

# WALKER

Provider Number: K216

## *How to Use Acid-etched Glass and Mirror to Meet Design Intents in Interior Applications*

Course Numbers  
AIA: WA2204-22



Credit(s) earned on completion of this course will be reported to **AIA CES** for AIA members. Certificates of Completion for both AIA members and non-AIA members are available upon request.

This course is registered with **AIA CES** for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

---

Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

# Copyright Materials

This presentation is protected by International copyright laws. Reproduction, distribution, display and use of the presentation without written permission of the speaker is prohibited.

Walker Glass Company Ltd.

**WALKER**



# COURSE DESCRIPTION

Acid-etched glass and mirror can be used in a variety of interior applications. This presentation will help you understand how design intents can be met with this type of product. The session will focus on different solutions meeting interior glazing objectives and will cover properties, specifications and constructability, to facilitate and improve the decision making process. The course also covers how acid-etched glass and mirror can meet sustainability objectives and support the LEED certification process.

# LEARNING OBJECTIVES

The participants will :

- Understand the design, functionality, performance and sustainable properties of acid-etched glass and mirror
- Evaluate how acid-etched glass and mirror can meet different interior application intents, including privacy, light flow, visual appearance and impact on the environment
- Understand how acid-etched glass and mirror can meet sustainability objectives of a project.
- Review acid etched glass and mirror specifications that are critical to meet the objectives of the project

A modern office interior with a glass wall and a whiteboard. The whiteboard has the text "UNDERSTANDING ACID ETCHING" written on it. The background shows a hallway with glass partitions and a staircase.

# UNDERSTANDING ACID ETCHING



THE PROCESS

# WHAT IS ACID ETCHING?

The surface of which has been treated with an aqueous solution of hydrofluoric acid, resulting in a smooth surface texture, a mat translucent appearance (glass) and a soft mat reflection (mirror).

- Acid-etching is a smoothing process providing various levels of translucency on glass and reflection on mirror
- Acid-etching is not a coating and is a permanent part of the glass or mirror surface

## **GLASS**

- No impact on visible light transmission
- Significant glare reduction
- Excellent light diffusion
- Enhance rendering of color on glass
- Adds a measure of privacy
- Provides unique designs
- Creates depth in a glass assembly

## **MIRROR**

- Slight reflection
- Unique visual effects
- Excellent light absorption

Durable and resistant surface

THE BENEFITS



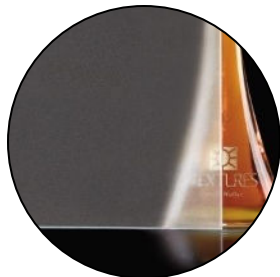
# FROM THE SAND PIT TO THE JOB SITE



Sand Pit



Float Glass  
Manufacturer



Acid-etched Glass  
Manufacturer



Architect



Job Site



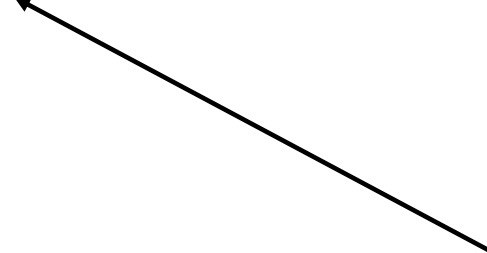
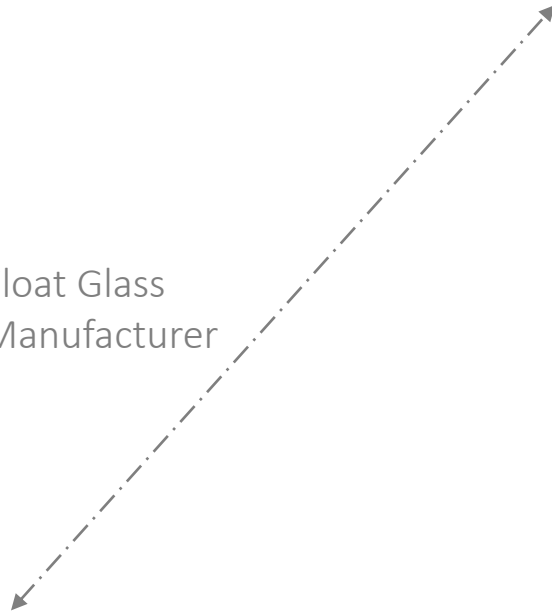
Glass  
Fabricator



General  
Contractor



Glazier





## GLASS FABRICATION

# COMPATIBLE FABRICATION PROCESSES

- Cutting (glass and mirror)
- Polishing (glass and mirror)
- Beveling (glass and mirror)
- Laminating\* (glass)
- Back painting (glass)
- Bending (glass)
- Drilling (glass and mirror)
- Tempering and heat soaking (glass)
- Fire rating (glass)

*\* Acid-etched glass may be laminated in the same manner as unetched glass providing that the laminate is applied to the unetched surface.*

A photograph of a modern interior space, likely a hallway or lobby, featuring large windows and a grid ceiling. The ceiling has several recessed lights. The windows are tall and narrow, providing a view of the outdoors. The overall atmosphere is bright and airy. The text "DAYLIGHTING" is overlaid in the center of the image.

