

# Building Materials for Space Design

*GLASS FOR FUTURE*



**Nippon Electric Glass**

# A New Era for Glass

Nippon Electric Glass creates new possibilities for glass.

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>NEOPARIÉS	>BLANC-NEIGE	>FIRELITE	>LX-57B	>LX PREMIUM	>PRO-GR	>GLASS BLOCK	>GLASSORE	>VELUNA	>INVISIBLE GLASS



**Warning** All the products in this catalog are made of glass. When they are chipped or broken, you might be injured seriously by a fragment of broken glass. Be very careful in handling them.

Please see our web site for further information about our building materials. >>> [www.negb.co.jp/en](http://www.negb.co.jp/en)

Subway Station of Düsseldorf (Düsseldorf, Germany)  
Design : Doring Dahmen Joeressen Architekten  
Neopariés : White

**The Delegation of the Ismaili Imam** (Ottawa, Canada)  
Design : Maki and Associates  
+ Moriyama & Teshima Architects  
Neopariés : Customized White



**Dallas Love Field Airport** (Dallas, U.S.A)  
Architect : Corgan Associates  
Neopariés : White



# NEOPARIÉS

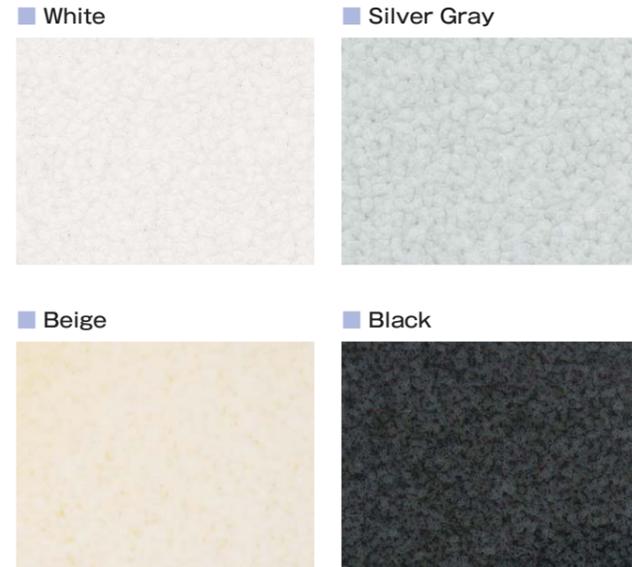
A luster that communicates dignity to the surrounding city

**SHOPPING JK IGUATEMI** (São Paulo, Brazil)  
Architectural Office : ARQUITECTONICA  
Builder : WTORRE Engenharia  
Neopariés : White



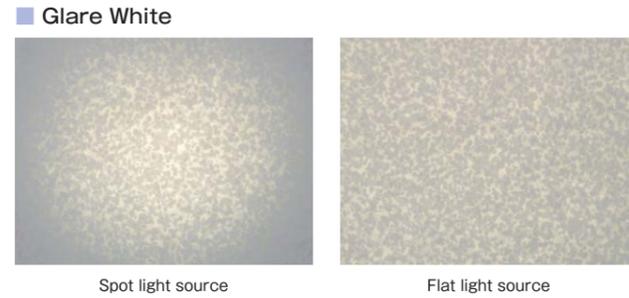
## VARIATION

### NEOPARIÉS Standard



### NEOPARIÉS Translucence (Made to Order)

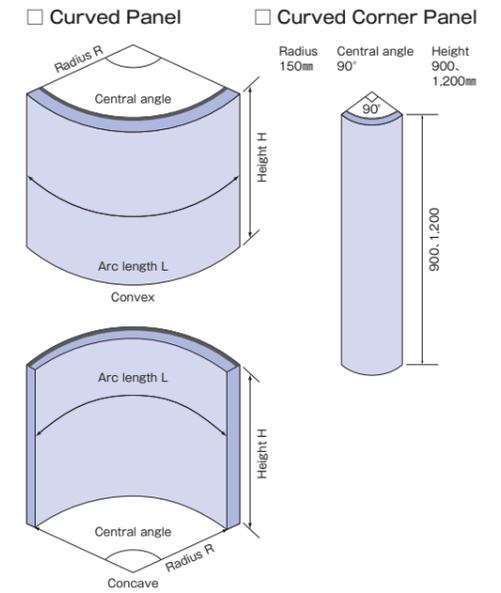
Glare White allows light to pass through.



\*Neopariés is a made to order product. \*Because of printed matter, actual colors are slightly different from the printed ones.  
\*Please confirm the texture of finished surface by samples. \*Please contact us about other colors.

## STANDARD SIZE

Shape	Size (mm)	Color	Remarks
Flat Panel	900×900	Standard Glare White	
	900×1,200		
	900×1800	White	
	1,200×2,400		
Curved Panel	200R 250R	Standard (except Black)	Max. central angle 90 deg. (1/4 circle) Convex only
	300R	Standard	Max. central angle 90 deg. (1/4 circle) [Note: Convex only on 650R] Convex, Concave
	350R 400R 450R 500R 550R 600R 650R		Convex, Concave
	700R~4,000R		
Curved Corner Panel	150R×90° (1/4 circle)×H900 150R×90° (1/4 circle)×H1,200	Standard (except Black)	Convex



\*Panel thickness is 15mm or more. (Slight thickness nonuniformity occurs as a result of production method.)  
\*Please ask us about sizes other than the above.  
\*Neopariés with adjoining square corner panels without joints is also available.  
In this instance, the short side must be within 100 mm, consult us about details.

