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Maintenance of Painted and Anodized Finishes

Recommended Inspection Procedures

Building managers and owners should have an engineer or other qualified person inspect cleaning and maintenance of anodized or painted finishes.

- It is important to check metal seams, sills, crevices and other areas that can trap dirt, cleaner or water to be sure they are clean and dry.
- It is recommended that a final inspection be made to verify that no stains or discoloration remain on surfaces.

Cleaning and Care of Painted Finishes

Architectural aluminum finishes, whether painted or anodized, require care before and during installation and periodic maintenance after installation. Although resistant to corrosion, discoloration and general wear, both types of finishes can be damaged by neglect, abuse, and harsh chemicals. Also, exterior surfaces collect various amounts of dirt and soil – of course, the amount depends on the environmental conditions, the building elevation and the type of finish.

Architectural aluminum should be cleaned at least once a year to prohibit accumulation of soil, which can speed-up the weathering of finishes. For efficiency, glass and aluminum cleaning should be scheduled simultaneously. More frequent cleaning is recommended for finished aluminum that is exposed to harsh marine environments. Buildings located in certain areas also may dictate more frequent cleaning. These include locations in heavy industrial areas, locations with heavy rainfall and sheltered areas lacking rainfall and encouraging condensation.

Cleaning Painted Finishes

When cleaning painted surfaces, precautions must be taken. These include:

- Cleaning should start at the top of the building, moving down to the ground level in a continuous descent the width of the scaffolding.
- Always consider the effects of run-off on personnel, plants and equipment when scheduling the cleaning of finishes.
- Choose the appropriate method of cleaning for the type of finish.
- First test a small area of the finish and follow recommendations for mixing and diluting cleaners.
- Avoid using abrasive materials such as steel wool or hard-bristle brushes, which can damage finishes. Strong window glass cleaners that may come in contact with aluminum should not be used.
- Do not use paint removers, aggressive alkaline, acid or abrasive cleaners. Never mix cleaners or substitute heavy-duty cleaners when milder cleaners are specified.
- Be sure that all sponges, cloths and other cleaning equipment are free of grit.
- Do not clean finishes during extreme temperatures, which can accelerate chemical reactions, therefore causing streaking or staining.
- Post-construction cleaning should take place as soon as possible, due to the fact that mortar, cement and other alkaline materials will corrode anodic coating and can possibly stain a painted finish when allowed to dry on the metal surface.

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Maintenance of Painted and Anodized Finishes

Cleaning Light Surface Soil

When removing light surface soil, only by testing progressively stronger procedures can be best method be determined.

- First, a strong water rinse should be applied to the finish.
- If soil is still present after the water rinse has dried, use a soft brush in conjunction with sprayed water.
- Next, try a 5-percent solution of commercial or industrial detergent with a cloth, sponge or soft brush in an alternate horizontal and vertical motion.
- Rinse the surface thoroughly with clean water after washing. Do not allow the detergent to dry on the aluminum. The thorough rinse should remove all cleaners from crevices and joints, as well as the surface.
- MEK, Mineral spirits or equivalent solvents are recommended for removing oil, wax, polish or like substances; however, care must be taken when applying to painted finishes.

Stain Removal—Painted Finishes

Specific solutions are appropriate in the removal of stains from painted finishes.

- Sodium hypochlorite solutions, such as laundry bleach, help remove certain stains.
- Acetic acid (vinegar) or oxalic acid solutions may be used to remove rust or alkali mortar stains from Duranar® and Fluropon® finishes. Surfaces should be flushed with water afterwards
- 10 percent muriatic acid, diluted with 10 volumes of water, can also be used for rust or mortar stains.
- With acids, limit contact to five minutes and always flush with clear water immediately after use. (Anodized surfaces should not be cleaned with acidic or caustic solutions.)

Mildew Removal—Painted Finishes

Mildew can be removed with a solution of:

1/3 cup detergent
2/3 cup trisodium phosphate
1 quart sodium hydrochlorite, 5-percent (bleach)

Rinse with clean water immediately afterwards.

Cleaning of Non-Water Soluble Deposits for Painted Finishes

Non-water soluble deposits such as grease, tar, oil and paint may be removed with solvents no stronger than mineral spirits or denatured alcohol. Use extreme care when using solvents on painted surfaces—many of them will reduce the gloss level of the painted finishes. When solvents remain on the finish for more than a few minutes, they may soften the paint and damage the coating. It is recommended that the contact between solvent and painted areas be as limited as possible.

