

LM-79-08 Test Report

For

ETI Solid State Lighting (Zhuhai) Ltd

No.1, Zhongzhu Road South, Science & Technology Innovation Coast, High Tech District, Zhuhai City,
Guangdong Prov., China 519085

LED Downlight

Model Name(s):

538411###

Representative (Tested) Model:

538411010

Model Difference:

1. The first and second # represents color tunable from 2700K, 3000K, 3500K, 4000K and 5000K, can be 00-99;
2. The third # represents factory code, can be 0-9;
3. All is the same construction, except model design.

Prepare by:



Engineer: Alan Wang

Date: 2020-09-28

Review by:



Technical Lead: Vincent Yuan

Issue Date: 2020-12-07

Revised Date: N/A

- Note:
1. The results contained in this report pertain only to the tested samples.
 2. This report shall not be reproduced, no limited part or full, without approval of Dongguan New Testing Centre Co., Ltd
 3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.

Client Information:

Applicant Name:	ETI Solid State Lighting (Zhuhai) Ltd
Brand Name:	Commercial Electric, ETI
Factory 1 Name:	ETI Solid State Lighting (Zhuhai) Ltd
Factory 1 Address:	No.1, Zhongzhu Road South, Science & Technology Innovation Coast, High tech District, Zhuhai City, Guangdong Prov., China 519085
Factory 2 Name:	NVC VIETNAM TECHNOLOGY AND LIGHTING COMPANY LIMITED
Factory 2 Address:	Lot CN23-1, Yen Phong Industrial park, Dong Phong commune, Yen Phong district, Bac Ninh province, Vietnam

Product Information:

Model Number:	538411####(###=000-999)
Product Type:	Indoor/Outdoor, LED Downlight
Rating Input:	120Vac, 60Hz, 12W
Declared CCT:	2700K/3000K/3500K/4000K/5000K
Declared Light Output:	720 lm
LED Manufacturer:	Samsung Electronics Co., Ltd.
LED Model:	SPMWH1229AQ7SGWXXX and SPMWH1229AQ5SGRXXX
LED Quantity:	SPMWH1229AQ7SGWXXX: 15 pcs SPMWH1229AQ5SGRXXX: 15 pcs

Test Information:

Standard Lamp:	Total Spectral Radiant Flux Standard Lamp, trace to NIST. 1. D908S for Gonio 2. D215S for Integrating Sphere
Date of Receipt Samples:	2020-09-03
Quantity of Receipt Samples:	3 pcs
Sample Number:	200903001-S1~S3

Laboratory Information:

Test Laboratory:	Dongguan New Testing Centre Co., Ltd
Laboratory Address:	3F, No. 1 the 1 st North Industry Road, Songshan Lake Science & Technology Park, Dongguan, Guangdong, China
Laboratory Contact Name:	Neil Zhong
Laboratory Contact E-mail:	Neil_zhong@ntc-cert.com

Report Information:

Issued Date of Test Report:	2020-12-07
Revised Date of Test Report:	N/A
Test Report No.:	NTCLR20090126
Remark (If applicable):	1. Test IS test for all CCT and test Gonio for 2700K.

Test Specification:	
Date of Test	2020-09-24
Test Item	1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Fidelity Index 8. Gamut Index 9. Local Chroma Shift
Reference Standard	IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products ANSI C78.377-2017 Specifications for the Chromaticity of Solid State Lighting Products CIE 13.3-1995 Method of Measuring and Specifying Color Rendering Properties of Light Sources CIE 15-2004 Technical Report Colorimetry ANSI IES TM-30-18 IES Method for Evaluating Light Source Color Rendition ANSI C78.77-10-2014 Harmonic Emission Limits – Related Power Quality Requirements IES TM-15-11 Luminaire Classification System for Outdoor Luminaires Addendum A for IES TM-15-11 Backlight, Uplight, and Glare (BUG) Ratings

Test Methods:
<p>1. Photometric and Electrical Measurements – Light Distribution Method:</p> <p>Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at 25 °C ± 1°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 required Voltage and Frequency. It was stabilized before measurement was made. Luminous Flux, Luminaire Efficacy and Zonal Lumen were calculated from the software taken at 1° vertical intervals and 15° horizontal intervals.</p>
<p>2. Photometric and Electrical Measurements – Integrating Sphere Method:</p> <p>Photometric parameters were measured using an integrating sphere, as spectroradiometer and software. The ambient temperature condition inside the sphere was measured at 25 °C± 1°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 require Voltage and Frequency. 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 1 nm intervals over the rage of 380 to 780 nm.</p>

Integrating Sphere Test Results:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
25.2	41.0	Face Down	90	10

Electrical Data:

Rated CCT	Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
2700K	120.0	60	0.1068	11.72	0.9149
3000K	120.0	60	0.1074	11.77	0.9130
3500K	120.0	60	0.1068	11.76	0.9182
4000K	120.0	60	0.1071	11.80	0.9175
5000K	120.0	60	0.1077	11.72	0.9071

Color Data:

Rated CCT	Test CCT (K)	R _a	R ₉	R _f	R _g	R _{cs, h1}	Chromaticity		
							(x, y)	(u', v')	Duv
2700K	2767	94	65	92	97	-4%	(0.4542, 0.4087)	(0.2597, 0.5258)	-0.0002
3000K	2978	94	65	91	97	-4%	(0.4362, 0.3999)	(0.2519, 0.5196)	-0.0016
3500K	3380	93	61	90	97	-5%	(0.4095, 0.3874)	(0.2399, 0.5105)	-0.0024
4000K	3830	91	52	89	97	-7%	(0.3868, 0.3768)	(0.2293, 0.5026)	-0.0018
5000K	4998	84	12	85	95	-12%	(0.3458, 0.3585)	(0.2092, 0.4881)	0.0032

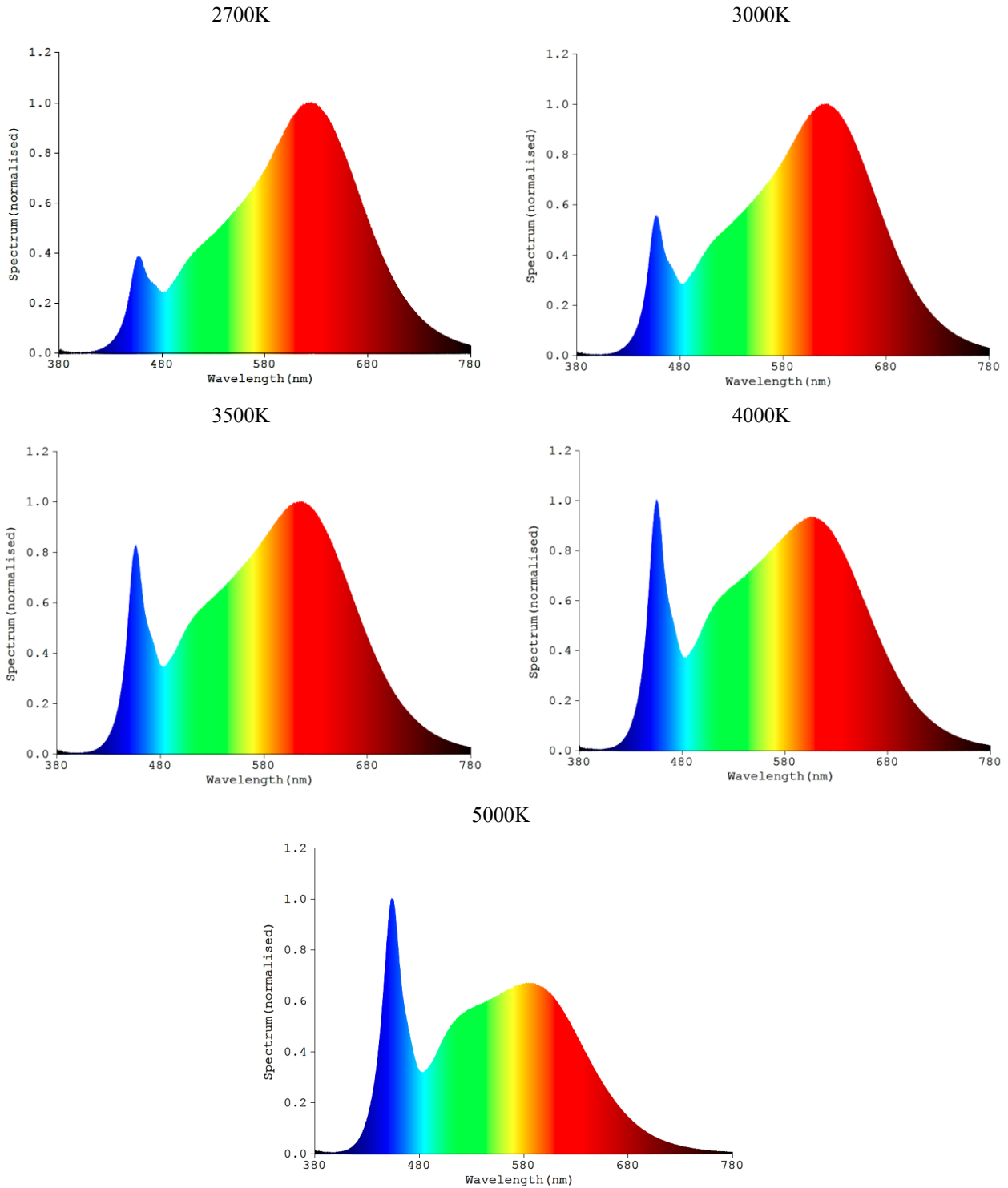
Specify Color Data:

Rated CCT	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
2700K	95	99	98	94	96	97	91	83	65	98	96	86	97	100	91
3000K	95	99	97	93	95	96	91	83	65	98	95	83	97	99	92
3500K	94	99	97	92	94	96	90	82	61	96	93	78	96	99	91
4000K	92	97	97	89	91	94	90	79	52	92	90	72	94	99	88
5000K	82	91	96	81	82	87	87	68	12	78	80	59	85	98	77

Output Data:

Rated CCT (K)	Light output (lm)	Efficacy (lm/W)
2700K	813.5	69.41
3000K	867.8	73.73
3500K	950.9	80.86
4000K	1006.4	85.29
5000K	1016.0	86.69

Spectrum Diagram:

