

Product Summary PS14

Description	Test Type	Test Number	Input Wattage (W)	LED Current	Total Lumens	Efficacy (L/W)	L ₇₀ (Hours)
PS14, 90W, 45K&60K, T5	LM79 _{1,2}	21732	87.1	500mA 48 LEDs	5966	68.5	>120,000
PS14, 75W, 45K&60K, T5	LM79 _{1,2}	Scaled	73.5	500mA 42 LEDs	5239	73.5	>120,000
PS14, 60W, 45K&60K, T5	LM79 _{1,2}	Scaled	63.5	500mA 36 LEDs	4675	73.6	>120,000

1. LM79 is done with 45K or 60K CCT, however same minimum flux bins are used for 45K and 60K products
2. LM79 is scaled from known LM79 testing (See IES file)

Summary of CCT / CRI Testing

	LM79 Test ₁	CCT	CRI
Integrating sphere (90W, 45K)	21733	4672K	73.4

1. Typical CCT is 4500K

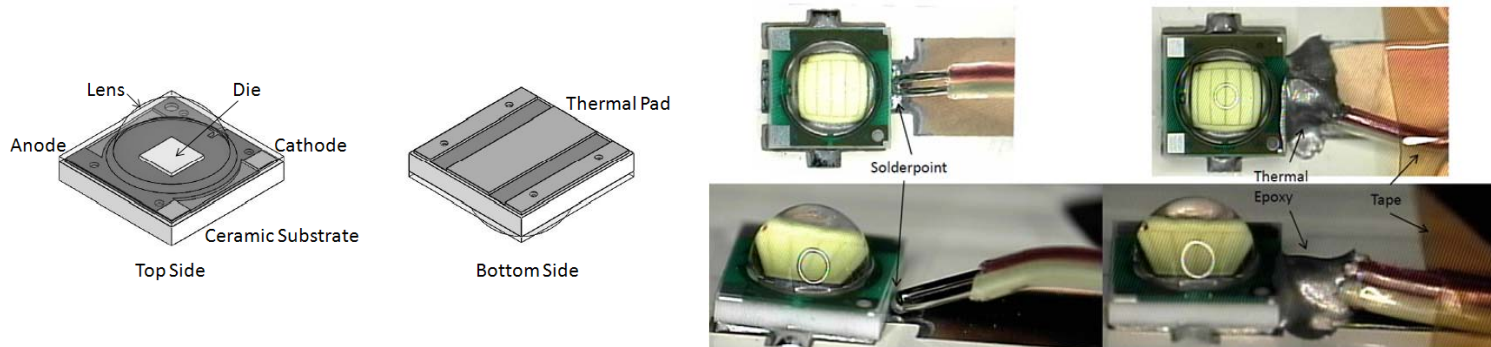
LM80 Lumen Maintenance and L_{70} Lifetime Projections

Component testing is conducted in accordance with the guidelines in LM-80-08, published by the Illuminating Engineering Society. These guidelines specify the conditions, measurement intervals, and minimum duration of the test. The test takes a minimum of 6000 hours to complete, but this is more feasible than a full lifetime test to L_{70} – which takes years to complete. The result from the LM-80 test data is a tool that can be used to predict lumen maintenance over time. Figure 1 is a schematic and photograph of the way that the thermal couples were attached at the manufacturer to measure the solder point of the LEDs. Our manufacturer has characterized their packaging so that we can predict junction temperature by knowing the temperature at these soldering points. Appendix A provides the LM80 data and L_{70} predictions for this product.

