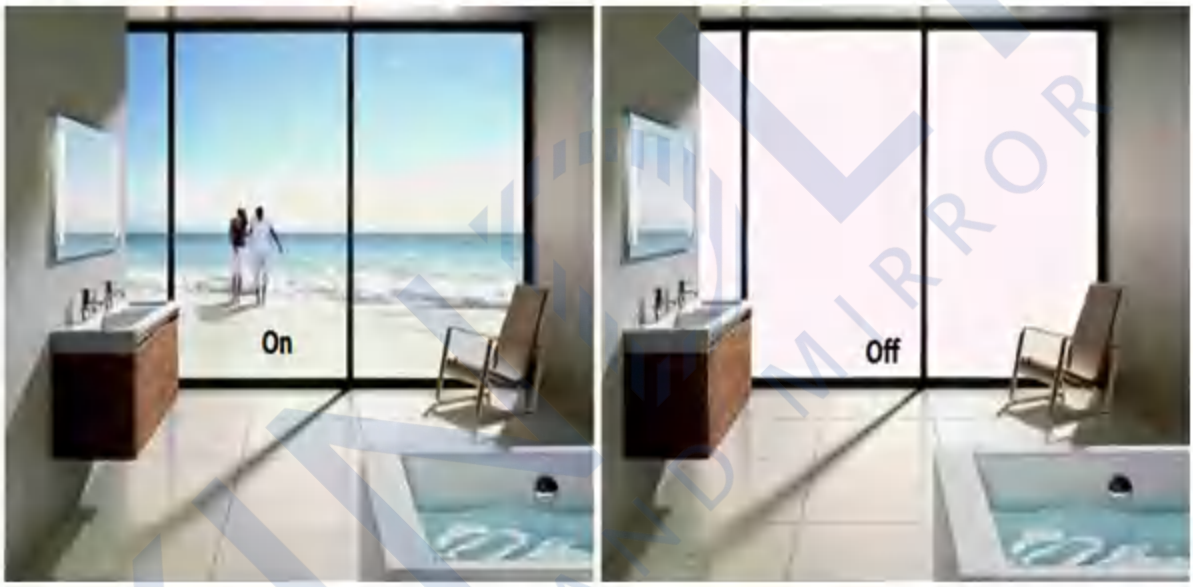
KINDLY™
GLASS AND MIRROR

Smart / Switchable / PDLC Glass

Smart / Switchable / PDLC Glass

can be converted in opaque and transparent forms, thus providing absolute privacy to the user. This kind of glass is also called an "electronically controlled discoloration glass curtain". The new liquid crystal material attached to the glass, through the current change to control the glass color depth and the intensity of the sun shines into the room, can block about 99% of the light and ultraviolet light, provide a comfortable environment for the user, belongs to the electronic technology and glass technology in-depth development of high-tech combined smart glass can be converted in opaque and transparent two forms, so can provide the user's absolute privacy.



How It Works

Smart Glass in its "off" state has a frosted or opaque appearance because the PDLC (Polymer Dispersed Liquid Crystal) remain in a randomized configuration that refracts the light that enters the mixture.In the clear, or "on" state, an electrical current is passed through the PDLC (Polymer Dispersed Liquid Crystal) interlayer aligning the microscopic crystals along a number of parallel axes, thus allowing vision through the glass.Smart Glass is a laminated glass product consisting of a Polymer Dispersed Liquid Crystal (PDLC) film sandwiched between two layers of glass and two layers of conductive interlayers. The PDLC film is what allows you to change the visual appearance of the glass from opaque to clear on command (or dim anywhere in between).Our approved technology provides unprecedented control over the amount of light, privacy and heat that enters a space and is ideal for Residential, Commercial Interior, Retail Store Front, Healthcare and Higher Education applications. Smart Glass is available in a variety of shapes, sizes, and compositions.

