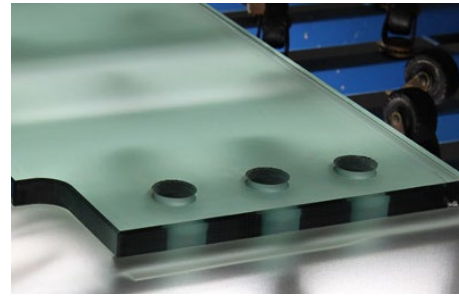


# National Glass Association

NGA is a not-for-profit trade association, and the only national trade association serving the entire glass and glazing industry.



PRIMARY GLASS  
MANUFACTURERS



FABRICATORS



GLAZING CONTRACTORS  
& FULL-SERVICE GLASS  
COMPANIES



SUPPLIERS

## NGA's Vision

We envision a future in which glass is the material of choice to enhance spaces where people live, play, learn and work.

# Balancing the Many Functions of Glazing

## Controlled Environment

- Weather protection
- Ventilation
- View
- Daylighting
- Fade resistance
- Energy efficiency
- Thermal comfort
- Solar gain
- Acoustics
- Privacy
- Human health
- Safety
- Structural protection
- Security
- Fire
- Egress



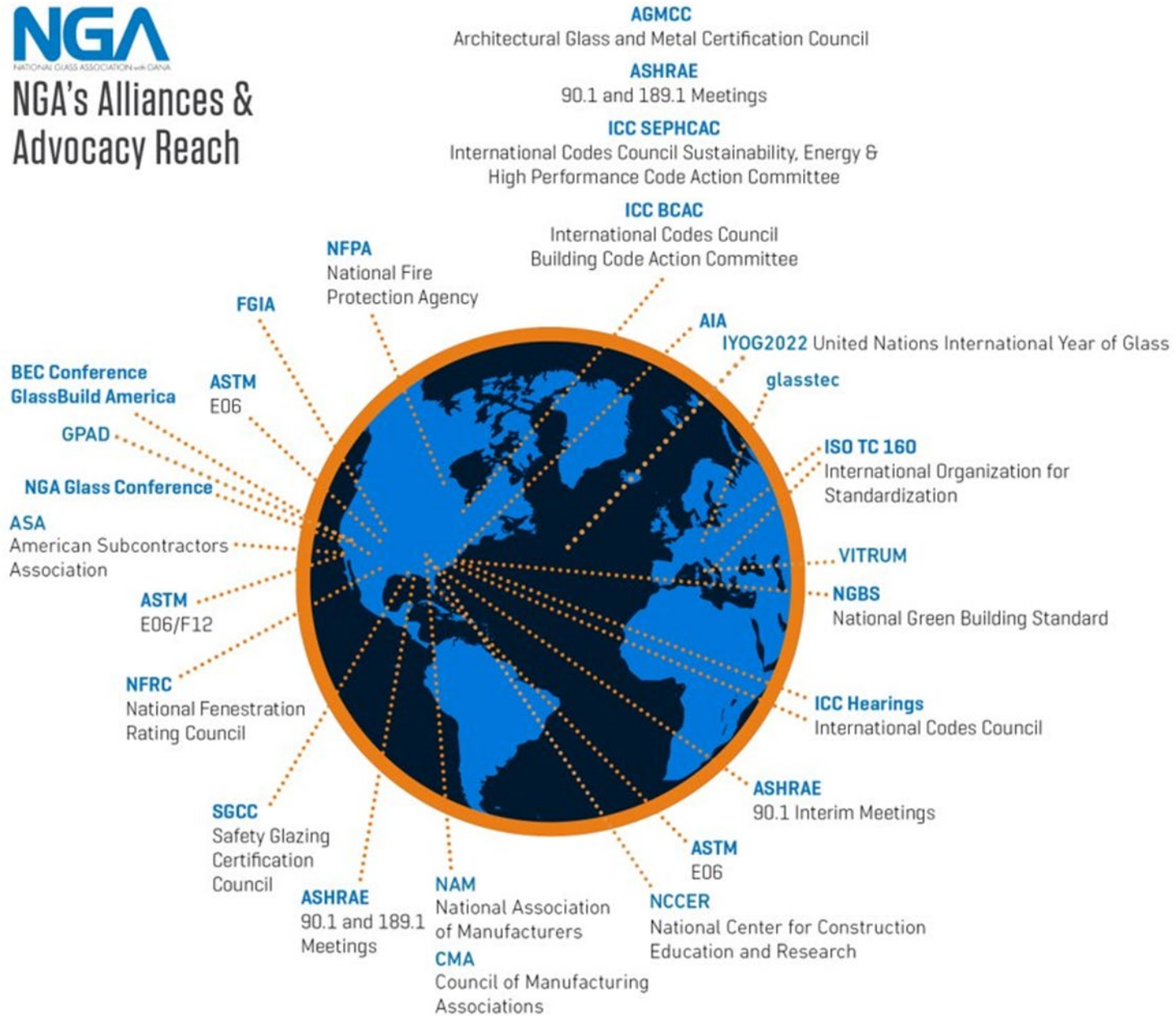
## Many Types

- Clear, low-iron, tint
- Low-e
- Heat treated
- Laminated
- Insulating
- Vacuum Insulated Glazing
- Thin glass
- Electrochromic, thermochromic
- Photovoltaic
- Decorative
- Patterned, fritted, etched
- Applied films



NATIONAL GLASS ASSOCIATION with GANA

# NGA's Alliances & Advocacy Reach





# NGA's Advocacy & Technical Services Team



- Urmilla Sowell – MSCE, PE – 24 years
  - Karen Wegert – MS ChE – 23 years
  - Georgia Scalfano – BSCE, EIT – 7 years
  - Amber Johnson – B.A.Com. – 9 years
  - Tom Culp – PhD ChE – 27 years
  - Thom Zaremba – JD/Litigation Attorney – 47 years glass/glazing codes
  - Nick Resetar – JD/Litigation Attorney – 15 years
  - Nicole Harris – Board Member, Council of Manufacturing Associations/NAM – 34 years
- \*William Koffel – P.E., FSFPE – 44 years

*Top row: Urmilla Sowell, Karen Wegert, Georgia Scalfano, Amber Johnson  
Bottom row: Tom Culp, Thom Zaremba, Nick Resetar, Nicole Harris*



# ASTM Update

[sales@astm.org](mailto:sales@astm.org)  
877-909-ASTM  
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ASTM INTERNATIONAL  
Helping our world work better

## ASTM Glass and Glazing Standards for the Building Industry

Co-published with  
National Glass Association

Get 96 key standards that span several Book of Standards volumes and ASTM committees.

This is a comprehensive resource co-published by ASTM International and National Glass Association encompassing the most widely used and referenced standards developed for the fenestration industry. Built for architects, engineers, specifiers, manufacturers and everyone in the building envelope industry to have one resource offering standard test methods, guides, practices and specifications that govern the glass and glazing industry.

