

# LM-79-08 Test Report

## Beyond LED Technology

(Brand Name: Beyond)

1939 Parker Court, Stone Mountain, GA 30087

### Replacement Lamps for Outdoor Pole/Arm-mounted Decorative Luminaires (Type B)

Model name(s): AST-CLW16-200WBCDA1-EXS30/40/50K  
Remark; a= the lamp base type,,the “a” represent the lamp base type, can be “E” for E39, “EX” for EX39  
d= dimming type: “C” for Continuous dimming and “S “ for Segmented dimmer  
cK= CCT, any two digits for single CCT, like 30K=3000K,40K=4000K,50K=5000K.

Representative (Tested) Model:  
AST-CLW16-200WBCDA1-ad30K  
AST-CLW16-200WBCDA1-ad40K  
AST-CLW16-200WBCDA1-ad50K

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

Test & Report By:



Engineer: Winny Wu

Date:2023-02-01

Review By:



Manager: Jason Luo

### 1.1 Product Information:

Organization Name	Beyond LED Technology	
Brand Name	Beyond LED Technology	
Model Number	AST-CLW16-200WBCDA1-EXS30/40/50K	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Replacement Lamps for Outdoor Pole/Arm-mounted Decorative Luminaires (Type B)	
Rated Voltage / Frequency	120-277Vac, 50/60 Hz	
Nominal Power	200W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,4000K,5000K(Color tunable)	
LED Manufacturer	Lumileds Holding B.V.	
LED Model	L128-XX80RC35003P1	
Sample Number	UTC2301006E-K1(3000K)	
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	2023-01-08
Date of Test	2023-01-10
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	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  $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ , 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. Goniophotometer far field detector  $f1' = 1.42\%$ , 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  $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ . 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.

Self-absorption:

AST-CLW16-200WBCDA1-ad30K:1.103

AST-CLW16-200WBCDA1-ad40K:1.104

AST-CLW16-200WBCDA1-ad40K:1.107

### 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 BL-QP-033)

Test date	2023-01-10	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	AST-CLW16-200WBCDA1-EXS30/40/50K		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230100	120.0	60	1.726	204.79	0.989	11.7
6E-K1	277.0	60	0.758	194.34	0.925	15.49
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

### Chromaticity Measurement - Sphere-Spectroradiometer Method in King

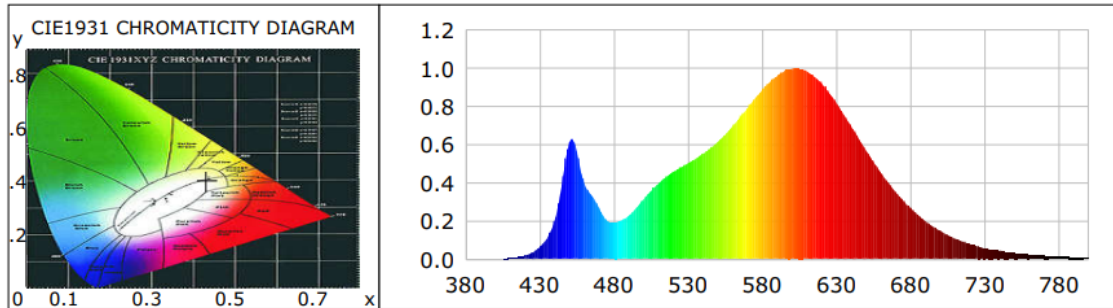
#### Luminaire K400 Series (Mogul Socket Version):

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	4
Frequency (Hz)	60	R2	91	R10	79
CCT (K)	3037	R3	96	R11	78
Duv	-0.0012	R4	79	R12	69
Chromaticity (x, y)	x=0.4327 y=0.3997	R5	80	R13	82
Chromaticity (u', v')	u(u')=0.2497 v'=0.5190	R6	89	R14	98
Color Rendering Index (CRI)	82	R7	81	R15	73
R9	4	R8	57	--	--
Rf	84	--	--	--	--
Rg	96	--	--	--	--
Rcs,h1(%)	-12	--	--	--	--

### Photometric Measurement – Goniophotometer Method in King Luminaire K400 Series (Mogul Socket Version):

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	22065.4	21447.4	>=1000(-10%)
Luminous Efficacy (lm/W)	107.75	110.36	Standard: >= 105(-3%)
Most worst Luminous/Highest	104.73		
Zonal lumens in the 0-90° (%)	81.90	--	>=65% (-3)
Beam Angle (°)	182.5	--	--
Center Beam Candle Power (cd)	847	--	--

### 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	0.1742	535	0.4798	290.0404	690	0.3495	211.3062
385	0.0004	0.2149	540	0.5012	302.9930	695	0.3054	184.6041
390	0.0005	0.2966	545	0.5252	317.4928	700	0.2671	161.4523
395	0.0003	0.1834	550	0.5518	333.5973	705	0.2301	139.0957
400	0.0007	0.4441	555	0.5799	350.5629	710	0.1994	120.5706
405	0.0013	0.7868	560	0.6139	371.1279	715	0.1715	103.6993
410	0.0033	2.0031	565	0.6523	394.3784	720	0.1476	89.2038
415	0.0081	4.9162	570	0.6967	421.2040	725	0.1250	75.5852
420	0.0177	10.6757	575	0.7421	448.6297	730	0.1069	64.6272
425	0.0336	20.3169	580	0.7892	477.1449	735	0.0917	55.4255
430	0.0614	37.1290	585	0.8406	508.1674	740	0.0781	47.2245
435	0.1091	65.9614	590	0.8871	536.3310	745	0.0658	39.7736
440	0.1984	119.9176	595	0.9267	560.2348	750	0.0566	34.2295
445	0.3878	234.4558	600	0.9602	580.4971	755	0.0483	29.1930
450	0.6097	368.5798	605	0.9850	595.4844	760	0.0413	24.9432
455	0.5664	342.4342	610	0.9981	603.4253	765	0.0357	21.5683
460	0.4004	242.0679	615	0.9969	602.7073	770	0.0307	18.5655
465	0.3360	203.1061	620	0.9848	595.3718	775	0.0253	15.3110
470	0.2682	162.1236	625	0.9568	578.4602	780	0.0218	13.1544
475	0.2045	123.6082	630	0.9211	556.8540	785	0.0183	11.0498
480	0.1908	115.3549	635	0.8722	527.2737	790	0.0158	9.5219
485	0.2021	122.1770	640	0.8185	494.8277	795	0.0133	8.0399
490	0.2257	136.4339	645	0.7580	458.2530	800	0.0117	7.0518
495	0.2667	161.2556	650	0.6958	420.6704			
500	0.3135	189.5074	655	0.6308	381.3498			
505	0.3554	214.8350	660	0.5692	344.1098			
510	0.3953	238.9926	665	0.5098	308.2010			
515	0.4283	258.9155	670	0.4511	272.7382			
520	0.4557	275.5071	675	0.3994	241.4438			
525	0.4798	290.0404	680	0.3495	211.3062			
530	0.5012	302.9930	685	0.3054	184.6041			

