

NGA GLASS CONFERENCE™ MILWAUKEE

AUGUST 6-8, 2024

NGA

NATIONAL GLASS ASSOCIATION with GANA



Ballot Participation

Committee Voting Protocol

Key takeaways:

- ONE voting member per company
- Miss voting on 3 ballots in a row → lose voting privileges for 3 months
- Negative votes: Provide suggested edit in your ballot comment

	Advocacy	GICC (Regulatory)	Fabricating	Forming (Flat Glass Mfrs ONLY)	Installing
Members may select activity status as indicated.	Voting Corresponding - no vote, but information is distributed to them for selected committees				
Member companies are required to ACTIVELY return ballots on time	Yes				
Operating Protocol	No	Yes	No	Yes	No
Voting/Balloting Each company shall have a primary and alternate voting member assigned	Yes	Yes	Yes	Yes	Yes
Number of votes per member company	ONE vote per company	ONE vote per company	ONE vote per company	ONE vote per company	ONE vote per company
Fee assessments	No	Yes	No	Yes	No
Voting/Balloting Period (duration) – Voting closes at 5 pm eastern time on closing day	21 business days				
Number of consecutively missed ballots per committee allowed after which loss of voting privileges on that committee will be in effect for three months <ul style="list-style-type: none"> • Repealed vote to be treated as corresponding member and get all notices and information from committee. • Request for vote to be returned to a member will be addressed by Committee Chair with approval by BOD and must be submitted in writing. A new voting member must be named. 	3	N/A	3	3	3
Voting Reminders (NGA to set up system to inform of ballot close) - only sent to those remiss	At 14 business days prior to closing of ballot At 7 business day prior to closing of ballot				
Minimum ballot response rate (of the voting members) for ballot validity.	66%	51% or 75% - See GICC Operating Protocol	66%	66%	66%
Threshold for approval of all committee ballots. Abstentions are removed from count for simple majority	simple majority (51%)		simple majority (51%)	simple majority (51%)	simple majority (51%)
Votes to be cast as one of the indicated choices. Negative votes must have comments. Comments must contain the following information to be considered: <ul style="list-style-type: none"> • Title of document being commented on • Direct and clear reference of material being rejected (paragraph, line, table number, figure number etc.) • Reason for rejection • Suggested language or changes required to resolve negative. • All properly submitted Negative comments from voting members must be considered. Other Negative comments (non-voting, submitted without suggested language for improvement, submitted without clear reference of material being rejected, etc.) may be taken up as new business or found non-persuasive at the discretion of the Chair. 	Approve Approve with Comment Negative with Comment Abstain				

New Coding System

for updated and republished Glass Technical Papers



Glass Technical Paper

FB30-11 (2019)

Proper Procedures for Receiving, Storage and Transportation of Flat Glass Mirrors



Glass Technical Paper

FB30-11 (2024)

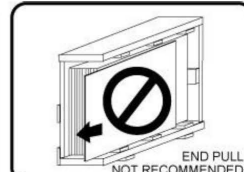
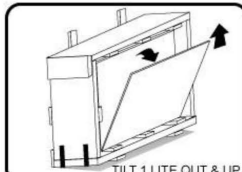
Proper Procedures for Receiving, Storage and Transportation of Flat Glass Mirrors

The purpose of this publication is to provide the latest available information to glass dealers, distributors and installers on the procedures recommended by the Mirror Division of the National Glass Association (NGA) for the proper receiving, storage and transportation of high-quality flat glass mirror products with the objective of helping preserve the integrity and prolonging the life of mirrors. Proper storage, handling, fabrication and good installation practices go a long way in reducing potential failures or damage to mirror quality.

Proper Procedures for Receiving, Storage and Transportation of Flat Glass Mirrors

Every time a mirror crate or an open mirror is moved, there is potential for damage. Therefore, the key to successful handling is to keep movements to a minimum. Plan your storage in an efficient manner. Use proper handling techniques and equipment. Ship wisely. Review the suggestions below and compare them to your present practices.