#### Content includes:

- Forced-entry resistant systems
- Glass
- Flat glass
- Glazing
- Building seals and sealants
- Environmental acoustics
- Fenestration products

The compilation includes two new standards for forced-entry resistant systems developed by the members of ASTM Committee F12.10 on Systems Products and Services.



#### Annual Digital Subscription

Includes redlines and historical standards.

Price: [Contact Sales](#)

Stock#: SUB-GLASSCMP

**NGA**  
NATIONAL GLASS ASSOCIATION with GANA

For more information: [sales@astm.org](mailto:sales@astm.org) | +1.877.909.ASTM

# ASTM Update – C14 Glass and Glass Products

C0162	C14.01	Standard Terminology of Glass and Glass Products
C0158	C14.04	Standard Test Methods for Strength of Glass by Flexure (Determination of Modulus of Rupture)
C1256	C14.04	Standard Practice for Interpreting Glass Fracture Surface Features
C1036	C14.08	Standard Specification for Flat Glass
C1048	C14.08	Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass
C1172	C14.08	Standard Specification for Laminated Architectural Flat Glass
C1279	C14.08	Standard Test Method for Non-Destructive Photoelastic Measurement of Edge and Surface Stresses in Annealed, Heat-Strengthened, and Fully Tempered Flat Glass
C1349	C14.08	Standard Specification for Architectural Flat Glass Clad Polycarbonate
C1376	C14.08	Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass
C1422/C1422M	C14.08	Standard Specification for Chemically Strengthened Flat Glass
C1464	C14.08	Standard Specification for Bent Glass
C1503	C14.08	Standard Specification for Silvered Flat Glass Mirror
C1900	C14.08	Standard Practice for Weathering and Evaluation of Laminated Glass
C1901-21e2	C14.08	Standard Test Method for Measuring Optical Retardation in Flat Architectural Glass
C1908	C14.08	Standard Test Method for Pummel Adhesion Testing of Two-ply Laminated Architectural Glass
C1914	C14.08	Standard Test Method for Bake and Boil Testing of Laminated Glass
C0724	C14.10	Standard Test Method for Acid Resistance of Ceramic Decorations on Architectural-Type Glass
C1649	C14.11	Standard Practice for Instrumental Transmittance Measurement of Color for Flat Glass, Coated and Uncoated
C1650	C14.11	Standard Practice for Instrumental Reflectance Measurement of Color for Flat Glass, Coated, and Uncoated
C1651	C14.11	Standard Test Method for Measurement of Roll Wave Optical Distortion in Heat-Treated Flat Glass
C1652/C1652M	C14.11	Standard Test Method for Measuring Optical Distortion in Flat Glass Products Using Digital Photography of Grids