**TM30**

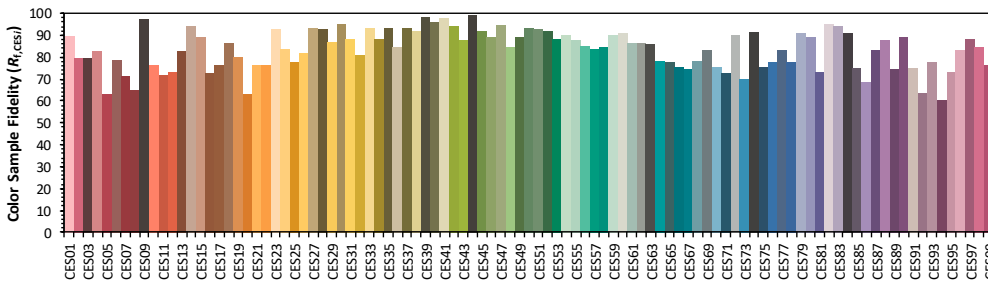
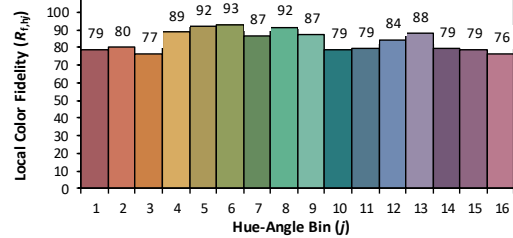
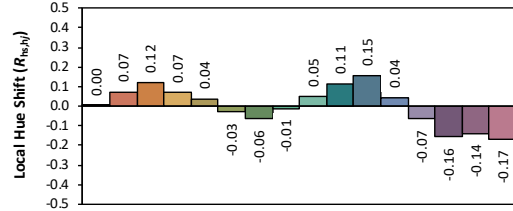
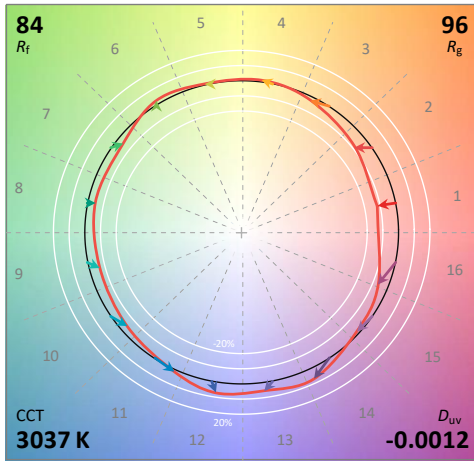
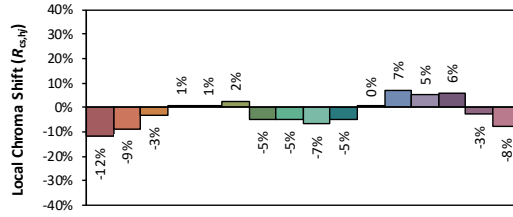
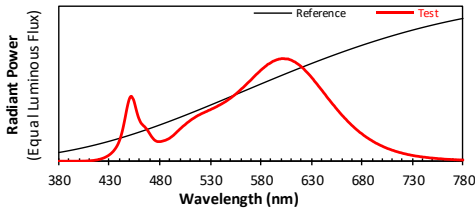
**ANSI/IES TM-30-18 Color Rendition Report**

**Source:** L128-XX80RC35003P1

**Manufacturer:** AS MART LIGHT CO., LTD

**Date:** 2023/1/10

**Model:** AST-CLW16-200WBCDA1-ad30K



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

$x$  0.4327  
 $y$  0.3997  
 $u'$  0.2497  
 $v'$  0.5190

CIE 13.3-1995 (CRI)  
 $R_a$  82  
 $R_g$  4

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

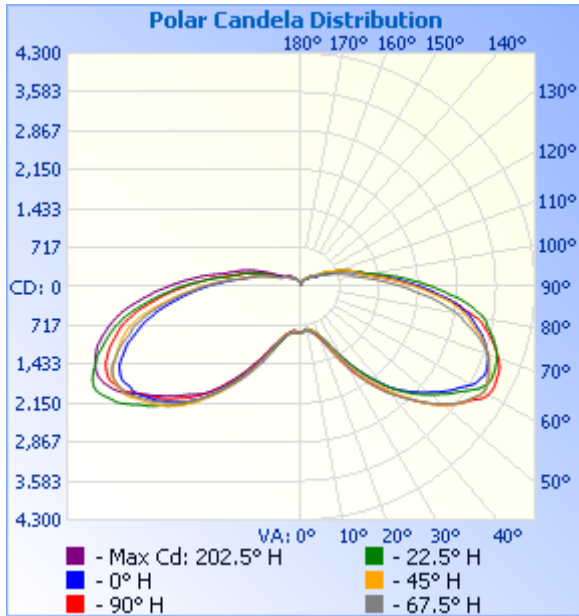
Zone	Lumens	% Lamp	% Luminaire
0-30	939.6	4.3%	4.3%
0-40	2,270.8	10.3%	10.3%
0-60	7,777.4	35.2%	35.2%
60-90	10,292.7	46.6%	46.6%
70-100	8,201.9	37.2%	37.2%
90-120	3,288.7	14.9%	14.9%
0-90	18,070.2	81.9%	81.9%
90-180	3,996.9	18.1%	18.1%
0-180	22,067.0	100%	100%

### Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	78.9	0.4%	90-100	1,736.2	7.9%
10-20	257.5	1.2%	100-110	1,008.3	4.6%
20-30	603.1	2.7%	110-120	544.3	2.5%
30-40	1,331.2	6.0%	120-130	300.4	1.4%
40-50	2,282.1	10.3%	130-140	194.6	0.9%
50-60	3,224.5	14.6%	140-150	119.1	0.5%
60-70	3,826.9	17.3%	150-160	63.0	0.3%
70-80	3,641.8	16.5%	160-170	26.1	0.1%
80-90	2,824.0	12.8%	170-180	4.9	0%



