



GREENLITE
GLASS SYSTEMS

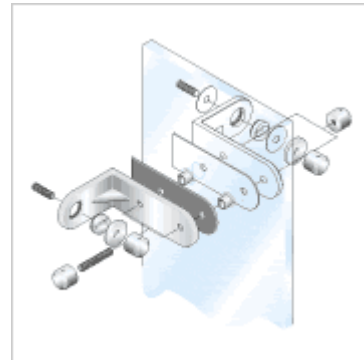
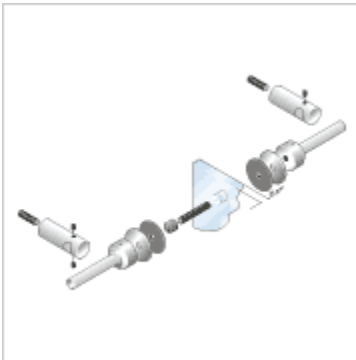
Distribution and Technical Service for **SAINT-GOBAIN-GLASS**

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LITEWALL – Point Fixed Glass Facades



Vast expanses of frameless, apparently weightless and transparent walls of light can be created using LITEWALL, the complete structural glazing system. LITEWALL blends versatility to a wide variety of subframe connection possibilities – steel elbows, steel spiders, or glass fin.



Applications:

Back-ventilated facades, external cladding or space-enclosing external glazing.

Glass Dimensioning:

Individual structural analyses have been determined for the applications as described in the Permit. The number of point-fixings (4 or 6) and the type of connection (fixed or articulated) are differentiated with independent tables. The tables are divided into glass dimensions and positive / negative design wind loads.

Basis for the analysis:

1. maximum bending stress giving a Safety Factor of > 2.4
2. maximum allowable deflection in glass of $L/100$
3. wind suction and pressure loads including forces from the assumption that the fixing points remain stiff and a temperature difference in the steel sub-frame of $+30^{\circ}\text{C}$

Important requirements of the Sub-Frame:

1. The Sub-Frame must be capable of supporting the self-weight of the Glass elements, Wind loads and the resulting loads.
2. The deflection of the sub-frame when the above mentioned loads are applied must not exceed $1/300$ of the Facade height
3. Stabilisation of the sub-frame by means of the Glass is not allowed.
4. The connection of the glass units to the sub-frame is to follow the stiff- / loose-connection principle.
5. The design must be carried out ensuring that tolerances can be accommodated

Weather sealing:

It is possible to use wet sealing or a wet / dry combination of seal. It is important to use a suitable type of silicone.

Engineering:

The system is engineered using state-of-the-art Finite Element Analysis software. The software, developed by industry-leading professionals has been used on many sophisticated and challenging projects. The engineering is backed by a leading engineering company in Germany.

Testing:

Component and system testing has been carried out at Eckelt's own testing facility and at independent test institutes. The design principles and engineering are based on this testing.

Pull-out, bending and seal testing have been carried out on the point-fixings.

Performance of units for every project is tested in association with procedures laid down by Dow Corning. Each project carries a structural performance warranty backed by Dow Corning.

Heat-Soak Testing:

All glass is 100% Heat-Soak tested to stringent European standards to ensure that no spontaneous breakage results from Nickel Sulphide inclusions.

Quality Control:

The system undergoes stringent quality control procedures as part of Eckelt's ISO 9000 Quality Control system.

Installation Note:

Installation is only to be carried out by experts. Eckelt & Greenlite Glass Systems offer training and or site-supervision for these purposes.

Fixed- and sliding support system:

The newly developed **Eckelt Spider fittings** fulfill the technical requirements of the fixed and loose support system. The patented inserts allow tolerances to be easily accommodated and ensure through correct use the performance of fixed, horizontal loose and loose support connections.