# DAYLIGHTING

# UNRESTRICTED LIGHT FLOW

## OBJECTIVES

- Allow light to flow through interior spaces
- Capture natural or artificial light to bring it into darker spaces
- Reduce the need for artificial light
- Open up spaces

## APPLICATIONS

- Office partitions and enclosures
- Room enclosures
- Separators
- Ramps and balustrades

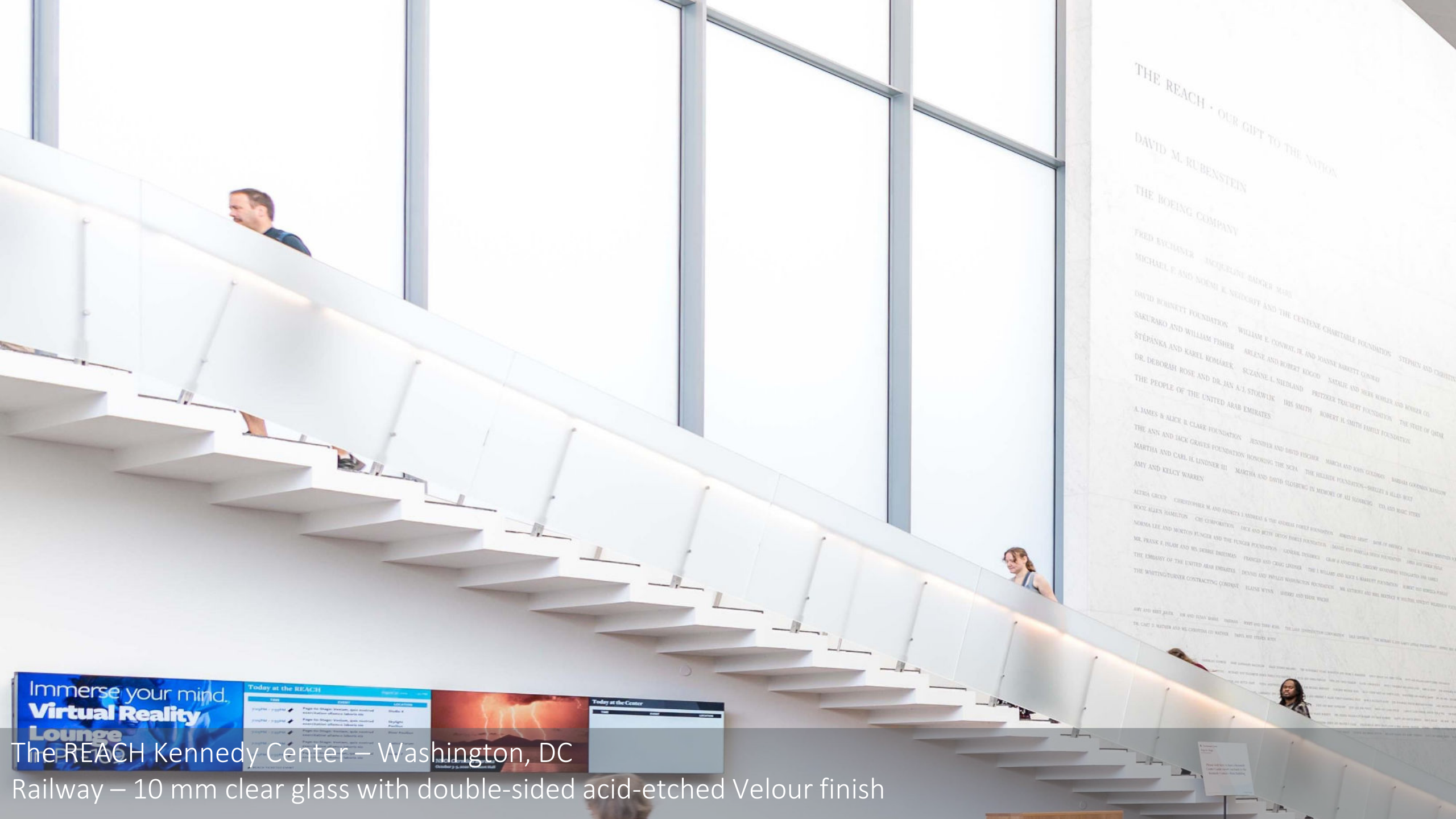
UNRESTRICTED LIGHT FLOW



# UNRESTRICTED LIGHT FLOW

## Visible Light Transmittance | Monolithic Glass

	6mm clear	6mm Starphire
Un-etched glass	89%	91%
Selected etch finishes	88% to 91%	90% to 93%



