

Test Report Of ANSI/IES LM-79-19

APPROVED METHOD FOR OPTICAL AND ELECTRICAL MEASUREMENTS OF SOLID-STATE LIGHTING PRODUCTS

Report Number..... : N02A23080352L00501

Client..... : ROYALUX EXPORTS PRIVATE LIMITED

Address..... : 150-B, NOIDA SPECIAL ECONOMIC ZONE, NOIDA, GAUTAM BUDDHA
NAGAR, UTTAR PRADESH, 201305, INDIA

Test Model..... : 2303Y0240W35L[Blank, BS], 2303Y0240W40L[Blank, BS],
2303Y0240W50L[Blank, BS]

Brand Name..... : 

Testing Laboratory... : Guangdong Meide Testing Technology Co., Ltd.

Address..... : 1st floor, B Area, Jinbaisheng Industrial Park, Headquarters 2 Road, Songshan
Lake Hi-tech Industrial Development Zone, Dongguan City, Guangdong Pr.,
China.

Testing location..... : As above

Date of receipt..... : Aug. 21, 2023

Date of test : Sep. 06, 2023 – Sep. 13, 2023

Date of report..... : Sep. 13, 2023

Tested by:



Jarvis Zhang/ Test Engineer

Checked by:



Sandy Chen/ Project Engineer

Approved by:



Jessie Li/ Technical Manager

Note 1: The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or use in part without prior written consent from Guangdong Meide Testing Technology Co., Ltd. This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Note 2: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Note 3: This report contains data that are not covered by the NVLAP accreditation. It is marked * in the title.

1. Product Description for Equipment under Test(EUT)

Representative (Tested) Model:	2303Y0240W35L[Blank, BS], 2303Y0240W40L[Blank, BS], 2303Y0240W50L[Blank, BS]
Manufacturer:	ROYALUX EXPORTS PRIVATE LIMITED
Product Type:	High Bay Luminaires (Commercial and Industrial)
Rated Voltage/Frequency:	100-277V AC, 50/60Hz
Rated Power:	240W
Rated luminous flux:	33600lm
Nominal CCT:	3500K/4000K/5000K
LED Manufacturer:	Bridgelux Inc.
LED Model No.:	BXEN-35E-11M-3CA, BXEN-50E-11M-3CA

2. Standards Used

- ANSI/IES LM-79-19:APPROVED METHOD:OPTICAL AND ELECTRICAL MEASUREMENTS OF SOLID-STATE LIGHTING PRODUCTS
- IES TM-30-18 IES Method for Evaluating Light Source Color Rendition (This Method is not in Nvlap accreditation scope)
- ANSI C82.77-10:2014 Harmonic Emission Limits – Related Power Quality Requirements for Lighting Equipment-Solid State

3. Test equipment list

Test Equipment	Serial No.	Model No.	Calibration due date
Full-field Speed Goniophotometer	MD-E028	GO-R5000	2023/09/17
Digital Power Meter	MD-E001	PF2010	2023/09/17
AC Testing Power Source	MD-E002	DPS1060	2023/09/17
Total Spectral Radiant Flux Standard Lamp	MD-E007	D908S	2023/10/13
Integrating Sphere System	MD-E029	2M	2023/09/17
High Accuracy Array Spectroradio Meter	MD-E011	HAAS-3000	2023/09/17
Digital Power Meter	MD-E008	PF310	2023/09/17
AC Testing Power Source	MD-E010	DPS1010	2023/09/17
Standard Lamp	MD-E036	D204	2023/10/13

Statement of Traceability: Guangdong Meide Testing Technology Co., Ltd. attested that all calibration has been performed using suitable standards traceable to national primary standards and International System of Unit(SI).

4. Test Method

Requirements of Ambient Condition

Product was tested with no seasoning. All stabilization and measurements were made in compliance with ANSI/IES LM-79-19. The product was operated at rated voltage or at voltage required by manufacturer. The ambient temperature of the sample was maintained at $25^{\circ}\text{C} \pm 1.2^{\circ}\text{C}$ during measurement. And relative humidity between 10% and 65%.

Goniophotometer System

The sample was tested according to the ANSI/IES LM-79-19.

Photometric parameters were measured using a type C goniophotometer and software. The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, Luminous efficacy, zonal flux were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals. Photometric distance was more than five times of the Largest dimension of the test SSL product.

Integrating Sphere System

The sample was tested according to the ANSI/IES LM-79-19.

The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using 4π geometry. The self-absorption factor is applied in the final test result. The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Fidelity Index (R_f) and Gamut Index (R_g) Calculation

The R_f , R_g was calculated according to IES TM-30-18 by using calculation tools. The calculation was based on the measured SPD from 380nm to 780nm with 1nm intervals. All the colors in this report is for reference only.

THD and PF Test

The sample was tested according to the ANSI C82.77-10:2014.

The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated from the digital power meter.

