Ningbo TengLi Testing Co., Ltd

2nd floor, Block B, Ningbo Testing and Certification Base, No. 66
Qingyi Road, Ningbo National Hi-Tech Zone, Ningbo, Zhejiang
Tel: 86574-8783 6802
Fax: 86574-8783 5902

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Certificate#4703.02

LM-79-08 Test Report

For

LEDVANCE LLC

(Brand Name: SYLVANIA)

200 BALLARDVALE STREET WILMINGTON, MA 01887

Model name(s): LEDRT4G650SC3

Report Type:	Testing and Report According to IES LM-79-2008
Type of Luminaire:	Directional downlights
Report Date:	2021-11-15
Prepared By:	Ningbo TengLi Testing Co., Ltd 2nd floor, Block B, Ningbo Testing and Certification Base, No. 66 Qingyi Road, Ningbo National Hi-Tech Zone, Ningbo, Zhejiang

Test & Report By:

Engineer: Nick Song

Review By:

Manager: Garman Mo

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.

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1.1 Product Information:		
Model Number	LEDRT4G650SC3	
Remark	N/A	
Representative (Tested) Model	LEDRT4G650SC3	
Model Difference	N/A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Directional downlights	
LED Manufacturer	Bridgelux,Inc.	
LED Model	BXFN-XXG-13H-98	
Dimming	Dimmable	
Sample Number	STD210933NB-B1	
Date of Receipt	Nov.03,2021	
Luminaire Aperture (for Downlight Retrofits)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

1.2 Rated Values:	
Rated Voltage / Frequency	120Vac,60 Hz
Nominal Power	9W
Rated Initial Lamp Lumen	--
Declared CCT	2700K/3000K/3500K/4000K/5000K

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1.3 Test Specifications:

Test item	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	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°C ± 1°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 25º C ± 1º 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 25º C ± 1º 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.

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2.1.1 Electrical, Photometric and Chromaticity Measurements

Test date	2021-11-04	**Test Ambient:**	25±1 ° C
Test Orientation	As intended	**Stabilization Time (min)**	45
Model Number	LEDRT4G650SC3 /2700K setting	**Total Operating Time(min)**	55

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
STD210933 NB-B1	119.9	60.01	0.0744	8.642	0.9688

Chromaticity Measurement - Sphere-Spectroradiometer Method: (Self-absorption: 1.0274) (4π geometry):

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	95.0
Duv	77
Chromaticity (x, y)	x=0.4603 y=0.4142
Chromaticity (u', v')	u'=0.2612 v'=0.5288
Color Rendering Index (CRI)	2772
R9	0.0013

Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	705.97
Luminous Efficacy (lm/W)	81.69
Beam Angle (°)	47.4
Center Beam Candle Power (cd)	826

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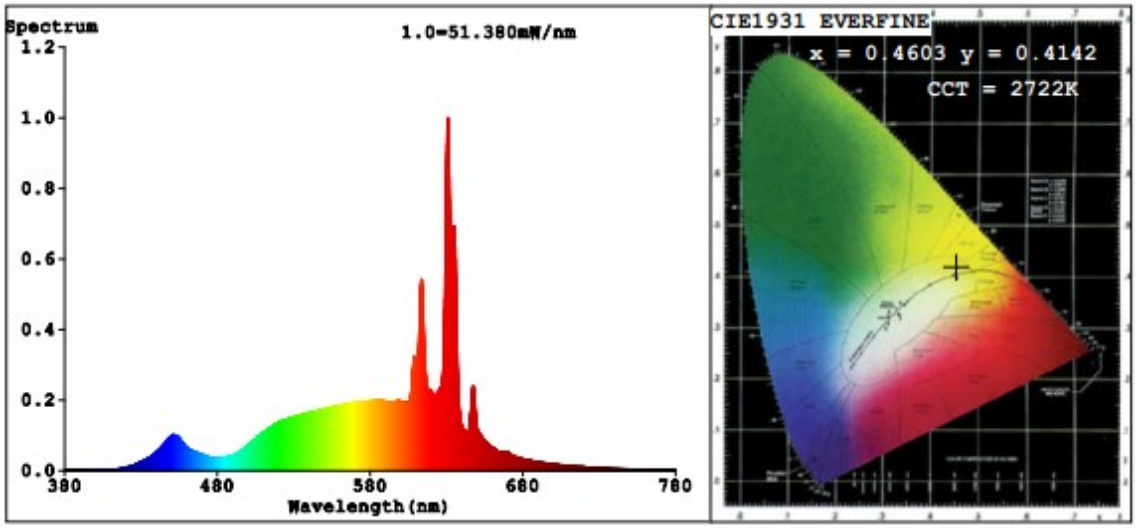
Spectral Power Distribution & Chromaticity Diagram