THE REACH - OUR GIFT TO THE NATION  
DAVID M. RUBENSTEIN  
THE BOEING COMPANY  
FRED RYCHNER MICHELENE BARTER MARI  
MICHAEL F. AND NOEMI E. NEIDORFF AND THE CENTENE CHARITABLE FOUNDATION STEPHEN AND CHRISTINE  
DAVID BOBINETT FOUNDATION WILLIAM E. CONWAY, JR. AND JOANNE BARRETT QUINN  
SAKURAKO AND WILLIAM FISHER ARLENE AND ROBERT KOGOD SATIJE AND JERRI KOMAR AND KOMAR CO.  
STĚPÁNKA AND KAREL KOMÁŘEK SUZANNE L. NIEBLAND PRITZKER TRACTEE FOUNDATION THE STATE OF OHIO  
DR. DEBORAH ROSE AND DR. JAN A.-J. STUWLIK IRIS SMITH PRITZKER TRACTEE FOUNDATION  
THE PEOPLE OF THE UNITED ARAB EMIRATES ROBERT H. SMITH FAMILY FOUNDATION  
A. JAMES & ALICE B. CLARE FOUNDATION JESSE AND DAVID FISHER MARCIA AND JOHN GULLOAN BARBARA GOODMAN RANSON  
THE ANN AND JACK GRAVES FOUNDATION HONORING THE SCIA THE HILLIARD FOUNDATION-SHELLEY & ALLAN WEIT  
MARTHA AND CARL H. LINDNER III MARTHA AND DAVID GLOEBING IN MEMORY OF ALI SLOANING, TIA AND BRAC TITEN  
AMY AND KELLY WARREN  
ALYXIA GROUP CHRISTOPHER M. AND ANTONIA I. ANDREAS & THE ANDREAS FAMILY FOUNDATION AMERICA ABERT BONE OF MATEA TRINA A. NORMAN BENTLEY  
BOOZ ALLEN HAMILTON CRI CORPORATION LUCK AND BETTY DEYON FAMILY FOUNDATION JAMES AND ANTELLA STEIN FOUNDATION JIM AND SARA SUGA  
NORMA LEE AND WINTON FUNGER AND THE FUNGER FOUNDATION GENERAL PEARCE GRAY & ASSOCIATES, CROWN KENNEDY INVESTIGATES AND LAMES  
MR. FRANK F. FLAHERTY AND MS. LORRIE DRUMMAN FRANCES AND CRAIG LAUNDER THE J. WILLIAM AND ALICE L. MARRIOTT FOUNDATION ROBERT AND KATHLEEN PEARCE  
THE EMBASSY OF THE UNITED ARAB EMIRATES DENNIS AND PAULINE WASHINGTON FOUNDATION MR. GUYTON AND MRS. MARIE K. WILSON STEVEN WARREN FOUN  
THE WHITTING-TUNNER CONTRACTING COMPANY HEANE WYNN JERRY AND BARRIE WOOD  
GARY AND BETT JARRE ER AND PEARL WARE THOMAS WRY AND TRACY WRY THE LAW CORPORATION COMPANY SUE GARDNER THE MORGAN LEWIS SKIDMORE OWINGS AND MERRILL  
DR. GARY D. MATHER AND WIL CHRISTINA CO. MATHER TARA AND STEVEN WRY

Immerse your mind.  
**Virtual Reality Lounge**

Today at the REACH

Time	Event	Location
10:00 AM - 11:00 AM	Page-to-Page Transition: Open innovation, identification, alliance, leadership, etc.	Studio 11
11:00 AM - 12:00 PM	Page-to-Page Transition: Open innovation, identification, alliance, leadership, etc.	Studio 11
12:00 PM - 1:00 PM	Page-to-Page Transition: Open innovation, identification, alliance, leadership, etc.	Studio 11
1:00 PM - 2:00 PM	Page-to-Page Transition: Open innovation, identification, alliance, leadership, etc.	Studio 11
2:00 PM - 3:00 PM	Page-to-Page Transition: Open innovation, identification, alliance, leadership, etc.	Studio 11



Today at the Center

Time	Event	Location
10:00 AM - 11:00 AM	Page-to-Page Transition: Open innovation, identification, alliance, leadership, etc.	Studio 11
11:00 AM - 12:00 PM	Page-to-Page Transition: Open innovation, identification, alliance, leadership, etc.	Studio 11
12:00 PM - 1:00 PM	Page-to-Page Transition: Open innovation, identification, alliance, leadership, etc.	Studio 11
1:00 PM - 2:00 PM	Page-to-Page Transition: Open innovation, identification, alliance, leadership, etc.	Studio 11
2:00 PM - 3:00 PM	Page-to-Page Transition: Open innovation, identification, alliance, leadership, etc.	Studio 11

The REACH Kennedy Center – Washington, DC  
Railway – 10 mm clear glass with double-sided acid-etched Velour finish



Colombia Center— Seattle, WA  
6mm clear glass Opaque 1 face – Tempered



AIA Texas Chapter – Dallas, TX  
12mm clear glass Opaque 1 face – Tempered

# LIGHT DIFFUSION

## OBJECTIVES

- Enhanced natural light dispersion into the building interior
- Create a glowing and diffusion effect with artificial light (light boxes, backlit panels)

