



LIGHTBLOCKS®

TECHNICAL SPECIFICATIONS

MB WELLINGTON STUDIO

ACRYLIC LIGHTBLOCKS® THICKNESSES & SIZES

Fraction (in)	Metric (mm)	Actual Thickness +/- (in)
1/16	1.5	.060
1/8	3.0	.118
3/16	4.5	.177
¼	5.6/6.0	.220/.236
3/8	9.0	.354
½	12.0	.472
¾	18.0	.708
1	24.0	.944
1 ¼	31.8	1.25
1 ½	38.1	1.5
1 ¾	44.5	1.75
2	50.8	2.00
2+	Custom Thicknesses Available	

Acrylic LIGHTBLOCKS® is available in all standard gauges, with a thickness tolerance of 10%-15% depending on thickness.

Many of the above thicknesses can be laminated together to create even more possibilities.

Most thicknesses are available in a minimum 48" x 96" sheet size, and many thicknesses are available in larger sheet sizes: 48" x 120", 60" x 96", 72" x 96", etc. Custom sheet sizes are also available.

APPROXIMATE WEIGHT OF LIGHTBLOCKS®		
Thickness (in/decimal)	Weight (lbs./sq. ft.)	Glass Comparison lbs./sq. ft.
1/8"/.118"	0.75	1.6
3/16"/.177"	1.10	2.4
¼"/.236"	1.50	3.3
3/8"/.354"	2.25	4.9
½"/.472"	3.00	6.4
¾"/.708"	4.50	9.6
1"/.944"	6.00	12.8
1 ½"/1.50"	9.00	19.2
2"/2.00"	12.00	25.6

Impact Resistance			
Material	Thickness	Wt of Free Falling Steel Ball (lb)	F50 Energy to Break (ft-lb)
Acrylic LIGHTBLOCKS®	0.118"	2.00	4.7
Acrylic LIGHTBLOCKS®	0.236"	5.0	18.1
Single Strength Window Glass	0.100"	0.25	0.8
Double Strength Window Glass	0.125"	0.25	1.8
Plate Glass	0.187"	0.25	2.0
Plate Glass	0.250"	0.25	1.0
Laminated Safety Glass	0.250"	0.25	1.1

Handling

Your LIGHTBLOCKS[®] panels will arrive with protective paper masking applied to the finished surfaces. This masking should remain in place for as long as possible, and only be removed when absolutely necessary. Continue to protect the panels during installation and from construction damage until the entire project is complete and the client takes possession. The paper masking can be removed by peeling it from the LIGHTBLOCKS[®] surface. Never use scrapers or sharp objects to remove this masking.

The back of single-sided LIGHTBLOCKS[®] has a protective layer consisting of either a 10 mil clear-gloss film, or various clear or opaque solid acrylic materials, depending on the application. The function of these backers is to protect the LIGHTBLOCKS[®] color layer from damage and should not be removed or altered for any reason. Please keep in mind that these backers are on the *back* of single-sided product only.

LIGHTBLOCKS[®] panels can have sharp edges, and large panels can be heavy. Suitable precautions should be exercised at all times, and hand protection should be used when moving and handling the material. Do not use suction cups or hooks to move material and take care not to scratch the surface or chip the edges. When handling unmasked sheets, make sure hands are clean and oil free: cotton gloves are recommended.

Storage

LIGHTBLOCKS[®] should be stored indoors in a cool, dry, well ventilated area out of direct sunlight and away from heat sources. Avoid temperature extremes during storage and allow the material to acclimate to ambient room temperature before installation.

Panels can be left on their shipping pallets for a short period of time, but should be removed if installation is substantially delayed. For long term storage, the material should be stored fully supported on edge at a 10° angle from the vertical. Horizontal storage should be done on a flat, sag free surface, clear of dirt and debris.