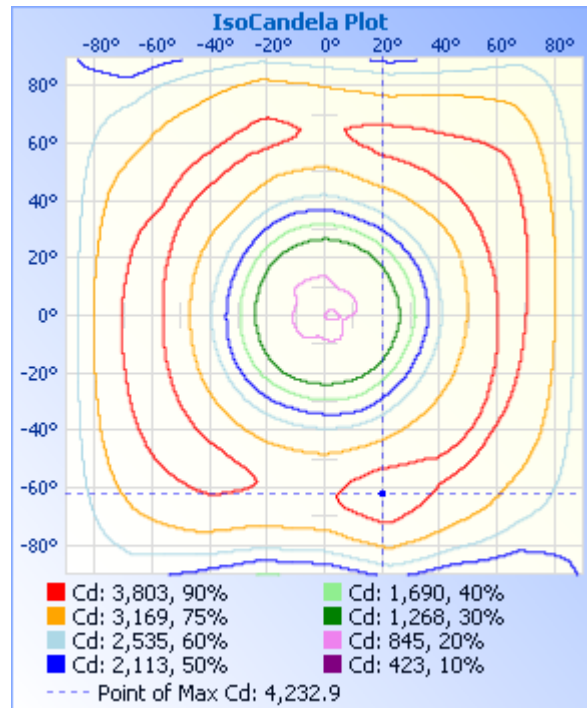
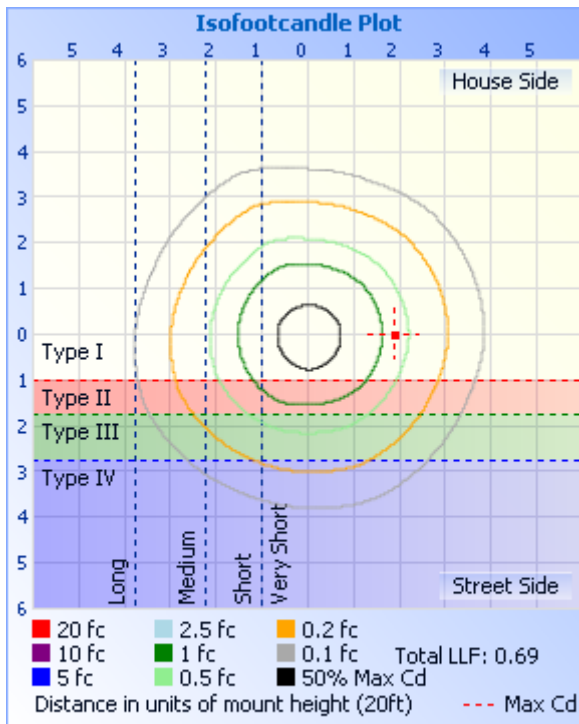
**Photometric Data**



**Illuminance at a Distance**

	Center Beam fc	Beam Width
17.0ft	2.93 fc	20.5 ft
34.0ft	0.73 fc	41.0 ft
51.0ft	0.33 fc	61.5 ft
68.0ft	0.18 fc	81.9 ft
85.0ft	0.12 fc	102.4 ft
102.0ft	0.08 fc	122.9 ft

■ Beam Spread: 62.1°



**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	847	847	847	847	847	847	847	847	847	847	847	847	847	847	847	847	847
1	846	844	842	837	836	839	836	841	845	847	850	851	860	860	856	852	846
2	846	844	836	829	827	824	829	841	843	838	847	851	860	858	854	851	846
3	838	830	824	815	819	815	826	837	836	835	838	844	852	857	851	852	838
4	826	822	816	807	798	798	821	837	830	836	835	841	847	849	845	845	826
5	813	811	809	796	792	789	819	838	834	827	834	837	846	840	832	828	813
6	802	797	803	796	792	789	823	842	838	830	834	841	842	829	818	816	802
7	793	788	803	805	797	798	831	846	839	833	836	845	841	823	810	818	793
8	793	784	808	816	808	807	832	850	844	836	842	858	844	817	814	824	793
9	795	789	814	829	817	818	837	853	850	841	847	868	849	818	820	831	795
10	802	797	818	839	826	831	843	856	857	854	852	872	854	824	831	841	802
11	813	807	825	848	835	845	850	861	860	867	859	876	859	834	840	851	813
12	823	817	828	858	848	860	858	870	866	878	868	883	863	847	848	861	823
13	835	828	832	864	860	874	865	879	876	886	876	891	870	864	856	870	835
14	845	841	839	869	875	888	875	891	887	898	885	898	876	879	869	878	845
15	856	857	849	877	890	903	890	907	902	914	895	907	885	895	881	887	856
16	871	873	864	890	912	919	908	927	921	935	910	920	900	915	894	899	871
17	886	890	881	908	937	942	930	953	947	961	932	940	916	935	911	913	886
18	903	905	905	931	963	967	957	981	976	988	957	962	937	957	933	927	903
19	922	927	929	961	993	1000	991	1013	1010	1021	990	987	964	983	957	944	922
20	947	953	959	994	1032	1038	1022	1052	1057	1061	1023	1016	994	1012	985	968	947
21	973	982	994	1034	1074	1082	1067	1098	1106	1106	1063	1051	1027	1044	1017	997	973
22	1008	1018	1035	1081	1119	1129	1115	1147	1161	1155	1112	1093	1066	1083	1049	1029	1008
23	1042	1057	1080	1133	1173	1187	1176	1211	1223	1212	1169	1145	1106	1121	1088	1065	1042
24	1084	1101	1132	1199	1233	1247	1252	1276	1291	1273	1232	1199	1152	1166	1138	1109	1084
25	1134	1152	1195	1269	1297	1320	1322	1347	1365	1337	1312	1261	1207	1219	1192	1160	1134
26	1192	1210	1260	1338	1374	1388	1397	1424	1448	1416	1390	1332	1270	1280	1257	1219	1192
27	1259	1274	1332	1421	1455	1464	1476	1517	1529	1489	1476	1424	1340	1349	1331	1286	1259

