

LM-79-08 Test Report

For

Beyond LED Technology

(Brand Name:Beyond)

1939 Parker Court, Stone Mountain, GA 30087

High-Bay Luminaries (Commercial and Industrial)

Model name(s):

BLT-HB21-100WH1JT2A1-BH50

Remark: "a" can be any two letters to represent lamp colors; BH=Black, WH=White, or Customized;

"b" can be "10SP", "20SP" or blank for Surge-Protective Device provided or not;

"c" can be "M", "P" or blank for DC Motion Sensor, DC PIR sensor provided or not;

"d" can be any digits for CCT, 30=3000K,40=4000K,45=4500K,50=5000K,57=5700K.

Representative (Tested) Model:

BLT-HB21-100WH1JT2A1-BH50

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

Test & Report By:

Candy Chen

Engineer: Candy Chen

Date: 2022-12-09

Review By:

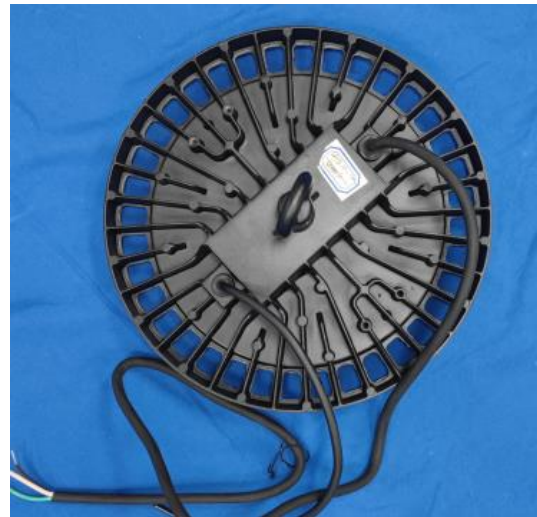
Jason Luo

Manager: Jason Luo

1.1 Product Information:

Organization Name	Beyond LED Technology	
Brand Name	Beyond	
Model Number	BLT-HB21-100WH1JT2A1-BH50	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	High-Bay Luminaires (Commercial and Industrial)	
Rated Voltage / Frequency	120-277Vac, 50/60 Hz	
Nominal Power	100W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,3500K,4000K,4500K, 5000K,5700K	
LED Manufacturer	Bridgelux Inc.	
LED Model	BXEN-XXE-13H-9D1-00-0-0	
Sample Number	BLC2211019E-A1	
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	2022-11-28
Date of Test	2022-12-01
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-79-2017 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	BL-QP-033

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° vertical intervals and 22.5° horizontal intervals. Goniophotometer far field detector $\text{fl}'=1.42\%$, Test distance: 14.14m

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.

Self-absorption:

BLT-HB21-100WH1JT2A1-BH50

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.

Laboratory: UTEST TECHNICAL LABORATORY CO.LTD A2LA Certificate# 4810.01

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Report Format Number BL-FM-SA-012

2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2022-12-01	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	BLT-HB21-100WH1JT2A1-BH50		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC221101	120.0	60	0.848	100.75	0.990	10.63
9E-A1	277.0	60	0.387	99.20	0.926	13.31
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

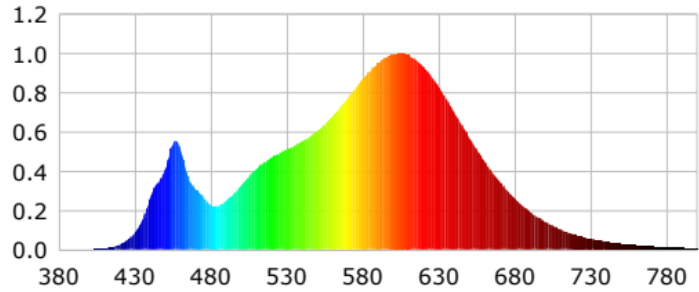
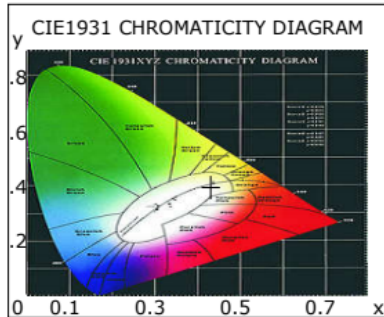
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	10
Frequency (Hz)	60	R2	93	R10	83
CCT (K)	3065	R3	95	R11	81
Duv	-0.0016	R4	81	R12	75
Chromaticity (x, y)	x=0.4302 y=0.3978	R5	83	R13	85
Chromaticity (u', v')	u(u')=0.2489 v'(v')=0.5179	R6	92	R14	98
Color Rendering Index (CRI)	83	R7	81	R15	75
R9	10	R8	60	--	--
Rf	85	--	--	--	--
Rg	96	--	--	--	--
Rcs,h1(%)	-11				

Photometric Measurement – Goniophotometer Method:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	13995.2	14039.8	>=10000(-10%)
Luminous Efficacy (lm/W)	138.91	141.53	Premium: >= 135(-3%)
Most worst Luminous/Highest	138.91		
Zonal lumens in the 20-50 °zone (%)	63.40	--	>=30(-10%)
Beam Angle (°)	82.1	--	--
Center Beam Candle Power (cd)	7526	--	--

