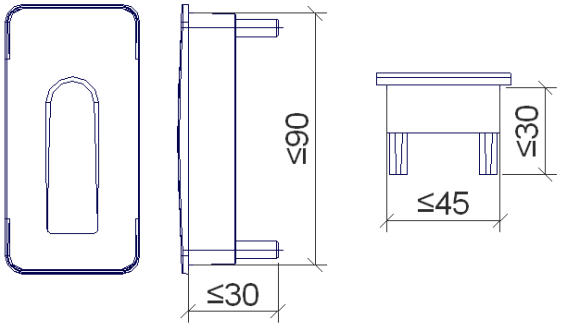
Scheme E-opener

Access systems

- Biometric systems
- Transponder-systems
- Infrared
- Wireless control

ekey biometric system home integra
FSB GmbH isis Fingerscan
KFV Genius

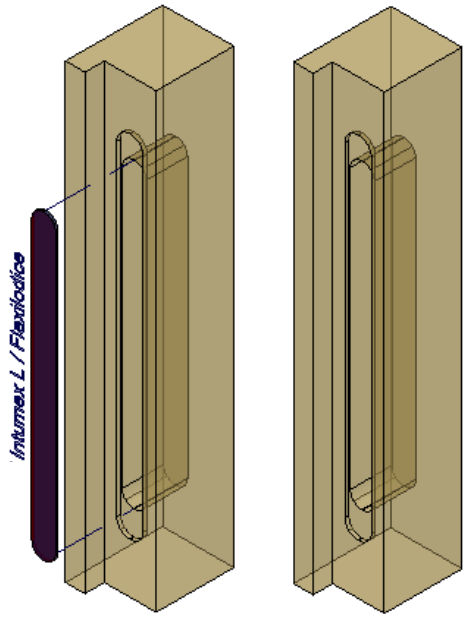
Further systems available on request and after prior consultation!



Milled pockets for pulser (plane)

e.g. for
fingerprint

max. 45 x 90 x 30mm (wxhxd)



Milled pockets in the rebate area

- **for plastic parts**
  e.g. control unit Fingerprint,
  GU Secure Connect

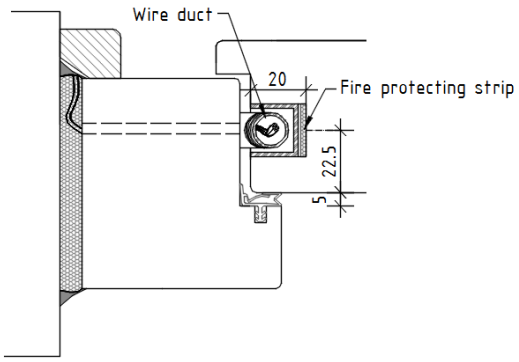
  max. 20 x 250 x 35mm (wxhxd)

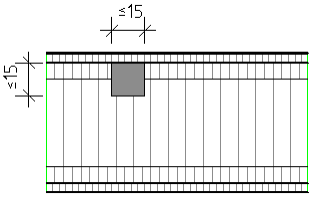
  An intumescent strip needs to be glued at the bottom of the pocket (Intumex L or Flexilodice width 18mm)!

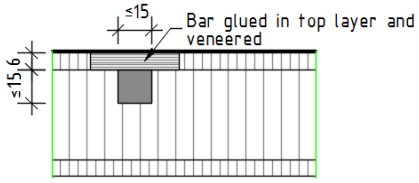
- **For sheet metal components**
  e.g. cable transition ekey

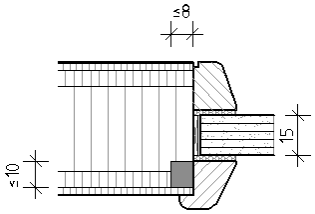
  max. 24 x 480 x 20mm (wxhxd)

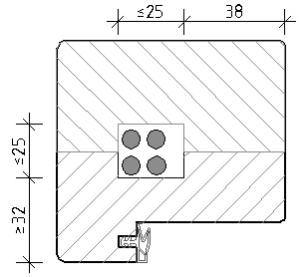
Cable channels / cable transition

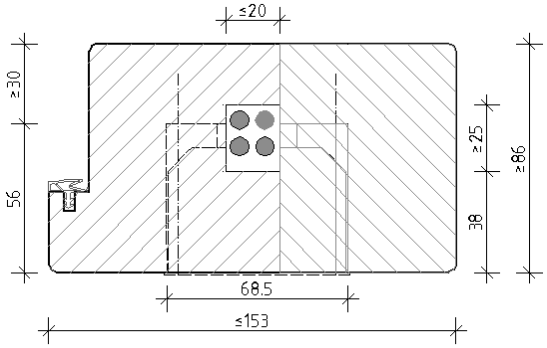












Wire duct

- within profile of frame / cross-bars of wooden block frame
  max. 25 x 25mm
- in rabbet area, partly milled in profile of frame / cross-bars
  max. 20 x 25mm
- milled in door panel and laminated
  max. 15 x 15mm
- milled in door panel and glued on surface layer
  max. 15 x 15mm
- in the door leaf via through-hole
  max. Ø 16mm
- milled behind glass rod
  max. 8 x 10mm
- cable through glass aperture
  → not milled!
  Cable diameter max. 3mm

Flush-mounted back boxes

Only in wooden block frame
max. 68,5 x 56mm
remaining frame depth min. 30mm

Fire protecting strips

Kerafix® Flexplan 200 (Kuhn)
Flexilodice (Odice)
Intumex L (Promat)
thickness 1,5-1,8mm

Installation & maintenance instructions

Moralt AG
Lenggrieser Str.52
83646 Bad Tölz
Germany

Phone.: +49 (0)8041 / 508-0
Fax.: +49 (0)8041 / 508-218
E-mail: werk.badtoelz@moralt-ag.de
Web.: www.moralt-ag.co.uk

Installation instructions

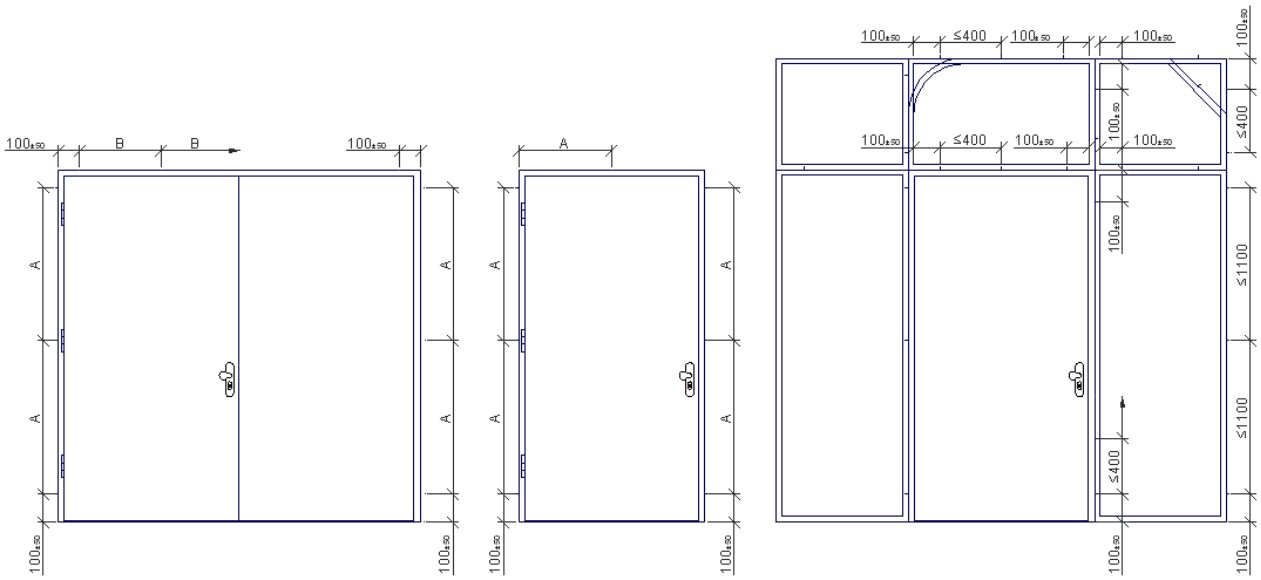
Functional doors, which are produced under license and in accordance with Moralt's production guidelines, are made of excellent quality products. In order to meet our high demands on quality and safety, it is of utmost importance that the products are assembled and maintained very accurately and carefully. Materials and raw materials are to be used in absolute accordance with these instructions. This enables us to meet our highest safety objective on life, health and quality.

1. **Supporting construction / Mounting walls**

Fire resistance class of the wall ≥ EI30	**Nominal thickness [mm]**	**Door frame, LAMINESSE-Zarge**	**Wrapped frame**	**Wrapped steel frame 1- o. 2-teilig**	**Steel frame**	**Glazing**
		Fitting of fixing material ≥ 40mm				
Concrete	≥ 100	screw / dowel limiting screws, Ø ≥ 5mm		Screws / dowels, altern. steel nails, Ø ≥ 3,8 mm		screw / dowel, limiting screws Ø ≥ 5mm
Masonry	≥ 115					
Aereated concrete	≥ 115					
Plasterboard panel soffits1x planked	≥ 100	plate/woodscrew, limiting screws Ø ≥ 3,8 mm			-	plate / wood screw, Ø ≥ 3,8 mm
Glazing	≥ 68	Wooden spring/ screws Ø ≥ 5mm	-	-	-	-

→Specific sound insulation requirements are to be considered with regard to load carrying structure!

2. **Check completeness of marked door element and accessories**
3. **Provide fitting aids**
4. **Connect the door element (please note manufacturers specifications) with side panel and/or top panel by inserting coupling springs, glue frame parts with PVAC (D3) or PUR- glue. Screw connections (Ø5 x frame + penetration depth min. 20mm) must be applied with in distance of at least 400 mm.**
5. **Glue sealing tapes, where applicable**
6. **Insert the door element in wall opening, aligned as necessary and flush at the correct height, secure with wooden logs. Construction joints 5-30mm**
7. **Fixing points, please see drawings and attachments, fix with screws or limiting screws, please see table load carrying structure und mounting. Assembly with wall tie/fastening holes/clamps. Weight forces need to be deflected into the masonry by using wooden blocks (solid wood density ≥ 500 kg/m³, min. 30x50mm)**
   Thresholds are to be screwed onto the floor with a penetration depth of at least 250mm (min. Ø 4 x 40mm).



Fixing distance

Fire resistance class of the wall ≥ EI30	Door frame, LAMINESSE-Zarge	Wrapped frame	Wrapped steel frame 1- o. 2-teilig	Steel frame	Glazing
	Screw depth, please see drawing in attachment				
A [mm]	≤1100	≤450	≤450	≤450	≤1100
B [mm]	≤600	≤450	≤800	≤800	≤600

8. **Filling of the construction joints**

Fire resistance class of the wall ≥ EI30	Nominal thickness [mm]	Door frame, LAMINESSE-Zarge	Wrapped frame	Wrapped steel frame Singe/double	Steel frame	Glazing
		Filling of the construction joints (solid)				
Concrete	≥ 100	PU-foam, mineral wool (melting point ≥ 1000°C)	PU-foam, mineral wool (melting point ≥ 1000°C)	Plaster min. MGII, mineral wool (melting point ≥ 1000°C)	Plaster min. MGII,	Plaster min. MGII, mineral wool (melting point ≥ 1000°C)
Masonry	≥ 115					
Aereated concrete	≥ 115					
Plasterboard panel soffits1x planked	≥ 100				-	
Glazing	≥ 68		-	-	-	-

Brands of PU-foam:

a. Promafoam C (Promat GmbH)
b. CF ISO (Hilti AG)
c. Sabesto Maxi PUR 65 1K (Würth Handelsgesellschaft mbH)
d. 816 Pistolenschaum Brandschutz (Ramsauer GmbH&Co.KG)
e. Firefoam 1C (Odice S.A.S)

9. Sealing of door element with permanently elastic sealing compound.
10. Integration of PVC plaster strips on both sides is possible.
11. Counter-rebated top panels are to be inserted from the bottom in a prepared angle, altern. studs and are to be fixed edgewise with upper panel holders at the bottom line
12. Hinge door leaf and adjust. Gap dimensions on three sides 4 +/- 2mm, at bottom 5 resp. 7+/- 2mm tighten clamping screws very firmly !
    Minimum length of doors: In accordance with the gap dimensions, Moralt LAMINESSE FireSmoke can be shortened as required.
13. Glazing: glazing beads need to be fixed at an angle of 25°±5° by screws (Ø ≥3x40mm) or steel nails (Ø ≥1,5x40mm). For Planline-glazings, the supplied eccentric connectors must be used in combination with intumescent strips and in accordance with the manufacturers'instructions. The distance out of the corner must be at least 80mm, distance between two fixing points ≥ 350mm.
14. Adjust hinge security, so that it touches the opposite side
15. Fitting and functional testing
16. Assemble lock system according to the instructions of the respective manufacturer
17. Check closing mechanism: door leafs need to be adjusted, so that door closes automatically within 5 seconds regardless of the angle.

Adjust door drop-down seal: by turning the adjusting screw hinge-side with light and constant pressure, the drop-down seal can be adjusted to the bottom seal.

Authorized modifications of fire protection doors

- Integration of contact points for locking monitoring, if they can be easily attached or mounted in factory-made cut-outs.
- Exchange of the lock with an appropriate equivalent self-locking or actively driven lock with latch, if a lock pocket can be integrated without any modifications of the iron mongery or striker plates.
- Visible cable channels
- Integration of an optical door viewer
- Application of notice signs at the door panel with screws, glue, rivets.
- Application of appropriate panic door cross bars possible upon availability of a sufficient number of anchorage points.
- Addition of block frames into wrapped frames and application of wooden cover strips at construction joints
- Application of decorative strips with glue or screws/nails, PVC, metals in each shape and at any location
- Clad-on panels up to 12 dm³ at each side of the door panel
- Application of decorative strips at the door frames

Maintenance instructions

The functionality of fire resistant doors must be guranteed at all times.
The use of the door in the intended purpose requires regular inspections, maintenance and repair of the door and its respective components.
The building principle or operator of facilities with fire- and smoke protection is responsible for the functionality of the fire- and smoke protection doors and that any kind of maintenance is to be carried out regularly by qualified staff or service providers.

Inspection intervals depend on the utilization level.

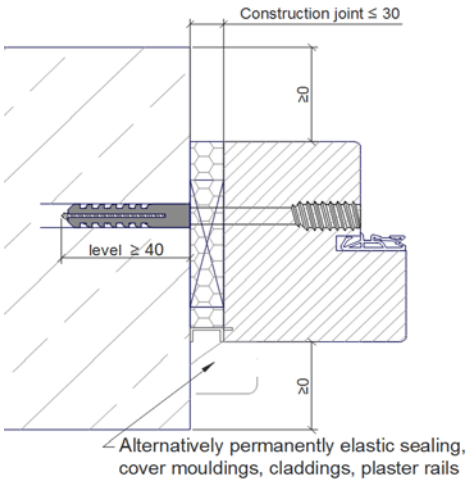
In escape and rescue routes for buildings with high passenger traffic, such as schools, hospitals, commercial buildings, airports,…	Every 7-14 days
In escape and rescue routes for ordinary passenger transport, such as housing facilities, places of public assembly	Monthly
Others	Every 6 months
Maintenance of all Connections	min. yearly
Repair	As required

Defective parts may only be exchanged by authorized specialists. Any Maintenance operations must be carried out in accordance with the instructions of the classification report 12102208.

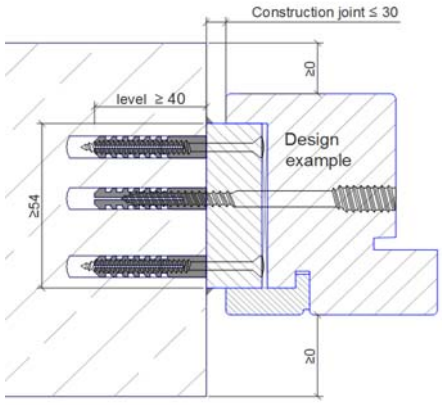
- Cleaning of all elements
- Check of all functions
  - Check closing function
  - Check of panic function
  - Check of catching device
  - Check of bottom seal regarding function and contact pressure
  - Check of all fitting components, if necessary moving parts should be greased
  - Check gap dimensions (on three sides 4+/-2, at bottom 5+/-2mm), adjust hinges, if necessary
  - Check hinge system and adjust, if necessary
- Check of tightness
  - Leave and frame seals
  - Glass sealant
  - Construction joints
  - Bottom seal
  - All sealants
- Visual check for any damage on glazing

Any deficiencies detected are to be straightened without any delay. In case, some parts need to be exchanged, please replaced by identical products, only. In case of any doubt, please contact the manufacturer and licenser of the door – Moralt AG.

