



STRUCTURAL GLASS MAIN STREET IOWA TECHNOTES

The popularization of Art Deco, Streamline, and Moderne architecture along with the dramatic growth of technology in the early 20th century sparked structural glass to become the building material of the “modernized look” of Main Streets throughout America during the 1920s, 30s, and 40s. Now, one of the most technical problems facing storefront preservation is the conservation of this beautiful building material.

Popularly known as Carrara Glass, Vitrolite, or Sani Onyx, this material was used by builders to upgrade and modernize storefronts in the reflective, shiny, colorful, and streamlined forms considered modern during the 1920s and 30s. It was originally only produced in white, but by the 1930s, more exotic colors such as tropic green, forest green, robin blue, suntan, and jade were offered by primary manufacturers in addition to the stock colors of gray, yellow, and tan.

Pigmented structural glass is an opaque, lime-based material that can be found in many different sizes and shapes, usually 11/32” – 7/16” in thickness. It was originally produced and marketed as a low-cost substitute for marble and was labeled the “cure-all of the building material industry.”

The versatility of structural glass contributed to its popularity. Not only could the material be applied to both the exterior and interior, the glass could be sculptured, cut, laminated, curved, colored, textured,

and illuminated. It was often applied directly over existing structures to remodel older buildings, as well as in new construction; a veneer of pigmented structural glass had the ability to define a building’s architectural character as new and up-to-date.

As tastes began to change and production costs rose, pigmented structural glass soon began to fall out of popularity and disuse by the mid 20th century. In recent years, with the re-interest of the Art Deco style, the restoration of pigmented structural glass is now part of many restoration projects, and is prized for its beauty, durability, and historic importance.

The preservation of pigmented structural glass remains more a materials issue than a detailing problem. The glass panels were and are extremely susceptible to breakage due to accident or vandalism, and just a small amount of broken panels can make a façade appear unattractive and run down. Coupled with being very fragile, the panels have not been widely produced in America since the 1960s and thus makes finding replacements very hard.

As a result of these and other factors, many owners and restorers overlook the importance of the material and either cover up the material with new glass to take buildings back to earlier periods, which is not always based on historical evidence.



The key to proper preservation and repair of structural glass is a thorough understanding of the material and the material’s installation. Fortunately, these specifications and techniques remain virtually unchanged from their first early 20th century application.

The glass panels were applied to a masonry or plastered surface, never on wood, with daubs of asphaltic mastic which made up the primary supporting component. In addition to the mastic, small metal brackets, or shelves, added more support for the veneer, usually put in every other course of panels. Finally, the joints were filled with tinted joint cement and in the end created a clean, uniform modular veneer.

Deterioration of structural glass as a building material is rare and basically unheard of, the major reasons for damage is from failures with the support systems, which bond the panels to the wall.

The three most common problems are joint failure, cracked or chipped panels, or mastic failure.

Joint failure occurs due to cracking or aging of the joint cement. The most successful means of repair is to simply fill opened joints with joint cement or polyester



resin that has been mixed to match color.

Cracked or chipped panels are very common with the fragile material. These can be fixed with colored caulk or a clear fiberglass filler that has been tinted to match color (can be tinted with acrylic paint).

Mastic failure occurs over time due to a loss of adhesiveness and flexibility of the asphaltic mastic. This is very common because of the short life span of the original materials. Repair involves removal of panels and replacing the mastic.

The removal of panels can be done using different methods; all include softening the mastic in some way. One such method is using commercial solvents to dissolve the mastic, other methods utilize heat guns or simply a heated wire to warm and soften the mastic so removal can be done.

The actual removal, after the mastic has been softened, can be done by using a pry bar or a taut wire to cut through remaining mastic.

Finding identical replacements for damaged panels can be a difficult task, and most of the time color matching can be the biggest problem if one gets lucky enough to find a stock pile of the precious glass.

An alternative to finding a matching panel is to remove a panel from an inconspicuous area of the building to be used as replacement in a more prominent setting.

If matching panels can not be found, there are other replacement

material options available.

A cheaper method is to use plexiglass that is cut to size and colored on the backside to match the color. Some downsides are that the color fades quickly, the surface will scratch easily, and the actual thickness is sometimes less than original panels (adding MDO can add thickness to panel). This method is often used at lower levels of walls.

There are more specialized materials on the market that can be used for more permanent replacement. For example, a product like modern Spandrel glass, used as cladding on contemporary buildings, can be utilized for replacement. Another product is Czech glass, which is a high enamel glass produced in Europe and most often used for fine glass work.

These products can be specially made to match color, size, and shape, but can be costly.

When replacing panels, one of the most important steps is to ensure that both the panel and the wall surface is clean of grime and soot that has built up. A mild solution of water and ammonia can be used to clean panels and wall surface.

It is also recommended to use the same mastic that was originally used for installation. Even though modern silicones and epoxies have flexibility and workability, they do not provide the same longevity and

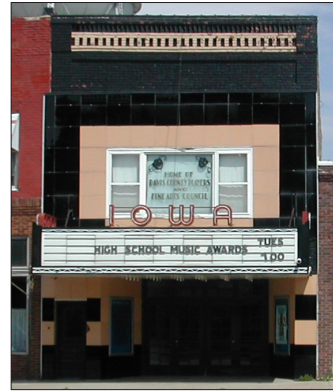
adhesive power of the original.

It still remains that periodical maintenance, inspection, careful repair, and selective replacement are essential for the longevity of any historic structural glass veneer.

Cleaning the front of the panels can be an effective way to enhance the appearance of the surface. Using a damp rag can be used in minor cases, but oven cleaner or paint thinners can be used to remove grime and stains from the panels.

Even though the architectural glass industry has continued to expand and grow, it has never surpassed the imaginative innovations of the early part of the 20th century.

Pigmented structural glass did, and still does, contribute a bold expression on an earlier generation to the diverse look and continuity of Main Street, and continues the evolution of our ever-growing downtowns throughout America.



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Additional Reading:

*"The Preservation of Historic
Pigmented Structural Glass"
Preservation Brief #12
U.S. Department of the Interior*