R1 =99	R2 =96	R3 =89	R4 =95	R5 =97	R6 =96	R7 =96	
R8 =92	R9 =77	R10=86	R11=94	R12=81	R13=98	R14=92	R15=95

Zonal Lumen Tabulation

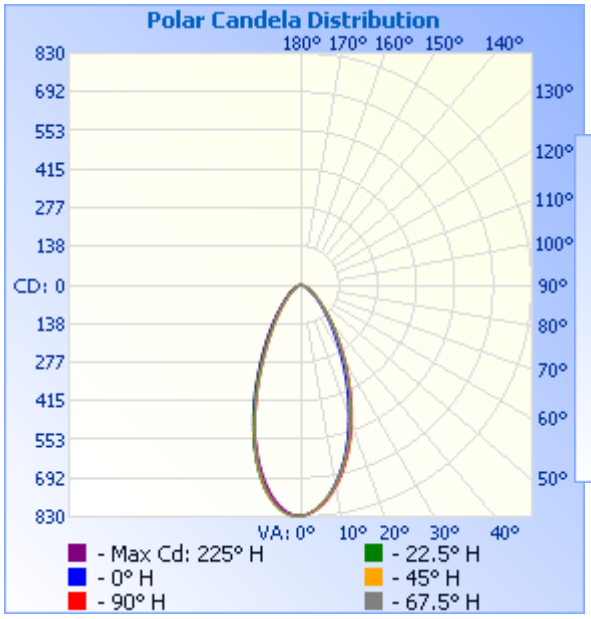
Zonal Lumen Summary

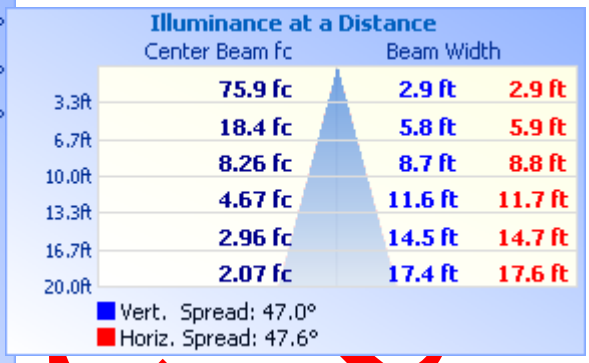
Zone	Lumens	% Luminaire
0-30	420.7	59.6%
0-40	544.3	77.1%
0-60	664.1	94.1%
60-90	41.6	5.9%
70-100	16.3	2.3%
90-120	0	0%
0-90	705.8	100%
90-180	0.0	0%
0-180	705.8	100%

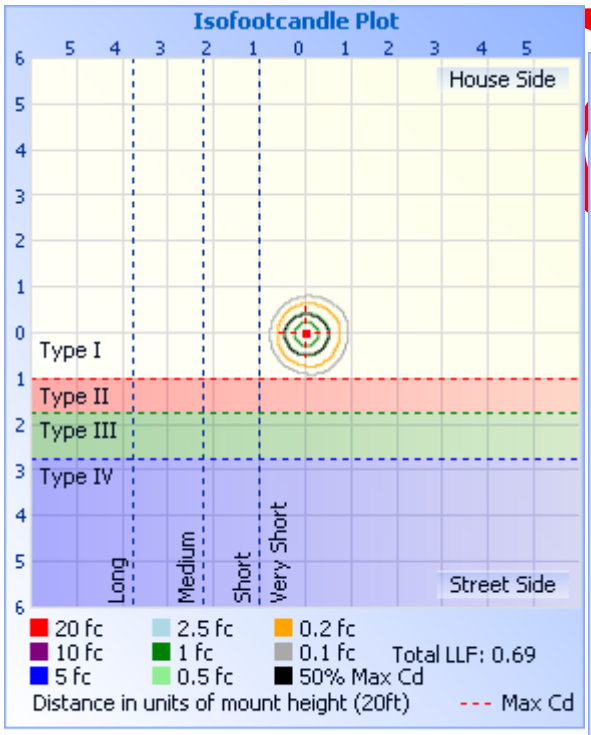
Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	74.1	10.5%	90-100	0	0%
10-20	172.6	24.5%	100-110	0	0%
20-30	174.0	24.7%	110-120	0	0%
30-40	123.6	17.5%	120-130	0	0%
40-50	75.7	10.7%	130-140	0.0	0%
50-60	44.2	6.3%	140-150	0	0%
60-70	25.3	3.6%	150-160	0	0%
70-80	12.9	1.8%	160-170	0	0%
80-90	3.4	0.5%	170-180	0	0%

