



Technical Bulletin

ATS-195
2023-05-19

Design, Handling, Inspecting, Fabricating, Installing and Maintenance of Pilkington **Mirropane™** Glass

Summary

Pilkington **Mirropane™** glass is a hard, neutral color, pyrolytic reflective coating on grey glass, for use as a transparent mirror (often referred to as 'one-way' or 'two-way' mirrors) for security, unobserved observation, and surveillance involves several unique design considerations. A transparent mirror consists of a silver colored, partially reflective, partially transparent coating, usually applied to ¼" (6 mm) thick, grey tinted glass. When viewed from the reflective surface coated side, Pilkington Mirropane™ appears to be a normal mirror, provided the light level on the other side is at least 8 times lower. When viewed from the glass side, with the same lighting as above, the viewer can easily observe what is happening on the other, brighter, side without being distracted by masking or veiling reflections.

The Pilkington **Mirropane™** coating is tough and durable, and for most situations the product can be handled, fabricated, installed, and maintained in a similar manner as uncoated glass.

Pilkington **Mirropane™** is not intended for use in exterior glazing where installations such as large curtain walls or structural glazing could reveal a slight non-uniformity of coating which would typically not be perceptible in interior applications.

Unpacking

The coated surface is hard and is not easily damaged, so cases can be opened normally.

Do not mark the coated surface with adhesive labels or wax crayons, and do not drag suction cups or metal objects across the surface. The coating will not be damaged by such materials, but it may be difficult to fully remove fine wax, rubber or metal residues due to the submicroscopic roughness of the coating.

Pilkington North America, Inc.

811 Madison Avenue, Toledo, Ohio 43604-5684

Telephone 800 221 0444 Fax 419 247 451

Surface Identification

The coating is highly reflective so the coated side can readily be identified by holding a pen or pencil point against the surface and looking for one or two reflected images. When only one reflected image is seen, and the pencil point is touching the reflected image point, then the pen or pencil is touching the coated side. If two reflected images of the pen or pencil point are seen (one about 20 times brighter than the other), and the point is touching the less bright image, then the point is touching the glass side.

The coating is not electrically conductive so a hand-held ohm-meter or continuity meter can NOT be used to identify the coated side by touching two probes to the coating.

With practice the coating can be felt by the slight increased drag when finger tips or a finger nail are rubbed on the coated side.

Inspection

The glass can be inspected, in reflection, for uniformity of coating by placing it in front of a mat black non-reflective background with a uniformly lit white surface behind the viewer, reflected in the glass. This simulates the viewing condition where a person looks at their reflection with the display turned off.

Inspections should also be performed in transmitted light by viewing through the glass to a uniformly bright surface with a dark background behind the viewer (to eliminate distracting reflections) to simulate ideal viewing of an operating display.

FABRICATION

Cutting

The glass can be cut with the coating side up or down depending on preference, but coating side up is recommended to minimize the risk of marking the coating. Cutting wheel pressures will be very similar to those for uncoated glass.

When hand cutting on the coated surface the scoring process may feel slightly different but no change in wheel types is needed from those used with uncoated glass of the same thickness.

If the glass is to be dragged across rollers or over a poorly inflated air-float table it is preferable to have the coating side up to avoid rub marks. However, care must be taken that straight edges, metal tape measures, or cutting bars are not dragged across the coated top surface, as marking may occur which would require special cleaning techniques (see ATS #143).

Edge preparation such as seaming or polishing should be done with the coated side facing up, as the rotation of seaming table castors could cause a swirling pattern mark where the castor wheel touches the coating when facing down.

Washing

Automatic washing machines using hot water and detergent can be used, as on uncoated glass. See Pilkington North America, Inc. ATS Bulletin #133 for details on hand washing techniques.

Razor blades and steel wool must not be used on the coated surface.

Pilkington North America, Inc.

811 Madison Avenue, Toledo, Ohio 43604-5684

Telephone 800 221 0444 Fax 419 247 4517

Abrasive cleaners should be only be used with great caution as they can often cause bright or dark spots which would only be visible under certain lighting conditions.