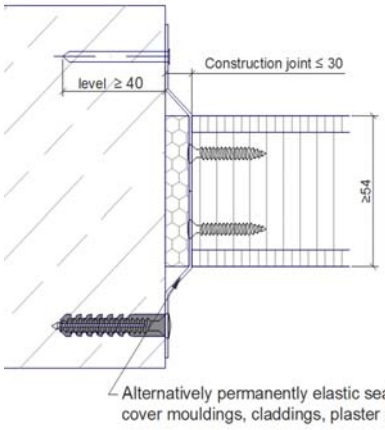
Attachment assembly drawings



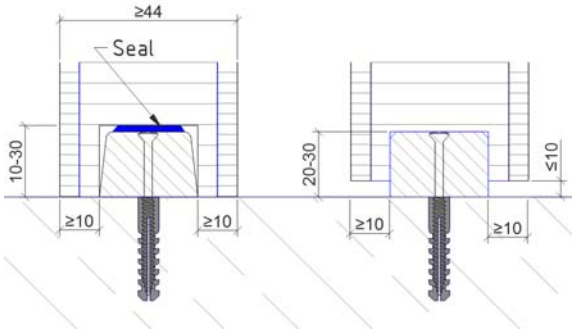
Frame in wall reveal



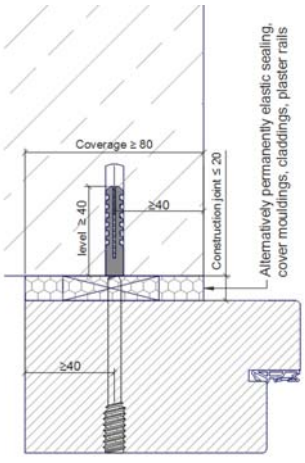
Door frame with hidden sub-frame



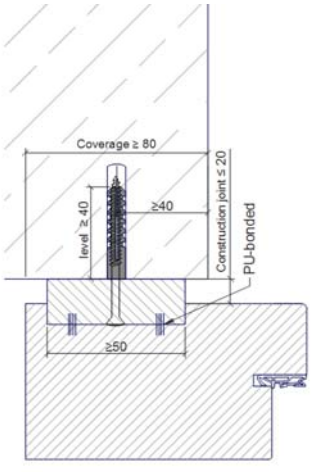
LAMINESSE-frame / side part



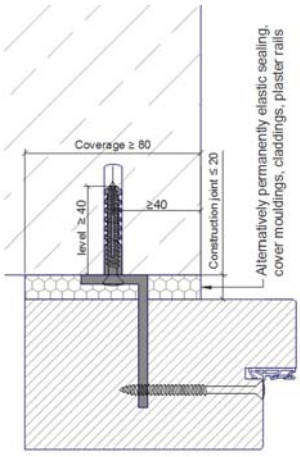
Bottom seal LAMINESSE



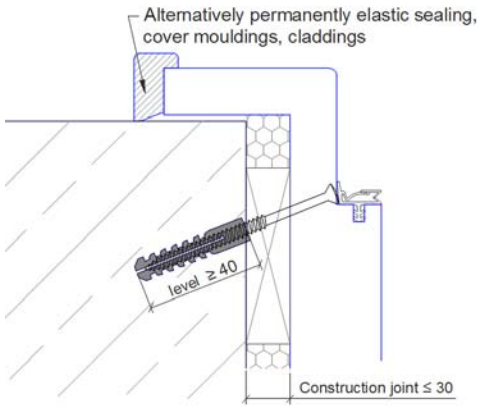
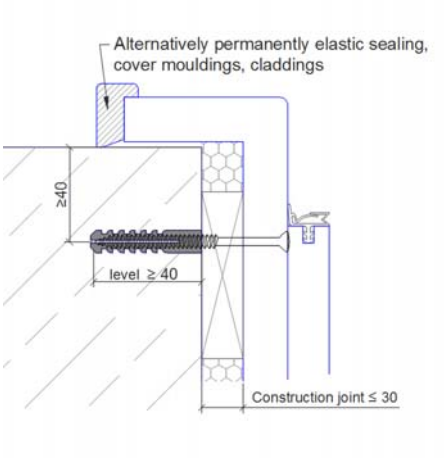
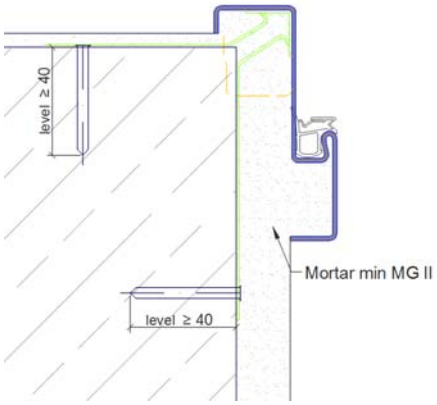
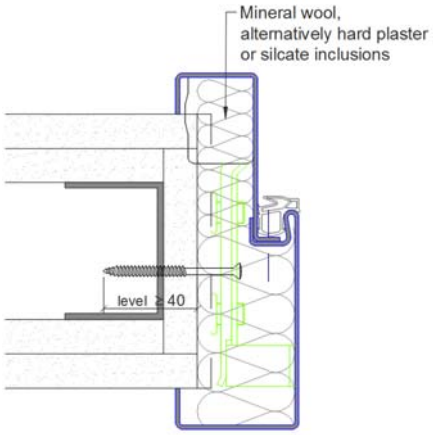
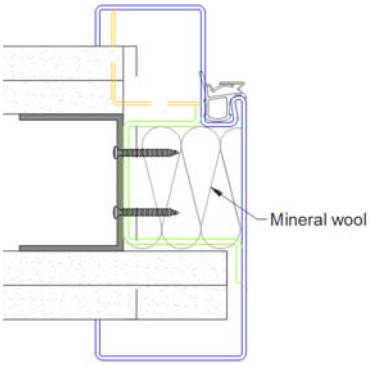
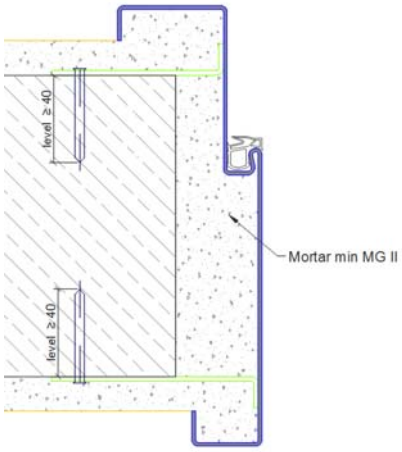
Screwed frames



Frame & connecting strips



Frame & mounting angle

	
Wrapped frame	Wrapped frame
	
Steel frame	Wrapped frame 2-piece
	
Wrapped frame plasterboard panel	Wrapped frame 1-piece

APPENDIX B

Assessed Intumescent Seal Specifications

Intumescent Seal Specifications for Moralt LAMINESSE Klassik and FireSmoke Door Leaves Installed in Timber and Steel Frames

Location	Option 1	Option 2
Stiles/ jambs	1no 20 x 4mm Palusol or 1no 18 x 2mm Odice, Promaseal or Intumex LDSK in leaf edge centrally fitted for flush leaves or centrally fitted in the rebate for over rebated leaves	1no 39 x 2mm BASF or Lorient Polyproducts Palusol 100 in the rear of the lipping for 44mm thick leaves (1no. 49 x 2mm for 54mm thick leaves) *(or where PVC lippings are included 2no 10 x 1.8mm Intumex LPSK seals one set at 5mm from each face in the leaf edge under the PVC lipping)*
Head	1no 20 x 4mm Palusol or 1no 18 x 2mm Odice, Promaseal or Intumex LDSK in leaf edge centrally fitted for flush leaves or centrally fitted in the rebate for over rebated leaves	1no 39 x 2mm BASF or Lorient Polyproducts Palusol 100 in the rear of the lipping for 44mm thick leaves (1no. 49 x 2mm for 54mm thick leaves) and 1no 20 x 1.5mm Roku-Strip L110 intumescent material or 1no 20 x 4mm Lorient Polyproducts Type 617 in a PVC case intumescent seal in leaf edge centrally fitted for flush leaves or centrally fitted in the rebate for over rebated leaves *(or where PVC lippings are included 2no 10 x 1.8mm Intumex LPSK seals one set at 5mm from each face in the leaf edge under the PVC lipping)*
Square or equal rebate overpanel junction	1no 20 x 4mm Palusol or 1no 18 x 2mm Odice, Promaseal or Intumex LDSK in leaf edge	1no 39 x 2mm BASF or Lorient Polyproducts Palusol 100 in the rear of the lippings for 44mm thick leaves (1no. 49 x 2mm for 54mm thick leaves) and 1no 20 x 1.5mm Roku-Strip L110 intumescent material or 1no 20 x 4mm Lorient Polyproducts Type 617 in a PVC case intumescent seal in leaf edge centrally fitted for flush leaves or centrally fitted in the rebate for over rebated leaves

Location	Option 1	Option 2
Square meeting stiles	1no 20 x 4mm Palusol or 1no 18 x 2mm Odice, Promaseal or Intumex LDSK in one leaf edge only	1no 39 x 2mm BASF or Lorient Polyproducts Palusol 100 in the rear of the lipping for 44mm thick leaves (1no. 49 x 2mm for 54mm thick leaves) (*or where PVC lippings are included 2no 10 x 1.8mm Intumex LPSK seals one set at 5mm from each face in the leaf edge under the PVC lipping)*
Equal rebated meeting stiles	1no 20 x 4mm Palusol or 1no 18 x 2mm Odice, Promaseal or Intumex LDSK in one leaf edge only	1no 39 x 2mm BASF or Lorient Polyproducts Palusol 100 in the rear of the lipping for 44mm thick leaves (1no. 49 x 2mm for 54mm thick leaves)
Unequal rebated meeting stiles	1no 20 x 4mm Palusol or 1no 18 x 2mm Odice, Promaseal or Intumex LDSK in one leaf edge only	1no 39 x 2mm BASF or Lorient Polyproducts Palusol 100 in the rear of the lipping for 44mm thick leaves (1no. 49 x 2mm for 54mm thick leaves)
Interface between overpanel and frame/ transom	1no 20 x 4mm Palusol or 1no 18 x 2mm Odice, Promaseal or Intumex LDSK in leaf edge or frame reveal	1no 39 x 2mm BASF or Lorient Polyproducts Palusol 100 in the rear of the lipping for 44mm thick leaves (1no. 49 x 2mm for 54mm thick leaves)

APPENDIX C

Assessed Leaf Size Envelope
with Timber Frames: FD20

Figure PAR/14247/01:C01 to C04

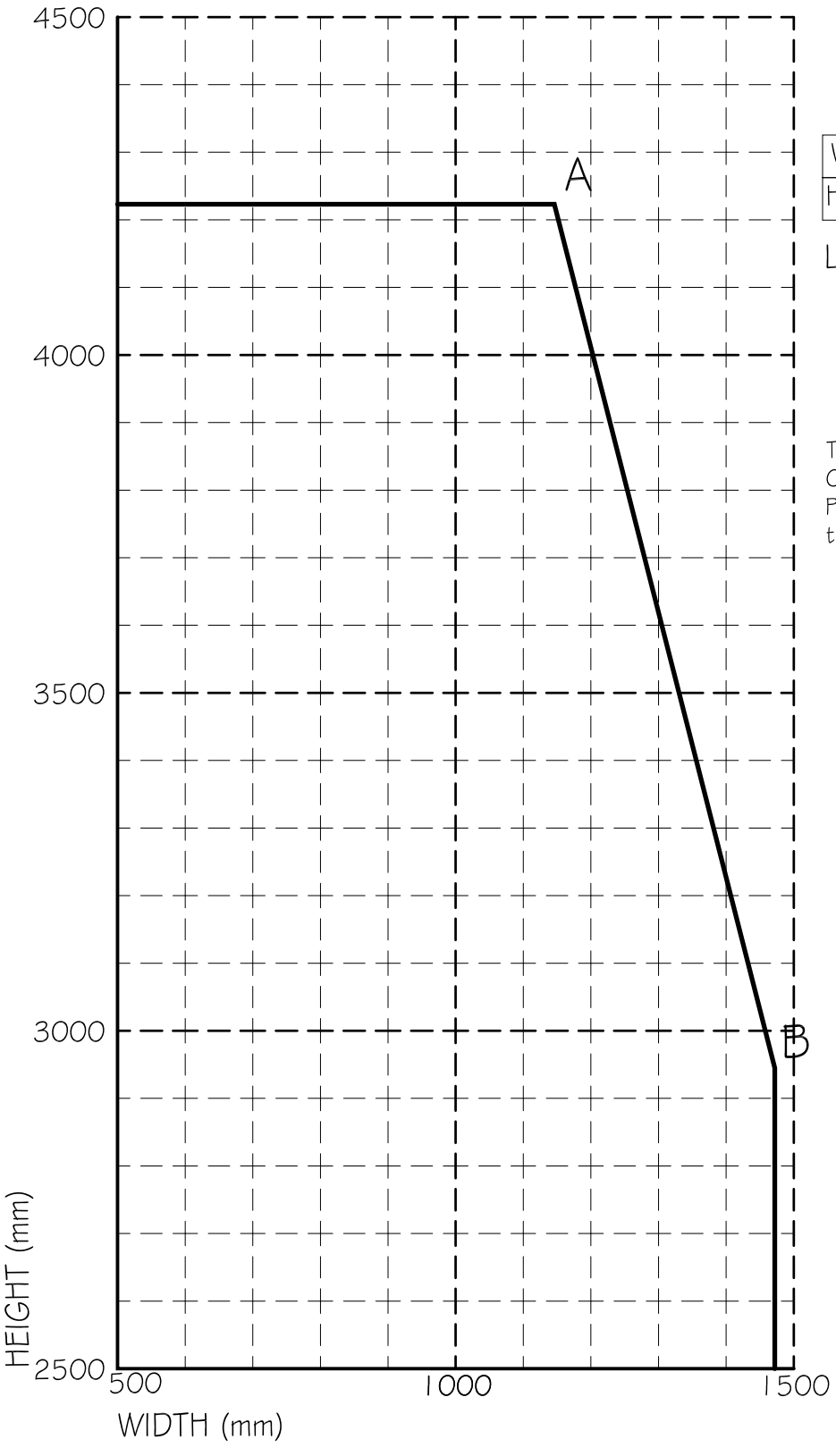
The figures in this Appendix are not included
in the sequential page numbering of this report

ENVELOPE OF APPROVED LEAF SIZES

The graph below 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 is approved.

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

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



PROPOSED CONFIGURATION

TIMBER FRAMES

LATCHED
SINGLE ACTING
SINGLE LEAF
WITH SIDE PANELS AND
TRANSOMMED OVERPANELS

REQUIRED INTEGRITY:
FD20

	A	B
Width	1146	1472
Height	4223	2945

LEAF SIZE ENVELOPE POINTS

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/14247/01, which contains full details of the assessed doorset construction.

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20 Park Street
PRINCES RISBOROUGH
Buckinghamshire
HP27 9AH
United Kingdom
Tel: +44 (0) 1844 275500
Fax: +44 (0) 1844 274002
Email: ifc@intfire.com
Website: http://www.intfire.com

Field of Application Report PAR/14247/01
Moralt AG
Moralt LAMINESSE FireSmoke Thickness 44mm FD20, FD30 and EI30 Door Leaf Range Installed in Timber and Steel Door Frames with Side Panels and Overpanels

Envelope of Approved Leaf Sizes:
Latched, Single Acting, Single Leaf Doorsets With Side Panels & Overpanels

Job number: 14247

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:C01

ENVELOPE OF APPROVED LEAF SIZES

The graph below 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 is approved.

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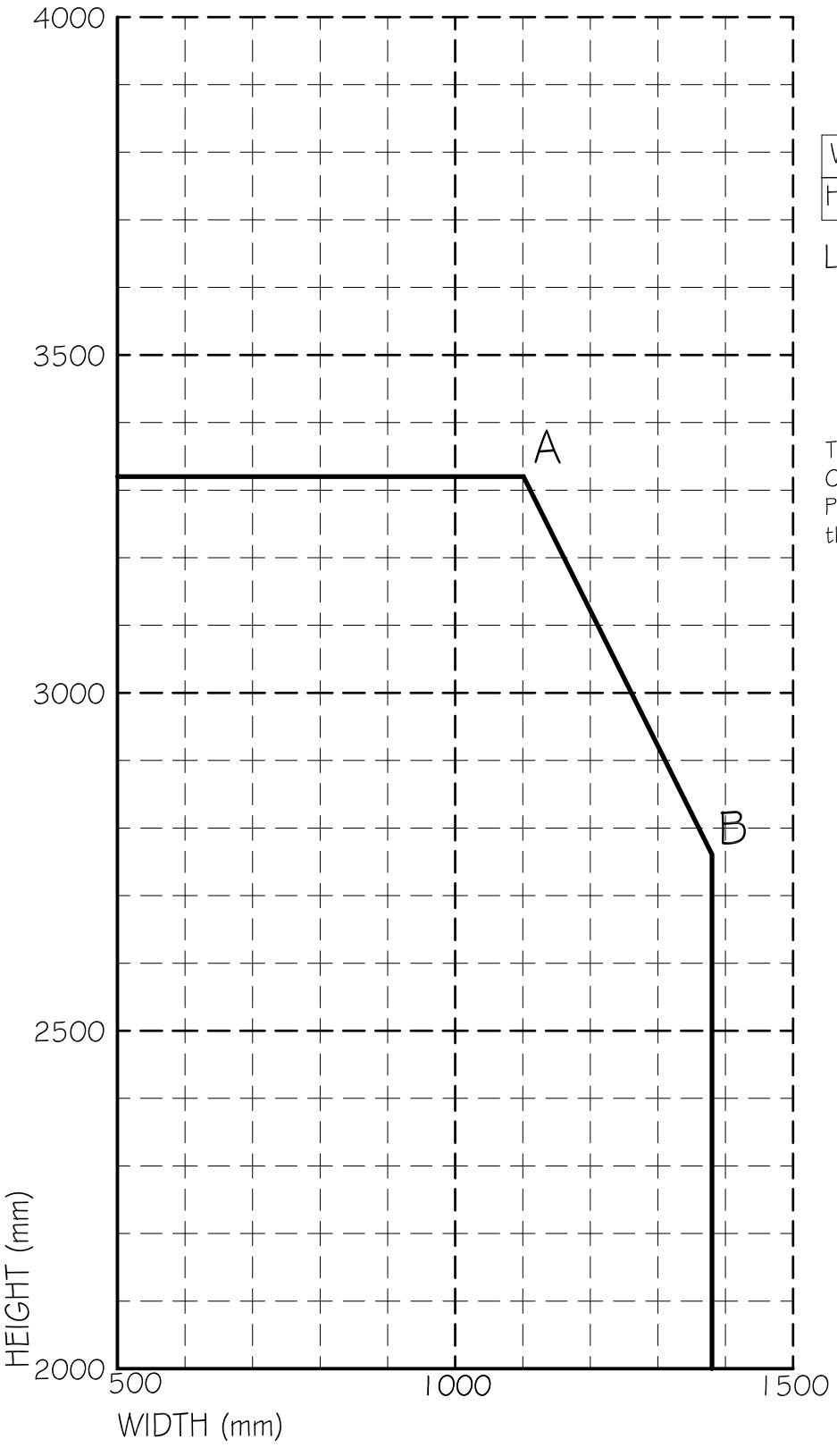

PROPOSED CONFIGURATION

TIMBER FRAMES

LATCHED
SINGLE ACTING
SINGLE LEAF
FLUSH or REBATED OVERPANEL
WITH SIDE PANELS

REQUIRED INTEGRITY:
FD20

	A	B
Width	1101	1380
Height	3320	2761

LEAF SIZE ENVELOPE POINTS

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20 Park Street
PRINCES RISBOROUGH
Buckinghamshire
HP27 9AH
United Kingdom
Tel: +44 (0) 1844 275500
Fax: +44 (0) 1844 274002
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Field of Application Report PAR/14247/01
Moralt AG
Moralt LAMINESSE FireSmoke Thickness 44mm FD20, FD30 and EI30 Door Leaf Range Installed in Timber and Steel Door Frames with Side Panels and Overpanels

Envelope of Approved Leaf Sizes:
Latched, Single Acting, Single Leaf Doorsets With Flush or Rebated Overpanel

Job number: 14247	
Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

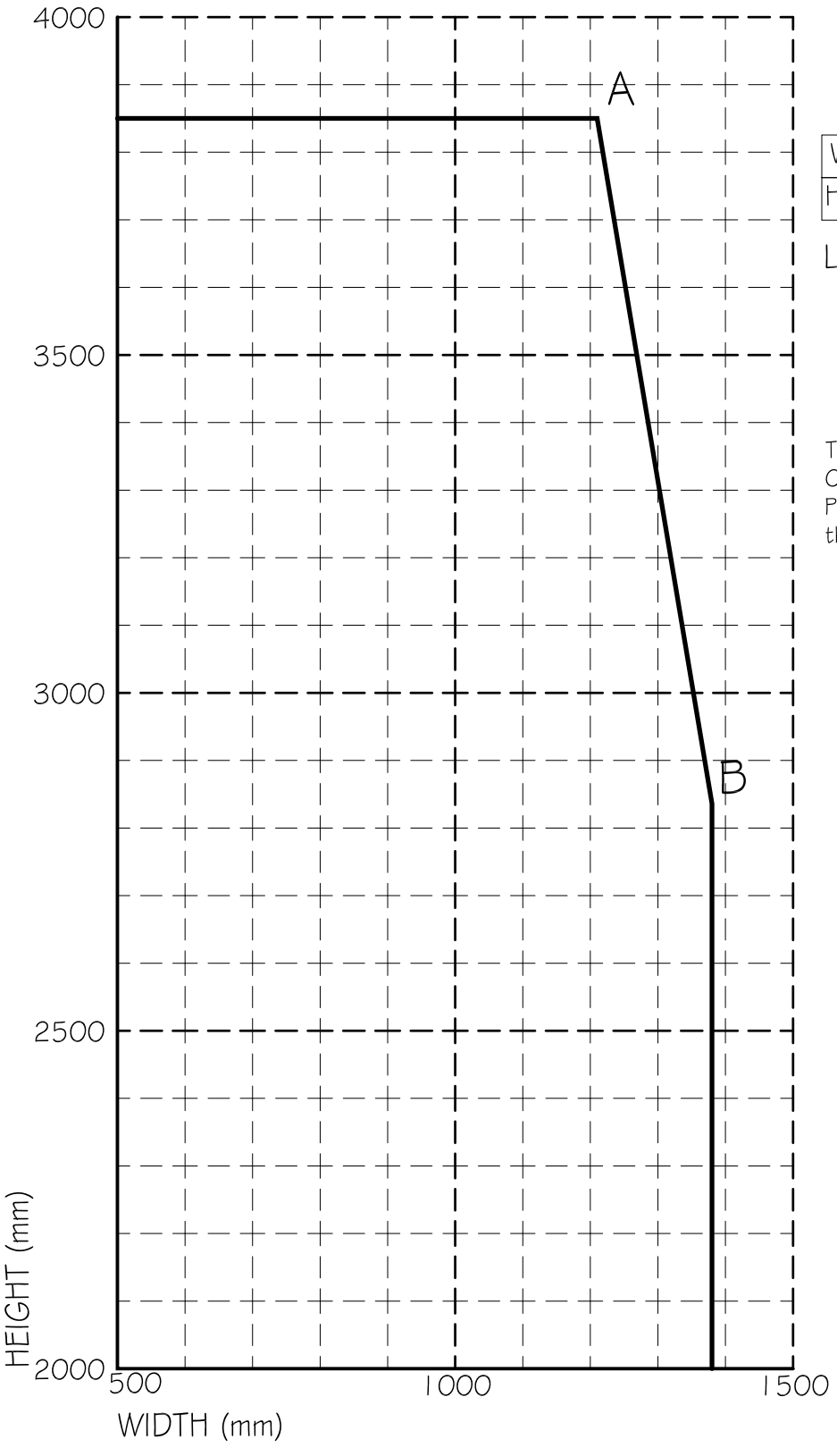
PAR/14247/01:C02

ENVELOPE OF APPROVED LEAF SIZES

The graph below 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 is approved.

