glass system

MODERN SOLUTIONS IN GLASS ARCHITECTURE

CATALOGUE 2016

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Glass System

We are a supplier of comprehensive glass architectural systems. Our products enable versatile use of glass, both indoor and on building facades.

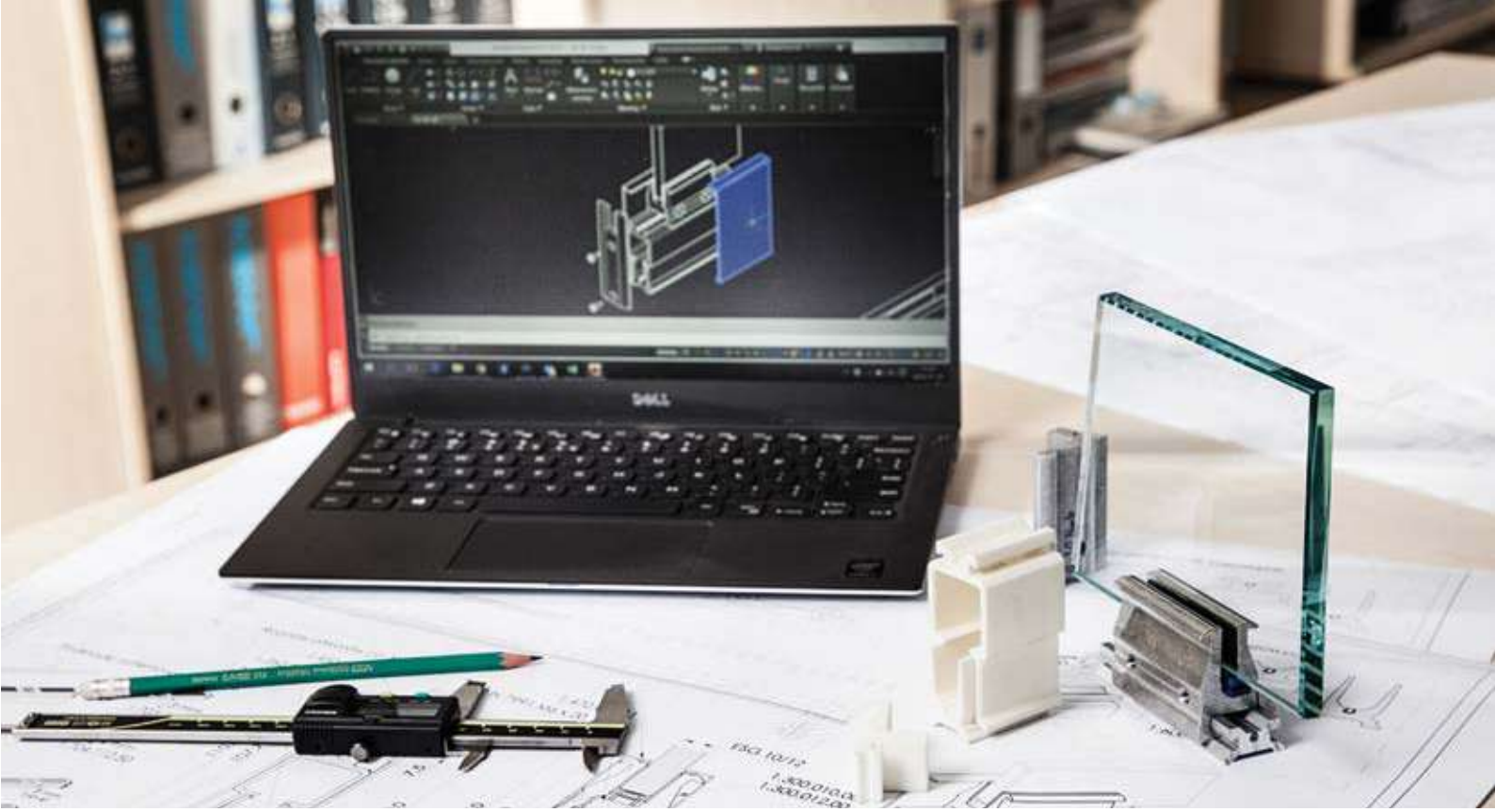
We provide our own innovative solutions that can be used in all types of spaces: commercial, service, office, and residential.

What makes us different from our competitors is our own design office which is capable of preparing even the most complex projects that meet unique needs of our customers.

Our products meet the highest quality standards, which is confirmed by appropriate certificates that have been issued after tests.

Strength
The GSW Pro and GSW Office Systems have been tested by the Building Research Institute according to ETAG 003 and received the European Technical Assessment (ETA) document.

Sound insulation
The GSW Office system has been tested by the Building Research Institute in accordance with the EN ISO 10140-2:2011 standard.

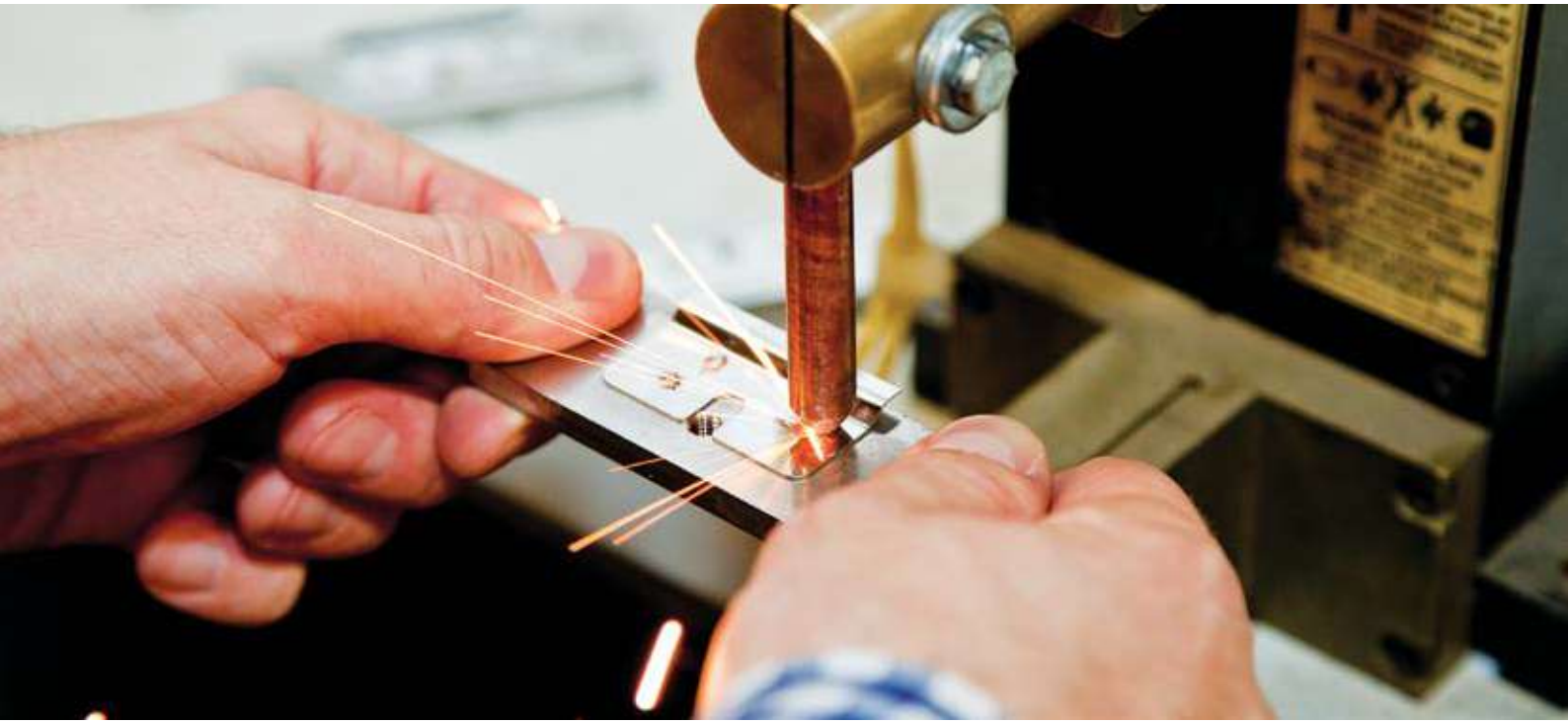


Our goal is to create original and useful solutions that meet the needs of our customers, architects, and contractors. All original Glass System products are made in Poland.

The ongoing direct control at individual production stages guarantees the highest quality and precise finish.

Furthermore, we have possibilities to develop individual object-oriented solutions for the purpose of the most demanding investments.

Together with our products, we offer our long experience. We build strong relations with our customers that are based on the highest level of services.



GLASS WALL SYSTEMS

Glass wall systems

The scope of application of glass in architecture is practically unlimited: glass can be used wherever modern appearance, space, aesthetics, and ecology are important.

GSW glass systems are suitable for multiple applications and work very well in shopping centers, office and service buildings, and in residential housing.

What distinguishes them from competing products is their performance and aesthetic characteristics.

The different applications are specified in European standards as categories of space and categories of use.

Category of space	Purpose	Category of use	
A	Residential	I / II	IV*
B	Office		
C	Meetings and gatherings	III	
D	Commercial		
E	Warehouse		

Classification according to EN 1991-1-1:2004 and ETAG 003.
* In case of failure risk includes the fall to a floor at a lower level.

Depending on the category, walls must meet specific strength and sound insulation criteria. The related parameters depend on both the type of glass and the fastening system.

In order to achieve high strength, tempered glass is used. On the other hand, laminated glass with sound-insulating film has better acoustic insulation characteristics.

Wherever tall glass walls are used and/or where walls are subject to larger service loads, e.g. in shopping malls, it is necessary to use fastening systems that guarantee stability and safety.

In locations where such features as minimalism and acoustic characteristics are the most important, e.g. in office spaces, smaller profiles are used, which additionally ensure distinctly better sound insulation.

Similar criteria apply to doors used in different types of walls. In buildings that are used more frequently, frameless, swing doors are used most often, whereas in offices, doors are smaller and often installed in door frames that ensure tightness.

Glass System products are designed especially in assumption of the specific applications, which are presented in the table below.

	GSW Pro	GSW Office
Category of use	IV	II
Max. height (mm)	4500	3200
Type of glass (wall)	ESG 10 or 12	ESG 10 or 12 VSG 55.1, 55.2, 66.1, 66.2
Acoustic characteristics	not tested	R_w max 38 dB R'_{A1} max 35 dB
Approval	ETA	ETA

GSW Pro

A,B,C,
D,E

KAT IV

ETA

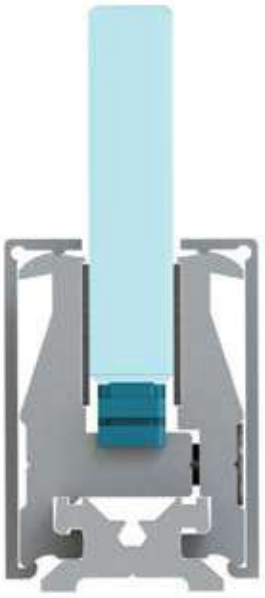
PATENT

ESG

ALU

INOX

CE



One of the most important Glass System products are systems for construction of glass walls in public facilities and shopping centers.

