

'New Glass for Old'

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In the tale "The Book of One Thousand and One Nights (Arabian Nights)" a sorcerer tricks the mother of Aladdin by offering 'new lamps for old' as a way of re-gaining possession of a magic oil lamp with its genie.

This ploy worked and the sorcerer was temporarily in power again, but Aladdin solved this 'problem' and re-gained control of the magic lamp through the 'solution' of a magic ring. Problem solved!

In the real world of architectural glass and glazing, technology exists not as 'magic' but as a proven 'solution' for re-gaining the original appearance and performance of 'problem glass'. Any glass that has lost, or is at risk of losing, its original light transmittance, clarity and cleanability is considered as Problem Glass.

Architects are speaking about buildings looking old before their time. Owners are refurbishing buildings instead of replacing them. Facility managers are struggling to keep glass looking and performing like new.

The time is right for building specifiers, owners and facility managers to take a close look at technologies renovating Problem Glass, making it look and perform like new (the 'cure').

Clearly 'prevention' is better than 'cure', so everyone in the glass supply chain – specifier, processor, fabricator, glazing contractor, building owner and occupants – profits even more by protecting glass when new than maintaining the original appearance and performance of glass – before, during and after installation.

What is Problem Glass?

New architectural glass is 'good', with real values of light transmission, clarity and cleanability. Problem Glass is any glass that has lost, or is at risk of losing, these original and important values – causing reduced visibility and day-lighting, dull appearance and increasingly difficult maintenance.

Losses of the original values of glass can occur before, during or after construction or refurbishment and are caused by three of the biggest enemies of glass – moisture, alkalinity and dirt. These enemies can attack the surface of any glass – new or old, exterior or interior. Surface damage can occur during glass fabrication, transport, storage, installation and use – causing 'good glass' to become Problem Glass.

Problem Glass causes delays in construction, spoils the appearance of buildings and reduces day-lighting and visibility as well as the productivity and well-being of building occupants. Problem Glass is a high-maintenance material that requires frequent washing, and sometimes intensive cleaning, generating high levels of emissions and carbon footprints.

As a result, solutions for Problem Glass create real added value. These solutions save much time, effort and money – before, during and after building construction or refurbishment. They make the glass "green" and protect its original appearance and performance.

What are the Causes of Problem Glass?

Like bare metal surfaces, unprotected glass is "raw" and chemically reactive. These and other properties of glass make its surface susceptible to degradation by moisture alkalinity and dirt. Unfortunately, glass is sometimes viewed as a finished product when in reality it is lacking surface protection.

Moisture and alkalinity attack unprotected glass surfaces - causing corrosion, etching and staining/discolouration. Dirt bonds firmly and makes the surface difficult, if not impossible, to clean and keep clean.

Moisture and alkalinity, either individually or in combination, can etch or dissolve the surface of glass, making it appear dull and often white in appearance. Moisture can exist in liquid form, such as rainfall, or as a vapour in high



humidity areas. Alkalinity comes from hard tap water, sea spray and construction materials such as cement dust and building run-off from concrete, bricks or mortar.

Dirt can damage the surface of glass in some cases, but most harm is caused by harsh and aggressive cleaning methods. There are two general categories of dirt:

- Organic dirt - does not normally attack glass but can attach firmly to its surface and be difficult to remove. For exterior glass, this includes traffic film, bird droppings and tree sap. For interior glass, organic dirt includes fingerprints and cooking oil vapours.

- Inorganic dirt - bonds chemically to glass and is difficult, if not impossible, to remove using conventional cleaning methods. For exterior glass, this includes sea spray, industrial emissions, metal oxides from railways and construction materials such as cement dust and building run-off. For interior glass, an example is limescale from hard tap water.

Where is Problem Glass?

