



Radiation Shielding Lead Glass

for Medical, Industrial, and Laboratory Use



Manufacturer

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

Consumer Glass Products Division, Sales
7-1, Seiran 2-chome, Otsu, Shiga 520-8639, Japan
Phone: (International)81-77-537-1804
Fax: (International)81-77-537-1812
<http://www.neg.co.jp/cgp/>

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LX-57B — Radiation Shielding Lead Glass (JIS* R3701 Certified Product)

*JIS : Japanese Industrial Standards

Because of its excellent radiation shielding capability and high light transmittance, radiation shielding lead glass LX-57B of Nippon Electric Glass (NEG) is widely used for medical, industrial and laboratory applications. LX-57B is manufactured in an NEG JIS-certified plant by continuous melting/rolling process which enables the production of large-size and high-quality LX-57B. LX-57B is highly transparent as both surfaces are polished. This makes it ideal for use in X-ray fluoroscopes, and for observation and operation windows in X-ray TV rooms, CT scanning rooms and angiography rooms.



The large-size LX-57B (max. 1,200 x 2,600 mm) produced by continuous production process.

■ Features of the LX-57B Glass

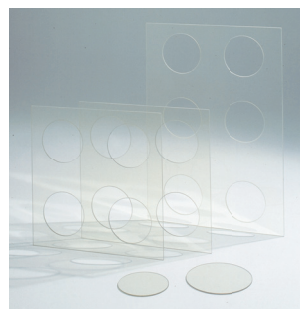
JIS Certified Product

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.



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.



Various processed LX-57B products

Excellent Transparency

LX-57B has a grade of optical glass quality. Because both surfaces are optically polished, it 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.

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.



The large-size LX-57B improves operations.

LX-57B Standards and Properties

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.

1 Glass Thickness and Lead Equivalent

LX-57B Glass Thickness (mm)	Lead Equivalent (mmPb)	Remarks
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	
14.0 ± 0.5*	3.0	Lead equivalent is guaranteed within an X-ray tube voltage range of 60 to 200 kV.

* JIS R3701 certified products
Glass over 14.0 mm in thickness available on request.

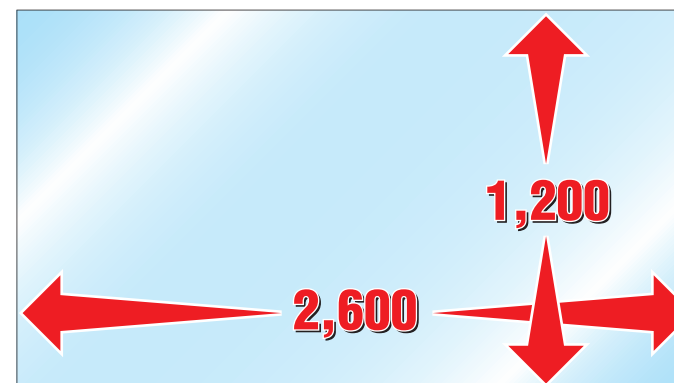
3 Properties

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

* The values above are not guaranteed values.

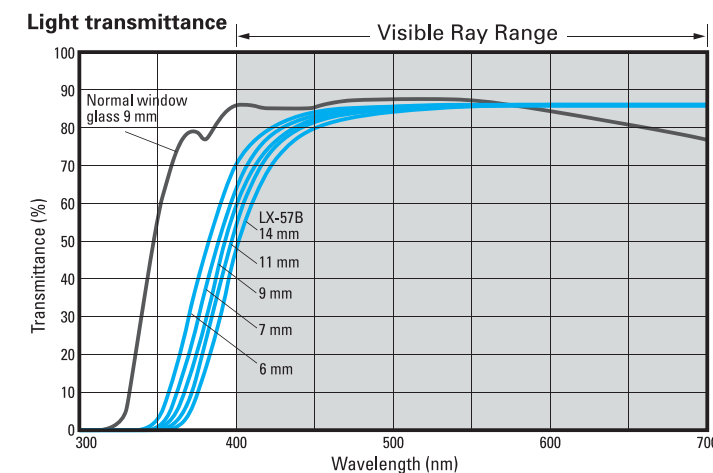
2 Size

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



4 Transparency

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



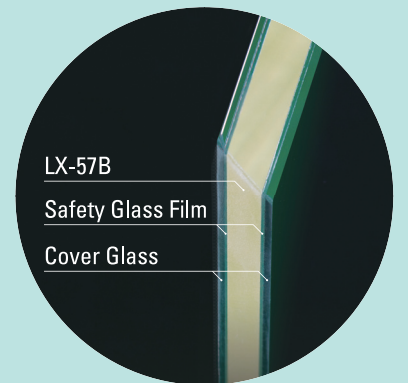
Warning LX-57B is glass material. If it is cracked or broken, you may be seriously injured by its fragments. Be careful in handling the product.

