MEMORANDUM

September 7, 2021

To:	**Westwood School Building Committee**
From:	**Roberto Fitzgerald**
Subject:	**Proprietary Specifications Vote**
Project Name:	**Hanlon-Deerfield School Building Project**
Project Number:	**19-0798**

Dear Members of the Westwood School Building Committee,

Mass. General Laws, Chapter 30 Section 39M(b), require that materials specifications in construction contracts name a minimum of three manufacturers for each material or product specified in order to provide for competitive bidding. Specifications that restrict competition to less than three manufacturers may only be used for "sound reasons in the public interest" after a reasonable investigation. A proprietary specification must be approved by an elected body, which in this case will be the Westwood School Building Committee.

1. **Thermal Insulation:** Kingspan Kooltherm Insulation Board:
2. **Light Diffusing Glazing,** Solera and Okalux Plus-
3. **Security Laminated Glazing** – SchoolGuard Glass
4. **Emergency Key Box (Fire Dept Use) :** KnoxBox
5. **Security (Video Recording, Access Control, Alarm):** The school district is embarking on district-wide study and desire unified system for maintenance and management.
6. **Network Switches and Wireless Access Points:** The school district is embarking on district-wide study and desire unified system for maintenance and management.

The reasoning for each proprietary specification is outlined on the following pages in a format that provides for the official recording of the vote. Each of these proprietary designations should be approved in separate votes.

Sincerely,

DORE + WHITTIER
Roberto Fitzgerald, Assoc. AIA, LEED AP, MCPPO
Project Manager

Westwood: Hanlon Elementary School Project
Record of Vote for Proprietary Designation for Products

Section 07 21 00 – Thermal Insulation

Product: Kingspan - Kooltherm Insulation Board:

- This phenolic foam plastic product provides a significantly higher R-value per inch than expanded polystyrene insulations and maintains NFPA 285 compliant testing with masonry veneer.
- The use of this insulation system allows for significant cost savings that results from reduced concrete foundation thickness and continuity in the thermal envelope when changing from masonry veneer to rainscreen system.
- Similar products that achieve this R-factor and complies with NFPA 285 testing cannot be found.

The Awarding Authority for the Westwood Hanlon Elementary School Project, hereby finds and determines after discussions with Dore & Whittier Architects Inc. the project Architect as presented above, and after reasonable investigation of other feasible alternatives, as reviewed by the Owner's procurement office, that it is in the best interests of the Owner and the public at large to have certain portions of the work, being the Kingspan Kooltherm Insulation Board be included in the specifications for such project as a proprietary specification and not provide for "or equal" substitutions**.**

VOTED BY THE _____

VOTE: ☐ APPROVED AS PROPRIETARY ☐ NOT APPROVED

DATE: _____

SIGNATURE / RECORDED BY: _____

NAME / TITLE: _____

Westwood: Hanlon Elementary School Project
Record of Vote for Proprietary Designation for Products

Section 08 80 00 – Glazing: Product: SchoolGuard Security Glazing

- School Guard Laminated Glazing - This laminated glazing product is unique as it provides a high level of strengthened glass and forced entry resistance by a combination of the materials used and the manufacturer's strict training and certification requirements for contractors in order to qualify as an installer.
- A product that meets the performance criteria and installation certification could not be located.

The Awarding Authority for the Westwood Hanlon Elementary School Project, hereby finds and determines after discussions with Dore & Whittier Architects Inc. the project Architect as presented above, and after reasonable investigation of other feasible alternatives, as reviewed by the Owner's procurement office, that it is in the best interests of the Owner and the public at large to have certain portions of the work, being the SchoolGuard Security Glazing be included in the specifications for such project as a proprietary specification and not provide for "or equal" substitutions**.**

VOTED BY THE _____

VOTE: ☐ APPROVED AS PROPRIETARY ☐ NOT APPROVED

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NAME / TITLE: _____

Westwood: Hanlon Elementary School Project
Record of Vote for Proprietary Designation for Products

Section 08 80 00 – Glazing: Product: Okalux Plus and Solera (Advanced Glazings) – Light diffusing glazing

- These products by two different manufacturers have insulative and light diffusing characteristics, which uses glass capillary tubes or veils within the glass unit and are UV stable. This enables the transmission of a high level of natural daylight without glare or excessive heat gain and without yellowing.

- While other options for translucent glass is available, they are typically a film applied to the glass and do not achieve the level of natural daylight transmission desired, nor does it have the same level of longevity expected. Other products that meet all of these characteristics could not be located.

The Awarding Authority for the Westwood Hanlon Elementary School Project, hereby finds and determines after discussions with Dore & Whittier Architects Inc. the project Architect as presented above, and after reasonable investigation of other feasible alternatives, as reviewed by the Owner's procurement office, that it is in the best interests of the Owner and the public at large to have certain portions of the work, being the Okalux and Solera light diffusing glazing be included in the specifications for such project as a proprietary specification and not provide for "or equal" substitutions**.**

VOTED BY THE _____

VOTE: ☐ APPROVED AS PROPRIETARY ☐ NOT APPROVED

DATE: _____

SIGNATURE / RECORDED BY: _____

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Westwood: Hanlon Elementary School Project
Record of Vote for Proprietary Designation for Products

Section 10 44 00 – Fire Protection Specialties: Product: Knox Box Rapid Entry System

- Per the policies of the local Fire Department, a specific exterior key box is required for the project to guarantee compatibility with fire department equipment and training, and to assure emergency access to the building.
- The proprietary product shall be KnoxBox key box as manufactured by Knox Company. www.knoxbox.com

The Awarding Authority for the Westwood Hanlon Elementary School Project, hereby finds and determines after discussions with Dore & Whittier Architects Inc. the project Architect as presented above, and after reasonable investigation of other feasible alternatives, as reviewed by the Owner's procurement office, that it is in the best interests of the Owner and the public at large to have certain portions of the work, being the Knox Box 3200 Series be included in the specifications for such project as a proprietary specification and not provide for "or equal" substitutions**.**

VOTED BY THE _____

VOTE: ☐ APPROVED AS PROPRIETARY ☐ NOT APPROVED

DATE: _____

SIGNATURE / RECORDED BY: _____

NAME / TITLE: _____

Westwood: Hanlon Elementary School Project
Record of Vote for Proprietary Designation for Products

Section 26 00 00 – Electrical: Integrated Electronic Security Systems:

Product: Video Recording, Access Control and Alarm

- It is in the best interest of the Awarding Authority to utilize the same access control and building security system currently used at other facilities and buildings in the School District, in order to have a system accessible to and familiar to the Facilities Staff.
- Systems of one manufacturer will provide for simplified maintenance and management of the system, resulting in reduced costs to the Owner.
- By matching the systems already in place, compatibility of the new building to the existing systems in use by the Owner will assure seamless transfer of data.
- The system to be specified is: to be determined by the School District

The Awarding Authority for the Westwood- Hanlon Elementary School Project, hereby finds and determines after discussions with Dore & Whittier Architects Inc. the project Architect as presented above, and after reasonable investigation of other feasible alternatives, as reviewed by the Owner's procurement office, that it is in the best interests of the Owner and the public at large to have certain portions of the work, being the Video Recording, Access Control and Alarm system be included in the specifications for such project as a proprietary specification and not provide for "or equal" substitutions**.**

VOTED BY THE _____

VOTE: ☐ APPROVED AS PROPRIETARY ☐ NOT APPROVED

DATE: _____

SIGNATURE / RECORDED BY: _____

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Section 27 20 00 – Data Communication System: Network Switches and Wireless Access Points

Westwood: Hanlon Elementary School Project
Record of Vote for Proprietary Designation for Products

- The Westwood School district is embarking on district-wide study and desire unified system for maintenance and management.
- It is in the best interest of the Awarding Authority to utilize the same Data Communication system, relative to Network Switches and Wireless Access Points planned for use at other facilities and buildings in the school district, in order to have a system accessible to and familiar to the IT staff
- Systems of one manufacturer will provide for simplified maintenance and management of the system, resulting in reduced costs to the Owner.
- By matching the systems already in place, compatibility of the new building to the existing systems in use by the Owner will assure seamless transfer of data.
- The system to be specified is: to be determined by the School District

The Awarding Authority for the Westwood Hanlon Elementary School Project, hereby finds and determines after discussions with Dore & Whittier Architects Inc. the project Architect as presented above, and after reasonable investigation of other feasible alternatives, as reviewed by the Owner's procurement office, that it is in the best interests of the Owner and the public at large to have certain portions of the work, being the Network Switches and Wireless Access Points be included in the specifications for such project as a proprietary specification and not provide for "or equal" substitutions**.**

