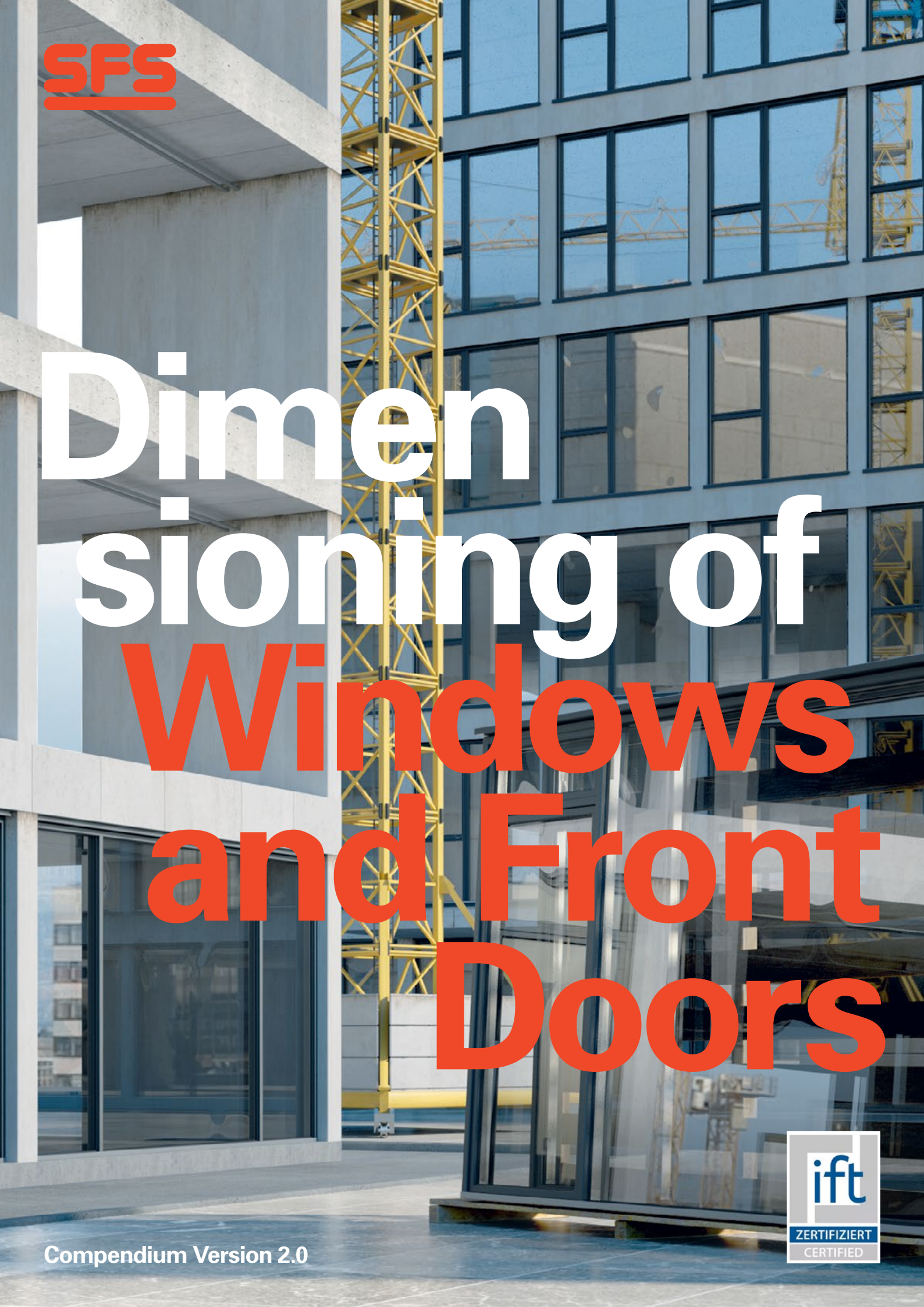
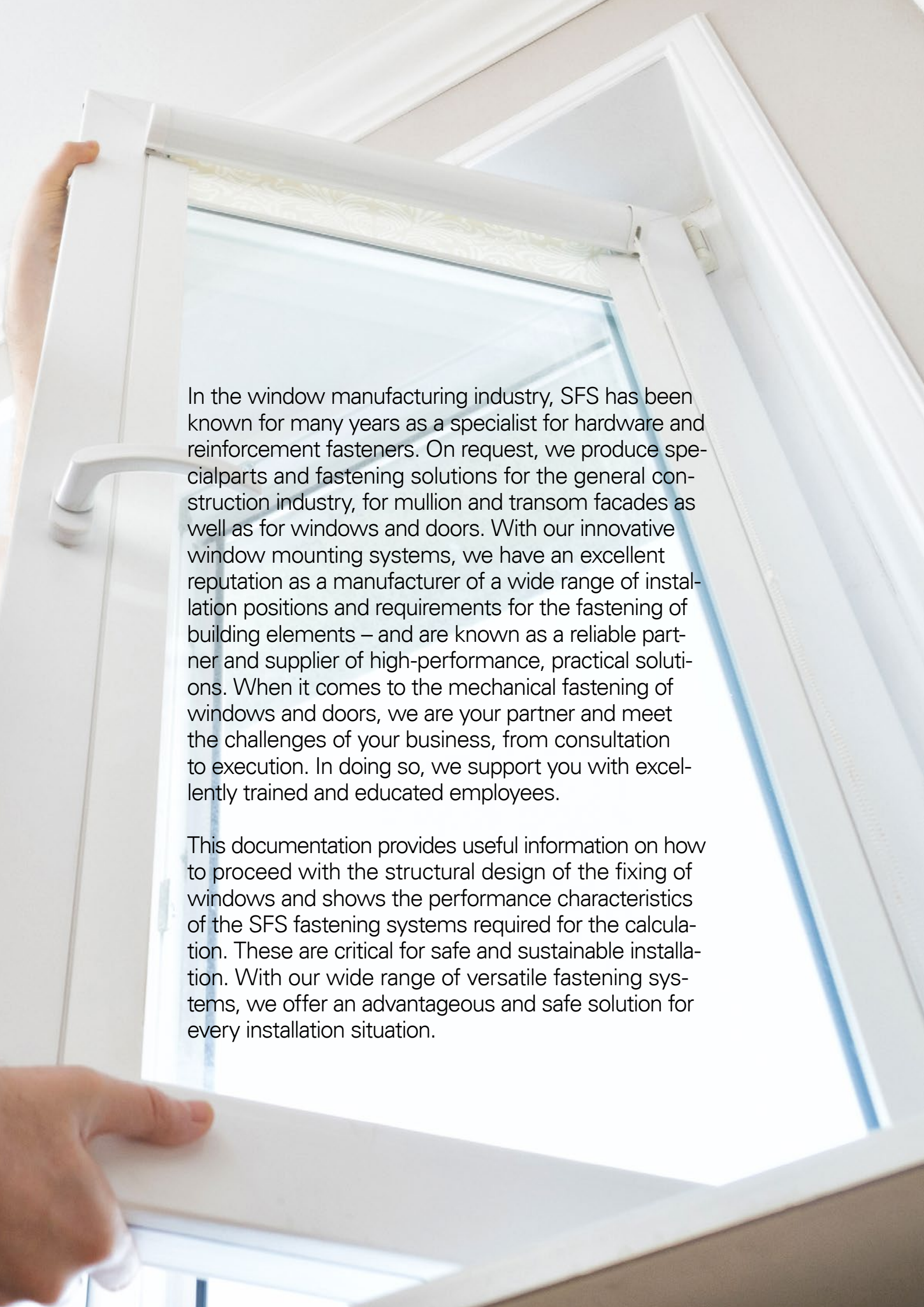


Dimensioning of Windows and Front Doors

Compendium Version 2.0



In the window manufacturing industry, SFS has been known for many years as a specialist for hardware and reinforcement fasteners. On request, we produce specialparts and fastening solutions for the general construction industry, for mullion and transom facades as well as for windows and doors. With our innovative window mounting systems, we have an excellent reputation as a manufacturer of a wide range of installation positions and requirements for the fastening of building elements – and are known as a reliable partner and supplier of high-performance, practical solutions. When it comes to the mechanical fastening of windows and doors, we are your partner and meet the challenges of your business, from consultation to execution. In doing so, we support you with excellently trained and educated employees.

This documentation provides useful information on how to proceed with the structural design of the fixing of windows and shows the performance characteristics of the SFS fastening systems required for the calculation. These are critical for safe and sustainable installation. With our wide range of versatile fastening systems, we offer an advantageous and safe solution for every installation situation.

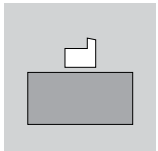
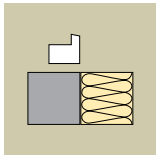
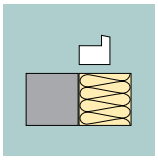
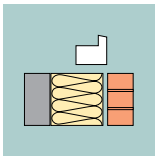
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General Information



Overview of Installation Situations and Fastening Solutions

Single skin masonry	**Insulated masonry**		**Double-skin masonry**
In the wall	0–40 mm at/above the edge	In front of wall installation	In front of wall installation
			
	 JB-D/L-P plate +  JB-D/L-A bracket	 JB-W/XL Winkel  JB-D-U console +	 JB-D-R console

FB/FL fastener
JB-W bracket
JB-W/XL bracket
JB-A bracket

Zertifikat / *Certificate*

Zertifikatsnr. / *Certificate No.*: 188-8002779-1-5

Baukörperanschlusssysteme

Structure fitting systems

Produktfamilien
product families
Befestigungssystem FB, FL, JB-D/L, JB-D, JB-W/XL, JB-D® PLUS / JB-D®/FA PLUS

Einsatzbereich
field of application
Befestigungssysteme für Fenster und Außentüren
Fixing systems for windows and pedestrian doors

Hersteller
manufacturer
SFS Group Germany GmbH
In den Schwarzwiesen 2, DE 61440 Oberursel

Produktionsstandort
production site
SFS Group Schweiz AG
Rosenbergsaustr. 10, CH 9435 Heerbrugg

Mit diesem Zertifikat wird bescheinigt, dass das benannte Bauprodukt den Anforderungen des zugrundeliegenden ift-Zertifizierungsprogramms in der aktuellen Fassung entspricht.

- Erstellung von Produktfamilien des aufgeführten Bauproduktes und Erstprüfung durch eine akkreditierte Prüfstelle nach der ift-Richtlinie MO-02/1:2015
- Einführung und Aufrechterhaltung einer werkseigenen Produktionskontrolle durch den Hersteller
- Erstinspektion des Werkes und der werkeigenen Produktionskontrolle durch ift-Zert
- kontinuierliche Fremdüberwachung des Werkes und der werkseigenen Produktionskontrolle durch ift-Zert

Dieses Zertifikat wurde erstmals am 26.10.2017 ausgestellt. Die aktuelle Version gilt bis zum 29.01.2026, wenn sich zwischenzeitlich die Festlegungen in der oben angeführten technischen Spezifikation oder die Herstellbedingungen im Werk oder in der werkseigenen Produktionskontrolle selbst nicht wesentlich verändert haben.

Das Zertifikat darf nur unverändert vervielfältigt werden. Alle Änderungen der Voraussetzungen für die Zertifizierung sind dem ift-Zert mit den erforderlichen Nachweisen unverzüglich schriftlich anzuzeigen.

Das Unternehmen ist berechtigt, das benannte Bauprodukt gemäß der ift-Zeichensatzung mit dem „ift-zertifiziert"-Zeichen zu kennzeichnen.

Dieses Zertifikat enthält 1 Anlage.

This certificate attests that the building product mentioned fulfils the requirements of the underlying ift-certification scheme in its current version.

- compilation of product families of the building product listed and initial type-testing by an accredited testing body as per ift-guideline MO-02/1:2015
- implementation and maintenance of a factory production control by the manufacturer
- initial inspection of the production site and the factory production control by ift-Zert
- continuous third-party control of the production site and the factory production control by ift-Zert

This certificate was first issued on 26.10.2017. The current version is valid until 29.01.2026, as long as neither the conditions laid down in the technical specification listed above nor the manufacturing conditions in the production site nor the factory production control itself are modified significantly.

The reproduction of the certificate without any change from the original is permitted. Any changes to the prerequisites applicable to certification shall be immediately communicated in writing to ift-Zert accompanied by the necessary evidence.

The company is authorized to affix the "ift-certified"-mark to the building product mentioned according to the ift-rules for use of the "ift-certified"-mark.

This certificate contains 1 annex.

ift Rosenheim
akkreditierte Produktzertifizierungsstelle
PZ

ift Rosenheim
30.01.2023

Christian Kehrer
Leiter der ift-Zertifizierungs- und Überwachungsstelle
Head of ift Certification and Surveillance Body

Gültig bis / *Valid until:* **26.01.2026**

Vertragsnr. / *Contract No.:* **188 8002779**

Ve-Zer-5162-de / 01.03.2022

Grundlage(n) /
Basis:

ift-Zertifizierungsprogramm für Baukörperanschlusssysteme nach der ift-Richtlinie MO-02
ift-certification scheme for hardware for structure fitting systems according to the ift-guideline MO-02
ift-Zertifizierung QM360:2018-01

Baukörperanschlusssysteme
structure fitting systems

MO-02/1

Befestigungssysteme
fixing systems

ZERTIFIZIERT
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Identitäts-Check
Identity check

www.ift-rosenheim.de/ift-zertifiziert
ID: 78E-78CB6

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Inspektion – EN ISO/IEC 17020
Zertifizierung Produkte – EN ISO/IEC 17065
Zertifizierung Managementsysteme – EN ISO/IEC 17021

Notified Body 0757
PÜZ-Stelle: BAY 18

DAkkS Deutsche Akkreditierungsstelle D-ZE-11349-01-00

General information

Various loads act on windows when they are installed. In addition to their own weight, these loads result, among other things, from the effects of wind, mechanical stresses during use and from extraordinary loads (e.g. during break-in attempts). These loads must be permanently transferred by the fastening to the loadbearing structure and the building foundation.
The following criteria must therefore be ensured for the window in the design:

- Stability
- Safety in use
- Limitation of deformations (serviceability)

In the past, the design of the fastening was primarily based on recognised rules of technology (arrangement of support and spacer blocks, fastening distances, etc.). Due to changes in construction technology (heavier windows, more porous and thus less load-bearing building materials, as well as the shift of the window position to the outside), a more precise consideration is unavoidable.
The "Guidelines for Planning and Execution of the Installation of Windows and Front Doors for New Buildings and Renovations", hereinafter referred to as the "Guidelines for Installation" (GfI), distinguishes between three cases in chapter 5 "Fastening and Load Transfer":

Fastening of windows and exterior doors
Element-wise load transfer at least on two opposite sides

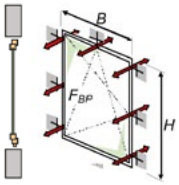
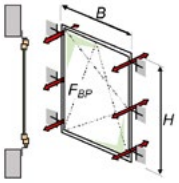
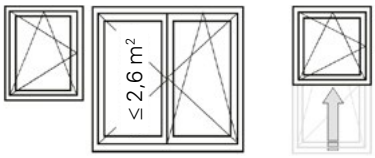
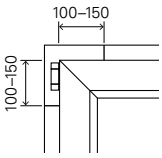
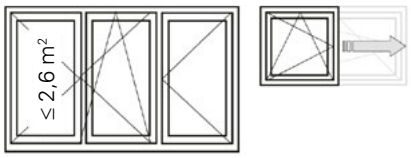
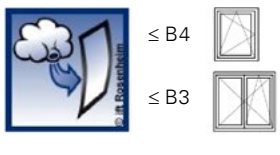
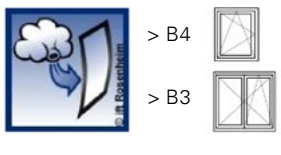
Standard Case 1	Standard Case 2	Special Case

• Load-bearing masonry with regard to fastening
• Installation in the wall with all-round fastening
• Window/exterior door:
  • max. 2 sashes
  • Sash area ≤ 2,6 m²
  • For turn or tilt&turn sashes:
  + Sash format b/h ≤ 1
  + Glass weight ≤ 35 kg/m²
• Required wind resistance class ≤ B3/B4 (double-leaf/single-leaf)
• In case of a sym. over-corner fastening in the corner and stay bearing area for tilt or tilt&turn sashes:
  • Glass weight ≤ 45 kg/m²
  • Consideration of vertical working loads (classes 1 and 2)
• In the case of special requirements, special case also applies in addition
	• Masonry with low load-bearing capacity with regard to fastening
	• Installation in front of the wall (prewall installation with brackets, angles or frames)
	• Oversizes (deviating from standard case 1)
	• Consideration of vertical working loads (classes 1 to 4 according to EN 13115)
	• Window installation in high-rise buildings
	• In the case of special requirements,
	• special case also applies in addition
		• Consideration of special requirements (e.g. installation of safety barrier or burglar-resistant or bullet- and explosion-resistant elements, consideration of effects due to fire or earthquakes)
		• In addition, standard case 1 or 2 are to be considered

Adherence to the known generally valid rules	Dimensioning of the fastening required	Static proof Proof of testing Proof of usability
Workshop and installation planning by the person responsible for installation		Structural engineer Testing laboratory Approval body

Source: "Guidelines for Installation" (GfI), Edition 2020-03

The following explanations help to define more clearly the criteria mentioned in the overview table in the GfI:

Standard Case 1		Standard Case 2
Special soffit stones	**Outer Wall**	High-heat insulating filigree/filled bricks
		
≥ C12/15 DFK ≥ 12 at DFK < 12 DFK ≥ 4		(DFK ≥ 12) without special soffit stones
 Installation in the wall and circumferential fastening	**Installation Situation**	 In front of the wall mounting or mounting not circumferential
 $n_{sash} \leq 2$ and $A_{sash} \leq 2{,}6\ m^2$ and b/h ≤ 1 (upright to square sash format) and glass weight ≤ 35 kg/m²  or for over-corner fastening: Glass weight ≤ 45 kg/m²	**Window Structure**	 $n_{sash} > 2$ or $A_{sash} > 2{,}6\ m^2$ or b/h > 1 (horizontal sash format) or Glass weight > 35 kg/m² resp. > 45 kg/m²
Wind Load ≤ B4 ≤ B3 Vertical Load P  With over-corner fastening EN 13115 Class 1–2	**Performance Characteristics**	Wind Load > B4 > B3 Vertical Load P  EN 13115 Class 1–4

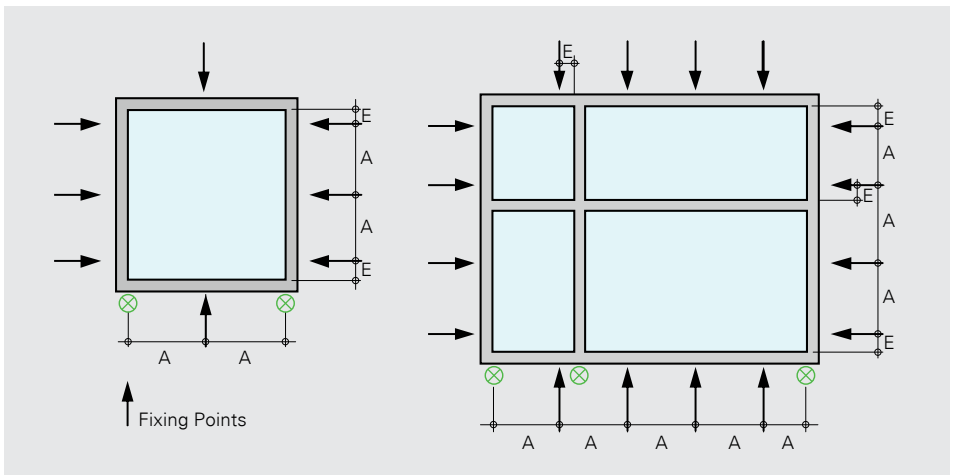
Special Case

Specific requirements, as:



Source: "Guidelines for Installation" (GfI), Edition 2020-03

Determination of the Fixing Points



A Spacing

- For Aluminium windows max. 800 mm
- For timber windows max. 800 mm
- For PVCu windows max. 700 mm

E Distance from the inside corner

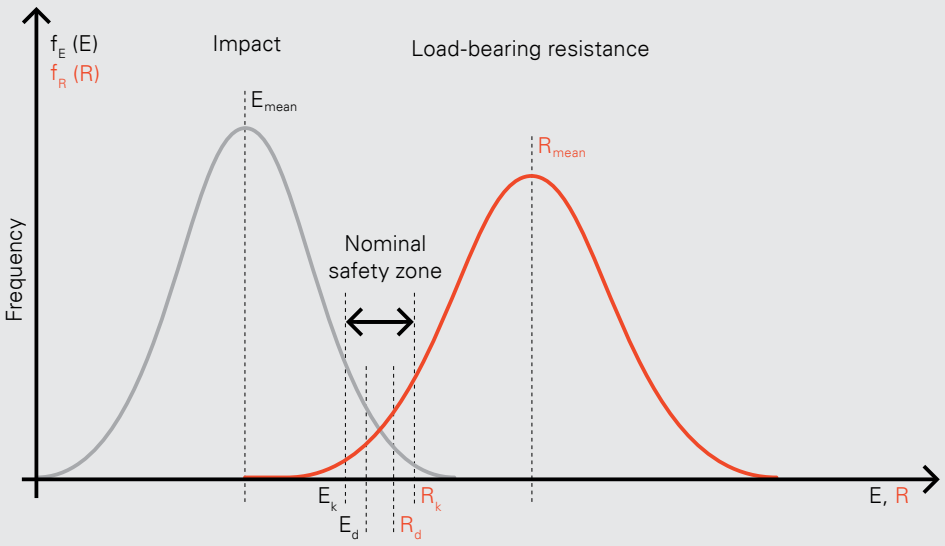
Distance from the **inside** corner of the frame and, for mullions a. transoms, from the inside of the profile 100 to 150 mm

⊗ Additional fastening point for load transfer in the window plane for projecting installation in front of the loadbearing wall construction. Replaces the support blocks. In the lateral area depending on the type of opening.

Design Basics

In the design, the acting forces (actions) are compared with the load-bearing resistance of the component or fastener.

Factorization by means of coefficients takes account of the variation in order to ensure the load-bearing capacity with sufficient safety.



E	Impact
E_{mean}	Impact mean value
E_k	Characterisitc value of the impact
E_d	Design value of the impact
R	Load-bearing resistance
R_{mean}	Mean value of the resistance
R_k	Characteristic value of the resistance
R_d	Design value of the resistance

Procedure structural engineer

Typically, the structural engineer performs his verification at design level, i.e. with design values on the side of the impact and load-bearing resistances **(Special Case)**.

Procedure according to GfI

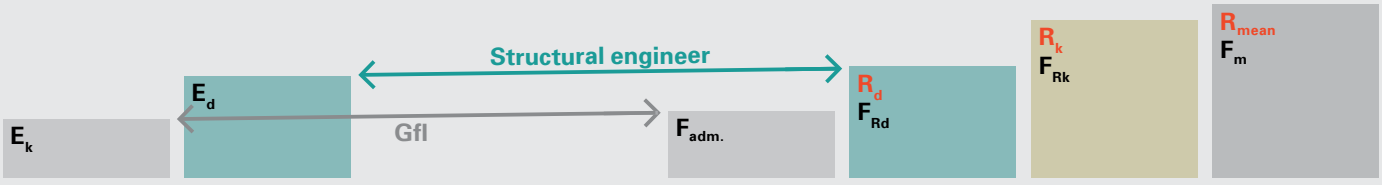
In contrast, the GfI chooses a simplified method for the verification by the executing company in **Standard Case 2**. The characteristic forces (actions) are compared with the admissible loads (service load) for the fastening systems:

Procedure structural engineer

Design value of the impact E_d < Design value of the resistance R_d

Procedure according to GfI

Characterisitc value of the impact E_k < Admissible loads (service load) $F_{adm.}$

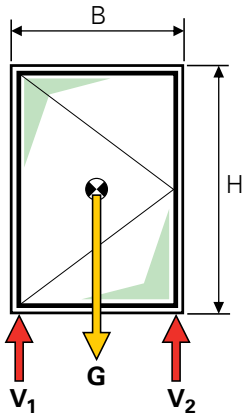


For this reason, our data sheets show both the design loads and recommended loads, leaving it up to the user to decide on the level of verification.