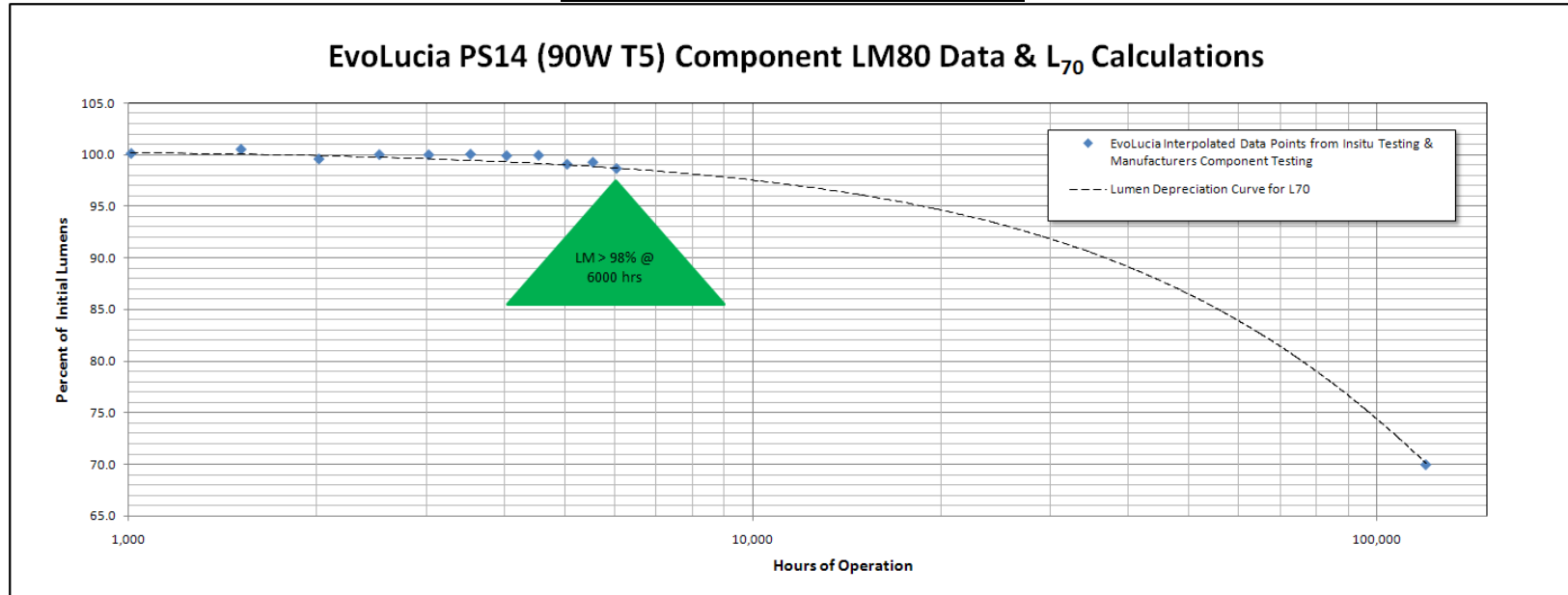
Power Supply:

The power supplies are UL1310/UL48 Class 2 and IP65 certified. They have a constant-current output, providing a DC voltage to the LEDs. Due to this there is no flicker. The power supplies can accept input voltages from 100 VAC to 277 VAC, and up to 480 VAC using an optional transformer. Power factor is better than 0.95 and THD <20%. The power supplies have protection circuits for over-voltage, over-current, over-power, and short-circuit built-in. In the event of a failure, they will automatically recover, so that the luminaire does not require the power to be cycled to clear a fault. They comply with EMC directives 47CFR, Part 2, Part 15, and Cisp PUB, 22 Class B. The MTBF is greater than 100,000 hours.