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VOTE: ☐ APPROVED AS PROPRIETARY ☐ NOT APPROVED

DATE: _____

SIGNATURE / RECORDED BY: _____

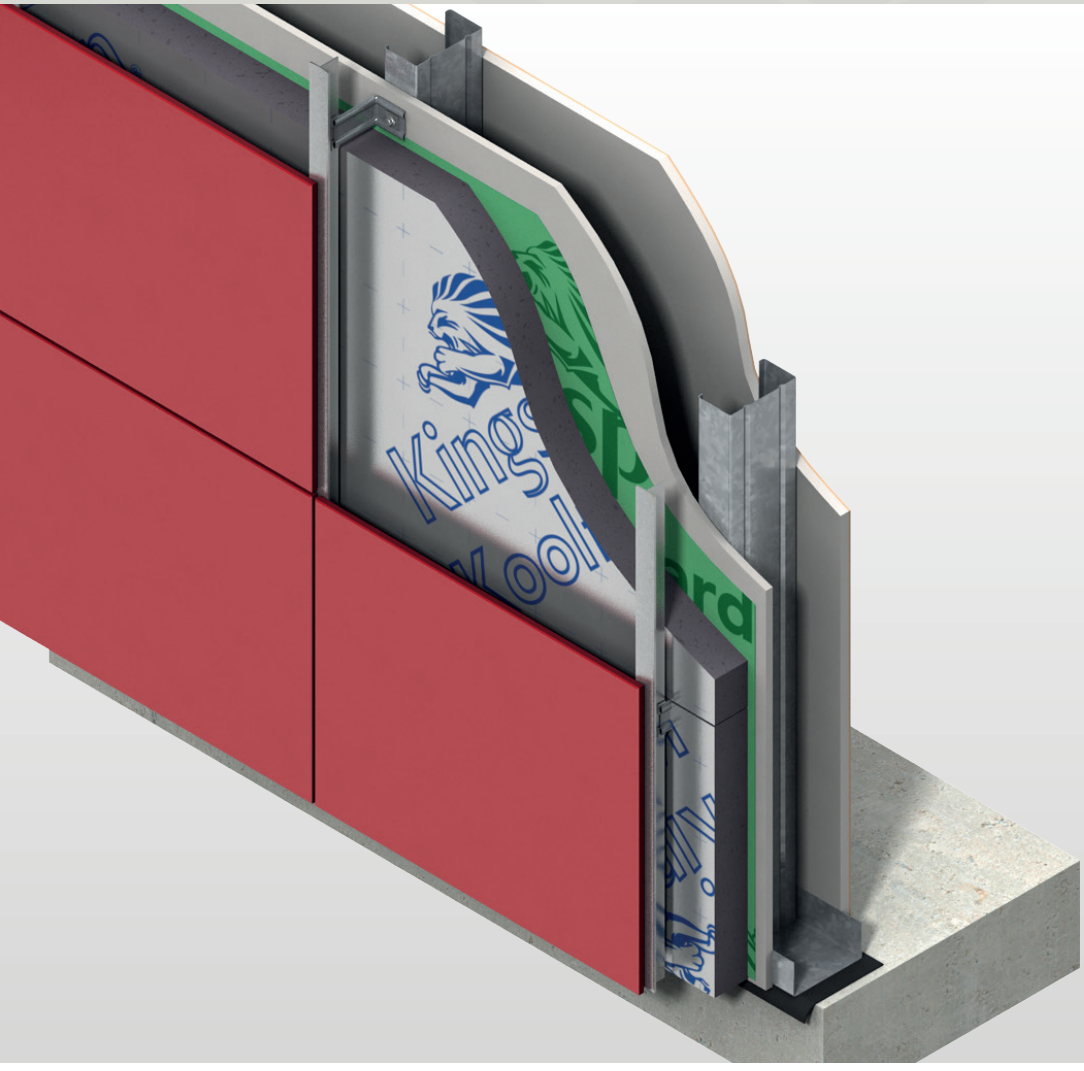
NAME / TITLE: _____

Insulation

Second Issue October 2019

Kooltherm® K15 Rainscreen Board

INSULATION FOR RAINSCREEN CLADDING SYSTEMS



- Premium performance rigid thermoset insulation
- NFPA 285 compliant
- UL Classified
- Higher R–value per inch than any commonly used insulation
- R-value of 16 on 2 in
- Negligible smoke developed
- ASTM E84 rating of 25/20 (flame-smoke)
- Clear cavity is maintained – resists moisture penetration
- Resistant to the passage of water vapor
- Easy to handle and install
- Manufactured with a blowing agent that has zero ODP, low GWP, HCFC and CFC free

Fiber-free Core

Kingspan®

Low Energy – Low Carbon Buildings

Typical Constructions

Introduction

Kingspan **Kool**therm® K15 Rainscreen Board is a premium performance insulation products, with a fiber–free rigid thermoset phenolic insulation core faced on both sides with a low emissivity composite foil facing. The product is used as insulation for rainscreen cladding systems.

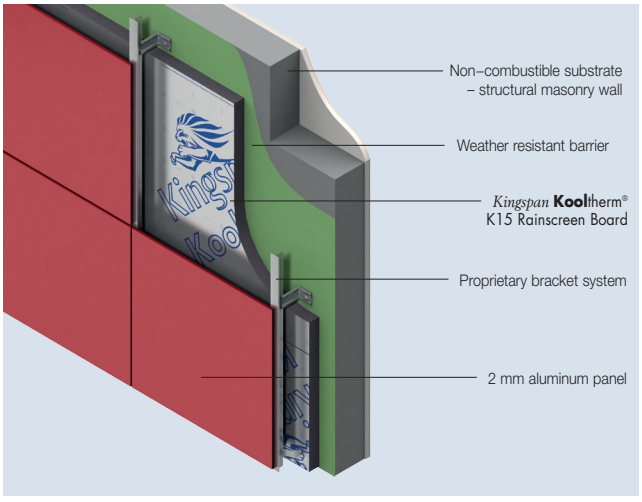


Figure 1 – Insulated Rainscreen Cladding Systems (2mm aluminum panel)

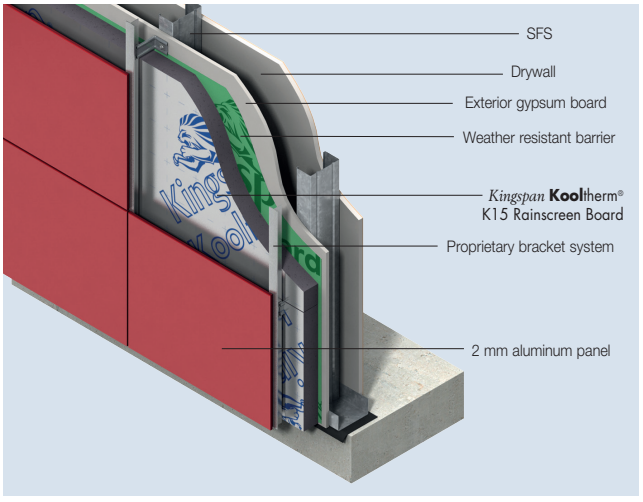


Figure 3 – Insulated Rainscreen Cladding Systems (2mm aluminum panel)

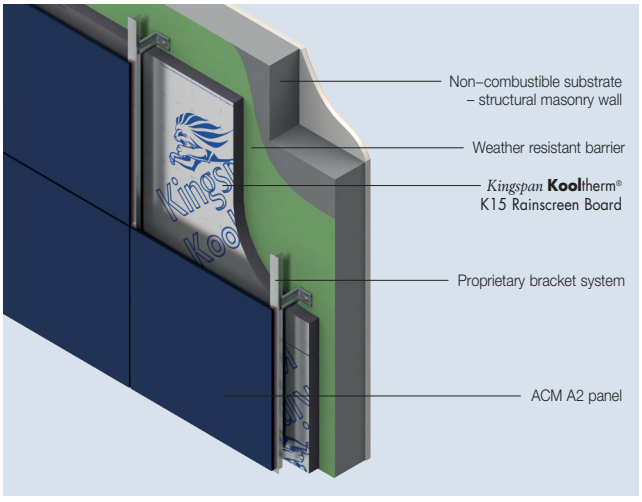


Figure 2 – Insulated Rainscreen Cladding Systems (ACM A2 panel finish)

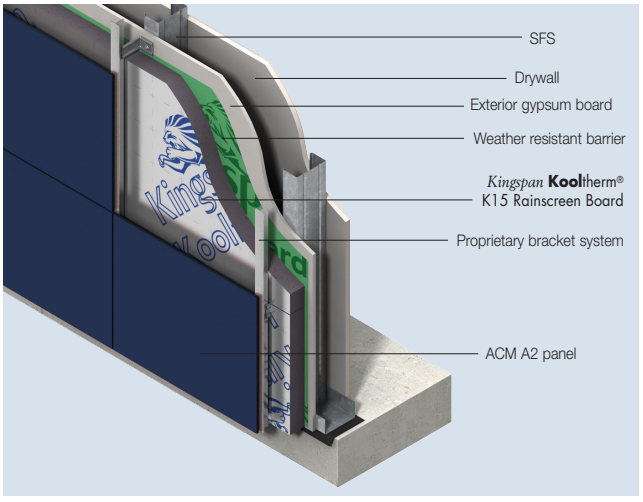


Figure 4 – Insulated Rainscreen Cladding Systems (ACM A2 panel finish)

Product Details

The Facings

Kingspan **Kool**therm® K15 Rainscreen Board is faced on both sides with a low emissivity composite foil, adhesively bonded to the insulation core during manufacture. This reflective, low emissivity surface improves the thermal resistance of any unventilated cavity adjacent to the board.

The Core

The core of *Kingspan* **Kool**therm® K15 Rainscreen Board is a premium performance rigid thermoset fiber-free phenolic insulant manufactured with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP).

Fiber-free Core

Standard Dimensions

Kingspan **Kool**therm® K15 Rainscreen Board is available in the following standard size(s):

Nominal Dimension	Availability	
	(in)	(mm)
Width	47.25	1200
Length	96	2438
Insulant Thickness	Refer to Kingspan Insulation for current stock and non–stock sizes.	

Durability

If correctly installed, *Kingspan* **Kool**therm® K15 Rainscreen Board can have an indefinite life. Its durability depends on the supporting structure and the conditions of its use.

