



Report No.: STD160711NB-C

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): HBF2-200D

Representative (Tested) Model: HBF2-200D (2700K)
HBF2-200D (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

Tel: 8620-3229 0320

Fax: 8620-32290422

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

1.1 Product Information:

Organization Name	CEA GROUP INTERNATIONAL CO.,LTD	
Brand Name	CEA EAEC	
Model Number	HBF2-200D	
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	200W	
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-C1(2700K), C2(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	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	HBF2-200D(2700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160711	120.0	60	1.729	206.9	0.9971	4.94
NB-C1	277.0	60	0.7537	200.6	0.9609	6.35
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

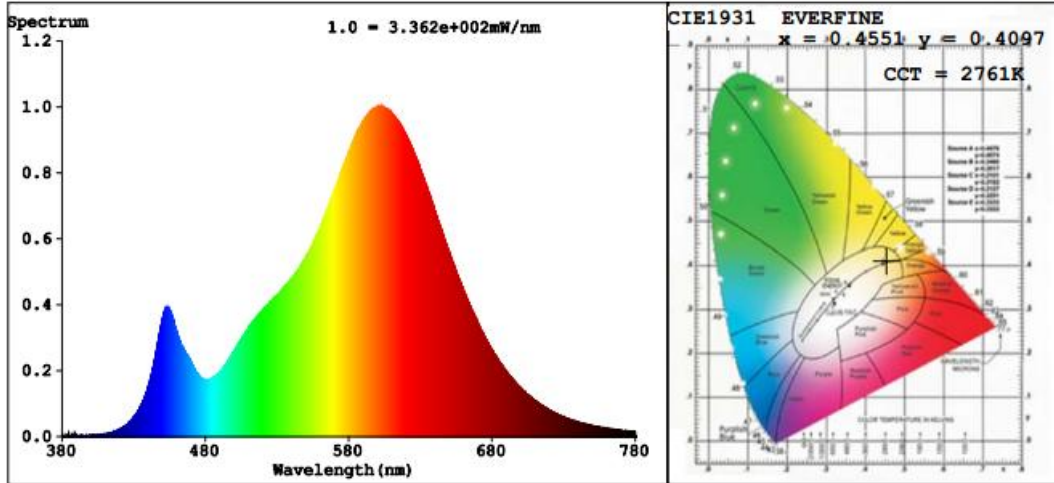
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	79	R9	0
Frequency (Hz)	60	R2	92	R10	78
CCT (K)	2761	R3	95	R11	73
Duv	0.0001	R4	76	R12	71
Chromaticity (x, y)	x=0.4551 y=0.4097	R5	78	R13	80
Chromaticity (u', v')	u'=0.2598 v'=0.5263	R6	89	R14	97
Color Rendering Index (CRI)	80.1	R7	79	R15	69
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)	21876	21609	>=10000(-10%)	
Luminous Efficacy (lm/W)	105.73	107.72	Standard: >= 105(-3%)	Premium: >= 130(-3%)
Zonal lumens in the 20-50 °zone (%)	56.5	--	>=30(-10)	
Beam Angle (°)	100.1	--	--	
Center Beam Candle Power (cd)	10722	--	--	

