

GUARDIAN GLASS ARCHITECTURAL SERVICES FOR SCGMA YPG GLASS

Reece Poth – ADM

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GUARDIAN FLAT GLASS LOCATIONS | North America

Headquarters: Auburn Hills, MI

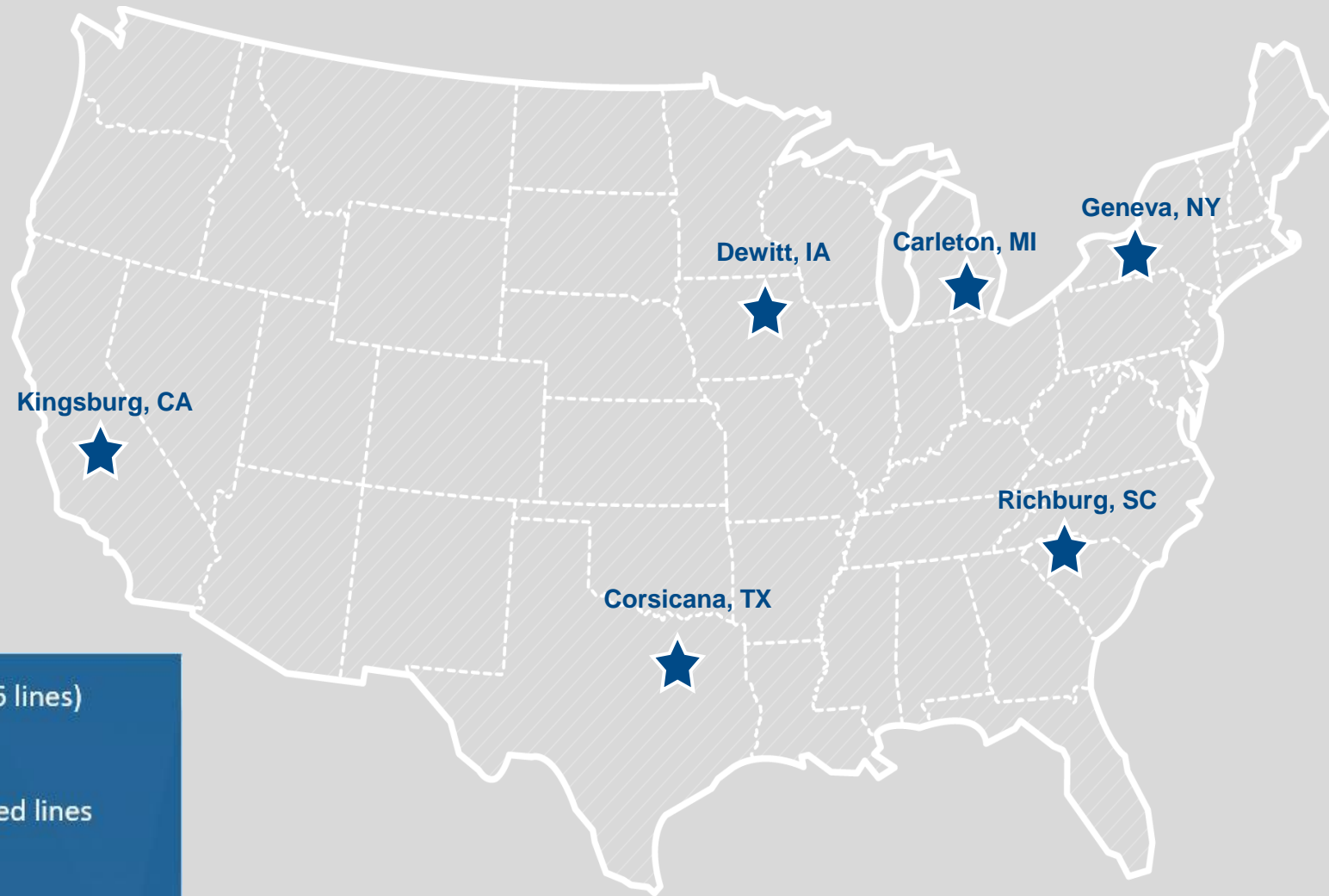
Science & technology Center (STC): Carleton, MI

US FLAT GLASS FOOTPRINT

- 7 float lines (2 – MI)
- 7 thin film sputter coaters (2 – MI)
- 3 high volume tempering lines
- 1 patterned glass line

12 miles OF GLASS*
produced at each of our
25 plants *PER DAY*

25 float glass plants (26 lines)
20 thin film coaters
11 wet coating lines
7 architectural laminated lines
2 patterned lines



Guardian West Coast Fabricators



Presented by:



Reece Poth

Guardian Architectural Design Manager – Southwest

512.968.0119

reece.poth@guardian.com

Speaker Bio:


- Lifelong glass and facades nerd
- 5 year tenure as Façade Engineer working for Simpson Gumpertz & Heger and Thornton Tomasetti
- Bachelor of Science in Architectural Engineering - University of Texas at Austin
- Published Façade Tectonics Institute World Conference – *“Heat-Treated Glass: The Designer’s Guide to Navigating Industry Trends and Minimizing the Appearance of Optical Distortions in Exterior Heat-Treated Glass”*
- Guest Lecturer: UT, JHU, NWU

Resource For:

- Business Development in Façade Architecture
- Facade Aesthetics
- Glazing Performance
- Glass Applications, Materials and Methods
- Resource Forecasting
- Design Assistance
- Samples and Entertainment

Roles and Responsibilities

ADM (Architectural Design Manager)

- Build a project pipeline by cultivating relationships with Architects, Spec Writers, and Glaziers
- New product and service updates
- **Assist with specifications** 

TSM (Territory Sales Manager)

- Manages fabricator pipeline
- Day to day interface with fabricators
- Assists with pricing, oversees quality issues and handle customer relations

ADS (Architectural Design Specialist)

- Sample Requests
- Lead Sharing
- Project follow-ups

PART 2 PRODUCTS

2.01 INSULATING GLASS UNITS

- A. Type IG - Sealed Insulating Glass Units: Vision glazing.
 - 1. Application: All exterior glazing unless otherwise indicated.
 - 2. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
 - a. Tint: Gray.
 - b. Coating: Low-E (passive type), on #2 surface
 - 3. Inboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 - 4. Total Thickness: 1 inch.
 - 5. Install fully tempered float glass for both outboard and inboard lites as required by applicable federal, state, and local codes and regulations.

2.02 GLAZING UNITS

2.03 EXTERIOR GLAZING ASSEMBLIES

- A. Structural Design Criteria: Select type and thickness to withstand dead loads and wind loads acting normal to plane of glass at design pressures calculated in accordance with IBC 2006 code.
 - 1. Use the procedure specified in ASTM E1300 to determine glass type and thickness.
 - 2. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
 - 3. Glass thicknesses listed are minimum.
- B. Air and Vapor Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier:
 - 1. In conjunction with vapor retarder and joint sealer materials described in other sections.
 - 2. To maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.

2.04 GLASS MATERIALS

- A. Float Glass Manufacturers:
 - 1. AGC Glass Company North America, Inc: www.us.agc.com.
 - 2. Cardinal Glass Industries: www.cardinalcorp.com.
 - 3. Guardian Industries Corp: www.sunguardglass.com.
 - 4. Pilkington North America Inc: www.pilkington.com/na.
 - 5. PPG Industries, Inc: www.ppgideasclapes.com.
 - 6. Substitutions: Refer to Section 01 60 00 - Product Requirements.
- B. Float Glass: Provide float glass based glazing unless noted otherwise.
 - 1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality-Q3.
 - 2. Heat-Strengthened and Fully Tempered Types: ASTM C1048, Kind HS and Kind FT.

Pain Points?



GUARDIAN PRODUCTS

While float glass is our core competency, we have developed value-added glass products for a variety of applications across these segments:

COMMERCIAL



RESIDENTIAL



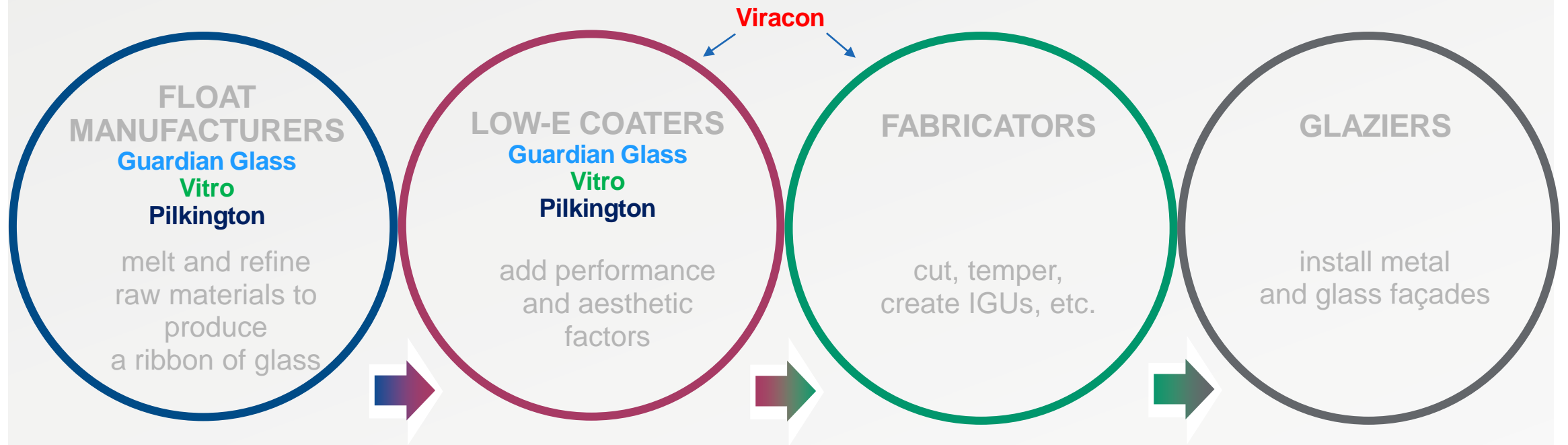
INTERIORS



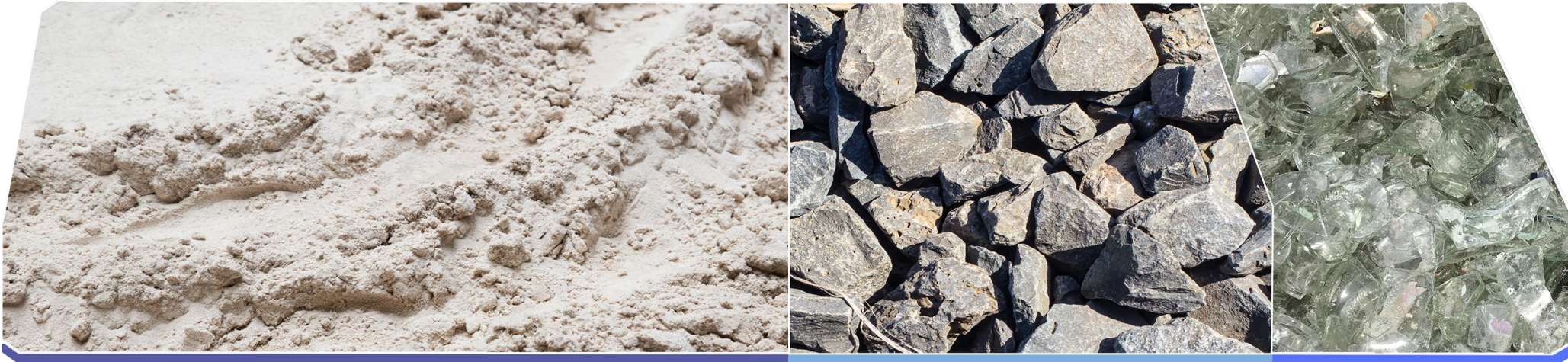
**TECHNICAL &
TRANSPORTATION**



Glass Supply Chain



GLASS INGREDIENTS



50% silica sand

+ soda ash, salt cake + dolomite + rouge/iron oxide

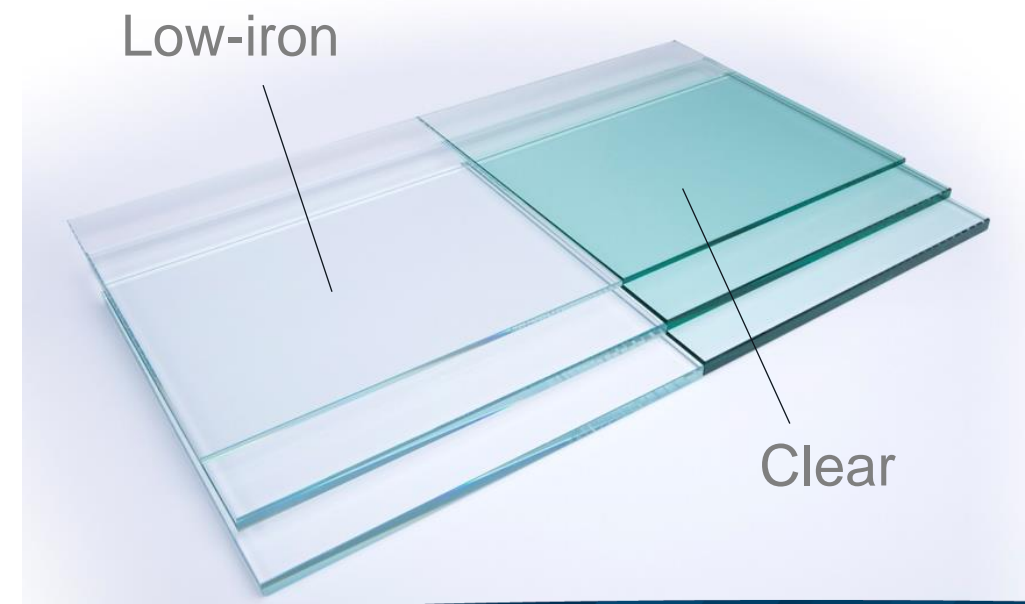
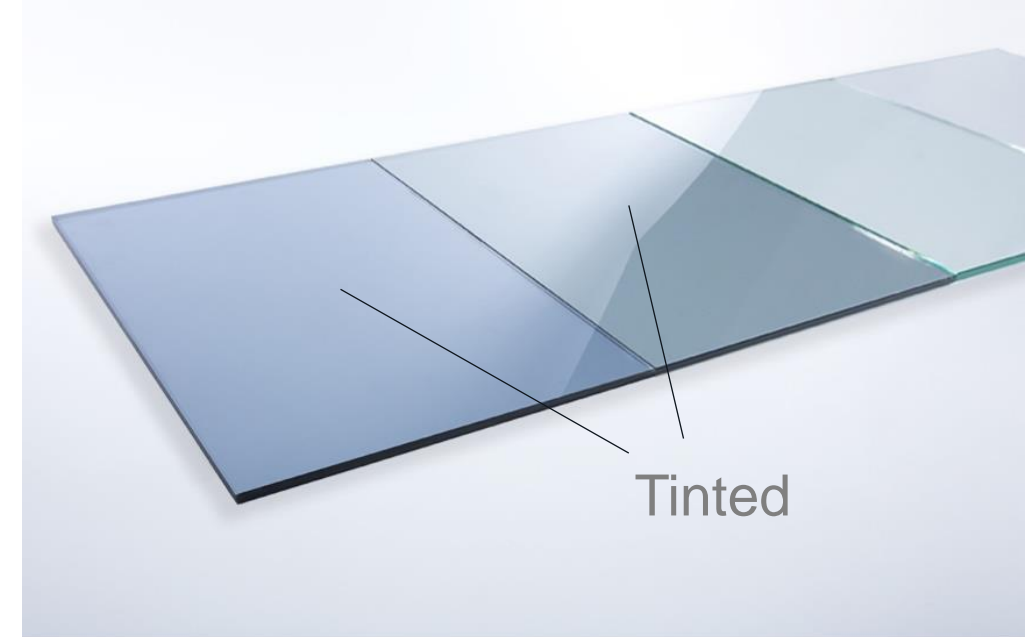
15-20% cullet

FLOAT GLASS OPTIONS

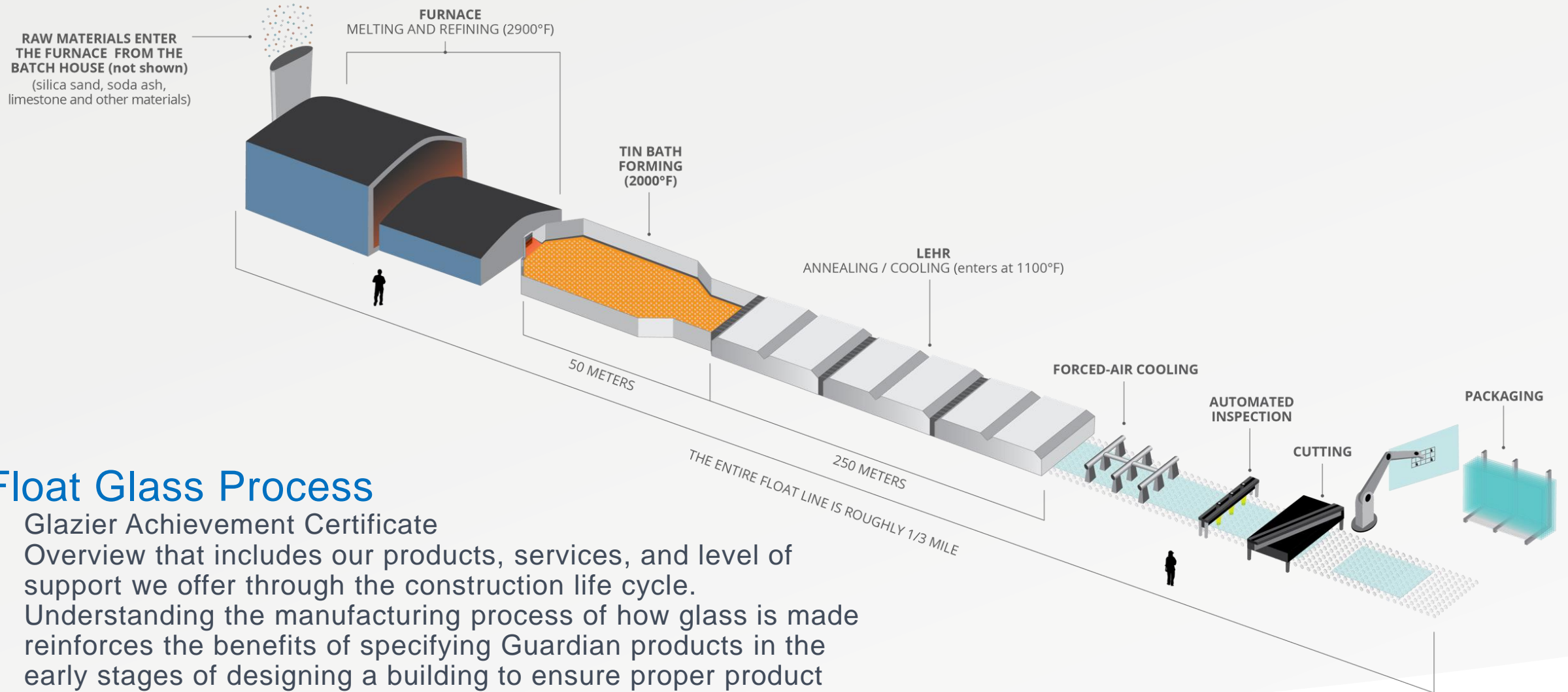
Clear follows the standard float recipe

Tinted uses metal oxides to add color

Low-iron reduces iron content and green appearance for clarity and neutrality



Guardian Plant Tour



Float Glass Process

- Glazier Achievement Certificate
- Overview that includes our products, services, and level of support we offer through the construction life cycle.
- Understanding the manufacturing process of how glass is made reinforces the benefits of specifying Guardian products in the early stages of designing a building to ensure proper product availability when it's at the installation phase.