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

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



PROPOSED CONFIGURATION

TIMBER FRAMES

LATCHED
SINGLE ACTING
DOUBLE LEAF
FLUSH or REBATED MEETING STILES
WITH SIDE PANELS AND
TRANSOMMED OVERPANELS

REQUIRED INTEGRITY:

FD20

	A	B
Width	1210	1417
Height	3850	2836

LEAF SIZE ENVELOPE POINTS

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20 Park Street
PRINCES RISBOROUGH
Buckinghamshire
HP27 9AH
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Moralt AG
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Envelope of Approved Leaf Sizes:
Latched, Single Acting, Double Leaf Doorsets
With Side Panels & Overpanels

Job number: 14247

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:C03

ENVELOPE OF APPROVED LEAF SIZES

The graph below 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 is approved.

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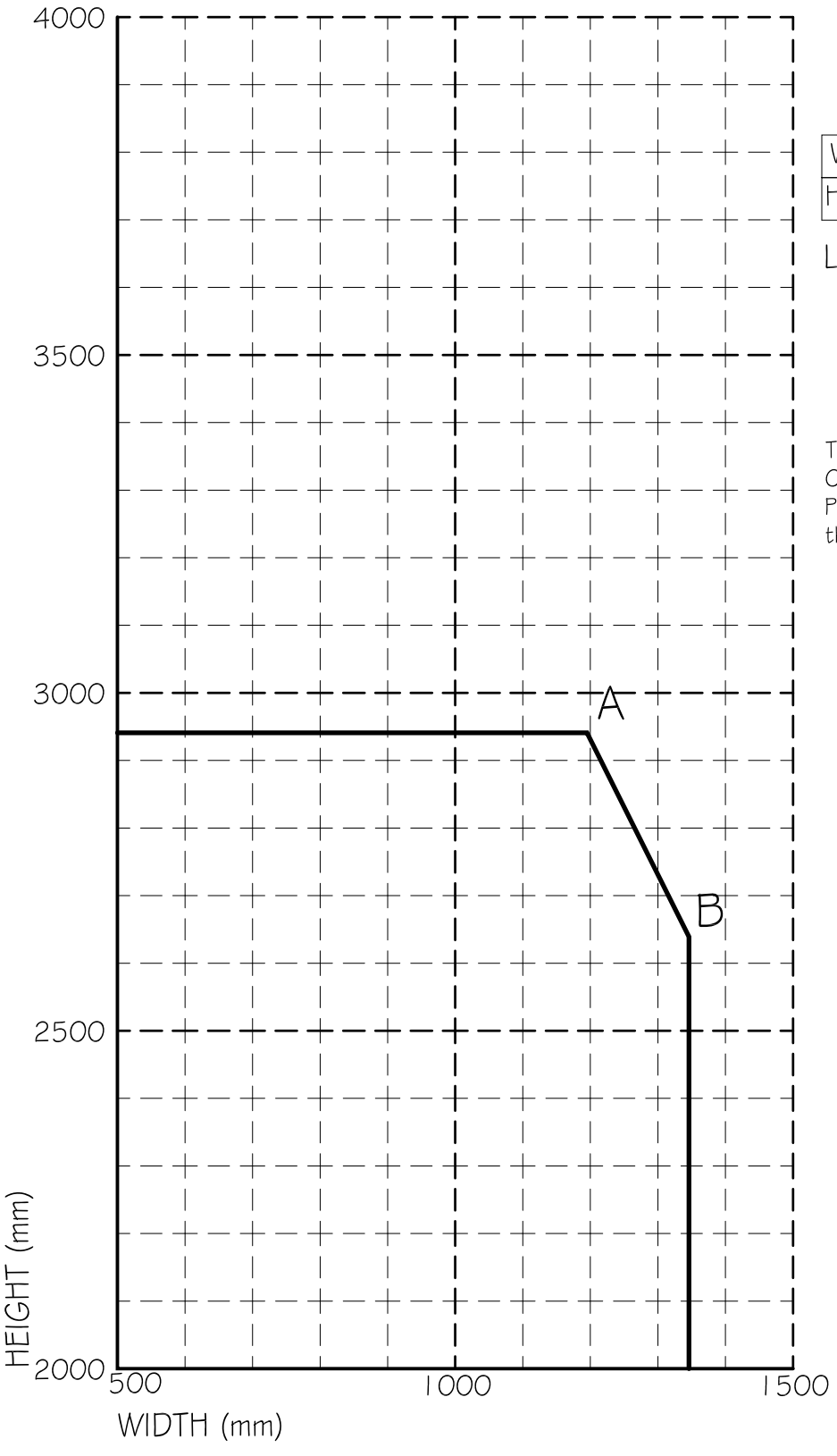
POINT B represents the maximum leaf width and its associated height.



PROPOSED CONFIGURATION

TIMBER FRAMES

LATCHED
SINGLE ACTING
DOUBLE LEAF
FLUSH or REBATED MEETING STILES
FLUSH or REBATED OVERPANEL
WITH SIDE PANELS

REQUIRED INTEGRITY:

FD20

	A	B
Width	1195	1346
Height	2941	2639

LEAF SIZE ENVELOPE POINTS

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20 Park Street
PRINCES RISBOROUGH
Buckinghamshire
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United Kingdom
Tel: +44 (0) 1844 275500
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Moralt AG
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Envelope of Approved Leaf Sizes:
Latched, Single Acting, Double Leaf Doorsets with Flush or Rebated Overpanel

Job number: 14247

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:C04

APPENDIX D

Assessed Leaf Size Envelope
with Timber Frames: FD30

Figure PAR/14247/01:D01 to D04

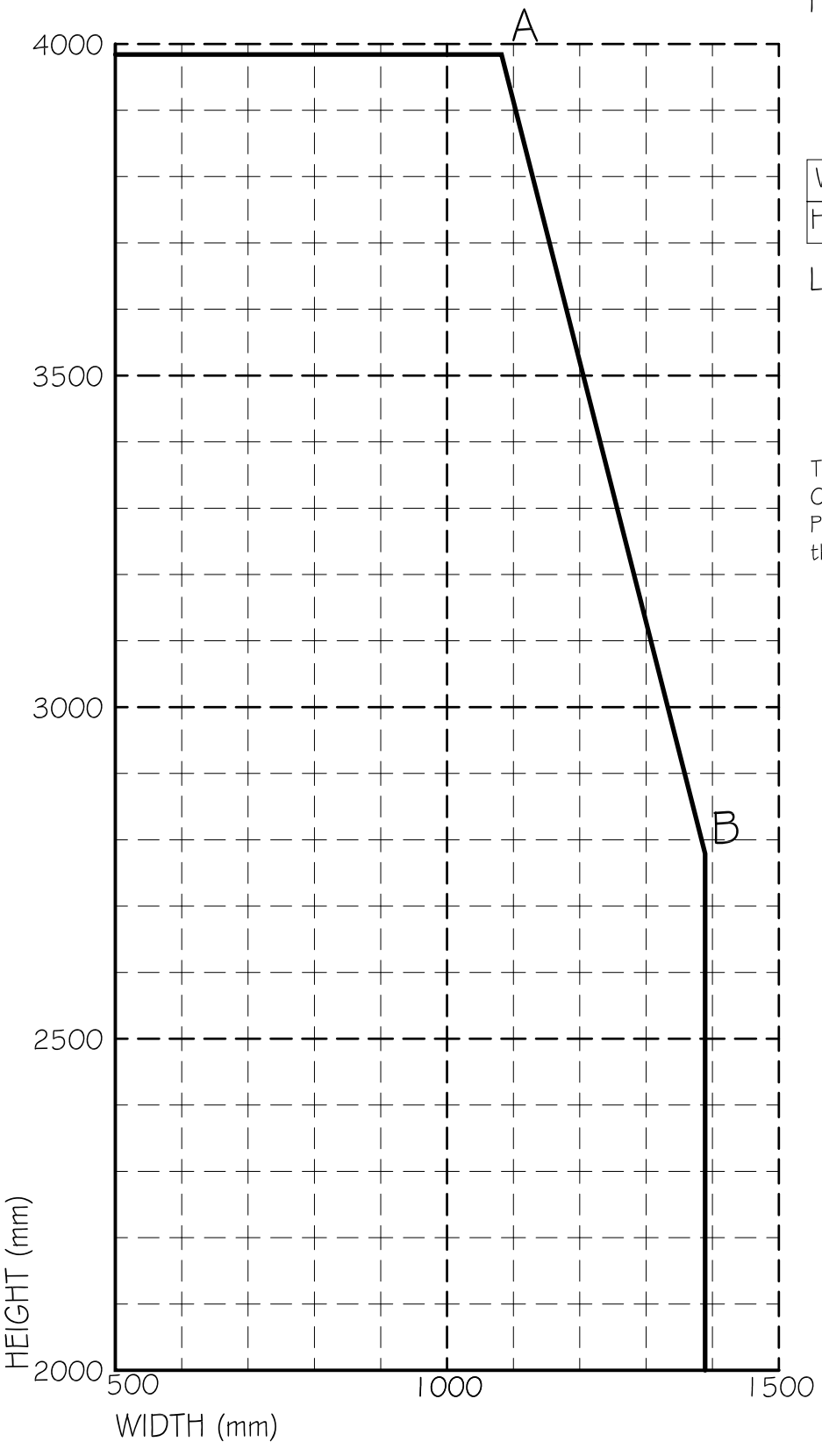
The figures in this Appendix are not included
in the sequential page numbering of this report

ENVELOPE OF APPROVED LEAF SIZES

The graph below 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 is approved.

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

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



PROPOSED CONFIGURATION

TIMBER FRAMES

LATCHED
SINGLE ACTING
SINGLE LEAF
WITH SIDE PANELS AND
TRANSOMMED OVERPANELS

REQUIRED INTEGRITY:
FD30

	A	B
Width	1082	1389
Height	3984	2779

LEAF SIZE ENVELOPE POINTS

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20 Park Street
PRINCES RISBOROUGH
Buckinghamshire
HP27 9AH
United Kingdom
Tel: +44 (0) 1844 275500
Fax: +44 (0) 1844 274002
Email: ifc@intfire.com
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Field of Application Report PAR/14247/01
Moralt AG
Moralt LAMINESSE FireSmoke Thickness 44mm FD20, FD30 and EI30 Door Leaf Range Installed in Timber and Steel Door Frames with Side Panels and Overpanels

Envelope of Approved Leaf Sizes:
Latched, Single Acting, Single Leaf Doorsets With Side Panels & Overpanels

Job number: 14247

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:D01

ENVELOPE OF APPROVED LEAF SIZES

The graph below 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 is approved.

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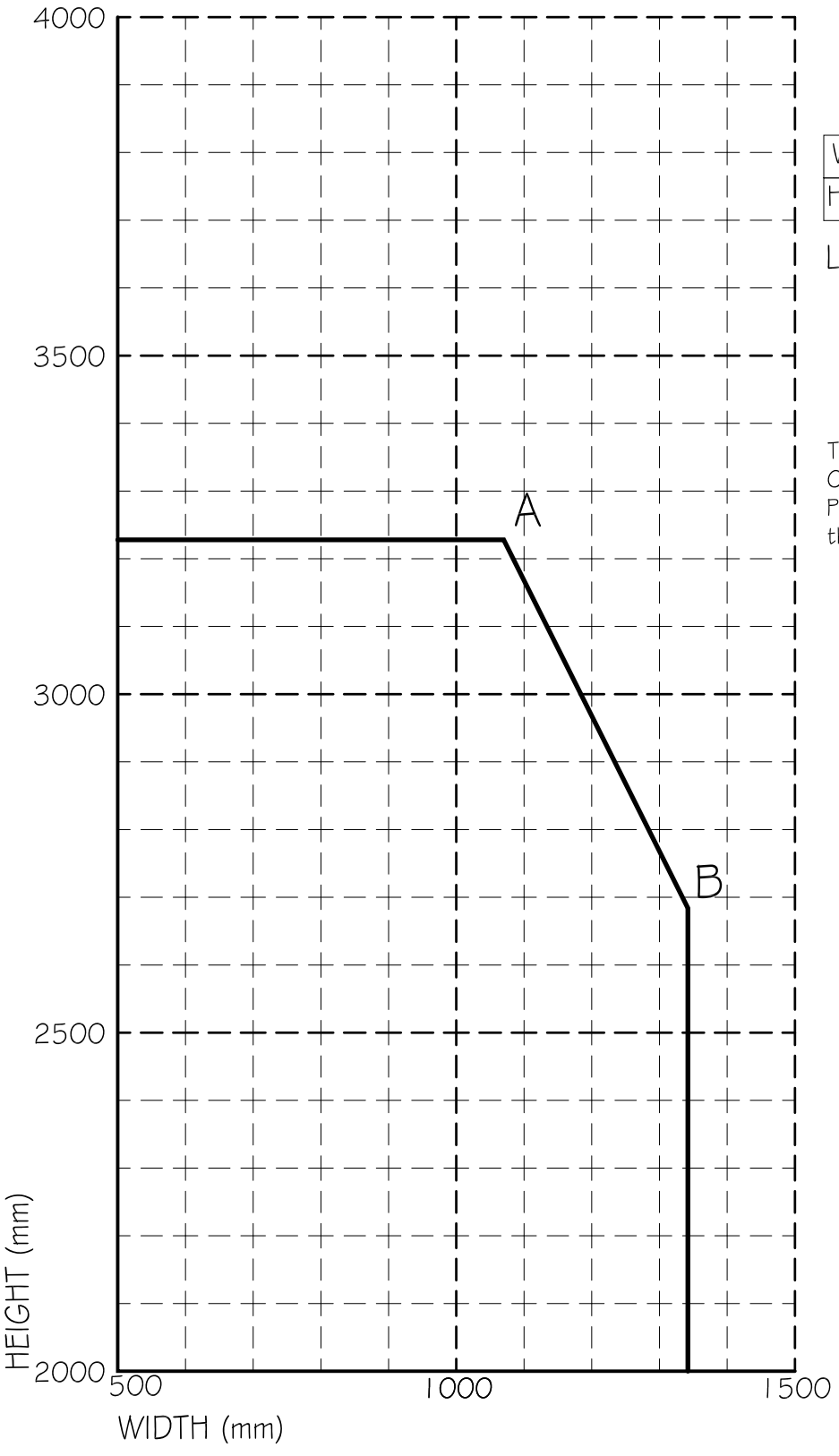

PROPOSED CONFIGURATION

TIMBER FRAMES

LATCHED
SINGLE ACTING
SINGLE LEAF
FLUSH or REBATED OVERPANEL
WITH SIDE PANELS

REQUIRED INTEGRITY:
FD30

	A	B
Width	1070	1342
Height	3228	2684

LEAF SIZE ENVELOPE POINTS

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20 Park Street
PRINCES RISBOROUGH
Buckinghamshire
HP27 9AH
United Kingdom
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Fax: +44 (0) 1844 274002
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Moralt AG
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Envelope of Approved Leaf Sizes:
Latched, Single Acting, Single Leaf Doorsets With Flush or Rebated Overpanel

Job number: 14247

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:D02

ENVELOPE OF APPROVED LEAF SIZES

The graph below 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 is approved.

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

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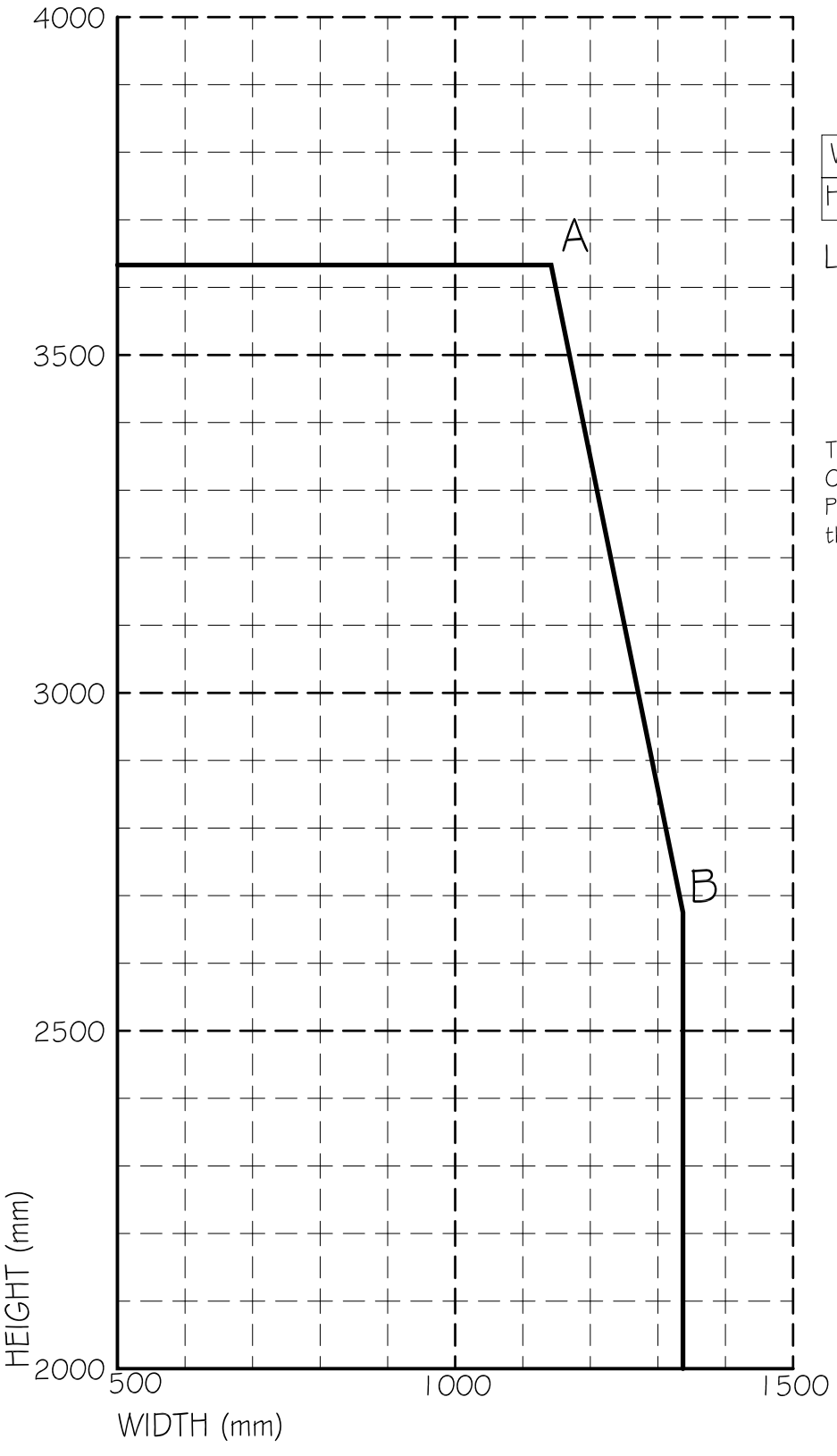

PROPOSED CONFIGURATION

TIMBER FRAMES

LATCHED
SINGLE ACTING
DOUBLE LEAF
FLUSH or REBATED MEETING STILES
WITH SIDE PANELS AND
TRANSOMMED OVERPANELS

REQUIRED INTEGRITY:

FD30

	A	B
Width	1142	1337
Height	3633	2675

LEAF SIZE ENVELOPE POINTS

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20 Park Street
PRINCES RISBOROUGH
Buckinghamshire
HP27 9AH
United Kingdom
Tel: +44 (0) 1844 275500
Fax: +44 (0) 1844 274002
Email: ifc@intfire.com
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Field of Application Report PAR/14247/01
Moralt AG
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Envelope of Approved Leaf Sizes:
Latched, Single Acting, Double Leaf Doorsets
With Side Panels & Overpanels

Job number: 14247

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:D03

ENVELOPE OF APPROVED LEAF SIZES

The graph below 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 is approved.