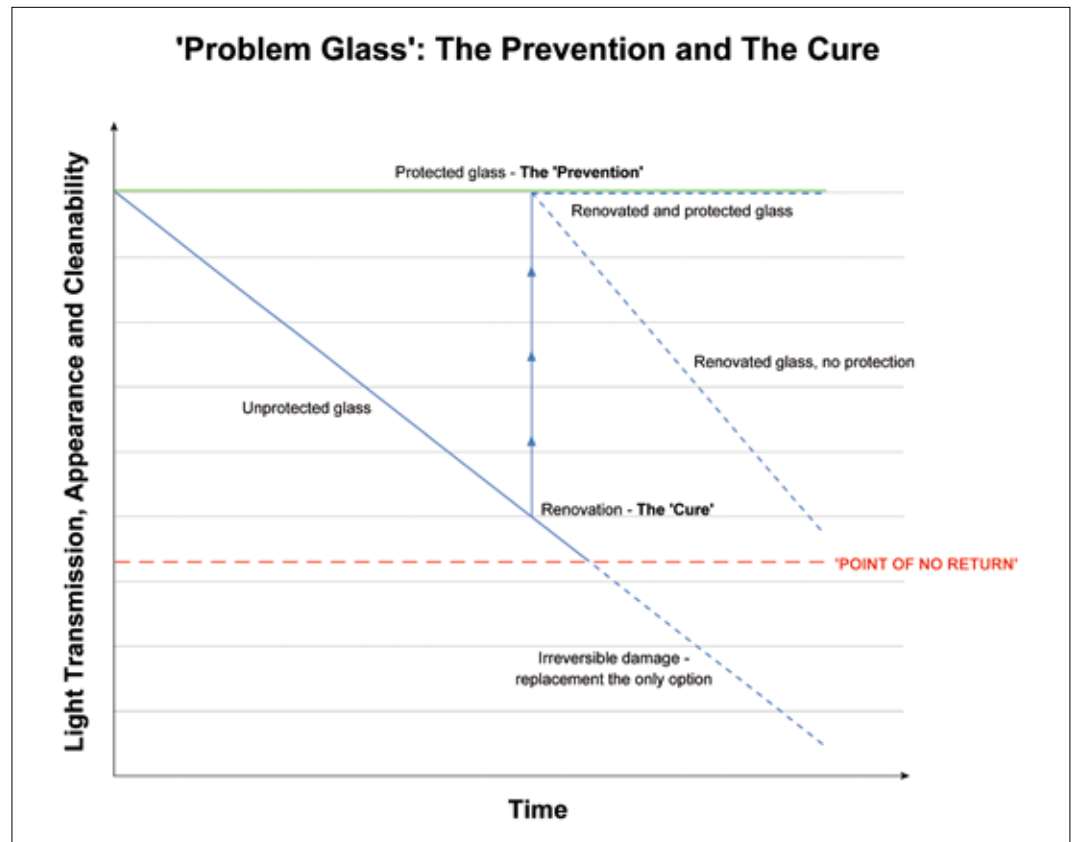
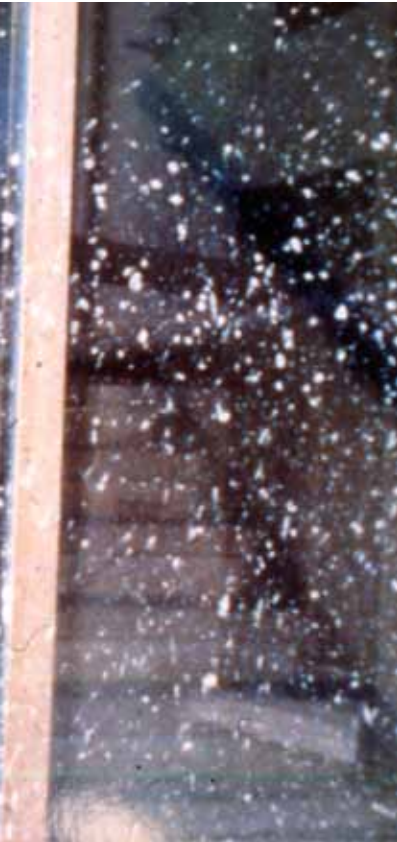
Problem Glass is all around us, in any location or installation where the enemies of glass are present. The most likely places are:

- containers used for shipping glass long distances, especially in wet or humid climates
- construction sites
- sloped glazing - conservatory roofs, rooflights, solar panels
- buildings with difficult access for routine washing
- glazing exposed to run-off from concrete, bricks, mortar, stonework, lead flashing, silicone sealants
- glazing in polluted areas - city centres, industrial estates, near railways, coastal areas
- interior glass – shower enclosures, sand-blasted glass, kitchen splashbacks.

What are the Consequences?

Problem Glass costs architects, contractors, owners and occupants substantial amounts of time, effort and money worldwide. These and other consequences can happen with any type of glass – new or old, exterior or interior. They can occur at any time – before, during or after construction or refurbishment.