# ASTM Update – C24 Building Seals and Sealants

## C28 Advanced Ceramics

C0717	C24.01	Standard Terminology of Building Seals and Sealants								
C0920	C24.10	Standard Specification for Elastomeric Joint Sealants								
C1193	C24.10	Standard Guide for Use of Joint Sealants								
C1249	C24.10	Standard Guide for Secondary Seal for Sealed Insulating Glass Units for Structural Sealant Glazing Applications								
C1281	C24.10	Standard Specification for Preformed Tape Sealants for Glazing Applications								
C1369	C24.10	Standard Specification for Secondary Edge Sealants for Structurally Glazed Insulating Glass Units								
C1392	C24.10	Standard Guide for Evaluating Failure of Structural Sealant Glazing								
C1394	C24.10	Standard Guide for In-Situ Structural Silicone Glazing Evaluation								
C1401	C24.10	Standard Guide for Structural Sealant Glazing								
C1564	C24.10	Standard Guide for Use of Silicone Sealants for Protective Glazing Systems								
C1087	C24.20	Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems								
C1265	C24.30	Standard Test Method for Determining the Tensile Properties of an Insulating Glass Edge Seal for Structural Glazing Applications								
C0864	C24.73	Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers								
C1115	C24.73	Standard Specification for Dense Elastomeric Silicone Rubber Gaskets and Accessories								
	C 28 Standards									
C1678	C28.03	Standard Practice for Fractographic Analysis of Fracture Mirror Sizes in Ceramics and Glasses								



# ASTM Update – D20 Plastics; E05 Fire Standards E06 Performance of Buildings

D0635	D20.30	Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position					
D1435	D20.50	Standard Practice for Outdoor Weathering of Plastics					
E0119	E05.11	Standard Test Methods for Fire Tests of Building Construction and Materials					
E0084	E05.22	Standard Test Method for Surface Burning Characteristics of Building Materials					
E0546	E06.22	Standard Test Method for Frost/Dew Point of Sealed Insulating Glass Units					
E0576	E06.22	Standard Test Method for Frost/Dew Point of Sealed Insulating Glass Units in the Vertical Position					
E2141	E06.22	Standard Test Method for Accelerated Aging of Electrochromic Devices in Sealed Insulating Glass Units					
E2188	E06.22	Standard Test Method for Insulating Glass Unit Performance					
E2189	E06.22	Standard Test Method for Testing Resistance to Fogging in Insulating Glass Units					
E2190	E06.22	Standard Specification for Insulating Glass Unit Performance and Evaluation					
E2269	E06.22	Standard Test Method for Determining Argon Concentration in Sealed Insulating Glass Units using Gas Chromatography					
E2649	E06.22	Standard Test Method for Determining Argon Concentration in Sealed Insulating Glass Units Using Spark Emission Spectroscopy					
E1186	E06.41	Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems					