Resistance to Solvents, Fungi & Pests

The insulation core is resistant to short–term contact with petroleum and with most dilute acids, alkalis and mineral oils. However, it is recommended that any spills be cleaned off fully before the boards are installed. Ensure that safe methods of cleaning are used, as recommended by the suppliers of the spilt liquid. The insulation core is not resistant to some solvent–based adhesive systems, particularly those containing methyl ethyl ketone. Adhesives containing such solvents should not be used in association with this product. Damaged boards or boards that have been in contact with harsh solvents or acids should not be used.

The insulation core and facings used in the manufacture of *Kingspan* **Kool**therm® K15 Rainscreen Board resist attack by mold and microbial growth, and do not provide any food value to pests.

Product Data

Property	Test Method	Result
General		
Nominal Thickness (in / mm) (in / mm) (in / mm)	Stock* 1.18 / 30 1.97 / 50 2.95 / 75	
Standard Dimensions Width (in / mm) Length (in / mm)		 47.25 / 1200 96 / 2438
Compressive Strength, Min. (psi)	ASTM C209	 15
Water Absorption, Max. (% by volume)	ASTM C272	 1.15
Density, Min. (lb/ft^3)	ASTM C1621	 2.0
Closed Cell Content (% of cells closed)	ASTM D6226	 94.67
Air Permeance (L/S/m^2) / (cfm/ft^2)	ASTM E2178	 0.002 / 0.000
Water Vapor Permeance, Max.[1] (perm)	ASTM E96	 0.51

[1] *Permeance shown is for 25mm thick board. Permeance typically decreases as board thickness increases.*

** Contact Kingspan Insulation for available non-stock sizes.*

CODE COMPLIANCE

ETL LISTED US

Intertek

CCRR-1066

Product Details

Standards & Approvals

Kingspan **Kool**therm® K15 Rainscreen Board, is manufactured to the highest standards under a management system certified to ISO 9001: 2008 (Quality Management Systems. Requirements), ISO 14001: 2004 (Environmental Management Systems. Requirements), and OSHAS 18001:2007 (Occupational Health & Safety Management Systems. Requirements).

Fire Performance

The rigid thermoset insulation core of *Kingspan* **Kool**therm® K15 Rainscreen Board, when subjected to the ASTM E84 (Standard Test Method for Surface Burning Characteristics of Building Materials) / UL 723 fire test specified in the table below, has achieved the result shown.

Flame Spread	Smoke Developed
25	20

Exterior Wall Fire Performance

With its superior fire properties, *Kingspan* **Kool**therm® K15 Rainscreen Board has gained the following NFPA 285 UL Certification Listings:

Alucobond ACM A2 Panel Rainscreen Wall System Certification

Dri-Design Aluminum Panel Rainscreen Wall System Certification

Henkel Acrylic Stucco Wall System

Masonry Veneer Wall System

Further details of the fire performance of Kingspan Insulation products may be obtained from Kingspan Insulation.

Thermal Resistance

The R–values detailed below are quoted in accordance with ASTM C518 (Standard Test Method for Steady–State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus).

Thermal resistance (R–value) varies with thickness and is calculated by dividing the thickness of the board by its thermal conductivity.

Insulant Thickness		Thermal Resistance
(in)	(mm)	(R–value)*
1.18 •	30	9.5
1.57	40	12.5
1.77	45	14.5
1.97 •	50	16
2.17	55	17.5
2.36	60	19
2.56	65	20.5
2.76	70	22
2.95 •	75	24
3.15	80	25.5
3.35	85	27
3.54	90	28.5
3.74	95	30
3.94	100	31.5

• *Stocked Items*
Refer to Kingspan Insulation for current stock and non–stock sizes.

* *Listed R-values are based on certified thermal conductivity testing at 75 mm.*

Design Considerations

Sustainability & Responsibility

Kingspan Insulation has a long–term commitment to sustainability and responsibility.

A report covering the sustainability and responsibility of Kingspan Insulation Ltd's British operations is available at

www.kingspaninsulation.co.uk/sustainabilityandresponsibility.

Specification Clause

Kingspan **Kool**therm® K15 Rainscreen Board should be described in specifications as:

The wall insulation shall be *Kingspan* **Kool**therm® K15 Rainscreen Board____ mm thick: comprising a premium performance rigid thermoset insulation core faced on both sides with a low emissivity composite foil facing. The product shall be manufactured: with a blowing agent that has zero Ozone Depletion Potential (ODP) and low Global Warming Potential (GWP); under a management system certified to BS / I.S. EN ISO 9001: 2008, BS / I.S. EN ISO 14001: 2004 and BS / I.S. OHSAS 18001: 2007 and ISO 50001: 2011; by Kingspan Insulation LLC; and installed in accordance with the instructions issued by them.

Sitework

General

Cutting

- Cutting should be carried out either by using a fine toothed saw, or by scoring with a sharp knife, snapping the board over a straight edge and then cutting the facing on the other side.
- Ensure accurate trimming to achieve close butting joints and continuity of insulation.

Daily Working Practice

- At the completion of each day's work, or whenever work is interrupted for extended periods of time, board edges and joints should be protected from inclement weather.

Availability

- *Kingspan* **Kool**therm® K15 Rainscreen Board is available through specialist insulation distributors throughout the US.

Packaging and Storage

- The polyethylene packaging of Kingspan Insulation products, which is recyclable, should not be considered adequate for outdoor protection.
- Ideally, boards should be stored inside a building. If, however, outside storage cannot be avoided, then the boards should be stacked clear of the ground and covered with an opaque polyethylene sheet or weatherproof tarp. Boards that have been allowed to get wet should not be used.

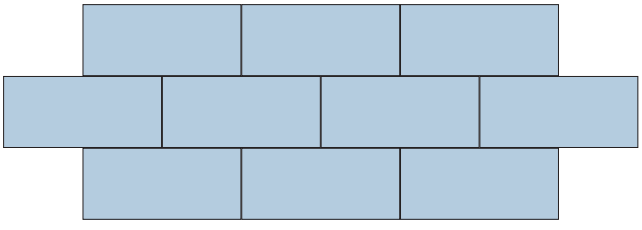
Health and Safety

- Kingspan Insulation products are chemically inert and safe to use.
- A Safety Data Sheet for this product is available from the Kingspan Insulation website www.kingspaninsulation.us

Please note that the reflective surfaces on this product are designed to enhance its thermal performance. As such, they will reflect light as well as heat, including ultraviolet light. Therefore, if this product is being installed during very bright or sunny weather, it is advisable to wear UV protective sunglasses or goggles, and if the skin is exposed for a significant period of time, to protect the bare skin with a UV block sun cream.

The reflective facings used on this product can be slippery when wet. Therefore, it is recommended that any excess material should be contained to avoid a slip hazard.

Warning – do not stand on or otherwise support your weight on this product unless it is fully supported by a load bearing surface.



Layer Staggered–Joint Pattern

Boards to be installed horizontally (meaning 96 in horizontal orientation)

Installation

- Since rainscreen cladding systems are proprietary and utilize different mechanisms for attaching cladding panels to the wall structure, installation guidance should be sought from the system manufacturer.
- However, in the absence of any other guidance the instructions laid out below may be followed.
- Insulation boards should be installed break–bonded with board edges lightly butted and in such a manner to achieve a close fit between the board and substrate interface so as to avoid gaps behind or between the boards.
- Boards should be cut neatly around fasteners and brackets, so as to avoid gaps. Where small gaps are unavoidable, fill gaps with fire rated sealant or expanding sealant.
- The number and type of mechanical fasteners required to fasten *Kingspan* **Kool**therm® K15 Rainscreen Board will vary with the geographical location of the building, the local topography, the height and width of the wall concerned, the wall structure, and the type of mechanism being used to attach the cladding system.
- A minimum of 9 fasteners are required to secure the insulation board to the wall structure.
- Please refer to the column opposite for recommended fastening patterns.
- Fasteners at board edges must be located > 2 in and < 6 in from edges and corners of the board and not overlap board joints.

Refer to:

EJOT	262-612-3550
www.ejot-usa.com	
SFS Intec	610-376-5751
www.sfsintec.ca	
Rodenhouse	616-454-3100
www.rodenhouse-inc.com/kingspan-kooltherm	
ITW Ramset	800-848-5611
www.ramset.com	

- The joints of *Kingspan* **Kool**therm® K15 Rainscreen Board should always be taped using a fire rated classified to Class 1 / Class A ASTM E84 / UL 723, 3 in. wide self–adhesive aluminium foil rainscreen cladding tape.
- In the absence of other protection, exposed edges of *Kingspan* **Kool**therm® K15 Rainscreen Board should be protected by a suitable self–adhesive aluminium foil tape fire rated classified to Class 1 / Class A ASTM E84 / UL 723, with a 3 in. min. wide overlap onto the insulation board face.

Kingspan Insulation

Company Details

Kingspan Insulation LLC is part of the Kingspan Group plc., one of Europe's leading construction product manufacturers. The Kingspan Group was formed in the late 1960s and is a publicly traded group of companies headquartered in Kingscourt, County Cavan, Ireland.

Kingspan Insulation LLC, headquartered in Atlanta, GA, is a leading manufacturer in energy efficiency and moisture management products, offering high performance insulation, building wraps and pre-insulated HVAC ductwork.

Products & Applications

Kingspan Insulation LLC has a vast product range that includes optimum, premium and high performance rigid insulation products and moisture management products.

Kingspan Insulation LLC products are suitable for both new build and renovation in a variety of applications within both residential and non–residential buildings.