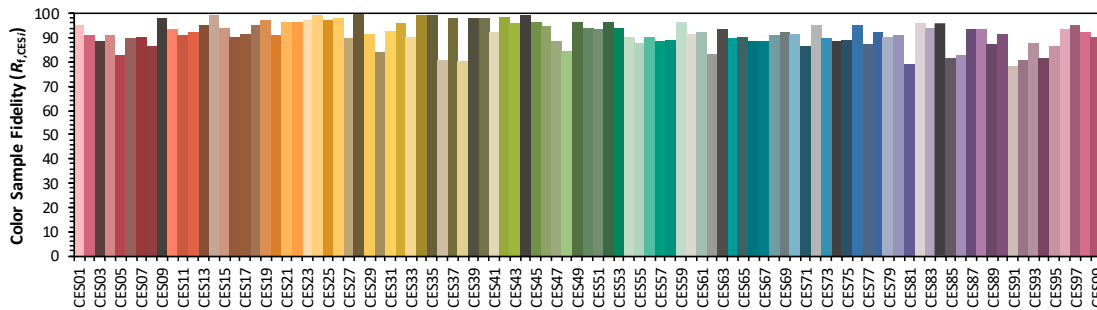
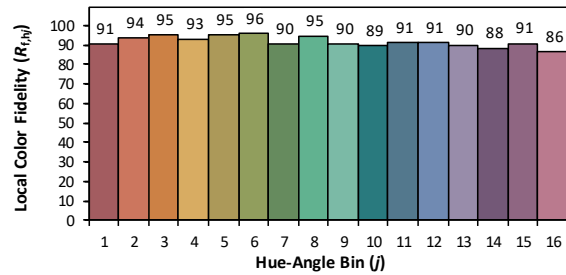
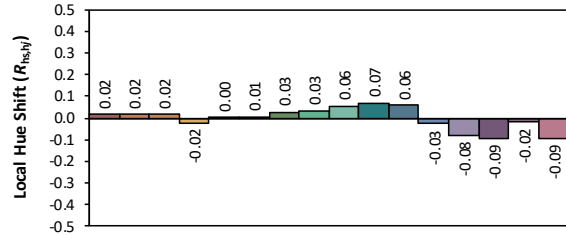
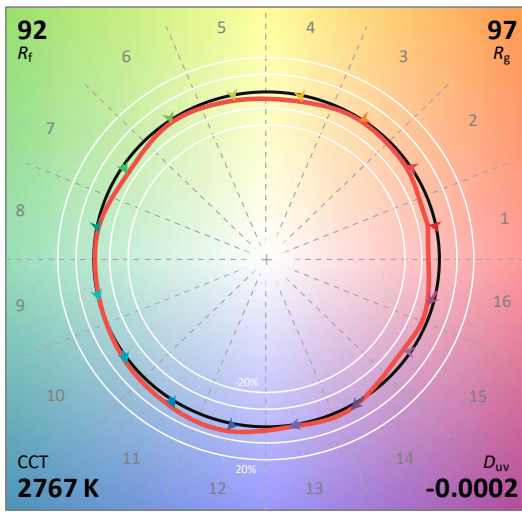
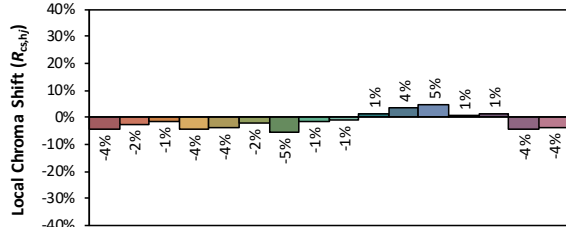
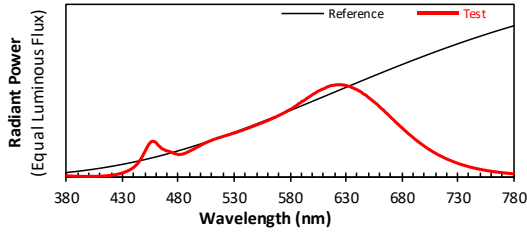


IES TM-30-18 Color Rendition Result for 2700K:

ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1
Date: 2020/9/28

Manufacturer: ETI Solid State Lighting (2)
Model: 538411###_2700K



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

x 0.4542
 y 0.4087
 u' 0.2597
 v' 0.5258

CIE 13.3-1995 (CRI)	
R_a	94
R_9	65

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

Spectrum Data for 2700K:

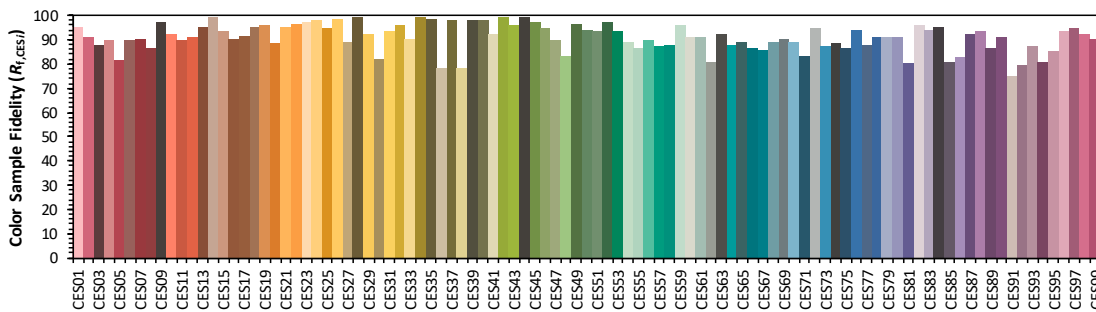
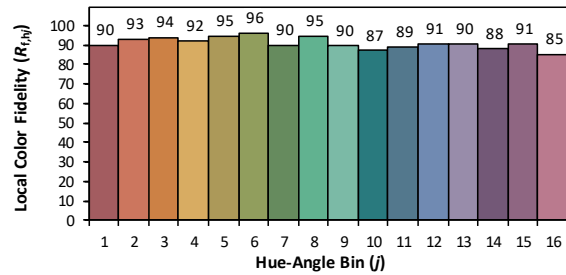
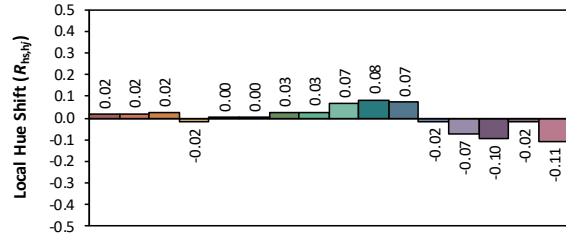
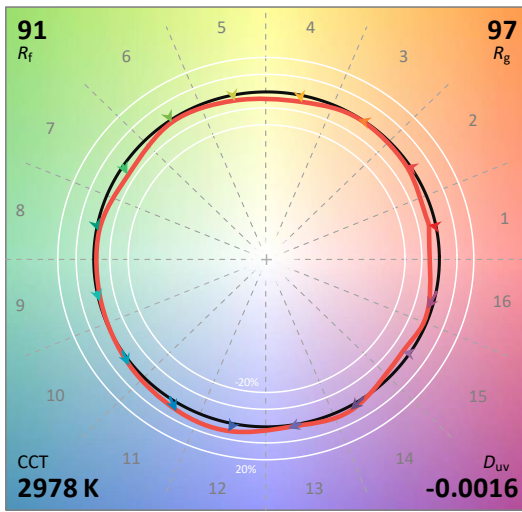
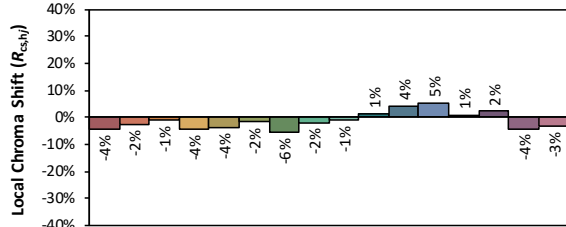
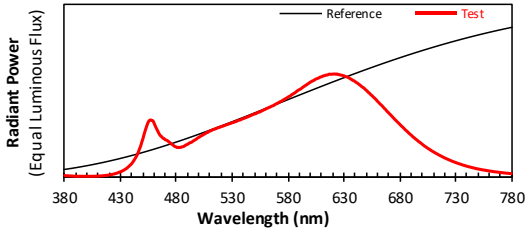
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381	0.0100	448	0.2236	515	0.4180	582	0.7403	649	0.8736	716	0.2175
382	0.0070	449	0.2491	516	0.4211	583	0.7500	650	0.8629	717	0.2127
383	0.0067	450	0.2697	517	0.4254	584	0.7588	651	0.8535	718	0.2060
384	0.0079	451	0.2954	518	0.4280	585	0.7669	652	0.8432	719	0.1997
385	0.0061	452	0.3185	519	0.4326	586	0.7732	653	0.8348	720	0.1948
386	0.0053	453	0.3403	520	0.4364	587	0.7834	654	0.8240	721	0.1892
387	0.0044	454	0.3580	521	0.4399	588	0.7940	655	0.8158	722	0.1838
388	0.0039	455	0.3707	522	0.4437	589	0.7996	656	0.8055	723	0.1794
389	0.0046	456	0.3817	523	0.4477	590	0.8093	657	0.7944	724	0.1741
390	0.0029	457	0.3840	524	0.4508	591	0.8198	658	0.7863	725	0.1693
391	0.0050	458	0.3811	525	0.4549	592	0.8215	659	0.7747	726	0.1640
392	0.0029	459	0.3779	526	0.4581	593	0.8311	660	0.7615	727	0.1599
393	0.0030	460	0.3695	527	0.4620	594	0.8385	661	0.7497	728	0.1546
394	0.0028	461	0.3543	528	0.4668	595	0.8487	662	0.7399	729	0.1505
395	0.0031	462	0.3401	529	0.4709	596	0.8575	663	0.7293	730	0.1463
396	0.0031	463	0.3305	530	0.4742	597	0.8645	664	0.7192	731	0.1411
397	0.0029	464	0.3185	531	0.4765	598	0.8720	665	0.7067	732	0.1372
398	0.0030	465	0.3072	532	0.4807	599	0.8810	666	0.6936	733	0.1334
399	0.0027	466	0.2995	533	0.4865	600	0.8897	667	0.6849	734	0.1300
400	0.0031	467	0.2951	534	0.4901	601	0.8970	668	0.6721	735	0.1257
401	0.0029	468	0.2876	535	0.4954	602	0.9047	669	0.6601	736	0.1221
402	0.0036	469	0.2835	536	0.4981	603	0.9100	670	0.6470	737	0.1187
403	0.0029	470	0.2790	537	0.5013	604	0.9194	671	0.6352	738	0.1156
404	0.0031	471	0.2768	538	0.5074	605	0.9261	672	0.6255	739	0.1122
405	0.0035	472	0.2727	539	0.5125	606	0.9333	673	0.6138	740	0.1081
406	0.0039	473	0.2689	540	0.5161	607	0.9381	674	0.6009	741	0.1052
407	0.0039	474	0.2637	541	0.5189	608	0.9438	675	0.5887	742	0.1020
408	0.0046	475	0.2592	542	0.5246	609	0.9511	676	0.5784	743	0.0995
409	0.0048	476	0.2536	543	0.5288	610	0.9536	677	0.5679	744	0.0963
410	0.0050	477	0.2501	544	0.5334	611	0.9585	678	0.5551	745	0.0935
411	0.0057	478	0.2458	545	0.5377	612	0.9657	679	0.5453	746	0.0908
412	0.0061	479	0.2441	546	0.5428	613	0.9723	680	0.5335	747	0.0879
413	0.0074	480	0.2404	547	0.5471	614	0.9775	681	0.5234	748	0.0854
414	0.0076	481	0.2390	548	0.5516	615	0.9806	682	0.5109	749	0.0829
415	0.0092	482	0.2423	549	0.5572	616	0.9856	683	0.5001	750	0.0796
416	0.0097	483	0.2427	550	0.5627	617	0.9904	684	0.4908	751	0.0781
417	0.0108	484	0.2447	551	0.5639	618	0.9903	685	0.4777	752	0.0751
418	0.0125	485	0.2501	552	0.5715	619	0.9916	686	0.4683	753	0.0735
419	0.0127	486	0.2541	553	0.5754	620	0.9954	687	0.4570	754	0.0711
420	0.0149	487	0.2578	554	0.5809	621	0.9952	688	0.4478	755	0.0692
421	0.0164	488	0.2664	555	0.5838	622	0.9990	689	0.4373	756	0.0666
422	0.0184	489	0.2706	556	0.5888	623	0.9964	690	0.4282	757	0.0644
423	0.0204	490	0.2762	557	0.5940	624	0.9980	691	0.4167	758	0.0630
424	0.0226	491	0.2834	558	0.6007	625	0.9989	692	0.4069	759	0.0608
425	0.0251	492	0.2887	559	0.6047	626	0.9980	693	0.3969	760	0.0585
426	0.0275	493	0.2944	560	0.6073	627	0.9954	694	0.3876	761	0.0576
427	0.0303	494	0.2999	561	0.6153	628	0.9960	695	0.3789	762	0.0550
428	0.0333	495	0.3077	562	0.6197	629	0.9934	696	0.3692	763	0.0532
429	0.0370	496	0.3137	563	0.6240	630	0.9887	697	0.3608	764	0.0524
430	0.0413	497	0.3207	564	0.6296	631	0.9874	698	0.3517	765	0.0508
431	0.0445	498	0.3262	565	0.6367	632	0.9824	699	0.3433	766	0.0486
432	0.0495	499	0.3331	566	0.6407	633	0.9810	700	0.3344	767	0.0471
433	0.0532	500	0.3396	567	0.6449	634	0.9777	701	0.3254	768	0.0458
434	0.0583	501	0.3466	568	0.6516	635	0.9704	702	0.3167	769	0.0448
435	0.0652	502	0.3531	569	0.6583	636	0.9662	703	0.3079	770	0.0430
436	0.0695	503	0.3595	570	0.6631	637	0.9598	704	0.3007	771	0.0415
437	0.0775	504	0.3644	571	0.6706	638	0.9539	705	0.2922	772	0.0404
438	0.0845	505	0.3704	572	0.6761	639	0.9499	706	0.2855	773	0.0393
439	0.0923	506	0.3751	573	0.6822	640	0.9452	707	0.2783	774	0.0384
440	0.1009	507	0.3815	574	0.6887	641	0.9366	708	0.2703	775	0.0369
441	0.1115	508	0.3843	575	0.6937	642	0.9296	709	0.2631	776	0.0355
442	0.1233	509	0.3908	576	0.7027	643	0.9242	710	0.2566	777	0.0352
443	0.1358	510	0.3961	577	0.7081	644	0.9177	711	0.2493	778	0.0337
444	0.1490	511	0.4004	578	0.7161	645	0.9059	712	0.2424	779	0.0319
445	0.1652	512	0.4053	579	0.7211	646	0.8976	713	0.2360	780	0.0302
446	0.1836	513	0.4085	580	0.7292	647	0.8905	714	0.2295	N/A	N/A

