

When Color Matters...



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High Performance Coatings

OPACI-COAT-300®

OPACI-COAT-500®

DIVISION 8 OPENINGS SECTION 08 81 00 SPANDREL GLAZING

SPANDREL SPECIFICATION GUIDE

Design Edition
for architects and specifiers

*A PLAN FOR TROUBLE-FREE
SPECIFICATIONS*

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INTRODUCTION

This white paper is intended for the architect and specifier professional. You have not only the unique task of creating a building but conveying important information to everyone who contributes to the construction of that building. For months your creation will be featured in architectural magazines the world over, you hope. If one little bit of the specification isn't clear and someone makes a mistake, it all falls on your shoulders. Even if it was someone else's mistake. Ensuring those mistakes or moments of interpretation do not occur is critical for the building's construction and your reputation. Can you afford to have your reputation in question?

In this guide, we will detail how to ensure your specifications are trouble free.

*The space within
becomes the reality
of the building.
Frank Lloyd Wright*

This Guide Will:

- Be a source of common glass definitions.
- Introduction to critical references; ASTM & GANA.
- Show why components must pass testing.
- Explain Quality Assurance verbiage in specifications.
- Show “trouble free” delivery, storage, and handling.
- Discuss types of spandrel configurations.
- Demonstrate key installation information.
- Give instructions for cleaning glass.

When a building is crafted and constructed, it includes many teams from many different areas. Include the uncountable components that go into construction of a building, and you have a very complex system.

Join the team discussion and keep up-to-date on any changes by joining in on the conversation via our blog, twitter, and facebook communities. You can find them by visiting our website at www.icdcoatings.com.

DEFINITIONS

Annealed Glass

In the manufacturing of float glass, it is the process controlled cooling done in a lehr to prevent residual stresses in the glass.

Curtain Wall

Outer covering of a building in which the outer walls are non-structural, but keep out the weather.

Flat Glass

Glass formed on a bath of molten tin.

Gasket

Pre-formed shapes, such as strips, of rubber or rubber-like composition, used to fill and seal a joint or opening.
Use non-neoprene with silicone opacifiers.

Glass Surface Numbering

For a monolithic lite of glass, the “#1” side is exposed to the exterior of the building, the “#2” side is exposed to what would be the interior of the building. For insulated glass units, there are 4 surfaces; #1 faces the exterior of the building, #2 faces the interior of the building but is inside the sealed unit, #3 faces the exterior of the building yet is inside the sealed unit, and #4 faces the inside of the building.

Glazing

Generic term used to describe an infill material such as glass. The process of installing an infill material into a prepared opening in windows.

Insulating Glass Unit

When two or more lites of glass are separated by a hermetically sealed space (with spacer and sealant), which may or may not contain air or other gasses. Creating an insulating unit, keeping temperatures inside a building even while outside it fluctuates.

Low-e Glass

Glass containing a coating that lowers the rate of emitting absorbed radiant energy. Some may and some may not be touched while handling, depending on the manufacturer.

Monolithic Glass

Glazing configuration consisting of one lite of glass, opposite would be the two lites used in insulating glass units.

Opacifier

A coating that when applied to glass, renders the glass near opaque.

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DEFINITIONS

Reflective Glass

Glass where a thin metallic coating is applied to the surface of flat glass, helping to reflect sun rays. Some are deposited during the float process, and some are deposited in a sputter operation.

Sealant

An elastomeric material with adhesive qualities, applied between components of similar or dissimilar nature to provide an effective barrier against the passage of the elements. ***It Must be neutral cure to use with silicone opacifiers.***

Spandrel

Glass that has been rendered near opaque by a coating, hiding the utilities and control areas of a building, usually between the occupancy floors.

Silicone Coating

A coating containing silicon and hydroxyl groups (SiOH), a coating that reacts with the silicon and hydroxyl groups that are also present on the surface of glass.

Tempered Glass

Flat or bent glass that has been heat-treated to a high surface stress and/or edge compression.

Setting Block

Generally rectangular, cured extrusions of rubber-like materials, on which the glass product bottom edge is placed to effectively support the weight of the glass. ***Use non-neoprene setting blocks with silicone opacifiers.***

Weep System

Systematic use of drain holes or slots in the framing member to prevent accumulation of condensation and water.