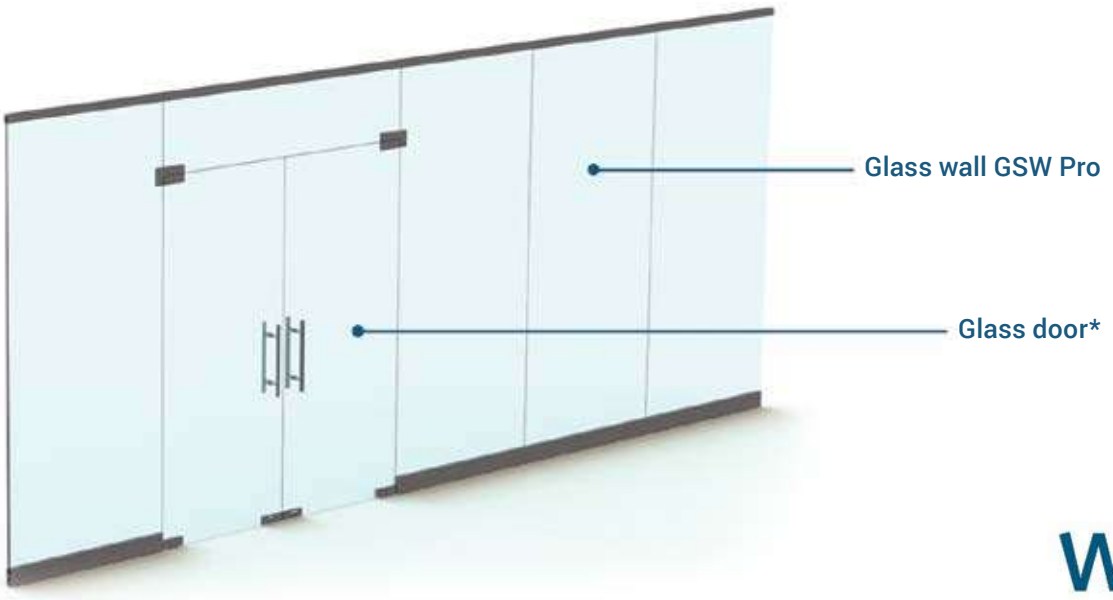
GSW Pro stands for the highest standards of safety, confirmed in relevant tests, which are a must in case of buildings with increased risk of accidents and improper use.

The design of the system is characterized by its versatility and ease of use. Clamp fasteners ensure a stable structure consisting of a glass pane fixed only along two edges. As it is not necessary to use vertical profiles, the system gains a better appearance, which is further improved by the possibility to select profile colors that meet the customer's needs.

The GSW Pro system enables using profile-less swing doors, also in locations where they are used frequently.

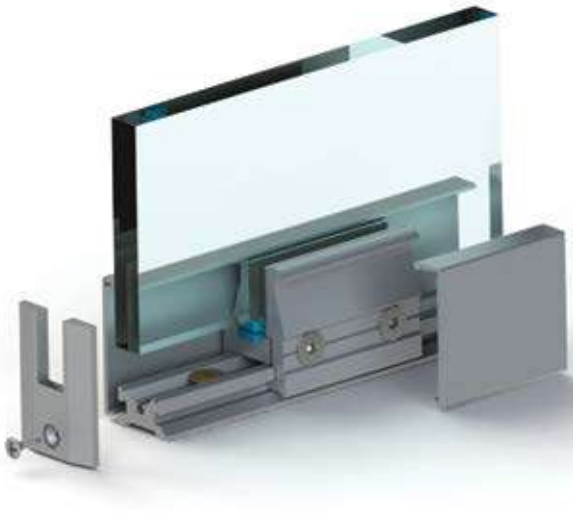
Specification

Category of use	IV
Category of space	A, B, C, D, E
Type of glass	ESG 10 or 12
Max. height (mm)	3500 (ESG 10) / 4500 (ESG 12)
Max. door dimensions (mm)	2400 x 2800 (ESG 10) / 2400 x 3200 (ESG 12)
Material/finish	Anodized aluminium / Powder coated aluminium / Brushed stainless steel
Approval document	ETA-15/0867



* fittings

WSS

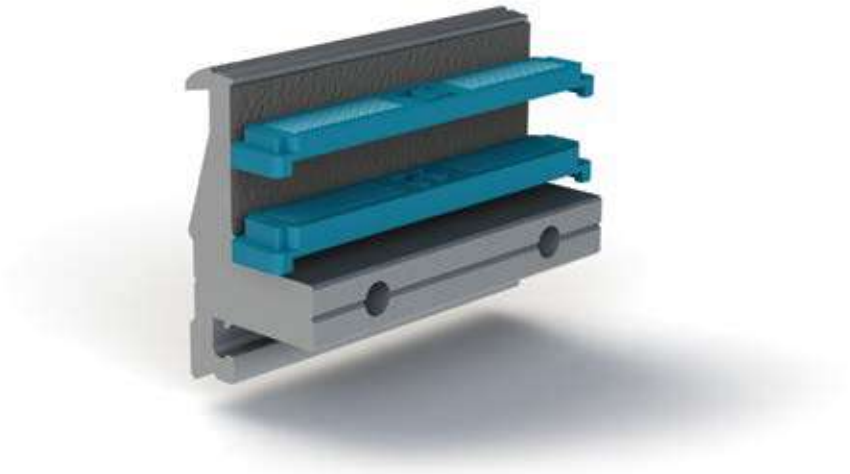


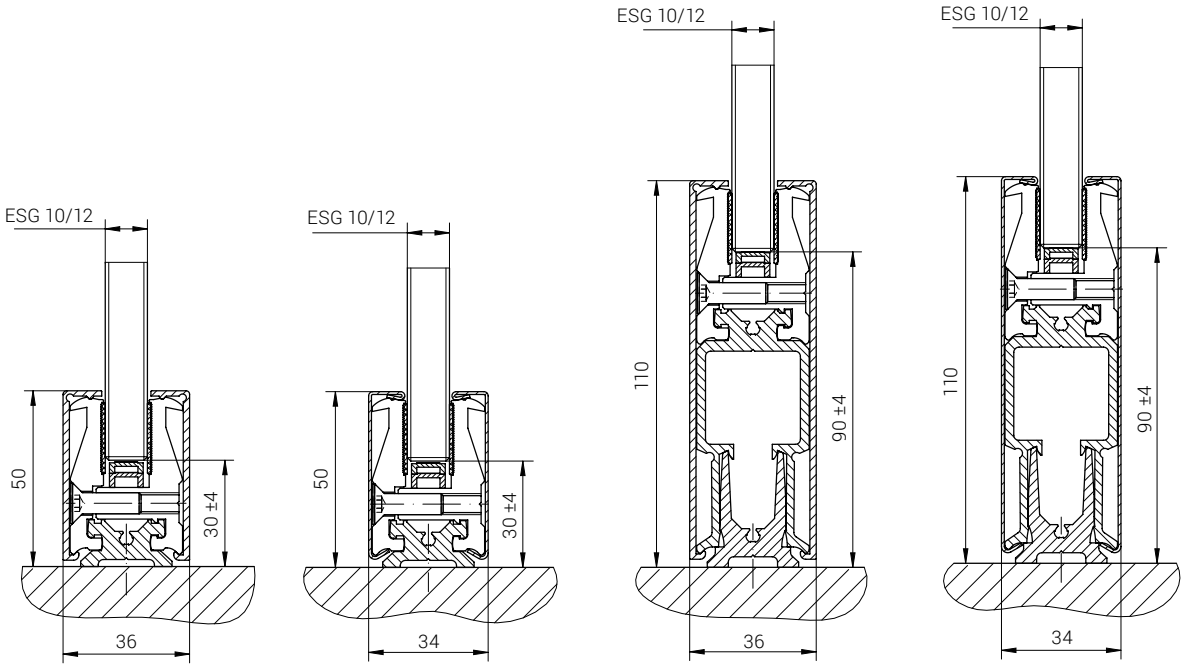
GSW Pro 50

GSW Pro 110

Technical characteristics

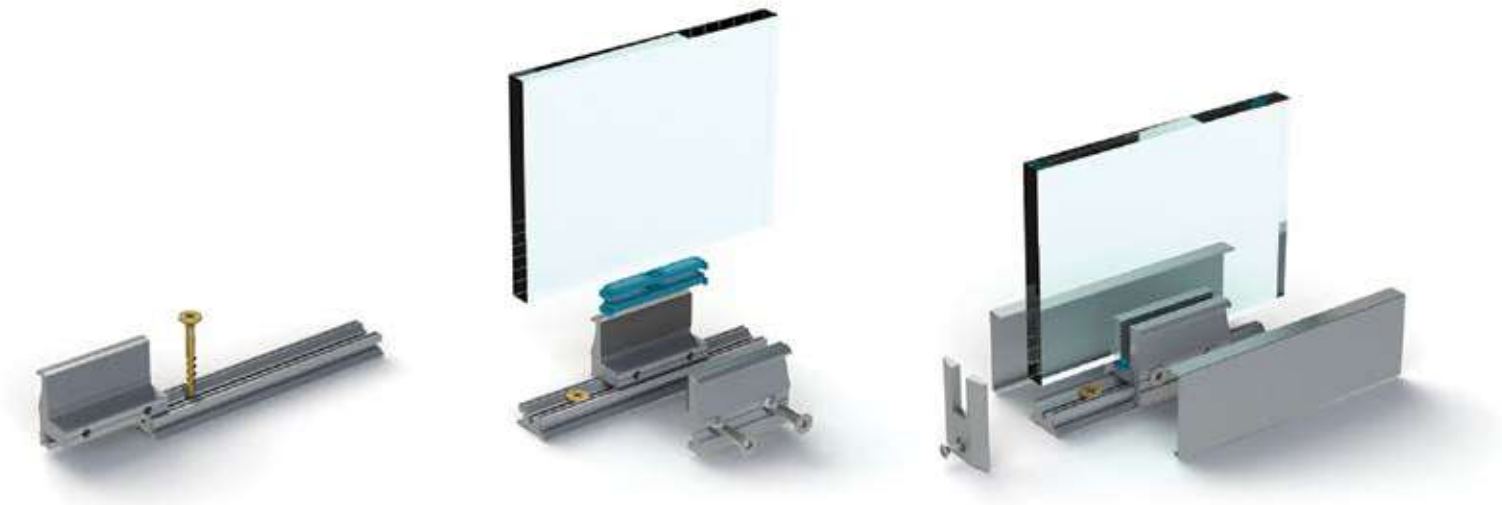
- two types of mounting profiles: 50 mm or 110 mm tall (the 110 mm profile is intended for locations that require additional protection of glass near the floor, e.g. due to the use of cleaning machines);
- guaranteed stability and strength of the structure: the glass is fastened using special fixing clamps;
- easy and convenient installation of the walls: possibility to make any changes to the position of the clamps along the symmetrical base profile whose centerline is the same as the centerline of the glass pane. Special spacers, being a part of the system, enable setting different distances without the need to use non-original elements;
- unique appearance: the masking covers are made of aluminium or stainless steel and are snap-fastened to the fixing clamps. It is possible to fix the covers after all other works are completed at the construction site, which helps avoiding the risk of damage.

