



Report No.: STD160711NB-B

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): HBF2-150D

Representative (Tested) Model: HBF2-150D (2700K)  
HBF2-150D (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

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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	HBF2-150D	
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	150W	
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-B1(2700K), B2(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"> <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  $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ , 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  $1\text{ }^{\circ}$  vertical intervals and  $22.5\text{ }^{\circ}$  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  $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ . 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)

<b>Test date</b>	2016-07-14	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	HBF2-150D(2700K)		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160711	120.0	60	1.255	149.8	0.9950	5.76
NB-B1	277.0	60	0.5678	146.2	0.9296	7.34
<b>DLC Pass Criteria</b>					<b>&gt;= 0.9(-3%)</b>	<b>&lt;= 20(+5)</b>

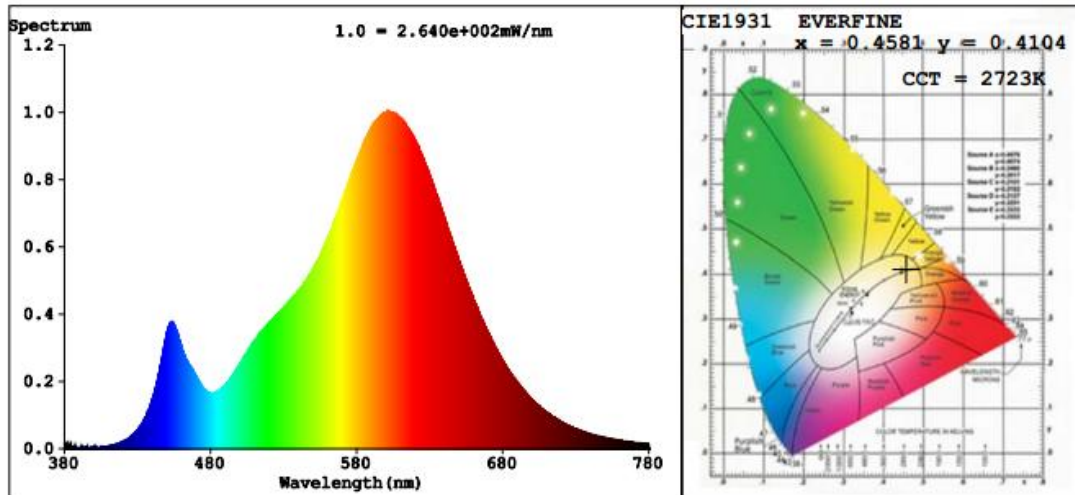
### Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	79	R9	0
Frequency (Hz)	60	R2	91	R10	78
CCT (K)	2723	R3	95	R11	73
Duv	0.0001	R4	78	R12	71
Chromaticity (x, y)	x=0.4581 y=0.4104	R5	77	R13	80
Chromaticity (u', v')	u'=0.2615 v'=0.5270	R6	89	R14	97
Color Rendering Index (CRI)	80.1	R7	80	R15	68
R9	0	R8	52	--	--

### 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)	15837	15662	>=10000(-10%)	
Luminous Efficacy (lm/W)	105.72	107.13	Standard: >= 105(-3%)	Premium: >= 130(-3%)
Zonal lumens in the 20-50 °zone (%)	55.2	--	>= 30(-20)	
Beam Angle ( °)	106.6	--	--	
Center Beam Candle Power (cd)	6508	--	--	