1. The very first step in maintaining mirror integrity is to check shipments upon arrival. If there appears to be moisture present, the mirrors should be unpacked and allowed to dry using a separating technique. Moisture can attack the backing or stain the face of a glass over a period of time.
2. Be sure that your mirror storage areas are in dry, adequately ventilated spaces. Do not store mirrors in areas of high humidity, where exposed to chemical fumes, or near high heat such as steam or water pipes. These conditions can cause deterioration of the mirror edges, backing, or surface staining.
3. Mirrors should be unpacked as soon as possible to allow moisture caused by condensation to dissipate; especially if the mirrors have been subject to temperature changes during shipment.
4. Store mirrors vertically, but it is not recommended to pull mirrors from the ends of the case. Do not lay mirrors flat. Glass exhibits more strength, fewer strains when stored vertically.



Republished with NO technical changes

Updated with technical changes



Glass Technical Paper

FB06-05 (2019)

Proper Procedures for Cleaning Flat Glass Mirrors

Mirrors provide both functional and aesthetic performance in the interior design for today's homes, office buildings, schools, medical and institutional facilities. In addition to the function of providing reflected images, mirrors are being used to move natural light further into buildings and enhance the openness of rooms. Proper cleaning procedures must be followed to ensure the long-term performance of mirrors.



Glass Technical Paper

FB06-24

Proper Procedures for Cleaning Flat Glass Mirrors

Mirrors provide both functional and aesthetic performance in the interior design for today's homes, office buildings, schools, medical and institutional facilities. In addition to the function of providing reflected images, mirrors are being used to move natural light further into buildings and enhance the openness of rooms. Proper cleaning procedures must be followed to ensure the long-term performance of mirrors.

Care and Cleaning of Mirrors

Many people are unaware of how to properly care for and clean the mirrors in their homes and offices. Many cleaning products make claims to be the best for mirrors. The truth is the care and cleaning of mirrors is simple and inexpensive. Care should always be taken to avoid getting the edges of the mirror wet with any liquid or substance. This can result in damage to the mirror edges, commonly called "black edge". Should mirror edges become wet, they should be dried off immediately.

The following are recommendations from manufacturers of quality mirrors:

Do's:

- Do use clean, warm water with a soft, lint-free cloth to clean the mirror. Wring all water from the cloth before wiping the mirror. Dry the mirror immediately with a dry lint-free cloth.
- Do use 0000 oil-free steel wool, not solvents, to remove surface marks or stubborn dirt. Use of solvents can attack and damage the edges and backing of mirrors.
- Do use soft, lint and grit free cloths to clean a mirror. This reduces the chances of scratching the mirror surface.
- Do make sure all joints and edges are dry so that no liquid or cleaner comes into contact with the edges and backing.

Don'ts:

- Don't use acid or alkali cleaners for mirror cleanup after installation. Either substance can attack the front surface and edges as well as the backing of the mirror. No abrasive cleaners should ever be used on any mirror surface.
- Don't spray cleaners directly on the mirror. Always apply cleaner directly to a soft, lint-free cloth and then wipe the mirror. This will help prevent the cleaner from contacting the edges of the mirror and damaging them.
- Don't clean across the face of multiple mirrors at the same time. When cleaning several mirrors installed on a wall, wipe the joints in the same direction as the joints. This will keep the cleaner from collecting in the area where the mirrors join.
- Don't use commercial mirror cleaners that contain ammonia or vinegar.

Toll Free (866) 342-5642 • (703) 442-4890 ext. 178
www.glass.org

Laminated ASTM International Standards – Ballot Activity

- C14 Glass
 - **C1172-24** – [Standard Specification for Laminated Architectural Flat Glass](#); published 2 -3 mos.
 - **C1900-24** – [Standard Practice for Weathering and Evaluation of Laminated Glass](#); published 2 – 3 mos.
- E06 Buildings
 - **E2353** – [Standard Test Methods for Performance of Glazing in Permanent Railing Systems, Guards, and Balustrades](#) (OFB - 9/2/24 close)
 - **E2358** – [Standard Specification for Performance of Glazing in Permanent Railing Systems, Guards, and Balustrades](#) (OFB - 9/2/24 close)
 - **WK59324** [Standard Guide for Design of Glass Railings, Guards and Balustrades](#) (OFB - 9/2/24 close)
 - **WK63025** [Design and Performance of Laminated Glass Subject to Hydrostatic Loads](#); published 2 – 3 mos.
 - **WK80563** [Practice for Effective Thickness Determination of Laminated Glass Performance](#); (RTB)
 - **WK86120** [Guide for Architectural and Structural Use of Glass](#) (RTB)

Laminated ASTM International Standards – Ballot Activity Cont...

