



Report No.: GZE160558-D

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 Full-Cutoff Wall-mounted Area Luminaire

Model name(s): HC-WPC-40

Representative (Tested) Model: HC-WPC-40 (3000K)  
HC-WPC-40 (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-WPC-40	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Outdoor Full-Cutoff Wall-mounted Area Luminaire	
Rated Voltage / Frequency	120 -277Vac, 50/60 Hz	
Nominal Power	40W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,5700K	
LED Manufacturer	Nichia Corporation	
LED Model	NF2L757DR	
Sample Number	GZE160558-D1(3000K), D2(5700K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

**Photo**


## 1.2 Test Specifications:

Date of Receipt	Jun.15,2016
Date of Test	Jun.16,2016
Test item	<ol style="list-style-type: none"> <li>1. Total Luminous Flux</li> <li>2. Luminous Distribution Intensity</li> <li>3. Luminous Efficacy</li> <li>4. Correlated Color Temperature</li> <li>5. Color Rendering Index</li> <li>6. Chromaticity Coordinate</li> <li>7. Electrical Parameters</li> </ol>
Reference Standard	<ol style="list-style-type: none"> <li>1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products</li> <li>2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products</li> <li>3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li> <li>4. CIE 15-2004 Technical Report Colorimetry</li> <li>5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</li> <li>6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems</li> </ol>
Reference Work Instruction	QD25

## 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  $1^{\circ}$  vertical intervals and  $22.5^{\circ}$  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 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-WPC-40(3000K)		

**Electrical Measurement :**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160558-D1	120.0	60	0.3408	40.54	0.9914	9.25
	277.0	60	0.1579	39.82	0.9102	16.50
<b>DLC Pass Criteria</b>					<b>&gt;= 0.9(-3%)</b>	<b>&lt;= 20(+5)</b>

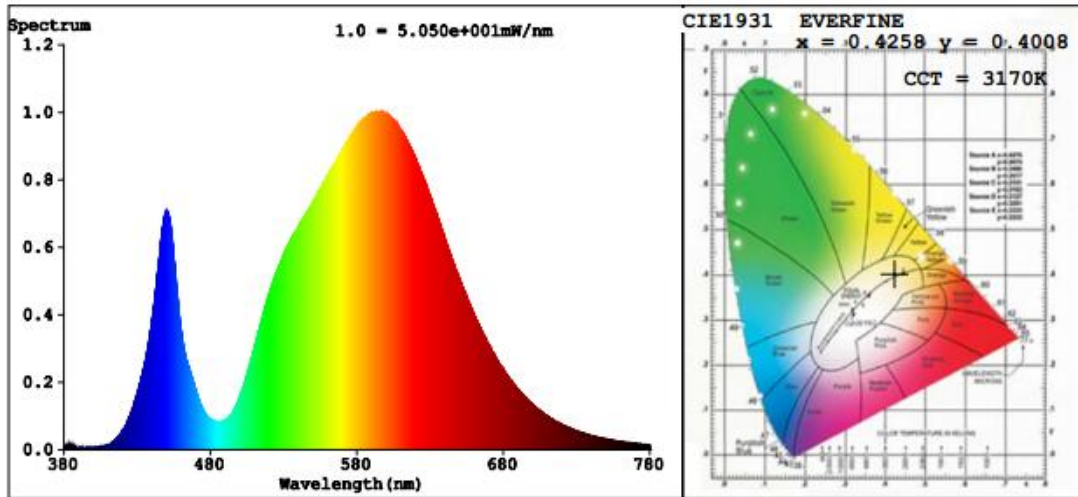
**Chromaticity Measurement - Sphere-Spectroradiometer Method :**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	70	R9	0
Frequency (Hz)	60	R2	80	R10	52
CCT (K)	3170	R3	88	R11	63
Duv	0.0004	R4	70	R12	41
Chromaticity (x, y)	x=0.4258 y=0.4008	R5	68	R13	71
Chromaticity (u', v')	u'=0.2448 v'=0.5184	R6	71	R14	93
Color Rendering Index (CRI)	72.2	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)	4357.7	4372.2	300-5000 (±10%)	
Luminous Efficacy (lm/W)	107.49	109.80	Standard: >= 90(-3%)	Premium: >= 110(-3%)
Zonal lumens in the 0-90° zone (%)	99.9	--	>=100(-3)	
Zonal lumens in the 80-90° zone (%)	0.2	--	<=10(+3)	
Beam Angle (°)	83.2	--	--	
Center Beam Candle Power (cd)	2496	--	--	

