



Report No.: STD160711NB-A

NVLAP LAB CODE 201011-0

LM-79-08 Test Report

For

CEA GROUP INTERNATIONAL CO.,LTD

(Brand Name: CEA EAEC)

Sanjiali Industrial Zone Zhucheng Road Panshi North baixiang Yueqing
Zhejiang China

High-bay Luminaires for Commercial and Industrial Buildings

Model name(s): HBF2-100D

Representative (Tested) Model: HBF2-100D (2700K)
HBF2-100D (5700K)

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

Test & Report By:

Jamie Lin

Engineer: Jamie Lin

Date: Jul.20,2016

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

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<http://www.standard-tech.com>

1.1 Product Information:

Organization Name	CEA GROUP INTERNATIONAL CO.,LTD	
Brand Name	CEA EAEC	
Model Number	HBF2-100D	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	High-bay Luminaires for Commercial and Industrial Buildings	
Rated Voltage / Frequency	100 -277Vac, 50/60 Hz	
Nominal Power	100W	
Rated Initial Lamp Lumen	--	
Declared CCT	2700K,3000K,3500K,4000K,4500K,5000K, 5700K	
LED Manufacturer	Guangzhou Hongli Opto-Electronic Co., Ltd.	
LED Model	HL-A-2835DW-S1-08-HR3	
Sample Number	STD160711NB-A1(2700K), A2(5700K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo


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1.2 Test Specifications:

Date of Receipt	Jul.12,2016
Date of Test	Jul.14,2016
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

1) Photometric and Light Distribution Measurement – Goniophotometer Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$, 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 $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$. 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 $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$. 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	2016-07-14	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HBF2-100D(2700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160711	120.0	60	0.8747	104.1	0.9918	6.98
NB-A1	277.0	60	0.4196	102.5	0.8819	10.31
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

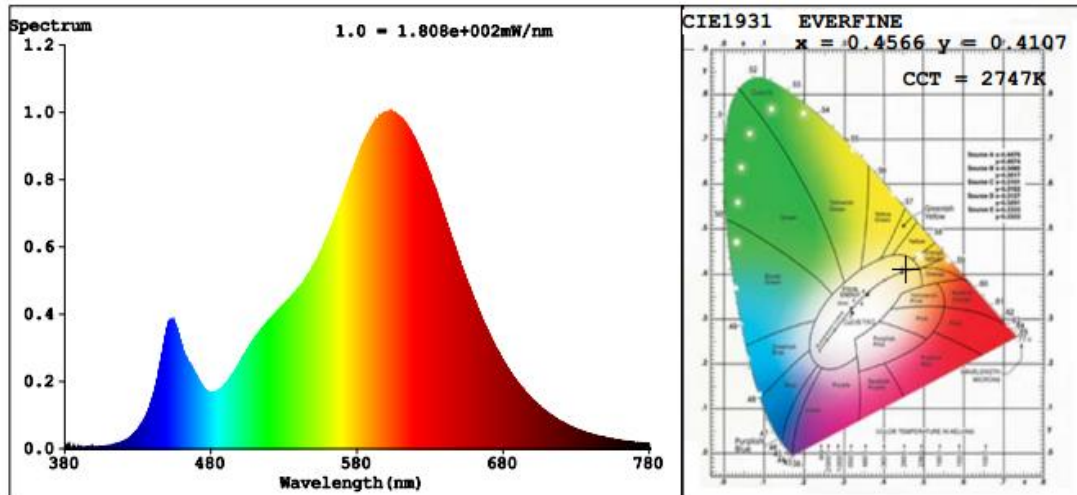
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	79	R9	0
Frequency (Hz)	60	R2	92	R10	78
CCT (K)	2747	R3	96	R11	73
Duv	0.0003	R4	78	R12	70
Chromaticity (x, y)	x=0.4566 y=0.4107	R5	79	R13	80
Chromaticity (u', v')	u'=0.2604 v'=0.5269	R6	90	R14	97
Color Rendering Index (CRI)	80.9	R7	80	R15	68
R9	0	R8	53	--	--

Photometric Measurement – Goniophotometer Method:

Parameter	Result		DLC V3.1 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	11451	11280	>=10000(-10%)	
Luminous Efficacy (lm/W)	110.00	110.05	Standard: >= 105(-3%)	Premium: >= 130(-3%)
Zonal lumens in the 20-50 °zone (%)	54.2	--	>= 30(-10)	
Beam Angle (°)	112.0	--	--	
Center Beam Candle Power (cd)	4128	--	--	