# ASTM Update – E06 Performance of Buildings

E0283	E06.51	Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
E0330/E0330M	E06.51	Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
E0331	E06.51	Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
E0547	E06.51	Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference
E0783	E06.51	Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors
E0987	E06.51	Standard Test Methods for Deglazing Force of Fenestration Products
E0997	E06.51	Standard Test Method for Evaluating Glass Breakage Probability Under the Influence of Uniform Static Loads by Proof Load Testing
E0998	E06.51	Standard Test Method for Structural Performance of Glass in Windows, Curtain Walls, and Doors Under the Influence of Uniform Static Loads by Nondestructive Method
E1233/E1233M	E06.51	Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls by Cyclic Air Pressure Differential
E1300	E06.51	Standard Practice for Determining Load Resistance of Glass in Buildings
E1424	E06.51	Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure and Temperature Differences Across the Specimen
E1425	E06.51	Standard Practice for Determining the Acoustical Performance of Windows, Doors, Skylight, and Glazed Wall Systems
E1886	E06.51	Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials
E1996	E06.51	Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes
E2025	E06.51	Standard Test Method for Evaluating Fenestration Components and Assemblies for Resistance to Impact Energies
E2112	E06.51	Standard Practice for Installation of Exterior Windows, Doors and Skylights
E2268	E06.51	Standard Test Method for Water Penetration of Exterior Windows, Skylights, and Doors by Rapid Pulsed Air Pressure Difference
E2319	E06.51	Standard Test Method for Determining Air Flow Through the Face and Sides of Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
E2395	E06.51	Standard Specification for Voluntary Security Performance of Window and Door Assemblies with and without Glazing Impact
E2431	E06.51	Standard Practice for Determining the Resistance of Single Glazed Annealed Architectural Flat Glass to Thermal Loadings
E2461	E06.51	Standard Practice for Determining the Thickness of Glass in Airport Traffic Control Tower Cabs
F0588	E06.51	Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact
F0842	E06.51	Standard Test Methods for Measuring the Forced Entry Resistance of Sliding Door Assemblies, Excluding Glazing Impact
E2099	E06.55	Standard Practice for the Specification and Evaluation of Pre-Construction Laboratory Mockups of Exterior Wall Systems
E2353	E06.56	Standard Test Methods for Performance of Glazing in Permanent Railing Systems, Guards, and Balustrades
E2358	E06.56	Standard Specification for the Performance of Glass in Permanent Glass Railing Systems, Guards, and Balustrades
E2751/E2751M	E06.56	Standard Practice for Design and Performance of Supported Laminated Glass Walkways
E0631	E06.94	Standard Terminology of Building Constructions

# ASTM Update – E33 Building and Environmental Acoustics; E34 Occupational Health and Safety; E60 Sustainability; F12 Security Systems and Equipment; F15 Consumer Products; F33 Detention and Correctional Facilities

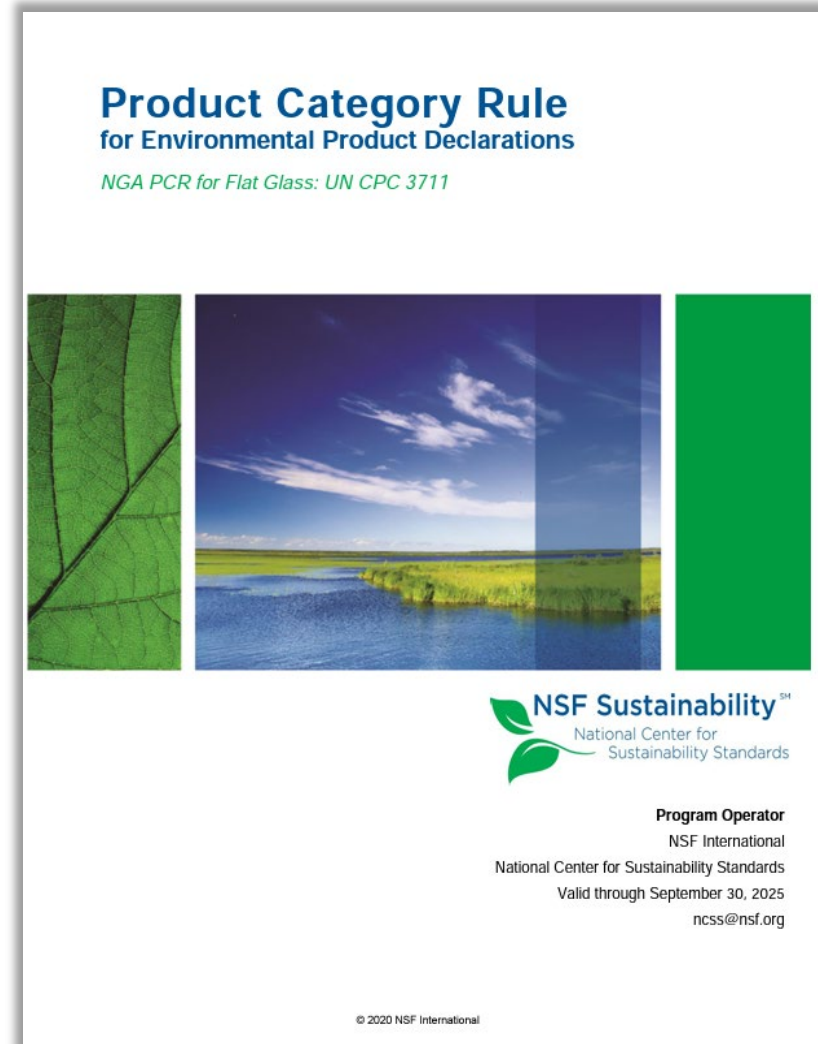
E0090	E33.03	Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements							
E0336	E33.03	Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings							
E0413	E33.03	Classification for Rating Sound Insulation							
E1332	E33.03	Standard Classification for Rating Outdoor-Indoor Sound Attenuation							
E2249	E33.03	Standard Test Method for Laboratory Measurement of Airborne Transmission Loss of Building Partitions and Elements Using Sound Intensity							
C0634	E33.07	Standard Terminology Relating to Building and Environmental Acoustics							
E2875/E2875M	E34.10	Standard Guide for Personal Protective Equipment for the Handling of Flat Glass							
E2129	E60.01	Standard Practice for Data Collection for Sustainability Assessment of Building Products							
F1233	F12.10	Standard Test Method for Security Glazing Materials and Systems							
F1642	F12.10	Standard Test Method for Glazing and Glazing Systems Subject to Airblast Loadings							
F2248	F12.10	Standard Practice for Specifying an Equivalent 3-Second Duration Design Loading for Blast Resistant Glazing Fabricated with Laminated Glass							
F2912	F12.10	Standard Specification for Glazing and Glazing Systems to Airblast Loadings							
F3006	F12.10	Standard Specification for Ball Drop Impact Resistance of Laminated Architectural Flat Glazing							
F3007	F12.10	Standard Test Method for Ball Drop Impact Resistance of Laminated Architectural Flat Glass							
F3038	F12.10	Standard Test Method for Timed Evaluation of Forced-Entry Resistant Systems							
F3057	F12.10	Standard Test Method for Electromagnetic Shielding Effectiveness of Glazings							
F3561	F12.10	Standard Test Method for Forced-Entry-Resistance of Fenestration Systems After Simulation Active Shooter Attack							
F2813	F15.42	Standard Specification for Glass Used as a Horizontal Surface in Desks and Tables							
F1915	F33.02	Standard Test Methods for Glazing for Detention Facilities							