- F12 - Security
 - **F1233** – **Standard Test Method for Security Glazing Materials And Systems** current – modifications planned
 - **F2912-17** **Standard Specification for Glazing and Glazing Systems Subject to Airblast Loadings** (under revision)
 - **F3006** **Standard Specification for Ball Drop Impact Resistance of Laminated Architectural Flat Glazing** [WK90185](#) (OFB closes 8/23/24)
 - **F3007** **Standard Test Method for Ball Drop Impact Resistance of Laminated Architectural Flat Glass** [WK90172](#) (OFB closes 8/23/24)
 - **F3279** – **Standard Test Method for Ballistic-Resistant Security Glazing Materials** NEW! Just Published!
 - **F3561** – **Standard Test Method for Forced-Entry-Resistance of Fenestration Systems After Simulated Active Shooter Attack** On ballot (8/23/24 close)

Laminated Glass Quality Parameter Review

- Dimensional Tolerances
- Length and Width and Offset
- Standards
 - ASTM C1172-24
 - EN ISO 12543- 5
 - AS/NZS 4667



ASTM C1172

Glass thickness	Transparent Glass	Patterned	Heat-Strengthened/FT
≤6 mm	+4, -1.6	+7.9, -3.2	+5.6, -2.4
≤12	+6.4, -1.6	+7.9, -3.2	+6.4, -3.2
≤25	+6.4, -3.2	+7.9, -3.2	+7.9, -3.2

EN ISO 12543-5

Glass Dimension	≤8 mm Lam	>8 mm (each pane <10 mm)	>8 mm (at least one pane ≥ 10 mm)
≤2000 mm (79 in.)	+3, -2	+3.5, -2	+5 -3.5
≤3000 mm (118 in.)	+4.5, -2.5	+5, -3	+6, -4
>3000 mm (118 in.)	+5, -3	+6, -4	+7, -5

Glass specification tolerance plus:

0.1 mm additional tolerance for interlayer ≤2 mm

0.2 mm additional tolerance for interlayer >2 mm

±3 mm for strengthened HS or FT glass

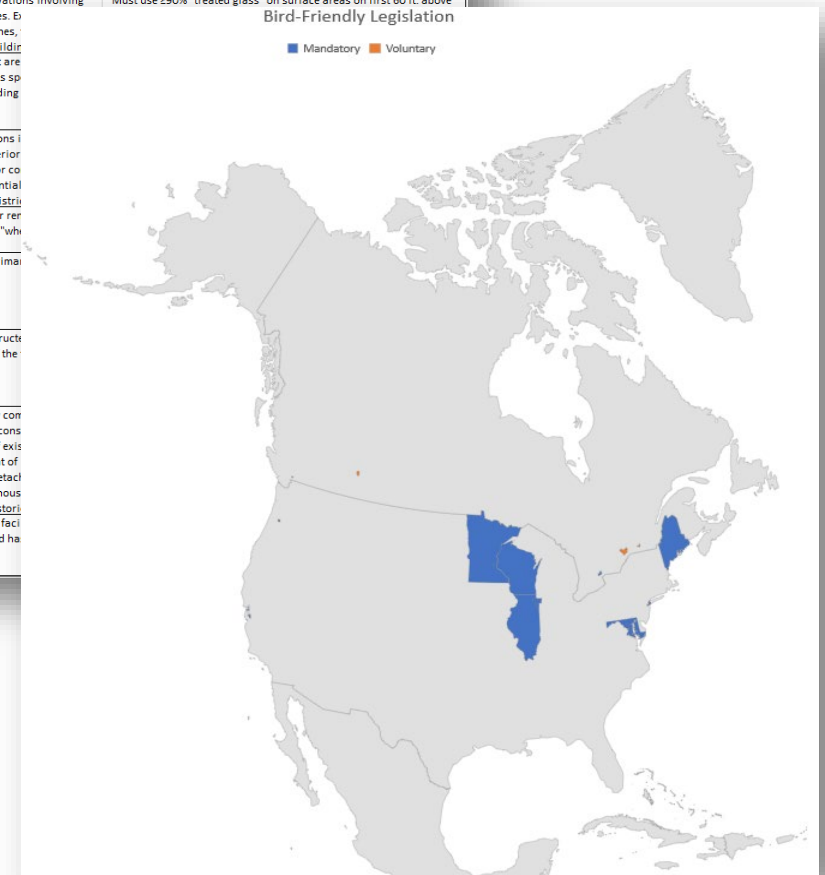
AS/NZS 4667

Glass Dimension	Tolerance (mm)	Glass thickness (mm)	Tolerance (mm)	Glass Thickness (mm)
	Laminated		Patterned Laminated	
<1200	±2	ALL	±3	3,4,5,6
			±4	8,10,12
≥1200	±2	<10	±4	<8
≥1200	±3	≥10	±5	≥8

Bird-Friendly Legislation

- Members-only resource for bird-friendly policy tracking
- State, date, voluntary/mandatory status, summary of policy, etc.
- Updated weekly by NGA

US & CAN Bird-Friendly Building Policies							
Jurisdiction	City	Year	Name	Mandatory or Voluntary	What structures does the policy apply to	What portion of each structure must be "bird-friendly"?	
California, USA	Emeryville, CA	2020	Emeryville Municipal Code 9-4.8 Bird-Safe Buildings	Mandatory	Projects that require a building permit and that are new construction involving new glass or other rigid transparent materials, replacements of any window, glass door or other rigid transparent materials, or glass structures (e.g., greenhouses, wind barriers,	>90% of glazing must be bird-friendly on any window or contiguous glazed segment (area within mullions and/or frames) with an area of ≥12 sq. ft.	
California, USA	Cupertino, CA	2021	Chapter 19.102 Glass and Lighting Standards	Mandatory	New construction and renovations involving glass or transparent features. E	Must use 290% "treated glass" on surface areas on first 60 ft. above	
District of Columbia, USA	Washington DC	2017	2017 District of Columbia Green Construction Code	Voluntary	Projects ≥ 10,000 sq. ft. that are construction or classified as sp alteration by the city's building	Bird-Friendly Legislation	
District of Columbia, USA	Washington DC	2023	D.C. Law 24-337 Migratory Local Wildlife Protection Act of 2022	Mandatory	New construction, renovations i replacement of >75% of exterior bird-hazard installations for co buildings, multi-unit residential institutional facilities, or Distri		
Illinois, USA	Forest Preserve District of Cook County, IL	2008	Forest Preserve District Code 1-16-3 "Bird-Safe Building Materials"	Mandatory	New construction and major rer projects; existing buildings "wh		
Illinois, USA	Highland Park, IL	2020	Highland Park Code of Ordinances, Sec. 170.126 Bird-Friendly Construction Requirements	Mandatory	New buildings to be used prima		
Illinois, USA	State of Illinois	2021	Public Act 102-0119 (HB0247)	Mandatory	State buildings newly constructs for which more than 50% of the substantially altered.		
Illinois, USA	Evanston, IL	2022	Bird-Friendly Building Design Guide	Mandatory	Planned developments, new con multifamily and industrial cons projects and renovations of exis that include the replacement of exterior glazing. Excludes detacl two-family dwellings, townhous residential buildings of ≤3 stori		
Illinois, USA	Lake County, IL	2024	Bird-Friendly Building Design Policy for Lake County Facilities	Mandatory	All Lake County government faci which the Lake County Board ha		



Statement on Argon and Gas-Filled Insulating Glazing Units

Many insulating glass units (IGUs) used in window applications contain argon or other gas fills which, over time, can leak and/or dissipate from the IGU.

The National Glass Association (NGA) does not have a position nor a published document on insulating glass window longevity related to retention of argon or other gas fills.

NGA recommends referring to the window manufacturer guidelines for information on insulating window gas retention, window longevity and warranty information.

Specifications task group

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The industry's most trusted specification content and cloud-based editing tools.