Protective foam should be used between all layers of material during storage, and the factory installed masking should remain in place. Do not allow water to come into direct contact with the material during storage. This could cause the material to warp, stain, or delaminate, and may make the masking difficult to remove.

Cleaning & Maintenance

LIGHTBLOCKS[®] panels do not require special care or maintenance. Their attractive appearance can be maintained with periodic cleaning or dusting. All finished surfaces have a clear sealer coat applied, which helps the panels resist marking and makes them easier to clean.

Day to day cleaning can be accomplished by lightly wiping the panels with a damp, soft cloth, or chamois. This will reduce static electricity and dust attraction. If the panels are dirty they should be washed with lukewarm water and mild soap or detergent (such as dishwashing liquid), and

rinsed clean. Avoid getting any water into exposed edge seams of double-sided LIGHTBLOCKS[®].

More stubborn dirt and marks not easily removed by the above method can be cleaned with household surface cleaners such as Fantastik[®] or Formula 409[®], or an acrylic cleaner such as 20/20 Plasti-Cleaner[®]. Aliphatic naphtha (VM&P naphtha), hexane, or kerosene can be used to remove the most stubborn marks. A rinse with soap and water may be necessary after using any of these cleaning agents. Always follow manufacturer's directions and safety recommendations, and refer to the Material Safety Data Sheet (MSDS) for any chemicals used.

Caution: Do not use kitchen scouring compounds, or solvents such as acetone, lacquer thinner, benzene, gasoline, or undiluted alcohol.

Always use soft fabric for cleaning cloths. Do not use abrasive compounds, paper towels, squeegees, scrapers, or other objects that might scratch the surface of the material. Keep cleaning cloths free of grit by frequent rinsing in clean water.

Table & Countertop Care

While LIGHTBLOCKS[®] surfaces are heat resistant, it is not recommended that hot pans or cookware be placed directly on the surface. These temperatures will damage most surfaces, including LIGHTBLOCKS[®]. Always use a hot pad under pans and cookware that are to be placed directly on a LIGHTBLOCKS[®] counter or table.

LIGHTBLOCKS[®] surfaces are tough and durable, but they should not be used as a cutting board. Be sure to use an appropriate surface for all kitchen cutting, chopping, and dicing operations.

Repairs & Scratch Removal

Even if scratched, many LIGHTBLOCKS[®] panels can be restored to their original condition. Some minor scratches can be removed in the field with careful use of a 3M Scotch-Brite[®] pad. By returning the damaged panel to our factory it can be refinished and have the top sealer coat reapplied. This process will not affect the color or other panel features.

For assistance or recommendations on repairs for your LIGHTBLOCKS[®] please contact our Technical Support department at 603-889-1115.

Routing

LIGHTBLOCKS[®] can be routed using portable routers as well as stationary machinery, such as Computerized Numerically Controlled (CNC) routers. This method can be used for cutting panels to size, trimming edges, and for cutting panels to a shape. It can also be used for cutting openings and for producing holes of all sizes.

Routing is the most effective method for trimming a small amount of material from the edge of a panel. A hand held router is best suited for this operation, along with a straight edge. If using clamps to hold a straight edge to guide the router, care must be taken to not over-tighten the clamps. Excessive clamp pressure on some LIGHTBLOCKS® products could leave visible marks within the finished panel.

CNC routing is the best method for cutting panels with a 10 mil protective backer (single-sided LIGHTBLOCKS®). For detailed information on this process please contact our Technical Support department.

Laser Cutting

LIGHTBLOCKS® Acrylic, Polycarbonate, and PETG panels can be supplied with intricate patterns and details that are achieved with laser cutting. Under some circumstances it is possible for this process to be completed by the contractor. For most installations however, this procedure is part of the manufacturing process and completed before the product is shipped.