Spectral Power Distribution & Chromaticity Diagram

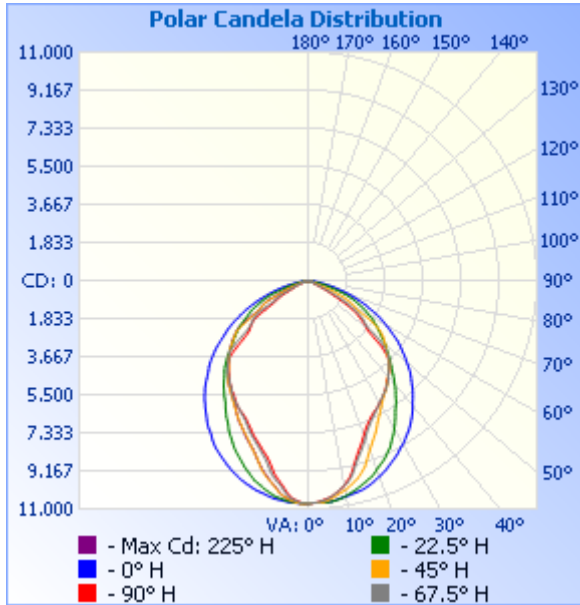


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	7,370.1	33.7%
0-40	11,682.2	53.4%
0-60	19,412.7	88.7%
60-90	2,423.5	11.1%
70-100	645.5	3%
90-120	10.0	0%
0-90	21,836.1	99.8%
90-180	37.6	0.2%
0-180	21,873.8	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	994.7	4.5%	90-100	1.8	0%
10-20	2,654.3	12.1%	100-110	3.5	0%
20-30	3,721.1	17.0%	110-120	4.7	0%
30-40	4,312.1	19.7%	120-130	5.9	0%
40-50	4,335.8	19.8%	130-140	6.2	0%
50-60	3,394.7	15.5%	140-150	5.8	0%
60-70	1,779.8	8.1%	150-160	5.0	0%
70-80	557.9	2.6%	160-170	3.4	0%
80-90	85.8	0.4%	170-180	1.3	0%

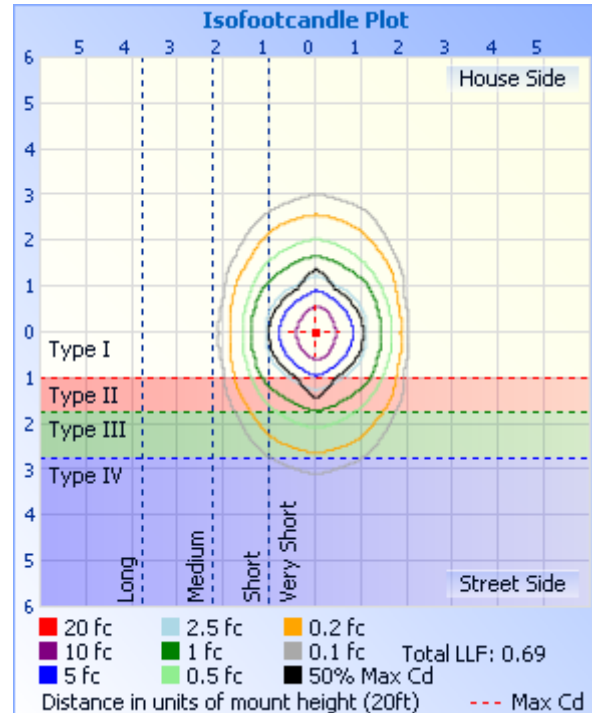
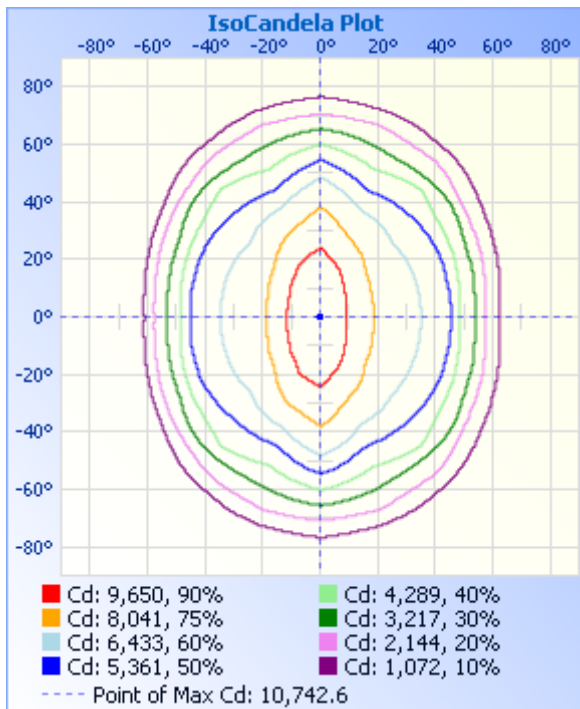
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	37.1 fc	47.8 ft	34.4 ft
34.0ft	9.3 fc	95.7 ft	68.7 ft
51.0ft	4.1 fc	143.5 ft	103.1 ft
68.0ft	2.3 fc	191.4 ft	137.5 ft
85.0ft	1.5 fc	239.2 ft	171.8 ft
102.0ft	1.0 fc	287.1 ft	206.2 ft