5. Integrating Sphere Test Results

5.1 Test Data

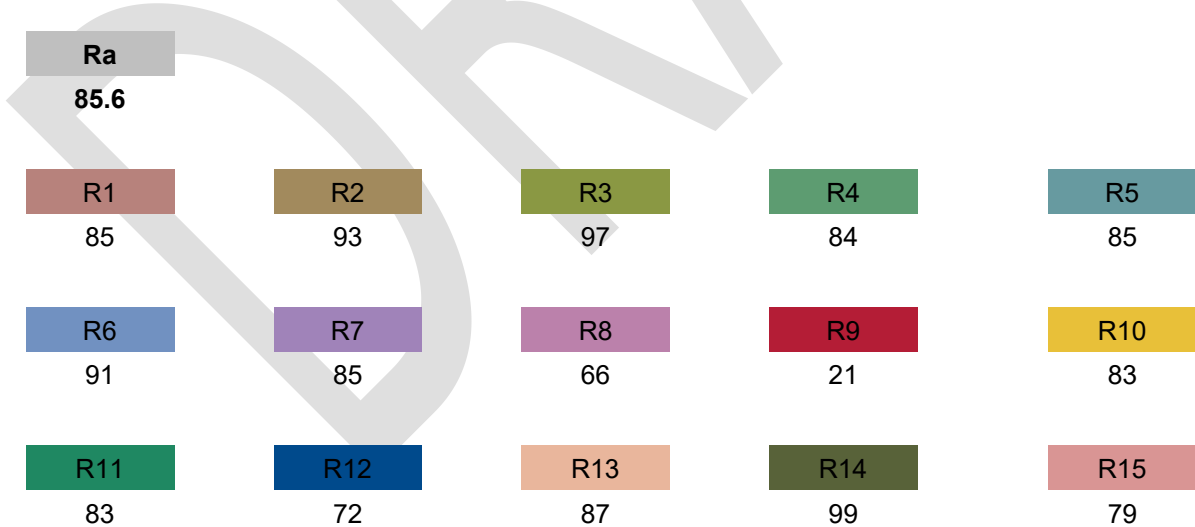
Test Ambient Temperature (Integrating sphere internal temperature)	25.3℃	Test orientation	Downward
Operate time(Min.)	60	stabilization time(Min.)	30

Optical and Electrical Measurement Result

Model	Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)	CCT (K)
2303Y0240W35L [Blank, BS]	120.12	60	1.998	239.8	0.9991	33329	138.99	3329
2303Y0240W40L [Blank, BS]	120.12	60	1.948	233.9	0.999	34936	149.38	3856
2303Y0240W50L [Blank, BS]	120.09	60	2.007	240.9	0.999	34143	141.74	4891

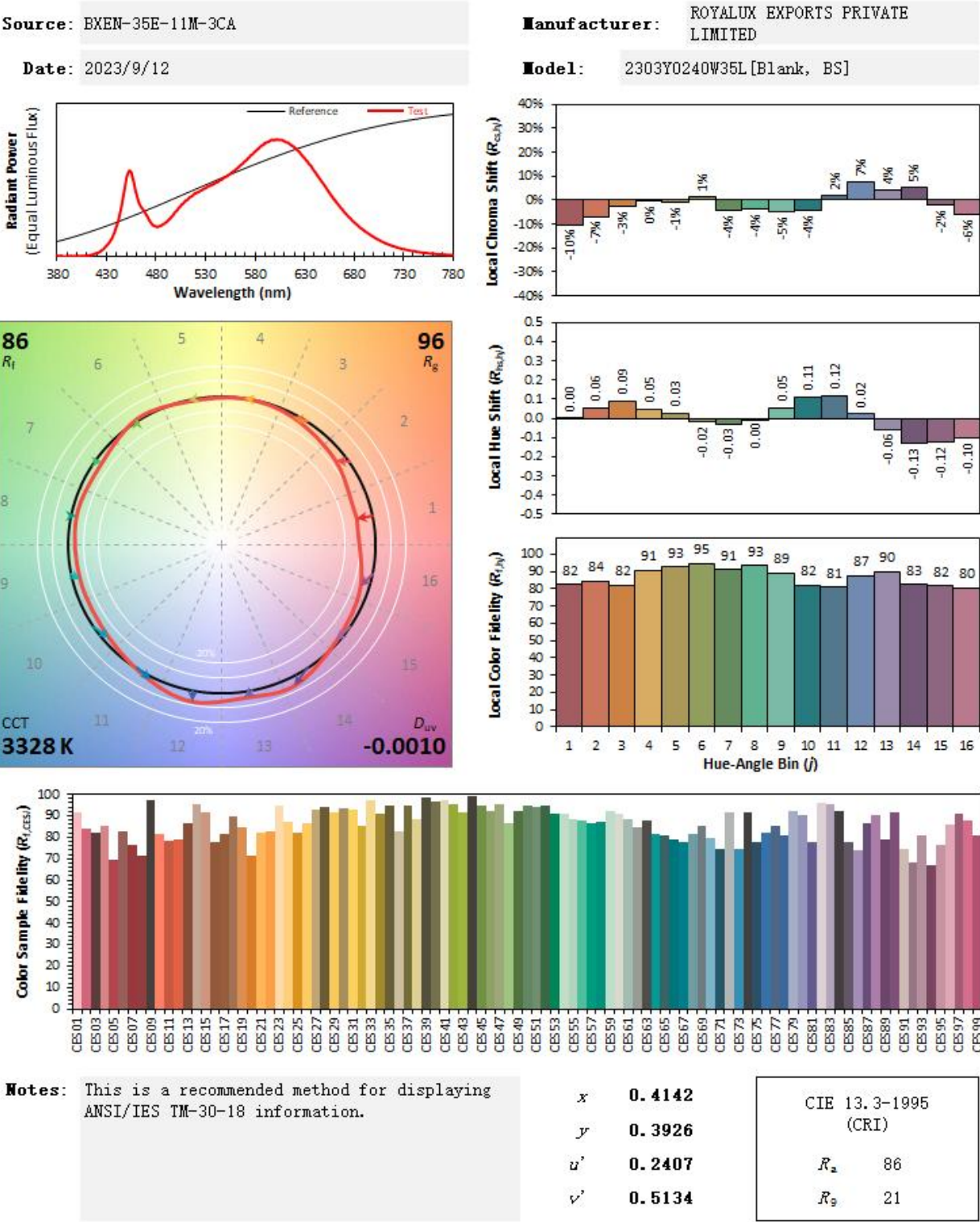
Model	Ra	R9	Rf	Rg	x	y	u'	v'	Duv
2303Y0240W35L [Blank, BS]	85.6	21	86	96	0.4142	0.3928	0.2406	0.5134	-9.48E-04
2303Y0240W40L [Blank, BS]	86.5	26	86	97	0.3858	0.3767	0.2287	0.5023	-1.57E-03
2303Y0240W50L [Blank, BS]	85.5	23	85	98	0.3483	0.3546	0.2124	0.4866	2.24E-04

