

MATERIAL SPECIFICATION GUIDE ›

## LUMISHIELD EX™

### DESCRIPTION

Lumishield EX was created specifically to meet the demands of outdoor projects for architects and designers while delivering the design sophistication consistent with the Lumicor brand. Formulated from exterior grade polycarbonate resin using 40% recycled content, this new application delivers high performance and design flexibility with exceptional aesthetics.

Utilize Lumicor EX to meet the demands of your toughest projects from sound barriers and bus shelters to wind screens and carports. Engineered with the high impact strength, UV resistance and flammability performance necessary for exterior applications.

### FEATURES AND BENEFITS

#### High Performance Resin

- Specially formulated Polycarbonate with UV cap on both sides
- 130 times the impact strength of glass
- Over 30 times the impact strength of acrylic
- Half the weight of glass
- Easy to fabricate and install

#### Low Environmental Impact

- 40% pre-consumer recycled content
- Qualifies for LEED MR Credit 4 and IEQ Credit 8.1 & 8.2 (daylight and views)
- 100% recyclable

#### Light Transmittance and Energy Efficiency

- Allows up to 85% of visible light transmittance
- Up to five times more energy efficient than glass

#### Building Codes

- Meets the criteria for approved interior finishes & light transmitting materials

#### Custom Design Solutions

- Variety of finishes available
- Any standard Spectrum™ colors and Opaques
- Digital Hi-Res prints
- Reflective Finishes Add-on

### SHEET DIMENSIONS

Lumishield EX is offered in standard 4' x 8' sheet sizes. Custom lengths and widths are available.

	feet	inches	millimeters
Standard	4 x 8	48 x 96	1219 x 2438

### SHEET THICKNESS

Lumishield EX is available in 0.118" (3mm), 0.236" (6mm) and .472" (12mm) with a standard tolerance of +/- 10% of nominal.

*Tolerance varies by décor.*

#### GAUGE EQUIVALENTS

Nominal Decimal (in)	Fraction Equivalent	Metric (mm)
.236	1/4"	6.0
.472	1/2"	12.0

*Actual dimensions may vary by décor, and some décors are not available in oversize sheets.*

### FINISHES

Lumicor products are available in a variety of surface finishes to provide different aesthetics. You can specify different finishes on each side of the sheet. Lumicor's heavier finishes such as frost, sandstone and satin provide better protection against minor surface scratches.

*See the fabrication guide on [www.lumicor.com](http://www.lumicor.com) for more details.*

#### STANDARD FINISHES

Matte	Gloss	Sandstone	Frost	Satin
Moiré	Diffusion	Brushed	Stucco	

*Not all finishes are available with all products.*

### FLATNESS TOLERANCE

Extending across the sheet, bowing is permitted to a maximum of 1/4" (6 mm) for each 48" (1.2 m) or fraction thereof. Panel is to be measured when laying horizontally under its own weight on a flat continuous surface.

## WEIGHT

Lumishield EX		1/4"	1/2"
Thickness	in	0.236	0.472
	mm	6.0	12.0
Weight / sq ft	lbs/ft <sup>2</sup>	1.47	2.95
Weight / sq m	kg/m <sup>2</sup>	7.19	14.39
48" × 96"	lbs	47.1	94.3
1219 × 2438mm	kg	21.4	42.8

All weights are estimated; actual weights will vary depending on décor.

## EXPANSION/CONTRACTION

Lumicor products will expand and contract nominally with changes in temperature. Please allow for expansion / contraction when installing fasteners, hardware, frame systems, or when edge butting sheets. The formula below can be used to calculate the appropriate allowance for the expansion and contraction of a Lumishield EX panel:

Length, Width, or Thickness	x	Temperature Change	x	Coefficient of Thermal Expansion	=	Expansion Allowance
in	x	°F	x	.000037	=	in
mm	x	°C	x	.000044	=	mm

Example:

A 48" × 96" Lumishield EX panel will be installed in an office building near the entrance. The coldest temperature of the panel in that location over the entire year is expected to be 50°F, and the warmest is expected to be 90°F. The temperature change will then be 40°F. The height would then change 0.142" from the coldest to the warmest temperature exposure, and the width would change 0.071".