KEY REFERENCES

- ASTM C162 - STANDARD TERMINOLOGY OF GLASS AND GLASS PRODUCTS
- ASTM C103 - STANDARD SPECIFICATION FOR FLAT GLASS
- ASTM C1048 - STANDARD SPECIFICATION FOR HEAT-TREATED FLAT GLASS
- CPSC 16 CFR 1201 - SAFETY STANDARD FOR ARCHITECTURAL GLAZING MATERIALS
- CAN/CGSB - 12.1-M TEMPERED OR LAMINATED SAFETY GLASS
- CAN/CGSB 12.2-M FLAT CLEAR SHEET GLASS
- CAN/CGSB - 12.3-M FLAT CLEAR FLAT GLASS
- GANA Glazing Manual
- GANA 89-1-6 SPECIFICATION FOR ENVIRONMENTAL DURABILITY OF FULLY TEMPERED OR HEAT-STRENGTHENED SPANDREL GLASS WITH APPLIED OPACIFIERS

IMPORTANCE OF TESTING

One of the clear areas where, as a design professional, you can affect the building most, is in understanding of how components will perform. As we know, thousands of products go into the construction of a building, each of them offering a area of error that could cause damage to the whole building.

Many industries that make products for buildings will offer standards and testing towards those products. This does several things; it ensures quality products are made by everyone in that industry and provides a clear feedback for anyone using those products.



In the glass industry, the organization that provides a wealth of information, testing, and standardization is the Glass Association of North America. When it comes to coatings applied to glass for opacification and spandrel use, one key standard needs to be fulfilled for that product to be as trouble free as possible. **That standard is: “GANA 89-1-6 Specification for Environmental Durability of Fully Tempered or Heat- Strengthened Spandrel Glass with Applied Opacifier.”** A spandrel coating that has either omitted parts of or not been subjected to this test at all, is potentially a huge area for error.

The reason this test is so important is, it provides a extensive testing of how that coated glass will perform in the building. Spandrel glass is aesthetic and functional, if it fails, it’s usually the aesthetic part that causes the most damage to how the building looks and everyone’s reputation. In this test, the coated glass is subjected to a wide range of high and low humidity, as well as ranges of UV light exposure, and extreme temperatures. The spandrel cavity of a building has been tested and shown to swing in both of those areas greatly during the day. A University of Missouri at Rolla study from 1995 showed in one 24-hour period that then temperatures of the spandrel cavity will swing from 9°F to 170°F. That same study found relative humidity, in the same period, to swing from 6% to 100%. (Behr, “On-Site Investigations of Spandrel Glass Microenvironments.”, Building and Environment, Vol. 30, No. 1, pp. 61-72, 1995)

Similarly, every component of a building is governed by some performance testing and standard by which to measure it against. The easiest thing to do in the design of a building is to know what those are and how they will affect your building. Many so called “conforming” spandrel coatings have said they pass this test, but in fact, they have omitted parts of the test, so they do pass. This is a fail. Know the products you use in your building of of quality!

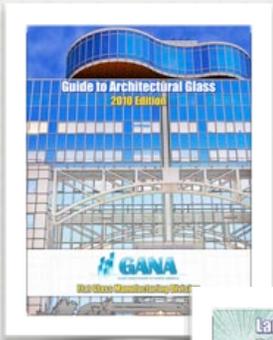
QUALITY ASSURANCE

In the specification, it is critical to write in what is expected of the components you are stating to be used. Obviously, you want to write in specific quality statements as they pertain to the components, such as; tempered glass, safety glazing compliant, etc.

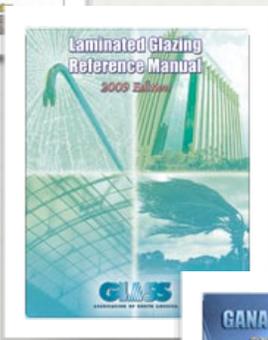
It is equally important to call attention to the commonly referenced industry standards by adding some statement similar to this:

“Comply with published recommendations of glass product manufacturers and organizations below, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this section or referenced standard.

