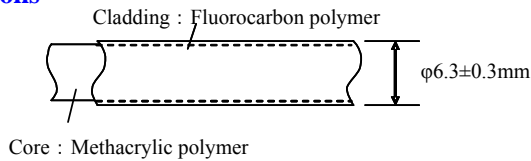


3M Light String

Ray Milky Flex 63 Technical Data Sheet

Basic Specifications

Specifications/
Outer diameter



Color(when unlit) ; Translucent white
Coefficient of thermal expansion; 1.0×10^{-4}
Rate of attenuation (@570nm) ; 1.2% / cm
Allowable input wavelength; 400nm to 720nm

Characteristic Data Table

	Luminance variation -Rate of luminance variation- *Note1	Color variation -(X,Y.)Coordinate variation- *Note2	Length Variation -Rate of Total Length Variation- *Note3	Outer diameter variation -Rate of outer diameter variation-
Heat resistance (100°Cx500hr)	No significant luminance variation is observed. -31% ~ -13%	No significant color variation is observed. (X, Y,) = (± 0.01, ± 0.02)	-0.07%	0.02
Heat cycle resistance 100°C×24hr → R.T. → -40°C×24hr → R.T. (4 cycles)	No significant luminance variation is observed. -36% ~ -13%	No significant color variation is observed. (X, Y,) = (± 0.01, ± 0.01)	-0.09%	0.02
Heat and wet cycle resistance -40°C×7.5hr → R.T. → 80°C×15.5hr → R.T. → -40°C×7.5hr → R.T. → 50°C·95%×15.5hr → R.T. (4 cycles)	No significant luminance variation is observed. -19% ~ +5%	No significant color variation is observed. (X, Y,) = (± 0.01, ± 0.01)	-0.07%	0.01
Humidity resistance (50°C·95%RH ×500hr)	No significant luminance variation is observed. -11% ~ +10%	No significant color variation is observed. (X, Y,) = (± 0.01, ± 0.01)	-0.08%	0.01
Water immersion (40°Cwater×500hr)	No significant luminance variation is observed. -2% ~ +11%	No significant color variation is observed. (X, Y,) = (± 0.01, ± 0.01)	-0.04%	0.00
Cold resistance (-40°C x500hr)	No significant luminance variation is observed. -4% ~ +1%	No significant color variation is observed. (X, Y,) = (± 0.01, ± 0.01)	-0.01%	0.00
Weather resistance Xenon weather meter 1000hr	No significant luminance variation is observed. -7% ~0%	No significant color variation is observed. (X, Y,) = (± 0.01, ± 0.01)	0.04%	0.00

Test description

Condition	Test description
Condition	Cut samples with the length of 1000mm were inserted into each testing conditions. After dwelled the samples left at room temperature for at least 30minutes before measurements.
Luminance and color evaluation method	Either end of each sample was connected to a 1W white LED ^{*Note4} , inserted into transparent linear pipe, and then the side luminance and the color was measured at the 10, 20, 30, 40, 50, 60, 70, 80, 90cm points from the LED connection end.
Outer diameter evaluation method	The outer diameter was measured at 6 points in the circumferential direction at points near the exact center in the lengthwise direction of each sample.
Length evaluation method	Each sample was inserted into 10mm-width linear grooves, and the length was measured.

*Note1 The luminance variation is based on human perception, and so the effect of the rate of variation was measured based on the Fechner's law which states that the strength of a sensation is proportional to the logarithm of the stimulus. Normally the range of -50% to +100% is considered to have no effect.

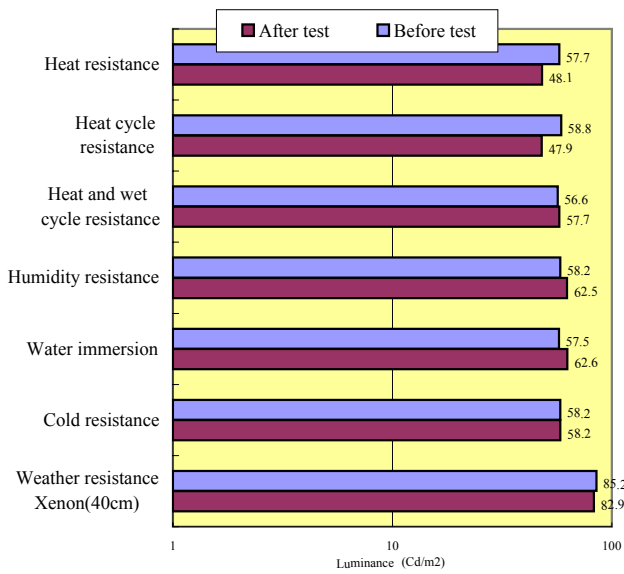
*Note2 Color variation was determined by the effect of color variation based on the CIE chromaticity diagram developed by the International Commission on Illumination (CIE) in 1931 (ref. next figure)

*Note3 The protrusion of core part may occur at both ends due to shrinkage of cladding after a series of durability test.