5.2 Color Rendering Index for Model # 2303Y0240W35L[Blank, BS]



*5.3.1 ANSI/IES TM-30-18 Color Rendition Report for Model # 2303Y0240W35L[Blank, BS]

ANSI/IES TM-30-18 Color Rendition Report

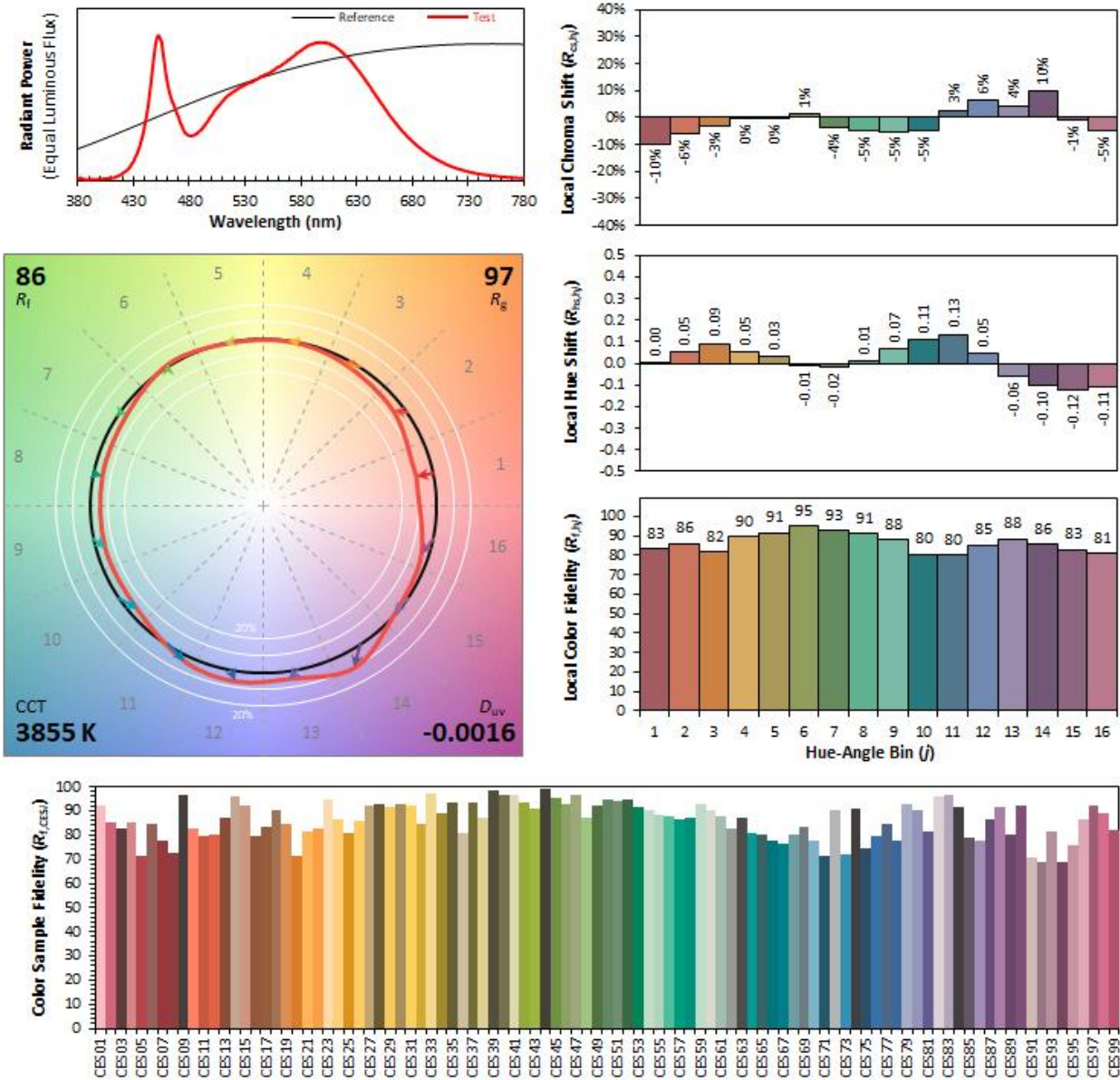


*5.3.2 ANSI/IES TM-30-18 Color Rendition Report for Model # 2303Y0240W40L[Blank, BS]

ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-35E-11M-3CA, BXEN-50E-11M-3CA
Date: 2023/9/12

Manufacturer: ROYALUX EXPORTS PRIVATE LIMITED
Model: 2303Y0240W40L [Blank, BS]



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

*5.3.3 ANSI/IES TM-30-18 Color Rendition Report for for Model # 2303Y0240W50L[Blank, BS]