Spectral Power Distribution & Chromaticity Diagram



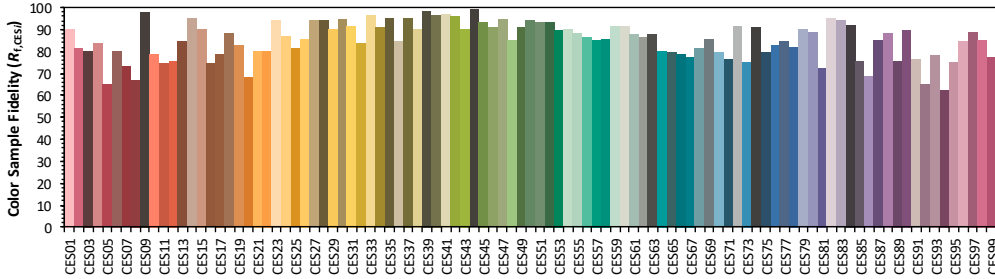
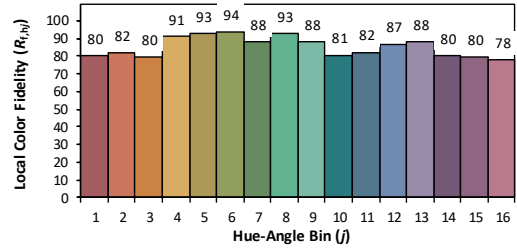
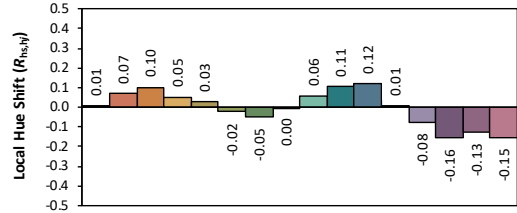
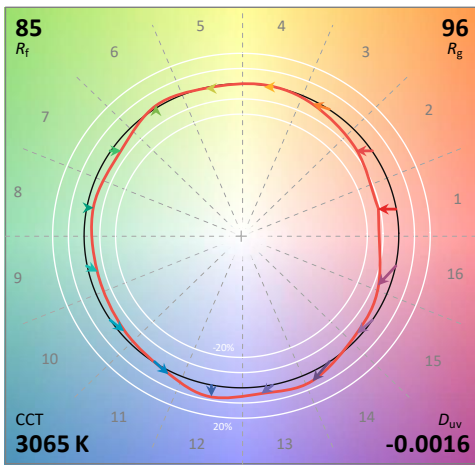
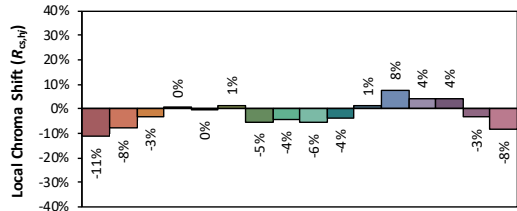
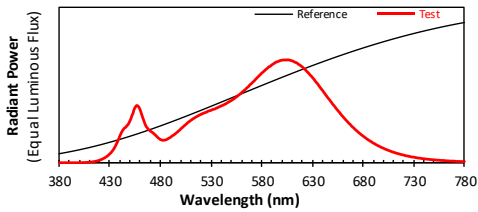
WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0002	0.0574	535	0.4904	154.6120	690	0.3448	108.7068
385	0.0004	0.1364	540	0.5097	160.7132	695	0.2995	94.4214
390	0.0004	0.1161	545	0.5296	166.9836	700	0.2596	81.8568
395	0.0003	0.0931	550	0.5523	174.1322	705	0.2235	70.4662
400	0.0008	0.2612	555	0.5754	181.4070	710	0.1919	60.5020
405	0.0022	0.6830	560	0.6047	190.6718	715	0.1646	51.8873
410	0.0053	1.6790	565	0.6392	201.5335	720	0.1416	44.6474
415	0.0119	3.7587	570	0.6787	213.9762	725	0.1202	37.9060
420	0.0246	7.7691	575	0.7246	228.4730	730	0.1026	32.3496
425	0.0472	14.8749	580	0.7709	243.0467	735	0.0877	27.6653
430	0.0854	26.9213	585	0.8211	258.8928	740	0.0752	23.7068
435	0.1501	47.3406	590	0.8720	274.9465	745	0.0630	19.8751
440	0.2590	81.6735	595	0.9129	287.8418	750	0.0541	17.0425
445	0.3403	107.2952	600	0.9521	300.1970	755	0.0453	14.2878
450	0.4073	128.4121	605	0.9805	309.1456	760	0.0392	12.3664
455	0.5356	168.8681	610	0.9973	314.4422	765	0.0339	10.6772
460	0.5156	162.5671	615	0.9998	315.2365	770	0.0283	8.9130
465	0.3750	118.2231	620	0.9916	312.6367	775	0.0249	7.8547
470	0.3089	97.4059	625	0.9683	305.3049	780	0.0215	6.7814
475	0.2701	85.1737	630	0.9324	293.9775	785	0.0172	5.4284
480	0.2267	71.4888	635	0.8831	278.4234	790	0.0145	4.5781
485	0.2219	69.9744	640	0.8289	261.3562	795	0.0129	4.0544
490	0.2475	78.0453	645	0.7689	242.4376	800	0.0117	3.6920
495	0.2841	89.5811	650	0.7041	222.0107			
500	0.3275	103.2732	655	0.6347	200.1159			
505	0.3709	116.9363	660	0.5697	179.6251			
510	0.4119	129.8827	665	0.5096	160.6826			
515	0.4443	140.0917	670	0.4500	141.8839			
520	0.4693	147.9616	675	0.3953	124.6217			
525	0.4904	154.6120	680	0.3448	108.7068			
530	0.5097	160.7132	685	0.2995	94.4214			

TM30

ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-XXE-13H-9D1-00-0-0
Date: 2022/12/1

Manufacturer: ASmart LIGHT CO., LTD
Model: AST-HB21-100WH1JT2A1-abc30



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.4302
 y 0.3978
 u' 0.2489
 v' 0.5179

