THE THERMOLITE WINDOW SYSTEM

GSA Contract Holder

Contract GS-07F-0116H

GSA Federal Supply Contract Information and Price List

General Services Administration
Federal Supply Service

Authorized Federal Supply Schedule Price List

Contract Number: GS-07F-0116H

Therm-O-Lite, LLC
3502 W. Sample St
South Bend, IN 46619
574-234-4004
574-234-4005 FAX
www.thermolitewindows.com

Veteran Owned Business

The web address for GSA Advantage! is:
http://www.gsaadvantage.gov

ENERGY SAVINGS

ENERGY EFFICIENCY

ENERGY INTEGRITY

ENERGY SECURITY

Therm-O-Lite, LLC
3502 West Sample
South Bend, IN 46619
Phone: 574-234-4004 Fax: 574-234-4005

GSA Contract # GS-07F-0116H

Federal Reserve Bank Eccles – Blast, thermal, historic
Washington, D.C.
Project Manager: Jacob Goldsmith (703) 928-0487

Jacob Javits Federal Building – Thermal
26 Federal Plaza
New York, New York.
Project Manager: Trane - Justin Johansen

EPA/Clinton Building – Thermal
Washington, D.C.
Project Manager: I-Star - Andrew Martin

VA Building – Thermal
Washington, D.C.
Project Manager: I-Star - Andrew Martin

Fort Worth Correctional Facility – Thermal
Ft. Worth, Texas
Project Manager: Ameresco

Fort Carswell Correctional Facility – Thermal
Ft. Worth, Texas
Project Manager: Ameresco

Fort Hamilton – Thermal
Brooklyn, NY
Project Manager: Ameresco

Clifton Young Federal Building – Thermal
Reno, Nevada
Project Manager: Ameresco

Phoenix Federal Building – Thermal
Phoenix, Arizona
Project Manager: Ameresco

Fort Riley – Blast, thermal
Fort Riley, Kansas
Project Manager: Capitol Glass

GSA – National Courts Complex – Thermal, historic
Washington, D.C.
Project Manager: GSA

GSA – Library of Congress – Blinds
Washington, D.C.
Project Manager: GSA

Catholic University Father O'Connell Hall - Thermal, historic
Washington, D.C.
Project Manager: Merit Commercial Windows

GSA – Silver Springs Deep Energy Retrofit - Thermal
Silver Springs, MD
Project Manager: Ameresco

GSA – New Carrollton Federal Building Deep Energy Retrofit - Thermal
Lanham, MD
Project Manager: Ameresco

Defense Contract Management Agency – Blast, thermal
Chantilly, VA
Project Manager: Signals Defense

Federal Reserve Bank New Orleans – STC, thermal
New Orleans, LA

GSA – Owensboro Courthouse – Thermal, historic
Owensboro, KY

Defense Logistics Agency – Blast, thermal
Richmond, VA
Project Manager: Abbott Construction

Bamlet Building – Thermal
Detroit, MI
Project Manager: History Wood and Window

Boston State House – Governor's Office – Blast, thermal, historic
Boston, MA
Project Manager: Consigli Construction

Department of Interior – Blast, thermal, historic
Washington, D.C.
Project Manager: Dave Onks, Caffes-Steele (301) 937-5750

Lafayette Building – Blast, thermal, historic
Washington, D.C.
Project Manager: Greta Soderman, Grunley Construction (202) 559-1177

St. Elizabeth's Adaptive Reuse – Blast, thermal, historic
Washington, D.C.
Project Manager: Bill Six, Grunley Construction (240) 399-2000

1800 F Street (GSA HQ) – Blast, thermal, historic
Washington, D.C.
Project Manager: David Smith, GPR Windows (703) 300-8868

Washington Naval Yard – Thermal, historic
Rockville, MD
Project Manager: John Wysong (202) 658-8871

American Building – Thermal
Indianapolis, IN
Project Manager: Rem Yoder (317) 363-3830

Federal Reserve Bank Annex (1709 New York Avenue) – Blast, thermal, historic
Washington, D.C.
Project Manager: Charlie House (202) 452-2061

Sidney Yates Building – Blast, thermal, historic
Washington, D.C.
Project Manager: John Schulte (757) 627-5684

Foley Federal Building – Blast, thermal
Las Vegas, Nevada
Project Manager: April Ratka, At Your Service (602) 943-6318 Ext 111

Fort Sill, Building #455 – Blast, thermal, historic
Lawton, Oklahoma
Project Manager: Ric Schulte, He & I Construction (580) 536-8180

Wheeler Opera House – Thermal, historic
Aspen, Colorado
Project Manager: City of Aspen (970) 920-5055

Indigo Garden District Hotel – Hurricane
New Orleans, Louisiana
Project Manager: Fred Shinkle, Commercial Renovation Services (770) 345-3570

New York Academy of Medicine, Rare Book Room – Thermal, historic
New York, New York
Project Manager: Bill Kennedy, Kilroy Windows (718) 638-2503

Philadelphia Federal Reserve Bank – Blast, thermal
Philadelphia, PA
Project Manager: Chris Ivanowski (215) 574-6560

Grey Towers Historic Mansion – Thermal, historic
Milford, PA
Site Director: John LoDolce (570) 296-6061 ext 2

Lifescan - Thermal
Milpitas, Ca
Project Engineer: Reena David (408) 956-4026
Staff Mechanical Engineer: Frank Lo (408) 956-4802

Great Lakes Naval Station- Blast, thermal, historic
Building #3
Great Lakes, IL
Project Manager: Blinderman Construction (773) 444-0500

McNamara Building – Thermal
Detroit, Michigan
Building Manager: Munir Muhammad (313) 226-2106
Project Manager: Chris Mourgelas (313) 226-2258
Contract Officer: Lisa Gonzalez (312) 886-4106

Anthony Celebrezze Federal Building - Thermal
Cleveland, Ohio
Building Manager: Greg Wade (216) 522-7156
Project Manager: Robert Lowe (216) 621-2973
Contract Officer: Evelyn Smith (312) 353-3955

Federal Trade Commission – Blast, thermal, historic
Washington, D.C.
Building Manager: Robert Bass (202) 326-2265

Department of Commerce (HCHB) – Blast, thermal, historic
Emergency Operations Center
Washington, D.C.
Procurement Specialist: Greg Servant (202)482-6124

National Defense University – Blast, thermal, historic
Fort McNair
Building #59
Washington, D.C.
Project Manager: Steve Hatch (202) 685-3929

Preble Hall – Blast, thermal, historic
Annapolis, MD
Project Manager: Paola Lyle (301) 963-5000

White House Visitor Center – Blast, thermal, historic
Washington, D.C.
Project Manager: Anthony Monday (202) 205-5166
Manager: Kathy Langley (202) 208-1631

University of Georgia – Clark Howell Hall - Thermal
Atlanta, Georgia
Project Manager: J.E.Dunn Construction

GENERAL SERVICES ADMINISTRATION
FEDERAL ACQUISITION SERVICE
AUTHORIZED FEDERAL SUPPLY SCHEDULE CATALOG/PRICE LIST

On-line access to contract ordering information, terms and conditions, up-to-date pricing, and the option to create an electronic delivery order is available through **GSA** *Advantage!,* a menu-driven database system. The INTERNET address for **GSA** *Advantage!* is **http://www.gsaadvantage.gov**

SCHEDULE TITLE: Federal Supply Schedule 056 – Buildings, Building Materials, Industrial Services and Supplies
FSC Group: 5620

CONTRACT NUMBER: GS-07F—0116H

CONTRACT PERIOD: August 31, 2013 – August 30, 2018

For more information on ordering from Federal Supply Schedules click on the GSA Schedules link at www.gsa.gov

CONTRACTOR: **Therm-O-Lite, LLC**
3502 West Sample Street,
South Bend, IN 46619
Phone: 574-234-4004
FAX: 574-234-4005
Email: info@thermolitewindows.com

CONTRACTOR'S ADMINISTRATION SOURCE: Mary Ann Perrine

BUSINESS SIZE: Small

Socioeconomic Indicators: Veteran-Owned

CUSTOMER INFORMATION:

1a. TABLE OF AWARDED SPECIAL ITEM NUMBERS (SINs)

SIN	DESCRIPTION
563 16	Blast Mitigation, Bullet Resistant, and Glass Fragmentation Products
563 23	Doors, Windows Panels, and Shutters
563 98	Ancillary Services Related to Building Materials/Supplies

1b. LOWEST PRICED MODEL NUMBER AND PRICE FOR EACH SIN:
(Government net price based on a unit of one)

SIN	MODEL	PRICE

To be completed by contractor on text file submission

1c. HOURLY RATES: (Services Only)
To be completed by contractor on text file submission

2. MAXIMUM ORDER*: $200,000 (SIN 563 16); $75,000 (SIN 563 23); and $200,000 (SIN 563 98)

*Ordering activities may request a price reduction at any time before placing an order, establishing a BPA, or in conjunction with the annual BPA review. However, the ordering activity shall seek a price reduction when the order or BPA exceeds the simplified acquisition threshold. Schedule contractors are not required to pass on to all schedule users a price reduction extended only to an individual ordering activity for a specific order or BPA.

3. MINIMUM ORDER: $100

4. GEOGRAPHIC COVERAGE: Domestic – 50 states, Washington, DC, Puerto Rico, US Territories and to a CONUS port or consolidation point for orders received from overseas activities

5. POINT(S) OF PRODUCTION: Therm-O-Lite, LLC
3502 West Sample Street
South Bend, IN 46619 (St. Joseph County)

6. DISCOUNT FROM LIST PRICES: GSA Net Prices herein.

7. QUANTITY DISCOUNT(S):

Number of Windows Per Order	Amount of Discount	Limit of Different Sizes
100 to 200	1.7%	5
201 to 500	3.4%	10
501 to 2000	5.0%	15
Over 2001	6.7%	20

8. PROMPT PAYMENT TERMS: Net 30 days . Information for Ordering Offices: Prompt payment terms cannot be negotiated out of the contractual agreement in exchange for other concessions.

9.a Government Purchase Cards must be accepted at or below the micro-purchase threshold.

9.b Government Purchase Cards are accepted above the micro-purchase threshold. Contact contractor for limit.

10. FOREIGN ITEMS: None

11a. TIME OF DELIVERY: Within 42 to 56 days after receipt of order

11b. EXPEDITED DELIVERY: Negotiated on a case by case basis

11c. OVERNIGHT AND 2-DAY DELIVERY: None Offered.

11d. URGENT REQUIRMENTS: Customers are encouraged to contact the contractor for the purpose of requesting accelerated delivery.

12. FOB POINT: Origin – Prepay/Add

13a. ORDERING ADDRESS: same as Contractor address above

13b. ORDERING PROCEDURES: For supplies and services, the ordering procedures, information on Blanket Purchase Agreements (BPA's) are found in FAR 8.405-3

14. PAYMENT ADDRESS: Same as Contractor address above

15. **WARRANTY PROVISION:** 1 year; manufacturer responsible for freight on warranty replacement. Customer should contact contractor for a copy of the warranty

16. **EXPORT PACKING CHARGES**: None

17. **TERMS AND CONDITIONS OF GOVERNMENT PURCHASE CARD ACCEPTANCE**: (any thresholds above the micro-purchase level may be inserted by contractor)

18. **TERMS AND CONDITIONS OF RENTAL, MAINTENANCE, AND REPAIR (IF APPLICABLE):** N/A

19. **TERMS AND CONDITIONS OF INSTALLATION (IF APPLICABLE): Services for installation are available.**

20. **TERMS AND CONDITIONS OF REPAIR PARTS INDICATING DATE OF PARTS PRICE LISTS AND ANY DISCOUNTS FROM LIST PRICES (IF AVAILABLE):** N/A

20a. **TERMS AND CONDITIONS FOR ANY OTHER SERVICES (IF APPLICABLE**): N/A

21. **LIST OF SERVICE AND DISTRIBUTION POINTS (IF APPLICABLE):** N/A

22. **LIST OF PARTICIPATING DEALERS (IF APPLICABLE):** N/A

23. **PREVENTIVE MAINTENANCE (IF APPLICABLE**): N/A

24a. **SPECIAL ATTRIBUTES SUCH AS ENVIRONMENTAL ATTRIBUTES (e.g. recycled content, energy efficiency, and/or reduced pollutants):** N/A

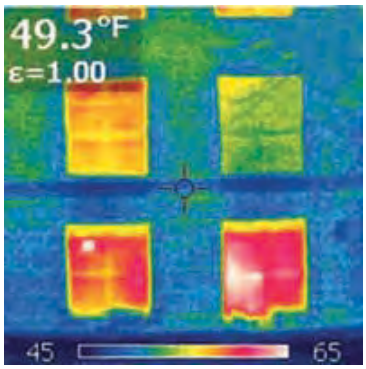
24b. **Section 508 Compliance for EIT:** as applicable

25. **DUNS NUMBER:** 03-935-3297

26. **NOTIFICATION REGARDING REGISTRATION IN SYSTEM FOR AWARD MANAGEMENT (SAM) DATABASE:** Contractor has an Active Registration in the SAM database.

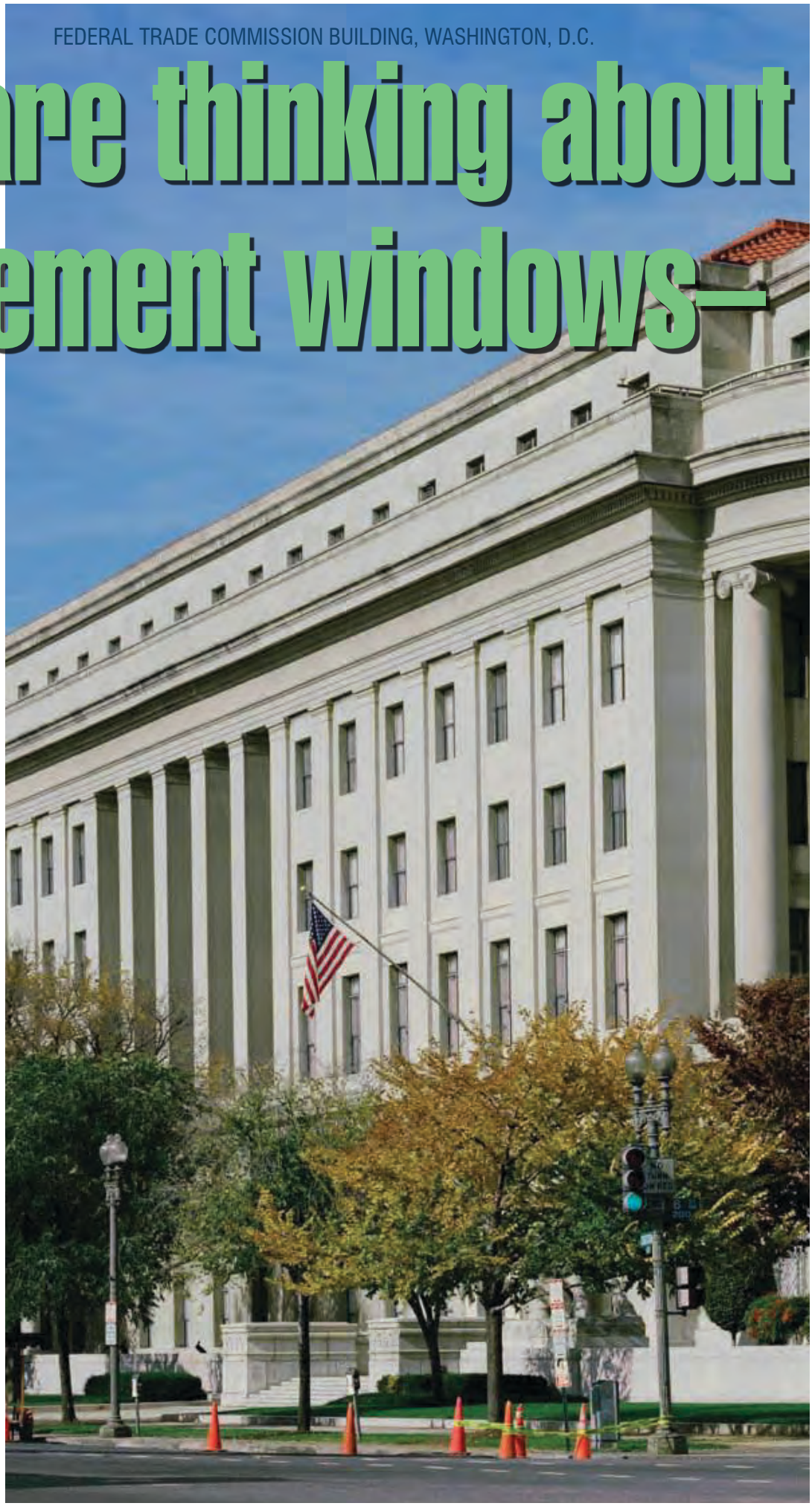
If you are thinking about replacement windows—

Designed to improve the performance of existing windows, Thermolite patented Window Systems are installed on the interior of windows that are structurally sound. Thermolite Window Systems work in conjunction with your existing windows to give you double or triple frame protection eliminating up to 90% of air infiltration and conduction heat loss up to 50%.



