

LM-79-08 Test Report

High-Bay Luminaires for Commercial and Industrial buildings

Item No: LHB-150CW

Remark: The letter "X" in the model name stand for CCT as bellow :3=3000K, 4=4000K, 5=5000K, 6=5700K; "YY" stand for different mounting option as bellow YK=Yoke, PD=Pendant; "ZZ" stand for housing color by use 2 digits to indicate all of color.

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

Test & Report By:

Johnson Sun

Engineer: Johnson Sun

Date: July.13,2015

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: 8th floor, Block B, No. 11 Caipin Road, Guangzhou Science City, Tianhe, Guangzhou 510663, China

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

U.S. Department of Energy

Lighting Facts™ Uniform LM-79 Reporting Template
Laboratory Information:

Name of Test Laboratory	Standard-Tech Co. Ltd
Date of Test Report	July.13,2015
Test Report No.	GZE150320-N
Laboratory Contact Name	Tommy Liang

Product Information:

Type of Luminaire (for integral lamps, list base type and lamp type)	High-Bay Luminaires for Commercial and Industrial buildings	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Electrical Measurements:	Integrating Sphere	Goniophotometer	
	Output	Output	
Input Wattage	--	152.0	W
Input Current	--	1.283	A
Input Voltage (ac)	--	120.0	V
Power Factor	--	0.9872	
Off-State Power	--		W

Photometric Characteristics

Total Initial Lumen Output	--	15418	lm
Initial Lumen Efficacy	--	101.43	lm/w
Correlated color temperature / CCT	3018	--	K
Color rendering index / CRI	82.8	--	
R9 Value	8	--	
Duv	0.0004	--	
Luminous Intensity Distribution			
Center beam candlepower (if applicable)	-----	11244	cd
Beam angle (if applicable)		70.8	°
Zonal lumens in the 0°-60° zone		91.5	%
Zonal lumens in the 60°-90° zone		7.1	%
Zonal lumens in the 90°-120° zone		0.7	%
Zonal lumens in the 120°-180° zone		0.7	%

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Luminaire Aperture (for downlights)	--	in.	
Luminaire Length	--	mm	
Luminaires Width	--	mm	
Number of Units (modular products)	N/A	s	

Electrical Measurements:	Integrating Sphere	Goniophotometer	
	Output	Output	
Input Wattage	149.2	--	W
Input Current	1.255	--	A
Input Voltage (ac)	120.0	--	V
Power Factor	0.9897	--	
Off-State Power	0	--	W

Photometric Characteristics

Total Initial Lumen Output	15869	--	lm
Initial Lumen Efficacy	106.39	--	lm/w
Correlated color temperature / CCT	5734	--	K
Color rendering index / CRI	84.3	--	
R9 Value	21	--	
Duv	0.0029	--	
Luminous Intensity Distribution			
Center beam candlepower (if applicable)			cd
Beam angle (if applicable)			°
Zonal lumens in the 0°-60° zone	-----	-----	%
Zonal lumens in the 60°-90° zone			%
Zonal lumens in the 90°-120° zone			%
Zonal lumens in the 120°-180° zone			%

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Test Specifications:	
Date of Receipt	: July.06,2015
Date of Test	: July.10,2015
Test item	: Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters
Reference Standard	IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources CIE 15-2004 Technical Report Colorimetry IESNA LM-16-93 Practical Guide to Colorimetry of Light Source IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

Test Methods

1. Photometric and Electrical measurements – Light Distribution 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 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. Photometric and Electrical Measurements – Integrating Sphere Method:

Photometric 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 Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at least 5 nm intervals over the range of 380 to 780 nm.

1. Product Information:

Luminaire Type	High-Bay Luminaires for Commercial and Industrial buildings
Rated Voltage / Frequency	120~ 277Vac, 50/60Hz
Nominal Power	150W
Rated Initial Lamp Lumen	--
Declared CCT	3000K, 4000K, 5000K,5700K
LED Manufacturer	Philips Lumileds
LED Model	LUXEON 3030 2D
Sample Receipt Date	July.06,2015
Sample Number	GZE150320-N1(3000K),N2(5700K)

Photo



2.1 Electrical, Photometric and Chromaticity Measurements (Refer to Work Instruction QD25)	IES LM-79 2008
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Test date	2015-07-10	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE150320	120.0	60	1.283	152.0	0.9872	13.79
-N1	277.0	60	0.5968	149.7	0.9056	18.54