- Prolonged contact with solvents may also damage organic sealants, gaskets and finishes.
- Most organic solvents are flammable and toxic and should be handled with extreme care. Use protective clothing, goggles and be sure of adequate ventilation.
- When using solvents, avoid open flames, sparks and electrical motors.

Maintenance of Painted and Anodized Finishes

Touching-Up Painted Aluminum (Large Areas)

Procedures for the touch-up of painted finishes in the field begin with surface preparation:

- First, be sure the surface is clean, dry and free of any contaminants.
- Sand the surface lightly, and feather edges at the damaged area.
- After sanding, remove dust with a clean cloth dampened in solvent.
- Pretreat any areas of bare aluminum with a conversion coating, such as Alodine 1201 or Amchems Alumiprep No. 33, following the manufacturer's label directions.
- Prime any bare aluminum with an approved wash primer, again following label directions.

After preparation of the aluminum surface, follow these procedures for the application of air-dry, touch-up enamel.

- For the application of the paint and an initial 24-hour drying period, be sure that ambient air and surface temperatures are at least 50 degrees F.
- Except for small scratches and minor defects, it is advised to apply touch-up coatings with air spray equipment due to the coating' drying speed.
- Multiple light passes are recommended to slowing build to the desired 1.0 mil minimum film thickness.

Touching-Up Painted Aluminum (Small Areas)

CAUTION: The guidelines below are to be used to touch up small scratches, not to repaint a large surface. These guidelines will not apply to all situations; therefore Valspar does not offer a warranty if this work is done. Please seek a qualified technical person to assess your specific situation and make recommendations. This is for Fluropon® using air dry additive.

Mixing ratio is 1 to 1. One part Fluropon®, and one equal part air-dry additive (920X346). Apply product in temperatures above 70 degrees F for best results.

It must be noted that the first step in repairing a damaged film is to observe the damage and evaluate what must be done.

If the surface to be repaired is intact and not exposed to the substrate, clean the locale of all dirt, oil, grease or other foreign matter. The most important step in painting any surface is to be sure the area is ready to be coated. Lightly scuff the damage with #400 grit sandpaper.

If the surface is damaged to the substrate or corrosion is present, then sanding to bare substrate and priming would be indicated.

Dampen a lint free cloth or tack cloth with MEK (Methyl Ethyl Ketone) using the proper precautions for handling solvents as instructed on the MSDS or container of the solvent. This may include safety glasses, gloves, protective clothing and a respirator. Wipe the surface liberally to clean the exposed area to be re-painted.

The surface must be dry before the finish coat is applied.

Maintenance of Painted and Anodized Finishes

Touching-Up Painted Aluminum (Small Areas) Cont'd

When applying touch up paint, less is best. Apply with as small an applicator as possible. To small imperfections such as surface scratches, a brush similar to a finger nail polish applicator is best. Dip the brush half the length of the bristles into the paint. Tap the brush against the side of the container but don't wipe against the lip. Hold at the handle near the base and apply light pressure with the fingertips to make the bristles flex slightly. Feather the touch up into the scratch using the least amount possible.

If the paint is applied in too thick a layer and spread to areas where it is not needed, long term differential fading between the two coatings present will be much more apparent. An air-dry paint is being applied to a surface that originally was factory applied and thermally cured. The same performance cannot be expected.

Follow the manufacturer's directions on the label of the material chosen for application instructions. There may be limitations such as ambient temperature at which the material may be applied and would cure properly.

Reworking Painted Finishes

There are no set reworking procedures, which cover all possible situations that occur. If reworking the surface exposes the aluminum substrates, one can assume the pretreatment of that area no longer exists and other considerations are needed. If bare aluminum has not been exposed, recoating is usually satisfactory. Keep in mind that touch-up enamel is intended for minor defects and scratches only. If larger areas of the aluminum need repainted, contact your manufacturer.

Protective Coatings for Painted Aluminum

Aluminum finishes should be protected at the job site and following installation. As stated earlier, cement, mortar and other alkaline materials, as well as acid-based cleaning materials for masonry products, are damaging to finishes and should be removed with soap and water immediately. Coatings that protect finishes at the job site include:

Stripping Plastic—these plastics have been available for some time, but they also have weaknesses:

- They are developed with cohesive strength but inadequate adhesive strength.
- Uniform thickness is difficult to achieve, and where the film is thin, the cohesive strength decreases and the adhesive strength increase.
- Exposure to the sun can make the vinyl film brittle.
- Thin coatings can be difficult to remove.
- Thick coatings, on the other hand, tend to peel off prematurely.
- If the time is taken to properly apply these plastic coatings, they can provide adequate protection at the job site.