THERMAL IMAGE SCAN SHOWING THERMOLITE WINDOW (UPPER RIGHT) REDUCES HEAT LOSS.

According to the Department of Energy[1], buildings account for 40% of U.S. Primary Energy Consumption and 50% of this energy is impacted by windows; almost 14% of the total energy in the U.S.



FEDERAL TRADE COMMISSION BUILDING, WASHINGTON, D.C.

Thermolite windows install on the interior to reduce the noise infiltration, provide a security barrier and increase energy efficiency of existing windows.

We have been securing America's most valuable buildings for over 30 years.

The technology perfected for the federal government saves time, energy, investment capital and lives. It is now available for use in the private sector for commercial, office, educational, hospitality, banks, historic and medical building projects.

Founded in the early 1980s, Thermolite's original concept to create an insulated glass window unit, by incorporating a supplemental pane of glass behind the existing exterior building glass, has evolved into something special.

THERMOLITE
WINDOW SYSTEMS

- Lower initial investment
- Reduces total energy costs
- Reduces sound infiltration
- Maintains architectural integrity
- Non-interruptive installation
- Enhanced security options
- Reduces condensation
- Reduces HVAC upgrades
- Improves building comfort
- Installs from the interior
- Does not affect sight line
- Blast, Hurricane & Signal Defense upgrades

ENERGY SAVINGS

- **Lower Investment**
- **Faster Return**
- **Financing Available**

Most installations realize immediate financial return with the Thermolite Window System. Besides lowering the initial investment (the "I" in ROI), the Thermolite Window System has a profound impact on the TOTAL BUILDING, which needs to be considered in your evaluation.

1. **Reduction in energy loss provides utility savings immediately – now and into the future.**
2. **Reduction in peak loads for electricity results in immediate utility cost reduction.**
3. **Lower total energy demand for your building results in smaller HVAC, boiler, chiller capital cost and capacity need. This is significant.**
4. **Reduction in load and HVAC capacity reduces the operating cost and overall maintenance cost, while extending the lifetime of this very expensive equipment.**
5. **Financing available through our Renewable Energy Equipment Leasing partnership.**

Photograph by Aivazovsky at en.wikipedia

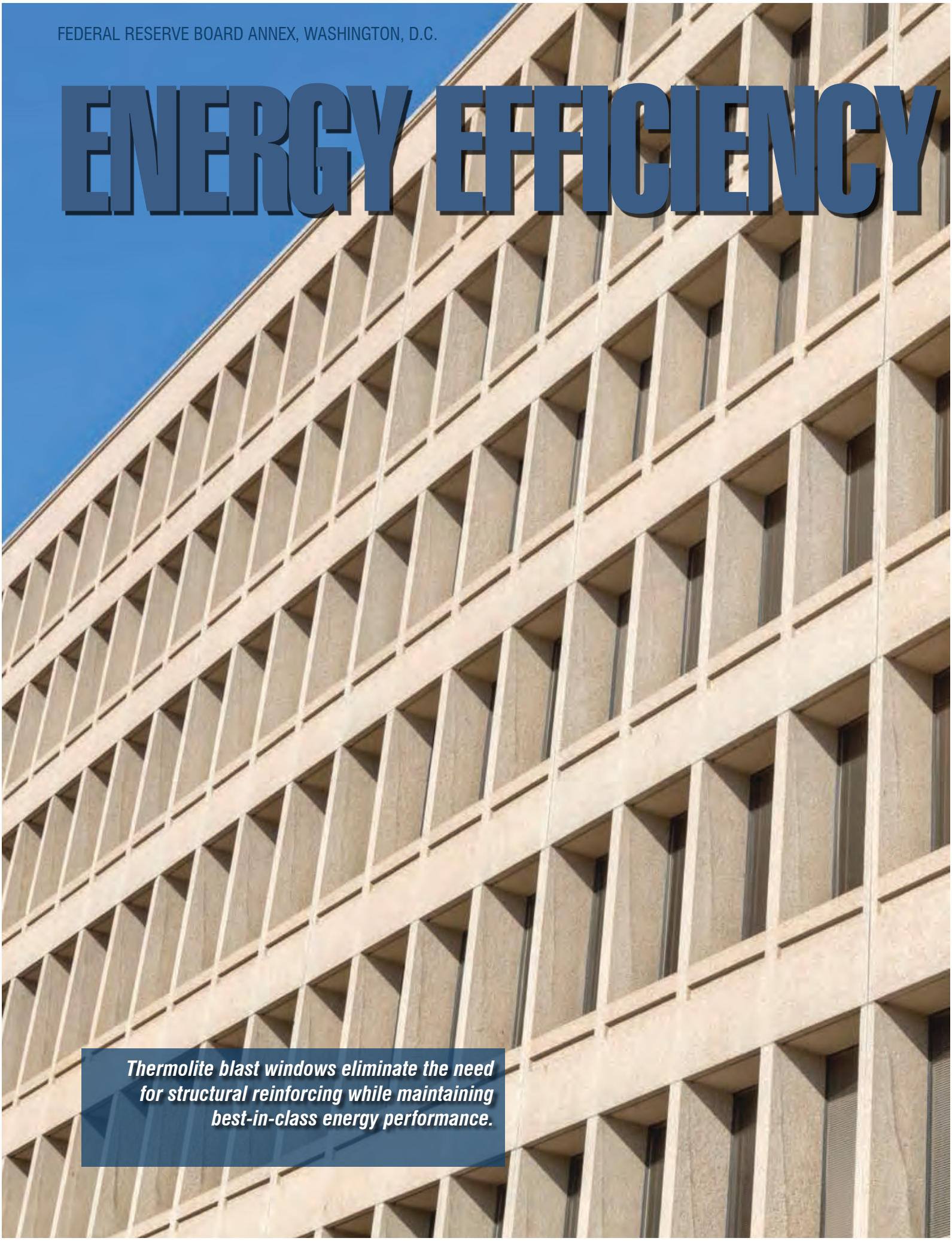
CELEBREZZE FEDERAL BUILDING, CLEVELAND, OH

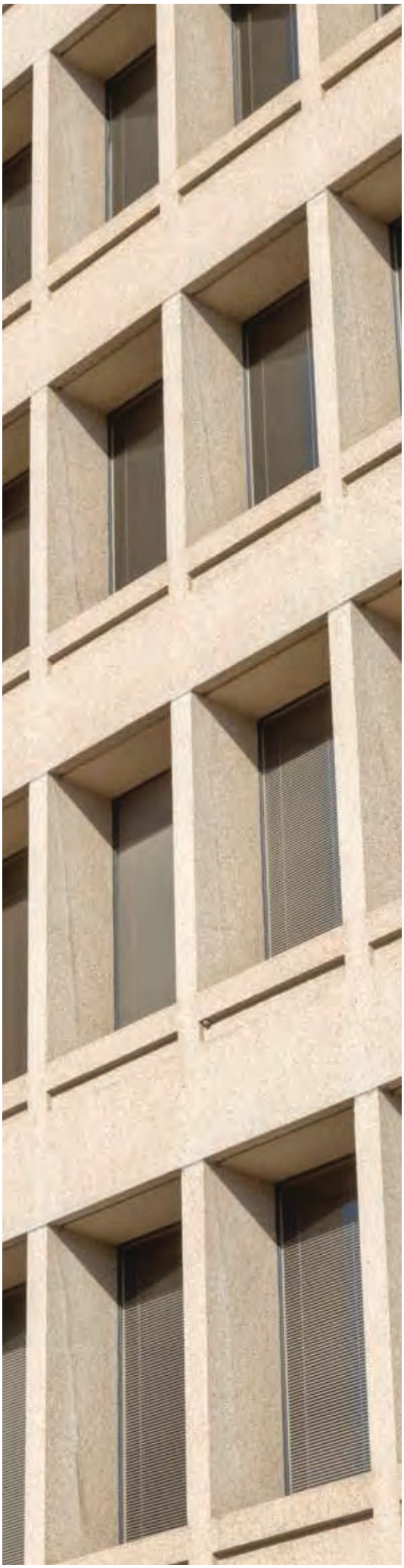
THERMOLITE WINDOWS INSTALLED IN YATES BUILDING

Department of Agriculture, Sidney Yates Building, Washington. D.C.

THERMOLITE WINDOW SYSTEM INSTALLED ON YATES BUILDING

Between-the-glass blinds can be adjusted to allow the sun into the building during the colder months.


FEDERAL RESERVE BOARD ANNEX, WASHINGTON, D.C.
ENERGY EFFICIENCY
Thermolite blast windows eliminate the need for structural reinforcing while maintaining best-in-class energy performance.



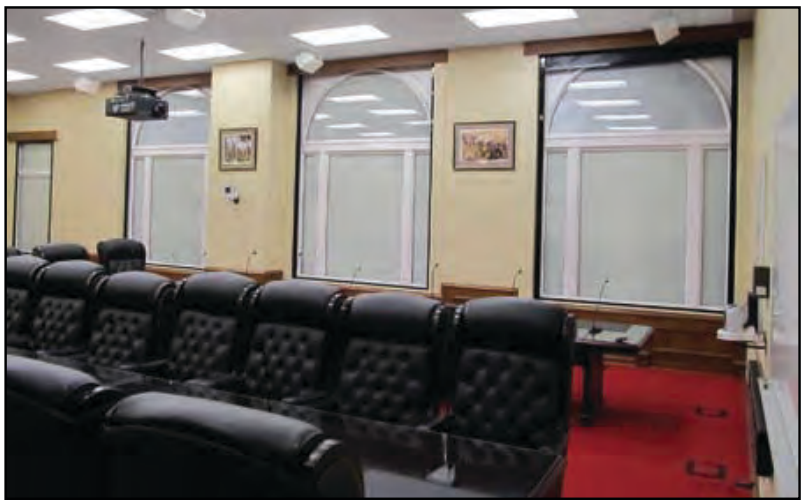
NO-MESS, NON-INTERRUPTIVE INSTALLATION

A window installation project does not have to be messy, noisy, unsightly and disruptive. Because Thermolite Window Systems fit inside the frame of existing windows, there is very little dust and no mess. The average estimated time to complete installation per window is 2 hours, and we will do the installation during non-work hours so your productivity and work flow will not be affected. The benefit of that is your visitors will not be greeted with a "construction zone" as they approach your building.

As a consumer, if you make an installation comparison between traditional replacement windows and Thermolite Window Systems, you will see that shorter install time and reduced interruption of your employees' productivity contribute to an overall lower project cost. When you specify Thermolite, you get project savings now plus energy savings not only immediately but over the life of the building.

HASSLE-FREE INSTALLATION

- **No exterior scaffolding**
- **No relocation of staff**
- **Minimum mess**
- **Off-hours install available**
- **No exterior indication of on-going project**



THERMOLITE WINDOWS INSTALLED IN THE ARCHED WINDOWS AT FT. SILL. –U.S. ARMY

MAINTAINS BUILDING'S ARCHITECTURAL AND HISTORIC INTEGRITY

Thermolite Window Systems are preferred by building and project managers for historical preservation requirements because they are engineered to fit the building's original openings. Besides looking like original windows, our system virtually eliminates condensation and significantly reduces street noise with an STC49 rating.

Not only do Thermolite Window Systems extend the life of existing windows, they also protect historic or artistic treasures and interior furnishings with the addition of between-glass blinds and/or laminate which significantly reduces UV damaging rays.

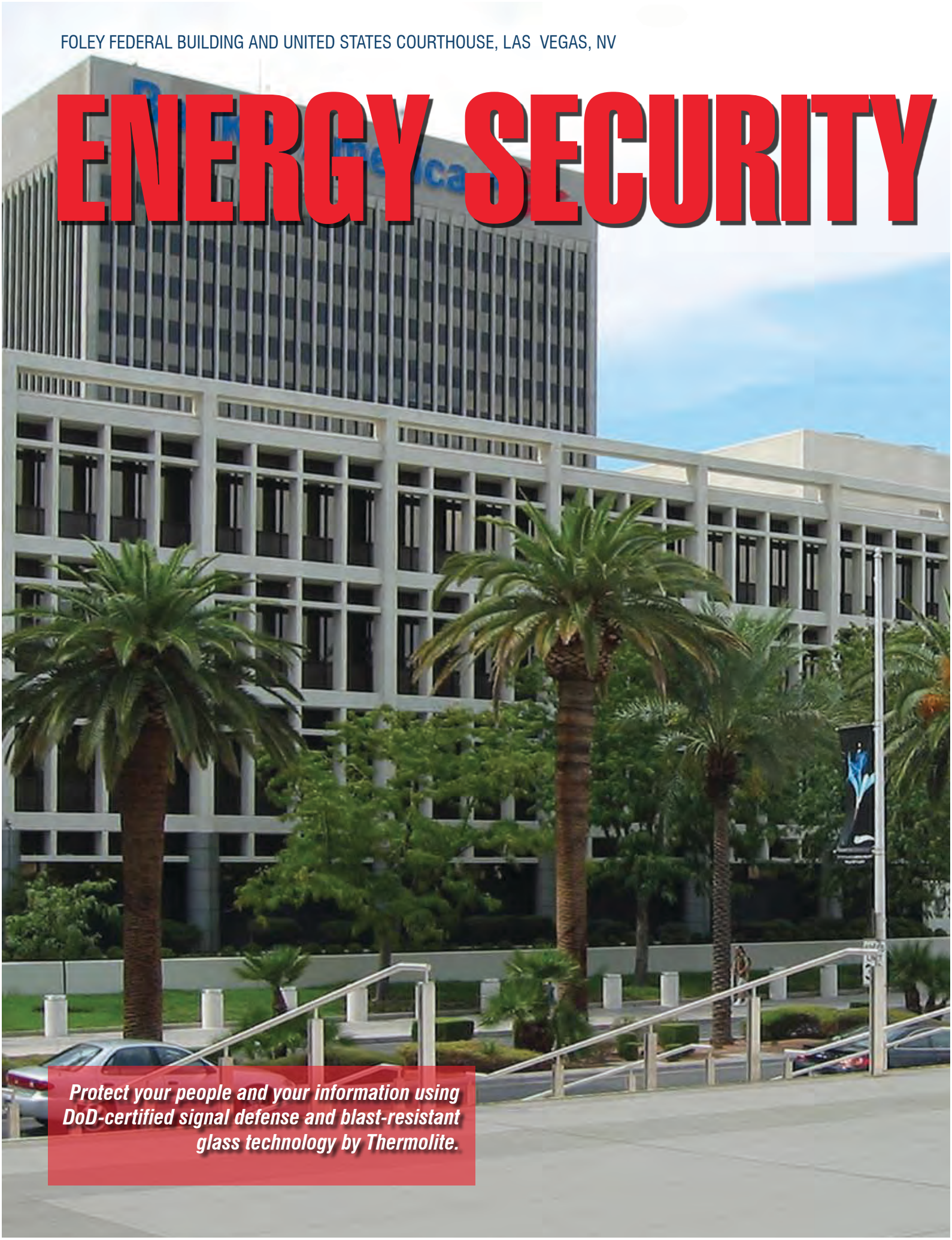
HISTORIC IMPACT

- ✔ **No change to sightlines**
- ✔ **Preserve existing windows**
- ✔ **Frame to match interior decor**
- ✔ **Virtually eliminate condensation**
- ✔ **Protect interior structure and furnishings**
- ✔ **Realize historic building credits**
- ✔ **Maintain historic registry**

ENERGY INTEGRITY

Thermolite window systems reduce sound transmission from street traffic in office space and hotel guest room applications.