**Spectral Power Distribution & Chromaticity Diagram**

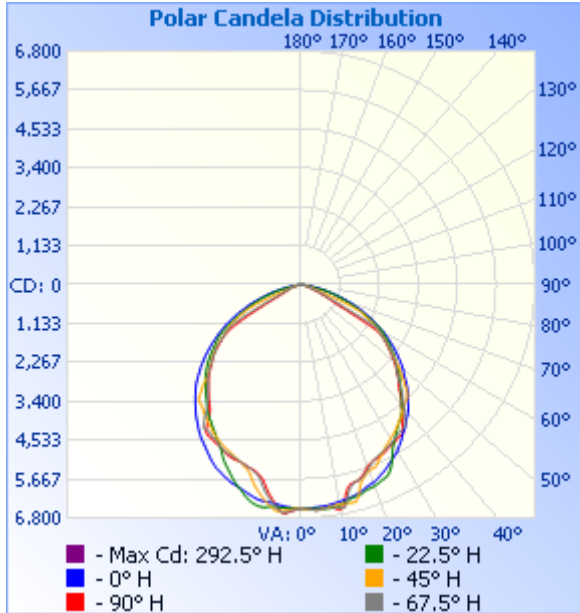


**Zonal Lumen Tabulation**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	4,879.7	30.8%
0-40	7,956.0	50.2%
0-60	13,794.0	87.1%
60-90	2,016.5	12.7%
70-100	522.4	3.3%
90-120	7.5	0%
0-90	15,810.6	99.8%
90-180	25.7	0.2%
0-180	15,836.3	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	621.3	3.9%	90-100	1.3	0%
10-20	1,711.0	10.8%	100-110	2.7	0%
20-30	2,547.4	16.1%	110-120	3.5	0%
30-40	3,076.3	19.4%	120-130	4.2	0%
40-50	3,122.2	19.7%	130-140	4.2	0%
50-60	2,715.8	17.1%	140-150	3.8	0%
60-70	1,495.5	9.4%	150-160	3.1	0%
70-80	466.2	2.9%	160-170	2.1	0%
80-90	54.9	0.3%	170-180	0.8	0%

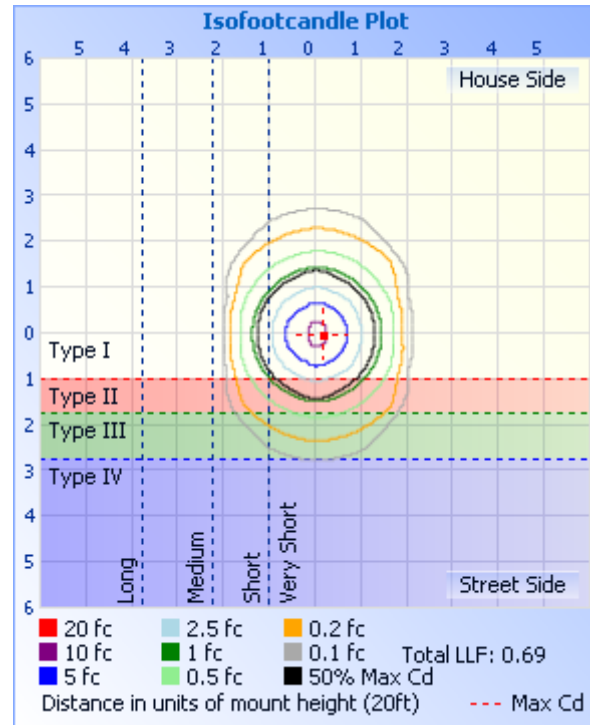
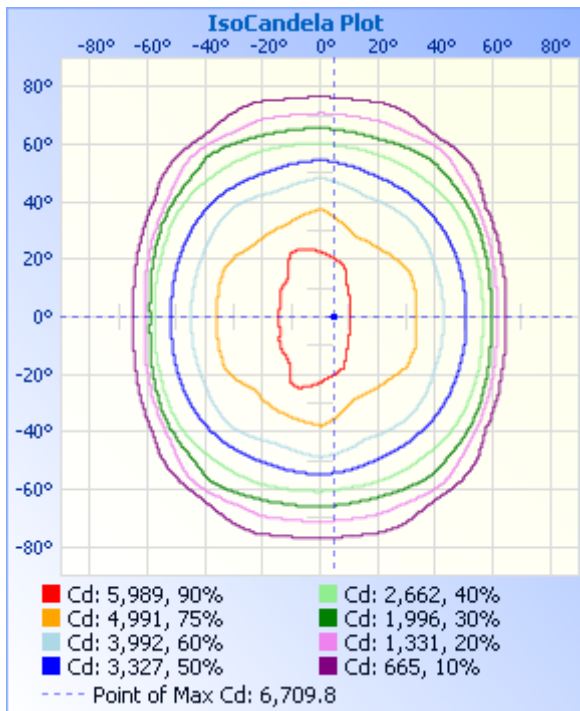
**Photometric Data**



