

LM-79-08 Test Report

For

SATCO PRODUCTS INC.

(Brand Name: SATCO/NUVO)

110 Heartland Blvd. Brentwood NY 11717

LED Downlights

Model name(s):
S11870

Representative (Tested) Model:

S11870 (Setting at 2700K)
S11870 (Setting at 3000K)
S11870 (Setting at 3500K)
S11870 (Setting at 4000K)
S11870 (Setting at 5000K)

Test & Report By:

Candy Chen

Engineer: Candy Chen

Date:2022-12-12

Review By:

Jason Luo

Manager: Jason Luo

1.1 Product Information:

Organization Name	SATCO PRODUCTS INC.		
Brand Name	SATCO/NUVO		
Model Number	S11870		
SKU (if available)	N/A		
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Downlights		
Rated Voltage / Frequency	120V/60HZ		
Nominal Power	12W		
Rated Initial Lamp Lumen	--		
Declared CCT	2700K, 3000K, 3500K, 4000K, 5000K(color tunable)		
LED Manufacturer	Lumileds Holding B.V.		
LED Model	L128-##90RA35000U1		
Sample Number	BLC2212001E-A1-PL		
Luminaire Aperture (for Downlights Retrofit)	--	in. mm mm s	
Luminaire Length	--		
Luminaires Width	--		
Number of Units (modular products)	N/A		
Photo			
			

1.2 Test Specifications:

Date of Receipt	2022-12-06
Date of Test	2022-12-10
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 C78.377-2008 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 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	BL-QP-033

1.3 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.
 Goniophotometer near field detector $f1'=1.13\%$, Test distance: 1.599m.

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.

Self-absorption:
 S11870:1.0225

2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2022-12-10	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	S11870 (Setting at 2700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
BLC2212001E-A1-PL	120.0	60	0.099	11.47	0.965

Sphere-Spectroradiometer Method:

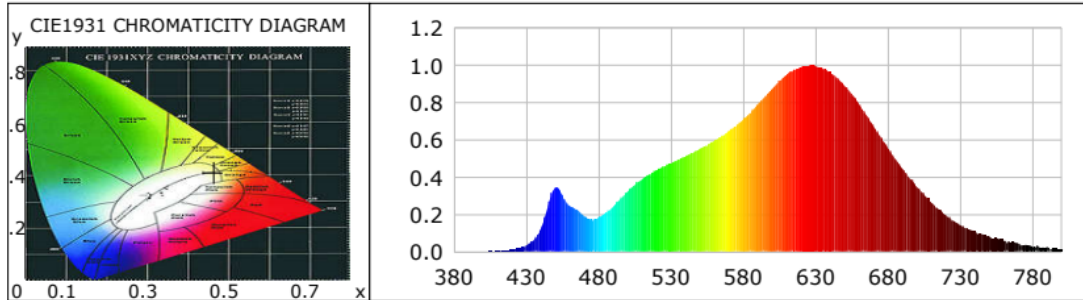
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	2702
Duv	0.00084
Chromaticity (x, y)	x=0.4612 y=0.4132
Chromaticity (u', v')	u(u')=0.2622 v'=0.5285
Color Rendering Index (CRI)	95
R9	67

Special Color Rendering Indices			
R1	95	R9	67
R2	98	R10	94
R3	99	R11	99
R4	96	R12	87
R5	96	R13	96
R6	98	R14	99
R7	93	R15	91
R8	85	--	--

Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	854.7
Luminous Efficacy (lm/W)	74.52
Beam Angle °	112.3
Center Beam Candle Power (cd)	312