Insulation for:

- Flat Roofs (XPS & VIP)
- Green Roofs (XPS & VIP)
- Cavity Walls
- Solid Walls
- Wood and Steel Framing
- Insulated Cladding Systems
- Insulated Render Systems
- Below Grade
- Basement Walls
- Floors
- Soffits
- Ductwork

Further Solutions:

- *Kingspan* **Kool**therm® Cavity Closer
- *Kingspan* **Kool**Duct® Pre–Insulated Ducting
- *Kingspan* **GreenGuard**® Building Wraps

Insulation Product Benefits

Product Overview

Kingspan OPTIM-R® **Vacuum Insulation Panel** (VIP)

- With an aged R-value of 28 per inch, these products provide an insulating performance that is up to five times better than other commonly available insulation materials.
- Provides high levels of thermal efficiency with minimal thickness.
- Over 90% (by weight) recyclable.

Kingspan **Kool**therm® K–range **Products**

- Higher R–value per inch than any commonly used insulation.
- Each product achieves the required fire performance for its intended application.
- ASTM E84 rating of 25/20 (flame-smoke)
- Manufactured with a blowing agent that has zero ODP, low GWP, HCFC and CFC free.

Kingspan **GreenGuard**® **Product Line**

- Rigid extruded polystyrene insulation (XPS) for use as general purpose insulation for roofing, wall and foundation applications requiring a minimum compressive strength.
- R–value of 5.0 per inch of thickness.
- Continuous Insulation (Ci) for above grade walls, as well as below grade walls and floors.
- Provides and extra barrier against moisture infiltration.
- Each product achieves the required fire performance for its intended application.

All Products

- Unaffected by air infiltration – a problem that can be experienced with mineral fiber and which can reduce thermal performance.
- Safe and easy to install.
- If installed correctly, can provide reliable long term thermal performance over the lifetime of the building.

Contact Details

Sales and Technical Support
Tel 1 800 241 4402
Fax 1 678 589 7325
email info@kingspaninsulation.us
website www.kingspaninsulation.us

Kingspan Insulation LLC believes the information and recommendations herein to be accurate and reliable. However, since use conditions are not within its control, Kingspan Insulation LLC does not guarantee results from use of such products or other information herein and disclaims all liability from any resulting damage or loss. No warranty, express or implied, is given as to the merchantability, fitness for particular purpose, or otherwise with respect to the products referred to.

For more information on specific building product recommendations and product data, contact your Kingspan Insulation LLC representative.

For the most current installation guidelines and compliance information go to www.kingspaninsulation.us.

Kingspan Insulation LLC
2100 RiverEdge Parkway, Suite 175, Atlanta, Georgia 30328
info@kingspaninsulation.us
1-800-241-4402
www.kingspaninsulation.us

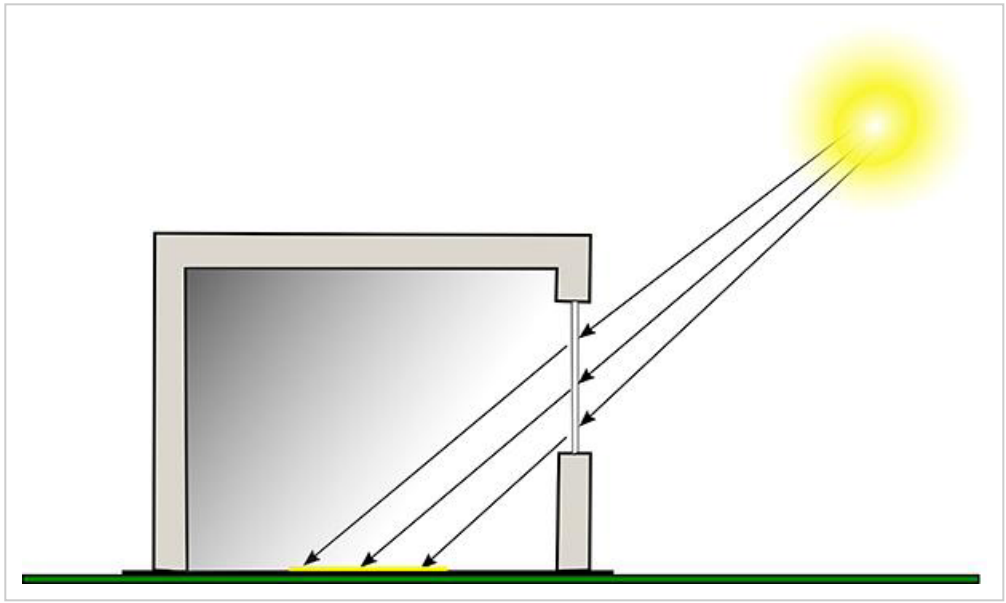
BRO-K15 1910

Light Distribution and Redirection

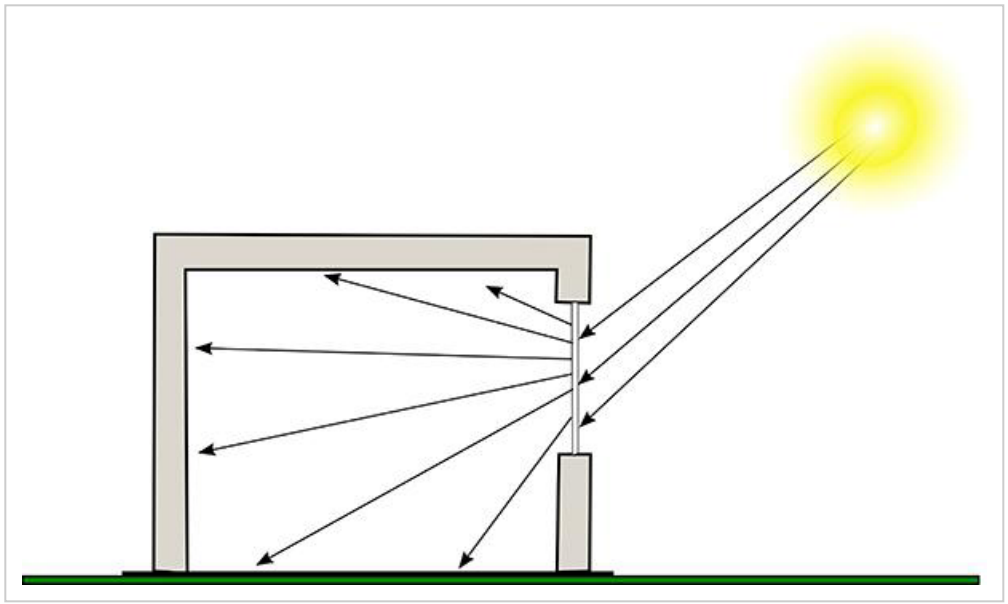
Light Redistribution by Diffusion

The use of fully diffuse translucent glazing materials redistributes the incoming light equally in all directions. This means rather than the light directing downward toward the floor, just as much is directed inward and upward. This redistribution means that the useful daylight is distributed deeper into a space. This maximizes daylight potential while eliminating glare and hotspots.

Standard Vision Glass



Solera® Insulated Glass Daylighting Units



Daylight Simulation

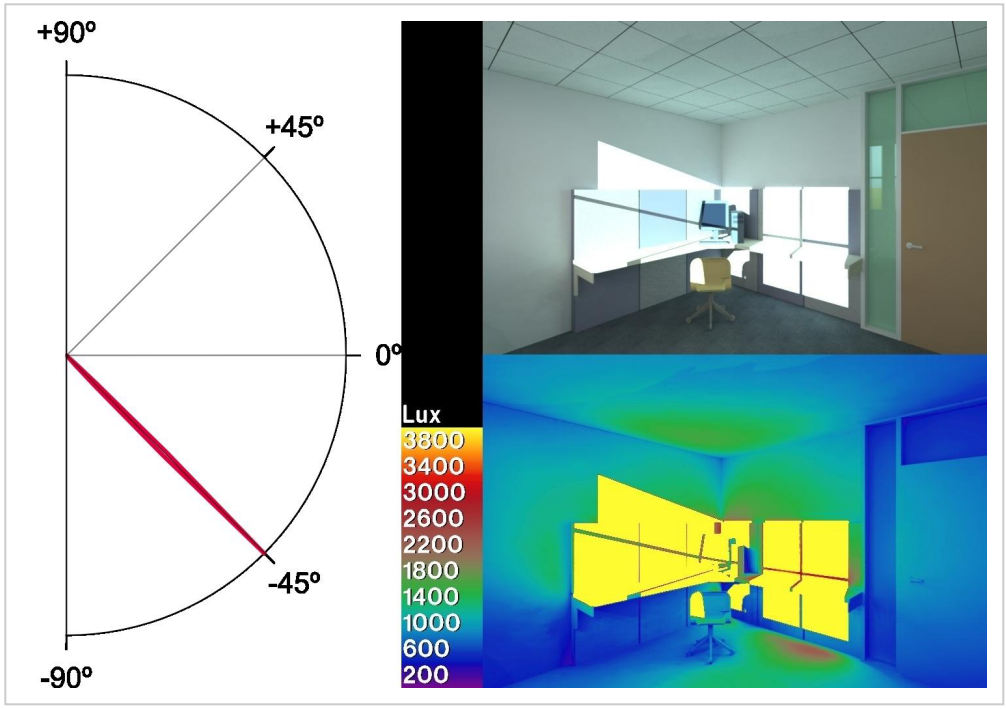
Advanced Glazings Ltd. conducts daylight simulations using LBNL's Radiance. Radiance is highly accurate ray-tracing software which is used by architects and engineers to predict illumination and evaluate designs and daylighting technologies. Radiance daylighting simulations will demonstrate how Solera® diffuses natural light thereby reducing contrast (glare) and increasing the overall ambient light level.