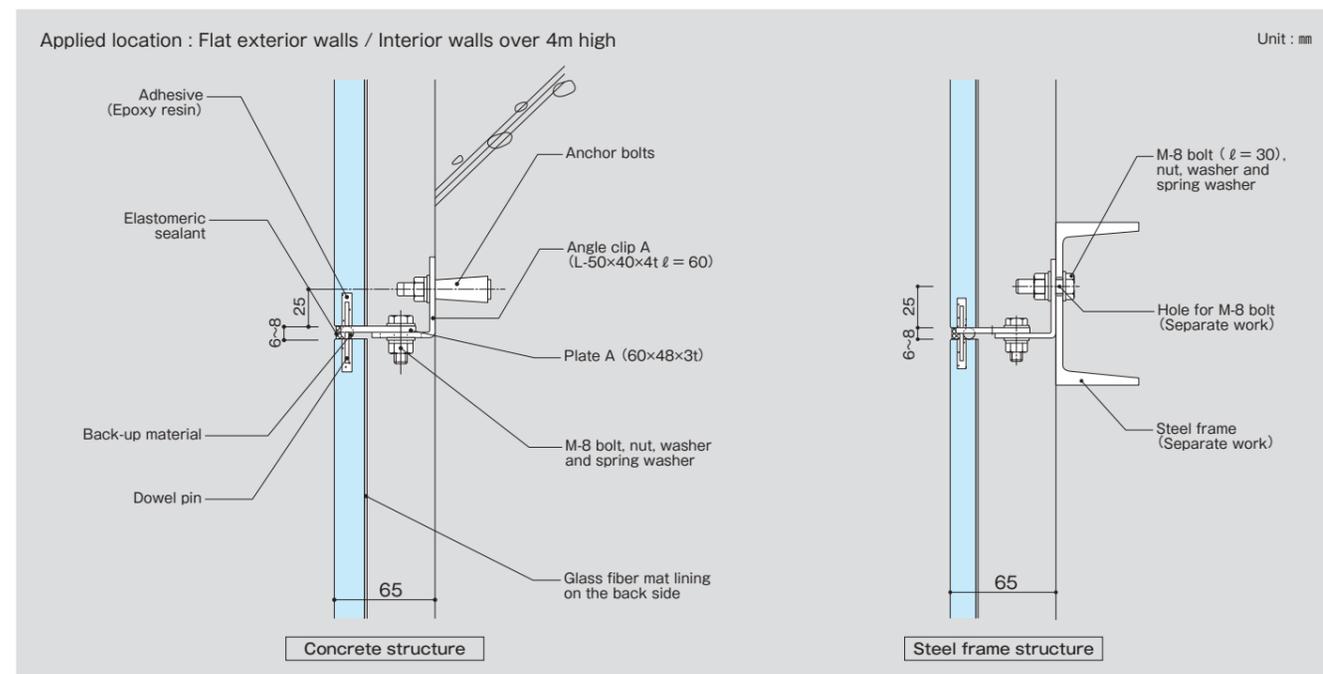
# NEOPARIÉS

The unique patterns of glass-ceramic allow creative expression.

Neopariés is made by the highly sophisticated and specialized technique of crystallization of glass.

We provide this glass-ceramic architectural material, which has high weather-resistance and endurance, in a rich variety of patterns and colors. In addition, this material can be heated and softened to form curved shapes.

## STANDARD INSTALLATION DETAILS FOR FLAT EXTERIOR WALLS



## CHARACTERISTICS OF NEOPARIÉS AND NATURAL STONES

Characteristics / Materials		Neopariés White	Marble	Granite
Lighting	Whiteness Degree (L-Value) (1)	94	approx. 90	—
	Diffuse Reflection Rate (%)	80	42	44
	Regular Reflection Rate (%)	4	4	4
Thermal	Thermal Expansion Coefficient (×10 <sup>-6</sup> /K)	6.1	7.0	7.0
	Thermal Conductivity (W/m·K)	1.6	2.3	2.1
	Specific Heat (J/kg·K)	710	750	750
Mechanical	Specific Gravity	2.7	2.7	2.7
	Bending Strength (N/mm <sup>2</sup> )	41	11	14
	Young's Modulus (×10 <sup>4</sup> N/mm <sup>2</sup> )	8.6	7.5	5.1
Chemical	Mohs' Hardness	5.5	3	5.5
	Acid Resistance (2) (mg/cm <sup>2</sup> )	0.2	267	26.2
	Alkali Resistance (3) (mg/cm <sup>2</sup> )	0.7	7.8	2.6
	Seawater Resistance (4) (mg/cm <sup>2</sup> )	0.1	0.2	0.2
	Water Absorption Rate (5) (%)	0.0	0.3	0.4
	Freeze Resistance (6) (%)	0.0	0.2	0.3

The above figures are measured values, not guaranteed.

- (1) One of the three elements of color. Index to represent brightness (whiteness). (100: Perfect white ⇔ 0: Perfect black). In-house measured data.
- (2) Weight loss of test piece of 25×25×5mm after 24-hour immersion in 1% H<sub>2</sub>SO<sub>4</sub> solution of 90°C.
- (3) Weight loss of test piece of 25×25×5mm after 24-hour immersion in 1% NaOH solution of 90°C.
- (4) Weight loss of test piece of 25×25×5mm after 24-hour immersion in simulated seawater of 90°C.
- (5) Weight increasing rate of test piece of 25×25×15mm after 48-hour immersion in water.
- (6) Weight loss of test piece of 15×15×10mm after 25 cycles: immersion of test piece in water of 25°C for 2 days=expose for 4 hours in a temperature of -20°C.