Spectral Power Distribution and Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0001	0.0017	535	0.4561	8.9634	690	0.6721	13.2081
385	0.0008	0.0157	540	0.4746	9.3262	695	0.6111	12.0094
390	0.0012	0.0233	545	0.4933	9.6951	700	0.5542	10.8904
395	0.0010	0.0199	550	0.5113	10.0482	705	0.4990	9.8065
400	0.0014	0.0268	555	0.5310	10.4348	710	0.4463	8.7713
405	0.0016	0.0310	560	0.5524	10.8553	715	0.3926	7.7152
410	0.0020	0.0389	565	0.5730	11.2615	720	0.3461	6.8022
415	0.0050	0.0982	570	0.5971	11.7340	725	0.3024	5.9426
420	0.0110	0.2165	575	0.6195	12.1739	730	0.2619	5.1472
425	0.0194	0.3811	580	0.6460	12.6957	735	0.2273	4.4675
430	0.0336	0.6596	585	0.6765	13.2954	740	0.1942	3.8164
435	0.0600	1.1788	590	0.7081	13.9163	745	0.1674	3.2888
440	0.1199	2.3554	595	0.7473	14.6856	750	0.1427	2.8044
445	0.2415	4.7455	600	0.7885	15.4961	755	0.1192	2.3432
450	0.3438	6.7555	605	0.8323	16.3562	760	0.1067	2.0962
455	0.3043	5.9796	610	0.8746	17.1872	765	0.0957	1.8812
460	0.2457	4.8289	615	0.9170	18.0202	770	0.0799	1.5702
465	0.2269	4.4584	620	0.9493	18.6564	775	0.0724	1.4227
470	0.1924	3.7816	625	0.9750	19.1603	780	0.0604	1.1877
475	0.1713	3.3664	630	0.9921	19.4961	785	0.0501	0.9854
480	0.1830	3.5968	635	0.9982	19.6175	790	0.0433	0.8504
485	0.2077	4.0816	640	0.9962	19.5771	795	0.0374	0.7360
490	0.2410	4.7367	645	0.9833	19.3239	800	0.0280	0.5505
495	0.2817	5.5352	650	0.9642	18.9482			
500	0.3228	6.3442	655	0.9312	18.2994			
505	0.3578	7.0323	660	0.8899	17.4875			
510	0.3882	7.6291	665	0.8442	16.5894			
515	0.4152	8.1592	670	0.7890	15.5051			
520	0.4371	8.5898	675	0.7327	14.3997			
525	0.4561	8.9634	680	0.6721	13.2081			
530	0.4746	9.3262	685	0.6111	12.0094			

Zonal Lumen Tabulation

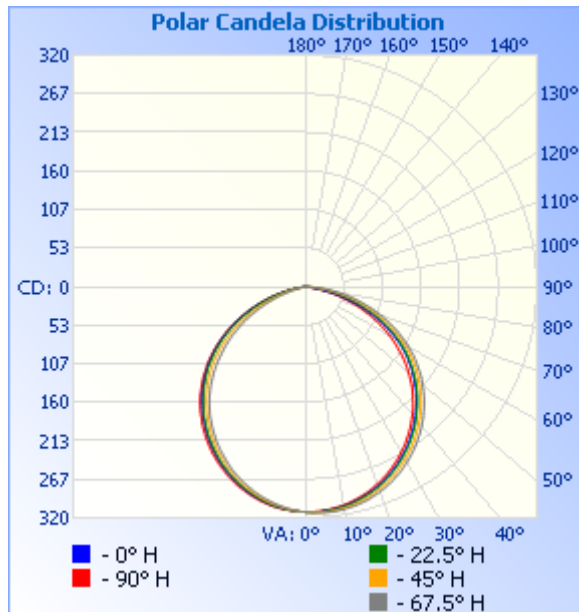
Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0-30	241.5	28.3%	28.3%
0-40	395.6	46.3%	46.3%
0-60	698.7	81.7%	81.8%
60-90	155.1	18.1%	18.1%
70-100	52.9	6.2%	6.2%
90-120	0.2	0%	0%
0-90	853.8	99.9%	99.9%
90-180	0.8	0.1%	0.1%
0-180	854.6	100%	100%

Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	29.5	3.4%	90-100	0.1	0%
10-20	84.3	9.9%	100-110	0.1	0%
20-30	127.7	14.9%	110-120	0.1	0%
30-40	154.1	18.0%	120-130	0.1	0%
40-50	160.1	18.7%	130-140	0.1	0%
50-60	143.0	16.7%	140-150	0.1	0%
60-70	102.3	12.0%	150-160	0.1	0%
70-80	46.9	5.5%	160-170	0.1	0%
80-90	5.9	0.7%	170-180	0.0	0%

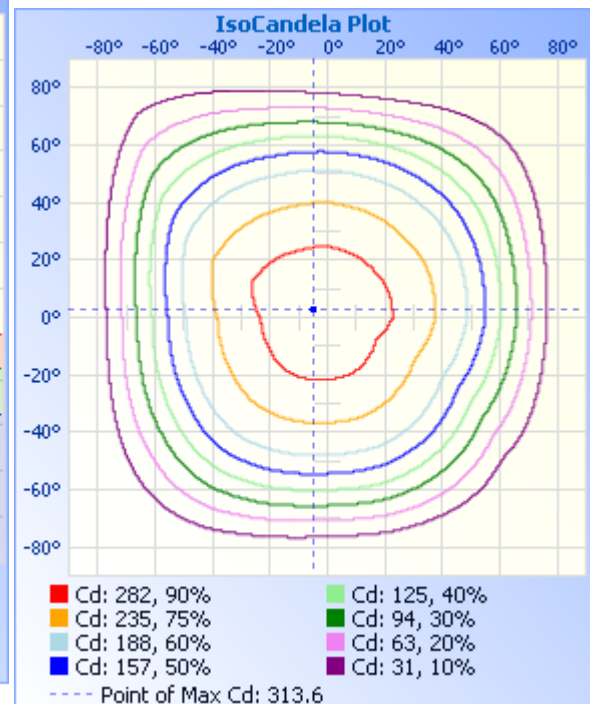
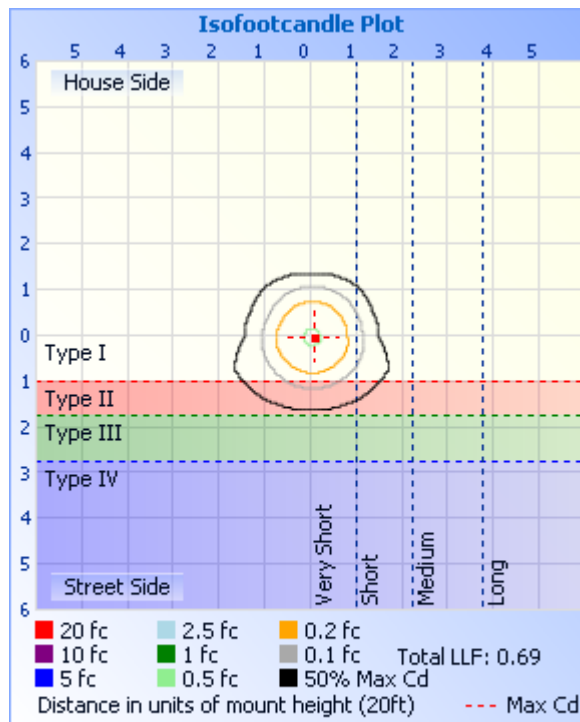
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	1.08 fc	50.7 ft	49.3 ft
34.0ft	0.27 fc	101.4 ft	98.6 ft
51.0ft	0.12 fc	152.0 ft	147.8 ft
68.0ft	0.07 fc	202.7 ft	197.1 ft
85.0ft	0.04 fc	253.4 ft	246.4 ft
102.0ft	0.03 fc	304.1 ft	295.7 ft

