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LONGIANO, FC, 47020, Italy

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A handwritten signature in black ink, appearing to read 'G. Di Martino'.

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TEST REPORT N.1105-23-T

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Main model under test / *Modello prodotto in test*: L803_2022

Test object / *Scopo*: ISTM and lifetime calculation following ANSI/UL 1598 – IES TM21

Test date / *Data dei test*: 10/03/2022

Tested by / *Testato da*: Simone ZOFFOLI

Supervised by / : Simone Zoffoli



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Results

Product:	Light 803 Model LU80300 32
Electrical parameters	
Input voltage	230V
Input frequency	50Hz
Input power	80.9
Power factor	0.987
Forward current of LED chip	415 mA
Temperature measurement	
Ts of LED chip 1	76.7
Ts of LED chip 2	79.9
Ts of LED chip 3	77.2
Ts of LED average	77.9
Ambient	50°C
TM21 Lifetime extrapolation	
LM80 report n. LUMI012-A2-160	
TEST CONDITION	85°C, 500mA
L90 Reported	90000h
L90 Calculated	115515h
L80 Reported	90000h
L80 Calculated	258875h
L70 Reported	90000h
L70 Calculated	421403h

Sample description

Model number: LU80300 32

Light source: Neri C0894 3000K CRI 70 – with 2 x (16 series of Lumileds 5050 L150-30705006000S0)

Ballast: Philips Xi FP 110W 0.3-1.0A SNLDAE 230V C133 sXt

Test method

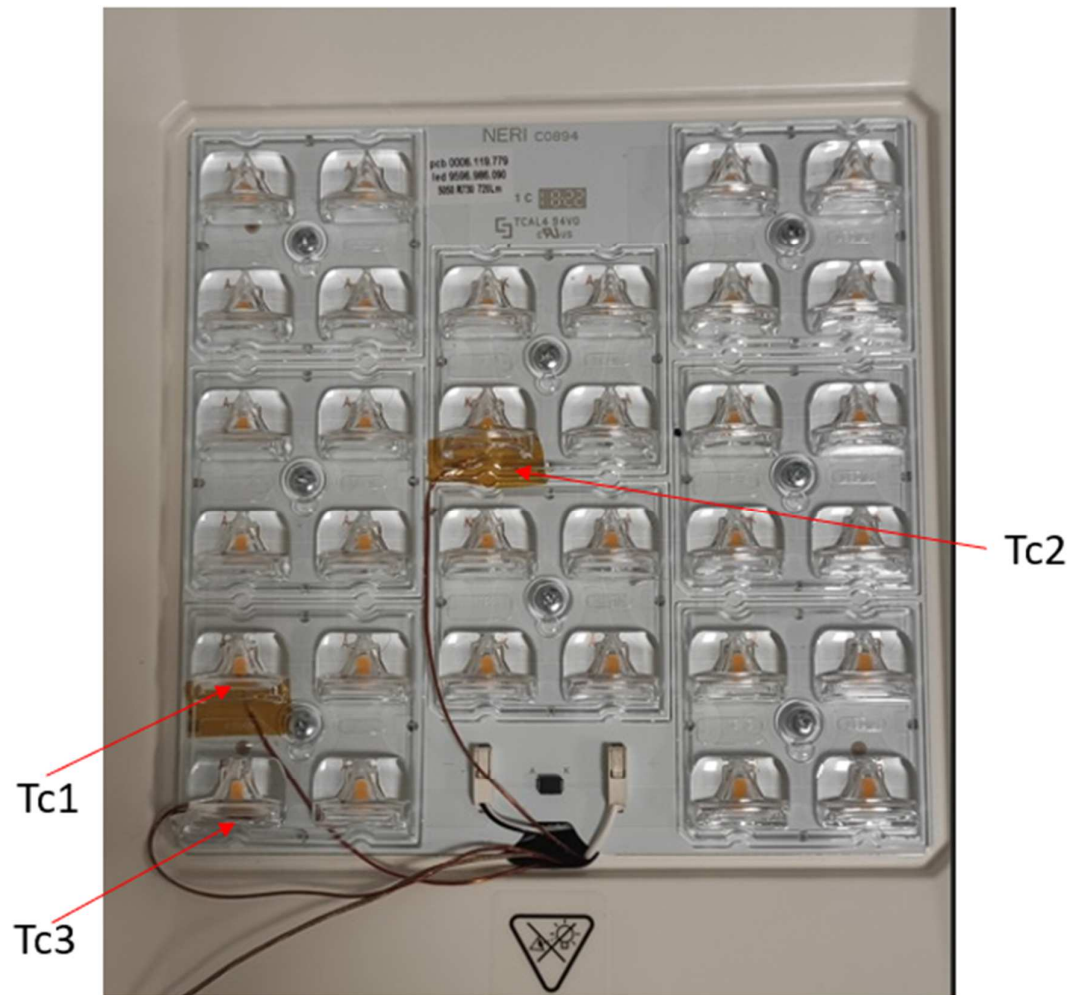
In Situ Temperature Measurement was performed with test sample operating in the position intended for installation. Thermocouples were positioned as required from LED chip manufacturer.