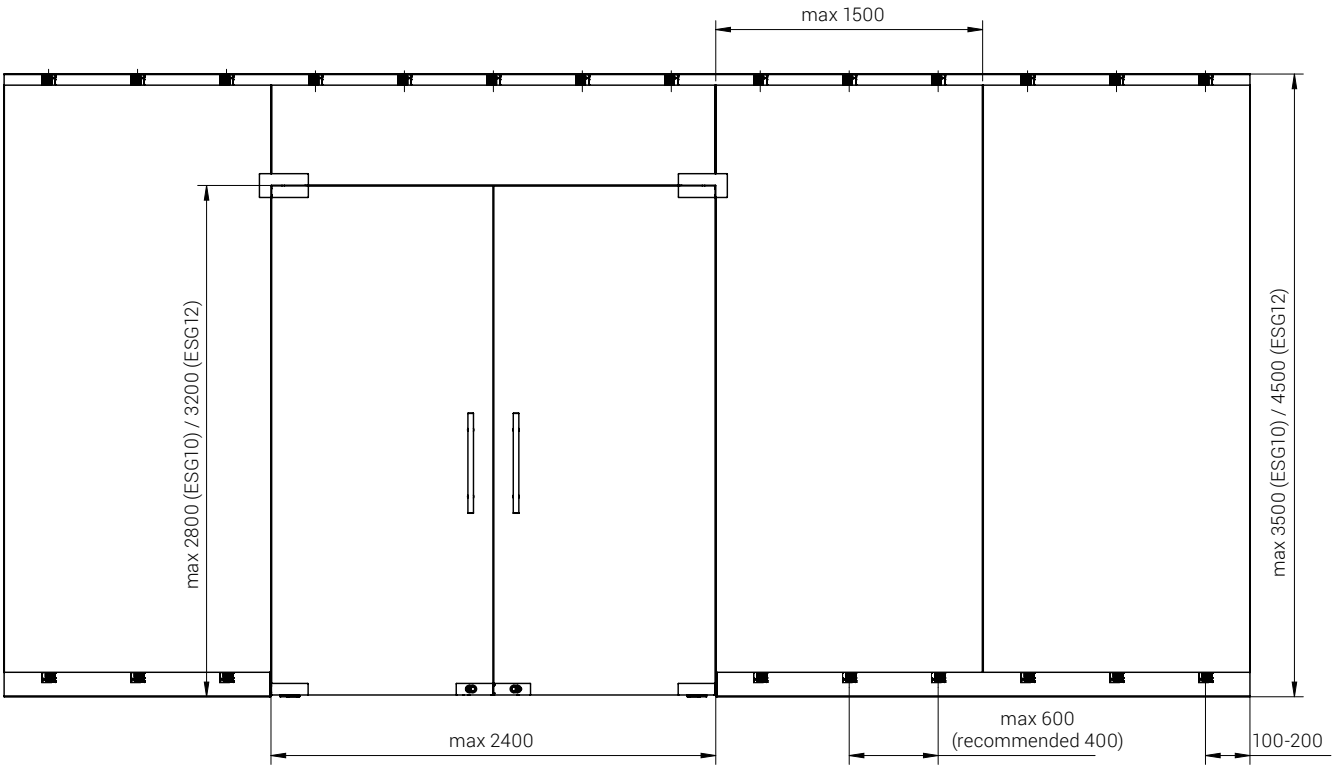




Installation sequence

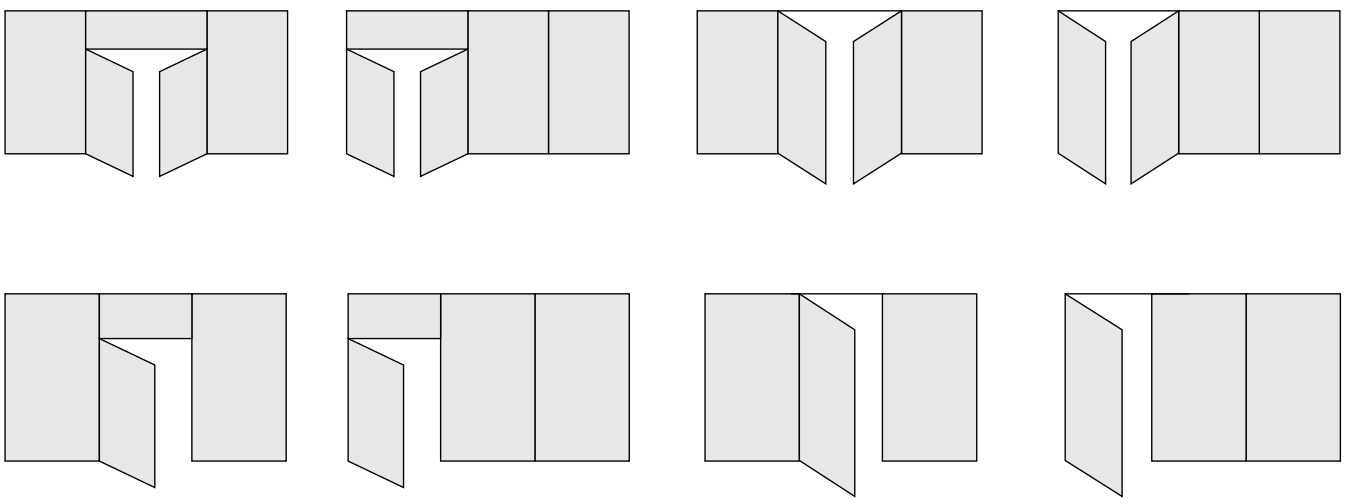
- the base profiles are fixed to the substructure, e.g. the floor, the lintel, or the steel substructure (in case of GSW Pro 110 profile use the mounting profile is installed first and then the base profile is fixed onto it);
- the sliding fixing clamps are installed in a special channel in the base profile;
- the optimum position of the clamps is set;
- special plastic pads are placed in the bottom clamps and the glass panes are set on them;
- both parts of the fixing clamps are tightened with screws;
- the snap-fastened masking profiles and the front caps are installed.





- The data concerning the location of the fixing clamps has been confirmed in strength tests performed in accordance with ETAG 003.
- The load-bearing ability of a single clamp for hanging glass wall is equal to 50 kg, which was determined by the analysis in accordance with the appropriate procedure of the Building Research Institute.

Typical variants of the system of GSW Pro walls



Quality standards and CE marking

The Factory Production Control system that has been implemented ensures the highest and repeatable quality of all components of the GSW Pro system. The functioning of the system has been confirmed in an audit conducted by the Building Research Institute (ITB).

The use of the GSW Pro system guarantees compliance with standards defined in European laws. The system has been tested in accordance with ETAG 003 for the purpose of issue of an European Technical Assessment (ETA) which enables CE marking of products.

As a part of the tests, GSW Pro walls were a subject to, among others, tests of resistance to structural damage from soft body impact load – 50 kg bag and hard body impact load – 1 kg steel ball. The tests were performed on walls made of the ESG 10 and ESG 12 glass. The results of the tests confirmed the highest performance and strength characteristics of the GSW Pro system.

