NATIONAL GLASS ASSOCIATION with GANA

Glass Technical Paper **FB47-15 (2021)**

Considerations When Installing Interior-Mounted Back-Painted Glass

This GTP specifically addresses glass with paint on the backside, or the second surface of the lite, that is not exposed to direct human contact. There are many factors to keep in mind when determining the durability of back-painted glass. It is generally installed in an interior setting and protected from the exterior elements; however, it is still subject to an environment and application that requires the product to be durable. Back-painted glass may be exposed to mechanical or chemical attacks from cleaners, moist environments due to proximity of water or plumbing fixtures, exposure to ultraviolet (UV) light, heat through windows, and various installation methods. This document will provide some of the factors to consider when determining the durability of a back-painted product and provide direction for testing to determine a products' durability.

What is Interior Back-painted Glass?

Back-painted glass is an application of paint on the second surface (the back) of the glass (refer to NGA Glass Technical Paper *Best Practices for Installed Painted Decorative Glass* for more information, including applicable testing standards). The viewer looks through the first surface of the glass to perceive the color on the second surface. The glass used can be clear, low-iron, tinted, textured or patterned. Back-painted glass is often mounted to a solid surface in some manner, be it vertical surfaces such as walls, doors, cabinetry, appliances, or horizontal surfaces such as desktops, countertops, and floors. For more information on the numbering or classification of glass surfaces, see NGA Glass Technical Paper *Describing Architectural Glass Constructions*.

Assessing the Compatibility of Glazing Materials and Components

When a new sealant, adhesive or coated glass is to be used in a project, consulting the manufacturer of the coated glass for their guidelines on compatibility and installation is important. If information is not available, or the situation arises that a different material is required for other reasons, performing some mock-up testing to assess the compatibility of the different components used together reduces the chance of unexpected incompatibilities. The NGA Glass Technical Paper *Assessing the Compatibility of Glazing Materials and Components,* provides a great tool to understand the factors influencing the compatibility and some information on how to test the compatibility of the components.

Types of Paint

The term 'paint' itself is just one of many terms that can be used to describe decorating materials designed to be applied to glass. Other terms are used, including ink, enamel, frit, or coating.

The paint is selected based on performance properties like adhesion, hardness, flexibility, lightfastness, chemical resistance and curing method. For example, fritted paint has a high degree of scratch resistance.

Paints come in a wide range of appearances. The color range possible depends on the pigmentation; the brightest colors can have limited durability, but some pigments can endure for decades. Paints can be transparent, translucent, or opaque. Various special effects can be obtained, such as metallic, pearlescent, crackle, iridescent, or simulated etched effects. Other paints or inks have functional purposes, such as anti-skid and anti-static/conductive materials.

Methods of Paint Application

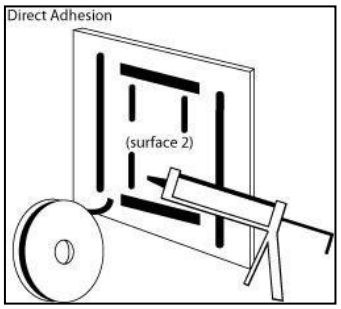
Product may be applied using a special digital printer, screen printing process, roll coater, curtain coater, automated sprayers, or hand-held spray guns. The paint may be air-dried, heat cured, UV cured, or high-heat activated depending on the specific formula and application method.

Methods of Installation

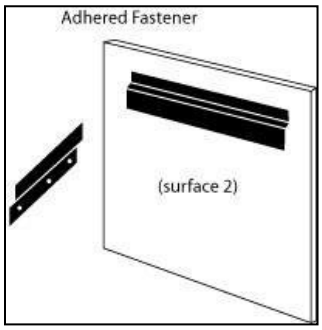
There are two main installation techniques for back-painted glass, structurally glazed and mechanically fastened. Structurally glazed back-painted glass is supported by one or more adhesives holding the painted glass to the installation surface. Mechanically fastened glass is held in place using hardware to prevent the glass from moving out of position and support the weight. Manufacturers usually recommend that glass be installed using a combination of adhesive and mechanical means. Below are some of the most common installation methods for back-painted glass.