28	1327	1354	1412	1506	1539	1539	1557	1604	1611	1558	1566	1515	1418	1423	1414	1366	1327
29	1410	1430	1499	1592	1628	1616	1649	1694	1694	1634	1670	1612	1502	1504	1504	1451	1410
30	1491	1508	1597	1676	1720	1705	1735	1786	1780	1714	1763	1709	1586	1586	1596	1545	1491
31	1574	1589	1686	1765	1813	1789	1818	1876	1862	1803	1851	1803	1676	1668	1700	1643	1574
32	1660	1670	1779	1868	1894	1870	1900	1961	1950	1885	1937	1901	1765	1762	1782	1759	1660
33	1751	1753	1871	1964	1977	1955	1984	2054	2033	1969	2024	1989	1855	1855	1876	1864	1751
34	1837	1835	1959	2058	2058	2041	2066	2138	2116	2054	2111	2078	1951	1946	1966	1966	1837
35	1928	1914	2046	2147	2142	2140	2159	2222	2195	2143	2214	2174	2038	2037	2053	2070	1928
36	2018	1996	2134	2243	2228	2231	2241	2303	2274	2241	2305	2270	2133	2125	2155	2159	2018
37	2100	2080	2224	2331	2308	2322	2327	2390	2374	2334	2393	2360	2214	2214	2244	2244	2100
38	2182	2176	2313	2424	2392	2414	2414	2470	2462	2430	2480	2455	2302	2308	2337	2318	2182
39	2266	2259	2403	2507	2473	2504	2511	2554	2544	2528	2575	2540	2396	2404	2443	2396	2266
40	2358	2352	2495	2575	2550	2605	2599	2634	2630	2623	2661	2620	2488	2489	2556	2484	2358
41	2444	2450	2586	2650	2631	2688	2687	2714	2710	2713	2750	2704	2578	2571	2655	2575	2444
42	2517	2531	2682	2722	2719	2769	2769	2792	2788	2814	2842	2782	2658	2643	2742	2662	2517
43	2585	2608	2770	2806	2798	2852	2851	2878	2857	2900	2921	2863	2736	2703	2814	2740	2585
44	2654	2682	2861	2883	2883	2937	2941	2948	2922	2979	3005	2936	2808	2755	2878	2828	2654
45	2719	2756	2959	2962	2977	3009	3022	3015	2995	3056	3082	3000	2882	2806	2940	2925	2719
46	2785	2828	3054	3039	3060	3085	3105	3084	3056	3131	3159	3066	2950	2860	3003	3001	2785
47	2846	2900	3152	3119	3145	3165	3184	3156	3116	3208	3225	3132	3012	2929	3065	3064	2846
48	2908	2964	3235	3213	3227	3241	3271	3220	3176	3283	3291	3197	3076	2996	3128	3130	2908
49	2968	3026	3315	3291	3304	3314	3340	3270	3228	3343	3350	3260	3156	3071	3192	3214	2968
50	3030	3099	3389	3361	3386	3375	3400	3318	3281	3416	3392	3313	3222	3143	3263	3303	3030
51	3090	3162	3459	3429	3455	3443	3462	3387	3337	3499	3443	3368	3275	3202	3334	3376	3090
52	3155	3221	3520	3497	3521	3508	3530	3444	3396	3574	3497	3435	3322	3262	3395	3446	3155
53	3215	3288	3581	3567	3591	3573	3599	3486	3436	3631	3542	3486	3378	3332	3455	3520	3215
54	3277	3357	3641	3627	3649	3625	3650	3529	3469	3696	3581	3527	3443	3405	3519	3587	3277
55	3336	3418	3699	3673	3703	3686	3708	3581	3517	3786	3625	3578	3488	3469	3584	3647	3336
56	3389	3471	3728	3718	3750	3745	3779	3633	3563	3864	3675	3637	3537	3539	3649	3691	3389
57	3434	3540	3767	3760	3819	3811	3864	3683	3606	3947	3737	3689	3601	3620	3706	3737	3434
58	3487	3615	3807	3815	3897	3883	3920	3716	3638	4010	3788	3736	3675	3713	3761	3780	3487

59	3553	3686	3853	3856	3950	3928	3950	3739	3645	4045	3805	3766	3752	3794	3817	3833	3553
60	3619	3764	3889	3877	3979	3958	3959	3761	3653	4096	3812	3791	3805	3862	3868	3881	3619
61	3667	3807	3883	3876	3994	3991	3971	3753	3683	4147	3830	3811	3832	3917	3896	3909	3667
62	3687	3854	3869	3875	4002	3989	3971	3746	3708	4193	3853	3823	3860	3964	3912	3926	3687
63	3714	3885	3860	3844	4002	3982	3955	3730	3711	4225	3861	3834	3894	3998	3929	3945	3714
64	3741	3893	3853	3819	3986	3962	3937	3711	3700	4233	3857	3837	3923	4039	3957	3946	3741
65	3748	3892	3829	3788	3978	3953	3924	3677	3678	4224	3833	3825	3922	4060	3973	3936	3748
66	3735	3882	3792	3766	3968	3927	3908	3644	3661	4201	3811	3802	3910	4078	3967	3906	3735
67	3720	3878	3764	3739	3959	3918	3892	3605	3622	4161	3765	3776	3895	4082	3953	3869	3720
68	3700	3859	3733	3717	3937	3894	3850	3561	3568	4113	3714	3719	3877	4073	3921	3822	3700
69	3684	3852	3712	3692	3899	3875	3822	3505	3507	4063	3663	3651	3846	4052	3878	3768	3684
70	3651	3832	3660	3653	3864	3833	3767	3447	3458	4012	3608	3604	3797	4025	3832	3706	3651
71	3615	3811	3617	3598	3807	3797	3729	3391	3405	3974	3564	3539	3758	4002	3779	3640	3615
72	3569	3766	3556	3537	3773	3742	3679	3322	3343	3902	3515	3473	3713	3968	3728	3560	3569
73	3537	3737	3513	3471	3718	3697	3631	3242	3258	3830	3468	3400	3657	3935	3681	3492	3537
74	3489	3691	3458	3403	3667	3643	3558	3157	3182	3765	3417	3307	3595	3890	3623	3439	3489
75	3448	3657	3401	3318	3612	3577	3499	3070	3106	3697	3360	3239	3525	3824	3563	3354	3448
76	3386	3605	3323	3231	3550	3526	3433	3000	3043	3634	3298	3199	3478	3768	3508	3289	3386
77	3322	3554	3260	3145	3485	3458	3388	2925	2968	3560	3229	3132	3420	3697	3452	3205	3322
78	3268	3496	3197	3060	3426	3425	3295	2826	2879	3489	3130	3015	3354	3633	3406	3147	3268
79	3216	3479	3154	3011	3369	3342	3208	2739	2779	3395	3045	2940	3271	3566	3329	3075	3216
80	3160	3421	3088	2924	3263	3283	3093	2647	2707	3320	2929	2847	3168	3486	3248	2997	3160
81	3104	3368	3023	2840	3159	3172	2996	2557	2604	3206	2818	2739	3088	3407	3150	2904	3104
82	2999	3259	2944	2718	3033	3099	2900	2453	2506	3102	2715	2636	2996	3321	3056	2818	2999
83	2939	3191	2847	2621	2952	2989	2772	2345	2400	2983	2584	2506	2875	3222	2959	2726	2939
84	2839	3091	2786	2518	2828	2886	2670	2233	2298	2872	2465	2393	2772	3107	2848	2635	2839
85	2738	2991	2666	2414	2705	2747	2538	2133	2206	2762	2358	2303	2665	2993	2718	2515	2738
86	2626	2882	2557	2287	2577	2661	2434	2030	2116	2654	2246	2194	2578	2893	2616	2397	2626
87	2504	2732	2426	2158	2450	2546	2337	1947	2020	2533	2140	2084	2465	2776	2493	2285	2504
88	2417	2636	2321	2050	2375	2476	2221	1849	1931	2416	2019	1984	2360	2693	2397	2177	2417
89	2296	2511	2226	1975	2271	2360	2120	1756	1843	2325	1925	1888	2253	2557	2282	2072	2296