**FIRELITE**

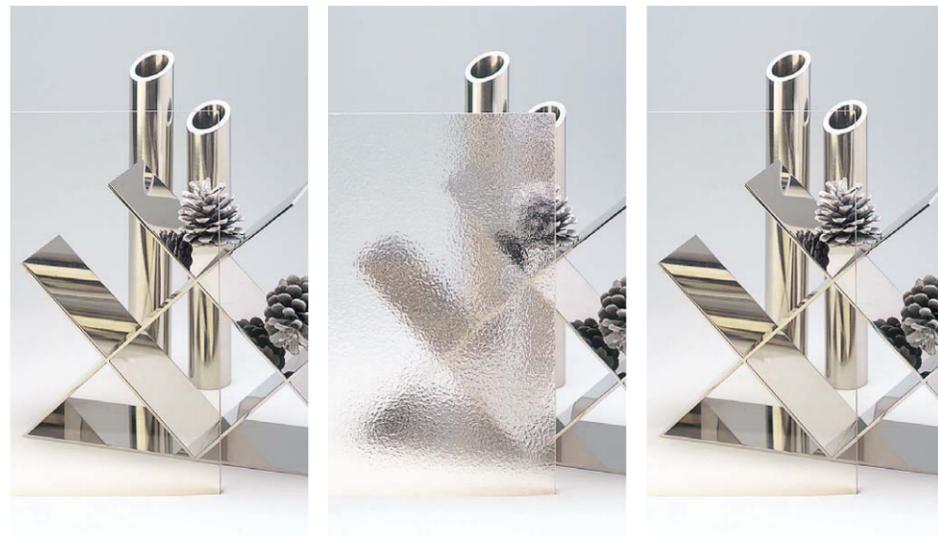
Clear fire-rated glass  
World-renowned FireLite



Toyotama Daini Junior High School (Tokyo, Japan)  
Design : Ishimoto Architectural & Engineering Firm, Inc.



## PATTERN & SIZE



■ FireLite Neo

■ FireLite Mist  
(Patterned glass)

■ FireLite Plus  
(Laminated glass)

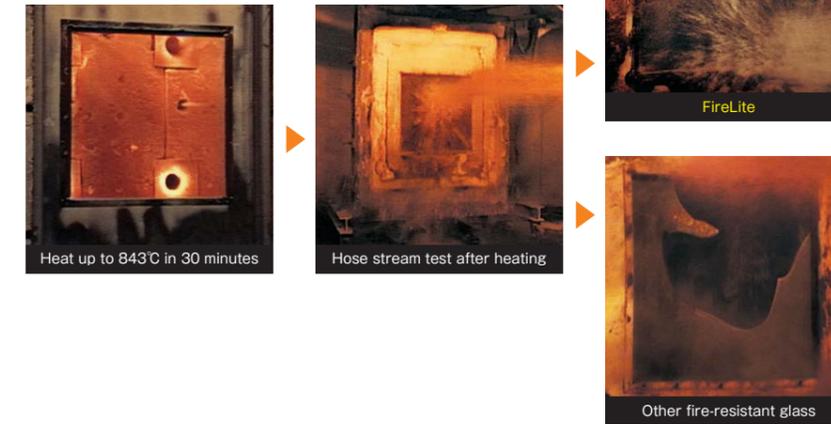
Size (mm)	Pattern	FireLite Neo	FireLite Mist
914×2,438×5t		●	●
1,219×2,438×5t		●	●

\*Please contact us about 914×2,438×8t and 1,219×2,438×8t sizes and FireLite Plus sizes.

## FIRELITE IS AN OUTSTANDING FIRE-RATED GLASS THAT MEETS UL STANDARDS IN THE USA.

UL standards set by Underwriters Laboratories Inc., the most prominent testing laboratory in the USA, require hose stream test in addition to heating test as an integral part of fire-rated glass test. The hose stream test proves that no significant fault would be caused to fire-rated glass during fire fighting to use water. As it meets the UL standards, FireLite is a highly regarded glass in North America.

### ■ Hose stream test (Thermal shock test)



### ■ UL test methods

Heating Time	30 minutes
Heating Temperature	843°C
Water Spray Distance	about 6 meters
Water Spray Time	10 seconds maximum
Water Spray Pressure	30 pounds/square inch (about 2.1 kg/cm <sup>2</sup> ) at the hose mouth
Area Sprayed	Water was sprayed at the entire front surface of the test object including the frame

## FIRELITE Excellent performance to resist both fire and water

### Reliability verified through severe tests

FireLite, the super heat-resistant glass ceramic, can resist the extremes of fire and water because its thermal expansion rate is almost zero. The fire protection performance of this glass has been verified around the world, including through use in Tokyo Fire Department fire trials and by withstanding rigorous tests in the USA.

## SURFACE QUALITY

Since FireLite has gone through a crystallization process, there are some distortions in reflected images.

## PRECAUTIONS FOR THE DESIGN AND INSTALLATION

- 1 Glass strength is equivalent to float glass.
- 2 FireLite can be cut with a standard glass-cutter.
- 3 When broken, it will crack radially like float glass.