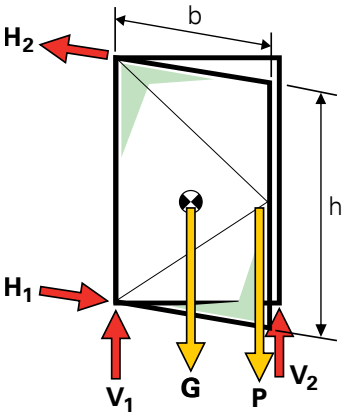


Acting and resulting Forces

Forces acting in window plane

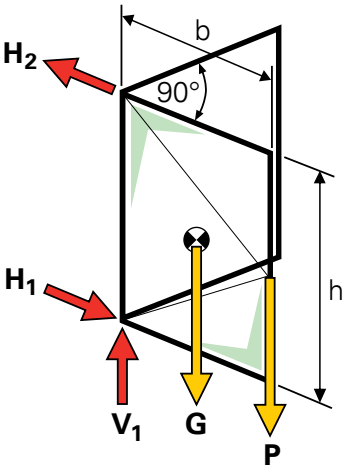


Dead weight: closed sash

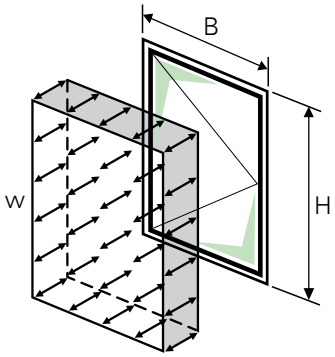


Dead weight and vertical live load:
minimum open sash

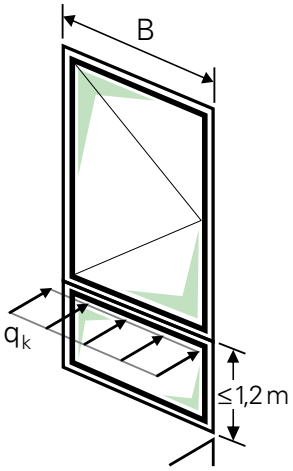
Forces acting perpendicular to the window plane



Dead weight and vertical live load:
sash 90° open



Wind loads (pressure + suction)

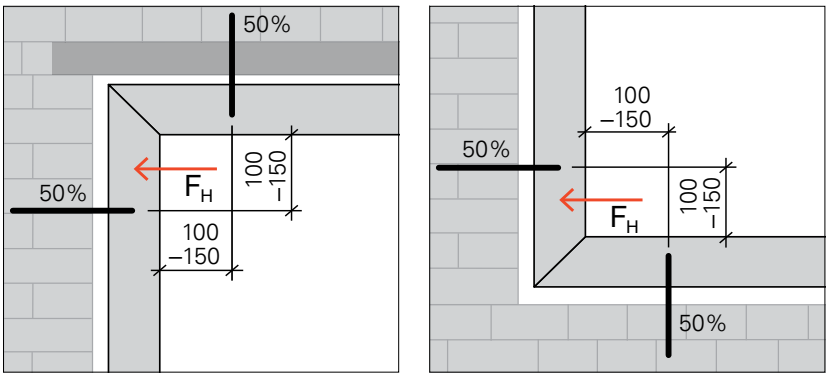


Horizontal live loads

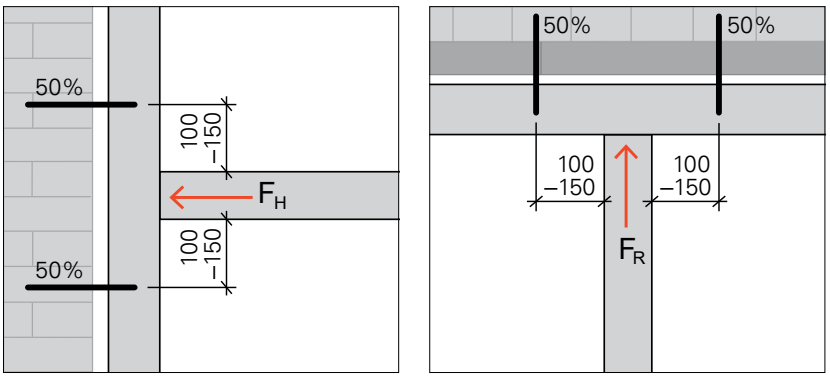
Distribution of Load Concentrations over several Fixing Points

If the applied forces exceed the load-bearing capacity of one fastening point, it is possible to divide them among several fastening points by means of a group fastening in the form of a cross-corner fastening or a double fastening.

1) Fastening across the corner
If two fixing points are fitted at a distance of 100–150 mm from the inner corner of the frame, the load can be distributed between them in a ratio of 50% to 50%.

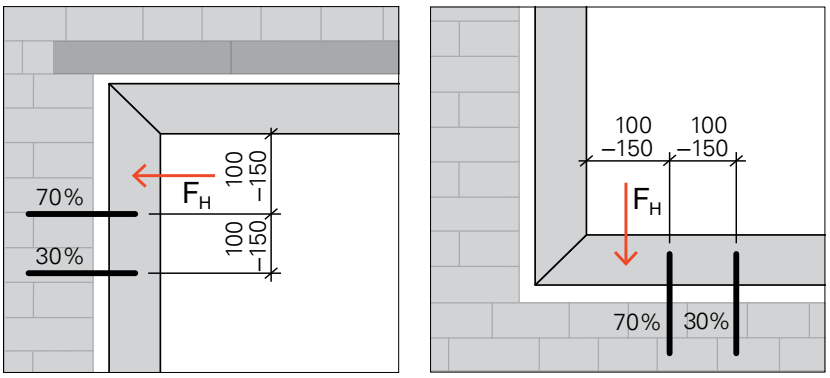


2) Double attachment symmetrical
In this case, too, the load can be distributed to both in a ratio of 50% to 50%.



3) Two grouped fixing points
With two grouped fixing points, the load can be applied to the side as well as at the bottom in a ratio of 70% (fixing point near the corner of the frame) to 30%. This leads to an increase in performance of 43% compared to the installation with only one fixing oint. The following distances must be observed:

- Distance to inner corner of frame: max. 100–150 mm
- Spacing: 100–150 mm



All dimensions in mm

Building Materials, Notices and Definitions

Values from tests according to guideline MO-02/1
The correspondingly marked values were determined in tests according to guideline MO-02/1 of ift Rosenheim, June 2015 edition, on individual bricks and with the specified edge distances.

Concrete
Values for concrete were determined in tests with sand-lime bricks and confirmed by means of reference testing. The class C20/25, which is usually stated, corresponds to the quality commonly used in building construction.

Lime sandbrick
The values were determined with bricks of density strength class (DFK) 20, partly in small formats (type 3DF, 240×175×113 mm), partly in XL format (type 14 DF, 248×200×498 mm). In the case of lime sandbricks, any finger holes must be taken into account.

Poroton vertically perforated clay blocks
All tests were carried out with Poroton vertically perforated clay blocks from Wienerberger. The values shown can be applied to blocks from other suppliers, provided they are equivalent (strength class, wall thicknesses and hole pattern). Due to common approvals, this is the case e.g. for bricks of the company Schlagmann with the corresponding designation.

Smooth coat rendering for Poroton vertically perforated bricks
Smooth coat rendering for Poroton vertically perforated bricks
The values were determined according to the practice-relevant situation partly with, partly without smooth coat rendering, see notes on the individual table sheets.

Smooth coat type: Lightweight plaster type 1
Compressive strength class according to DIN EN 998-1: CS II (2,5–5 N/mm²). The smooth coat fills the profile of the block in the layup. In individual cases, an increased thickness of 10–12 mm was selected in the tooth base, which is noted on the corresponding table page. Values without smooth coating can also be used for applications with smooth coating, as the smooth coating leads to a higher load-bearing capacity.

Aerated concrete
Depending on the application, the values were determined with bricks of the typical building strength classes (PP).

Values from German general building approvals/general construction type approvals (abZ/aBG)
The general conditions of the corresponding abZ/aBG with regard to building materials, application limits (edge and intermediate distances, etc.) and processing must be taken into account.

Examples of tested block types


HLz-Plan-T acc. to Z-17.1-868


Plan-T8 acc. to Z-17.1-108


Poroton-T8-P acc. to Z-17.1-982


Poroton-T10 acc. to Z-17.1-889

Special Case

Fastening building components with special characteristics

Special requirements as well as the installation of windows in high-rise buildings are to be carried out in accordance with the requirements for the special case.

These exist, among others, for:
- Building components with burglary-restistant characteristics
- Building components with safety barrier characteristics
- Doors in escape routes and emergency exits
- Fire safety elements

Building components with burglary-restistant characteristics
Our fastening systems have been tested for their burglarresistant properties in various application variants. The test certificates are listed in the corresponding chapters.

Building components with safety barrier characteristics
The requirements for safety barrier component fastening are described in the Guidelines for Installation (GfI), chapter 5.3.2. The focus is on the protection of life and limb. Nowadays, french balconies are increasingly fastened directly to the window element and thus by the window installer. Even fixed glazed window elements must be secured against falling, depending on the height of the sill.

SFS provides you with complete systems for high-performance, safety barrier fastening. We have an extensive product range for the secure installation of windows and exterior doors, the suitability of which has been proven for the most varied wall substrates and window positions.

Liability Disclaimer
All information is non-binding and without guarantee. Before using the products, all specifications and calculations must be checked by a suitably qualified person and local regulations must be observed. This document is subject to revision. We reserve the right to make technical changes.



Installation in the Wall

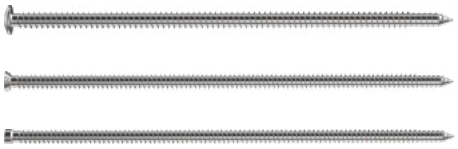
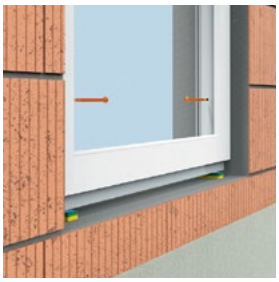
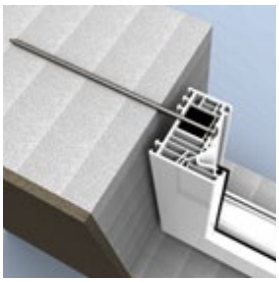


Tested according to:

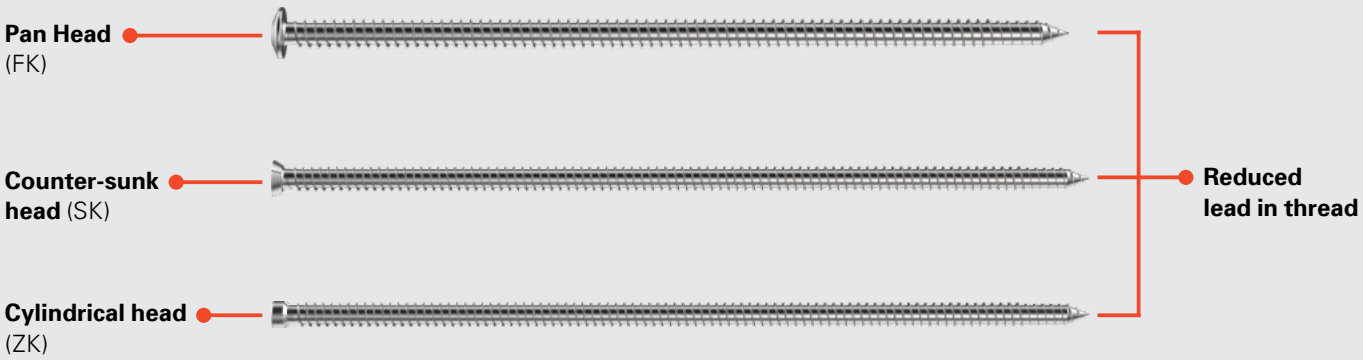
- RC2 acc.to DIN EN 1627
- RC3 acc.to DIN EN 1627
- Component test acc. to MO-02/1

General Information

Product Overview

System		Application	
FB			Universal frame anchor for various substrates in three head styles
FL			Special frame fastener for aerated concrete and vertically perforated bricks with low load-bearing capacity
JB-W			Mounting bracket for threshold fastening with low to medium height
JB-W/XL			Mounting bracket for threshold fastening up to medium heights and for increased performance requirements
JB-A			Heavy-duty mounting bracket for high floor constructions/threshold heights

Product Benefits System FB

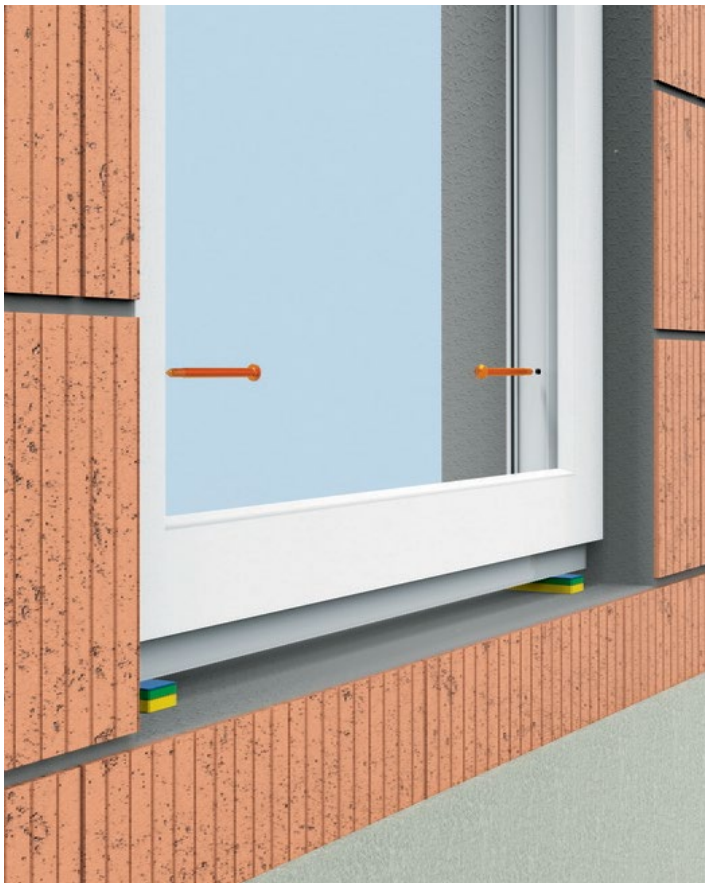


The solution – universal mounting fastener FB
The most common form of mounting is through-hole mounting with mounting fasteners. The FB fastener type covers a wide range of different substrates. With our product, you can fix to most substrates and have a secure fixing. Our range of fasteners includes extensive variants, starting with three head shapes and a wide range of lengths. Extensive test documentation and services round off the range for you. This type of fastener is compatible and tested with all our other assembly systems.

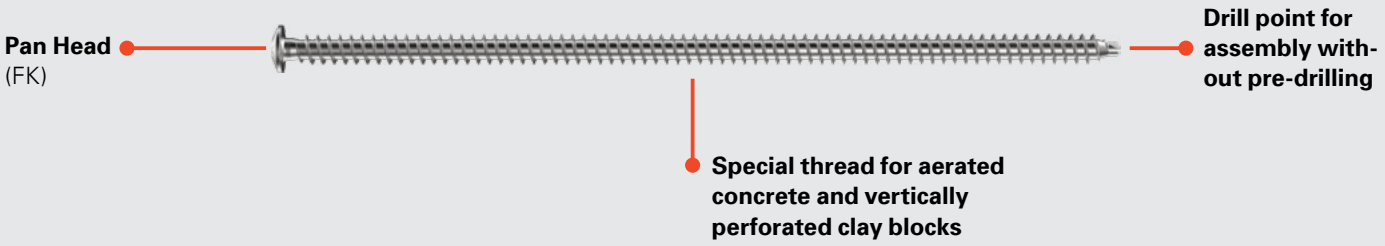
Product benefits at a glance
- Tested and approved up to RC3
- Design values available, MO-02 tested
- Various lengths
- Tapered inlet thread, supports an easy installation
- Highest quality level in straightness and forming
- Tested in combination with all systems of the SFS JB product family
- Clear characteristic & performance values for processing
- Attractive pan head for the "FK" variant

Tested according to:

- ☑ ift-zertified
- ☑ Resistance class RC2 + RC3
- ☑ Serviceability acc. to MO-02/1
- ☑ Fastening acc. to ONORM B 5320

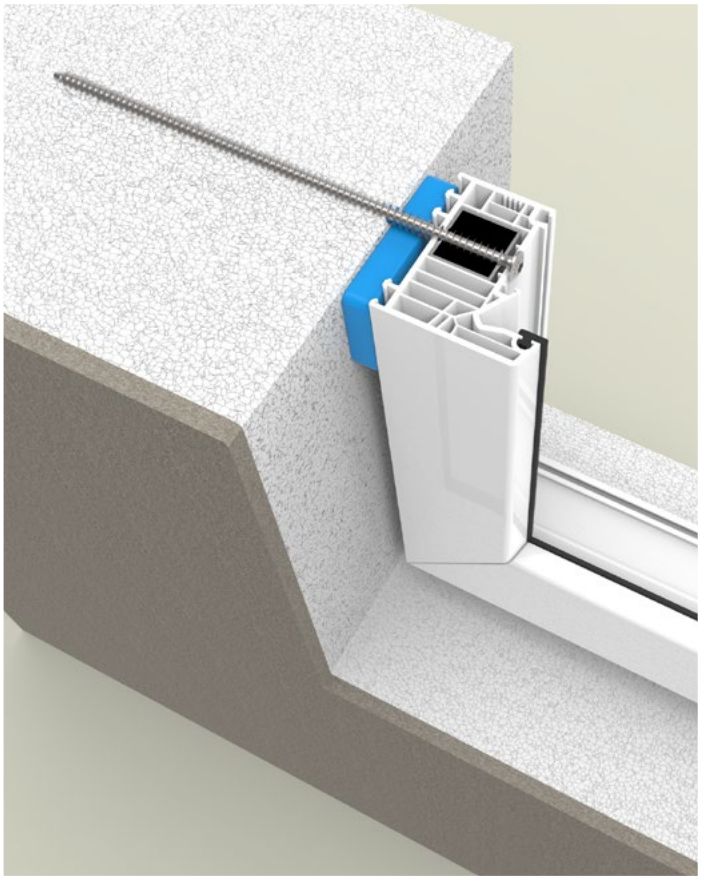


Product Benefits System FL



The solution – Frame Fastener FL
The fastening of windows always poses new challenges for the fabricators. Especially with weak wall substrates such as aerated concrete PP2 or vertically perforated bricks, where the standard solutions can reach their limits. With the FL frame fastener, you achieve a high load-bearing capacity and work quickly and safely.

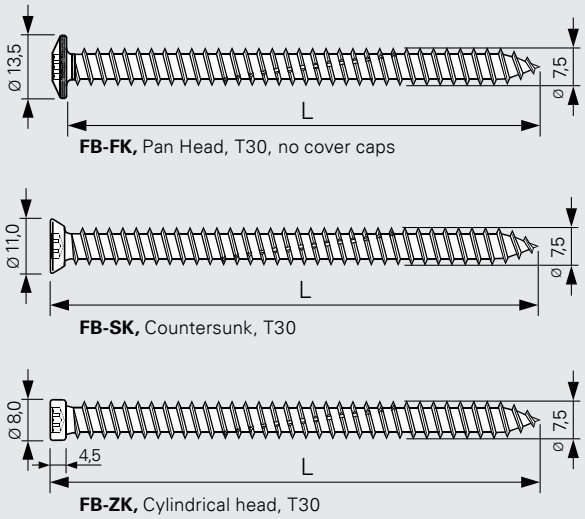
Product benefits at a glance
- Load-bearing fastening for critical wall substrates
- RC2-tested and passed
- Design values available, MO-02 tested
- Can be installed without pre-drilling (PP2)
- Highly corrosion-resistant surface
- Attractive pan head type “FK”
- Window frame pre-drilling with standard drill 6 mm



Tested according to:

- ☑ ift-zertified
- ☑ Resistance class RC2
- ☑ Serviceability acc. to MO-02/1
- ☑ Fastening acc. to ÖNORM B 5320

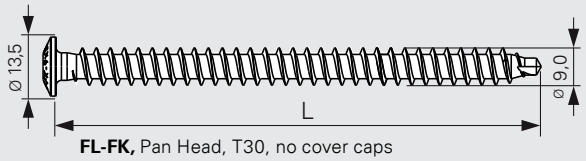
Description and Installation Instructions for FB and FL Systems



FB-FK, Pan Head, T30, no cover caps

FB-SK, Countersunk, T30

FB-ZK, Cylindrical head, T30



FL-FK, Pan Head, T30, no cover caps

FB Fastener

Material	Carbon steel, case hardened
Coating	White zinc plated
Cover caps	RAL-colors (only for FB-SK)
Packaging	Carton of 50/100 pieces (depending on length)
Processing	Electric or pneumatic screwdriver, Speed 700 rpm. Power over 500 W
Tip shape	Threaded tip
Application	Fastening in various substrates

FL Fastener

Material	Carbon steel, case hardened
Coating	HP special surface for increased corrosion protection
Cover caps	–
Packaging	Carton of 50 pieces
Processing	Electric or pneumatic screwdriver, Speed 700 rpm. Power over 500 W
Tip shape	Drill point
Application	Special fastener for aerated concrete and vertically perforated clay blocks

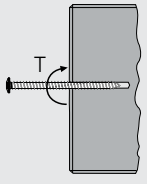
Setting torque and over-torque of fasteners

General conditions
Pre-drilling diameter and type:
Depending on the substrate, see "Processing instructions".

These values are not relevant for through-fixing, as the fixing is made at a distance. Accordingly, only the value for fixing brackets or consoles with FB to concrete is shown below.

To ensure sufficient assembly safety, the following condition must be fulfilled in accordance with MO-02:

$(T_u/T_{inst.})_{Rk} \geq 1{,}3$
This condition was met in the applications tested.



Substrate	Type/ Class	Insertion depth ET (mm)
Concrete	C20/25	40 to 60

Remarks
Testing and evaluation were carried out in accordance with MO-02/1, June 2015 edition. The fasteners have been tested in conjunction with SFS bracket and fastening systems. A transfer of the values to other systems and own constructions must be checked on site.

Testing and evaluation were carried out in accordance with MO-02/1, June 2015 edition. The fasteners have been testedin conjunction with SFS bracket and fastening systems. A transfer of the values to other systems and own constructions must be checked on site.

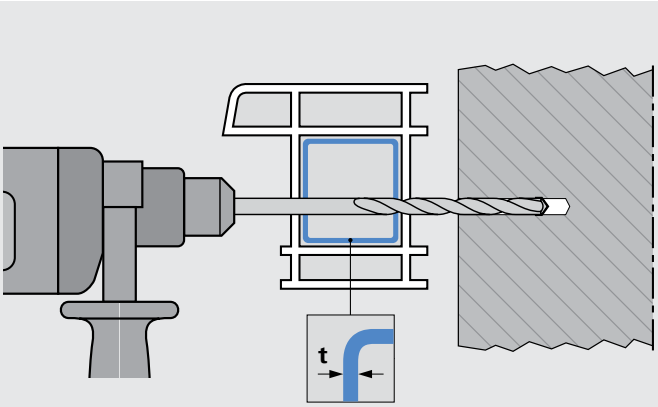
Pre-drilling Ø and insertion depth in various substrates

Substrate	Class	Fastener	Drill hole Ø (mm)	Rotary drilling	Impact drilling
Concrete	–	FB-7,5×L	6,0	–	x
Lime sandstone	≥ FKL 12		6,0	–	x
Poroton vertical perf. brick	< FKL 12		5,5	x	–
	≥ FKL 12		5,0	x	–
Aerated concrete	PP2	FL-9×L*	no pre-drilling	–	–
	≥ PP4		5 mm**	x	–
		FB-7,5×L	no pre-drilling	–	–
Timber	–		6,0	x	–
Steel	–		6,0	x	–

** Drilling depth: min. 50 mm

* **Pre-drilling-Ø für FL-9×L per reinforcement thickness**

t (mm)	**Ø** (mm)
1,5	6,0
2,0	6,5
3,0	7,5



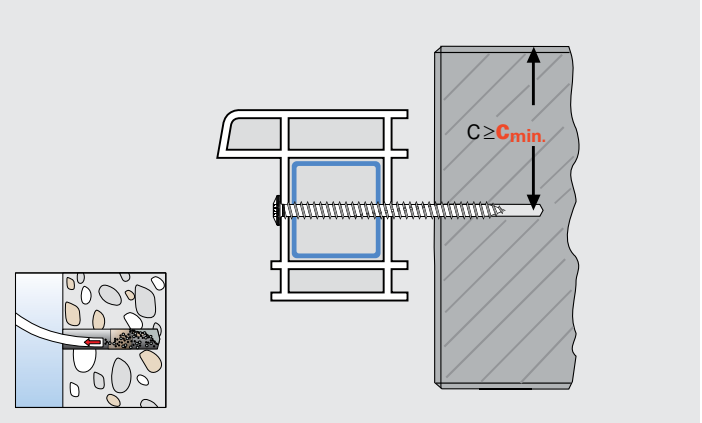
- Inserting and aligning of the window frame
- Drill holes through the pre-drilled window frames in the
- substrate
- Observe borehole diameter and depth!
- Drilling dust, dirt, etc. must be removed from the borehole with suitable tools

Edge distances

As a recognised rule of technology, the GfI basically specifies a **minimum edge distance (c_{min}) of 60 mm** for all substrates. Especially for substrates with low load-bearing capacity, such as vertically perforated bricks, an increase is necessary to achieve a permanently load-bearing connection. The specific edge distance for which the performance values were determined for each substrate is shown in the tables and must be observed.