Task Group Review Complete:

- Security Glazing
- Mirror
- Decorative

Under Peer Review:

- Fire-Rated
- 088000 General Glazing

Education Ideas:

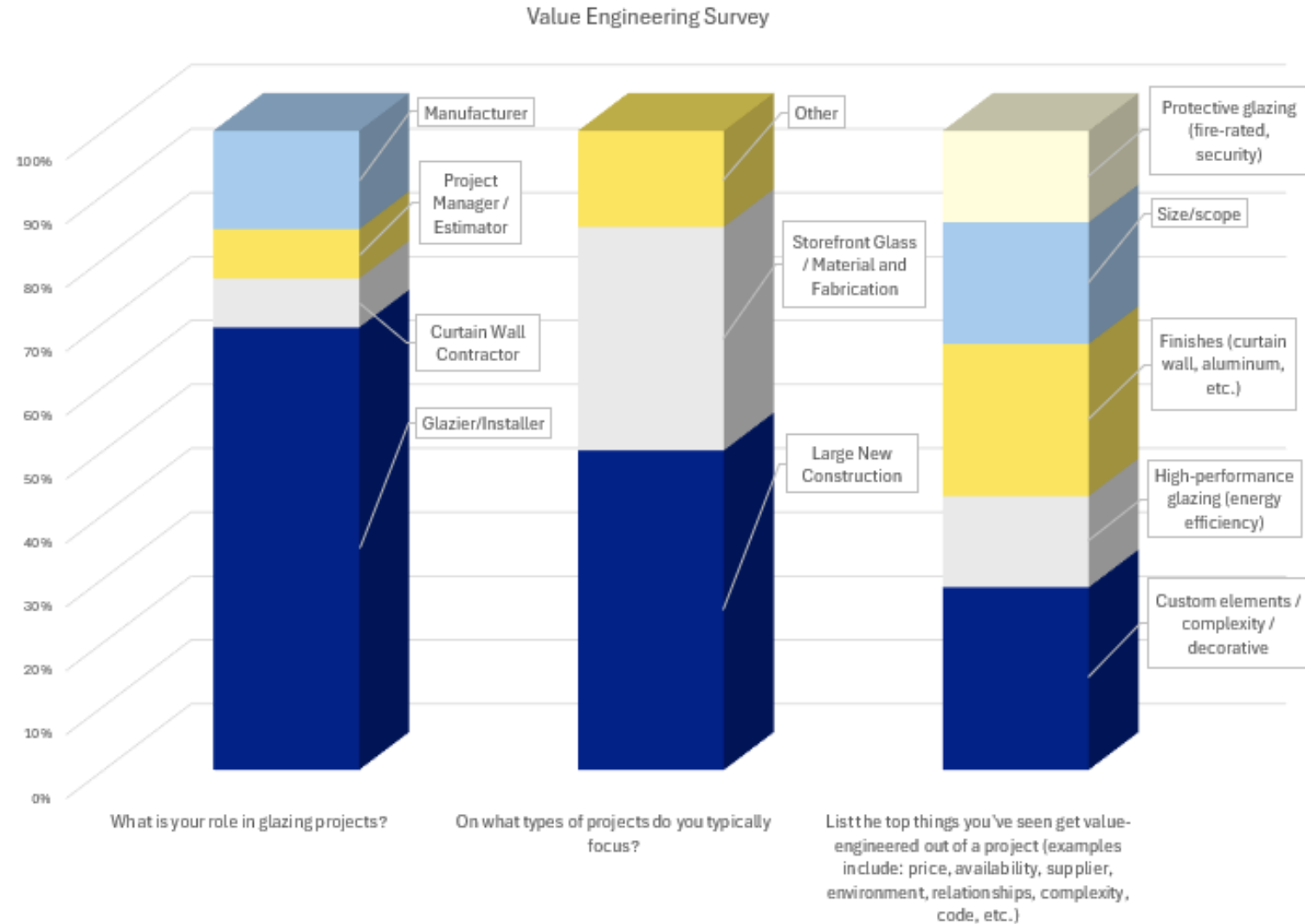
- Spec Writing for Security Glazing as an article and/or presentation for architects
- Potential spec issues for glaziers (areas of the template that may cause issues, such as disconnect between product construction and tests specified)

Up Next for Task Group Review:

- Curtainwall
- Storefront

Value Engineering Survey Results

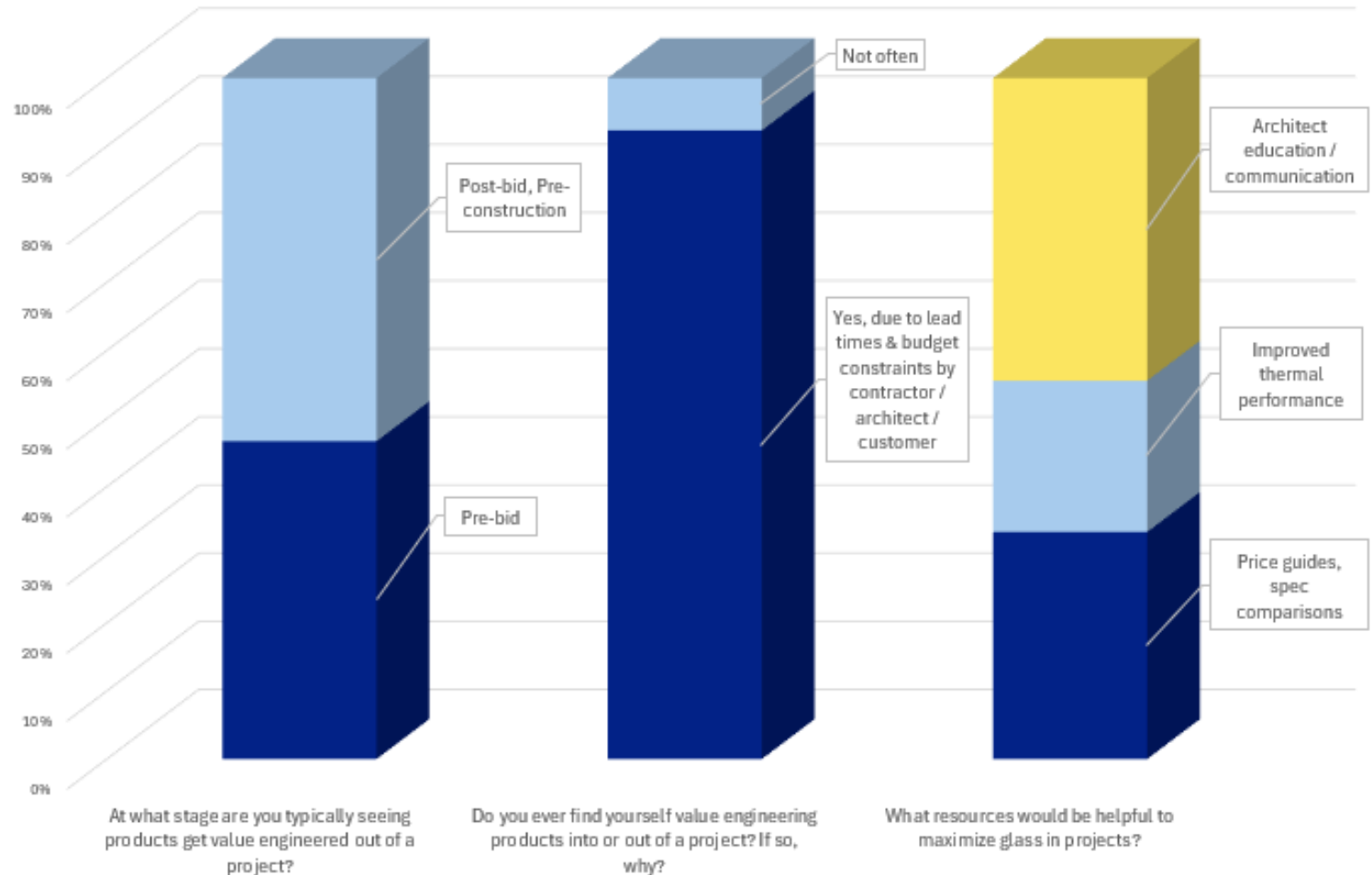
- What is your role in glazing projects?
- On what types of projects do you typically focus?
- List the top things you've seen get value-engineered out of a project.