**Spectral Power Distribution & Chromaticity Diagram**

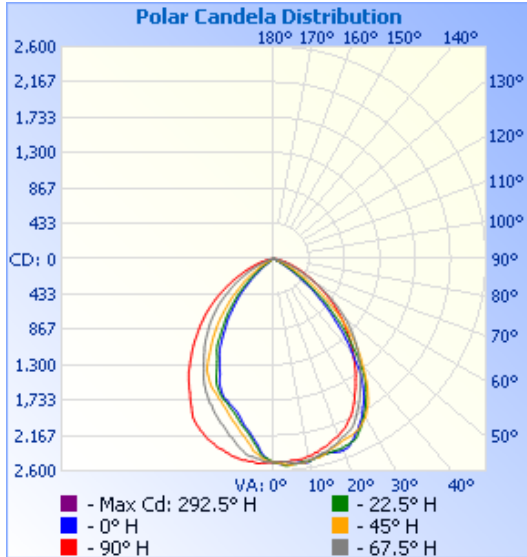


**Zonal Lumen Tabulation**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,818.0	41.7%
0-40	2,835.2	65.1%
0-60	4,111.6	94.4%
60-90	239.2	5.5%
70-100	60.3	1.4%
90-120	0.1	0%
0-90	4,350.8	99.9%
90-180	5.4	0.1%
0-180	4,356.2	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	231.7	5.3%	90-100	0.0	0%
10-20	640.6	14.7%	100-110	0.0	0%
20-30	945.7	21.7%	110-120	0.1	0%
30-40	1,017.2	23.4%	120-130	0.6	0%
40-50	817.3	18.8%	130-140	1.1	0%
50-60	459.1	10.5%	140-150	1.3	0%
60-70	178.9	4.1%	150-160	1.1	0%
70-80	53.5	1.2%	160-170	0.8	0%
80-90	6.9	0.2%	170-180	0.3	0%

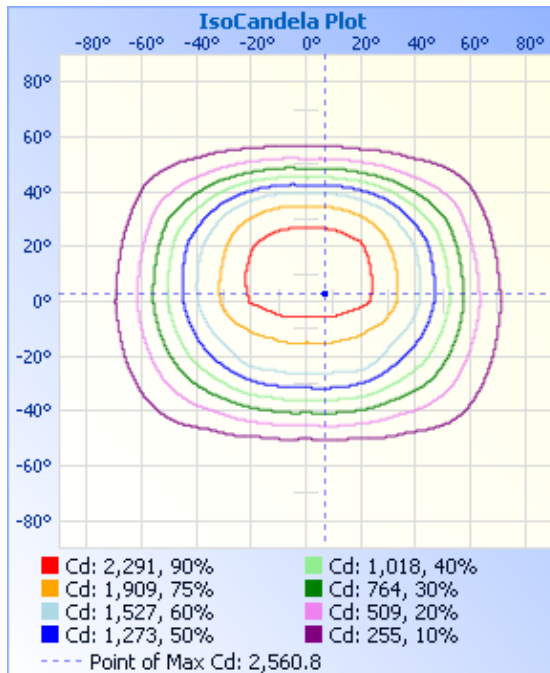
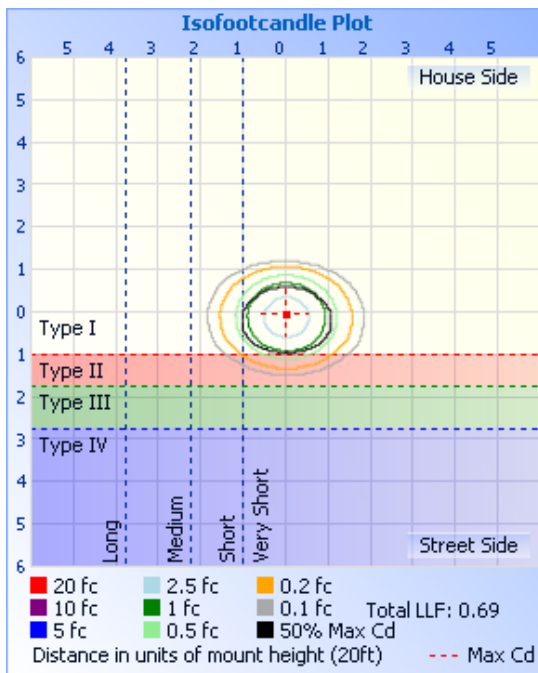
**Photometric Data**