Cleaning of the drill holes

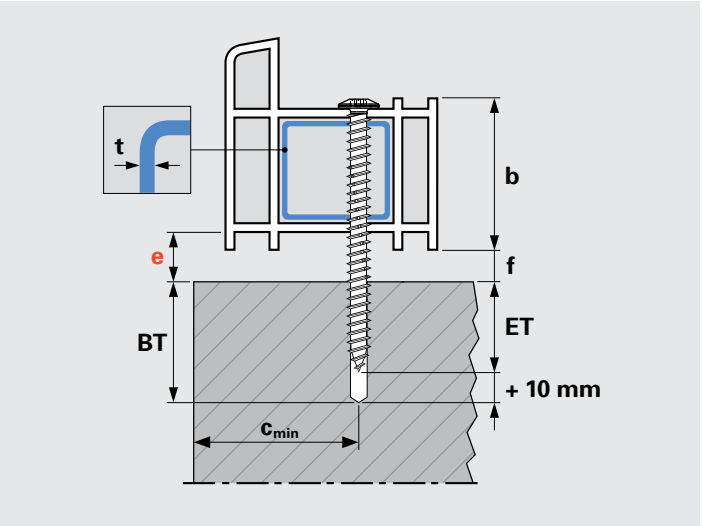
Drilling dust or other dirt must be removed from the drill holes.



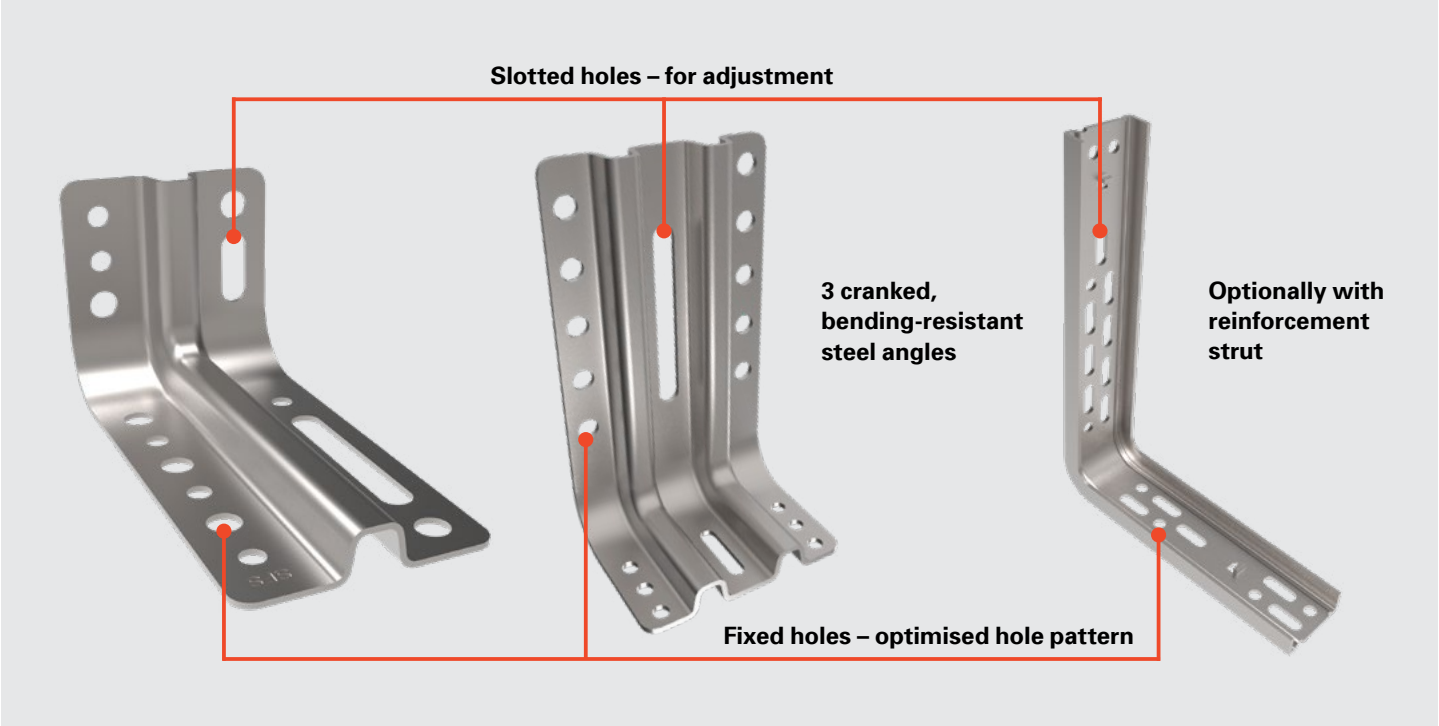
Free fastener length, determination of correct fastener length and drilling depth

The free fastener length "**e**" corresponds to the joint width plus any profiling of the frame or masonry. It is recommended to check the minimum drilling depth before setting the fasteners. The correct drilling depth without impurities must be observed. Minimum fastener length and minimum drilling depth are determined according to the following sketch:

b Frame width variable
f Joint width Frame to wall 10 10–20 mm (rec.)
BT Drilling depth Fastener-in depth + 10 mm
ET Fastener-in depth
c_{min} Minimum edge distance of 60 mm



Product Benefits JB-W, JB-W/XL and JB-A



The solution – mounting brackets JB-W, JB-W/XL and JB-A
Mounting brackets are used regularly in daily practice and are indispensable for craftsmen and fitters. We have developed a wide variety of mounting brackets for the most diverse needs and requirements. Whether for the force-locking installation of substructure profiles or the bottom connection on the window sill. As always, tested quality from SFS with clear application descriptions and load characteristics.



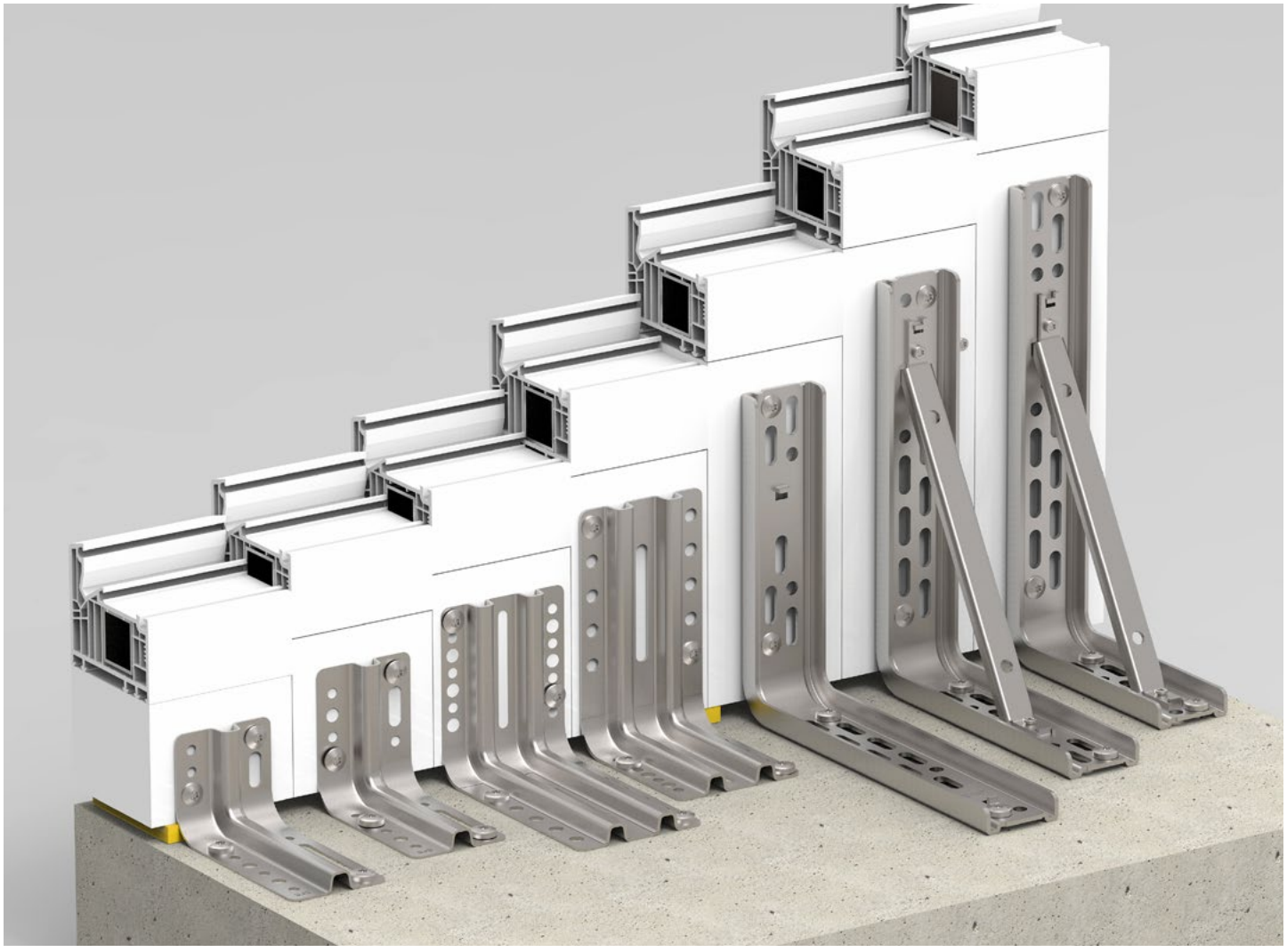
Description of Systems JB-W, JB-W/XL and JB-A

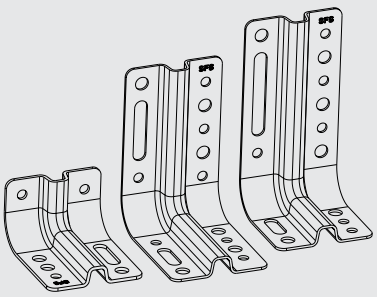
With the SFS bracket range, all threshold heights can be securely fastened.
Floor structures are getting higher and higher. With floortoceiling window elements, this makes it necessary to install higher threshold profiles. However, several coupled profiles act statically like a joint. To ensure the stability of the threshold and a safe transfer of the wind and service loads of windows, suitable fasteners must be used.

Product advantages at a glance
- Efficient, secure fastening of the profiles
- High flexibility due to offset fixing hole pattern
- Angles can be used on both sides
- Low stock keeping
- Tested and safe

The complete bracket range from SFS
- Tested safety for floor-level elements in any installation situation
- Designed for all threshold heights and even suitable for XXL heights (> 300 mm)
- Developed for stable, durable connections
- Designed for the highest loads
- Increased load transfer thanks to optional reinforcement struts

Tested
- ☑ ift-Guideline MO-02/1
- ☑ ETB-Guideline
- ☑ RC2 acc. to DIN EN 1627

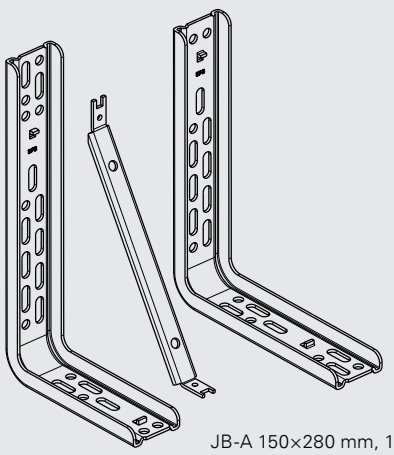




JB-W 70×40 mm, 120×60 mm, 100×80 mm

JB-W Mounting bracket

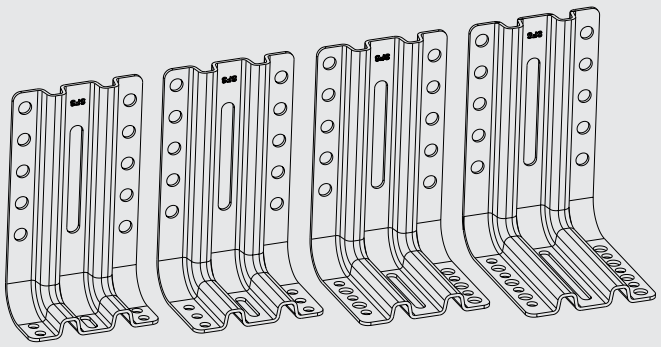
Material	Carbon steel S235
Coating	White zinc plated
Thickness	1,5 mm
Width	60 mm
Corrugation	10 mm
Hole Pattern	Ø 8/6 mm
Packaging	Carton of 50 pieces
Application	Carbon steel mounting bracket for secure fixing during window installation



JB-A 150×280 mm, 190×240 mm, JB-AS 205 mm

JB-A Mounting bracket

Material	Carbon steel S235
Coating	White zinc plated
Thickness	2,5 mm
Width	47 mm
Corrugation	15 mm
Hole pattern	Ø 8 mm
Packaging	Carton of 25 pieces
Application	Carbon steel mounting brackets for safe load transfer for floor-to-ceiling window elements



JB-W/XL 140×40 mm, 140×60 mm, 140×80 mm, 140×100 mm

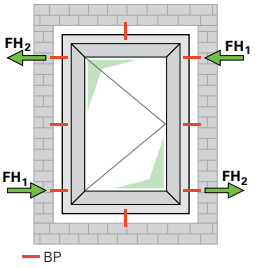
JB-W/XL Mounting bracket

Material	Carbon steel S235
Coating	White zinc plated
Thickness	2 mm
Width	80 mm
Corrugation	12 mm
Hole Pattern	Ø 8/6 mm
Packaging	Carton of 50 pieces
Application	Carbon steel mounting brackets for a safe load transfer, for in front of the wall mounting and threshold fastening

Design Values Systems FB and FL In Window Plane

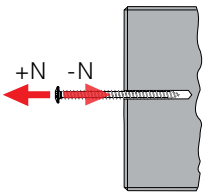
Constraints

Free fastener length (e)	Up to 20 mm (joint width + any profiling depth)
Pre-drilling diametrer and type	Depending on the substrate, see "Installation instructions"
Of blocking	In lime sandstone, concrete and aerated concrete ≥ PP 4, no blocking is required. For all other substrates, blocking is required
Profile extensions	Must be rigidly attached to frame profile, extension must be reinforced
Masonry strength classes	Values can be used for higher strength classes

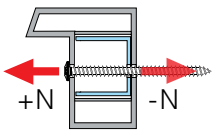




Fastening to the sides and the top

Arrangement and force direction	In the substrate						Compression and traction	
	Building material	Type/ Class	Fastening	Min. screw-in depth $ET_{min.}$ (mm)	Min. edge distance $c_{min.}$ (mm)	Tested acc. to	Permissible load $F_{empf.}$ (kN)	Design load F_{Rd} (kN)
	Concrete	C20/25	FB-7,5×L	40 1)	50	MO-02/1	0,85	1,19
	Lime sandstone	FKL 20		40				
	Clay block Poroton-T8	FKL 6		235	100		2)	2)
	Clay block Poroton-T8-P							
	Clay block Poroton-T10	FKL 8		120/235				
	Clay block Poroton-T12	FKL 10						
	Aerated concrete	PP 2	FL-9×L	160	60			
					100			
		PP 4			60		1,63	2,28
			FB-7,5×L	90	80		0,60	0,84
	Timber	C24		40	40		2,48	3,48

1) For concrete, the screw-in depth (ET) is min. 40 mm to max. 60 mm.
2) The load is transferred via suitable support blocks

In the window frame					Compression and traction	
	Building material	Type/ Class	Fastening	Tested acc. to	Permissible load $F_{empf.}$ (kN)	Design load F_{Rd} (kN)
	PVCu reinforced	1,5 mm	FB-7,5×L	MO-02/1	2,37	3,32
	PVCu reinforced square	1,5 mm	FL-9×L		3,96	5,54
	PVCu, unreinforced	3)			1,43	2,01
	Softtimber SPF 4)	400 kg/m³			2,49	3,48
	Aluminium 6)	1,5 mm	FB-7,5×L		1,20	1,68
	Aluminium 7)				2,39	3,35

3) Profile Type: Aluplast energeto® 8000
4) Profile Type: Salamander evoCore+
5) Required insertion depth in timber: at least 41 mm
6) Predrilled hole diameter: Stepped hole 6/8 mm in the frame profile
7) Predrilled hole diameter: 6 mm
8) The application-dependent influence factors A_1, A_2 and A_3 must be considered.

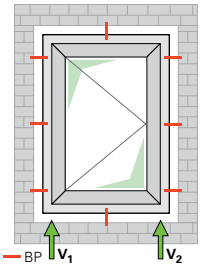
Remarks
Testing and evaluation were carried out in accordance with MO-02/1, June 2015 edition.
In the case of a penetrating downward fastening, the frame profile must be adequately sealed.
Concrete: Values determined in tests in lime sandbrick DFK 20.
Poroton: Values determined with smooth coat rendering (except soffit bricks). Clay block supplier: Wienerberger.

All information is non-binding and without guarantee.

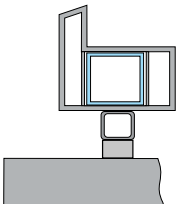
Design Values Systems FB and FL In Window Plane

Constraints

Free fastener length (e)	Up to 20 mm (joint width + any profiling depth)
Pre-drilling diametrer and type	Depending on the substrate, see “Installation instructions”
Of blocking	In lime sandstone, concrete and aerated concrete ≥ PP 4, no blocking is required. For all other substrates, blocking is required
Profile extensions	Must be rigidly attached to frame profile, extension must be reinforced
Masonry strength classes	Values can be used for higher strength classes



Fastening to the bottom

Arrangement and force direction	In the substrate
	The load is transferred via suitable support blocks

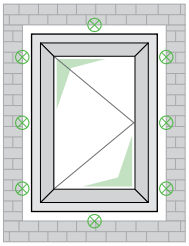
Remarks
Testing and evaluation were carried out in accordance with MO-02/1, June 2015 edition.
In the case of a penetrating downward fastening, the frame profile must be adequately sealed.
Concrete: Values determined in tests in lime sandbrick DFK 20.
Poroton: Values determined with smooth coat rendering (except soffit bricks). Clay block supplier: Wienerberger.

All information is non-binding and without guarantee.

Design Values Systems FB and FL
90° to the Window Plane

Constraints

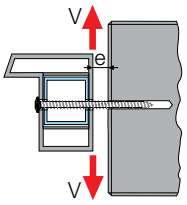
Free fastener length (e)	Up to 20 mm (joint width + any profiling depth)
Pre-drilling diametrer and type	Depending on the substrate, see "Installation instructions"
Of blocking	In lime sandstone, concrete and aerated concrete ≥ PP 4, no blocking is required. For all other substrates, blocking is required
Profile extensions	Must be rigidly attached to frame profile, extension must be reinforced
Masonry strength classes	Values can be used for higher strength classes





Fastening umlaufend

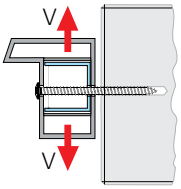
Arrangement and force direction



In the substrate

Building material	Type/ Class	Fastening	Min. screw-in depth $ET_{min.}$ (mm)	Min. edge distance $c_{min.}$ (mm)	Tested acc. to	Transverse load: Permissible load $F_{empf.}$ (kN)	Transverse load: Design load F_{Rd} (kN)
Concrete	C20/25	FB-7,5×L	40 1)	50	MO-02/1	1,69	1,90
				60		1,91	1,91
Lime sandstone	FKL 20		40	50		0,88	1,23
				60		1,90	1,90
Clay block Poroton-T8	FKL 6		235	100		0,59	0,63
Clay block Poroton-T8-P						0,38	0,38
Clay block Poroton-T10	FKL 8		120			0,37	0,52
			235			0,72	1,01
Clay block Poroton-T12	FKL 10		120			0,38	0,53
			235			0,66	0,93
Aerated concrete	PP 2	FL-9×L	160	60		0,37	0,52
				100		0,48	0,60
	PP 4			60		0,75	0,77
		FB-7,5×L	90	80		0,56	0,78
Timber	C24		40	40		0,95	0,95

1) For concrete, the screw-in depth (ET) is min. 40 mm to max. 60 mm.
If the ET for concrete is higher than 60 mm, pre-drilling with D = 6.5 mm is recommended. Please note that the load values change when increasing the drill diameter. Please send your enquiry for the application separately.



In the window frame

Building material	Type/ Class	Fastening	Tested acc. to	Transverse load: Permissible-load $F_{empf.}$ (kN)	Transverse load: Design load F_{Rd} (kN)
PVCu reinforced	1,5 mm	FB-7,5×L	MO-02/1	2,39	2,39
PVCu reinforced square	1,5 mm	FL-9×L		2,60	2,60
PVCu, unreinforced	2) 4)			1,39	1,39
PVCu, unreinforced	3) 4)			1,14	1,24
Softtimber SPF 3)	400 kg/m³			2,31	2,31
Aluminium	1,5 mm	FB-7,5×L		1,78	1,92

2) Profile Type: Aluplast energeto® 8000
3) Profile Type: Salamander evoCore+
4) The application-dependent influence factors A_1, A_2 and A_3 must be considered.

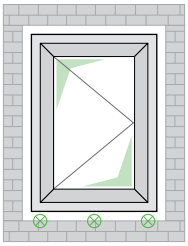
Remarks
Testing and evaluation were carried out in accordance with MO-02/1, June 2015 edition.
In the case of a penetrating downward fastening, the frame profile must be adequately sealed.
Concrete: Values determined in tests in lime sandbrick DFK 20.
Poroton: Values determined with smooth coat rendering (except soffit bricks). Clay block supplier: Wienerberger.

All information is non-binding and without guarantee.