Test were carried out following ANSI/UL 1598 section 19.1 to 5, 19.7 and 19.10 to 16.

For lifetime calculation were used LM80 data provided by LED chip manufacturer and TM-21-19 excel calculator.

Annex A: photographic documentation





Annex B: LM80 data



LM-80 15000 Hour Interval Test Report

IES LM-80-15 Approved Method for Measuring Lumen Maintenance of LED Light Sources

CSA Group Report: LUMI012-A2-160

January 27, 2021

Manufacturer:	LUMILEDS
Models tested:	L150-2770503000050 LUXEON 5050
Test conditions:	24 devices @ 33.0 C, 0.100 A 24 devices @ 85.0 C, 0.100 A 24 devices @ 105.0 C, 0.100 A

Prepared for: Lumileds Lighting Company, LLC 370 W. Trimble Road San Jose, CA 95131	Testing performed by: CSA Group Seattle 14833 NE 87th St Redmond, WA 98052 425-605-8500 www.csagroupseattle.org
Attn:	
Test report prepared by: <i>Gabriel Trippel</i> Project Engineer, Test and Measurement Services	Test report approved by: <i>KC Fletcher</i> Project Manager, Test and Measurement Services

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CSA Group Seattle
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1.0 Statement of test conditions, summary of results, and reporting requirements:

Part number: L150-2770503000050					
Life test conditions			Summary of results		
Test condition	Drive current (A)	Case temperature (°C)	Elapsed life test time (hrs)	Average lumen maintenance (%)	Average chromaticity shift ($\Delta u/v$)
TC1	0.100	55	15000	99.3	0.0009
TC2	0.100	85	15000	97.8	0.0023
TC3	0.100	105	15000	95.5	0.0040
LM-80-15 Reporting requirements					
1. Number of samples tested:	24 per test condition				
2. Description of LED light sources	LED Package ¹				
3. Description of auxiliary equipment	see section 6.1 below				
4. Operating cycle	LED packages are driven at constant current for life test and are pulsed for photometric test.				
5. Ambient conditions, airflow, relative humidity	LED's are operated on controlled thermal plates in an environment that complies with the requirements given in Section 4.4 of LM-80-15. Case temperature (Ts): controlled to within -2°C, Surrounding air temp: controlled to within -5°C of Ts, Humidity: < 65 RH, No forced air flow				
6. Case temperature (test point temperature)	See summary table above for test conditions. The temperature measurement point is shown in Sec. 6.3.				
7. Drive current during life test	see summary table above				
8. Initial luminous flux and forward voltage	see data tables for individual test conditions				
9. Lumen maintenance data for each individual LED light source	see data tables for individual test conditions				
10. Observation of LED light source failures	see data tables for individual test conditions				
11. LED light source monitoring intervals	see data tables for individual test conditions				
12. Photometric measurement uncertainty	k=2 expanded measurement uncertainty for relative luminous flux measurements is $\pm 2.0\%$				
13. Chromaticity shift reported over the measurement time	see data tables for individual test conditions				
14. Test start date	April 18, 2019				
15. ANSI target and calculated CCT values	see data tables				

