

TRANSFORMING SPACE

LIGHTBLOCKS materials transform any space from ordinary to WOW! From the idea or conception, its capturing light and color in illuminating ways. It's the artistic expression of the designer in creating and transforming the space. From inspiration through fabrication and project completion, you'll get the guidance and expertise you need to support your vision.



LIGHTBLOCKS general technical specifications manual provides guidelines for use and technical information to be considered in the design and fabrication of LIGHTBLOCKS products. All technical information is applicable to LIGHTBLOCKS Acrylic products. Where noted, information may be pertinent to Polyester or Polycarbonate products only. Please consult one of our Project Developers for special applications not covered in this guide or for application in special uses.

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- Sheet Size, Thickness & Weights
- Impact Resistance
- Expansion & Contraction
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- Cold Bending Radius
- Sound Transmission Data

FABRICATION

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- Holes: Drilling, Tapping & Threaded Inserts
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PHYSICAL PROPERTIES

SPECIFICATION	TEST	LIGHTBLOCKS Acrylic (0.236 Thickness)*	LIGHTBLOCKS Polycarbonate (0.125 Thickness)*	LIGHTBLOCKS Polyester (0.125 Thickness)*
PHYSICAL PROPERTIES				
Specific Gravity	ASTM D-792	1.19	1.20	1.27
Refractive Index	ASTM D-542	1.49	1.586	1.57
Light Transmission	ASTM D-1003	92%	86%	86%
MECHANICAL				
Tensile Strength	ASTM D-638	10,000 psi	9,000 psi	7,700 psi
Modules of Elasticity		400,000-450,000 psi	345,000 psi	320,000 psi
Flexural Strength	ASTM D-790	16,000-17,000 psi	13,500 psi	11,200 psi
Modulus of Elasticity		450,000-480,000 psi	345,000 psi	310,000 psi
Compression Strength	ASTM D-695	17,000-18,000 psi	12,500 psi	
Rockwell Hardness	ASTM D-785	M90-M94	M70	R115
Izod Impact Strength Notched	ASTM D-256	0.3-0.4 ft. lbs./in.	12-16 ft. lbs./in.	1.2-1.7 ft. lbs./in.
THERMAL PROPERTIES				
Heat Deflection Temperature @ 264 psi	ASTM D-648	210° F	270° F	157° F
Coefficient of Thermal Expansion	ASTM D-696	4.0 x 10 ⁻⁵ in./in.°F	3.75 x 10 ⁻⁵ in./in.°F	3.8 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	
Temperature (max. continuous service temperature)		160°F-180°F	250°F	

* Some values will change with thickness

PHYSICAL PROPERTIES

SPECIFICATION	TEST	LIGHTBLOCKS Acrylic (0.236 Thickness)**	LIGHTBLOCKS Polycarbonate (0.125 Thickness)**	LIGHTBLOCKS Polyester (0.125 Thickness)**
FLAMMABILITY*				
Smoke Density	ASTM D-2843	4%-10%	65%	<75
Horizontal Burn (.0125")	ASTM D-635	1.0-1.2 in./min.	<1 in.	<1 in.
Self-Ignition Temperture	ASTM D-1929	850°F-910°F	1070°F	800°F
Flammability Classification	UL 94	94HB	V2 < 0.236" V0 ≥ 0.236"	94HB
MISCELLANEOUS				
Model Building Codes Light Transmitting Plastics	UBC & IBC	CC-2	CC-1	CC-1
Safety Glazing	ANSI Z 97.1	Yes	Yes	
CPSC Glazing Std I &II	16 CFR 1201	Yes	Yes	
Bullet Resistance	UL 752	Level 1		
Burglary Resistance	UL 972		0.093"- 0.50"	
Hockey Rink Glazing	ASTM F-1703	Yes		

The statements, technical information and recommendations contained herein are believed to be accurate as of the date indicated. Since the conditions and methods of use of the product and of the information referred to herein are beyond our control, LIGHTBLOCKS expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on this information. No warranty of fitness for any particular purpose, warranty for merchantability, or any other warranty expressed or implied is made concerning the goods described or the information provided herein. The information provided herein relates only to the specific product designated and may not be applicable when such product is used in combination with other materials or in any process.