■ Vert. Spread: 112.3°
 ■ Horiz. Spread: 110.8°



Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	312	312	312	312	312	312	312	312	312	312	312	312	312	312	312	312	312
1	312	312	312	312	312	311	312	311	311	311	311	311	311	311	312	311	312
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29	272	273	279	283	268	266	267	263	260	258	254	249	263	265	265	268	272

Laboratory: UTEST TECHNICAL LABORATORY CO. LTD A2LA Certificate# 4810.01

Unit 401, No. 309 Xinxin Seven Road, Zengcheng District,
Guangzhou, People's Republic of China. engineer@etk-utest.com

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93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
117	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
124	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

126	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
131	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
134	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
136	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
143	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
144	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
146	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
148	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
151	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
154	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
156	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

158	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
167	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
171	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
173	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
174	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
176	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
178	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
179	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2022-12-10	Test Ambient:	25.0 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	S11870 (Setting at 3000K)		

Sphere-Spectroradiometer Method:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
BLC2212001E-A1-PL	120.0	60	0.101	11.71	0.966

Sphere-Spectroradiometer Method:

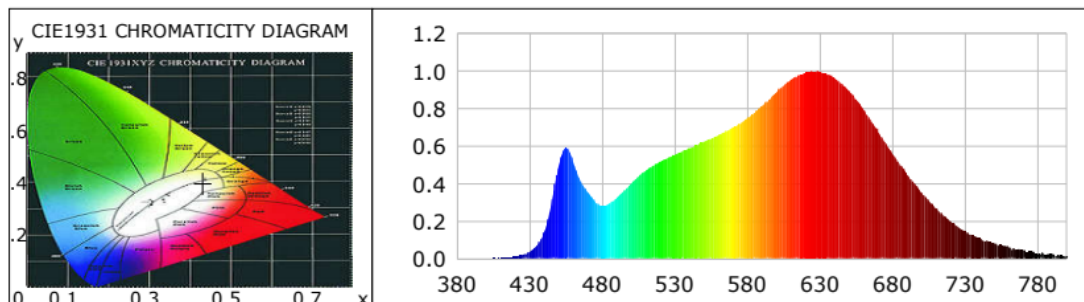
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	3058
Duv	-0.00194
Chromaticity (x, y)	x=0.4301 y=0.3969
Chromaticity (u', v')	u(u')=0.2493 v'=0.5175
Color Rendering Index (CRI)	96.3
R9	79

Special Color Rendering Indices			
R1	98	R9	79
R2	99	R10	99
R3	99	R11	99
R4	97	R12	82
R5	98	R13	100
R6	96	R14	99
R7	93	R15	96
R8	90	--	--

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	892.9
Luminous Efficacy (lm/W)	76.25