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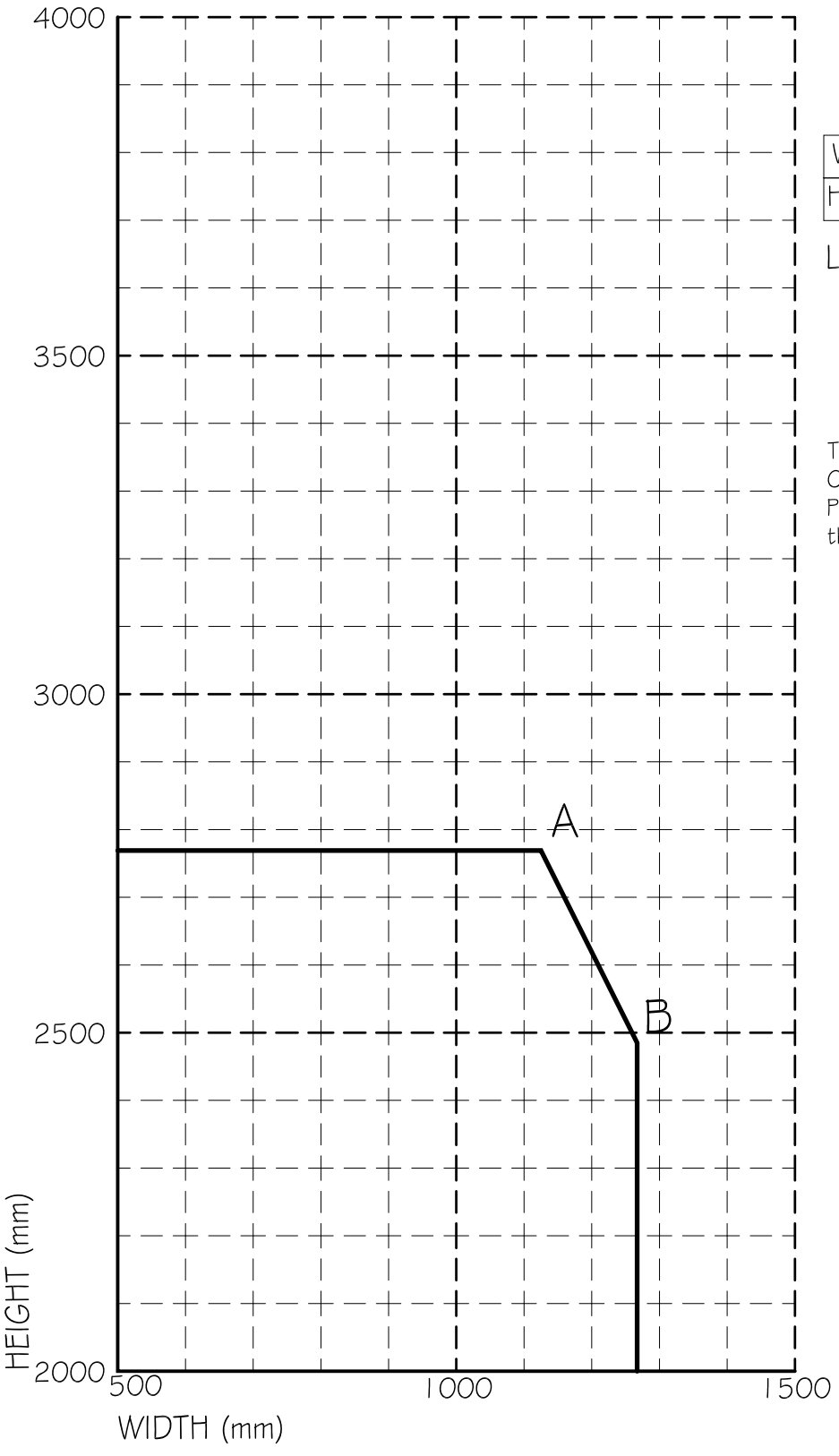

PROPOSED CONFIGURATION

TIMBER FRAMES

LATCHED
SINGLE ACTING
DOUBLE LEAF
FLUSH or REBATED MEETING STILES
FLUSH or REBATED OVERPANEL
WITH SIDE PANELS

REQUIRED INTEGRITY:

FD30

	A	B
Width	1125	1267
Height	2769	2484

LEAF SIZE ENVELOPE POINTS

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20 Park Street
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Buckinghamshire
HP27 9AH
United Kingdom
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Envelope of Approved Leaf Sizes:
Latched, Single Acting, Double Leaf Doorsets with Flush or Rebated Overpanel

Job number: 14247

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:D04

APPENDIX E

Assessed Leaf Size Envelope
with Timber Frames: EI30

Figure PAR/14247/01:E01 to E04

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

ENVELOPE OF APPROVED LEAF SIZES

The graph below 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 is approved.

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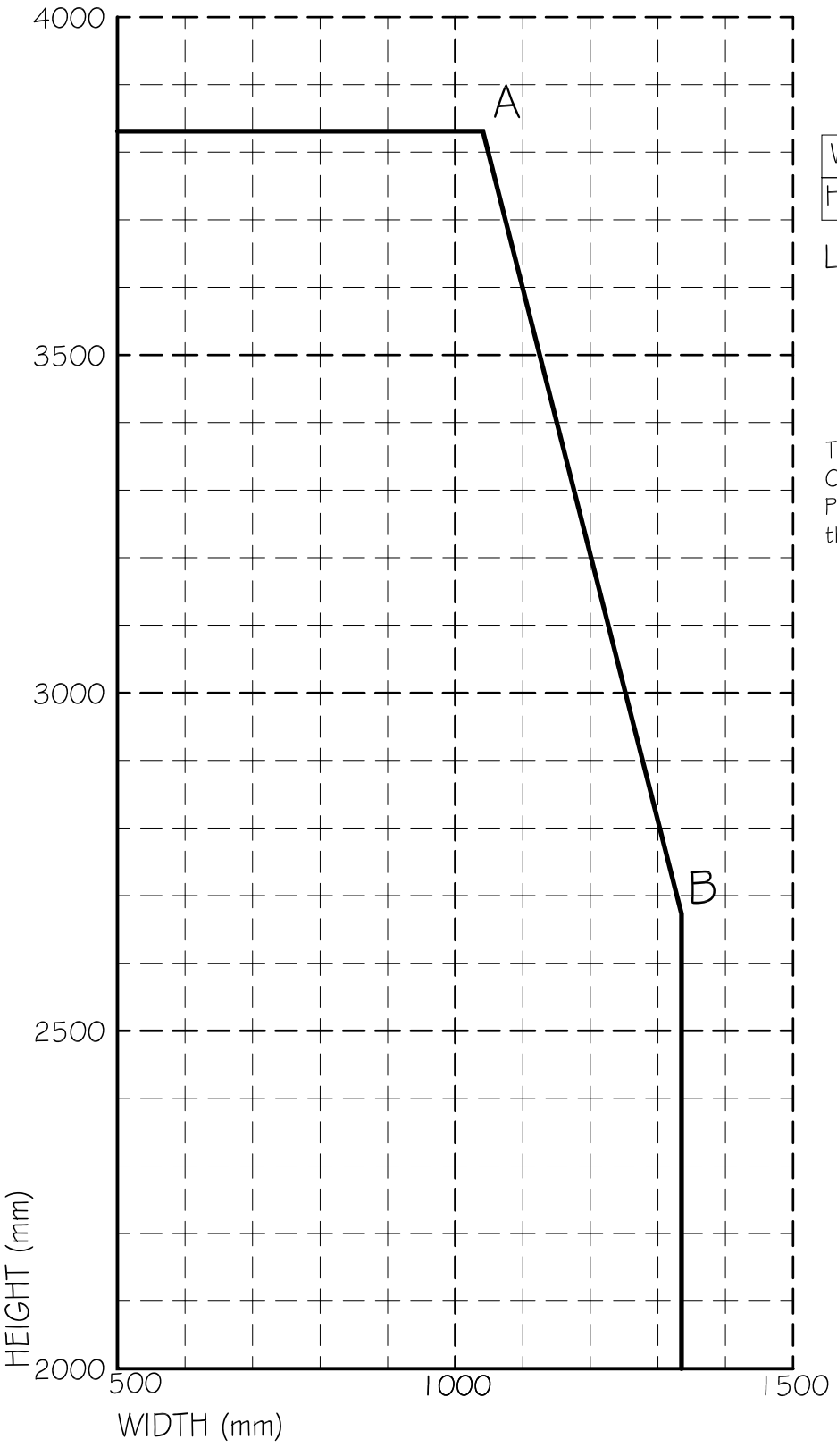

PROPOSED CONFIGURATION

TIMBER FRAMES

LATCHED
SINGLE ACTING
SINGLE LEAF
WITH SIDE PANELS AND
TRANSOMMED OVERPANELS

REQUIRED INTEGRITY:
EI30

	A	B
Width	1041	1336
Height	3831	2673

LEAF SIZE ENVELOPE POINTS

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20 Park Street
PRINCES RISBOROUGH
Buckinghamshire
HP27 9AH
United Kingdom
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Fax: +44 (0) 1844 274002
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Field of Application Report PAR/14247/01
Moralt AG
Moralt LAMINESSE FireSmoke Thickness 44mm FD20, FD30 and EI30 Door Leaf Range Installed in Timber and Steel Door Frames with Side Panels and Overpanels

Envelope of Approved Leaf Sizes:
Latched, Single Acting, Single Leaf Doorsets With Side Panels & Overpanels

Job number: 14247

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:E01

ENVELOPE OF APPROVED LEAF SIZES

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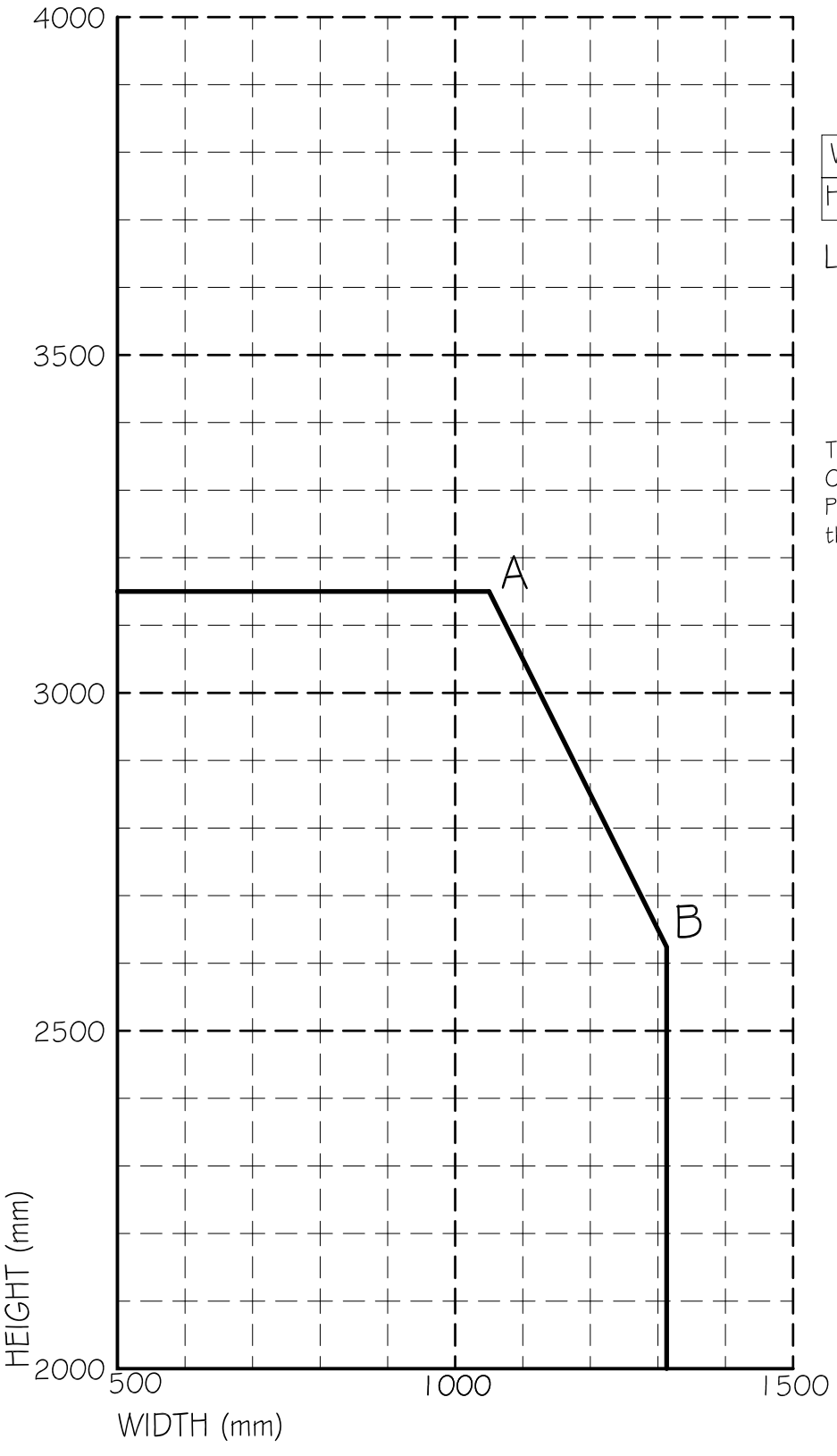

PROPOSED CONFIGURATION

TIMBER FRAMES

LATCHED
SINGLE ACTING
SINGLE LEAF
FLUSH or REBATED OVERPANEL
WITH SIDE PANELS

REQUIRED INTEGRITY:
EI30

	A	B
Width	1050	1313
Height	3150	2624

LEAF SIZE ENVELOPE POINTS

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20 Park Street
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Buckinghamshire
HP27 9AH
United Kingdom
Tel: +44 (0) 1844 275500
Fax: +44 (0) 1844 274002
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Envelope of Approved Leaf Sizes:
Latched, Single Acting, Single Leaf Doorsets With Flush or Rebated Overpanel

Job number: 14247

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:E02

ENVELOPE OF APPROVED LEAF SIZES

The graph below 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 is approved.

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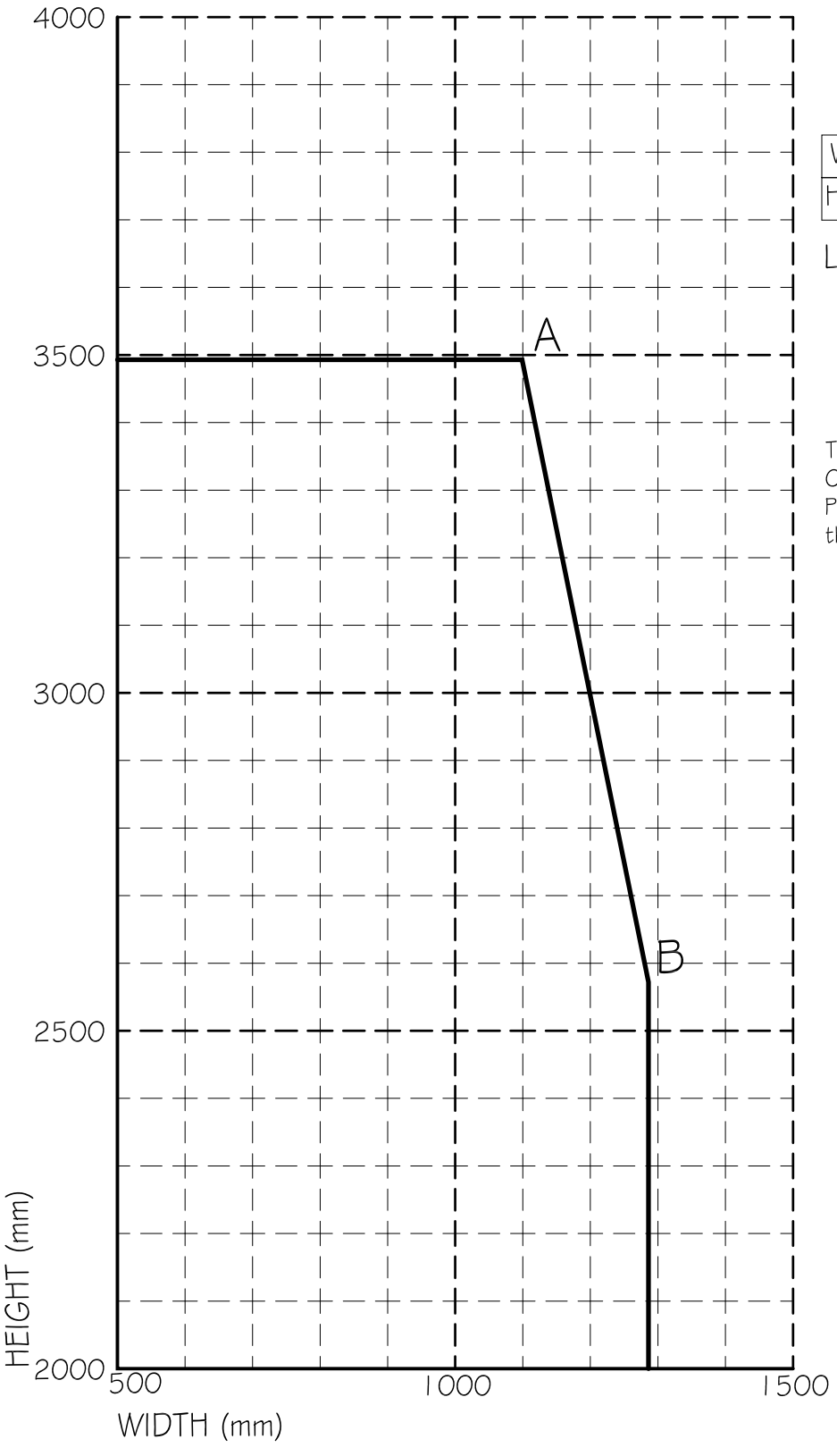
POINT B represents the maximum leaf width and its associated height.