Evaluating Light Diffusion

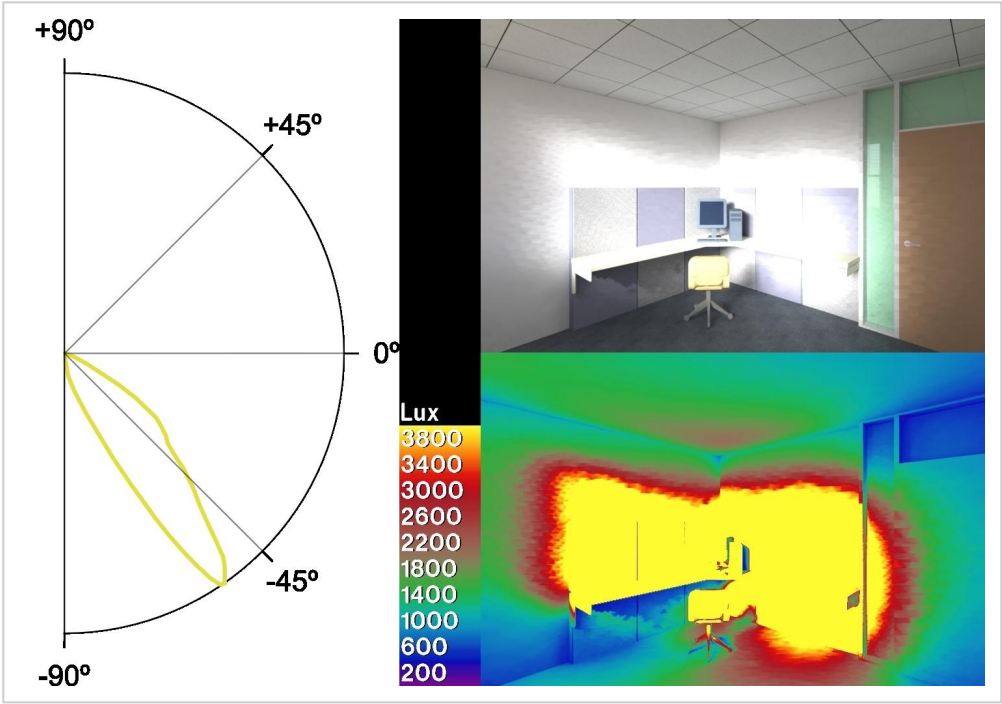
Not all Translucent materials are equal. Transmittance of materials can be vary from specular to fully diffused, or some varying degree or combination between the two. Vision glass has purely specular transmission, i.e. light passes straight through with no scattering. Other glazing materials such as acid etched glass, or white laminate PVB scatter light sufficiently to obscure view, but the scattering is of relatively narrow angle, therefore the brightness of those materials will vary greatly depending on your direction of view and the direction of the incident light. Solera® is an excellent light diffuser, meaning light that it transmits is widely scattered such that the brightness is equal in all directions.

Regardless of the angle the sun strikes Solera®, the unit should appear equally bright regardless of the direction of view. Radiance daylight simulations can be used to evaluate and demonstrate the relative performance of different glazing materials. The following figures combine plots from physical light diffusion measurements with renderings generated with Radiance. The plots show the measured distribution of what comes out of the glazing material when light shines into the glazing at 45°. Two versions of renderings are depicted, one showing a photorealistic representation of an example space, the other with a falsecolour version showing incident light levels. These clearly demonstrate the superiority of fully diffused light.

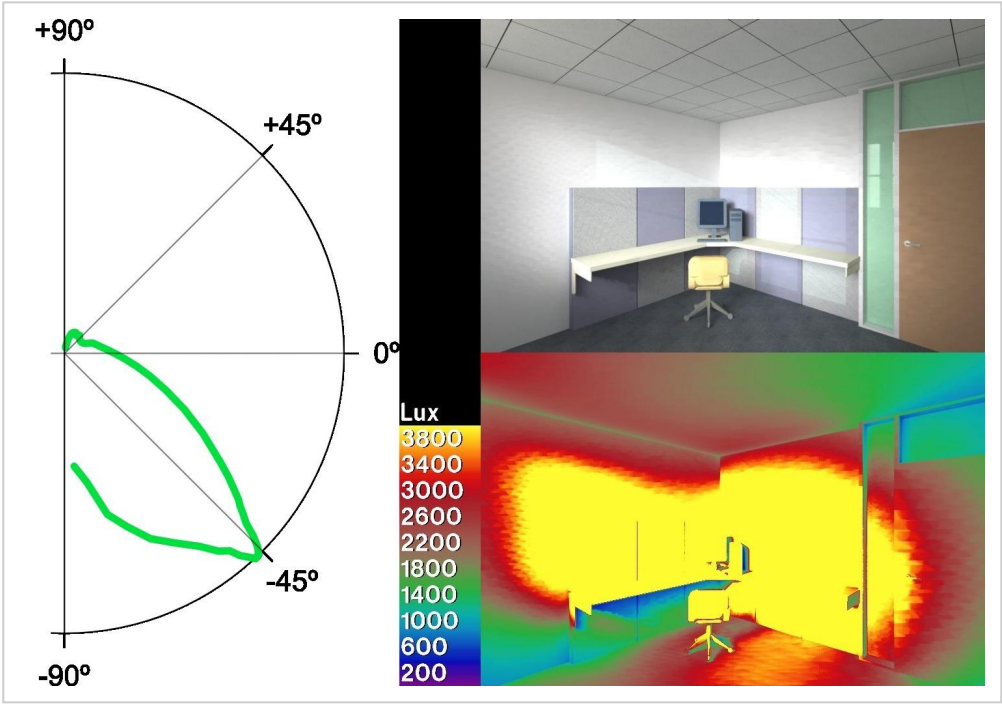
Standard Vision Glass



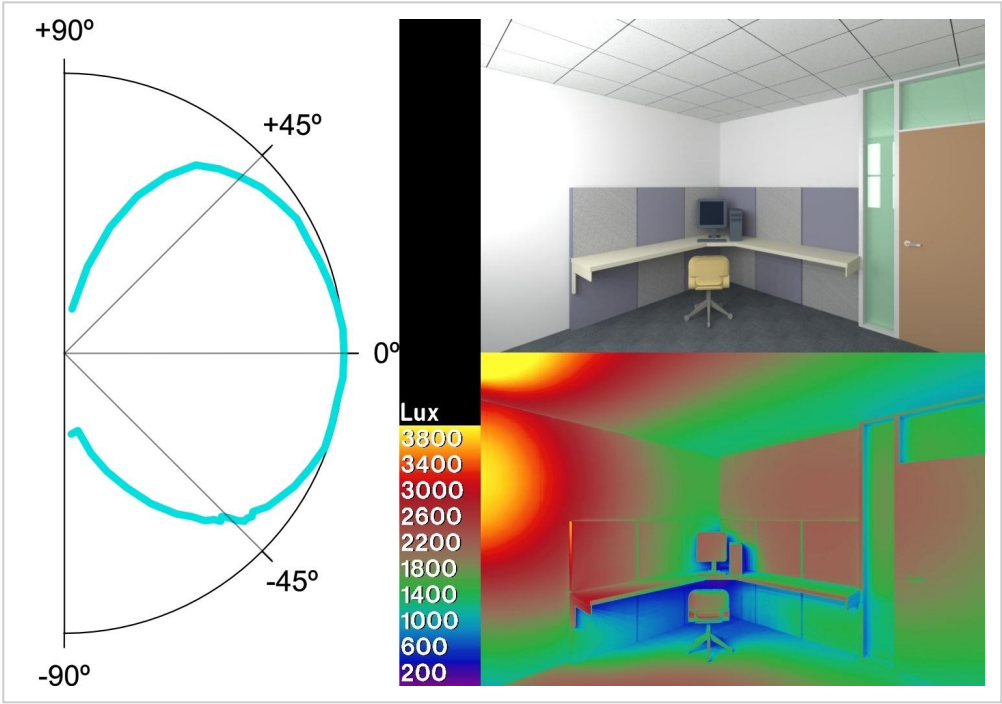
Acid Etched Glass



White Laminated Glass



Solera® Insulated Glass Daylighting Units



CONTINUE YOUR DAYLIGHTING EDUCATION: **SUSTAINABILITY** (/EDUCATION/SUSTAINABILITY)

The glazing sample is illuminated by a quartz halogen spotlight, at an incidence of 45 degrees. A light meter measures the radiant intensity leaving the aperture in the mask that covers the back of the sample. The measurement is repeated over a range of angles from -85 to +85 and the results are recorded. (Measurements at exactly 90° not physically possible).

While products such as Acid Etched Glass and White Laminated Glass can be classified as "Narrow Angle Light Diffusers," Solera® – with its exceptional light diffusion – is classified as a "Wide Angle Light Diffuser." For a technical brief on the LDP setup and experiment, contact us (/contact) today.

0:00 / 0:23

OKA*LUX* + KAPI*LUX*

Capillary Daylighting

OKALUX

Wir denken Architekturglas weiter.

OKALUX and Sustainability:

Optimal energy efficiency with the highest possible convenience for the user with OKALUX functional glazing – our contribution for the buildings of tomorrow.

We create everything with lasting value in mind. Every step, from the idea through the processing to the finished project, is carried out with conviction and a dedication to sustainability.

Capillary Daylighting

OKALUX insulating glass with capillary slabs have many talents. They diffuse daylight into the depth of the room, while providing very good sun and glare protection. Their heat insulation properties are excellent and the transmission values of the glass can be individually adjusted to suit the requirements of your building.