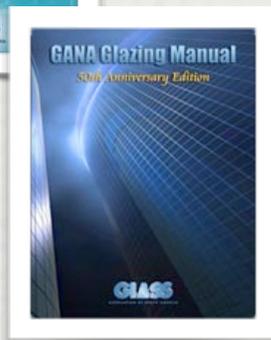
1. GANA Publications
2. AAMA Publications
3. IGMA/IGMAC Publications”



GANA Guide to Architectural Glass



GANA Laminated Glazing Reference Manual



GANA Glazing Manual

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DELIVERY/STORAGE

Delivery, storage, and handling of components in a building is one of the most heated debates around. When something goes wrong, many will point fingers, where the products were stored and how they are stored are one of the first fingers to point.

It is very important to state in a specification that all involved must comply with the manufacturer's instruction for receiving, handling, and storing of products. Especially glass, which may arrive in crates. Glass might seem extremely tough but leave it out in the elements, and you will soon see how acid rain and other contaminants will damage it.

Always state that the materials are to be delivered in the manufacturer's original, unopened, undamaged containers with clear identification labels intact.

The same cautions go for cleaning of product after it's in place. A statement about the correct cleaning of glass, for example, is important.

For your reference, here are some very important bulletins to be aware of:

[GANA 01-0300 "Proper Procedures for Cleaning Architectural Glass" \(www.glasswebsite.com\)](#)

[GANA DD 01-0608 "Guidelines for Handling and Cleaning Decorative Glass" \(www.glasswebsite.com\)](#)

[GANA FGMD 02-0809 "Protecting Glass Against Weld Splatter" \(www.glasswebsite.com\)](#)

[GANA TD 03-1003 "Construction Site Protection and Maintenance of Architectural Glass" \(www.glasswebsite.com\)](#)

MATERIALS

To ensure the specific product you are specifying actually is what's used, it's important to be as precise as possible in your descriptions of the materials. For example, if you simply state that an opacifying coating is to be used, and that's it. You never know what you will actually get, and you have left the door open for products that will fail. In some regions of the world, if you are not specific in the opacifying coating, the fabricating employee's have been known to use simple spray paint. This may be fine to touch up a wooden chair at home but it will peel and fall of the back of the glass in a commercial building.

Using one of our products as an example, a solid call out for a specific spandrel would read as follows:

2.02 MATERIALS A. Monolithic OPACI-COAT-300® Spandrel Glass.

1. The OPACI-COAT-300® opacifying coating shall have a minimum thickness of 4-5 mils dry (0.004"/0.10mm to 0.005"/0.127mm). For fallout protection a minimum thickness of 6.50 mils dry (0.0065"/0.17mm) is required.

2. Only Approved Factory Fabricators (AFF) are allowed to produce the OPACI-COAT-300® silicone spandrel, as AFF glass fabricators are certified and trained by ICD in the application and manufacture of the spandrel glass.

3. For a list of Approved Factory Fabricators, please contact ICD at 1.360.546.2286 or www.icdcoatings.com.

4. Approved manufacturers of OPACI-COAT-300®:

a. ICD High Performance Coatings, 13911 NW 3rd CT, Vancouver, WA 98685, USA.

By calling out a specific product by name and adding the qualifying statement of "Only Approved Factory Fabricators", you are setting up a known fact of quality that will be used in the building. It's not always possible to be this specific but most of the mistakes in specification writing come from being too generic, allowing much room for people to interpret.



INSTALLATION

Installation is a key area where you get to add important data about how the glass will be installed. These stipulations are like the last line of defense to ensure a smooth construction. It's good to add clauses such as; "cut all glazing sheets square, assure edges are smooth and free of chips and hairline cracks." Often this key information will come from the manufacturer or someone in the curtain wall engineering end of things. Yet, to know a few key points that could cause problems, will insure a smooth process.

A few key areas are to point out:

- Referencing the GANA Glazing Manual will allow for no excuses in a glazer not knowing something.
- For silicone coatings as opacifiers, calling out that one must use non-acidic sealants and neoprene gaskets. Of course, you will have already called out specific products but this section adds an extra notice for those who might throw some other product into the construction.

There is one key issue that comes up again and again, spandrel glass cannot be used in a vision area. If you want a totally opaque vision glass, you must design it differently. One common way for 6mm monolithic glass is to have two 3mm lites coated with the same color and then placing them coating to coating in the installation. Every coating for spandrel will have some amount of acceptable pinholes and blemishes that are never seen with backed by the spandrel cavity. But when you place that glass with a light source behind it, you will be seeing the milky way galaxy of stars in front of you.

Never specify spandrel glass in a vision area, I can't reiterate this enough, and I can't tell you how many headaches this will save.

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