■ Vert. Spread: 109.2°
■ Horiz. Spread: 90.6°



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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	1072	1072	1072	1072	1072	1072	1072	1072	1072	1072	1072	1072	1072	1072	1072	1072
5	1040	1045	1057	1066	1069	1071	1064	1055	1053	1055	1058	1062	1071	1067	1058	1047
10	942	956	991	1039	1055	1052	1024	1001	1001	1010	1030	1048	1057	1041	993	960
15	845	857	911	992	1038	1015	968	901	887	908	970	1016	1033	996	911	859
20	782	791	829	933	1002	967	866	804	786	803	867	972	1000	930	827	793
25	722	731	766	865	959	908	780	731	720	728	776	907	956	860	764	730
30	687	689	702	785	910	827	702	683	683	681	700	835	907	777	704	687
35	642	643	647	708	853	735	649	647	645	643	645	730	844	698	651	642
40	592	598	602	635	782	647	598	599	599	596	594	638	772	630	599	597
45	539	544	546	559	705	561	549	551	548	546	536	555	697	560	542	541
50	368	423	482	488	622	487	484	455	374	461	479	478	615	477	480	416
55	303	321	417	416	536	413	421	320	298	316	417	406	521	413	416	319
60	157	179	264	337	438	345	266	205	149	197	264	335	427	336	264	176
65	73.3	82.9	166	269	337	270	185	59.5	36.0	58.4	177	262	325	261	150	81.9
70	27.8	39.3	67.3	188	238	189	51.7	24.0	22.6	23.3	51.6	184	225	173	64.9	38.1
75	19.9	20.6	28.1	88.4	142	90.0	20.1	17.5	17.4	17.5	19.6	82.1	130	80.1	25.2	20.6
80	11.8	12.7	13.8	21.1	61.8	15.9	12.7	12.7	12.8	12.6	12.2	16.1	53.7	24.1	13.4	12.6
85	5.38	5.72	5.98	6.91	13.0	6.79	6.73	5.94	5.86	5.77	6.06	6.21	10.5	6.37	5.92	5.75
90	0.00	0.00	0.02	0.26	0.51	0.25	0.03	0.00	0.00	0.00	0.26	0.18	0.47	0.21	0.00	0.00
95	0.00	0.00	0.00	0.31	0.49	0.26	0.00	0.00	0.00	0.00	0.07	0.26	0.74	0.36	0.00	0.00
100	0.00	0.00	0.05	0.48	0.70	0.40	0.05	0.00	0.00	0.00	0.06	0.47	1.07	0.54	0.07	0.00
105	0.00	0.00	0.30	0.57	0.88	0.49	0.22	0.05	0.02	0.04	0.18	0.59	1.02	0.58	0.26	0.03
110	0.08	0.17	0.45	0.71	0.81	0.63	0.39	0.13	0.11	0.13	0.30	0.69	0.92	0.66	0.40	0.16
115	0.25	0.32	0.56	0.62	0.77	0.66	0.51	0.31	0.21	0.27	0.38	0.63	0.75	0.65	0.51	0.32
120	0.36	0.42	0.68	0.69	0.56	0.63	0.65	0.42	0.33	0.37	0.52	0.70	0.45	0.65	0.64	0.40
125	0.49	0.54	0.76	1.14	0.55	1.03	0.72	0.56	0.39	0.44	0.55	1.07	0.50	1.04	0.69	0.45
130	0.57	0.59	0.80	1.19	0.58	1.07	0.77	0.58	0.50	0.51	0.65	1.17	0.54	1.15	0.81	0.57
135	0.58	0.63	0.86	1.20	0.59	1.10	0.82	0.59	0.57	0.57	0.69	1.25	0.63	1.23	0.84	0.64
140	0.67	0.76	0.86	1.22	0.66	1.14	0.83	0.74	0.62	0.68	0.72	1.38	0.66	1.28	0.84	0.79
145	0.68	0.78	0.92	1.23	0.66	1.19	0.79	0.76	0.72	0.73	0.76	1.42	0.77	1.33	1.01	0.91
150	0.73	0.80	1.13	1.29	0.69	1.25	1.04	0.83	0.81	0.79	0.93	1.53	0.85	1.33	1.42	1.04
155	0.76	0.88	1.36	1.32	0.78	1.26	1.27	0.92	0.88	0.84	1.01	1.52	0.94	1.20	1.48	1.12
160	0.80	0.95	1.39	1.36	0.84	1.27	1.34	0.99	0.93	0.92	1.08	1.40	1.14	1.01	1.54	1.27
165	0.87	1.02	1.48	1.37	0.91	1.30	1.39	1.04	0.96	0.98	1.09	1.29	1.31	1.05	1.52	1.46
170	0.98	1.15	1.55	1.39	1.02	1.39	1.66	1.11	1.11	1.08	1.25	1.56	1.47	1.08	1.50	1.72
175	1.11	1.24	1.55	1.24	1.04	1.37	1.68	1.22	1.15	1.14	1.27	1.54	1.36	1.05	1.36	1.68
180	1.12	1.17	1.43	1.15	0.95	1.23	1.59	1.16	1.12	1.12	1.20	1.43	1.17	0.97	1.24	1.60