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	82.8
R9	8
CCT (K)	3018
Chromaticity (x, y)	x=0.4363 y=0.4049
Chromaticity (u', v')	u'=0.2498 v'=0.5216
Duv	0.0004

Special Color Rendering Indices			
R1	81	R9	8
R2	91	R10	80
R3	96	R11	80
R4	81	R12	72
R5	81	R13	83
R6	89	R14	99
R7	83	R15	74
R8	59	--	--

Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	15418
Luminous Efficacy (lm/W)	101.43
Beam Angle °	70.8
Center Beam Candle Power (cd)	11244
S/MH(C0/180)	1.01
S/MH(C90/270)	1.02

Goniophotometer Method:

Parameter	Result
Test Voltage (V)	277.0
Frequency (Hz)	60
Total Luminous (lm)	15086
Luminous Efficacy (lm/W)	100.79

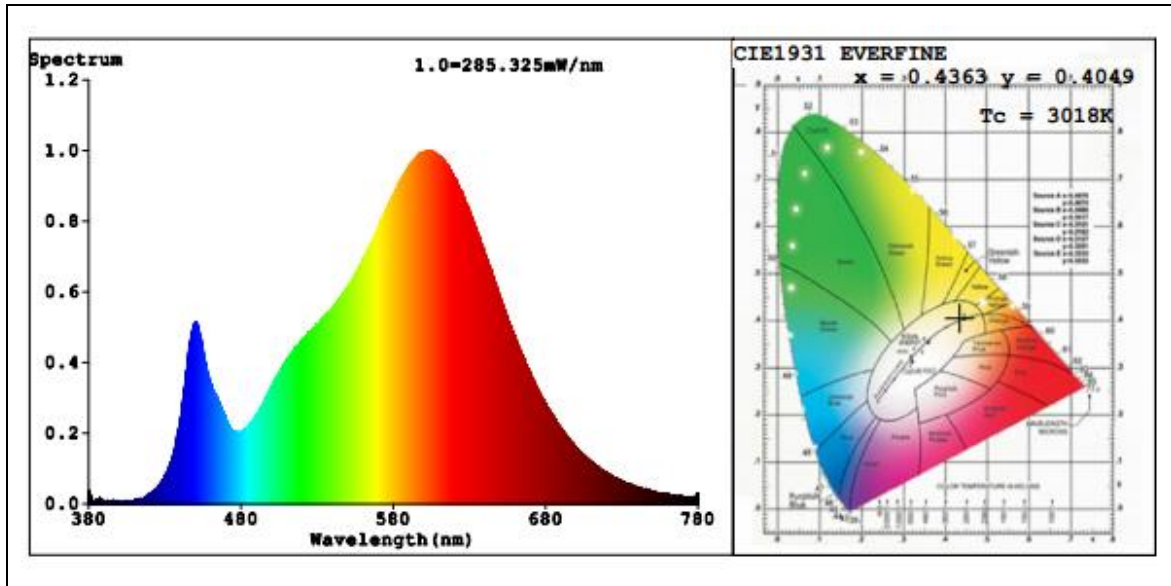
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Spectral Power Distribution & Chromaticity Diagram



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Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	8,699.3	56.4%
0-40	12,045.0	78.1%
0-60	14,108.0	91.5%
60-90	1,101.1	7.1%
70-100	534.6	3.5%
90-120	113.9	0.7%
0-90	15,209.1	98.7%
90-180	206.9	1.3%
0-180	15,416.0	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	939.5	6.1%	90-100	53.0	0.3%
10-20	2,881.7	18.7%	100-110	39.0	0.3%
20-30	4,878.2	31.6%	110-120	21.9	0.1%
30-40	3,345.7	21.7%	120-130	18.3	0.1%
40-50	1,156.1	7.5%	130-140	19.4	0.1%
50-60	906.9	5.9%	140-150	20.1	0.1%
60-70	619.5	4.0%	150-160	17.9	0.1%
70-80	315.5	2.0%	160-170	13.0	0.1%
80-90	166.1	1.1%	170-180	4.3	0%

