CNCGLASS
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Installing and Maintaining PDLC Switchable Glass: A Practical Guide

Two products, two installation methods

PDLC is offered in more than one construction, and the installation method follows the construction. A self-adhesive switchable film can be applied to existing glass, much as a high-grade window film is applied: the glass is cleaned to a very high standard, the film is cut and positioned, and a squeegee works out water or air so the adhesive wets the pane. A factory-laminated unit is different. The PDLC layer is bonded between glass plies with EVA in a laminator, then delivered as a finished pane to be glazed like any other laminated unit. We generally prefer the laminated route for new work, because the active layer is protected inside the glass and the unit can be designed as safety glazing.



Figure 1. A laminated specimen and bonding film, the construction we recommend for lasting switchable units.

For retrofit film, cleanliness is everything. Dust, residual silicone, or moisture left under the sheet will show as optical defects and can disturb electrical contact. Gloves, a controlled room, and enough time to let the adhesive settle are not optional. For laminated units, the critical work happens earlier, on the laminator: a dry stack, a complete vacuum, a cure that clears the EVA, and a bus and edge that will survive glazing.

Electrical work is part of the installation

Both constructions need a transformer matched to the area of film and to the specified driving voltage, with wiring that is not pinched in a gasket or folded across a sharp edge. Poor connections are the most common reason a pane fails to switch. We recommend checking polarity, contact along the bus, and the actual voltage at the glass, not only at the supply.

Alignment, in the retrofit case, is easier with two people and should be done without stretching the film. If the sheet has to be lifted and reset, it should be done before the adhesive has taken a final set. In the laminated case, alignment is a factory problem: the PDLC must be square in the pane, with a planned bus position that the frame can hide.

Care in service

Clean switchable glass with a soft cloth and a mild, non-abrasive cleaner. Solvents and rough pads can mark a retrofit film surface and are unnecessary on a laminated face, which is simply glass. Periodically inspect plugs, transformers, and any visible bus for heat marks or corrosion. A pane that becomes slow to clear, or that shows a dull band along one edge, should be investigated as a power or moisture problem rather than washed more aggressively.

Extreme, prolonged heat at the edge is unkind to adhesives and to PDLC. External units, in particular, need an edge detail that was designed for weather, not a film that was applied as an afterthought to an untreated pane.

When the glass does not switch

If the pane stays frosted or stays clear, start with the supply and the connections. Confirm that the transformer is live, that the output matches the specification, and that the circuit is not interrupted. Localized dead areas often point to a damaged bus, a kinked film, or, in a laminate, a lamination or moisture defect. Persistent problems are better referred to the fabricator than “fixed” with more voltage.

A carefully installed, correctly powered unit—especially a factory-laminated EVA-PDLC pane—should then give years of ordinary service, which is the only definition of success we use.

Decide first whether the project is a retrofit film or a laminated unit, then install to that standard. Most failures we see are not mysterious material faults; they are cleaning, edge, or power-supply faults that could have been avoided.

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We advise on EVA lamination cycles for switchable units and on the electrical and edge details that keep those units working in the building.