Photometric Data







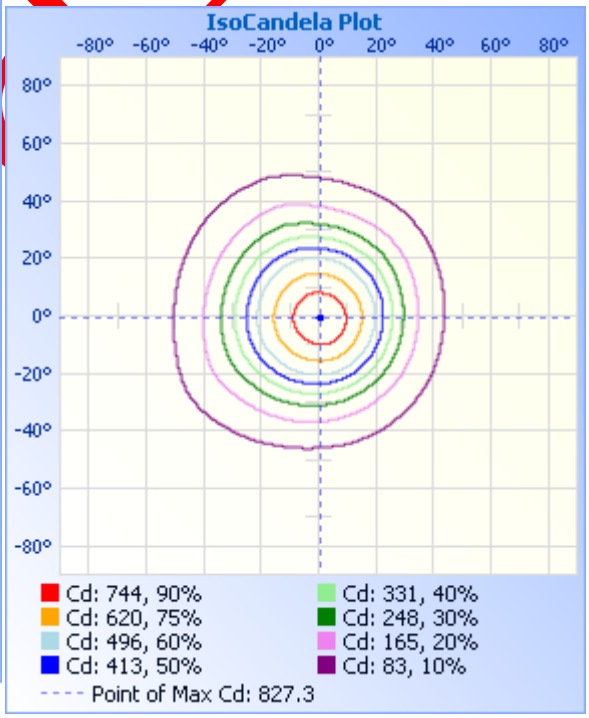


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Table--1 UNIT: cd

γ (DEG) \ C (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	826	826	826	826	826	826	826	826	826	826	826	826	826	826	826	826
5	805	802	797	793	792	793	794	795	798	799	801	803	807	809	809	809
10	729	727	720	716	720	724	725	727	732	732	730	731	737	740	738	734
15	612	614	608	613	620	629	631	633	641	639	632	625	626	628	621	615
20	473	480	483	494	505	521	525	526	536	531	516	503	498	491	478	473
25	338	348	361	374	389	411	414	416	424	419	397	382	369	358	341	338
30	230	241	259	270	288	312	315	316	323	318	293	276	261	247	232	231
35	155	164	180	189	207	234	231	230	238	238	211	195	182	168	156	156
40	105	113	123	131	148	173	164	162	170	178	149	135	125	114	106	106
45	72.2	78.5	84.9	91.2	105	125	117	115	121	130	106	92.8	85.9	78.6	71.6	70.3
50	50.1	55.6	60.1	64.2	74.2	88.4	83.8	83.3	86.8	92.4	74.1	65.0	60.5	55.2	49.2	47.6
55	35.1	39.6	43.3	45.8	52.5	63.3	60.5	60.1	62.7	65.9	52.6	46.3	43.6	39.4	34.5	33.1
60	25.3	28.8	31.6	32.6	37.1	45.7	43.4	43.0	45.1	47.4	37.6	33.3	31.9	28.5	25.0	23.9
65	18.6	21.0	23.2	23.4	26.3	32.3	30.7	30.1	32.2	33.9	26.9	24.2	23.4	20.8	18.6	17.8
70	13.5	15.1	16.7	16.7	18.5	22.4	21.4	20.9	22.5	23.7	19.0	17.4	16.9	15.0	13.6	13.1
75	9.04	10.1	11.2	11.3	12.4	14.8	14.3	14.1	15.1	15.7	12.9	11.9	11.5	10.2	9.12	8.74
80	5.30	5.90	6.57	6.69	7.29	8.52	8.42	8.47	9.09	9.34	7.91	7.32	6.99	6.04	5.36	5.14
85	2.11	2.31	2.49	2.66	2.89	3.17	3.57	3.69	3.75	3.85	3.43	3.16	2.93	2.56	2.24	2.12
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2.2.2 Electrical, Photometric and Chromaticity Measurements	IES LM-79 2008