HOW GLASS IS MADE

ENHANCE WITH

COATINGS

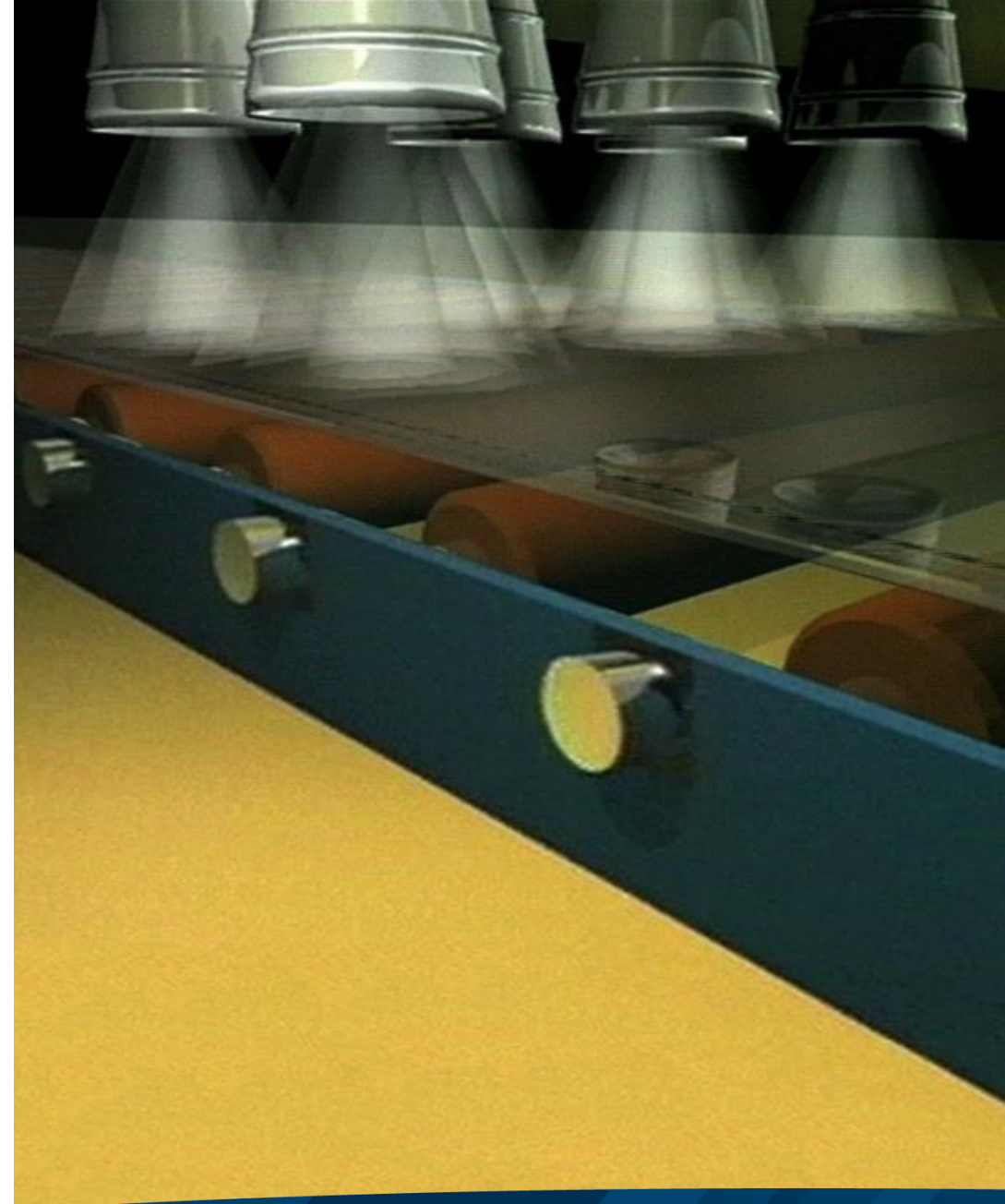
PERFORMANCE COATINGS

Pyrolytic Coating

Applied on the line, during the float glass making process

Limited performance

Limited aesthetic options



PERFORMANCE COATINGS

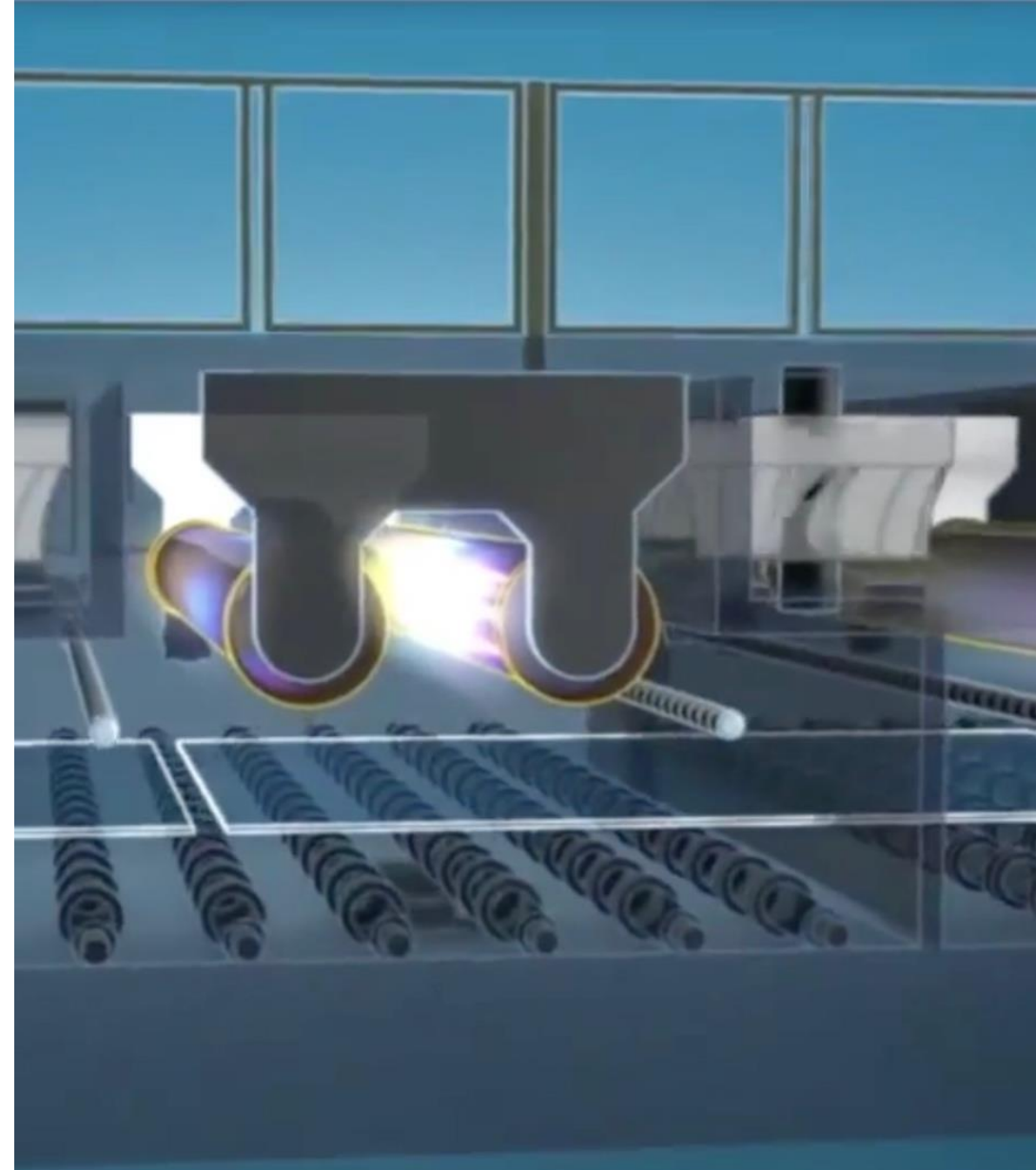
Sputter coatings

Glass enters a vacuum chamber where metals are sputtered on to the glass in layers

Comprised of microscopic layers of metal

High performance and wide range of aesthetics

Better LSG ratio



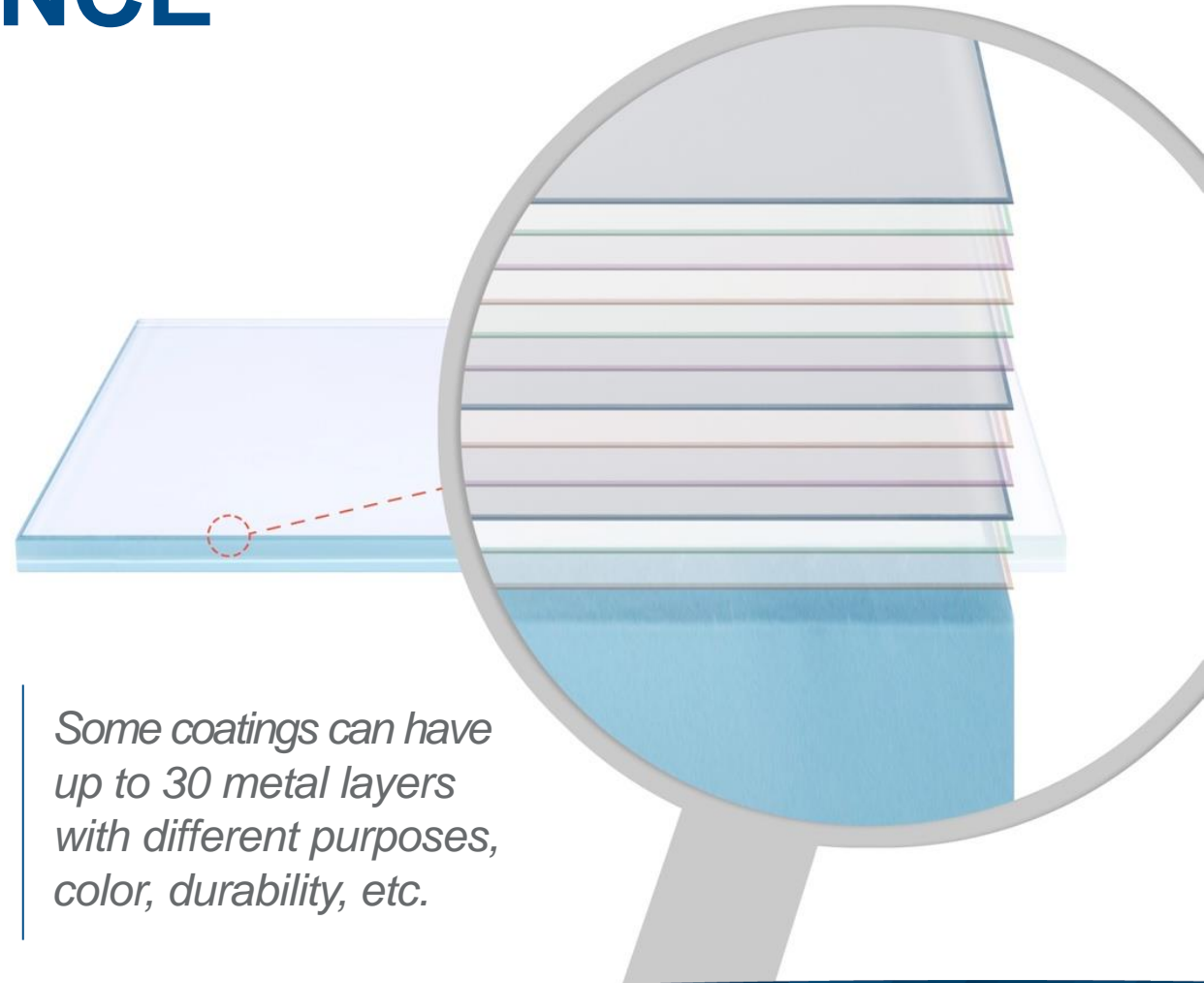


HOW GLASS IS COATED

THIN METAL LAYERS FOR HIGH PERFORMANCE

Metals are sputtered on the glass
in a vacuum

Overall thickness is less than
1/500 of a sheet of paper



*Some coatings can have
up to 30 metal layers
with different purposes,
color, durability, etc.*