Drilling

When drilling holes in LIGHTBLOCKS® best results will be obtained by using drills that are specifically designed for plastic fabrication (60°- 90° tip angle). These drill bits are readily available at most hardware and plastics supply stores. In some applications standard twist drills can be used, but extra care is needed to prevent damage to the LIGHTBLOCKS® panel and to produce satisfactory results. In either case, it is important to properly back up the panel with scrap material to prevent break-out of the back surface. Feed rate, drill bit speed (rpm), and force, will all vary with hole size and material thickness. All holes that receive fasteners must be oversized to allow for expansion and contraction of the material.

Tapping and Threaded Inserts

Standard machine shop tools and techniques can be used for cutting threads directly into LIGHTBLOCKS® for receiving fasteners. This can be a slow process requiring a great degree of precision, but satisfactory results can be obtained for some applications. If greater strength is required, or repeated disassembly is anticipated, then threaded metal inserts are recommended. Press-in inserts are available in a variety of styles and thread sizes. MB Wellington Studio can supply your panels with inserts installed to your specifications. It should be noted that in some application this hardware will be visible from the surface of the material.

Gluing

Many LIGHTBLOCKS® products can be adhered to substrates such as MDF and particleboard. Contact adhesives, mastics, and construction adhesives are all options that can be used in this process. In order to insure that the material specified for your project is suitable for this type of application, please contact our office for assistance.

Structural bonds are also possible with many LIGHTBLOCKS® products. All such gluing is done at our factory by our well trained fabricators. Because of our unique materials and processes, these bonds are not suitable for customer fabrication.

Forming

Cold Forming: Single-sided LIGHTBLOCKS® can be curved to a shape using a track type attachment system. For the minimum bending radius of different thicknesses please refer to the Cold Bending Radius page of our Technical Specifications.

Thermoforming: A variety of LIGHTBLOCKS® products can be thermoformed (drape formed) into curves to match the requirements of most projects. All panels needing to be heat formed will be supplied from our factory ready for installation.

Line Bending: Some LIGHTBLOCKS® products can be bent at an angle along a straight line. Panels are supplied with all necessary bends included.

Graphics

LIGHTBLOCKS® products can be used for all types of signage and feature walls. Our material can be screen printed and engraved, or receive virtually any surface applied graphics. MB Wellington Studio can furnish signs ready for installation, or supply material to be used as a substrate for applied graphics. Please call our studio to discuss your requirements.

Point Fastening Systems

LIGHTBLOCKS® panels can be installed using a sufficient number of mechanical fasteners, such as standoffs, bolts, or machine screws. Fasteners should be located as needed to adequately support the panel, as well as to insure a flat, uniform appearance. Recommended spacing is 18"-24", depending on panel size, thickness, and application. When installing hardware care should be taken to not over-tighten the fasteners. Rubber or nylon washers and/or grommets may be used if needed.

When drilling holes to support LIGHTBLOCKS® by a point fastening system, please follow these guidelines to allow for proper expansion / contraction space:

- 1) The hole diameter should be at least 1/16"-1/8" larger than the fastener diameter. This hole size should be adjusted for large panels and/or panels with numerous fasteners.
- 2) The distance from the edge of the sheet to the center of the hole should be at least 3 times the hole diameter. This distance should be adjusted for large panels and/or panels with numerous fasteners.
- 3) Through holes should be pre-drilled. In some applications it is possible to drill and tap LIGHTBLOCKS® or to install threaded inserts.

Expansion & Contraction

LIGHTBLOCKS[®] panels will expand and contract nominally with changes in temperature and humidity. This movement is eight times that of glass, and needs to be accounted for as part of the design. The coefficient of thermal expansion for LIGHTBLOCKS[®] is 0.00004 (in/in/°F).

