



LM-79-08 Test Report

For

P.Q.L., Inc.

2285 Ward Avenue / Simi Valley, CA 93065

Model name(s): 93783

Report Type: Testing and Report According to IES LM-79-2008
Type of Luminaire: Retrofit Kits for Direct Linear Ambient Luminaires
Report Date: 2023-08-29
Ningbo TengLi Testing Co., Ltd
Prepared By: 2nd floor, Block B, Ningbo Testing and Certification Base,
No. 66 Qingyi Road, Ningbo National Hi-Tech Zone,
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Test & Report By:

Engineer: Wat Wang

Review By:

Manager: Nick Song

Note: 1. The results contained in this report pertain only to the tested samples
2. This report does not imply product certification, approval, or endorsement by A2LA, or any agency of the Federal Government.



1.1 Product Information:		
Model Number	93783	
Representative (Tested) Model	93783 (0%,3500K) 93783 (50%,4000K) 93783 (100%,5000K)	
Model Difference	N/A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Retrofit Kits for Direct Linear Ambient Luminaires	
LED Manufacturer	ShenZhen JuFei Optoelectronics Co., Ltd.	
LED Model	01.JT.CC2835W80P03	
Dimming	Continuous	
Integral Controls	No	
Sample Number	STD230824NB-C1	
Date of Receipt	Aug.13,2023	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

1.2 Rated Values:	
Rated Voltage / Frequency	120-277Vac, 50/60Hz
Nominal Power	20W/30W/40W (Power Adjustable)
Rated Initial Lamp Lumen	--
Declared CCT	3500K,4000K,5000K (Color Tunable)



1.3 Test Specifications:

Test item	<ol style="list-style-type: none"> 1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	<ol style="list-style-type: none"> 1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2015 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source

1.4 Test Methods

1) Photometric and Light Distribution Measurement – Goniophotometer Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals.

2) Chromaticity Measurement – Sphere-Spectroradiometer Method:

Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.

3) Electrical Measurements:

Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.



2.1 Summary of Test Result

Criteria Item	Measured Value		Compliance	Requirement (DLC V5.1)
Minimum Total Luminous	6164.2		Pass	≥ 375 lm/ft (-10%)
Minimum Luminous Efficacy	154.97		Pass	Standard: ≥ 115 (-3%) Premium: ≥ 130 (-3%)
Minimum Power Factor	0.9611		Pass	≥ 0.9 (-3%)
Maximum THD %	14.48		Pass	≤ 20 (+5)
Minimum CRI	82.9		Pass	≥ 80 (-1)
Minimum R9	6		Pass	≥ 0 (-1)
Minimum Rg	96		Pass	≥ 89 (-1)
Minimum Rf	84		Pass	≥ 70 (-1)
Res, h1	-12		Pass	-12%-23%(-1%)
CCT (K)	3500K	3465	Pass	≤ 6500 K
	4000K	4159		
	5000K	5075		
Zonal Lumen Requirement	0-60°:	81.2	Pass	≥ 40 (-3)
UGR	21.2		Pass	< 22



2.2 Electrical, Photometric and Chromaticity Measurements

Test date	2023-08-15	Test Ambient:	25 ± 1 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	93783 (0%,3500K)	Total Operating Time(min)	75

Electrical Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD230824	120.1	60.01	0.3341	39.92	0.9948	6.30
NB-C1	277.2	60.01	0.1494	39.78	0.9611	14.48

**Photometric Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS–
 Goniophotometer Method(Test Distance: 26.00m):**

Parameter	Result	
Test Voltage (V)	120	277
Frequency (Hz)	60	60
Total Luminous (lm)	6201.3	6164.2
Luminous Efficacy (lm/W)	155.34	154.97
Zonal lumens in the 0-60° zone (%)	81.2	--
Beam Angle (°)	117.7	--
Center Beam Candle Power (cd)	2128	--
UGR Viewed Crosswise	21.2	--
UGR Viewed Endwise	20.2	--