# ASTM standards updates

- Active Shooter retrofit
- Bird friendly
  - NGA's Bird Friendly Design Guide into an ASTM Design Guide
- Standard Guide for Architectural and Structural Use of Glass
- VIG Load Resistance activities

# Flat Glass PCR

- NGA PCR for Flat Glass was published by NSF describing requirements for LCAs and EPD of flat glass
- Valid through Sept. 30, 2025




[https://www.glass.org/sites/default/files/2021-10/pcr\\_flat\\_glass\\_2020.pdf](https://www.glass.org/sites/default/files/2021-10/pcr_flat_glass_2020.pdf)



# Flat Glass EPD: Industry Average

- NGA flat glass member companies (members of Forming Committee) published an industry average EPD for flat glass produced in the US in December 2019.
  - Average GWP is 1,430 kg CO2 eq
- Valid through Dec. 20, 2024




**Environmental Product Declaration**  
According to ISO 14025

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Flat Glass

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This EPD was not written to support comparative assertions. Even for similar products, differences in declared unit, use and end-of-life stage assumptions, and data quality may produce incomparable results. It is not recommended to compare EPDs with another organization, as there may be differences in methodology, assumptions, allocation methods, data quality such as variability in data sets, and results of variability in assessment software tools used.

**Issue Date:** December 20, 2019  
**Valid Until:** December 20, 2024  
**Declaration Number:** 121

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Declaration Number: ASTM-EPD121

