Switchable PDLC Film and Glass

InnoGlass Technology
Switchable PDLC Glass and Film
Application Warning

The Work Voltage:
Use the working voltage based on our products requirement, don’t more than that;
Don’t use other type and high voltage power, we suggest you use our transformer;
If the quality problem cause due to use other transformer, we will not responsible;
Note: our film working voltage: AC 65±5V

About the Silicon Sealant Glue:
Our film and glass can’t use acid glue to seal the glass or film edge and busbar, you
must use the neutral silicon glue, we suggest use TOSHIBA 381;
If you use the wrong silicon sealant glue, we will not responsible for the quality!

The Film and Glass Clean:
Don’t use water to clean the film or glass, pls use alcohol;

The Film Handle:
The film can’t be fold, if fold easy damage, the film will be not work;
The film should be roll station or flat on the flat table;

![Wrong and Correct Examples](image-url)
About the Busbar:

Don’t pull the busbar wire, the busbar is easy to pull separate with the film or glass!
Don’t let two busbar wire shortcut!
Content:

1. The Self-adhesive Film structure;

2. Film stick Operation Instruction;

3. How to install Busbar?

4. How to connect?

The Self-adhesive PDLC film Structure

Normally, the self-adhesive film have three layer, pls see the following showing:

1. We have the lable “自粘面” or “self-adhesive side” on one side, this side is the self-adhesive side, and this side stick on glass;
2. The self-adhesive film have three main layer:

A layer: the protection film;

B layer: the PDLC film;

C layer: the protection film on the self-adhesive side;

Note: when you touch the self-adhesive side, the surface have little stick, another side, no self-adhesive function, the surface is smooth;

For the self-adhesive surface, if have some dirty on the surface, you can use alcohol to clean, Don’t worry, the self-adhesive function will be work well still;
The Self-adhesive Smart PDLC Film Installation Instruction

1. 准备相关材料和工具（prepare the material and tools）

![Image of tools]

You can buy the car stick film tool also;

**Tools Prepare:**
Glass cleaner: detergent dilution, pressure watering can, glass cleaning blade, blade;
Film Tool: tape measure, alcohol watering can, knife, masking, clean cloth, special glass, plastic, glass, plastic gun, scraper tendon
Wiring Connect tool: electric iron, solder, electrical tape

工具准备
玻璃清洁：洗洁精稀释液、压力喷壶、玻璃清洁刮、铲刀
贴膜：卷尺、酒精喷壶、美工刀、美纹纸、无尘布、专用玻璃胶、玻璃胶枪、牛筋刮板
接线：电烙铁、焊锡、电工胶布；
Glass cleaning

Size Measurement: based on the drawing, check the size and measurement.
Initial positioning: for non-film area, film location requirements in accordance with customer needs, using the tape to location positioning.
Pre-Clean: The position of the glass foil sprayed evenly detergent dilution, preliminary cleaning glass and scrape dilution.
Fine clean: spray again dilution, using the blade to the edge of the glass surface and scraping around again, with raised points on the surface, dirty spots and edges of the glass must be scraping gum several times to clean and final cleaning: Follow step 3 Clean glass or two times, to ensure that the glass is clean.

玻璃清洁
尺寸测量：对照调光膜清单（图纸）对现场尺寸进行测量确认。
初步定位：对于非全覆盖式贴膜，需按照客户贴膜位置要求，在贴膜位置边线使用美纹纸定位。

预清洁：对贴膜位置玻璃均匀地喷洒洗洁精稀释液，对玻璃作初步清洁，并刮除稀释液。

精细清洁：再次喷洒稀释液，使用铲刀对玻璃表面及边部各处铲刮一遍，对表面有凸起点、脏点及边部玻璃胶须铲刮数遍至干净。最终清洁：按照步骤3清洁玻璃一至两遍，确保玻璃干净。
3. Film Cleaning: After removing PDLC film, infiltration of alcohol use clean cloth, clean the dust from veneer.

4. Film stick: In accordance with the design requirements, the film placed in the position of the film.
area, after confirm, torn from top to bottom part of the self-adhesive surface protection film; After fixing the upper region of the film, the film inside the bubbles using a squeegee expelled and shall posted a good and orderly film and then ripped the upper area of the region beneath the protective film to reduce dust floating into.

贴膜：按照设计要求，把调光膜放置于贴膜位置，经过确认位置后，从上往下撕开一部分自粘面保护膜；固定上部膜区域后，使用刮板赶出膜内侧气泡，并须有序地贴好上方区域调光膜后再撕开下方区域保护膜，以减少灰尘飘入。

5. 利用棍子把残留的气泡赶出。（注意电极部位）
（Eliminate again the remain bobbles after sticking whole films by Roller
（Be careful for damage for the Buzz bar part）

6. 利用电烙铁接好电线。
（Connectin the wire from buzz bar in using spot welding tool）
7. 利用胶带把保护膜揭掉.（禁止利用手指甲）
（Take off the protective films in using of the Tape）
（Don’t use by hand when take off the protective film）

8. 利用中性胶处理好电极部位.
（Silicon work for buzz bar part）

The silicon sealant we suggest, you need use the neutral sealant (TOSHIBA83 or TOSHIBA381):
Silicon sealant operation: use our special silicon sealant to protect the film four edge, the sealant width of 5mm, ensure the water vapor can’t into the film edge from external influence, the sealant need cover the copper belt.