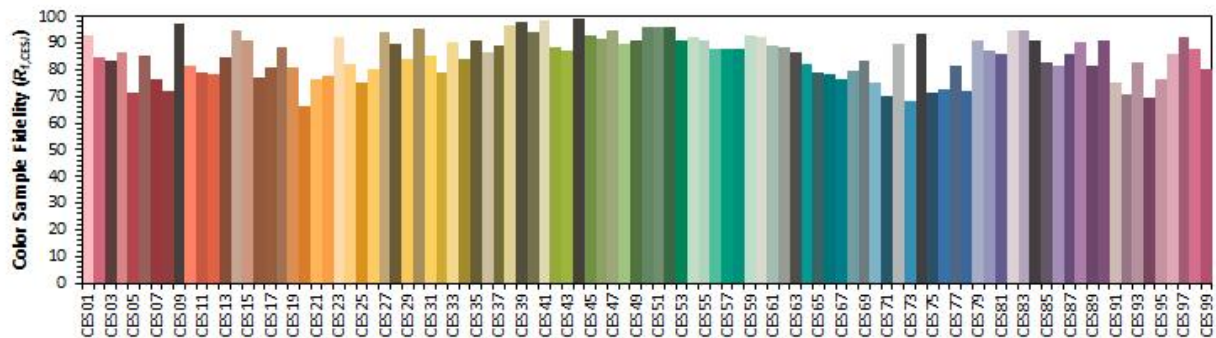
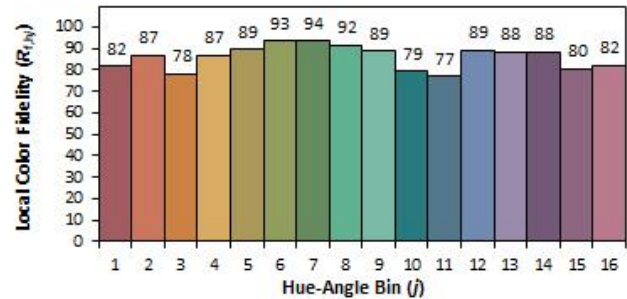
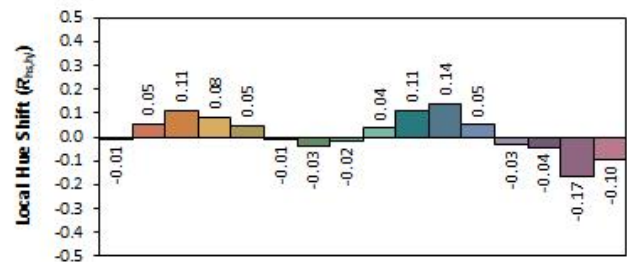
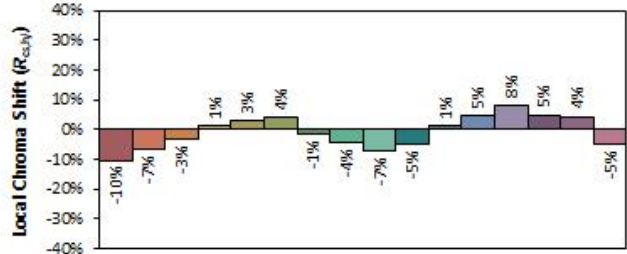
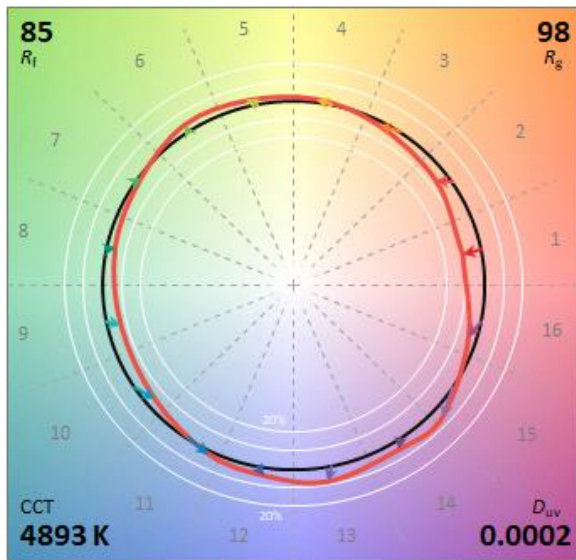
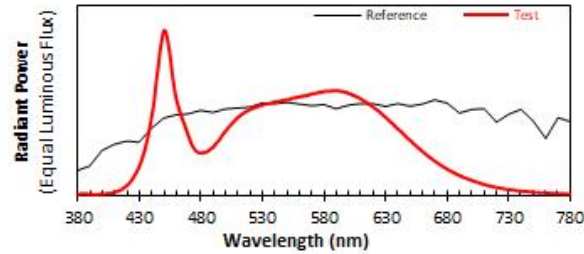
ANSI/IES TM-30-18 Color Rendition Report

Source: BXEN-50E-11M-3CA

Date: 2023/9/12

Manufacturer: ROYALUX EXPORTS PRIVATE LIMITED

Model: 2303Y0240W50L[Blank, BS]



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

x 0.3482

y 0.3544

u' 0.2124

v' 0.4865

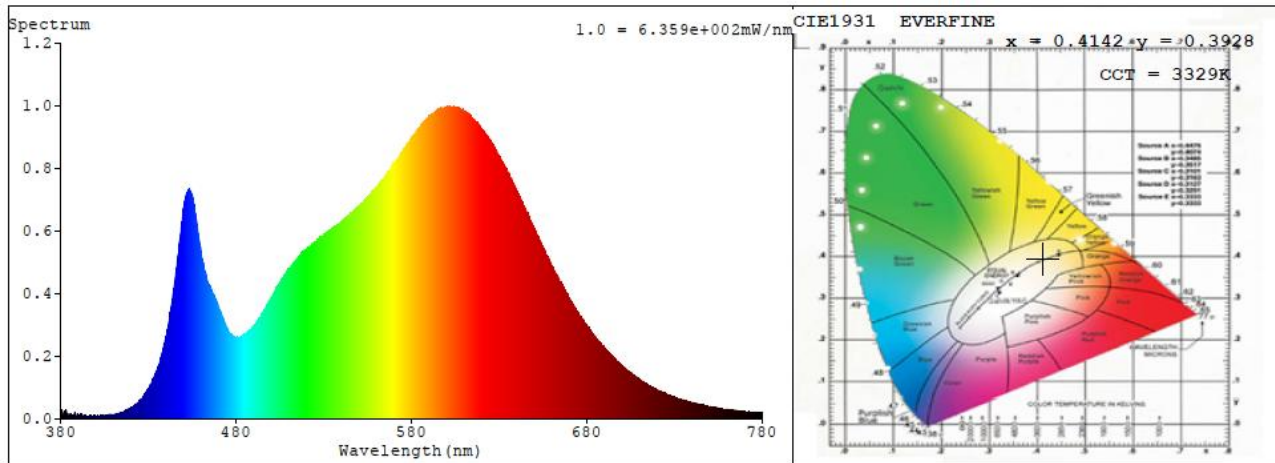
CIE 13.3-1995
(CRI)