CIE 13.3-1995 (CRI)	
R _a	83
R ₉	10

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

Zonal Lumen Tabulation

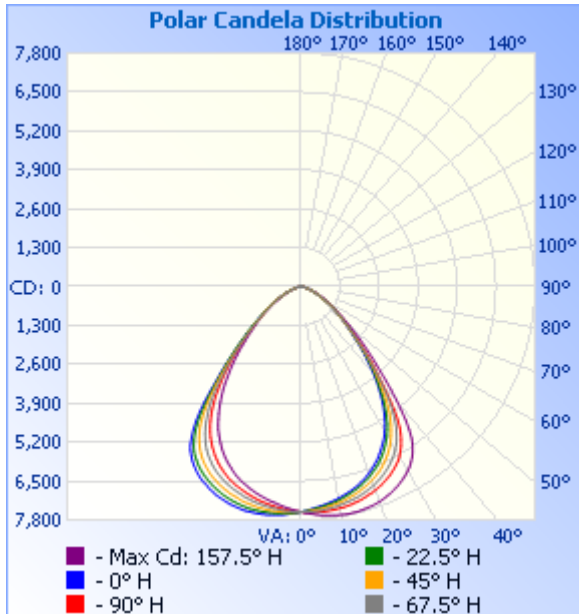
Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0-30	5,881.8	42%	42%
0-40	9,278.0	66.3%	66.3%
0-60	12,955.6	92.6%	92.6%
60-90	971.1	6.9%	6.9%
70-100	330.2	2.4%	2.4%
90-120	19.4	0.1%	0.1%
0-90	13,926.7	99.5%	99.5%
90-180	66.4	0.5%	0.5%
0-180	13,993.0	100%	100%

Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	714.0	5.1%	90-100	6.5	0%
10-20	2,059.7	14.7%	100-110	6.2	0%
20-30	3,108.0	22.2%	110-120	6.7	0%
30-40	3,396.2	24.3%	120-130	8.1	0.1%
40-50	2,358.9	16.9%	130-140	9.7	0.1%
50-60	1,318.7	9.4%	140-150	10.5	0.1%
60-70	647.4	4.6%	150-160	9.6	0.1%
70-80	268.4	1.9%	160-170	6.7	0%
80-90	55.3	0.4%	170-180	2.4	0%

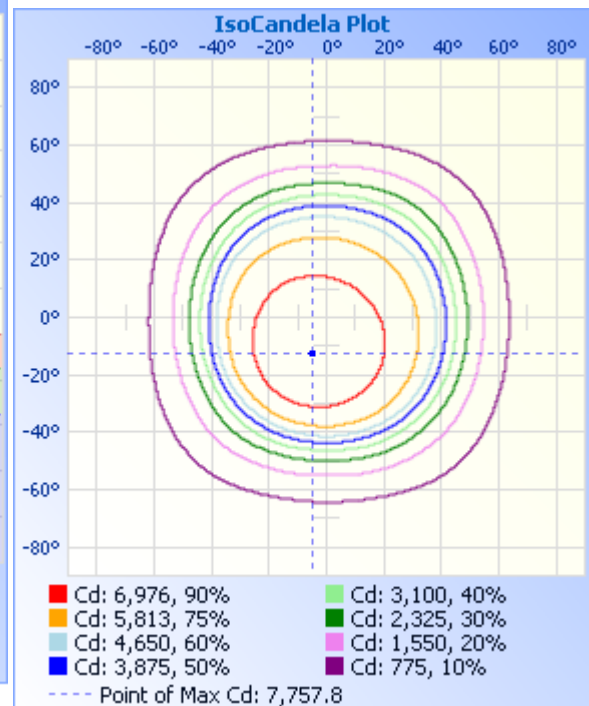
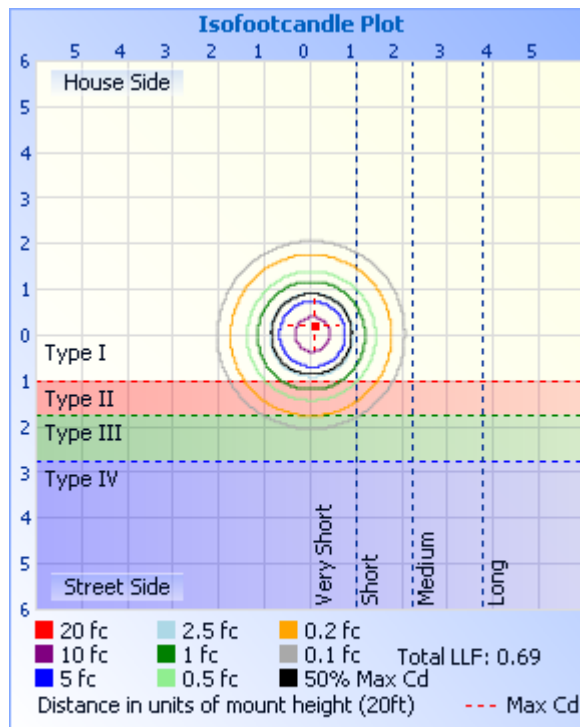
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	26.0 fc	29.6 ft	28.6 ft
34.0ft	6.51 fc	59.3 ft	57.3 ft
51.0ft	2.89 fc	88.9 ft	85.9 ft
68.0ft	1.63 fc	118.5 ft	114.6 ft
85.0ft	1.04 fc	148.2 ft	143.2 ft
102.0ft	0.72 fc	177.8 ft	171.8 ft

■ Vert. Spread: 82.1°
■ Horiz. Spread: 80.2°



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	7526	7526	7526	7526	7526	7526	7526	7526	7526	7526	7526	7526	7526	7526	7526	7526	7526
1	7500	7506	7520	7526	7541	7547	7560	7563	7563	7550	7539	7527	7512	7496	7492	7492	7500
2	7460	7483	7506	7527	7553	7566	7583	7585	7579	7567	7546	7527	7501	7475	7461	7464	7460
3	7430	7455	7488	7525	7555	7583	7610	7614	7605	7588	7548	7519	7486	7452	7431	7433	7430
4	7393	7423	7466	7514	7554	7602	7635	7643	7634	7593	7555	7509	7474	7422	7404	7392	7393
5	7362	7402	7455	7507	7554	7608	7650	7663	7656	7606	7558	7499	7443	7388	7364	7354	7362
6	7333	7369	7438	7490	7554	7618	7673	7686	7670	7616	7558	7479	7420	7357	7326	7318	7333
7	7297	7344	7403	7470	7543	7629	7693	7707	7682	7621	7549	7470	7393	7320	7299	7272	7297
8	7254	7316	7377	7456	7539	7629	7705	7715	7701	7624	7549	7445	7369	7282	7260	7243	7254
9	7226	7284	7356	7442	7527	7629	7705	7729	7709	7624	7540	7435	7336	7250	7217	7198	7226
10	7180	7246	7327	7414	7514	7623	7711	7739	7716	7628	7524	7410	7309	7222	7180	7156	7180
11	7140	7208	7302	7388	7503	7616	7717	7751	7716	7623	7517	7389	7282	7184	7140	7116	7140
12	7096	7161	7261	7361	7484	7603	7715	7758	7716	7614	7497	7364	7243	7136	7089	7068	7096
13	7052	7118	7220	7336	7472	7590	7704	7751	7717	7614	7474	7336	7205	7100	7043	7018	7052
14	7002	7072	7185	7308	7438	7577	7704	7752	7718	7596	7454	7298	7167	7053	6994	6967	7002
15	6951	7021	7144	7279	7418	7560	7700	7741	7700	7579	7438	7274	7126	7004	6943	6915	6951
16	6895	6971	7098	7240	7385	7541	7678	7726	7683	7561	7403	7228	7083	6952	6883	6857	6895