## PROPERTIES

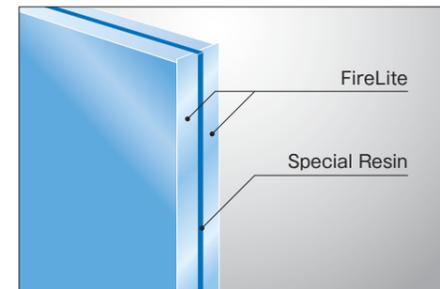
Properties		FireLite	Float Glass
Optical	Visible Ray Transmittance (t=5mm, %)	87	89
	Refractive Index (n <sub>D</sub> )	1.54	1.52
Thermal	<b>Thermal Expansion Coefficient</b> (30~750°C, ×10 <sup>-6</sup> /°C)	<b>-0.3</b>	<b>8.5</b>
	Specific Heat (25°C, J/g·K)	0.71	0.76
	Thermal Conductivity (25°C, W/m·K)	1.51	0.76

\*The values above are not guaranteed values.  
\*Float glass data have been taken from catalogs.  
\*The thermal expansion coefficient of float glass is for 30-350°C.

## FIRELITE PLUS

FireLite Plus is a laminated fire-rated and impact safety-rated glazing material.

### ■ Laminated glass of FireLite



### ⚠ Warning

FireLite is not a tempered glass. It has the same strength as float glass. When FireLite is broken, glass fragments can cause serious injury.

- To minimize the danger from broken glass accidents, design the glass surroundings with sufficient consideration for the strength of FireLite.
- FireLite Plus (laminated glass) would be a smart choice for windows in entrances, atriums and other locations where people or objects could easily come into contact with the glass.

## IN A REAL-WORLD FIRE TEST, ONLY FIRELITE SURVIVED THE HOSE STREAM TEST.

### Results of research on fire-rated glass components under conditions approaching real-world fire accident

The National Research Institute of Fire and Disaster, The University of Tokyo, E.R.S. and Nippon Electric Glass Co., Ltd. conducted joint research on the behavior of fire-rated glass. Through observation and measurement, they gathered data under heating conditions approaching those of a real-world fire while monitoring for damage and the reaction when the glass sheets were exposed to a water stream from a fire-fighting hose.

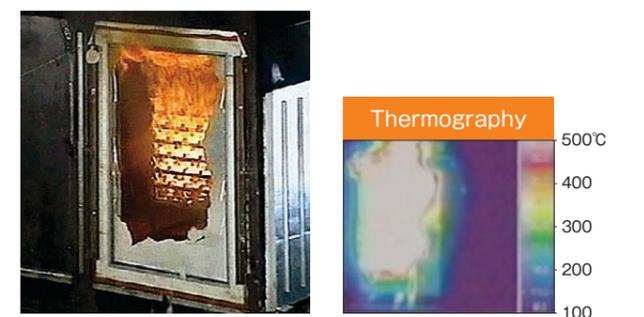
### ■ Heat resistant glass ceramics t5.0mm/ FireLite



### ■ Test Method

A 1.22 meter × 1.93 meter panel of fire-rated glass mounted in a frame was installed in a test room measuring 4 m × 4 m × 2.3 m high. The test also used a doubled-up block of No. 2 crib as a test fire source that maintained a room temperature of 700°C for about 15 minutes. When the side of the glass not exposed to the fire reached the point of maximum temperature (about 470°C), it was impacted with a water-filled ball made of polyethylene film (with a water volume of 300 cc to 930 cc).

### ■ Heat resistant tempered glass t8.0mm



### ■ Test Result

FireLite showed no change at all from the impact of the water ball under the simulated real-world fire accident conditions. On the other hand, the tempered heat-resistant glass shattered into pieces from the temperature shock created by the impact of the water ball, causing the fire to flare up considerably.



# LX-57B RADIATION SHIELDING GLASS

JIS\* R3701 Certified Product \*JIS : Japanese Industrial Standards

LX-57B is high lead-barium glass, and features high radiation shielding capability and excellent transparency. LX-57B is produced under strict product standards and quality control.

## Features

### 1 JIS Certified Product

With its high content of lead and barium, LX-57B lead glass has excellent radiation shielding capability. For example, 9 mm-thick LX-57B has the same X-ray shielding capability (lead equivalent: 2.0 mmPb) as 2 mm-thick lead plating. LX-57B is a JIS certified product.

### 2 Large Sizes Increase the Field of Vision

The largest LX-57B product is 1,200 x 2,600 mm. Use of large-size LX-57B for observation and operation windows in X-ray TV rooms, CT scanning rooms and angiography rooms provides a wider field of vision to improve operations.

### 3 Glass Characteristics

LX-57B would not be combustible even in the event of a fire because it is an inorganic glass. LX-57B is easy to process. It can also be formed into a disk plate, or drilled for glove box.

### 4 Excellent Transparency

LX-57B allows very high light transmittance. This transmittance is almost the same as that of a normal window glass. Because of its excellent transmittance, LX-57B can be used with great advantage in observation and operation windows of radiation equipment.

## Glass Thickness and Lead Equivalent

Glass Thickness (mm)	Lead Equivalent (mmPb)	Notes
6.0 ± 0.5	1.1	Lead equivalent is guaranteed within an X-ray tube voltage range of 60 to 150 kV.
7.0 ± 0.5	1.5	
9.0 ± 0.5	2.0	
11.0 ± 0.5	2.5	Lead equivalent is guaranteed within an X-ray tube voltage range of 60 to 200 kV.
14.0 ± 0.5	3.0	

\*NEG also offers products with a shielding capability of over 3.0 mmPb in lead equivalent (radiation source: X rays) as well as products for radiation sources other than X rays. For more information, please contact us.