LX PREMIUM—Radiation Shielding Glass

LX Premium, an Innovative Radiation Shielding Glass
That Causes No Fog When Wiped With Wet Cloth
LX Premium has excellent radiation shielding capability
and ensures a clear view

LX Premium has a multi-layer structure, manufactured by inserting LX-57B high-lead glass (which has excellent radiation shielding capability) between cover glasses. As a result, a glass surface will not fog even when chemicals splash on it or it is wiped with wet cloth. While lead glass can shield radiation, conventional products have had problems with fogging when moisture adheres to glass surfaces. This can occur when glass surfaces are touched by bare hands (transferring sweat or lipids) or when glass is wiped with wet cloth. LX Premium has overcome the weakness of lead glass and achieved high maintainability. Having evolved from conventional radiation shielding lead glass, it represents the next generation of radiation shielding glass with excellent shock resistance.

Cross Section of LX Premium



1 Purpose

LX Premium significantly reduces healthcare workers' exposure to radiation at radiological diagnostic facilities.

2 Main Applications

- ① Window of an X-ray control booth that requires sterilization
- ② Observation window for an angiography room or the like where chemicals are likely to spatter
- ③ Inspection window of a door that is frequently touched by people

3 Features

• High Transparency

Because the lead glass is protected by cover glasses, the glass surface will not fog (which refers to discoloration or staining caused when lead substances react to moisture or lipids) even when chemicals adhere to it or it is wiped with wet cloth. High transparency can be maintained with ease.

• Excellent Maintainability

Because it is protected by cover glasses on both surfaces, the glass can be cleaned using such items as wet cloth, glass cleaners, and detergents without any concern about fogging, in the same way as cleaning ordinary windowpanes.

• Safety

Because it is multi-layer laminated glass of LX-57B and cover glasses, it is impact-safe and shatter resistant. (The laminated glass meets the requirements of JIS* R 3205 classification II-1)

*JIS: Japanese Industrial Standards



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

4 Lead Equivalent and Glass Thickness

Lead Equivalent (mmPb)	LX PREMIUM Glass Thickness (mm)	Maximum Size (mm)
1.1	11 ± 1.2	1,200 x 2,600
1.5	12 ± 1.2	
2.0	14 ± 1.4	
2.5	16 ± 1.4	
3.0	19 ± 1.4	

Warning LX Premium is glass material. If it is cracked or broken, you may be seriously injured by its fragments. Be careful in handling the product.



Pro-GR — Gamma Ray Shielding Glass for PET Facilities

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

New product "Pro-GR" is made of glass materials having a lead oxide content rate of roughly 70% that is equivalent to ultra-high lead content block glass for nuclear power facilities.

1 Product Data

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

Values for effective dose transmission factor and lead equivalent are for gamma rays (0.511 MeV).

- Maximum Size : 1,000 × 1,500 mm (42" × 60")
- Specific Gravity : Min. 5.20
- Knoop Hardness : 320
- Visible Light Transmission : 83%



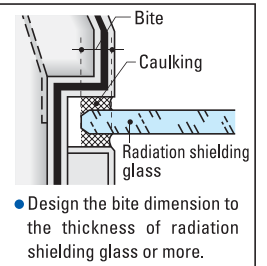
2 When Higher Shielding Performance Is Required

Pro-GR Combination Examples			Glass Thickness (mm)	Effective Dose Transmission Factor (%)	Lead Equivalent (mmPb)
Number of 14.7 mm Sheets	Number of 21.8 mm Sheets	Total			
× 2	—	2	30	24.5	10.1
× 1	× 1		37	16.4	12.9
—	× 2		44	11.0	15.6
× 2	× 1	3	53	7.4	18.2
× 1	× 2		60	4.8	21.0
—	× 3		67	3.1	23.6

Installation and Cleaning

Instructions for Installation

- 1 Design the bite dimension of radiation shielding glass to the thickness of radiation shielding glass or more.
- 2 Cover the frame peripheries with lead plates to prevent X-ray leakage.
- 3 Fix the four edges of radiation shielding glass with beads.
- 4 Seal LX-57B and Pro-GR using a non-acetic acid type silicon sealant.