Heat Treating

Pilkington **Mirropane™** can be tempered for safety glazing or increased impact resistance, however being highly reflective, tempering distortions due to the coating will be more visible. Where safety glazing is required then annealed laminated glass can be used with typically less distortion than tempered monolithic. Guidance on lamination is provided below.

The emissivity of the coating is the same as that of glass. Initial tempering furnace settings and quench flow rates should be similar to those used for the same thickness Pilkington **Optifloat™** Grey glass.

The glass can be tempered with the coating down when needed. However, care must be taken to prevent any sliding actions which could cause marking from the furnace rolls, or from the loading and unloading conveyors.

Laminating

Laminated glass must be fabricated with the coating out, away from the PVB interlayer, to preserve the high reflectivity. The coating could, physically, be laminated with the coating touching the interlayer if needed, but there would be some decrease in reflectivity and an increase in transmission. Note that Laminating can change the optics, and hence the Observation and Masking Ratios. Laminating with the coating against the interlayer would have a "wetting" effect which would reduce the reflectivity and increase the visible transmission.

Impact testing should be repeated to ensure correct adhesion and preservation of the safety fracture properties of laminated glass.

Packing

When packing Pilkington **Mirropane™** for shipping with the coating exposed, it is preferable to use paper or hardwood flour as an interleaving medium. Over long distances, the acrylic beads in Lucor powder can be abraded and leave a deposit on the coating which is difficult to remove.

Care should also be taken to minimize the contact of Styrofoam packing materials with the coated surface. Styrofoam packing materials can leave a rub mark on the coating that is difficult to remove.

Installation

Procedures are similar to those used for plain glass. The coating is compatible with commonly available glazing sealants.

Pilkington **Mirropane™** is not intended for exterior glazing applications. Installations such as large curtain walls or structural glazing could reveal a slight non-uniformity of coating which would typically not be perceptible in interior applications.

Pilkington North America, Inc.

811 Madison Avenue, Toledo, Ohio 43604-5684

Telephone 800 221 0444 Fax 419 247 4517

Maintenance

Pilkington **Mirropane™** can be cleaned and maintained by hand washing with non-abrasive, ordinary, glass cleaning solutions. For hand washing, a mild detergent and water solution is recommended. Uniformly apply the solution to the glass and wash with a clean, soft cloth, sponge, or pad. Rinse thoroughly with clean water and wipe or squeegee dry immediately. Make sure no metal parts of the cleaning equipment touch the reflective glass surface, and that no abrasive particles are trapped between the glass and the cleaning materials.

Stubborn stains can be removed with organic solvents such as mineral spirits, de-natured alcohol, acetone, or MEK, following appropriate safety procedures. The solvent wash should be followed immediately by a detergent wash and clear water rinse to remove solvent and dirt residues.

Do not use harsh chemical cleaners, abrasives, opaque liquid cleaning solutions such as Soft Scrub® by Clorox, steel wool, or razor blades on the reflective surface.

Do not use any strong acidic cleaners on Pilkington **Mirropane™** reflective coatings.

The reflective surface of Pilkington **Mirropane™** can be severely damaged by using some commercially available solutions for 'rejuvenating' water-stained glass surfaces, as these products usually contain hydrofluoric acid.

The Pilkington **Mirropane™** reflective coating can be cleaned like ordinary glass, but the reflective surface will show dirt and other deposits more readily. The reflective coating should never be allowed to become dirtier than is visibly acceptable. It should be cleaned as frequently as is necessary to prevent it from ever appearing unacceptably dirty. In this way problems with the accumulation and hardening of dirt deposits can be prevented.

If the glass is cleaned on a regular basis, there should be no need for special washing techniques.

Summary	Editor	Date
Original (derived from ATS 191)	K. Natividad	05/19/23

Pilkington North America, Inc.

811 Madison Avenue, Toledo, Ohio 43604-5684

Telephone 800 221 0444 Fax 419 247 4517

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.

Pilkington North America, Inc.

811 Madison Avenue, Toledo, Ohio 43604-5684

Telephone 800 221 0444 Fax 419 247 4517