PROPOSED CONFIGURATION

TIMBER FRAMES

LATCHED
SINGLE ACTING
DOUBLE LEAF
FLUSH or REBATED MEETING STILES
WITH SIDE PANELS AND
TRANSOMMED OVERPANELS

REQUIRED INTEGRITY:

EI30

	A	B
Width	1099	1286
Height	3493	2572

LEAF SIZE ENVELOPE POINTS

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Envelope of Approved Leaf Sizes:
Latched, Single Acting, Double Leaf Doorsets
With Side Panels & Overpanels

Job number: 14247

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:E03

ENVELOPE OF APPROVED LEAF SIZES

The graph below 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 is approved.

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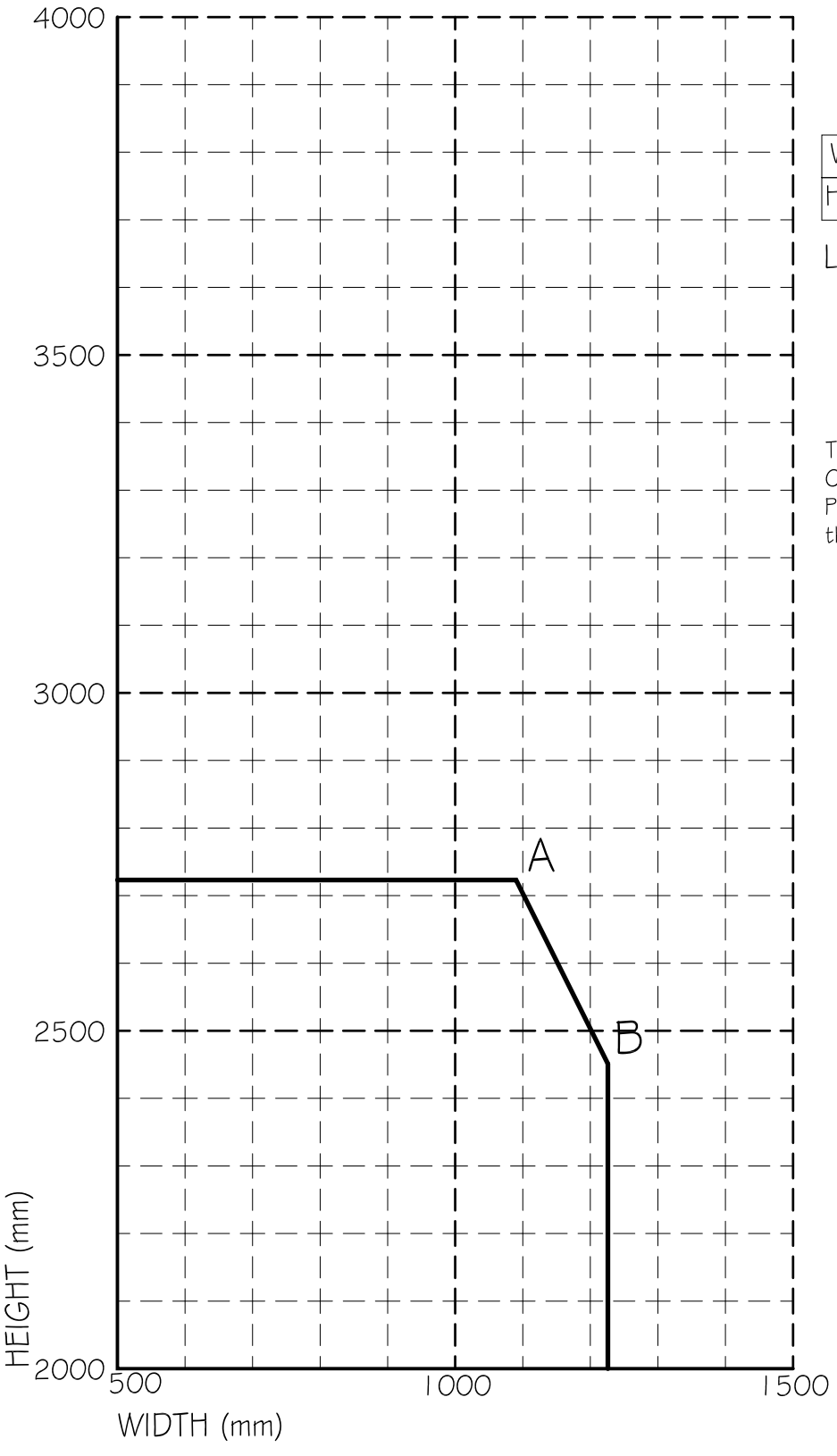

PROPOSED CONFIGURATION

TIMBER FRAMES

LATCHED
SINGLE ACTING
DOUBLE LEAF
FLUSH or REBATED MEETING STILES
FLUSH or REBATED OVERPANEL
WITH SIDE PANELS

REQUIRED INTEGRITY:

EI30

	A	B
Width	1090	1226
Height	2723	2451

LEAF SIZE ENVELOPE POINTS

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Envelope of Approved Leaf Sizes:
Latched, Single Acting, Double Leaf Doorsets with Flush or Rebated Overpanel

Job number: 14247

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:E04

APPENDIX F

Assessed Leaf Size Envelope with Steel Frames: FD20

Figure PAR/14247/01:F01 to F04

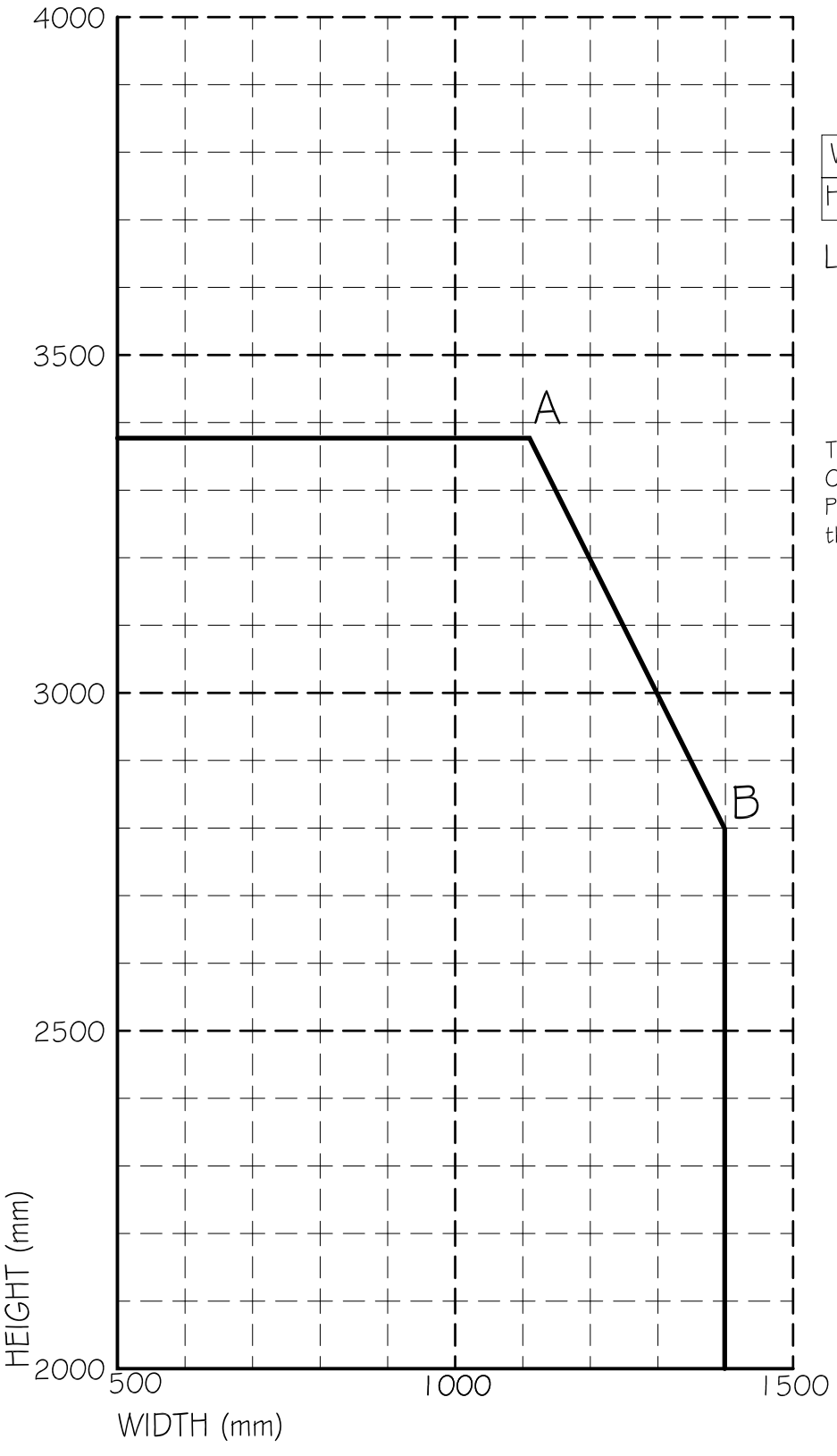
The figures in this Appendix are not included in the sequential page numbering of this report

ENVELOPE OF APPROVED LEAF SIZES

The graph below 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 is approved.

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

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



PROPOSED CONFIGURATION

STEEL FRAMES

LATCHED
SINGLE ACTING
SINGLE LEAF
WITH SIDE PANELS AND
TRANSOMMED OVERPANELS

REQUIRED INTEGRITY:
FD20

	A	B
Width	1110	1399
Height	3377	2799

LEAF SIZE ENVELOPE POINTS

This figure forms part of International Fire Consultants Ltd's Field of Application Report PAR/14247/01, which contains full details of the assessed doorset construction.

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20 Park Street
PRINCES RISBOROUGH
Buckinghamshire
HP27 9AH
United Kingdom
Tel: +44 (0) 1844 275500
Fax: +44 (0) 1844 274002
Email: ifc@intfire.com
Website: http://www.intfire.com

Field of Application Report PAR/14247/01
Moralt AG
Moralt LAMINESSE FireSmoke Thickness 44mm FD20, FD30 and EI30 Door Leaf Range Installed in Timber and Steel Door Frames with Side Panels and Overpanels

Envelope of Approved Leaf Sizes:
Latched, Single Acting, Single Leaf Doorsets With Side Panels & Overpanels

Job number: 14247

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:F01

ENVELOPE OF APPROVED LEAF SIZES

The graph below 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 is approved.

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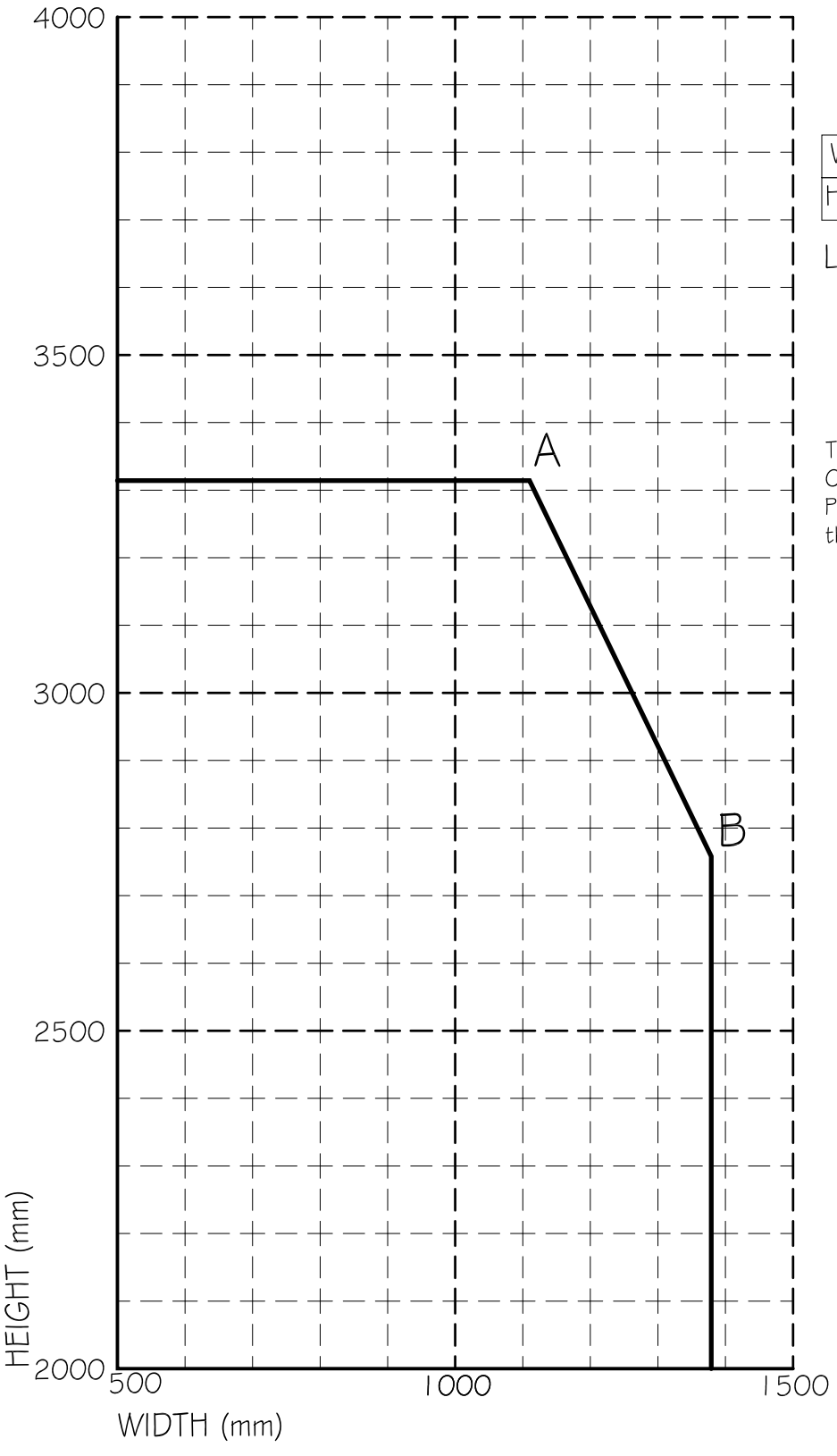

PROPOSED CONFIGURATION

STEEL FRAMES

LATCHED
SINGLE ACTING
SINGLE LEAF
FLUSH or REBATED OVERPANEL
WITH SIDE PANELS

REQUIRED INTEGRITY:
FD20

	A	B
Width	1101	1379
Height	3314	2758

LEAF SIZE ENVELOPE POINTS

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Buckinghamshire
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United Kingdom
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Envelope of Approved Leaf Sizes:
Latched, Single Acting, Single Leaf Doorsets With Flush or Rebated Overpanel

Job number: 14247	
Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:F02

ENVELOPE OF APPROVED LEAF SIZES

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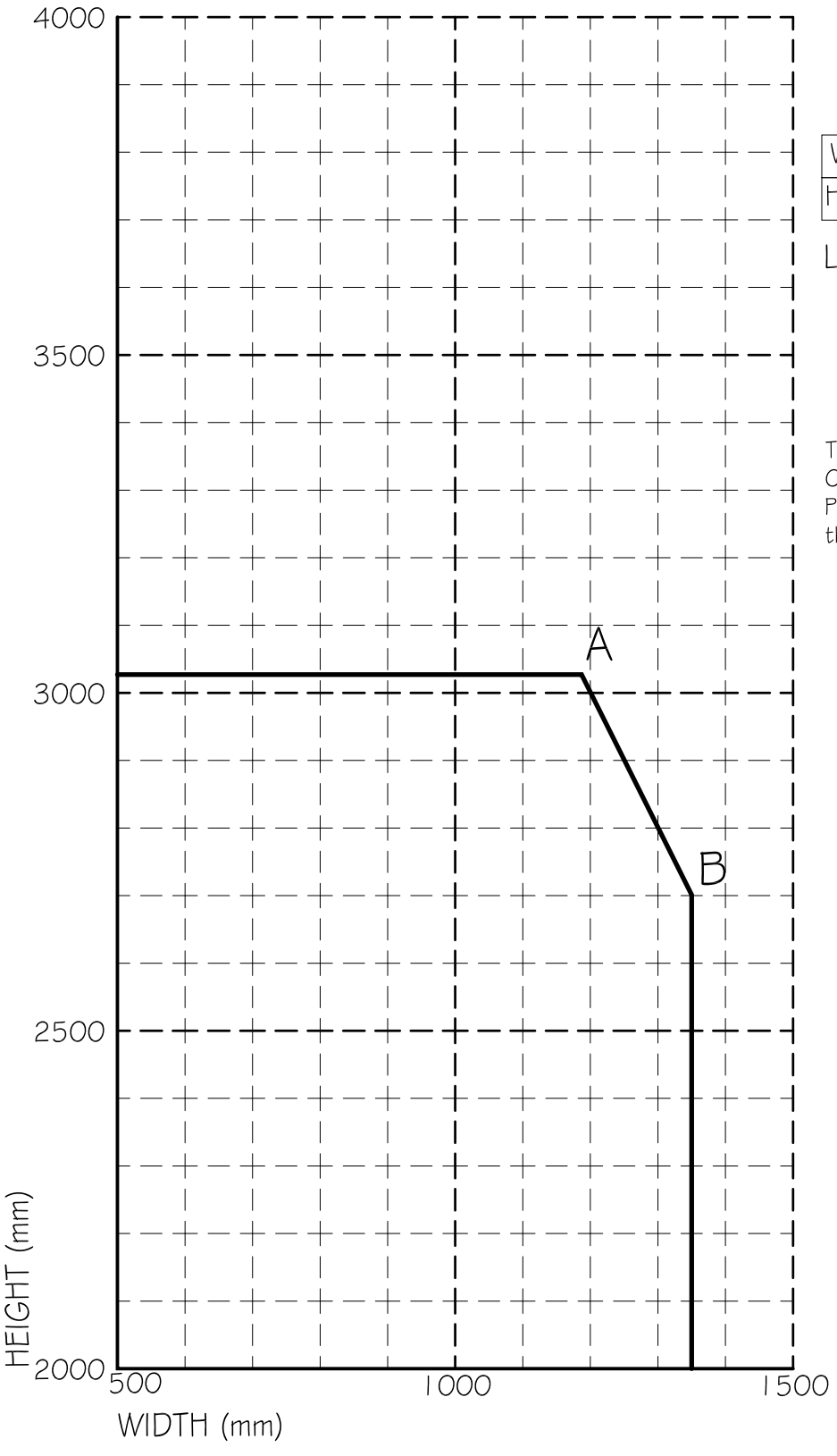

PROPOSED CONFIGURATION

STEEL FRAMES

LATCHED
SINGLE ACTING
DOUBLE LEAF
FLUSH or REBATED MEETING STILES
WITH SIDE PANELS AND
TRANSOMMED OVERPANELS

REQUIRED INTEGRITY:

FD20

	A	B
Width	1187	1350
Height	3027	2701

LEAF SIZE ENVELOPE POINTS

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Envelope of Approved Leaf Sizes:
Latched, Single Acting, Double Leaf Doorsets
With Side Panels & Overpanels