Spectral Power Distribution & Chromaticity Diagram

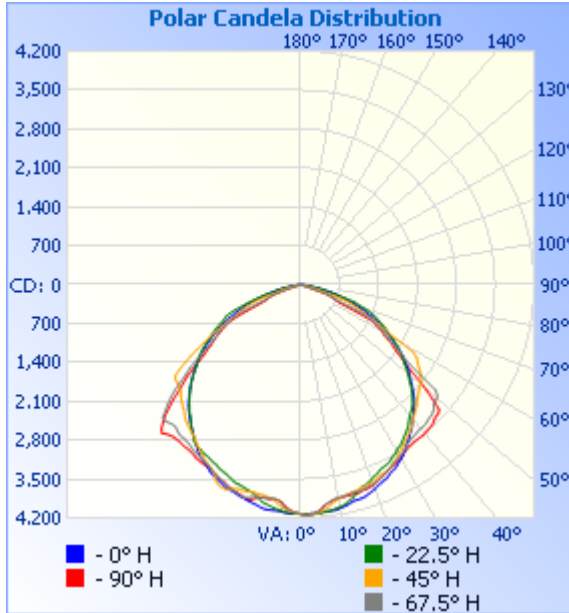


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	3,184.9	27.8%
0-40	5,317.5	46.4%
0-60	9,750.6	85.2%
60-90	1,682.6	14.7%
70-100	395.0	3.4%
90-120	4.5	0%
0-90	11,433.2	99.9%
90-180	16.0	0.1%
0-180	11,449.2	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	383.0	3.3%	90-100	0.7	0%
10-20	1,098.8	9.6%	100-110	1.6	0%
20-30	1,703.1	14.9%	110-120	2.2	0%
30-40	2,132.6	18.6%	120-130	2.8	0%
40-50	2,367.5	20.7%	130-140	2.7	0%
50-60	2,065.6	18.0%	140-150	2.3	0%
60-70	1,288.3	11.3%	150-160	1.9	0%
70-80	362.3	3.2%	160-170	1.3	0%
80-90	31.9	0.3%	170-180	0.5	0%

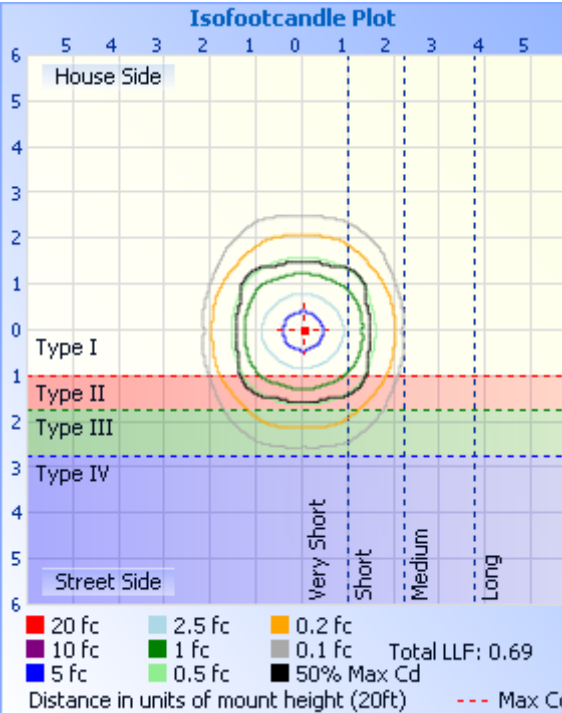
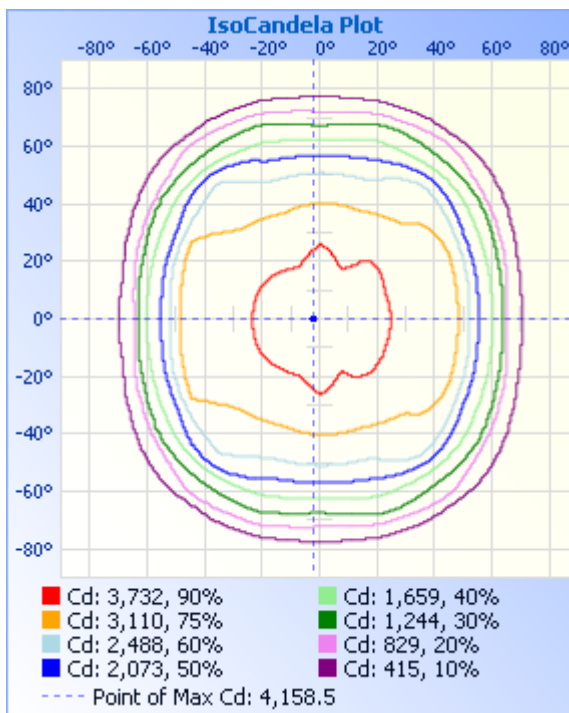
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	14.28 fc	52.0 ft	48.9 ft
34.0ft	3.57 fc	104.0 ft	97.7 ft
51.0ft	1.59 fc	156.1 ft	146.6 ft
68.0ft	0.89 fc	208.1 ft	195.4 ft
85.0ft	0.57 fc	260.1 ft	244.3 ft
102.0ft	0.40 fc	312.1 ft	293.1 ft