The formula below can be used to calculate the total movement of a panel, and thus the appropriate allowance for expansion and contraction.

$$\text{PANEL LENGTH (in)} \times \text{CHANGE IN TEMPERATURE* (°F)} \times \text{COEFFICIENT (0.00004)} = \text{TOTAL MOVEMENT (in)}$$

EXAMPLE: 48" X 96" Acrylic LIGHTBLOCKS Panel

$$(96") \times (32°F) \times (.00004) = .123" (1/8")$$

*Estimated maximum possible temperature change

** At 30° F Temperature Difference

Minimum Expansion Requirements:

Panel Length	Minimum Allowance **
24 in.	1/32"
36 in.	1/16"
48 in.	1/16"
60 in.	3/32"
72 in.	3/32"
96 in.	1/8"
120 in.	5/32"

Coefficient of Thermal Expansion Comparison

Acrylic	.0000400 in./in. °F
Polycarbonate	.0000375 in./in. °F
Glass	.0000050 in./in. °F
Solid Surface	.0000180 in./in. °F
Aluminum	.0000129 in./in. °F
Steel	.0000063 in./in. °F

Framing Systems

LIGHTBLOCKS[®] panels can be satisfactorily supported by rigid frames on all four sides. The frames must be of sufficient size to supply adequate support for the given panel size. The panel must be set into the frame enough to insure panel sturdiness, and still leave an allowance for expansion and contraction of the material (see chart). The nominal thickness of LIGHTBLOCKS[®] (see chart) also needs to be taken into account. It may be necessary to include gasket material in the frames.

If no side frames are preferred, LIGHTBLOCKS[®] should be installed in a top channel that securely clamps the material along its entire width so that the panel “hangs” and the weight is evenly distributed (see drawings). The weight of the panel must be supported by the clamp

arrangement and not by the individual fasteners. Gasket material may be included with this method. LIGHTBLOCKS® should not rest on the bottom edge without side support.

Cold Bending Radius

Single-sided LIGHTBLOCKS® panels can be cold formed to a smooth contour and held in curved channel supports. Exceeding the design criteria may result in cracking or crazing of the panel. The shape and size of the panel will also influence the minimum radius that can be obtained. In some cases, a considerable amount of force may be needed to hold the panel to the desired shape. Cold forming LIGHTBLOCKS® is best accomplished using a full framing system rather than a point fastening system. Call MB Wellington Studio for design assistance.

The minimum (tightest) radius that ACRYLIC LIGHTBLOCKS® can be cold formed is approximately 300-350 times the material thickness.

Examples: (minimum radius for framed installation)

$1/16'' (.060'') = 18''-21''$

$1/8'' (.118'') = 35''-41''$

$3/16'' (.177'') = 53''-62''$

$1/4'' (.236'') = 71''-83''$

$3/8'' (.354'') = 106''-124''$

$1/2'' (.472'') = 142''-165''$

The minimum (tightest) radius that POLYCARBONATE LIGHTBLOCKS® can be cold formed is approximately 100 times the material thickness.

Examples: (minimum radius for framed installation)

$1/16'' (.060'') = 6.25''$

$1/8'' (.125'') = 12.5''$

$3/16'' (.187'') = 18.5''$

$1/4'' (.250'') = 25''$

$3/8'' (.375'') = 37.5''$

$1/2'' (.500'') = 50''$

TECHNICAL SPECIFICATIONS

Physical Properties

	Acrylic LIGHTBLOCKS® (0.236" Thickness)*	Polycarbonate LIGHTBLOCKS® (0.125" Thickness)*
<u>Physical</u>		
Specific Gravity ASTM D-792	1.19	1.20
Refractive Index ASTM D-542	1.49	1.586
Light Transmission ASTM D-1003	92%	86%

Mechanical

Tensile Strength ASTM D-638	10,000 psi	9,000 psi
Modules of Elasticity	400,000-450,000 psi	345,000 psi
Flexural Strength ASTM D-790	16,000-17,000 psi	13,500 psi
Modulus of Elasticity	450,000-480,000 psi	345,000 psi
Compression Strength ASTM D-695	17,000-18,000 psi	12,500 psi
Rockwell Hardness ASTM D-785	M90-M94	M70
Izod Impact Strength		
Notched ASTM D-256	0.3-0.4 ft. lbs./in.	12-16 ft. lbs./in.