R_a 86

R_g 23

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

5.4 Relative Spectral Power Distribution for Model # 2303Y0240W35L[Blank, BS]



nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	0.0138	414	0.0161	448	0.5745	482	0.2581	516	0.5153
381	0.0073	415	0.0202	449	0.6212	483	0.2632	517	0.5217
382	0.0094	416	0.0215	450	0.6727	484	0.2631	518	0.5309
383	0.0105	417	0.0262	451	0.6977	485	0.2669	519	0.5394
384	0.0124	418	0.0286	452	0.7194	486	0.2718	520	0.5395
385	0.0092	419	0.0325	453	0.7328	487	0.2802	521	0.5456
386	0.0056	420	0.0322	454	0.7257	488	0.2823	522	0.549
387	0.0047	421	0.0355	455	0.7151	489	0.2871	523	0.5538
388	0	422	0.0404	456	0.6785	490	0.2959	524	0.5567
389	0.0081	423	0.0455	457	0.6465	491	0.2999	525	0.5629
390	0.0065	424	0.051	458	0.6086	492	0.3104	526	0.5656
391	0.0086	425	0.059	459	0.5676	493	0.3194	527	0.5717
392	0.0086	426	0.0636	460	0.5367	494	0.3242	528	0.5781
393	0.0053	427	0.0694	461	0.5039	495	0.3368	529	0.5806
394	0.0125	428	0.0789	462	0.4758	496	0.3453	530	0.5855
395	0.0048	429	0.0895	463	0.4508	497	0.3517	531	0.5899
396	0.0057	430	0.0974	464	0.4353	498	0.3686	532	0.5973
397	0.0102	431	0.1081	465	0.4208	499	0.3792	533	0.6
398	0.0069	432	0.1173	466	0.4125	500	0.388	534	0.6015
399	0.0063	433	0.1286	467	0.398	501	0.3929	535	0.6079
400	0.0064	434	0.1421	468	0.3867	502	0.404	536	0.6103
401	0.0101	435	0.1548	469	0.3736	503	0.4201	537	0.6124
402	0.0067	436	0.1738	470	0.3552	504	0.4244	538	0.6206
403	0.0095	437	0.1942	471	0.346	505	0.4346	539	0.6234
404	0.0095	438	0.2129	472	0.3278	506	0.4478	540	0.6269
405	0.0073	439	0.2404	473	0.3125	507	0.4502	541	0.6349
406	0.0105	440	0.2626	474	0.3004	508	0.4615	542	0.6326
407	0.0107	441	0.2854	475	0.2885	509	0.4705	543	0.642
408	0.0116	442	0.3158	476	0.2772	510	0.4793	544	0.6485
409	0.0101	443	0.3574	477	0.2691	511	0.4817	545	0.6516
410	0.0126	444	0.3927	478	0.267	512	0.4867	546	0.6538
411	0.0123	445	0.4346	479	0.2611	513	0.4998	547	0.6609
412	0.015	446	0.4781	480	0.2588	514	0.5077	548	0.6718
413	0.0152	447	0.5264	481	0.2562	515	0.5118	549	0.6721

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
550	0.679	599	0.9907	648	0.6327	697	0.1842	746	0.0431
551	0.6833	600	0.9905	649	0.6242	698	0.1817	747	0.0411
552	0.6854	601	0.9961	650	0.6105	699	0.1766	748	0.0396
553	0.6958	602	0.9961	651	0.5983	700	0.1716	749	0.0394
554	0.699	603	0.9937	652	0.5871	701	0.1642	750	0.0383
555	0.7049	604	0.9943	653	0.5722	702	0.1603	751	0.0366
556	0.7131	605	0.9932	654	0.5625	703	0.1557	752	0.0367
557	0.7185	606	0.9913	655	0.5475	704	0.1517	753	0.0353
558	0.727	607	0.9922	656	0.5379	705	0.1465	754	0.0348
559	0.731	608	0.9899	657	0.5211	706	0.1438	755	0.0338
560	0.7372	609	0.9835	658	0.5154	707	0.1372	756	0.0323
561	0.7461	610	0.9824	659	0.4998	708	0.1322	757	0.0313
562	0.7518	611	0.9724	660	0.4878	709	0.1311	758	0.03
563	0.7582	612	0.9715	661	0.4831	710	0.1256	759	0.0297
564	0.7667	613	0.9711	662	0.4672	711	0.121	760	0.0293
565	0.7756	614	0.9674	663	0.4565	712	0.1174	761	0.0295
566	0.7815	615	0.9573	664	0.4471	713	0.1132	762	0.0271
567	0.7887	616	0.9538	665	0.4372	714	0.1124	763	0.0272
568	0.7936	617	0.9451	666	0.4264	715	0.107	764	0.0252
569	0.8066	618	0.9411	667	0.4149	716	0.1045	765	0.0255
570	0.8113	619	0.9371	668	0.4061	717	0.1013	766	0.0244
571	0.8201	620	0.925	669	0.3986	718	0.0985	767	0.0243
572	0.8263	621	0.9215	670	0.3838	719	0.0946	768	0.0231
573	0.8385	622	0.9119	671	0.3746	720	0.0928	769	0.0234
574	0.8438	623	0.9061	672	0.3684	721	0.0898	770	0.0226
575	0.853	624	0.8965	673	0.3568	722	0.0877	771	0.0217
576	0.8656	625	0.8909	674	0.3489	723	0.0848	772	0.0218
577	0.8672	626	0.8761	675	0.3386	724	0.0811	773	0.0212
578	0.8766	627	0.8678	676	0.3306	725	0.0789	774	0.0197
579	0.8845	628	0.8578	677	0.3246	726	0.0773	775	0.0192
580	0.8946	629	0.8477	678	0.3132	727	0.0739	776	0.0187
581	0.8977	630	0.8392	679	0.3033	728	0.0725	777	0.0184
582	0.9098	631	0.8295	680	0.2988	729	0.0689	778	0.0178
583	0.9173	632	0.8168	681	0.2901	730	0.0693	779	0.0187
584	0.9211	633	0.8127	682	0.2829	731	0.0672	780	0.0187
585	0.9329	634	0.7952	683	0.2761	732	0.0643		
586	0.9407	635	0.7868	684	0.2686	733	0.0625		
587	0.9458	636	0.779	685	0.2607	734	0.061		
588	0.9481	637	0.7685	686	0.2532	735	0.0602		
589	0.9551	638	0.7509	687	0.2448	736	0.0571		
590	0.968	639	0.7404	688	0.2414	737	0.0552		
591	0.9679	640	0.7276	689	0.2337	738	0.054		
592	0.9724	641	0.7201	690	0.2283	739	0.0525		
593	0.9746	642	0.7049	691	0.2198	740	0.0505		
594	0.9781	643	0.6921	692	0.2156	741	0.0492		
595	0.9851	644	0.6814	693	0.2101	742	0.0492		
596	0.9889	645	0.6707	694	0.2033	743	0.0469		
597	0.9945	646	0.6565	695	0.1981	744	0.0445		
598	0.9918	647	0.6469	696	0.1931	745	0.0442		