Single-Glazing

or

Double-Glazing



LITEWALL MONO



LITEWALL ISO

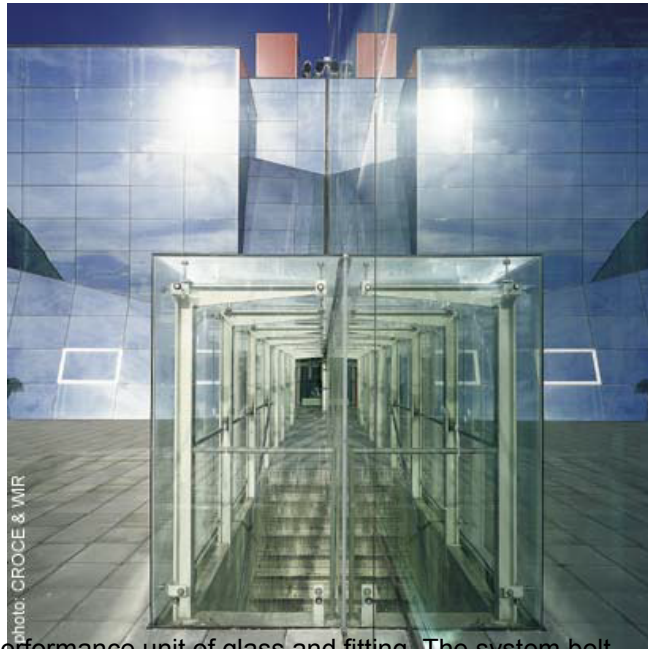
SGG LITEWALL® is a patented point-fixed glazing system - designed, engineered and manufactured by Eckelt Glas GmbH in Steyr, Austria. Eckelt Glas is a wholly owned subsidiary of Saint-Gobain Glass – the world's largest glass company. Distributed in North America by Greenlite Glass Systems Inc.

History:

The system has been in service on many prestigious projects throughout the world for over 10 years. It can be found in Shanghai, Bahrain, Seoul, Dubai, Oakland, Anchorage, and across Europe. It has been used by many leading architects and Contractors. It has withstood the most extremes of environmental conditions. It has been used on high towers, large skylights and extensive facades.

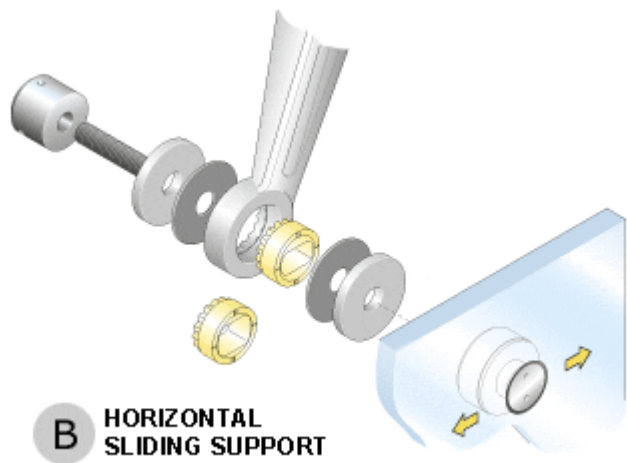
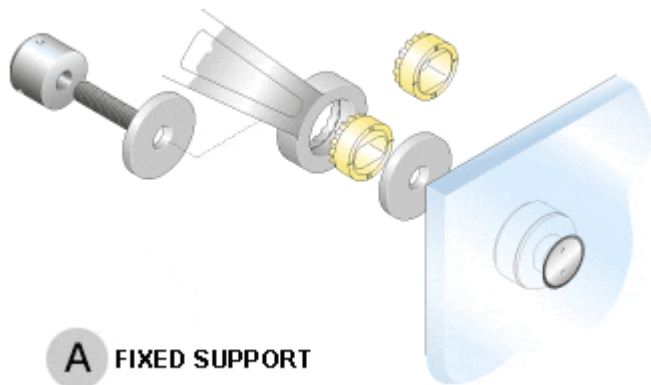
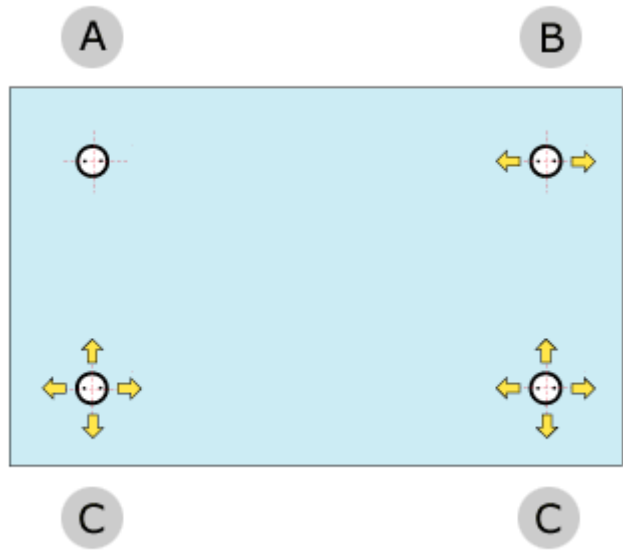
The system has been acknowledged by both the Austrian and German governments as suitable for national accreditation under the most stringent regulations.