**Illuminance at a Distance**

	Center Beam fc	Beam Width	
17.0ft	8.64 fc	25.6 ft	35.2 ft
34.0ft	2.16 fc	51.3 ft	70.4 ft
51.0ft	0.96 fc	76.9 ft	105.7 ft
68.0ft	0.54 fc	102.6 ft	140.9 ft
85.0ft	0.35 fc	128.2 ft	176.1 ft
102.0ft	0.24 fc	153.9 ft	211.3 ft

■ Vert. Spread: 74.0°  
■ Horiz. Spread: 92.0°



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C (DEG) γ (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338
0	2496	2496	2496	2496	2496	2496	2496	2496	2496	2496	2496	2496	2496	2496	2496	2496
5	2513	2531	2540	2532	2521	2525	2533	2504	2481	2451	2377	2318	2288	2321	2394	2457
10	2484	2525	2530	2528	2523	2520	2505	2500	2454	2345	2177	2098	2074	2101	2189	2357
15	2421	2493	2480	2482	2472	2476	2470	2450	2393	2182	1999	1929	1896	1932	2020	2197
20	2354	2419	2421	2492	2497	2468	2395	2362	2310	2026	1840	1807	1798	1820	1867	2049
25	2240	2311	2385	2411	2370	2410	2350	2278	2177	1878	1737	1652	1557	1669	1765	1895
30	2034	2137	2269	2216	2176	2211	2251	2077	1980	1695	1577	1369	1330	1387	1621	1713
35	1819	1904	2038	1976	1907	1974	2007	1849	1753	1471	1304	1104	1034	1137	1350	1491
40	1577	1689	1720	1621	1493	1633	1691	1628	1518	1272	1049	841	763	878	1086	1298
45	1338	1445	1382	1195	1067	1209	1365	1407	1277	1046	756	569	483	603	800	1095
50	1113	1166	974	781	678	798	979	1152	1051	812	498	310	237	344	541	881
55	878	880	606	423	353	439	624	871	817	586	286	122	92.7	138	329	647
60	643	604	326	171	122	184	345	596	591	381	132	56.8	57.0	61.0	160	440
65	440	366	141	52.9	40.2	58.3	157	363	402	223	56.1	41.9	49.0	44.0	65.0	268
70	278	190	49.9	18.0	17.7	20.1	58.5	191	254	117	28.2	31.3	36.5	32.7	30.5	147
75	163	84.5	17.3	9.12	9.33	9.66	20.8	86.7	142	53.7	16.0	19.7	22.7	20.5	16.5	72.2
80	75.4	29.9	5.45	3.96	3.72	4.05	6.25	30.5	62.5	21.0	7.88	10.1	11.5	10.7	8.28	29.8
85	19.5	4.21	1.07	0.51	0.45	0.64	0.95	4.43	14.4	4.23	2.24	2.50	2.95	3.21	2.70	7.21
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	0.95	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	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.62	0.50	0.06	0.00	0.00	0.00	0.00	0.32
120	0.81	0.43	0.00	0.00	0.00	0.00	0.00	0.63	0.94	1.00	0.57	0.00	0.00	0.00	0.32	0.63
125	1.44	0.93	0.00	0.00	0.00	0.00	0.38	1.19	1.31	1.38	0.85	0.51	0.57	0.57	0.50	1.07
130	1.93	1.44	0.18	0.00	0.00	0.19	0.60	1.51	1.88	1.82	1.13	1.13	1.20	1.33	1.07	1.45
135	2.50	1.55	0.31	0.44	0.44	0.75	0.88	1.71	2.38	2.25	1.50	1.51	1.77	1.77	1.44	1.89
140	2.69	1.63	0.56	1.00	0.88	1.26	0.95	2.02	2.63	2.53	1.88	2.08	2.12	2.08	1.64	2.19
145	2.73	1.63	0.9988	1.44	1.13	1.58	1.15	2.05	2.69	2.71	2.13	2.40	2.34	2.66	2.15	2.41
150	2.62	1.63	1.62	1.63	1.75	1.77	1.45	2.14	2.69	2.76	2.47	2.64	2.54	3.04	2.73	2.57
155	2.52	1.81	2.31	1.95	2.07	1.95	2.02	2.37	2.65	2.79	2.52	2.80	2.74	2.97	2.94	2.67
160	2.31	2.13	2.52	2.33	2.28	2.21	2.46	2.49	2.69	2.84	2.57	2.87	2.93	2.95	3.06	2.90
165	2.50	2.50	2.75	2.51	2.46	2.65	2.77	2.56	3.06	2.88	2.63	3.07	3.12	3.18	3.15	3.09
170	3.05	2.69	3.37	3.26	3.02	3.47	3.65	2.63	3.39	3.57	3.19	3.74	4.10	4.17	4.04	3.72
175	3.37	2.94	3.54	3.58	3.97	3.68	3.75	2.77	3.48	3.55	3.41	3.58	3.97	4.61	3.97	4.03
180	3.25	3.07	3.56	3.65	4.16	3.72	3.72	2.90	3.19	3.19	3.06	3.58	3.59	4.17	3.72	3.71