6. Goniophotometer Test results for Model # 2303Y0240W35L[Blank, BS]

6.1 Test Data

Test Ambient Temperature	25.2°C	Test orientation	Downward
Operate time(Min.)	90	stabilization time(Min.)	30

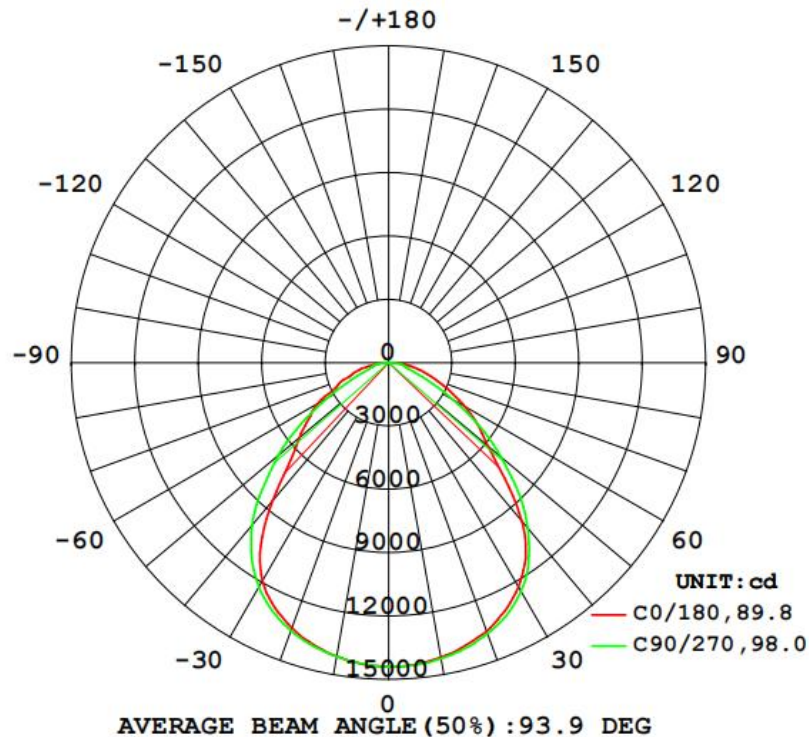
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current(A)	Power Factor	Power(W)
119.9	60	2.0079	0.9992	240.5