## Max. Size and Specific Gravity

Maximum Stock Size	Specific Gravity
1,200×2,600mm	Min.4.36

## Properties

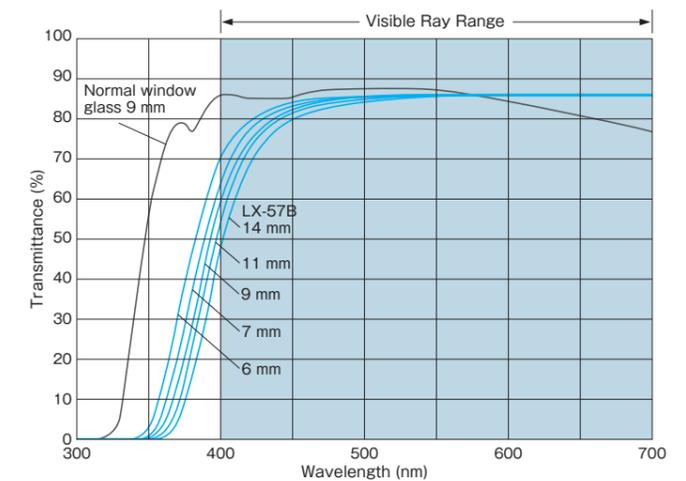
Subject		Value
Thermal	Thermal expansion coefficient (1/°C)	80×10 <sup>-7</sup> (30~380°C)
	Softening point (°C)	585
Mechanical	Bending strength (MPa)	25
	Young's modulus (GPa)	63
	Poisson ratio	0.24
Optical	Knoop hardness	370
	Refractive index (Na-D rays)	1.71
	Transmittance at 550 nm (%)	85

\*The values above are not guaranteed values.

## Transparency

Transparency is almost the same as that of normal window glass.

## Light Transmittance





**LX PREMIUM** RADIATION SHIELDING GLASS  
Non-Staining Radiation Shielding Glass

LX Premium has a multilayer structure, created by inserting LX-57B high-lead glass (which has excellent radiation shielding capability) between special cover glasses.

**Features**

- 1 High Transparency**  
Because the lead glass is protected by special cover glasses, the glass surface will not stain or discolor even when chemicals adhere to it or it is wiped with a wet cloth. High transparency can be maintained with ease.
- 2 Excellent Maintainability**  
Because it is protected by cover glasses on both surfaces, the glass can be cleaned using such items as a wet cloth, glass cleaners, and detergents without any concern about staining or discoloration in the same way as cleaning ordinary windowpanes.
- 3 Safety**  
Because it is multilayer laminated glass of LX-57B and special cover glasses, it is impact-safe and shatter resistant.
- 4 Larger in Size**  
The maximum size of LX Premium is 1,200x2,600mm. Use of large-size LX Premium provides a wider field of vision to improve operations.

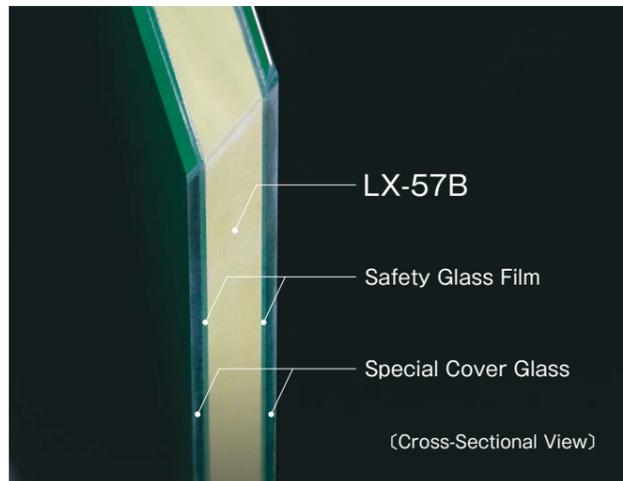
**Glass Thickness and Lead Equivalent**

Glass Thickness (mm)	Lead Equivalent (mmPb)	Notes
11 ± 1.2	1.1	Lead equivalent is guaranteed within an X-ray tube voltage range of 60 to 150 kV.
12 ± 1.2	1.5	
14 ± 1.4	2.0	
16 ± 1.4	2.5	Lead equivalent is guaranteed within an X-ray tube voltage range of 60 to 200 kV.
19 ± 1.4	3.0	

\*NEG also offers products with a shielding capability of over 3.0 mmPb in lead equivalent (radiation source: X rays) as well as products for radiation sources other than X rays. For more information, please contact us.

**Max. Size**

Maximum Size
1,200x2,600mm



A lead glass surface discolored because its surfaces was leaved wet condition.



**PRO-GR** GAMMA RAY SHIELDING GLASS FOR PET FACILITIES

An observation window of PET facility requires higher radiation shielding performance than that of an X-ray or CT room, because PET uses gamma ray of such a relatively high energy as 0.511 MeV.

