



Report No.: GZE160558-B

NVLAP LAB CODE 201011-0

LM-79-08 Test Report

For

HOCAN GROUP CO LTD

(Brand Name: N/A)

Rm 1902, Easet cinn Bldg 253-261 Hennessy Rd Wanchai, HongKong

Outdoor Non-Cutoff and Semi-Cutoff Wall-mounted Area Luminaires

Model name(s): HC-WPB-60

Representative (Tested) Model: HC-WPB-60 (3000K)
HC-WPB-60 (5700K)

Model Different: All construction and rating are the same, except CCT

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Jun.16,2016

Review By:

Tommy Liang

Manager: Tommy Liang

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Laboratory: Standard-Tech Co. Ltd Testing Center
NVLAP CODE: 201011-0

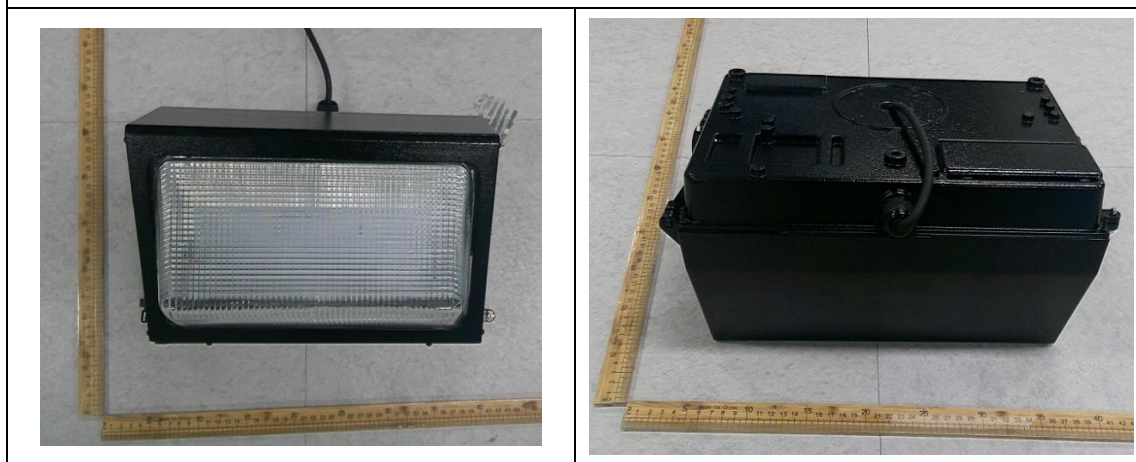
Report Format Number STD/QR4909-A/2

Address: Standard-Tech Building, No.6 Guanhong Road, Guangzhou Science City, Guangzhou 510663, China

Tel: 8620-3229 0320 Fax: 8620-32290422 <http://www.standard-tech.com>

1.1 Product Information:

Organization Name	HOCAN GROUP CO LTD	
Brand Name	N/A	
Model Number	HC-WPB-60	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Non-Cutoff and Semi-Cutoff Wall-mounted Area Luminaires	
Rated Voltage / Frequency	120 -277Vac, 50/60 Hz	
Nominal Power	60W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,5700K	
LED Manufacturer	Nichia Corporation	
LED Model	NF2L757DR	
Sample Number	GZE160558-B1(3000K), B2(5700K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo


Laboratory: Standard-Tech Co. Ltd Testing Center
NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

Address: Standard-Tech Building, No.6 Guanhong Road, Guangzhou Science City, Guangzhou 510663, China

Tel: 8620-3229 0320 Fax: 8620-32290422 <http://www.standard-tech.com>

1.2 Test Specifications:

Date of Receipt	Jun.15,2016
Date of Test	Jun.16,2016
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 C78.377-2008 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	QD25

1.3 Test Methods

<p>1) Photometric and Light Distribution Measurement – Goniophotometer Method:</p> <p>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.</p>
<p>2) Chromaticity Measurement – Sphere-Spectroradiometer Method:</p> <p>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.</p>
<p>3) Electrical Measurements:</p> <p>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.</p>

2.1 Electrical, Photometric and Chromaticity Measurements
(Refer to Work Instruction QD25)

Test date	2016-06-16	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HC-WPB-60(3000K)		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160558-B1	120.0	60	0.4963	59.06	0.9916	4.66
	277.0	60	0.2311	57.90	0.9043	17.16
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

