

## Cleaning Instructions—Glass

GG 004—2015-02-23

The following cleaning instructions are intended for vision and spandrel glass used in typical architectural construction. Glass used in unusual ways or special types of glass may require special cleaning procedures. Always consult with the manufacturer of those products. Mirrors also have special cleaning requirements that are not covered by these instructions. Refer to Trulite’s Technical Bulletin, MR 005 *Cleaning Instructions – Mirror*, for specific mirror cleaning techniques. In addition, please also refer to the Glass Association of North America’s (GANA) document GANA 01-0300, *Proper Procedures for Cleaning Architectural Glass Products*, for more recommendations.

Glass is the hardest common building material currently in use. However, since glass is made to be “looked through”, even slight imperfections may become annoying under critical lighting and viewing conditions. **Preventive measures during construction are more effective than the best cleaning methods known.** Glass should be protected from all alkali materials, any mechanical process that may cause damage to the glass surface, and exposure to any fluoride bearing compounds. These materials may permanently damage the glass surface and glass replacement may be the only method of correcting the problem.

### **DO NOT USE RAZOR BLADES OR ANY OTHER METAL TOOL TO CLEAN GLASS!**

The most common form of glass damage involves the use of metal scraping tools during the cleaning process. Metal tools, scrapers, razor blades, steel wool or similar materials should never be used a general cleaning tool. For very stubborn stains it is recognized that use of such tools may be the last resort, however, Trulite cannot be held responsible for any damage when these tools are used. Even though glass is very hard, it can be scratched by metal implements. Scratches that occur during construction or the cleaning process are not the responsibility of the glass manufacturer or fabricator.

### **Potential Problems**

#### **Low E Coatings**

Vacuum coated (MSVD) Low E products may be very sensitive to any type of solvent or strong chemical. It is critical to use only the recommended glass cleaning materials of mild soap or detergent mixed with water. Never use commercial glass cleaning agents that contain alcohol, petroleum-based solvents, fluorine-containing compounds, vinegar or ammonia. These materials can damage the glass, the insulating unit sealants and the Low E coating.

#### **Water Runoff**

Water flowing over the façade of a building is deflected, absorbed or allowed to run down the building. If this water runs over masonry, cement, stucco, sealants, organic coatings, etc., it may carry contaminants onto the glass surface. These contaminants may be very difficult to remove, or they may chemically bond to the glass surface and cause a permanent stain.

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Generally, cleaning this type of contamination is either impossible or more expensive than replacing the glass. Protecting the glass from water runoff is best done during the design process. Reveal, flashing, splay or drips can be used to effectively limit water runoff from washing over the glass.

### Construction Damage

Construction schedules frequently call for glass to be installed while other potentially damaging construction activities are being carried out. The following issues are known to cause damage to glass surfaces. However, this list is not all-inclusive. Both glazing contractors and general contractors should look for potential problems, which could damage the glass. Prevention is always faster and less expensive than correcting a problem that has occurred.

**Glass labels or protective pads** that are left on the glass for any period of time after glazing may cause problems. The action of the sun may make the adhesive harden and become very difficult to remove. In addition, if the adhesive is alkaline, it may corrode or etch the glass surface. If the adhesive is slightly acidic, the glass may not be damaged, but it will be protected from normal weathering. When the label is removed, the undamaged area will have a different appearance from the rest of the lite. Trulite recommends that product labels and protective buttons be removed within 24 hours after glazing.

**Welding splatter** will cause a rough, pitted surface on glass. Heavy splatter may even leave slag on the glass. Any glass damaged by welding splatter is recommended to be replaced. The glass strength can be severely degraded by this damage and may no longer perform as designed.

**Concrete splatter** is common on the ground floor of high-rise buildings. If the concrete is allowed to dry, the glass will most likely have to be replaced. Immediate flooding of the glass surface with water may wash away fresh concrete. Don't rub the concrete off the glass; scratching of the glass surface will almost always occur if you do.

**Material storage** often occurs near glass that has already been glazed. Do not allow other trades to lean materials against the glass. Scratches may result. This is especially critical if reflective glass is being used. Scratches are more visible on reflective glass.

**Joint compound** (dry wall mud) is frequently allowed to drip onto the glass. If it is cleaned up immediately, it can be removed with water. If it is allowed to harden, the lime may permanently etch the glass surface. Scratching may also occur if the compound is scraped off the glass.

**Suspended ceiling** installers sometimes lean their metal stringers against the glass while installing the ceiling grid. Glass scratching can occur, especially on reflective glass.

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**Insulation** installers will sometimes lay flexible fiberglass bats against the glass and cut the insulation with a razor blade knife. Glass scratching often occurs, especially on reflective glass.

**Organic sealants** may exude, bleed or leach solvents, oils or plasticizers. These materials may adhere very strongly to glass if they are allowed to set for any length of time. Frequent cleaning, even during construction, may be required. This is usually a bigger problem when the building is new, than after it has aged for a few years. These sealants don't have to be in direct contact with the glass to cause a problem. Residues from sealants used to seal adjacent joints in metal panels, between concrete panels, or at the parapet may all be carried over the glass by weathering action. Consult the sealant manufacturer for advice and their recommendations.