**Performance and Specification**

Glass Thickness (mm)	Effective Dose Transmission Factor (%)	Lead Equivalent (mmPb)
14.7 ± 1.0	52.6	5.0
21.8 ± 1.0	36.0	7.5

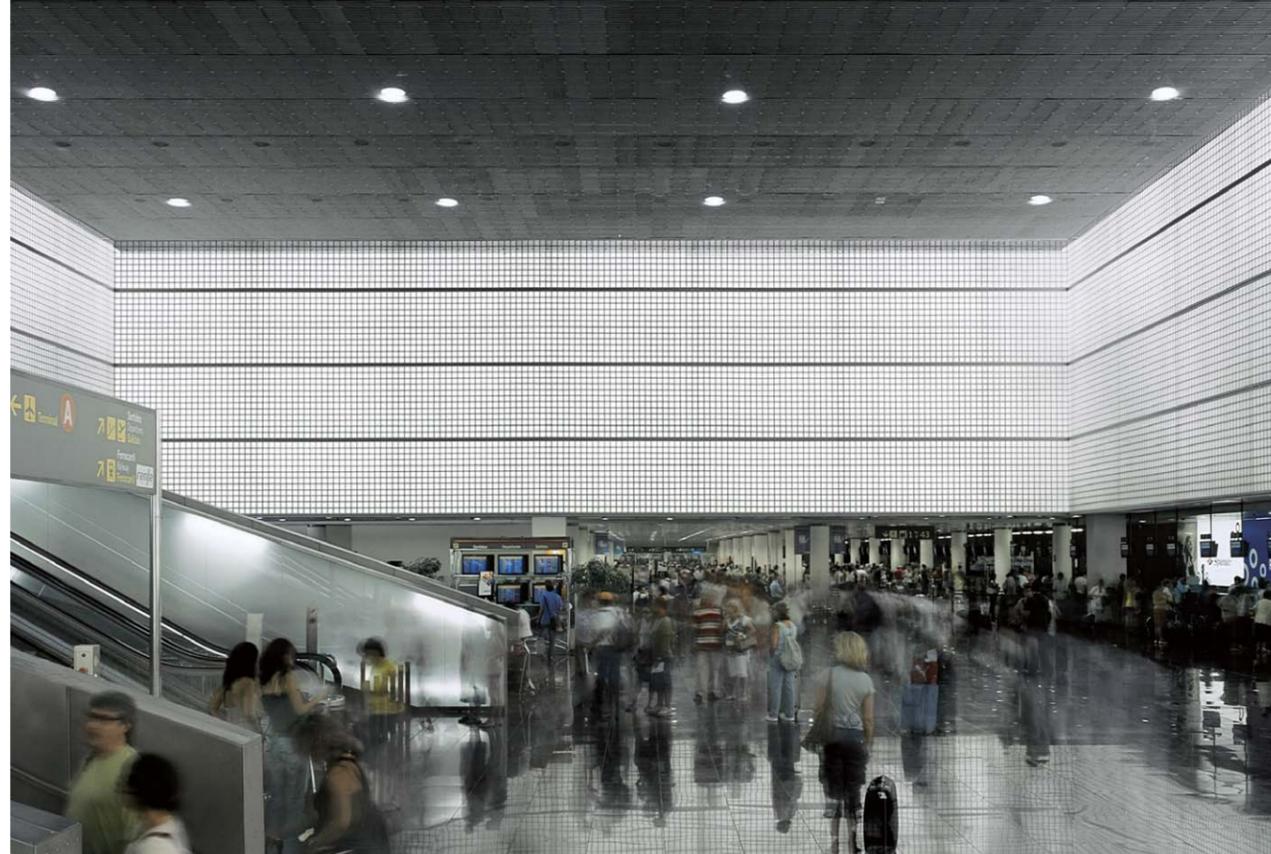
\*Glass thickness and shielding performance of Pro-GR against 0.511 MeV gamma ray.

**Max. Size and Specific Gravity**

Maximum Size	Specific Gravity
1,000x1,500mm	Min.5.2



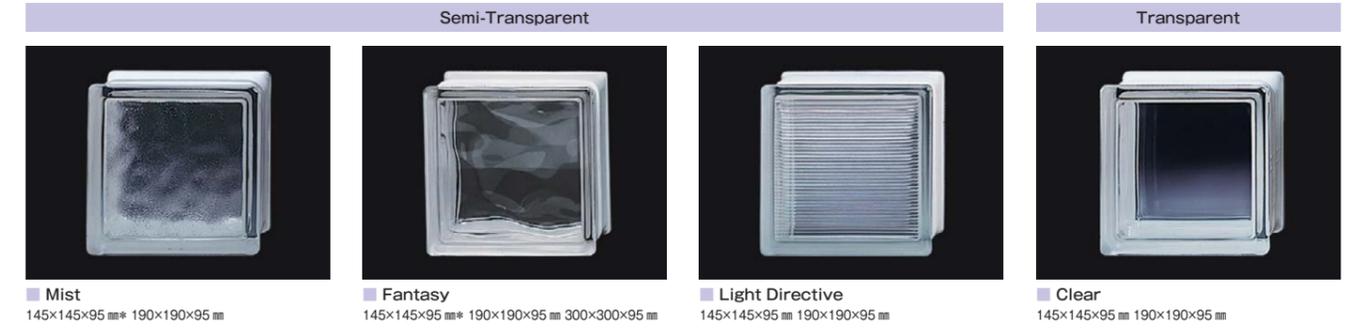
**Barcelona Airport Intermodal Terminal** (Barcelona, Spain)  
 Design : Artigues & Sanabria Architectes  
 Glass Block : Opaline(Plain)



## PATTERN & SIZE

### Basic Glass Block

Translucent glass block with identical patterns on both sides



### Basic Glass Block

Translucent glass block with identical patterns on both sides



### Translucent Milky-White Glass Block



### Fire-rated Glass Block F145 & F190

The glass block panels have excellent fire-proofing and fire-protection capabilities.