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Products Characteristics

- Power transparent, power transmission opaque: this feature is mainly due to the smart membrane liquid crystal "electro-light effect", the product response speed is fast, from completely transparent to completely opaque or vice versa can be done instantaneously.
- Safety: Due to the use of laminated glass process, the film in the dimmed glass will be firmly bonded to the glass, so that the smart glass in the impact of broken, glass fragments glued to the film in the middle, there is no glass debris splashing injured.
- Environmental features: The smart film and film in the middle of the smart glass can shield more than 90% of the infrared and ultraviolet light. Shielding infrared to reduce thermal radiation and transmission. And shielding ultraviolet, can protect the interior of the furnishings do not appear due to UV irradiation, aging and so on.to protect personnel from diseases caused by direct ultraviolet radiation. Available office partition, important organ control center, high-level residential interior design: light cover glass curtain, sun room, living room, bathroom cubicle, merchandise display and commercial advertising.

Power-on state (on)　　Power-off status (off)

- Soundproofing characteristics: the smart film and film in the middle of the smart glass have the effect of sound damping. Effectively blocks all types of noise.
- Control diversification: manual switch, light control, voice control, temperature control, remote control, remote network control can be.
- Simple architecture, low cost, easy installation, convenient control mode, save the installation of curtains cumbersome and future cleaning trouble.
- With any area of glass matching, power transparent, opaque state when power is lost, free switching, simple and convenient.

- Healthcare

How do you measure the cost of air borne illnesses from Hospital blinds? Blinds and other partitions need to be cleaned and sterilized on a frequent basis to minimize the presence MRSA and VRE viruses that could become fatal. Smart Film used in Hospitals presents a cost effective solution to practically negating the chances of airborne viruses being present or surviving in the Hospital setting. Easy to clean and sterilize without labor intensive removal and replacement allowing for ongoing usage of hospital facilities and providing the needed privacy.

- Residential

Designing or redesigning your space in hopes of creating more openness?
Can't afford a tear down renovation?
Smart Film can help!
Smart Film gives you that design option to install glass walls to create that open feel when you want it...flip a switch and you create the privacy you need.

- Commercial

How do you create an open office environment but still have office walls?
With Smart Film of course!!!
Smart Film on glass walls allows you to maintain the open office setting but gives you the flexibility to create needed privacy at the flip of a switch.

Advantages

·Smart Glass also known as PDLC Glass provides Instant and precise privacy control
·Efficient use of space in the built environment
·Smart Glass blocks 98+% of damaging UV rays
·Eco friendly product
·Exceptional optical qualities that reduce glare and eye strain
·Large sizes of many shapes can be produced
·Our Smart Glass provides stable colour characteristics for the life of the unit
·Aesthetically pleasing
·Hygienic low maintenance reducing the transmission of MRSA and VRE pathogens
·Smart Glass enhances corporate image
·Reduces uncomfortable “Gold fish bowl” feeling when living or working in high-density buildings such as apartment blocks or office complexes
·Reduced fading of carpets, furniture and protect valuable artwork with the advantages of Smart Glass
·High UV stability
·Low working voltage
·High video contrast at any viewing angle and any illumination level
·Long life – tested to in excess of 3,000,000 cycles gives our Smart Glass an incredible advantage over competition.

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Kindlyglass Smart Glass Paratermeter

Test Item	Situation	Test Results	Test Standard
Appearance	/	OK	GB15763.3-2009
Max.Size/Thickness	1800x4200mm	5+5 / 6+6mm	
Guard Edge Size	11mm	120×150	Q/FTXFR
	13mm	200×300	
	17mm	300×300	
Visible LightTransmission	on	> 72%	GB5137.2-2002
	off	< 2%	
Total Transmittance of Light	on	> 76%	GB5137.1-2002
	off	> 45%	
Haze	on	< 3%	
	off	> 95%	
Scattering	on	< 2%	
	off	> 45%	
Visual Angle of View	on	> 140°	Q/FTXFR
Response Time	on	< 8ms	
	off	< 120ms	
Working Voltage	on	48V	GB4706.1-2005
Power Dissipation	on	< 3W/㎡	Q/FTXFR
Heat Resistance	/	OK	GB15763.3-2009
Wet Resistance	/	OK	GB15763.3-2009
Irradiation Resistance	/	OK	GB15763.3-2009
Drop Ball Impact Stripping Performance	/	OK	GB15763.3-2009
Pellet Bag Impact Performance	/	Ⅱ-1	GB15763.3-2009
Working Temperature	/	-10～60℃	Q/FTXFR
Storage Temperature	/	-20～70℃	
Sound Insulation	/	> 35dB	GB18910.1-2005
Thermal Insulation	/	OK	GB8484-2008
Vibration Performance	/	OK	GB6382.1-1995
Working Life	on	> 50000 hr	GB18910.5-2008