17	6834	6919	7052	7201	7351	7518	7663	7707	7665	7534	7359	7190	7035	6901	6828	6802	6834
18	6769	6855	7004	7162	7311	7496	7647	7693	7649	7507	7331	7152	6988	6837	6768	6733	6769
19	6701	6790	6950	7115	7284	7462	7625	7670	7620	7478	7303	7109	6936	6779	6700	6669	6701
20	6625	6725	6893	7063	7234	7422	7594	7645	7585	7445	7258	7060	6881	6711	6628	6591	6625
21	6548	6651	6829	7013	7190	7387	7557	7613	7556	7406	7218	7011	6821	6643	6549	6503	6548
22	6465	6578	6761	6952	7142	7337	7516	7573	7523	7358	7172	6958	6748	6563	6467	6419	6465
23	6371	6492	6688	6887	7085	7291	7470	7535	7477	7319	7115	6896	6675	6480	6378	6333	6371
24	6283	6405	6609	6823	7028	7238	7422	7490	7431	7266	7063	6833	6598	6396	6283	6237	6283
25	6177	6309	6515	6753	6972	7180	7368	7439	7374	7212	7006	6769	6516	6302	6190	6135	6177
26	6071	6214	6424	6672	6901	7126	7318	7381	7317	7155	6944	6682	6423	6205	6085	6026	6071
27	5953	6101	6325	6587	6827	7061	7254	7326	7266	7094	6865	6599	6328	6107	5968	5907	5953
28	5844	5980	6216	6496	6748	6994	7192	7259	7202	7025	6790	6505	6221	5992	5844	5783	5844
29	5717	5857	6097	6396	6662	6907	7116	7190	7130	6949	6702	6410	6113	5872	5716	5656	5717
30	5572	5718	5967	6276	6555	6818	7036	7110	7042	6869	6608	6299	5992	5737	5574	5524	5572
31	5430	5577	5823	6154	6423	6716	6943	7024	6954	6776	6500	6179	5868	5604	5439	5383	5430
32	5272	5424	5666	6015	6287	6601	6843	6918	6854	6674	6376	6033	5732	5468	5295	5211	5272
33	5101	5240	5496	5836	6125	6457	6701	6795	6737	6554	6238	5881	5580	5297	5116	5045	5101
34	4926	5057	5316	5677	5948	6292	6551	6656	6605	6412	6085	5715	5403	5129	4943	4875	4926
35	4732	4864	5125	5456	5735	6068	6363	6483	6441	6226	5910	5536	5235	4954	4764	4697	4732

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36	4553	4667	4901	5233	5462	5841	6144	6276	6220	6022	5718	5325	5035	4766	4588	4519	4553
37	4344	4441	4676	4985	5168	5572	5868	5989	5976	5784	5477	5124	4839	4573	4401	4337	4344
38	4148	4234	4434	4720	4853	5239	5508	5675	5692	5493	5227	4902	4626	4376	4216	4139	4148
39	3932	4024	4198	4426	4507	4871	5140	5310	5362	5141	4943	4651	4375	4167	4023	3922	3932
40	3737	3831	3957	4124	4209	4534	4768	4945	5000	4820	4641	4383	4164	3958	3826	3728	3737
41	3499	3605	3737	3854	3920	4182	4426	4586	4611	4474	4348	4107	3921	3736	3633	3536	3499
42	3296	3384	3514	3578	3675	3875	4093	4232	4257	4146	4037	3827	3690	3531	3432	3338	3296
43	3100	3191	3277	3328	3435	3594	3781	3888	3938	3858	3738	3598	3461	3326	3239	3148	3100
44	2900	2991	3052	3099	3211	3299	3524	3618	3640	3579	3473	3367	3243	3104	3044	2959	2900
45	2715	2780	2835	2862	2970	3046	3275	3357	3338	3334	3211	3118	3018	2884	2848	2768	2715
46	2524	2577	2610	2649	2758	2822	3033	3093	3081	3097	2965	2902	2822	2686	2672	2592	2524
47	2347	2402	2424	2467	2556	2611	2818	2869	2848	2877	2720	2704	2638	2506	2512	2430	2347
48	2186	2251	2246	2284	2369	2407	2586	2656	2624	2656	2509	2509	2461	2323	2345	2267	2186
49	2048	2108	2081	2122	2204	2209	2398	2451	2419	2447	2321	2323	2291	2165	2203	2109	2048
50	1924	1962	1935	1974	2041	2051	2230	2247	2225	2275	2158	2138	2110	2015	2051	1985	1924
51	1804	1836	1816	1847	1907	1909	2066	2081	2058	2107	1999	1984	1965	1873	1897	1855	1804
52	1684	1704	1691	1716	1783	1785	1904	1922	1898	1951	1832	1842	1830	1745	1767	1743	1684
53	1577	1598	1585	1607	1653	1664	1755	1773	1752	1802	1698	1706	1703	1622	1657	1633	1577
54	1479	1499	1487	1502	1537	1538	1634	1643	1629	1654	1578	1577	1585	1519	1556	1522	1479