\*Please confirm the actual color or pattern with a sample.

# GLASS BLOCK

Design with captured light

## Glass Blocks—The architecture of light

We manufacture our glass blocks by sealing two press-formed glass boxes. As a result, we can provide a rich variety of blocks that have excellent sound and heat insulation capabilities. The timeless, clear radiance created by our glass blocks is loved by all and opens a wide range of design possibilities.

**K-House** (Tokyo, Japan)  
 Design : Noanoa Architecture & Design Studio Inc.  
 Glass Block : Fantasy, Clear



## COSMO GRID Glass Block Top Light Unit

Thick, Highly Impact-resistant Glass Block for Paved Top Lights.

### Features

- High Strength**  
Cosmo Grid, consisting of tough glass block sets in a stainless steel frame has high load capacity, enabling people to walk on it.
- High Quality**  
All joints are filled with specially formulated sealants, which ensure high waterproof performance. The stainless steel lattice frames are rust-resistant and lightweight.
- High Design Quality**  
Cosmo Grid is characterized by high design quality with only a small number of support beams. The number of joints can also be reduced for large assemblies. Frames are available in square, rectangular, notched, and terraced shapes. Large top light assemblies can also be created by connecting Cosmo Grid products.
- High Insulation Performance**  
Glass Block has a low heat transmission coefficient and high insulation performance, making top lights virtually free from condensation on the indoor side surface.

### Products

Item	Matrix (pcs)	Opening Dimension (mm)	Flame Dimension (mm)	Total Weight (kg)
CM-190-11	1×1	205×205	355×355	12
CM-190-22	2×2	405×405	555×555	33
CM-190-33	3×3	605×605	755×755	65
CM-190-44	4×4	805×805	955×955	108
CM-190-55	5×5	1005×1005	1155×1155	162

### Unit Image



[190×190×100mm]  
 Thick, tough and highly impact-resistant Glass Block products can be used for top lights. The Glass Block surface has a non-slip finish.

**Grand Hyatt Fukuoka**  
**Bar Fizz** (Fukuoka, Japan)  
 Design : Super Potato  
 GlassOre : Semi-Transparent



## LINE-UP

GlassOre constructs space with artistic light. The very moment GlassOre is lit up, its expression changes dramatically.

### GlassOre Milky White

Milky glass brick, whose inward glass-crystals produce distinctive expression



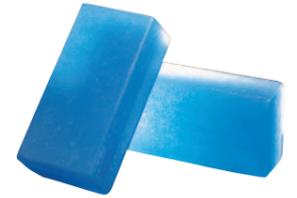
### GlassOre Semi-Transparent

Semi-transparent glass brick, which contains numerous fine air-bubbles



### GlassOre Blue

Blue glass brick, which sends out plenty of glorious blue sparkle in light



### GlassOre VOA

GlassOre in the shape of a bar



■ Milky White   ■ Semi-Transparent   ■ Blue

Size	50×50×1,000mm
Weight	5.9kg/piece

### GlassOre BAN

GlassOre in the shape of a narrow rectangular plate



■ Milky White   ■ Semi-Transparent   ■ Blue

Size	100×50×600mm
Weight	7.2kg/piece

# GLASSORE

A glass that creates spaces with the drama of light



**Toriyoshi** (Tokyo, Japan)  
 Design : Bis At'ic Inc.  
 GlassOre : Semi-Transparent

## SPECIFICATIONS

### GlassOre (Brick type)

Size	100×200mm
Thickness	50mm
Weight	2.3kg/piece

\*Please ask us about the other shapes and sizes.

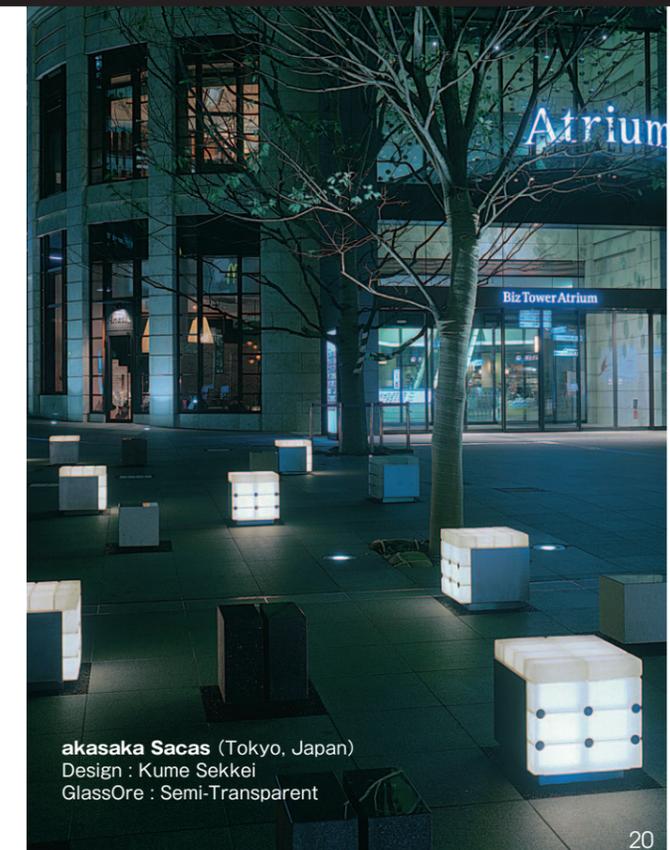
### Properties

Subject	Value	Interlocking Block JASS7 M101
Density (10 <sup>3</sup> kg/m <sup>3</sup> )	2.34	—
Water Absorption Rate (wt%)	0.007~0.012	—
Bending Strength (MPa)	18	5
Compression Strength (MPa)	80	32
Abrasion Resistance (g)	0.002~0.005	—
Slip Resistance (BPN)	Dry	85~91
	Wet	40~42

\*The above-mentioned numerical values are measured, not guaranteed.