OKALUX

Wir denken Architekturglas weiter.

Capillary glass – the perfect combination of functionality and aesthetics.

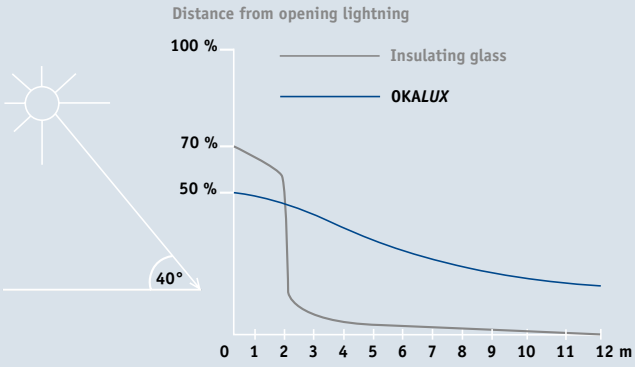
Light Right to the Depths of the Room

OKA*LUX*+ Insulating glass with capillary slab

Cité de l'Océan et du Surf, Biarritz | FR
Steven Holl Architects
Solange Fabião
Rüssli Architekten

KAPI*LUX* T

OKALUX light-diffusing insulating glass illuminates rooms evenly without hard shadows. Conventional insulating glass only provides intensive illumination in the proximity of the façade where hard shadows are cast.



Even Light Diffusion

Daylight determines the natural rhythm of life and creates a feeling of well-being at work and at play. With OKALUX capillary glass, you can bring a lot of natural light into museums and sports halls, as well as administration and industrial buildings. The insulating glass elements contain countless little translucent or white capillary tubes in the cavities which break up the incident daylight and diffuse it throughout the interior.

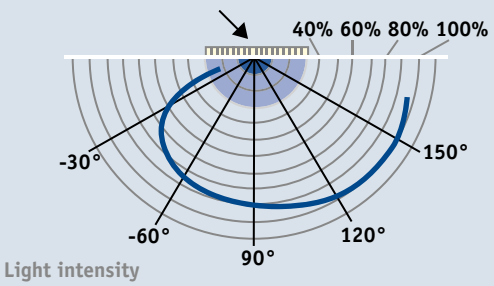
The insulating glass can be precisely adapted to the requirements of each building situation. Various glass fibre tissues influence the light diffusing effect.

Bright Rooms without Glare

Sports halls require excellent light conditions. Not only does OKALUX capillary glass offer excellent thermal sun protection and a high degree of light transmission, it ensures evenly diffused, glare-free daylight without bright or dark zones. Thus, every part of the room is clearly visible and there is good orientation within the room – a necessity for optimal playing and training conditions.

Outstanding light diffusion: a light transmission of 60 % with an angle of -30 % against the direction of incidence demonstrates the high quality of the glazing.

Light incidence at an angle of 45°, parallel beam



Hans-Joachim-
Brandenburg-Halle
Sports Hall
Herzebrock-
Clarholz | DE

werk 9 architekten

OKA*LUX* K

Conventional insulating glass (1 and 3) in comparison with OKALUX functional glass (2 and 4): Simulations of different situations of daylight can be made in the early planning stages for comparison and evaluation.

Protection against Heat and Thermal Loss

Capillary glass is distinguished by its particularly good heat insulation properties. The small capillary tubes on the inside work like little air cushions which prevent the convection of air in the cavity. In addition to this, the capillary slabs reduce thermal radiation from the sun. Depending on requirements, thermal sun protection can be set to a total solar energy transmittance of up to 15 %.

Convention Center
Zaragoza | ES
Nieto Sobejano
Arquitectos

OKA*LUX*

© Roland Halbe

Save energy! Capillary glass improves the U_g-value (Btu) of the façade significantly and reduces the cooling loads.

Outstanding Protection against Sun Radiance

© Sebastian Schels + Deppisch Architekten

Biohotel im Apfelgarten,
Hohenbercha | DE
Deppisch Architects

KAPI*LUX* W

Citroen Showroom
C42, Paris | FR
Manuelle Gautrand
Architect

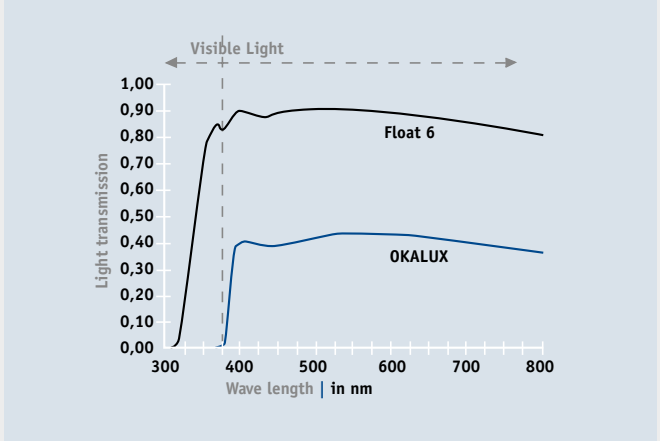
KAPI*LUX* T

The fine surface of the capillary structure is wonderfully vivid as the material provides a perfect backdrop for the fascinating interplay of light and shade. The users in the interior profit from the screening effect offered by the insulating glass with translucent capillary inlay.

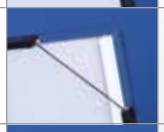
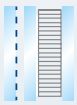
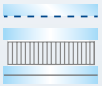
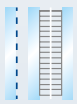
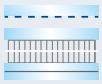
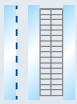
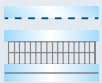
OKALUX capillary glass not only creates a private sphere but also protects valuable exhibits from fading through too much exposure to UV rays. A further quality: Colourless capillary structures transmit all wave lengths of visible light. The entire colour spectrum is reflected in its original brilliance allowing an unadulterated perception of the objects.

© Philippe Ruault

OKALUX capillary systems offer UV protection up to 390 nm.



Technical Data

Products	View	Structure Façade	Structure Roof	Dimensionsmax.[mm][ft²][1]	Total thickness [mm]	Type	Krypton: Ug-value [W/(m²K)] [2] [Btu/(hr ft² °F)]	Argon: Ug-value [W/m²K)] [2] [Btu/(hr ft² °F)]
OKA*LUX*®				2000 x 4500	ab 16	45/47 38/40 25/28		
OKA*LUX*®+				1230 x 4000	ab 26	39/34 34/22 24/16	0,9 [0.16] 0,9 [0.16] 0,9 [0.16]	1,3 [0.23] 1,3 [0.23] 1,3 [0.23]
OKA*LUX*® K K-value (Btu) optimized				2000 x 6000	ab 30	43/37 38/23 24/18	0,8 [0.14] 0,8 [0.14] 0,8 [0.14]	1,1 [0.19] 1,1 [0.19] 1,1 [0.19]
OKA*LUX*® EVO				2000 x 6000	ab 28	42/36 37/22 31/20	0,8 [0.14] 0,8 [0.14] 0,8 [0.14]	1,0 [0.18] 1,0 [0.18] 1,0 [0.18]
KAPI*LUX*® T Translucent				2400 x 6000	ab 42	62/47 54/30 46/26	0,8 [0.14] 0,8 [0.14] 0,8 [0.14]	1,0 [0.18] 1,0 [0.18] 1,0 [0.18]
KAPI*LUX*® W White				2400 x 6000	ab 42	35/29 31/19 26/17	0,8 [0.14] 0,8 [0.14] 0,8 [0.14]	1,0 [0.18] 1,0 [0.18] 1,0 [0.18]
KAPI*LUX*® WS White / inclined				2400 x 4400	ab 42	35/29 31/19 26/17	0,8 [0.14] 0,8 [0.14] 0,8 [0.14]	1,0 [0.18] 1,0 [0.18] 1,0 [0.18]

All technical values, such as light transmission, total solar energy transmittance and U_g-values (Btu) can be varied by using other constructions and glass types.