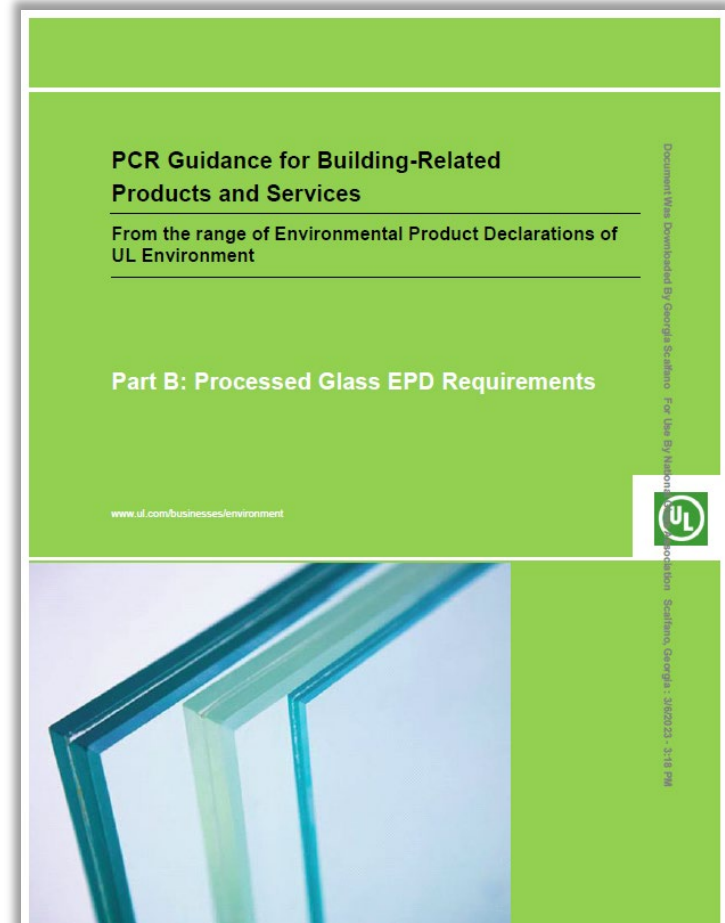
[https://www.glass.org/sites/default/files/2019-12/NGA\\_EP\\_D\\_2019\\_12\\_16\\_signed.pdf](https://www.glass.org/sites/default/files/2019-12/NGA_EP_D_2019_12_16_signed.pdf)

# Processed Glass PCR

- PCR Guidance for Building-Related Products and Services Part B: Processed Glass EPD Requirements (Established Aug. 2016)
  - Original expiration date Dec. 6, 2023 extended to June 2024

## Updates

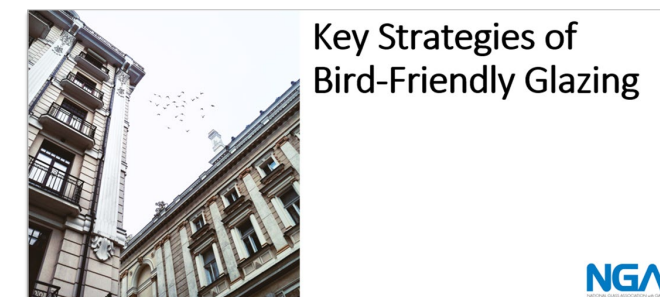
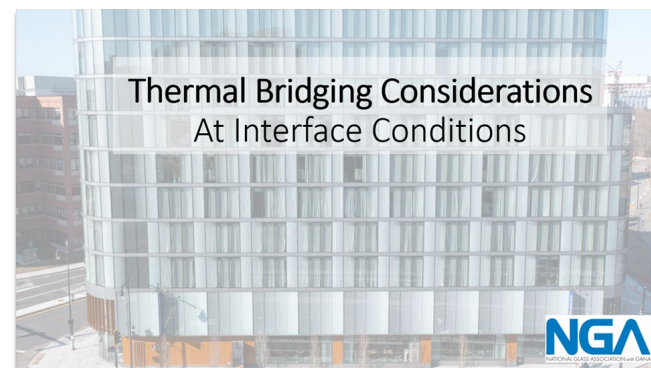
- UL is working with industry stakeholders to update. EPA PCR requirements. EPA Grant



<https://www.shopulstandards.com/ProductDetail.aspx?UniqueKey=35842>

# AIA Presentations

<https://www.glass.org/architect>



# AIA CONTINUING EDUCATION & RESOURCES FOR ARCHITECTS

NGA's resources for architects include on-demand AIA-accredited courses, the Glass & Glazing Design Academy, NGA's Glass Technical Papers, and All about Glass and Metal: A Guide for Architects & Specifiers. NGA is an AIA-approved provider of CES credits for architects.

## AIA Continuing Education Provider

### ARCHITECT CONTINUING EDUCATION

[AIA LUS FOR ARCHITECTS](#)

[ARCHITECT TECHNICAL PAPER MIXTAPE](#)

[ARCHITECT'S GUIDE TO GLASS & GLAZING](#)



### GLASS & GLAZING DESIGN ACADEMY

NGA's accredited AIA presentations are now available in an on-demand, multimedia format through the Glass & Glazing Design Academy. Available to architects and industry professionals through a new partnership with Architectural Record, the online academy helps architects understand the performance, design considerations and benefits of the many glazing and glass building products available today.

[Read our article on Occupant Comfort, featured in Architectural Record.](#)

Earn 1.0 LU/HSW when you [read the full article and take the accompanying quiz](#) in our academy.