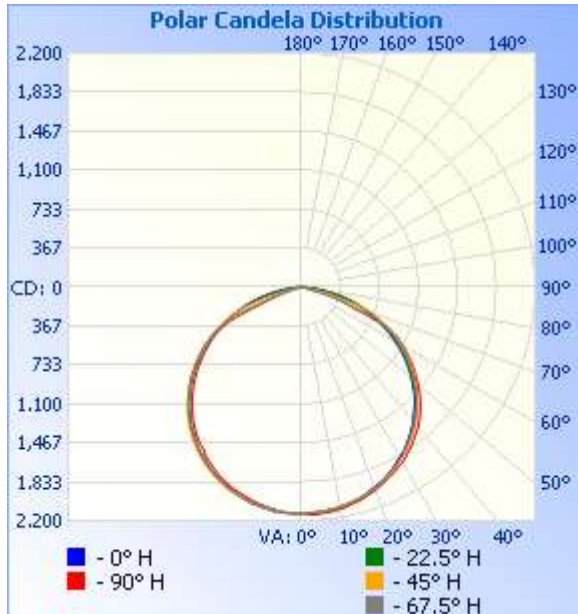


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,682.2	27.1%
0-40	2,784.2	44.9%
0-60	5,033.0	81.2%
60-90	1,157.5	18.7%
70-100	353.8	5.7%
90-120	4.7	0.1%
0-90	6,190.4	99.8%
90-180	10.1	0.2%
0-180	6,200.5	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	%Total
0-10	202.1	3.3%	90-100	1.7	0%
10-20	583.4	9.4%	100-110	1.4	0%
20-30	896.7	14.5%	110-120	1.5	0%
30-40	1,102.0	17.8%	120-130	1.3	0%
40-50	1,169.7	18.9%	130-140	1.3	0%
50-60	1,079.0	17.4%	140-150	1.1	0%
60-70	805.4	13.0%	150-160	0.9	0%
70-80	311.9	5.0%	160-170	0.6	0%
80-90	40.1	0.6%	170-180	0.2	0%

Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
4.0ft	133.0 fc	13.1 ft	13.3 ft
8.0ft	33.2 fc	26.3 ft	26.6 ft
12.0ft	14.8 fc	39.4 ft	39.9 ft
16.0ft	8.3 fc	52.5 ft	53.2 ft
20.0ft	5.3 fc	65.7 ft	66.5 ft

■ Vert. Spread: 117.3°
■ Horiz. Spread: 117.9°

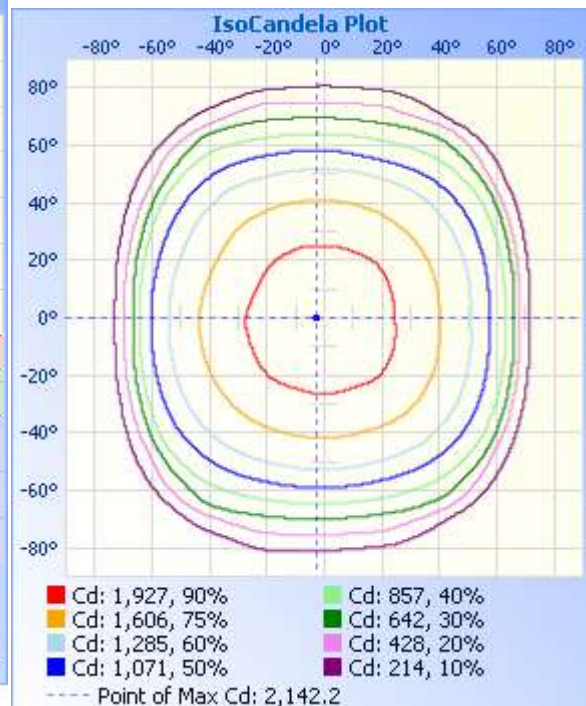
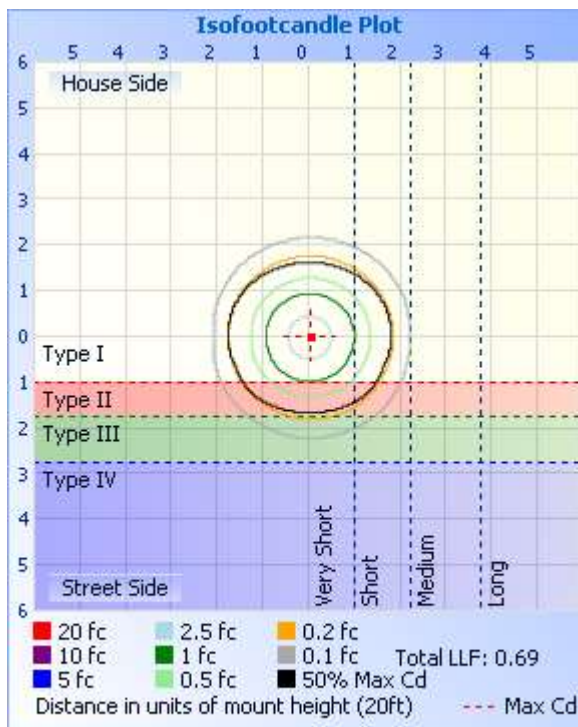