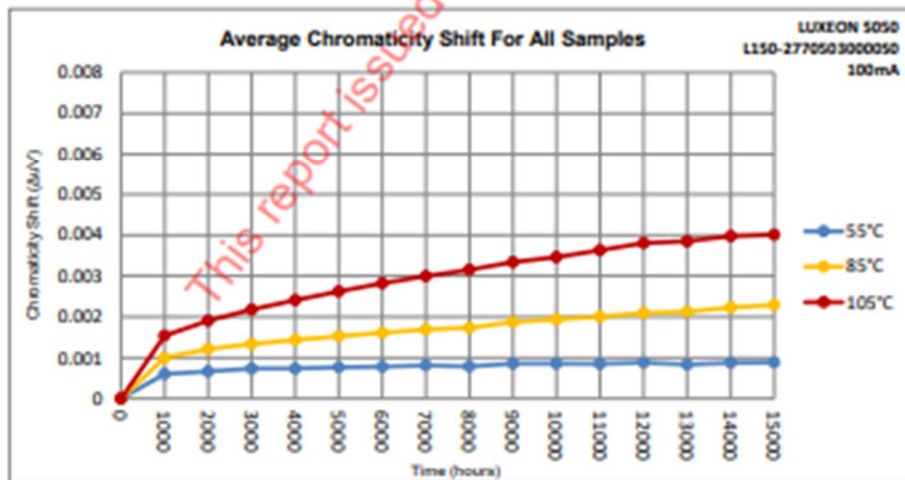
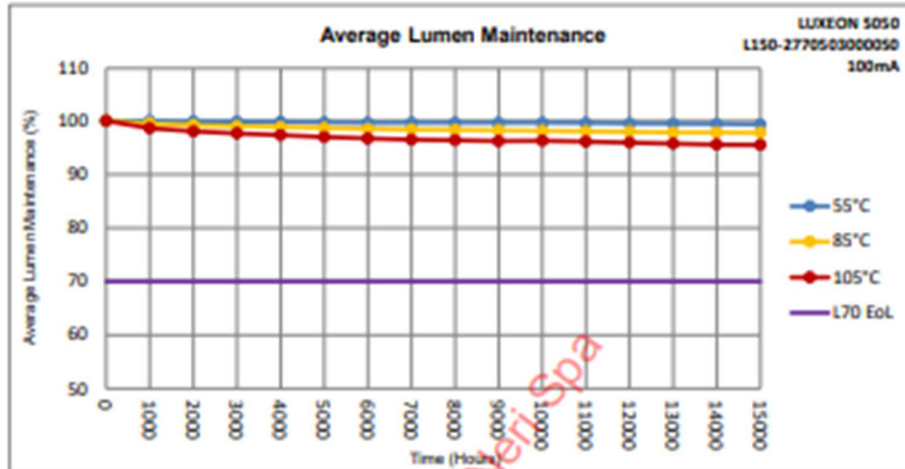
Notes:

- per ANSI/IESNA RP-16-05 Addendum b, *Nomenclature and Definitions for Illuminating Engineering*

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5.0 Charts:



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1.4 TM-21-11 Data

Lumen maintenance L_{70} lifetimes are calculated according to IESNA TM-21-11 method with 15,000 hrs of maintenance data with a minimum sample size of 24 per test condition.

Test Conditions	alpha	B	L_{70} (hrs)	
			Reported	Projected
50mA 55°C	-7.0269E-08	0.9996	90,000	-5,070,807
50mA 85°C	5.0053E-07	0.9950	90,000	702,547
50mA 105°C	1.4159E-06	0.9874	90,000	242,948
100mA 55°C	4.1621E-07	1.0001	90,000	857,262
100mA 85°C	8.2159E-07	0.9896	90,000	421,418
100mA 105°C	1.3117E-06	0.9744	90,000	252,163

Additional Projected L_{xx} per TM-21-11:

Projected L_{80}

	If = 50mA	If = 100mA
Ts = 55°C	-3,170,520	536,434
Ts = 85°C	435,768	258,891
Ts = 105°C	148,640	150,365

Projected L_{90}

	If = 50mA	If = 100mA
Ts = 55°C	-1,494,348	253,444
Ts = 85°C	200,452	115,531
Ts = 105°C	65,454	60,573

Annex C: list of used equipment

Measurement	Testing / measuring equipment / materials used	Range used	Calibration Date	
			Last	Due
Thermal tests and Electrical parameter	LAB030 – Digital power meter WT-230 YOKOGAWA	0-300Vac 0-5A 0-1,5KW	2022-10-28	2023-10-28
Endurance test and thermal tests	LAB019 – Thermal test room and acquisition system	0-300°C	2022-12-13	2023-12-13
Power supply stabilizer	LAB032 – AC source	0-300V a.c.	2021-06-28	2024-06-28

END OF TEST REPORT