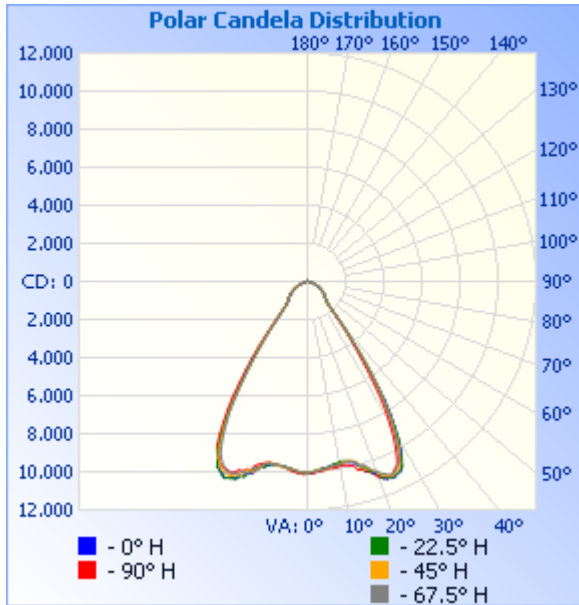
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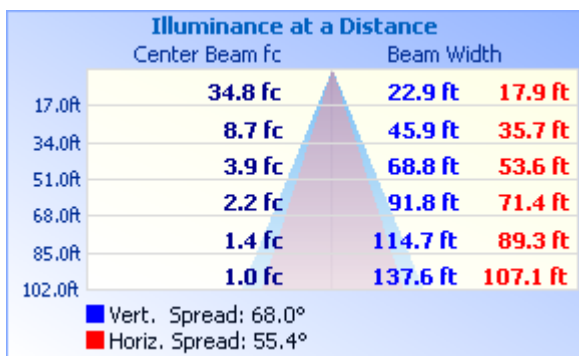
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Photometric Data



Illuminance Plots



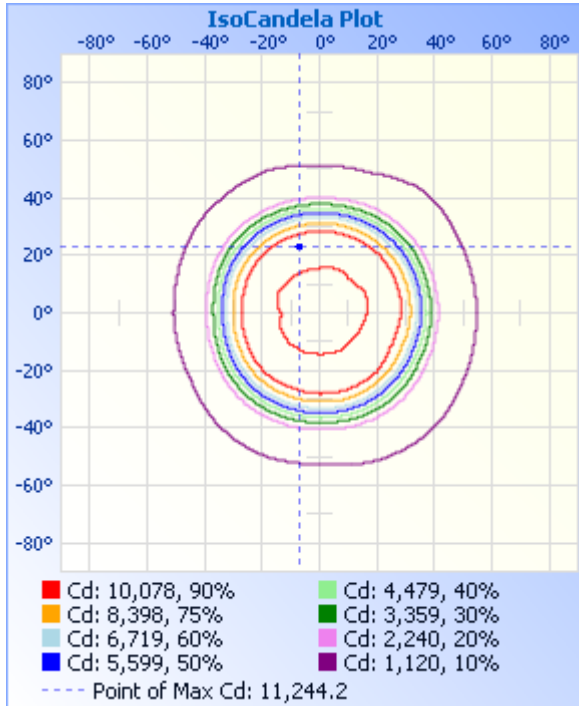
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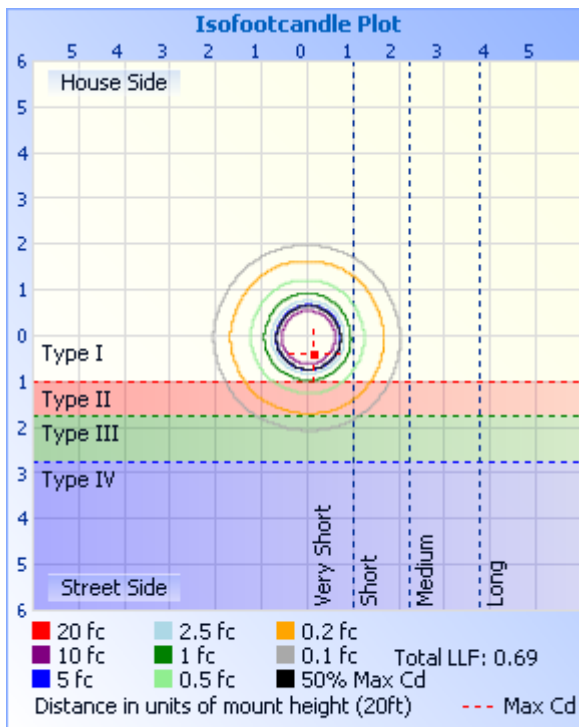
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ISOCANDELA DIAGRAM