[EXPLORE THE FULL ACADEMY](#)

**ON-DEMAND EDUCATION FOR ARCHITECTS**  
**MULTIMEDIA VIDEOS & QUIZZES FOR CREDIT**



# Communications



July 2023

## Current Activities

**30-Day Public Review of ASHRAE 90.1 Addendum**  
The first Public Review of BSR/ASHRAE/IES Addendum k to ANSI/ASHRAE/IES Standard 90.1-2022, *Energy Standard for Sites and Buildings Except Low-Rise Residential Buildings* is now [open for comment online](#). The deadline is August 6, 2023. This addendum expands the renewable energy provisions of Standard 90.1 to allow the use of off-site renewable energy to meet the requirements, as specified for each climate zone. These changes include additional information about how off-site renewable energy procurement is to be documented.

## Event News

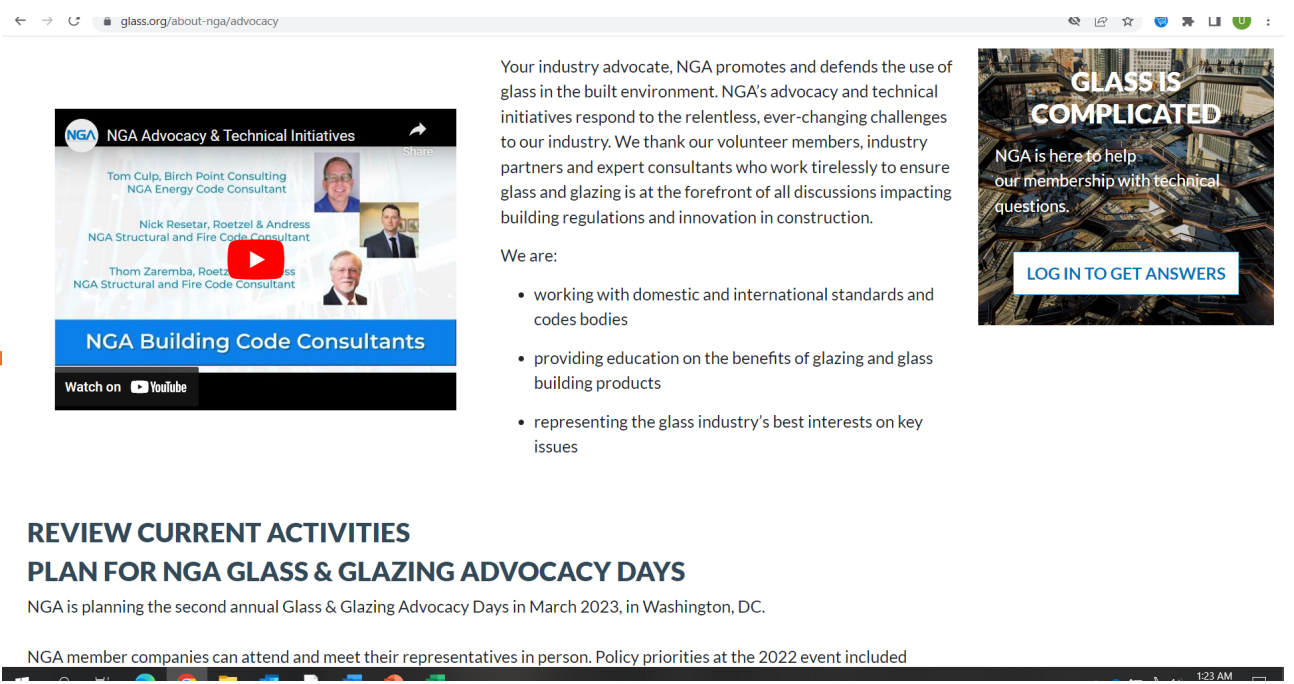
**Fabricating Committee Sessions at NGA Glass Conference: Tacoma**  
Join us at [NGA Glass Conference: Tacoma](#), July 25-27, to participate in discussions that impact the glass and glazing industry. The NGA Fabricating Committee will meet all three days of the conference.

**Session Spotlight: Protective Glazing**  
On Wednesday morning, July 26, the NGA Fabricating Committee's Protective Glazing segment will focus on bird-friendly glazing and school security glazing.



