UniteGlass Smart pdlc film manufacturer,we enable smarter living.

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Guide to Install Switchable PDLC Film

1. RECEIVING & HANDLING

1.1 Before signing and accepting the shipment from the carrier, inspect the container (i.e. box, crate) for any signs of physical damage. If there is any indication of damage, it is critical to open the container and inspect the shipment in the presence of the carrier. If any damage is found, the shipping documents should be noted accordingly and signed by the driver as a witness. Photographs should also be taken as proof of damage and submitted to UNITEGLASS for review. Failure to do so will hold you personally liable for any damage to the product and alleviate the carrier and UNITEGLASS from any responsibility.

1.2 Carefully open container to prevent causing any damage to the film and handle with care.

1.3. Do not fold or crease the film as this will cause permanent damage to the product. The film must be kept loosely rolled or flat at all times (see images below).

1.4 Always use nitrile gloves when handling and installing the product.

1.5 When moving the film it is best to hold it as close to the corners as possible. It is beneficial to have 2 people move larger sheets to reduce risk of damage. Use adequate numbers of skilled workers (based on project size) who are trained and experienced in the necessary crafts.

1.6 When handling films take particular care with the edges to avoid delamination.

2 STORAGE

Smart Film can sustain damage between delivery and installation; therefore care should be taken when the product is being handled, recommended guidelines for the handling of smart film included in this document. If the Film is not being installed immediately after uncrating, care must be taken to protect it and stored flat, out of direct sunlight, where the relative humidity is

less than 80% and a near constant temperature between -20 and +60 degree in order to prevent the formation of condensation on the film.

3 INSTALLATION FILM

3.1 PREPARATION

3.1.1 PLANNING & PREPARATION IS THE KEY TO A SUCCESSFUL INSTALLATION!!!

Items/tools required:

a. Nitrile gloves (or other non-powdered, lint-free gloves)

b. Glass cleaner (non-ammonia based)

c. Silicone adhesive sealant

d. Applicator squeegee/Glass scraper

e. Rubber Roller

f. Lint free cloth (microfiber)

g. Low adhesive tape (painters tape)

h. Packaging tape

i. Wire mold / trim

j. Ladder (if necessary)

k. Electrical tester (switch cord)

l. Soldering iron

m. Electrical wire leads

3.1.2 Remove smart film from container and place in a clean safe location near the installation area (preferably on a clean table top).

3.1.3. Inspect each piece of film immediately prior to start of installation. Do not install film pieces which are improperly sized, have damaged edges or are deficient in any other manner.

3.1.4 Test each piece of film (with a switch cord) to ensure it operates properly. Please notify a representative immediately should there be an issue with the operation of the product.

3.1.5 Once all materials are gathered and product has been properly reviewed and tested, you can proceed with the installation of smart film.

3.2 EXECUTION Step

Step1: Thoroughly clean the surface of the glass with glass cleaner & squeegee, and ensure there are no particles/debris left on the glass. It is best to clean both sides of glass (if possible) in order to distinguish debris on application side. If necessary spray the glass with a 99% isopropyl alcohol and carefully use a window scraper or blade to remove any dirt from the surface of the glass. –the surface needs to be COMPLETELY SMOOTH. Using a lint free cloth, clean the glass surface meticulously with IPA (isopropyl alcohol) and leave to evaporate.

NOTE: The cleaner you get the glass from the start, the quicker the installation time as there will be fewer air bubbles to deal with during installation. Glass must be completely dry prior to application of film. The following steps should be done in a clean, dry, dust free environment for best results.

Step 2: With nitrile gloves on, wipe the protective liner (that protect the adhesive on the side already facing up) using a dry microfiber cloth and ensure it is free from dust or other contaminants. Note: Do not remove the protective liner (Self Adhesive Side) until you are ready to install the film. The protective liner (Non-Adhesive Side) should remain until installation is completed.

Step 3: Before commencing installation ensure the film fits the area to be filmed by carefully positioning it against the surface whilst checking for the required clearances.Note that there are 2 copper mesh tabs (bus bar) along one side of the film as specified by customer. Make sure

that the film is oriented correctly so that the copper mesh tabs are located on the intended side. Copper tabs are not to come in contact with any metal framing or stops.

Step 4: Peel back the first 2-3”of the protective liner from the electrical contact side.

Step 5: Align the electrical contact side of the Smart Film with the top edge of the glass. Run your finger along the electrical contact side while pressing firmly on the film. The exposed adhesive will hold the film in position. Gently reposition if necessary.