■ Vert. Spread: 113.7°
■ Horiz. Spread: 110.3°



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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	4128	4128	4128	4128	4128	4128	4128	4128	4128	4128	4128	4128	4128	4128	4128	4128
5	3927	3952	4029	4081	4118	4123	4112	4073	4067	4062	4089	4129	4099	4078	4009	3950
10	3893	3901	3853	3964	4086	4062	3919	3888	3905	3888	3915	4045	4076	3973	3846	3885
15	3957	3957	3848	3797	4005	3881	3838	3859	3895	3870	3830	3864	3973	3804	3851	3963
20	3844	3842	3916	3696	3911	3723	3779	3821	3834	3818	3784	3746	3897	3699	3925	3855
25	3715	3715	3832	3606	3770	3595	3685	3694	3701	3688	3673	3593	3764	3579	3715	3715
30	3654	3612	3545	3510	3620	3454	3525	3567	3602	3559	3525	3439	3591	3497	3544	3591
35	3585	3525	3369	3354	3391	3283	3349	3426	3502	3425	3341	3293	3343	3357	3336	3499
40	3571	3462	3228	3117	3144	3064	3152	3369	3484	3360	3152	3053	3109	3086	3202	3441
45	3505	3503	3055	2834	2892	2848	2960	3327	3411	3297	2942	2818	2839	2823	3015	3459
50	2754	3000	2885	2532	2568	2532	2818	3198	2965	3197	2759	2507	2528	2518	2856	2960
55	2056	2189	2654	2245	2246	2227	2600	2258	2112	2240	2536	2193	2199	2216	2666	2163
60	1653	1677	1968	1913	1860	1877	2104	1725	1700	1698	2022	1845	1817	1871	1906	1680
65	801	1209	1299	1601	1467	1567	1339	1329	781	1269	1297	1518	1413	1547	1269	1208
70	426	526	894	1171	1049	1185	912	541	458	523	880	1112	986	1109	864	533
75	37.2	43.5	319	561	635	594	327	41.8	34.6	40.3	294	520	577	516	297	43.3
80	23.7	27.0	32.7	179	275	186	30.5	23.2	20.6	23.4	30.3	138	240	144	32.3	26.5
85	14.4	16.4	18.3	22.9	58.2	21.5	16.6	13.0	11.7	13.1	15.7	19.6	47.1	21.0	17.1	15.7
90	0.00	0.00	0.05	1.24	2.15	1.19	0.08	0.00	0.00	0.00	0.00	0.49	1.53	0.98	0.00	0.00
95	0.00	0.00	0.00	1.25	1.86	1.09	0.00	0.00	0.00	0.00	0.00	0.98	2.94	1.85	0.00	0.00
100	0.00	0.00	0.38	2.02	2.44	2.01	0.44	0.00	0.00	0.00	0.39	1.41	4.29	2.29	0.66	0.00
105	0.11	0.33	1.36	2.44	3.15	2.23	1.41	0.43	0.28	0.44	1.09	1.95	3.80	2.56	1.69	0.60
110	0.76	1.14	2.17	2.99	3.04	2.93	2.12	1.14	0.93	0.93	1.52	2.29	3.21	2.89	2.18	1.31
115	1.36	1.58	2.87	2.76	2.94	2.78	2.99	1.85	1.31	1.64	2.28	2.47	2.71	2.45	2.78	1.75
120	2.07	2.24	3.42	2.98	2.01	2.77	3.27	2.46	2.13	2.24	2.49	3.25	1.63	2.88	3.15	2.35
125	2.95	3.11	3.72	4.87	2.12	4.57	3.82	3.22	2.42	2.48	2.65	4.65	1.76	2.45	3.27	2.58
130	3.01	3.09	3.96	4.90	2.16	4.74	3.86	3.39	2.77	2.51	2.99	5.14	1.97	4.62	3.52	2.82
135	3.01	3.05	3.92	4.82	2.21	4.64	3.90	3.17	2.86	2.68	2.99	5.40	2.20	4.70	3.48	2.96
140	3.07	3.09	3.64	4.73	2.23	4.52	3.55	3.34	2.95	2.98	2.99	5.53	2.45	4.85	3.32	3.72
145	3.17	3.11	3.75	4.71	2.26	4.78	3.33	3.33	3.22	3.11	3.26	5.85	2.78	4.92	3.89	3.84
150	3.19	3.13	4.13	4.76	2.34	4.84	3.87	3.38	3.32	3.20	3.74	5.69	2.99	4.99	5.26	3.96
155	2.95	3.15	5.05	4.88	2.66	4.88	4.74	3.44	3.39	3.25	3.91	5.15	3.49	4.30	5.39	4.21
160	2.87	3.17	6.47	5.07	2.99	4.91	4.85	3.49	3.46	3.32	3.98	4.74	4.24	3.59	5.52	4.82
165	2.88	3.39	5.64	5.41	3.17	4.98	5.24	3.83	3.53	3.51	4.02	4.88	5.16	3.80	5.65	5.53
170	3.38	3.88	5.87	5.37	3.42	5.04	6.49	3.94	3.79	3.85	4.84	5.86	5.60	3.92	5.56	6.22
175	3.94	4.48	5.89	4.88	3.64	5.06	6.54	4.28	3.97	3.95	4.35	5.63	4.94	3.64	4.91	6.62
180	4.10	4.37	5.60	4.22	3.31	4.62	6.22	4.10	3.99	3.99	4.29	5.47	4.46	3.43	4.53	6.29