Maintenance of Painted and Anodized Finishes

Insulating Coatings for Painted Aluminum

For jobs that require that the architectural aluminum be attached directly to other metals, a coating should be applied to act as an insulator between the two metals. A zinc-based primer is the most common coating. It should be applied to the steel or other metal, as opposed to the aluminum--its pigment offers cathodic protection for the coated metal. The formulation used depends on the solvent system, as well as the vehicle used.

Zinc and clear lacquer are often used when aluminum is installed with direct contact with uncured concrete plaster or other alkaline material. This type of coating protects the aluminum from corrosion. Bituminous paint is also used for insulation. It has very good resistance to water, salts, acids and alkalines that depend on water as a carrier for ionization. Bituminous paints are inexpensive allowing contractors to use a thick coating, which provides insulation against galvanic action. These paints are easily dissolved with almost any organic solvent.

AAMA Reference Publication

The American Architectural Manufacturers Association (AAMA) has published a combined specification guide to provide information on the care and maintenance of architectural finishes.

- AAMA 609 & 610-02—
  Cleaning and Maintenance
  Guide for Architectural
  Finished Aluminum
- For copies of the guide, contact:
  American Architectural Manufacturers Association
  1827 Walden Office Square, Suite 104
  Schaumburg, IL 60173
  Phone: 847.303.5664

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Maintenance of Painted and Anodized Finishes

Anodized Finishes Designation

The Aluminum Association Designation System is considered the standard of the industry for standard anodized finishes. The Aluminum Association, however, lists many finishes, some of which are not often used in architectural applications. In order to keep costs down and to maintain optimum shipping schedules, while still providing the finest in architectural aluminum, Oldcastle Glass® Engineered Products currently offers seven standard finishes. For internal record keeping, a 3-digit designation has been assigned to our standard finishes.

Trade Names		Oldcastle Glass®Engineered Products	AA
CLEAR	CLASS II	204	AA-M12C22A31
CLEAR	CLASS I	215	AA-M12C22A41
BRONZE	CLASS I	740	AA-M12C22A44
BLACK	CLASS I	760	AA-M12C22A44
LIGHT BRNZ	CLASS I	700	AA-M12C22A44
MED BRNZ	CLASS I	710	AA-M12C22A44
CHAMPAGNE	CLASS I	699	AA-M12C22A44

Class I - .7 mils, Class II - .4 mils

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Building managers and owners should have an engineer or other qualified person inspect cleaning and maintenance of anodized or painted finishes.

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- It is recommended that a final inspection be made to verify that no stains or discoloration remain on surfaces.

Cleaning, Care and Maintenance of Anodized Finishes

Architectural aluminum finishes, whether painted or anodized, require care before and during installation and periodic maintenance after installation. Although resistant to corrosion, discoloration and general wear, both types of finishes can be damaged by neglect, abuse and harsh chemicals. Also, exterior surfaces collect various amounts of dirt and soil—of course, the amount depends on the environmental conditions, the building elevation and the type of finish.

Architectural aluminum should be cleaned at least once a year to prohibit accumulation of soil, which can speed-up the weathering of finishes. For efficiency, glass and aluminum cleaning should be scheduled simultaneously. More frequent cleaning is recommended for finished aluminum that is exposed to harsh marine environments. Buildings located in certain areas also may dictate more frequent cleaning. These include locations in heavy industrial areas, locations with heavy rainfall and sheltered areas lacking rainfall and encouraging condensation.

Maintenance of Painted and Anodized Finishes

Cleaning Anodized Finishes

When cleaning anodized surfaces, precautions must be taken. These include:

- Cleaning should start at the top of the building, moving down to the ground level in a continuous descent the width of the scaffolding.
- Always consider the effects of run-off on personnel, plants and equipment when scheduling the cleaning of finishes.
- Choose the appropriate method of cleaning for the type of finish.
- First test a small area of the finish and follow recommendations for mixing and diluting cleaners.
- Avoid using abrasive materials such as steel wool or hard-bristle brushes, which can damage finishes. Strong window glass cleaners that may come in contact with aluminum should not be used.
- Do not use paint removers, aggressive alkaline, acid or abrasive cleaners. Never mix cleaners or substitute heavy-duty cleaners when milder cleaners are specified.
- Be sure that all sponges, cloths and other cleaning equipment are free of grit.
- Do not clean finishes during extreme temperatures, which can accelerate chemical reactions, therefore causing streaking or staining.
- Post-construction cleaning should take place as soon as possible, due to the fact that mortar, cement and other alkaline materials will corrode anodic coatings when allowed to dry on the metal surface.
- Brickwash, which is also acidic, can corrode anodic coatings.