## PROTECTIVE FINISH OPTIONS

ChemShield™ is a high performance clear film that can be applied to one or both sides of Lumishield EX products. With ChemShield applied, Lumicor products can be used in environments requiring superior stain and chemical resistance.

ChemShield is available in most finishes, but cannot be renewed if damaged.

## MATERIAL PROPERTIES

Property	Result	ASTM
Type	Polycarbonate (PC)	
Specific Gravity (density to water)	1.20	D-792
Water Absorption	0.15%	D-570
Sound Transmission 1/8" (3mm)	31 db	E-90

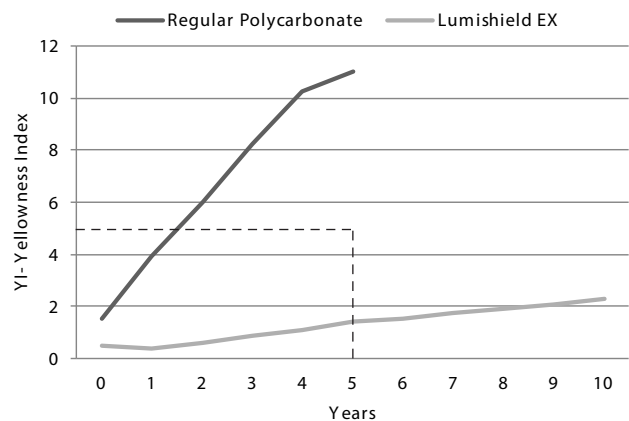
Property	Result	ASTM
Optical		
Optical Refractive Index	1.59	D-542
Regular Light Transmittance	86%	D-1003
Haze Light Transmittance	1.1%	D-1003
UV - Resin Degradation	No	
Mechanical		
Tensile Strength Max	9,500 psi (65.5 MPa)	D-638
Tensile Elongation Max	110%	D-638
Tensile Modulus	340,000 psi (2,344 MPa)	D-638
Flexural Strength Max	13,500 psi (93 MPa)	D-790
Flexural Modulus	345,000 psi (2,379 MPa)	D-790
Izod Impact Strength	18 ft-lb/in (961J/m)	D-256
Rockwell Hardness	M-70/R-118	D-785
Abrasion Resistance (%Haze)	30% @ 100 cycles	D-1044
Thermal		
Max Continuous Service Temp.	257 °F (125 °C)	
Softening Temperature	297 °F (147 °C)	
Deflection Temperature @ 264 psi (1.8 MPa)	270 °F (132 °C) @1.8 MPa 280°F (134C) @ 0.455 MPa	D-648
Coefficient of Thermal Expansion	3.75x10 <sup>-5</sup> in/in °F (6.8x10 <sup>-5</sup> m/m °C)	D-696
Thermal Conductivity	1.35 BTU in/hr ft <sup>2</sup> °F (.0019 W/cm °C)	C-177
R4		
R4 Resin	40%	
R4 Recycled Glass	N/A	

Material properties apply to the resin itself. Results may vary for finished sheets with encapsulated materials.

## CODE RATINGS

- Approved for CPSC (16CFR 1201) Categories I & II.
- Meets ANSI Z97.1-2004: American National Standard for Safety Glazing Materials.

## UV TEST



Yellowness Index standard is < 5 in a 5 year period.

### FLAMMABILITY

#### DATA

Property	Result	ASTM
Flammability (Burning Rate)	PASS, CC1	D-635
Smoke Density Rating (75% max)	68, PASS	D-2843
Self Ignition Temperature	1,070 °F (577 °C) pass > 650 °F (343 °C)	D-1929

#### RATING

Gauge	Rating	Result	ASTM
1/4"	Class B	FSI: 65 SDI: 450	UL 723/ASTM E-84
1/2"	Class B	FSI: 40 SDI: 350	UL 723/ASTM E-84