THE SPECIAL INGREDIENT

Silver (Ag) adds powerful insulation

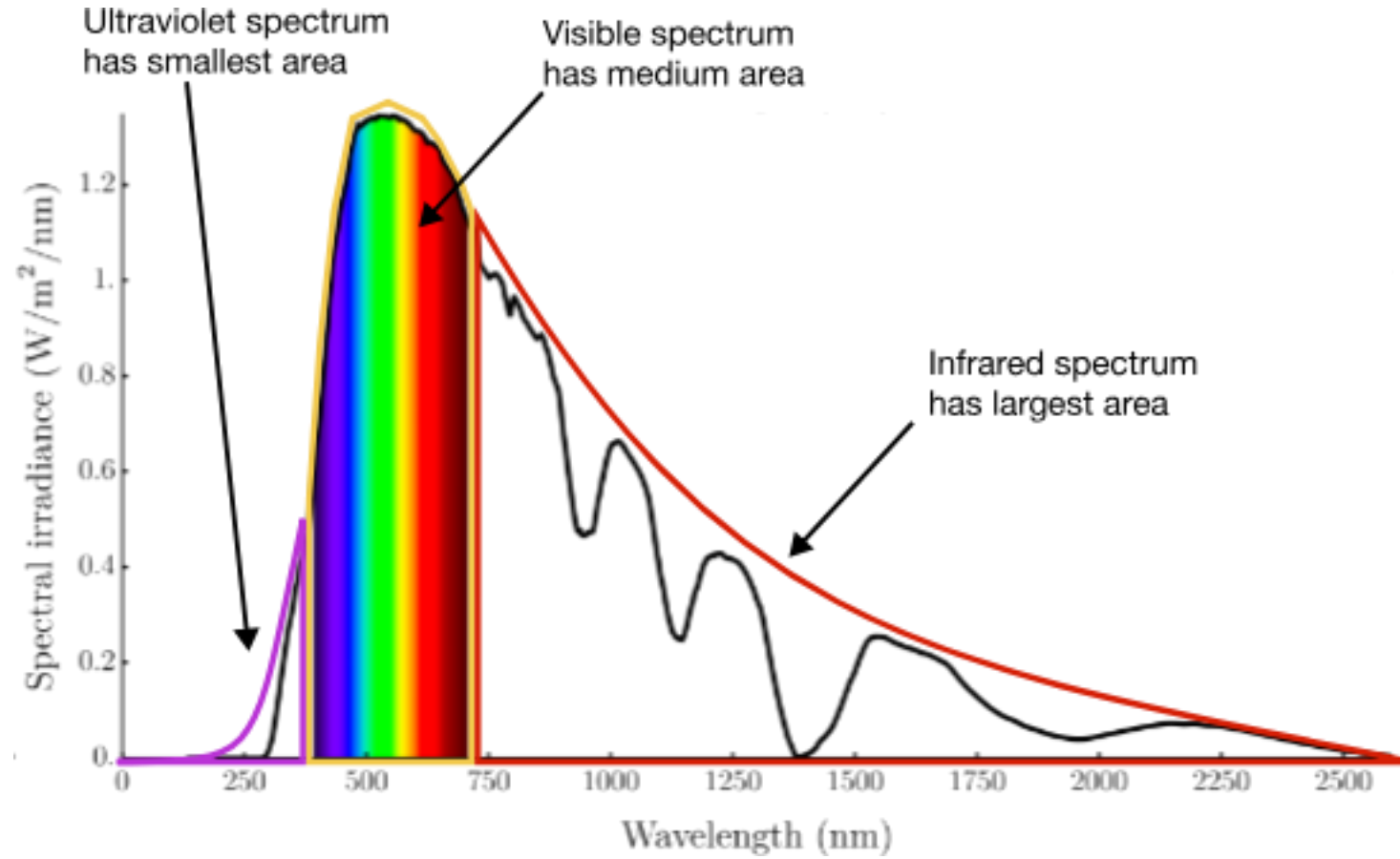
Single silver = 5 layers

Double silver = 15 layers

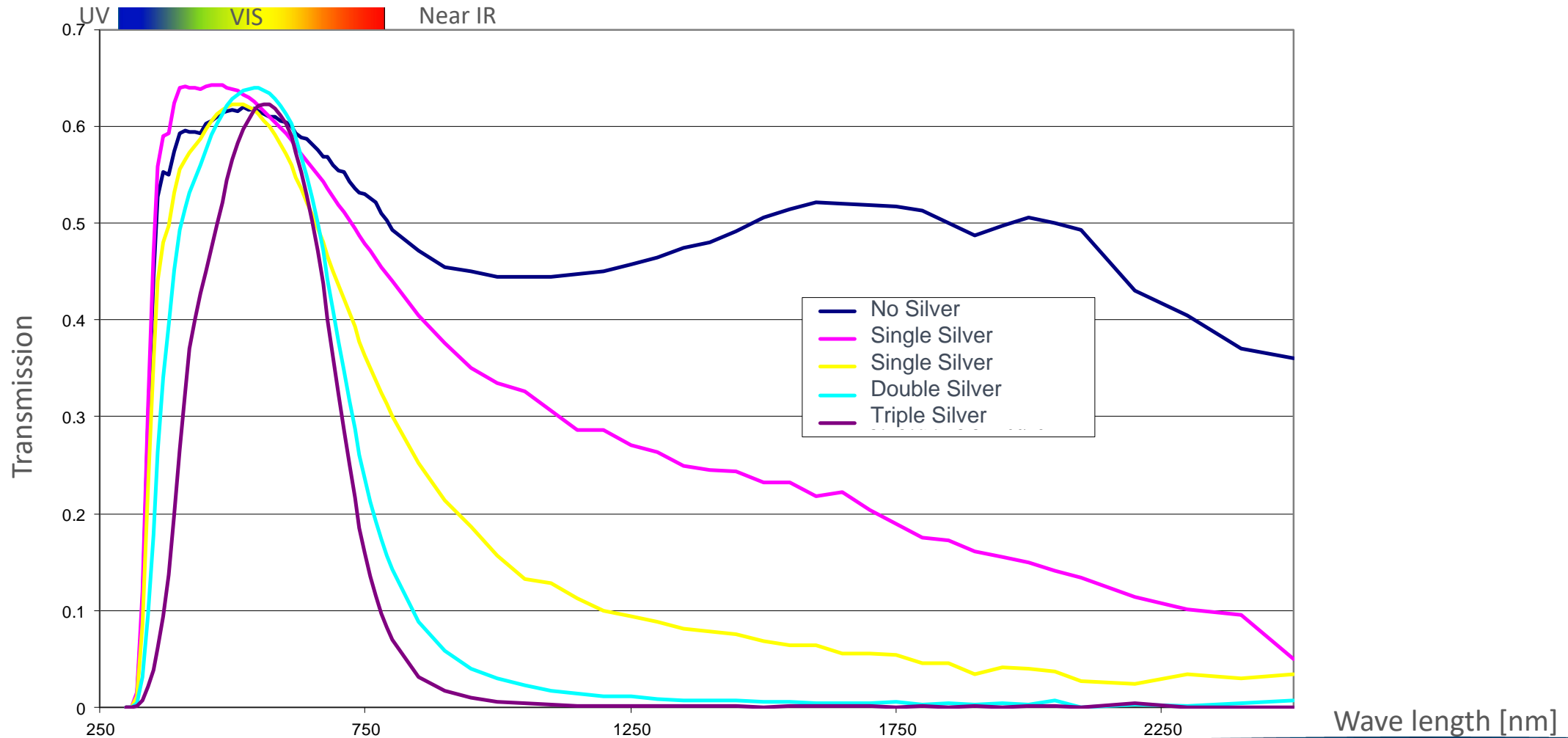
Triple silver = 18 layers



SOLAR SPECTRUM



Heat reflective vs Light reflective



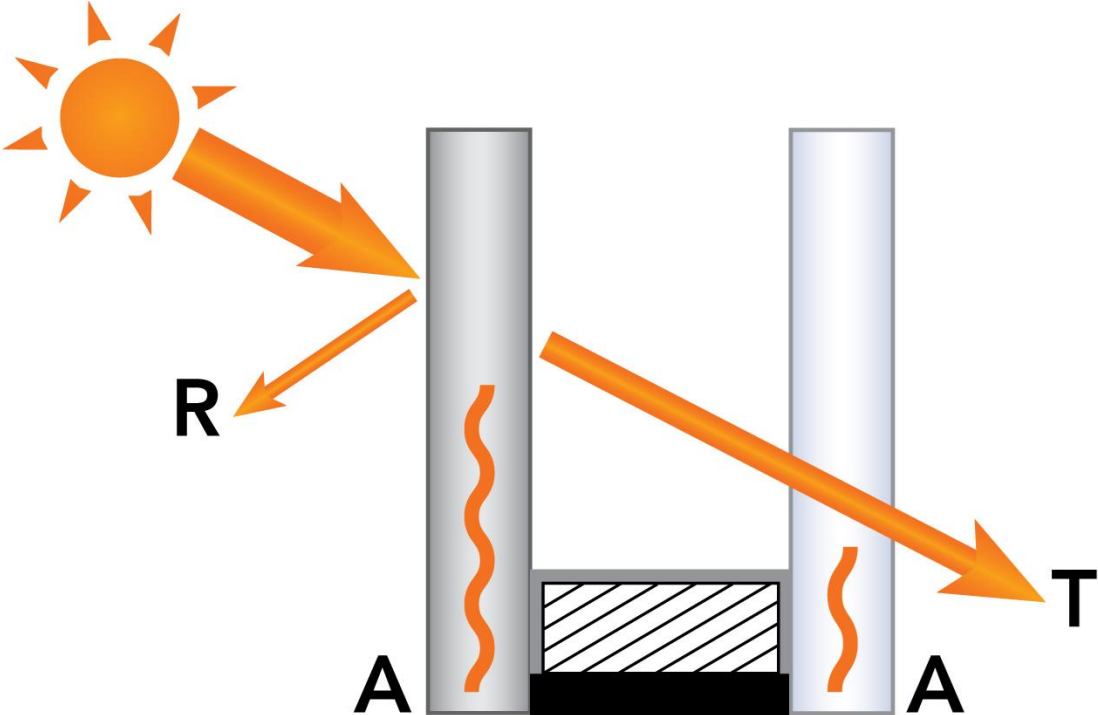
LOW-E GLASS

Performance at every pane

A—Absorb

R—Reflect

T—Transmit



SELECTING THE RIGHT PERFORMANCE

- U-Factor
- Solar Heat Gain Coefficient
- Light to Solar Gain
- Visible Light Transmittance