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55	1378	1401	1394	1394	1416	1429	1525	1517	1508	1538	1476	1457	1466	1416	1431	1408	1378
56	1279	1292	1289	1315	1331	1338	1411	1410	1413	1440	1385	1358	1368	1322	1339	1294	1279
57	1172	1179	1191	1215	1237	1256	1320	1314	1331	1326	1305	1277	1285	1242	1250	1204	1172
58	1084	1080	1096	1117	1144	1172	1226	1222	1237	1235	1227	1198	1205	1170	1156	1121	1084
59	1000	997	1000	1027	1038	1084	1143	1131	1147	1157	1156	1119	1125	1074	1063	1026	1000
60	920	915	923	943	946	998	1052	1048	1069	1075	1079	1029	1039	995	974	939	920
61	844	839	842	862	871	918	973	965	996	995	992	942	945	916	891	853	844
62	763	771	767	782	799	833	885	890	916	902	913	857	865	833	807	768	763
63	692	699	704	717	724	761	812	814	836	819	828	776	793	751	731	700	692
64	630	636	647	659	661	703	746	741	761	742	755	704	714	681	668	635	630
65	578	575	590	605	606	642	684	672	690	672	676	639	650	627	615	584	578
66	535	529	541	562	556	587	608	613	633	616	618	578	594	578	571	541	535
67	492	493	499	507	506	535	558	563	580	566	565	523	541	531	527	494	492
68	448	451	455	464	451	482	510	514	529	509	509	472	490	486	477	460	448
69	414	413	413	421	410	439	467	470	485	465	465	430	446	441	437	420	414
70	382	377	377	380	374	401	422	430	441	425	423	389	408	403	393	386	382
71	349	346	341	350	345	357	388	390	405	385	389	360	369	366	357	355	349
72	323	315	313	320	315	331	347	357	365	350	351	328	339	334	325	320	323
73	294	289	284	291	289	304	319	321	332	324	322	295	311	304	299	295	294

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74	272	262	258	265	265	279	286	293	300	293	288	272	279	275	268	272	272
75	245	242	240	243	234	247	261	264	269	261	264	253	257	253	246	245	245
76	224	219	217	218	206	218	231	235	235	239	236	230	235	233	233	232	224
77	201	189	186	188	184	188	197	205	211	212	211	206	215	219	211	205	201
78	179	168	165	166	157	160	171	173	180	184	182	178	185	197	179	175	179
79	150	145	135	142	129	134	144	147	152	153	156	153	160	166	155	151	150
80	130	118	120	119	108	109	119	126	124	131	132	132	136	138	132	129	130
81	106	100	102	95	86	94	98	99	105	109	110	115	115	112	111	107	106
82	89	88	79	84	71	76	80	84	81	90	89	91	92	90	90	92	89
83	73	72	68	65	62	64	67	64	70	73	77	72	75	75	74	72	73
84	63	62	56	54	48	46	43	38	56	56	59	63	57	64	62	59	63
85	51	46	44	42	36	35	33	33	40	44	46	50	51	48	39	44	51
86	33	34	36	33	24	26	29	22	25	33	33	39	41	42	40	36	33
87	32	28	28	28	21	20	14	16	20	19	23	33	29	34	27	23	32
88	24	20	16	15	10	12	8	8	14	12	16	23	21	13	25	21	24
89	16	13	12	11	0	8	8	0	10	12	13	12	12	14	10	9	16
90	13	9	7	11	7	6	0	9	10	13	11	12	7	9	8	8	13
91	14	8	0	9	0	8	7	0	8	9	11	9	8	8	0	11	14
92	13	8	10	7	0	0	7	0	10	8	0	9	0	6	0	0	13

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93	15	0	9	12	0	0	7	7	11	10	8	8	0	0	7	0	15
94	13	9	9	8	0	7	0	7	8	8	12	7	0	8	8	0	13
95	11	6	0	11	0	0	7	6	11	9	8	10	0	0	10	8	11
96	11	0	7	7	0	6	0	7	8	12	7	11	0	8	10	0	11
97	11	11	10	8	0	0	0	0	0	10	10	8	0	0	8	0	11
98	6	9	9	10	0	0	0	6	8	10	7	11	0	0	8	8	6
99	11	10	7	10	6	0	0	7	7	9	8	9	0	0	7	8	11
100	8	10	7	10	0	0	0	0	10	8	8	8	0	0	7	8	8
101	10	10	0	11	0	0	0	0	8	9	8	8	0	7	8	8	10
102	11	10	11	11	0	0	8	0	8	11	9	10	0	0	7	10	11
103	10	9	6	8	6	0	7	0	9	11	11	11	0	8	8	0	10
104	10	10	11	10	0	0	0	0	11	8	11	9	0	8	10	0	10
105	12	8	0	7	0	7	0	7	12	9	0	12	0	8	7	0	12
106	10	10	10	10	0	0	0	0	9	8	10	11	0	9	7	0	10
107	9	8	6	10	0	0	6	7	11	7	8	10	0	0	7	0	9
108	9	7	6	8	0	0	0	0	0	8	9	8	0	0	7	8	9
109	9	6	10	12	0	0	6	0	10	7	10	11	0	7	0	9	9
110	12	9	10	0	0	0	8	7	8	10	7	7	0	6	8	8	12
111	11	11	11	10	6	0	0	6	8	9	10	6	0	7	0	8	11

