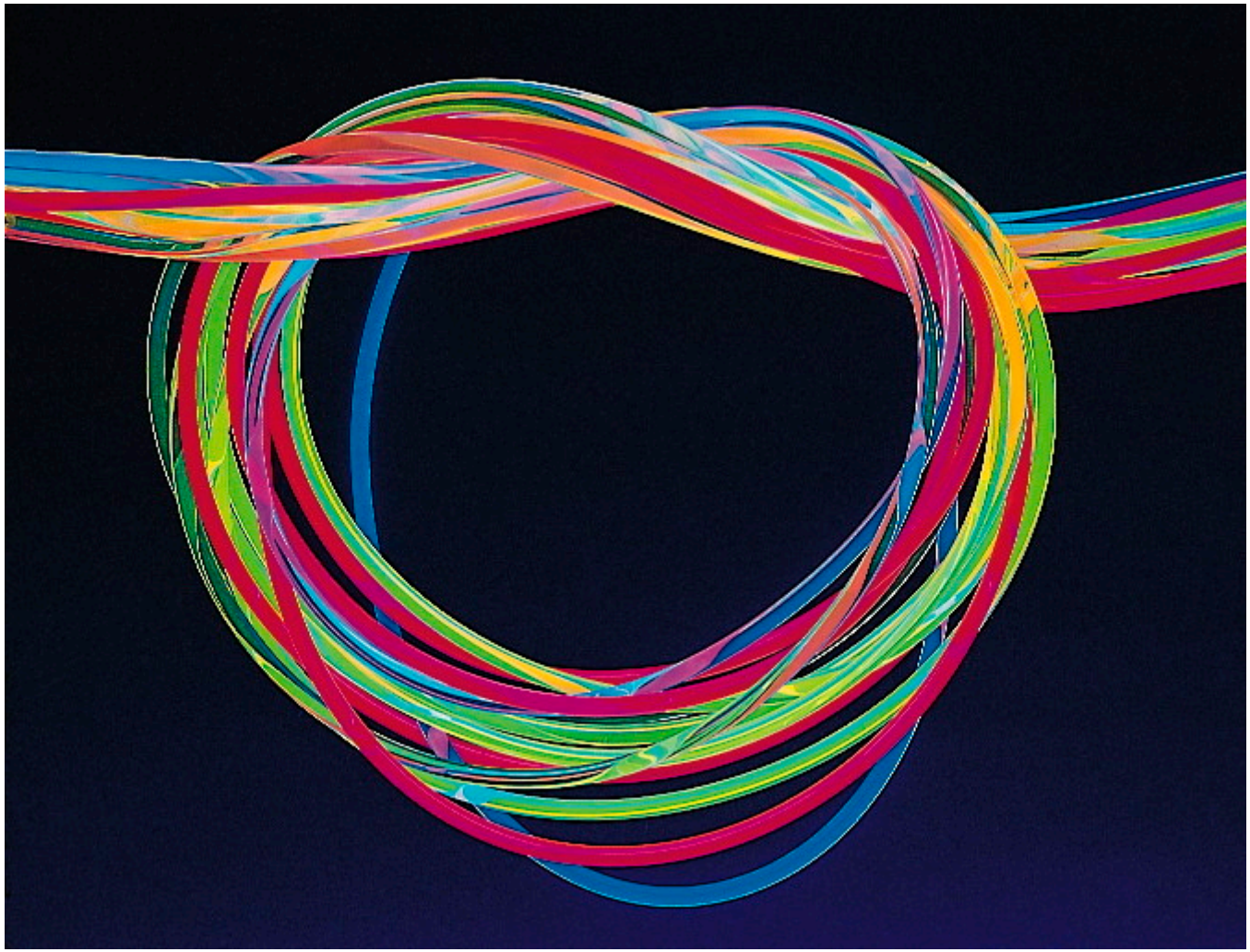
LUMATEC®

LIQUID LIGHTGUIDES



A TECHNOLOGICAL BREAKTHROUGH IN LIGHT TRANSMISSION

LUMATEC®

LIQUID LIGHTGUIDES

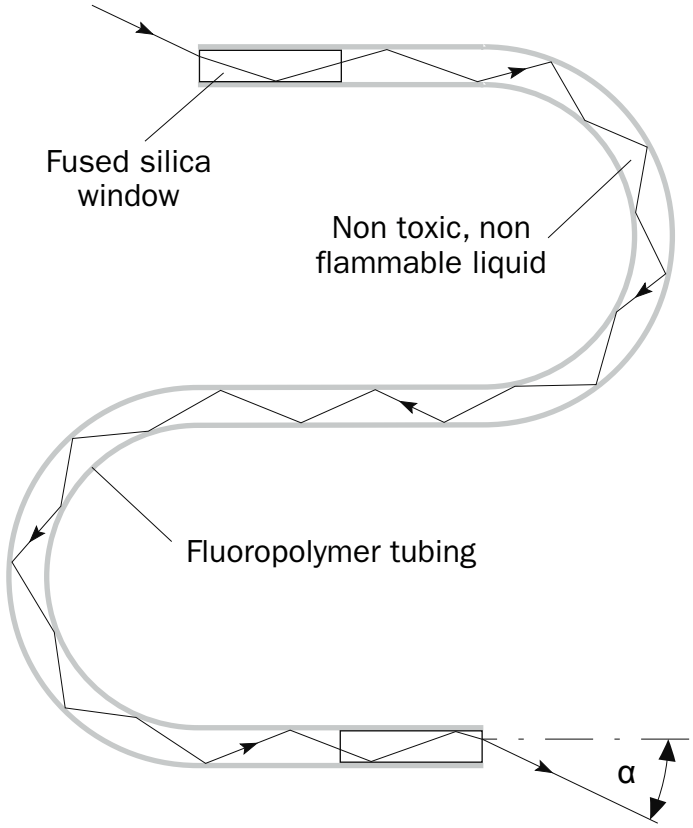
For illumination, irradiation, and metrology

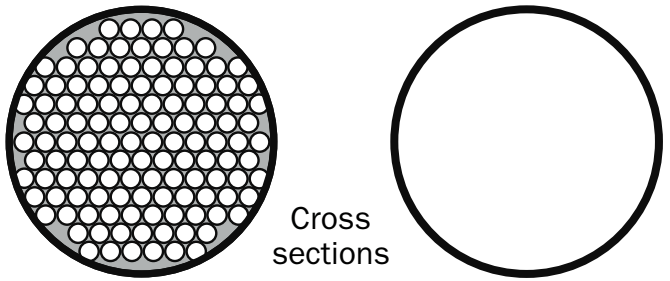
What is a Liquid Lightguide?
A Liquid Lightguide functions in the same way as a glass fiber light guide. In this case the liquid represents the optical core with a high refractive index, and the plastic tubing represents the cladding with a lower refractive index. By means of total reflection on the tubing wall, light travels down the Liquid Lightguide in a zig-zag path.

What are the benefits of a Liquid Lightguide?
Liquid Lightguides excel when cross sections of 2mm or more are required. Whilst glass fibers have to be bundled to hundreds or thousands of fibers – called a fiber bundle – to achieve a large cross section, the Liquid Lightguide does this job with one single large "fiber". Because it has no dead spots in between fibers it is more efficient. It has no fragile fibers which break with age and continuous flexing. In the end ferrules no epoxy is required to keep the fibers together, so high radiation power and even most lasers present no problem. The homogenous end faces are a huge advantage – if not condition – in many optical arrays.

What are the limitations of a Liquid Lightguide?
Liquid Lightguides always need a circular cross section. Liquid Lightguides feel most comfortable in the same environment as human beings, they do not like extreme temperatures for extended time, with exception of the ferrules.

What types of Liquid Lightguides are available?
Liquid Lightguides can be made with a variety of liquids, resulting in different properties. The basic characteristics are shown in the spectral graph and property table.