Table--1

UNIT: cd

C (DEG) γ (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5			
0	2128	2128	2128	2128	2128	2128	2128	2128	2128	2128	2128	2128	2128	2128	2128	2128			
5	2119	2120	2124	2118	2126	2117	2119	2125	2137	2129	2131	2127	2126	2126	2115	2125			
10	2087	2098	2111	2098	2097	2099	2099	2104	2119	2114	2114	2107	2106	2097	2103	2099			
15	2039	2051	2067	2064	2065	2066	2064	2061	2083	2076	2080	2071	2065	2069	2067	2065			
20	1987	1998	2009	2003	2003	2014	2010	2010	2030	2028	2034	2014	2010	2013	2026	2011			
25	1911	1922	1942	1934	1937	1947	1949	1942	1962	1969	1963	1947	1946	1939	1960	1940			
30	1820	1832	1856	1848	1851	1867	1874	1860	1903	1893	1885	1863	1855	1855	1876	1856			
35	1716	1730	1752	1746	1750	1760	1777	1765	1812	1800	1787	1761	1758	1748	1773	1752			
40	1595	1614	1615	1628	1637	1655	1670	1654	1709	1693	1676	1645	1637	1628	1655	1640			
45	1457	1482	1502	1491	1507	1523	1546	1532	1585	1566	1545	1514	1508	1498	1522	1509			
50	1305	1335	1350	1342	1358	1362	1405	1397	1435	1425	1405	1367	1359	1347	1371	1363			
55	1140	1176	1186	1158	1197	1208	1252	1240	1273	1270	1245	1207	1200	1181	1203	1198			
60	970	999	1008	989	1019	1039	1083	1074	1104	1099	1071	1033	1024	1004	1020	1020			
65	724	793	820	812	832	850	901	888	858	912	886	842	823	812	828	784			
70	268	332	623	624	643	667	705	447	446	470	688	646	624	612	592	335			
75	54.5	88.9	223	430	439	470	320	156	55.8	189	324	451	427	417	213	90.4			
80	21.3	21.1	29.3	238	253	246	31.0	16.1	17.2	15.8	36.7	266	239	192	29.8	21.6			
85	18.2	18.3	15.7	17.6	98.8	24.9	12.3	13.4	14.3	13.0	12.4	32.9	88.7	15.5	16.2	18.6			
90	0.33	1.59	3.89	5.18	5.83	4.06	1.77	0.17	0.56	0.65	3.46	5.32	5.91	5.49	3.36	0.83			
95	0.03	1.01	2.61	2.34	3.22	1.57	0.88	0.00	0.08	0.27	2.22	2.24	1.65	2.71	2.28	0.40			
100	0.13	0.55	1.15	1.59	3.71	1.19	0.47	0.00	0.35	0.50	0.79	1.46	2.72	1.85	1.09	0.54			
105	0.38	1.06	1.04	1.56	3.91	1.22	0.60	0.24	0.54	0.61	0.92	1.64	3.63	2.05	1.25	1.11			
110	0.46	1.14	1.12	1.81	3.33	1.37	0.68	0.40	0.79	0.79	1.17	2.04	4.04	2.41	1.53	1.27			
115	0.70	1.11	1.17	1.72	2.74	1.49	0.70	0.49	0.92	0.88	1.33	2.04	3.86	2.46	1.72	1.38			
120	0.70	1.03	1.20	1.44	2.13	1.47	0.93	0.59	0.95	1.14	1.51	1.97	3.45	2.36	1.82	1.40			
125	0.73	1.14	1.25	1.59	1.40	1.49	1.14	0.70	1.11	1.27	1.48	1.79	2.46	2.02	1.84	1.51			
130	0.95	1.14	1.22	1.92	1.70	2.05	1.14	0.94	1.41	1.53	1.56	2.07	1.85	2.05	1.92	1.62			
135	1.19	1.22	1.22	1.94	1.30	2.08	1.17	1.13	1.44	1.56	1.58	2.37	1.80	2.46	1.92	1.65			
140	1.22	1.37	1.22	2.07	1.29	2.23	1.22	1.16	1.57	1.61	1.74	2.37	1.22	2.76	2.05	1.70			
145	1.33	1.40	1.28	2.14	1.42	2.33	1.32	1.24	1.62	1.61	1.94	2.37	1.27	2.79	2.23	1.78			
150	1.33	1.40	1.56	2.17	1.50	2.36	1.56	1.35	1.65	1.67	2.12	2.37	1.42	2.68	2.23	2.16			
155	1.43	1.50	1.68	2.07	1.50	2.28	1.95	1.59	1.87	1.80	2.27	2.37	1.55	2.25	2.34	2.35			
160	1.62	1.56	1.81	2.07	1.78	2.33	1.95	1.67	2.03	2.01	2.30	2.37	1.86	1.82	2.91	2.43			
165	2.19	2.14	2.22	2.30	1.93	2.71	2.21	2.24	2.20	2.17	2.40	2.45	2.34	1.98	3.22	2.65			
170	2.46	2.40	2.73	2.35	2.01	2.91	2.75	2.46	2.63	2.56	2.58	2.75	2.29	2.05	3.19	2.91			
175	2.90	2.48	2.76	2.35	2.06	2.94	2.83	2.51	2.98	2.91	2.58	2.75	2.29	2.05	2.96	2.86			
180	2.90	2.59	2.63	2.35	2.06	2.86	2.86	2.56	2.92	2.85	2.48	2.63	2.26	2.05	2.91	2.83			