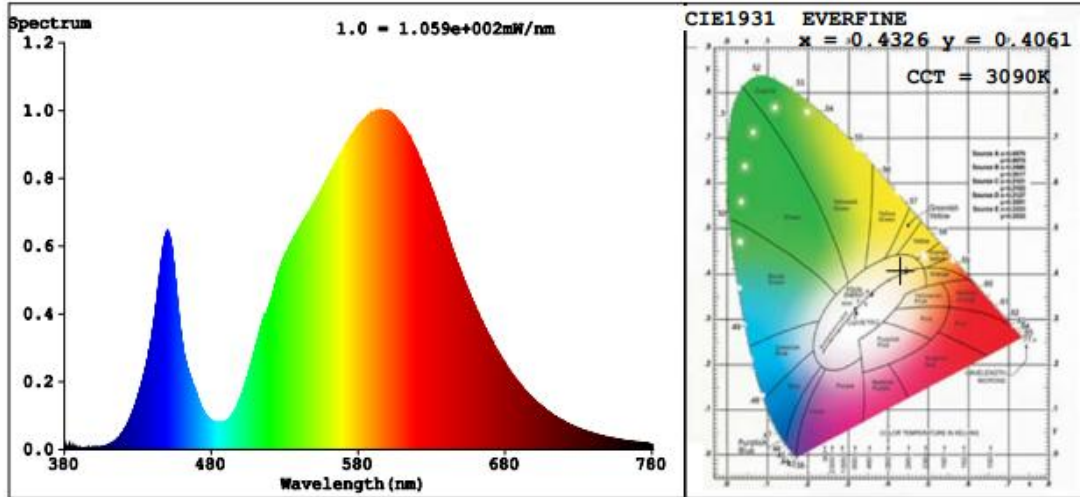
Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	69	R9	0
Frequency (Hz)	60	R2	80	R10	52
CCT (K)	3090	R3	88	R11	63
Duv	0.0014	R4	69	R12	41
Chromaticity (x, y)	x=0.4326 y=0.4061	R5	67	R13	71
Chromaticity (u', v')	u'=0.2469 v'=0.5215	R6	71	R14	93
Color Rendering Index (CRI)	72.0	R7	81	R15	64
R9	0	R8	50	--	--

Photometric Measurement – Goniophotometer Method :

Parameter	Result		DLC V4.0 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	8533.3	8492.3	--	
Luminous Efficacy (lm/W)	144.49	146.67	--	
Total Luminous (lm) (0°-90° zone)	6632.6	6602.1	5000-10000 (± 10%)	
Luminous Efficacy (lm/W) (0°-90° zone)	112.30	114.03	Standard: >= 95(-3%)	Premium: >= 115(-3%)
Zonal lumens in the 80-90° zone (%) (0-90° zone)	13.0	--	<=10(+3)	
Beam Angle (°)	115.7	--	--	
Center Beam Candle Power (cd)	1536	--	--	

Spectral Power Distribution & Chromaticity Diagram

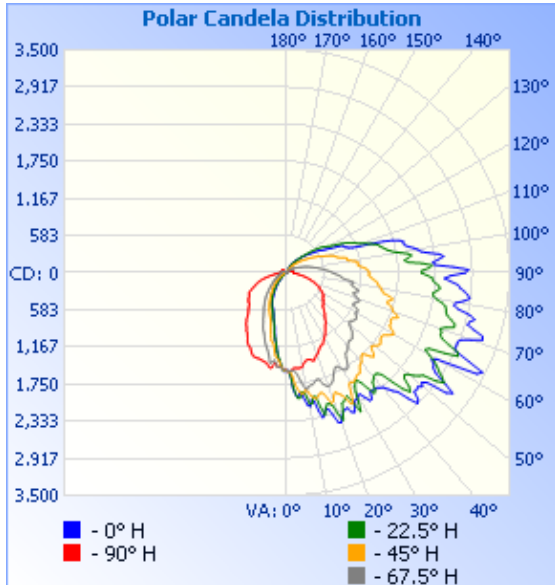


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,207.7	14.1%
0-40	1,958.4	22.9%
0-60	3,763.5	44.1%
60-90	2,869.2	33.6%
70-100	2,579.2	30.2%
90-120	1,578.5	18.5%
0-90	6,632.6	77.7%
90-180	1,902.8	22.3%
0-180	8,535.4	100%

