LUMENYTE INTERNATIONAL CORPORATION

GENERAL INSTALLATION & DESIGN GUIDELINES
IMPORTANT INFORMATION

THE FOLLOWING INSTALLATION AND DESIGN GUIDELINES MUST BE OBSERVED TO HELP ENSURE THE PROPER FUNCTIONING AND SAFE USE OF LUMENYTE® FIBER OPTIC LIGHTING SYSTEMS. REVIEW PRODUCT SPECIFICATION SHEETS AND ILLUMINATOR MANUALS FOR ADDITIONAL INFORMATION ABOUT PRODUCTS AND USE.

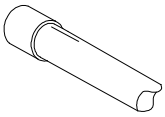
GENERAL INSTALLATION GUIDELINES

OPTICAL FIBER:

- **OPTICAL FIBER END PROTECTION:**

  Optical fiber ends not entering the illuminator MUST BE PROTECTED from water/moisture and sunlight intrusion. Use the appropriate Lumenyte end seal: **Clear End Seal (ES**XXX**-B**) for end light applications, **White ES**XXX**-W** for single-ended linear light applications and **Water Feature Fittings** (**XL-**XXX) for underwater lighting. Bond to outer vinyl jacket using a clear PVC glue suitable for flexible PVC. Clear PVC glue can be purchased at most local hardware and plumbing retailers or garden centers. Take care to apply the glue only to the outer jacket material and not to the fiber core.

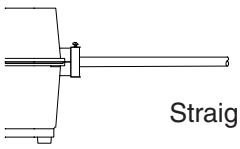
White End Seal



Clear End Seal

- **OPTICAL FIBER EXITING THE ILLUMINATOR:**

  Larger fibers (3/4", 1/2", 3/8" or 19mm-10mm diameters) MUST exit the illuminator STRAIGHT for at least 18"-24" (45-60cm), before turns are made to or into the design. Smaller fibers (1/4", 3/16", 1/8" or under 7mm, must exit STRAIGHT for at least 12"-18", (30-45cm). Failure to do so will result in significantly reduced light transmission.



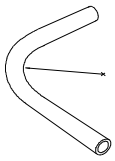
Straight exit with no bends

- **INTERIOR & EXTERIOR/HIGHER ABUSE APPLICATIONS:**

  SWN STA-FLEX® **fibers** are for **interior use only and should NOT be exposed to moisture or sunlight**. **SFC** (LUMENYTE® Flexcoat™) **LEF™**, **SFR** & **SEL fibers are jacketed with U.V. stabilized extrusions for outdoor, water-related or higher abuse applications.** These fibers can also be used for interiors. The above "OPTICAL FIBER END PROTECTION" must be followed indoors or outdoors. For underwater side-lit applications, -WR jacket is necessary (SFC, SFR, LEF).

- **MAKING TURNS & BENDS:**

  Straight, uninterrupted fiber is best for optimum light output. Bends in any optical fiber will diminish the final lighting effect. For best light flow, it is recommended that no optical fiber be bent beyond 12 times the diameter of that fiber.



Minimum bend radius no more than 12 times the diameter.

- **CONDUIT:**

  Unseen portions of fiber runs should be protected with **conduit, heat-bent PVC or PVC with electrical sweeps (no hard 90s)**. This is critical for outdoor applications (i.e., underground, rooftop). Conduit should be large enough to allow the fiber to move freely inside the raceway for easy installation. Ideally, sweeps or heat bent PVC should incorporate 8"-12" radius turns (or larger) based on fiber size.

- **STRAIGHT FIBER RUN DESIGNS:**

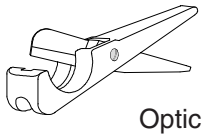
  For straight line designs with SFC, SWN, LEF or SFR fiber optics, use of side-by-side tracking is strongly advised. Use continuous 7' lengths of WUC, CUC, LST or PLS tracking. **Clips are not advised**. Without track, natural slight curves and waviness result in these fibers.

- **SFC, LEF™, SFR, & SEL JACKET REMOVAL FOR FIBER INSERTION INTO NON-HARNESS POWERHOUSE™ ILLUMINATORS:**

  All fibers with the exception of SWN fibers must be stripped of their outer jackets prior to insertion into PH series (NON-HARNESS) illuminators. Instructions for this procedure are on **Page 5 of the Powerhouse™ Metal Halide and the Powerhouse™ Quartz Halogen Illuminator Operating Manuals** (provided in each illuminator's shipping box). To remove the outer jacket, use an optic cutter and score lightly all around it about 4-5" from the fiber end to enter the illuminator. When using maximum numbers of fibers, jacket material should be stripped approximately 5" from the end. **DO NOT CUT INTO THE TEFLON® CLADDING OF THE FIBER.** When scored, bend the part that is to be removed back and forth until it separates. The jacket part to be removed will then slip off from around the Teflon® cladding.