2.2 Electrical, Photometric and Chromaticity Measurements

Test date	2023-08-15	Test Ambient:	25 ± 1 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	93783 (0%,3500K)	Total Operating Time(min)	61

Electrical Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD230824	120.0	60	0.3377	40.32	0.9949	6.29
NB-C1	277.0	60	0.1509	40.18	0.9612	14.47

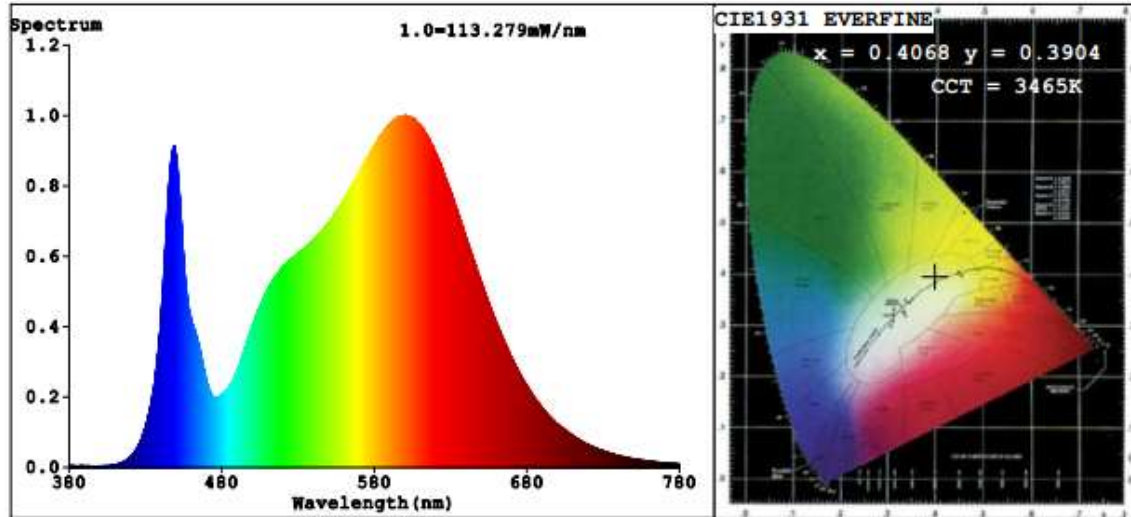
Chromaticity Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS - Sphere-Spectroradiometer Method(Self-absorption:1.1285)(4π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	3465
Duv	-0.0005
Chromaticity (x, y)	x=0.4068 y=0.3904
Chromaticity (u', v')	u'=0.2368 v'=0.5113
Color Rendering Index (CRI)	82.9
R9	6
Rg	97
Rf	84
Rcs,h1(%)	-12

Photometric Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS–Sphere-Spectroradiometer Method:

Parameter	Result	
Test Voltage (V)	120	277
Frequency (Hz)	60	60
Total Luminous (lm)	6270	6232
Luminous Efficacy (lm/W)	155.51	155.10