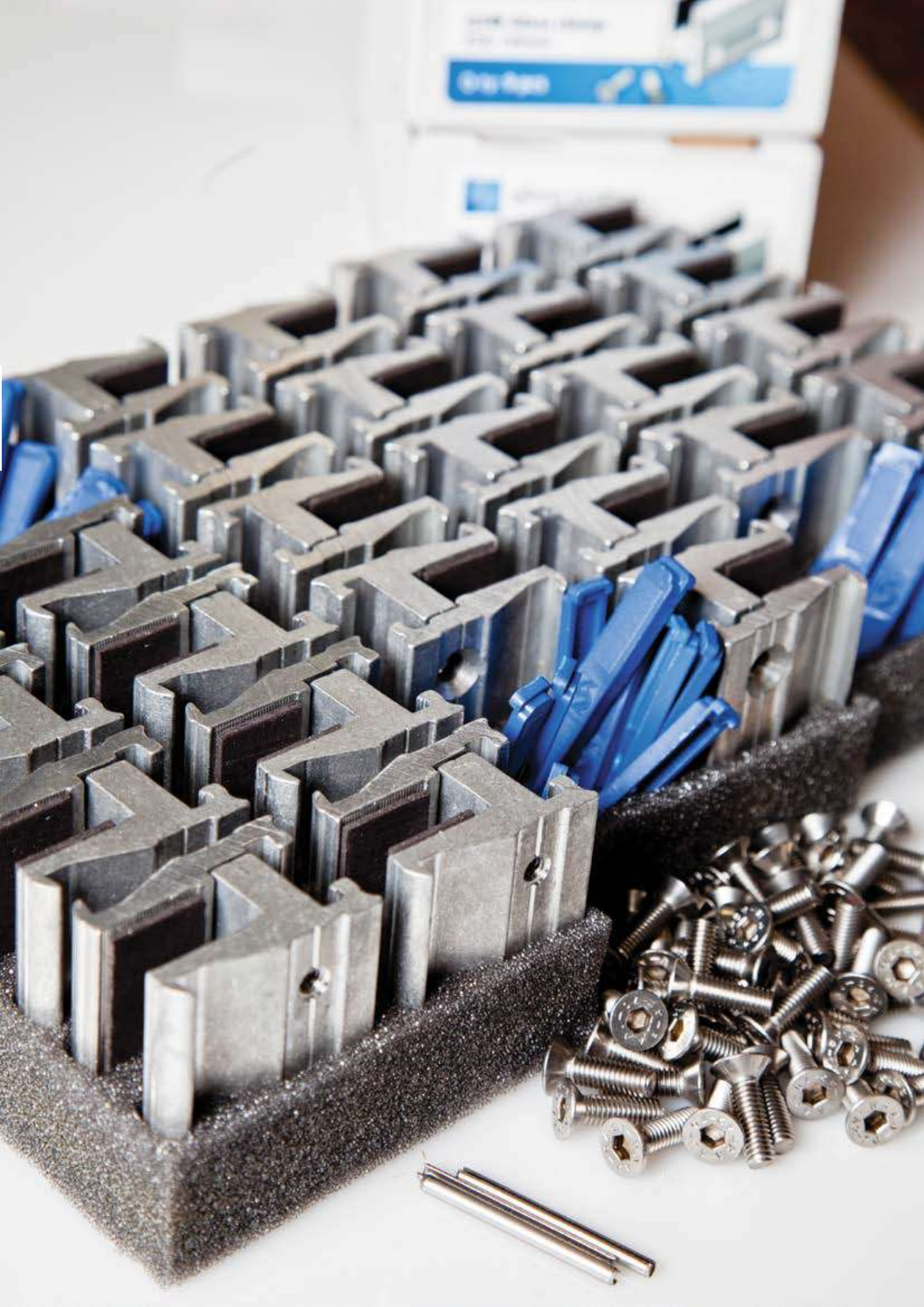

European Technical Assessment

ETA-15/0867

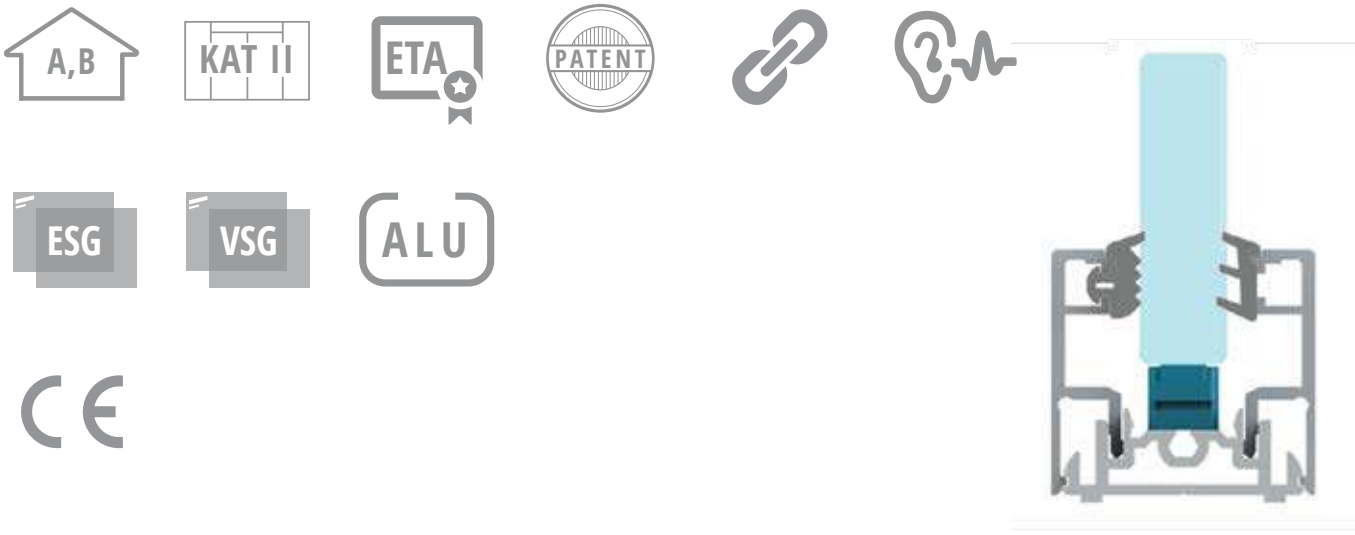
GSW Pro

EOTA

CE



GSW Office



Glass System has developed a unique solution intended especially for construction of partition walls in offices.

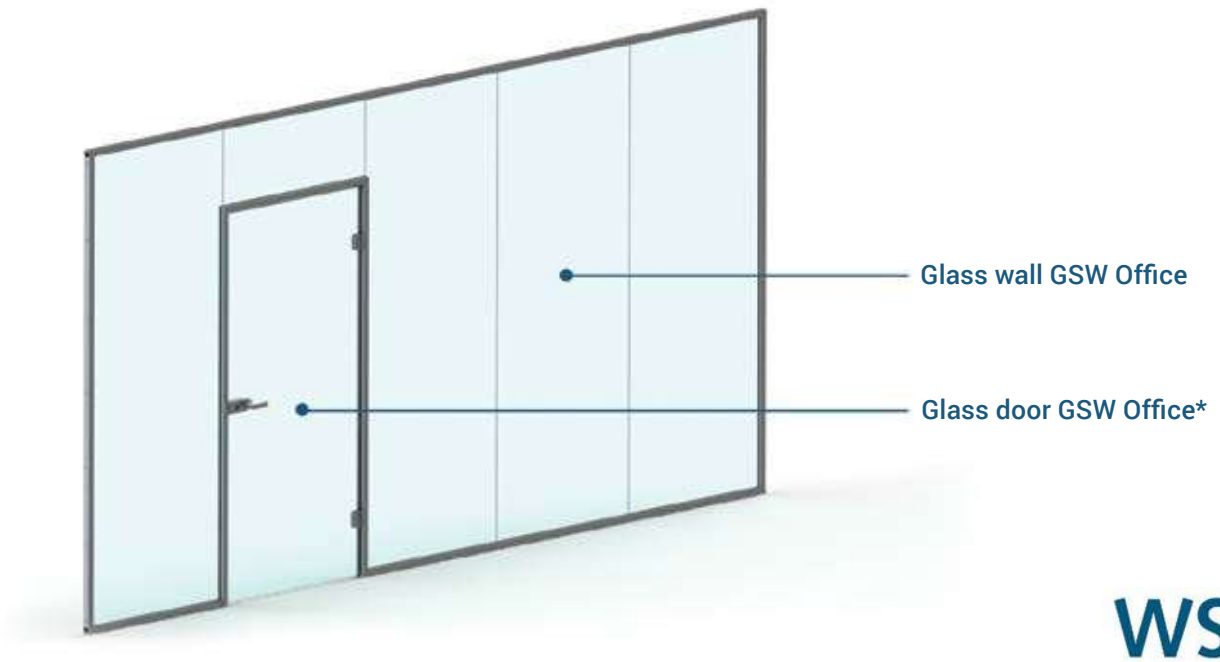
What sets the GSW Office system apart from other systems of this type is its light and simple structure. It has been designed to enable using either hardened or laminated glass (including laminated glass with a sound-insulating film).

One of the key features of the system is its tightness, which guarantees improved sound insulation characteristics. This applies not only to fixed components but also to doors.

Specification

Category of use	II
Category of space	A, B
Type of glass	ESG 10, 12; VSG* 55.1, 55.2, 66.1, 66.2
Max. height (mm)	3200
Max. door dimensions (mm)	Details on page 26
Acoustic insulation	R_w max 38 dB / R'_{A1} max 35 dB
Material/finish	Anodized aluminium / Powder coated aluminium
Approval document	ETA-16/0446

* Including laminated glass with a sound-insulating film

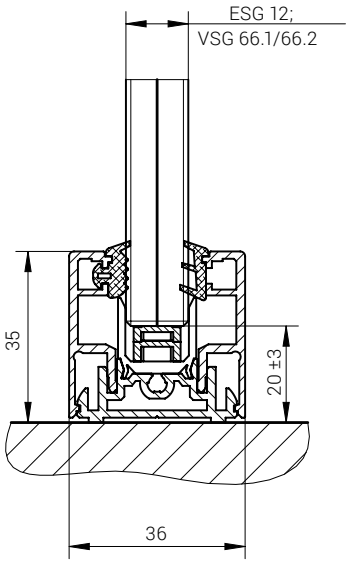


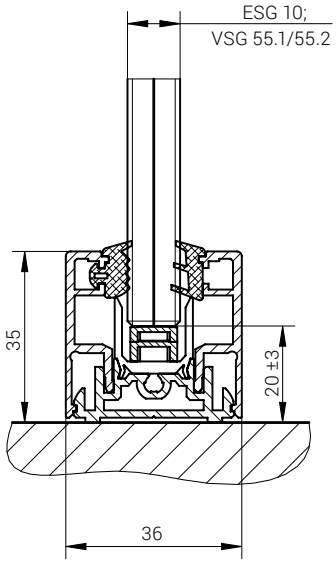
* fittings

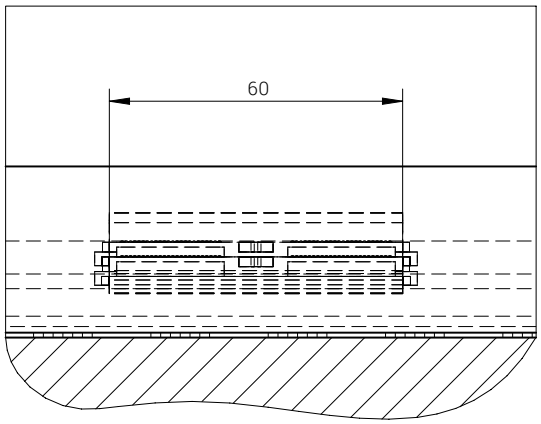
WSS

Technical characteristics

- small and light mounting profile, 35 mm high;
- symmetrical structure of the system: the centerline of the base profile is aligned with the centerline of the glass pane;
- convenient and quick installation of walls: an innovative fastening system that uses special brackets for the glass pane. Special spacers, being a part of the system, enable setting different distances without the need to use non-original elements;
- improved sound insulation thanks to gaskets that fasten the glass and to the fact that adjacent glass panes are connected using special tapes;
- unique appearance: the masking covers are made of aluminium and are snap-fastened to the base profile. Fastening gaskets are available in different colors.