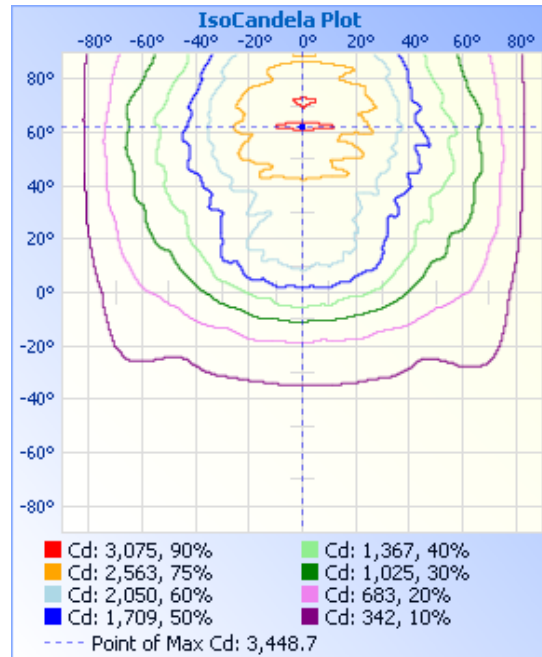
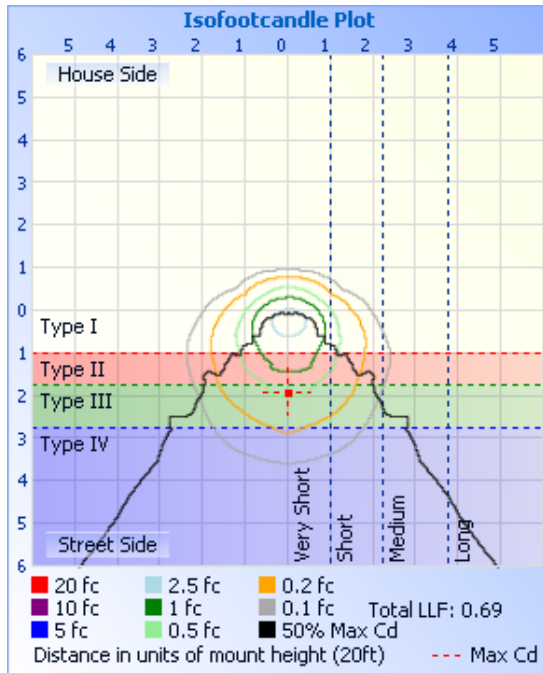
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	151.1	1.8%	90-100	727.2	8.5%
10-20	422.7	5.0%	100-110	527.2	6.2%
20-30	634.0	7.4%	110-120	324.0	3.8%
30-40	750.7	8.8%	120-130	180.9	2.1%
40-50	851.6	10.0%	130-140	90.3	1.1%
50-60	953.5	11.2%	140-150	39.5	0.5%
60-70	1,017.2	11.9%	150-160	11.9	0.1%
70-80	988.8	11.6%	160-170	1.3	0%
80-90	863.2	10.1%	170-180	0.3	0%

Photometric Data



	Center Beam Fc	Beam Width
17.0ft	5.32 fc	44.2 ft 32.3 ft
34.0ft	1.33 fc	88.3 ft 64.6 ft
51.0ft	0.59 fc	132.5 ft 96.9 ft
68.0ft	0.33 fc	176.6 ft 129.1 ft
85.0ft	0.21 fc	220.8 ft 161.4 ft
102.0ft	0.15 fc	265.0 ft 193.7 ft

■ Vert. Spread: 104.8°
■ Horiz. Spread: 87.0°



Laboratory: Standard-Tech Co. Ltd Testing Center
 NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

Address: Standard-Tech Building, No.6 Guanhong Road, Guangzhou Science City, Guangzhou 510663, China