## APPLICATIONS

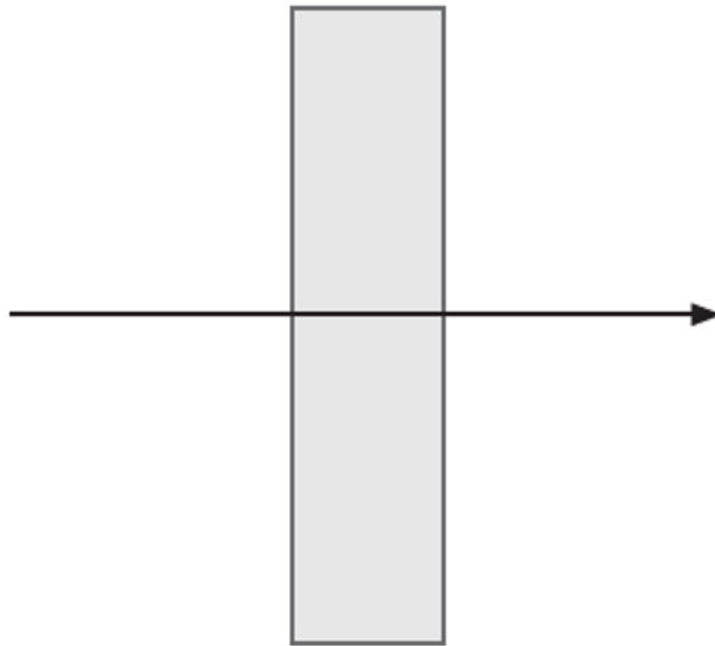
- Light box
- Backlit panel
- Partitions, separators, enclosures

LIGHT DIFFUSION

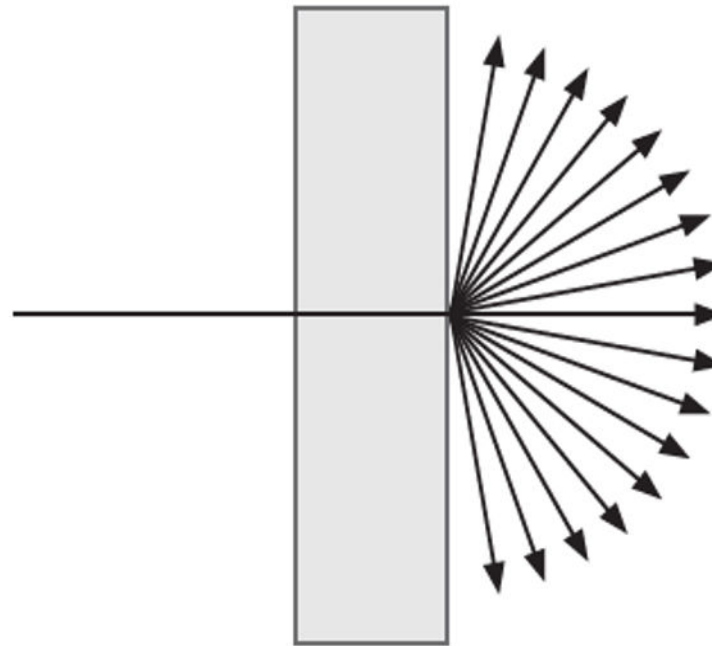


# LIGHT DIFFUSION

Un-etched Glass  
Direct Light



Acid-etched Glass  
Diffuse Transmittance & Haze



# LIGHT DIFFUSION PROPERTIES

Test/Standard: ASTM D1003-13



Acid-etched Finish	Glass Substrate	Thickness mm (in)	Total Luminous Transmittance	Diffuse Transmittance	Haze
Opaque	Clear	6mm (1/4")	82.5%	75.09%	90.73%
Velour	Clear	6mm (1/4")	88.44%	79.00%	89.30%
Satin	Clear	6mm (1/4")	72.75%	32.66%	44.89%
Satinlite	Clear	6mm (1/4")	75.41%	9.73%	12.90%

**Total Luminous Transmittance** is the ratio of transmitted light to the incident light and is influenced by absorption and reflection properties.

**Diffuse Transmittance** is the portion of light that is scattered or diffused by the glass surface.

**Haze** is the percentage of light which in passing through deviates from the incident beam greater than 2.5 degrees on average. Haze is equal to the diffuse transmittance divided by the total luminous transmittance.



MCQ – Quebec, QC  
6mm blue glass Satin 1 face – 6mm green glass Satin 1 face – 6mm Starphire Ultra-Clear™ glass Satin 1 face  
All tempered



ABB Canada Campus – Montreal, QC  
Insulated Glass Unit – 6mm Starphire Ultra-Clear™ Opaque Surface #2

# LIGHT ABSORPTION

## OBJECTIVES


- Reduce reflection of the light off decorative glass surfaces
- Create a smooth surface
- Create a pleasing environment

## APPLICATIONS

- Wall cladding
- Free standing structures
- Decorative glass panels



LIGHT ABSORPTION



Aecom – Cleveland, OH  
6mm grey mirror acid-etched Satin finish



Roccabella Condos – Montreal, QC  
6mm bronze mirror acid-etched Satin finish



TDC2– Montreal, QC  
6mm low-iron mirror with acid-etched Satin finish

# COLOR RENDERING

# COLOR & IMAGE RENDERING

## OBJECTIVES

- Reduce reflection and glare to enhance the color or the image integrated in the glazing system

## APPLICATIONS

- Back painted glass panels
- Decorative laminates with graphic or colored interlayer
- Glass panels with patterns or graphics