Unpacking and Storage

1) Unboxing

The box should be kept upright at the time of unsealing, or leaning against a slope of 5 to 7 degrees. To prevent damage to the smart glass, the upper cover should be opened first, and then removed from the four sides, carefully remove the smart glass.

▲Warning: Any wires that connect smart glass are not available to lift, move, or secure the smart glass, nor can they be pulled by force.

2) Storage

The edges and corners of the glass are often damaged by careless handling, so you should be alert from time to time. If the smart glass

The place where the glass is used or the storage condition sits at more than 80%, and you should always pay attention to seal protection. smart glass must be installed in a dry environment to avoid staining. The glass storage temperature is -20to 60 degrees C, and the overall glass temperature should be consistent to avoid moisture condensing on the panel. Boxes containing dimmed glass should be kept upright or leaning against a sturdy slope of 5 to 7 degrees to support the weight of the box.

Glass Installation

1) Before installation must check each piece of glass, if there is a size error, corner breakage, scratches, wear or quantity is not the right, please do not install.

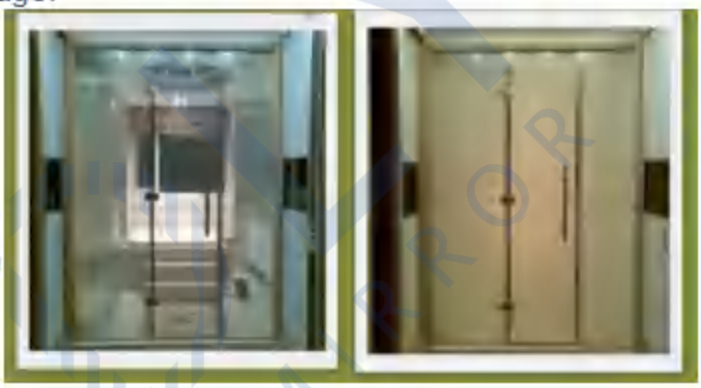
2) If there is no manufacturer's instructions, please do not arbitrarily remove the label of the glass supplier, follow the light-encased glass installation instructions and drawings.

3) Remove residue and other hard material bulges from the frame.

4) There must be a gasket on the window frame, according to the manufacturer's recommendations to trim the size and quantity, the standard width, thickness gasket mounted on the window frame. Gaskets can use rubber, wood blocks and other materials, in the corner and connection area for waterproof and air-sealing edge protection.

5) The four sides of the glass factory have been protected by sealing glue, in order to prevent the elements of the glass glue from erosion into the interior of the smart glass, so before installation must confirm that the sealing rubber is intact. If there is a local sealing edge glue off, the installer needs to re-seal the edge glue.

6) Before installing the smart glass, the check box body has an outlet hole or groove, when installing, pay attention to the connection of the electrical route. When using smart glass in wet environments, special attention must be paid to the connection safety of the circuit during installation.
7) When installing the glass needs to be installed vertically, not to tear off the protective film.
8) When installing the outer border after the glass is fixed, care should be taken to prevent hard objects from touching the glass or welding sparks burning the glass. Dust, welding sparks or other hard objects that touch the glass surface during installation may cause irreparable damage.
9) After installation, you need to hit the glass glue immediately: use non-acid glass glue, please make sure to use smart glass special glass glue.
10) Installation and finished product protection site environment to maintain clean, dust-free pollution, benzene-free volatile pollution, otherwise will corrode damaged smart glass.