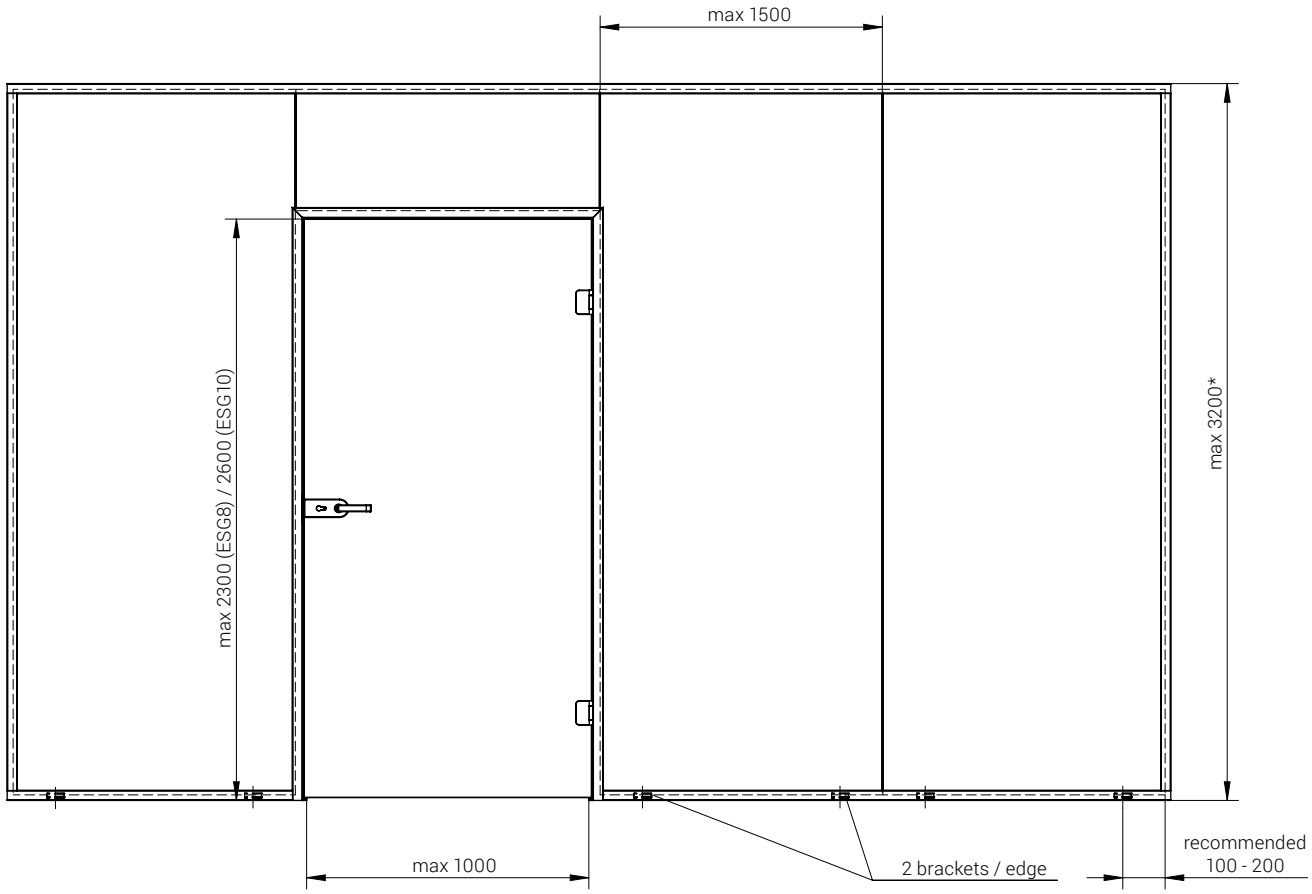






Installation sequence

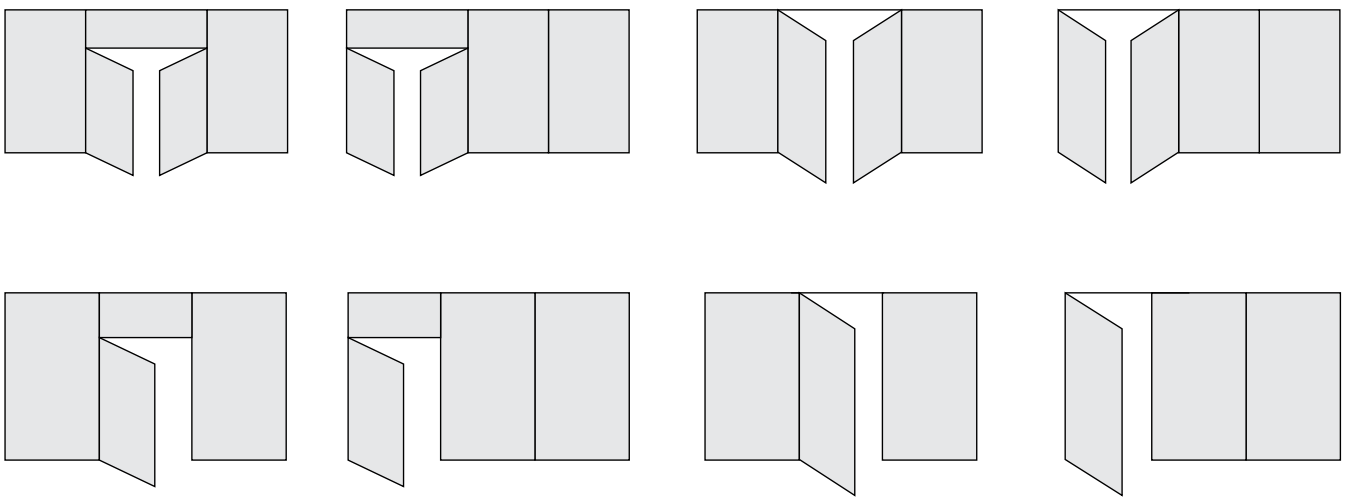
- the base profiles are fixed to the substructure, e.g. the floor, the lintel, or the steel structure;
- covers are fixed to one side together with the gaskets;
- special brackets and spacers of appropriate thickness are installed in the lower base profile;
- the glass is set on the base profile, the side profiles are then installed;
- the glass pane is finally stabilized and the structure is sealed with gaskets.



* above 2700 mm it is recommended to use ESG12 lub VSG 66.1 / 66.2 glass

- It is recommended to use two plastic brackets on the lower edge of the glass;
- The target stability and strength characteristics are achieved after the side profiles and gaskets are installed: the fastening brackets perform an auxiliary role (they are not a structural component).

Typical variants of the system of GSW Office walls



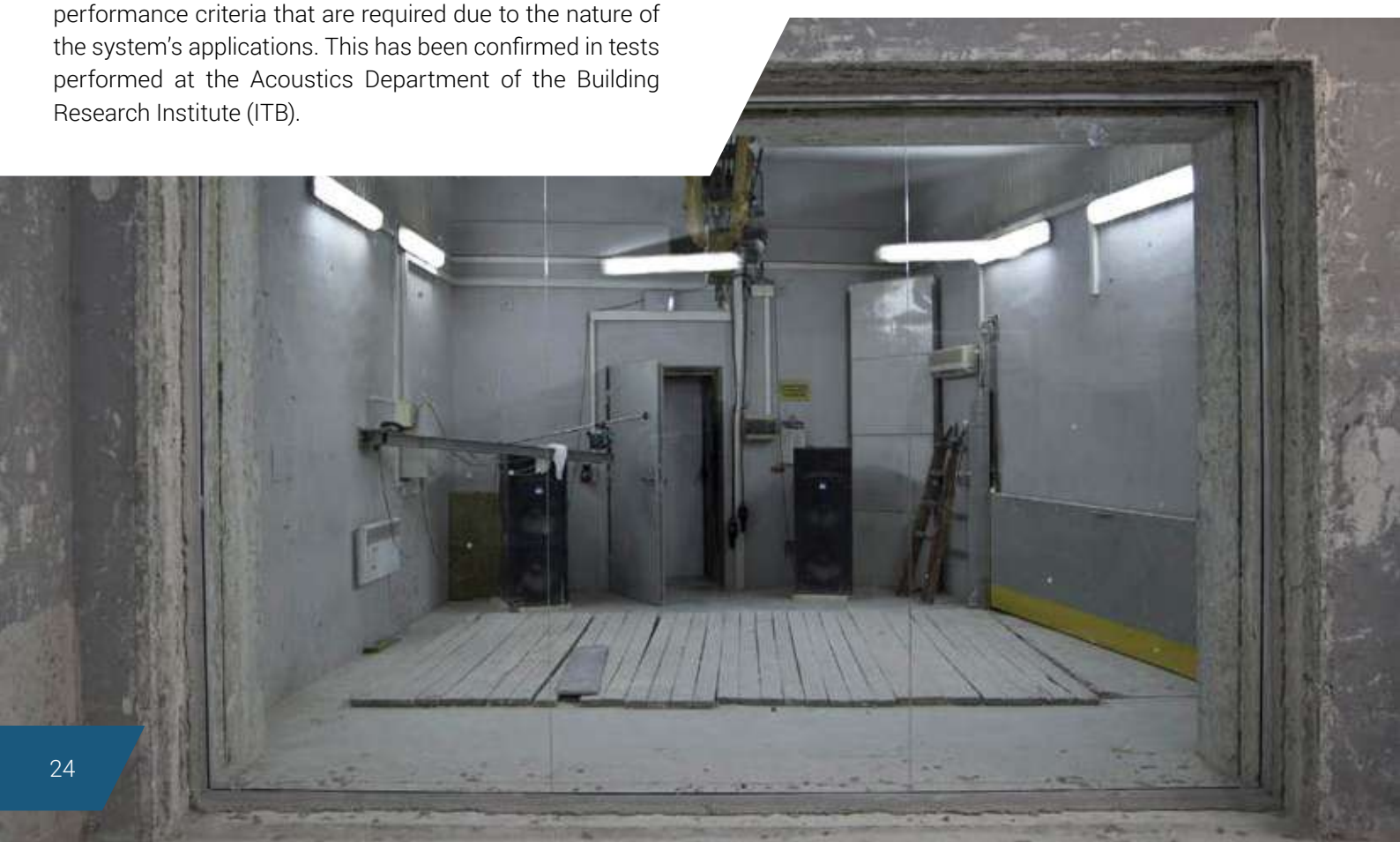
The use of the GSW Office system guarantees the construction's compliance with standards defined in European laws. The system has been tested in accordance with ETAG 003 for the purpose of issue of a European Technical Assessment (ETA) which enables CE marking of products.

As a part of the tests, GSW Office walls were a subject to, among others, tests of resistance to structural damage from soft body impact load – 50 kg bag and hard body impact load – 1 kg steel ball. The tests covered all types of glass that are compatible with the system.

The results of the tests confirmed the good performance and strength characteristics of the GSW Office system.

Acoustic tests

The GSW Office walls also meet the acoustic insulation performance criteria that are required due to the nature of the system's applications. This has been confirmed in tests performed at the Acoustics Department of the Building Research Institute (ITB).



GSW Office - Door

Doors are an integral part of GSW Office system walls. Like the entire system, they stand out thanks to their excellent aesthetic appearance and their good acoustic-insulation characteristics.

The door leaf, made of tempered glass, is fixed to an aluminium frame set in the wall. The hinged doors of this type are, as a standard, fitted with a lock and a door handle.

The system includes an automatic door bottom strip to ensure even better sound-insulation performance, and an electric strike enabling the creation of the access control system.

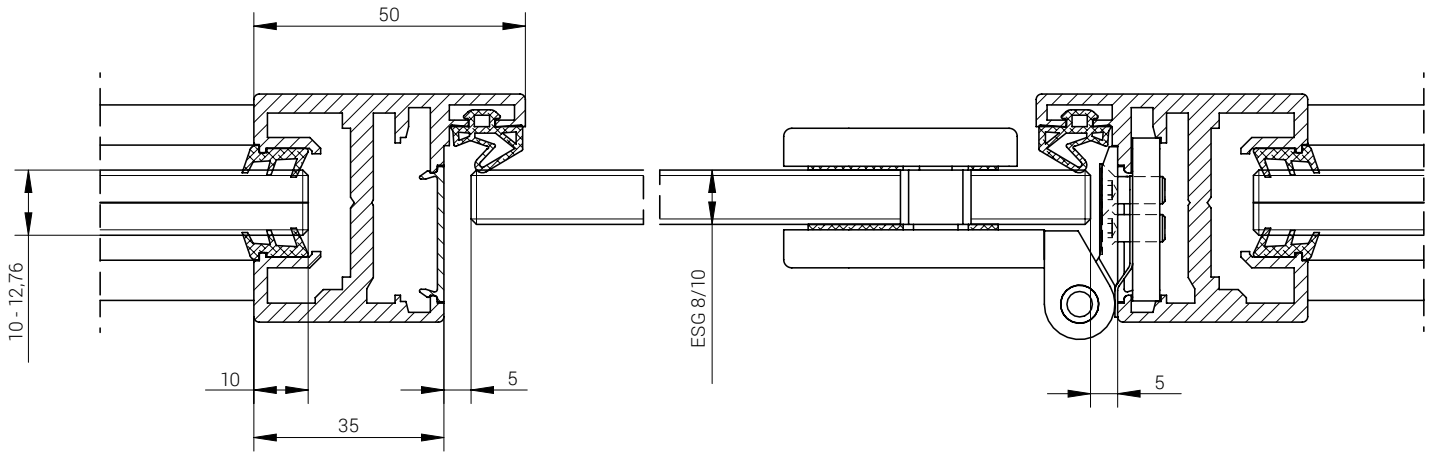
Specyfication

Durability	Class 6 (200 000 cycles)
Type of glass	ESG 8 or 10
Max. door leaf height (mm)	2300 (ESG 8)* / 2600 (ESG 10)*
Max. door leaf width (mm)	1000
Acoustic insulation	R_w max 31 dB / R'_{A1} max 28 dB**
Material/finish	Anodized aluminium / Powder coated aluminium

* above 2200 mm it is recommended to use 3 hinges
** if an automatic drop-down seal is used