HOTEL ALLEGRO, CHICAGO IL


FOLEY FEDERAL BUILDING AND UNITED STATES COURTHOUSE, LAS VEGAS, NV
ENERGY SECURITY
Protect your people and your information using DoD-certified signal defense and blast-resistant glass technology by Thermolite.

THERMOLITE WINDOW SYSTEMS CAN SAVE LIVES

Protect the most valuable part of your bulding—the people inside—with the Thermolite Window System. Every energy product we manufacture can be equipped with blast, ballistic, hurricane and signal defense technology.

Broken glass from windows is the largest contributor to injuries and fatalities in a blast event. In the 1995 Oklahoma City bombing, more than 40% of the injuries and fatalities were attributed to broken windows. Since then, the incorporation of blast-resistant windows in new construction for high profile buildings has been a standard practice. Existing buildings often times do not have the structural reinforcement for new blast windows and had to rely on window film which will allow the window glass to detach if it is not structurally fastened. Our system eliminates the need for structural reinforcing while maintaining high levels of blast mitigation as specified by GSA and the Department of Defense.

- **Reduces structural reinforcement**
- **Reduces anchorage needed**
- **Maintains historic integrity**
- **Most affordable high-performance blast system available**

ENERGY SECUIRTY

THERMOLITE WINDOW SYSTEMS PROTECT LIVES

BLAST

Our patented compression release technology allows for minimal anchoring and no structural reinforcement. What this means is lower cost, higher ROI, larger window openings, pain-free installation—all with the highest level of security possible and with the most exceptional energy performance in the industry today.

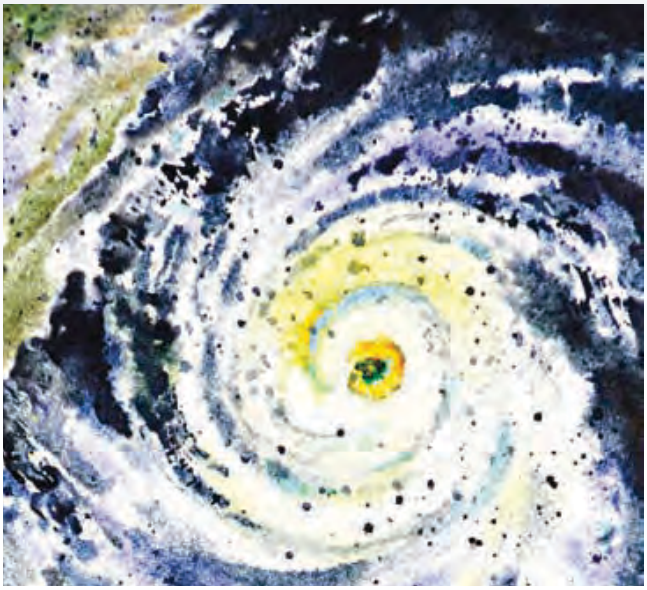
Building Classification	Examples	Minimum Overpressure	Minimum Impulse
A	No protection	0	0
B	No protection	0	0
C	Federal Courts, Federal Buildings	4 psi	28 psi ms.
D	High-level Military	10 psi	90 psi ms.
E	State Department	Classified	Classified

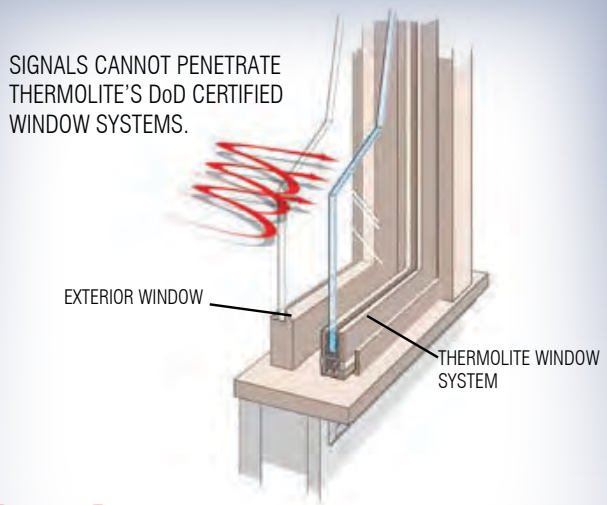
Performance Condition	Protection Level	Hazard Level	Description of Window Glazing Response
1	Safe	None	Glazing does not break. No visible damage to glazing or frame.
2	Very High	None	Glazing cracks but is retained by the frame. Dusting or very small fragments near sill or on floor acceptable.
3a	High	Very Low	Glazing cracks. Fragments enter space and land on floor no further than 3.3 ft. from the window.
3b	High	Low	Glazing cracks. Fragments enter space and land on floor no further than 10 ft. from the window.
4	Medium	Medium	Glazing cracks. Fragments enter space and land on floor and impact a vertical witness panel at a distance of no more than 10 ft. from the window at a height no greater than 2 ft. above the floor.
5	Low	High	Glazing cracks and window system fails catastrophically. Fragments enter space impacting a vertical witness panel at a distance of no more than 10 ft. from the window at a height greater than 2 ft. above the floor.

HURRICANE

Building openings like windows and doors have to be secure during a high-wind storm or the entire building will be at risk. Minimizing water damage is not the main purpose of hurricane windows. Instead, they protect the entire building from an overload of wind pressure, which may contribute to the entire roof lifting off. Wind blowing over the roof will create a negative pressure. Once the windows of a building fail, positive pressure will build up inside the structure, and total structural failure is likely.

The Thermolite Window System easily installs on the inside of the building and will secure your building. Our systems have been tested for large and small impacts and meet the strictest building codes in the country.





SIGNAL DEFENSE

Organizations desiring to properly secure locations handling sensitive and/or classified information should consider adding some kind of signal defense capabilities to the Thermolite Window System. A single event of information theft could devastate a business, and we have a solution ready to protect. Laminated glass with patented technology can be placed on the interior of your building, which will protect any kind of information from theft coming from your company's cell phones, routers or even audio espionage through the glass itself. We can provide an interior system to comply with US DoD Policy, Infrared and Radio Frequency Emanation Standard, Intelligence Community Directive 705.2, Certified TEMPEST Technical Authority (CTTA) specifications.

THERMOLITE CLIENTS

UNITED STATES ARMY

UNITED STATES NAVY

NATIONAL DEFENSE UNIVERSITY

DEPARTMENT OF HOMELAND SECURITY

DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE

DEPARTMENT OF AGRICULTURE

FEDERAL RESERVE BANK SYSTEM

STATE / FEDERAL BUILDINGS

PRIVATE / PUBLIC UNIVERSITIES

HOTELS, OFFICE & COMMERCIAL BUILDINGS

WHITE HOUSE VISITORS CENTER, COMMERCE BUILDING, WASHINGTON D.C.

THERMOLITE™
WINDOW SYSTEMS

3502 Sample Street
South Bend, Indiana 46619
Phone: 574.234.4004
Fax: 574.234.4005

E-mail: info@Thermolitewindows.com
Website: www.Thermolitewindows.com

Please call or e-mail us to find out how THERMOLITE can be your window system.

THERMOLITE WINDOW SYSTEMS

SIN 563-23

Thermolite 2014 GSA Price List

Energy Series 2000AL
Aluminum Fixed Window

Interior fixed window system with painted aluminum sash and painted aluminum track.

Standard

Square Feet	1/4" annealed glass
0-10	$166.46 each
Over 10 to 16	$17.07/sq. ft
Over 16 to 26	$15.10/sq. ft.
Over 26 to 36	$13.67/sq. ft.
Over 36	$12.49/sq. ft.

Add $3.59 per sq. ft. for 1/4" or 3/16" Laminated.
Add $4.19 per sq. ft. for 5/16" Laminated.

Add 1" blinds: $2.39 per square foot

NOTES:
1. Standard painted aluminum colors are white and black.
2. Aluminum Framing may be required for installation process.
5. See **Additional Pricing Information** page before completing pricing.

THERMOLITE WINDOW SYSTEMS

SIN 563-23

Thermolite 2014 GSA Price List

Energy Series RetroWAL
Aluminum Fixed Window

Interior fixed window system with painted aluminum sash and painted aluminum track.

Standard

Square Feet	1/4" annealed glass
0-10	$166.46 each
Over 10 to 16	$17.07/sq. ft
Over 16 to 26	$15.10/sq. ft.
Over 26 to 36	$13.67/sq. ft.
Over 36	$12.49/sq. ft.

Add $3.59 per sq. ft. for 1/4" or 3/16" Laminated.
Add $4.19 per sq. ft. for 5/16" Laminated.

Add 1" blinds: $2.39 per square foot

NOTES:
1. Standard painted aluminum colors are white and black.
2. Aluminum Framing may be required for installation process.
5. See **Additional Pricing Information** page before completing pricing.

THERMOLITE WINDOW SYSTEMS

SIN 563-23

Thermolite 2014 GSA Price List

STORM SERIES 2000
CAT 3 Hurricane
Aluminum Fixed Window

Interior fixed window system with painted aluminum sash and painted aluminum track.

Standard

Square Feet	5/16" laminated glass
0-10	$335.15 each
Over 10 to 16	$33.52/sq. ft
Over 16 to 26	$32.32/sq. ft.
Over 26 to 36	$31.12/sq. ft.
Over 36	$29.92/sq. ft.

Add 1" blinds: $2.39 per square foot

NOTES:
1. Standard painted aluminum colors are white and black.
2. Aluminum Framing may be required for installation process.
5. See **Additional Pricing Information** page before completing pricing.

THERMOLITE WINDOW SYSTEMS

SIN 563-16

Thermolite 2014 GSA Price List

Safety Series 2000™
GSA LEVEL C – 4 PSI
Blast Resistant Aluminum Fixed Window Systems

This product combines the energy benefits of Therm-O-Lite's products with high levels of blast resistance (Up to GSA Performance Condition 1 rating).

Standard

Square Feet	5/16" laminated glass
0-10	$365.97 each
Over 10 to 16	$32.41/sq. ft.
Over 16 to 26	$28.98/sq. ft.
Over 26 to 36	$27.36/sq. ft.
Over 36	$25.97/sq. ft.

Add 1" blinds: $2.39 per square foot

NOTES:
1. Aluminum Framing **must** be added onto window pricing for Safety Series 2000. See **Additional Pricing Information** page for pricing.
2. Standard painted aluminum colors are white and black.
3. See **Additional Pricing Information** page before completing pricing.

THERMOLITE WINDOW SYSTEMS

SIN 563-23

Thermolite 2014 GSA Price List

Additional Pricing Information

Optional Low "E" Glass

Add $3.56 per square foot

Tempered Glass

$4.04: 1-1200 square feet
$1.20: over 1200 square feet

Aluminum Framing

1" x 1"	$4.13 per lineal foot
1" x 1 ½"	$4.72 per lineal foot
1" x 2"	$5.62 per lineal foot
2" x 2"	$6.61 per lineal foot
1" x 3"	$7.55 per lineal foot
3-1/2" p-tube	$10.07 per lineal foot
4-1/2" p-tube	$12.04 per lineal foot

Anodizing

Add $.92 per lineal foot

Custom Painted Color

Add $ .48 per lineal foot

THERMOLITE WINDOW SYSTEMS

Thermolite 2014 GSA Price List

Minimum Delivery Charge
FOB South Bend

Destination Distance From South Bend	Minimum Shipping Cost
Under 25 Miles	$100.00
26 to 75 Miles	$225.00
76 to 125 Miles	$350.00
126 to 175 Miles	$475.00
For Every 50 Miles Over 175 Miles	Add $125.00

*Distributor should make every effort to combine small orders.

*If Company can combine orders to other distributors in your general area, this minimum charge would be prorated as to quantity and distance.

*For multiple orders, total miles through final delivery will determine the distance. If Company can negotiate better delivery rates, the savings will be passed through to the Distributor.

Note: at every 200 mile increment (200, 400, 600, etc.) **add $100.00 per diem**.

Example: 600 Mile Trip

$ 475.00
1,125.00 (9 x 125)
300.00 per diem
$ 1,900.00

GSA LABOR CATALOG PRICING
Contract Number GS-07F-0116H SIN 563-98
THERM-O-LITE WINDOW INSTALLATION

Training and Certification fees for In-House Installation $602.76 per day
Travel Expenses Quoted upon area of request

GENERAL CONDITIONS

Standard application into wood or aluminum prime frame where pre-drilling or anchors are not required.
All furnishings and accessories must be clear of immediate area.
Inside of prime window including sill must be clean.
Receiving and storage area must be provided.
Project Sequencing, Escorts when required, and access must be scheduled to allow for continuous work schedules.
All prices are based upon performing work during normal working hours, Monday thru Friday between 7:00 am and 5:00pm, excluding Holidays.

FRAME & GLASS INSTALLATION (NO WOOD FRAME)

Fixed Aluminum	$1.32/U.I.	($92.40 Minimum)
Safety Series 2000™	$5.21/U.I.	($364.40 Minimum)
Operable	$5.42/U.I.	($379.40 Minimum)
Blast/Design-Build Fixed	$9.96/U.I.	($697.20 Minimum)
Framing	$1.82/U.I.	($127.40 Minimum)

*United Inches equals the sum of one width & one height per window

BLIND INSTALLATION

Install blinds $34.53 each

WOOD FRAME INSTALLATION

Wood window frame installation with track pre-installed

Wood/Drywall	$ .72/U.I.
Masonry	$1.43/U.I.

REMOVAL/DISPOSAL FEES

Remove existing draperies	$59.38/man hour
Reinstall draperies	$59.38/man hour

MISCELLANEOUS FEES

Cleaning Prime window inside	$ .39 sq. ft.
Measuring windows	$2.66 per opening
Staging of products to point of installation	$3.82 each lite
Installation of mullions and caulking	$2.42 per foot
Drill and anchor mullions (standard)	$2.38 per lineal foot
Remove film	$3.64 per square foot

ADDITIONAL ANCHORAGE

ANCHOR DIAMETER	ANCHOR DEPTH PER FOOT COST	HOLE SIZE DIAMETER
1”	$258.44	2 ½”

Therm-O-Lite, LLC
3502 West Sample Street
South Bend, IN 46619
Phone: 574-234-4004 Fax: 574-234-4005
Email: info@thermolitewindows.com
www.thermolitewindows.com

THERMOLITE™
WINDOW SYSTEMS

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South Bend, Indiana 46619 | Fax: 574.234.4005

E-mail: info@Thermolitewindows.com | Website: www.Thermolitewindows.com

Please call or e-mail us to find out how **THERMOLITE** can be your window system.

THERMOLITE

CUT COSTS & INCREASE VALUE

INTERIOR WINDOW RETROFITS

CASE STUDIES, ENERGY ANALYSES & DATA REPORTS

A comprehensive overview of the benefits of interior secondary window retrofits, including energy savings, security upgrades, historical integrity protection, and more.

Window Retrofit Benefits

THERM-O-LITE, LLC | THERMOLITEWINDOWS.COM

QUICK OVERVIEW

Interior window retrofits achieve what no other window system can do

Thermolite's patented secondary window system is a one-of-a-kind alternative to traditional replacement windows. A secondary window retrofit installs on the interior of a building's existing windows with a simple frame system. This not only minimizes installation time and costs, but transforms a building's existing windows into a high-performing window upgrade that significantly reduces energy use and utility costs.

LOW-COST SOLUTION

Upgrading a building's window system is one of the most effective ways to improve energy efficiency. Unfortunately, removing and replacing all of the windows in a building is costly — especially for high-rise buildings and facilities located in densely populated cities. Thermolite's innovative retrofit system provides a simple and effective solution for reducing energy consumption in these types of building at a fraction of the cost.

EASY TO INSTALL

Unlike traditional replacement windows, which require a lengthy and invasive installation process, Thermolite windows install quickly and easily on the interior of a building's existing windows. The original glass stays in place, which eliminates the timely and costly need to remove and replace any glass. No scaffolding or intensive labor is required whatsoever, making the Thermolite system one of the easiest and most affordable commercial window upgrades available.