**Masonry** frequently releases alkaline materials during normal weathering cycles that will stain or permanently etch glass surfaces. Concrete adjacent to glass should be completely cured and all surface treatments (acid washing, sandblasting, bush hammering, grouting and waterproofing) should be completed **before** glazing begins. Glass should be examined frequently during construction and after building occupancy to see if an alkaline build-up is occurring. If so, the glass should be cleaned immediately.

**Weathering steel** may also cause problems for glass. Weathering steels release oxides as they age. These oxides may adhere tenaciously to the glass surface and expensive cleaning techniques may be needed if they are left on the glass for any length of time.

**Acid washing** is frequently used on brick or concrete surfaces. Muratic acid is most commonly used. Muratic acid may attack glazing sealants, glass substrates, reflective coatings, and even the back side of metal IG spacers. Acid washing should be carried out **before** glazing begins.

## Hard Water Damage

Lawn sprinklers often spray water on the ground floor glass of commercial buildings. Minerals from hard water will precipitate out on the glass. These minerals will adhere strongly to the smooth glass surface. If left in place for any length of time, they may form a chemical bond with the glass. Cleaning of these deposits will be difficult. Glass replacement may be the only feasible answer. Care should be taken to keep over-spray from sprinklers off of the glass.

## Air Pollution

Air pollution may contain chemicals that will adhere tightly to glass surfaces, especially in the presence of water, such as rain. These chemicals may bond so tightly that normal cleaning techniques will not remove them. If left in place too long, chemical bonding may take place or

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the glass surface may be etched. If either of these conditions occurs, the glass will most likely have to be replaced.

## Basic Glass Cleaning Principles

Buildings should be cleaned from top to bottom so runoff from top floor glass will not dirty glass that has already been cleaned. Individual lites of glass should also be cleaned from top to bottom.

1. Use a solution of water and mild soap or liquid dishwashing detergent (10 to 15 drops of detergent to 3–4 gals. of water) for cleaning. **(WARNING: Never use detergents that contain phosphates. They may attack and damage high performance coatings.)** Apply by spraying or using clean, grit-free wet cloths or a clean, grit-free sponge. It is best to clean an area of about 10 square feet at a time. Using a circular motion and light to medium pressure, wipe the cleaning solution on the glass. Try 3 to 5 passes to clean the area. Adjust number of passes as needed, depending on the severity of the residue.
2. Rinse the glass immediately with generous amounts of clean water. Be sure to remove all the cleaning solution.
3. Use a clean, lint-free cloth or a squeegee to dry the glass surface.
4. If residue is still evident, repeat steps 1,2 and 3.
5. Paint residue may be removed with an appropriate solvent or paint remover. **Use of a razor blade to scrape away excess paint will likely damage the glass.** Grease or oil residue may be removed with a solvent, however, **do not allow solvents to run into the glazing pocket.** This could damage the IG seals and/or and pass into the air space attacking the coating or leaving a chemical fog on the glass surface. Solvents may also damage waterproofing sealants and metal finishes. When using solvents, apply them first to a clean cloth without saturating it and wipe the area needed.
6. After application of solvents, wash glass following steps 1, 2 and 3.
7. **Avoid cleaning glass in direct sunlight.** The cleaning solution will dry before proper cleaning has occurred. The dry surface may also allow scratching to occur.

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## Glass Cleaning Procedure With Cerium Oxide

For really stubborn stains like hard water, alkali run off, sprinkler spray, or where the glass surface shows signs of devitrification (glass corrosion), a more aggressive cleaning technique is required. Cerium oxide is actually a mild abrasive and used as polishing agent in polishing glass edges to a lustrous finish. It can also be used to restore a surface with heavy stains or corrosion.

1. Make a liquid paste with cerium oxide and water.
2. Use a clean, grit-free cloth to wipe the paste on the glass. Use a circular motion with light (2 to 4 pound) pressure. Cerium oxide is an abrasive, and heavy pressure could scratch the glass. Clean an area of 3 to 5 square feet. Try 3 to 5 passes to clean the area. Adjust the number of passes as needed, depending on the severity of the residue.
3. When a stain requires extensive rubbing, a commercial polishing pad can be applied to the end of a drill or even an orbital sander. The pad is typically made of sponge material with grooves or recesses in its surface to hold the cerium oxide. Wet that pad with a spray bottle of water and apply the cerium oxide to the pad, making a paste on the surface. As the pad is applied to the glass, have the spray bottle handy to keep the cerium oxide as a paste and not dry out.
4. Rinse the glass surface with generous amounts of water, cleaning off all the cerium oxide paste. Use a damp, grit-free cloth or sponge to help remove the cerium oxide.
5. Use a clean, lint-free cloth or a squeegee to dry the glass surface.
6. If residue is still evident, repeat steps 1 through 5.

Only optical grade cerium oxide should be used. Cerium oxide is available from:  
C. R. Laurence Co., Inc.  
(800) 421-6144

For other cleaning procedures or techniques not listed above please contact Trulite.