封玻璃胶：在调光膜四边涂注我司调光膜专用玻璃胶，宽约 5mm，确保保护边部不受外部水汽影响，电极边玻璃胶须覆盖铜箔。

9. 接电源确认是否正常工作（On/off test）
10. Covering the buzz bar with Plastic strip or Aluminum frame

Note:
1. Confirm whether the precise size, to avoid duplication of effort.
2. Always handle clean glass surface, you can use tools such as blade repeatedly cleaned to avoid protrusions or the presence of impurities, liquid crystal film on a very low tolerance for dust;
3. Before sticking the glass surface residual moisture should not, this action will lead layer fails, the evaporation of water, function returned to normal; cause leakage can cause severe burning electrodes.
4. When patching, try to find a good position to avoid duplication; uncover a little bit protective film paste, must avoid the entry of dust, while beneficial to the exhaust, once the dust, be sure to remove the presence of impurities greatly affect product appearance, will lead to serious breakdown occurs; avoid the impact of hard objects such as nails silica surface, if damaged beyond repair. (Rubber roller can be replaced with a scraper)

5. Electrode fragile, non-pull, this action will cause adverse supply even burned electrodes.

6. Please use our special silicon sealant, other products may not be used.

7. PDLC film Fear wet acid stimulation, avoid these contacts.

8. You must use a dedicated power supply.

**The Busbar Installation Instruction**

1. 将需要的液晶膜切好（cut the liquid crystal film）

2. 为电极位置划线，宽度 6-7mm, 每条极的长度为电极制作边的 45%。电极正反面各做一条(draw electrode position, the widths of 6-7 mm, the length of each pole is 45% than the edge of electrode production. Do a positive and negative electrodes of each)
3、取一个美工刀片或手术刀片加热。(Heating an artist blade or surgical blades)

4、加热至变红后，弯曲接近 90 度(After heated to become red, bend close to 90 degrees)
5、做好一个手柄，保护手
(Make a handle for protecting of the hand)

6、将刀片从液晶膜夹层中间切入，很容易找到两层中间。
(Cut from liquid crystal film sandwiched with the blade, it's easy to find two layer.)

7、沿着我们画的电极线切割下来-1
(Cutting electrode line along we draw – 1),
7、沿着我们画的电极线切割下来-2(Cutting electrode line along we draw – 2),

8、另外一面也一样做，沿着我们画的电极线切割下来(The other side also do, Cutting electrode line along we draw)
9、准备棉花球，蘸取无水乙醇擦拭切割完的剖面上白色的物质--液晶高分子觉何物-1 (prepare cotton ball and dip in anhydrous ethanol and wipe the profile of white substance after cutting, liquid crystal polymer what – 1)

10、擦拭至透明状，力度不要太大。(Wipe to transparent, don't be too strongly.)

11、准备毛刷。(prepare a brush,)
12. 用毛刷蘸取导电银浆 (dipping in conductive silver pulp with brush)

13. 均匀的涂抹至擦拭至透明的地方，不可以摸到切割线上。 (Evenly daub to wipe to transparent place, can not touch the cutting line.)

14. 用吹风机吹干银浆 (Blow dry silver pulp with blower)
15、到银浆发白完全干燥为止(Until pale silver pulp completely dry)

16、贴导电铜箔(Stick a conductive copper foil)

16、贴导电铜箔-两面都要哦(Stick a conductive copper foil - both sides)
17、准备焊锡丝和导线(prepare the solder wire and cable)

18、将电烙铁预热(Preheat soldering iron)

19、将导线焊接好(welding well wire)
20、两面都是(Both sides are)

21、通电测试(Electric test)

22、断电(Power outages)
How To Connect?

The Smart Glass and Film Connect drawing:

- Each smart glass with 4 wires on short side, two wires on right short side, two wires on left short side.
- There are two output wires on power driver. One wire on the right short side and one wire on the left short side connect power driver two output wire then it is ok. Two pieces of smart glass in parallel ways.

No need to distinguish the positive and negative of power driver two output wires when connect with smart glass wires.

The Car Self-adhesive Film Connect Drawing:

- Attention:
  1. Should need power driver if smart glass directly connect with power supply. Smart glass will break down.
  2. When installation, glass facade should be smooth, should be flexible material. The glass's horn contact shall not be less than 40 square centimeters.
  3. If need one glass glue, should use one our company offered. If use other glass glue, it will happen that glass glue react with glass then made glass break.
Thanks!

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