Peerless

Light Loss Factor Calculations for LEDs

LLF = .85 = RSDD x LDD x BF x LLD

LLF includes:

- .98 RSDD (room surface dirt depreciation) and LDD (luminaire dirt depreciation)
- 1.0 (ballast/driver) factor
- .87 LLD* (lamp lumen depreciation)

LLF (Light Loss Factor) is the product of several factors, each depreciating light output at certain point in time in the future compared to initial light output.

Recoverable factors typically considered in these calculations are:

Room Surface Dirt Depreciation (RSDD)

RSDD weighs the changes in the cleanliness of room surfaces from which light bounces off. These days it is common to consider RSDD negligible in most spaces.*

Luminaire Dirt Depreciation (LDD)

LDD takes into account the dirt accumulation on the lens or other components of the luminaire that may reduce light output.

Because most of the environments in which luminaires are placed are clean (interior rooms) and are assumed to be well-maintained, the assumption is:

RSDD x LDD = .98

Lamp Lumen Depreciation (LLD)

The L_{70} metric recognizes the fact that lumen output depreciates over time and establishes LEDs' rated life as the point at which lumen depreciation has reached 30% (LLD=0.70). Since this point is likely to be years in the future, using L_{70} as a factor to design around may lead to significant, initial over-lighting.

A more accurate mean value for LEDs assumes a point in time that approximates the mean life of familiar sources (T8 and T5 fluorescent) that have traditionally been defined as 40% of their rated life. Conservatively, LEDs at a comparable time have lost about 12-13% of their light output.*

LLD = .87 - .88

LLF = .98 x .87 = .85

References

*Benya, James R., PE, FIES, FIALD "Lighting Calculations in the LED Era", June 2011.

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