IES TM-30-18 Color Rendition Result for 3000K:

ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1
Date: 2020/9/28

Manufacturer: ETI Solid State Lighting (2)
Model: 538411###_3000K



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

x 0.4362
 y 0.3999
 u' 0.2519
 v' 0.5196

CIE 13.3-1995
(CRI)
 R_a 94
 R_9 65

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

Spectrum Data for 3000K:

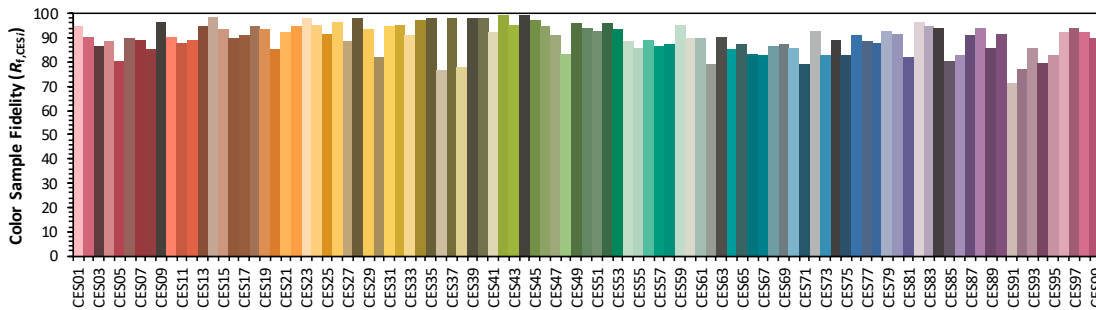
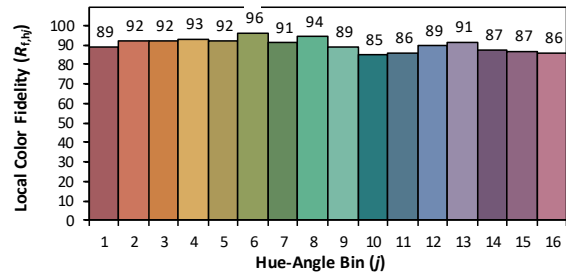
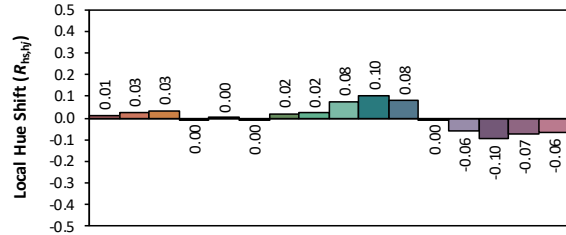
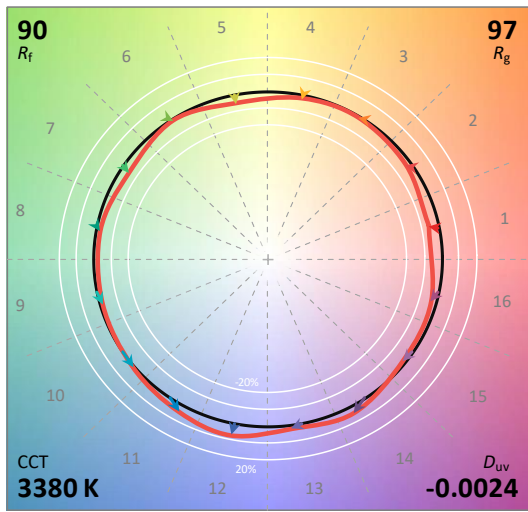
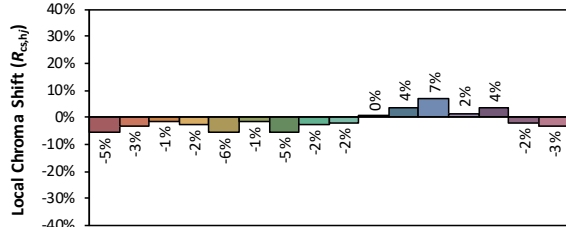
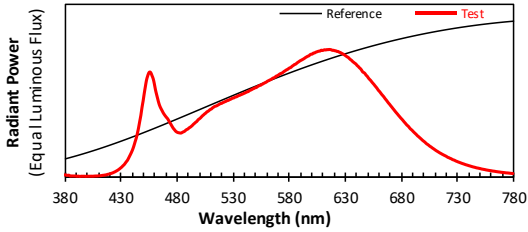
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	0.0124	447	0.2697	514	0.4619	581	0.7804	648	0.8635	715	0.2121
381	0.0095	448	0.2965	515	0.4645	582	0.7848	649	0.8509	716	0.2063
382	0.0081	449	0.3339	516	0.4702	583	0.7950	650	0.8414	717	0.2014
383	0.0086	450	0.3666	517	0.4746	584	0.8010	651	0.8324	718	0.1956
384	0.0070	451	0.4071	518	0.4775	585	0.8083	652	0.8199	719	0.1899
385	0.0070	452	0.4429	519	0.4819	586	0.8151	653	0.8121	720	0.1843
386	0.0064	453	0.4773	520	0.4855	587	0.8224	654	0.7999	721	0.1796
387	0.0060	454	0.5081	521	0.4897	588	0.8317	655	0.7910	722	0.1742
388	0.0047	455	0.5331	522	0.4929	589	0.8401	656	0.7803	723	0.1699
389	0.0043	456	0.5477	523	0.4980	590	0.8456	657	0.7697	724	0.1646
390	0.0041	457	0.5517	524	0.5010	591	0.8515	658	0.7593	725	0.1602
391	0.0042	458	0.5472	525	0.5053	592	0.8583	659	0.7491	726	0.1552
392	0.0035	459	0.5435	526	0.5089	593	0.8673	660	0.7354	727	0.1508
393	0.0040	460	0.5225	527	0.5130	594	0.8752	661	0.7246	728	0.1468
394	0.0042	461	0.4966	528	0.5162	595	0.8825	662	0.7130	729	0.1426
395	0.0034	462	0.4731	529	0.5199	596	0.8897	663	0.7024	730	0.1383
396	0.0040	463	0.4521	530	0.5255	597	0.8964	664	0.6926	731	0.1349
397	0.0031	464	0.4296	531	0.5274	598	0.9046	665	0.6810	732	0.1301
398	0.0037	465	0.4095	532	0.5318	599	0.9113	666	0.6681	733	0.1262
399	0.0044	466	0.3964	533	0.5349	600	0.9197	667	0.6578	734	0.1237
400	0.0026	467	0.3874	534	0.5395	601	0.9251	668	0.6460	735	0.1191
401	0.0040	468	0.3743	535	0.5450	602	0.9322	669	0.6327	736	0.1154
402	0.0030	469	0.3710	536	0.5490	603	0.9353	670	0.6228	737	0.1120
403	0.0035	470	0.3596	537	0.5514	604	0.9440	671	0.6110	738	0.1095
404	0.0039	471	0.3557	538	0.5560	605	0.9497	672	0.6006	739	0.1056
405	0.0037	472	0.3498	539	0.5614	606	0.9539	673	0.5888	740	0.1021
406	0.0040	473	0.3420	540	0.5652	607	0.9581	674	0.5771	741	0.0995
407	0.0043	474	0.3327	541	0.5690	608	0.9628	675	0.5653	742	0.0964
408	0.0054	475	0.3237	542	0.5750	609	0.9700	676	0.5539	743	0.0941
409	0.0054	476	0.3155	543	0.5774	610	0.9716	677	0.5436	744	0.0909
410	0.0058	477	0.3076	544	0.5822	611	0.9774	678	0.5321	745	0.0884
411	0.0062	478	0.2986	545	0.5870	612	0.9815	679	0.5221	746	0.0855
412	0.0074	479	0.2921	546	0.5916	613	0.9832	680	0.5110	747	0.0832
413	0.0075	480	0.2887	547	0.5961	614	0.9886	681	0.4998	748	0.0798
414	0.0084	481	0.2827	548	0.6019	615	0.9886	682	0.4892	749	0.0778
415	0.0102	482	0.2852	549	0.6056	616	0.9928	683	0.4794	750	0.0756
416	0.0104	483	0.2843	550	0.6104	617	0.9976	684	0.4681	751	0.0733
417	0.0128	484	0.2855	551	0.6118	618	0.9966	685	0.4568	752	0.0712
418	0.0129	485	0.2902	552	0.6188	619	0.9964	686	0.4474	753	0.0694
419	0.0148	486	0.2920	553	0.6238	620	0.9978	687	0.4377	754	0.0666
420	0.0170	487	0.2963	554	0.6296	621	0.9987	688	0.4265	755	0.0655
421	0.0185	488	0.3042	555	0.6297	622	0.9991	689	0.4166	756	0.0635
422	0.0206	489	0.3104	556	0.6376	623	0.9961	690	0.4075	757	0.0618
423	0.0232	490	0.3147	557	0.6418	624	0.9991	691	0.3979	758	0.0592
424	0.0260	491	0.3213	558	0.6484	625	0.9936	692	0.3869	759	0.0580
425	0.0287	492	0.3296	559	0.6523	626	0.9925	693	0.3789	760	0.0558
426	0.0317	493	0.3323	560	0.6577	627	0.9894	694	0.3685	761	0.0544
427	0.0351	494	0.3377	561	0.6646	628	0.9870	695	0.3611	762	0.0527
428	0.0393	495	0.3461	562	0.6672	629	0.9849	696	0.3516	763	0.0510
429	0.0436	496	0.3527	563	0.6741	630	0.9811	697	0.3426	764	0.0493
430	0.0480	497	0.3596	564	0.6774	631	0.9768	698	0.3348	765	0.0476
431	0.0519	498	0.3659	565	0.6838	632	0.9713	699	0.3268	766	0.0463
432	0.0582	499	0.3752	566	0.6883	633	0.9706	700	0.3177	767	0.0453
433	0.0635	500	0.3813	567	0.6921	634	0.9649	701	0.3091	768	0.0436
434	0.0706	501	0.3882	568	0.6992	635	0.9587	702	0.3000	769	0.0423
435	0.0776	502	0.3955	569	0.7066	636	0.9512	703	0.2935	770	0.0407
436	0.0854	503	0.4009	570	0.7114	637	0.9455	704	0.2852	771	0.0395
437	0.0951	504	0.4074	571	0.7168	638	0.9373	705	0.2779	772	0.0386
438	0.1053	505	0.4141	572	0.7231	639	0.9332	706	0.2708	773	0.0370
439	0.1158	506	0.4189	573	0.7293	640	0.9263	707	0.2641	774	0.0365
440	0.1262	507	0.4287	574	0.7333	641	0.9179	708	0.2566	775	0.0346
441	0.1415	508	0.4300	575	0.7404	642	0.9112	709	0.2493	776	0.0337
442	0.1572	509	0.4377	576	0.7478	643	0.9037	710	0.2434	777	0.0328
443	0.1754	510	0.4438	577	0.7536	644	0.8946	711	0.2370	778	0.0318
444	0.1923	511	0.4472	578	0.7601	645	0.8867	712	0.2310	779	0.0304
445	0.2142	512	0.4529	579	0.7660	646	0.8769	713	0.2240	780	0.0291
446	0.2398	513	0.4582	580	0.7742	647	0.8690	714	0.2191	N/A	N/A