## COLOR & IMAGE RENDERING





Saint Joseph's Oratory – Montreal, QC  
6mm low-iron acid-etched glass, tempered & laminated with colored interlayers



 **simons**

CÉLEBRER \* OFFERER \* RASSEMBLER \* JOUER \* PARTAGER \* MERVEILLE \* AMOUR \* FAMILLE \* MOMENTS \* RÉCIEUX \* AMITIÉ \* AMOUR \* FAMILLE \* MOMENTS \* RÉCIEUX \* OFFERER \* RASSEMBLER \* JOUER \* CÉLEBRER \* PARTAGER

Simons Store – Gatineau, QC  
6mm low-iron acid-etched glass, back painted and tempered



NEWARK LIBERTY  
INTERNATIONAL AIRPORT

Newark Airport – Newark, NJ  
6mm clear acid-etched glass, tempered & laminated



Aquarium of Pacific – Long Beach, CA  
6mm Starphire Ultra-Clear™ Glass Velour 1 face on surface 1 laminated to two other glass substrates

# LIGHTING EFFECTS

# LIGHTING EFFECTS

## OBJECTIVES

- Create muted lighting effects with LED (haze and level of opacity)
- Make the LED light glow through the glass

## APPLICATIONS

- Lightbox
- Backlit glass panel

LIGHTING EFFECTS





H&M Store Eaton Center – Toronto, ON  
8mm low-iron glass with acid-etch finish on all 4 surfaces of the IGU



DECORATIVE AND DESIGN  
ACCENT



## DECORATIVE & DESIGN ACCENT

# DECORATIVE AND DESIGN ACCENT

### OBJECTIVES

- Add a design element to the interior décor (pattern, texture)
- Create a modulation effect

### APPLICATIONS

- Separator, partition, enclosure
- Door lite
- Glass showcase
- Shelves and display units



Firelands Regional Medical Center – Sandusky, OH  
12mm clear glass with acid-etched pattern 512, 2 faces



Laura Store – Calgary, AB  
10mm clear glass with acid-etched pattern 512, tempered



Wilson Condos – Montreal, QC  
10mm clear glass with acid-etched pattern 103

A photograph of a modern office hallway with frosted glass doors. A white rectangular overlay is centered on the image, containing the word "PRIVACY" in a dark, sans-serif font. The hallway is brightly lit, and the floor is a dark, polished material. The glass doors have silver-colored handles and are set in a white frame.

PRIVACY

# PRIVACY

## OBJECTIVES

- Maximize light flow and open up spaces while creating an element of privacy
- Block line of vision

## APPLICATIONS

- Doors, office, classroom and conference room enclosures
- Dividers for restroom accessories, partitions and cubicles
- Bathroom doors and enclosures

PRIVACY





Revel Hotel & Casino – Atlantic City, NJ  
6mm clear glass with custom Nuance Velour stripes, tempered and laminated



Moody's Investors Service – New York, NY  
Custom pattern – 6mm clear glass with acid-etched stripes, tempered



Greiche & Scaff Optometry – Montreal, QC  
6mm grey mirror Satin 1 face – 6mm mirror Starphire Ultra-Clear™ Satin 1 face – 10mm clear glass Opaque 1 face, tempered



SAFETY AND SECURITY



## SAFETY AND SECURITY

# SAFETY AND SECURITY

## OBJECTIVES

- Prevent people from crashing into the glass
- Slip resistance on glass walkways
- Block line of sight in schools and public buildings

## APPLICATIONS

- Doors
- Room enclosures
- Floors
- Staircases

# SLIP RESISTANCE FOR WALKWAY APPLICATIONS

Test/Standard		Pattem 406	Pattem 407
Procedure Dynamic Coefficient of Friction (DCOF)	ANSI A137.1-2012 Section 9.6	0,67	0,66

According to the ANSI A137.1 standard for ceramic tile:

*"Unless otherwise specified, tiles suitable for level interior spaces expected to be walked upon when wet shall have a (minimum) wet DCOF of 0.42 ..."*



Queens Museum – Queens, NY  
12mm Starphire glass with pattern 406, tempered and laminated



Queens Museum – Queens, NY  
12mm Starphire glass with pattern 406, tempered and laminated



Onassis Cultural Center– Queens, NY  
12mm Starphire glass with pattern 406, tempered and laminated





CHUM Intensive Care Unit – Montreal, QC  
partial surface – 6mm clear glass with one acid-etched stripe, tempered



ABB Canada Campus (LEED® Gold Certified) – Montreal, QC  
6mm Starphire Ultra-Clear™ glass Opaque finish on surface 2



ABB Canada Campus (LEED® Gold Certified) – Montreal, QC  
6mm Starphire Ultra-Clear™ glass Opaque finish on surface 2



ABB Canada Campus (LEED® Gold Certified) – Montreal, QC  
6mm Starphire Ultra-Clear™ glass Opaque finish on surface 2



FUNCTIONAL SURFACES

# FUNCTIONAL SURFACES

## OBJECTIVES

- Writing surfaces
- Work surfaces made of glass to preserve light flow and keep spaces open
- Display surfaces
- Reduce glare off surfaces