MINIMAL DOWNTIME

Office downtime is an important concern when considering energy improvement options for a building. Major renovations like conventional replacement windows can shut down valuable office space for weeks and even months at a time. Thermolite windows, on the other hand, attach easily to the interior of the building. The entire installation can be completed outside of normal business office hours, eliminating the extra costs related to office downtime.

CONTENTS

Additional case studies, energy reports and past project details are available upon request. Contact 574-234-4004 or info@thermolitewindows.com for more information.

CASE STUDY: LARGE BUILDING RETROFIT

THE JACOB K. JAVITS FEDERAL OFFICE Building, located at 26 Federal Plaza in New York City, is the tallest federal building in the U.S. The plaza itself is comprised of a 45-story office building constructed from 1963-69 and an additional 45-story annex that was built from 1975-77. Both buildings are connected to the Watson Court of International Trade via a 4-story pedestrian bridge. Designed by Alfred Easton Poor, Kahn & Jacobs, and Eggers & Higgins, the entire complex consists of about 2.9 million square feet. The Jacob K. Javits Federal Office Building houses numerous government agencies including the Social Security Administration and the General Services Administration.

Curtainwall and high-rise window retrofits that reduce peak loads and annual energy costs

OVERVIEW

Like most buildings constructed in the 1960s and 1970s, the Jacob K. Javits Federal Office Building features conventional non-thermally-broken windows. These are center-pivot, clear, aluminum-framed windows with a single pane of untreated glass. Although the most commonly used window at the time, this type of window system offers poor insulation, resulting in substantial energy loss, and in turn, higher utility costs. With more than 7,250 single-pane conventional windows, the facilities staff at the Jacob K. Javits Federal Office Building wanted a cost-effective way to reduce its annual energy costs.

THERMOLITE'S INNOVATIVE INTERIOR WINDOW SOLUTION

After a review of the current windows installed at the Jacob K. Javits Federal Office Building, including a complete evaluation of the amount of energy escaping through them, Thermolite recommended the installation of its RetroWAL Gold fixed interior window system. Unlike traditional replacement windows, Thermolite's RetroWAL system is installed on the interior of the building's current windows, omitting the high labor cost of replacing the exterior windows, the outdoor liability of multi-story scaffolding and high-rise labor, and the cost of office downtime due to a longer and more intrusive installation process.

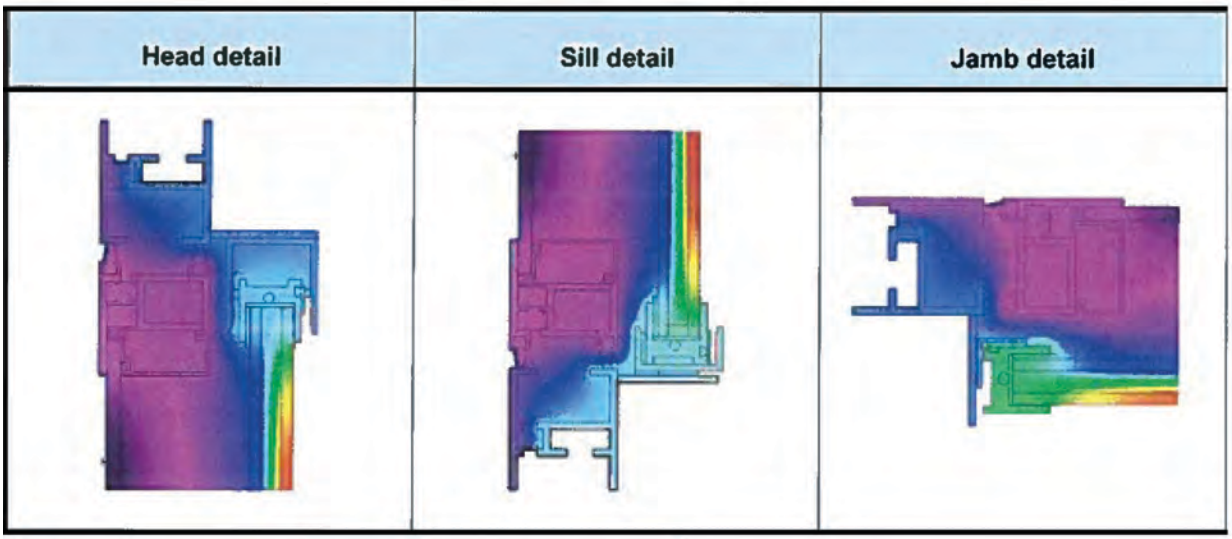
INCREASING INSULATION AND THERMAL PERFORMANCE

Thermolite's RetroWAL window system creates an air gap that mitigates heat loss by essentially trapping it between the glass panes. Thermolite installed double-pane, coated glass to provide additional layers of insulation. Because the installation of the RetroWAL system requires no removal of the original window glass and can be performed quickly, Thermolite was able to upgrade the complex's window system from single-pane to triple-pane glass at a fraction of the cost of a traditional window replacement system. Thermolite improved the R value of the building's windows from <1 to >3, and eliminated the air infiltration of the existing glass.

Thermolite addressed not only the energy inefficiency of the window glass, but also that of its frames. The original windows at the Jacob K. Javits Federal Office Building included outside and inside aluminum frames mounted directly onto each other, creating a powerful thermal bridge. Non thermally-broken windows like these create an easy pathway for heat transfer and result in a significant overall reduction in thermal insulation.

The new window system included a barrier between the window frames, breaking the existing thermal bridge to block the natural flow of heat in the building, especially during colder months.

TEMPERATURE DISTRIBUTION THROUGH WINDOW ELEMENTS (HEAD, SILL AND JAMB)



Computer models of the RetroWAL system were used to conduct a thermal analysis to meet client-specified performance requirements.

USING LOW EMISSIVITY GLASS TO INCREASE ENERGY EFFICIENCY

In addition to upgrading the federal plaza to triple-pane glass and eliminating the costly thermal bridge, the Thermolite RetroWAL window system utilized argon-filled low emissivity glass to further seal the building envelope for maximum insulation.

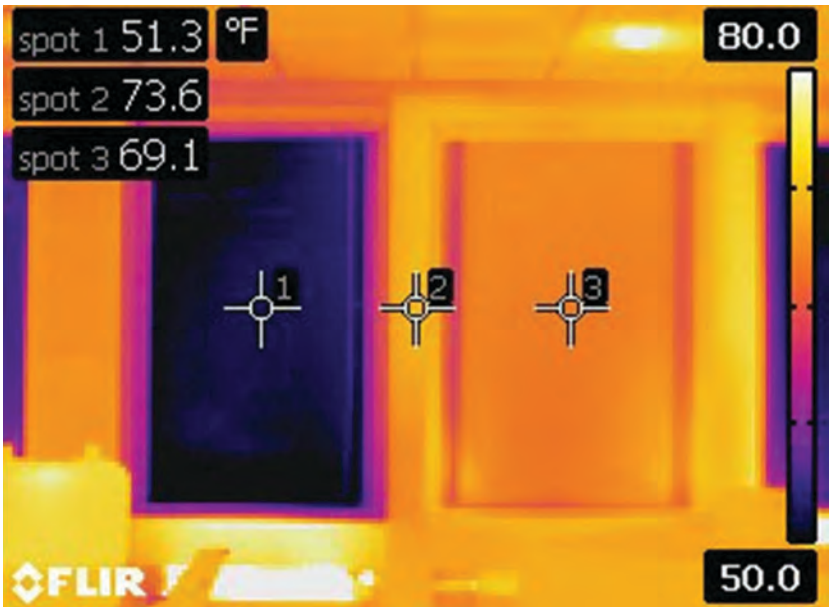
Low emissivity glass increases the energy efficiency of windows by reducing the transfer of heat. Low E glass differs from normal, clear glass in that one side of the glass has a special metal coating designed to minimize the amount of infrared energy that can pass through the glass without compromising the amount of transmitted visible light. Low E coatings play an important role in the overall performance of a window and can significantly affect the overall heating, lighting and cooling costs of a building.

Thermolite installed soft coat low E glass at the Jacob K. Javits Federal Office Building. This type of glass is treated with multiple layers of transparent silver and metal oxide in a vacuum chamber, a process that provides the highest level of energy efficiency performance and a nearly invisible coating.

One of our installation technicians measures a two-inch wall pocket against the original window frame. Thermolite's RetroWAL system was installed on the opposite side of the gap, providing an effective thermal break.

Thermolite's RetroWAL Gold fixed interior window system installed in one of the offices at the Jacob K. Javits Federal Office Building.

A close-up of the installed RetroWAL Gold double-pane window with the building's original window behind it, creating a triple pane system.



This thermal image shows the comparison of the new window (right) to the existing window. The Thermolite window has an interior temperature of 18-19˚F higher than the existing window.

This image shows the existing window (left) beside the installed Thermolite RetroWAL Gold window.

CASE STUDY: INTERIOR BLAST WINDOWS

BOMB BLAST WINDOWS OFFER PROTECTION for buildings that are high profile targets for terrorist attacks, including government and military facilities. In general, bomb blast protective measures – especially blast resistant windows – must be integrated into the architectural design of the building. Bomb blast windows not only serve to protect the lives of people inside a facility in the case of an explosion, but also the valuable infrastructure and assets of the building and its material contents. This case study provides an overview of Thermolite's patented retrofit blast window system, which meets and exceeds General Services Administration (GSA) and Department of Defense (DOD) blast level requirements, and can be installed for a fraction of the cost of conventional blast windows.

Low-cost, high ROI physical security upgrades for government and military buildings

Designing an efficient bomb blast window system requires a detailed assessment of a building's particular weaknesses and vulnerabilities, including its risk factors for potential security threats.

To best mitigate the threat of injury and damage from a terrorist explosion, Thermolite conducts a thorough assessment that evaluates a building's risk for both short-distance and long-distance bomb attacks that incorporates important variables such as stand-off distance, charge weight and angle of incidence.

Other important factors to consider include the size of the building's existing window glass, the depth of the frame, the materials in the walls, and how the window is attached to the building.

Given that each building is unique in terms of its particular weaknesses and risk factors, Thermolite offers an extensive range of bomb blast windows and curtain wall solutions, including fully customizable systems developed specifically to provide safety and protection for any building or facility.

PATENTED COMPRESSION RELEASE TECHNOLOGY

Thermolite's blast window retrofit is the only system made in the United States that uses dynamic loading to accomplish the objective of keeping glass from shattering into the building. Its balanced design and Compression Release Technology™ enables our blast window retrofit system to withstand a high pressure impact without the need for structural steel reinforcement. This type of unique approach addresses a variety of factors, including the forces applied to window on glass, how glass force is transferred to frame and how the blast energy is transferred to the wall, floor and ceiling structure of a building.

While blast windows require strong glass that doesn't easily penetrate upon a blast force, even heavy glass is ineffective if not properly secured. Conventional blast window designs include a combination of strong glass and structural steel reinforcement around the window frames. In these systems, a heavy blast glazing on the glass acts as a rigid body that transfers the blast pressure impulse to the steel frame.

Thermolite's Compression Release Technology™ eliminates the need for expensive heavy structural framing. Instead of utilizing a fixed steel window frame, Thermolite's blast windows feature a patented frame design that absorbs the last pressure transfer until the negative phase of the blast pressure wave occurs. This type of dynamic blast mitigation system: 1) does not require structural steel; 2) is faster to install; and 3) is half the total cost of traditional blast windows.

BLAST REPORT FOR THE DEPARTMENT OF INTERIOR

In August of 2011, Thermolite contracted with an independent engineering firm to conduct an official blast test report for the U.S. Department of Interior regarding the effectiveness of Thermolite's blast resistant window system. To maintain variables, the firm constructed a replica test site using the same materials that were used to build the Department of Interior facility, including identical ratios of brick to mortar, concrete masonry anchors and encased steel beam reinforcements above the windows.

The test took place in a deserted area of New Mexico. A 600-pound ANFO explosive charge was detonated at a [undisclosed] distance from a test wall that had been fitted with Thermolite's interior blast resistant window system. The test reported that the internal window cracked, but retained in the frame and emitted no glass inside the structure other than a slight dusting. There were no indentations, penetrations or marks on the witness panel, and no glass fragments were found inside the structure with a united dimension of 1-inch or greater.

Thermolite's blast window system performed at Condition 2 — the second highest performance standard for blast windows set by the U.S. General Services Administration.

A. The Thermolite blast window remained intact after the test explosion.

B. Another image showing the Thermolite window after the test explosion.

C. This image shows the exterior post-test window unit.

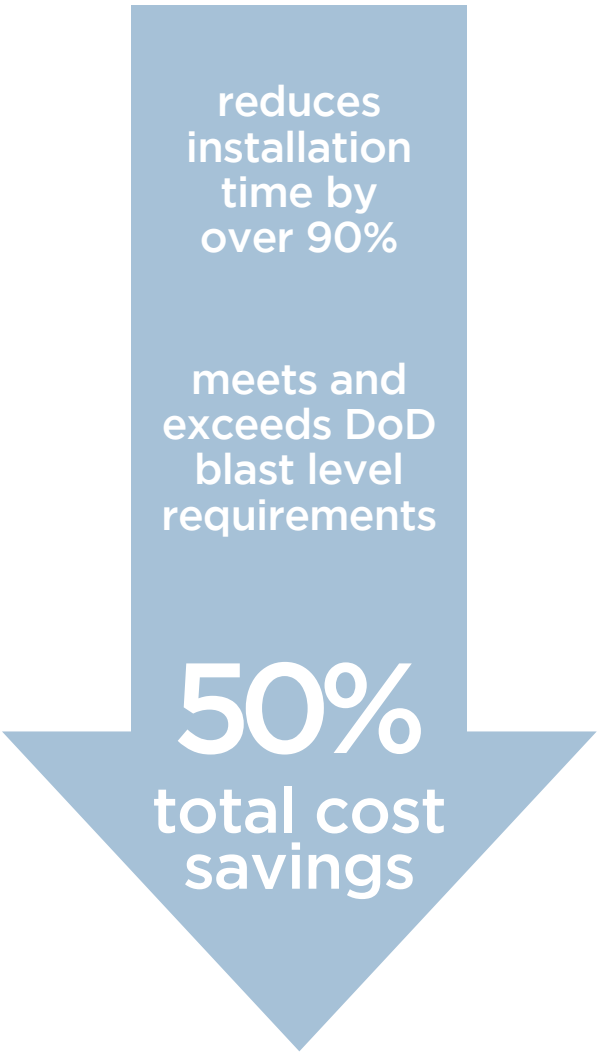
D. The test blast caused visible cracks in the masonry of the wall unit

CONCLUSION: BETTER BLAST PROTECTION AT A LOWER COST

Thermolite's unique Compression Release Technology™ results in a lower total project cost and a much faster installation time than traditional blast systems.

Unlike traditional blast window retrofit products, the Thermolite system is installed on the interior of existing windows, eliminating the costly need to tear out the wall and place steel support beams inside the window frame. The entire system only takes one to two hours to install and meets and exceeds DOD blast level requirements.

In comparison to conventional exterior blast windows, Thermolite's interior blast window retrofit is more cost-effective, yields a higher ROI, and requires a shorter, less invasive installation process — all while providing the highest level of security possible and the most exceptional energy performance in the industry today. Installation can even be performed discreetly during hours that are convenient for you and your building's occupants



ADDITIONAL FEDERAL BOMB BLAST RESOURCES

UFC 4-010-01 DoD Minimum Anti-Terrorism Standards for Buildings

The Unified Facilities Criteria (UFC) system is prescribed by MIL-STD 3007 and provides planning, design, construction, sustainment, restoration, and modernization criteria, and applies to Military Departments, Defense Agencies and the DoD Field Activities in accordance with USD(AT&L) Memorandum dated May 29, 2002.

US General Services Administration Standard Test Method for Glazing and Window Systems Subject to Dynamic Overpressure Loadings

This test standard is intended to ensure an adequate measure of standardization and quality assurance in the testing of window systems including but not limited to glazing, sealants, seats and seals, frames, anchorages and all attachments and/or secondary catcher or restraint mechanisms designed to mitigate the hazards from flying glass and debris.