Circuit Installation

1) All relevant circuits for smart glass wiring must be installed by qualified electrical engineers or directed on site by manufacturer personnel.
2)Before installation, the exposed electrode, electrode and wire contact with the metal frame, so as not to damage the power supply and smart glass. The exposed electrodes and wires during the glue process or transport can be covered with insulation tape.
3)First make sure that the power supply is not switched on, the installation of smart glass before the confirmation box body has an outlet hole or groove.
4)Before installation, check whether the electrode position of each piece of glass is well sealed and confirm that there is no sealant off.
5) Glass wiring as shown in Figure 1 (as reference disreference dononon on the last page of this manual): It is prohibited to connect the glass electrode line directly to 220V voltage, and the smart glass electrode line is connected with AC70V or 60V at the power output. Multi-piece smart glass should be connected in parallel with the power supply outlet as shown in Figure 1. (Power input, output voltage actually see power identification)
Warning: smart glass must operate at a special supply voltage, and excessive voltage and current can cause serious damage to the glass product. Service in service and circuitry must be provided only after a professional electrical engineer has fully understood the product.

6) When wiring, the two lines of the smart glass are connected to the line of fire at the power output point, and the wiring method is connected by T-branch,
The wiring process must not pull the wires hard.
7) Pull the waterproof tape tightly wrapped to the wiring, and then wrap the insulation tape seal.
8) After wiring, put the main line in the wiring slot to prevent rats from gnawing.
9) Before plugging in, test the resistance reading between the metal frame and the electrode to determine if it is infinite, otherwise you must check the short circuit and insulate the electrode part of the metal frame.
10) After turning on the power supply, check that the glass panel is transparent, if any one or more smart glass does not respond:
a, check that the current circuit breaker is ok, otherwise the fuse must be reset or replaced.
b, check the wall socket is properly powered, otherwise it must be replaced.
c, check the input of the power supply and the wire connecting the wall socket to the power supply is properly energized.
d, check the output of the power supply is normal, otherwise it may be a blown fuse, must replace the same kind, size of the fuse.
Warning: Do not replace a higher-grade fuse! The right fuse is important to protect the smart glass and the power supply.

Product Cleaning

When the glass is installed, the architect, contractor or user must take responsibility for the protection and cleaning of the glass, and regular cleaning of the glass on a daily basis is also necessary. Rust-prone steel and alkaline substances can damage the glass surface. Wear-and-wear cleaners should never be used, especially when glass surfaces are reflective coatings. After cleaning with a clean, soft cloth with neutral soap or alcohol liquid, clean and dry immediately with clean water.

After-sales Service

In order to ensure that the interests of customers are not harmed, our company promises to dimglass within one year free quality assurance, life-long maintenance services, power supply and accessories warranty period of one year.
1) Free quality assurance within one year: my company's smart glass in the customer's location from the date of one year, within one year, in the normal use of quality problems, my company will give free repair services.
2) Life-long maintenance services: our company smart glass products after one year of use, will be at a favorable price to provide accessories and maintenance services.

Precautions

In one of the following cases, product damage is not covered by the warranty, including:
1) Glass damage occurs during handling, storage and installation.
2) Not in accordance with our company's installation requirements for installation, commissioning, use, resulting in damage.
3) Man-made damage damage to the sealing material around the glass.
4) Not timely and correct use of our company to provide special glue sealglass perimeter and gaps between the glass;
5) Do not use the power supply (transformer) or controller that our company provides or approves, or do not wire according to the requirements of the glass circuit wiring in the instructions.
6) Remove or repair the smart glass (including edge strip, power supply and controller).
7) Man-made bumpglass or scratch the glass surface.
8) Failure caused by irresistible factors such as natural disasters.
9) Other failures caused by misuse, unmanageable, accident, or use in an abnormal work environment.