KEEP BUILDINGS INSULATED

U-Factor

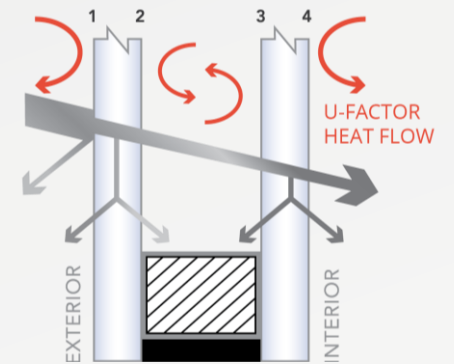
Measure of heat gain or loss through glass due to difference between indoor and outdoor temperatures

Lower is better—0.25 U-Factor with argon fill in a standard or oversized IGU



U-Value

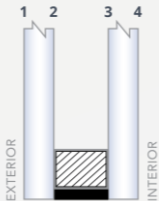
Heat gain or loss through glass due to difference between indoor and outdoor temperatures



1/4" Glass | 1/2" Air Space | Optimal Coatings and Locations

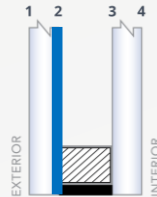
Double-Pane
No Coating
Air Fill

0.47



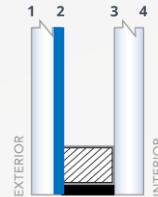
Double-Pane
1 Coating
Air Fill

0.29



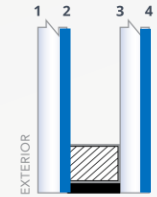
Double-Pane
1 Coating
Argon Fill

0.24



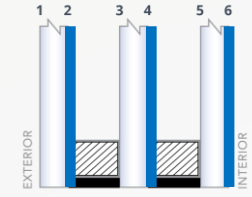
Double-Pane
2 Coatings
Argon Fill

0.20



Triple-Pane
3 Coatings
Argon Fill

0.11

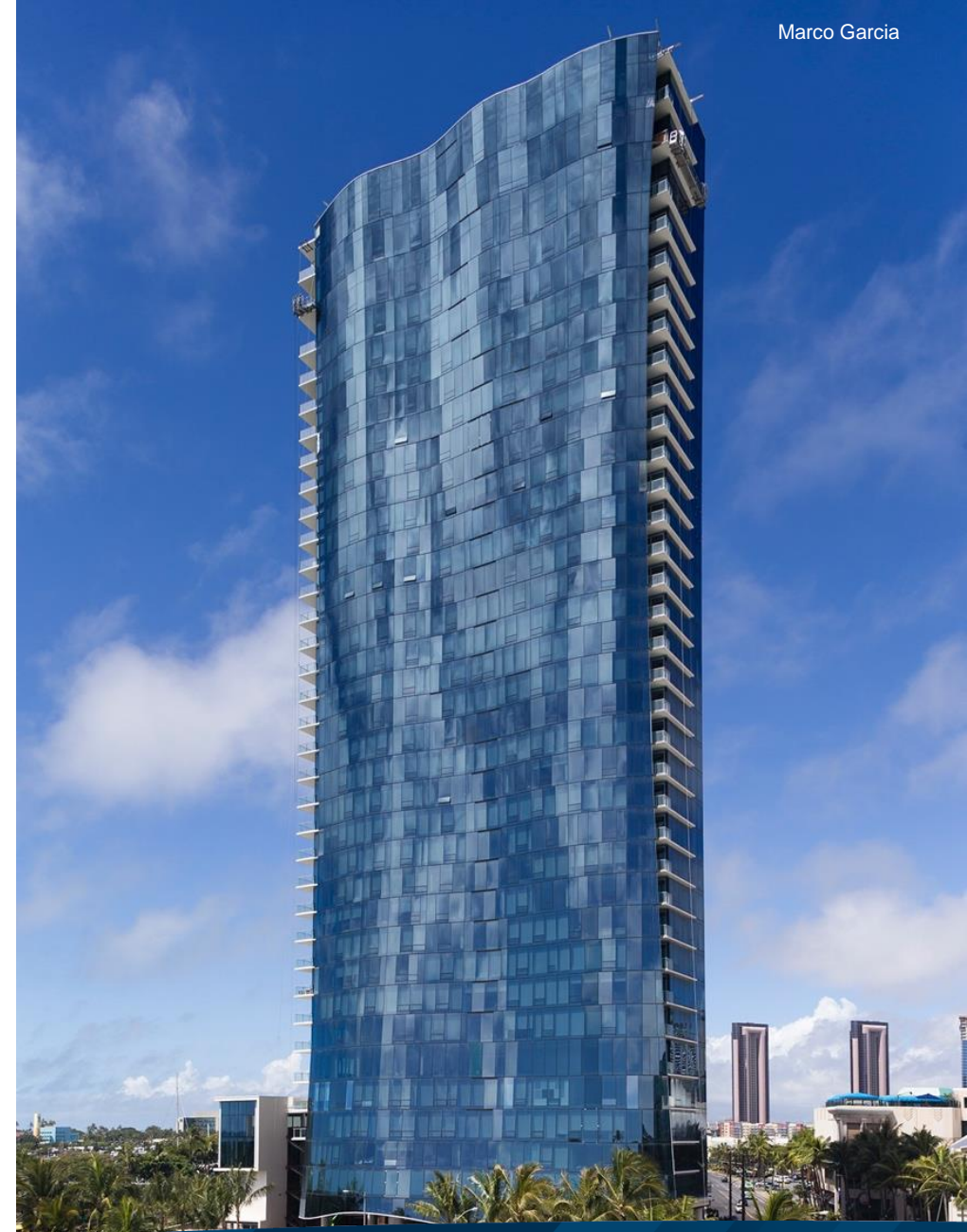


KEEP BUILDINGS COOL

Solar Heat Gain Coefficient (SHGC)

Percentage of solar energy that is transmitted through the IGU

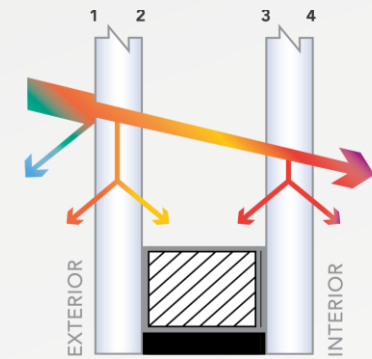
*As low as 0.23 SHGC with
low-E coatings on clear float glass*



Solar Heat Gain Coefficient (SHGC)

Decimal share of solar energy that transfers indoors

1/4" Glass | 1/2" Air Space | 1/4" Glass | Coating on Surface 2 as Applicable



No
Coating

0.74

SN
68

0.38

SNX
62/27

0.27

SNE
50/25

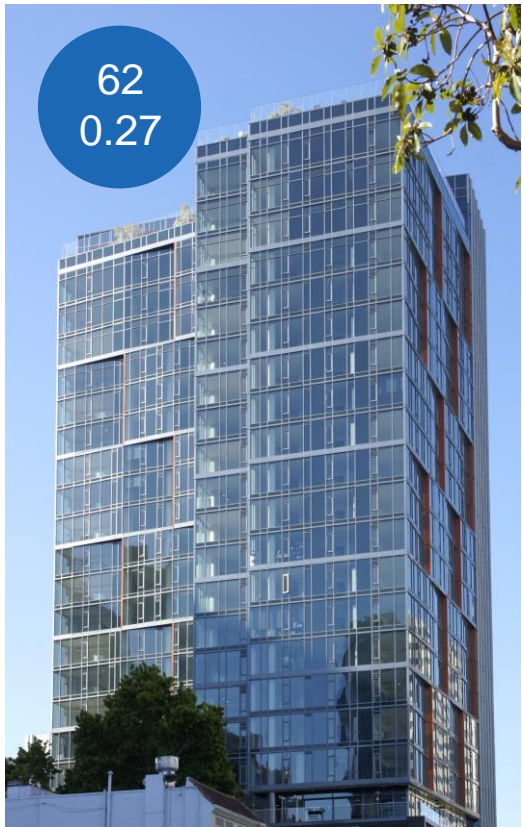
0.25

SNX
51/23

0.23

SNR
35

0.17



No
Coating

0.74

SN
68

0.38

SNX
62/27

0.27

SNE
50/25

0.25

SNX
51/23

0.23

SNR
35

0.17

KEEP BUILDINGS BRIGHT

Visible Light Transmission (VLT)

The percent of visible light that passes through glass

Can achieve up to 78% visible light transmission with low-E coatings

Photo © Bruce Damonte



KEEP BUILDINGS COMFORTABLE

Light to Solar Heat Gain Ratio (LSG)

Compares the amount of visible light transmitted to the SHGC

2:1 LSG ratio can be achieved with low-E coatings



GUARDIAN GOALS

Establish Long-term Relationships

- Be a trusted glass expert
- Stay engaged with projects from inception through procurement
- Provide relevant and timely information
- Collaborate with Glaziers and Fabricators
- **Specifications – Can help update older specs and incorporate Guardian Glass as approved**
- **Educate - Product training, how to properly view glass, expectations for installed façade**

Educate and Develop Key Industry Partners with Glaziers and Fabricators

- Continuous product training
- Dialogue on on-going and new projects
- Trusted glass resource
- Expand network

SNR 43 and SN 54



MARKET FOCUS - COMMERCIAL

Education / Healthcare / Institutional - 2023

- Significant part of overall commercial segment
- Earmarked and secured financing (less likely to be put on hold)
- Stable outlook
- Our product portfolio aligns with this segment (minimal gaps)
- Competition - no segment focus by other companies
- Profitability - less discounting than the larger projects and no imports due to release schedules
- Floor stock glass (no additional inventory)

Continued Focus

- High-Rise
- Low-Rise
- Education
- Office
- Retail
- Multi-Family
- Mix-Use
- Health Care
- Sporting Arenas



SNX 62/27 on Clear - Clemson University



SNR 43 on Clear - Huguley Hospital Patient Tower

ARCHITECTURAL STRATEGY

Implementation

- Find new projects!
- Project specific meetings – show value
- Pursuit and follow-up of all projects
- External project lead sources; Construct Connect, Business Journals, Industry Events, etc.
- Focus on collaborative approach
- Educational Seminars – AIA, Facades+, CSI
- Creative ways to capture audience and build relationships →



AIA PRESENTATIONS



“Making Glass Come to Life: The Principles of Glass Selection”

I would sincerely welcome the opportunity to conduct this accredited course at your office or via a MicroSoft® Teams meeting. Those in attendance would acquire one learning unit towards maintaining their AIA Membership. This course qualifies for **Health, Safety and Welfare** and **Sustainable Design** credit. The program number is GRD 12, provider # J535.