**Illuminance at a Distance**

	Center Beam fc	Beam Width	
17.0ft	22.5 fc	46.9 ft	42.4 ft
34.0ft	5.6 fc	93.7 ft	84.8 ft
51.0ft	2.5 fc	140.6 ft	127.3 ft
68.0ft	1.4 fc	187.4 ft	169.7 ft
85.0ft	0.9 fc	234.3 ft	212.1 ft
102.0ft	0.6 fc	281.1 ft	254.5 ft

■ Vert. Spread: 108.1°  
■ Horiz. Spread: 102.6°



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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	6508	6508	6508	6508	6508	6508	6508	6508	6508	6508	6508	6508	6508	6508	6508	6508
5	6654	6710	6651	6568	6494	6559	6572	6568	6562	6550	6576	6512	6458	6529	6632	6654
10	5963	6080	6345	6593	6419	6517	6497	6603	6652	6577	6457	6517	6399	6578	6336	6093
15	5556	5577	5779	6335	6311	6371	6423	5964	5958	5957	6479	6353	6246	6351	5722	5566
20	5448	5416	5427	5991	6137	6245	5763	5710	5652	5700	5791	6143	6095	5927	5405	5420
25	5332	5317	5234	5518	5888	6053	5504	5438	5480	5415	5491	6060	5873	5436	5226	5310
30	5181	5132	5051	5018	5598	5367	5188	5285	5347	5258	5125	5440	5527	5003	5037	5138
35	4642	4983	4797	4684	5204	4946	4927	5128	5165	5114	4919	5031	5188	4679	4787	4939
40	4188	4235	4567	4308	4838	4545	4659	4654	4547	4665	4671	4519	4779	4295	4541	4215
45	3806	3848	3913	3948	4381	4082	4348	4057	4016	4014	4282	4034	4343	3945	3912	3837
50	3361	3380	3393	3525	3879	3643	3696	3588	3552	3560	3630	3624	3829	3545	3386	3365
55	2843	2876	2916	3060	3332	3167	3080	3074	3044	3069	3071	3161	3277	3063	2899	2870
60	1687	2182	2358	2538	2760	2719	2553	2525	1793	2507	2521	2691	2693	2538	2372	2185
65	540	639	1774	1881	2136	2041	1967	815	694	818	1943	1999	2079	1867	1767	636
70	368	379	554	1332	1500	1395	641	378	307	368	610	1352	1447	1294	523	369
75	182	213	276	769	886	831	245	175	160	174	237	812	852	729	259	206
80	55.3	62.2	116	174	389	188	102	61.9	56.6	61.7	94.9	175	365	152	112	60.6
85	27.8	30.6	34.9	53.8	86.9	51.7	31.0	25.3	24.7	27.0	31.0	45.8	78.3	45.9	36.7	30.7
90	0.00	0.00	0.08	1.98	3.55	1.84	0.09	0.00	0.00	0.00	0.05	1.21	3.53	1.82	0.00	0.00
95	0.00	0.00	0.00	2.30	3.08	1.71	0.05	0.00	0.00	0.00	0.14	1.59	5.73	3.09	0.17	0.00
100	0.00	0.00	1.26	3.89	4.51	2.97	0.72	0.00	0.00	0.00	0.50	2.80	8.37	4.10	1.27	0.00
105	0.44	0.60	2.36	4.38	5.61	3.57	1.65	0.39	0.39	0.39	1.27	3.67	7.43	4.51	2.44	0.83
110	1.37	1.97	3.24	5.37	5.51	4.51	2.54	1.33	1.05	1.27	1.97	4.71	6.43	5.19	3.26	1.89
115	2.15	2.53	4.34	4.84	5.39	4.29	3.26	2.27	1.98	2.09	2.69	4.15	5.23	4.72	4.09	2.69
120	2.97	3.02	5.65	4.88	3.63	4.18	4.58	2.88	2.37	2.64	3.73	4.55	3.03	4.57	5.30	3.11
125	3.85	4.29	6.02	7.76	3.72	6.71	5.31	3.98	2.86	3.09	3.96	7.18	3.19	7.15	5.52	3.77
130	4.40	4.68	5.94	7.96	3.97	6.81	5.41	4.27	3.69	3.63	4.26	7.73	3.58	7.65	5.89	4.43
135	4.43	4.73	5.85	8.12	4.03	6.88	5.85	4.42	4.11	3.96	4.39	8.28	3.96	8.59	5.90	4.68
140	4.45	4.95	5.76	8.20	4.08	7.28	5.31	4.82	4.29	4.56	4.45	8.71	4.29	8.88	5.47	5.60
145	4.47	5.07	5.71	8.22	4.14	7.43	5.21	4.87	4.62	4.72	4.95	9.04	4.95	8.99	6.42	5.93
150	4.49	5.15	7.08	8.33	4.29	8.25	6.23	5.05	5.06	4.92	5.77	9.15	5.39	8.91	9.46	6.48
155	4.62	5.22	8.40	8.56	4.95	8.34	7.39	5.23	5.34	5.04	6.31	8.52	5.94	7.74	9.94	7.20
160	4.90	5.66	8.73	8.60	5.23	8.24	8.06	5.65	5.56	5.39	6.52	7.85	7.32	6.27	9.88	8.08
165	4.99	6.23	9.37	8.82	5.72	8.17	8.70	5.92	5.74	5.77	6.65	7.88	8.47	6.72	9.80	9.30
170	5.83	6.98	9.88	9.10	6.16	8.64	10.2	6.76	6.77	6.49	7.58	8.80	8.86	6.67	9.55	10.9
175	6.49	7.43	9.89	8.17	6.66	8.42	10.4	7.03	6.82	6.63	7.47	9.31	8.31	6.55	8.50	10.3
180	6.60	6.99	8.85	7.40	5.67	7.48	9.51	6.98	6.71	6.60	6.97	8.83	7.48	5.94	7.73	9.80