Tel: 8620-3229 0320 Fax: 8620-32290422 <http://www.standard-tech.com>

γ (DEG) \ C (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	1536	1536	1536	1536	1536	1536	1536	1536	1536	1536	1536	1536	1536	1536	1536	1536
5	1492	1600	1846	1923	1968	1977	1821	1571	1501	1521	1455	1407	1383	1366	1397	1489
10	1520	1871	1853	2058	2130	2096	1896	1855	1462	1417	1229	1085	1064	1056	1175	1444
15	1435	1787	2035	2270	2281	2310	1973	1754	1411	1213	939	806	785	800	975	1225
20	1420	1798	2139	2331	2506	2373	2140	1902	1373	1059	751	659	632	641	760	1041
25	1344	1768	2141	2202	2416	2169	2167	1739	1261	838	662	567	551	571	649	881
30	1246	1773	2067	2211	2224	2158	1985	1751	1178	702	530	459	434	469	546	730
35	1111	1603	1907	2259	2287	2215	1945	1624	1051	607	431	350	321	363	443	620
40	987	1523	1842	2250	2349	2126	1827	1491	932	513	349	256	227	264	358	521
45	858	1458	1976	2511	2904	2583	1859	1456	821	416	279	176	147	183	289	422
50	772	1294	1877	2412	2779	2482	1778	1289	755	334	206	121	109	120	217	335
55	737	1299	1885	2922	3035	3013	1800	1294	690	259	148	90.9	66.3	86.6	158	269
60	686	1223	1992	2407	2709	2587	1938	1248	647	208	115	63.2	44.8	59.4	119	218
65	612	1288	1736	2819	2949	2965	1797	1150	558	175	89.8	42.3	30.7	42.2	92.5	179
70	511	1176	1777	2591	3082	2566	1771	1183	469	149	64.0	15.2	8.47	15.4	65.7	152
75	398	1203	1832	2662	2977	2614	1682	1133	352	130	37.9	4.38	4.94	4.12	40.5	130
80	262	1086	1555	2486	2705	2392	1515	1032	232	112	28.2	5.12	5.68	4.79	30.2	111
85	163	871	1433	2521	2736	2404	1387	863	142	112	23.3	5.99	6.84	5.67	25.3	103
90	115	746	1367	2188	2802	2112	1296	721	108	111	19.6	6.29	7.37	5.74	20.5	97.4
95	103	621	1185	2019	2386	1911	1157	581	96.3	92.9	16.6	6.45	7.46	5.93	17.0	85.3
100	95.5	511	1105	1821	2093	1812	1068	462	92.9	77.5	13.2	6.00	7.30	5.93	13.1	73.8
105	89.8	384	965	1630	1893	1548	925	356	92.3	65.1	10.0	5.79	7.43	5.89	10.02	66.6
110	85.5	291	850	1378	1222	1345	781	267	90.7	51.2	7.88	5.45	7.04	5.47	7.81	55.9
115	78.3	218	680	1132	989	1109	621	198	83.0	36.3	5.75	5.11	6.61	5.13	5.93	40.4
120	66.7	164	537	869	752	873	495	147	71.4	25.2	4.68	5.04	6.17	4.92	4.58	27.3
125	51.7	124	417	688	604	713	379	111	57.7	17.4	3.55	4.17	5.34	4.11	3.57	18.2
130	35.1	94.9	315	527	462	551	291	84.9	40.3	12.4	3.33	3.93	4.46	3.87	3.23	12.4
135	22.8	68.6	243	389	368	392	222	60.9	25.8	9.06	3.34	3.86	4.18	3.89	3.23	8.87
140	15.0	44.3	190	284	282	277	169	38.6	16.3	6.53	3.41	3.97	4.12	3.92	3.44	5.91
145	9.98	23.4	140	213	219	197	124	18.6	10.6	4.87	3.55	4.04	4.28	4.25	3.84	3.96
150	6.80	10.6	84.2	152	167	137	74.4	11.3	6.78	4.00	3.65	4.04	4.26	4.25	3.90	3.29
155	4.26	6.00	34.3	88.1	113	79.1	30.0	6.60	3.79	3.00	3.27	3.63	3.92	3.69	3.77	3.24
160	2.86	2.88	3.91	29.2	40.6	26.9	2.75	3.30	2.46	2.67	3.21	3.30	3.51	3.58	3.50	3.26
165	2.80	2.62	2.32	1.88	5.32	2.01	1.99	2.52	2.53	2.74	3.16	3.36	3.45	3.31	3.37	3.29
170	3.13	2.73	2.67	2.08	1.56	1.94	2.42	2.76	3.73	3.80	4.23	4.50	4.33	3.75	4.38	4.00
175	3.51	3.46	3.34	2.75	2.36	2.63	3.03	3.47	3.59	3.67	4.33	4.45	4.12	3.68	3.77	3.92
180	3.27	3.67	3.75	3.36	2.70	2.90	3.90	3.50	3.33	3.40	3.75	3.77	3.17	2.76	3.03	3.63

Laboratory: Standard-Tech Co. Ltd Testing Center
 NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

Address: Standard-Tech Building, No.6 Guanhong Road, Guangzhou Science City, Guangzhou 510663, China