Presentation Overview:

The presentation reviews the foundations of glass selection and explores options for meeting both aesthetic and performance goals. Covering the glass manufacturing process and the basics of performance measurement, it also provides a comprehensive overview of float and coated glass choices—and related fabrication decisions—that can affect the final appearance of the glass façade.

Discussion points include:

- How all the parts of a glass façade work together to meet project vision and goals.
- Glass composition and low-E coatings affect aesthetics and performance.
- Identify important design considerations for glass substrates and low-E coatings.
- Recognize the ways fabricated glass can affect building aesthetics and performance.

In addition, there is a special focus on understanding the variety of performance coatings and customized glass fabrication options.

To schedule a presentation, contact Michael Mendoza at mmendoza2@guardian.com or 630-930-6834.

Guardian Glass is a global manufacturer of float glass, including the following value-added glass products: SunGuard® Advanced Architectural Glass, CrystalGray® and CrystalBlue® tinted float glass, Guardian UltraClear® low-iron float glass, SatinDeco® acid-etched glass and ShowerGuard® protective coating for shower doors. Guardian also makes heat-strengthened and fully tempered glass, laminated safety glass, patterned glass, and mirrors.

Visit GuardianGlass.com

See Guardian glass in some of the world's most innovative buildings. You can also compare products, obtain technical information, find a Guardian Select® Fabricator and order glass samples. Additional information regarding Guardian's AIA presentations can be found at www.guardianglass.com/us/en/tools-and-resources/library/continuing-education-units.

Michael Mendoza
Architectural Design Manager
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See what's possible™

2300 Harmon Road, Auburn Hills, Michigan 48326
1-866-GuardSG (482-7274)

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AIA/CES Program Presentation

“The Evolution of Architectural Glass & High Performance Coatings 2”

We would sincerely welcome the opportunity to conduct this accredited course at your office. Those in attendance would acquire one learning unit towards maintaining their AIA Membership. This course qualifies for **Health, Safety and Welfare** and **Sustainable Design** credit. The program number is GRD 4, provider # J535.

Discussion points include:

- A brief historical perspective of glass
- Glass defined
- Overview of glass manufacturing processes
- Coated glass technologies
- Market trends
- Energy metrics
- Simulated building model and energy costs savings - with a return on investment model
- Design considerations

Architectural Glass technology continues to evolve. This results in glass coatings which can provide immediate and longer-term energy costs savings for all types of commercial buildings. In addition, new products are being introduced, which can add further value. To schedule a presentation, contact Michael Mendoza at mmendoza2@guardian.com or 630-930-6834.

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AIA PRESENTATIONS



AIA CES Program Presentation

Bird-Friendly Glass Solutions: Understanding the Fundamentals of Safe Design

Guardian Glass welcomes the opportunity to conduct this accredited course at your office or via a Microsoft® Teams meeting. Those in attendance would acquire one Health, Safety and Welfare credit toward maintaining their AIA Membership.

Course #: 14
Provider #: J535

Presentation Overview

Architecture tells us a great deal about society. In fact, glass and glazing are used to blur the lines between inside and out, helping elevate performance and the experiences of people. Yet while humans can use environmental cues to identify glass as a barrier, there is growing realization that birds cannot.

The solution is bird-friendly glass that delivers on performance, energy efficiency and the needs of people. This course from Guardian Glass is intended to provide the basis for a better understanding of how to recognize issues affecting the bird population while learning about best practices and design fundamentals for smarter, safer buildings.

Upon completion of this course, participants will be able to:

- Recognize the basic behavioral patterns of birds
- Identify the four most common reasons that bird building collisions occur
- Investigate the different types of product testing
- Assess some available and emerging glazing solutions

To schedule a presentation, call 1.866.482.7374.

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Edward Caruso Photography

AIA CES Program Presentation

Glazing for Schools: Determining the right glass solution for your K-12 or higher education project

Guardian Glass welcomes the opportunity to conduct this accredited course at your office or via a Microsoft® Teams meeting. Those in attendance would acquire one Health, Safety and Welfare credit toward maintaining their AIA Membership.

Course #: 16
Provider #: J535

Presentation overview

Architects balance a wide variety of needs when designing a school. Educational spaces must promote learning and teaching, while also fostering holistic student wellbeing, enhancing comfort in any climate, addressing safety concerns and incorporating appealing aesthetics.

When selected intentionally, glass can enhance a school's functionality, user experience and energy efficiency. This course from Guardian Glass demonstrates the numerous ways glass can add value to school building projects, and shares design guidance to ensure a successful specification and result.

Upon completion of this course, participants will be able to:

- Recognize the unique design needs of education facilities
- Discuss the glass attributes that add value to education facilities
- Identify cost saving measures in the glass supply chain
- Specify a glazing unit to meet the specific needs of an education project
- Understand low-E glass selection for optimal performance and comfort
- Know the fabricated glass types and how they meet project goals for safety, acoustics and aesthetics

To schedule a presentation, call 1.866.482.7374.

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ONLINE RESOURCES

Our easy-to-use, online suite of engineering and analytic tools for glass can help you in planning your next project.

These tools demonstrate the advantages of high-performance glass in building facades:

- Sustainability Calculator
- **Performance Calculator**
- **Glass Visualizer**
- Building Energy Calculator
- BIM Generator

****Guardian Glazier Connection***

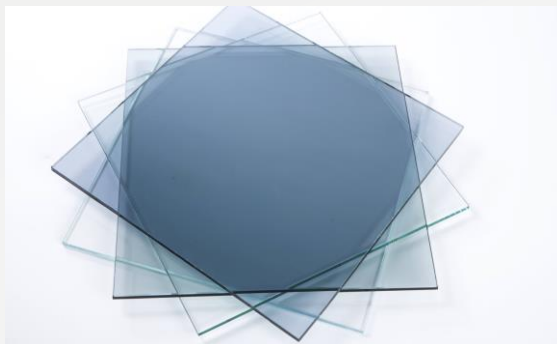
A Guardian Select Partner program that gives you powerful tools to help you build your business.



North American Products

Float Glass

- Clear
- Ultra Clear (Low-Iron)
- Gray
- CrystalGray
- Green
- ~~Crystal Blue~~



Low - E Coatings

- SNX 62/27
 - SNX 51/23
 - SN 68
 - SN 54
 - SNR 50
 - SNR 43
 - SNR 35
 - SNE 50/25
 - NU 78/65
 - ~~(AG 50)~~
 - ~~(AG 43)~~
 - ~~(NU 50)~~
 - ~~(NU 40)~~
 - ~~(Silver 20)~~
 - IS 20 (Interior Surface)
- Triple Silver
- Double Silver
- Single Silver