Different Types of Smart Glass FYI

1. Color smart glass

No doubt our first thought is the color smart glass, the color smart glass changed the original smart glass single white, so that the smart glass has a variety of colors. Color smart glass can be divided into the following categories according to manufacturing methods:

Processing methods	Color stability	Color gorgeous degree	Color change	Price
Glass staining	High	Low	Low	Low
Film dyeing	General	General	Low	General
PET dyeing	General	General	Low	General
Liquid Crystal Dyeing	General	High	High	High

Through the table above we can know that the processing method (or dyeing method) of color liquid crystal smart glass can be divided into: glass dyeing, film dyeing, pet dyeing and liquid crystal dyeing. Glass dyeing can generally use stained glass or coated glass to change the overall color of smart glass, the color is relatively single but low cost. Film dyeing is similar to PET dyeing, is dyed on film or PET, more types of colors, but the disadvantage is that the color of the depth can not be changed with the power of the glass. Finally, we want to focus on the liquid crystal dyeing smart glass. This practice is to dye the liquid crystal directly (more difficult), so the color will be lighter with the liquid crystal when the glass is energized. Therefore, this kind of color smart glass is the most practical one. This process is currently only a small number of manufacturers in the country can be achieved, and the price is relatively high.

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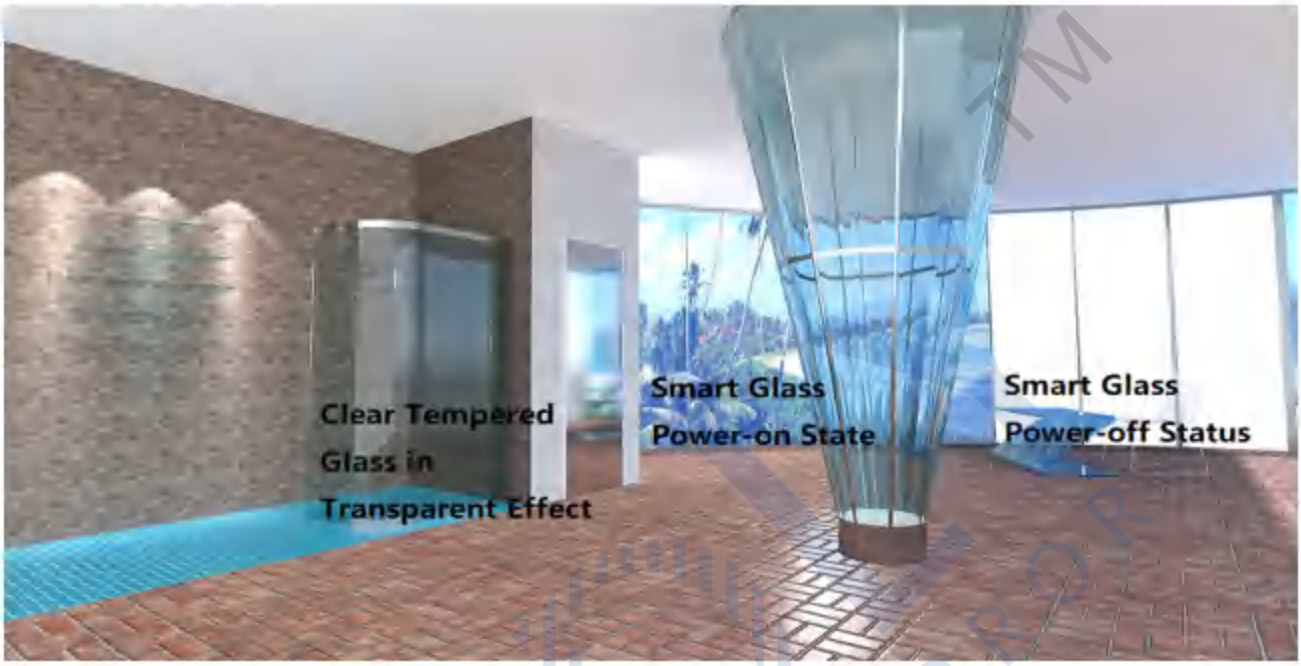

2. Fire-resistant smart glass

Fire-resistant smart glass is a kind of safety glass product that combines fireproof glass with smart glass. Its fire resistance varies with the performance of the fire substrate used. Generally we commonly use fireproof glass for 90 minutes of fireproof glass. Fire-resistant smart glass is suitable for a variety of fire proofing projects with fire requirements. It is also important to note that in practice, fire-resistant smart glass in practice must be each piece of fire-resistant smart glass has a separate frame (that is, all sides have a frame) otherwise can not pass the fire acceptance.