90	2213	2424	2127	1872	2154	2262	2007	1669	1748	2215	1838	1814	2151	2452	2166	1974	2213
91	2091	2291	2009	1769	2030	2153	1891	1572	1662	2092	1736	1707	2061	2359	2051	1871	2091
92	1997	2201	1931	1671	1924	2045	1794	1481	1551	1978	1638	1607	1982	2249	1961	1777	1997
93	1902	2072	1807	1583	1817	1959	1684	1396	1469	1855	1543	1517	1844	2148	1868	1699	1902
94	1817	1986	1745	1489	1728	1867	1592	1305	1383	1761	1461	1428	1756	2026	1749	1613	1817
95	1716	1867	1637	1414	1626	1789	1512	1237	1307	1653	1378	1335	1684	1930	1668	1528	1716
96	1630	1773	1553	1328	1537	1677	1409	1160	1224	1547	1281	1243	1582	1839	1575	1440	1630
97	1530	1650	1459	1253	1451	1619	1344	1085	1136	1439	1192	1155	1487	1733	1492	1366	1530
98	1462	1562	1382	1180	1362	1506	1281	1016	1077	1344	1113	1078	1377	1620	1397	1292	1462
99	1368	1465	1311	1108	1318	1466	1208	962	1016	1273	1045	1005	1308	1514	1308	1221	1368
100	1301	1363	1246	1059	1247	1372	1142	923	986	1226	1000	951	1236	1417	1209	1140	1301
101	1208	1277	1172	1000	1204	1358	1131	898	948	1184	955	917	1154	1356	1151	1069	1208
102	1138	1199	1130	972	1171	1325	1086	864	906	1146	918	882	1119	1292	1085	1013	1138
103	1097	1162	1101	947	1144	1287	1070	828	870	1089	868	844	1077	1241	1038	975	1097
104	1060	1119	1077	915	1108	1249	1014	783	819	1036	818	805	1038	1202	990	944	1060
105	1024	1084	1039	881	1065	1203	981	757	781	977	764	760	963	1147	956	911	1024
106	976	1029	1004	839	1016	1152	940	717	721	919	715	712	913	1087	921	873	976
107	938	984	969	801	973	1105	902	686	677	854	669	672	869	1036	855	836	938
108	890	941	942	767	939	1048	870	652	637	788	617	626	804	980	815	798	890
109	849	900	904	732	895	988	833	621	589	707	571	570	753	914	767	756	849
110	796	867	864	700	847	938	802	587	548	636	525	520	700	856	723	709	796
111	749	815	834	663	810	875	767	556	516	576	487	486	648	788	672	661	749
112	708	788	802	627	773	820	735	525	490	527	459	439	598	723	615	616	708
113	666	749	751	589	732	766	704	496	469	476	421	421	552	663	564	574	666
114	627	712	737	557	704	720	677	474	454	435	422	394	498	611	519	527	627
115	589	673	694	530	669	678	648	458	444	404	403	382	447	551	476	490	589
116	549	650	652	507	639	629	624	442	427	394	383	377	421	490	440	459	549
117	510	598	627	462	612	592	589	435	402	390	383	372	392	446	410	424	510
118	478	562	606	457	582	562	543	428	386	359	370	360	374	409	383	399	478
119	449	547	582	439	548	538	507	402	368	352	357	349	361	377	362	382	449
120	428	509	561	434	512	509	467	374	346	352	359	350	350	361	347	369	428

121	410	496	544	439	480	458	417	350	334	343	340	342	342	350	335	360	410
122	385	473	505	426	442	410	376	336	323	322	316	321	333	338	323	349	385
123	360	424	453	424	394	376	352	322	313	306	309	314	326	329	314	331	360
124	339	397	427	396	369	358	336	308	300	298	301	308	319	322	305	317	339
125	322	372	400	359	354	342	322	299	291	292	296	303	313	316	298	306	322
126	312	344	375	350	338	328	310	292	283	285	288	297	308	309	290	296	312
127	305	343	357	357	324	315	302	285	276	277	282	292	302	304	286	288	305
128	295	339	332	331	314	305	296	279	270	272	274	284	298	299	280	281	295
129	286	307	312	306	306	298	290	274	265	266	269	276	293	294	274	274	286
130	277	298	297	299	299	291	285	271	257	261	263	270	287	289	269	268	277
131	270	291	292	294	293	284	280	267	251	256	257	264	281	282	263	262	270
132	262	286	285	288	286	278	275	264	245	251	249	257	275	277	259	258	262
133	253	277	277	281	280	272	270	262	240	247	244	251	269	270	252	253	253
134	245	271	267	272	274	266	265	258	234	243	238	246	263	264	246	248	245
135	237	264	261	266	267	261	261	254	228	238	233	242	256	257	239	242	237
136	231	257	254	259	262	258	258	249	224	233	228	237	250	250	232	235	231
137	225	251	247	253	256	252	254	244	218	226	223	231	244	243	226	228	225
138	219	245	242	247	251	246	249	239	214	219	220	224	238	237	219	221	219
139	215	240	237	241	245	237	244	231	209	212	216	219	232	230	212	215	215
140	210	234	232	233	238	229	236	225	205	208	212	212	225	223	204	208	210
141	205	228	225	225	231	220	228	218	200	204	208	207	219	215	195	200	205
142	201	219	218	214	223	213	222	211	196	200	204	200	212	206	186	191	201
143	195	213	213	204	215	206	214	203	190	196	200	193	205	197	177	184	195
144	189	206	209	198	207	200	205	197	185	191	197	187	200	186	170	178	189
145	183	198	206	191	197	192	198	191	179	187	189	180	193	178	163	171	183
146	178	191	203	184	188	185	192	185	175	180	183	174	188	170	158	167	178
147	174	185	199	176	178	179	186	180	170	175	175	169	181	162	155	161	174
148	171	179	196	168	171	170	182	175	164	169	170	164	175	154	155	154	171
149	167	175	193	161	162	166	177	169	159	162	165	159	167	147	155	148	167
150	162	171	188	155	155	160	175	162	154	175	161	153	162	140	155	142	162
151	155	167	184	149	149	155	171	155	149	149	157	146	155	135	153	135	155