Figure 1 – Component Thermal Testing Solder Point

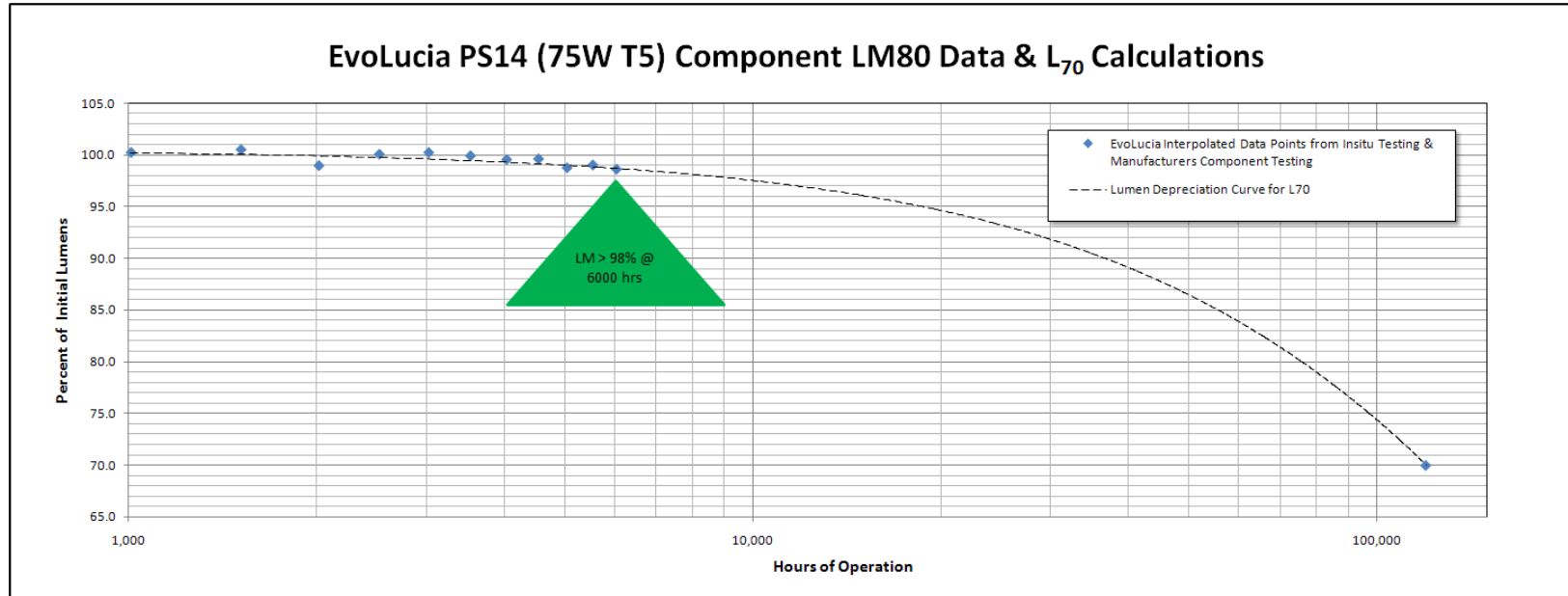


Appendix A – Lumen Maintenance



Manufacturers Component LM80 Data for White LEDs																				L ₇₀		
Comments	LM80 Test Conditions			Statistics				Initial Lumens, Vf		Mean Lumen Maintenance (%)											Greater Than 120,000	
	T _{s,a} (C)	T _j (C)	If (mA)	n	Sigma	Min	Max	Mean Values		t=0	1008	1512	2016	2520	3024	3528	4032	4536	5040	5544		6048
XPG WHT	85	105	1000	29	6.6	96.0	124.4	115.40	2.97	100.0	100.0	100.5	100.2	99.9	99.7	100.2	100.2	100.3	99.4	99.5	98.7	
XPG WHT	85	95	350	28	4.9	114.5	131.9	125.10	3.11	100.0	99.0	98.4	97.9	97.8	98.2	98.8	98.4	98.4	98.7	98.4	98.7	
XPG WHT	55	75	1000	30	4.1	105.1	123.5	118.64	3.02	100.0	100.4	100.5	98.4	100.1	100.5	99.8	99.2	99.3	98.4	98.8	98.6	
XPG WHT	55	61	350	30	11.2	94.4	124.0	112.90	3.10	100.0	98.1	98.6	98.6	99.1	99.2	98.6	98.3	98.7	97.6	99.3	99.1	
XPG WHT	45	65	1000	29	6.58	113.3	136.6	128.00	3.17	100.0	101.4	101.7	101.0	101.1	101.0	100.5	100.0	99.5	98.9	98.6	98.7	
EvoLucia Interpolated Data Points from Insitu Testing & Manufacturers Component Testing																						
XPG WHT	85	105	1000	29	6.6	96.0	124.4	115.40	2.97	100.0	100.0	100.5	100.2	99.9	99.7	100.2	100.2	100.3	99.4	99.5	98.7	
XPG WHT	55	75	1000	30	4.1	105.1	123.5	118.64	3.02	100.0	100.4	100.5	98.4	100.1	100.5	99.8	99.2	99.3	98.4	98.8	98.6	
PS14 90W T5	85	95	500							100.0	100.1	100.5	99.6	100.0	100.0	100.0	99.9	99.9	99.1	99.3	98.7	70