### CHEMICAL RESISTANCE

Chemical	6 days / 23 °C	6 days / 50 °C
Acetic acid (10 % in water)	+	+
Acetone	swells	
Ammonia (0.1 % in water)	-	
Ammonium nitrate (10 % in water/ neutral)	+	-
Benzene	swells	
Benzine (free from aromatic hydrocarbons)	+	+
Butyl acetate	-	
Carbon tetrachloride	swells	
Chloroform	dissolves	
Citric acid (10 % in water)	+	
Dibutyl phthalate	-	
Diethyl ether	-	
Dimethyl formamide	dissolves	
Dioctyl phthalate	-	
Dioxane	dissolves	
Ethanol (pure)	+	+
Ethyl acetate	swells	
Ethylamine	-	
Ethylene chloride	swells	
Ethylene glycol (1:1 with water)	+	+
Glycerin	reacts	
Hexane	+	+
Hydrochloric acid (10% in water)	+	+
Hydrogen peroxide (30 % in water)	+	

Chemical	6 days / 23 °C	6 days / 50 °C
Iron(III) chloride, saturated/aqueous solution	+	+
Isooctane (2,2,4-trimethyl pen- tane, pure)	+	+(40 °C)
Isopropanol (pure)	+	
Methanol	-	
Methyl ethyl ketone	swells	
Methylamine	reacts	
Methylene chloride	dissolves	
Nitric acid (10 % in water)	+	
n-propanol	-(30 °C)	
Ozone (1 % in air)	-	
Paraffin, paraffin oil (pure/free from aromatic hydrocarbons)	+	+
Phosphoric acid (1 % in water)	+	-
Potassium hydroxide (1 % in water)	-	
Propane	+	+
Silicone oil	+	+
Sodium carbonate (10 % in water)	+	-(70 °C)
Sodium chloride (saturated/aque- ous solution)	+	+
Sodium hydroxide (1 % in water)	-	
Styrene	-	
Sulfuric acid (10 % in water)	+	+
Tetrachloroethane	swells	
Tetrachloroethylene	-	
Trichloroethylene	swells	
Tricresyl phosphate	-	
Triethylene glycol	+	+
Xylene	swells	

resistant (+), non-resistant (-)

### CLEANING PROCEDURES

The proprietary UV surface treatment on Lumishield EX significantly improves long-term performance. Periodic cleaning using proper procedures and compatible cleaners is recommended to prolong service life. For general cleaning, it is recommended that the following instructions and cleaning agents be used.

#### PROCEDURES

1. Wash with a mild solution of soap or detergent and lukewarm water.
2. Using a soft cloth or sponge, gently wash the sheet to loosen dirt and grime and rinse well with clean water.
3. To prevent water spotting, thoroughly dry with chamois or cellulose sponge.
4. Avoid the use of abrasive cleaners, squeegees and/or other cleaning implements that may scratch or gouge the coating.

## CLEANING PROCEDURES CONT'D

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### AGENTS

Cleaning agents which have been found to be compatible with Lumishield EX sheet under laboratory conditions.

#### Aqueous Solutions of Soaps and Detergents

- Joy®
- Palmolive Liquid®
- Windex D with Ammonia D®

#### Organic Solvents\*

- Naphtha VM&P
- Hexcel F.O 554 (Butyl Cellosolve)
- Kerosene (Neleco-Placer)

#### Alcohols

- Methanol
- Isopropyl Alcohol

\*All residual organic solvents should be removed with a secondary rinse.

### GRAFFITI REMOVAL

- Butyl cellosolve (for removal of paints, marking pen inks, lipstick, etc). The use of masking tape, adhesive tape or lint removal tools works well for lifting off old weathered paints.
- To remove labels, stickers, etc., the use of kerosene or VM&P naphtha are generally effective. If the solvent will not penetrate sticker material, apply heat (hair dryer) to soften the adhesive and promote removal.

*If a material is found to be incompatible in a short-term test, it will usually be found to be incompatible in the field. The converse, however, is not always true. Favorable performance is no guarantee that actual end-use conditions have been duplicated, therefore, these results should be used as a guide only and it is recommended that the products be tested under actual end-use conditions by the user.*

## DISCLAIMER

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