- **CUTTING FIBER ENDS:**

  Fibers should always be cut at **90 degrees straight**. LIC's **Optic Cutter (LOC-002)** is ideal for this. Replacement blades (LOC-006) are available to ensure a clean cut.



Optic Cutter (LOC-002)

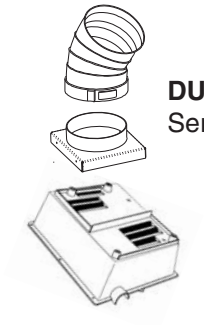
ILLUMINATORS:

- **VENTILATION:**

  Illuminators require positive ventilation and **MUST NOT BE SEMI- OR FULLY-ENCLOSED** without additional venting considerations (or use of a **Burial Box**). Also, **illuminators should be spaced 2' apart or staggered to avoid intake of warm exhaust air from neighboring illuminators.**

Teflon® is a registered trademark of DuPont.

LIC's Exhaust Ducts, **DUCT-PH** for the PH series and **DUCT-AR** for the Encore™ series of illuminators are available to aid in exhaust-venting.

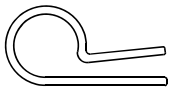


DUCT-PH for Powerhouse™ Series Illuminators

DUCT-AR for Encore™ Series Illuminators

MOUNTING:

- **Optic Clips** (OPCL-X) **ARE NOT ADVISED** for **EXTERIOR USE** because they are not UV stabilized.



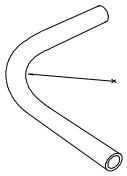
Optic Clip (Not Advised for exterior use)

- As noted under ***FIBER OPTIC,*** above, **Clips ARE NOT ADVISED** for **STRAIGHT LINE DESIGNS OF FIBERS.** Use WUC, CUC, LST, or PLS track.
- When using WUC or CUC tracks, **periodic countersunk screws/anchors** are generally advised for further security on turns and other parts of tracking. Camouflage the heads of the screws to match the background. A dark or black screw head will be visible through SFC & SWN fiber. Also apply a bead of silicon on each side of mounting tracks.

GENERAL DESIGN GUIDELINES

- **MINIMIZE FIBER OPTIC BENDS:**

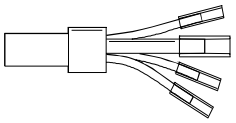
  In design and installation, **minimize or eliminate bends in fibers wherever possible.** For best lightflow into the design, **entry and exit bends should be generous; diagonal entries or elongated openings are advised. Unseen portions of fiber runs should be straight or with very loose turns only.**



Minimum bend radius no more than 12 times the diameter.

- **USING MAXIMUM NUMBERS OF FIBERS IN ILLUMINATOR:**

  Whenever a maximum number of fibers are used in an illuminator, the dispersion of light to those fibers will be subject to the "footprint" of the lamp reflector. This means all fiber ends will not receive the same intensity of light. **If equal light intensity is most critical to the design, limit the number of fibers to 1/2 or less the maximum fit. Pre-cut and pre-focused harnesses may also be advised when illuminating multiple fibers from one illuminator.**



Harness with fibers

- **ARCHITECTURAL RUN LENGTHS:**

  For architectural linear side light applications, we generally advise **from 50' to 100' (or 15m to 30m) BETWEEN ILLUMINATORS or LOOPED INTO ONE ILLUMINATOR.** Although brightnesslevels are always subjective, 50' (or 15m) should be brightest, 70-80' (21m - 24m) should be medium/consistent lighting, and up to 100' (30m) should be medium/slightly subdued. **Factors to consider which impact brightness & run length decisions include:** light source, ambient light, color of light, number and size of bends, number of fibers filling aperture, contrast ratio between fiber color and background color, the client's expectations, etc.

  Single linear side light runs, those running one way out of an illuminator, ideally should be used ONLY when runs are straight out of the illuminator and straight (or only very loose bends) in the design. In that case, for side-lit or end-lit fibers, we advise from **25' to 35' (7.5m - 10.5m) as maximum run length** before light drop-off (attenuation) becomes apparent. Any tighter bend or bends will advance attenuation from the bend on, causing a visible difference. **Shorter lengths should be used if a bend or bends are in the design or if brightness is critical, or the fiber should be "fed" into a second illuminator or looped back to the original one.**

  For optimum performance with LEF™ Linear Emitting Fiber, we recommend using metal halide illuminators and criteria as follows:

	Single-Ended	Double-Ended	Recommended Max Number in Harness
LEF510M	20' (6.1m)	40' (12.2m)	2
LEF410M	10' (3.0m)	20' (6.1m)	3
LEF310M	6' (1.8m)	12' (3.6m)	7