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112	9	11	11	10	0	0	0	11	13	6	0	11	0	0	9	8	9
113	13	9	12	9	0	0	0	6	9	7	0	9	0	0	8	9	13
114	12	7	11	13	0	7	0	0	8	11	10	13	8	0	6	0	12
115	11	10	13	11	0	7	0	0	9	9	8	9	7	7	6	9	11
116	12	8	12	11	0	0	0	8	10	9	10	9	0	10	9	9	12
117	13	11	13	11	7	0	0	8	9	7	9	8	0	0	12	7	13
118	10	7	14	11	0	6	8	0	10	8	9	8	0	8	9	0	10
119	11	12	8	13	0	0	0	11	9	10	10	11	7	9	8	0	11
120	16	8	10	9	7	7	7	0	9	7	11	12	0	9	7	0	16
121	11	10	14	12	8	6	10	8	10	8	9	9	0	0	7	7	11
122	13	10	11	0	0	0	7	7	9	0	11	12	0	9	9	12	13
123	13	8	9	13	8	7	7	9	13	11	7	13	7	7	8	8	13
124	12	9	11	11	7	0	7	7	10	10	10	10	7	11	8	8	12
125	10	8	13	11	10	9	9	0	11	11	8	12	6	9	12	7	10
126	11	11	11	13	8	8	0	9	14	10	10	14	0	10	9	7	11
127	11	10	13	11	7	8	8	0	12	10	11	12	11	0	11	11	11
128	13	12	12	9	8	8	8	10	12	10	11	15	9	10	12	11	13
129	14	9	11	13	10	8	10	9	12	11	10	14	11	9	10	11	14
130	14	14	14	13	9	7	11	9	10	9	10	14	7	0	12	12	14

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131	12	14	13	13	10	8	8	8	14	12	11	13	9	11	13	12	12
132	12	11	17	10	11	9	11	9	11	12	12	15	11	12	12	13	12
133	14	14	16	14	10	10	9	9	12	11	15	16	10	12	13	14	14
134	15	14	10	16	11	9	11	10	12	14	15	14	0	8	12	14	15
135	11	15	15	15	11	11	0	12	14	12	14	14	9	11	6	12	11
136	15	13	16	14	0	10	10	14	14	14	16	16	11	13	16	13	15
137	14	15	18	16	10	12	11	8	17	12	12	17	11	11	14	14	14
138	16	15	18	16	13	12	11	12	16	15	16	15	14	14	16	13	16
139	16	15	16	14	12	14	12	8	18	13	18	17	9	16	15	16	16
140	16	16	16	14	9	6	12	17	19	14	16	18	11	15	12	17	16
141	16	9	16	17	12	13	14	15	15	13	17	18	14	15	12	13	16
142	18	18	17	13	16	12	13	11	16	13	19	19	16	16	14	19	18
143	19	21	15	16	12	14	15	15	16	17	15	17	11	14	19	20	19
144	17	17	20	18	15	15	11	8	19	17	18	22	15	17	17	15	17
145	19	15	20	16	11	14	14	15	20	19	16	18	14	18	18	20	19
146	13	20	23	23	19	15	11	15	21	17	16	22	17	18	20	18	13
147	16	23	21	21	15	13	17	17	13	14	19	24	19	15	18	17	16
148	21	22	19	21	16	17	18	16	21	20	20	21	14	17	20	21	21
149	22	10	20	21	18	14	17	18	18	20	15	20	17	18	19	21	22

150	23	22	23	26	20	16	17	18	19	16	18	23	18	16	22	20	23
151	17	21	21	20	16	20	18	17	24	20	17	23	17	16	17	18	17
152	18	20	19	19	18	17	16	15	20	20	16	16	19	19	21	24	18
153	25	22	24	22	16	15	17	16	22	21	23	26	19	21	21	24	25
154	24	26	24	25	19	20	19	19	21	25	23	21	19	21	25	21	24
155	23	23	23	22	18	16	14	19	23	19	22	23	21	22	21	21	23
156	24	23	26	23	17	17	18	20	20	22	25	20	22	21	14	24	24
157	24	25	24	25	19	16	17	18	23	20	20	18	19	22	21	29	24
158	21	23	26	24	17	22	15	18	19	18	26	27	20	23	25	25	21
159	26	24	24	24	18	20	17	22	23	23	21	27	23	20	25	26	26
160	23	23	25	30	17	16	19	25	23	24	24	25	20	24	22	23	23
161	25	26	28	24	14	21	22	25	23	23	24	29	21	22	21	20	25
162	27	23	24	21	22	22	22	22	23	24	23	26	24	23	25	23	27
163	25	17	26	24	20	21	20	24	24	24	25	25	18	20	23	26	25
164	23	27	24	29	20	22	22	26	22	25	22	23	22	24	25	24	23
165	26	27	23	23	22	21	23	22	28	23	24	28	21	24	24	25	26
166	26	27	26	26	21	23	20	22	24	23	24	26	25	23	25	24	26
167	26	27	27	27	23	20	23	24	24	23	26	30	26	23	25	25	26
168	27	27	25	28	21	20	25	25	24	22	28	25	19	24	25	25	27

169	25	26	29	24	19	25	23	27	27	26	26	28	24	25	25	23	25
170	24	25	26	29	23	26	23	28	26	25	28	26	20	21	24	25	24
171	28	26	27	29	17	24	25	26	27	26	16	25	28	25	22	26	28
172	27	25	25	26	21	22	25	24	25	24	25	30	24	22	25	29	27
173	26	25	23	27	24	22	20	25	31	18	24	31	23	26	22	16	26
174	26	29	29	23	21	24	22	23	33	26	29	28	23	24	25	23	26
175	24	29	27	31	24	20	24	24	29	29	25	30	23	24	23	27	24
176	27	24	27	25	19	14	23	26	28	20	20	29	24	19	25	25	27
177	23	16	28	29	23	13	24	28	28	23	24	26	27	19	24	28	23
178	19	23	24	26	17	23	22	22	29	22	25	23	23	14	24	25	19
179	26	26	22	26	22	24	24	23	29	27	28	27	21	24	26	28	26
180	21	26	28	30	20	23	19	16	25	21	27	28	23	19	16	25	21

UGR

UGR Table - Corrected

Reflectances

Ceiling Cavity	70	70	50	50	30	70	70	50	50	30
Walls	50	30	50	30	30	50	30	50	30	30
Floor Cavity	20	20	20	20	20	20	20	20	20	20