Design Values Systems JB-W
90° to the Window Plane

Boundary conditions

Distance top edge angle to frame	Up to 20 mm
Tested profile extensions	Veka Softline 82 mm, reinforced square 1,5 mm Stadur FrameTec 82 mm
Connection profile extensions	Must be designed to be bend-resistant. Selected: • PVCu: 4 × SPC4-5,5×L, screwing from the extension into the frame, distance 40/200 mm • Stadur: 4 × BS-4,8×L, screwing from the extension into the frame, distance 40/200 mm The profile extensions must have sufficient load-bearing capacity. PVCu profiles must be reinforced PVCu reinforced: 2 × FB-FK-7,5×42
Bracket attachment	Stadur: 2 × FB-FK-7,5×62 Concrete: 6 mm, impact drilling
Pre-drill diameter and type	PVCu: 4,3 mm for SPC4 into the extension, rotary drilling Stadurlon: 5 mm, into the extension, rotary drilling The values shown are valid within these framework conditions



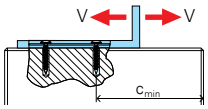

JB-W 70×40


JB-W 120×60


JB-W 100×80

Fastening to the bottom

Arrangement and force direction

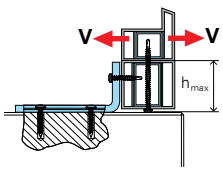


In the substrate

Building material	Type/ Class	Fastening	Min. edge distance $c_{min.}$ (mm)	Tested acc. to	Transverse load: Permissible load $F_{empf.}$ (kN) Tension 3)	Permissible load $F_{empf.}$ (kN) Compr. 4)	Design load F_{Rd} (kN) Tension 3)	Design load F_{Rd} (kN) Compr. 4)
Concrete	C20/25	2 × MMS-plus-P-7,5×50	50	MO-02/1	1)	1)	1)	1)
Lime sandstone	DFK 20							

1) Failure in the JB-W or in the window frame

In the window frame



Building material	Construction hight 2) $h_{max.}$ (mm)	Type/ Class	Fastening	Tested acc. to	Transverse load: Permissible load $F_{empf.}$ (kN) Tension 3)	Permissible load $F_{empf.}$ (kN) Compr. 4)	Design load F_{Rd} (kN) Tension 3)	Design load F_{Rd} (kN) Compr. 4)
PVCu reinf. square	80	1,5 mm	2 × FB-FK-7,5×42	MO-02/1	1.69	1.09	1.69	1.09
+ PVC reinforced	120				1.09	0.62	1.09	0.62
PVCu reinf. square	80	1,5 mm	2 × FB-FK-7,5×62		1.45	1.14	1.45	1.14
+ Stadur	120				0.86	0.71	0.86	0.71

2) Extension incl. possible underblocking
3) Outwards
4) Inwards
5) The application-dependent influence factors A_1, A_2 and A_3 must be considered.

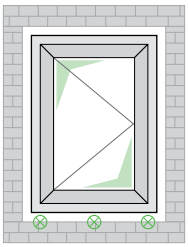
Remarks
Testing and evaluation were carried out in accordance with MO-02/1, June 2015 edition.
In the case of a penetrating downward fastening, the frame profile must be adequately sealed.
Concrete: Values determined in tests in lime sandstone DFK 20.

All information is non-binding and without guarantee.

Design Values Systems JB-W/XL
90° to the Window Plane

Boundary conditions

Distance top edge angle to frame	Up to 20 mm
Tested profile extensions	Veka Softline 82 mm, reinforced rectangular tube 1.5 mm, Stadur FrameTec 70/82×150 mm Rodenberg Porta FRAME RV 70×150 mm
Connection profile extensions	Must be designed to be bend-resistant. Selected: • PVC reinforced, construction height 120 mm: 4×SPC4-5.5×125, connection from the extension into the frame, distance 60 and 200 mm from the central axis of the angle. Predrilled hole 5.5 mm in the extension. • PVC reinforced, construction height 160 mm: 3×FB-FK-7.5×182, connection from the frame into the extension, distance 200 mm. Predrilled hole 6 mm in the extension. • Stadur: 4×FB-FK-7.5×132, connection from the frame into the extension, predrilled hole 6 mm. Or 4×BS-4.8×170 or BS-4.8×130 (construction height 120 mm), connection from the profile extension into the frame, predrilled hole 5 mm in the extension. Distance 40 and 200 mm from the central axis of the angle. • Rodenberg: 4×BS-4.8×170, connection from the profile extension into the frame, distance 40 and 200 mm from the central axis of the angle. Predrilled hole 5 mm in the extension. The profile extensions must be structurally adequate. PVC profiles must be reinforced.
Bracket attachment at the profile processor works	PVCu reinforced: 2 × FB-FK-7,5×42, 6 mm predrilled hole Stadur and Rodenberg: 3×FB-FK-7.5×62, no predrilled holes
Predrilled hole diameter and type	Concrete: 6 mm, hammer drill The documented values apply within these boundary conditions



⊗BP



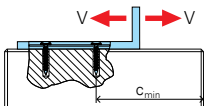
JB-W/XL 140×80



JB-W/XL 140×100

Fastening to the bottom

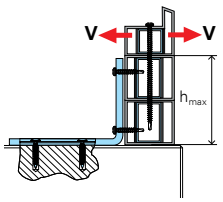
Arrangement and force direction



In the substrate

Building material	Type/ Class	Fastening	Min. edge distance $c_{min.}$ (mm)	Tested acc. to	Transverse load: Permissible load $F_{empf.}$ (kN) Tension 3)	Permissible load Compr. 4)	Design load F_{Rd} (kN) Tension 3)	Design load Compr. 4)
Concrete	C20/25	2 × MMS-plus-P-7,5×50	50	MO-02/1	1)	1)	1)	1)
Lime sandstone	DFK 20							

1) Failure in the JB-W/XL or in the window frame



In the window frame

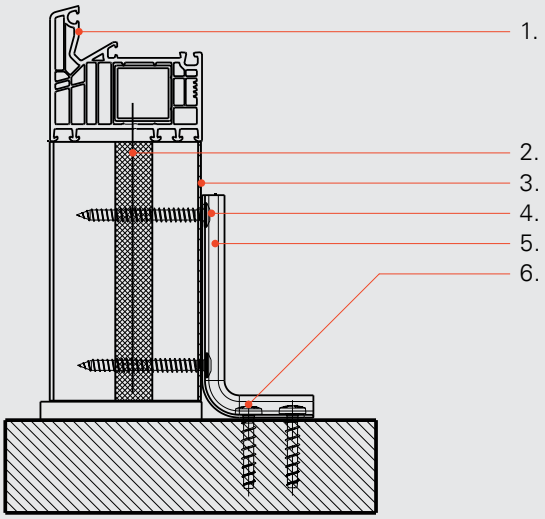
Building material	Construction hight 2) $h_{max.}$ (mm)	Type/ Class	Fastening	Tested acc. to	Transverse load: Permissible load $F_{empf.}$ (kN) Tension 3)	Permissible load Compr. 4)	Design load F_{Rd} (kN) Tension 3)	Design load Compr. 4)
PVC reinf. square.	120	1,5 mm	2 × FB-FK-7,5×42	MO-02/1	1,43	1,21	1,43	1,21
+ PVCu reinforced	160				0,72	0,59	0,72	0,59
PVC reinf. square	120		3 × FB-FK-7,5×62		1,53	1,63	1,53	1,63
+ Stadur 5)	160				0,67	0,87	0,67	0,87
PVCu reinforced + Rodenberg 5)					0,94	0,47	0,94	0,47

2) Extension incl. possible underblocking
3) Outwards
4) Inwards
5) The application-dependent influence factors A_1, A_2 and A_3 must be considered.

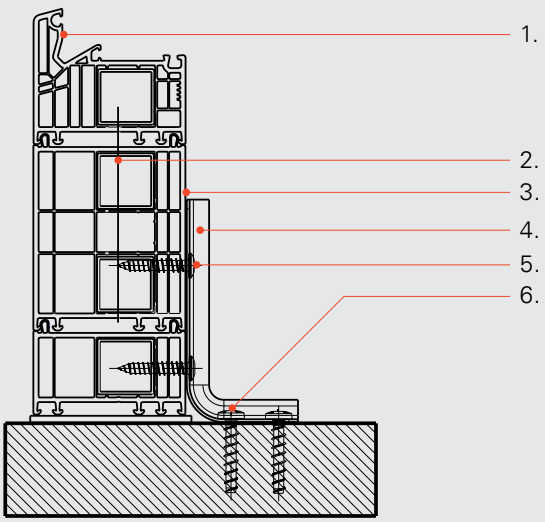
Remarks
Testing and evaluation were carried out in accordance with MO-02/1, June 2015 edition.
In the case of a penetrating downward fastening, the frame profile must be adequately sealed.
Concrete: Values determined in tests in lime sandstone DFK 20.

All information is non-binding and without guarantee.

Installation Situations JB-W and JB-W/X



Description
1. Window frame
2. Fastener BS-4,8×L/BS-6,1×L/FB-FK 7,5×L
3. Additional profile extension Stadur Frame Tec
4. Fastener FB-FK 7,5×L
5. Bracket JB-W/JB-W/XL
6. Fastener Multi Monti-plus 7,5×L

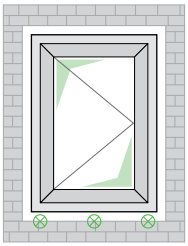


Description
1. Window frame
2. Fastener SPC-5,5×L/FB-FK 7,5×L
3. Additional profile
4. Winkel JB-W/JB-W/XL
5. Fastener FB-FK 7,5×L
6. Fastener Multi Monti-plus 7,5×L

Design Values Systems JB-A
90° to the Window Plane

Boundary conditions

Distance top edge of angle to window frame	Up to 20 mm
Approved profile extensions	Veka Softline 2×100 mm + 1×45 mm, reinforced 1.5 mm, Stadur Frame Tec 70×290 mm Rodenberg Porta FRAME RV 70×290 mm
Connection profile extensions	• PVC reinforced: 2×SPC4-5.5×75 (extension into profile) and 2 x SPC4-5.5x125 mm (extensions to one another) • Stadur: 4×FB-FK-7.5×132, connection from the frame into the extension, distance 40 and 200 mm from the central axis of the angle. • Rodenberg 4×BS-4.8×300, connection from the profile extension into the frame, distance 40 and 200 mm from the central axis of the angle.
Connection angle at the profile processor works	PVC reinforced: 2 × FB-FK-7,5×42, 6 mm hole predrilled Stadur: 4 × FB-FK-7,5x72, not predrilled Rodenberg: 4 × FB-FK-7,5×62, not predrilled
Predrilled hole diameter and type	Concrete: 6 mm, hammer drill
Use reinforcement strut	For all applications except with leg height 150 mm to the window frame. The documented values apply within these boundary conditions



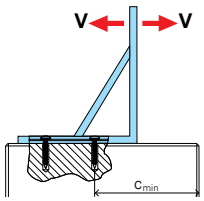

JB-A 150/280 + JB-AS-205


JB-A 190/240 + JB-AS-205


JB-A 150/280

Fastening to the bottom

Arrangement and force direction

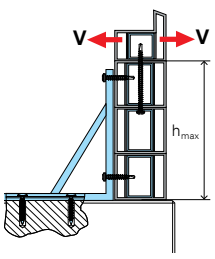


In the substrate

Building material	Type/ Class	Fastening	Min. edge distance $c_{min.}$ (mm)	Tested acc. to	Transverse load: Permissible load $F_{empf.}$ (kN) Tension 3)	Transverse load: Permissible load $F_{empf.}$ (kN) Compr. 4)	Transverse load: Design load F_{Rd} (kN) Tension 3)	Transverse load: Design load F_{Rd} (kN) Compr. 4)
Concrete	C20/25	2 × FC-7,2×45	60	MO-02/1	1)	1)	1)	1)
		2 × MMS-plus-P-7,5×50	50					

1) Failure in the JB-A or in the window frame

In the window frame



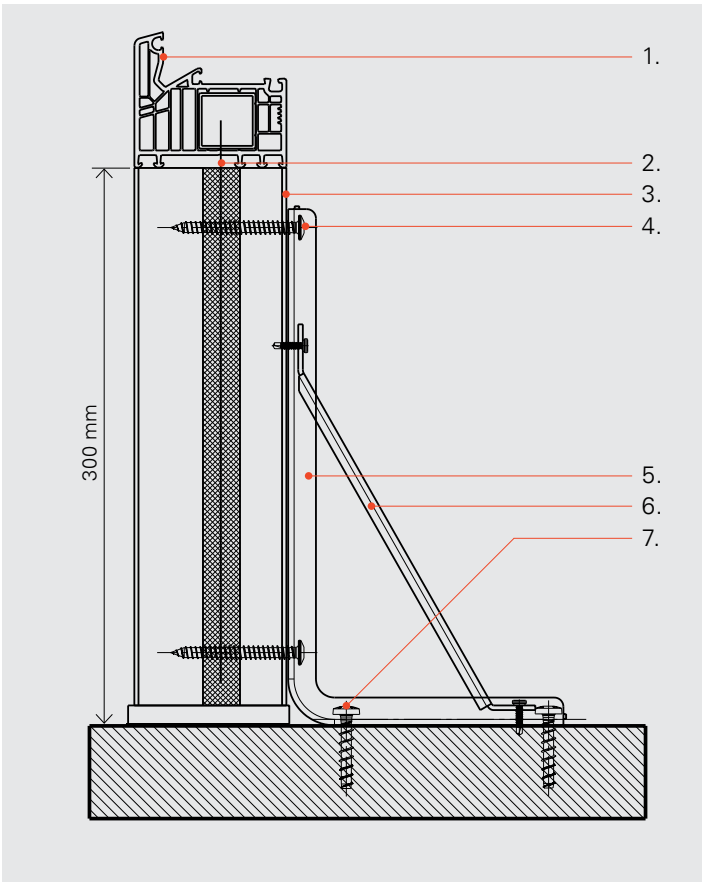
Building material	Type/ Class	Construct. hight 2) $h_{max.}$ (mm)	Fastening	Tested acc. to	Transverse load: Permissible load $F_{empf.}$ (kN) Tension 3)	Transverse load: Permissible load $F_{empf.}$ (kN) Compr. 4)	Transverse load: Design load F_{Rd} (kN Tension 3)	Transverse load: Design load F_{Rd} (kN Compr. 4)
PVCu reinforced + PVCu reinforced	1,5 mm	260	3 × FB-FK-7,5×42	MO-02/1	0,92	0,61	0,92	0,61
PVCu reinforced + Stadur		300	4 × FB-FK-7,5×72		0,53	0,35	0,53	0,35
PVCu reinforced + Rodenberg 5)			4 × FB-FK-7,5×62		0,55	0,39	0,55	0,39

2) Extension incl. possible underblocking
3) Outwards
4) Inwards
5) The application-dependent influence factors A_1, A_2 and A_3 must be considered.

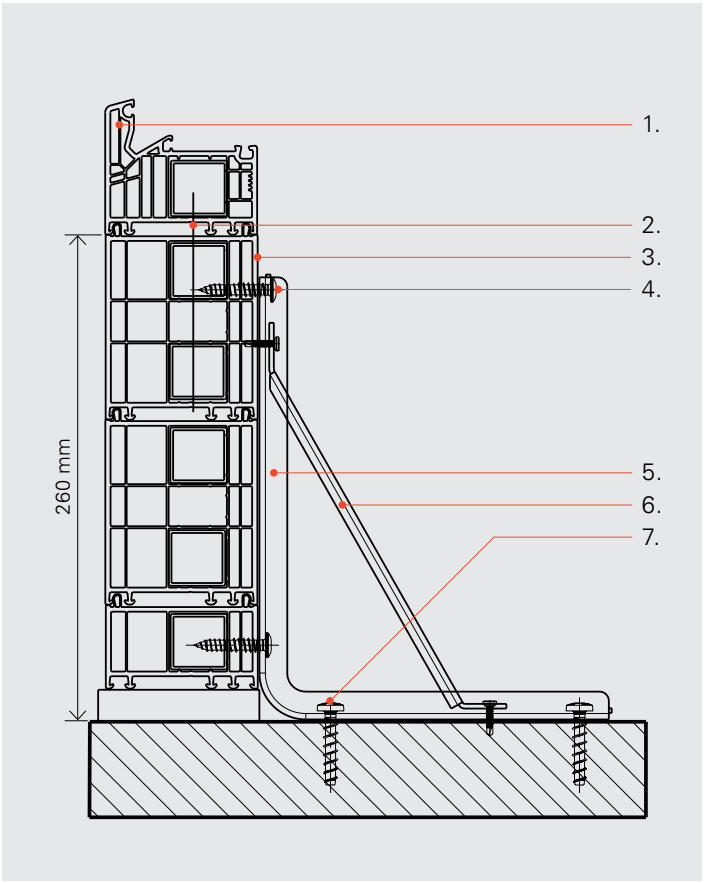
Remarks
Testing and evaluation were carried out in accordance with MO-02/1, June 2015 edition.
In the case of a penetrating downward fastening, the frame profile must be adequately sealed.
Concrete: Values determined in tests in lime sandstone DFK 20.

All information is non-binding and without guarantee.

Installation Situations JB-A



PVCu reinforced + Stadurlon
1. Window frame
2. Fastener FB-FK 7,5×L
3. Additional profile extension Stadur
4. Fastener FB-FK 7,5×L
5. Bracket JB-A
6. Strut JB-AS 205
7. Fastener Multi Monti-plus 7,5×L



PVCu reinforced
1. Window frame
2. Fastener SPC4-5,5×L/FB-FK-7,5xL
3. Additional profile
4. Fastener FB-FK 7,5×L
5. Bracket JB-A
6. Strut JB-AS 205
7. Fastener Multi Monti-plus 7,5×L

Test Reports and Installations Instructions Systems FB and FL

Application	System	What	Substrate/Remark	Institut	No.	Year	Link	QR-Code
Installation in the wall, Standard	FB	Component testing acc. to MO-02/1	Vertical perforated clay block Plan-T10-30.0-10DF	ift	14-004099-PR02	2015	www.sfs.com/bc_141	
Installation in the wall, Break-in resistance	FB	RC2 acc. to DIN EN 1627:2011	Brick work ≥ DFK12, with back lining	ift	18-002193-PR02	2018	www.sfs.com/bc_143	
Installation in the wall, Standard	FL	Installation instruction	Aerated concrete PP2	–	–	2020	www.sfs.com/bc_154	
Installation in the wall, Break-in resistance	FL	RC2 acc. to DIN EN 1627:2011		ift	18-002501-PR01	2018	www.sfs.com/bc_155	

Further test reports and installation manuals available in German Language

Test Reports and Installations Instructions Systems JB-W, JB-W/XL and JB-A

Application	System	What	Substrate/Remark	Institut	No.	Year	Link	QR-Code
Safety Barrier	JB-W, JB-W/XL, JB-A	Proof	ETB	ift Rosen-heim	19-004079-PR01 20-001405-PR01	2020	www.sfs.com/bc_107	
Threshold fastening	JB-A	Installation manual	Concrete/ Limesandstone	–	–	2020	www.sfs.com/bc_108	
Threshold fastening	JB-W	Installation manual	Concrete/ Limesandstone	–	–	2020	www.sfs.com/bc_109	
Threshold fastening	JB-W/XL	Installation manual	Concrete/ Limesandstone	–	–	2021	www.sfs.com/bc_113	
Threshold fastening	JB-A	Proof	MO-02	ift Rosen-heim	19-002573-PR04	2020	www.sfs.com/bc_110	

Further test reports and installation manuals available in German Language

Delivery Range FB and FL

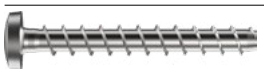
Product	Designation	Code	Recess	Ø (mm)	Length (mm)	PU (pcs.)	Item no.
	FB Universal frame anchor Type **FK**	FB-FK-7,5×L	T30	7,5	42	100	1117989
					62		1117987
					72		1115791
					82		1115795
					92		1117985
					102		1117984
					112		1117982
					122		1115797
					132		1089936
					152		1115545
					182		1115546
					212		1117981
					252	50	1322555
					300		1175443
					350		1563818
					400		1563819
	FB Universal frame anchor Type **ZK**	FB-ZK-7,5×L	T30	7,5	42	100	533628
					62		533630
					72		533631
					82		533633
					92		533634
					102		533635
					112		533636
					122		533637
					132		533641
					152		533647
					182		533648
					212		533649
					252	50	1504218
					300		1504217
	FB Universal frame anchor Type **SK**	FB-SK-7,5×L	T30	7,5	42	100	1622825
					62		1622827
					72		1622828
					82		1622841
					92		1622843
					102		1622844
					112		1622846
					122		1622848
					132		1622849
					152		1622855
					182		1622857
					212		1622858
					252	50	1504216
					300		1107630
	FL Special frame fastener Type **FK**	FL-FK-9×L	T30	9,0	245	50	1580711
					300		1580718

Product	Designation	Code	Ø (mm)	Colour	PU (pcs.)	Item no.
	Cover caps, only for Type **SK**	CC-FB-RAL9010	10,5	White	100	283394
		CC-FB-RAL1015		Beige		633956
		CC-FB-RAL7035		Grey		935450
		CC-FB-RAL8014		Chestnut		633957
		CC-FB-RAL9005		Black		839147

Delivery Range Systems JB-W, JB-W/XL and JB-A

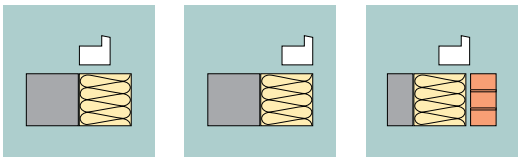
Product	Designation	Code	Length/s (mm)	Width (mm)	PU (pcs.)	Item no.
	JB-W Mounting bracket	JB-W-70×40	70/40	55	50	1653825
		JB-W-120×60	120/60			1653826
		JB-W-100×80	100/80			1653872
140×40 140×60 	JB-W/XL Mounting bracket	JB-W/XL-140×40	140/40	80	50	1573530
		JB-W/XL-140×60	140/60			1573575
140×80 140×100 		JB-W/XL-140×80	140/80			1691959
		JB-W/XL-140×100	140/100			1691946
	JB-A Mounting bracket	JB-A-150×280	150/280	47	25	1548812
		JB-A-190×240	190/240			1548789
	JB-A Strut	JB-AS-205	205	20		1548811

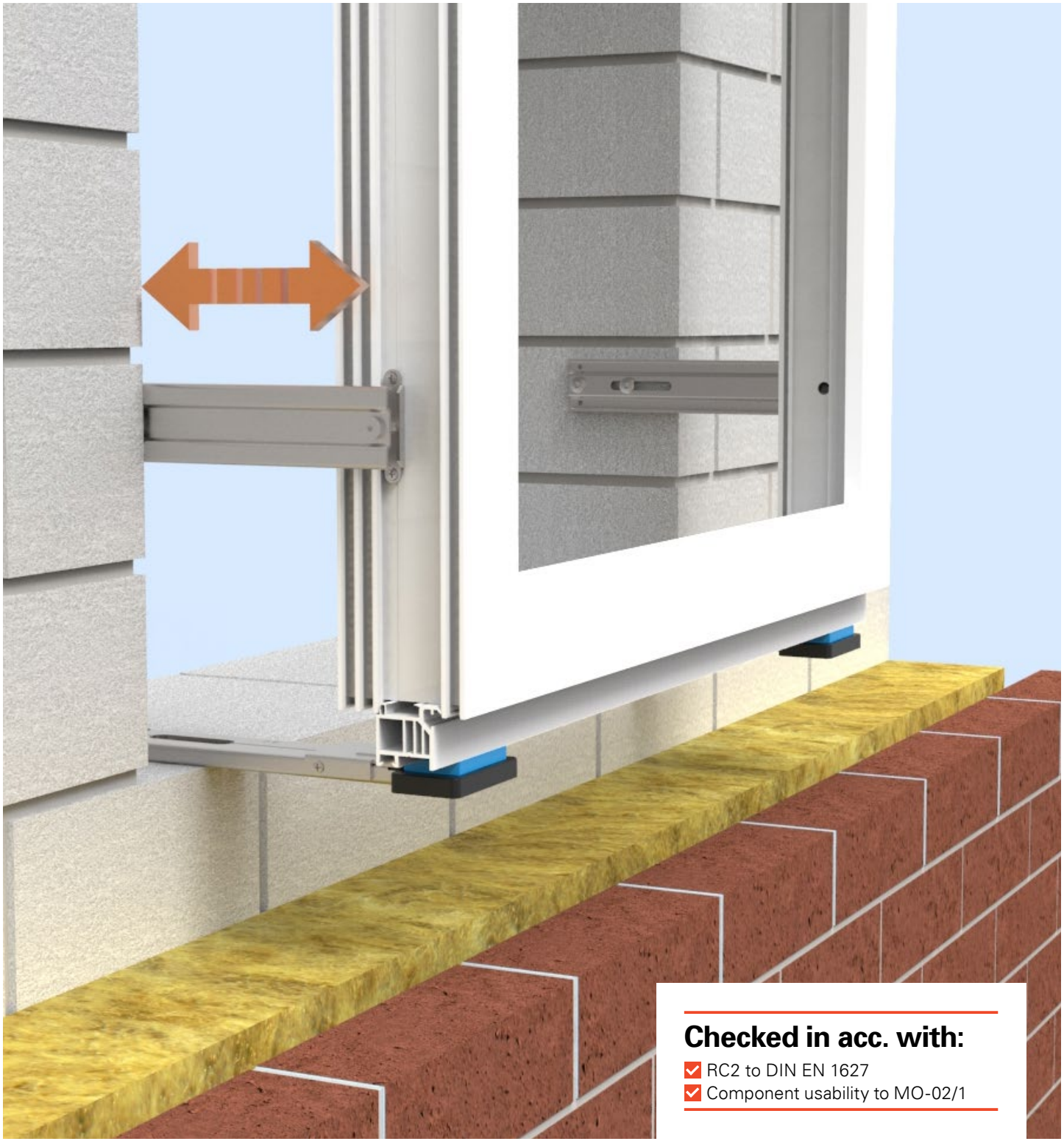
Accessories for Systems FB, FL, JB-W, JB-W/XL, JB-A