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## 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-WPC-40(5700K)		

### Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160558-D2	120.0	60	0.3309	39.52	0.9953	9.94
	277.0	60	0.1533	38.82	0.9142	17.16
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

### Chromaticity Measurement - Sphere-Spectroradiometer Method :

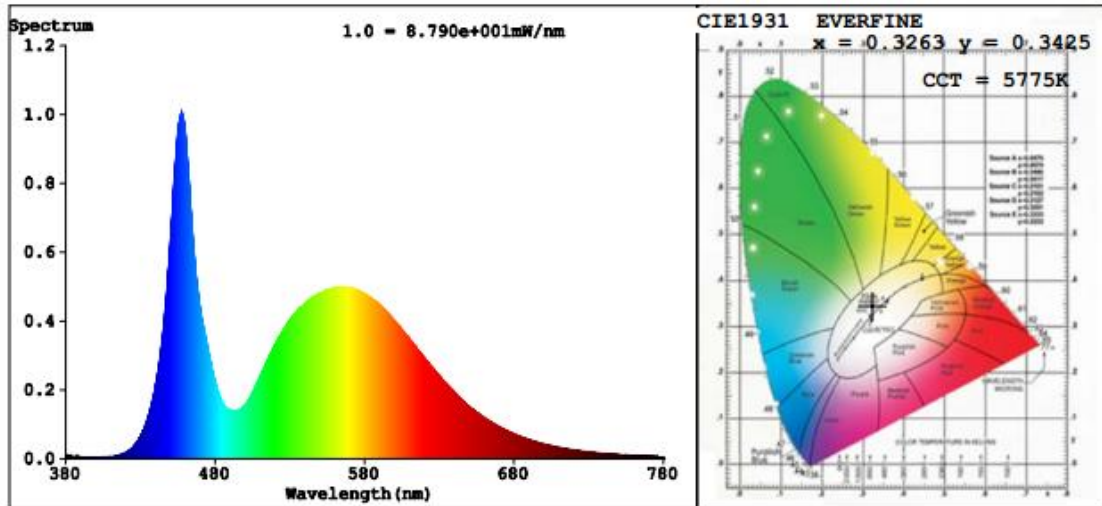
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	70	R9	0
Frequency (Hz)	60	R2	83	R10	56
CCT (K)	5775	R3	88	R11	60
Duv	0.0035	R4	67	R12	40
Chromaticity (x, y)	x=0.3263 y=0.3425	R5	69	R13	74
Chromaticity (u', v')	u'=0.2021 v'=0.4773	R6	73	R14	93
Color Rendering Index (CRI)	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)	4576	4591	300-5000(±10%)	
Luminous Efficacy (lm/W)	115.79	118.26	Standard: >= 90(-3%)	Premium: >= 110(-3%)



**Spectral Power Distribution & Chromaticity Diagram**



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### 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 \*\*\*\*\***

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