## 2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

<b>Test date</b>	2016-07-14	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	HBF2-150D(5700K)		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
STD160711	120.0	60	1.266	151.39	0.9966	5.11
NB-B2	277.0	60	0.5727	147.75	0.9313	7.03
<b>DLC Pass Criteria</b>					<b>&gt;= 0.9(-3%)</b>	<b>&lt;= 20(+5)</b>

### Chromaticity Measurement - Sphere-Spectroradiometer Method:

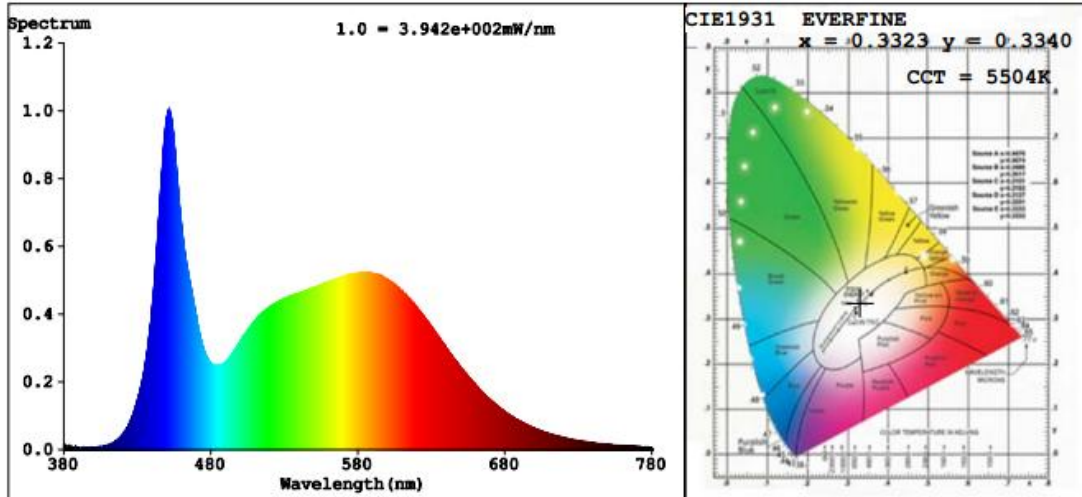
Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	86	R9	25
Frequency (Hz)	60	R2	91	R10	78
CCT (K)	5504	R3	93	R11	86
Duv	0.0023	R4	86	R12	65
Chromaticity (x, y)	x=0.3323 y=0.3340	R5	87	R13	88
Chromaticity (u', v')	u'=0.2095 v'=0.4739	R6	86	R14	96
Color Rendering Index (CRI)	86.2	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)	16495	16313	>=10000(-10%)	
Luminous Efficacy (lm/W)	108.96	110.41	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 \*\*\*\*\***

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