Glass that fails to live up to expectations can result in call-backs and delays in construction, increasing costs for the glazing contractor, general contractor and owner/developer. Disputes and legal actions may follow.



Problem Glass spoils the aesthetics for building architect and owner, and incurs maintenance difficulties and costs for facility managers and building occupants. For building occupants, dissatisfaction is caused by dirty glass with reduced day-lighting and visibility to the outside world.

As a further consequence, the loss in cleanability of glass is attracting more and more attention as green building design becomes increasingly important. Problem Glass is not “green” because it requires regular but often ineffective washing with higher energy needs, and it generates substantial amounts of climate-changing emissions of carbon dioxide (CO₂) and other greenhouse gases.

Washing of glass in buildings, both exterior and interior, requires a lot of mechanical, electrical and chemical energy. Major reductions in emissions and carbon footprints can be achieved by cutting the energy requirements as follows:

- site visits for routine glass washing or intensive cleaning
- use of water, a valuable asset in many areas of the world
- manpower
- operation, maintenance and fuel for vehicles

- production and use of cleaning materials
- operation and maintenance of access equipment.

Each of the above requirements generates emissions and carbon footprints which can be significantly reduced by protecting the surface of glass against attack by its enemies. Durable glass surface protection has positive consequences in terms of reduced energy requirements, such as less need for artificial lighting, reduced frequency of cleaning with less trips to job sites with lower consumption of fuel and other costs, reduced costs of operating and maintaining access equipment, reduced consumption of cleaning chemicals and other materials and less risk of delays in completion of projects.

Problem Glass Solutions - Before, During and After Installation

Problem Glass solutions help to avoid costly delays in construction or refurbishment caused by damage to glass surfaces during handling, transport, storage and installation. These solutions also reduce costs of the final builder’s clean.

During construction, Problem Glass solutions resist attack by moisture from building run-off,

alkalinity from cement dust, concrete splatter and slurry as well as various types of airborne dirt and other pollution.

After construction, solutions for Problem Glass help to –

- maintain the original light transmission, visibility and day-lighting;
- protect the original “sparkling” appearance of glass and aesthetics of the building;
- reduce by 50% on average the frequency of site visits for routine washing of glass - cutting energy requirements, emissions and carbon footprints by equally large amounts and making the glass “green” in performance.

Solutions for Problem Glass apply at any time during the life cycle of a building, unless the glass has reached a “point of no return” as shown in Figure 1, when the only options are toleration of the problems or costly replacement.

Added value solutions are also available for glass already installed that has lost its original visibility, clarity or cleanability. These solutions renovate the glass to an “as new” appearance and condition.