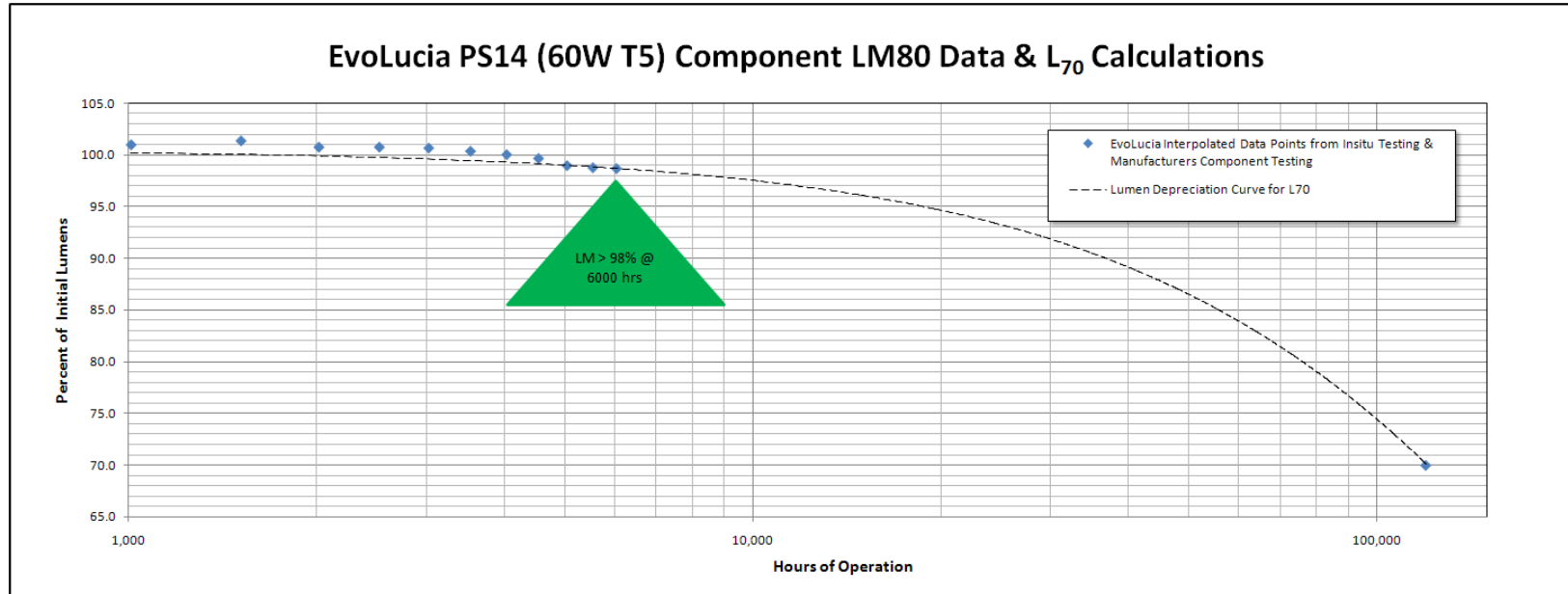
- Notes:
1. Interpolation was done using: $L_{T_{MP}} = L_{Below} + (L_{Above} - L_{Below} / T_{s,Above} - T_{s,Below}) (T_{MP,LED} - T_{s,Below})$ per Energy Star Requirements
 2. L₇₀ is Predicted using an Exponential Degredation Curve Fit from Interpolated Insitu Data based on Mean Lumen Depreciation at 6000 Hrs Operation per Energy Star Requirements
 3. IES TM-21 will be used for L₇₀ calculations when it has been finalized and approved
 4. Thermal data has been scaled & calculated from insitu temperature measurements at max temp or nominal temp conditions (25C ambient typical) and stated LED drive currents



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PS14 75W T5	75	85	500					NA		100.0	100.2	100.5	99.0	100.1	100.2	99.9	99.6	99.6	98.8	99.0	98.6	70	

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