Spectral Power Distribution and Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0001	0.0019	535	0.5349	10.0850	690	0.6763	12.7498
385	0.0008	0.0158	540	0.5527	10.4198	695	0.6173	11.6372
390	0.0012	0.0224	545	0.5721	10.7863	700	0.5576	10.5119
395	0.0010	0.0187	550	0.5877	11.0798	705	0.5021	9.4655
400	0.0017	0.0316	555	0.6041	11.3894	710	0.4496	8.4759
405	0.0020	0.0370	560	0.6221	11.7272	715	0.4001	7.5423
410	0.0013	0.0240	565	0.6415	12.0942	720	0.3503	6.6041
415	0.0046	0.0859	570	0.6576	12.3972	725	0.3067	5.7813
420	0.0112	0.2112	575	0.6777	12.7767	730	0.2658	5.0101
425	0.0198	0.3732	580	0.6981	13.1606	735	0.2284	4.3065
430	0.0358	0.6759	585	0.7206	13.5855	740	0.1981	3.7343
435	0.0670	1.2628	590	0.7487	14.1140	745	0.1689	3.1838
440	0.1362	2.5686	595	0.7787	14.6801	750	0.1451	2.7348
445	0.2836	5.3461	600	0.8129	15.3256	755	0.1206	2.2744
450	0.4855	9.1528	605	0.8482	15.9904	760	0.1104	2.0820
455	0.5886	11.0961	610	0.8874	16.7293	765	0.0979	1.8464
460	0.5201	9.8051	615	0.9222	17.3863	770	0.0813	1.5318
465	0.4177	7.8754	620	0.9546	17.9972	775	0.0736	1.3878
470	0.3570	6.7301	625	0.9769	18.4164	780	0.0625	1.1792
475	0.3059	5.7669	630	0.9918	18.6973	785	0.0499	0.9410
480	0.2795	5.2700	635	0.9994	18.8410	790	0.0458	0.8640
485	0.2926	5.5153	640	0.9973	18.8015	795	0.0379	0.7144
490	0.3228	6.0863	645	0.9851	18.5708	800	0.0283	0.5340
495	0.3605	6.7962	650	0.9646	18.1854			
500	0.3993	7.5279	655	0.9324	17.5789			
505	0.4361	8.2206	660	0.8956	16.8845			
510	0.4667	8.7994	665	0.8479	15.9852			
515	0.4942	9.3171	670	0.7963	15.0117			
520	0.5157	9.7229	675	0.7380	13.9135			
525	0.5349	10.0850	680	0.6763	12.7498			
530	0.5527	10.4198	685	0.6173	11.6372			

2.3 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2022-12-10	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	S11870 (Setting at 3500K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
BLC2212001E-A1-PL	120.0	60	0.100	11.56	0.965

Sphere-Spectroradiometer Method:

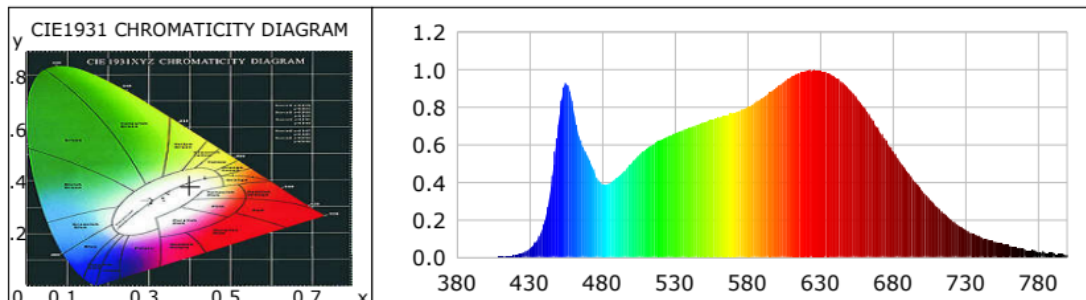
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	3543
Duv	-0.00256
Chromaticity (x, y)	x=0.4004 y=0.3825
Chromaticity (u', v')	u(u')=0.2359 v'=0.5070
Color Rendering Index (CRI)	96.4
R9	89

Special Color Rendering Indices			
R1	98	R9	89
R2	98	R10	98
R3	99	R11	99
R4	97	R12	77
R5	97	R13	98
R6	95	R14	99
R7	94	R15	97
R8	93	--	--

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	942.3
Luminous Efficacy (lm/W)	83.12