Job number: 14247

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:F03

ENVELOPE OF APPROVED LEAF SIZES

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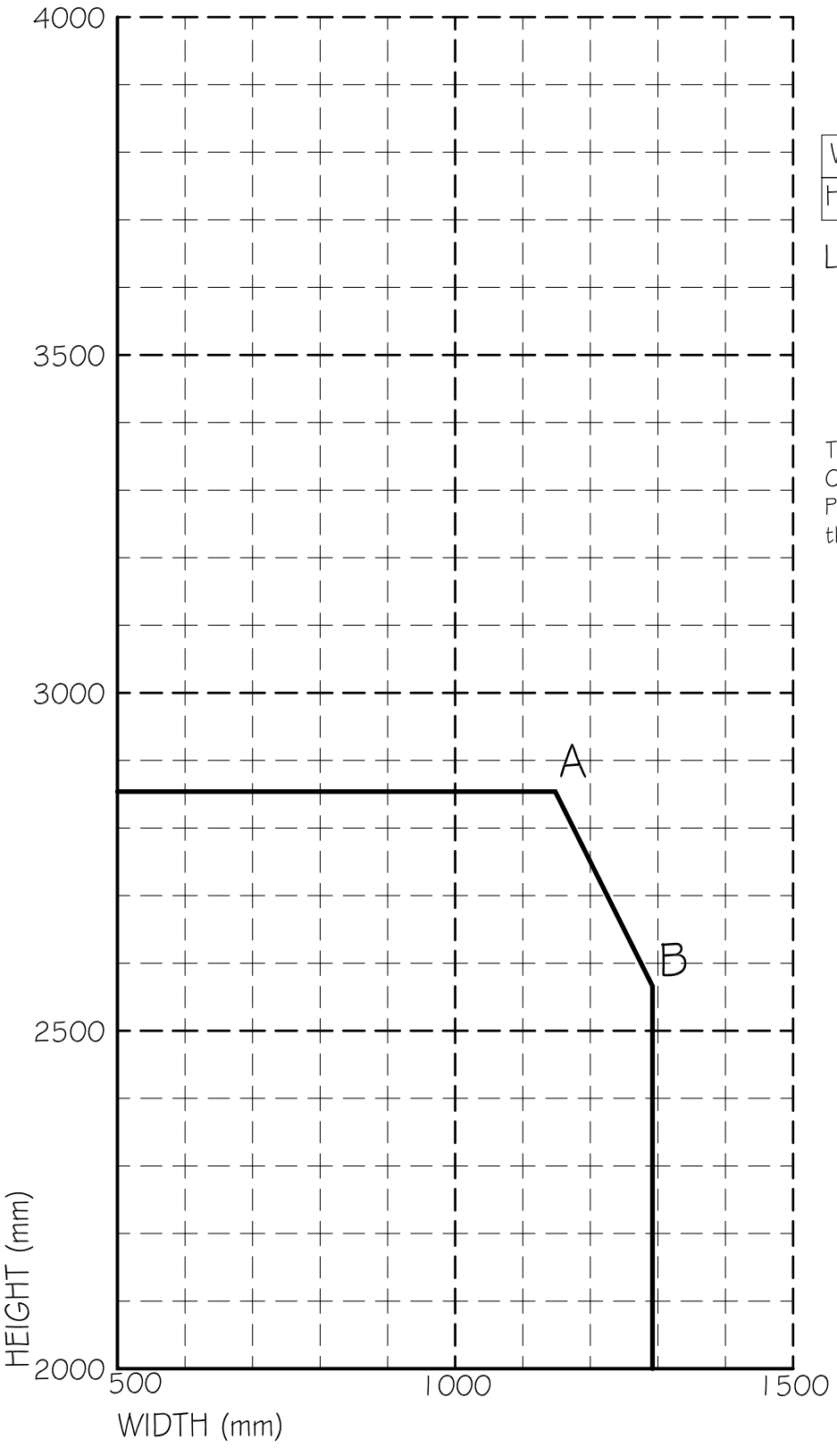

PROPOSED CONFIGURATION

STEEL FRAMES

LATCHED
SINGLE ACTING
DOUBLE LEAF
FLUSH or REBATED MEETING STILES
FLUSH or REBATED OVERPANEL
WITH SIDE PANELS

REQUIRED INTEGRITY:

FD20

	A	B
Width	1148	1292
Height	2854	2566

LEAF SIZE ENVELOPE POINTS

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Envelope of Approved Leaf Sizes:
Latched, Single Acting, Double Leaf Doorsets with Flush or Rebated Overpanel

Job number: 14247

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:F04

APPENDIX G

Assessed Leaf Size Envelope
with Steel Frames: FD30

Figure PAR/14247/01:G01 to G04

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

ENVELOPE OF APPROVED LEAF SIZES

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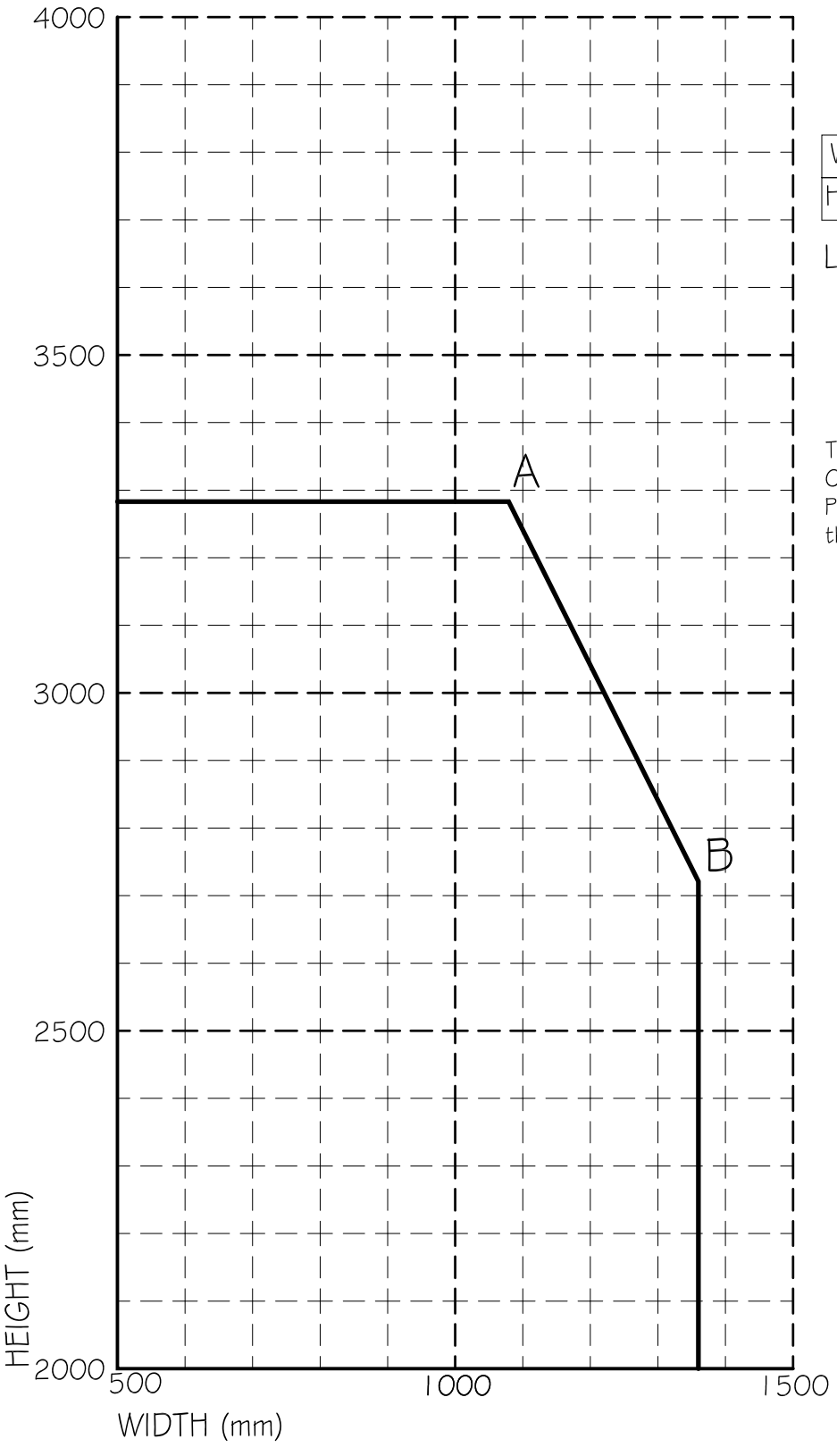

PROPOSED CONFIGURATION

STEEL FRAMES

LATCHED
SINGLE ACTING
SINGLE LEAF
WITH SIDE PANELS AND
TRANSOMMED OVERPANELS

REQUIRED INTEGRITY:
FD30

	A	B
Width	1079	1360
Height	3283	2721

LEAF SIZE ENVELOPE POINTS

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20 Park Street
PRINCES RISBOROUGH
Buckinghamshire
HP27 9AH
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Moralt AG
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Envelope of Approved Leaf Sizes:
Latched, Single Acting, Single Leaf Doorsets With Side Panels & Overpanels

Job number: 14247

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:G01

ENVELOPE OF APPROVED LEAF SIZES

The graph below 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 is approved.

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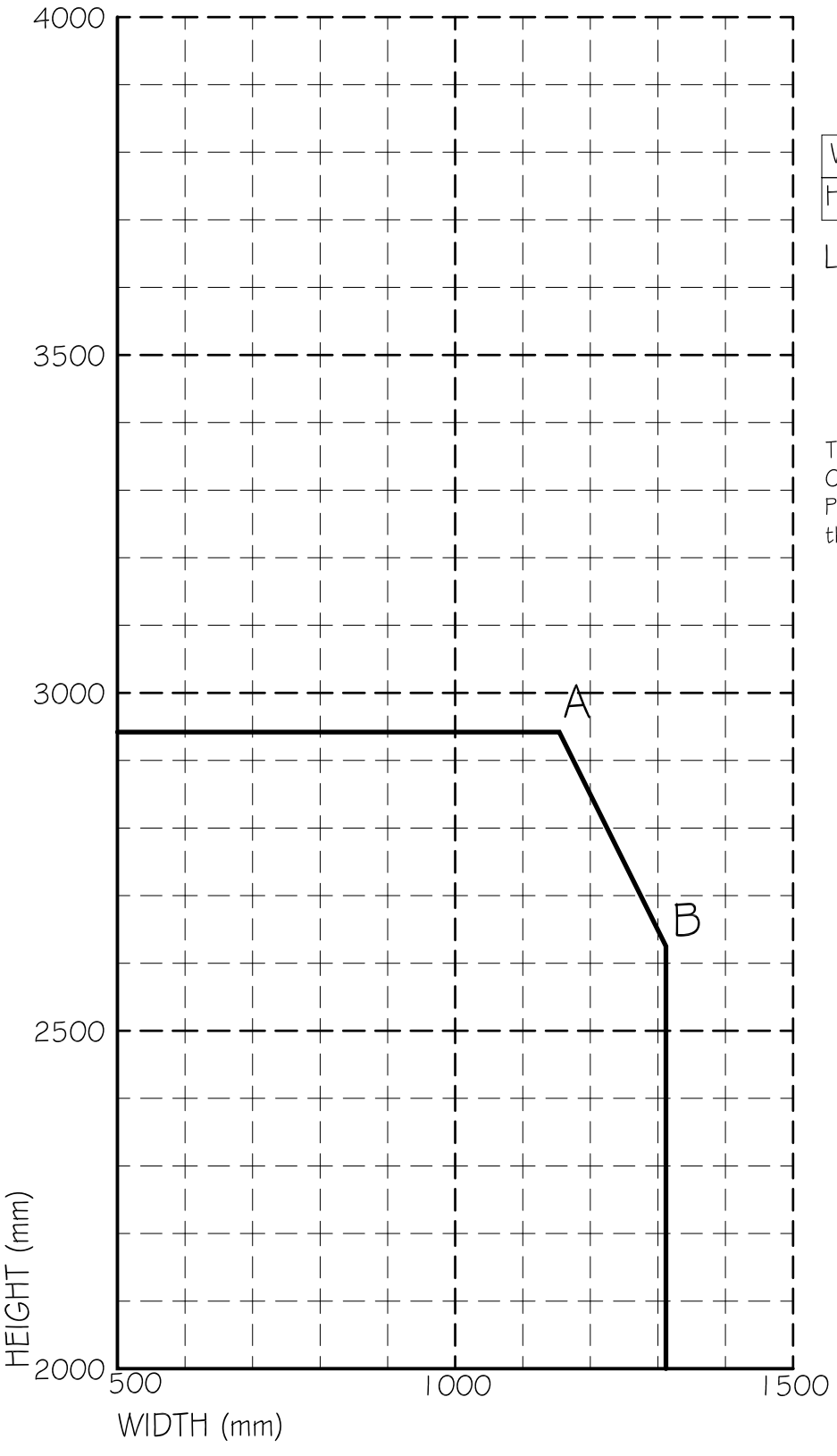

PROPOSED CONFIGURATION

STEEL FRAMES

LATCHED
SINGLE ACTING
DOUBLE LEAF
FLUSH or REBATED MEETING STILES
WITH SIDE PANELS AND
TRANSOMMED OVERPANELS

REQUIRED INTEGRITY:

FD30

	A	B
Width	1154	1312
Height	2942	2625

LEAF SIZE ENVELOPE POINTS

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Envelope of Approved Leaf Sizes:
Latched, Single Acting, Double Leaf Doorsets
With Side Panels & Overpanels

Job number: 14247

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:G03

ENVELOPE OF APPROVED LEAF SIZES

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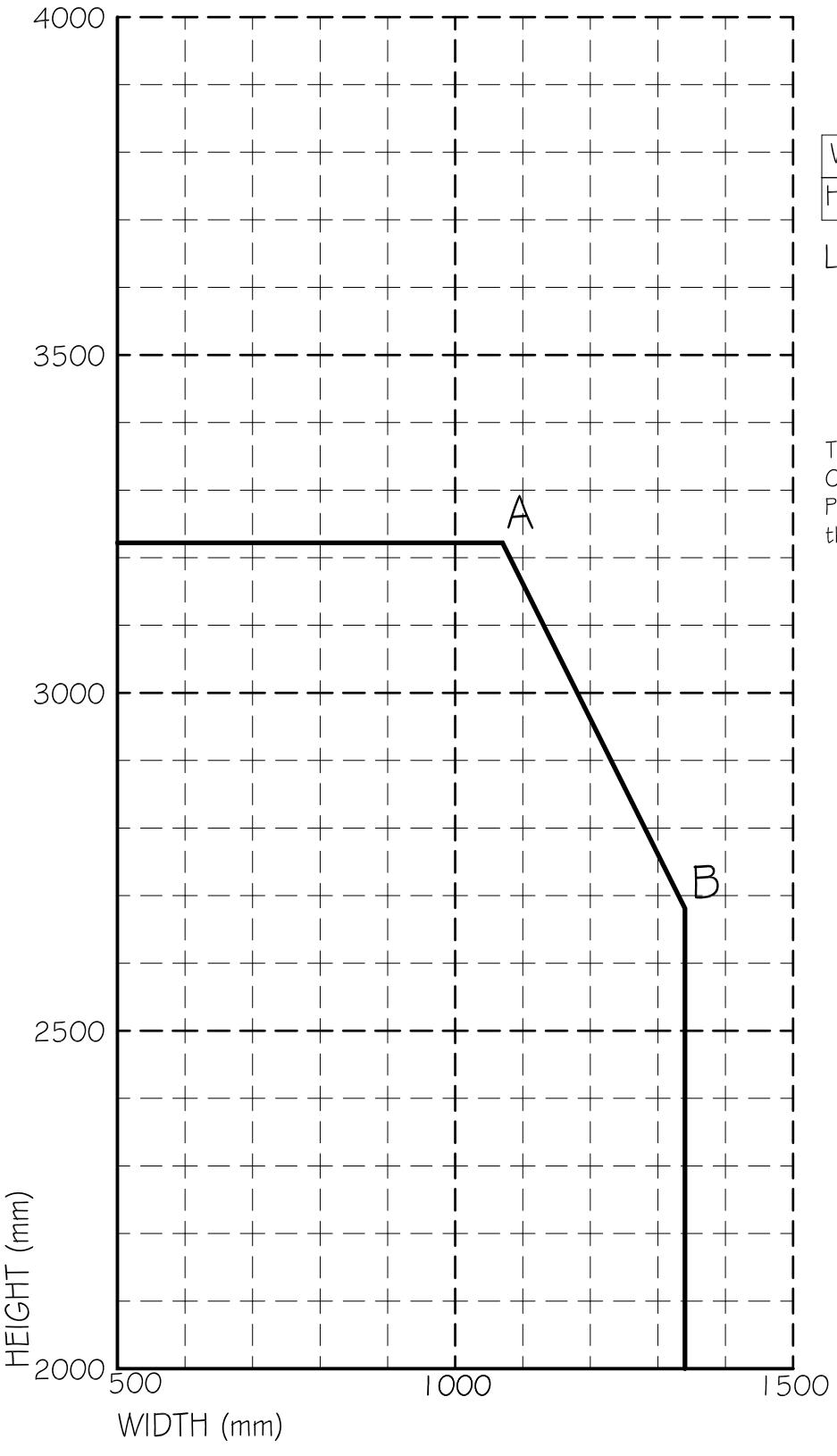

PROPOSED CONFIGURATION

STEEL FRAMES

LATCHED
SINGLE ACTING
SINGLE LEAF
FLUSH or REBATED OVERPANEL
WITH SIDE PANELS

REQUIRED INTEGRITY:
FD30

	A	B
Width	1070	1340
Height	3222	2681

LEAF SIZE ENVELOPE POINTS

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Envelope of Approved Leaf Sizes:
Latched, Single Acting, Single Leaf Doorsets With Flush or Rebated Overpanel

Job number: 14247	
Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:G02

ENVELOPE OF APPROVED LEAF SIZES

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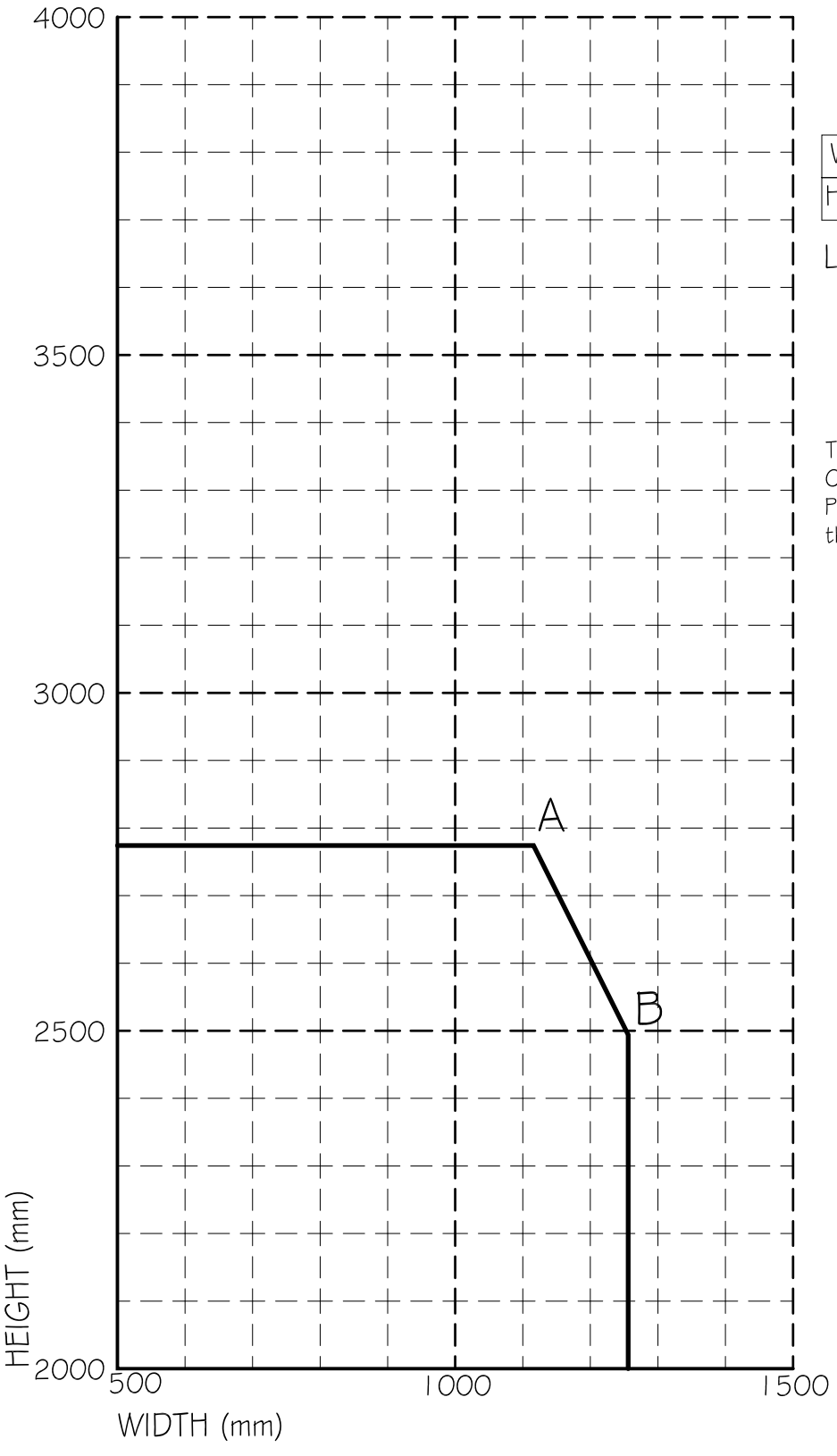