* For additional specifications for LIGHTBLOCKS Fire Rated Materials please see LIGHTBLOCKS [FR] technical specifaions.

** Some values will change with thickness

MATERIAL PROPERTIES

SHEET SIZE

Acrylic	48" x 96"
Acrylic	48" x 120"
Acrylic	60" x 96"
Acrylic	72" x 96"
Acrylic	60" x 120"

Custom sheet sizes are also available.
Some thicknesses are not available in all sizes.

THICKNESS

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

Thickness Fraction (in.)	Thickness Fraction (decimal)	Min.-Max. Class 2 G-1	Metric (mm)
$\frac{1}{16}$	0.060	0.032 - 0.084	1.5
$\frac{1}{8}$	0.118	0.088 - 0.138	3.0
$\frac{3}{16}$	0.177	0.140 - 0.200	4.5
$\frac{1}{4}$	0.236	0.191 - 0.261	6.0
$\frac{3}{8}$	0.354	0.294 - 0.384	9.0
$\frac{1}{2}$	0.472	0.402 - 0.502	12.0
$\frac{3}{4}$	0.708	0.629 - 0.739	18.0
1	0.944	0.858 - 0.968	24.0
$1\frac{1}{4}$	1.250	1.156 - 1.302	31.8
$1\frac{1}{2}$	1.500	1.379 - 1.539	38.1
$1\frac{3}{4}$	1.750	1.613 - 1.799	44.5
2	2.000	1.848 - 2.058	50.8
2+	Custom Thicknesses Available		

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

MATERIAL PROPERTIES

WEIGHT

Approximate weight of LIGHTBLOCKS—Glass Comparative

Thickness (in./decimal)	Weight (lbs./sq. ft.)	Glass Comparison (lbs./sq. ft.)
1/8"/0.118"	0.75	1.6
3/16"/0.177"	1.10	2.4
1/4"/0.236"	1.50	3.3
3/8"/0.354"	2.25	4.9
1/2"/0.472"	3.00	6.4
3/4"/0.708"	4.50	9.6
1"/0.944"	6.00	12.8
1 1/4"/1.25"	7.50	16.1
1 1/2"/1.50"	9.00	19.2
2"/2.00"	12.00	25.6

IMPACT RESISTANCE

Acrylic LIGHTBLOCKS—Glass Comparative

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

MATERIAL PROPERTIES

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.

$$\text{PANEL LENGTH (IN.)} \times \text{CHANGE IN TEMPERATURE}^1 \text{ } ^\circ\text{F} \times \text{COEFFICIENT (0.0004)} = \text{TOTAL MOVEMENT (IN.)}$$

EXAMPLE: 48" X 96" Acrylic LIGHTBLOCKS Panel

$$(96") \times (32^\circ\text{F}) \times (.00004) = 0.123" \text{ (} \frac{1}{8}" \text{)}$$

Minimum Expansion Requirements

Panel Length	Minimum Allowance ²	Panel Length	Minimum Allowance ²
2' 0"	1/32"	6' 0"	3/32"
3' 0"	1/16"	8' 0"	1/8"
4' 0"	1/16"	10' 0"	5/32"
5' 0"	3/32"		

Coefficient of Thermal Expansion Comparison (in./in.°F)

Acrylic	0.0000400
Polycarbonate	0.0000375
Glass	0.0000050
Solid Surface	0.0000180
Aluminum	0.0000129
Steel	0.0000063

¹ Estimated maximum possible temperature change

² At 30°F Temperature Difference

COLD BENDING RADIUS DATA

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)

Material Thickness		Radius	Material Thickness		Radius
1/16"	=	18"-21"	1/4"	=	71"-83"
1/8"	=	35"-41"	3/8"	=	106"-124"
3/16"	=	53"-62"	1/2"	=	142"-165"

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

Examples: (minimum radius for framed installation)

Material Thickness		Radius	Material Thickness		Radius
1/16"	=	6.25"	1/4"	=	25"
1/8"	=	12.5"	3/8"	=	37.5"
3/16"	=	18.5"	1/2"	=	50"

SOUND TRANSMISSION DATA

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

MACHINING AND FABRICATION

FABRICATION

LIGHTBLOCKS can be fabricated with most conventional woodworking tools, as well as tools designed specifically for plastic. The following information provides general guidelines for working with our material. More detailed information is available by contacting our Technical Support department.