IES TM-30-18 Color Rendition Result for 3500K:

ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1
Date: 2020/9/28

Manufacturer: ETI Solid State Lighting (2)
Model: 538411###_3500K



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

x 0.4095
 y 0.3874
 u' 0.2399
 v' 0.5105

CIE 13.3-1995
(CRI)
 R_a 93
 R_9 61

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

Spectrum Data for 3500K:

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	0.0151	447	0.4361	514	0.5528	581	0.8554	648	0.8109	715	0.1872
381	0.0152	448	0.4830	515	0.5553	582	0.8588	649	0.7980	716	0.1825
382	0.0113	449	0.5439	516	0.5589	583	0.8679	650	0.7897	717	0.1772
383	0.0123	450	0.5948	517	0.5645	584	0.8731	651	0.7769	718	0.1728
384	0.0122	451	0.6540	518	0.5692	585	0.8805	652	0.7661	719	0.1681
385	0.0062	452	0.7067	519	0.5751	586	0.8836	653	0.7575	720	0.1639
386	0.0070	453	0.7574	520	0.5763	587	0.8903	654	0.7461	721	0.1589
387	0.0069	454	0.7890	521	0.5817	588	0.8976	655	0.7355	722	0.1531
388	0.0068	455	0.8136	522	0.5852	589	0.9032	656	0.7257	723	0.1500
389	0.0067	456	0.8226	523	0.5895	590	0.9098	657	0.7141	724	0.1453
390	0.0059	457	0.8145	524	0.5928	591	0.9143	658	0.7038	725	0.1421
391	0.0043	458	0.7927	525	0.5984	592	0.9191	659	0.6922	726	0.1365
392	0.0059	459	0.7695	526	0.5996	593	0.9241	660	0.6791	727	0.1331
393	0.0040	460	0.7311	527	0.6051	594	0.9297	661	0.6700	728	0.1301
394	0.0037	461	0.6845	528	0.6085	595	0.9362	662	0.6585	729	0.1250
395	0.0050	462	0.6475	529	0.6131	596	0.9412	663	0.6467	730	0.1216
396	0.0046	463	0.6129	530	0.6180	597	0.9463	664	0.6368	731	0.1178
397	0.0049	464	0.5793	531	0.6193	598	0.9494	665	0.6262	732	0.1145
398	0.0046	465	0.5537	532	0.6253	599	0.9578	666	0.6135	733	0.1112
399	0.0038	466	0.5350	533	0.6273	600	0.9621	667	0.6030	734	0.1078
400	0.0046	467	0.5184	534	0.6308	601	0.9631	668	0.5913	735	0.1045
401	0.0047	468	0.5016	535	0.6369	602	0.9709	669	0.5795	736	0.1017
402	0.0046	469	0.4880	536	0.6392	603	0.9717	670	0.5696	737	0.0985
403	0.0049	470	0.4758	537	0.6433	604	0.9771	671	0.5579	738	0.0953
404	0.0051	471	0.4650	538	0.6468	605	0.9804	672	0.5474	739	0.0928
405	0.0048	472	0.4544	539	0.6507	606	0.9837	673	0.5359	740	0.0901
406	0.0056	473	0.4390	540	0.6546	607	0.9861	674	0.5252	741	0.0872
407	0.0063	474	0.4247	541	0.6585	608	0.9869	675	0.5138	742	0.0847
408	0.0068	475	0.4094	542	0.6631	609	0.9936	676	0.5033	743	0.0820
409	0.0067	476	0.3941	543	0.6668	610	0.9911	677	0.4932	744	0.0793
410	0.0078	477	0.3802	544	0.6698	611	0.9937	678	0.4823	745	0.0770
411	0.0086	478	0.3698	545	0.6769	612	0.9968	679	0.4721	746	0.0750
412	0.0091	479	0.3587	546	0.6806	613	0.9953	680	0.4615	747	0.0723
413	0.0103	480	0.3520	547	0.6849	614	0.9979	681	0.4523	748	0.0700
414	0.0120	481	0.3476	548	0.6904	615	0.9978	682	0.4423	749	0.0686
415	0.0128	482	0.3457	549	0.6936	616	0.9991	683	0.4312	750	0.0665
416	0.0145	483	0.3440	550	0.6993	617	0.9985	684	0.4216	751	0.0647
417	0.0159	484	0.3441	551	0.7004	618	0.9965	685	0.4107	752	0.0619
418	0.0185	485	0.3488	552	0.7072	619	0.9924	686	0.4021	753	0.0603
419	0.0208	486	0.3534	553	0.7123	620	0.9928	687	0.3942	754	0.0586
420	0.0226	487	0.3573	554	0.7171	621	0.9895	688	0.3825	755	0.0571
421	0.0257	488	0.3655	555	0.7190	622	0.9885	689	0.3735	756	0.0549
422	0.0286	489	0.3716	556	0.7254	623	0.9840	690	0.3662	757	0.0532
423	0.0318	490	0.3755	557	0.7292	624	0.9836	691	0.3566	758	0.0516
424	0.0361	491	0.3840	558	0.7350	625	0.9783	692	0.3478	759	0.0502
425	0.0402	492	0.3891	559	0.7389	626	0.9753	693	0.3395	760	0.0488
426	0.0452	493	0.3961	560	0.7436	627	0.9704	694	0.3311	761	0.0474
427	0.0503	494	0.4039	561	0.7504	628	0.9653	695	0.3215	762	0.0456
428	0.0562	495	0.4133	562	0.7544	629	0.9610	696	0.3147	763	0.0447
429	0.0628	496	0.4206	563	0.7593	630	0.9547	697	0.3064	764	0.0433
430	0.0703	497	0.4289	564	0.7629	631	0.9488	698	0.2988	765	0.0416
431	0.0774	498	0.4353	565	0.7689	632	0.9420	699	0.2903	766	0.0404
432	0.0870	499	0.4469	566	0.7750	633	0.9374	700	0.2826	767	0.0391
433	0.0948	500	0.4538	567	0.7777	634	0.9290	701	0.2760	768	0.0380
434	0.1064	501	0.4606	568	0.7840	635	0.9206	702	0.2682	769	0.0368
435	0.1185	502	0.4697	569	0.7909	636	0.9144	703	0.2597	770	0.0355
436	0.1296	503	0.4791	570	0.7937	637	0.9051	704	0.2540	771	0.0347
437	0.1459	504	0.4862	571	0.8003	638	0.8981	705	0.2475	772	0.0337
438	0.1635	505	0.4946	572	0.8068	639	0.8913	706	0.2398	773	0.0326
439	0.1811	506	0.5008	573	0.8110	640	0.8847	707	0.2348	774	0.0312
440	0.2003	507	0.5101	574	0.8142	641	0.8738	708	0.2277	775	0.0308
441	0.2225	508	0.5144	575	0.8208	642	0.8664	709	0.2219	776	0.0300
442	0.2493	509	0.5218	576	0.8278	643	0.8564	710	0.2157	777	0.0290
443	0.2793	510	0.5287	577	0.8333	644	0.8487	711	0.2093	778	0.0279
444	0.3076	511	0.5326	578	0.8395	645	0.8375	712	0.2034	779	0.0269
445	0.3452	512	0.5413	579	0.8434	646	0.8233	713	0.1983	780	0.0260
446	0.3872	513	0.5471	580	0.8503	647	0.8182	714	0.1926	N/A	N/A