Spectral Power Distribution & Chromaticity Diagram



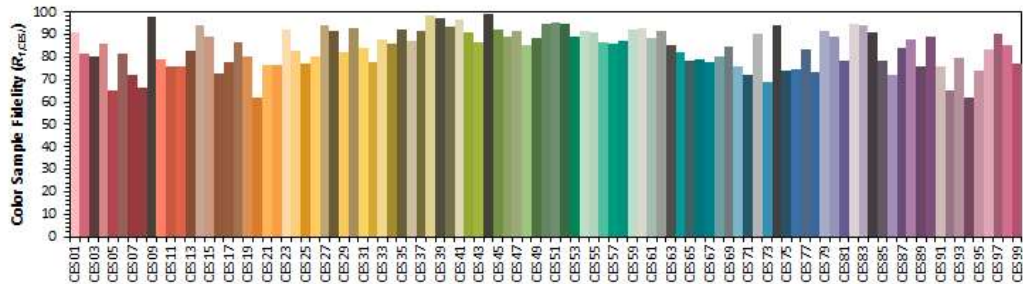
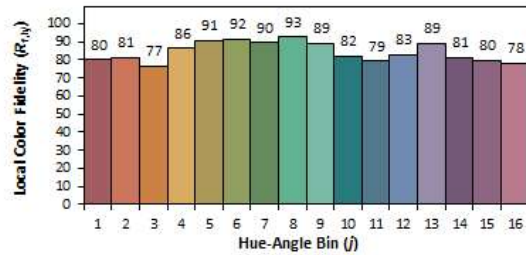
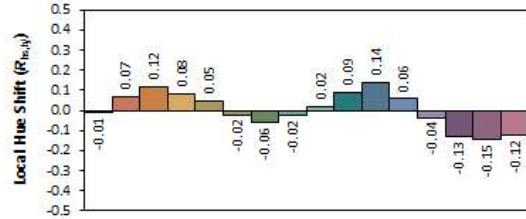
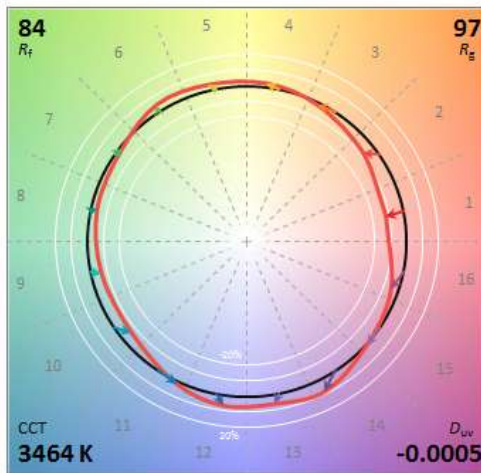
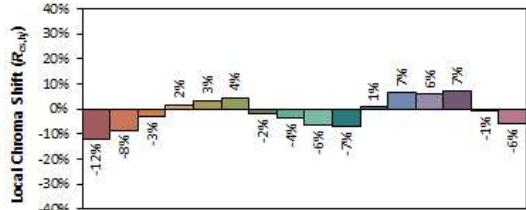
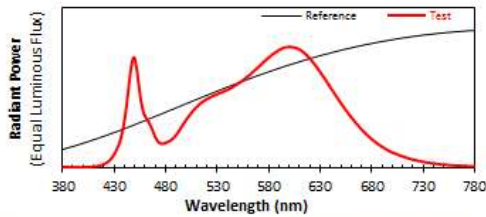
R1 =81	R2 =89	R3 =96	R4 =82	R5 =82	R6 =86	R7 =84		
R8 =62	R9 =6	R10=76	R11=82	R12=67	R13=83	R14=98	R15=74	



TM30

ANSI/IES TM-30-18 Color Rendition Report

Source: 01.JT.CC2835W80P03 Manufacturer: P.Q.L., Inc.
 Date: 2023-08-15 Model: 93783 (0%, 3500K)



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.4068	CIE 13.3-1995 (CRI)	
y	0.3902		
u'	0.2369		
v'	0.5113		
		R _a	83
		R _g	6

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



2.3 Electrical, Photometric and Chromaticity Measurements

Test date	2023-08-15	Test Ambient:	25 ± 1 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	93783 (50%,4000K)	Total Operating Time(min)	61

Electrical Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD230824	120.0	60	0.3218	38.41	0.9946	6.32
NB-C1	277.0	60	0.1437	38.28	0.9615	14.44