Room Size	UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H Y=2H	23.5	24.9	23.9	25.2	25.5	23.8	25.2	24.2	25.5	25.8
3H	24.3	25.4	24.6	25.8	26.1	24.5	25.7	24.9	26.0	26.4
4H	24.5	25.6	24.9	26.0	26.3	24.7	25.8	25.1	26.2	26.6
6H	24.6	25.7	25.1	26.0	26.4	24.8	25.8	25.2	26.2	26.6
8H	24.7	25.6	25.1	26.0	26.4	24.8	25.8	25.2	26.2	26.6
12H	24.7	25.6	25.1	26.0	26.4	24.8	25.7	25.2	26.1	26.5
4H 2H	23.8	24.9	24.2	25.2	25.6	24.1	25.2	24.5	25.5	25.9
3H	24.7	25.6	25.1	26.0	26.4	24.9	25.8	25.3	26.2	26.6
4H	25.0	25.8	25.4	26.2	26.7	25.2	26.0	25.7	26.4	26.9
6H	25.2	25.9	25.7	26.4	26.8	25.4	26.1	25.8	26.5	27.0
8H	25.2	25.9	25.7	26.4	26.8	25.4	26.0	25.8	26.5	27.0
12H	25.3	25.9	25.8	26.3	26.8	25.4	26.0	25.9	26.4	26.9
8H 4H	25.1	25.7	25.5	26.2	26.6	25.3	25.9	25.7	26.4	26.8
6H	25.3	25.9	25.8	26.4	26.9	25.5	26.0	26.0	26.5	27.0
8H	25.4	25.9	25.9	26.4	26.9	25.5	26.0	26.0	26.5	27.0
12H	25.5	25.9	26.0	26.4	27.0	25.5	26.0	26.0	26.4	27.0
12H 4H	25.1	25.6	25.5	26.1	26.6	25.3	25.8	25.7	26.3	26.8
6H	25.3	25.8	25.9	26.3	26.8	25.5	25.9	26.0	26.4	27.0
8H	25.4	25.9	25.9	26.3	26.9	25.5	25.9	26.0	26.4	27.0

Maximum UGR = 27.0

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2022-12-01	Test Ambient:	25.1 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	BLT-HB21-100WH1JT2A1-BH50		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
BLC221101	120.0	60	0.848	100.72	0.990	10.52
9E-A2	277.0	60	0.390	99.86	0.925	13.09
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

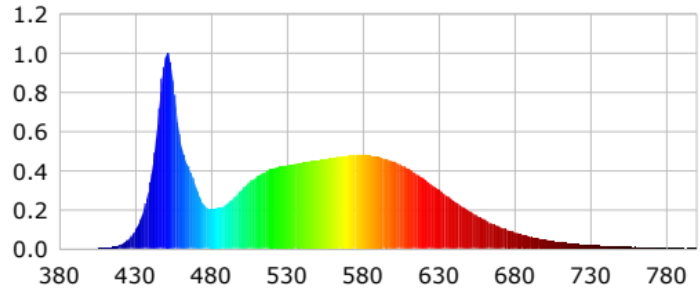
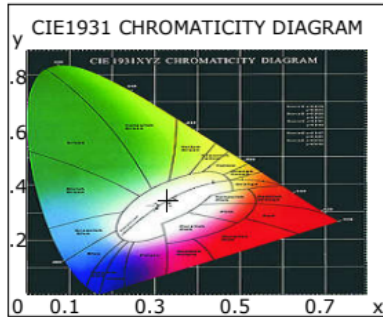
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	81	R9	3
Frequency (Hz)	60	R2	88	R10	71
CCT (K)	5612	R3	92	R11	81
Duv	0.0020	R4	82	R12	58
Chromaticity (x, y)	x=0.3299 y=0.3427	R5	82	R13	83
Chromaticity (u', v')	u(u')=0.2045 v'=0.4780	R6	83	R14	96
Color Rendering Index (CRI)	82	R7	86	R15	76
R9	3	R8	67	--	--
Rf	82	--	--	--	--
Rg	95	--	--	--	--
Rcs,h1 (%)	-13				

Photometric Measurement – Sphere-Spectroradiometer Method:

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	14785.7	15010.0	>=10000(-10%)
Luminous Efficacy (lm/W)	146.80	150.31	Premium: >= 135(-3%)
Most worst Luminous/Highest Watts	146.80		