152	148	162	178	144	143	149	168	150	145	146	154	140	149	130	148	130	148
153	140	160	171	140	135	145	164	144	139	141	152	135	144	124	143	126	140
154	135	155	164	133	127	142	157	139	135	135	148	130	136	119	138	123	135
155	129	152	158	132	121	139	151	133	131	130	142	125	126	115	133	121	129
156	125	149	152	131	117	136	145	128	125	124	137	121	120	113	128	118	125
157	123	145	147	129	114	133	138	123	116	118	130	117	113	112	124	115	123
158	123	139	140	128	113	130	132	118	109	115	124	112	106	109	117	113	123
159	125	133	132	124	112	125	124	117	104	112	120	110	99	107	111	113	125
160	125	126	125	123	113	120	118	113	99	108	115	106	94	102	106	113	125
161	122	119	118	118	112	115	114	108	94	103	110	104	91	96	101	111	122
162	118	113	111	114	109	108	109	103	93	98	105	101	90	93	95	110	118
163	110	107	106	110	101	102	103	98	93	94	100	96	89	88	91	105	110
164	104	101	101	105	94	97	98	91	91	88	95	90	83	84	87	100	104
165	98	96	98	99	87	93	93	89	85	84	89	85	80	82	83	96	98
166	92	91	91	91	80	86	89	84	79	80	83	80	93	78	77	90	92
167	86	86	85	85	73	80	84	80	76	75	77	76	71	74	74	87	86
168	81	81	79	79	68	74	78	76	71	69	72	71	68	70	72	82	81
169	76	76	74	73	61	66	72	71	67	65	67	66	63	66	69	77	76
170	70	70	68	68	56	58	65	66	64	61	61	61	59	62	64	70	70
171	65	65	62	61	51	51	59	61	62	57	55	57	55	58	60	64	65
172	60	59	55	57	46	45	53	58	59	54	52	54	51	55	56	59	60
173	55	52	51	50	42	40	48	54	56	52	49	49	48	51	53	54	55
174	49	49	44	43	45	37	44	51	50	45	46	43	43	47	45	46	49
175	49	54	48	47	47	39	42	48	44	42	46	44	40	48	43	42	49
176	52	55	52	51	48	41	40	46	43	46	47	47	45	51	45	41	52
177	51	50	51	50	49	43	39	40	45	47	46	46	44	46	44	45	51
178	51	47	48	48	48	44	38	38	45	45	44	45	43	43	40	46	51
179	48	45	45	46	47	46	35	36	45	43	43	44	44	39	37	46	48
180	45	43	44	45	47	46	36	35	45	44	42	44	46	36	35	45	45

**BUG**

**Lum. Classification System (LCS)**

<b>LCS Zone</b>	<b>Lumens</b>	<b>%Lamp</b>	<b>%Lum</b>
FL (0-30)	453.5	2.1	2.1
FM (30-60)	3352.1	15.2	15.2
FH (60-80)	3770.0	17.1	17.1
FVH (80-90)	1473.4	6.7	6.7
BL (0-30)	485.8	2.2	2.2
BM (30-60)	3486.6	15.8	15.8
BH (60-80)	3697.8	16.8	16.8
BVH(80-90)	1350.0	6.1	6.1
UL (90-100)	1735.8	7.9	7.9
UH (100-180)	2260.4	10.2	10.2
Total	22065.4	100.1	100.0
<b>BUG Rating</b>	<b>B4-U5-G5</b>		



## 2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

<b>Test date</b>	2023-01-10	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	AST-CLW16-200WBCDA1-ad40K		

### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230100	120.0	60	1.674	199.08	0.991	11.75
6E-K2	277.0	60	0.734	188.4	0.926	15.46
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

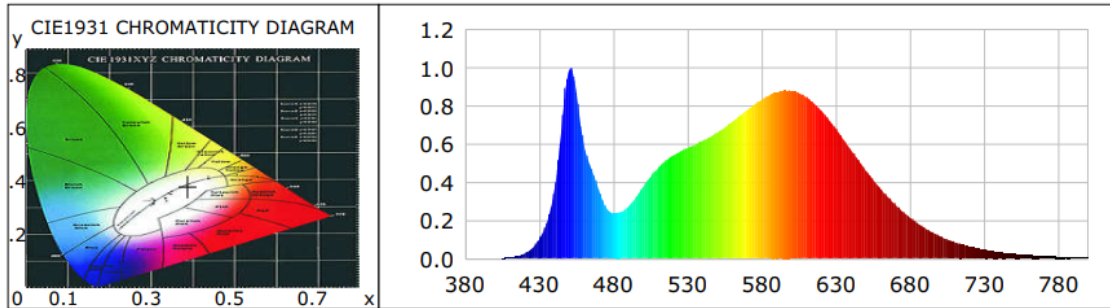
### Chromaticity Measurement - Sphere-Spectroradiometer Method in King Luminaire K400 Series (Mogul Socket Version):

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	83	R9	13
Frequency (Hz)	60	R2	91	R10	78
CCT (K)	3810	R3	95	R11	81
Duv	-0.0029	R4	82	R12	64
Chromaticity (x, y)	x=0.3869 y=0.3745	R5	83	R13	85
Chromaticity (u', v')	u(u')=0.2303 v'(v')=0.5016	R6	87	R14	98
Color Rendering Index (CRI)	84	R7	84	R15	77
R9	13	R8	65	--	--
Rf	84	--	--	--	--
Rg	96	--	--	--	--
Rcs,h1(%)	-12	--	--	--	--

### Photometric Measurement – Goniophotometer Method in King Luminaire K400 Series (Mogul Socket Version):

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	24851.4	23916.7	>=1000(-10%)
Luminous Efficacy (lm/W)	124.83	126.95	Standard: >= 105(-3%)
Most worst Luminous/Highest	120.14		

**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	0.1831	535	0.5614	354.5156	690	0.2823	178.2758
385	0.0003	0.1921	540	0.5790	365.6385	695	0.2456	155.1055
390	0.0004	0.2542	545	0.5968	376.9047	700	0.2139	135.0766
395	0.0007	0.4627	550	0.6170	389.6575	705	0.1849	116.7791
400	0.0006	0.3805	555	0.6364	401.9088	710	0.1594	100.6886
405	0.0019	1.1965	560	0.6596	416.5444	715	0.1366	86.2505
410	0.0048	3.0378	565	0.6874	434.0935	720	0.1178	74.3765
415	0.0115	7.2728	570	0.7177	453.2055	725	0.1000	63.1583
420	0.0259	16.3717	575	0.7473	471.9167	730	0.0855	54.0114
425	0.0517	32.6512	580	0.7782	491.4398	735	0.0728	45.9886
430	0.1000	63.1426	585	0.8075	509.9579	740	0.0623	39.3152
435	0.1854	117.0924	590	0.8336	526.4109	745	0.0526	33.2271
440	0.3461	218.5781	595	0.8561	540.6019	750	0.0449	28.3277
445	0.6756	426.6446	600	0.8726	551.0310	755	0.0383	24.1975
450	0.9844	621.6706	605	0.8810	556.3508	760	0.0328	20.6829
455	0.8760	553.1768	610	0.8788	554.9952	765	0.0272	17.1875
460	0.6052	382.1749	615	0.8679	548.1081	770	0.0241	15.2231
465	0.4744	299.6166	620	0.8480	535.5469	775	0.0207	13.1011
470	0.3636	229.6447	625	0.8162	515.4459	780	0.0168	10.6401
475	0.2691	169.9443	630	0.7771	490.7480	785	0.0146	9.2345
480	0.2373	149.8752	635	0.7301	461.0351	790	0.0126	7.9809
485	0.2453	154.9228	640	0.6795	429.0901	795	0.0107	6.7265
490	0.2705	170.8035	645	0.6255	394.9784	800	0.0084	5.2970
495	0.3192	201.5567	650	0.5716	360.9502			
500	0.3755	237.1258	655	0.5162	325.9743			
505	0.4283	270.4876	660	0.4626	292.1169			
510	0.4740	299.3499	665	0.4126	260.5451			
515	0.5100	322.0956	670	0.3646	230.2711			
520	0.5384	340.0282	675	0.3224	203.6033			
525	0.5614	354.5156	680	0.2823	178.2758			
530	0.5790	365.6385	685	0.2456	155.1055			