IES TM-30-18 Color Rendition Result for 4000K:

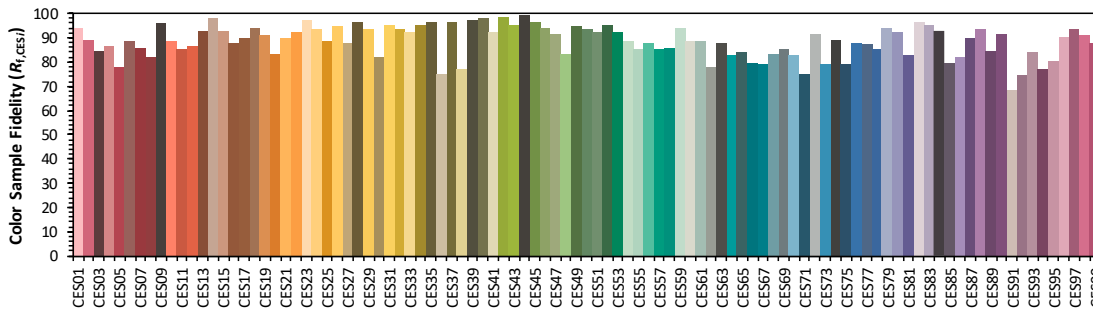
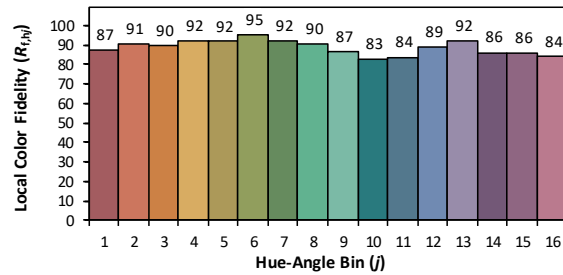
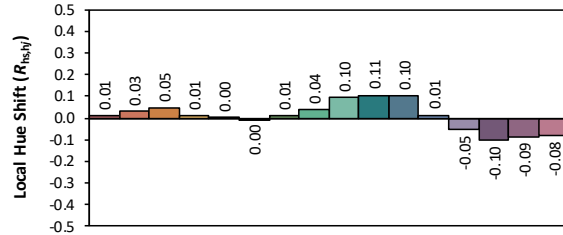
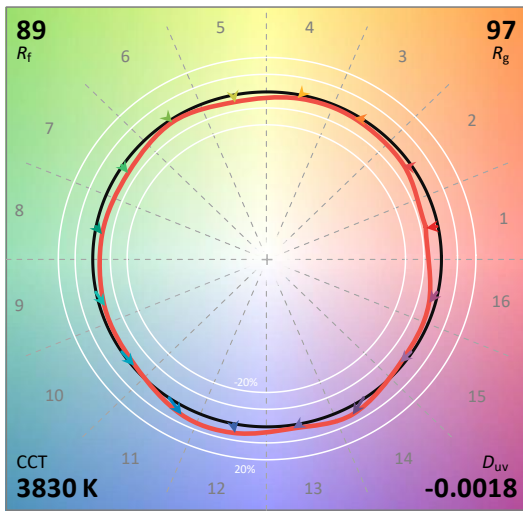
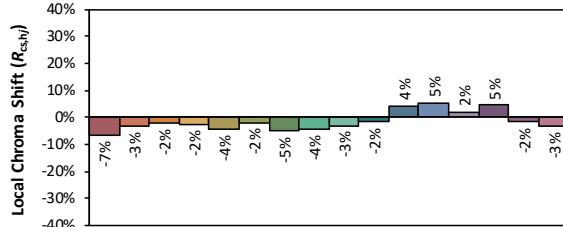
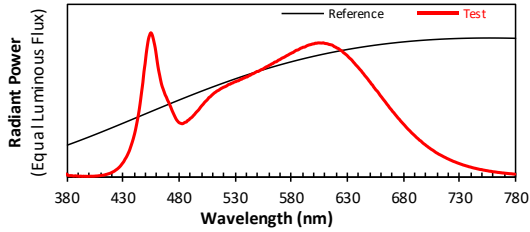
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: ETI Solid State Lighting (2

Date: 2020/9/28

Model: 538411###_4000K



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

x 0.3868
 y 0.3768
 u' 0.2293
 v' 0.5026

CIE 13.3-1995 (CRI)	
R _a	91
R ₉	52

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

Spectrum Data for 4000K:

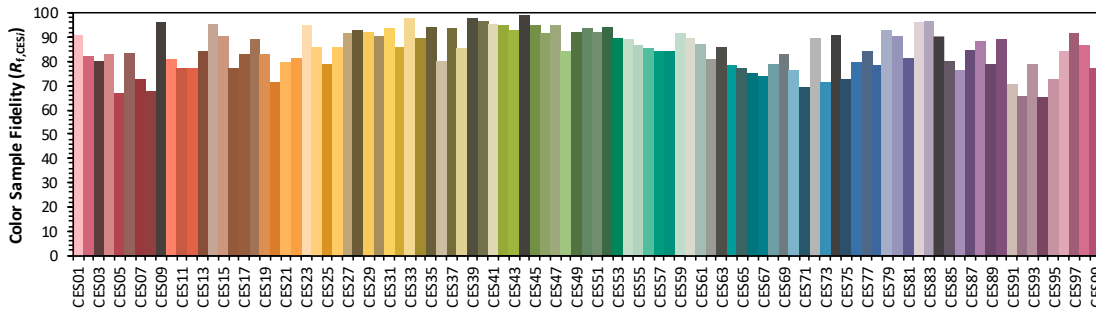
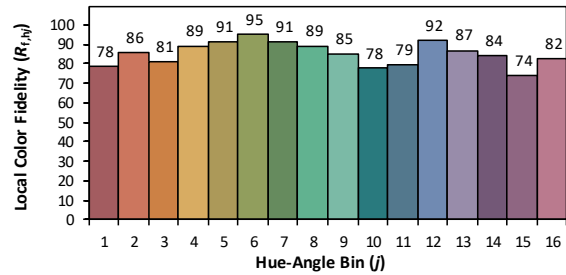
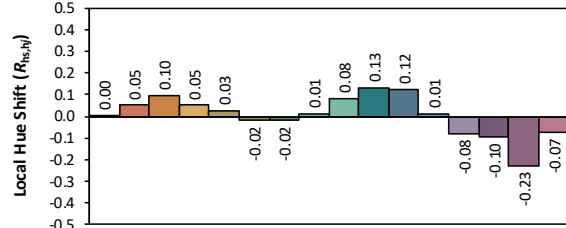
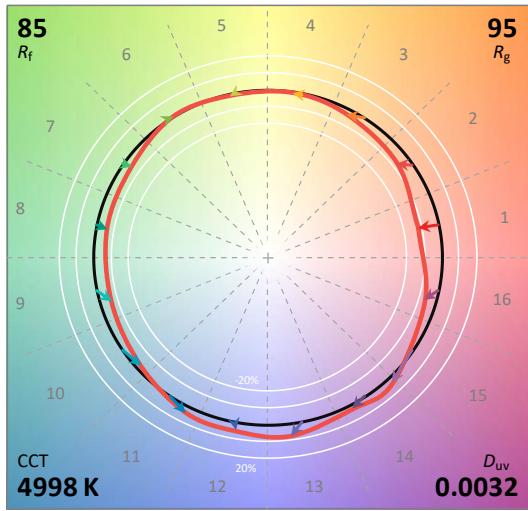
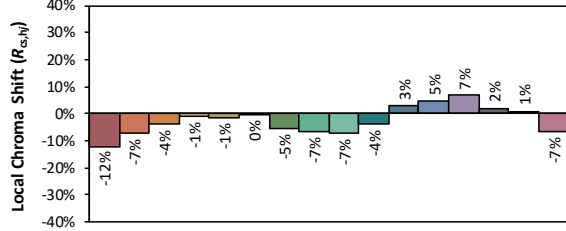
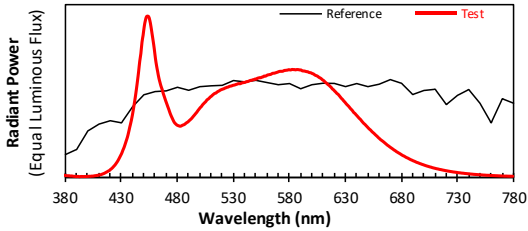
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	0.0212	447	0.5966	514	0.5954	581	0.8606	648	0.6867	715	0.1473
381	0.0130	448	0.6554	515	0.5992	582	0.8632	649	0.6771	716	0.1430
382	0.0099	449	0.7310	516	0.6035	583	0.8687	650	0.6658	717	0.1388
383	0.0100	450	0.7864	517	0.6093	584	0.8740	651	0.6568	718	0.1353
384	0.0097	451	0.8552	518	0.6142	585	0.8790	652	0.6449	719	0.1310
385	0.0093	452	0.9098	519	0.6182	586	0.8800	653	0.6375	720	0.1271
386	0.0070	453	0.9564	520	0.6224	587	0.8835	654	0.6247	721	0.1239
387	0.0077	454	0.9821	521	0.6251	588	0.8885	655	0.6150	722	0.1198
388	0.0088	455	0.9995	522	0.6287	589	0.8932	656	0.6042	723	0.1166
389	0.0065	456	0.9915	523	0.6329	590	0.8958	657	0.5971	724	0.1131
390	0.0073	457	0.9677	524	0.6390	591	0.8998	658	0.5875	725	0.1094
391	0.0049	458	0.9338	525	0.6431	592	0.9005	659	0.5760	726	0.1065
392	0.0062	459	0.8965	526	0.6441	593	0.9031	660	0.5643	727	0.1039
393	0.0060	460	0.8455	527	0.6498	594	0.9082	661	0.5553	728	0.1004
394	0.0045	461	0.7904	528	0.6517	595	0.9119	662	0.5447	729	0.0975
395	0.0059	462	0.7432	529	0.6559	596	0.9147	663	0.5347	730	0.0947
396	0.0049	463	0.7053	530	0.6601	597	0.9169	664	0.5253	731	0.0918
397	0.0055	464	0.6665	531	0.6615	598	0.9185	665	0.5149	732	0.0891
398	0.0047	465	0.6343	532	0.6662	599	0.9214	666	0.5039	733	0.0864
399	0.0049	466	0.6122	533	0.6671	600	0.9231	667	0.4949	734	0.0834
400	0.0052	467	0.5903	534	0.6705	601	0.9241	668	0.4832	735	0.0814
401	0.0054	468	0.5687	535	0.6770	602	0.9281	669	0.4738	736	0.0789
402	0.0057	469	0.5539	536	0.6775	603	0.9272	670	0.4648	737	0.0765
403	0.0054	470	0.5338	537	0.6827	604	0.9293	671	0.4538	738	0.0746
404	0.0058	471	0.5189	538	0.6856	605	0.9300	672	0.4462	739	0.0716
405	0.0062	472	0.5009	539	0.6887	606	0.9295	673	0.4359	740	0.0701
406	0.0072	473	0.4829	540	0.6940	607	0.9292	674	0.4266	741	0.0681
407	0.0073	474	0.4629	541	0.6937	608	0.9287	675	0.4170	742	0.0655
408	0.0083	475	0.4455	542	0.6992	609	0.9305	676	0.4075	743	0.0635
409	0.0094	476	0.4287	543	0.7034	610	0.9275	677	0.4000	744	0.0616
410	0.0100	477	0.4124	544	0.7066	611	0.9256	678	0.3896	745	0.0602
411	0.0113	478	0.3978	545	0.7122	612	0.9249	679	0.3811	746	0.0581
412	0.0124	479	0.3879	546	0.7154	613	0.9233	680	0.3725	747	0.0564
413	0.0131	480	0.3792	547	0.7185	614	0.9199	681	0.3643	748	0.0545
414	0.0151	481	0.3745	548	0.7232	615	0.9184	682	0.3557	749	0.0527
415	0.0176	482	0.3720	549	0.7277	616	0.9165	683	0.3464	750	0.0520
416	0.0194	483	0.3697	550	0.7324	617	0.9147	684	0.3379	751	0.0504
417	0.0222	484	0.3715	551	0.7318	618	0.9095	685	0.3297	752	0.0483
418	0.0242	485	0.3765	552	0.7371	619	0.9033	686	0.3226	753	0.0471
419	0.0271	486	0.3803	553	0.7414	620	0.9011	687	0.3145	754	0.0455
420	0.0306	487	0.3824	554	0.7457	621	0.8951	688	0.3059	755	0.0443
421	0.0348	488	0.3923	555	0.7476	622	0.8926	689	0.2991	756	0.0431
422	0.0386	489	0.3957	556	0.7530	623	0.8881	690	0.2917	757	0.0412
423	0.0435	490	0.4042	557	0.7581	624	0.8817	691	0.2846	758	0.0402
424	0.0495	491	0.4100	558	0.7632	625	0.8770	692	0.2764	759	0.0396
425	0.0547	492	0.4161	559	0.7663	626	0.8719	693	0.2697	760	0.0375
426	0.0613	493	0.4252	560	0.7704	627	0.8629	694	0.2632	761	0.0364
427	0.0685	494	0.4330	561	0.7753	628	0.8575	695	0.2552	762	0.0358
428	0.0768	495	0.4429	562	0.7787	629	0.8511	696	0.2507	763	0.0346
429	0.0870	496	0.4517	563	0.7844	630	0.8451	697	0.2432	764	0.0334
430	0.0973	497	0.4594	564	0.7869	631	0.8370	698	0.2357	765	0.0320
431	0.1076	498	0.4678	565	0.7931	632	0.8284	699	0.2295	766	0.0316
432	0.1225	499	0.4789	566	0.7976	633	0.8214	700	0.2242	767	0.0304
433	0.1346	500	0.4892	567	0.7991	634	0.8150	701	0.2173	768	0.0296
434	0.1492	501	0.4980	568	0.8040	635	0.8063	702	0.2122	769	0.0283
435	0.1661	502	0.5064	569	0.8103	636	0.7963	703	0.2056	770	0.0281
436	0.1836	503	0.5169	570	0.8130	637	0.7880	704	0.2007	771	0.0268
437	0.2060	504	0.5248	571	0.8178	638	0.7782	705	0.1946	772	0.0261
438	0.2294	505	0.5319	572	0.8233	639	0.7704	706	0.1898	773	0.0254
439	0.2539	506	0.5405	573	0.8268	640	0.7620	707	0.1851	774	0.0246
440	0.2818	507	0.5509	574	0.8301	641	0.7528	708	0.1795	775	0.0236
441	0.3125	508	0.5555	575	0.8344	642	0.7437	709	0.1736	776	0.0232
442	0.3490	509	0.5633	576	0.8396	643	0.7357	710	0.1683	777	0.0227
443	0.3891	510	0.5707	577	0.8436	644	0.7247	711	0.1643	778	0.0216
444	0.4308	511	0.5776	578	0.8474	645	0.7160	712	0.1590	779	0.0207
445	0.4794	512	0.5843	579	0.8529	646	0.7048	713	0.1553	780	0.0199
446	0.5360	513	0.5891	580	0.8563	647	0.6960	714	0.1513	N/A	N/A

IES TM-30-18 Color Rendition Result for 5000K:

ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1
Date: 2020/9/28

Manufacturer: ETI Solid State Lighting (Z
Model: 538411###_5000K



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

x	0.3458	CIE 13.3-1995 (CRI)
y	0.3585	
u'	0.2092	
v'	0.4881	
		R_a 84
		R_g 12

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

Spectrum Data for 5000K:

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	0.0131	447	0.7199	514	0.5206	581	0.6660	648	0.3285	715	0.0491
381	0.0112	448	0.7673	515	0.5226	582	0.6661	649	0.3210	716	0.0480
382	0.0106	449	0.8373	516	0.5286	583	0.6688	650	0.3138	717	0.0463
383	0.0100	450	0.8810	517	0.5329	584	0.6678	651	0.3062	718	0.0448
384	0.0100	451	0.9342	518	0.5364	585	0.6680	652	0.2991	719	0.0435
385	0.0085	452	0.9711	519	0.5414	586	0.6661	653	0.2935	720	0.0418
386	0.0089	453	0.9953	520	0.5440	587	0.6678	654	0.2857	721	0.0409
387	0.0080	454	0.9990	521	0.5470	588	0.6679	655	0.2791	722	0.0394
388	0.0068	455	0.9949	522	0.5489	589	0.6670	656	0.2734	723	0.0383
389	0.0067	456	0.9722	523	0.5529	590	0.6655	657	0.2664	724	0.0370
390	0.0053	457	0.9350	524	0.5554	591	0.6654	658	0.2599	725	0.0359
391	0.0052	458	0.8894	525	0.5584	592	0.6604	659	0.2537	726	0.0348
392	0.0062	459	0.8438	526	0.5599	593	0.6594	660	0.2463	727	0.0336
393	0.0043	460	0.7942	527	0.5637	594	0.6588	661	0.2405	728	0.0328
394	0.0052	461	0.7370	528	0.5655	595	0.6569	662	0.2338	729	0.0317
395	0.0056	462	0.6922	529	0.5668	596	0.6551	663	0.2288	730	0.0309
396	0.0054	463	0.6547	530	0.5700	597	0.6544	664	0.2236	731	0.0296
397	0.0052	464	0.6181	531	0.5714	598	0.6504	665	0.2180	732	0.0287
398	0.0058	465	0.5901	532	0.5731	599	0.6490	666	0.2120	733	0.0281
399	0.0054	466	0.5647	533	0.5758	600	0.6473	667	0.2061	734	0.0269
400	0.0059	467	0.5448	534	0.5779	601	0.6431	668	0.2000	735	0.0263
401	0.0063	468	0.5197	535	0.5809	602	0.6411	669	0.1954	736	0.0257
402	0.0071	469	0.4991	536	0.5803	603	0.6358	670	0.1900	737	0.0246
403	0.0068	470	0.4777	537	0.5810	604	0.6317	671	0.1849	738	0.0239
404	0.0079	471	0.4586	538	0.5850	605	0.6293	672	0.1801	739	0.0233
405	0.0079	472	0.4390	539	0.5862	606	0.6254	673	0.1752	740	0.0225
406	0.0090	473	0.4201	540	0.5881	607	0.6197	674	0.1698	741	0.0219
407	0.0104	474	0.3994	541	0.5885	608	0.6162	675	0.1658	742	0.0211
408	0.0112	475	0.3820	542	0.5925	609	0.6115	676	0.1603	743	0.0204
409	0.0126	476	0.3670	543	0.5935	610	0.6050	677	0.1562	744	0.0199
410	0.0134	477	0.3519	544	0.5952	611	0.6006	678	0.1518	745	0.0190
411	0.0151	478	0.3393	545	0.5987	612	0.5940	679	0.1479	746	0.0186
412	0.0165	479	0.3320	546	0.6010	613	0.5874	680	0.1435	747	0.0181
413	0.0188	480	0.3254	547	0.6018	614	0.5820	681	0.1389	748	0.0175
414	0.0217	481	0.3216	548	0.6049	615	0.5752	682	0.1348	749	0.0171
415	0.0242	482	0.3191	549	0.6059	616	0.5703	683	0.1318	750	0.0165
416	0.0277	483	0.3171	550	0.6095	617	0.5633	684	0.1274	751	0.0160
417	0.0317	484	0.3187	551	0.6085	618	0.5567	685	0.1233	752	0.0156
418	0.0353	485	0.3226	552	0.6140	619	0.5477	686	0.1205	753	0.0150
419	0.0396	486	0.3253	553	0.6157	620	0.5426	687	0.1168	754	0.0144
420	0.0433	487	0.3284	554	0.6178	621	0.5346	688	0.1130	755	0.0142
421	0.0498	488	0.3342	555	0.6175	622	0.5281	689	0.1094	756	0.0135
422	0.0551	489	0.3395	556	0.6210	623	0.5200	690	0.1066	757	0.0132
423	0.0621	490	0.3437	557	0.6226	624	0.5152	691	0.1030	758	0.0131
424	0.0699	491	0.3504	558	0.6279	625	0.5072	692	0.1004	759	0.0126
425	0.0777	492	0.3568	559	0.6269	626	0.4985	693	0.0974	760	0.0121
426	0.0875	493	0.3630	560	0.6299	627	0.4897	694	0.0938	761	0.0117
427	0.0976	494	0.3710	561	0.6341	628	0.4833	695	0.0915	762	0.0113
428	0.1096	495	0.3796	562	0.6355	629	0.4744	696	0.0889	763	0.0111
429	0.1229	496	0.3876	563	0.6372	630	0.4672	697	0.0859	764	0.0108
430	0.1366	497	0.3963	564	0.6384	631	0.4586	698	0.0836	765	0.0104
431	0.1507	498	0.4044	565	0.6426	632	0.4506	699	0.0808	766	0.0103
432	0.1692	499	0.4147	566	0.6452	633	0.4439	700	0.0786	767	0.0098
433	0.1855	500	0.4232	567	0.6454	634	0.4362	701	0.0760	768	0.0096
434	0.2062	501	0.4323	568	0.6474	635	0.4272	702	0.0736	769	0.0091
435	0.2278	502	0.4389	569	0.6497	636	0.4202	703	0.0712	770	0.0091
436	0.2497	503	0.4490	570	0.6519	637	0.4122	704	0.0692	771	0.0087
437	0.2772	504	0.4564	571	0.6549	638	0.4021	705	0.0671	772	0.0082
438	0.3084	505	0.4636	572	0.6568	639	0.3967	706	0.0649	773	0.0079
439	0.3376	506	0.4703	573	0.6572	640	0.3886	707	0.0634	774	0.0082
440	0.3702	507	0.4800	574	0.6572	641	0.3812	708	0.0609	775	0.0078
441	0.4085	508	0.4847	575	0.6585	642	0.3732	709	0.0590	776	0.0075
442	0.4513	509	0.4909	576	0.6623	643	0.3655	710	0.0572	777	0.0074
443	0.4957	510	0.4983	577	0.6629	644	0.3592	711	0.0555	778	0.0071
444	0.5453	511	0.5032	578	0.6640	645	0.3503	712	0.0536	779	0.0071
445	0.5989	512	0.5099	579	0.6647	646	0.3421	713	0.0525	780	0.0072
446	0.6561	513	0.5157	580	0.6673	647	0.3344	714	0.0507	N/A	N/A

Goniophotometer Test Results:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
25.1	37.9	Face Down	90	25

Electrical Data:

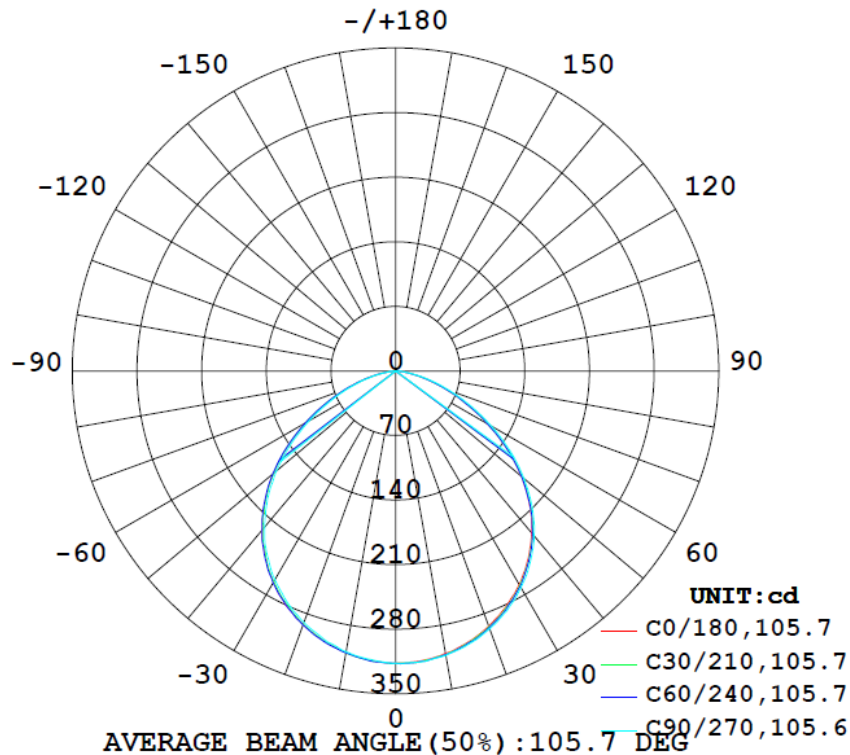
Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	0.1068	11.72	0.9149

Goniophotometer Data:

Parameter	Results
Total Luminous (lm)	813.5
Luminous Efficacy (lm/w)	69.41
Zonal Lumens Distribution (0-60°)	84.4%
Beam Angle (°)	105.7

Luminous Intensity Distribution Diagram:

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM

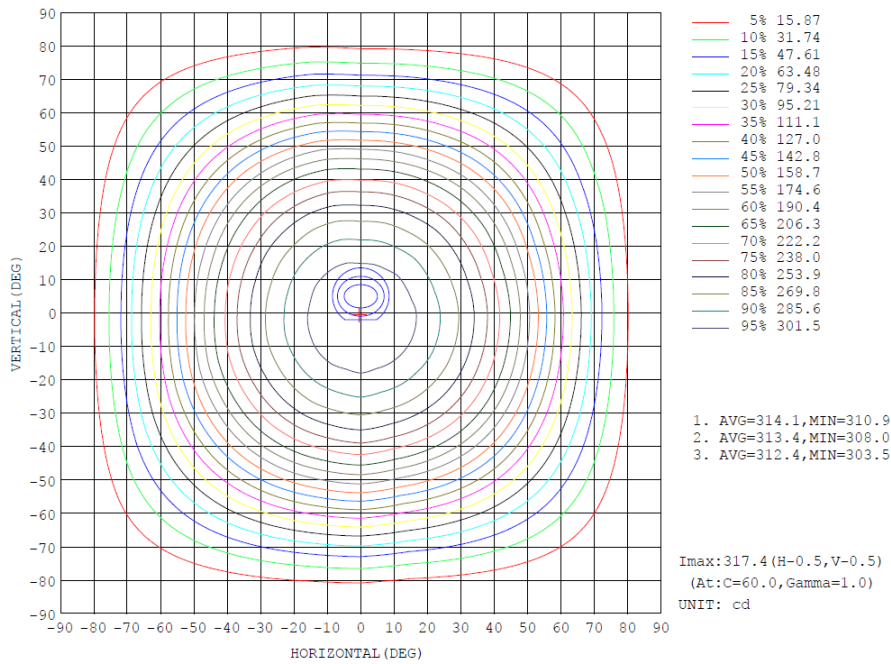


Zonal Flux Diagram:

ZONAL FLUX DIAGRAM:

y	C0	C45	C90	C135	C180	C225	C270	C315	y	φ zone	φ total	lum, lamp
10	310.9	311.6	313.0	311.8	310.1	310.1	309.1	309.9	0- 10	29.96	29.96	3.68,3.68
20	294.4	296.2	297.6	295.5	292.8	292.2	290.3	291.7	10- 20	85.72	115.7	14.2,14.2
30	267.6	269.3	271.3	268.3	264.4	264.5	261.3	264.1	20- 30	129.7	245.4	30.2,30.2
40	229.5	231.2	233.0	229.7	225.0	225.4	220.7	223.5	30- 40	155.2	400.6	49.2,49.2
50	178.0	178.4	181.5	178.7	173.0	173.3	168.4	171.6	40- 50	156.1	556.7	68.4,68.4
60	115.4	115.9	120.1	117.8	112.3	112.6	107.8	109.8	50- 60	129.5	686.3	84.4,84.4
70	58.52	58.65	62.38	60.65	56.64	56.84	53.40	54.57	60- 70	83.86	770.1	94.7,94.7
80	16.25	16.15	18.61	17.25	14.88	15.23	13.03	14.02	70- 80	37.08	807.2	99.2,99.2
90	0.0050	0.0008	0.1876	0.0665	0	0.0017	0	0.0001	80- 90	5.941	813.2	100,100
100	0	0	0	0	0	0	0	0	90-100	0.0013	813.2	100,100
110	0	0	0	0	0	0	0	0	100-110	0	813.2	100,100
120	0	0	0	0	0.0198	0.0196	0.0220	0.0199	110-120	0.0022	813.2	100,100
130	0.0226	0.0237	0.0203	0.0225	0.0878	0.0871	0.0926	0.0907	120-130	0.0251	813.2	100,100
140	0.0701	0.0699	0.0671	0.0692	0.1587	0.1588	0.1624	0.1605	130-140	0.0659	813.3	100,100
150	0.1049	0.1065	0.1026	0.1043	0.2251	0.2262	0.2301	0.2282	140-150	0.0877	813.3	100,100
160	0.1462	0.1424	0.1417	0.1429	0.2830	0.2825	0.2840	0.2845	150-160	0.0879	813.4	100,100
170	0.1779	0.1757	0.1786	0.1775	0.2748	0.2747	0.2698	0.2700	160-170	0.0625	813.5	100,100
180	0.2409	0.2415	0.2347	0.2334	0.2402	0.2391	0.2342	0.2337	170-180	0.0218	813.5	100,100
DEG	LUMINOUS INTENSITY:cd Less than 35% Percent = 11.1 %								UNIT:lm			

