

Channel	Filter#	3 mm liquid light guide		1 mm optical fiber	
		Power (mW)◇	Irradiance (mW/mm ²)*	Power (mW)◇	Irradiance (mW/mm ²)*
Violet	395/25	295	42	106	135
Blue	440/20	256	36	82	104
Cyan	470/24	196	28	58	74
Teal	510/25	62	9	19	24
Green	550/15	260	37	78	99
Yellow	575/25	310	44	98	125
Red	640/30	231	33	65	83
nIR◎	740/20	74	10	19	24

Table 1. SPECTRA X light engine outputs from liquid light guides and optical fibers.

Filter center wavelength (CWL)/full width at half maximum (FWHM) in nm.

◇ Specimen measurement of SPECTRA X light engine output power through 3 mm liquid light guide or 1 mm optical fiber. These values represent averages of measurements on multiple SPECTRA X light engines. Values for individual SPECTRA X light engines will vary.

◎ Requires SPECTRA X with near-IR source option.


* Irradiance at the output window of the light guide or optical fiber.

Liquid Light Guides

A liquid light guide is like a single silica fiber in that it has a single continuous optical transmission medium. However much larger diameters are possible, allowing delivery of higher power levels (Table 1). Furthermore, transmission is not limited by the dead volume (packing losses) associated with large-diameter fiber bundles. The light guide consists of a non-toxic, high refractive index liquid enclosed in a sealed fluoropolymer tube with polished fused silica windows for light input and output at the ends. The exterior packaging consists of a PVC jacket with stainless steel end caps. Both end cap dimensions are the same, as are the connecting receptacles, so the direction of installation between the light engine and the collimator is unimportant. Thermal motion in the liquid light guide constantly alters the optical path and scatters light so that any spatial and temporal coherence introduced by the light source is eliminated. The major damage mechanisms for liquid light guides are heating of the end caps and ultraviolet (UV) light-induced degradation of the liquid transmission medium. Since Lumencor light engines do not generate either UV or significant heat levels at the output port, the normal service lifetime of a liquid light guide is many years. Note however that although liquid light guides are very flexible, bending beyond the minimum bend radius (Table 2) may cause a permanent kink, causing significant transmission losses and non-uniform spatial distribution of the light output.

Sizes	3 mm, 5 mm
Transmission	>75% 400 – 700 nm
Minimum bend radius	40 mm (~1.5 inches)
Numerical aperture	0.59

Table 2. Characteristics of Lumencor liquid light guides



Lumencor Liquid Light Guide

Please observe the following usage precautions to ensure optimum performance.

1. Do not bend the light guide beyond its specified minimum bending radius (40 mm or 1.6 inches). Extreme bending of the light guide may cause permanent deformation, resulting in decreased light transmission.
2. Do not reposition the light guide while it is secured to the light engine and the microscope. Release the securing set screws, reposition the light guide, then refasten the set screws.
3. Do not use outside the specified operating temperature range (-5 – 35 degrees Celsius).
4. When shipping the light guide, detach it from the light engine and microscope and coil it loosely in the original shipping pouch. When packing, make sure that the light guide is placed so that it cannot be pinched between solid objects (for example between the lid and the body of a Pelican case).