**TM30**

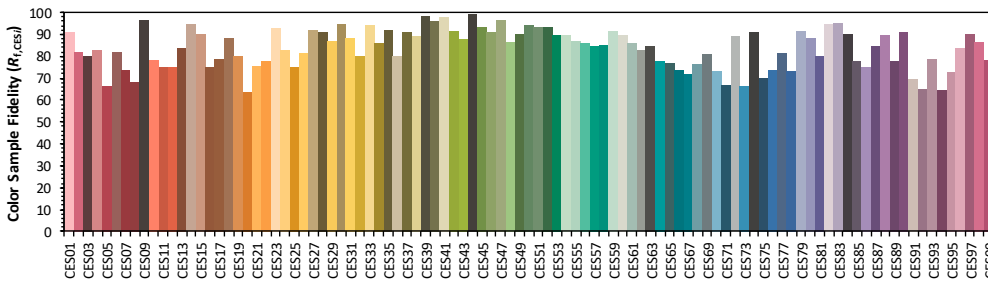
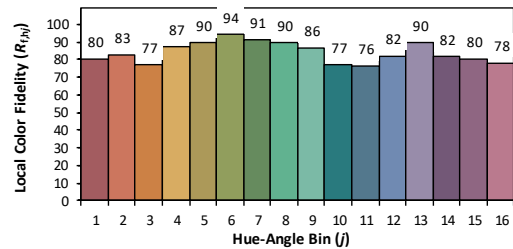
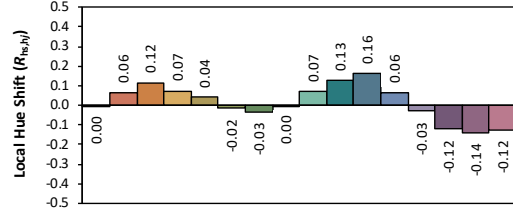
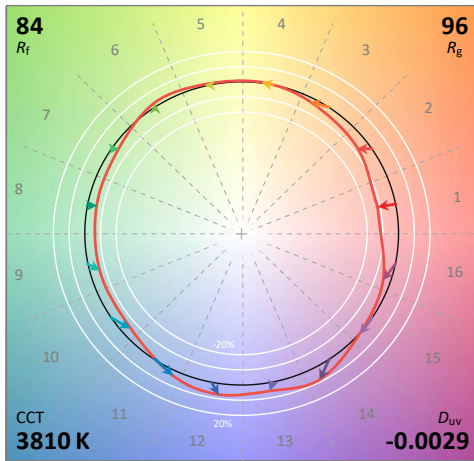
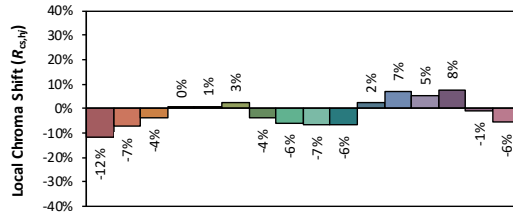
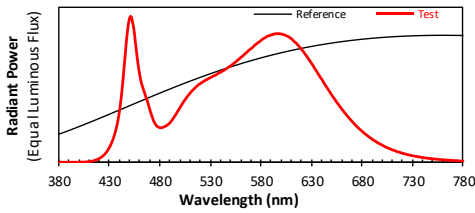
**ANSI/IES TM-30-18 Color Rendition Report**

**Source:** L128-XX80RC35003P1

**Manufacturer:** AS MART LIGHT CO., LTD

**Date:** 2023/1/10

**Model:** AST-CLW16-200WBCDA1-ad40K



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

$x$  0.3869  
 $y$  0.3745  
 $u'$  0.2303  
 $v'$  0.5016

CIE 13.3-1995 (CRI)	
$R_a$	84
$R_9$	13

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

### 2.3 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction BL-QP-033)

Test date	2023-01-10	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	AST-CLW16-200WBCDA1-ad50K		

#### Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
UTC230100	120.0	60	1.720	204.69	0.992	11.77
6E-K3	277.0	60	0.758	194.25	0.925	15.35
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

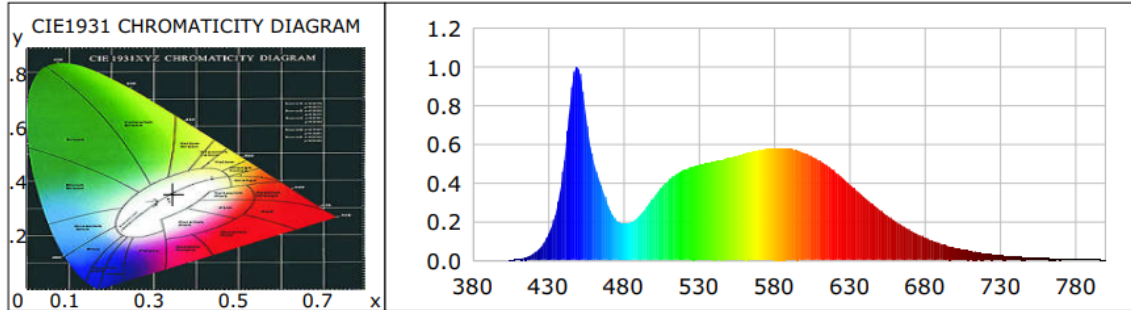
#### Chromaticity Measurement - Sphere-Spectroradiometer Method in King Luminaire K400 Series (Mogul Socket Version):

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	80	R9	5
Frequency (Hz)	60	R2	87	R10	68
CCT (K)	4964	R3	91	R11	80
Duv	0.0006	R4	82	R12	55
Chromaticity (x, y)	x=0.3462 y=0.3537	R5	80	R13	82
Chromaticity (u', v')	u(u')=0.2114 v'(v')=0.4859	R6	81	R14	95
Color Rendering Index (CRI)	82	R7	87	R15	75
R9	5	R8	67	--	--
Rf	82	--	--	--	--
Rg	97	--	--	--	--
Rcs,h1(%)	-13	--	--	--	--