<u>Structurally Glazed</u>

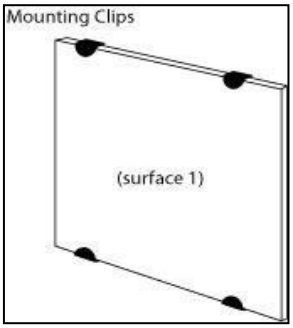
Direct Adhesion - Glass is held in place with double-sided glazing tape, while a secondary adhesive like silicone or mastic cures to create a stronger adhesion to the surface. This installation method can be performed directly to the installation surface or to another material creating a composite panel to be installed in another method. Mechanical fasteners may be required to support the shear weight or dead load. Testing of adhesive compatibility is of utmost importance to determine the suitability of any adhesive as it may vary from one glass coating to another. Communication with the glass manufacturer is strongly recommended. The opacity of the glass and the color of the adhesives should be considered with this method.



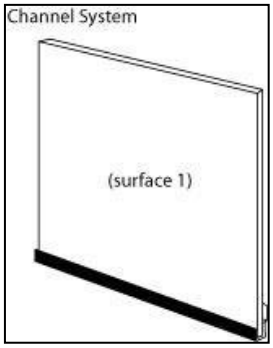
Adhered Fasteners - Mounting hardware like z-clips or other fabricated fasteners when adhered to the back of the glass surface are still considered structurally glazed as the adhesive bonding the hardware is required to support the whole load. This method of installation concentrates the weight of the glass on only the area of the glass where the adhesive is present. Testing for adhesion and compatibility of the whole system is of utmost importance to determine the suitability of any adhesive as it may vary from one glass coating to another. Communication with the glass manufacturer and adhesive manufacturer is strongly recommended.



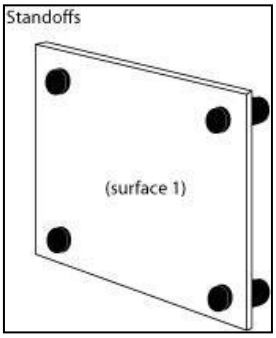
Mechanically Fastened



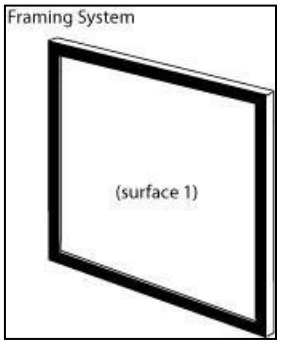
Mounting Clips - Hardware like J-clips, clips and screws, spring-loaded clips, and edge grips, hold the glass from the edges and are screwed into the installation surface. The ability of the fastener to hold the weight of the glass determines its effectiveness. If the fasteners are not screwed into a stud or if an undersized wall anchor is used the weight of the glass may not be sufficiently supported.



Channel Systems - J-channels or L-channels may be used to support the sheer weight of the glass either just along the entire bottom edge of the glass, or along the top and bottom of the glass. This method is often used in conjunction with adhesive methods to ensure additional support.



Stand-offs - These columns support the glass away from the wall through a hole that has been drilled through the glass. The barrels can be round or square, are available in a wide assortment of finishes and sizes, and can vary in length to create different effects in utilizing the distance from the wall.



Framing Systems - Back painted glass may be held in place using a framed mounting system. These systems will hold the glass in place as well as mount to the installation surface. These systems, although functional, are designed to be seen and contribute to the overall look of the installation. These framing systems can be made of metal or wood to cover the edges of the glass and hold it in place.

For more in-depth information regarding durability properties, please reference NGA Glass Technical Paper *Assessing the Durability of Decorative Glass.*

Visit www.glass.org/store for a complete list of Glass Technical Papers, as well as other glazing and glass building products industry reference materials. Most Glass Technical Papers are available free of charge to NGA members and for a small fee to nonmembers.

The Technical Services Division of the National Glass Association (NGA) has produced this Glass Technical Paper solely for informational purposes. NGA makes no representations or warranties, express or implied, with respect to the information provided in this Paper or to its use. This Paper makes no attempt to provide all information or considerations for the topic area covered within this Paper. NGA disclaims any responsibility for any specific results related to the use of this Paper, for any errors or omissions contained in the Paper, and for any liability for injury, loss or damage of any kind arising out of the use of this Paper. This Paper is a "living document," and NGA reserves the right, in its sole discretion, to update, revise, and amend the Paper from time to time as it sees fit and to do so without notice to prior recipients or current users of this Paper.

This Paper was developed by dedicated member volunteers and subject matter experts. The original version of this document was approved and published in 2015. It was updated in November 2021.