## APPLICATIONS

- Markerboards
- Commercial counter and table tops
- Retail display fixtures

FUNCTIONAL SURFACES

WELCOME





Private Office – Toronto, ON  
10mm low iron acid-etched glass Velour finish tempered & polished



Audi Dealership – Toronto, ON  
6mm low iron acid-etched glass Satinlite finish with white back paint

# ACID-ETCHED GLASS AND MIRROR PROPERTIES

DAVID BOHNET  
SAKURAKO AND  
ŠTĚPÁNKA AND  
DR. DEBORAH R  
THE PEOPLE OF

A. JAMES & ALICE  
THE ANN AND JAC  
MARTHA AND CA  
AMY AND KELCY

ALTRIA GROUP CHI  
BOOZ ALLEN HAMILT  
NORMA LEE AND MO  
MR. FRANK F. ISLAM A  
THE EMBASSY OF TH  
THE WHITTING-TURNE

AMY AND BETT BAER J  
DR. GARY D. MATHER AND  
DAVIS W. CLIFTON ALLOY AND MARK  
DC COMMISSION



# SURFACE RESISTANCE

Test/Standard		Select acid-etched glass products	Float glass	Unit of Measure
Resistance to Wear	ASTM-C501	198 to 215	183.29	Abrasive Wear Index (Ix)
Resistance to Staining	ASTM-C1378	A	A	Classification
Scratch Hardness	MOHs	5 to 7	5,5	Out of a possible 10



POST INSTALLATION  
CLEANING &  
MAINTENANCE

# POST INSTALLATION CLEANING & MAINTENANCE

- Follow the manufacturer's post installation cleaning guidelines
- If the glass is unusually dirty after being installed
  - Use a soapy sponge
  - Do not use aggressive chemicals
- Standard building maintenance protocols should be followed

CLEANING & MAINTENANCE





QUALITY STANDARDS  
AND WARRANTY

# QUALITY STANDARDS AND WARRANTY

- Acid-etched glass products should be made from selected float glass and mirror which conforms to standards accepted by the glass industry in North America.
- To preserve the quality of the glass specified, a warranty meeting the above standards should be requested.
- Acid-etch manufacturers can offer a warranty up to 10 years against surface degradation



A modern office hallway with dark wood paneling and glass walls. The hallway leads to a glass door at the end, which is slightly ajar, revealing a bright outdoor area. The lighting is soft and even, highlighting the sleek design of the space.

ACID-ETCHED GLASS AND  
MIRROR  
SUSTAINABILITY

# RELEVANCE OF ACID-ETCHED GLASS & MIRROR PRODUCTS TO LEED®

- Low-Emitting Materials
  - Product Category Calculation
  - Glass is a non-emitting source
- Daylight
  - Design to maximize daylight
- Material and resources
- Quality views
- Innovation strategies
- Conformity of the manufacturing process to local environmental legislation



# RELEVANCE OF ACID-ETCHED GLASS & MIRROR PRODUCTS TO LEED®

- Building Product Disclosure and Optimization  
Environmental Product Declaration (EPD)  
(1 point)

Report describing a product's potential environmental impacts, according to the life cycle assessment criteria and in conformity with ISO protocol 14025.

- Building Product Disclosure and Optimization - Material  
Ingredients  
Health Product Declaration® (HPD®)  
(1 point)

A declaration that includes a complete list of a product's ingredients and their associated effects on health.



The background of the image shows a desk with several architectural sketches. At the top, there are four small, simple line drawings of building elevations. Below these, a larger sketch depicts a building facade with a grid of windows, some of which are highlighted in blue. To the left of this main sketch is a green tree-like shape. In the foreground, several markers are scattered: a blue-tipped marker on the left, a grey marker with a blue cap, and two grey markers with black and green caps on the right. The overall scene is a workspace for architectural design.