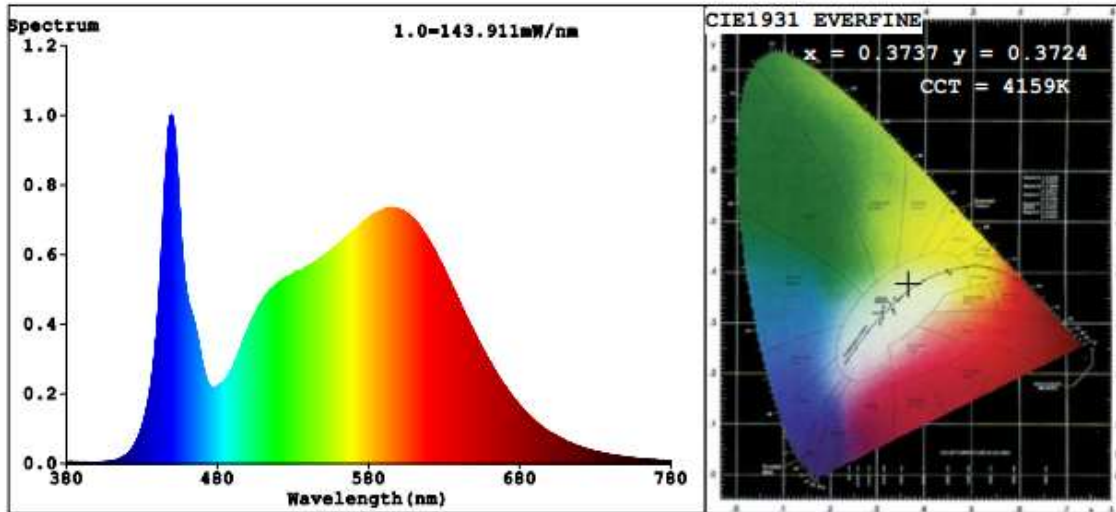
Chromaticity Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS - Sphere-Spectroradiometer Method(Self-absorption:1.1283)(4π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	4159
Duv	-0.0000
Chromaticity (x, y)	x=0.3737 y=0.3724
Chromaticity (u', v')	u'=0.2224 v'=0.4986
Color Rendering Index (CRI)	84.4
R9	14
Rg	96
Rf	85
Rcs,h1(%)	-12

Photometric Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS–Sphere-Spectroradiometer Method:

Parameter	Result	
Test Voltage (V)	120	277
Frequency (Hz)	60	60
Total Luminous (lm)	6461	6422
Luminous Efficacy (lm/W)	168.21	167.76

Spectral Power Distribution & Chromaticity Diagram



R1 =83 R2 =90 R3 =95 R4 =84 R5 =83 R6 =86 R7 =87
R8 =67 R9 =14 R10=76 R11=84 R12=63 R13=85 R14=97 R15=77

TM30

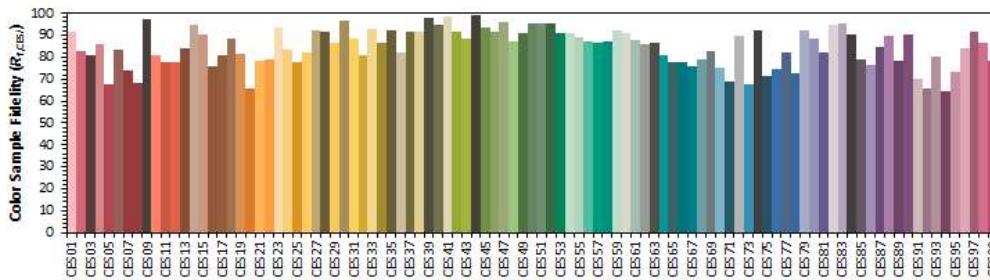
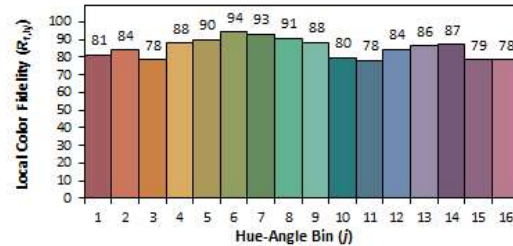
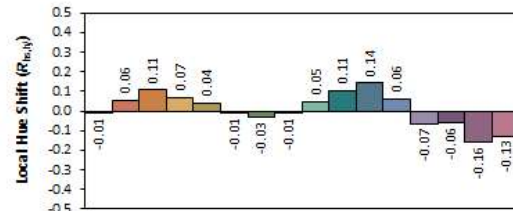
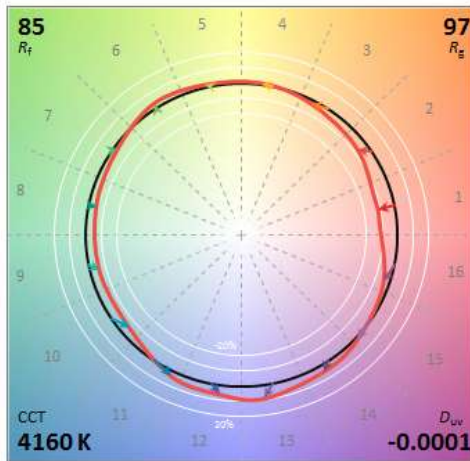
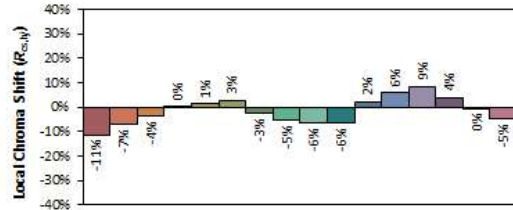
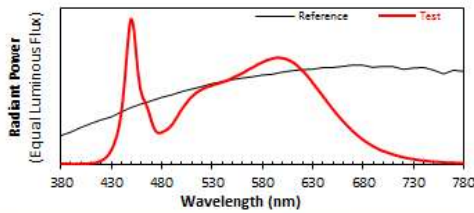
ANSI/IES TM-30-18 Color Rendition Report

Source: 01.JT.CC2835W80P03

Manufacturer: P.Q.L., Inc.