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-07-14	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	HBF2-100D(5700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160711	120.0	60	0.8806	104.8	0.9918	6.76
NB-A2	277.0	60	0.4224	103.19	0.8825	13.05
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

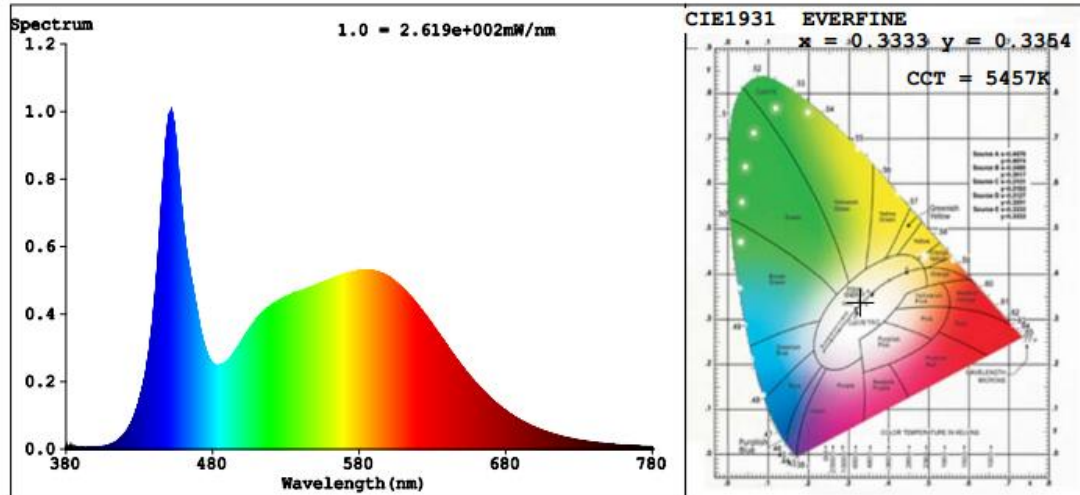
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	86	R9	23
Frequency (Hz)	60	R2	91	R10	78
CCT (K)	5457	R3	93	R11	85
Duv	-0.0034	R4	86	R12	65
Chromaticity (x, y)	x=0.3333 y=0.3354	R5	86	R13	88
Chromaticity (u', v')	u'=0.2097 v'=0.4747	R6	86	R14	96
Color Rendering Index (CRI)	86.0	R7	88	R15	83
R9	23	R8	72	--	--

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V3.1 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	12480	12294	>=10000(-10%)	
Luminous Efficacy (lm/W)	119.08	119.14	Standard: >= 105(-3%)	Premium: >= 130(-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	2016-07-01	2017-06-30
ST-R-331	Spectral analysis system HAAS-2000	2016-07-01	2017-06-30
D204	Standard Lamp	2016-07-01	2017-06-30
PF2010	Power Meter for Integrating Sphere	2016-07-01	2017-06-30
EE-09	Goniophotometer system	2016-07-01	2017-06-30
D908S	Standard Lamp	2016-07-01	2017-06-30
PF210	Power Meter for Goniophotometer	2016-07-01	2017-06-30
ST-R-181A	Temperature Tester	2016-07-01	2017-06-30
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

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