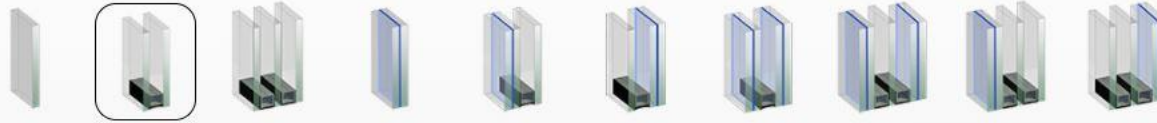
Product	Substrate Outboard-Inboard	Appearance	Visible Light				UV	SHGC	U-Value	Light to Solar Gain	SHGC	U-Value	Light to Solar Gain
			Transmittance %	Reflectance		Color Rendering Index	Transmittance %						
Coating #2 surface - except Neutral 78/65 on #3 surface													
			Out %	In %			Argon			Air			
SNX 62/27	Guardian UltraClear®	Ultra Clear	64	11	13	95.0	8	0.26	0.24	2.44	0.27	0.29	2.40
	Clear-Clear	Clear	62	11	12	93.0	6	0.26	0.24	2.36	0.27	0.29	2.31
	Green-Clear	Green	52	9	12	85.1	3	0.23	0.24	2.25	0.24	0.29	2.13
	CrystalGray-Clear	Light Gray	44	8	11	89.8	3	0.21	0.24	2.08	0.22	0.29	1.98
	Gray-Clear	Gray	31	6	11	90.7	3	0.17	0.24	1.83	0.18	0.29	1.71
SNX 51/23	Guardian UltraClear	Neutral Blue	53	14	14	94.2	13	0.23	0.24	2.34	0.23	0.29	2.27
	Clear-Clear	Neutral Blue	51	14	14	91.9	10	0.23	0.24	2.26	0.23	0.29	2.18
	Green-Clear	Blue-Green	43	11	13	84.1	5	0.20	0.24	2.12	0.21	0.29	1.99
	CrystalGray-Clear	Light Gray	36	9	13	88.8	6	0.18	0.24	1.96	0.20	0.29	1.85
	Gray-Clear	Gray	26	7	13	89.8	5	0.15	0.24	1.70	0.16	0.29	1.57
SNE 50/25	Guardian UltraClear	Blue-Silver	50	19	18	91.4	22	0.25	0.24	1.99	0.25	0.29	1.96
	Clear-Clear	Blue-Silver	48	19	18	88.9	17	0.25	0.24	1.95	0.25	0.29	1.90
	CrystalGray-Clear	Blue-Gray	34	12	17	86.0	9	0.20	0.24	1.71	0.21	0.29	1.62
SN 68	Guardian UltraClear	Ultra Clear	71	11	13	97.9	40	0.39	.245	1.82	0.39	0.29	1.80
	Clear-Clear	Clear	68	11	12	95.4	30	0.37	.245	1.82	0.38	0.29	1.80
	Green-Clear	Green	57	9	12	86.9	13	0.29	.245	1.99	0.30	0.29	1.92
	CrystalGray-Clear	Light Gray	48	8	11	92.1	17	0.29	.245	1.69	0.30	0.29	1.64
	Gray-Clear	Gray	34	6	11	93.2	14	0.24	.245	1.43	0.25	0.29	1.37
SN 54	Guardian UltraClear	Ultra Clear	56	15	21	97.6	21	0.28	0.24	1.98	0.29	0.29	1.95
	Clear-Clear	Clear	54	14	20	96.3	16	0.28	0.24	1.95	0.28	0.29	1.91
	Green-Clear	Green	46	11	19	88.2	7	0.23	0.24	1.99	0.24	0.29	1.89
	CrystalGray-Clear	Light Gray	39	9	19	93.5	9	0.22	0.24	1.75	0.23	0.29	1.67
	Gray-Clear	Gray	27	7	19	94.3	7	0.18	0.24	1.49	0.20	0.29	1.40
SNR 50	Guardian UltraClear	Light Silver	50	27	17	93.8	25	0.25	0.24	2.00	0.25	0.29	1.96
	Clear-Clear	Light Silver	48	26	17	91.3	19	0.25	0.24	1.96	0.25	0.29	1.91
	CrystalGray-Clear	Silver Gray	34	15	16	88.2	10	0.20	0.24	1.71	0.21	0.29	1.63
SNR 43	Guardian UltraClear	Light Silver	45	28	14	93.5	24	0.22	0.24	1.99	0.23	0.29	1.96
	Clear-Clear	Light Silver	43	28	14	91.1	17	0.22	0.24	1.94	0.23	0.29	1.89
	Green-Clear	Green	36	21	14	83.0	8	0.19	0.24	1.89	0.20	0.29	1.78
	CrystalGray-Clear	Silver Gray	31	16	14	87.9	9	0.18	0.24	1.68	0.19	0.29	1.59
	Gray-Clear	Silver Gray	22	11	13	89.2	8	0.15	0.24	1.41	0.17	0.29	1.31
SNR 35	Guardian UltraClear	Light Silver	34	36	20	92.1	15	0.16	0.24	2.09	0.17	0.29	2.03
	Clear-Clear	Light Silver	33	35	19	89.8	11	0.17	0.24	2.00	0.17	0.29	1.92
	Green-Clear	Green	28	26	19	81.9	10	0.15	0.24	1.80	0.17	0.29	1.67
	CrystalGray-Clear	Silver Gray	23	20	19	86.7	6	0.14	0.24	1.63	0.15	0.29	1.51

GUARDIAN RESOURCES - GLASS ANALYTICS

MAKE-UP: SN 68

RENAME

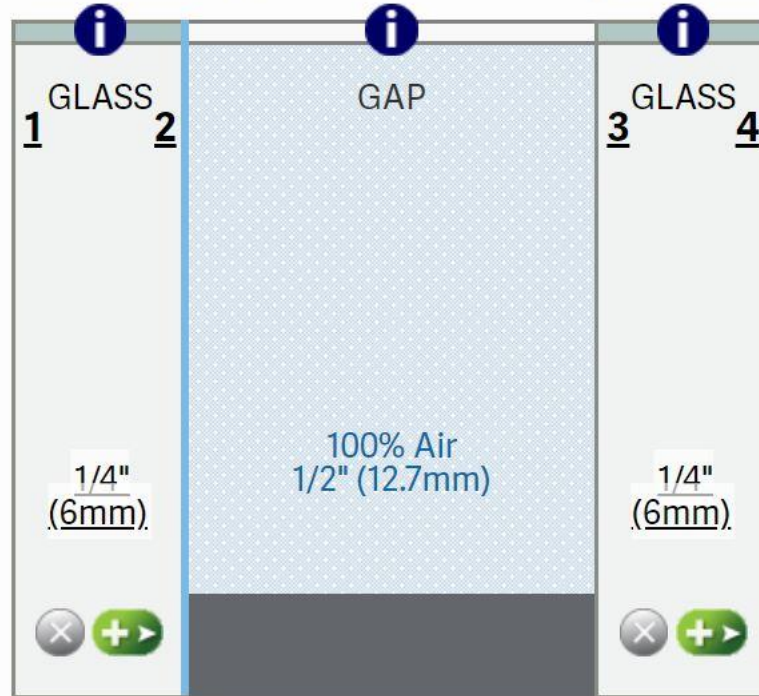
TYPE:



ADD NEW MAKE-UP

REGION: North America

Hover over  below to see make-up details.



outdoor side

indoor side

----- Total Nominal Thickness: 1 in -----
Estimated Nominal Glazing Weight: 5.75 lb/ft²

GUARDIAN RESOURCES - GLASS ANALYTICS

Lite Information

Surface 1	Guardian Clear Glass (North America) 1/4" (6mm)	Surface 2 SunGuard® SN 68 (North America)
Guardian North America Commercial		
<ul style="list-style-type: none"> None SunGuard® SNE 50/25 (North America) SunGuard® SNX 62/27 (North America) SunGuard® SNX 51/23 (North America) SunGuard® SNX-L 62/34 (North America) SunGuard® SNR 35 (North America) SunGuard® SNR 43 (North America) SunGuard® SNR 50 (North America) SunGuard® SN 68 (North America) SunGuard® SN-L 68 (North America) SunGuard® SN 54 (North America) SunGuard® AG 50 (North America) SunGuard® AG 43 (North America) SunGuard® Neutral 78/65 (North America) SunGuard® Neutral 50 (North America) 		

CLOSE

Low-e coating surface #2

Lite Information

Surface 1	Guardian Clear Glass (North America) 1/4" (6mm)	Surface 2 SunGuard® SN 68 (North America)
All		
All		
<ul style="list-style-type: none"> Guardian Green (Latin America)* PureVision (IGDB)* Guardian Clear Glass (North America) Guardian UltraClear® Glass (North America) Guardian CrystalBlue™ Glass (North America) Guardian CrystalGray® Glass (North America) Guardian Gray Glass (North America) Guardian Green Glass (North America) Guardian ExtraClear™ (Mexico)* Guardian MidnightGray™ Glass (North America)* Guardian PrivaGuard® Glass (North America)* Guardian SMG II Glass (North America)* Guardian SMG III Glass (North America)* 		

CLOSE

Outboard lite substrate

Lite Information

Ceramic Frit

<p>Color</p> <ul style="list-style-type: none"> <input type="radio"/> Ferro Black <input type="radio"/> Ferro Dark Gray <input type="radio"/> Ferro High Opacity Black <input type="radio"/> Ferro White <input type="radio"/> Translucent <input type="radio"/> Warm Gray 	<p>Frit Pattern</p> <ul style="list-style-type: none"> <input type="radio"/> Dots <input type="radio"/> Stripes <input type="radio"/> Holes
<p>Percent Coverage</p> <ul style="list-style-type: none"> <input type="radio"/> 40% <input type="radio"/> 50% <input type="radio"/> 60% <input type="radio"/> 100% (full coverage) 	
<p><input type="radio"/> <input type="text" value="40"/> % APPLY</p>	

CLOSE

Ceramic Frit / Spandrel



GUARDIAN RESOURCES - GLASS ANALYTICS



PERFORMANCE CALCULATOR

08.November.2021
 By Michael Mendoza
 mmendoza2@guardian.com 6309306834

New Project 05

Make-up Name	Make-up Icon	Visible Light			Solar Energy	Thermal Properties	
		Transmittance	Reflectance		Solar Heat Gain Coefficient (SHGC)	U-Value	
		Visible (τ_V %)	ρ_V % out	ρ_V % in		Winter Night (Btu/hr-ft ² -F)	Summer Day (Btu/hr-ft ² -F)
Solarban 60		70	11	13	0.39	0.29	0.27
SuperNeutral 68		68	11	12	0.38	0.29	0.28

Calculation Standard: NFRC 2010

GLASS ANALYTICS



Guardian SuperNeutral 68



Vitro Solarban 60

New SunGuard Coatings

SNE 50/25

SNR50

SNR35

SNE 50/25

- Low solar heat gain coefficient at 0.25
- Mid-exterior reflection at 19%
- 48% Tvis
- Subtle blue reflected color
- Ideal for warmer climates where solar control is a priority



SNE 50/25



Georgia State
Convocation Center –
Atlanta, GA

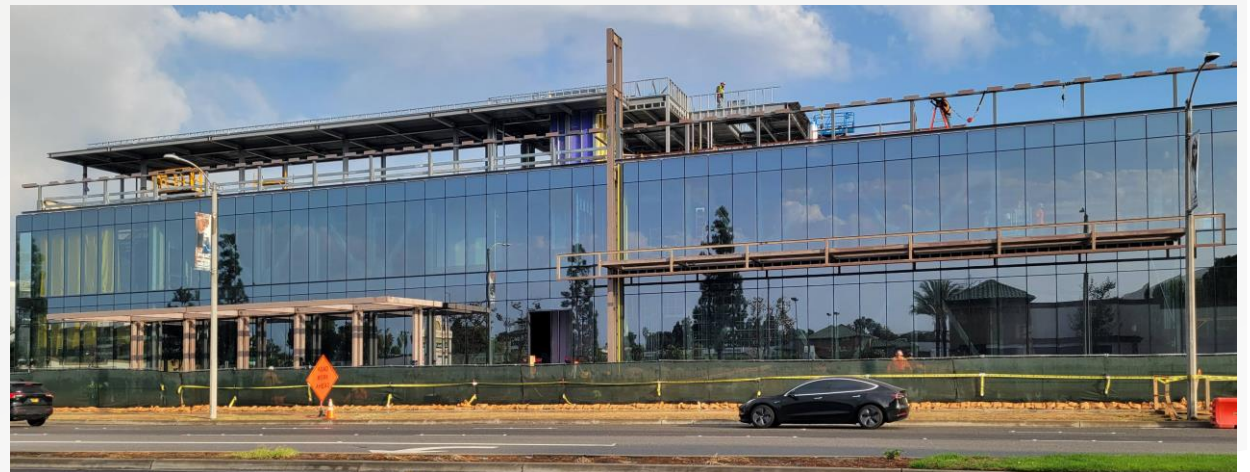


1000M

RENTAL RESIDENCES

SNR 50

- Low solar heat gain coefficient at 0.25
- Mid – high exterior reflection at 26%
- 48% Tvis
- Neutral / silver reflected color
- Ideal for warmer climates where solar control and privacy is a priority