Date: 2023-08-15

Model: 93783 (50%, 4000K)



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.3736
 y 0.3723
 u' 0.2224
 v' 0.4986

CIE 13.3-1995 (CRI)

R_a 84
 R_g 14

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



2.4 Electrical, Photometric and Chromaticity Measurements

Test date	2023-08-15	Test Ambient:	25 ± 1 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	93783 (100%,5000K)	Total Operating Time(min)	61

Electrical Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD230824	120.0	60	0.3316	39.60	0.9953	6.24
NB-C1	277.0	60	0.1481	39.46	0.9617	14.42

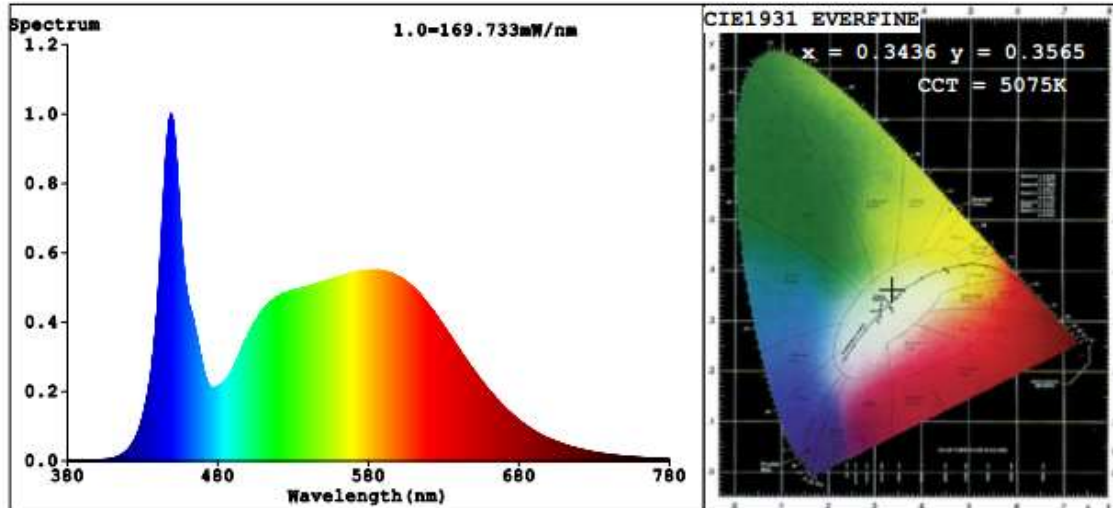
Chromaticity Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS - Sphere-Spectroradiometer Method(Self-absorption:1.1284)(4π geometry):

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
CCT (K)	5075
Duv	0.0031
Chromaticity (x, y)	x=0.3436 y=0.3565
Chromaticity (u', v')	u'=0.2085 v'=0.4868
Color Rendering Index (CRI)	83.5
R9	9
Rg	96
Rf	84
Rcs,h1(%)	-12

Photometric Measurement in LITHONIA SERIES L2 32 MOVLT GEB10IS–Sphere-Spectroradiometer Method:

Parameter	Result	
Test Voltage (V)	120	277
Frequency (Hz)	60	60
Total Luminous (lm)	6356	6318
Luminous Efficacy (lm/W)	160.51	160.11