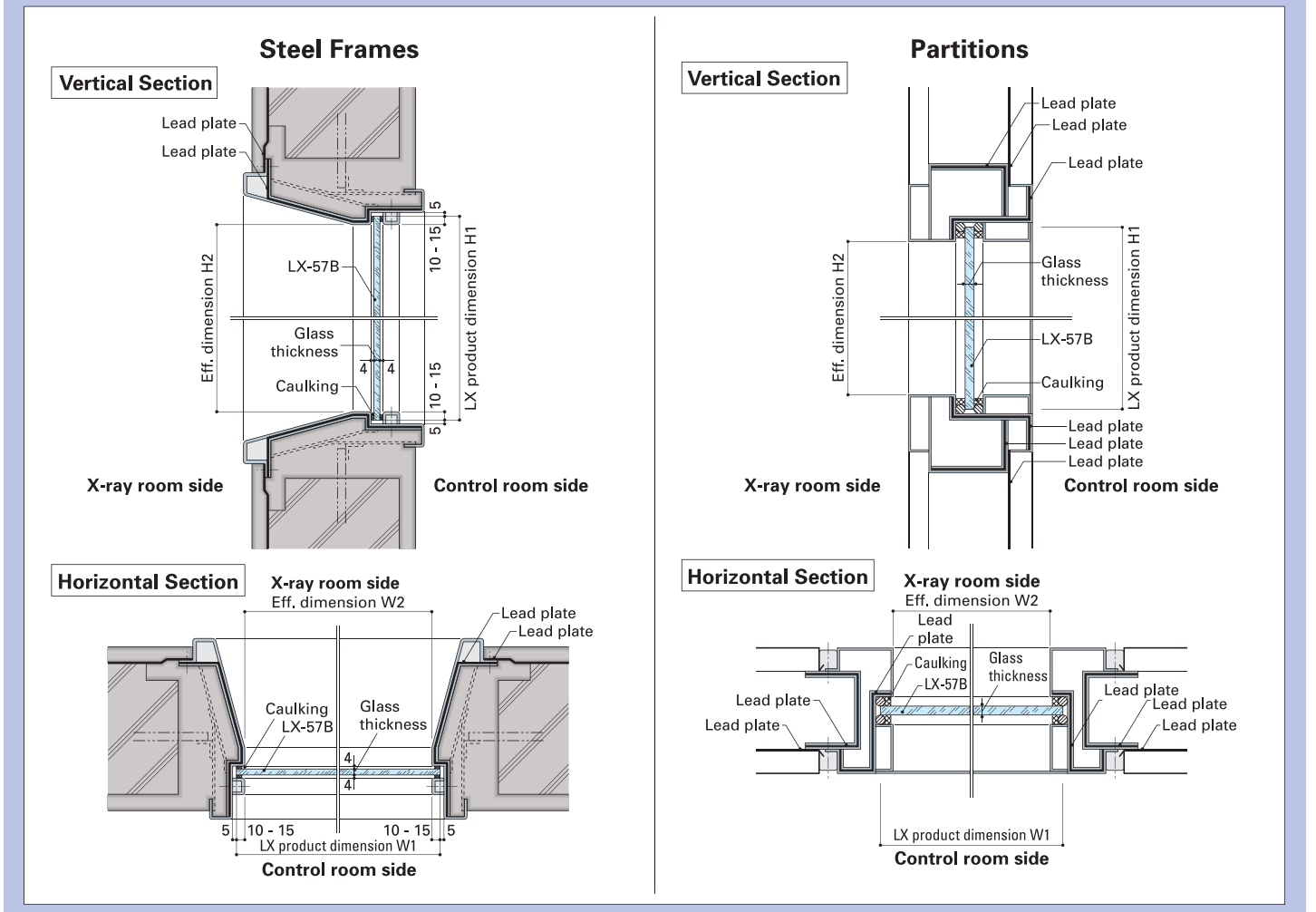


Precautions for Installation and Cleaning

As a high lead content glass, LX-57B and Pro-GR are more susceptible to staining as compared with normal window glass. Pay attention to the following precautions for installation and cleaning.

- 1 Do not stick anything on the surface of LX-57B and Pro-GR in installation. (When masking tape is used in caulking, remove it immediately after caulking and wipe off any tape traces with alcohol.)
- 2 Do not use wet cloth or water to clean LX-57B and Pro-GR. Immediately wipe off water in case LX-57B and Pro-GR becomes wet.
- 3 When LX-57B and Pro-GR becomes dirty or marked with fingerprints, polish the surface slightly hard with a dry, clean cloth like gauze using alcohol (or a special type of glass polisher recommended by NEG). Wipe LX-57B and Pro-GR again afterwards with a new dry, clean cloth to completely remove the alcohol remaining on the surface.