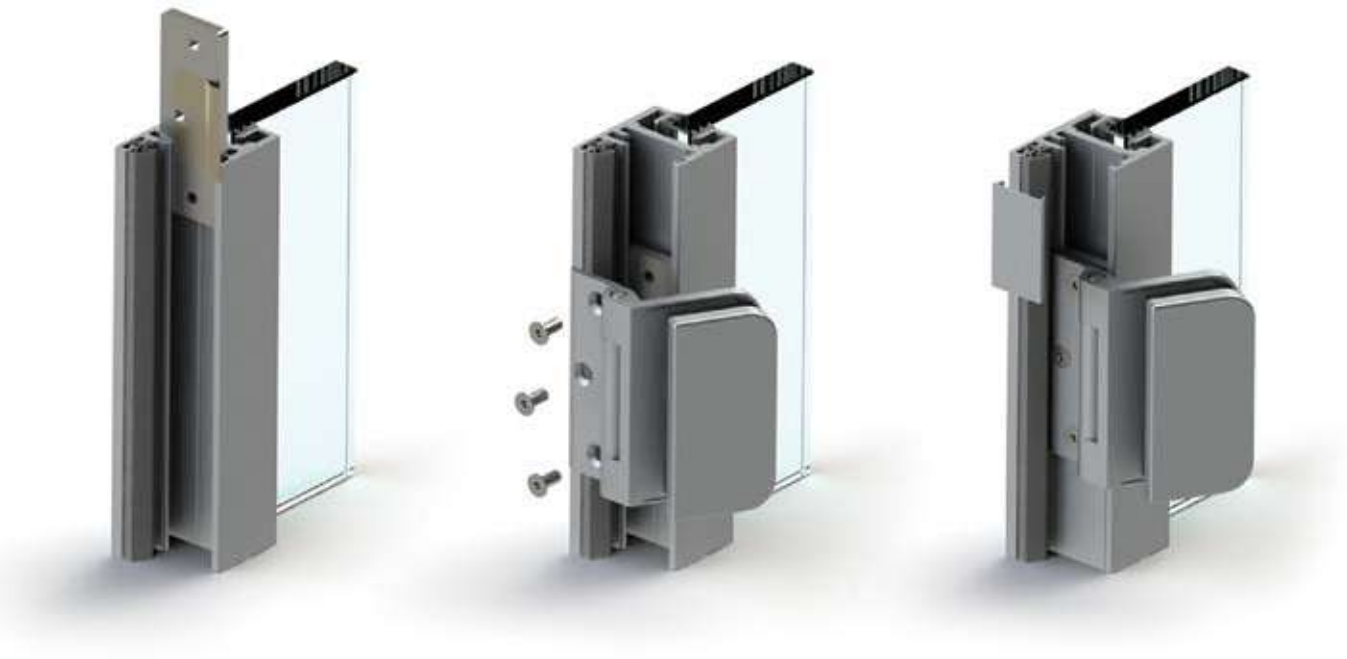
* fittings

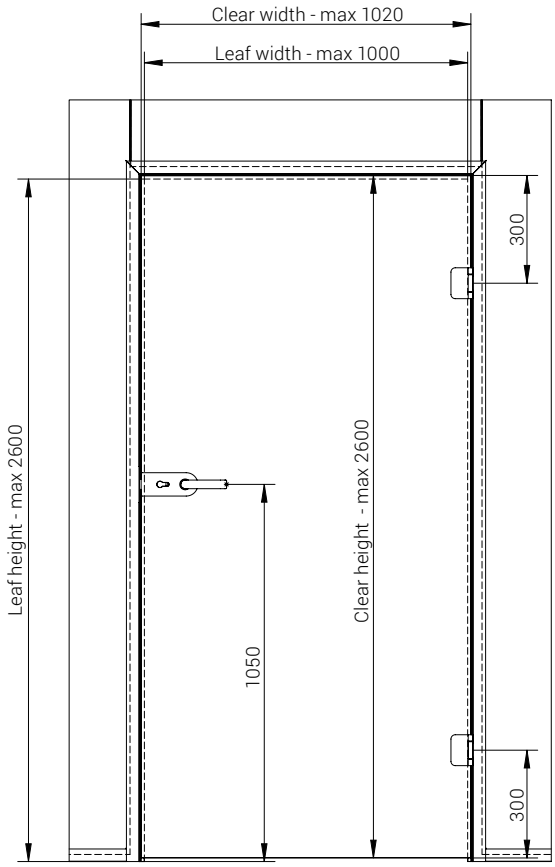
WSS



Technical characteristics

- The frame profile's dimensions and finish match the basic mounting profile in the GSW Office system.
- Installation in a fully glazed structure or directly in a wall.
- Symmetrical structure: for left-handed and right-handed doors.
- An innovative way of fastening the hinges and the lock's strike plate: no need for prefabrication of profiles thanks to sliding installation elements.
- Many possible configurations: doors can be additionally fitted with electric strike lock and/or surface-mounted automatic door closers.
- The complete set consists of frame profile, cover profile, mounting brackets, hinge plates, screws, a closing seal, and a strike plate for a Studio type lock.





Installation sequence

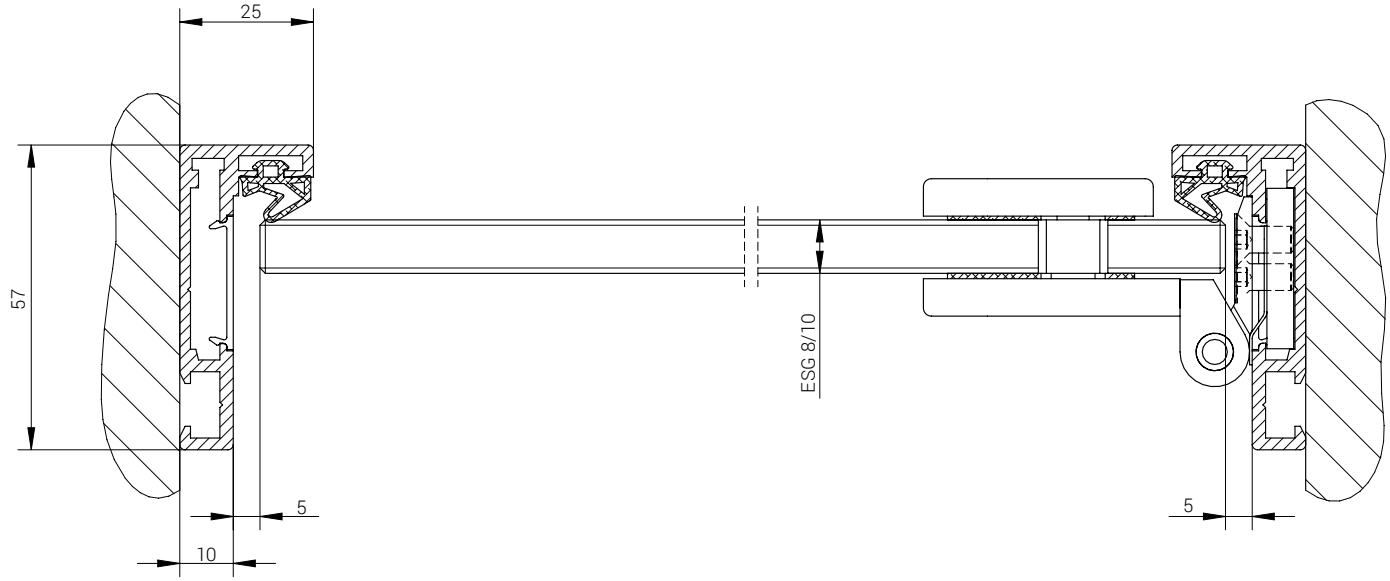
- the door frame is initially installed with the use of special mounting brackets placed into the corners of connected profiles, hinge mounting plates are then inserted into vertical frame profile;
- the frame is embedded in the glass wall and linked to the base profiles by means of screws, and then the frame with the glass is sealed with properly selected gaskets,
- the hinges are screwed on to mounting plates earlier embedded in the frame, and the door leaf is set on the hinges;
- the strike plate of the lock is installed at the appropriate height;
- the covering profiles are cut to size and installed together with the glazing gasket.

GSW Office D is a doorframe designed for mounting in the wall. Narrower profiles are used in this variant, the other design solutions and functional features are analogous to the GSW Office F frame.

Specification

Durability	Class 6 (200 000 cycles)
Type of glass	ESG 8 or 10
Max. door leaf height (mm)	2300 (ESG 8)* / 2600 (ESG 10)*
Max. door leaf width (mm)	1000
Acoustic insulation	R_w max 31 dB / R'_{A1} max 28 dB**
Material/finishing	Anodized aluminium / Powder coated aluminium

* above 2200 mm it is recommended to use 3 hinges
** if an automatic drop-down seal is used



GSW Office system is designed to be used with fittings manufactured by German company Wilh. Schlechtendahl & Söhne (WSS). Their use ensures maintenance of the highest aesthetic, functional and strength parameters of the whole structure.

Apart from the tests of complete doors in GSW systems, the locks and hinges are additionally tested in a manufacturer's laboratory, and the obtained results confirm their above-average reliability and durability.

Specification

Durability	Class 4 (1 000 000 cycles)
Corrosion resistance (DIN EN 1670)	Class 4
Type of glass	ESG 8 or 10
Material/finishing	Anodized aluminium /Powder coated aluminium

Standard fittings

Locks

WSS Studio UV

WSS Studio PZ

WSS Studio WC

WSS Studio PZ/W

Door handles

WSS type C round

WSS type C flat

WSS type L mitred

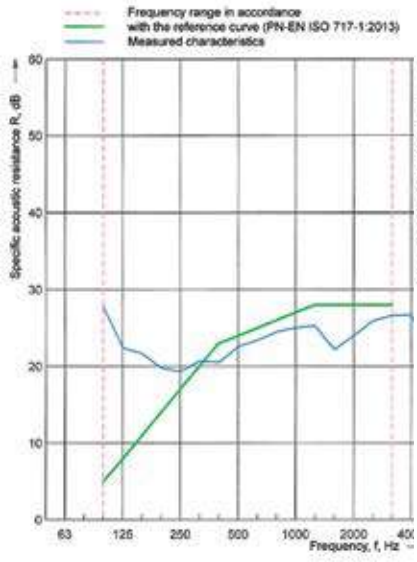
Hinge

WSS Atelier

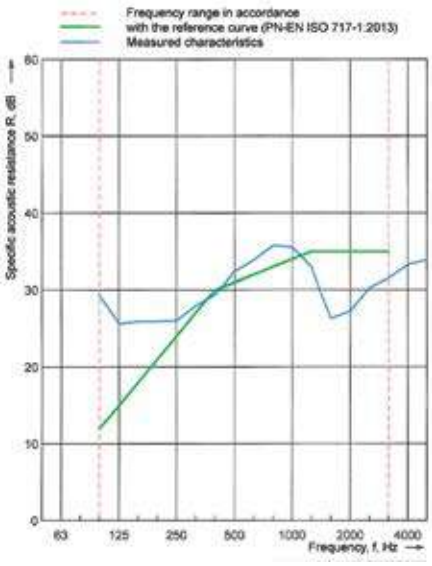
More fittings and information in WSS catalogues

Acoustic tests

The doors, similarly to the GSW Office system walls, have been subjected to tests determining the degree of acoustic insulation. The tests included doors with and without drop-down seal. In both variants the results confirmed the meeting of specific requirements determined in the Polish standards.



Doors without drop-down seal:
$R_{tr}(C;C_W)$ = 24 (0; -1) dB



Doors with drop-down seal:
$R_W(C;C_{tr})$ = 31 (-1; -1) dB

Strength tests

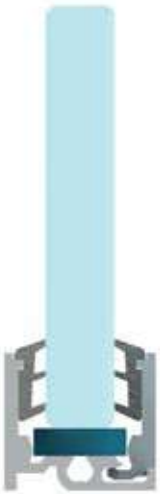
Quality and strength tests have particular importance for doors. Due to this fact, our doors were tested by the Building Research Institute, among which the most important, based on their functionality, is the test of mechanical strength carried out on the basis of the standard EN 12400:2004. Obtained results indicate the possibility to install the GSW Office doors in places of frequent use.