The Risk Management Process for Federal Facilities: An Interagency Security Committee Standard

This ISC Standard defines the criteria and processes that those responsible for the security of a facility should use to determine its facility security level and provides an integrated, single source of physical security countermeasures for all nonmilitary Federal facilities. The Standard also provides guidance for customization of the countermeasures for Federal facilities.

RetroWAL™

THE WORLD'S FIRST DO-IT-YOURSELF COMMERCIAL WINDOW RETROFIT SYSTEM

RetroWAL™ is the most affordable and effective solution for improving the energy efficiency of curtainwall, storefront and window wall buildings. Unlike traditional replacement windows, the RetroWAL™ system installs quickly and easily on the interior of a building's existing windows, creating an insulating dead air space. The existing glass stays in place, eliminating the costly need for scaffolding or intrusive downtime. RetroWAL™ not only reduces energy consumption, but also reduces energy demand and provides sound control.

REDUCES ENERGY USE BY 20%

BETTER ALTERNATIVE TO FILM

EASY-TO-INSTALL (DIY)

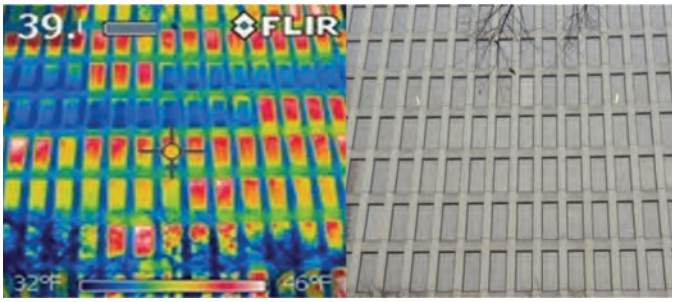
LIGHTWEIGHT AND SAFE

IMPROVES SOUND CONTROL

RetroWAL™ is Available in Silver & Gold Series

RetroWAL™ Silver uses monolithic low-e glass to convert a single pane window to double pane, improving insulation and reducing both solar heat gain and air infiltration. RetroWAL™ Gold upgrades a single pane window to triple pane with low-e, argon-filled glass. Both the Silver and Gold Series are ideal energy solutions for curtainwall buildings constructed in the 50s, 60s and 70s. Installation is simple and can be done by contractors, local glazers or even building owners and their staff.

	1/4" clear	+ Silver	+ Gold
R Value	1	3	5
U Value	1.02	.36	.18
SHGC	.83	.70	.44
VT	.89	.77	.61
Weight	-	3.3	3.5
Center of Glass Value			



THERMOLITE

SOUND CONTROL WINDOWS FOR HOTELS

TRAVELERS MAY WELCOME THE CONVENIENCE of staying in a hotel near an airport or train station, but the noise from the airplanes is not only a nuisance, but repeated exposure to such high decibels can be potentially dangerous. Modern buildings often deal with sound problems because of inefficient windows with air leakage that contributes to loud outdoor noise entering the building. Thermolite worked with a major hotel in a close proximity to the San Francisco International Airport on their sound control problems. We were able to reduce the sound levels by approximately 90% with the installation of our RetroWAL™ interior curtainwall retrofit system, according to sound transmission loss tests performed by Architectural Testing, Inc.

METHODOLOGY

While the sound improvement to the major San Francisco hotel was quite perceptible after the installation of RetroWAL™, Thermolite was interested in quantifying these results through sound transmission class (STC) and outdoor indoor transmission class (OITC) ratings performed in a laboratory setting. STC rating measures the sound transmission loss of mid to high frequency noises (such as conversation or television) over a frequency range from 125 to 4000 hertz, while OITC rating measures low frequency sounds (such as airplane noise) over a frequency range of 80 to 4000 hertz. The higher the rating, the better the product is at blocking noise from entering the room

Product	Glazing (Nominal Dimensions)	STC	OITC
Existing Curtainwall	1” IG (1/4” heat strengthened, 1/2” air space, 1/4” heat strengthened)	31	26
Thermolite’s RetroWAL™	Primary 1” IG (1/4” heat strengthened, 1/2” air space, 1/4” heat strengthened) sound control glass	47	40

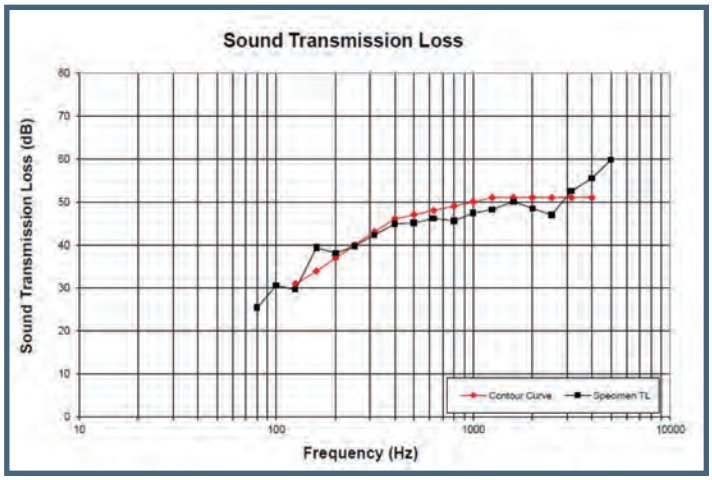
RESULTS

The existing single-lite curtain wall system in place at the hotel had a 1” IG (1/4” Heat Strengthened, 1/2” Air Space, 1/4” Heat Strengthened) and measured at an STC rating of 31 and an OITC rating of 26. When Thermolite’s RetroWAL™ was installed on the interior of the existing single-lite curtain wall system, the Architectural Testing Inc. laboratory findings measured an STC rating of 47 and an OITC rating of 40. To put this information into perspective, a 4 point increase is enough for a perceptible reduction in noise, while a 10 point increase is about 50% lower levels of sound, according to the American Architectural Manufacturers Association (AAMA). Since the hotel in which RetroWAL™ was installed was as at such close proximity to the low frequency noise from the San Francisco International Airport, the 14 point increase in OITC rating is especially significant because it means that Thermolite reduced the most intrusive sound levels by even more than 50%.

CONCLUSION

Thermolite’s sound control interior curtainwall retrofit system is so effective because it increases the existing window’s insulating properties with our double pane low-e glazing. This creates an air gap between the panes of glass, which traps excess sound and prevents it from reaching the interior of the room. Since Thermolite’s system installs on the interior of existing windows, it also seals up any air leakage which may contribute to noise entering the premises from outdoors.

Thermolite’s interior window system is not only affordable, but it saves money by improving the building’s energy performance. Unlike using replacement windows for sound control, our product has a quick and non-disruptive installation that does not require hotels to inconvenience guests or close temporarily and lose business.



In 2014, Thermolite contracted with an independent engineering firm to conduct a sound transmission loss report for Thermolite’s RetroWAL system. The report concluded that the sample window system performed at a STC rating of 47 and at and an OITC of 40. Note: to obtain the STC in the graph above, read the Sound Transmission Loss of the contour curve at 500 Hz. The sum of the deficiencies below the contour curve cannot exceed 32. The maximum deficiency at any one frequency cannot exceed 8.

CASE STUDY: HURRICANE WINDOWS

Hurricanes and super storms pose a dangerous threat to both people and the buildings they occupy. Retrofitting these buildings with hurricane storm windows not only protects building occupants during severe weather, but also helps prevent extensive structural damage. Thermolite's unique hurricane storm window system attaches to the inside of a building's existing glass. In doing so, the Thermolite system not only prevents glass from shattering into the building, but also prevents wind, debris and water from entering – all of which can cause both injury and substantial property damage.

THE IMPORTANCE OF STORM WINDOWS DURING SUPER STORMS AND HURRICANES

It is no secret that hurricanes and tropical storms can cause devastating damage to a community. While much of this destruction is directly attributable to a storm's high-speed wind and rain, a lesser known (but equally dangerous) threat posed by hurricanes is glass implosion. The wind pressure caused by tropical storms like Hurricane Sandy can force windows beyond their breaking point, causing an interior explosion of flying glass shrapnel that can seriously harm and even kill building occupants.

The aftermath of a hurricane can also be a dangerous situation. In buildings with imploded windows, water and debris can enter and cause further damage. When windows are destroyed, it causes another set of added

expenses — from replacing the actual windows to repairing the building's interior features and equipment that were compromised during the storm.

Another cause of potential damage and destruction during a severe storm is roof lift. While roof damage is sometimes attributed to powerful winds, many building owners are not aware that another common cause of roof lift is compromised windows. When windows implode from the pressure of hurricane winds, the air pressure in the building changes and can cause internal and structural damage, including roof lift-off. And when the roof has been affected and lifts off, the entire building structure is vulnerable to collapse and extensive damage.

PROVEN BENEFITS OF THERMOLITE'S STORM WINDOW SYSTEM

Retrofitting buildings located in high-risk areas with hurricane storm windows not only protects building occupants during a severe storm, but also helps prevent extensive structural damage. Thermolite's unique hurricane storm window system attaches to the inside of a building's existing glass. In doing so, the Thermolite system creates a layer of insulating dead air space between the new storm window and the existing window. This air cushion minimizes the vibrations caused by hurricane winds that otherwise often results in shattered glass.

Of course, sometimes flying wind debris shatters windows during a hurricane. In this case, building occupants are still protected because the secondary Thermolite storm window catches any flying glass before it can enter the room. The Thermolite storm window system also prevents wind, debris and water from entering the building.

THERMOLITE VS. HURRICANE ISAAC

In 2012, Thermolite installed a hurricane window system at the Indigo Garden District Hotel in New Orleans. The installation was completed just two days before Hurricane Issac struck, causing $2.39 billion in total damage. During the storm, Thermolite's installation team stayed in a sister hotel that was located right next to Hotel Indigo. The sister hotel – which featured no storm window protection – lost 15% of its total windows during the hurricane, as well as other damage.

The Indigo's windows, on the other hand, remained completely intact. The Thermolite storm window system prevented any glass from shattering by minimizing both the pressure differential and air flow through the window – demonstrating just how important it is to have an efficient hurricane storm window system in place during a super storm.

ENERGY SAVINGS AND SOUND CONTROL BENEFITS

The Thermolite storm system is one of the only hurricane window systems that also provides energy savings and sound control. By installing on the interior of a building's existing windows, the Thermolite system mitigates the transfer of heat by essentially trapping it between the glass panes. Since the installation of Thermolite windows requires no removal of the original glass, the Thermolite storm window system upgrades a building's single pane windows to double pane, and double pane windows to triple pane. In most cases, this upgrade results in a 20% reduction in annual energy costs. Another unique benefit of the Thermolite hurricane window system is sound control. By creating an additional layer of insulating air space, the Thermolite window system reduces external noise by up to 90%. Contact us today to learn more about the results of sound transmission loss tests conducted on Thermolite windows.

This image shows several boarded windows that were blown out by Hurricane Isaac in a hotel located adjacent to the Hotel Indigo.

This image shows Hotel Indigo featuring Thermolite blast mitigation windows fully intact after Hurricane Isaac struck.

An interior view of a Thermolite blast mitigation window installed at Hotel Indigo.

A closeup-view of a window in a New Orleans hotel that was completely blown out by Hurricane Isaac.

CASE STUDY: BANKING INDUSTRY

Federal banking buildings have a unique set of needs and challenges for their windows. Government mandates require them to follow both safety and energy performance protocols, while historical preservation guidelines prohibit work that changes the appearance of the windows. Thermolite has worked with numerous federal banking buildings that are also considered National Historic Places, including: Washington, D.C.'s 12-story Lafayette Building (also known as Export-Import Bank Building), the 5-story Marriner S. Eccles Federal Reserve Board Building in D.C., the Federal Reserve Bank of Philadelphia, and the 8-story Federal Reserve Banking Annex Building in DC, to remain in compliance of security, energy efficiency, and historical integrity guidelines with the use of our interior curtain wall retrofit window systems.

SECURITY WINDOWS FOR FEDERAL BANKS

While exact product installation details cannot be shared, Thermolite was able to provide the above mentioned federal banking buildings the unique opportunity to improve not only the security of their windows, but also the energy performance – without any disruption of building operations or altering of the exterior windows that would violate historical preservation guidelines. Thermolite's RetroWAL™ window system is an ideal solution for buildings with renovation limitations because the system installs on the interior of the existing window. This type of installation was quicker and more cost-effective than traditional replacement windows. The bank building tenants reported very favorable results in terms of the lack of disruption to their workdays during the installation, as well as observed daily comfort and reduced need for temperature control afterwards.

The Federal Reserve Bank of Philadelphia, located at 10 N. Independence Mall West

The Marriner S. Eccles Federal Reserve Board Building in Washington, D.C.

BOMB BLAST WINDOWS

Thermolite offers the only interior bomb blast window system made in the U.S. that uses dynamic loading to absorb a blast impact and prevent glass from the existing window from shattering into the building. Traditional replacement windows require costly, labor-intensive structural steel reinforcements that serve to withstand the impact of an explosion via resistance. Thermolite blast windows, on the other hand, feature Compression Release Technology™ and a patented frame design that controls how blast energy is transferred. Thermolite's line of physical security windows also include forced entry and ballistic protection, each of which mounts easily on the inside of the existing window.

HURRICANE WINDOWS

Thermolite's Hurricane Commercial Storm Window System utilizes a patented design that can withstand hurricane winds. The system installs easily on the inside of the existing window and meets the strictest building codes in the country. In 2012 Thermolite completed a project two days before Hurricane Issaac struck New Orleans. Thermolite's hurricane window system not only helped protect the building from natural disaster, but also reduced energy consumption, preserved its historical integrity and enabled the owners to qualify for a 20% tax credit.

CYBER DEFENSE WINDOWS

Thermolite offers a complete product line of cyber defense window systems called CyberWAL, an effective and easy-to-install interior window that uses transparent metal-based coatings to deflect electromagnetic waves and block audio transmissions. Proven to mitigate virtually all forms of electronic spying, CyberWAL helps keep the sensitive data inside your building from escaping, and helps prevent dangerous outside electromagnetic surveillance technology from intruding.

RetroWAL™

Sound Control Windows

www.RetroWAL.com

Decrease noise. Improve comfort.

office buildings

Minimizing outside noise increases productivity and office space value

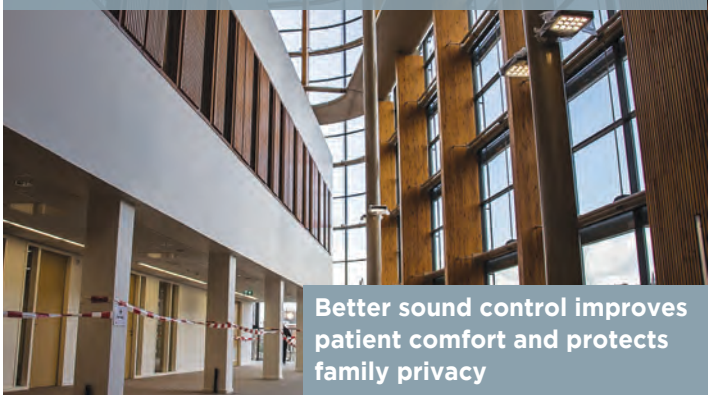
hotels/motels

Sound control windows help give your guests a more comfortable stay

universities/schools

Reducing audio distractions provides students a better learning experience

health care centers



Better sound control improves patient comfort and protects family privacy

RetroWAL™ upgrades your building's value

DON'T LET excessive noise degrade the value of your commercial or public building. RetroWAL™ is an easy-to-install window system that reduces outside noise by up to 90%. RetroWAL™ installs on the interior of your existing windows, creating an insulating air space that traps excess sound.

RetroWAL™ is an ideal sound control solution for office buildings, hotels, colleges and universities, medical centers, and buildings located near airports, train stations and busy highways.

In addition, RetroWAL™ seals building envelopes, cutting annual energy usage by 20%. Contact us today to find out how much you will save by improving sound control in your building.