Subject to technical changes

[1] Maximally dimensioned glazing may necessitate blunt joints or joint profiles

[2] DIN EN 673 | [3] DIN EN 410

[4] VDI 2078 | [5] GANA Manual

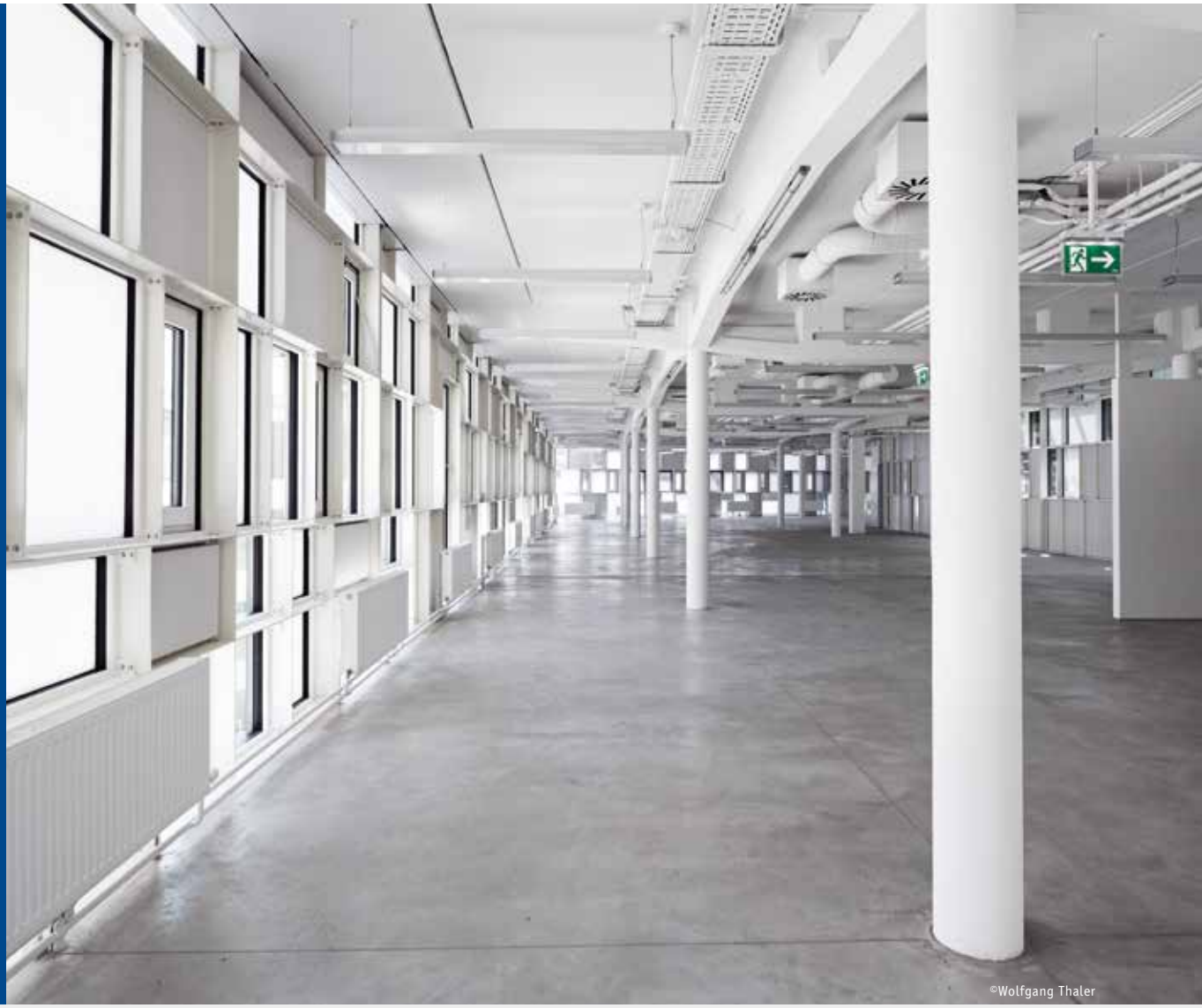
Air: Ug-value [W/m²K)] [2] [Btu/(hr ft² °F)]	TSET, SHGC % direct [3]	TSET, SGGC % diffused [3]	TSET/0.86)Shading coefficent SC [	Light transmission % direct [3]	Light transmission diffused [3]	Preferred application
2,7 - 1,3* [0.48 - 0.23]	47 40 28	36 31 23	59 (55) 50 (46) 36 (33)	45 38 25	34 29 19	Very narrow double glazing can be used for example for restoration of listed objects
1,5 [0.26] 1,5 [0.26] 1,5 [0.26]	34 22 16	28 18 14	43 (40) 27 (25) 20 (19)	39 34 24	30 26 18	Narrow layout with optimized U_g-values (Btu) for museums and sports halls
1,4 [0.25] 1,3 [0.23] 1,3 [0.23]	37 23 18	28 18 14	46 (43) 29 (27) 22 (20)	43 38 24	32 28 17	Optimized triple glazing for industrial and administrative buildings, schools, universities
1,2 [0.21] 1,1 [0.19] 1,1 [0.19]	36 22 20	26 16 14	45 (42) 28 (26) 25 (23)	42 37 31	28 24 21	Optical depth effect through visible capillary structure for roof and façade glazing
1,2 [0.21] 1,1 [0.19] 1,2 [0.21]	47 30 26	34 21 19	59 (55) 37 (35) 33 (31)	62 54 46	41 36 31	High requirements on light transmission and sun protection with partial transparency
1,2 [0.21] 1,1 [0.19] 1,2 [0.21]	29 19 17	18 11 10	36 (34) 23 (22) 21 (19)	35 31 26	18 16 13	High demands on sun and glare control with partial throughvision (transparency)
1,2 [0.21] 1,1 [0.19] 1,2 [0.21]	29** 19** 17**	18** 11** 10**	36 (34)** 23 (22)** 21 (19)**	35** 31** 26**	18** 16** 13**	Roof glazing with high demands on sun and glare control

* Depending on OKA*PANE* insert 8 - 40 mm

The listed values are estimates. They were determined on the basis of measurements conducted by certified test institutes and the calculations derived from them in compliance with the relevant valid standards. Values determined on a project-specific basis may vary from the above values. The values continue to vary if other coatings are used. You will find more detailed, glass-specific information on soundproofing, fire protection, building and personal protection etc. in the internet www.okalux.com, along with specified texts which we will provide on request.

Wirtschaftspark
Breitensee
Wien | AT
HOLODECK
architects

KAPI*LUX* W



The requirements concerning working conditions in industrial and technological buildings are especially high. A comfortable daylight atmosphere in the interior is the best prerequisite for efficient production conditions, innovative development as well as an increase in work output.
OKALUX capillary glass diffuses light glarefree and deep into the rooms, allowing for optimal use of industrial buildings for work and research.

OKA*LUX* + KAPI*LUX*: Benefits at a Glance

High Functionality

- Optimal, even illumination of the room, without hard shadows
- Effective sun and glare protection
- High light transmission, light entry can be adjusted individually
- High colour rendering
- Good heat and sound insulation
- Protection from UV rays
- Bird-friendly solution
- Fire protection according to requirements

Sustainability

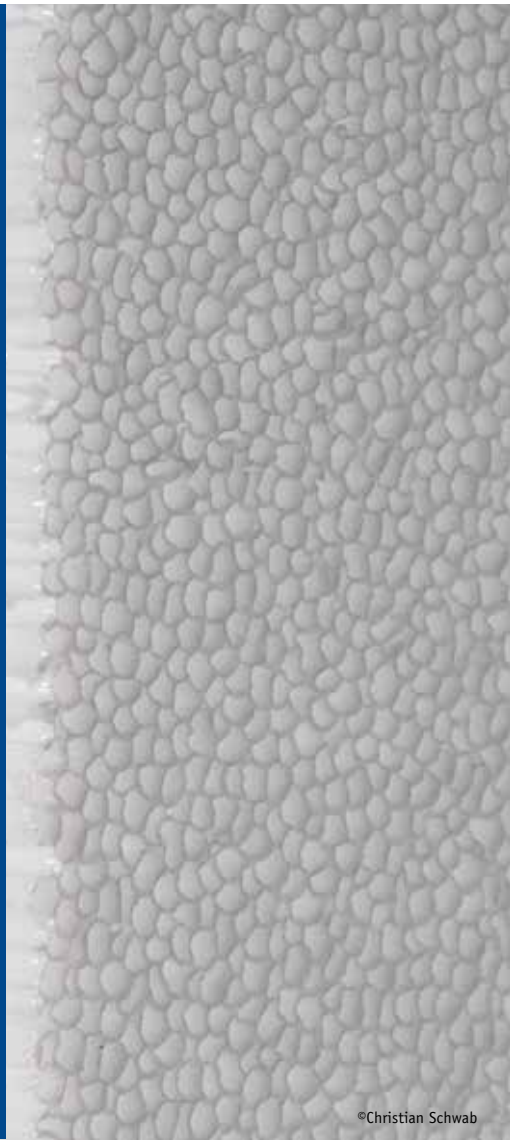
- Daylight entry reduces amount of artificial light required
- Reduction of cooling loads in summer
- Fully recyclable

Attractive Aesthetics

- Attractive appearance
- Vivid surface with depth effect
- Can be printed with colour and décor

User Comfort

- Comfortable daylight atmosphere
- Effective privacy protection
- Reduced amount of solar input



©Christian Schwab

08/16 Proesler Kommunikation GmbH

OKA*LUX* + KAPI*LUX*

OKA*SOLAR*

OKA*SOLAR* 3D

OKALUX HPI

OKA*TECH*

OKA*WOOD*

OKA*COLOR*

OKA*STONE*

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info@okalux.de
www.okalux.com

DGNB
Deutsche Gesellschaft für Nachhaltiges Bauen
German Sustainable Building Council

OKALUX is member of the German Sustainable Building Council.

OKALUX

We take architectural glass a step ahead.

School Guard Glass' products are manufactured by:

LTI Smart Glass, Inc.

14 Federico Drive / Pittsfield, MA 01201 /

PRODUCT NAME: **SG4™ IGU (PATENT PENDING)**

PRODUCT DESCRIPTION: SG4™ IGU is a hermetically sealed make up consisting of SG4™ on the interior lite and tempered or laminated glass on the exterior lite. SG4™ IGU combines the forced entry attributes of SG4™ while also complying with strict energy codes. Our IGU make up can be combined with almost any glass coating for an aesthetically pleasing and energy efficient window or entrance.

CONSTRUCTION: SG4™ on interior lite, tempered or laminated glass on exterior lite.

STANDARD DIMENSIONS: Up to 60" x 96"

MAXIMUM DIMENSIONS: 72" x 144" (Up to 50 sq. ft.)

NOMINAL THICKNESS: 1" - 1 ½"

WEIGHT (SQ/FT): 7.4 lbs.

WARRANTY: 10 year warranty against delamination and 10 year warranty against seal failure. Please refer to the warranty information sheets.

INSTALLATION INSTRUCTIONS: Notify a School Guard Glass representative and request installation instructions pertaining to the glazing system(s) being used.