Test date	2021-11-04	Test Ambient:	25±1 ° C
Test Orientation	As intended	Stabilization Time (min)	45
Model Number	LEDRT4G650SC3 /3000K setting	Total Operating Time(min)	55

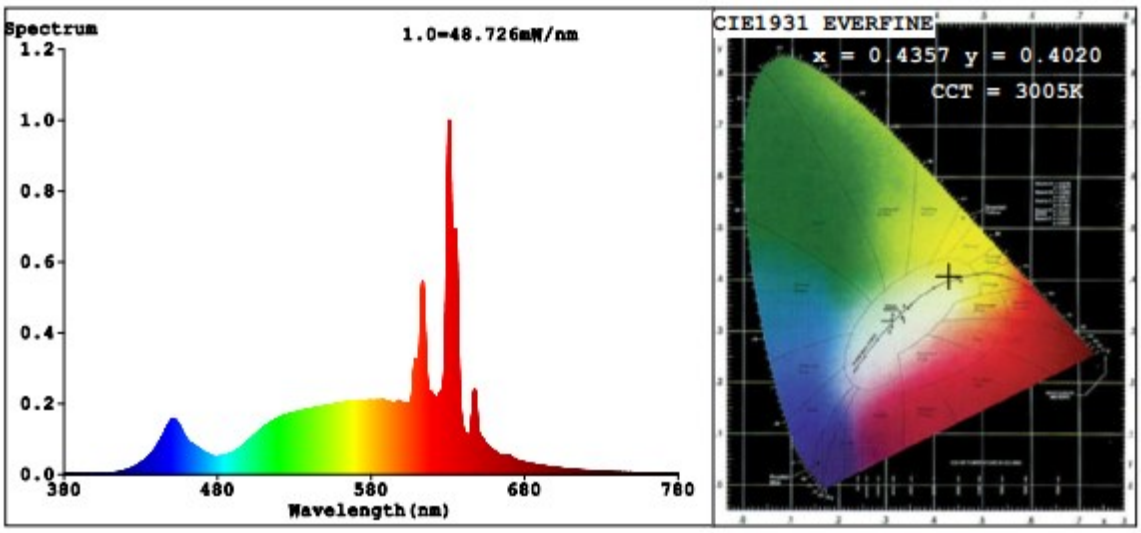
Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz	Current (A)	Power (W)	Power Factor
STD210933 NB-B1	120.06	60	0.0743	8.657	0.9711

Sphere-Spectroradiometer Method: (Self-absorption: 1.0274) (4π geometry):

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	95.8
R9	84
CCT (K)	3005
Duv	-0.0006
Chromaticity (x, y)	x=0.4357 y=0.4020
Chromaticity (u', v')	u'=0.2506 v'=0.5204
Total Luminous (lm)	712.5
Luminous Efficacy (lm/W)	82.30

Spectral Power Distribution and Chromaticity Diagram



R1 =99	R2 =97	R3 =90	R4 =95	R5 =98	R6 =96	R7 =96	
R8 =95	R9 =84	R10=88	R11=93	R12=82	R13=99	R14=92	R15=98

.2.3 Electrical, Photometric and Chromaticity Measurements	IES LM-79 2008

Test date	2021-11-04	Test Ambient:	25±1 ° C
Test Orientation	As intended	Stabilization Time (min)	45
Model Number	HT-G65ERRD5-812-35D-ZZ1 /3500K setting	Total Operating Time(min)	55

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz	Current (A)	Power (W)	Power Factor
STD210933 NB-B1	120.11	60	0.0745	8.649	0.97671

Sphere-Spectroradiometer Method: (Self-absorption: 1.0274) (4π geometry):

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	95.8
R9	88
CCT (K)	3456
Duv	-0.0004
Chromaticity (x, y)	x=0.4074 y=0.3909
Chromaticity (u', v')	u'=0.2370 v'=0.5117
Total Luminous (lm)	722.5
Luminous Efficacy (lm/W)	83.54