## NOTICE

- All measurements are approximate.
- GlassOre has individual differences, such as transparency, thickness and color tone.
- GlassOre's surfaces except the base are rough.
- Actual color might differ from this catalog slightly. Please confirm it with a sample.



**akasaka Sacas** (Tokyo, Japan)  
 Design : Kume Sekkei  
 GlassOre : Semi-Transparent



# VELUNA

Accumulates light and glows in the dark

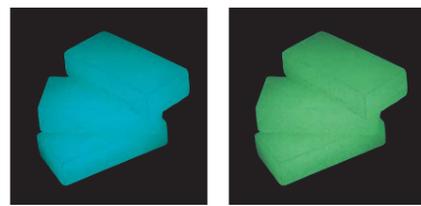
# INVISIBLE GLASS

It amazingly gives a crystal clear view

## LINE-UP

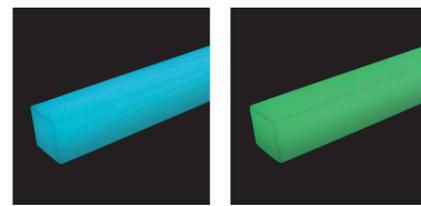
Veluna helps produce fantastic spaces. The luminescence lasts for more than one hour after the lights are turned off.

### Veluna BRICK



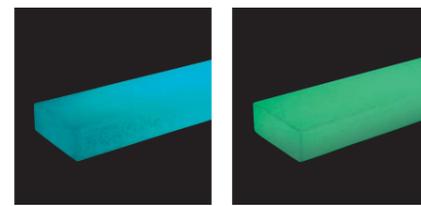
Size	100×200mm
Thickness	50mm
Weight	2.3kg/piece

### Veluna VOA



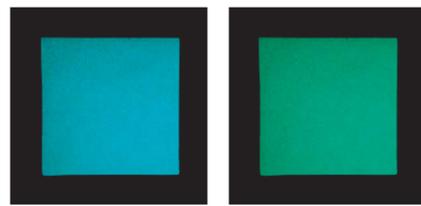
Size	50×50×1,000mm
Weight	5.8kg/piece

### Veluna BAN



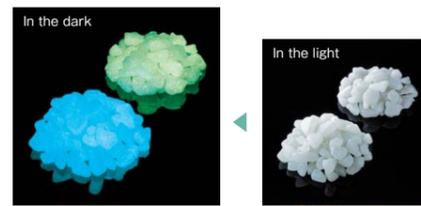
Size	100×50×600mm
Weight	7.2kg/piece

### Veluna PANEL



Standard Size	450×450mm
Thickness	18mm
Weight	50kg/m <sup>2</sup>

### Veluna STONE



Size	20~50mm
------	---------

### Properties

	After 20 minutes under the fluorescent light (1,000 lux)
Illuminating Time	5min. : approx.240mcd/m <sup>2</sup>
	20min. : approx.100mcd/m <sup>2</sup>
	60min. : approx.30mcd/m <sup>2</sup>

### Notice

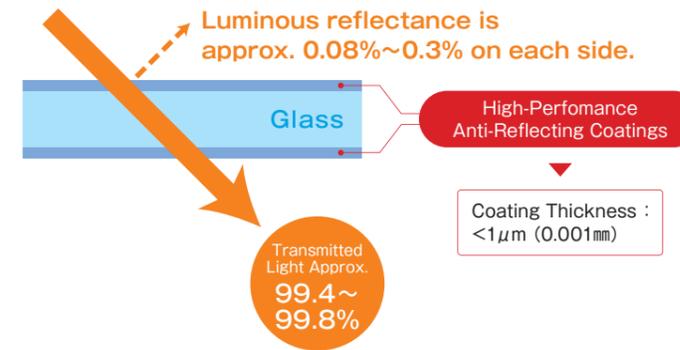
Veluna collects and stores light on exposure to short-wavelength light (ultraviolet rays) such as that of fluorescent lights. The use of light source without ultraviolet wavelength or lighting system with UV-ray shields is not recommended.

\*Please ask us about the other shapes and sizes.  
 \*All measurements are approximate.  
 \*Both Veluna Bricks and Panels can not be made to precise thickness and will have some thickness variation from piece to piece.

## Invisible Glass™

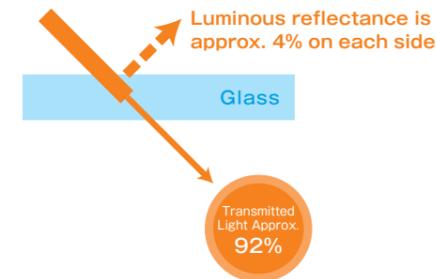
Invisible Glass consists of high-performance anti-reflecting coatings formed on both sides of the glass, and minimizes reflection and glare on the glass surface.

### Invisible Glass



The minimum luminous reflectance of Invisible Glass is 0.08%, far below that of bare glass (approx. 4%).

### Bare Glass



\*For information on handling and cleaning Invisible Glass, please contact us.



**Nippon Electric Glass Co.,Ltd.**

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