PROPOSED CONFIGURATION

STEEL FRAMES

LATCHED
SINGLE ACTING
DOUBLE LEAF
FLUSH or REBATED MEETING STILES
FLUSH or REBATED OVERPANEL
WITH SIDE PANELS

REQUIRED INTEGRITY:

FD30

	A	B
Width	1116	1256
Height	2774	2494

LEAF SIZE ENVELOPE POINTS

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Envelope of Approved Leaf Sizes:
Latched, Single Acting, Double Leaf Doorsets with Flush or Rebated Overpanel

Job number: 14247

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:G04

APPENDIX H

Assessed Leaf Size Envelope
with Steel Frames: EI30

Figure PAR/14247/01:H01 to H04

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ENVELOPE OF APPROVED LEAF SIZES

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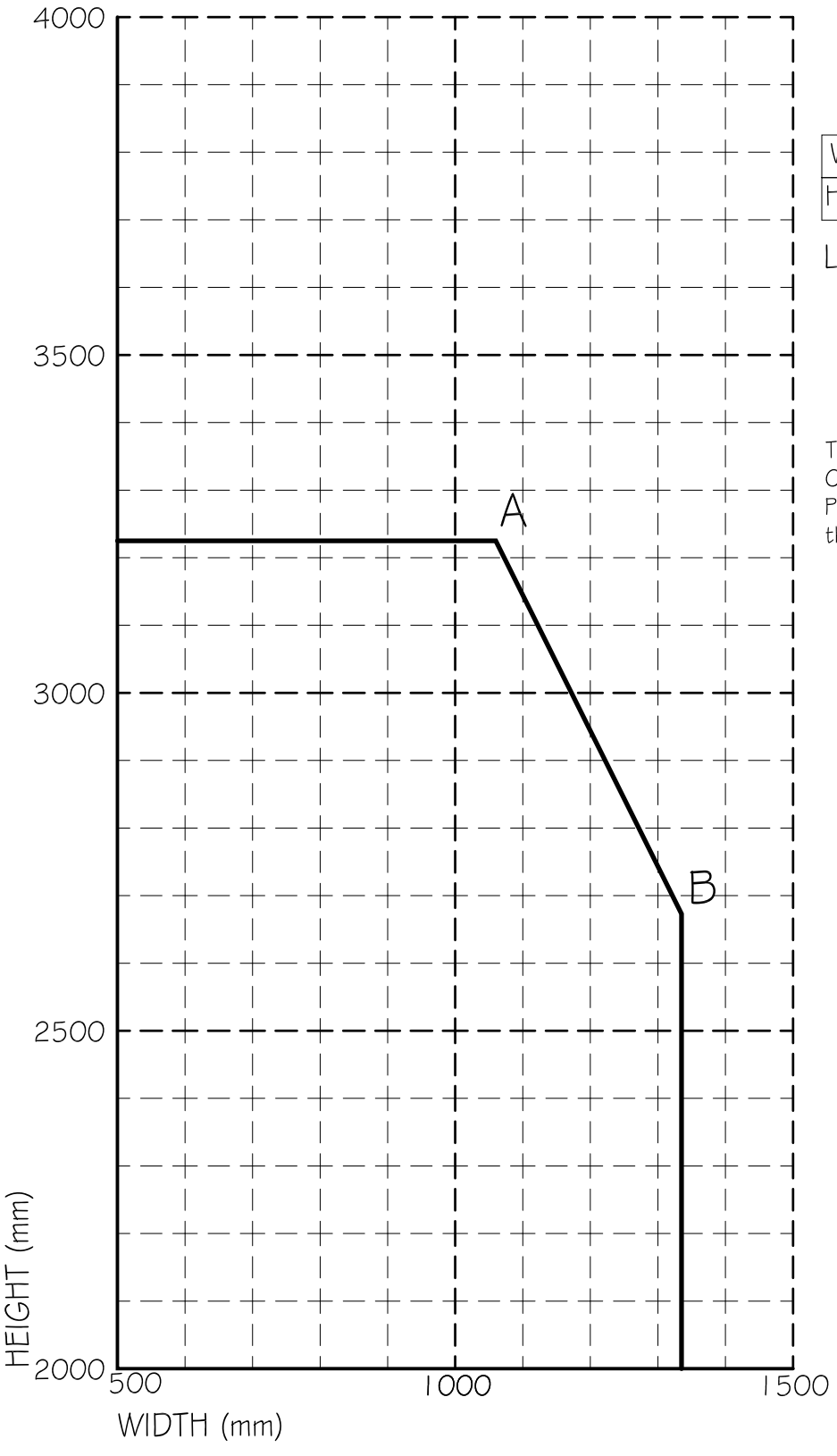

PROPOSED CONFIGURATION

STEEL FRAMES

LATCHED
SINGLE ACTING
SINGLE LEAF
WITH SIDE PANELS AND
TRANSOMMED OVERPANELS

REQUIRED INTEGRITY:
EI30

	A	B
Width	1060	1336
Height	3225	2673

LEAF SIZE ENVELOPE POINTS

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Envelope of Approved Leaf Sizes:
Latched, Single Acting, Single Leaf Doorsets With Side Panels & Overpanels

Job number: 14247

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:H01

ENVELOPE OF APPROVED LEAF SIZES

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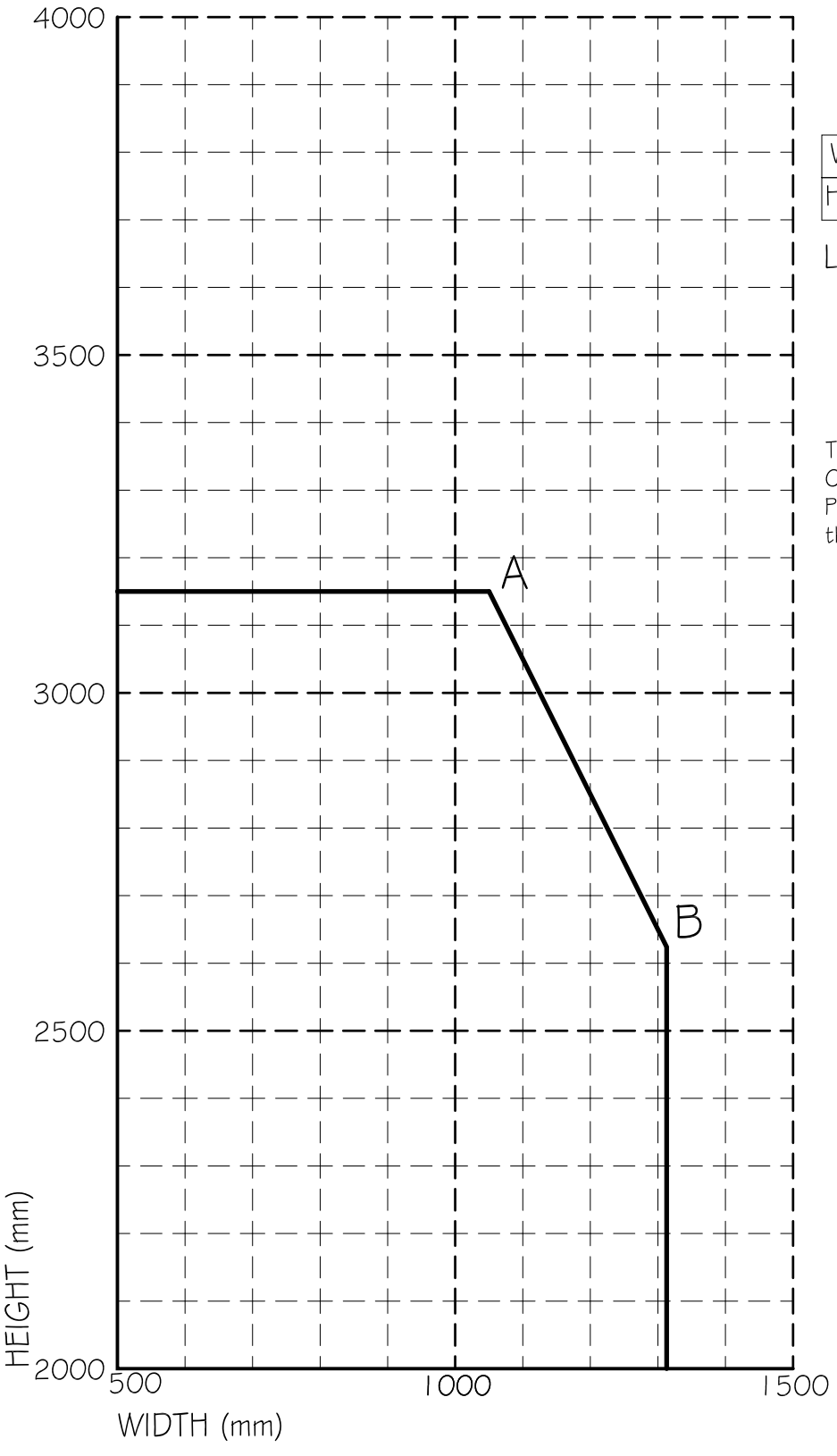

PROPOSED CONFIGURATION

STEEL FRAMES

LATCHED
SINGLE ACTING
SINGLE LEAF
FLUSH or REBATED OVERPANEL
WITH SIDE PANELS

REQUIRED INTEGRITY:
EI30

	A	B
Width	1050	1313
Height	3150	2624

LEAF SIZE ENVELOPE POINTS

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Envelope of Approved Leaf Sizes:
Latched, Single Acting, Single Leaf Doorsets With Flush or Rebated Overpanel

Job number: 14247

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:H02

ENVELOPE OF APPROVED LEAF SIZES

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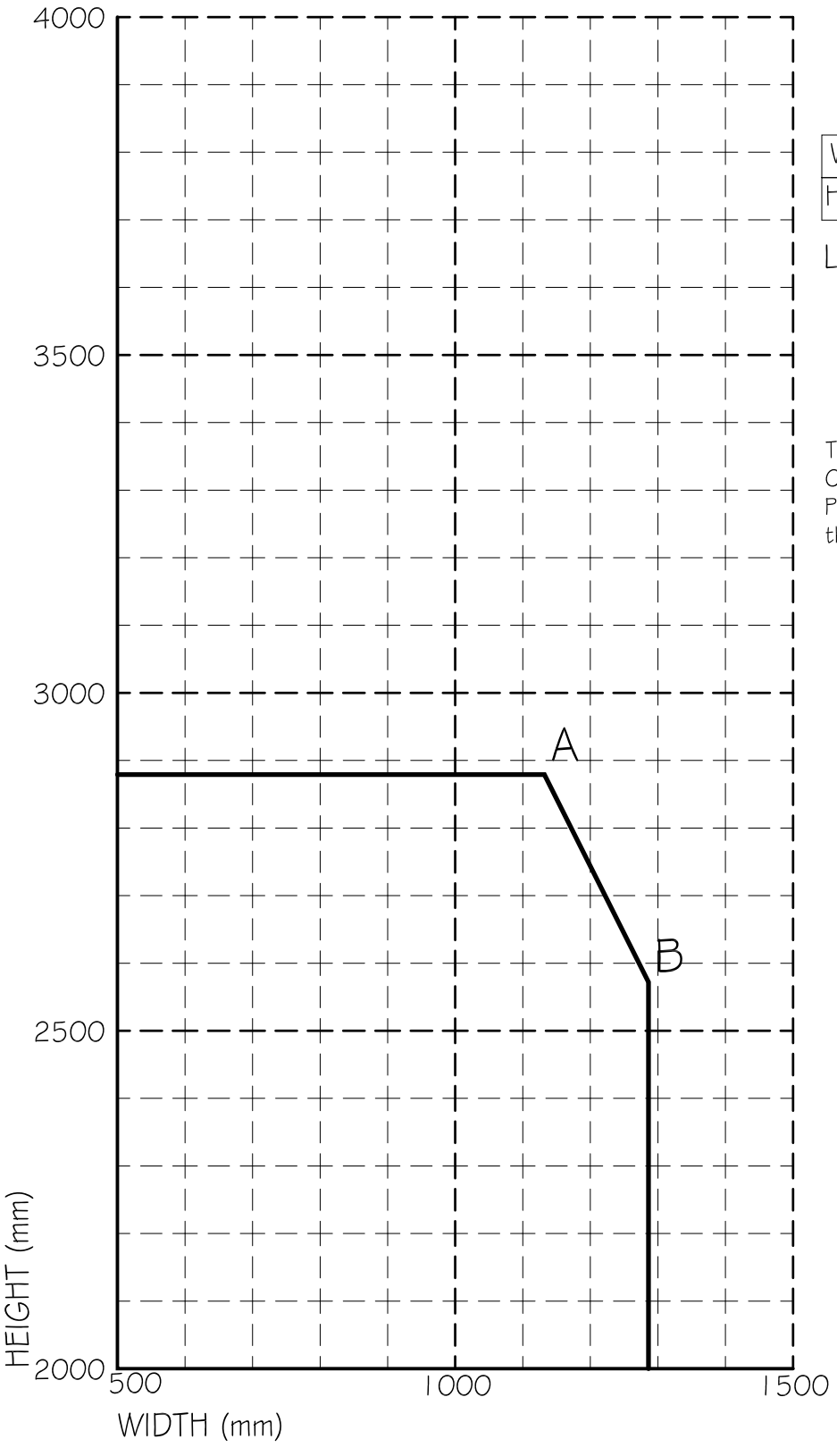

PROPOSED CONFIGURATION

STEEL FRAMES

LATCHED
SINGLE ACTING
DOUBLE LEAF
FLUSH or REBATED MEETING STILES
WITH SIDE PANELS AND
TRANSOMMED OVERPANELS

REQUIRED INTEGRITY:

EI30

	A	B
Width	1132	1286
Height	2879	2572

LEAF SIZE ENVELOPE POINTS

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Latched, Single Acting, Double Leaf Doorsets
With Side Panels & Overpanels

Job number: 14247

Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:H03

ENVELOPE OF APPROVED LEAF SIZES

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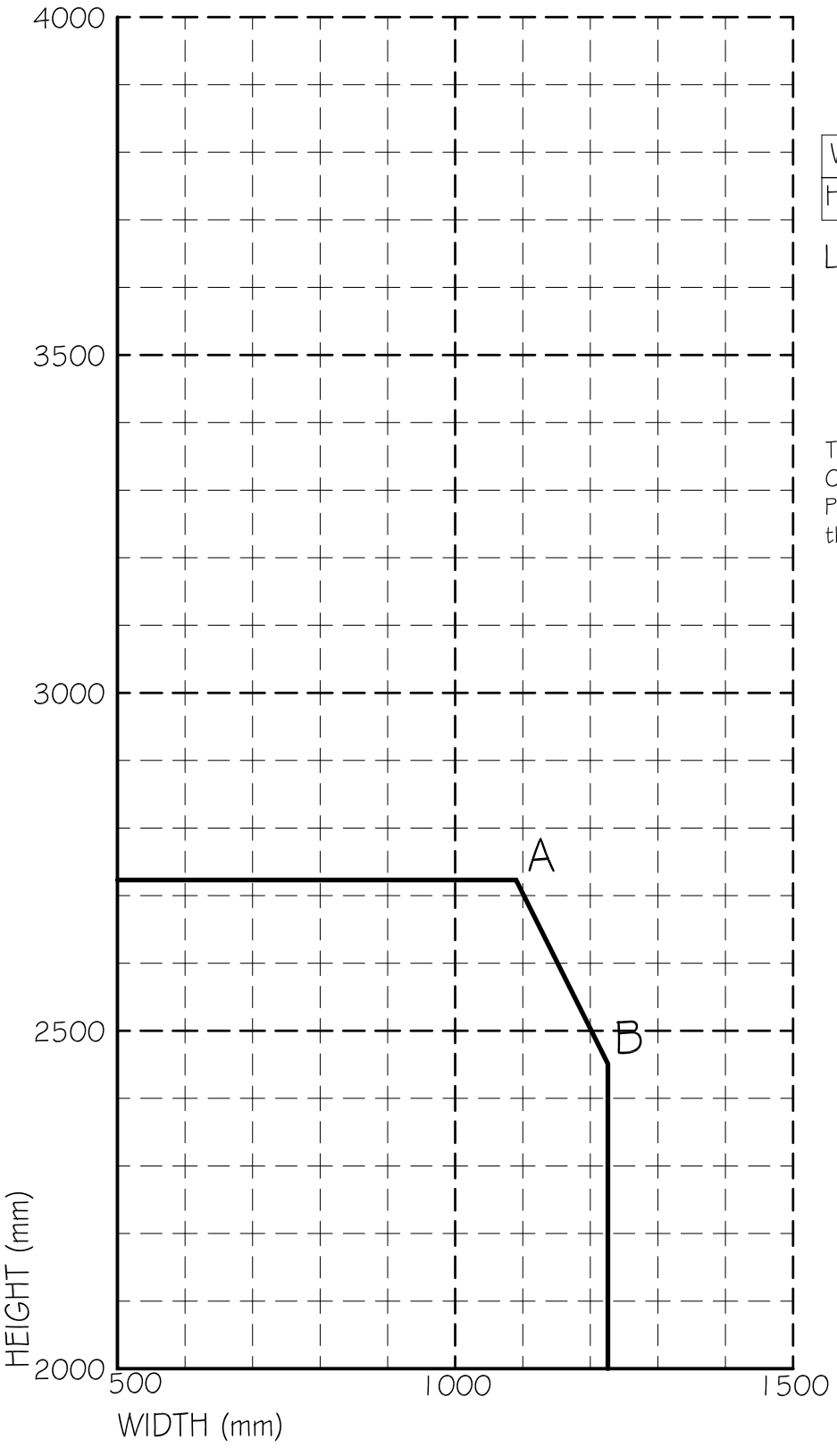

PROPOSED CONFIGURATION

STEEL FRAMES

LATCHED
SINGLE ACTING
DOUBLE LEAF
FLUSH or REBATED MEETING STILES
FLUSH or REBATED OVERPANEL
WITH SIDE PANELS

REQUIRED INTEGRITY:

EI30

	A	B
Width	1090	1226
Height	2723	2451

LEAF SIZE ENVELOPE POINTS

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Envelope of Approved Leaf Sizes:
Latched, Single Acting, Double Leaf Doorsets with Flush or Rebated Overpanel

Job number: 14247	
Drawn by: CSP	Checked by: DJC
Not To Scale	Drawn: Nov 2014

PAR/14247/01:H04

APPENDIX I

General Guidance on Installation of Hardware

General Guidance on Installation of Hardware

I.1 Hinges

I.1.1 Butt Hinges

The hinges used with steel frames in testing of the assessed door type were 2no galvanised steel Simonswerk VX 7939/160, 2no stainless steel Simonswerk VX 7939/160 18-3 and 2no steel lift-off Anuba Herkula 318.