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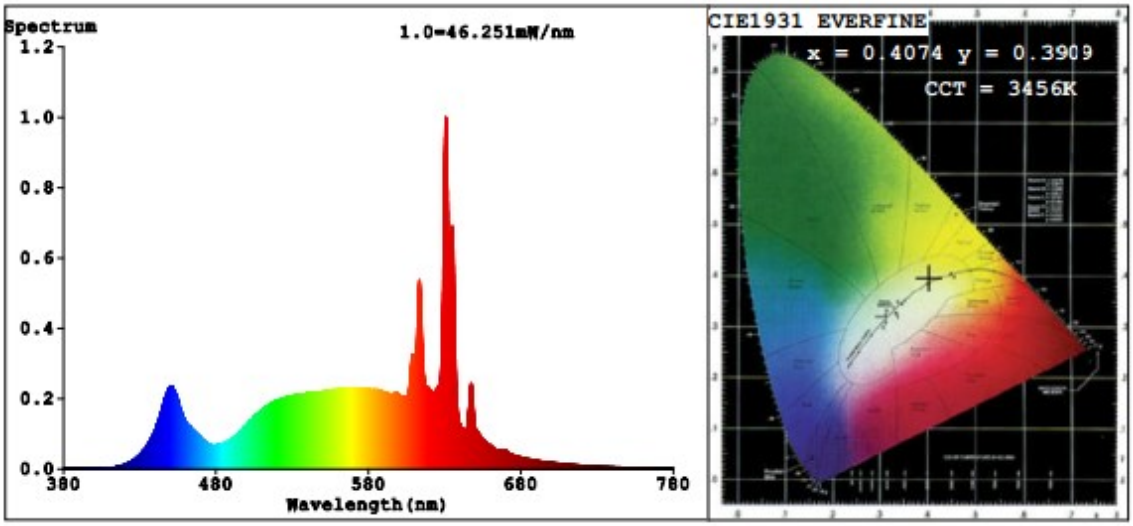
Spectral Power Distribution and Chromaticity Diagram



R1 =100	R2 =96	R3 =90	R4 =94	R5 =98	R6 =95	R7 =96	
R8 =97	R9 =88	R10=88	R11=93	R12=78	R13=99	R14=93	R15=99

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2.2.4 Electrical, Photometric and Chromaticity Measurements	**IES LM-79 2008**

Test date	2021-11-04	**Test Ambient:**	25±1 ° C
Test Orientation	As intended	**Stabilization Time (min)**	45
Model Number	LEDRT4G650SC3 /4000K setting	**Total Operating Time(min)**	55

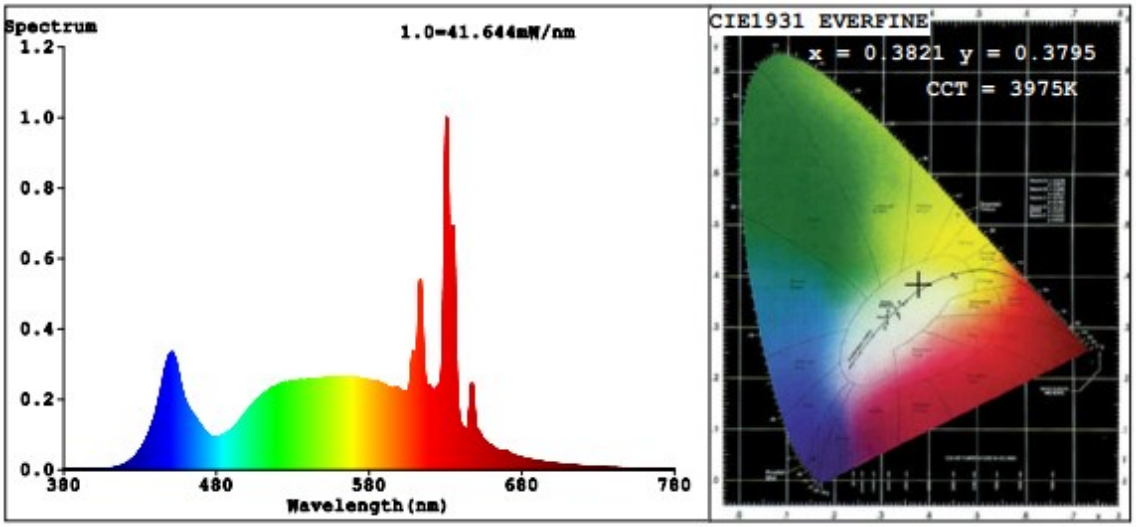
Electrical Measurement:

Sample No.	**Voltage (Vac)**	**Frequency (Hz**	**Current (A)**	**Power (W)**	**Power Factor**
STD210933 NB-B1	120.07	60	0.7452	8.665	0.9684