Please carefully inspect all products upon receipt and prior to installation or fabrication. Inform LIGHTBLOCKS immediately of any damages or defects. Failure to do so may jeopardize your rights to warranty replacement. When you install or fabricate LIGHTBLOCKS material you are deemed to have accepted the product in its existing condition.

Precautions should be taken to ensure that the material is not scratched or damaged during handling and fabrication. The original protective masking should remain in place during all operations, and for as long as possible during and after installation. Remove only what is necessary, leaving the masking intact until the final stages of the project. If it is necessary to remove some or all of the protective masking prior to the jobs completion, the LIGHTBLOCKS panels should be remasked with a suitable masking or in some other manner protected from damage.

THE MATTE FINISHED SIDE OF LIGHTBLOCKS IS THE FRONT SIDE OF THE MATERIAL ON SINGLE SIDED PRODUCTS. THE GLOSSY SIDE IS THE BACK. ON DOUBLE SIDED MATERIAL, BOTH THE FRONT AND BACK SURFACES ARE MATTE FINISHED.

Be sure to follow all manufacturers' safety recommendations for equipment and materials used in fabricating LIGHTBLOCKS. Tools should be sharp, clean, and free from damage to ensure safe operation. Always wear adequate personal safety protection. Where appropriate, obtain and review the Material Safety Data Sheet (MSDS) for materials used in the fabrication of LIGHTBLOCKS.

SAWING

Cutting sheets of LIGHTBLOCKS is best accomplished using a sliding table saw or a vertical panel saw. However, with some care, a stationary table saw can also be used. Hand circular saws are not recommended for finished cuts, but can be used if rough trimming is required.

Saw blades should have teeth that are tungsten carbide tipped with a modified triple chip grind. A 10-inch blade should have 60-80 teeth. The feed rate should be adjusted to maximize cut quality and to prevent melting along the edge. Making practice cuts in scrap material is recommended.

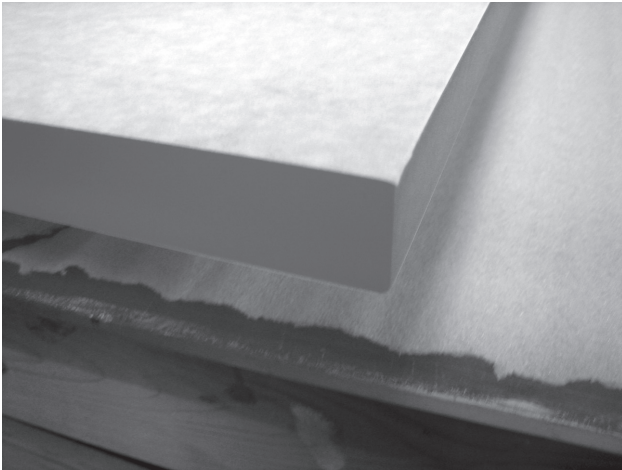
All material should be supported as necessary to prevent chatter during cutting. Thin material especially should be well supported or clamped to minimize vibration. If proper care is not taken, damage to the panel such as cracking or chipping may occur.

Sawing single sided LIGHTBLOCKS, which has a clear 10 mil protective backer, is not recommended for most applications (see Routing). Call our Technical Support department for detailed instructions if this procedure is necessary.

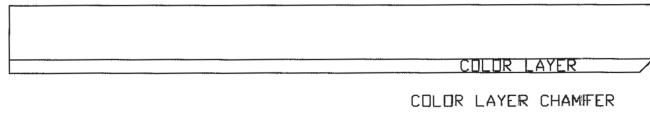
Band saws and jig saws can also be used to successfully cut LIGHTBLOCKS. For band saw blades, metal cutting blades work better than blades designed for cutting wood. Blade width, number of teeth, and type of teeth depend on the thickness of the material, the type of cut, and the band saw being used. For jig saws, blades specifically designed for cutting plastic are available and are the best choice.