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	HBF2-200D(5700K)		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160711	120.0	60	1.742	208.5	0.9975	3.46
NB-C2	277.0	60	0.7596	202.2	0.9610	6.01
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

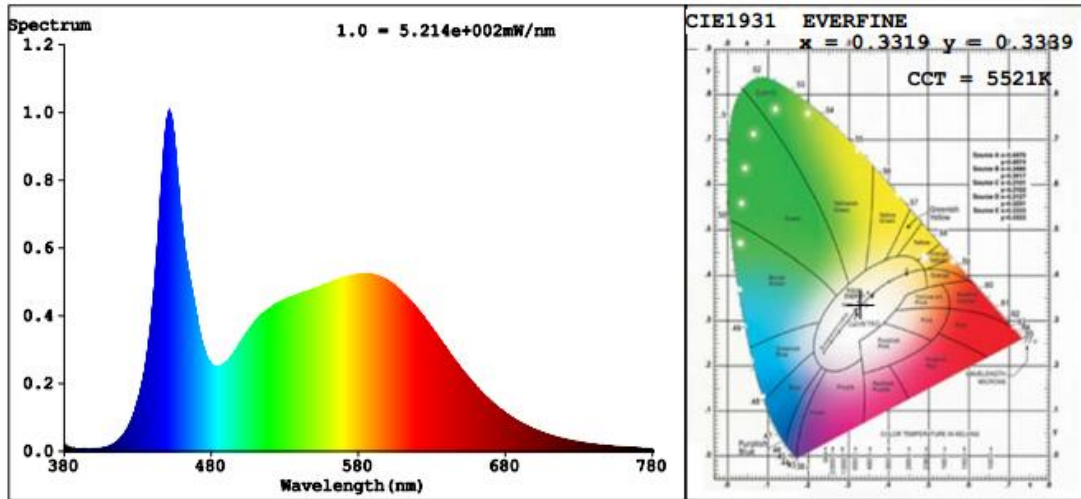
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	86	R9	25
Frequency (Hz)	60	R2	91	R10	78
CCT (K)	5521	R3	93	R11	86
Duv	0.0023	R4	86	R12	65
Chromaticity (x, y)	x=0.3319 y=0.3339	R5	87	R13	88
Chromaticity (u', v')	u'=0.2093 v'=0.4738	R6	86	R14	96
Color Rendering Index (CRI)	86.3	R7	88	R15	83
R9	25	R8	73	--	--

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)	24421	24123	>=10000(-10%)	
Luminous Efficacy (lm/W)	117.13	119.30	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 *******