



Technical Bulletin

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Maintenance and Hand Cleaning of Pilkington **Activ™** Self-Cleaning Glass

Summary

Pilkington **Activ™** Self-Cleaning Glass has a thin, clear, permanent, pyrolytic Titanium Oxide coating on one of its surfaces. The coating has a hydrophilic property which makes raindrops spread out, or sheet, across the surface to wash away inorganic dirt particles. It also acts as a catalyst, when activated by daylight, to break down organic dirt into water vapor and CO₂ gas. The coating has a very fine, hard texture compared to smooth, non-coated, glass and requires a slightly different cleaning procedure. For suitability of cleaners not discussed here please contact the Architectural Technical Services Department of Pilkington North America, Inc. at (419) 247-4448.

Routine Maintenance

Normal weather with daylight and occasional rain will keep the coating activated and self-cleaning. Small particles of organic dirt can be observed while they are being broken down by the faint halo around the original dirt spot. Typically the dirt spot and associated halo will disappear in a week or so without any manual intervention. Ideally the coating should be allowed to remove any surface dirt by its own self-cleaning action. If faster cleaning is required then the manual processes described below can be used.

Extended dry periods will continue to break down and evaporate organic dirt but will allow an accumulation of inorganic particles to form, particularly in dusty areas such as facing a dirt road or a salted highway in winter. To remove deposits such as dust, salt, or large lumps of bird droppings which can take excessive amounts of time to break down, the glass can be simply hosed down with clean water. Start the action at the top of the window and spray the water back and forth, working downwards towards the bottom of the window. This will flush the dirt away from the clean areas. Allow the glass to dry naturally. No rubbing or squeegee action should be required.

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The water used to rinse Pilkington **Activ™** self-cleaning glass should not be 'hard' (with dissolved inorganic minerals). In regions where 'hard' well water is used and domestic water softeners are common, a spray bottle (such as the portable one or two gallon container used for garden spraying) of soft, or distilled water can be used to rinse dust from the coating. Alternatively, hard water can be used to rinse the glass if a very small amount of liquid dishwashing detergent is added: this is easily done by using a garden spray bottle attachment on a garden hose. Add 2 or 3 drops of detergent to a half liter of water and spray the glass as described above.

If dried water spots or deposits become visible when the glass dries after hosing with water that was too hard, then they can be safely removed by a gentle hand wipe with domestic cleansers containing dilute Phosphoric Acid or Oxalic Acid, such as 'Lime A-Way' by Reckitt Benckiser Inc. or 'The Works Tub and Shower Cleaner' by BioLab Inc., available at Kmart and Wal-Mart stores, while following the application directions on the product container. If the 10 to 1 diluted strength is not effective then increase the concentration and repeat the application. Always perform a clean water rinse of the coating after such operations.

See Bulletin: ATS #144 "Manual Washing of Clear and Tinted (Non-Reflective Coated) Glass", for cleaning instructions for the plain glass (non-coated) side of the light.

Cleaning

If the results from clean water spraying, as described above, are inadequate then hand washing should be considered. A mild detergent and water solution is recommended. Care should be taken as the coated surface can be permanently damaged by inappropriate techniques. Such damage could cause permanently visible marks or significantly reduce the effectiveness of the self-cleaning properties.

Hand cleaning of the coating after installation, or to remove accumulated dust, dirt or fingerprints, can be accomplished with the use of a number of different glass cleaning products:

Recommended Routine Cleaning Products

- Sparkle Glass Cleaner (purple colored transparent liquid available from grocery stores), produced by A.J. Funk & Co., Elgin, IL
- Windex® Glass & Surface (clear liquid available from grocery stores), produced by SC Johnson & Son, Inc., Racine, WI
- Mixture of one part vinegar with one to ten parts clean water.

In addition to the above products, commercially available vinegar-based glass cleaners have generally demonstrated an ability to provide a clean, streak free glass surface.

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Manual Cleaning Procedure

- First rinse the surface by spraying clean water from a spray bottle or garden hose. This is best done when the glass is in shade and is not being heated by direct sunlight. (Spraying tap water onto hot glass can create visible spots of mineral deposits from water evaporation). Start spraying the glass at the top of the window. Spray the water back and forth, working downwards towards the bottom of the window. This will flush the dirt away from the clean areas from top to bottom to ensure the entire surface is wetted out. By doing this the water flow should remove the bulk of the dirt from the glass surface.
- Flood the Active coated surface with the spray-on cleaning solution or with a cloth saturated with the cleaning solution. Be generous with the amount of solution applied.
- Rub the wetted surface gently with a clean, lint free towel or cloth.
- Wipe until nearly dry with a dry, clean, lint-free towel or cloth. The use of a squeegee on the coated surface is not recommended. If it is absolutely necessary to use a squeegee then particular care must be taken to prevent any metal parts from contacting the coating or dirt particles becoming trapped under the blade and dragged across the coating.
- Rinse liberally with clean 'soft' water.
- Wipe nearly dry with a dry, clean, lint free towel or cloth.
- To prevent streaking, stop wiping when the glass is almost dry and there is still a uniform thin film of moisture left on the glass surface. This film will quickly evaporate leaving a clean surface

When the coating has been cleaned with detergents it may need several days exposure to daylight to break down any detergent residue and become fully reactivated.

Spot Cleaning

Occasionally spot cleaning may be required to remove stubborn dirt, metal rub marks or foreign materials that can adhere to the coated glass surface. Spot cleaning products can be used to remove marks or residue from grease, oil, tape adhesive, and crayons or other waxy materials as well as paint and rub marks from plastics.

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Recommended Spot Cleaning Products

- Acetone (solvent available from hardware stores)
- MEK (Methyl Ethyl Ketone)
- 1,1,1 Trichloroethane
- Mineral Spirits
- Acid Magic™ Muriatic Acid Replacement (available from hardware stores), produced by Universal Chemicals & Supplies Inc., Div. of Certol International LLC, 6120 E. 58th. Ave., Commerce City, CO. Tel 800 843 3343.

Spot Cleaning Procedure

- Apply a small quantity of one of the cleaners listed above to a clean cloth.
- Lightly rub on areas of glass needing spot cleaning.
- Wipe clean using a dry, clean, lint free towel or cloth followed by the routine detergent and water cleaning and rinsing procedure given above.
- When the coating has been cleaned with solvents it will need several days exposure to sunlight to fully break down any solvent residue and become fully re-activated.

Mechanical, Abrasive or Acid Cleaning

- Do not contact the coated surface with razor blades, steel wool or other metallic objects as they can permanently damage the coating.
- Do not use any abrasive cleaners such as "Bon Ami" powder, Cerium Oxide or the white, opaque liquids: "Sparkle" by C. R. Lawrence and "Soft Scrub" by The Clorox Company.
- Do not use any solutions containing Hydrofluoric acid or Fluorine compounds on the coating, and do not allow any such solutions or harsh alkali solutions from adjacent brick work cleansers etc., to come in contact with the coating.

The information contained in this bulletin is offered for assistance in the application of Pilkington North America Inc. flat glass products, but **IT DOES NOT CONSTITUTE A WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.** Actual performance may vary in particular applications.

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