MACHINING AND FABRICATION DETAILS

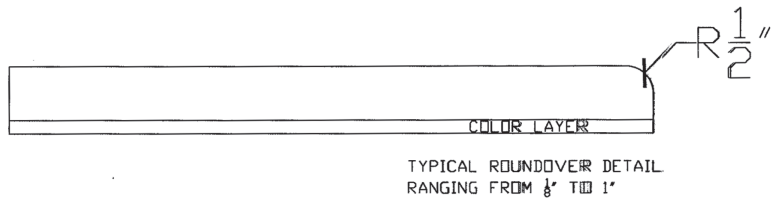
LIGHTBLOCKS TYPICAL EDGE PROFILE DETAILS FOR LIGHTCAST TABLES & COUNTERTOPS



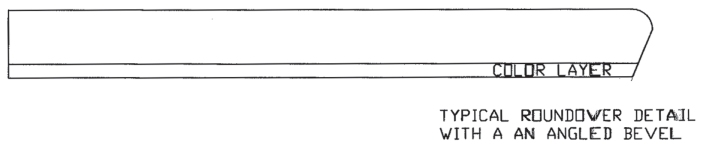
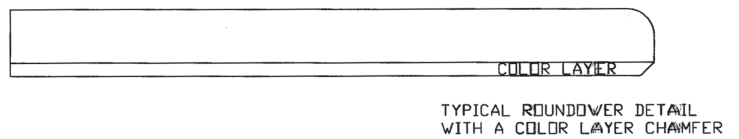
Sqaure edge, square corner, chamfered color layer



Square edge, radius corner, chamfered color layer



Roundover edge, radius corner, chamfered color layer



MACHINING AND FABRICATION

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 handheld 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 overtighten 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 Polyester (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 & 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. LIGHTBLOCKS can supply your panels with inserts installed to your specifications. It should be noted that in some applications this hardware will be visible from the surface of the material.

FORMING—COLD FORMING

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 LIGHTBLOCKS for design assistance.

FORMING—THERMOFORMING & LINE BEND

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.

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

ADHESIVES—GLUING

Many LIGHTBLOCKS products can be adhered to substrates such as MDF and particle board. Mastics and construction adhesives are all options that can be used in this process. In order to ensure that the material specified for your project is suitable for this type of application, please contact LIGHTBLOCKS 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.

ADHESIVES—SHEET ADHESIVES

LIGHTBLOCKS can be supplied with “sheet adhesive” (full coverage) pre-installed on the back side of the material. The adhesive comes with a protective mask on the face which when removed allows the material to be adhered to many smooth surfaces. Consult LIGHTBLOCKS for specific applications and uses.

GRAPHICS

LIGHTBLOCKS products can be used for all types of signage and feature walls. Our material can be printed and engraved, or receive virtually any surface-applied graphics. LIGHTBLOCKS can furnish signs ready for installation or supply material to be used as a substrate for applied graphics.

ATTACHMENT: POINT FASTENING & FRAMING

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 ensure 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 overtighten 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 $\frac{1}{16}$ ”- $\frac{1}{8}$ ” 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 predrilled. In some applications it is possible to drill and tap LIGHTBLOCKS or to install threaded inserts.

MATERIAL HANDLING AND MAINTENANCE

MATERIAL 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. 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 multilayer LIGHTBLOCKS has a protective layer consisting of either a 10mil clear-gloss film, coatings, or various clear or opaque solid polymer 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 multilayer 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 resin 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 multilayer or laminated 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®. 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.

MATERIAL HANDLING AND MAINTENANCE

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.

SCRATCH REMOVAL & REPAIRS

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.

CONTACT TECHNICAL SUPPORT

For technical assistance or recommendations on repairs for LIGHTBLOCKS please contact our Project Developers at 603-889-1115.