Sphere-Spectroradiometer Method: (Self-absorption: 1.0274) (4π geometry):

Parameter	**Result**
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	95.1
R9	87
CCT (K)	3975
Duv	0.0008
Chromaticity (x, y)	x=0.3821 y=0.3795
Chromaticity (u', v')	u'=0.2251 v'=0.5030
Total Luminous (lm)	724.7
Luminous Efficacy (lm/W)	83.64

Spectral Power Distribution and Chromaticity Diagram



R1 =98	R2 =95	R3 =90	R4 =95	R5 =96	R6 =93	R7 =96	
R8 =97	R9 =87	R10=86	R11=94	R12=74	R13=97	R14=93	R15=97

2.2.5 Electrical, Photometric and Chromaticity Measurements	IES LM-79 2008

Test date	2021-11-04	Test Ambient:	25±1 ° C
Test Orientation	As intended	Stabilization Time (min)	45
Model Number	LEDRT4G650SC3 /5000K setting	Total Operating Time(min)	55

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz	Current (A)	Power (W)	Power Factor
STD210933 NB-B1	120.08	60	0.0745	8.635	0.9656

Sphere-Spectroradiometer Method: (Self-absorption: 1.0274) (4π geometry):

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	92.0
R9	70
CCT (K)	5001
Duv	0.0046
Chromaticity (x, y)	x=0.3460 y=0.3617
Chromaticity (u', v')	u'=0.2081 v'=0.4896
Total Luminous (lm)	713.1
Luminous Efficacy (lm/W)	82.58

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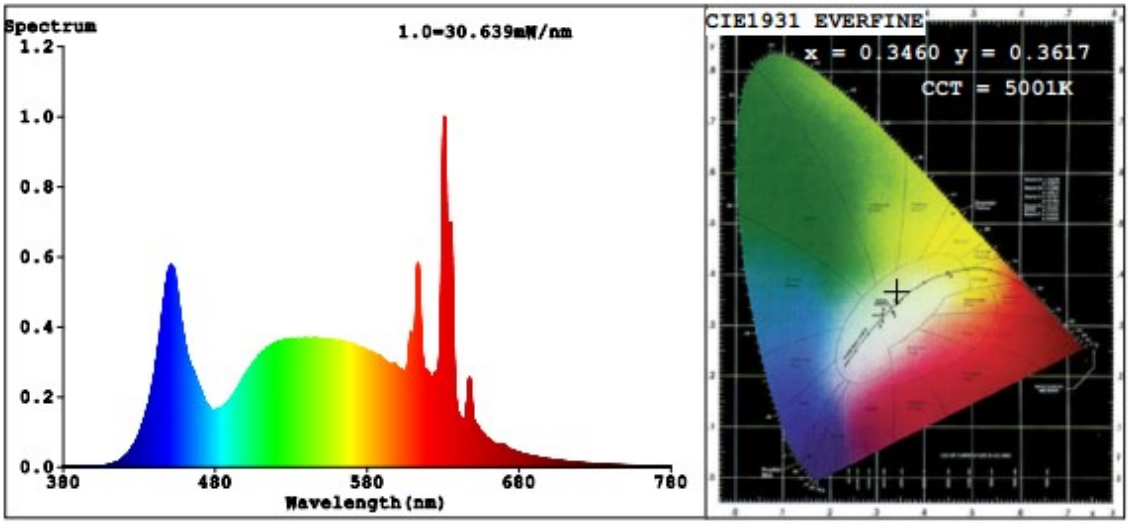
Spectral Power Distribution and Chromaticity Diagram



R1 =93	R2 =92	R3 =90	R4 =93	R5 =92	R6 =90	R7 =95	
R8 =91	R9 =70	R10=80	R11=93	R12=71	R13=92	R14=94	R15=92

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	2021-02-21	2022-02-20
ST-R-704	Power Meter for Integrating Sphere	2021-01-04	2022-01-03
ST-R-714	Goniophotometer system	Verified by D908S standard lamp	
ST-R-710	Standard Lamp D908S	2021-02-21	2022-02-20
ST-R-711	Power Meter for Goniophotometer	2021-01-04	2022-01-03
Uncertainty(K=2): Photometric Measurement (Sphere):3.94% Chromaticity Measurement(Sphere):48.2K Photometric Measurement(Goniophotometer):3.96%			

4. Product Photo

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