The hinges used with timber frames in testing of the assessed door type were 2no galvanised steel Simonswerk VX 7939/160 Planum and 3no galvanised steel 3-part lift-off Anuba TOP 320 Lift.

Other hinges may be used, subject to compliance with the specifications below.

Hinge types:	Fixed pin, washered butt, ball bearing butt or journal supported hinges may be used.
Number of hinges:	Minimum 2no (1 pair) per leaf in steel hinges and minimum 3no (1½ pairs) per leaf in timber hinges.
Positions:	Top hinge set maximum 250mm from head of leaf and bottom hinge set maximum 500mm up from the bottom of the leaf. Intermediate hinges must be spaced between the top and bottom hinge.
Fixings:	Some of the hinges listed above have bespoke fixing methods recommended by the manufacturer. Alternative hinge types must have blades secured with steel screws, as recommended by the hinge manufacturers, but in no case smaller than No 8 (3.8mm diameter) by 32mm long, and having thread for the full length. The position of screws (in relation to the door face) in blades of alternative hinge types shall be similar to the tested hinges.
Hinge blade sizes:	2.4–3.5mm thick by 89–110mm high by 32–37mm wide. (These dimensions refer to the blade size, i.e. the parts 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:	None required.

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

I.1.2 Concealed Hinges

Concealed hinges can be included with the assessed door type with steel and timber frames.

They are thus approved on the basis of the following specifications:

- Minimum 2no hinges per leaf.
- Hinges to be positioned maximum 250mm from the head of the leaf and maximum 600mm from the base of the door.
- Fixing methods to be as tested and recommended by the manufacturer.
- The hinges must be able to support the final weight of the door leaf in the cold state.
- Maximum mortice size, excluding intumescent protection to be 32mm wide x 37mm deep.
- For Simonswerk Tectus hinges an additional 25 x 4mm Palusol or graphite based intumescent material should be included in either the edge of the leaf for flush leaves or in the rebate for over rebated leaves at the hanging jamb, running the whole length of the jamb.
- For Basys Pivota hinges the mortice of the hinge must be lined with 1mm thick Promaseal-LW SK.
- For all other hinge types, the mortice of the hinge must be lined with minimum 2mm thick non-pressure forming intumescent or gaskets as supplied by hinge manufacturer.

Note I1 *Pivot assemblies are included with Section I.5, single and double acting floor springs and pivot accessories.*

I.2 Mortice Latches/Locks

The mortice latches/locks used in testing of the assessed door type were;

- BKS FS B 7076
- BKS EVP 2146
- BKS B 1206/5
- BKS B 1828
- Dorma PHA 2500 SVP2
- Dorma TV-Z510
- Karl Fliether Genius 2602 FSCB
- Sächsische Schlossfabrik ES 22 PZW FR 20/55 72 08
- Sächsische Schlossfabrik FH 19 PZW FR 20/65 72 09

The three point locks used in testing of the assessed door type were;

- Gretsch-Unitas Security B 211/B
- Gretsch-Unitas Security Automatic 2111 RZ22
- Glutz AG-Treplane 1834

Some of the tested doorsets included panic handles linked to the mortice latches/locks.

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

Mortice latches or locks 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 20mm wide x 3mm thick
	Latch body -	18mm wide (thick) x 170mm high x 135mm deep
	Strikeplate -	235mm long x 20mm wide x 3mm thick

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.

Mortice locks/latches may be utilised with lever handles or push pads/bars, as required.

Minimum 1.5mm thick graphite based intumescent material should be included on both faces of the lock/latch body. The lock/latch forend and strike plates do not require additional protection.

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

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

I.3 Bolts

The bolts used on passive leaves in testing of the assessed door type were as follows, and included recessed attachments within the door leaf;

- BKS B9000 0320 stainless steel latch plate, with BKS 1899 bolt system, with a BKS 1895 top bolt and a BKS B9006 004 bottom bolt
- BKS B 2189, with a BKS B 1895 top bolt and a BKS B 9006 0004 bottom bolt and BKS B 9009 lock casing

These bolts may be utilised or steel flush bolts may be utilised, subject to the following limitations:

- Maximum size of flush bolt is 250mm long x 20mm wide and 18mm deep.
- The body of the bolt should be bedded on minimum 1mm thick non-pressure forming intumescent material.
- Edge fixed bolts shall be positioned centrally in leaf thickness.
- Face fixed flush bolts shall be fixed so that there is a minimum of 50mm between the bolt and the door edge.
- Surface mounted barrel bolts shall not exceed 400mm in length, but there is no limitation on their width. They shall be fixed so that there is a minimum of 50mm between the bolt and the door edge. Screws for fixing bolts must be at least 25mm long, and have thread for the full screw length.

I.4 Door Closers

Each hinged door leaf must be fitted with a self-closing device unless they are normally kept locked shut and labelled as such with an appropriate sign which complies with ISO 3864.

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.

The closers utilised must comply with the specifications below.

- Face-fixed overhead door closer (and accessories such as soffit brackets) that have been tested, assessed or otherwise approved for use on unlatched EI30 cellulosic door leaves in timber frames may be used.

  The face fixed overhead closers utilised in the tests summarised in Appendix G were;

  - Gretsch-Unitas 730
  - Gretsch-Unitas OTS 730
  - Dorma TS93
  - Dorma TS99

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

- This Assessment Report approves the use of Dorma ITS 96 or Geze Boxer (size 2–4 or 3–6 model) concealed overhead closer in minimum 54mm thick flush doorset constructions (see Sections 3.4.1 and 3.4.2).

These are 'slide-arm' type, with the closer installed in a relatively deep mortice in the head of the leaf with timber or steel frames or in the frame head in timber frames and a single arm and roller acting in a slide channel morticed into the frame or leaf.

Limitations on the use of these closers are summarised thus;

i) Inclusion of minimum 1.5mm thick graphite based intumescent material to all sides of the closer body;

ii) In doors with apertures (e.g. for glazing), the top margin between the leaf head and aperture must be minimum 175mm;

iii) The top edge of the leaf must include an 18mm lipping;

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

I.5 Single and Double Action Floor Springs and Pivot Accessories

Single and double acting floor springs and pivot accessories may be used, subject to having appropriate fire test or assessment evidence for use on timber 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 5mm of the intumescent edge seals in leaf edge;
- Minimum 1mm thick intumescent sheet must line the mortice of the top strap and pivot in both the door leaf and frame head and the mortice for the bottom pivot;
- No removal of the timber or intumescent strip at the leaf stile (except for a 6-8mm diameter access hole for the top strap adjustment screw).

I.6 Cableways and Electrically Operated Devices

A number of the doorsets of the assessed door type were tested with cable ways and electrically operated devices. These included locks/latches and other surface mounted items including finger print readers. All morticed items should be installed in accordance with Section F.2. Surface mounted items should be installed with the methods utilised in relevant fire resistance testing.

- Where the cable enters the door leaf from the frame an escape terminal is required. The tested terminal was the Dorma TL-Compact Set, consisting of TL-ST S55 and TL-NC-S55 components.
- When installed at the leaf edge a maximum 19mm deep x 20mm wide recess can be formed with 1.5mm graphite based intumescent seal installed at the base of the recess.
- When installed within door leaves the cables can be included in maximum 15mm deep x 20mm wide recesses.

I.7 Door Selectors

Door selectors are used on double leaf doorsets with rebated meeting stiles, to ensure that the leaves close in sequence. Door selectors fitted to the assessed doorsets must not be recessed into the frame head to the extent that they interrupt any intumescent strips. Recesses cut to accommodate these items must be as tight as possible. Only selectors suitable for 12mm rebates should be used.

I.8 Non-Essential Hardware Items

Letter plates: These must be tested, assessed or otherwise approved for use in 44mm thick (or less) timber/cellulosic EI30 doors. They must be fitted in accordance with the manufacturer's instructions, including all intumescent liners and flaps. Plates must not be less than 100mm away from the leaf edge, or any other aperture.

Note I2 *The installation of such items in a door leaf may compromise its performance as a smoke control doorset.*

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

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

Intumescent air transfer grilles: These must be tested, assessed or otherwise approved for use with 44mm thick (or less) timber/cellulosic EI30 doors. They must be fitted fully in accordance with the manufacturer's instructions, including all intumescent liners and cloaking grilles/beads. They must be no larger than that for which test or assessment evidence exists. (See Sections 3.7.4 and 3.8.4 for restrictions on maximum size and placement of any apertures). These restrictions also apply to grilles, which must also be included in the total area permitted for apertures given in Sections 3.7.4 and 3.8.4.

Note I3 *The installation of such items in a door leaf may compromise its performance as a smoke control doorset.*

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

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

Dropseals: Athmer BS10, Athmer Schall-Ex L15, Planet BM, Deventer DSD1530, Deventer DS 115 automatic threshold dropseals have been included in testing of the assessed door type and can be fitted into the bottom edge of the door leaves.

Other dropseals can be used, subject to a maximum dimension of 30mm high x 20mm wide and being centrally fitted in the base of the door leaf.

APPENDIX J

Advice Regarding CE Marking of Fire Resisting Doorsets

Advice Regarding CE Marking of Fire Resisting Doorsets

International Fire Consultants Ltd (IFC) have a duty of care to advise users of this report that the Harmonised Product Standard for fire resisting doorsets (EN 16034) was published in October 2014, completing the group of EN documents which relate to the CE marking of doorsets within the scope of the Construction Products Regulations that apply to all Member States of the EU. However, the CE marking of doorsets is not permitted until the Harmonised Product Standard is formally published in the Official Journal of the European Union; this is expected to be in early 2015. Furthermore, although all relevant EN standards referenced in the CE marking process will then be in place, and voluntary CE marking can commence, there will be a transition period before CE marking of fire resisting doorsets becomes mandatory. The transition period will be confirmed at the time of publication in the Official Journal and it is possible that CE marking of fire resisting doorsets will become mandatory during the validity period of this report; hence the inclusion of this advice.

It should be noted that the Assessment and Verification of Constancy of Performance (AVCP) process to enable the CE marking of doorsets, can only be conducted by a Notified Certification Body, such as IFC Certification Ltd., and only applies to "fire resisting doorsets".

EN16034 defines doorsets as ".....including any frame,... door leaf or leaves,...including any side panel(s), vision panel(s), flush overpanel(s), transom panel(s) and/or glazing together with the building hardware and any seals (whether provided for the purpose of fire resistance or smoke control) which form the assembly and fulfilling the provisions of this European Standard".

By implication, CE marking only applies when all of the above mentioned elements of the doorset are assembled and supplied 'at the same time' and 'from a single source'; and so CE marking does not apply to fire doors, (or doors and frames), that are supplied 'in isolation', and where the other elements are supplied/fitted by others.

The recent changes in standards and regulations for construction products are quite complex; particularly since there are National and European standards operating in parallel. For example, the guidance in Approved Document B of the Building Regulations for England & Wales currently requires that 'fire doors' must have evidence of fire performance in accordance with either BS 476: Part 22: 1987, or EN1634-1: 2014. Users of this report may be aware that the CE marking process is related to EN standards, and some may be mistaken in believing that the forthcoming requirement for CE marking of fire resisting doorsets does not apply if they only supply products that claim to comply with BS 476: Part 22:1987. This is not the case, and any fire resisting assemblies that are supplied as 'doorsets' (as defined above) must be CE marked - once the process becomes mandatory - and thus can only be based upon testing to EN1634-1.

It should also be noted that fitting of CE marked products, such as hardware and glass, (which are subject to different standards and procedures), to a fire door, (even if the design has been independently tested to EN1634-1, as part of development testing by the manufacturer), does NOT 'convert' the assembly into a CE marked doorset. All items of the assembly must be tested, and the combinations approved, by a Notified Certification Body.

It is recommended that anyone using this report after January 2015 should seek advice from IFC, or IFC Certification Ltd, as to the ongoing status of the CE marking process, and how it applies to doors approved in this report.

The above advice is intended to help suppliers of products understand how the new CPR Regulations/EN Standards affect them. Although based on our current understanding of the requirements it is not an authoritative interpretation of the Regulations/Standards, which is a matter for the courts. The guide explains the requirements in general terms, but it does not cover all the details. You should refer to the Regulations/Standards themselves for a full statement of the requirements. The Construction Product Regulation, 305/2011, is readily downloadable and gives valuable information on the responsibilities and duties of manufacturers and suppliers. EN16034 and other Standards can be obtained from BSI.

APPENDIX K

Summary of Fire Test Evidence

Summary of Fire Test Evidence

Test Report	Specimen Description	Test Standard	Integrity (Insulation)
FIRES-FR-212-12-AUNE	Latched, single acting, single over rebated leaf in timber frame (2460mm high x 1360mm wide x 44mm thick)	BS EN1634-1: 2008	28 minutes (28 minutes)
FIRES-FR-213-12-AUNE	Latched, single acting, single over rebated leaf in timber frame (2466mm high x 1228mm wide x 54mm thick)	BS EN1634-1: 2008	34 minutes (34 minutes)
FIRES-FR-214-12-AUNE	Latched, single acting, single over rebated leaf in timber frame (2126mm high x 1102mm wide x 44mm thick)	BS EN1634-1: 2008	21 minutes (21 minutes)
FIRES-FR-215-12-AUNE	Indicative 1179mm high x 1176mm wide x 60mm thick	BS EN1634-1: 2008	34 minutes (34 minutes)
IBS 10120909	Latched, single acting, double over rebated leaf in timber frame (2850mm high x 1357/548mm wide x 68mm thick)	BS EN1634-1: 2008	38 minutes (38 minutes)
IBS 11112807	Latched, single acting, single over rebated leaf with rebated overpanel in timber frame (2085mm high x 852mm wide x 44mm thick)	BS EN1634-1: 2008	38 minutes (38 minutes)
IBS 1112808	Latched, single acting, double over rebated lead in timber frame (2297mm high x 1036/1176mm wide x 54mm thick)	BS EN1634-1: 2008	33 minutes (33 minutes)
IBS 12081413	Latched, single acting, single over rebated leaf in steel frame (2170mm high x 1102mm wide x 44mm thick)	BS EN1634-1: 2008	34 minutes (34 minutes)
Ift Rosenheim 271 37152	Latched, single acting, double over rebated leaves in a steel frame (2472mm high x 1247.5mm + 1247.5mm wide x 45mm thick)	BS EN1634-1: 2000	16 minutes (16 minutes)
Ift Rosenheim 271 37524	Latched, single acting, double over rebated leaves in a steel frame (2450mm high x 1199.5mm + 1199.5mm wide x 45mm thick)	BS EN1634-1: 2000	38 minutes (38 minutes)

Test Report	Specimen Description	Test Standard	Integrity (Insulation)
Ift Rosenheim 271 37669	Latched, single acting, single over rebated leaf in a steel frame (734mm high x 734mm wide x 54mm thick)	BS EN1634-1: 2000	33 minutes (33 minutes)
Ift Rosenheim 271 37670	Latched, single acting, double over rebated leaf with rebated overpanel in a steel frame (2472mm high x 1237mm + 1237mm wide x 45mm thick plus 2004mm high x 2480mm wide x 45mm thick)	BS EN1634-1: 2000	26 minutes (26 minutes)
Ift Rosenheim 271 37671	Latched, single acting, single over rebated leaf in steel frame (2485mm high x 1359mm wide x 45mm thick)	BS EN1634-1: 2000	31 minutes (30 minutes)
Ift Rosenheim 271 38418	Latched, single acting, single leaf in steel frame with top and side light (2097mm high x 1300mm wide x 45mm thick)	BS EN1634-1: 2000	37 minutes (30 minutes)
Ift Rosenheim 271 38419	Latched, single acting, double over rebated leaves in a timber frame (2442mm high x 1203mm + 1203mm wide x 55mm thick)	BS EN1634-1: 2000	19 minutes (19 minutes)
Ift Rosenheim 271 38724	Latched, single acting, double leaves in timber frame with top and side lights (2186.5mm high x 877.5mm + 880mm wide x 50mm thick)	BS EN1634-1: 2000	25 minutes (25 minutes)
Ift Rosenheim 271 38944	Latched, single acting, single leaf in timber frame (2410.5mm high x 1117mm wide x 60mm thick)	BS EN1634-1: 2000	36 minutes (36 minutes)
Ift Rosenheim 271 38945	Latched, single acting, single over rebated leaf in steel frame (2485.5mm high x 1014.5mm wide x 46mm thick)	BS EN1634-1: 2000	24 minutes (19 minutes)
Ift Rosenheim 11-000468-PR01	Latched, single acting, single over rebated leaf in timber frame (2490mm high x 1180mm wide x 44mm thick)	BS EN1634-1: 2008	28 minutes (28 minutes)
Ift Rosenheim 11-000742-PR01	Latched, single acting, double leaf in timber frame (3493mm high x 1099/1099mm wide x 44mm thick)	BS EN1634-1: 2008	27 minutes (27 minutes)
Ift Rosenheim 11-001102-PR01	Latched, single acting, single over rebated leaf in steel frame (2456mm high x 1033mm wide x 58mm thick)	BS EN1634-1: 2008	31 minutes (31 minutes)

Test Report	Specimen Description	Test Standard	Integrity (Insulation)
Ift Rosenheim 11-001102-PR02	Latched, single acting, single over rebated leaf in timber frame (2450mm high x 1178mm wide x 84mm thick)	BS EN1634-1: 2008	52 minutes (52 minutes)
Ift Rosenheim 11-002924-PR01	Latched, single acting, single over rebated leaf with rebated overpanel in timber frame (3043mm high x 1047mm wide x 54mm thick)	BS EN1634-1: 2008	33 minutes (33 minutes)
Ift Rosenheim 11-000468-PR02	Latched, single acting, single over rebated leaf with rebated overpanel in steel frame (2196mm high x 1083mm wide x 44mm thick)	BS EN1634-1: 2008	24 minutes (24 minutes)
Ift Rosenheim 13-002178-PR01	Latched, single acting, single over rebated leaf in timber frame (2462mm high x 1063mm wide x 44mm thick	BS EN1634-1: 2008	28 minutes (28 minutes)
Ift Rosenheim 13-002178-PR02	Latched, single acting, single over rebated leaf in timber frame (2462mm high x 1063mm wide x 44mm thick)	BS EN1634-1: 2008	37 minutes (37 minutes)
Ift Rosenheim 13-003281-PR02	Latched, single acting, single over rebated leaf in timber frame (2462mm high x 1064mm wide x 54mm thick)	BS EN1634-1: 2008	36 minutes (36 minutes)
Ift Rosenheim 13-003372-PR01	Latched, single acting, single over rebated leaf in timber frame (2462mm high x 1064mm wide x 44mm thick)	BS EN1634-1: 2008	37 minutes (37 minutes)
Ift Rosenheim 13-003372-PR02	Latched, single acting, single over rebated leaf in timber frame (2462mm high x 1064mm wide x 54mm thick)	BS EN1634-1: 2008	35 minutes (35 minutes)

Note:

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