ISOLUX DIAGRAM



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Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	10069	10069	10069	10069	10069	10069	10069	10069	10069	10069	10069	10069	10069	10069	10069	10069	10069
1	10025	10002	10001	10008	10070	10047	10048	10032	10027	10012	10024	10033	10129	10108	10080	10061	10025
2	9986	9964	9964	9988	10063	10025	10040	10027	10010	10005	10018	10022	10082	10056	10039	10018	9986
3	9946	9933	9915	9958	10001	9984	9994	9977	9984	9973	9966	10010	10064	10030	10034	9974	9946
4	9864	9878	9884	9913	9978	9949	9927	9958	9934	9919	9919	9925	10021	9982	9964	9878	9864
5	9843	9851	9881	9898	9935	9908	9925	9920	9885	9876	9889	9856	9967	9935	9892	9826	9843
6	9805	9838	9864	9845	9897	9885	9909	9878	9843	9824	9874	9843	9892	9898	9831	9766	9805
7	9745	9768	9805	9807	9864	9861	9861	9843	9801	9786	9826	9798	9826	9852	9808	9731	9745
8	9711	9704	9775	9777	9880	9866	9852	9830	9779	9780	9810	9753	9785	9790	9743	9700	9711
9	9700	9662	9758	9786	9875	9848	9868	9838	9798	9778	9807	9752	9757	9744	9724	9705	9700
10	9679	9619	9719	9763	9829	9806	9814	9825	9775	9773	9800	9748	9750	9719	9705	9692	9679
11	9645	9601	9661	9721	9826	9806	9794	9822	9778	9777	9720	9750	9723	9680	9664	9647	9645
12	9666	9634	9655	9705	9860	9858	9832	9870	9844	9823	9764	9775	9720	9641	9644	9647	9666
13	9733	9679	9680	9705	9911	9909	9892	9934	9968	9965	9782	9829	9783	9673	9722	9739	9733
14	9762	9739	9697	9732	9981	9937	9937	9991	10061	10017	10065	9935	9849	9728	9777	9764	9762
15	9932	9808	9789	9851	10251	10156	10238	10188	10212	10147	10187	10168	9944	9763	10006	9853	9932
16	10070	10166	10084	10059	10261	10201	10286	10256	10465	10236	10442	10235	10068	9941	10191	9979	10070
17	10387	10189	10337	10061	10409	10463	10341	10403	10537	10485	10342	10510	10357	9968	10379	10049	10387
18	10385	10472	10316	10270	10512	10635	10521	10680	10630	10797	10422	10560	10352	10224	10213	10305	10385
19	10662	10573	10478	10519	10688	10699	10726	10766	10810	10768	10774	10535	10546	10417	10457	10674	10662
20	10768	10655	10718	10590	10919	10942	10836	10842	11005	11022	10766	10808	10524	10473	10747	10654	10768
21	11012	11095	10886	10783	11039	10991	11011	10977	11018	11066	10896	10765	10735	10765	10721	10916	11012
22	11187	11011	11019	10903	11091	11037	11144	11001	11107	11126	11023	10827	10814	10863	10907	11023	11187
23	11139	11227	11113	11025	11123	11034	11062	11019	11214	11172	10954	10859	10753	10976	11056	11168	11139
24	11244	11180	11105	11004	11022	11020	11008	10940	11024	11117	10890	10671	10738	10917	11060	11167	11244
25	11144	11130	11011	10943	10843	10898	10984	10817	10941	10916	10801	10567	10676	10884	10915	11123	11144
26	11110	11074	10929	10770	10723	10746	10787	10715	10773	10853	10553	10331	10545	10737	10854	11012	11110
27	10934	10902	10725	10611	10345	10362	10492	10312	10409	10447	10379	10065	10358	10646	10721	10866	10934
28	10540	10485	10343	10222	9848	9907	10004	9870	9989	10110	9974	9608	10145	10333	10395	10507	10540
29	10086	9981	9868	9641	9313	9350	9451	9314	9375	9529	9312	9099	9809	9869	9955	9976	10086