Tel: 8620-3229 0320 Fax: 8620-32290422 <http://www.standard-tech.com>

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-06-16	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HC-WPB-60(5700K)		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160558-B2	120.0	60	0.4838	57.64	0.9928	7.28
	277.0	60	0.2253	56.51	0.9055	19.31
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

Chromaticity Measurement - Sphere-Spectroradiometer Method :

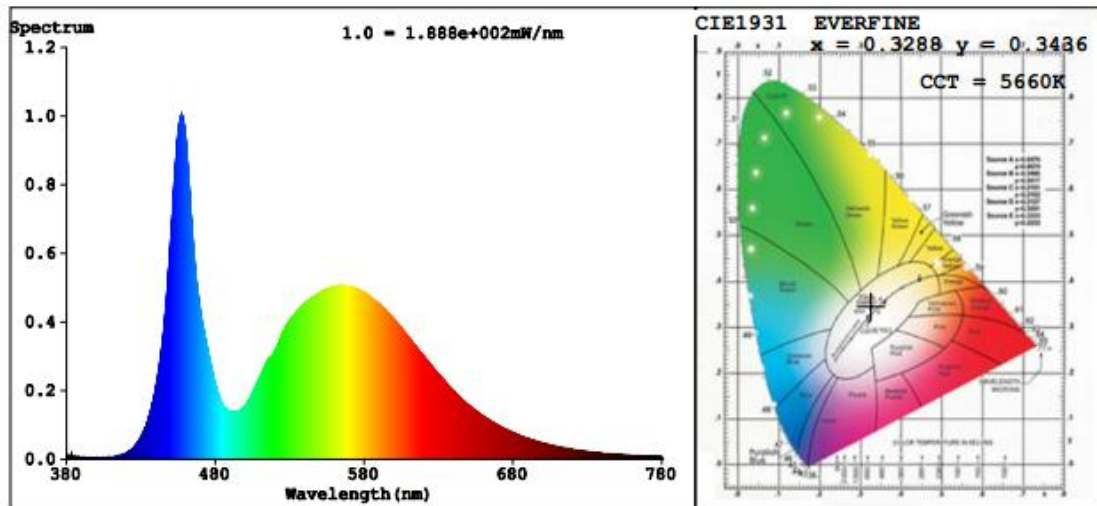
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	70	R9	0
Frequency (Hz)	60	R2	83	R10	56
CCT (K)	5660	R3	88	R11	60
Duv	0.0029	R4	67	R12	40
Chromaticity (x, y)	x=0.3288 y=0.3436	R5	69	R13	74
Chromaticity (u', v')	u'=0.2034 v'=-0.4783	R6	73	R14	93
Color Rendering Index (CRI)	73.5	R7	82	R15	66
R9	0	R8	55	--	--

Photometric Measurement – Sphere-Spectroradiometer Method :

Parameter	Result		DLC V4.0 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	8613	8572	--	
Luminous Efficacy (lm/W)	149.43	151.69	--	
Total Luminous (lm) (0°-90° zone)	6692*	6660*	5000-10000 (± 10%)	
Luminous Efficacy (lm/W) (0°-90° zone)	116.10	117.86	Standard: >= 95(-3%)	Premium: >= 115(-3%)

* These values are calculated assuming ZLD of 0°-90° zone is 77.7% (see “Zonal Lumen Tabulation” on page 5).

Spectral Power Distribution & Chromaticity Diagram



Laboratory: Standard-Tech Co. Ltd Testing Center
NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

Address: Standard-Tech Building, No.6 Guanhong Road, Guangzhou Science City, Guangzhou 510663, China

Tel: 8620-3229 0320 Fax: 8620-32290422 <http://www.standard-tech.com>

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2015-07-01	2016-06-30
ST-R-331	Spectral analysis system HAAS-2000	2015-07-01	2016-06-30
D204	Standard Lamp	2015-07-01	2016-06-30
PF2010	Power Meter for Integrating Sphere	2015-07-01	2016-06-30
EE-09	Goniophotometer system	2015-07-01	2016-06-30
D908S	Standard Lamp	2015-07-01	2016-06-30
PF210	Power Meter for Goniophotometer	2015-07-01	2016-06-30
ST-R-181A	Temperature Tester	2015-07-01	2016-06-30
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

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

Laboratory: Standard-Tech Co. Ltd Testing Center
NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

Address: Standard-Tech Building, No.6 Guanhong Road,Guangzhou Science City, Guangzhou 510663, China

Tel: 8620-3229 0320 Fax: 8620-32290422 <http://www.standard-tech.com>