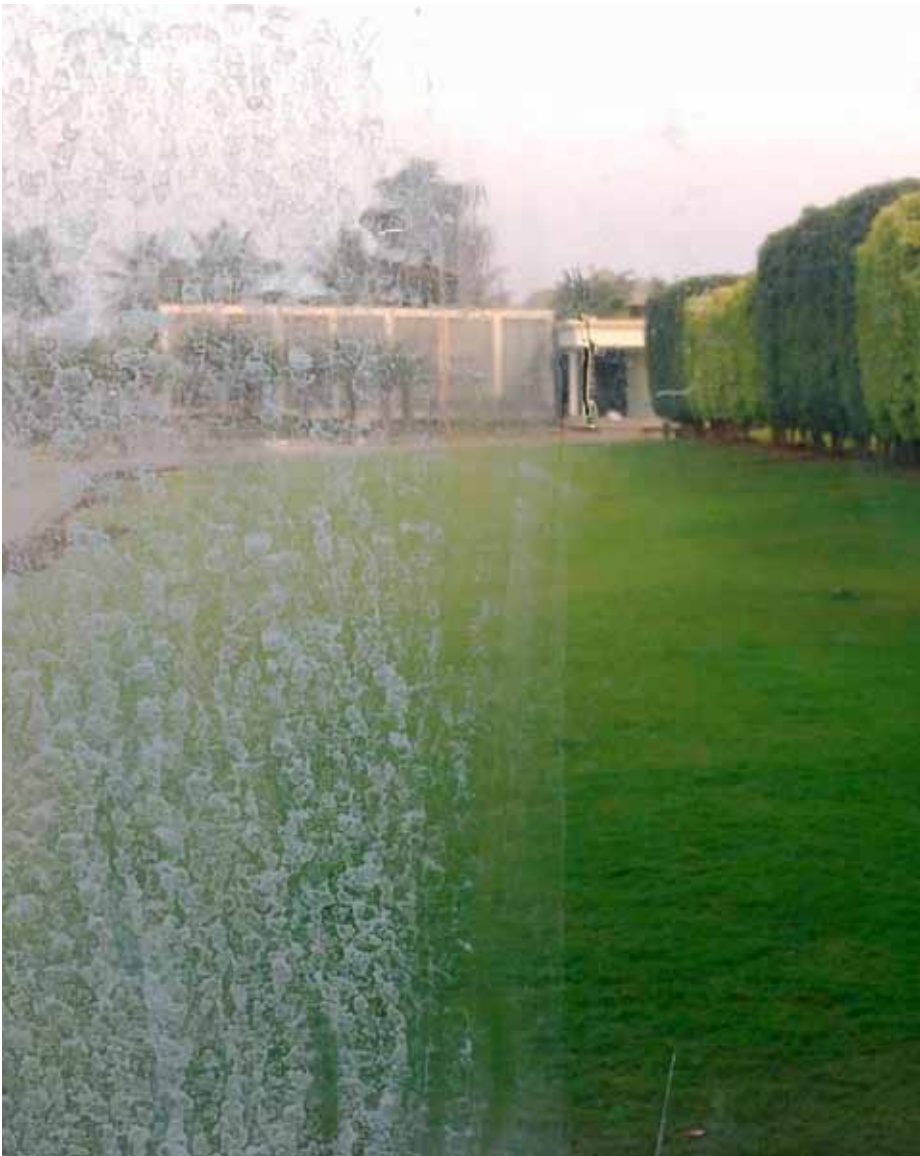


Figure 1 illustrates the effects of renovation, protection and maintenance depending on whether durable glass surface protection is applied to new glass in a factory or to existing glass that has been renovated on-site.

New Glass instead of Old - the 'prevention'

Solutions for Problem Glass can apply at any time in the lifecycle of a building, but 'prevention' is better than 'cure'. Clearly the best time to apply protection to any building surface is before installation when labour costs are much lower and special access equipment may not be required.

Protecting glass when new adds the highest value because this reduces or eliminates the probabilities of becoming Problem Glass. Durable surface protection helps glass maintain

its original light transmission and meet industry standards. It substantially reduces emissions and carbon footprints by cutting the frequency of routine glass washing, reducing energy requirements and lowering maintenance cost – making the glass "green" in performance.

These and other advantages depend on durable protection of the glass surface against attack by the enemies of glass, and the protection requires:

- high levels of resistance to moisture and alkalinity;
- "non-stick", easy-clean performance to resist the adhesion of all types of dirt – both organic and inorganic;

New Glass for Old - the 'cure'

For glass already attacked by its enemies, there are solutions for renovating the glass

surface and protecting it. This "cure" restores the surface to an "as new" appearance and condition, then protects it against degradation.

Degradation of the surface of glass is, therefore, not inevitable and is curable. If not protected at the source, glass can be renovated and protected as a cure. With a proper maintenance programme, glass can be kept looking and performing like new for its lifetime.

Conclusions

Problem Glass is all around us and its causes - before, during and after construction - are well known. Solutions for Problem Glass are available at any stage in the life cycle of a building based on a complete system of glass renovation, protection and maintenance. These solutions are cost-effective, eco-friendly and offer major opportunities with real 'added value'. They should, therefore, be seriously considered in all new construction and building refurbishment projects.

There are no magic lamps, genies or rings to solve Problem Glass for building owners, architects, contractors, facility managers or occupants. There are, however, real and practical solutions of benefit to everyone in the glass supply chain - specifiers, processors and fabricators, glazing contractors, building owners and occupants.

Today there is no reason to overlook or ignore the causes of Problem Glass and a proven 'cure' by glass surface renovation – 'new glass for old'. As always, 'prevention' is better than cure and everyone in the glass supply chain benefits when durable, "non-stick" glass surface protection is applied at or near the top of the supply chain.

Ritec International Limited is developer and manufacturer of the only complete system for glass renovation, protection and maintenance – the award-winning ClearShield Eco-System™. For more than 30 years, this innovative System has been proven under actual field conditions on all types of buildings, marine vessels and transportation vehicles around the world.

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