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30	9520	9528	9260	9153	8662	8707	8790	8642	8695	8880	8740	8520	9199	9311	9371	9558	9520
31	8856	8859	8674	8538	8023	8033	8128	8011	8154	8232	8080	7948	8563	8792	8734	8883	8856
32	8231	8107	7943	7822	7290	7296	7455	7272	7384	7449	7339	7119	7939	8063	8025	8119	8231
33	7448	7306	7153	7100	6471	6465	6644	6570	6641	6634	6517	6378	7238	7306	7295	7336	7448
34	6585	6482	6460	6365	5640	5682	5828	5783	5885	5837	5711	5627	6418	6545	6466	6546	6585
35	5742	5654	5708	5580	4884	4972	5071	5025	5137	5175	4972	4927	5676	5776	5694	5722	5742
36	4911	4880	4949	4786	4182	4241	4356	4305	4424	4492	4300	4199	4977	5012	4961	4932	4911
37	4121	4164	4167	4043	3589	3632	3745	3720	3821	3882	3767	3657	4264	4239	4221	4174	4121
38	3447	3468	3471	3439	2996	3023	3135	3135	3218	3273	3233	3114	3623	3574	3522	3484	3447
39	2890	2875	2790	2840	2404	2415	2526	2552	2616	2664	2701	2574	3026	2994	2907	2857	2890
40	2386	2356	2314	2346	2053	1997	2105	2156	2244	2265	2284	2214	2538	2473	2381	2431	2386
41	2007	1982	1938	1952	1770	1717	1820	1886	1957	1989	1968	1944	2202	2112	2068	2025	2007
42	1686	1749	1747	1752	1543	1499	1601	1655	1713	1771	1751	1719	1923	1817	1827	1740	1686
43	1539	1583	1559	1558	1416	1365	1429	1508	1547	1602	1585	1545	1698	1687	1696	1572	1539
44	1393	1418	1371	1363	1386	1330	1394	1469	1494	1564	1538	1505	1596	1559	1566	1405	1393
45	1363	1386	1338	1330	1350	1290	1351	1430	1453	1522	1498	1464	1498	1430	1436	1365	1363
46	1325	1348	1298	1297	1314	1250	1306	1384	1405	1470	1449	1421	1460	1390	1392	1324	1325
47	1291	1309	1259	1261	1272	1210	1263	1340	1357	1422	1403	1376	1416	1344	1348	1282	1291
48	1253	1273	1221	1227	1236	1173	1224	1298	1315	1375	1363	1335	1373	1304	1311	1241	1253
49	1219	1240	1187	1193	1199	1137	1185	1258	1273	1332	1321	1295	1335	1265	1276	1203	1219
50	1186	1209	1153	1164	1165	1102	1146	1216	1224	1288	1272	1254	1298	1232	1242	1172	1186
51	1149	1173	1116	1127	1128	1067	1110	1176	1180	1244	1229	1215	1259	1195	1205	1135	1149
52	1114	1137	1083	1093	1092	1027	1070	1134	1133	1198	1186	1172	1218	1159	1172	1099	1114
53	1077	1100	1049	1056	1057	991	1033	1090	1086	1153	1141	1131	1178	1123	1135	1066	1077
54	1043	1066	1018	1023	1020	956	997	1046	1040	1103	1093	1091	1139	1087	1103	1033	1043
55	1006	1030	985	983	978	921	959	1002	996	1054	1044	1048	1102	1049	1066	997	1006
56	970	992	952	945	940	886	924	958	955	1008	997	1002	1058	1010	1030	963	970
57	932	957	920	912	901	852	890	920	912	968	961	964	1017	974	996	929	932
58	897	922	892	875	863	819	854	877	873	928	920	926	977	938	963	894	897
59	863	887	857	842	825	781	812	832	831	884	876	886	939	900	928	860	863
60	826	846	820	799	784	743	772	790	786	839	831	844	898	861	892	827	826