Spectral Power Distribution & Chromaticity Diagram



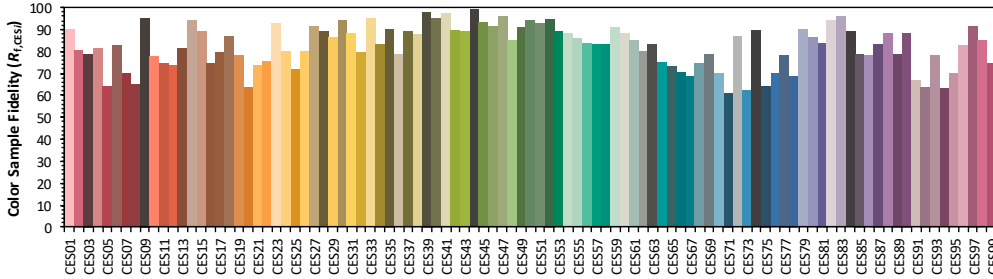
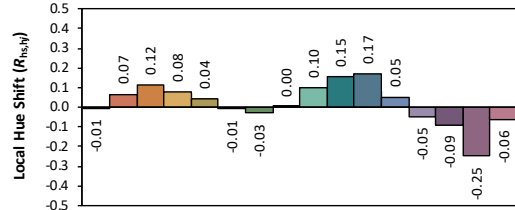
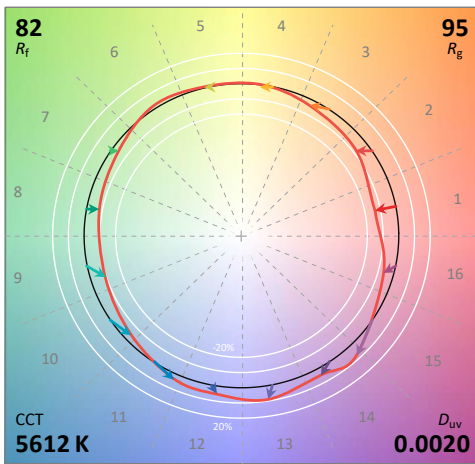
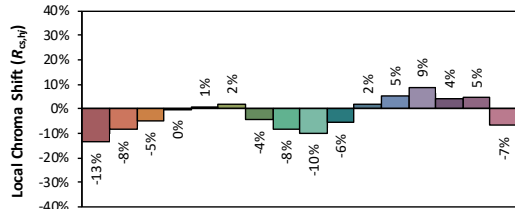
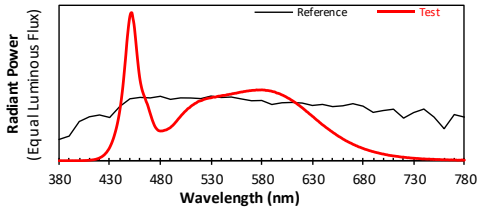
WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0003	0.1440	535	0.4191	213.3012	690	0.1114	56.7001
385	0.0004	0.1862	540	0.4258	216.7128	695	0.0961	48.9101
390	0.0010	0.5230	545	0.4323	220.0148	700	0.0833	42.4095
395	0.0002	0.1043	550	0.4398	223.8292	705	0.0717	36.4749
400	0.0010	0.5014	555	0.4442	226.0909	710	0.0618	31.4767
405	0.0013	0.6688	560	0.4506	229.3361	715	0.0530	26.9786
410	0.0032	1.6409	565	0.4569	232.5405	720	0.0456	23.2069
415	0.0082	4.1894	570	0.4655	236.8991	725	0.0374	19.0123
420	0.0188	9.5794	575	0.4712	239.8300	730	0.0326	16.5710
425	0.0421	21.4206	580	0.4754	241.9509	735	0.0283	14.4123
430	0.0895	45.5362	585	0.4795	244.0634	740	0.0247	12.5757
435	0.1805	91.8627	590	0.4796	244.0929	745	0.0211	10.7184
440	0.3404	173.2590	595	0.4757	242.1257	750	0.0173	8.7999
445	0.6440	327.7538	600	0.4699	239.1596	755	0.0146	7.4057
450	0.9782	497.8750	605	0.4579	233.0409	760	0.0126	6.4004
455	0.8621	438.7662	610	0.4454	226.6812	765	0.0115	5.8549
460	0.5454	277.5680	615	0.4278	217.7284	770	0.0088	4.4842
465	0.4224	214.9630	620	0.4077	207.5222	775	0.0089	4.5055
470	0.3201	162.9161	625	0.3841	195.4958	780	0.0071	3.6225
475	0.2282	116.1648	630	0.3584	182.4275	785	0.0058	2.9569
480	0.2011	102.3771	635	0.3300	167.9449	790	0.0058	2.9496
485	0.2077	105.7105	640	0.3009	153.1306	795	0.0043	2.1812
490	0.2251	114.5731	645	0.2720	138.4477	800	0.0045	2.2766
495	0.2600	132.3193	650	0.2434	123.8699			
500	0.3007	153.0297	655	0.2181	110.9990			
505	0.3372	171.6166	660	0.1929	98.1944			
510	0.3674	186.9773	665	0.1696	86.3299			
515	0.3897	198.3213	670	0.1476	75.1350			
520	0.4060	206.6528	675	0.1286	65.4698			
525	0.4191	213.3012	680	0.1114	56.7001			
530	0.4258	216.7128	685	0.0961	48.9101			

TM30

ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-XXE-13H-9D1-00-0-0
Date: 2022/12/1

Manufacturer: ASmart LIGHT CO., LTD
Model: AST-HB21-100WH1JT2A1-abc57



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x 0.3299
 y 0.3427
 u' 0.2045
 v' 0.4780

CIE 13.3-1995 (CRI)	
R_a	82
R_9	3

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

Calculated Efficacy Data for family models:

Model Number	Luminous Flux (lm)	Power (W)	Efficacy (lm/W)
AST-HB21-100WH1JT2A1-abc30	13995.2	100.75	138.91
AST-HB21-100WH1JT2A1-abc35	14153.3	100.74	140.50
AST-HB21-100WH1JT2A1-abc40	14311.4	100.74	142.07
AST-HB21-100WH1JT2A1-abc45	14469.5	100.74	143.64
AST-HB21-100WH1JT2A1-abc50	14627.6	100.74	145.21
AST-HB21-100WH1JT2A1-abc57	14785.7	100.72	146.80

*1: This value is calculated and the calculation formula is as below:

$$14153.3 = (14785.7 - 13995.2) / 5 + 13995.2$$

$$14311.4 = (14785.7 - 13995.2) / 5 + 14153.3$$

$$14469.5 = (14785.7 - 13995.2) / 5 + 14311.4$$

$$14627.6 = (14785.7 - 13995.2) / 5 + 14469.5$$

*2: This value is calculated and the calculation formula is as below:

$$100.74 = (100.72 + 100.75) / 2$$

*3: This value is calculated and the calculation formula is as below:

$$140.50 = 14153.3 / 100.74$$

$$142.07 = 14311.4 / 100.74$$

$$143.64 = 14469.5 / 100.74$$

$$145.21 = 14627.6 / 100.74$$

3. Test Equipment

Equipment Name	Model No.	Serial No.	Calibration Date
Goniophotometric System	GPM-3000	DYHXF120001	2022-01-18
AC Power Source	CHP-500C	DYBWD010159	2022-01-25
Total Luminous Flux Standard Lamp	24V/150W	DYJYR040040	2022-01-25
Digital Power Meter	WT500	DYDWQ20010	2022-01-25
Integral Sphere (2M)	2M	DYJCE120067	2022-01-18
Digital Power Meter	WT500	DYDWQ200006	2022-01-25
Optical Color and Electrical Measurement System	CMS-3000S	DYJCE120067	2022-01-18
Expand Uncertainty: Photometric Measurement (Sphere): 2.08%, k=2 Chromaticity Measurement(Sphere):25.6K, k=2 Photometric Measurement(Goniophotometer):2.645%, k=2			

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