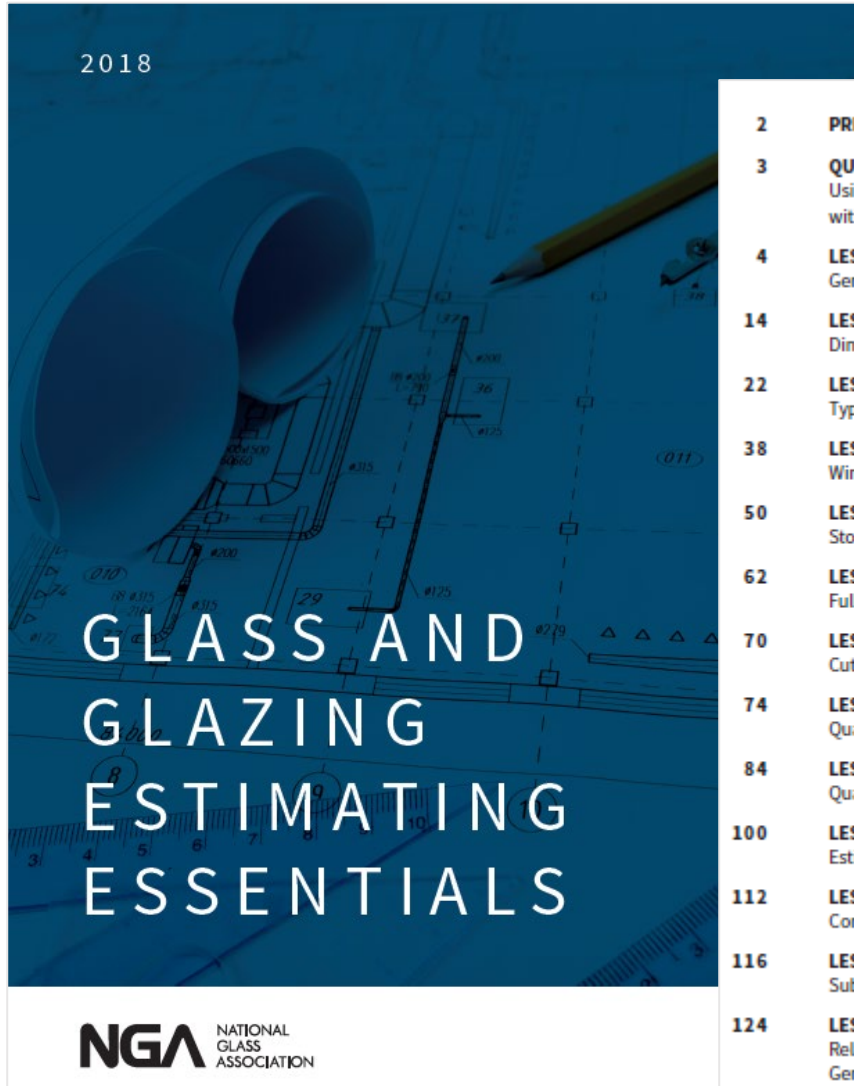
Value Engineering Survey Results

- At what stage are you typically seeing products get value engineered out of a project?
- Do you ever find yourself value engineering products into or out of a project? If so, why?
- What resources would be helpful to maximize glass in projects?

Value Engineering Survey



Glass & Glazing Estimating Essentials Manual



2	PREFACE & ACKNOWLEDGEMENTS
3	QUICK GUIDE Using the Glass & Glazing Estimating Essentials Manual with your MyGlassClass.com Courses
4	LESSON 01 General Description of a Set of Plans
14	LESSON 02 Dimensions, Angles and Scales
22	LESSON 03 Types of Glass and Setting Methods
38	LESSON 04 Windows, Sealants and Plan Abbreviations
50	LESSON 05 Storefront Metal
62	LESSON 06 Fully Tempered Glass Doors
70	LESSON 07 Cutting of Glass, Edgework & Glass Processing
74	LESSON 08 Quantity Survey
84	LESSON 09 Quantity Takeoffs
100	LESSON 10 Estimating Labor
112	LESSON 11 Completing the Estimate
116	LESSON 12 Submitting a Bid
124	LESSON 13 Relationships between the Architect, Owner, General Contractor and Glazing Contractor

Frameless Shower Resources



Task Group Chair
Danny Donahue, FHC



- Consumer One-Pager- Visual Diagram
 - Manage expectations for water leakage, design considerations
 - Cleaning glass and hardware
- Live Action Videos
 - Brief clips demonstrating specific installation issues
- Guide to Building Codes
 - ADA
 - Plumbing
 - Electrical

New NGA Event in Spring 2026

NGA Glass Conference

- Technical programming
- Committee Work
- Networking

Glass Processing Automation Days (GPAD)

- Glass factory innovation and resulting business decisions
- Typically attended by business owners, factory managers and engineers