Stain Removal—Anodized Finishes

If general cleaning procedures have been attempted, the next step is cleaning with an abrasive pad soaked in clean water or mild detergent.

- Hand-scrub the metal surface using a small, nylon cleaning pad. Rub the metal in the direction of the grain.
- After cleaning, rinse the surface thoroughly with clean water or wipe with solvent to remove all residue.
- If cleaning solutions have dried on the surface, wipe dry with a clean cloth, squeegee or chamois.
- For the removal of heavy soils, a power-cleaning tool may be needed. If this operation is necessary, the surface must be kept wet with a clean water or mild detergent to provide lubrication and dirt removal. As with hand cleaning, alternate horizontal and vertical strokes should be used.
- The area then must be rinsed and scrubbed again with a hard-bristle brush. The operation is completed by a final rinse, and the surface is wiped dry or air-dried. Any cleaner running down onto unclean surfaces should be removed to avoid staining.

Cleaning of Non-Water Soluble Deposits for Anodized Finishes

Non-water soluble deposit such as grease, tar, oil and paint may be removed with solvents.

- Prolonged contact with solvents may also damage organic sealants, gaskets and finishes.
- Always avoid using solvents on anodic finishes protected by clear coatings such as lacquer. Use organic solvents in accordance with manufacturer's safety recommendations.
- Most organic solvents are flammable and toxic and should be handled with extreme care. Use protective clothing, goggles and be sure of adequate ventilation.
- When using solvents, avoid open flames, sparks and electrical motors.

Maintenance of Painted and Anodized Finishes

Protective Coatings for Anodized Aluminum

Aluminum finishes should be protected at the job site and following installation. As stated earlier, cement, mortar and other alkaline materials, as well as acid-based cleaning materials for masonry products, are damaging to finishes and should be removed with soap and water immediately. Coatings that protect finishes at the job site include:

Lacquer—although a clear lacquer coating can temporarily protect the surface of anodized aluminum, it has draw-backs, which include:

- Changing the appearance of anodized finishes.
- Making the surface seem painted rather than anodized.
- Causing small white areas to appear where there is a loss of adhesion.

Strippable Plastic—these plastics have been available for some time, but they also have weaknesses:

- They are developed with cohesive strength but inadequate adhesive strength.
- Uniform thickness is difficult to achieve, and where the film is thin, the cohesive strength decreases and the adhesive strength increases.
- Exposure to the sun can make the vinyl film brittle.
- Thin coatings can be difficult to remove.
- Thick coatings, on the other hand, tend to peel off prematurely.
- If the time is taken to properly apply these plastic coatings, they can provide adequate protection at the job site.

Insulating Coatings for Anodized Aluminum

For jobs that require that the architectural aluminum be attached directly to other metals, a coating should be applied to act as an insulator between the two metals. A zinc-based primer is the most common coating. It should be applied to the steel or other metals, as opposed to the aluminum--its pigment offers cathodic protection for the coated metal. The formulation used depends on the solvent system, as well as the vehicle used.

Zinc and clear lacquer are often used when aluminum is installed with direct contact with uncured concrete plaster and other alkaline material. This type of coating protects the aluminum from corrosion. Bituminous paint is also used for insulation. It has very good resistance to water, salts, acid and alkaline that depend on water as a carrier for ionization. Bituminous paints are inexpensive allowing contractors to use a thick coating, which provides insulation against galvanic action. These paints are easily dissolved with almost any organic solvent.

AAMA Reference Publication

The American Architectural Manufacturers Association (AAMA) has published ~~two~~ a combined specification guide to provide information on the care and maintenance of architectural finishes.

- AAMA 609 & 610-02 - Cleaning and Maintenance Guide for Architectural Finished Aluminum
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  1827 Walden Office Square, Suite 104
  Schaumburg, IL 60173
  Phone: 847.303.5664

Trulite
GLASS & ALUMINUM SOLUTIONS

Technical Bulletin

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 contaminates onto the glass surface. These contaminates may be very difficult to remove, or they may chemically bond to the glass surface and cause a permanent stain.

Cleaning Instructions—Glass

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.

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

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.

Cleaning Instructions—Glass

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.