Step 6: Slowly pull away the protective liner and let the film self adhere to the glass surface. Use the roller to gently press on the film and adhere it to the glass as you continue to slowly pull away the liner. If you miss an air bubble, carefully lift the film and let it re-adhere to the glass under its own weight. Repeat the process until the entire film adheres to the glass and the installation is free of bubbles. Note: No hard scraping on the film. It may hurt the crystal inside of film.

Step 7: Use the small squeegee gently work out any remaining small bubbles to the edges of the film, ensuring that the edges have good contact with the glass.

NOTE: Should you need to lift the film from the glass once it has been fully applied, to avoid any damage to the edge of the film, use the tip of a fine blade (eg.. a scalpel or craft knife) to gently and carefully ease one of the bottom corners away from the glass, taking great care not to damage the silicone cling liner which adheres the film to the glass. NEVER use a thumb or finger nail, this will damage the corner of the film and possibly cause de-lamination.

Step 8: Cut and Trim the film with a pair of stainless steel or titanium scissors.

Do not use a razor blade or knife it could cause delamination of the film.

After cutting and trimming, you need to use a cylinder to rolling press the cutting area edge, or it could cause high voltage and burn spot in cutting position, and even electric shocks. So it’s strongly suggested UNITEGLASS finish all cutting for clients.

Note: We always recommend you provide us the correct measurements so we can professionally cut to size at our facility eliminating any risk of material fault.

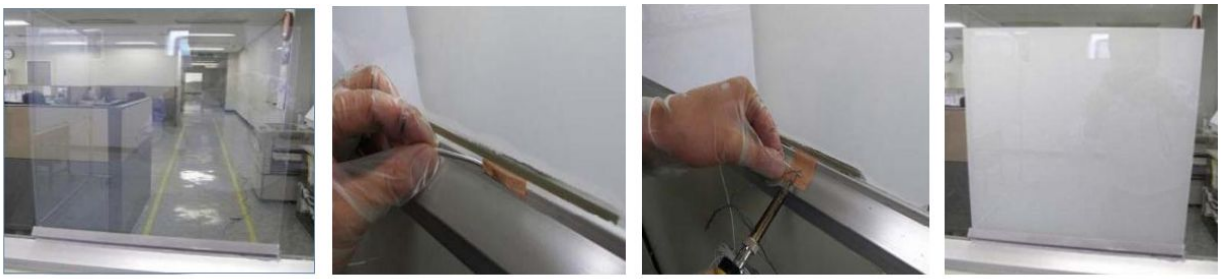
Step 9: Remove the outer protective liner.

Step 10: Connect electrical wiring to copper mesh tabs using a soldering iron (be sure to protect the film from potential solder drops). Solder a cable to one tab on the left (positive connection)

and to one on the right (negative connection). Quickly test the film to ensure it is working before proceeding. Once you have tested it you can trim off the spare portion of the mesh tab.

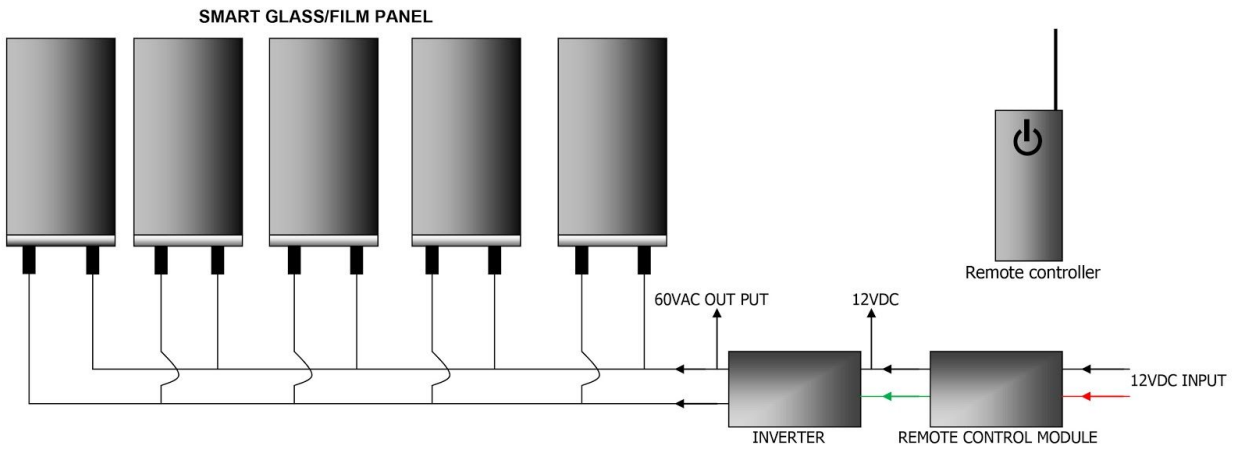
Note: you can also use wire nuts to connect wires to the copper mesh tab.