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61	786	806	784	759	743	705	734	745	743	793	785	797	856	822	852	789	786
62	746	765	743	717	704	669	693	705	706	749	745	754	812	777	809	748	746
63	709	727	707	682	666	636	656	665	669	706	708	714	771	735	770	710	709
64	674	690	672	647	630	603	616	624	632	663	670	678	732	698	731	674	674
65	636	649	637	613	589	565	576	582	593	623	633	636	691	657	691	637	636
66	600	610	601	579	551	528	536	541	554	584	597	597	649	618	650	597	600
67	563	571	562	542	516	494	500	504	517	546	560	560	609	578	608	560	563
68	526	533	527	506	481	459	460	466	481	508	523	521	570	540	568	521	526
69	489	495	489	471	446	424	425	431	446	469	486	482	528	501	528	485	489
70	453	459	452	438	416	394	391	398	413	434	447	446	484	464	489	452	453
71	418	425	419	407	387	366	360	368	383	400	413	413	446	431	453	422	418
72	387	393	389	378	358	341	331	338	354	365	382	381	409	400	419	393	387
73	357	360	357	350	328	310	300	308	320	334	349	349	377	370	388	365	357
74	329	330	329	322	299	284	270	280	293	303	319	321	343	341	357	336	329
75	299	302	300	296	270	258	245	252	265	276	290	292	313	314	326	310	299
76	274	275	274	270	245	234	225	228	241	252	266	269	285	288	298	284	274
77	250	250	250	247	224	215	206	207	219	234	245	247	262	264	273	261	250
78	229	230	228	226	208	199	194	193	204	218	231	233	240	244	254	240	229
79	216	215	211	210	199	189	185	184	195	207	220	224	226	229	238	225	216
80	208	206	201	200	192	184	179	180	188	198	212	217	217	222	230	220	208
81	203	198	193	192	185	178	172	175	182	191	206	210	212	216	227	216	203
82	196	188	184	183	176	168	164	166	173	181	195	200	206	212	220	209	196
83	186	178	176	174	165	158	155	156	161	168	182	187	199	204	209	198	186
84	174	165	165	163	154	147	143	143	147	154	167	174	188	194	196	186	174
85	159	152	153	151	140	134	130	128	132	139	151	159	176	181	183	171	159
86	144	138	140	140	130	124	119	116	120	126	137	147	164	166	165	152	144
87	131	126	128	128	121	116	109	107	111	116	126	135	152	152	150	138	131
88	122	117	118	118	111	105	101	100	104	108	115	122	141	142	138	129	122
89	114	108	108	109	96	92	91	88	96	98	105	108	125	127	125	120	114
90	106	101	97	96	87	84	78	61	72	70	88	93	110	111	116	111	106
91	99	91	90	86	76	72	56	33	39	36	63	75	96	98	104	92	99

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92	71	62	77	76	64	57	38	26	26	26	40	56	79	80	81	55	71
93	39	36	58	63	51	44	30	31	25	27	28	40	60	61	55	33	39
94	30	30	39	48	40	36	29	54	43	50	25	30	44	44	37	29	30
95	33	39	33	37	36	34	29	60	59	58	24	27	34	34	32	48	33
96	55	61	32	33	36	34	32	57	58	54	25	26	29	30	31	67	55
97	64	62	32	33	37	36	37	51	53	48	27	29	28	29	32	65	64
98	60	57	35	33	43	39	38	46	47	42	27	33	29	31	36	60	60
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100	52	49	38	42	60	49	37	39	39	34	27	47	43	39	41	50	52
101	50	45	38	48	65	48	37	38	36	32	27	52	52	44	40	46	50
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103	40	38	38	55	61	47	34	33	35	32	29	57	64	48	34	38	40
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105	31	29	32	51	52	43	28	27	31	30	28	51	57	46	27	30	31
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112	21	21	24	33	32	29	20	19	18	19	22	30	33	32	22	21	21
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115	18	17	22	28	27	26	20	14	15	14	21	25	27	27	20	16	18
116	16	15	22	27	26	24	20	14	14	15	20	24	25	25	20	15	16
117	14	15	22	26	24	23	20	15	13	16	20	22	24	24	20	14	14
118	13	16	22	24	24	22	20	17	14	18	20	21	23	23	20	16	13
119	14	17	22	24	24	22	20	17	15	17	20	21	22	22	20	18	14
120	15	18	22	23	24	22	21	17	17	17	20	20	22	22	20	18	15
121	17	18	21	23	24	21	21	16	18	17	20	20	22	21	20	18	17
122	19	18	22	23	24	21	21	16	18	17	20	20	22	21	20	18	19

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123	19	17	22	22	24	21	22	17	18	16	20	20	22	21	21	18	19
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152	36	39	40	29	34	36	45	43	41	40	43	36	26	28	37	36	36
153	37	40	41	30	35	37	47	43	41	41	43	38	25	30	38	36	37