Optical Measurement

Luminous Flux (lm)	Efficacy(lm/W)	Imax (cd)	ZL (20-50°)
33252	138.26	14406	57.2%

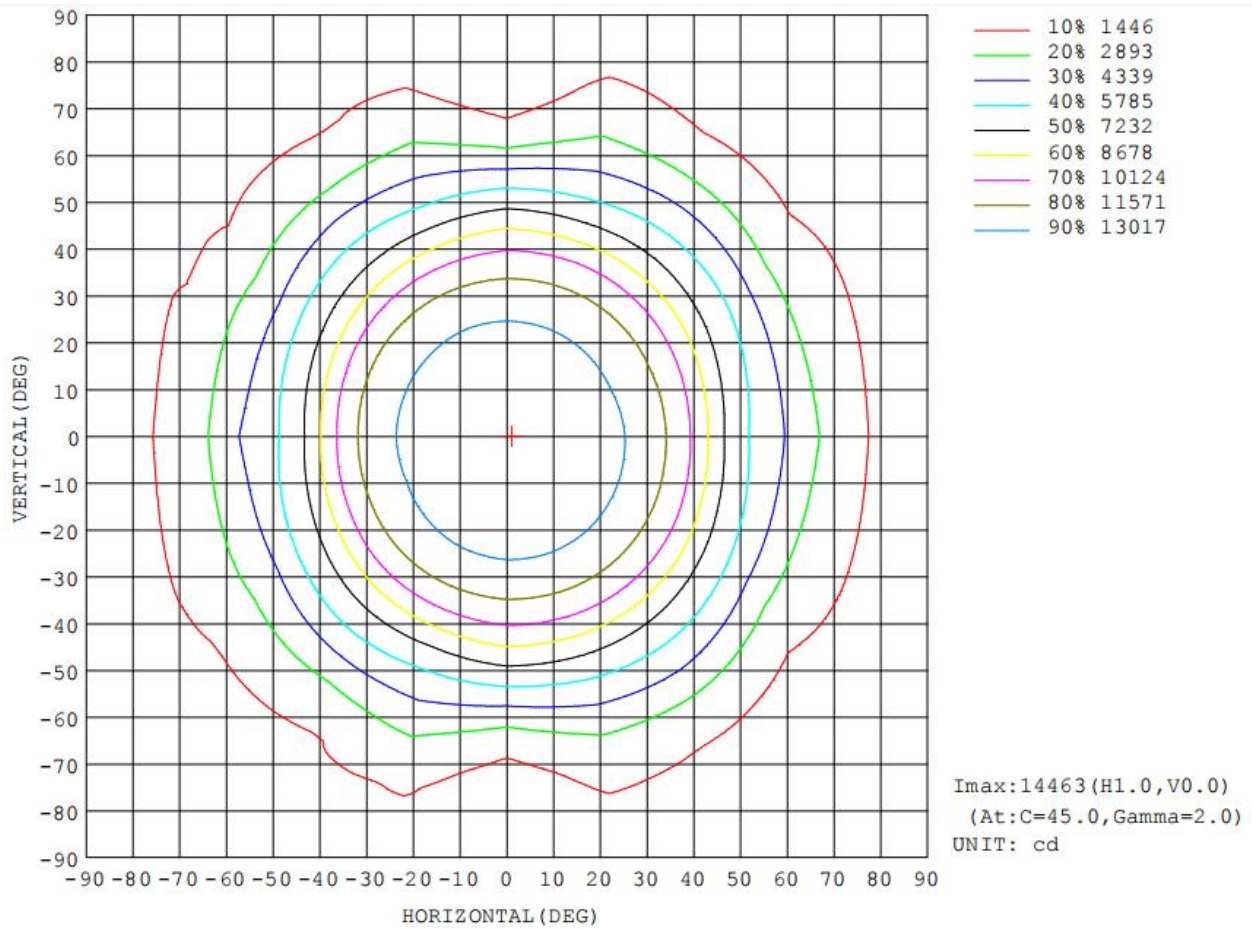
6.2 Luminous Intensity Distribution



6.3 Zonal Flux Diagram

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	1417	1423	1423	1419	1413	1414	1413	1414	0- 10	1364	1364	4.1,4.1
20	1353	1362	1366	1352	1338	1340	1351	1349	10- 20	3925	5289	15.9,15.9
30	1227	1245	1252	1222	1195	1205	1228	1226	20- 30	5977	11266	33.9,33.9
40	981.7	1012	1026	935.7	853.6	922.1	1006	989.4	30- 40	6942	18208	54.8,54.8
50	612.2	671.3	694.1	614.6	551.7	596.3	680.2	656.3	40- 50	6096	24304	73.1,73.1
60	420.3	405.4	353.6	324.9	388.6	325.7	334.6	391.4	50- 60	4458	28762	86.5,86.5
70	237.8	173.6	128.5	150.7	200.7	162.3	115.8	164.0	60- 70	2557	31319	94.2,94.2
80	116.1	98.51	68.34	92.18	88.73	93.00	63.32	94.16	70- 80	1375	32694	98.3,98.3
90	6.650	0.0794	6.647	3.223	0.2166	0.1967	4.803	9.430	80- 90	491.4	33186	99.8,99.8
100	0.1943	0.1983	0.2397	4.555	5.625	3.829	0.3150	0.3025	90-100	12.39	33198	99.8,99.8
110	0.2792	0.2720	0.3384	2.212	2.597	1.511	0.4012	0.3707	100-110	15.28	33213	99.9,99.9
120	0.3950	0.4466	0.4254	0.5725	1.344	0.5098	0.4491	0.4525	110-120	7.968	33221	99.9,99.9
130	0.6494	0.7750	0.6242	0.6421	0.7088	0.6959	0.6620	0.7841	120-130	5.711	33227	99.9,99.9
140	1.009	0.9325	0.8389	0.9078	1.085	1.108	0.9677	1.113	130-140	6.470	33233	99.9,99.9
150	1.059	1.040	0.9537	1.084	1.492	1.511	1.276	1.310	140-150	7.010	33240	100,100
160	1.016	1.206	1.167	1.261	1.610	1.668	1.542	1.592	150-160	6.080	33247	100,100
170	1.279	1.267	1.325	1.354	1.677	1.676	1.542	1.540	160-170	4.030	33251	100,100
180	1.497	1.502	1.549	1.568	1.490	1.512	1.521	1.563	170-180	1.419	33252	100,100
DEG	LUMINOUS INTENSITY:X10cd									UNIT:lm		