Product	Designation	Code	Recess	Ø (mm)	Length (mm)	PU (pcs.)	Item no.
	Drill fastener BS	BS-4,8×L	T25	4,8	70	250	1261140
					100		1261144
					120		1261146
					170		1261151
					220		1261154
					300		1261157
		BS-6,1×L		6,1	70		1352562
					100		1352565
					120		1351286
					170		1352567
					220		1352579
					300		1352583
	Coupling fastener SPC	SPC4-5,5×L	T25	5,5	45	100	1133336
					55		1133777
					65		1133778
					75		1133779
					85		1133780
					95		1133782
					105		1133783
					125		1384747
					150		1384501
	VAP mounting fastener for timber and PVCu, not reinforced	VAP-6,0×40	T30	6,0	40	100	1147091
	MULTI-MONTI-plus-P for concrete and limesandstone	MMS-plus-P-7,5×50	T30	7,5	50	100	1480041
		P-7,5×60			60		1480042

Product	Designation	Code	Recess	Ø (mm)	Length (mm)	PU (pcs.)	Item no.
	Bit T25	T25-25-Hex¼"	T25	¼"	25	10	24008
	Bit T30	T30-50-Hex¼"	T30	¼"	50	1	57539
	Bit T30	T30-90-Hex¼"	T30	¼"	90	1	654613
	Special drill for vertical perforated clay block	ZSD-5,0×400/300		5,0	400	1	1514297
		ZSD-5,5X400/300		5,5			1488880

Installation in front of the wall



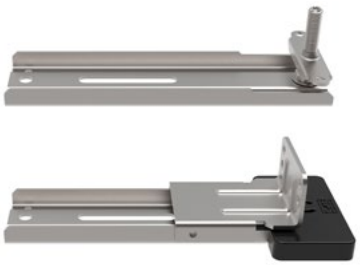
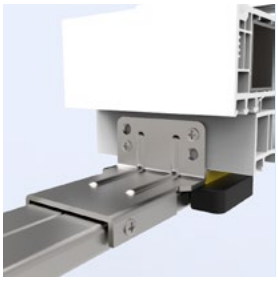
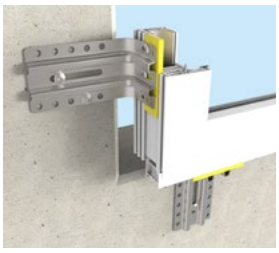


Checked in acc. with:

- ☑ RC2 to DIN EN 1627
- ☑ Component usability to MO-02/1

General information

Product overview

System		Application	
JB-D®-U			In front of wall installation using bracket, side with bolt, bottom with plate
JB-D®-R			In front of wall installation using bracket, for large cantilevers and high loads, side with bolt, bottom with plate
JB-D®-CB			Additional bracket for fastening to substrates with low load capacity or to hollow bricks
JB-D®-W			Angle for transferring horizontal loads bottom
JB-W/XL			Edge fastening on the outside, also for use with windows deeper than the reveal opening

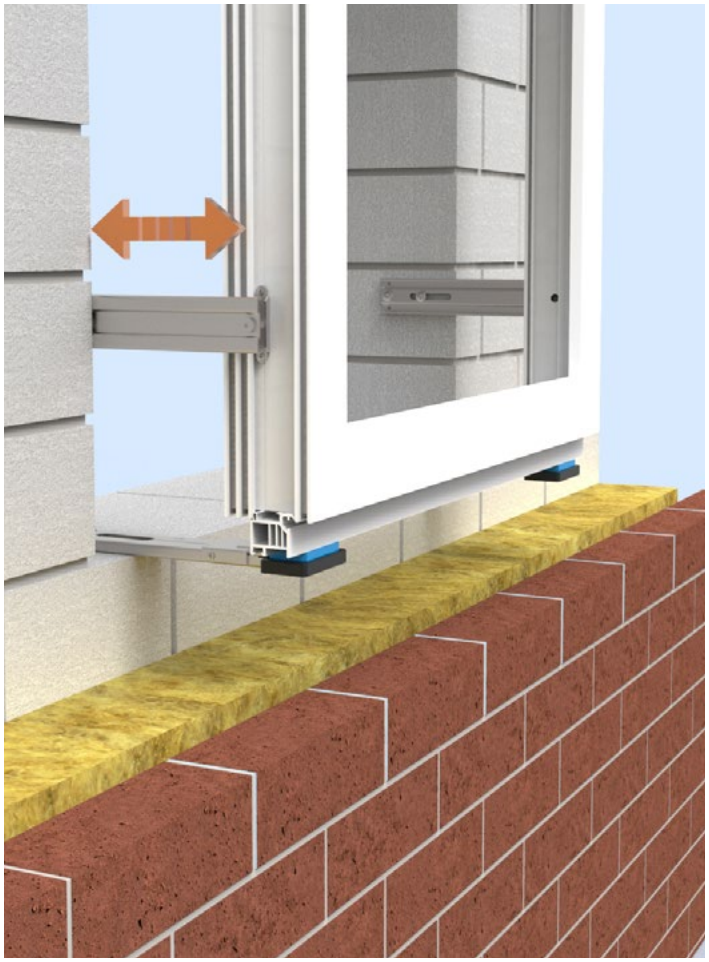
The solution – JB-D® PLUS bracket system

From now on, window installation in front of load-bearing wall constructions will be simpler, quicker and safer than ever before: the JB-D® PLUS fastening system for in front of the wall installation – suitable for use for load transfer and safety barrier – has a National Technical Approval (abZ). Specially designed for transferring large loads, the structurally certified system solution with documented component load capacities provides the best basis for durable, safe assembly and installation. Manufactured out of the non-combustible material steel in accordance with the provisions of DIN 4102-1 class A, the system can satisfy high requirements for safety against fire. High quality is also assured by ift certification, proof of burglar resistance and thermal calculations.

Consistently designed for added value
The high capabilities of the JB-D® PLUS create additional advantages for fabricators, assemblers and installers. All the forces acting on the window are transferred as point loads through rigid brackets which can be also be used for cantilevers up to 150 mm. Thus providing the greatest possible flexibility. For compliant fabrication and assembly. This greatly increased scope of application means the system can be used with all common frame materials, frame extensions and wall substrates.

Further Added Value comes from the rectangular cross section specially designed for long cantilevers: ensuring the highest load capacity without additional support angles, forming the ideal solution for installation in double-skinned masonry with wall opening edging strips. JB-D PLUS® installation does not necessarily require any change in the sequence of traditional construction operations around the opening.

Fusing cost-effectiveness and efficiency
High cost-effectiveness, efficient installation and low fabrication costs – the JB-D® PLUS system has inherent advantages when it comes to saving time and money. They extend from easy 3D adjustment and robust load transfer during installation to trouble-free interfaces with subsequent trades such as ETICS installation. Other great benefits include the ability to install from inside the building and the consistent implementation of a well-designed modular system, versatility and reduced warehousing requirements.



Product advantages at a glance

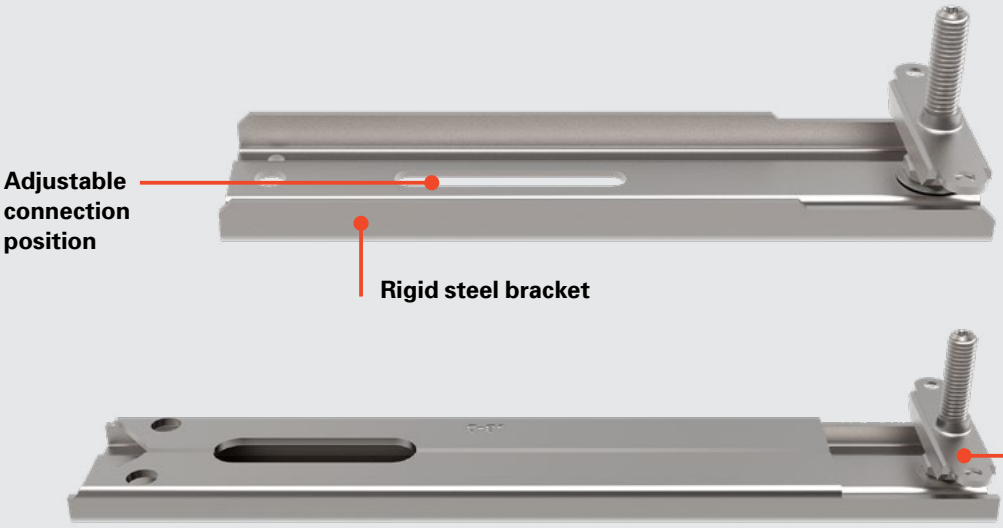
- A fastening system for in front of the wall installation with national technical approval – which also satisfies building components with safety barrier characteristics
- Reduced number of fastening points required due to this solution catering for both load transfer and the installation of safety barriers (e.g. Juliet balconies)
- Structurally certifiable solution with documented component load capacities
- Point load transfer of all the forces from the installed elements through rigid brackets
- 3D adjustability for simple and quick alignment
- Suitable for use on all cantilevers up to 150 mm
- Universal application, including double-skin brick wall with wall opening edge strips
- Flexible installation – can be installed from the interior of the building
- Steel-based system, non-combustible material in accordance with DIN 4102-1 class A

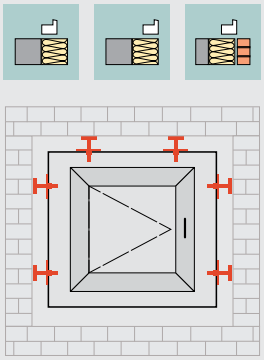
Tested and approved

- ☑ National Technical Approval (abZ), Z-14.4-806 (DIBt)
- ☑ MO-02/1 – usability in accordance with ift guideline
- ☑ Fastenings in accordance with Austrian standard ÖNORM B 5320
- ☑ ift certified
- ☑ RC2 - Burglary resistance class in acc. with DIN EN 1627

SFS Werk 30 Z-14.4-806

JB-D® PLUS system advantages – connection at the sides and top





Rotatable, threaded bolts
Mounting plate for fixing to frame profile (predrilled 10.5 mm), adjustable

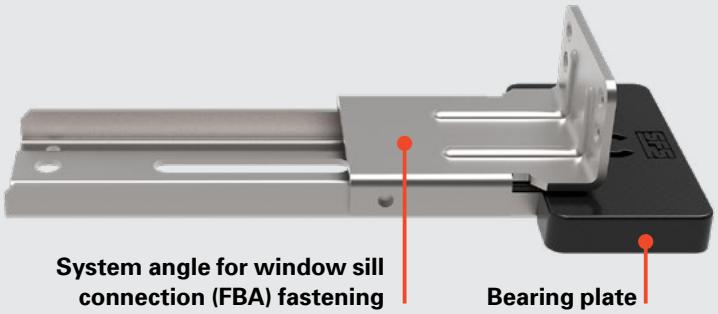
JB-D® PLUS – efficient fastening
JB-D® PLUS clearly demonstrates its strengths with fastenings at the sides and top of the window element. In addition to the high load capacity of the rigid steel brackets, they are infinitely adjustable and can be pre-assembled at the factory. Furthermore, the ability to connect to all commonly available frame materials increases flexibility of use.

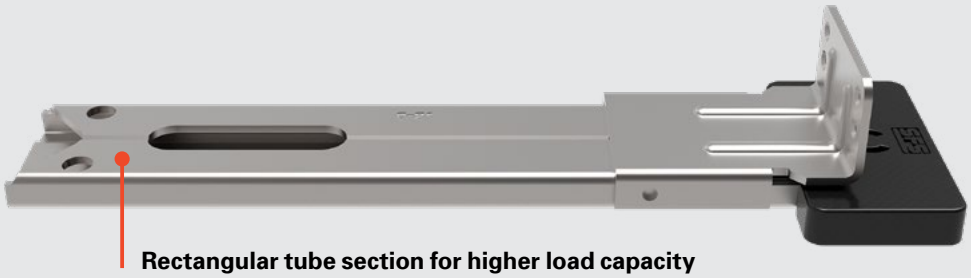
Simple to use, even in Double-skinned walls
When used in double-skin walls, both the installer and the fabricator benefit from significant time and cost savings: Importantly, the JB-D design is practice-proven and does not require any change to the traditional sequence of construction work on site.

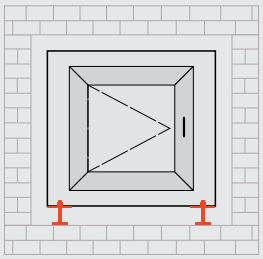
Product advantages at a glance
- High load capacity through rigid steel brackets
- Ideal for installation in double-skin walls
- Cantilever variably adjustable
- Pre-assembly in the factory possible
- Suitable for connection to all commonly available frame materials



JB-D® PLUS system advantages – connection at bottom





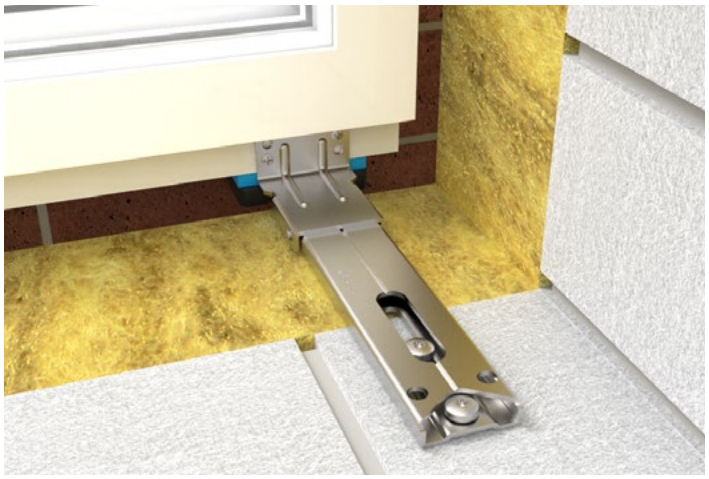


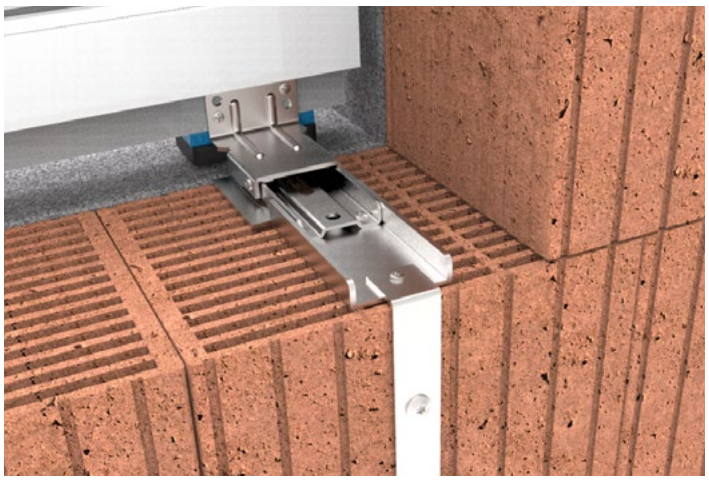
Optional blockwork clamp
For installation on Hollow brick and low load-transfer capacity substrates

JB-D® PLUS – high load capacity
When fitted at the bottom of the window opening, the JB-D® PLUS is an efficient system with high load-bearing capacity. Furthermore, the high strength of the rectangular tube makes the use of an additional support angle unnecessary, even for large cantilevers. The same is true for both hollow brick and weak wall substrates. These carefully designed clamp solutions ensure longterm, safe load transfer.

The simple way of adjusting the height of the JB-D® PLUS using commonly available spacer blocks and the stable, flat bearing surface for load transfer prove extremely practical during installation, as does the attachment of the window sill connection (FBA) profile using system angles. Subsequent Follow-on trades benefit from considerable time and cost savings As a result of the connection assembly lying flat on the reveal and having a low profile.

Product advantages at a glance
- Highest possible load transfer capacity ensured by the rectangular tube, even with large cantilevers
- As the fastener connection boasts a low profile and sits flat on the reveal leaves the optimum conditions for the completion of follow-on-trades such as sealing and ETICS installation.
- The stable and flat bearing surface transmits loads from the installed windows
- Simple height adjustment using commonly available spacers, similar to soffit mounting
- Quick and secure attachment of window sill connection (FBA) profile using system angles
- Increased load transfer capacity from brackets for perforated blocks and weak wall substrates


Direct attachment


Attachment with clamp

Connection at the sides and top

Window in front of the wall

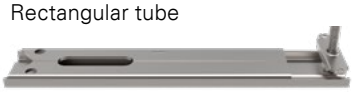


Cantilever AK_B

Wall type / width (mm)		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Side, top																	
Concrete  Min. C20/C25	160			15 **20** 50							85 **22/24** 120						
							45 **21** 80								125 **23/25** 150		
	170		5 **20** 50							75 **22/24** 120							
						35 **21** 80								115 **23/25** 150			
	180	0 **20** 50							70 **22/24** 120								
					30 **21** 80								110 **23/25** 150				
	200	0 **20** 50							70 **22/24** 120								
					30 **21** 80								110 **23/25** 150				
Lime-sand stone block (KS)/XL 	175		10 **20** 50							80 **22/24** 120							
						40 **21** 80								120 **23/25** 150			
	200	0 **20** 50							70 **22/24** 120								
					30 **21** 80								110 **23/25** 150				
	240	0 **20** 50							70 **22/24** 120								
					30 **21** 80								110 **23/25** 150				
Timber 	160					35 **20** 50							**22/24**				
								65 **21** 80							**23/25**		
	180			15 **20** 50							85 **22/24** 120						
							45 **21** 80								125 **23/25** 150		
	200	0 **20** 50							70 **22/24** 120								
					30 **21** 80								110 **23/25** 150				
	220	0 **20** 50							70 **22/24** 120								
					30 **21** 80								110 **23/25** 150				
	240	0 **20** 50							70 **22/24** 120								
					30 **21** 80								110 **23/25** 150				
Aerated concrete 	175		10 **20** 50							80 **22/24** 120							
						40 **21** 80								120 **23/25** 150			
	200	0 **20** 50							70 **22/24** 120								
					30 **21** 80								110 **23/25** 150				
	240	0 **20** 50							70 **22/24** 120								
					30 **21** 80								110 **23/25** 150				
Hollow brick clay block (HLZ) 	175		10 **20** 50							80 **22/24** 120							
						40 **21** 80								120 **23/25** 150			
	200	0 **20** 50							70 **22/24** 120								
					30 **21** 80								110 **23/25** 150				
	240	0 **20** 50							70 **22/24** 120								
					30 **21** 80								110 **23/25** 150				

Product and ordering code for **# 20–25**, see following page, column **#**

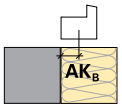
Programme overview side and top

Wall type	Product	Ordering code	#	PU	Art No.	Application example
Concrete, lime sand stone (KS), vertically perforated clay block (HLZ), aerated concrete class PP2/4/6, timber	U-channel 	JB-D-U155	**20**	50	1651506	
		JB-D-U185	**21**		1651529	
		JB-D-U225	**22**		1651505	
		JB-D-U265	**23**		1651504	
	Rectangular tube 	JB-D-R225	**24**	25	1651503	
		JB-D-R265	**25**		1651502	

Side/top: for safety barrier requirements

- Can be attached directly to concrete, lime sand stone XL and timber substrates. Solutions and application range for other substrates: see JB-D/FA PLUS

Joint width up to 35 mm
Cantilever AK_B = distance of the fastening point from the reveal edge



Connection at bottom

Window in front of the wall



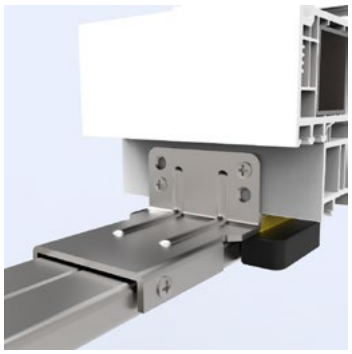
Cantilever AK_B

Wall type / width (mm)		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Bottom, direct																	
Concrete  Min. C20/C25	160			15 **26** 50							85 **28/30** 120						
							45 **27** 80								125 **29/31** 150		
	170		5 **26** 50							75 **28/30** 120							
						35 **27** 80								115 **29/31** 150			
	180	0 **26** 50							70 **28/30** 120								
					30 **27** 80								110 **29/31** 150				
	200	0 **26** 50							70 **28/30** 120								
					30 **27** 80								110 **29/31** 150				
Lime sand stone (KS)/XL 	175		10 **26** 50								80 **28/30** 120						
						40 **27** 80								120 **29/31** 150			
	200	0 **26** 50							70 **28/30** 120								
					30 **27** 80								110 **29/31** 150				
	240	0 **26** 50							70 **28/30** 120								
					30 **27** 80								110 **29/31** 150				
Timber 	160					35 **26** 50							**28/30**				
									65 **27** 80						**29/31**		
	180			15 **26** 50							85 **28/30** 120						
							45 **27** 80								125 **29/31** 150		
	200	0 **26** 50							70 **28/30** 120								
					30 **27** 80								110 **29/31** 150				
	220	0 **26** 50							70 **28/30** 120								
					30 **27** 80								110 **29/31** 150				
	240	0 **26** 50							70 **28/30** 120								
					30 **27** 80								110 **29/31** 150				
Aerated concrete  PP2/4/6	175		10 **26** 50								80 **28/30** 120						
						40 **27** 80								120 **29/31** 150			
	200	0 **26** 50							70 **28/30** 120								
					30 **27** 80								110 **29/31** 150				
	240	0 **26** 50							70 **28/30** 120								
					30 **27** 80								110 **29/31** 150				
Bottom, clamp																	
Aerated concrete  PP2	175		5 **32+26** 50							75 **32+28/30** 120							
						35 **32+27** 80								115 **32+29/31** 150			
	200	0 **33+26** 50							70 **33+28/30** 120								
					30 **33+27** 80								110 **33+29/31** 150				
	240	0 **34+26** 50							70 **34+28/30** 120								
					30 **34+27** 80								110 **34+29/31** 150				
Vertically perforated clay block (HLZ) 	175		5 **32+26** 50							75 **32+28/30** 120							
						35 **32+27** 80								115 **32+29/31** 150			
	200	0 **33+26** 50							70 **33+28/30** 120								
					30 **33+27** 80								110 **33+29/31** 150				
	240	0 **34+26** 50							70 **34+28/30** 120								
					30 **34+27** 80								110 **34+29/31** 150				

Product and ordering code for **# 26–34**, see following page, column **#**

A window sill connection (FBA) angle #35 or #36 must be used as an additional component for the connection to the profile

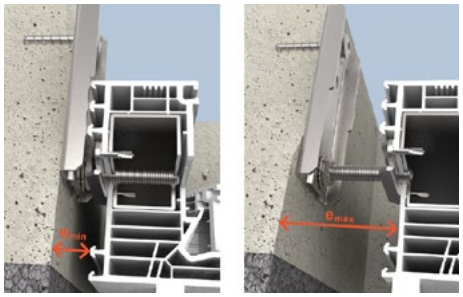
Programme overview connection bottom

Wall type	Product	Ordering code	#	PU	Art No.	Application example
Concrete, lime sand stone (KS), aerated concrete PP2/4/6, timber	U-profile 	JB-DK-U155	**26**	50	1651501	
		JB-DK-U185	**27**		1651496	
		JB-DK-U225	**28**		1651493	
		JB-DK-U265	**29**		1772128	
	Rectangular tube 	JB-DK-R225	**30**	25	1651494	
		JB-DK-R265	**31**		1651495	
Vertically perforated clay block (HLZ), aerated concrete class PP2	Clamp, bottom 	JB-D-CB175	**32**	25	1651497	
		JB-D-CB200	**33**		1651499	
		JB-D-CB240	**34**		1651500	
	Window sill connection (FBA) angle 	JB-D-W32/47	**35**	25	1644746	
		JB-D-W65/47	**36**		1644747	

Cantilever AK_B = distance of the fastening point from the reveal edge

Fabrication instructions

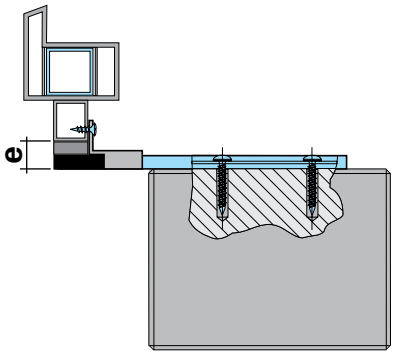
Joint width “e” sides and top



	Joint width “e” (mm)	
Frame material	Direct attachment	
	e_{min}	e_{max}
PVC	10	35
Timber, with AM8-UD	17	
Timber, with AM8-T	12	25
Aluminium, with AM8-UD	17	35
Aluminium, with AM8-T, surface mounted	12	
Aluminium, with AM8-T, inserted	10	

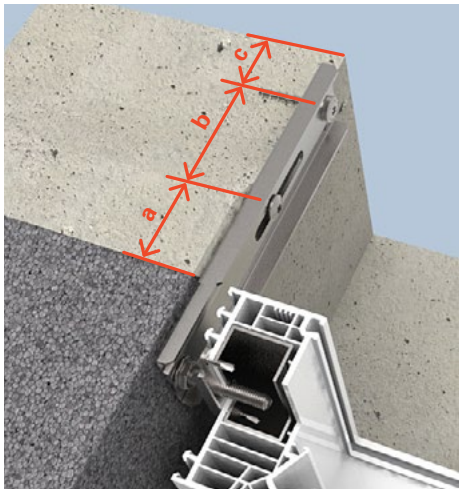
All rails come supplied with AM8-UD as standard.
The AM8-T can be ordered separately. See product list.
Processing window frame profile: hole Ø 10.5 mm.