Spectral Power Distribution and Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0001	0.0021	535	0.6432	11.5382	690	0.6798	12.1941
385	0.0017	0.0298	540	0.6603	11.8439	695	0.6199	11.1199
390	0.0016	0.0294	545	0.6765	12.1347	700	0.5630	10.1000
395	0.0012	0.0215	550	0.6901	12.3799	705	0.5073	9.0996
400	0.0017	0.0300	555	0.7056	12.6580	710	0.4543	8.1485
405	0.0014	0.0254	560	0.7194	12.9049	715	0.4011	7.1957
410	0.0015	0.0276	565	0.7328	13.1457	720	0.3533	6.3371
415	0.0046	0.0826	570	0.7446	13.3568	725	0.3101	5.5628
420	0.0118	0.2120	575	0.7559	13.5596	730	0.2688	4.8220
425	0.0223	0.4002	580	0.7689	13.7918	735	0.2317	4.1558
430	0.0443	0.7940	585	0.7840	14.0639	740	0.2011	3.6070
435	0.0873	1.5666	590	0.8025	14.3956	745	0.1701	3.0513
440	0.1773	3.1806	595	0.8229	14.7615	750	0.1467	2.6315
445	0.3765	6.7531	600	0.8475	15.2024	755	0.1236	2.2171
450	0.7079	12.6976	605	0.8782	15.7527	760	0.1103	1.9792
455	0.9286	16.6571	610	0.9052	16.2369	765	0.0980	1.7578
460	0.8006	14.3617	615	0.9351	16.7731	770	0.0830	1.4888
465	0.6243	11.1989	620	0.9617	17.2520	775	0.0733	1.3153
470	0.5402	9.6896	625	0.9792	17.5656	780	0.0617	1.1077
475	0.4489	8.0527	630	0.9931	17.8142	785	0.0499	0.8953
480	0.3900	6.9965	635	0.9976	17.8953	790	0.0462	0.8280
485	0.3936	7.0604	640	0.9949	17.8465	795	0.0365	0.6552
490	0.4232	7.5917	645	0.9812	17.6002	800	0.0287	0.5142
495	0.4585	8.2249	650	0.9620	17.2558			
500	0.5004	8.9762	655	0.9354	16.7796			
505	0.5401	9.6890	660	0.8935	16.0283			
510	0.5738	10.2926	665	0.8496	15.2410			
515	0.6014	10.7871	670	0.7977	14.3101			
520	0.6244	11.2000	675	0.7409	13.2905			
525	0.6432	11.5382	680	0.6798	12.1941			
530	0.6603	11.8439	685	0.6199	11.1199			

2.4 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2022-12-10	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	S11870 (Setting at 4000K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
BLC2212001E-A1-PL	120.0	60	0.100	11.54	0.965

Sphere-Spectroradiometer Method:

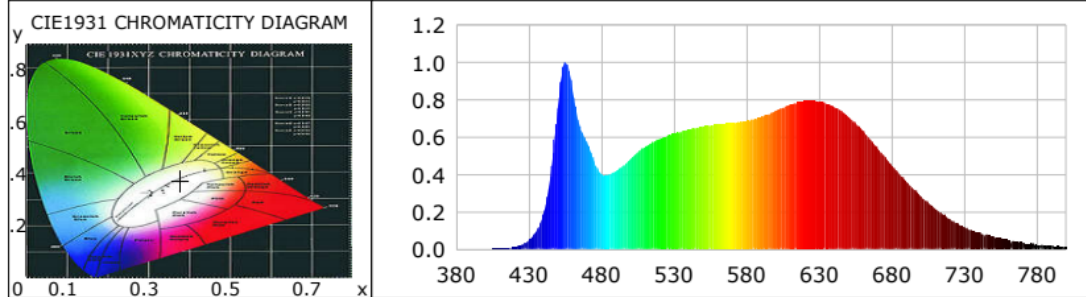
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	4064
Duv	-0.00142
Chromaticity (x, y)	x=0.3767 y=0.3714
Chromaticity (u', v')	u(u')=0.2248 v'=0.4987
Color Rendering Index (CRI)	96.1
R9	92

Special Color Rendering Indices			
R1	98	R9	92
R2	98	R10	99
R3	99	R11	97
R4	95	R12	72
R5	96	R13	99
R6	96	R14	99
R7	94	R15	96
R8	94	--	--

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	959.2
Luminous Efficacy (lm/W)	83.12