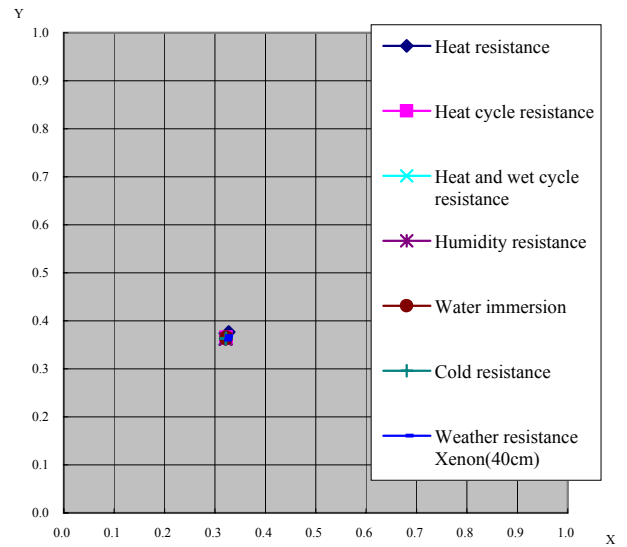
*Note4 Light flux: 45 lumens, Directional pattern (2Θ1/2) : 110°

3M Light String
Ray Milky Flex 63 _ Graphs

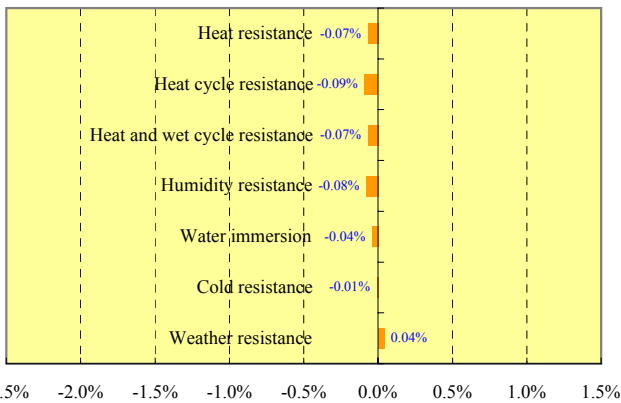
Luminosity Variation - Rate of Luminance Variation -
 (60cm point from the light source)



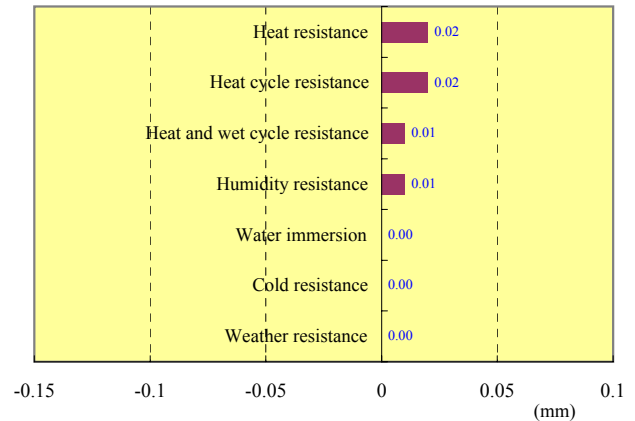
Color Variation - (X.Y.) Coordinate Variation -
 (60cm point from the light source)



Length variation - Rate of Total Length Variation -



Outer Diameter Variation - Rate of Outer Diameter Variation -



Notes

1. Dark spots may occur in illumination from the cut surface to about 10mm due to air gap between the core and cladding.
2. Do not repeatedly bend, stretch, or subject the Light String to strong impact. This could damage it.
3. Be careful not to damage the Light String when installing it. If it hits a hard object or scrapes against the floor, the cladding can be damaged, and the illumination quality can be adversely affected.
4. Do not apply high tension to the Light String when connecting or securing it. If it is stretched, the illumination quality can be adversely affected.
5. Please contact 3M about displacement absorption methods in the longitudinal direction.

- The technical information and data, recommendations, and other statements provided in this document are based on tests which 3M believes to be reliable, but the accuracy and completeness of such information is not guaranteed.
- The user is responsible for determining beforehand whether a product is suitable for a particular purpose and assumes all responsibility for any hazards inherent with the use of the product.
- If any product is proved to be defective, the seller and manufacturer are responsible only for replacement of the defective product. 3M is not liable for information and recommendations not included in this document unless provided for in a written agreement signed by authorized officers of the seller or manufacturer.

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