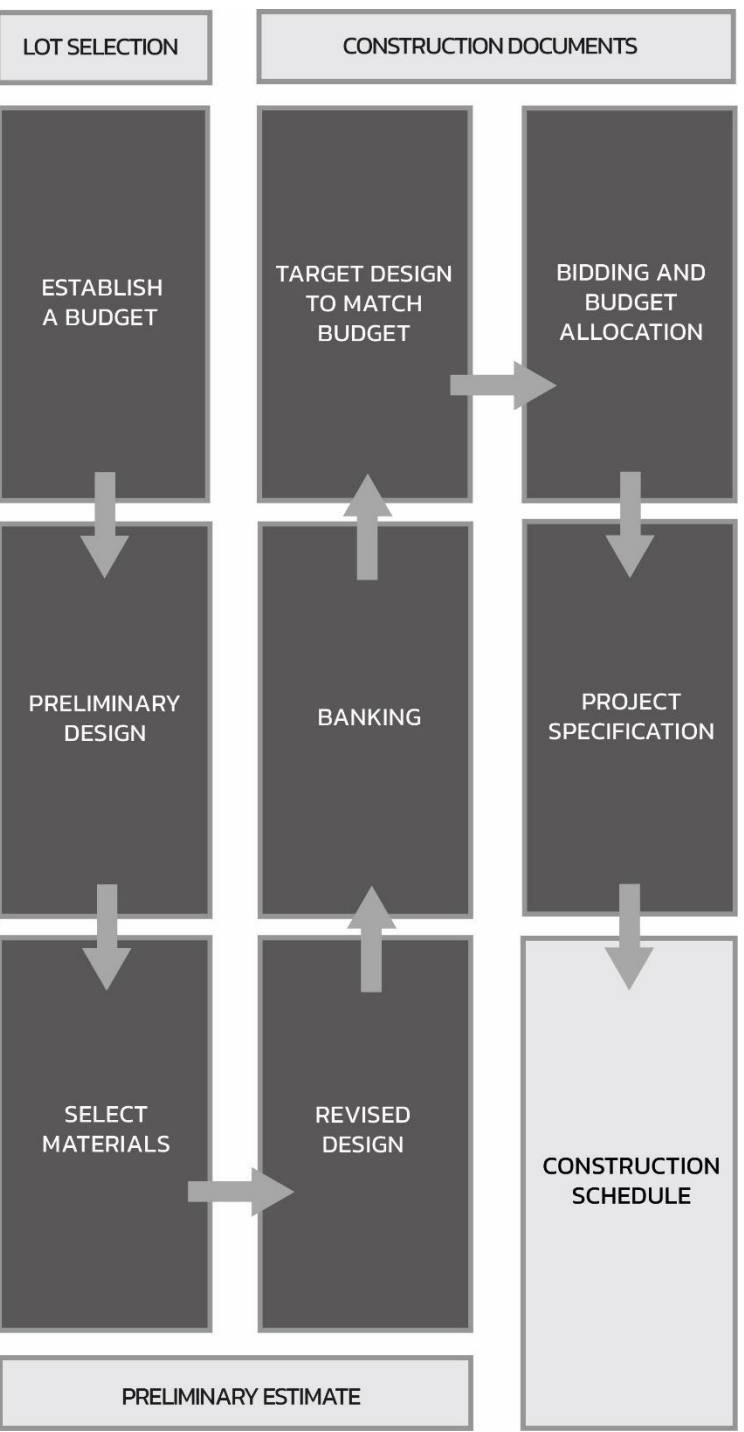
# ACID-ETCHED GLASS SPECIFICATIONS

# KEY ACID-ETCHED GLASS SPECIFICATIONS

- Validate glass specifications at the design development stage
  - Surface finish
  - Substrate (clear, low iron, tinted glass)
  - Size
  - Thickness
- Surfaces to etch
- Glass performance properties
- Gloss tolerance of the etch finish
- Warranty on etched surface degradation



DESIGN PROCESS DEVELOPMENT



# DEVELOPMENT

- Involve the acid-glass manufacturer in the early stages
- Validation
  - Product Availability
  - Constructability
  - Fabrication
  - Budget
  - Samples
  - Testing

# SUMMARY ANALYSIS

- Does not restrict light flow
- Surface does not degrade or discolor
- Visual appearance is uniform and consistent
- Surface is easy to clean
- Can meet a variety of design and functional intents
- Can be integrated in an appropriate sustainability plan

SUMMARY ANALYSIS



This concludes The American Institute of Architects  
Continuing Education Systems Course

**WALKER**

Walker Glass Company Ltd  
9551 Ray Lawson Blvd., Montreal, Quebec H1J 1L5  
Canada T. 888-320-3030  
[www.walkerglass.com](http://www.walkerglass.com)



# WALKER



Walker Textures®  
Acid-etched Glass & Mirror

Sustainable Materials  
EPD / HPD®



AviProtek®  
Bird Safe Glass

Subscribe to our Newsletter



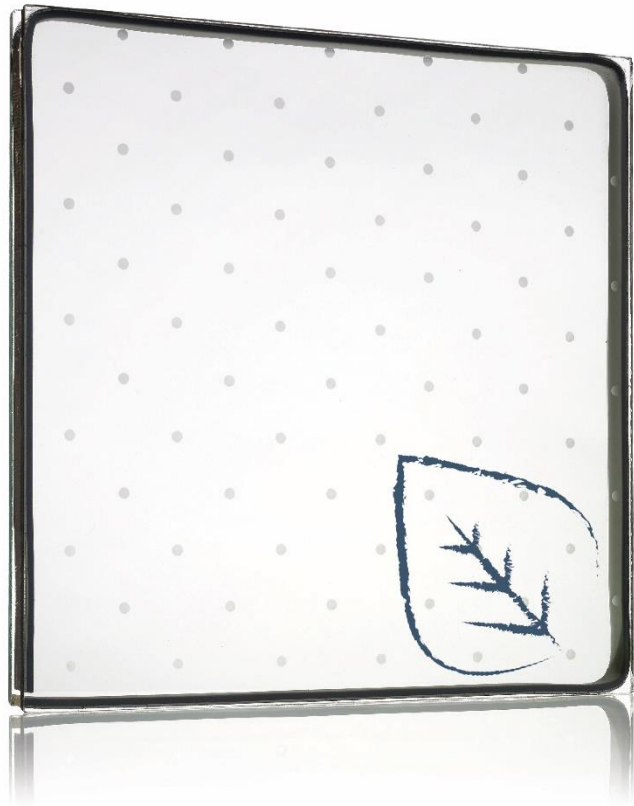
Walker Textures®  
Specialties

Follow us on Social Media



walkerglass.com

# Sustainable Materials



## **EPD – Environmental Product Declaration**

Bird Friendly Glass

Acid-etched Glass

Acid-etched & Un-etched Mirror

Patterned Acid-etched Glass

## **HPD® – Health Product Declaration®**

Acid-etched Glass

Acid-etched Mirror

Acid-etched Patterns & Bird Friendly Glass

# Warranty on Surface Degradation

Walker warrants, for a period of 10 years, that the AviProtek® surface will not degrade, provided that the surface is not subjected to any conditions that would otherwise lead to premature degradation of unetched float glass.