Spectral Power Distribution and Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0001	0.0021	535	0.6036	12.5087	690	0.5409	11.2088
385	0.0009	0.0197	540	0.6161	12.7686	695	0.4944	10.2466
390	0.0015	0.0312	545	0.6297	13.0505	700	0.4467	9.2570
395	0.0007	0.0146	550	0.6393	13.2488	705	0.4032	8.3569
400	0.0015	0.0313	555	0.6488	13.4448	710	0.3615	7.4914
405	0.0018	0.0374	560	0.6570	13.6154	715	0.3203	6.6389
410	0.0015	0.0317	565	0.6648	13.7775	720	0.2830	5.8656
415	0.0051	0.1053	570	0.6686	13.8569	725	0.2468	5.1156
420	0.0122	0.2527	575	0.6737	13.9613	730	0.2154	4.4646
425	0.0238	0.4927	580	0.6757	14.0036	735	0.1851	3.8364
430	0.0475	0.9846	585	0.6802	14.0969	740	0.1601	3.3174
435	0.0934	1.9361	590	0.6870	14.2383	745	0.1378	2.8567
440	0.1870	3.8762	595	0.6973	14.4512	750	0.1171	2.4277
445	0.3883	8.0464	600	0.7092	14.6981	755	0.0976	2.0222
450	0.7524	15.5921	605	0.7230	14.9831	760	0.0889	1.8418
455	1.0000	20.7241	610	0.7415	15.3679	765	0.0792	1.6404
460	0.8618	17.8609	615	0.7582	15.7134	770	0.0668	1.3851
465	0.6645	13.7710	620	0.7761	16.0834	775	0.0599	1.2404
470	0.5752	11.9197	625	0.7879	16.3290	780	0.0496	1.0272
475	0.4710	9.7612	630	0.7930	16.4349	785	0.0404	0.8382
480	0.4007	8.3038	635	0.7963	16.5036	790	0.0378	0.7841
485	0.3979	8.2467	640	0.7894	16.3586	795	0.0288	0.5964
490	0.4182	8.6662	645	0.7794	16.1533	800	0.0228	0.4719
495	0.4473	9.2696	650	0.7627	15.8068			
500	0.4831	10.0119	655	0.7408	15.3523			
505	0.5184	10.7441	660	0.7097	14.7082			
510	0.5473	11.3422	665	0.6746	13.9800			
515	0.5701	11.8139	670	0.6350	13.1594			
520	0.5900	12.2277	675	0.5876	12.1779			
525	0.6036	12.5087	680	0.5409	11.2088			
530	0.6161	12.7686	685	0.4944	10.2466			

2.5 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2022-12-10	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	S11870 (Setting at 5000K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
BLC2212001E-A1-PL	120.0	60	0.099	11.49	0.965

Sphere-Spectroradiometer Method:

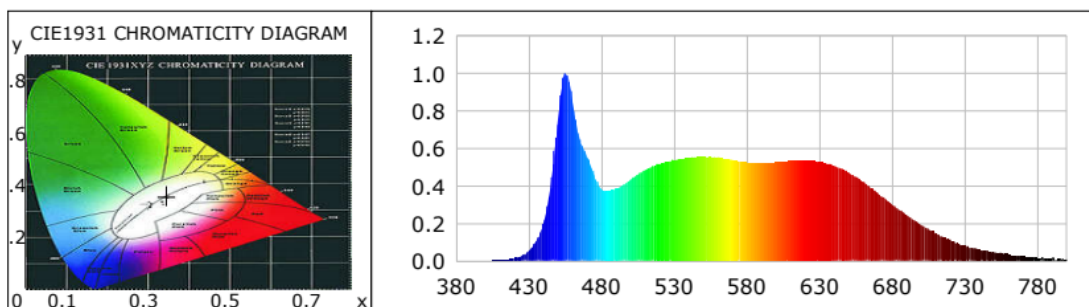
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
CCT (K)	5048
Duv	0.00297
Chromaticity (x, y)	x=0.3443 y=0.3569
Chromaticity (u', v')	u(u')=0.2088 v'=0.4871
Color Rendering Index (CRI)	95
R9	84