Thermal Properties

Heat Deflection Temperature		
@ 264 psi ASTM D-648	210 °F	270 °F
Coefficient of Thermal Expansion		
ASTM D-696	4.0 x 10 ⁻⁵ in./in. °F	3.75 x 10 ⁻⁵ in./in. °F
Coefficient of Thermal Conductivity	1.3 BTU-in/hr-ft ² -°F	1.35 BTU-in/hr-ft ² -°F
Maximum Continuous Service		
Temperature	160 °F-180 °F	250 °F

Flammability

Smoke Density ASTM D-2843	4%-10%	65%
Horizontal Burn (0.125") ASTM D-635	1.0-1.2 in./min.	<1 in.
Self Ignition Temperature ASTM D-1929	850 °F-910 °F	1070 °F
Flammability Classification UL 94	94HB	V2 < 0.236" V0 ≥ 0.236"

*Some values will change with thickness

Sound Transmission Data (STC Rating)			
Thickness	Acrylic LIGHTBLOCKS®	Polycarbonate LIGHTBLOCKS®	Glass
1/8"	23-25	25	25
3/16"	26	29	-
1/4"	28-29	31	27
3/8"	30	34	-
1/2"	32-33	34	32

ACRYLIC

MODEL BUILDING CODES: Acrylic meets the requirements of the Model Building Codes (UBC and IBC) for Class CC-2 Light Transmitting Plastics.

HORIZONTAL BURN LENGTH: Acrylic material has a horizontal burn length from 1.0 to 1.2 in/min for 0.125" material when tested in accordance with ASTM D-635.

SMOKE DENSITY RATING: Acrylic material has a smoke density rating from 4% to 10% for 0.236" material when tested in accordance with ASTM D-2843.

SELF-IGNITION TEMPERATURE: Acrylic has a self-ignition temperature between 850°F and 910°F when tested in accordance with ASTM D-1929.

UL 94 FLAMMABILITY CLASSIFICATION: Acrylic material has a flammability rating of 94HB.

SAFETY GLAZING:

Meets ANSI Z 97.1, Safety Glazing Materials used in Buildings.

Approved for safety glazing according to model building codes.

Suitable for use in Consumer Products Safety Commission, Safety Standard for Architectural Glazing Material under 16 CFR 1201, Categories I & II.

BULLET RESISTANCE: 1.25" thick acrylic is rated as a Level 1 bullet resistant material in accordance with UL 752.

HOCKEY RINK GLAZING: Acrylic is suitable for use as a glazing material for hockey rinks per ASTM F-1703 (Standard Guide for Ice Hockey Playing Facilities).

POLYCARBONATE

MODEL BUILDING CODES: Polycarbonate meets the requirements of the Model Building Codes (UBC and IBC) for Class CC-1 Light Transmitting Plastics.

HORIZONTAL BURN LENGTH: Polycarbonate material has a horizontal burn length of <1 in. for 0.125" material when tested in accordance with ASTM D-635.

SMOKE DENSITY RATING: Polycarbonate material has a smoke density rating of 65% when tested in accordance with ASTM D-2843.

SELF-IGNITION TEMPERATURE: Polycarbonate has a self-ignition temperature of 1070°F when tested in accordance with ASTM D-1929.

UL 94 FLAMMABILITY CLASSIFICATION: Polycarbonate material has a flammability rating of V-0 or V-2, depending on thickness.

SAFETY GLAZING:

Meets ANSI Z 97.1, Safety Glazing Materials used in Buildings.

Approved for safety glazing according to model building codes.

Suitable for use in Consumer Products Safety Commission, Safety Standard for Architectural Glazing Material under 16 CFR 1201, Categories I & II.

BURGLARY RESISTANCE: Meets UL 972 for thicknesses of 0.093" to 0.50".

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