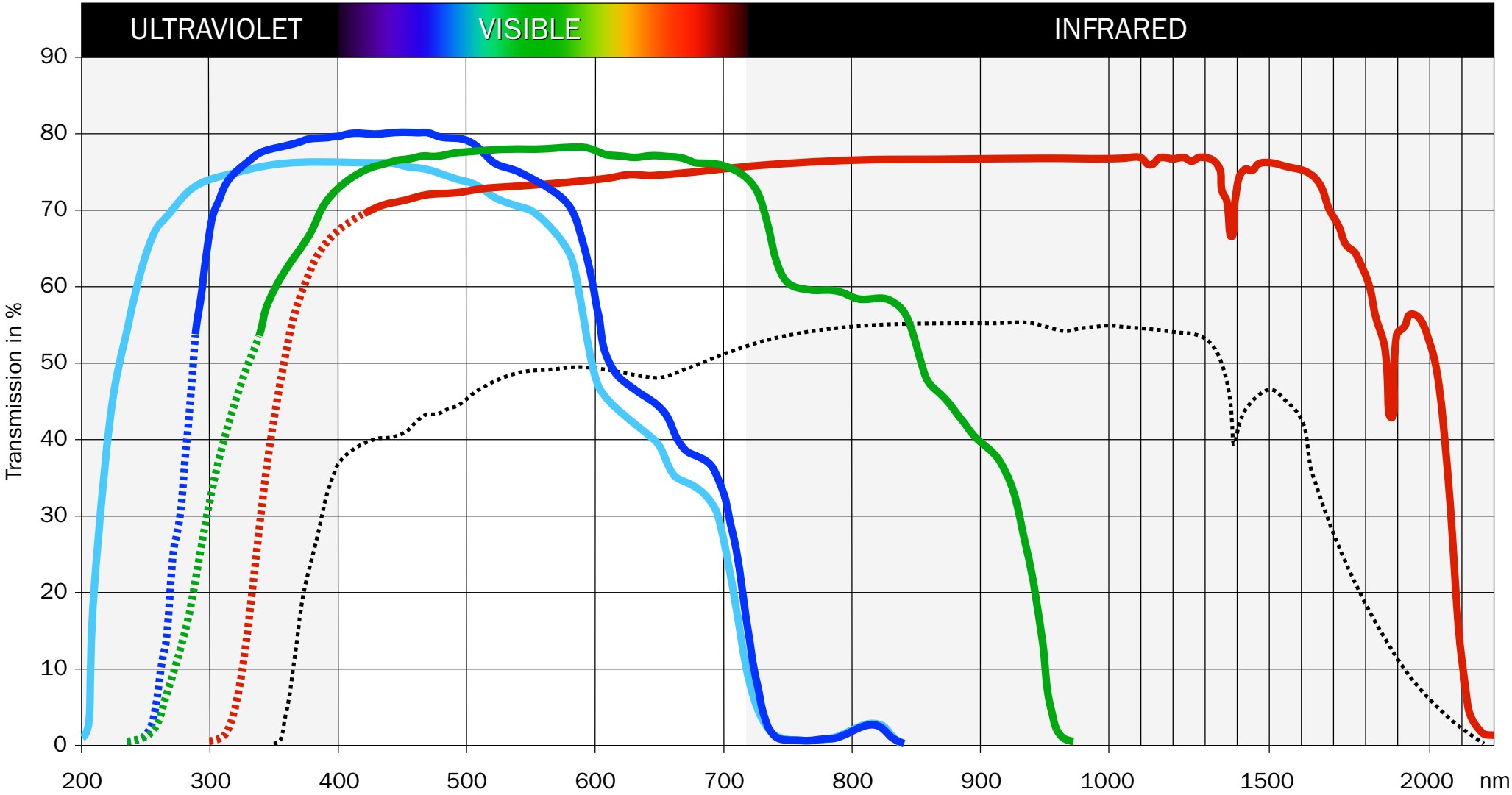


Cross sections

Fiber Bundle

Liquid Lightguide

LUMATEC® LIQUID LIGHTGUIDES Spectral Characteristics



Measured with 2α=50° (Series 250 2α=34°), length 2000 mm, active core Ø5 mm

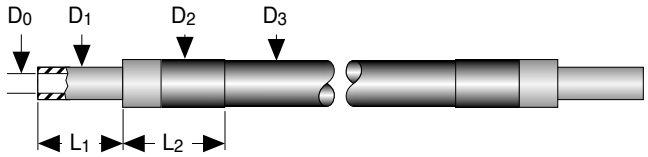
LUMATEC® LIQUID LIGHTGUIDES Property Table

Series	Core Diameters	NA 2α	Application Examples and Spectral Range	Specific Properties
250	3, 5, 8 mm	50°	Wafer manufacturing, curing of UV adhesives with tack free surfaces. Lengths up to 5m (15ft). 220nm - 650nm	Outstanding photo stability even in the UVC range, suitable for high power UV lasers. Recommended light sources: deep UV mercury, xenon, excimer. Temperature range (long term): +5° to +30°
300	2, 3, 5, 8, 10 mm	72°	UV adhesive curing and UV fluorescence inspection at lengths of up to 20 m (60 ft). 280nm - 650nm	Superior transmission of up to 5W of UV radiation. Suitable for very rugged environments. Recommended light sources: mercury and xenon short arc, tungsten halogen, LED. Temperature range (long term): -5°C to +35°C
380	2, 3, 5, 8, 10 mm	72°	Outstanding white light illumination at lengths of up to 30m (100ft). 340nm - 800nm	Excellent transmission from the near UV to the far red even at a length of 30m. Suitable for very rugged environments. Recommended light sources: tungsten halogen, LED, xenon, metal halide. Temperature range (long term): -5°C to +35°C
2000	3, 5, 8 mm	62°	Visible and near infrared illumination. Lengths up to 4m (12ft). 420nm - 2000nm	Transmission of high power near infrared radiation in the multi-watt range. Integrated long pass filter for radiation below 420nm. Recommended light sources: xenon or tungsten halogen lamps, Nd-YAG or diode lasers. Temperature range (long term): +5°C to +35°C

Dimensions of Standard End Fittings Series 300 and 380 (mm)

Active Core Ø	Standard End Fittings				Protective Sleeve	Minimum Bending Radius
D_0	D_1	L_1	D_2	L_2	D_3	
2	4	6.7	8	20	5.5	30
3	5	20	9	24	7	40
5	7	20	10	24	9.5	60
8	10	20	15	40	12.5	100
10	14	20	19.8	41	15	200

Detailed leaflets are available for every series.



Many other end fittings, a variety of claddings, and custom designs are available on request.

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