Class	Conditions of use	Number of cycles
0	-	-
1	occasional	5 000
2	light	10 000
3	infrequent	20 000
4	moderate	50 000
5	normal	100 000
6	**often**	**200 000**
7	heavy	500 000
8	very heavy	1 000 000

Classification in accordance with PN-EN 12400:2004

GSW Light

ESG VSG ALU



The supplementation of Glass System offer within the scope of glass walls are the GSW Light profiles. They are typically used for construction of smaller glazing in places where strength requirements are not decisive. The purpose of the product allows the significant reduction in profile sizes.

The profiles GSW Light are available in two versions: uniform and two-piece compound. They are used depending on the assembly capabilities.

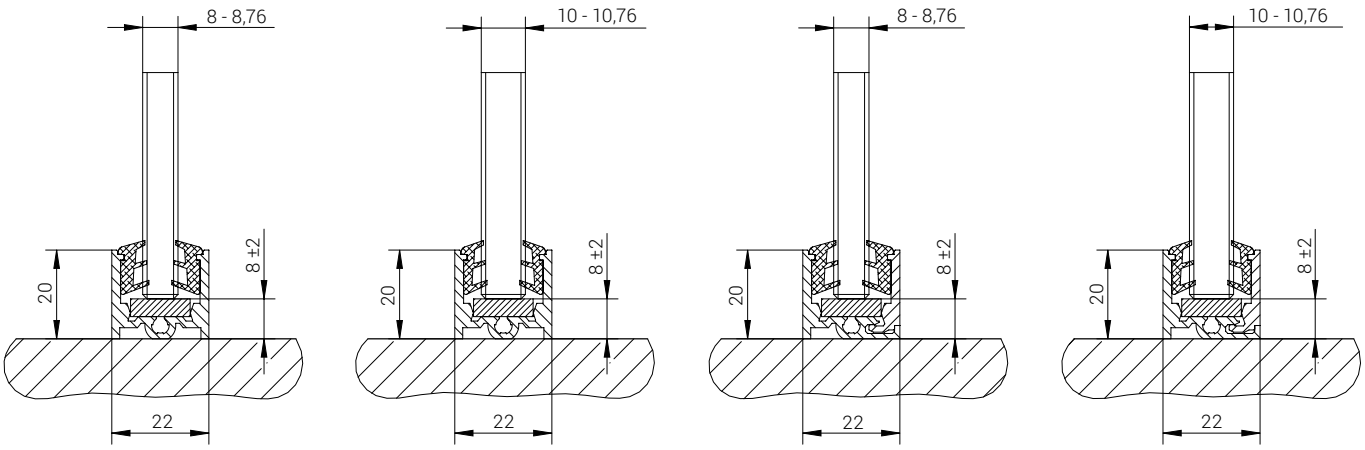
Due to the lack of tests the use of profiles require individual project.

Specification

Category of use	not specified
Category of space	not specified
Type of glass	ESG/VSG 8-10,76
Max. height (mm)	not specified
Material/finishing	Anodized aluminium / Powder coated aluminium
Approval document	Individual documentation

GSW Light U

GSW Light UI



Technical characteristics

- small and lightweight mounting profile 20 mm high,
- convenient and fast assembly of glass structures – the possibility to use the uniform or two-piece compound profile,
- the possibility to use in various types of glass structures, also in combination with other systems.

GLASS
RAILING SYSTEMS

Glass Railing Systems

Glass railing systems are an important part of modern architecture. Thanks to the unique aesthetic values, they are increasingly used inside and outside buildings. Such structures provide an unique character for residential and commercial facilities, such as offices, shopping centers, etc.

Due to the functional character of glass railings, the safety aspects, and particularly the railing strength for various loads depending on application place, are essential during design and assembly stage.

Category of space	Purpose	Horizontal load
A	Residential	0,5 kN/m
B	Office	
C	Meetings and gatherings	1,0 kN/m (3,0 kN*)
D	Commercial	
E	Warehouses	2,0 kN/m

*refers to C5 (public areas susceptible to overcrowding, e.g. concert halls, sports halls including stands, terraces etc.)
Classification according EN 1991-1-1-2004.

For safety reasons, each glass railing should be made in accordance with individual design documentation ensuring the safety of use.

Due to the fact that in full glass railings the glass is the main structural material, it must provide the stability of the structure in all conditions – also in case of partial damage, and this is the reason why such structures are made of tempered and laminated glass of an appropriate thickness and the handrail is mounted on the upper edge of the railing.

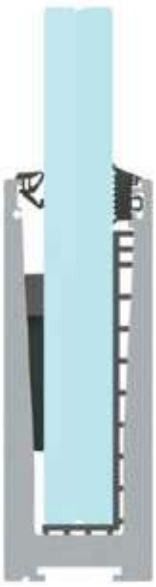
The handrail, besides its aesthetic function, is primarily a structural element with the purpose to stabilize the pane in case of damage and ensure that the railing remains in one part. It also protects the exposed edge of pane where the tempered glass is exceptionally vulnerable to mechanical damage.

The method of attachment of the railing to building structure is also very important. The system profile can be directly mounted to reinforced concrete or with use of different mounting brackets.

Due to different design solutions, the Glass System offer includes several variants of profiles. Each of them was tested together with the glass in terms of strength in different assembly configurations. In order to ensure safety, GS Railings have undergone load tests (transfer of horizontal forces, impact resistance).

	GS Railing
Strength	1,0 kN/m
Max. height (mm)	1300
Type of glass	VSG ESG 88.2, 88.4, 1010.2, 1010.4
Approval document	Individual documentation

GS Railing



GS Railing is a complete system for the construction of glass railings, both inside and outside the buildings.

Glass is the main structural element in this system and that is why the use of aluminium profiles and other assembly elements is reduced to a minimum.

This is an important aesthetic value and provides extraordinary solutions of modern space arrangement.

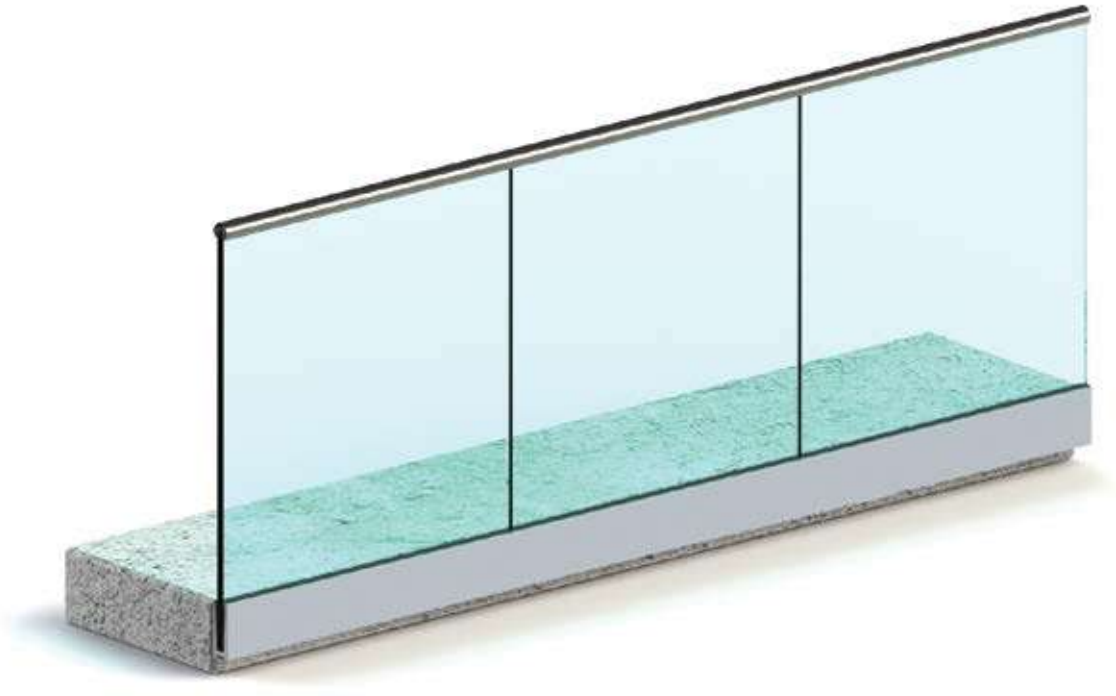
The systems are designed in various variants in terms of attachment to the ground, allowing the precise matching to the design requirements.

It is possible to use various types of handrails on the upper edge of the glass, with different shape and material, depending on the vision of an architect.

Specification

Category of spaces	A, B, C*, D
Strength	1,0 kN/m
Type of glass	VSG ESG 88.2, 88.4, 1010.2, 1010.4
Max. height (mm)	1300
Material/finishing	Anodized aluminium / Powder coated aluminium
Approval document	Individual documentation

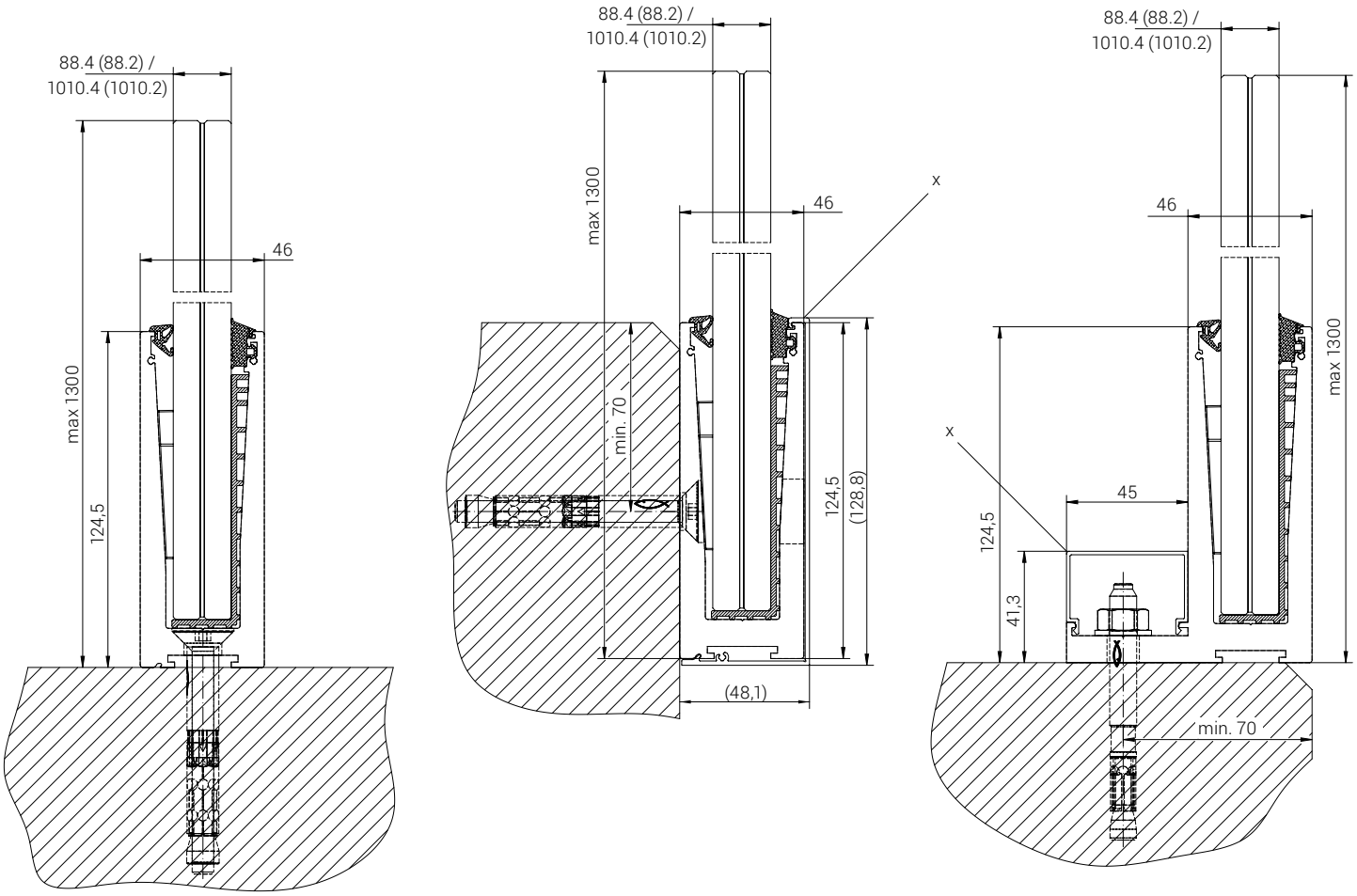
*except C5 (public areas susceptible to overcrowding, e.g. concert halls, sports halls including stands, terraces etc.)