Reference Installation Diagrams



Warning Pro-GR is glass material. If it is cracked or broken, you may be seriously injured by its fragments. Be careful in handling the product.

LFX-9 — Lead-free Radiation Shielding Glass

LFX-9 is a completely new type of radiation shielding glass that has no lead in it. With its outstanding features exceeding those of conventional lead glass or lead acrylic, LFX-9 is suitable for protection from relatively weak radiation, especially as a shield for mammography that requires impact safety.

1 Features

- Lead-free**
 Lead-free, yet assuring lead equivalency of 0.5 mmPb/50, 80 kV
- Easy-to-clean**
 No risk of staining on the glass surface. High surface hardness to prevent scratches. These make it possible to clean LFX-9 just like regular window glass.
- High Transparency for Clear View**
 LFX-9 has a high visible light transmission rate, allowing you a clear view.
- Impact Safety**
 Three sheets of special glass are laminated together using safety interlayers to make LFX-9 impact safe.

2 X-ray Shielding Performance

X-ray Tube Voltage (kV)	X-ray Transmission (%)	Lead Equivalency (mmPb)
50	0.04	0.5
80	1.75	

Test results according to IEC1331-1, 1994

The X-ray transmission of LFX-9 was measured at 30 kV as well, however, readings higher than background could not be obtained. This means that X-rays of 30 kV are perfectly shielded.

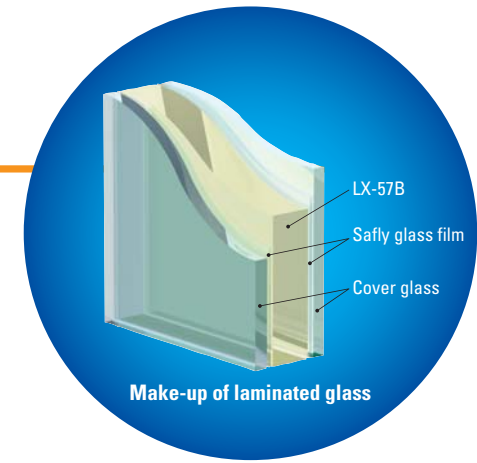
- Maximum Size : 1,200 × 2,400 mm
- Thickness : 9 mm
- Specific Gravity : 2.7
- Knoop Hardness : 520
- Visible Light Transmission : 85%



Warning LFX-9 is glass material. If it is cracked or broken, you may be seriously injured by its fragments. Be careful in handling the product.

LX Protective Screen

LX Protective Screen is an impact-safe, portable radiation shielding screen made with LX-57B Radiation Shielding Lead Glass. Its excellent shielding capability and ease of use are highly evaluated by a wide range of users in hospitals and clinics



Lead Equivalent : 1.5 mm Pb-92 kg in total weight
 Lead Equivalent : 2.0 mm Pb-106 kg in total weight



Lead Equivalent : 1.5 mm Pb-96 kg in total weight
 Lead Equivalent : 2.0 mm Pb-106 kg in total weight



Lead Equivalent : 1.5 mm Pb-101 kg in total weight
 Lead Equivalent : 2.0 mm Pb-109 kg in total weight

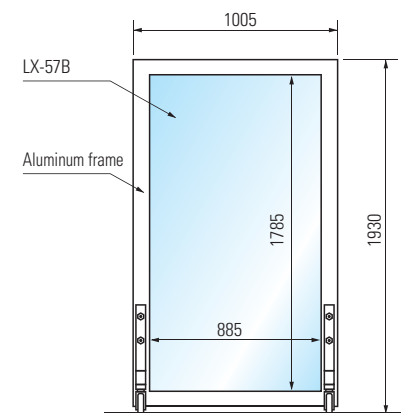
*Lead-lined decorative steel plate is available in blue or cream.

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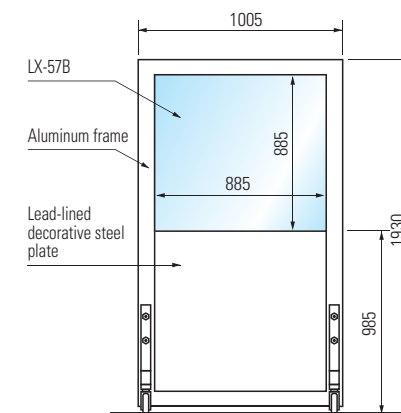
* Surrounding aluminum frames are not lead-lined. For joining use of two Screens, Lead-lined Coupler is available as an option.

Dimensions (Unit: mm)

■ Type L-A



■ Type L-B



■ Type L-C