- Cuts energy costs by 20%
- Reduces noise by up to 90%
- Installs behind existing glass
- No scaffolding or downtime
- STC 49 and OITC 40

Listen to a before and after audio sample of a window treated with RetroWAL™ at www.RetroWAL.com/sound

CASE STUDY: HISTORIC BUILDINGS

The Sidney R. Yates Federal Building is a 5-story historic complex located at 14th Street and Independence Avenue SW in Washington, D.C. The building features 152,329 square feet of office and support space, and was designated a Category III Landmark by the National Register of Historic Places. It was constructed from 1878-1880 in the Classical Revival style to serve as home to the Bureau of Engraving and Printing. Formerly known as the Auditors Building Complex, the building was renamed in honor of Illinois Congressman Sidney R. Yates. It now serves as the USDA Forest Service headquarters, and contains a Visitors Center with a museum and the National Fire Center.

Reducing energy usage while meeting federal historic preservation guidelines

The facilities staff at the Yates Building was looking for ways to improve the energy efficiency of the building, particularly due to the Visitors Center and National Fire Center (NFC) being open outside of the normal office hours of the rest of the building's occupants. Maintaining temperature control for these two areas required the entire building's heating, ventilating, and air condition (HVAC) system.

As a means to save energy, the facilities staff wanted to isolate the HVAC system for the Visitors Center and NFC so the entire building's system wouldn't need to be operating in order to maintain temperature for these two areas.

Since the Yates Building is a Category III Landmark, exterior renovation options to improve its energy efficiency were limited by the D.C. Commission of Fine Arts (CFA) and possibly the National Capitol Planning Commission (NCPC). The top priority of these agencies is preserving the external appearance of historic buildings, such as matching the original materials and details; however, the standard option for improving a building's energy performance typically includes replacing older fixtures with new versions that reduce air infiltration.

As replacement is generally not an option for historical building renovations, the Yates Building facilities staff was presented with the challenge of determining how to improve energy efficiency without changing the exterior appearance of the building.

UPGRADING WINDOWS IN ACCORDANCE WITH PRESERVATION GUIDELINES

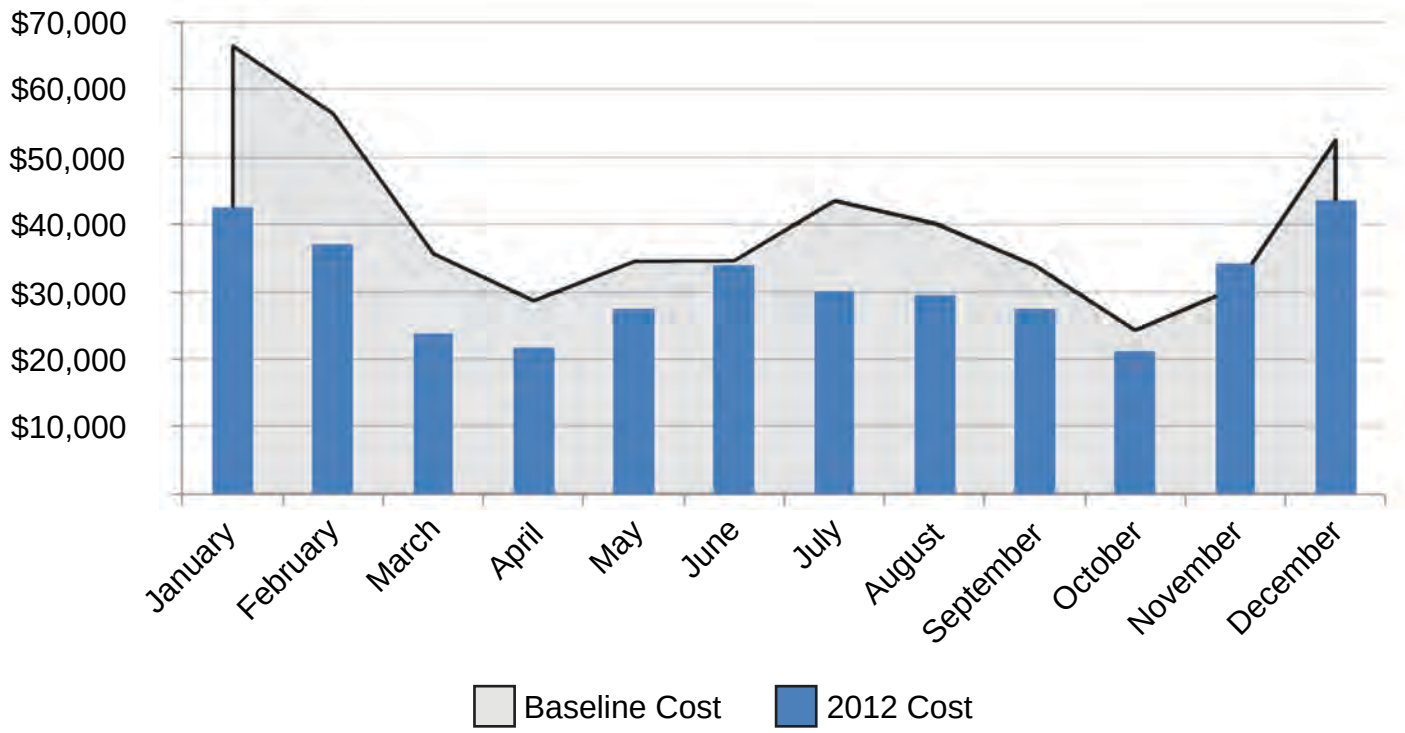
The Yates building is a General Services Administration (GSA) property, and all proposed changes must be reviewed, approved, funded and managed by the GSA. The GSA commissioned an energy analysis of the Yates Building in 2009 to develop strategies for their future management goals, in which it was recommended that high efficiency windows be installed to improve building energy performance.

In 2011, Thermolite was contracted to retrofit the existing windows of the Yates Building, which was completed in January 2012. This solution allowed for all historic exteriors to remain untouched, while still making the building more energy efficient.

Thermolite's window system installed in the hallway of the Sidney Yates Building, viewed from the inside.

The outside appearance of the windows remained unaltered per historic preservation requirements.

2012 Energy Cost ($) vs. Baseline



ENERGY SAVINGS FINDINGS

A utility baseline report was developed in 2013 for the evaluation of energy savings related to Thermolite's upgrade of the windows at the Yates Federal Building. The utility bill history was provided by the building occupants and the operating information was obtained during a brief site review with the assistance of the building occupants.

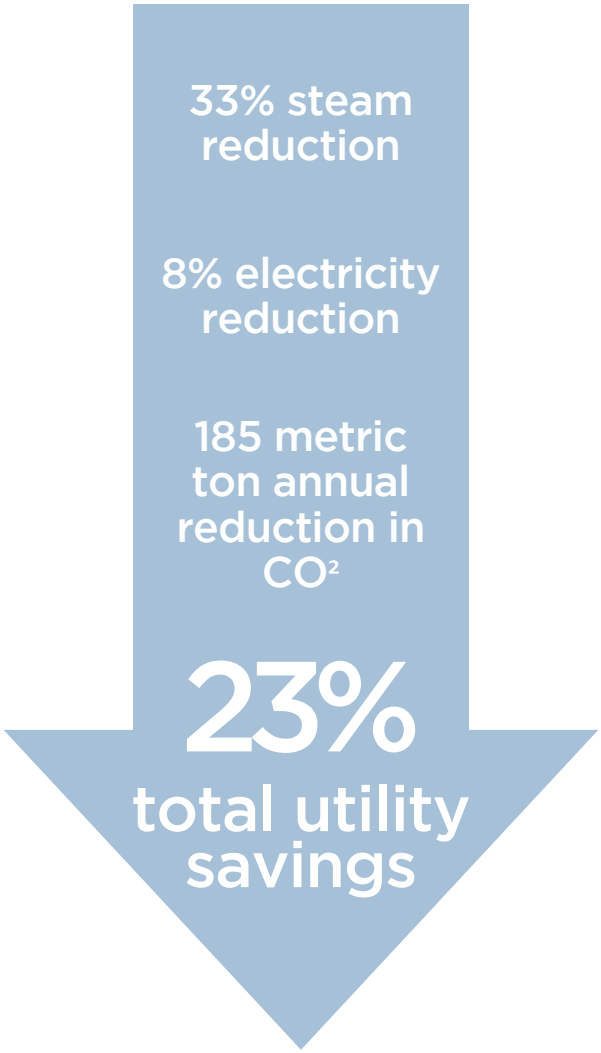
The baseline was developed utilizing two years of utility history, which was then compared with energy data for the following third year after it was normalized for temperature variations. During the time of this study, there were no significant occupancy changes or other energy upgrades.

An average level of energy consumption at the building was established based on normalizing the two years of utility data for specific criteria, such as weather, billing cycle, building size and occupancy.

The result is a "true" utility baseline for the facility that can then be used to compare against utility bills in future years to determine the level of savings generated from upgrades implemented at the building.

The reduction in utility consumption is experienced for both electricity and steam. However, the steam savings provides a very high level of savings due to the significant reduction in cold air infiltration and reduced heat loss through the windows.

The chart on the previous page provides an overview of the monthly savings related to the utility cost at the building pre- and post-retrofit of the windows (gray = pre-retrofit, blue bar = post-retrofit).

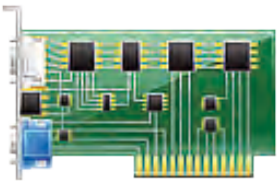


CASE STUDY:
SIGNAL DEFENSE WINDOWS

PHONES & TABLETS

ROUTERS

SERVERS



GRAPHICS CARDS

THERMOSTATS

Most of the general public is aware of the threat of cyber attacks and the need to take proactive steps to protect your identity online. However, people who maintain rigorous cyber security efforts are still at risk from potential criminals who seek to steal data via other means. Wireless data theft involves the use of surveillance equipment designed to intercept audio and electromagnetic signals, which can provide cyber criminals with covert access to sensitive information. This case study examines the weak link in signal defense for buildings, and more importantly, how engineers and architects can help protect the public from wireless data breaches.

State-of-the-art protection against high-tech espionage and wireless data theft

When it comes to signal defense, the most vulnerable part of a building is its windows. Regular windows offer zero protection from both incoming and outgoing electromagnetic waves. This means that anyone outside the building who has the proper surveillance equipment can steal sensitive data from virtually anyone inside – unless the building is protected by a signal defense window system.

Fortunately, installing a window defense system designed to protect a building from wireless data theft is now a fairly simple process. Thermolite offers a complete product line of patented window solutions called CyberWAL, an effective and easy-to-install system that uses transparent metal-based coatings to deflect electromagnetic waves and block audio transmissions. Proven to mitigate virtually all forms of electronic spying, CyberWAL helps keep the sensitive electromagnetic data inside your building from escaping, and helps prevent dangerous outside electromagnetic surveillance technology from intruding.

Unlike traditional window installations, the CyberWAL system is installed on the interior of your building, which not only saves you the cost of removing the original windows, but also provides additional insulation that seals the building envelope to increase thermal performance and temperature comfort levels.

Thermolite's CyberWAL defense system is the most energy-efficient window defense system available, and has been proven to save building owners up to 20% on their annual energy costs.

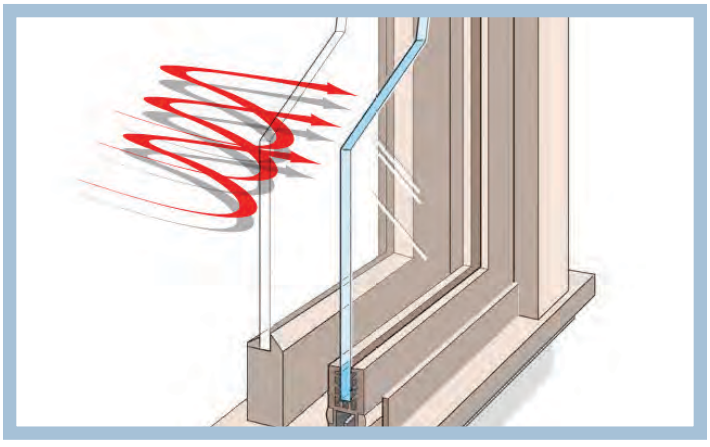
This photo shows the eastern core entrance to a federal facility that was the target of more than 150 cyber attacks from 2010 to 2014. During these attacks, cyber criminals successfully accessed the personal records of more than 4.2 million current and former federal employees. Incidents like these demonstrate the need for increased signal defense security measures at buildings that may be considered high profile targets for cyber criminals.

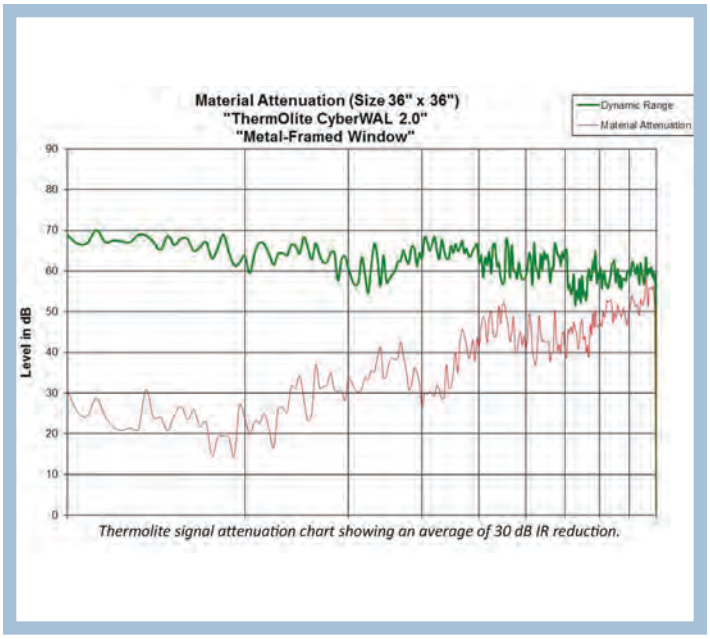
HOW CYBER CRIMINALS USE SIGNALS AND LASERS TO STEAL DATA AND COMMIT ESPIONAGE

One of the most sophisticated forms of wireless data theft involves the RF signals to steal valuable information. Modern electronic devices like cell phones, routers, servers, graphics cards and even digital thermostats all emit electromagnetic waves. With the right equipment, it is not difficult to intercept these EM waves and, in the process, collect passwords and login information that can provide a criminal with covert access to your devices, bank account, and other highly sensitive information.

It is also possible to use infrared lasers to commit espionage via audio signals. In these instances, criminals beam an invisible laser into a building via a window. The laser detects vibrations on a surface in the room, converts them into electromagnetic signals, and then transmits them back to a receiver outside the building. With the proper surveillance equipment, a criminal can conduct real-time covert audio monitoring without being inside or even near the targeted facility.

Thermolite's CyberWAL defense system protects buildings from both wireless data theft *and* audio espionage. The metal-coating in the CyberWAL window glass provides effective RF and IR shielding that weakens incoming signals and prevents data breeches via the most advanced surveillance technology.





Thermolite signal attenuation chart showing an average of 30 dB IR reduction.

THE IMPORTANCE OF A REPUTABLE 3RD PARTY TEST

Before choosing any kind of security system, it is always prudent to be sure it has been vetted by a reputable, unbiased 3rd party organization. This is especially true for signal defense.

In July 2016, one of the leading cyber security labs in the country (endorsed by both the National Security Agency and the U.S. Army) – conducted a RF Shielding Effectiveness and Infrared Letter Test Report to determine the precise effectiveness of the CyberWAL system. The RF Shielding Effectiveness evaluation was performed on one sample of Thermolite CyberWAL 2.0 Glass in accordance with the "Standard Test Method for Electromagnetic Shielding Effectiveness of Glazings" as set by ASTM International, a not-for-profit organization that provides a forum for the development and publication of international voluntary consensus standards for dozens of industry sectors.

The goal of the report was to determine the level of signal attenuation, or in other words, how effective the CyberWAL system is at weakening the strength of both incoming and outgoing electromagnetic signals.

The higher the attenuation, the weaker the signal. As previously mentioned, regular untreated window glass offers no signal attenuation, leaving buildings vulnerable to outside RF and IR surveillance equipment.

The ASTM RF Shielding Effectiveness Requirements state that window treatments must provide an average of at least 38 dB of RF attenuation between a pre-established range of frequencies. The CyberWAL 2.0 glass test results revealed that, when the antenna was in the horizontal polarization, the RF Shielding Effectiveness was an average attenuation of 39.5 dB over the same frequency range, providing a slightly higher average attenuation than the requirement.