6.4 Isocandela Diagram



6.5 Luminous Distribution Intensity Data

Table--1 UNIT: X10cd

C (DEG) y (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5			
0	1439	1439	1439	1439	1439	1439	1439	1439	1439	1439	1439	1439	1439	1439	1439	1439			
5	1435	1437	1438	1439	1437	1436	1435	1434	1432	1432	1432	1432	1431	1433	1434	1435			
10	1417	1419	1423	1426	1423	1422	1419	1414	1413	1413	1414	1414	1413	1416	1414	1415			
15	1389	1396	1398	1401	1401	1400	1390	1386	1381	1381	1383	1387	1388	1389	1388	1388			
20	1353	1359	1362	1366	1366	1364	1352	1344	1338	1338	1340	1346	1351	1350	1349	1350			
25	1299	1307	1313	1319	1320	1312	1298	1286	1278	1278	1283	1294	1298	1299	1298	1298			
30	1227	1235	1245	1252	1252	1238	1222	1206	1195	1200	1205	1218	1228	1229	1226	1226			
35	1130	1141	1147	1155	1155	1132	1107	1078	1057	1072	1091	1112	1129	1131	1127	1130			
40	982	1003	1012	1022	1026	980	936	888	854	883	922	962	1006	1000	989	989			
45	780	813	836	854	867	797	758	712	661	702	742	784	845	826	819	812			
50	612	649	671	689	694	636	615	579	552	564	596	623	680	659	656	653			
55	518	514	543	550	526	511	471	430	458	418	468	492	508	524	532	529			
60	420	361	405	418	354	401	325	314	389	300	326	377	335	405	391	372			
65	320	228	270	302	216	305	221	187	276	179	215	282	199	305	258	235			
70	238	143	174	215	128	222	151	156	201	139	162	203	116	225	164	151			
75	170	105	126	163	86.7	165	127	124	149	108	126	149	80.0	170	119	111			
80	116	82.0	98.5	119	68.3	121	92.2	69.7	88.7	66.6	93.0	113	63.3	123	94.2	84.6			
85	56.4	46.4	59.3	59.7	36.8	48.0	34.2	23.5	30.0	25.8	40.7	48.8	36.1	62.3	57.3	47.5			
90	6.65	6.36	0.08	0.19	6.65	0.55	3.22	0.11	0.22	0.18	0.20	0.19	4.80	10.1	9.43	4.82			
95	0.15	0.15	0.14	0.17	0.18	1.82	2.14	0.15	0.28	0.25	2.66	2.07	0.24	0.26	0.23	0.23			
100	0.19	0.21	0.20	0.20	0.24	1.26	4.55	6.81	5.62	5.35	3.83	1.09	0.32	0.30	0.30	0.30			
105	0.23	0.26	0.23	0.26	0.29	0.36	2.09	4.87	3.32	4.11	1.81	0.42	0.37	0.35	0.35	0.36			
110	0.28	0.30	0.27	0.36	0.34	0.28	2.21	2.54	2.60	2.16	1.51	0.38	0.40	0.41	0.37	0.39			
115	0.33	0.35	0.33	0.46	0.40	0.35	0.94	3.30	3.17	1.96	0.82	0.41	0.42	0.48	0.39	0.42			
120	0.40	0.42	0.45	0.52	0.43	0.46	0.57	1.44	1.34	1.13	0.51	0.47	0.45	0.52	0.45	0.45			
125	0.50	0.53	0.61	0.60	0.57	0.57	0.54	1.00	0.93	0.75	0.56	0.56	0.55	0.59	0.59	0.55			
130	0.65	0.69	0.78	0.73	0.62	0.72	0.64	0.70	0.71	0.71	0.70	0.70	0.66	0.71	0.78	0.73			
135	0.83	0.86	0.86	0.73	0.74	0.74	0.76	0.78	0.88	0.89	0.90	0.80	0.81	0.83	0.96	0.98			
140	1.01	1.00	0.93	0.79	0.84	0.83	0.91	0.89	1.08	1.11	1.11	0.98	0.97	0.95	1.11	1.23			
145	1.09	1.06	0.98	0.89	0.89	0.95	1.01	1.02	1.35	1.36	1.33	1.20	1.12	1.17	1.28	1.39			
150	1.06	1.03	1.04	0.98	0.95	1.06	1.08	1.06	1.49	1.55	1.51	1.39	1.28	1.31	1.31	1.49			
155	1.10	1.13	1.05	1.10	1.11	1.19	1.10	1.17	1.66	1.69	1.57	1.59	1.40	1.36	1.50	1.58			
160	1.02	1.08	1.21	1.15	1.17	1.24	1.26	1.12	1.61	1.63	1.67	1.67	1.54	1.51	1.59	1.59			
165	1.17	1.24	1.24	1.18	1.22	1.29	1.31	1.24	1.69	1.68	1.71	1.68	1.57	1.53	1.54	1.64			
170	1.28	1.25	1.27	1.29	1.33	1.37	1.35	1.30	1.68	1.67	1.68	1.62	1.54	1.51	1.54	1.61			
175	1.33	1.35	1.43	1.46	1.51	1.54	1.53	1.44	1.57	1.57	1.60	1.63	1.59	1.59	1.60	1.59			
180	1.50	1.52	1.50	1.52	1.55	1.57	1.57	1.55	1.49	1.50	1.51	1.51	1.52	1.54	1.56	1.57			

7. THD and PF Test

Model	Voltage (V AC)	Frequency (Hz)	Power Factor	THD (%)
2303Y0240W35L[Blank, BS]	100.0	60	0.998	2.91
	120.0	60	0.999	3.41
	277.0	60	0.965	10.26
2303Y0240W40L[Blank, BS]	277.0	60	0.964	10.39
2303Y0240W50L[Blank, BS]	277.0	60	0.966	10.38

8. Photo of sample

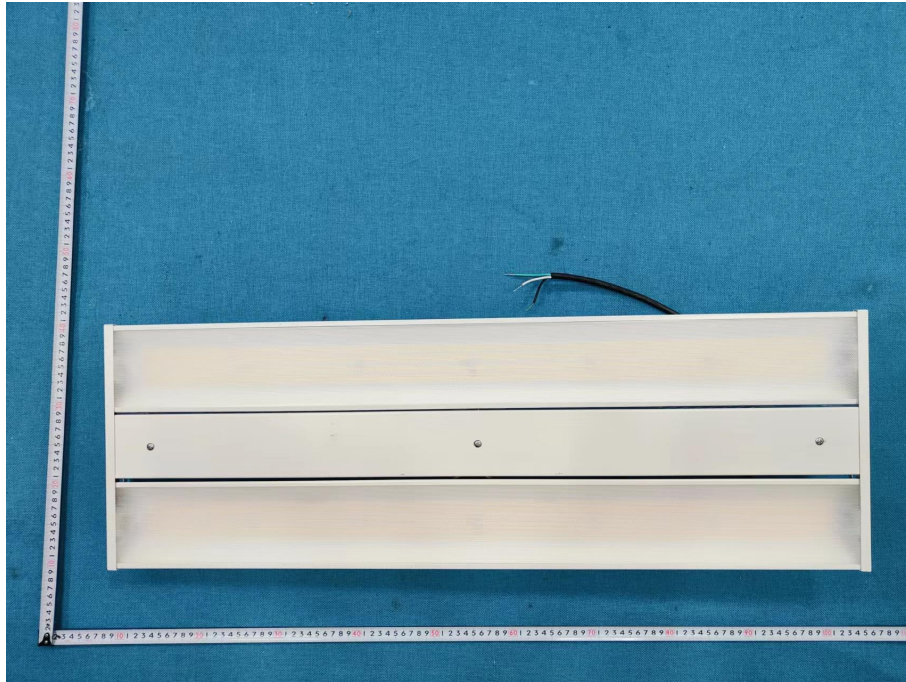


Figure 1



Figure 2

---End of Report---