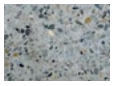
Joint width “e” bottom



	Joint width “e” (mm)	
Frame material	Direct attachment	Clamp attachment
	e_{min}	e_{min}
PVC	12	15
Timber		
Aluminium		

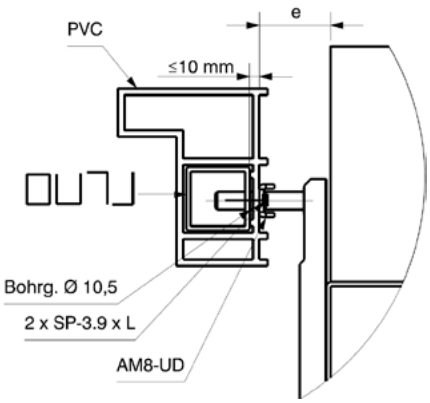
Edge distance and distance between fasteners



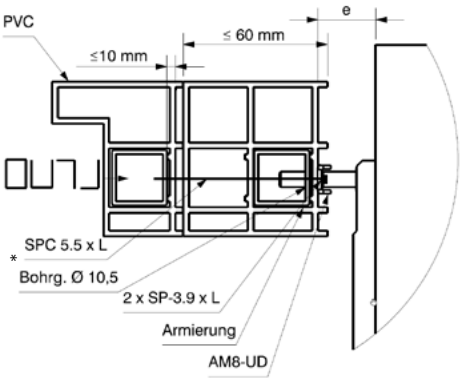
Wall type	**a** mm	**b** mm	**c** mm		
	50	≥ 35	≥ 40	Ø 7.5×60	Ø 6 mm, hammer drill
			≥ 50		
			≥ 60	Ø 8×80	Ø 5 mm, rotary drill
			≥ 50	Ø 7.5×132	
				Ø 8×61 Ø 9×245	No predrilling

Profile variants and connection

PVC, profile reinforced

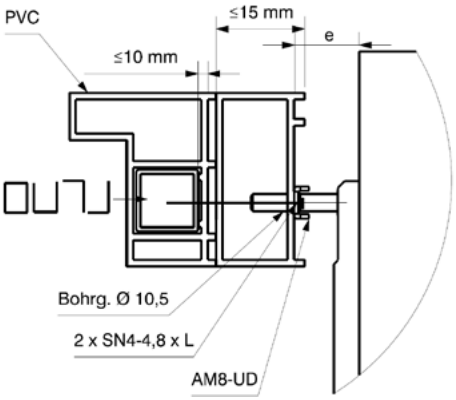


PVC with extension, profile reinforced

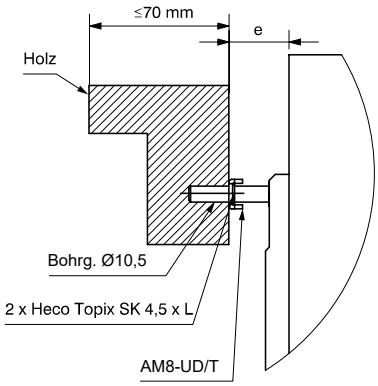


* Extensions must always be connected with two SPC fasteners at a maximum distance of 150 mm to the connection

PVC with extension, profile not reinforced

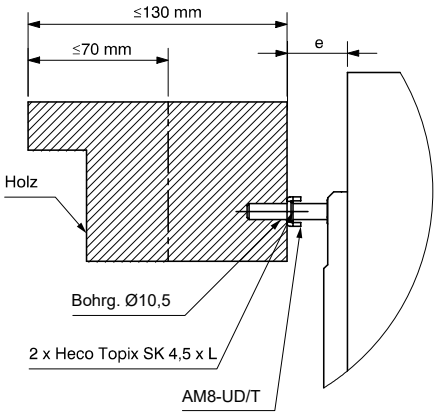


Timber

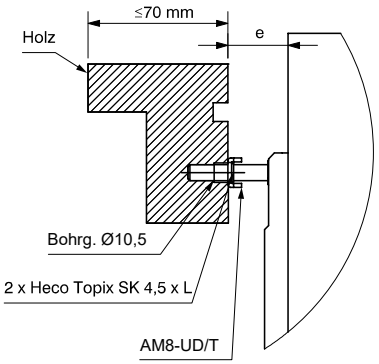


Timber

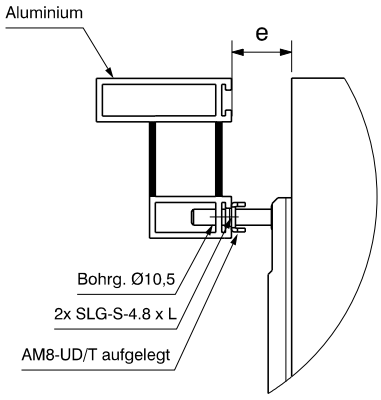
Frames with large face widths (one-part or parts structurally connected together)

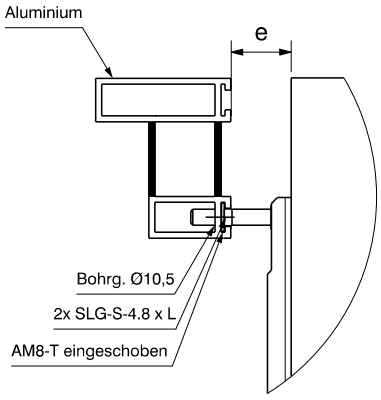


Profiled Timber

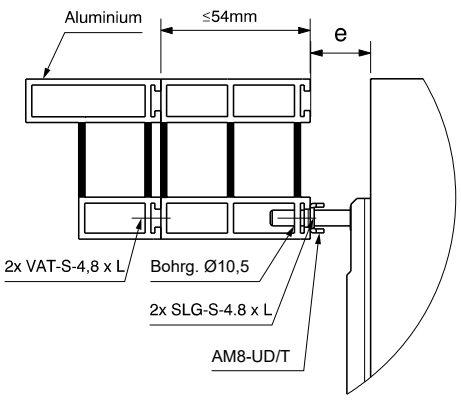


Aluminium



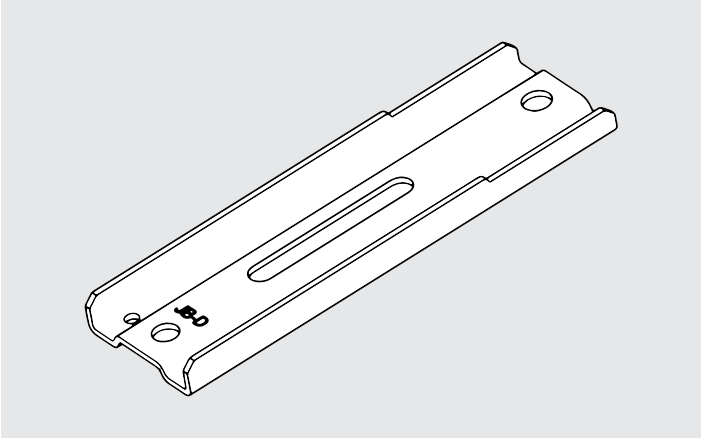


Aluminium with extension



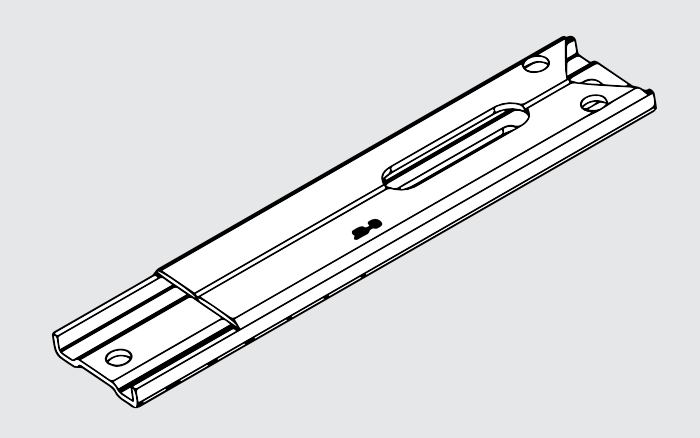
Technical data

JB-D® PLUS – Steel bracket



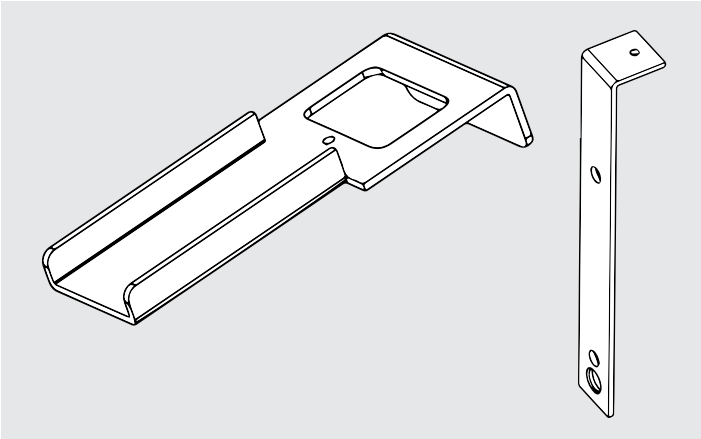
Mat.	Surface	Mat. thick (mm)	Width (mm)	Height (mm)	Length (mm)	Cross section (mm^2)	Moment of inertia (mm^4)
S 350 GD	Galva-nised Z275	2	47	12	155 185 225 265	134.9	1144

JB-D® PLUS – Rectangular tube



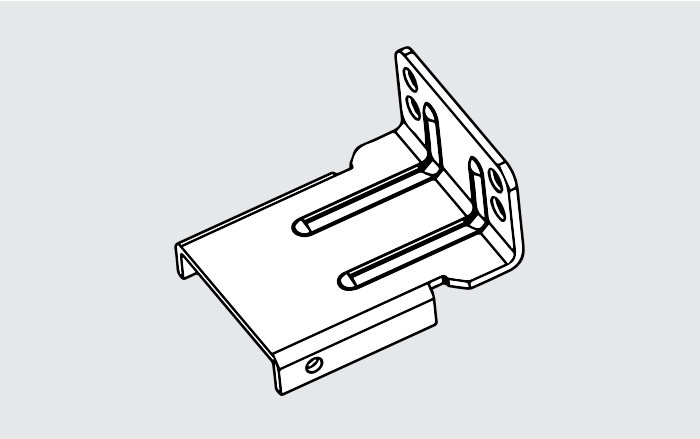
Mat.	Surface	Mat. thick (mm)	Width (mm)	Height (mm)	Length (mm)	Cross section (mm^2)	Moment of inertia (mm^4)
S 355 MC	Galva-nised Zinc flake	2.5	47	12	– – 225 265	260.7	5395

JB-D® PLUS – Clamp, bottom



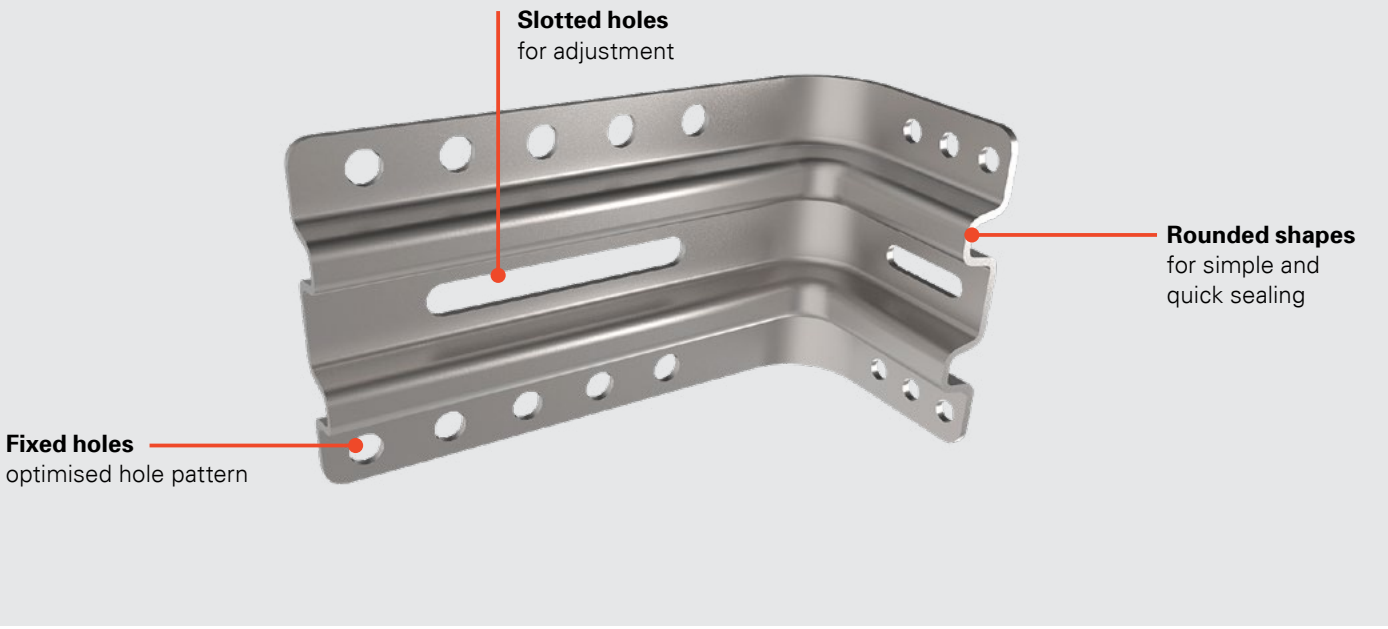
Mat.	Surface	Mat. thick (mm)	Width (mm)	Height (mm)	Length (mm)	Cross section (mm^2)	Moment of inertia (mm^4)
S 350 GD	Galva-nised Z275	3	74/53	28/15	171 196 236	–	–
S 350 GD	Galva-nised Z275	2.5	25	192	33	–	–

JB-D® PLUS – Window sill connection (FBA) angle



Mat.	Surface	Mat. thick (mm)	Width (mm)	Height (mm)	Length (mm)	Cross section (mm^2)	Moment of inertia (mm^4)
S 350 GD	Galva-nised Z275	2.5	57	32/65	70	–	–

Product Benefits System JB-W/XL

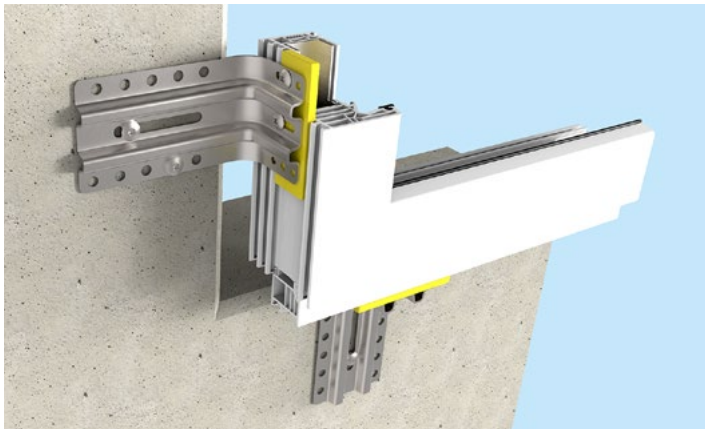


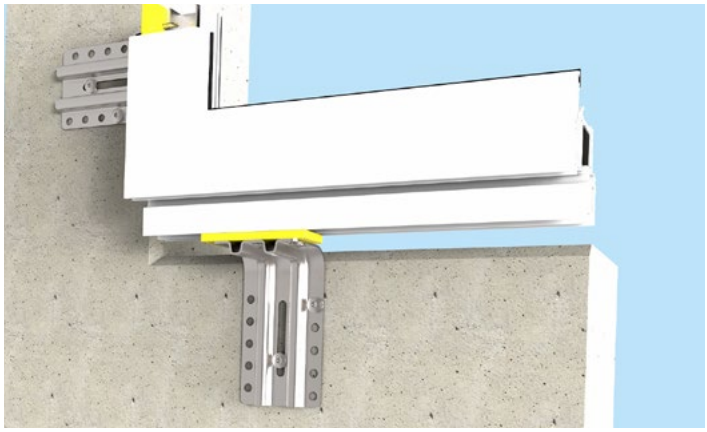
The Solution – JB-W/XL Bracket System
In-house designs are usually without verification and cause high process costs in operation in the event of complaints. Conventional brackets lack both the necessary rigidity and the corresponding test certificates. The JB-W/XL mounting bracket system is specially designed to meet the high demands of in front of the wall installation, and its durability and safety have been tested to the highest standards.

Product advantages at a glance
- Characteristic load capacity up to 4.800 N
- Tested according to ift test guideline MO-02/1
- Mounting bracket system with design values
- Slotted holes for quick and easy alignment
- Allows installation of large window formats at the insulation level
- Variable hole pattern for simplified and secure installation
- Rounded shape for easy sealing
- Safety due to approved fasteners
- Steel-based system, non-combustible material according to DIN 4102-1 class A

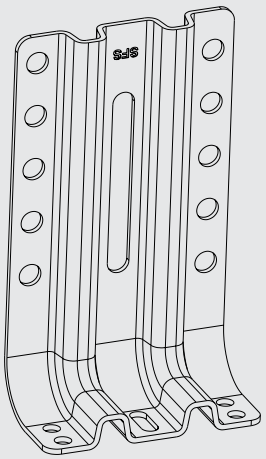
Tested according to

- ☑ ift certified
- ☑ ETB tested
- ☑ Serviceability acc. to MO-02/1

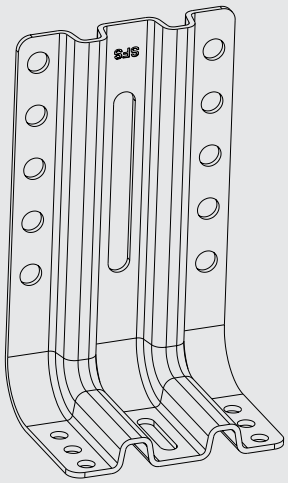




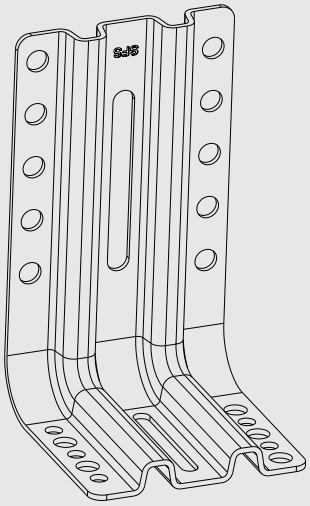
Description System JB-W/XL



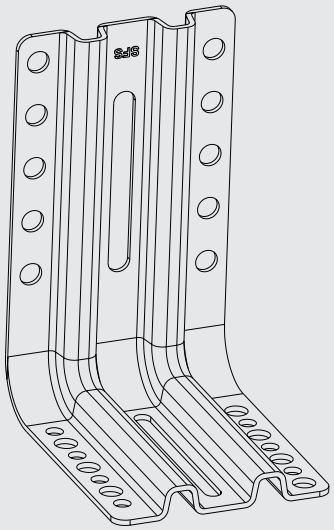
JB-W/XL
140×40



JB-W/XL
140×60



JB-W/XL
140×80

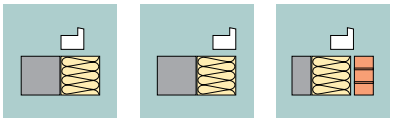


JB-W/XL
140×100

JB-W/XL Mounting bracket

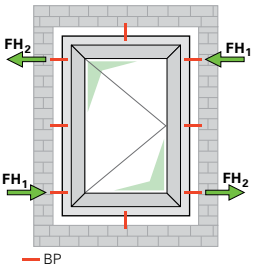
Material	Carbon steel S235
Coating	White zinc plated Z275
Thickness	2 mm
Width	80 mm
Corrugation	12 mm
Hole Pattern	Ø 8/6 mm
Packaging	Carton of 50 pieces
Application	Carbon steel mounting brackets for a safe load transfer, for in front of the wall mounting and threshold fastening

Design values JB-D® PLUS system
In window plane – Cantilever AK_B up to 150 mm



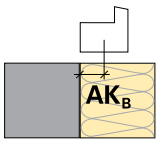
Limiting conditions

Cantilever (AK_B)	Projection of the fastening point beyond the reveal edge
Joint width (e)	Up to 35 mm (joint width + profile depth if applicable)
Predrilled hole diameter and type	Dependent on substrate, see "General instructions"
PVC reinforcement window profile	U, L or rectangular tube, min. 1.5 mm
Profile extensions and FBA	See separate description
Masonry strength classes	Values can be used for higher strength classes

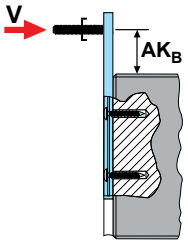




JB-D-U JB-D-R

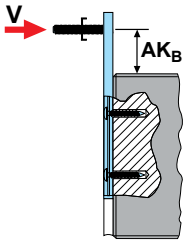


Fastening side and top



Arrangement and force direction	In substrate					Compression											
	Material format min. (mm)	Type/ class	Brackets JB-D® PLUS	Fastener (2x in each case)	Checked in acc. with	Working load $F_{empf.}$ (kN) AK_B, max. (mm)						Design load F_{Rd} (kN) AK_B, max. (mm)					
						30	60	80	100	120	150	30	60	80	100	120	150
	Concrete	C20/25	U155	MMS-plus-P-7.5×60	abZ/ aBG	2.22	–	–	–	–	–	2.54	–	–	–	–	–
			U185			–	1.49	1.06				–	1.71	1.06			
			U225				–	1.14	0.80				–		0.73		
			R225					2.10	1.47					2.00	1.38		
			U265					–	–	0.52	0.31			–	–	0.61	0.38
			R265							1.45	0.69					1.38	0.90
	Lime-sand stone small format	FKL 20	U155	MMS-plus-P-7.5×60	abZ/ aBG	1.94	–	–	–	–	–	2.54	–	–	–	–	–
			U185			–	1.34	0.98				–	1.71	1.06			
			U225				–	–	0.77	0.57			–	–	0.73	0.61	
			R225					1.83	1.52	1.22				2.00	1.38	1.38	
			U265					–	–	–	0.32			–	–	–	0.38
			R265								0.68						0.90
	Lime-sand stone XL 248× 175×498	20/2.0	U155	MMS-plus-P-7.5×60	abZ/ aBG	2.22	–	–	–	–	–	2.54	–	–	–	–	–
			U185			–	1.49	1.06				–	1.71	1.06			
			U225				–	1.14	0.80				–		0.73		
			R225					2.1	1.47					2.00	1.38		
			U265					–	–	0.52	0.31			–	–	0.61	0.38
			R265							1.45	0.69					1.38	0.90
	Plan-T 175 to 240	12/0.9	U155	FB-FK 7.5× 102	abZ/ aBG	1.74	–	–	–	–	–	2.40	–	–	–	–	–
			U185			–	1.17					–	1.15				
			U225	FB-FK 7.5× 132			–	0.89	0.64				–	0.82	0.65		
			R225					1.63	1.35					1.70	1.50		
			U265					–	–	0.38				–	–	0.47	
			R265							1.07	0.27					1.29	0.39

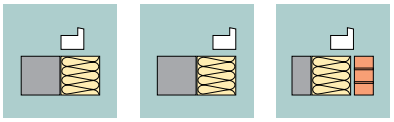
Table continued on the next page

Arrangement and force direction	In substrate					Compression											
	Material format min. (mm)	Type/ class	Brackets JB-D® PLUS	Fastener (2x in each case)	Checked in acc. with	Working load $F_{empf.}$ (kN) AK_B, max. (mm)						Design load F_{Rd} (kN) AK_B, max. (mm)					
						30	60	80	100	120	150	30	60	80	100	120	150
	Aerated concrete PB	2	U155	IGR-8×61	MO-02/1	0.53	–	–	–	–	–	0.74	–	–	–	–	–
			U185			–	0.40					–	0.57				
			U225				–	0.34					–	0.48			
			R225					–	0.08					–	0.11		
			U265						–						–		
			R265							0.22	0.11					0.30	0.15
			U155	FL-9×245		1.55				–	–	1.92				–	–
			U185			–	0.92					–	1.12				
			U225				–	0.78					–	0.81			
			R225					–	0.62					–	0.74		
			U265						–						–		
			R265							0.67	0.37					0.67	0.42
		4	U155	IGR-8×61	MO-02/1	1.18	–	–	–	–	–	1.65	–	–	–	–	–
			U185			–	1.33					–	1.33				
			U225				–	0.95					–	0.95			
			R225					–	0.46					–	0.65		
			U265						–						–		
			R265							0.58	0.36					0.81	0.50
			U155	FL-9×245		2.35				–	–	2.40				–	–
			U185			–	1.25					–	1.25				
			U225				–	0.96					–	0.96			
			R225					–	1.13					–	1.13		
			U265						–						–		
			R265							0.96	0.65					0.96	0.65
		6	U155	IGR-8×61	abZ/aBG	1.81	–	–	–	–	–	2.24	–	–	–	–	–
			U185			–	1.18					–	1.26				
			U225				–	0.94					–	0.91			
			R225					0.84	0.60	0.36				1.45	1.18	0.89	
			R265					–	–	0.67	0.26			–	–	0.92	0.47
	Timber	C24	U155	HT-T-FH-FT-8×80	abZ/aBG	2.31	–	–	–	–	–	2.23	–	–	–	–	–
			U185			–	1.59					–	1.20				
			U225				–	1.10	0.62				–	0.80	0.57		
			R225					–	1.14					–	1.04		
			U265						–	0.45	0.28				–	0.40	0.34
			R265							0.89	0.63					0.92	0.73

Comments
abZ/aBG: Values determined on the basis of the DIBt National Technical Approval (abZ)/General Construction Technique Permit (aBG) Z-14.4-806.
MO-02/1: Values determined on the basis of tests and assessments in accordance with ift Guideline MO-02/1, Version June 2015.
Values for concrete were determined in tests in lime-sand stone.
Intermediate values can be interpolated linearly.