Spectral Power Distribution & Chromaticity Diagram



R1 =82	R2 =88	R3 =92	R4 =84	R5 =83	R6 =84	R7 =87		
R8 =68	R9 =9	R10=71	R11=85	R12=64	R13=83	R14=96	R15=76	

TM30

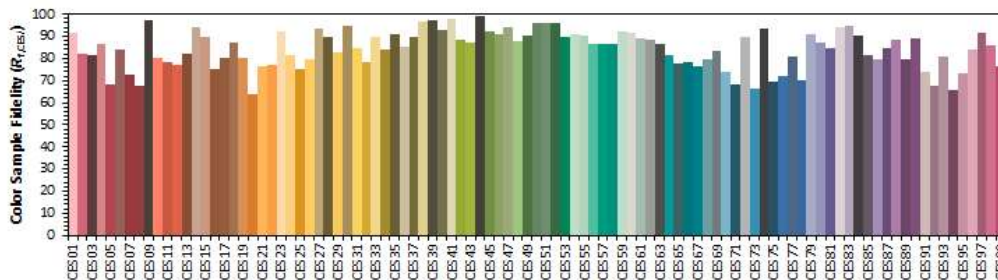
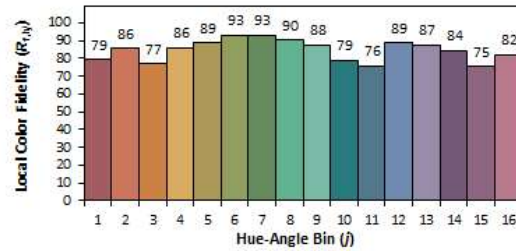
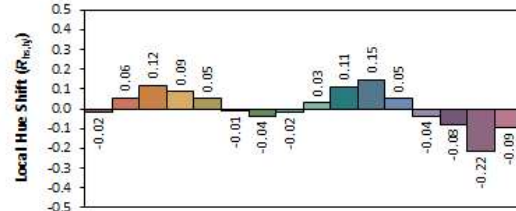
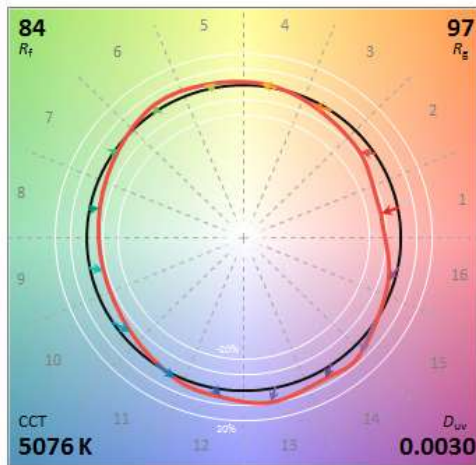
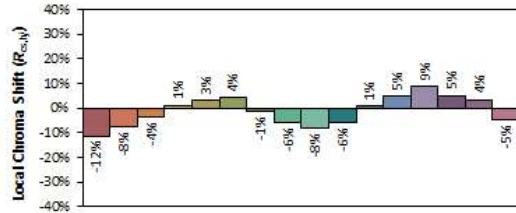
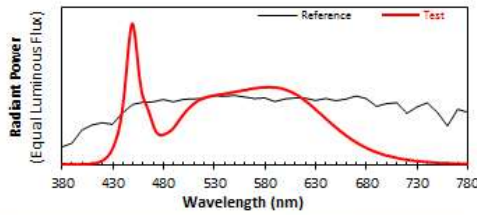
ANSI/IES TM-30-18 Color Rendition Report

Source: 01.JT.CC2835W80P03

Manufacturer: P.Q.L., Inc.

Date: 2023-08-15

Model: 93783 (100%, 5000K)



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.3435
 y 0.3563
 v' 0.2085
 v'' 0.4867

CIE 13.3-1995
(CRI)
 R_a 83
 R_g 9

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



2.5 Data comparison for different power

Test date	2023-08-15	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	60
Model Number	93783	Total Operating Time(min)	61

Sample No.	Wattage and CCT setting	Test Voltage (V)	Flux(lm)	P(W)	Luminous Efficacy lm/W
STD230824NB-C1	20W,3500K setting	120	3151	18.93	166.46
STD230824NB-C1	30W,3500K setting	120	4860	30.34	160.18
STD230824NB-C1	40W,3500K setting	120	6201.3	39.92	155.34



3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-702	2 meter Integrating Sphere	Verified by D204 standard lamp	
ST-R-701	Spectral analysis system HAAS-1200	Verified by D204 standard lamp	
ST-R-703	Standard Lamp D204	2022-12-29	2023-12-28
ST-R-704	Power Meter for Integrating Sphere	2022-12-29	2023-12-28
ST-R-707	Temperature Probe for Integrating Sphere	2023-01-03	2024-01-02
ST-R-714	Goniophotometer system	Verified by D908S standard lamp	
ST-R-710	Standard Lamp D908S	2022-12-29	2023-12-28
ST-R-711	Power Meter for Goniophotometer	2022-12-29	2023-12-28
ST-R-709	Hygrothermograph for Goniophotometer	2023-01-03	2024-01-02
Uncertainty(K=2): Photometric Measurement (Sphere):3.40% Chromaticity Measurement(Sphere):44.8K Photometric Measurement(Goniophotometer):3.64%			

4. Product Photo



***** END OF REPORT *****