Special Color Rendering Indices			
R1	96	R9	84
R2	99	R10	96
R3	98	R11	84
R4	92	R12	71
R5	94	R13	98
R6	95	R14	99
R7	94	R15	95
R8	91	--	--

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	959.2
Luminous Efficacy (lm/W)	83.12

Spectral Power Distribution and Chromaticity Diagram



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0001	0.0035	535	0.5278	13.5775	690	0.3611	9.2890
385	0.0014	0.0361	540	0.5374	13.8239	695	0.3303	8.4955
390	0.0012	0.0313	545	0.5439	13.9918	700	0.3001	7.7207
395	0.0009	0.0239	550	0.5488	14.1186	705	0.2703	6.9532
400	0.0011	0.0290	555	0.5510	14.1735	710	0.2442	6.2813
405	0.0023	0.0587	560	0.5537	14.2432	715	0.2174	5.5918
410	0.0023	0.0587	565	0.5533	14.2321	720	0.1905	4.9017
415	0.0052	0.1339	570	0.5494	14.1317	725	0.1663	4.2774
420	0.0133	0.3425	575	0.5446	14.0104	730	0.1431	3.6814
425	0.0266	0.6846	580	0.5373	13.8215	735	0.1268	3.2614
430	0.0529	1.3614	585	0.5303	13.6404	740	0.1107	2.8465
435	0.1032	2.6549	590	0.5248	13.5011	745	0.0934	2.4036
440	0.1967	5.0607	595	0.5213	13.4109	750	0.0806	2.0740
445	0.3905	10.0444	600	0.5202	13.3829	755	0.0655	1.6861
450	0.7383	18.9919	605	0.5212	13.4070	760	0.0605	1.5567
455	1.0000	25.7241	610	0.5242	13.4845	765	0.0568	1.4613
460	0.8591	22.0998	615	0.5265	13.5426	770	0.0459	1.1807
465	0.6548	16.8447	620	0.5319	13.6830	775	0.0406	1.0452
470	0.5598	14.4010	625	0.5332	13.7162	780	0.0353	0.9068
475	0.4586	11.7974	630	0.5344	13.7474	785	0.0290	0.7457
480	0.3838	9.8732	635	0.5307	13.6518	790	0.0242	0.6224
485	0.3718	9.5646	640	0.5263	13.5386	795	0.0199	0.5128
490	0.3861	9.9333	645	0.5176	13.3150	800	0.0151	0.3892
495	0.4043	10.4012	650	0.5075	13.0558			
500	0.4338	11.1581	655	0.4916	12.6459			
505	0.4598	11.8268	660	0.4718	12.1364			
510	0.4839	12.4469	665	0.4488	11.5443			
515	0.5024	12.9242	670	0.4200	10.8038			
520	0.5147	13.2395	675	0.3884	9.9923			
525	0.5278	13.5775	680	0.3611	9.2890			
530	0.5374	13.8239	685	0.3303	8.4955			

3. Test Equipment

Equipment Name	Model No.	Serial No.	Calibration Date
Goniophotometric System	GPM-3000	DYHXF120001	2022-01-18
AC Power Source	CHP-500C	DYBWD010159	2022-01-25
Total Luminous Flux Standard Lamp	24V/150W	DYJYR040040	2022-01-25
Digital Power Meter	WT500	DYDWQ20010	2022-01-25
Integral Sphere (2M)	2M	DYJCE120067	2022-01-18
Digital Power Meter	WT500	DYDWQ200006	2022-01-25
Optical Color and Electrical Measurement System	CMS-3000S	DYJCE120067	2022-01-18
Expand Uncertainty: Photometric Measurement (Sphere): 2.08%, k=2 Chromaticity Measurement(Sphere):25.6K, k=2 Photometric Measurement(Goniophotometer):2.645%, k=2			

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