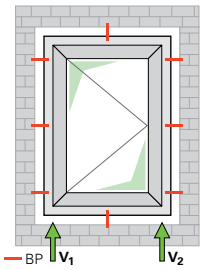
All information is non-binding and given without liability.

Design values JB-D® PLUS system
In window plane – Cantilever AK_B up to 150 mm



Limiting conditions

Cantilever (AK_B)	Projection of the fastening point beyond the reveal edge
Joint width (e)	Up to 35 mm (joint width + profile depth if applicable)
Predrilled hole diameter and type	Dependent on substrate, see "General instructions"
PVC reinforcement window profile	U, L or rectangular tube, min. 1.5 mm
Profile extensions and FBA	See separate description
Masonry strength classes	Values can be used for higher strength classes





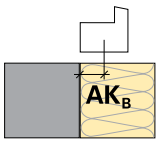
JB-D-U



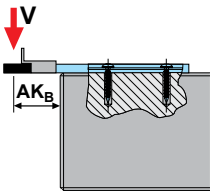
JB-D-R



JB-D-CB

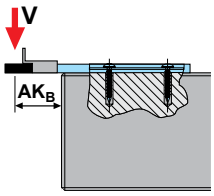


Fastening bottom



Arrangement and force direction	In substrate					Compression											
	Material format min. (mm)	Type/ class	Brackets JB-D® PLUS	Fastener (2x in each case)	Checked in acc. with	Working load $F_{empf.}$ (kN) AK_B, max. (mm)						Design load F_{Rd} (kN) AK_B, max. (mm)					
						30	60	80	100	120	150	30	60	80	100	120	150
	Concrete	C20/25	U155	MMS-plus-P-7.5×60	abZ/ aBG	2.22	–	–	–	–	–	2.54	–	–	–	–	–
			U185			–	1.49	1.06				–	1.71	1.06			
			U225				–	1.14	0.80				–		0.73		
			R225					2.10	1.47					2.00	1.38		
			U265					–	–	0.52	0.31			–	–	0.61	0.38
			R265							1.45	0.69					1.38	0.90
	Lime-sand stone Lime-sand stone (KS)	FKL 20	U155		MO-02/1	1.94	–	–	–	–	–	2.54	–	–	–	–	–
			U185			–	1.34	0.98				–	1.71	1.06			
			U225				–	–		0.57			–	–	0.73	0.61	
			R225					1.83	1.52	1.22				2.00	1.38	1.38	
			U265					–	–	–	0.32			–	–	–	0.38
			R265								0.68						0.90
	Lime-sand stone XL 248× 175×498	20/2.0	U155		abZ/ aBG	2.22	–	–	–	–	–	2.54	–	–	–	–	–
			U185			–	1.49	1.06				–	1.71	1.06			
			U225				–	1.14	0.80				–		0.73		
			R225					2.1	1.47					2.00	1.38		
			U265					–	–	0.52	0.31			–	–	0.61	0.38
			R265							1.45	0.69					1.38	0.90
	Poroton-T 175 to 240	12/0.9	U155 + CB	FB-FK 7.5× 132		2.14	–	–	–	–	–	2.75	–	–	–	–	–
			U185 + CB			–	1.32	0.63				–	1.21	0.64			
			U225 + CB				–	0.81					–				
			R225 + CB					1.06	0.97					1.00	1.00		
			R265 + CB					–		0.88	0.49			–	–	1.00	0.45

Table continued on the next page

Arrangement and force direction	In substrate					Compression											
	**Material format min.** (mm)	**Type/ class**	**Brackets JB-D® PLUS**	**Fasten-er** (2x in each case)	**Check-ed in acc. with**	**Working load $F_{empf.}$** (kN) **AK_B, max.** (mm)						**Design load F_{Rd}** (kN) **AK_B, max.** (mm)					
						30	**60**	**80**	**100**	**120**	**150**	**30**	**60**	**80**	**100**	**120**	**150**
	Aerated concrete PB	2	U155 + CB	IGR-8×61	abZ/ aBG	1.90	–	–	–	–	–	2.40	–	–	–	–	–
			U185 + CB			–	1.10					–	0.92				
			U225 + CB				–	0.82					–	0.75			
			R225 + CB					1.14	0.92					1.06	0.97	–	
			R265 + CB					–	–	0.69	0.25			–	–	0.89	0.34
		4	U155	IGR-8×61	MO-02/1	1.18	–	–	–	–	–	1.65	–	–	–	–	–
			U185			–	1.33					–	1.33				
			U225				–	0.95					–	0.95			
			R225					–	0.46					–	0.65		
			U265						–						–		
			R265							0.58	0.36					0.81	0.50
			U155	FL-9×245		2.35				–	–	2.40				–	–
			U185			–	1.25					–	1.25				
			U225				–	0.96					–	0.96			
			R225					–	1.13					–	1.13		
			U265						–						–		
			R265							0.96	0.65					0.96	0.65
		6	U155	IGR-8×61	abZ/ aBG	1.81	–	–	–	–	–	2.24	–	–	–	–	–
			U185			–	1.18					–	1.26				
			U225				–	0.94					–	0.91			
			R225					0.84	0.60	0.36				1.45	1.18	0.89	
			R265					–	–	0.67	0.26			–	–	0.92	0.47
	Timber	C24	U155	HT-T-FH-FT-8×80	abZ/ aBG	2.31	–	–	–	–	–	2.23	–	–	–	–	–
			U185			–	1.59					–	1.20				
			U225				–	1.10	0.62				–	0.80	0.57		
			R225					–	1.14					–	1.04		
			U265						–	0.45	0.28				–	0.40	0.34
			R265							0.89	0.63					0.92	0.73
	Steel frame system	S390 1.2 mm	U155	SD3-5.5×22	MO-02/1	1.32[1]	–	–	–	–	–	1.32[1]	–	–	–	–	–
			R225			–			0.34[2]			–			0.34[2]		
			U225	SD3-5.5×22 +SP3-3.9×13					0.51[2]						0.51[2]		
			R255						0.86[2]						0.86[2]		
		S390 1.8 mm	U155	SD3-5.5×22		1.65[1]			–			1.90[1]			–		
			R225			–			0.41[2]			–			0.41[2]		
			U225	SD3-5.5×22 +SP3-3.9×13					0.59[2]						0.59[2]		
			R225						1.22[2]						1.22[2]		

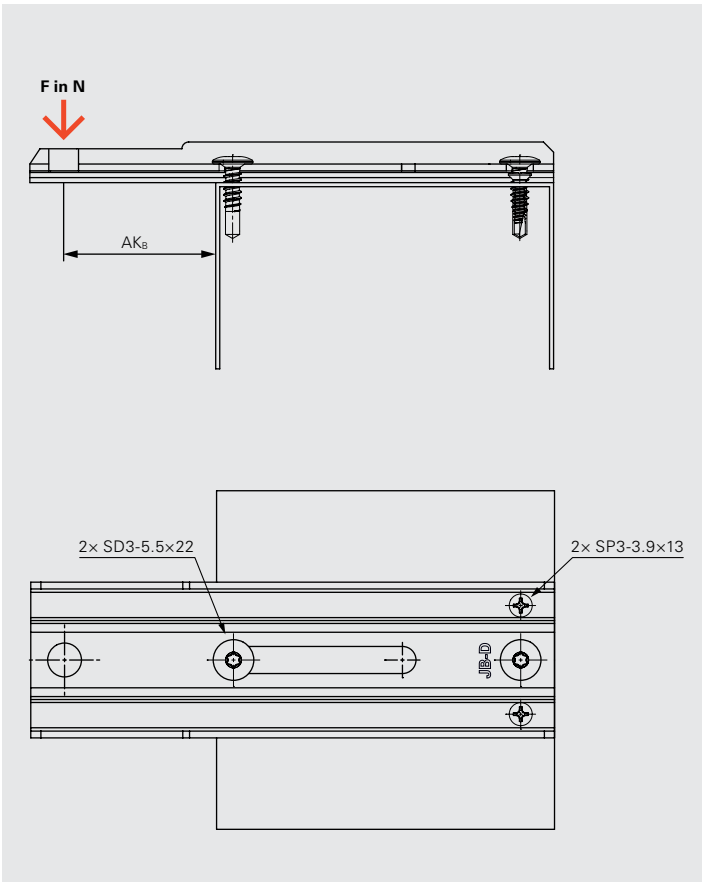
[1] AK_B max. 40 mm

[2] AK_B max. 110 mm

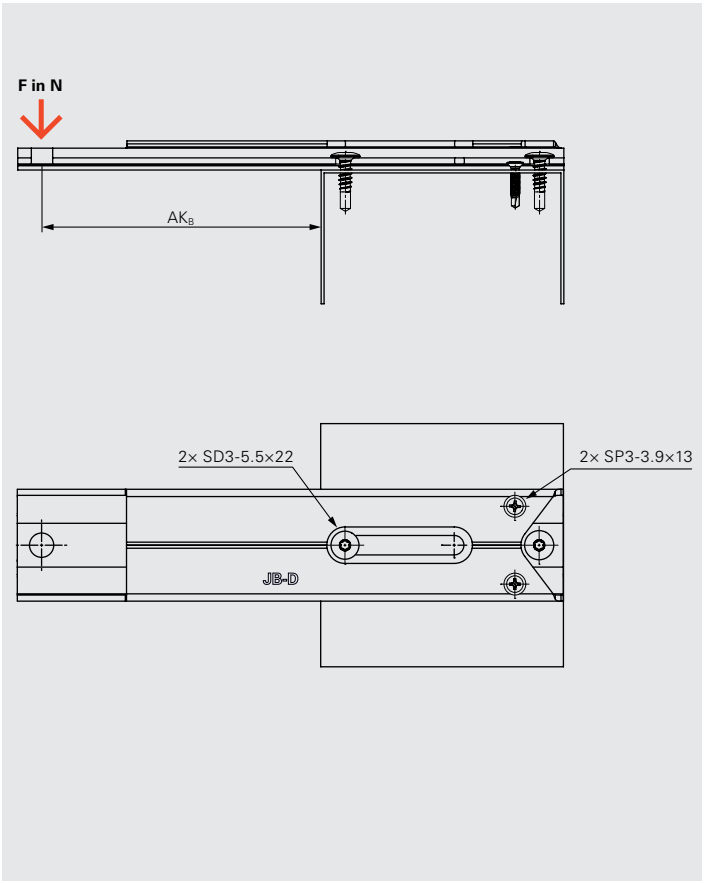
Comments
abZ/aBG: Values determined on the basis of the DIBt National Technical Approval (abZ)/General Construction Technique Permit (aBG) Z-14.4-806.
MO-02/1: Values determined on the basis of tests and assessments in accordance with ift Guideline MO-02/1, Version June 2015.
Values for concrete were determined in tests in lime-sand stone.
Intermediate values can be interpolated linearly.

All information is non-binding and given without liability.

Explanation of the design values for the steel frame system

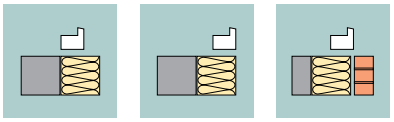


Compression test:
JB-DK-U155 fixed on Steel U-Profile 1.2 mm/1.8 mm
100x55x55 mm with
2× SD3-5.5×22
2× SP3-3.9×13
Cantilever = 40 mm



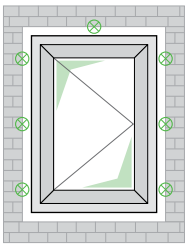
Compression test:
JB-DK-R225 fixed on Steel U-Profile 1.2 mm/1.8 mm
100x55x55 mm with
2× SD3-5.5×22
2× SP3-3.9×13
Cantilever = 110 mm

Design values JB-D® PLUS system
90° to window plane – Cantilever AK_B up to 150 mm



Limiting conditions

Cantilever (AK_B)	Projection of the fastening point beyond the reveal edge
Joint width (e)	Up to 35 mm (joint width + profile depth if applicable)
Predrilled hole diameter and type	Dependent on substrate, see "General instructions"
PVC reinforcement window profile	U, L or rectangular tube, min. 1.5 mm
Profile extensions and FBA	See separate description
Masonry strength classes	Values can be used for higher strength classes



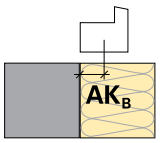
⊗BP



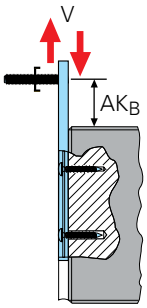
JB-D-U



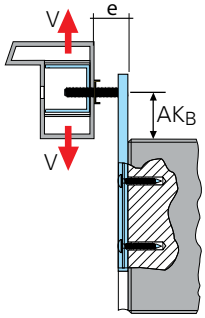
JB-D-R



Fastening side and top

Arrangement and force direction	In substrate					Transverse load	
	**Material**	**Type/ class**	**Bracket JB-D® PLUS**	**Fastener** (2× in each case)	**Design load in acc. with**	**Working load $F_{empf.}$** (kN)	**Design load F_{Rd}** (kN)
	Concrete	C20/25	JB-D-U JB-D-R	MMS-plus-P-7.5×60	abZ/ aBG	1)	1)
	Solid lime-sand stone	FKL 20			MO-02/1	0.96	1.35
	Solid lime-sand stone XL	20/2.0			abZ/ aBG	1.01	1.41
	Poroton-T	FKL 12		FB-FK-7.5×132	MO-02/1	0.62	0.87
	Aerated concrete	PP 2		IGR-8×61		0.43	0.60
				FL-9×245		0.48	0.67
		PP 4		IGR-8×61		0.82	1.14
				FL-9×245		1.32	1.85
		PP 6		IGR-8×61		0.62	0.87
	Timber	C24		HT-T-FH-FT-8×80	abZ/ aBG	1)	1)

1) No verification in substrate required, connection to the frame is determinant

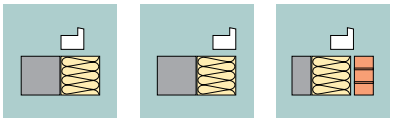
Arrangement and force direction	In window frame					Transverse load							
	Material	Type/class	Extension (mm)	Fastener (2× in each case)	Checked in acc. with	Working load $F_{empf.}$ (kN)				Design load F_{Rd} (kN)			
						Max. joint width e (mm)				Max. joint width e (mm)			
						20	25	30	35	20	25	30	35
	PVC reinforced	Rm ≥ 270 N/mm², 1.5 mm	None	SP-3.9×L	abZ/ aBG	1.71	1.42	1.12	0.83	1.71	1.42	1.12	0.83
			Up to 60, reinf.			1.01	0.89	0.76	0.64	1.01	0.89	0.76	0.64
			≥ = 15, Not reinf.	SN4-4.8×L		1.06	0.93	0.80	0.67	1.06	0.93	0.80	0.67
	PVC not reinforced 1) 2)	–	None	SPT/24-4.3×30	MO-02/1	0.91	–	–	–	1.27	–	–	–
	Timber	rho_k ≥ 400 kg/m³	Up to 60	HT-T-4.5×L	abZ/ aBG	1.62	1.35	1.08	0.81	1.62	1.35	1.08	0.81
				HT-T-4.5×L 3)		1.55	1.28	–	–	1.55	1.28	–	–
	Timber, profiled connection surface		None	HT-T-4.5×L		1.28				1.28			
			Up to 60			1.26	1.26			1.26	1.26		
			None	HT-T-4.5×L 3)		1.24	1.24			1.24	1.24		
	Aluminium	EN AW 6060 T66, t ≥ 1.5 mm, Rm ≥ 200 N/mm²	None	SLG-S-4.8×L		2.01	1.68	1.36	1.03	2.01	1.68	1.36	1.03
			Up to 54			1.07	0.99	0.90	0.82	1.07	0.99	0.90	0.82
			None	SLG-S-4.8×L 4)									
				SLG-S-4.8×L 5)		2.01	1.64	–	–	2.01	1.64	–	–
	Steel	Rm ≥ 270 N/mm², 1.5 mm	None	SP-3.9×L		1.71	1.42	1.12	0.83	1.71	1.42	1.12	0.83
			Up to 60 mm			1.01	0.89	0.76	0.64	1.01	0.89	0.76	0.64

1) Profile type: Aluplast energeto® 8000
2) The application-dependent influence factors A_1, A_2 and A_3 must be considered.
3) With alternative connection piece AM8-T
4) With alternative connection piece AM8-T, pushed into the aluminium profile
5) With alternative connection piece AM8-T, placed on the aluminium profile

Comments
abZ/aBG: Values determined on the basis of the DIBt National Technical Approval (abZ)/General Construction Technique Permit (aBG) Z-14.4-806.
MO-02/1: Values determined on the basis of tests and assessments in accordance with ift Guideline MO-02/1, Version June 2015.
Values for concrete were determined in tests in lime-sand stone.
Intermediate values can be interpolated linearly.

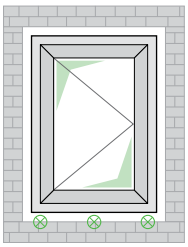
All information is non-binding and given without liability.

Design values JB-D® PLUS system
90° to window plane – Cantilever AK_B up to 150 mm



Limiting conditions

Cantilever (AK_B)	Projection of the fastening point beyond the reveal edge
Joint width (e)	Up to 35 mm (joint width + profile depth if applicable)
Predrilled hole diameter and type	Dependent on substrate, see "General instructions"
PVC reinforcement window profile	U, L or rectangular tube, min. 1.5 mm
Connection profile extensions and FBA	See separate description
Masonry strength classes	Values can be used for higher strength classes



⊗BP



JB-D-U



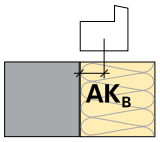
JB-D-R



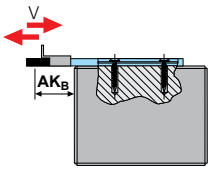
JB-D-CB



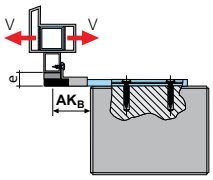
JB-D-W



Fastening bottom

Arrangement and force direction	In substrate					Transverse load	
	**Material**	**Type/ class**	**Bracket JB-D® PLUS**	**Fastener** (2× in each case)	**Design load in acc. with**	**Working load** $F_{empf.}$ (kN)	**Design load** F_{Rd} (kN)
	Concrete	C20/25	JB-D-U JB-D-R	MMS-plus-P-7.5×60	abZ/ aBG	1)	1)
	Solid lime-sand stone	FKL 20			MO-02/1	0.96	1.35
	Solid lime-sand stone XL	20/2.0			abZ/ aBG	1.01	1.41
	Poroton-T	FKL 12	JB-D-U/ JB-D-R + CB	FB-FK-7.5×132	MO-02/1	0.46	0.52
	Aerated concrete	PP 2		IGR-8×61		0.84	0.84
				SXRL-10x80		0.87	0.87
		PP 4	JB-D-U JB-D-R	IGR-8×61		0.82	1.14
				FL-9×245		1.32	1.85
		PP 6		IGR-8×61		0.62	0.87
	Timber	C24		HTP-T-4.5x40	abZ/ aBG	1)	1)

1) No verification in substrate required, connection to the frame is determinant

Arrangement and force direction	In window frame / window sill connection profile (FBA)					Transverse load	
	**Frame material**	**Type/class**	**Connection point**	**Fastener** (2× in each case)	**Design load in acc. with:**	**Working load** $F_{empf.}$ (kN)	**Design load** F_{Rd} (kN)
	PVC [1]	A	FBA PVC	SPT/19 4.3×30	MO-02/1	0.62	0.72
	Timber	400 kg/m³	Profile	HT-T-4.5×40		0.81	0.81
	Aluminium	EN AW 6060 T66, t ≥ 1.5 mm, Rm ≥ 200 N/mm²	FBA PVC, reinforced 1.5 mm rect. tube	SPE2/4.4×34		0.46	0.46

1) The application-dependent influence factors A_1, A_2 and A_3 must be applied to the values.

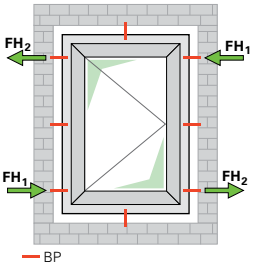
Comments
abZ/aBG: Values determined on the basis of the DIBt National Technical Approval (abZ)/General Construction Technique Permit (aBG) Z-14.4-806.
MO-02/1: Values determined on the basis of tests and assessments in accordance with ift Guideline MO-02/1, Version June 2015.
Values for concrete were determined in tests in lime-sand stone.
Intermediate values can be interpolated linearly.

