

## Glass Surface Staining

GG 001—2015-02-24

Glass is a hard, lustrous, and durable material used in buildings around the world for centuries. Because of its durability, it may be surprising that glass can be damaged by surrounding construction or by something as common as water. However, in certain circumstances water related damage can result in the need for costly restoration or replacement. The purpose of this bulletin is to help avoid a potentially frustrating and unnecessary experience for both Trulite and our customers.

Architectural glass products are exposed to moisture from a variety of sources, including rain, condensation, lawn sprinkler systems, building run off, etc. If not regularly cleaned, surface contamination can accumulate and react with the glass, or exposed coatings. Accumulated basic or acidic contaminants can lead to rapid and permanent staining or damage to the glass. While most noticeable in reflective glass products, such damage can occur to any substrate given the right conditions.

Visible stain begins to appear as slight off-angle iridescence. With time, this can progress to a permanent blue, or milky and tactile deposit on the surface. In the earliest iridescent stage, the stain may be removable with special cleaning procedures. However, if not quickly addressed, staining becomes virtually impossible to remove and may require replacement of the glass. The staining will vary from lite to lite, showing more heavily on some lites. There are many reasons for this variability, including the protective nature of the tin side versus the airside of float glass and possible localized ambient conditions. Additionally, covered areas such as gasket lines, cork pads, and labels offer some protection and may leave a pristine surface when removed. These areas can provide excellent proof as to the condition of the surface prior to installation.

Some causes of surface staining can be addressed in the design phase, such as irrigation sprinkler heads, exposed and weathering steel, building drainage systems, drip ledges or masonry run off. Other contributors to staining include site storage for prolonged periods, contamination from other trades, or improper cleaning techniques. These conditions may not be initially obvious, but can eventually be damaging. It requires vigilance by the general contractor, glazing contractor, or building owner. This is an area where a clear and verifiable paper trail of glass cleaning and maintenance schedules, as well as an explicit description of the condition of the glass, is invaluable.

In some cases a building's interior is left unfinished, with exposed aggregates, dirt, green concrete floors, dry wall, paint etc., intended to be finished to occupant specifications at a later date. Depending on local conditions or the season, and especially within coastal and temperate climate zones, the building may not be heated or ventilated. This can result in high humidity levels and subsequent condensation on the glass surface. Left unchecked, glass staining can occur in as little as a few weeks. With no occupants or reason to clean the glass, a potentially

expensive problem can develop. The glazing contractor should proactively address these conditions in order to avoid callbacks and limit liability. When the work is complete, address the cleaning and maintenance issue immediately by putting in writing that the risk of loss is no longer the glazing contractor's or glass fabricator's responsibility.

This document does not identify every source of surface staining. However, the cause and mechanism are always the same. The main variables will be time and level of exposure. Inspection, as well as routine maintenance and cleaning cannot be an after-thought. Consideration and planning for inspection, cleaning, and maintenance will provide long and trouble free service. Always recommend regular cleaning and maintenance of the glass rather than waiting until it becomes visibly dirty. Provide appropriate cleaning instructions and advise the potential damage from improper maintenance or neglect.



**Figure 3 – Reaction Contaminant**  
**Acid rain/masonry/glazing material**  
**run-down on the glass surface.**  
**Removal requires an acidic solution, or**  
**may not be practically possible.**



**Figure 4 – Surface Corrosion**  
**Glass corrosion is typically caused by**  
**prolonged exposure to high humidity**  
**and temperature and is often not**  
**removable.**

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