Top **Side** **Edge**

Technical characteristics

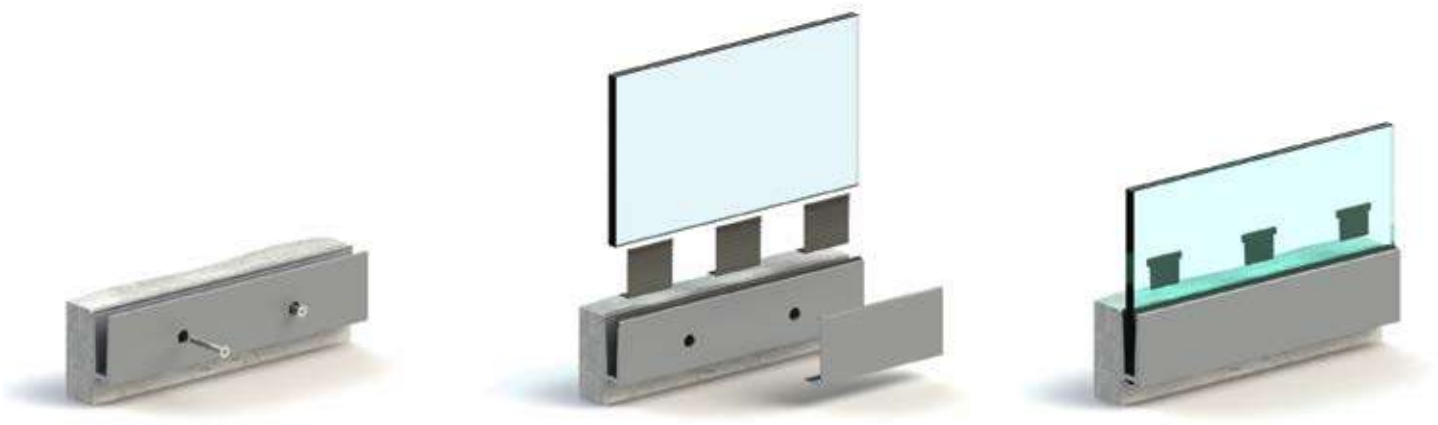
- three types of base profile 125 mm high, designed to side, top and edge assembly,
- guarantee of stability and strength – glass fitted with special wedges,
- quick and easy installation of railings,
- the possibility to install glass after completion of all other works (no risk of damage),
- the possibility to use different types of handrails on the top edge of the glass – e.g. stainless steel, aluminium or wood.



X - optional covering profile

Installation sequence

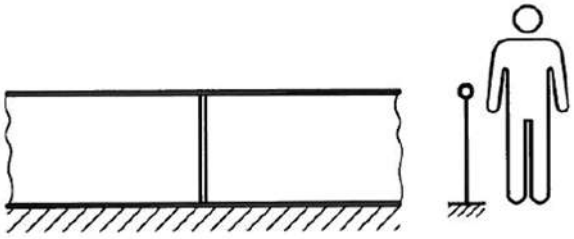
- the profile is installed to concrete or steel substructure;
- the plastic pads are attached to the glass profile, the gasket is then installed in the profile on the outer side of railing;
- the glass is set in the profile;
- the glass pane is stabilized with the wedges, the gasket is installed on the inner side of the railing.



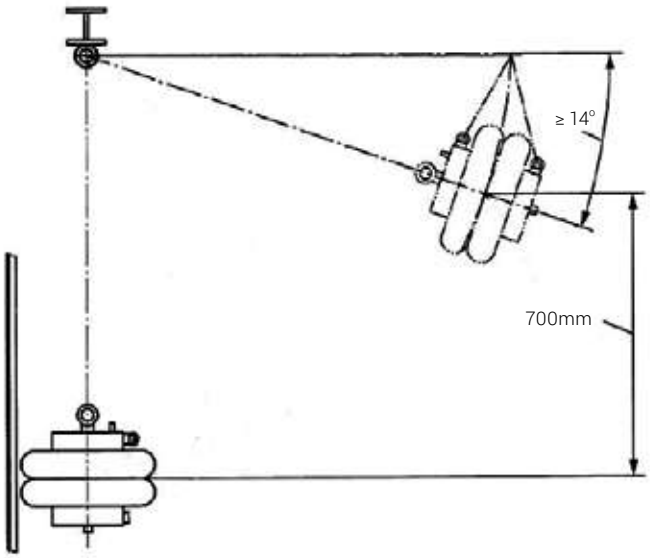
Strength tests

Within the scope of strength tests the GS Railing systems were tested by pendulum impact, in accordance with the standard DIN 18008-4. The standard classifies railings of this type as the category B, with strictly defined test procedure.

The test results confirmed the parameters guaranteeing the safety, which allows using Glass System railings according to their intended purpose.

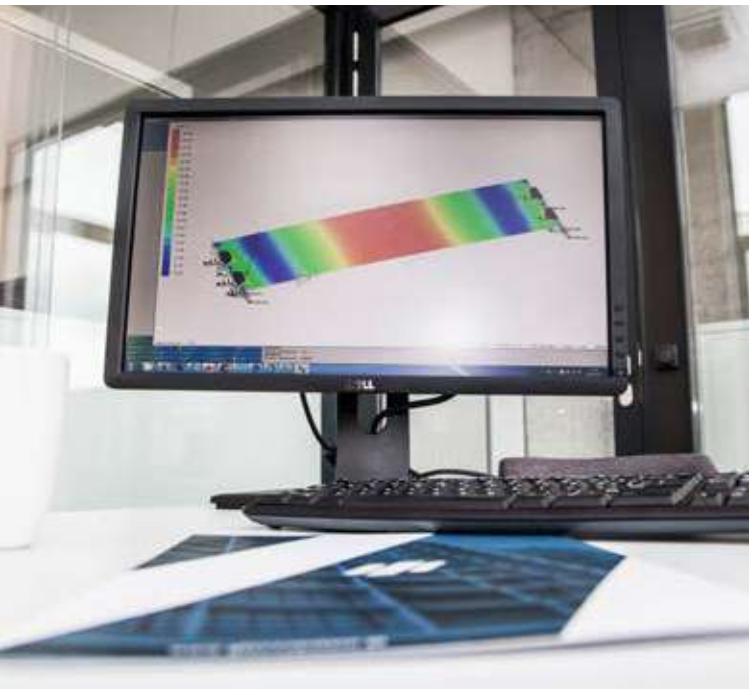


Category B in accordance with DIN 18008-4



Pendulum impact in accordance with DIN 18008-4

GS Custom



In addition to system products, Glass System also offers the possibility to prepare individual solutions. The scope is not limited only to interiors, it is also applied to glass facades of buildings. All such projects are made in cooperation of company's technical department with the Customer.

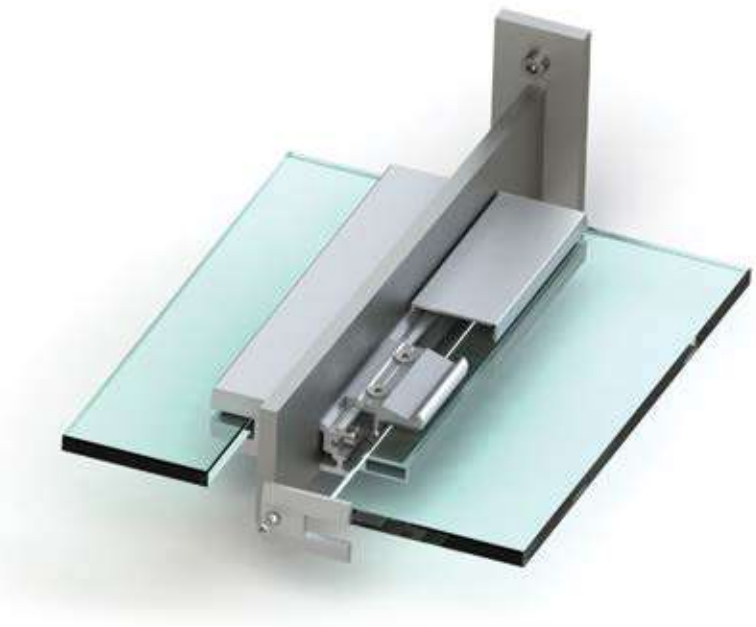
The advantage of Glass System as a producer is the possibility to make the profiles and other structural elements of any shape and specification. The functionality and technical accuracy of the solutions is determined at the design stage, with the use of modelling and static analysis.

That all – with professional technical advice – not only allows to implement ambitious modern designs, but also optimize them in terms of economy.

Examples of solutions

Glass blinds

Glass pane mounted horizontally in special clamps, attached to steel fins of building facades.

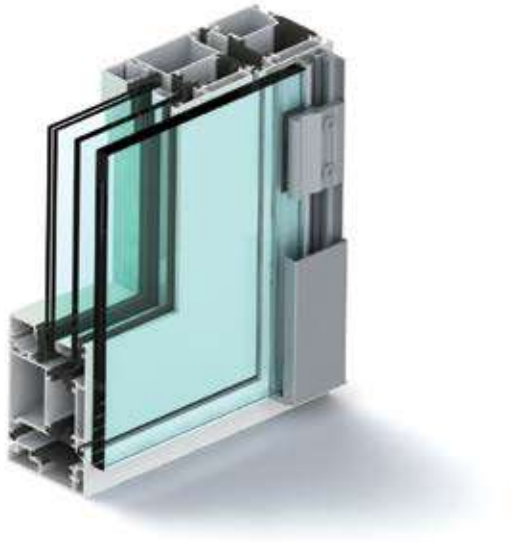


Glass fins

Vertical glass panes acting as a reinforcement of structure as glass fins (instead of standard aluminium bars), installed in system profiles by Glass System

French balconies

Glass panes acting as railings, mounted in dedicated clamping profiles attached to building facades.



Smoke curtains

Suspended glass panes acting as smoke partitions, mounted in clamp brackets with special protection against slipping.

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