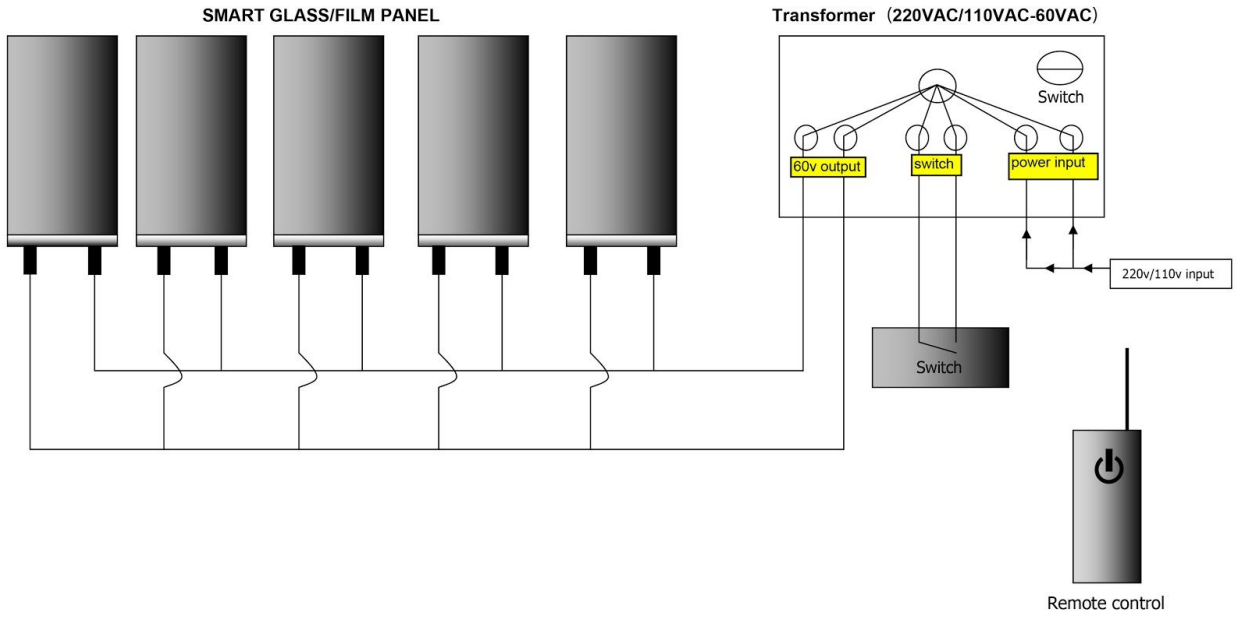
Step 11: Use non-acid based silicone along the bus bar edge to hold the wire mold/trim in place. Using acid based silicone can cause irreparable damage to the film product.



Step 12: Completely cover the bus bar area within existing frame or with Wire mold/trim (match existing finishes) to avoid exposure to electric shock. It is recommended to use a non-conductive wire mold (i.e. plastic). If you wish to use a metal wire mold we suggest you contact an electrician. Notch wire mold with dremel to accommodate wiring and attach prior to soldering. It is optional to cover remaining three edges with trim to meet any aesthetic requirements.

Step13: Solder the cable/wire to the power transformer,which all wires should be series connection. Test switch on/off function.





Till now the installation is completed, you can now do a final clean of the film with non-ammonia based cleaner and wipe down with a soft dry lint-free cloth. Never use any chemicals or abrasive cleaners on Film surface. The precise measurement of a window or glass panel is extremely important to the success of a smart film installation. The film comes pre-sized to fit and cannot be altered on site. If the measurement is too small, the film won't cover the entire glass area. However if your measurement is too large, the film won't fit within the allotted space. And when two or more films are being applied side by side on a single piece of glass, a gap of 0.5 to 1mm should be left to prevent an electrical short damaging the film edges.

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