

Innovative High-Rise  
Products p. 28

Glass Restoration Gives  
New Life p. 34

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# Glass Restoration Gives New Life to Stained Windows

By John McGrath

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For most owners and managers of high-rise buildings, exterior window cleaning is a relatively inexpensive budget line item. Astute commercial property owners and managers understand the importance of preventive maintenance, typically conducting exterior glass cleaning two to three times per year. But much to their frustration, it's not uncommon for glass to look dirty, even having just been cleaned.

Glass is perhaps the most versatile element in architecture, combining strength, aesthetics, and low maintenance; however, its smooth, flat surface belies the fact that glass actually consists of microscopic crests and crevices.

Without a proper cleaning schedule (and sometimes even with one) mineral deposits, dirt and atmospheric pollution can become deeply embedded into the crevices of the glass, resulting in a perpetually cloudy appearance.

## **Cause and Effect**

These deep, inalterable stains, commonly referred to as mineral deposit stains, are unresponsive to conventional cleaning methods. Left uncorrected, they can worsen over time and become permanently etched into the glass, leaving replacement as the only viable option. Aside from improper maintenance, the most common cause of mineral deposit staining is when

minerals leach onto the glass from adjacent unsealed concrete or precast façade.

Unsealed concrete and precast are porous surfaces, so they absorb precipitation (rain, snow, and even humidity). Eventually, the entrapped moisture leaches out of the façade and over the glass areas, along with microscopic mineral deposits. While the moisture ultimately evaporates, the mineral deposits remain on the glass, becoming deeply embedded over time. Of course, this is a simplified version of the chemical reactions involved. For a more detailed and technical explanation, "The Systematic Cleaning and Restoration of Architectural Glass" is available on the International Window Cleaning Association website ([www.iwca.org](http://www.iwca.org)).

An unsealed façade isn't the only way that water acts as the vehicle for leaching minerals onto glass. This type of staining can also be caused by:

- Misguided irrigation sprinkler heads that allow water with high mineral content to spray onto the glass.
- Steel or aluminum window frames and other metal building features that release oxides while aging.
- A location in close proximity to a highway or airport. The presence of vehicle or jet fuel exhaust and a variety of other industrial carbons create what is known as acid rain.



## Straight to the Source

When mineral deposits have been identified as the main cause of stained windows, their source must be addressed before any corrective measures

are applied. The unsealed concrete or precast must be sealed in conjunction with the glass restoration process – otherwise, staining will almost certainly reoccur, even accounting for the implementation of any regular cleaning schedule.

When choosing a waterproofing sealer, be sure to choose one that provides a warranty against the recurrence of mineral deposit stains. There are many reputable waterproofing sealers on the market, but not all of them address that specific issue.

## A Clear View

Once the cause of mineral deposit staining has been addressed, what is commonly known in the industry as glass restoration can take place. There are two ways to effectively remove mineral deposit stains from glass; they are either chemically rubbed out with a non-acidic rubbing compound or burned off using a harsh acidic cleaner. Both methods are time consuming, expensive and aggressive in nature.

Additionally, both methods are meant as one-time applications, and multiple rounds of an aggressive strategy can be detrimental to the glass. Either process should only be conducted by a qualified contractor experienced in glass restorations. The return on investment of a glass restoration includes:

- Returning the property to pristine condition.
- Reducing the chance of permanent damage and increased restoration costs due to long-term stain accumulation.

- Showing tenants, employees and investors that you practice diligent building care.
- Reducing unexpected costs, like those arising from a due diligence report.

The root cause of the stain and the length of time the stain has been allowed to reside on the glass will determine a restoration's ultimate cost and outcome. An experienced and reputable contractor will always test a small area to determine the amount of restoration needed, as well as the potential for success. Results and costs can vary from year to year if the stain has been allowed to worsen. Again, it's important to note that if the source of staining is not corrected, the stains will return.

Here are some tips to keep in mind:

- Establish and maintain an exterior window cleaning schedule of two to three times per year.
- If mineral deposit staining has occurred, don't cut back on cleanings until restoration funds are available. Adhering to the regular cleaning schedule will mitigate any further damage.
- When contracting for a glass restoration, ensure that the proposed glass restoration process includes investigation and correction of the root cause of staining.

Property owners and managers are highly encouraged to take advantage of low-cost preventive maintenance window cleaning as a way to protect the exterior glass of all commercial buildings. The Building Owners and Managers Association (BOMA) offers a detailed explanation of optimum maintenance plans for exterior windows and other maintenance challenges in its "BOMA International Guide to Exterior Maintenance Management" publication, available at [www.boma.org](http://www.boma.org).

*John McGrath is President of Scottie's, a commercial window cleaning and exterior building maintenance company located in Raleigh, North Carolina.*

*Glass Restoration in Progress*



*Preventive maintenance cleanings and deep cleaning of exterior metal can prevent the need for costly painting or replacement.*



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