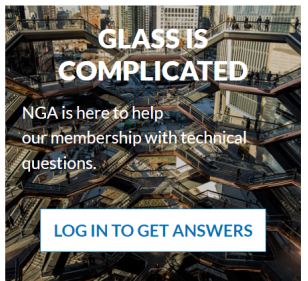
NGA's Code Consultant, Nick Resetar of Roetzel & Andres will present an update on the existing legislation and voluntary ordinances to help

## ADVOCACY NEWS



Your industry advocate, NGA promotes and defends the use of glass in the built environment. NGA's advocacy and technical initiatives respond to the relentless, ever-changing challenges to our industry. We thank our volunteer members, industry partners and expert consultants who work tirelessly to ensure glass and glazing is at the forefront of all discussions impacting building regulations and innovation in construction.

- We are:
- working with domestic and international standards and codes bodies
  - providing education on the benefits of glazing and glass building products
  - representing the glass industry's best interests on key issues



### BUILDING CODES

Energy, ICC, IECC

CODES

### INDUSTRY STANDARDS

ASHRAE, ASTM, DOE

STANDARDS

### LEGISLATION

Buy Clean, Building Resilience

LEGISLATION

### PRIORITY ISSUES

School security, bird-friendly, RAP, recyclability

PRIORITIES

### SUSTAINABILITY

PCRs, EPDs, triple glazing, recycling

SUSTAINABILITY

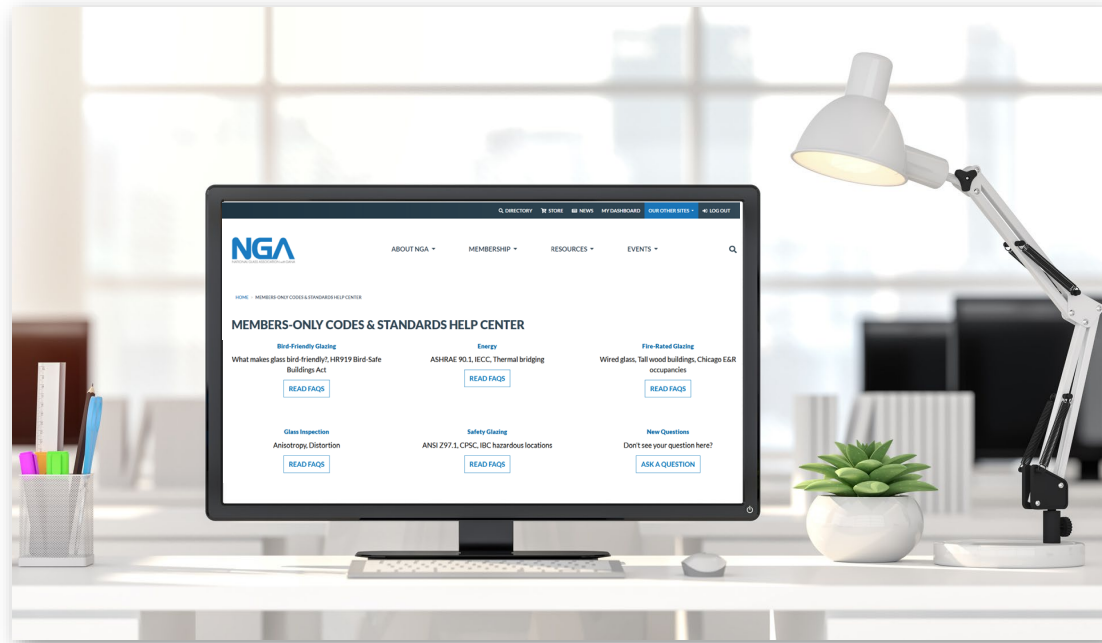
### GET INVOLVED

Volunteer for our committee task groups

COMMITTEES

# HAVE QUESTIONS? GET ANSWERS!

## Members-Only Codes & Standards Help Center



Glass is complicated—NGA is here to help.

**Exclusively for NGA members**, we have compiled answers to **75** tough technical codes and standards questions in an easy-to-use, online help center.

**NEW: Security Glazing added!**

Available now (member login required).

Get started: [glass.org/members-only-resources](https://glass.org/members-only-resources)

# Upcoming Events

## **Building Envelope Contractors (BEC) Conference**

March 2-4, 2025 | Horseshoe/Paris Hotel | Las Vegas, NV

## **Glass & Glazing Advocacy Days**

Multiple Dates in 2025 | Washington, DC

## **NGA Glass Conference: Ann Arbor**

Sept 29-Oct 2, 2025 | Ann Arbor Marriott | Ypsilanti, MI

## **GlassBuild America 2025**

November 4-6, 2025 | Orlando, FL | [glassbuildamerica.com](https://glassbuildamerica.com)