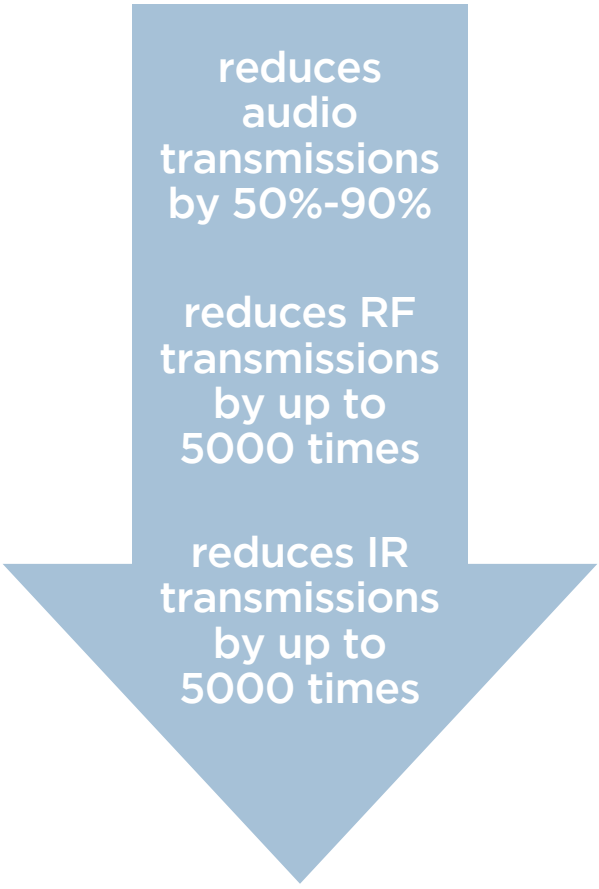
In addition, the ASTM IR Attenuation Requirements state that window treatments must provide at least 20 dB of IR attenuation between a pre-established range of frequencies. The CyberWAL 2.0 glass test results revealed in the Infrared evaluation that the test sample met the 20 dB attenuation requirement. The overall test report concluded that CyberWAL 2.0 reduced electromagnetic signal strength by 5,000 times.

A CALL TO ACTION FOR ENGINEERS, ARCHITECTS, BUILDING OWNERS AND GOVERNMENT OFFICIALS

Whether it concerns customer account numbers, passwords, trade secrets or governmental data, wireless identity theft is a dangerous threat to the world – especially because it is not the kind of threat that everyday civilians can easily defend themselves against. They have no say in how their sensitive information is safeguarded in a data center. That's why it's important for engineers, architects, building owners and government officials to stay informed about the dangers of wireless identity theft and the most effective ways to combat it. Any organization or agency that handles sensitive and/or classified information should consider adding a signal defense system to their facilities, or at the very least, learn more about them.

One final note: the specific frequency ranges used in the RF Shielding Effectiveness and Infrared Letter Test Report have been omitted from this case study to prevent such valuable analytics from being readily available to cyber criminals. That said, this information is helpful in fully understanding both the dangers of electromagnetic interception and the benefits of a strong signal defense. For this reason, the precise metrics used in the test report are made available to individuals, businesses, government agencies and other entities upon request after proper verification. To receive this confidential information or to learn more about the CyberWAL window defense system and the overall threat of wireless data theft, call 574-234-4004 or contact info@thermolitewindows.com.

CyberWAL can be added to any Thermolite window system, including blast mitigation, hurricane mitigation, historic preservation, sound control and energy efficient windows.



THERMOLITE

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Retrowal.com

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NFRC U-FACTOR, SHGC, VT, & CONDENSATION RESISTANCE COMPUTER SIMULATION REPORT

Rendered to:
THERM-O-LITE, INC.

SERIES/MODEL:
Curtain Wall with Window Attachment Lite

Report Number: **D9625.01-116-45**
Report Date: **07/25/14**

130 Derry Court
York, PA 17406

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f. 717.764.4129

Intertek | Architectural Testing

NFRC U-FACTOR, SHGC, VT, & CONDENSATION RESISTANCE
COMPUTER SIMULATION REPORT

Rendered to:
THERM-O-LITE, INC.
635 South Lafayette Boulevard
South Bend, Indiana 46601

Report Number:	D9625.01-116-45
Simulation Date:	07/25/14
Report Date:	07/25/14

Project Summary:
Architectural Testing, Inc. was contracted to perform U-Factor, Solar Heat Gain Coefficient, Visible Transmittance, and Condensation Resistance* computer simulations in accordance with the National Fenestration Rating Council (NFRC). The products were evaluated in full compliance with NFRC requirements to the standards listed below.

**NFRC's Condensation Resistance rating is NOT equivalent to a Condensation Resistance Factor (CRF) determined in accordance with AAMA 1503.*

Standards:

NFRC 100-2014:	*Procedure for Determining Fenestration Product U-Factors*
NFRC 200-2014:	*Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence*
NFRC 500-2014:	*Procedure for Determining Fenestration Product Condensation Resistance Values*

Software:

Frame and Edge Modeling:	THERM 6.3.46
Center-of-Glass Modeling:	WINDOW 6.3.74
Total Product Calculations:	WINDOW 6.3.74
Spectral Data Library:	IGDB 36.0

Simulations Specimen Description:

Series/Model:	Curtain Wall with Window Attachment Lite
Type:	Fixed, 4-Sided
Frame Material:	AU Thermally Improved
Sash Material:	AL Aluminum (Non-thermally broken)
Standard Size:	1200mm x 1500mm

Modeling Assumptions/Technical Interpretations:

1) To prevent air infiltration, tape was applied to all interior sash crack locations.

Specialty Products Table:

The specialty products method allow the manufacturer to determine the overall product SHGC and VT for any glazing option. The center of glass SHGC and/or VT must be determined using WINDOW 6.3.74. The method gives overall product SHGC and VT indexed on center of glass properties. All values used in the calculations are truncated to six decimal place precision.

Existing Curtainwall

	No Dividers	Dividers < 1	Dividers > 1
SHGC0	0.006109	0.008952	0.011635
SHGC1	0.817921	0.734529	0.655817
VT0	0.000000	0.000000	0.000000
VT1	0.811812	0.725578	0.644182

Existing Curtainwall + Silver Attachment Lite

	No Dividers	Dividers < 1	Dividers > 1
SHGC0	0.008096	0.010808	0.013362
SHGC1	0.757622	0.677577	0.602212
VT0	0.000000	0.000000	0.000000
VT1	0.749526	0.666769	0.588850

Existing Curtainwall + Gold Attachment Lite

	No Dividers	Dividers < 1	Dividers > 1
SHGC0	0.003944	0.006737	0.009372
SHGC1	0.807800	0.724773	0.646427
VT0	0.000000	0.000000	0.000000
VT1	0.803855	0.718036	0.637056

$$SHGC = SHGC0 + SHGCc\ (SHGC1 - SHGC0)$$

$$VT = VT0 + VTc\ (VT1 - VT0)$$

Validation Matrix:

The following products are part of a validation matrix. Only one is required for validation testing.

Product Line	*Report Number*
None	-

Spacer Option Description

	Sealant		
Spacer Type	*Primary*	*Secondary*	*Code*
Aluminum Spacer	Butyl Rubber	Butyl Rubber	A1-D

Grid Option Description

Grid Size	*Grid Type*	*Grid Pattern*
None	-	-

Reinforcement Option Description

Location	*Material*
None	-

Gas Filling Technique Description

Fill Type	*Method*
Air	

Edge-of-Glass Construction

Interior Condition	EPDM gasket between glass and sash or frame
Exterior Condition	EPDM gasket between glass and sash or frame

Weatherstripping

Type	*Quantity*	*Location*
None		

Frame/Sash Materials Finish

Interior	Painted Aluminum
Exterior	Painted Aluminum

NFRC 100/200/500 Summary Sheet
Curtain Wall with Window Attachment Lite

ID	Pane Thickness 1	Gap Width 1	Pane Thickness 2	Gap Width 2	Pane Thickness 3	Gap Width 3	Pane Thickness 4	Gap Fill	Low-e (Surface#)	Tint	Spacer	Grid Type
	U-Factor			Solar Heat Gain Coefficient (SHGC) Grids (None / <1 / >=1)					Visible Transmittance (VT) Grids (None / <1 / >=1)		Condensation Resistance	
1	CLR (6MM)											
	0.223									CL	N	N
	U-Factor 0.90			SHGC (N) 0.67					VT (N) 0.72		CR 13	
2	CLR (6MM) // S500 (6MM) ATTACHMENT LITE											
	0.223	2.000	0.223					AIR	0.215(#3)	CL	N	N
	U-Factor 0.37			SHGC (N) 0.50					VT (N) 0.55		CR 56	
3	CLR (6MM) // S500/AIR/SB60 (6MM/6MM) ATTACHMENT LITE											
	0.223	2.000	0.223	0.500	0.223			AIR	0.215(#3) / 0.035(#5)	CL	A1-D	N
	U-Factor 0.21			SHGC (N) 0.36					VT (N) 0.47		CR 68	

The Condensation Resistance results obtained from this procedure are for controlled laboratory conditions and do not include the effects of air movement through the specimen, solar radiation, and the thermal bridging that may occur due to the specific design and construction of the fenestration system opening.

Ratings values included in this report are for submittals to an NFRC-licensed IA and are not meant to be used directly for labeling purposes. Only those values identified on a valid Certification Authorization Report (CAR) by an NFRC accredited Inspection Agency (IA) are to be used for labeling purposes. The ratings values were rounded in accordance to NFRC 601, NFRC Unit and Measurement Policy.

Architectural Testing, Inc. is an NFRC accredited simulation laboratory and all simulations were conducted in full compliance with NFRC approved procedures and specifications. The NFRC procedure requires that the computational results be verified through actual test results.

Architectural Testing will service this report for the entire test record retention period. Test records that are retained such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Architectural Testing, Inc. for the entire test record retention period. The test record retention end date for this report is July 25, 2018.

Results obtained are simulated values and were secured by using the designated test methods. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the product simulated. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.:

SIMULATED BY:

Megan M. Yingst
Digitally Signed by: Megan Yingst

Megan M. Yingst
Simulation Technician

REVIEWED BY:

Kristen L. Louder
Digitally Signed by: Kristen Louder

Kristen L. Louder
Senior Simulation Technician
Simulator-In-Responsible-Charge

MMY:mmy
D9625.01-116-45

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix A: Drawings and Bills of Material (3)

Architectural Testing

AAMA 1801 SOUND TRANSMISSION LOSS TEST REPORT

Rendered to:

THERM-O-LITE INC.

SERIES/MODEL: RetroWAL™ Silver

TYPE: Two-Lite Curtain Wall System

Summary of Test Results					
Data File No.	**Glazing Option (Nominal Dimensions)**	**Air Infiltration (cfm/ft²)**		**STC**	**OITC**
		1.57 psf	**6.24 psf**		
D5569.01A	1/4" Annealed	0.12	0.28	31	28
D5569.01B	Primary 1/4" annealed, Interior panel 1/4" laminated, Glass temperature 75°F	0.08	0.17	43	33

Reference should be made to Architectural Testing, Inc. Report No. D5569.01-113-11 for complete test specimen description. The complete test results are listed in Appendix B.

130 Derry Court
York, PA 17406-8405
phone: 717-764-7700
fax: 717-764-4129
www.archtest.com

Architectural Testing

ACOUSTICAL PERFORMANCE TEST REPORT

Rendered to:

THERM-O-LITE INC.
635 South Lafayette Boulevard
South Bend, Indiana 46601

Report No:	D5569.01-113-11
Test Date:	03/17/14
Report Date:	03/27/14
Record Retention End Date:	03/17/18

Test Sample Identification:

Series/Model: RetroWAL™ Silver

Type: Two-Lite Curtain Wall System

Overall Size: 78-3/4" by 78-3/4"

Glazing (Nominal Dimensions):

Option A: 1/4" Annealed

Option B: Primary 1/4" Annealed, Interior Panel 1/4" Laminated, Glass Temperature 75°F

Project Scope: Architectural Testing, Inc. was contracted by Therm-O-Lite Inc. to conduct air leakage and sound transmission loss tests on a Series/Model RetroWAL™ Silver, two-lite curtain wall system. A summary of the results is listed in the Test Results section, and the complete test data is included as Appendix B of this report. The sample was provided by the client.

Test Methods: The acoustical test was conducted in accordance with the following:

AAMA 1801-11, Voluntary Specification for the *Acoustical Rating of Windows, Doors, and Glazed Wall Sections.*
ASTM E 1425-07, *Standard Practice for Determining the Acoustical Performance of Exterior Windows and Doors.*
ASTM E 90-09, *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.*
ASTM E 413-10, *Classification for Rating Sound Insulation.*
ASTM E 1332-10a, *Standard Classification for Rating Outdoor-Indoor Sound Attenuation.*

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York, PA 17406-8405
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Test Methods: (Continued)

ASTM E 283-04 (Reapproved 2012), *Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.*
ASTM E 2235-04 (Reapproved 2012), *Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods*.

Test Equipment: The equipment used to conduct this test meets the requirements of ASTM E 90. The microphones were calibrated before conducting the sound transmission loss test. The test equipment and test chamber descriptions are listed in Appendix A.

Sample Installation: Sound transmission loss tests were initially performed on a filler wall that was designed to test 40" by 86" and 80" by 86" specimens. The filler wall achieved an STC rating of 68.

The specimen plug was removed from the filler wall assembly. The test specimen was placed on a foam isolation pad in the test opening. Duct seal was used to seal the perimeter of the test specimen to the test opening on both sides. The interior side of the specimen frame, when installed, was approximately 1/4" from being flush with the receiving room side of the filler wall. A stethoscope was used to check for any abnormal air leaks around the test specimen prior to testing.

Test Procedure:

Air Leakage Test: A negative pressure of 1.57 psf was applied inside the chamber that was placed around the interior side of the test specimen. The total air leakage and extraneous air leakage measurements were used to calculate the specimen air leakage. Barometric pressure corrections were applied to the air leakage calculations.

The procedure above was repeated with a negative pressure of 6.24 psf applied to the inside of the chamber.

Sound Transmission Loss Test: The sound transmission loss tests were conducted in accordance with the ASTM E 90 test method using a single direction of measurement. One background noise sound pressure level and five sound absorption measurements were conducted at each of five microphone positions. Two sound pressure level measurements were made simultaneously in both rooms at each of five microphone positions. The air temperature and relative humidity conditions were monitored and recorded during the background, absorption, source, and receive room measurements.

Sample Descriptions:

Primary Frame Construction:

		Frame
Size		78-3/4" by 78-3/4"
Thickness		5-1/4"
Corners		Butted
	Fasteners	Screws
	Seal Method	None
Material		Aluminum
	Thermal Break Material	None
	Reinforcement	N/A
Daylight Opening Size (X2)		35-3/16" by 73-3/8"

Interior Panel Frame Construction:

		Frame
Size		35-3/8" by 72-11/16"
Thickness		1/2"
Corners		Mitered
	Fasteners	Screws
	Seal Method	None
Material		Aluminum
	Thermal Break Material	None
	Reinforcement	N/A
Daylight Opening Size (X2)		33-7/16" by 70-11/16"

N/A-Non Applicable

Sample Descriptions: (Continued)

Primary Glazing:

	Exterior Sheet
Measured Thickness	0.223"
Muntin Pattern	N/A
Material	Annealed
Laminate Material	N/A
Glazing Method	Pressure glazed

Interior Panel Glazing:

	Exterior Sheet
Measured Thickness	0.240"
Muntin Pattern	N/A
Material	Laminated
Laminate Material	PVB
Glazing Method	Channel

Components:

	TYPE	QUANTITY	LOCATION
Weatherstrip			
	No weatherstrip		
Hardware			
	No hardware		
Drainage			
	5/16" Diameter weep hole	8	Bottom of snap covers

N/A-Non Applicable

Sample Descriptions: (Continued)

Sample Weights:

Overall Sample Area:	m^2	ft^2
	4	43.06

Sample Identification:	**Total Weight**		**Weight Per Unit Area**	
	kg	lbs	kg / m^2	lbs / ft^2
D5569.01A	102.5	226	25.63	5.25
D5569.01B	158.75	350	39.69	8.13

Comments: The design drawings (included in Appendix C) supplied by the client, accurately describe the Series/Model RetroWAL™ Silver, two-lite curtain wall system. The dimensions on the drawings that are circled and/or checked were verified against the test specimen. The two-lite curtain wall system was disassembled, and the components will be retained by Architectural Testing for four years. Photographs of the test specimen are included in Appendix D.