**10** Year  
**WARRANTY**

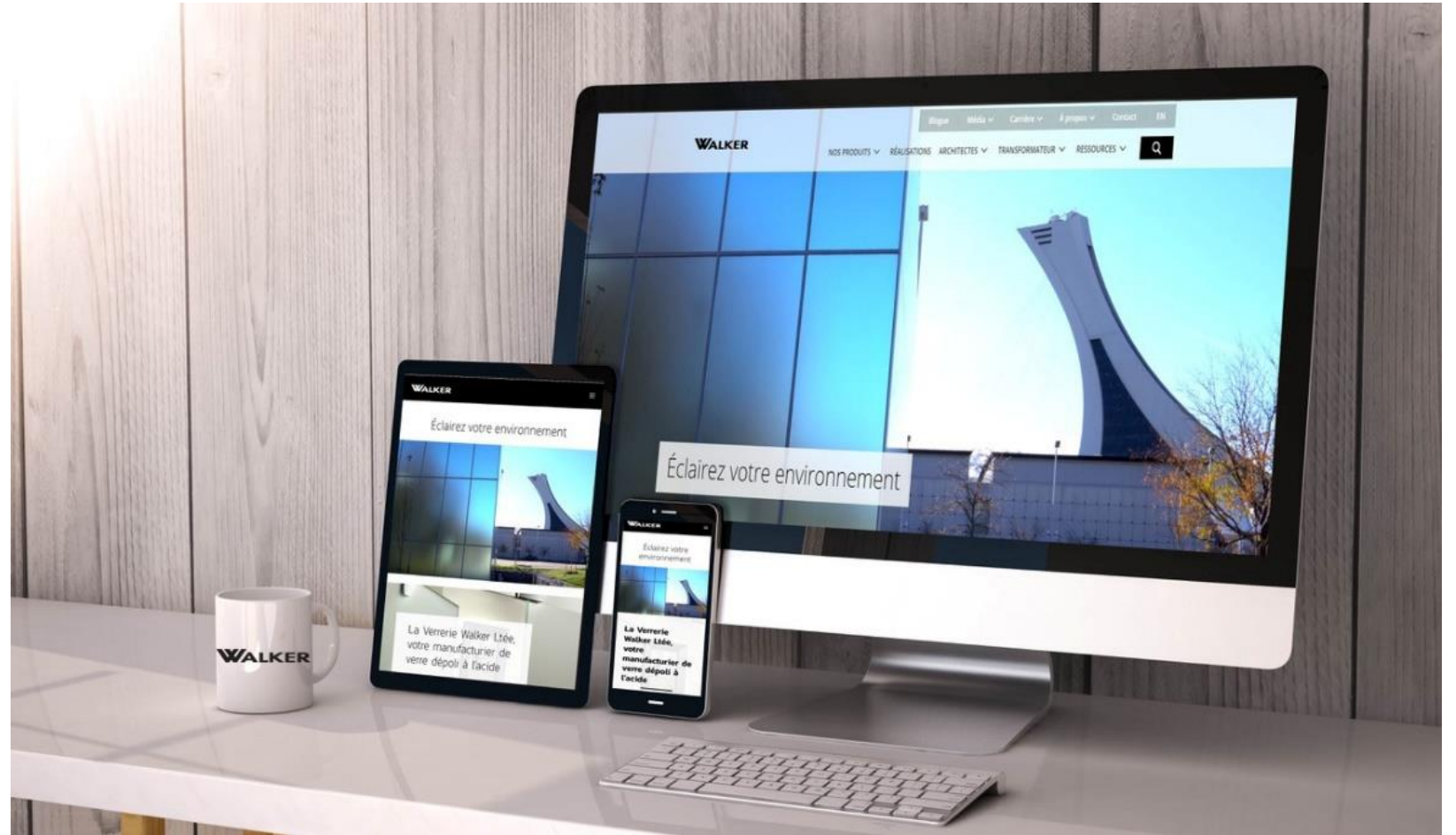
# Support

- Samples: architectural kit, 12x12, full size
- Architectural managers
- Literature, specifications, performance data available
- Marketing alliance with Vitro Architectural Glass and Pilkington



# Online Resources

- Website
- Monthly Newsletter
- Social Media
- Blogs and Videos



[www.walkerglass.com](http://www.walkerglass.com)

Thank You!

**WALKER**

[www.walkerglass.com](http://www.walkerglass.com)