SNR 35

- Extremely Low solar heat gain coefficient at 0.17
- High exterior reflection at 35%
- 33% Tvis
- “Crisp” silver reflected color
- Ideal for warmer climates where solar control and privacy is a priority



New Sample Viewing Boxes



Making Glass Safer for Birds

Guardian bird-friendly glass provides a range of options:



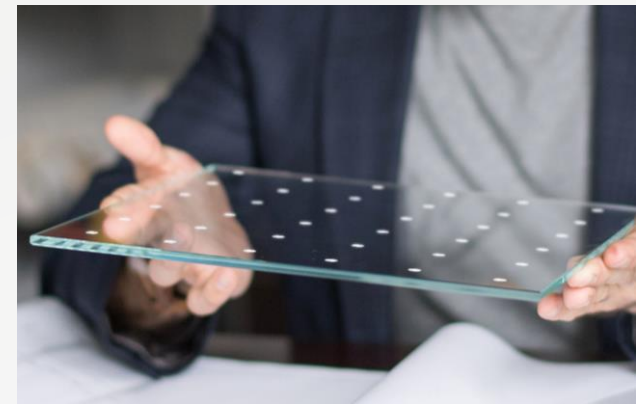
Guardian Bird1st™ UV

Helps limit bird collisions while leaving views clear and open.*



Guardian Bird1st™ Etch

Comes in four unique patterns.



Bird-friendly fritted glass

Lowest cost solution.

*The UV stripes are more pronounced when the glass is wet or when condensation forms. Surface residue can also make the stripes more visible.

Bird1st UV

DETAILS

SIZE

102" x 144" (maximum)

WARRANTY

10 years

THICKNESS

6mm

SAFETY

Heat-treated and laminated

OPTIONS

- Guardian UltraClear™ low-iron glass
- Standard clear glass



MAKEUP NAME	TRANSMITTANCE			REFLECTANCE			U-VALUE		Relative Heat Gain (RHG)	Solar Heat Gain Coefficient (SHGC)	Light To Solar Gain (LSG)
	Visible (τ_v %)	UV (τ_{UV} %)	Solar (τ_e %)	Visible ρ_v % out	Visible ρ_v % in	Solar ρ_e % out	Winter Night (Btu/hrft ² -F)	Summer Day (Btu/hrft ² -F)			
Bird1st with NU 78/65 (#5)	76	0	48	12	13	14	0.30	0.29	139	0.59	1.29
Bird1st with SN 68 (#4)	66	0	30	11	12	22	0.29	0.27	86	0.36	1.83
Bird1st with SNX-L 62/34 (#5)	63	0	25	12	12	27	0.28	0.27	92	0.38	1.65
Bird1st with SNX 62/27 (#4)	60	0	22	11	12	26	0.28	0.26	65	0.27	2.22

Bird1st Etch

Available SunGuard products

- SN 68 HT on clear and UltraClear
- SNX 62/27 HT on clear and UltraClear
- SNX 51/23 on HT clear and UltraClear
- 6mm thickness only
- Size 96x130



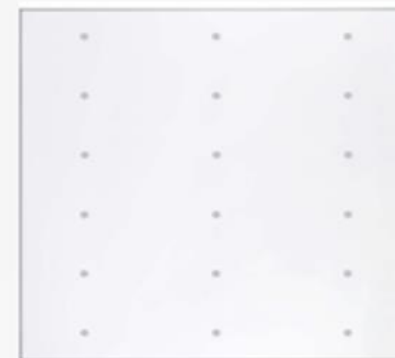
Pattern 11
Vertical



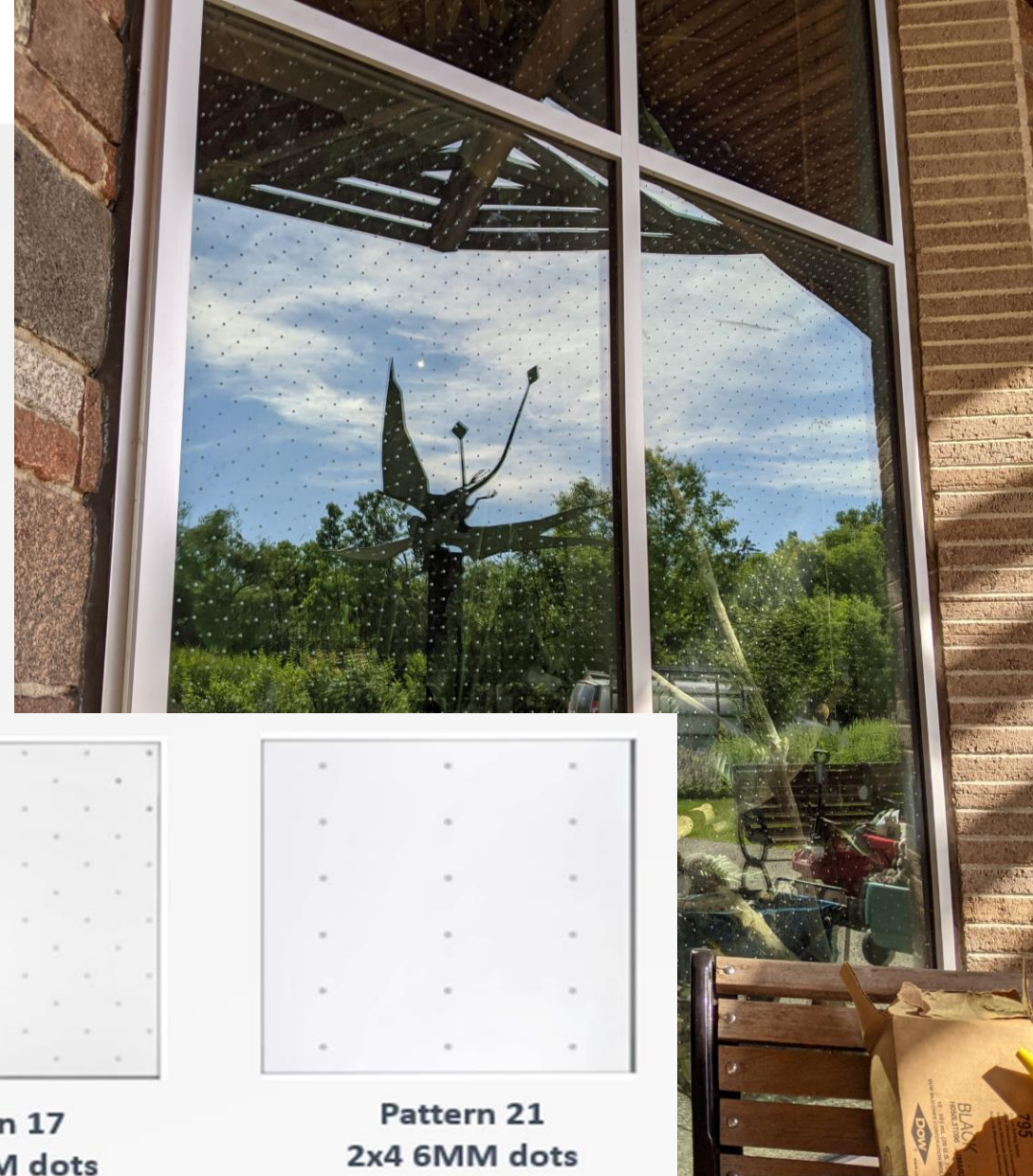
Pattern 13
Horizontal



Pattern 17
2x2 5MM dots



Pattern 21
2x4 6MM dots



GUARDIAN SUNGUARD – Bird1st Etch #1 + SNX 51/23 #2 on UltraClear

These photos highlight inspiring building designs and unique representations of our coatings – illustrating how glass can look different in a variety of settings



Architect: Flad
Glazier: SPS Corporation
Fabricator: Press Glass

Entry: Bird1st Etch #1 + SNX 62/27 Ultraclear #2; pattern 21 (2x4 dots)

Main façade: Bird1st Etch #1 + SNX 51/23 Ultraclear #2; pattern 21 (2x4 dots)

Online Resources

Our easy-to-use, online suite of engineering and analytic tools for glass can help you in planning your next project.

These tools demonstrate the advantages of high-performance glass in building facades:

- Sustainability Calculator
- **Performance Calculator**
- Glass Visualizer
- Building Energy Calculator
- BIM Generator





Please fill out form and return to:
<ADM Name>
<ADM Email>

Guardian Glass Project Lead Preferences Form (Page 1 of 2)

The Guardian® Architectural Design Team uses many avenues to identify qualified project opportunities in your market. Our goal is to provide you with project leads as soon as we find out about them, ideally in the pre-design and design phases so you have advance notice of new opportunities. As we acquire more information and awards are made, updated leads will go out for that opportunity.

We will provide email notification to you according to the project specific criteria you indicate in the enclosed form below. Please provide the following information to get signed up to our Guardian Leads Program:

Company Name:

Company Address:

Company Phone Number:

Lead recipient name, title, email:

Name	Title	Email
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>

For which states/provinces would you like leads for? Please highlight all that apply.

States: AK, AL, AR, AZ, CA, CO, CT, DC, DE, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MA, MD, ME, MI, MN, MO, MS, MT, NC, ND, NE, NH, NJ, NM, NV, NY, OH, OK, OR, PA, RI, SC, SD, TN, TX, UT, VA, VT, WA, WI, WV, WY

Provinces: AB, BC, MB, NB, NL, NS, ON, PE, QC, SK

What is your preferred size (glass sq/ft) of projects? Please put an "X" in all that apply.

- <10,000 10,000 – 49,999 50,000 – 99,999
 100,000 – 199,999 Greater than 200,000

Stronger Together

- Relationship is key
- Trusted resource - that will get you the information you need
- Project specific pricing to win competitive jobs
- Events – Where can we support you? Golf outings, CSI, etc.
- In person – Let's get together for project reviews, product updates, or customer assistance to better build the strong relationship

WE ARE HERE TO LISTEN AND HELP WHERE WE CAN

- What can Guardian do better?
- End of the day I want to be your glass “go-to” resource.



THANK YOU

Reece Poth– ADM

512.968.0119

reece.poth@guardian.com