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154	38	40	42	32	36	38	48	43	41	41	43	39	25	31	40	37	38
155	38	40	43	34	37	40	48	42	41	41	43	41	26	33	41	37	38
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180	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40

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BUG Rating: B4-U3-G1

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	4357.3	28.3
FM - Front-Medium(30-60)	2806.9	18.2
FH - Front-High(60-80)	489.02	3.2
FVH - Front-Very High(80-90)	89.174	0.6
Total Forward Light	7847.6	50.9

BL - Back-Low(0-30)	4342.1	28.2
BM - Back-Medium(30-60)	2604	16.9
BH - Back-High(60-80)	445.97	2.9
BVH - Back-Very High(80-90)	76.88	0.5
Total Back Light	7570.7	49.1

UL - Uplight-Low(90-100)	52.967	0.3
UH - Uplight-High(100-180)	154.01	1.0
Total Up Light	206.98	1.3

BUG(Back,Up,Glare) Rating	B4-U3-G1
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Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	7742.3	105.22	7847.6
Street Side	7468.9	101.75	7570.7

2.2 Electrical, Photometric and Chromaticity Measurements <i>(Refer to Work Instruction QD25)</i>	IES LM-79 2008
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Test date	2015-07-10	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	TLHBC1506YYZZ-P-PC16		

Electrical Measurement:

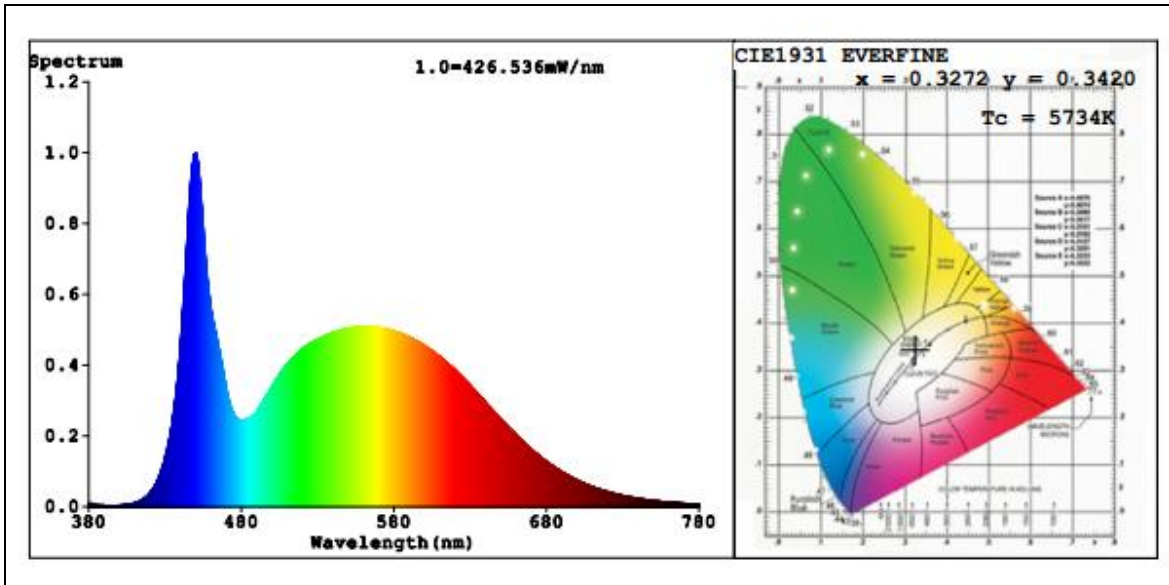
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE150320	120.0	60	1.255	149.2	0.9897	14.42
-N2	277.0	60	0.5909	148.4	0.9067	19.21

Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	84.3
R9	21
CCT (K)	5734
Chromaticity (x, y)	x=0.3272 y=0.3420
Chromaticity (u', v')	u'=0.2029 v'=0.4772
Duv	0.0029
Total Luminous (lm)	15869
Luminous Efficacy (lm/W)	106.39

Special Color Rendering Indices			
R1	83	R9	21
R2	88	R10	71
R3	91	R11	83
R4	84	R12	61
R5	83	R13	84
R6	83	R14	95
R7	89	R15	79
R8	73	--	

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 DATASHEET PACKAGE *******