Test Results: The STC (Sound Transmission Class) rating was calculated in accordance with ASTM E 413. The OITC (Outdoor-Indoor Transmission Class) was calculated in accordance with ASTM E 1332. A summary of the sound transmission loss test results on the Series/Model RetroWAL™ Silver, two-lite curtain wall system is listed below.

Summary of Test Results					
Data File No.	**Glazing Option (Nominal Dimensions)**	**Air Infiltration (cfm/ft^2)**		**STC**	**OITC**
		1.57 psf	**6.24 psf**		
D5569.01A	1/4" Annealed	0.12	0.28	31	28
D5569.01B	Primary 1/4" annealed, Interior panel 1/4" laminated, Glass temperature 75°F	0.08	0.17	43	33

The complete test results are listed in Appendix B. Flanking limit tests and reference specimen tests are available upon request.

Architectural Testing will service this report for the entire test record retention period. Test records, such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained by Architectural Testing for the entire test record retention period.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing.

For ARCHITECTURAL TESTING, INC:

Kurt A. Golden
Senior Technician - Acoustical Testing

Eric J. Miller
Director - Acoustical Testing

KAG:jmcs

Attachments (pages): This report is complete only when all attachments listed are included.
- Appendix-A: Equipment description (1)
- Appendix-B: Complete test results (8)
- Appendix-C: Design drawings (2)
- Appendix-D: Photographs (1)

THERMOLITE
WINDOW SYSTEMS

MANUFACTURER'S LIMITED WARRANTY

Therm-O-Lite, LLC, the manufacturer of this product, warrants to the original retail purchaser that such product will be free from defects in materials and workmanship for a period of one (1) year from substantial completion as evidenced by purchaser's proof of purchase. Purchaser shall mean the person for whom the product is originally installed. Therm-O-Lite, LLC will repair or replace, in its sole discretion, any defects in materials or workmanship in the product occurring during the one-year warranty period. The cost of installation and shipping of a replacement product shall be born by the purchaser. **SUCH REPAIR SHALL BE THE ONLY REMEDY AVAILABLE TO THE PURCHASER UNDER THIS LIMITED WARRANTY.**

This limited warranty gives you specific legal rights, and you may have other rights which vary from state to state. **THIS LIMITED WARRANTY IS MADE IN LIEU OF ANY OTHER EXPRESS WARRANTIES. ANY IMPLIED WARRANTIES ARISING IN CONNECTION WITH THE SALE OF THIS PRODUCT, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO THE TERM OF THIS WARRANTY.** No employee, dealer, agent or other person is authorized to make any warranty or representation with respect to this product, other than is expressly contained herein. **IN NO EVENT SHALL THERM-O-LITE, LLC BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

Any claims arising under the foregoing must be reported to Therm-O-Lite, LLC in writing within a period of one (1) year and ten (10) days from the date of substantial completion.

Breakage of any original glazing is not a condition of warranty.

Therm-O-Lite, LLC
3502 West Sample Street
South Bend, IN 46619
574-234-4004

Therm-O-Lite TERMS AND CONDITIONS OF SALE

All sales are expressly limited to, and made conditional upon, the acceptance by the purchaser indicated on this Invoice ("Purchaser") of the exact terms and conditions contained in these Terms and Conditions. The terms and conditions of purchase and/or sale contained on any request for quotation, purchase order or other business document received from Purchaser are expressly superseded hereby and shall not be construed as part of the agreement indicated on this Invoice between Therm-O-Lite, LLC. (TOL) and Purchaser. This document, the Credit Application, if any, completed by Purchaser, TOL's glazing instructions, if any, and TOL's limited warranties, if any, given on selected products, if given in writing, and referencing this Invoice (the "Limited Warranties"), constitute the complete and exclusive statement of the terms of the agreement between TOL and Purchaser with respect to the subject matter hereof and supersedes any writing, document or agreement of Purchaser. TOL and Purchaser acknowledge that all of the terms and conditions herein are commercially fair and reasonable and reflect an acceptable allocation of the rights and obligations of the parties of the sale contemplated herein. Sales by TOL are commercial, business to business sales and are not for direct personal, home or consumer use. EXCEPT FOR THE LIMITED WARRANTIES (AS HEREIN DEFINED), TOL MAKES NO OTHER, AND HEREBY DISCLAIMS ANY, REPRESENTATIONS OR WARRANTIES, WHETHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY OR WARRANTY THAT THE MATERIAL SHALL BE FIT FOR A PARTICULAR PURPOSE OR USE. No affiliate, stockholder, subsidiary, director, officer or employee of TOL shall be in any way liable in connection with the products which are the subject of this Invoice (the "Product"), whether under any warranty, representation or condition or otherwise.

1. **INSPECTION: ACCEPTANCE OR REJECTION**

(a) **Inspection at Plant**. Purchaser may, and if TOL so requests, Purchaser shall, inspect the Products at TOL's manufacturing site referenced on this Invoice (the "Plant"). Such inspection shall be conducted so as not to unreasonably interfere with TOL's operations. Purchaser's approval or rejection of the Products resulting from such inspection must be communicated to TOL in writing prior to completion of the production run for the Products, if possible, or, at a minimum, prior to shipment of the Products to Purchaser, and failure of Purchaser to communicate a rejection of the Products before shipment shall be deemed an approval of the Products by the Purchaser.

(b) **Inspection Upon Delivery**. If not inspected as set forth in (a) above, the Products shall be inspected by Purchaser upon receipt, and failure of Purchaser to notify TOL of defects or nonconformities in writing within 24 hours (for loose lites) and 10 days (for case goods delivery by TOL truck) of receipt of the Products by Purchaser shall be deemed an acceptance of the Products and a waiver of all claims for damages based on any defect or nonconformity of the Products, except claims for breach of express limited warranties as set forth in any applicable Limited Warranty (and subject to the provisions, limitations, conditions, exceptions and procedures contained therein). If Purchaser has approved the Products prior to delivery pursuant to (a) above, then the Products delivered shall not be defective or nonconforming if they conform to the Products so inspected or to the specifications set forth in this Invoice. Purchaser shall have nor right to revoke acceptance of the Products.

(c) **Rejection**. If Purchaser does not accept the Products, then Purchaser shall provide proof of purchase to TOL and shall afford TOL a reasonable opportunity to inspect the Products. Purchaser shall hold such Products in a safe place and shall protect them from damage or destruction. Purchaser shall not return any Products without the prior written consent of TOL. If TOL determines that the Products are defective or nonconforming, TOL shall furnish instructions for their disposition.

(d) **Purchaser's Sole Remedies**. (i) Nonconforming or Defective Products. Upon validation and verification by TOL of any Product nonconformity or breach, TOL shall, at its option either (1) furnish Purchaser with a replacement Product or if the Product is no longer made, a replacement Product, which, in the sole discretion of TOL, is comparable to the original Product, F.O.B. the Plant, freight collect, or (2) refund the original purchase price (less freight and other charges) which the Purchaser paid for the failed portion of the Product. A COMPARABLE REPLACEMENT, WHETHER FABRICATED BY TOL OR A PARTY CHOSEN BY TOL IN IT'S SOLE DISCRETION, MAY HAVE CHARACTERISTCS INCLUDING, BUT NOT LIMITED TO, COLOR, SHADING, CO-EFFICIENT, U-VALUE AND/OR SURFACE APPEARANCE, WHICH VARY FROM THE ORIGINAL PRODUCT BUT SHALL, NONETHLESS SATISFY TOL'S OBLIGATION TO REPLACE THE PRODUCT. If TOL elects to supply a replacement Product, any Limited Warranty on the replacement Product shall extend only for the balance of the original Limited Warranty period of the failed Product. In no event shall TOL be liable for removal of defective Product or replacement or reinstallment of the Product or the cost thereof. At TOL's request, all defective Product which is replaced pursuant hereto shall be returned to TOL, at Purchaser's expense, within thirty (30) days after such replacement. In no event shall TOL be responsible for any costs attendant to replacing nonconforming or defective

Products (including, but not limited to, labor costs), other than as specified in subsections (1) or (2) of this subsection (d)(i).

2. **DISCLAIMERS AND REMEDIES** THE PROVISIONS OUTLINED IN THESE TERMS AND CONDITIONS AND IN ANY APPLICABLE LIMITED WARRANTY CONSTITUTE PURCHASER'S SOLE AND EXCLUSIVE REMEDY UNDER ANY CLAIM OR THEORY OF LIABILITY, INCLUDING CLAIMS BASED UPON FAILURE OF, OR DEFECT IN, PRODUCTS SOLD HEREUNDER, WHETHER THE FAILURE OR DEFECT ARISES BEOFRE OR DURING ANY LIMITED WARRANTY PERIOD AND WHETHER A CLAIM, HOWEVER INSTITUTED, IS BASED UPON CONTRACT, INDEMNITY, LIMITED WARRANTY, TORT (INCLUDING NEGLIGENCE), STRICT LIABLILITY OR OTHERWISE. TOL SHALL NOT BE LIABLE FOR CONSEQUENTIAL, DIRECT, INDIRECT, INCIDENTAL, PUNITIVE OR EXEMPLARY DAMAGES, CLAIMS OR COSTS OF ANY NATURE INCLUDING, WITHOUT LIMITATION, LABOR COSTS OF ANY KIND RELATING TO THE REMOVAL OF FAILED PRODUCTS AND/OR REINSTALLATION OF REPLACEMENT PRODUCTS THEREFOR OR DAMAGES, CLAIMS, OR COSTS OTHERWISE ARISING FROM, OR IN CONNECTION WITH, ALLEGED BREACH OF ANY LIMITED WARRANTY OR NEGLIGENCE ON THE PART, OR STRICT LIABILITY, OF TOL. TOLRESERVES THE RIGHT TO CHANGE, ALTER OR AMEND, IN ANY FASHION, WITHOUT NOTICE, THE PROVISIONS OF ITS WARRANTIES FOR ANY OR ALL OF ITS PRODUCTS. THE FOREGOING NOTWITHSTANDING, NO EXTENSION OR EXPANSION OF ANY LIMIITED WARRANTY SHALL BE EFFECTIVE UNLESS IN WRITING AND SIGNED BY TOL'S PRESIDENT.

3. **PERMISSABLE VARIATIONS, STANDARDS AND TOLERANCES** Except for the particulars specified by Purchaser and expressly agreed to in writing by TOL, all Products shall be produced in accordance with TOL's standard practices. All Products, including goods produced to meet exact specifications, shall be subject to tolerances and variations (concerning dimension, weight, straightness, bow, warp, section, composition, and mechanical properties, normal variations in surface, internal conditions, and quality) consistent with custom and usage in TOL's industry. Glass products are produced to ASTM standard C 1172-09.

4. **DELAY** All orders are accepted by TOL upon the express understanding by Purchaser that, if a specific shipping date is designated on this Invoice, or any Quotation or other written or oral communication, TOL shall not be liable for delays in delivery of the Products, all such shipping dates to be considered non-binding estimated shipping dates. Without limiting the foregoing, in no event shall TOL be liable for any delays caused by inability to obtain transportation, equipment, labor or material; insurrection, fires, floods, storms or embargoes; actions of any military or civil authorities, whether legal or de facto; strikes, lock outs and other labor difficulties; riots; acts of God, delay in delivery of specifications or additional specifications or changes in the specifications; or other circumstances beyond the control of TOL.

5. **DELIVERY** Delivery of the Products by TOL to common carrier at the Plant shall constitute delivery of the Products to the Purchaser. Therefore, all risk of loss, damage or destruction and any incidental or consequential damages attendant thereto shall be Purchaser's sole responsibility. The full amount of this Invoice must be paid by Purchaser regardless of any such loss, damage, or destruction. ALL CLAIMS AND ALLOWANCES FOR DAMAGE TO THE PRODUCTS INCURRED IN TRANSIT MUST BE FILED AGAINST, AND BE PRESENTED TO, THE CARRIER OF PURCHASER. UNDER NO CIRCUMSTANCE MAY PURCHASER DEDUCT SUCH CLAIMS AND ALLOWANCES FROM AMOUNTS DUE TOL. Products sent by mail are insured at the cost of the Purchaser.

6. **TAXES** Any taxes which TOL may be required to pay or collect under any existing or future law, upon or with respect to the sale, purchase, delivery, storage, process, use or consumption of any Products covered hereby. including taxes upon or measured by the receipts from the sale of such Products, shall be for the account of the Purchaser, who shall promptly pay the amount thereof to TOL upon demand. Such amounts shall not be subject to any cash or other discounts.

7. **PAYMENT** Payment Terms are Net 30 Days and may include a mobilization. Orders will not be started until mobilization payment is received. Orders are not binding upon TOL until accepted by TOL. Any quotations given by TOL will be valid only for the period stated on the quotation. Customer agrees to pay interest on all past-due sums at the highest rate allowed by law.

8. **COLLECTION** In the event that affirmative action (including, without limitation, consultation with lawyers or collection efforts prior to the filing of any lawsuit) is required on the part of TOL to collect any amount owing to TOL by Purchaser, Purchaser shall pay to TOL all costs of collection including, but not limited to, legal fees incurred by TOL and return check charges deemed appropriate by TOL, but in no event less than $20 per returned check.

9. **WAIVER** A waiver by TOL of any breach by Purchaser of these Terms and Conditions must be in writing to be binding upon TOL and shall not constitute a waiver by TOL of any other breach by Purchaser.

10. **AMENDEMENTS** These Terms and Conditions may not be modified, including pursuant to any order made by Purchaser or in any other document, unless such modification is made in writing and is executed on behalf of TOL by it's President.

11. **CANCELLATION** No cancellation or change order shall be accepted by TOL once glass is fabricated or any activity has otherwise been undertaken by TOL to process window system units or other Products to be provided by TOL pursuant to this Invoice. For size changes after acknowledgement, TOL will charge appropriately, depending on the status of the glass at the time of said change. If changes are required increasing glass sizes, or orders are canceled, TOL shall determine charges based on salvage values and costs incurred for work done prior to the change order or cancellation order. In no event may Purchaser cancel all or any portion of any regularly entered order unless such cancellation is effected in writing and upon terms that will protect TOL against any and all costs and losses that TOL may suffer due to such cancellation, and Purchaser hereby affirmatively assumes responsibility for, and agrees to pay for, all such costs and losses.

12. **PURCHASER'S OBLIGATIONS** Purchaser agrees that (i) before using the goods Purchaser shall determine the suitability of the Product for Purchaser's intended use and shall assume all risk and liability whatsoever in connection with that determination; (ii) Purchaser shall use Products properly; and (iii) Purchaser shall install the Product in accordance with applicable Federal, State, and local laws and codes. Purchaser shall indemnify and hold harmless TOL, and if so requested defend TOL, from any and all costs, claims, damages, judgments, and expenses (including reasonable attorney's fees) suffered or incurred by TOL as a result of, or in connection with, any act, omission or use of the Product by Purchaser, its employees or customers or any breach by Purchaser of this agreement.

13. **APPLICABLE LAW** THIS INVOICE AND THESE TERMS AND CONDITIONS AND ALL ORDERS PLACED BY PURCHASER WITH TOL HEREUNDER, SHALL BE GOVERENED BY, AND CONTRUED IN ACCORDANCE WITH, THE LAWS OF THE STATE OF INDIANA AND ST JOSEPH COUNTY. All sales are expressly limited to, and made condition upon, the acceptance by Purchaser of these Terms and Conditions, the Credit Application, if any, and the Limited Warranties, if any. The terms and conditions of purchase and/or sale and/or limited or express warranties contained on any purchase order, request for quotation or other business document utilized by Purchaser, whether or not received by TOL from Purchaser, are expressly superseded hereby and shall not be construed as part of the agreement between TOL and Purchaser for the purchase of the Products.

Therm-O-Lite LLC
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