#### Photometric Measurement – Goniophotometer Method in King Luminaire K400 Series (Mogul Socket Version):

Parameter	Result		DLC V5.1 Pass Criteria
Test Voltage (V)	120.0	277.0	--
Frequency (Hz)	60	60	
Total Luminous (lm)	24685.4	23925.1	>=1000(-10%)
Luminous Efficacy (lm/W)	120.60	123.17	Standard: >= 105(-3%)
Most worst Luminous/Highest	116.88		

**Spectral Power Distribution & Chromaticity Diagram**



WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)	WL(nm)	PL	PE(mW/nm)
380	0.0004	0.3703	535	0.4810	413.3129	690	0.1553	133.4104
385	0.0004	0.3864	540	0.4914	422.2220	695	0.1352	116.1379
390	0.0008	0.6603	545	0.5005	430.0219	700	0.1169	100.4778
395	0.0006	0.5055	550	0.5114	439.4043	705	0.1008	86.6510
400	0.0010	0.8969	555	0.5186	445.5983	710	0.0869	74.6956
405	0.0021	1.7664	560	0.5291	454.5936	715	0.0746	64.0843
410	0.0058	4.9874	565	0.5381	462.3167	720	0.0637	54.7316
415	0.0142	12.1885	570	0.5498	472.4301	725	0.0549	47.1972
420	0.0314	26.9954	575	0.5598	480.9497	730	0.0470	40.3513
425	0.0652	56.0540	580	0.5677	487.7826	735	0.0401	34.4771
430	0.1275	109.5534	585	0.5761	495.0379	740	0.0337	28.9845
435	0.2390	205.3633	590	0.5801	498.4353	745	0.0292	25.0806
440	0.4597	395.0256	595	0.5799	498.2467	750	0.0244	20.9388
445	0.8297	712.9278	600	0.5759	494.7837	755	0.0209	17.9517
450	0.9961	855.8302	605	0.5677	487.7408	760	0.0173	14.8620
455	0.7580	651.3213	610	0.5557	477.4818	765	0.0154	13.2746
460	0.5198	446.6100	615	0.5385	462.6592	770	0.0133	11.4283
465	0.3939	338.4199	620	0.5171	444.3033	775	0.0110	9.4363
470	0.2817	242.0373	625	0.4910	421.8473	780	0.0096	8.2195
475	0.2096	180.1142	630	0.4603	395.4715	785	0.0079	6.7791
480	0.1893	162.6855	635	0.4284	368.0725	790	0.0072	6.1974
485	0.1960	168.3902	640	0.3940	338.5685	795	0.0064	5.5006
490	0.2242	192.6065	645	0.3591	308.5149	800	0.0059	5.0932
495	0.2715	233.2681	650	0.3258	279.8976			
500	0.3244	278.7460	655	0.2922	251.0752			
505	0.3727	320.1982	660	0.2598	223.2671			
510	0.4138	355.5149	665	0.2307	198.2614			
515	0.4435	381.0477	670	0.2029	174.3156			
520	0.4668	401.1166	675	0.1783	153.2200			
525	0.4810	413.3129	680	0.1553	133.4104			
530	0.4914	422.2220	685	0.1352	116.1379			

**TM-30**

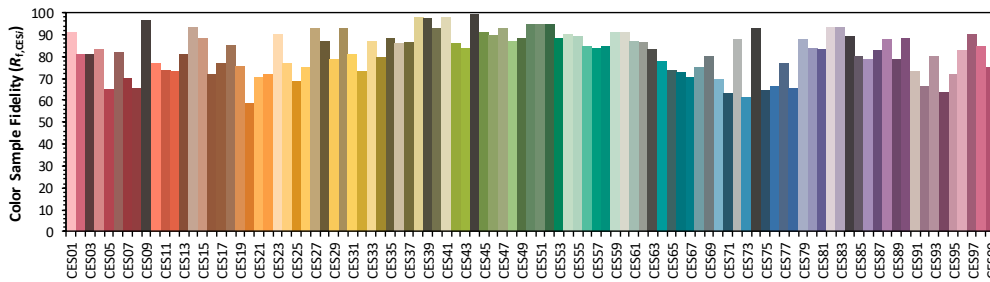
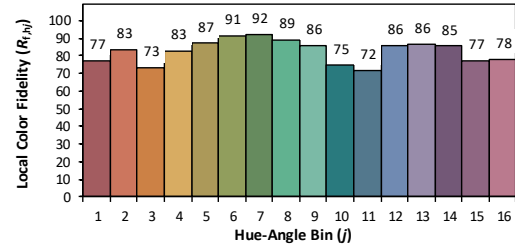
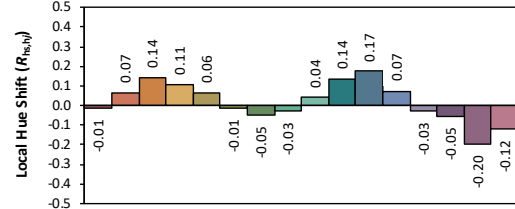
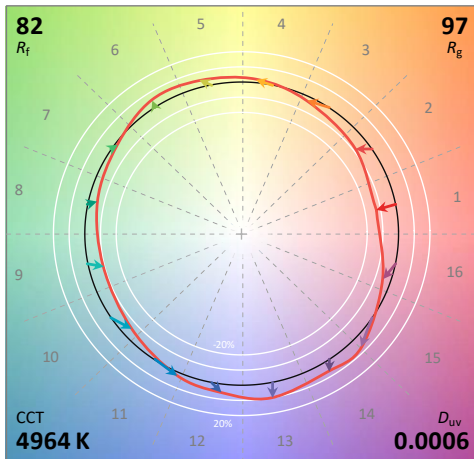
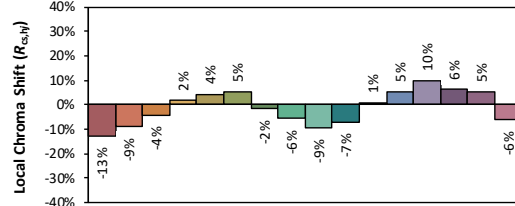
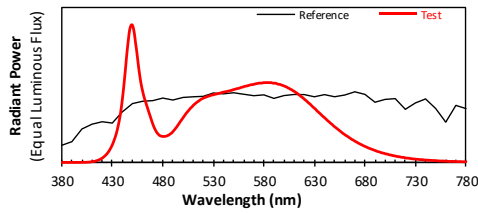
**ANSI/IES TM-30-18 Color Rendition Report**

**Source:** L128-XX80RC35003P1

**Manufacturer:** AS MART LIGHT CO., LTD

**Date:** 2023/1/10

**Model:** AST-CLW16-200WBCDA1-ad50K



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

$x$  0.3462  
 $y$  0.3537  
 $u'$  0.2114  
 $v'$  0.4859

CIE 13.3-1995 (CRI)	
$R_a$	82
$R_9$	5

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

### 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	DYDWQ20006	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 \*\*\*\*\*