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Design values JB-W/XL system
In window plane – Cantilever AK_B up to 100 mm

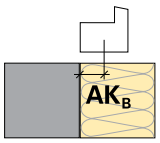
Limiting conditions

Cantilever (AK_B)	Projection of the fastening point beyond the reveal edge
Joint width (e)	Up to 20 mm + up to 7 mm profile depth if appropriate
Predrilled hole diameter and type	Dependent on substrate, see "General instructions"
PVC reinforcement window profile	U, L or rectangular tube, min. 1.5 mm
Profile extensions and FBA	See separate description
Masonry strength classes	Values can be used for higher strength classes

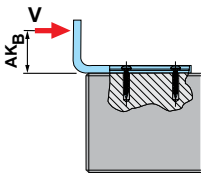




JB-W/XL



Fastening side and top

Arrangement and force direction	In substrate					Compression							
	Material Minimum format (mm)	Type/ class	Angle JB-W/XL	Fastener (2× in each case)	Checked in acc. with	Working load $F_{empf.}$ (kN)				Design load F_{Rd} (kN)			
						AK_B, max. (mm)				AK_B, max. (mm)			
						30	50	70	90	30	50	70	90
	Concrete	C20/25	140×40	MMS-plus-P-7.5×50	MO-02/1	2.42	–	–	–	3.39	–	–	–
			140×60				2.81				2.81		
			140×80					1.99				1.99	
			140×100						1.28				1.28
	Lime-sand stone small format	FKL 20	140×40	MMS-plus-P-7.5×50	MO-02/1	2.42	–	–	–	3.39	–	–	–
			140×60				2.81				2.81		
			140×80					1.99				1.99	
			140×100						1.28				1.28
	Lime-sand stone XL 248×175×498	20/2.0	140×40	MMS-plus-P-7.5×50	MO-02/1	2.42	–	–	–	3.39	–	–	–
			140×60				2.81				2.81		
			140×80					1.99				1.99	
			140×100						1.28				1.28
	Aerated concrete PB 599×240×249 599×175×249;	4	140×40	FB-FK-7.5×152	MO-02/1	1.85	–	–	–	1.85	–	–	–
			140×60				1.99				1.99		
			140×80					1.03				1.03	
			140×100						0.87				0.87
	Timber	C24	140×40	FB-FK-7.5×62	MO-02/1	1.79	–	–	–	1.79	–	–	–
			140×60				1.65				1.65		
			140×80					1.65				1.65	
			140×100						1.31				1.31

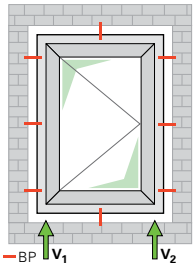
Comments
MO-02/1: Values determined on the basis of tests and assessments in accordance with ift Guideline MO-02/1, Version June 2015.
Values for concrete were determined in tests in lime-sand stone.
Intermediate values can be interpolated linearly.

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Design values JB-W/XL system
In window plane – Cantilever AK_B up to 100 mm

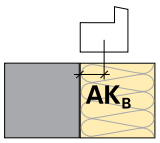
Limiting conditions

Cantilever (AK_B)	Projection of the fastening point beyond the reveal edge
Joint width (e)	Up to 20 mm + up to 7 mm profile depth if appropriate
Predrilled hole diameter and type	Dependent on substrate, see "General instructions"
PVC reinforcement window profile	U, L or rectangular tube, min. 1.5 mm
Profile extensions and FBA	See separate description
Masonry strength classes	Values can be used for higher strength classes

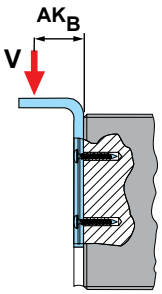




JB-W/XL



Fastening bottom



Arrangement and force direction	In substrate					Compression							
	Material Minimum format (mm)	Type/ class	Angle JB-W/XL	Fastener (2× in each case)	Checked in acc. with	Working load $F_{empf.}$ (kN)				Design load F_{Rd} (kN)			
						AK_B, max. (mm)				AK_B, max. (mm)			
						30	50	70	90	30	50	70	90
	Concrete	C20/25	140×40	MMS-plus-P-7.5×50	MO-02/1	2.42	–	–	–	3.39	–	–	–
			140×60				2.81				2.81		
			140×80					1.99				1.99	
			140×100						1.28				1.28
	Lime-sand stone small format	FKL 20	140×40	MMS-plus-P-7.5×50	MO-02/1	2.42	–	–	–	3.39	–	–	–
			140×60				2.81				2.81		
			140×80					1.99				1.99	
			140×100						1.28				1.28
	Lime-sand stone XL 248×175×498	20/2.0	140×40	MMS-plus-P-7.5×50	MO-02/1	2.42	–	–	–	3.39	–	–	–
			140×60				2.81				2.81		
			140×80					1.99				1.99	
			140×100						1.28				1.28
	Aerated concrete PB 599×240×249; 599×175×249	4	140×40	FB-FK-7.5×152	MO-02/1	1.85	–	–	–	1.85	–	–	–
			140×60				1.99				1.99		
			140×80					1.03				1.03	
			140×100						0.87				0.87
	Timber	C24	140×40	FB-FK-7.5×62	MO-02/1	1.79	–	–	–	1.79	–	–	–
			140×60				1.65				1.65		
			140×80					1.65				1.65	
			140×100						1.31				1.31

Comments
MO-02/1: Values determined on the basis of tests and assessments in accordance with ift Guideline MO-02/1, Version June 2015.
Values for concrete were determined in tests in lime-sand stone.
Intermediate values can be interpolated linearly.

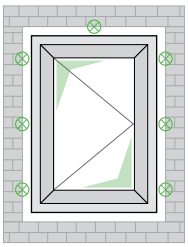
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Design values JB-W/XL system
90° to window plane – Cantilever AK_B up to 100 mm



Limiting conditions

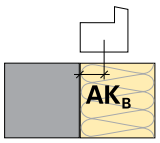
Cantilever (AK_B)	Projection of the fastening point beyond the reveal edge
Joint width (e)	Up to 20 mm + up to 7 mm profile depth if appropriate
Predrilled hole diameter and type	Dependent on substrate, see "General instructions"
PVC reinforcement window profile	U, L or rectangular tube, min. 1.5 mm
Profile extensions and FBA	See separate description
Masonry strength classes	Values can be used for higher strength classes



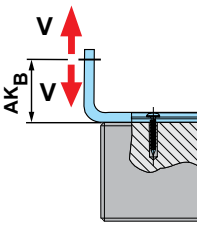
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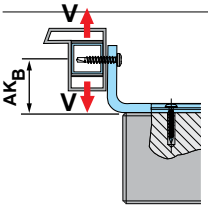


JB-W/XL



Fastening side and top

Arrangement and force direction	In substrate						Transverse load	
	**Material**	**Minimum format** (mm)	**Type/ class**	**Angle JB-W/XL**	**Fastener** (2× in each case)	**Check-ed in acc. with**	**Working load** $F_{empf.}$ (kN) **Tension/compression**	**Design load** F_{Rd} (kN) **Tension/compression**
	Concrete	–	C20/25	All	MMS-plus-P-7.5×50	MO-02/1	1.23	1.72
	Lime-sand stone	–	FKL 20					
	Lime-sand stone XL	248×175×498	20/2.0					
	Aerated concrete	500×120×300; 500×250×300	4		FB-FK-7.5×152		1.12	1.57
	Timber	–	C24		FB-FK-7.5×62		2.57	2.57

	In window frame					Transverse load	
	**Frame material**	**Type/class**	**Angle JB-W/XL**	**Fastener** (2× in each case)	**Check-ed in acc. with**	**Working load** $F_{empf.}$ (kN) **Tension/compression** **Max. joint width e** (mm) **20**	**Design load** F_{Rd} (kN) **Tension/compression** **Max. joint width e** (mm) **20**
	PVC reinforced	Rectangular tube, $R_m \geq 270$ N/mm², 1.5 mm	All	FB-FK-7.5×42	MO-02/1	2.17	2.17
		U, $R_m \geq 270$ N/mm², 1.5 mm		SPR3/25-5.5×43		1.35	1.35
	PVC not reinforced 1)	Aluplast energeto® 8000		VAP/34-6×40		0.86	1.21
		Salamander evoCore+				0.77	1.05
	Timber	$rho_k \geq 400$ kg/m³				1.12	1.12

1) The application-dependent influence factors A_1, A_2 and A_3 must be considered.

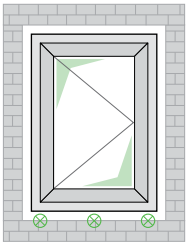
Comments
MO-02/1: Values determined on the basis of tests and assessments in accordance with ift Guideline MO-02/1, Version June 2015.
Values for concrete were determined in tests in lime-sand stone.
Intermediate values can be interpolated linearly.

All information is non-binding and given without liability.

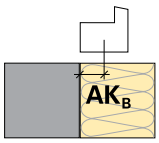
Design values JB-W/XL system
90° to window plane – Cantilever AK_B up to 100 mm

Limiting conditions

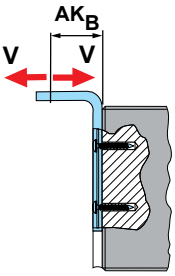
Cantilever (AK_B)	Projection of the fastening point beyond the reveal edge
Joint width (e)	Up to 20 mm + up to 7 mm profile depth if appropriate
Predrilled hole diameter and type	Dependent on substrate, see "General instructions"
PVC reinforcement window profile	U, L or rectangular tube, min. 1.5 mm
Profile extensions and FBA	See separate description
Masonry strength classes	Values can be used for higher strength classes



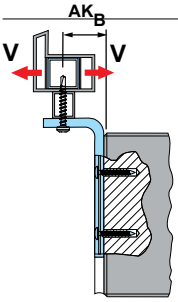

JB-W/XL



Fastening bottom



Arrangement and force direction	In substrate						Transverse load	
	Material	**Minimum format** (mm)	**Type/ class**	**Angle JB-W/XL**	**Fastener** (2× in each case)	**Checked in acc. with**	**Working load** $F_{empf.}$ (kN) **Tension/compression**	**Design load** F_{Rd} (kN) **Tension/compression**
	Concrete	–	C20/25	Alle	MMS-plus-P-7.5×50	MO-02/1	1.23	1.72
	Lime-sand stone	–	FKL 20					
	Lime-sand stone XL	248×175×498	20/2.0					
	Aerated concrete	500×120×300; 500×250×300	4		FB-FK-7.5×152		1.12	1.57
	Timber	–	C24		FB-FK 7.5×62		2.57	2.57



	In window frame/window sill connection profile (FBA)					Transverse load	
	Frame material	**Type/class**	**Connection point**	**Fastener** (2× in each case)	**Checked in acc. with**	**Working load** $F_{empf.}$ (kN) **Tension/compression** **Max. joint width e** (mm) **20**	**Design load** F_{Rd} (kN) **Tension/compression** **Max. joint width e** (mm) **20**
	PVC reinforced	Rectangular tube, $R_m \geq 270$ N/mm², 1.5 mm	FBA	FB-FK-7.5×72	MO-02/1	0.93	0.93
		U, $R_m \geq 270$ N/mm², 1.5 mm		SPC-5.5×55		0.88	0.88
		Rectangular tube, $R_m \geq 270$ N/mm², 1.5 mm	Profile	FB-FK-7.5×42		2.17	2.17
		U, $R_m \geq 270$ N/mm², 1.5 mm				1.56	1.56
	PVC not reinforced [1]	Aluplast energeto® 8000	FBA	SPTR-6×80		0.91	0.91
		Salamander evoCore+				0.41	0.41
	Timber	$rho_k \geq 400$ kg/m³	Profile	VAP/34-6×40		1.12	1.12

1) The application-dependent influence factors A_1, A_2 and A_3 must be considered.

Comments
MO-02/1: Values determined on the basis of tests and assessments in accordance with ift Guideline MO-02/1, Version June 2015.
Values for concrete were determined in tests in lime-sand stone.
Intermediate values can be interpolated linearly.

All information is non-binding and given without liability.

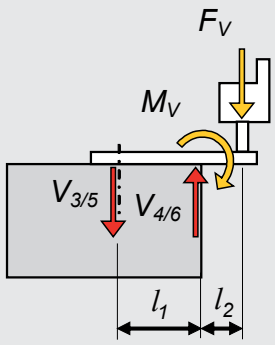
Verification calculation for the cantilevering installation with the JB-D® PLUS system

A verification calculation can be used as an alternative to using the values from the table for the cantilevering installation of the JB-D® PLUS under the following conditions:

- For the resistance to the load in the plane of the window
- Vertical attachment in the reveal (not for the use of blockwork brackets in hollow brick masonry)

Refer also to LzM, section 5.1.2.1
The forces and moments can be represented by the following equations:

Vertical



$$F_V = \frac{G_{Fenster}}{2} \; bzw.$$

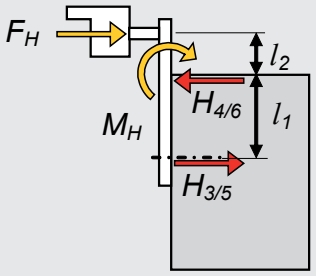
$$F_V = \frac{G_{BR}}{2} + G_{Flügel} + P$$

$$M_V = F_V \cdot l_2$$

$$V_{3/5} = F_V \cdot \frac{l_2}{l_1}$$

$$V_{4/6} = F_V + V_{3/5}$$

Horizontal



$$F_H = \frac{b}{h} \cdot \left(\frac{G_{Flügel}}{2} + P \right)$$

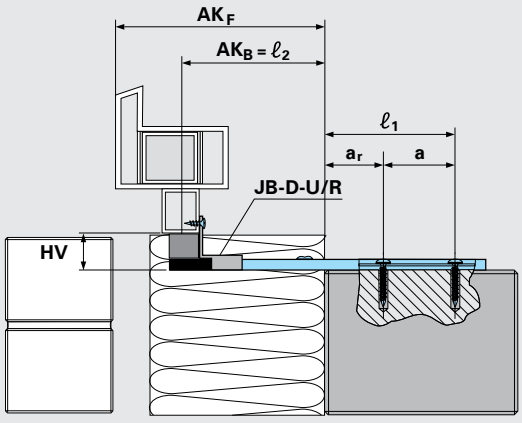
$$M_H = F_H \cdot l_2$$

$$H_{3/5} = F_H \cdot \frac{l_2}{l_1}$$

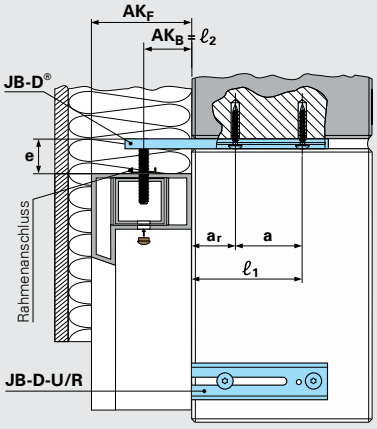
$$H_{4/6} = F_H + H_{3/5}$$

l_1 Distance to the rear fastener in the substrate (= a_r+a)
l_2 Cantilever: Distance to the attachment point projecting beyond reveal edge (= AK_B)

Source: Guideline for installation (LzM), edition March 2014



Fastening bottom



Fastening side

Calculation to determine l_1

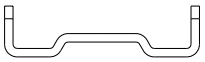
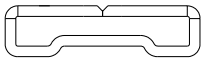
$$l_1 = l_{Konsole} - 20\ mm - l_2$$

Type **JB-D PLUS**	$l_{Konsole}$ (mm)	$l_1 + l_2$ (mm)
U100	100	80
U155	155	135
U185	185	165
U225/R225	225	205
U265/R265	265	245

Cantilever AK l_2 (mm)

0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Distance of fastening from the front edge l_1 (mm)															
80	70	60	–	–	–	–	–	–	–	–	–	–	–	–	–
135	125	115	105	95	85										
165	155	145	135	125	115	105	95	85							
205	195	185	175	165	155	145	135	125	115	105	95	85			
245	235	225	215	205	195	185	175	165	155	145	135	125	115	105	95

Properties of the JB-D PLUS system

			 JB-D-U	 JB-D-R
Strength (yield strength)	f_y	N/mm²	390	390
E-modulus (steel)	E	N/mm²	210,000	210,000
Section modulus	W_y	mm³	142	839
Area moment of inertia	ι_y	mm⁴	1144	5395

Verification: Profile and fastener

	Horizontal	**Vertical**
Verification of stress	$\sigma_{b,H,eff} = M_H / W_{JB\text{-}D}$	$\sigma_{b,V,eff} = M_V / W_{JB\text{-}DK}$
	Requirement: $\sigma_{b,eff} < f_y/1.1$	
Verification of deflection	$f_{vor} = (F_H \cdot l_2^2 \cdot (l_1 + l_2)) / (3 \cdot E \cdot I_{JB\text{-}D})$	$f_{vor} = (F_V \cdot l_2^2 \cdot (l_1 + l_2)) / (3 \cdot E \cdot I_{JB\text{-}DK})$
	Requirement: $f_{v,eff} < f_{max.}$	
Verification of fastener pull-out	$H_{3/5} = F_H \cdot \frac{l_2}{l_1}$	$H_{3/5} = F_V \cdot \frac{l_2}{l_1}$
	Requirement: $H_{eff} < F_{Bef.}$	Requirement: $V_{eff} < F_{Bef.}$

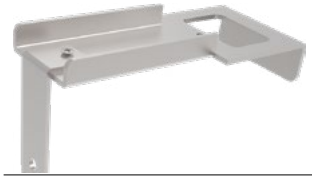
Maximum deflection $f_{max.}$: Recommendation in LzM: 3 mm

Test reports/installation instructions JB-D® PLUS and JB-W/XL System

Use	System	What	Substrate/ note	Approval body	No.	Year	Link	QR-Code
Safety barrier & load transfer	JB-D® PLUS JB-D® FA PLUS	Approval	National Technical Approval (abZ)	DIBt	Z-14.4-808	2022	www.sfs.com/bc_70	
Direct attachment	JB-D® PLUS	Installation instructions	All substrates	–	–		www.sfs.com/bc_71	
Clamp attachment		Installation instructions	Vertically perforated clay block (HLZ) and aerated concrete				www.sfs.com/bc_72	
Burglar resistance		RC2 certificate	Test report and appendices	EPH			www.sfs.com/bc_74	
Thermal performance certificate		Thermal bridge calculation		gbd Dornbirn			www.sfs.com/bc_75	
ift certification		Component test		ift			www.sfs.com/bc_76	
Suitability of use	JB-W/XL	Component test	Lime-sand stone	ift	17-003254-PR01	2018	www.sfs.com/bc_77	
Burglar resistance		RC2 certificate	Test report and appendices	EPH	EH-20-06-10-01		www.sfs.com/bc_78	
					Anlage zu EH-20-06-10-01		www.sfs.com/bc_79	
					EH-20-06-10-02		www.sfs.com/bc_80	
					Anlage zu EH-20-06-10-02		www.sfs.com/bc_81	
In front of the wall installation		Installation manual	Standard installation	–	–		www.sfs.com/bc_82	
In front of the wall installation, safety barrier			Safety barrier fastening, ETB tested ETB geprüft				www.sfs.com/bc_83	

Component range JB-D PLUS

JB-D® PLUS – Steel bracket and rectangular tube for direct attachment in concrete, lime-sand stone, timber and aerated concrete

Product	Description/use	Ordering code	#	Length (mm)	Width (mm)	PU	Art No.
	JB-D® PLUS steel bracket side	JB-D-U155	**20**	155	47	50	1651506
		JB-D-U185	**21**	185			1651529
		JB-D-U225	**22**	225			1651505
		JB-D-U265	**23**	265			1651504
	JB-D® PLUS rectangular tube side	JB-D-R225	**24**	225	47	25	1651503
		JB-D-R265	**25**	265			1651502
	JB-DK® PLUS steel bracket bottom	JB-DK-U155	**26**	155	47	50	1651501
		JB-DK-U185	**27**	185			1651496
		JB-DK-U225	**28**	225			1651493
		JB-DK-U265	**29**	265			1772128
	JB-DK® PLUS rectangular tube bottom	JB-DK-R225	**30**	225	47	25	1651494
		JB-DK-R265	**31**	265			1651495
	JB-D® PLUS clamp bottom	JB-D-CB175	**32**	175	74	25	1651497
		JB-D-CB200	**33**	200			1651499
		JB-D-CB240	**34**	240			1651500
	JB-D® PLUS window sill connection (FBA) angle	JB-D-W32/47	**35**	32	57	25	1644746
		JB-D-W65/47	**36**	65			1644747

Component range JB-D PLUS

JB-D® PLUS – Accessories for fastenings in substrates

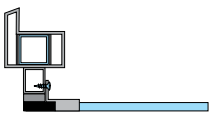
Product	Description/use	Product code	Drive bit	Ø	Length (mm)	PU	Art No.
	Concrete, lime-sand stone (KS)	MMS-plus-P-D15-7.5×60	T30	7,5	60	50	1205035
	Timber	HTP-T-FH-FT-8×80/74	T30	8	80	50	1205373
	Hollow brick/vertically perforated clay block (HLZ)	FB-FK-T30-7.5×132	T30	7,5	132	100	1089936
	Aerated concrete	IGR-FK/T25-8×61	T25	8	61	100	1407343
	PP2/hollow brick/vertically perforated clay block (HLZ) bottom with clamp	SXRL-10×80-T	T30	10	80	25	1562247
	PP2/PP4	FL-FK-T30-9×245	T30	9	245	50	1580711

JB-D® PLUS – Accessories for fastenings to window frames

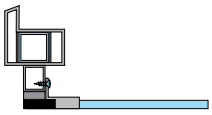
Product	Description/use	Product code	Drive bit	Ø	Length (mm)	PU	Art No.
	PVC reinforced/steel	SP3/9-M3.9×16-GSW	PH2	3.9	16	2000	1550925
	PVC with ≤15 mm extension	SN4/24-7504P-4.8×32	PH2	4.8	32	1000	689570
	Timber	HTP-T-CS-PT-4.5×40	T25	4.5	40	500	1205259
	Aluminium	SLG-S-4.8×20	HEX 8	4.8	20	100	1772647
	Connection PVC extension	SPC4/33-5.5×45-GS	T30	5.5	45	100	1133336
	Timber and aluminium, for smaller joint widths	JB-AM8-T	–	–	70	250	1346176
	Colour: White	CC-JB/10.5 RAL9010	–	–	13	100	846879
	Colour: Brown	CC-JB/10.5 RAL8011	–	–			846877
	Drive bit: T25/¼"	T25-70-HEX¼"	¼"	–	70	10	1167067

*Extension must be predrilled. / **Length of SPC fastener must be matched to the extension.

Attachment JB-D-W to the window sill connection without profile reinforcement

Product	Description/use	Product code	Drive bit	Ø	Length (mm)	PU	Art No.
		SPT/24-4.3×30	PH2	4.3	30	1000	1523991

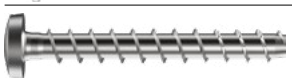
Attachment JB-D-W to the window sill connection with profile reinforcement

Product	Description/use	Product code	Drive bit	Ø	Length (mm)	PU	Art No.
		SP3-3.9×25	PH2	3.9	25	2000	1550934

Delivery Range System JB-W/XL

Product	Designation	Product code	Length/s (mm)	Width (mm)	PU (Pcs)	Item No.
140×40 140×60 	JB-W/XL Mounting bracket	JB-W/XL-140×40	140/40	80	50	1573530
		JB-W/XL-140×60	140/60			1573575
140×80 140×100 		JB-W/XL-140×80	140/80			1691959
		JB-W/XL-140×100	140/100			1691946

System Accessories JB-W/XL

Product	Designation	Product code	Recess	Ø (mm)	Length (mm)	PU (Pcs)	Item No.
	SPR drill fastener for PVCu, reinforced	SPR3-5.5×38	T30	5.5	38	100	1607033
	SPM mounting fastener for PVC-u, reinforced	SPM3-5.5×25		5.5	25		1141761
	FB mounting fastener anchor Type **FK**	FB-FK-7.5xL		7.5	42		1117989
					62		1117987
					72		1115791
	VAP mounting fastener for timber and PVCu non reinforced	VAP-6.0×40		6.0	40		1147091
	SDA5 for Aluminium	SDA5-5.5×20	6-kant	5.5	20	500	1499657
	MULTI-MONTI-plus-P for concrete and masonry	MMS-plus-P-7.5×50	T30	7.5	50	100	1480041

Product	Designation	Product code	Recess	Ø (mm)	Length (mm)	PU (Pcs)	Item No.
	Bit T×50 W	T30W-50-Hex¼"	T30	¼"	50	1	57539

SFS Group Fastening Technology Ltd.
Segment Fastening Systems
153 Kirkstall Road
Leeds LS4 2AT

ukenquiries@sfs.com
uk.sfs.com

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