Isocandela Diagram:



Luminous Distribution Intensity Data:

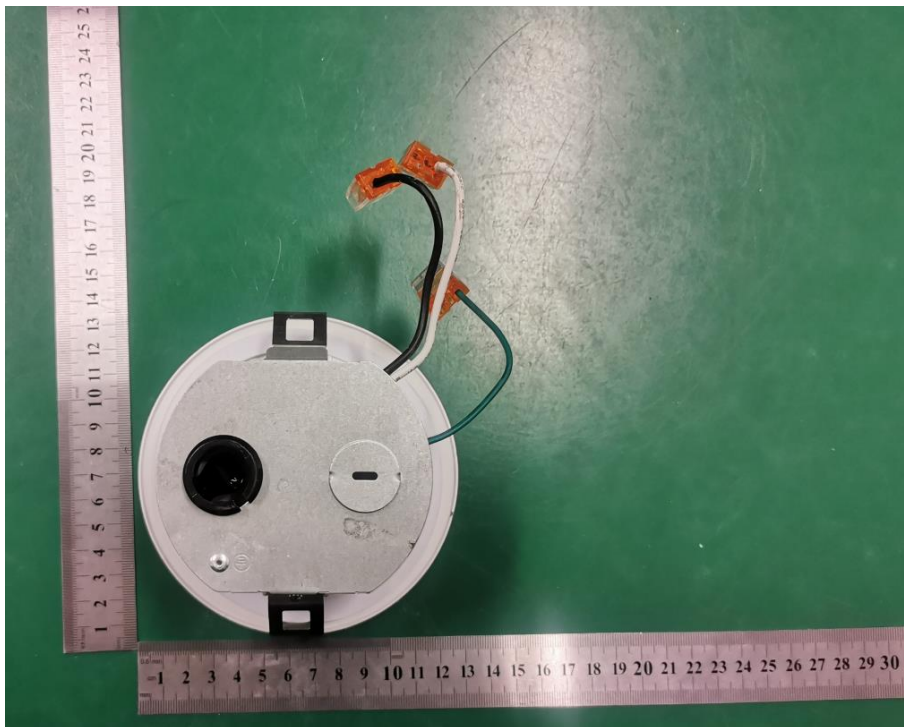
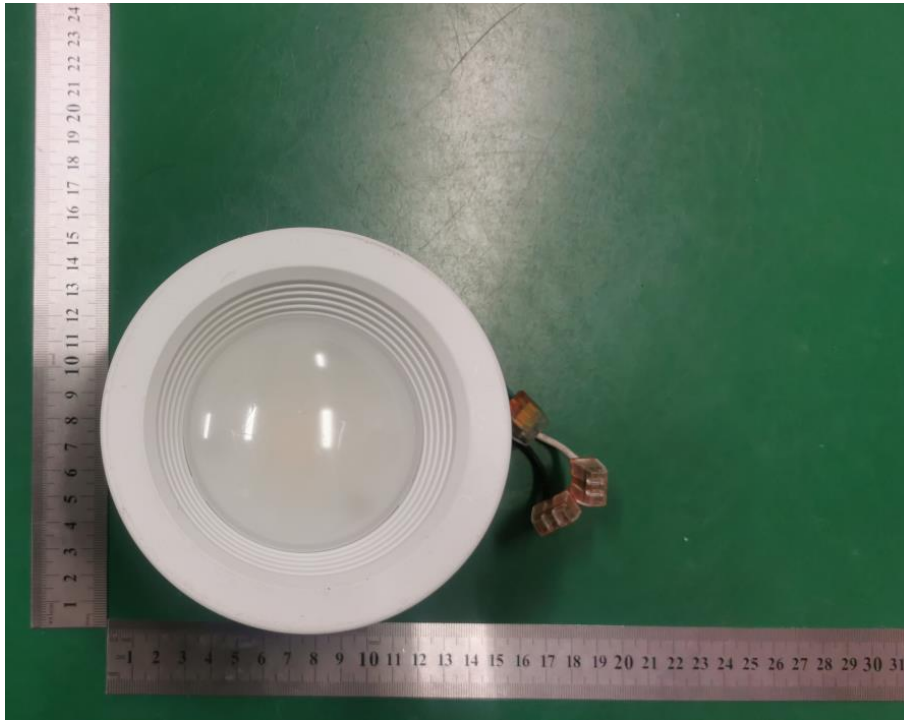
Table--1 UNIT: cd

C (DEG) Y (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	
0	317	317	317	317	317	317	317	317	317	317	317	317	317	317	317	317	317	317	317	317
5	315	315	316	316	316	316	316	316	317	316	316	316	316	315	314	315	315	316	314	314
10	311	312	312	312	312	312	313	313	312	312	312	312	310	311	310	310	310	310	310	309
15	304	305	305	305	305	305	307	306	306	305	305	304	302	303	303	303	303	301	301	301
20	294	296	295	296	296	295	298	297	297	296	295	294	293	292	292	292	293	292	290	290
25	282	283	283	284	284	284	286	286	284	283	283	282	280	279	279	280	280	279	277	277
30	268	268	269	269	270	269	271	271	270	268	268	267	264	263	264	264	265	263	261	261
35	250	251	251	251	251	251	254	253	252	251	250	249	246	245	246	246	247	246	243	243
40	230	231	231	231	231	229	233	232	231	230	229	228	225	224	224	225	225	224	221	221
45	205	206	207	207	206	205	209	208	207	206	205	205	200	200	199	201	201	200	196	196
50	178	179	179	178	178	177	182	181	180	179	178	177	173	172	173	173	174	173	168	168
55	147	148	148	148	147	146	152	151	150	149	148	148	143	143	143	144	144	143	138	138
60	115	116	116	116	115	114	120	119	119	118	117	117	112	112	112	113	113	113	108	108
65	85.0	85.7	85.5	85.4	85.0	84.7	89.9	89.3	88.6	87.7	87.3	87.0	83.0	82.8	82.8	83.4	83.8	83.8	78.9	78.9
70	58.5	58.8	58.6	58.6	58.3	57.7	62.4	61.8	61.4	60.7	60.3	60.0	56.6	56.5	56.6	56.8	57.2	57.6	53.4	53.4
75	35.2	35.3	35.2	35.1	34.8	34.4	38.3	37.8	37.3	36.7	36.4	36.3	33.4	33.3	33.4	33.7	34.1	34.4	30.8	30.8
80	16.3	16.3	16.2	16.1	15.9	15.5	18.6	18.2	17.7	17.2	17.0	16.9	14.9	14.9	15.0	15.2	15.5	15.7	13.0	13.0
85	4.60	4.62	4.58	4.53	4.45	4.33	5.64	5.42	5.22	5.00	4.89	4.83	4.02	4.03	4.06	4.14	4.21	4.31	3.19	3.19
90	0.01	0.00	0.01	0.00	0.00	0.00	0.19	0.15	0.11	0.07	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.02	0.02	0.02	0.02
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
130	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.09
135	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.13
140	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
145	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.20
150	0.10	0.10	0.10	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.23	0.23	0.23	0.23	0.22	0.22	0.23	0.23
155	0.13	0.13	0.13	0.13	0.13	0.13	0.12	0.13	0.13	0.13	0.13	0.12	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
160	0.15	0.14	0.15	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
165	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15	0.29	0.29	0.28	0.29	0.29	0.28	0.28	0.28
170	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
175	0.21	0.21	0.21	0.21	0.21	0.21	0.20	0.20	0.20	0.20	0.20	0.19	0.27	0.27	0.26	0.26	0.26	0.26	0.26	0.26
180	0.24	0.24	0.24	0.24	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.23

Table--2 UNIT: cd

C (DEG) Y (DEG)	285	300	315	330	345															
0	317	317	317	317	317															
5	315	315	315	315	315															
10	310	310	310	310	310															
15	302	301	302	303	303															
20	291	291	292	293	293															
25	279	278	279	280	281															
30	264	263	264	266	266															
35	244	244	245	247	247															
40	223	223	224	226	226															
45	198	198	199	201	201															
50	170	170	172	173	174															
55	140	140	141	142	143															
60	109	109	110	111	111															
65	79.8	79.9	80.4	81.4	81.8															
70	54.0	54.0	54.6	54.9	55.2															
75	31.3	31.5	31.9	32.3	32.4															
80	13.4	13.7	14.0	14.2	14.3															
85	3.38	3.50	3.65	3.76	3.83															
90	0.00	0.00	0.00	0.00	0.00															
95	0.00	0.00	0.00	0.00	0.00															
100	0.00	0.00	0.00	0.00	0.00															
105	0.00	0.00	0.00	0.00	0.00															
110	0.00	0.00	0.00	0.00	0.00															
115	0.00	0.00	0.00	0.00	0.00															
120	0.02	0.02	0.02	0.02	0.02															
125	0.05	0.05	0.05	0.05	0.05															
130	0.09	0.09	0.09	0.09	0.09															
135	0.13	0.13	0.13	0.13	0.13															
140	0.16	0.16	0.16	0.16	0.16															
145	0.20	0.20	0.20	0.20	0.19															
150	0.23	0.23	0.23	0.23	0.23															
155	0.26	0.26	0.26	0.26	0.26															
160	0.28	0.28	0.28	0.28	0.28															
165	0.28	0.28	0.28	0.29	0.29															
170	0.27	0.27	0.27	0.27	0.27															
175	0.26	0.26	0.26	0.26	0.26															
180	0.24	0.23	0.23	0.24	0.24															

Photo of Sample:



Equipment List:

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2019-11-13	2020-11-12
NTC-F01-006	2.0 meter Integrating Sphere	2019-11-13	2020-11-12
NTC-F01-012	Standard Lamp	2019-11-13	2020-11-12
NTC-F01-013	Standard Lamp	2019-11-13	2020-11-12
NTC-F01-031	Digital Power Meter	2020-08-22	2021-08-21
NTC-F01-019	Temperature & Humidity Meter	2019-11-15	2020-11-14

*****End of Report*****