Single-Glazing Applications

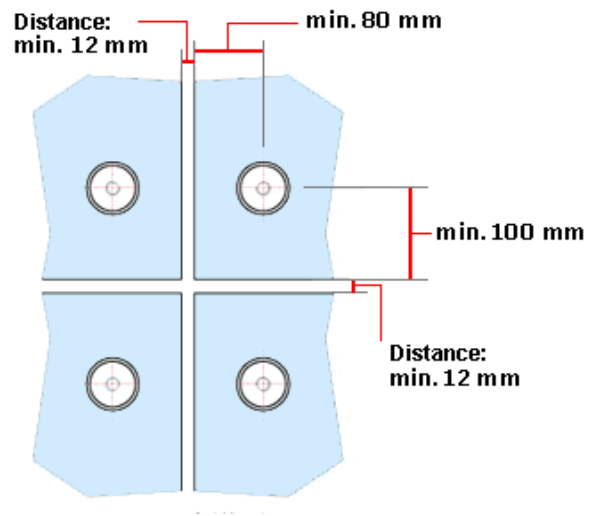


LITEWALL MONO is the point-fixed performance unit of glass and fitting. The system bolt connections are factory pre-mounted onto the thermally toughened glass under controlled conditions. The units can be installed vertically or to a maximum angle of 10° to the vertical. For barrier-loadings or designed-in structural stiffening of the sub-construction it is necessary to apply for construction permission from Building Control.

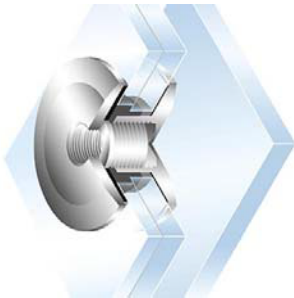
Max. Dimensions The system has possible maximum dimensions of 2800 x 6000mm (110 x 236 inches). This is possible using the latest in European glass manufacturing technology and machinery.



Recommended fixing locations (view from inside):



Double Glazed Thermal LITEWALL



LITEWALL ISO is a point-fixed insulating glass with ideal system separation between mechanical safety and thermal insulation. The patented glass connection characterises an uninterrupted outer surface with integrated safety against collapse.

Applications

For filigree glass facades, roofs and entrances

Design

The system separation facilitates the non-drilled outer sheet to be designed with energy- or solar-insulating coatings as well as optional Seralit-LITEX screen-printing.

Standard composition (variable with design)

Outer sheet:

8 mm SECURIT tempered safety glass, coated

Cavity:

12 mm air filled with thermal bridge

Inner sheet:

14 mm STADIP laminated safety glass comprising:

- 6 mm SECURIT tempered safety glass
- 0,76 mm pvb
- 8 mm SECURIT tempered safety glass

Swisspacer-V (SS-V) in colour black is used as the standard cavity spacer bar providing improved thermal-insulation (U-Value) of 0,2 W/m²K when compared to conventional aluminium spacer bars (refer to LITEWALL-ISO TECHNOLOGY)

The carrying inner sheet is laminated safety glass comprising two sheets of tempered safety glass and a highly tear-resistant pvb interlayer.

Safety concept

Wind pressure and suction loads aswell as the self-weight of the unit are transferred to the inner sheet via the structural silicone edge seal. The outer sheet of tempered safety glass has four mechanical restraint clips which connect it to the inner sheet. The restraining clips act as a mechanical restraint should the structural silicone seal ever fail. The clips are designed to hold the glass until structural overloading, Should this ever occur the tempered outer sheet will shatter typically into particles.

Requirements of the Sub-Frame:

1. The Sub-Frame must be capable of supporting the self-weight of the Glass elements, Wind loads and the resulting loads.
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3. Stabilisation of the sub-frame by means of the Glass is not allowed.
4. The design must be carried out ensuring that tolerances can be accommodated

Installation:

is only to be carried out by experts. ECKELT offers training and/or site-supervision for these purposes.

Thermal Insulation:

Improvement using Swisspacer (SS-V). Conventional U-values of glazing are normally considered without influences of the warm edge condition of the glass element and frame. In order to document an improvement in the thermal insulation performance of a facade it is necessary to take the facade construction into account.

An actual evaluation of our system is possible through EN ISO 10077 (provisional version 1999). This allows evaluation of the improvement of the energy transmission value of the facade (Uw-Value) using Swisspacer V in comparison to conventional aluminium spacer bars:

Uv-Glass in W/m ² K	spacer bar aluminium	spacer bar Swisspacer	Improvement in W/m ² K
1,6	2,1	1,9	0,2