3. Insulated sound-proofing glass

The insulated sound-proofing glass is put together because the same glass process simultaneously solves the thermal insulation sound insulation problem of smart glass. Insulated sound-proofdim glass is simply to add a layer of hollow layer to the outer layer of the smart glass to protect the sound insulation purpose. Depending on the thermal insulation needs we have to choose different substrates and middle layers. Common configurations are 3.2 plus 2 plus 3.2 plus 12A plus 6, 6 plus 2 plus 6 plus 12 plus 6.

4. One-way perspective smart glass

One-way perspective smart glass is a high-level combination of one-way perspective glass and smart glass. Its performance can not only meet the effect of one-way perspective glass, but also can achieve the effect of smart glass. It is important to note that the best one-way glass and smart glass must be selected for perfect results.
Example: One-way smart glass installed on the exterior of the villa
Effect: Daytime smart glass open, outdoor can not see indoor, indoor can be observed outdoor. Night smart glass is off and cannot be seen indoors and outdoors

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Smart Film Ranges

◆ Lamination smart film is a switchable interlayer suitable for glass manufacturers and custom applications. Ideal for Residential, Commercial Interior, Retail Store Front and Healthcare applications.
The seamless nature of laminate glass enables panels to be positioned side by side without the need for any vertical frames. Ideal for glass walls and partitions, the switchable film is bonded between two layers of glass replacing the need for old fashion blinds or curtains. Switchable Laminate film is available in a range of colors and sizes.

◆ Self-adhesive Smart Window Film applies to any existing or new smooth glass surface. A simple ON – OFF mode switches the PDLC film from being clear (transparent) to frosted (opaque). In its frosted state the film acts as an electronic blind providing privacy and security for any glass, window or partition.Custom shapes and sizes can be created, and multiple pieces can be joined together to create large switchable glazed panels or partitions.
When glass cannot be removed or replaced, this product delivers the solution you need.

FAQ

·Does Smart Film privacy film block harmful UV rays?
Yes, It blocks over 98% of the harmful UV rays in both its energized and un-energized state.

·Is Smart Film energy efficient?
Yes, It is considered a green product that consumes between 3 and 6 watts per meter squared.

·What is the difference between Smart Film Self Adhesive and Smart Film NON-Adhesive backings?
Smart Film Glass offers a Self Adhesive and a Non-Adhesive switchable privacy film that has the ability to contour to the curves of various types of glass. Smart Film is very popular for projection screens, electronic blinds, white boards, and high tech window treatments. Smart Film switchable privacy film provides maximum clarity when energized and extreme privacy when powered off. The only difference between the two switchable films is that Self Adhesive has a peel and stick backing and or non-adhesive can be installed with a double sided adhesive clear 3m VHB tape.

·How much does Smart Film cost?
Every Smart Film project is different and we custom manufacture your material into almost any shape or size, pre-wire, test and send you a ready to install kit with a package price. We have the quickest lead times in the business. We have a price match guarantee!

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·How can I purchase or get a job quote?
If you would like to get a quote, click the "Smart Film" for a no obligation quote and provide us the details of your project.

·Can Smart Film be installed on the half of the glass only?
Yes, you can install our Smart Film privacy film on the top half or bottom half only if desired.

·Is it less expensive than smart glass?
Yes, it is a fraction of the cost and no construction required.

·Do you offer Smart Glass?
Yes, our Smart Glass is all custom cut to order. Call for a Free no obligation quote.

·Can you project on Smart Film?
Yes, Smart Film is ideal with its extremely high gain rate to be used as a projection film. We have many happy retail customers that utilize their store glass façade as a video billboard.

Thank you for your using our products!

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