COMPLIANCE:

- ASTM 1048 – Standard Specification-Heat Strengthened & Fully Tempered Flat Glass
- ASTM C1036 - Standard Specification-Flat Glass
- ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass
- ANSI Z97.1 Safety Materials Used in Buildings
- CPSC 16 CFR 1201

RATINGS: 5-aa1 rated for 6 minutes.
BR Level 2 low spall in certain configurations.
UL 972

PERFORMANCE CRITERIA/VALUES: Values vary.
Please refer to the performance criteria sheets.

	Ballistic Impact	Concentrated Assault		Forced Entry (sequentially tested)			
Product	**5 shots with a .762 round**	**Brick**	**Steel Toed Boots**	**Tools[1] 2 min. test**	**3lb. Hammer & Bat 3½ min. test**	**Sledge hammer 6 min. test**	**Total Time to Failure**
1/4" Tempered	Fail - 1 shot	Fail	Fail	Fail	Fail	Fail	0 seconds
1/4" Tempered w/12 mil. Blast Film	Pass[2]	Fail - 4 impacts	Pass	Fail - 8 seconds	Fail - 2 impacts/2 seconds	N/A	4 seconds
5/16" Annealed Laminated Glass w/ 0.060 SGP® Interlayer by DuPont ®	Pass[2]	Fail - 20 impacts	Fail	Fail	Fail	N/A	16 seconds
5/16" Annealed Laminated Glass w/ 0.090 PVB Interlayer	Pass[2]	Pass	Pass	Fail - 40 seconds	Fail	N/A	40 seconds
3/8" Glass Clad Polycarbonate	Pass[2]	Pass	Pass	Fail - 1 min. 12 sec.	Fail	N/A	1 min. 12 sec.
SG4™ IGU	Pass[2]	Pass	Pass	Pass	Pass	N/A	6 mins. 10 sec.
Test failure occurs when a 4" object can pass through the glass or frame material.							
[1] See testing methods for tools list. [2]Bullets penetrate but glass stays in place.							

Independent Testing Completed by H.P. White Laboratory, Inc. 3114 Scarboro Road, Street, MD 21154-1822

KNOX®
When seconds matter™

CAMPUS SECURITY

SCHOOLS | UNIVERSITIES

KNOX RAPID ACCESS SOLUTIONS

When an emergency strikes, our Rapid Access Solutions enhance security and safety for students, faculty and staff. Emergency first responders are able to act more quickly and efficiently when every second matters. This helps ensure the safety of what is most important – the lives of students, faculty, staff and campus property.

ENHANCED SECURITY FOR ULTIMATE CAMPUS SAFETY

FACILITY & PERIMETER ACCESS

KnoxBoxes®, **Gate & Key Switches™**, and **Knox Padlocks™** are all part of a **Master Key System**. These systems allow emergency responders or campus personnel to gain quick access to locked doors, gates, fences, and perimeters during critical emergencies. This ensures the ability to get help where it is needed most and as quickly as possible.

FIRE PROTECTION SYSTEM ACCESS

Fire Department Connections (FDCs) and Standpipe Connections are your building's lifeline to critical fire protection systems. When damaged and clogged with debris, fire sprinklers and standpipes are restricted from providing optimal water flow. Knox FDC Locks™, Knox Standpipe Locks™ and Knox Storz Locks™ ensure protection for maximum water pressure.

POWER CONTROL

With the **Knox Remote Power Box™**, first responders can remotely operate a shunt trip breaker to safely remove power from a building or equipment — minimizing potential injuries.

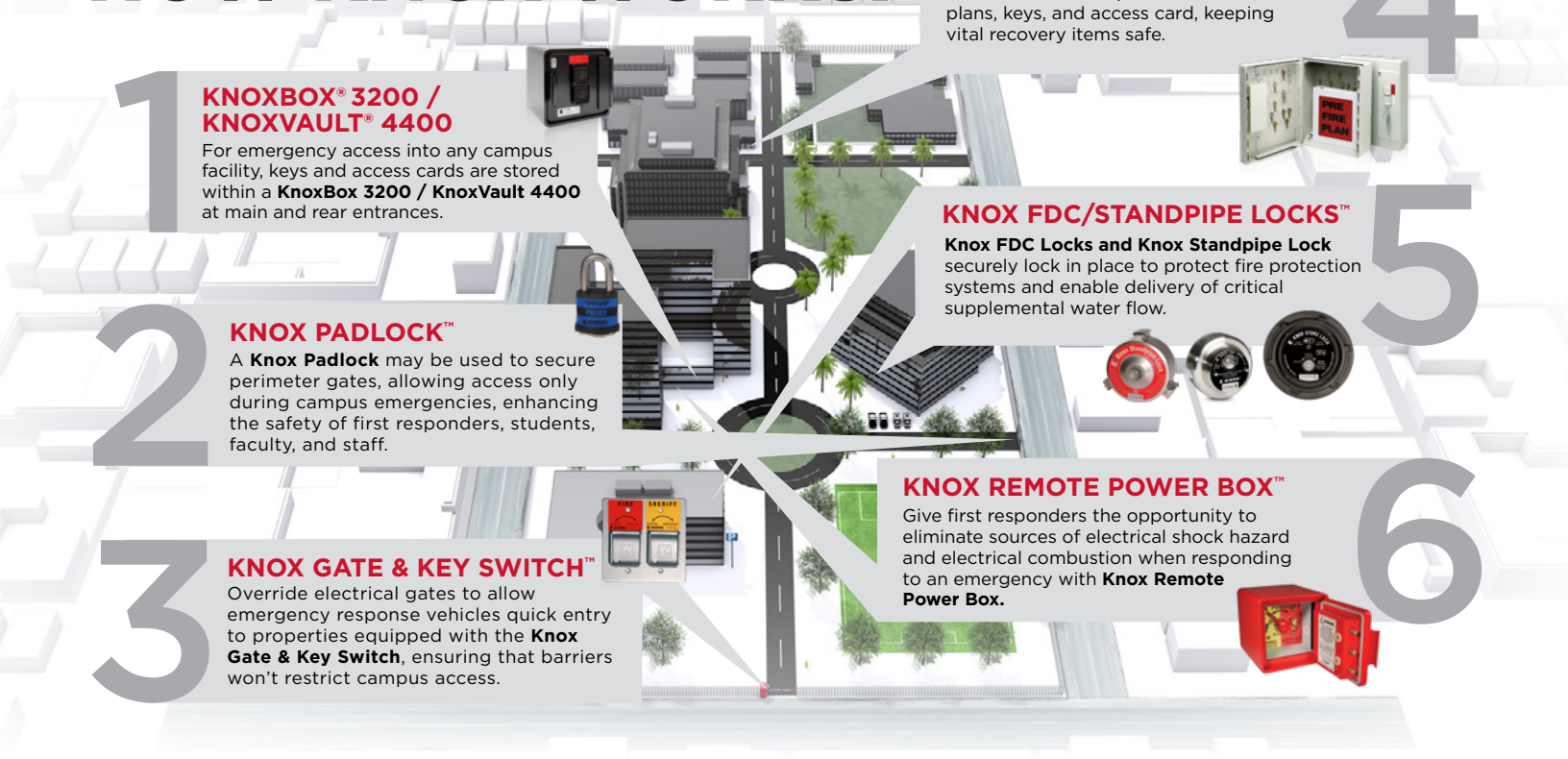
ORDER ONLINE:
KNOXBOX.COM

TO LEARN MORE, CALL:
1.800.552.5669

Our products have passed UL rigorous security testing.
Built Knox-Rugged.

UL LISTED

HOW KNOX WORKS:



1 KNOXBOX® 3200 / KNOXVAULT® 4400

For emergency access into any campus facility, keys and access cards are stored within a **KnoxBox 3200 / KnoxVault 4400** at main and rear entrances.

2 KNOX PADLOCK™

A **Knox Padlock** may be used to secure perimeter gates, allowing access only during campus emergencies, enhancing the safety of first responders, students, faculty, and staff.

3 KNOX GATE & KEY SWITCH™

Override electrical gates to allow emergency response vehicles quick entry to properties equipped with the **Knox Gate & Key Switch**, ensuring that barriers won't restrict campus access.

4 KNOX DOCUMENT CABINET™

For indoor usage, the **Knox Document Cabinet** houses critical campus documents, master plans, keys, and access card, keeping vital recovery items safe.

5 KNOX FDC/STANDPIPE LOCKS™

Knox FDC Locks and Knox Standpipe Lock securely lock in place to protect fire protection systems and enable delivery of critical supplemental water flow.

6 KNOX REMOTE POWER BOX™

Give first responders the opportunity to eliminate sources of electrical shock hazard and electrical combustion when responding to an emergency with **Knox Remote Power Box.**

ABOUT KNOX COMPANY

Over forty years ago, a unique concept in rapid access for emergency response was born. The KnoxBox®, a high-security key lock box, was designed to provide rapid access for emergency responders to reduce response times and protect property from forced entry.

Today, one revolutionary lock box has grown into a complete system providing rapid access for public safety agencies, industries, military, and property owners across the world. The Knox Company is trusted by over 14,000 fire departments, law enforcement agencies, and governmental entities.

KNOX®
When seconds matter™

KNOX COMPANY
1601 W. DEER VALLEY RD
PHOENIX, AZ 85027

T. 800.552.5669
F. 623.687.2290

KNOXBOX.COM
INFO@KNOXBOX.COM

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CALL: **1.800.552.5669** **OR** VISIT: **KNOXBOX.COM/CAMPUS-SAFETY**