

LM-79-08 Test Report

For

VENAS Co., LIMITED

Flat /RM 8B 4/F Lippo Sun Plaza 28 Canton Road TSIM SHA TSUI Kowloon Hong Kong SAR, China

LED Panel Light

Model Name(s):

P7-30W DXYYZZ

Representative (Tested) Model:

P7-30W DXYYZZ (0%, 3500K)

P7-30W DXYYZZ (50%, 4000K)

P7-30W DXYYZZ (100%, 5000K)

Model Difference: N/A

Prepare by:



Engineer: Alan Wang

Date: 2021-04-30

Review by:



Technical Lead: Vincent Yuan

Issue Date: 2021-05-18

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:	VENAS Co., LIMITED
Brand Name:	

Product Information:

Model Number:	P7-30W DXYYZZ
Product Type:	2x4 Luminaires for Ambient Lighting of Interior Commercial Spaces
Rating Input:	120-277Vac, 50/60Hz, 20/25/30W
Declared CCT:	3500K/4000K/5000K
Declared Light Output:	3900 lm
LED Manufacturer:	Shenzhen Runlite Technology Co., Ltd
LED Model:	P28351-W34SJ0K1FE8F2-XXXX and P28351-W50SJ0K2FE8F2-XXXX
LED Quantity:	P28351-W34SJ0K1FE8F2-XXXX: 96 pcs P28351-W50SJ0K2FE8F2-XXXX: 96 pcs
Driver Manufacturer:	Shenzhen Xiezhen Electronics Co., LTD
Driver Model:	XZ-SE40B-380075-065050-Y-D

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:	2021-04-26
Quantity of Receipt Samples:	1 pc
Sample Number:	210426006-S1

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:	2021-05-18
Revised Date of Test Report:	N/A
Test Report No.:	NTCLR21040252
Remark (If applicable):	1. Product tested IS and Electrical tests for all CCT with the default maximum wattage; 2. Product tested Gonio test for the lowest CCT with the default maximum wattage.

Test Specification:	
Date of Test	2021-04-28
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 10. THD and PF
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 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

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>
<p>3. THD and PF Measurements:</p> <p>The sample was tested according to the ANSI C82.77-2002, the sample was operated at requirement Voltage and Frequency, and was stabilized before measurement. The Total Harmonic Distortion was calculated from the Digital Power Meter.</p>

Integrating Sphere Test Results:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
25.4	41.0	Face Down	90	10

Electrical Data:

Rated CCT	Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
3500K	120.0	60	0.2438	29.11	0.9952
4000K	120.0	60	0.2575	30.65	0.9919
5000K	120.0	60	0.2541	30.27	0.9928

Color Data:

Rated CCT	Test CCT (K)	R _a	R ₉	R _f	R _g	R _{cs, h1}	Chromaticity		
							(x, y)	(u', v')	Duv
3500K	3499	83.8	11	85	97	-11%	(0.4047, 0.3888)	(0.2361, 0.5104)	-0.0007
4000K	4103	85.1	20	84	97	-11%	(0.3651, 0.3639)	(0.2200, 0.4935)	-0.0013
5000K	5125	83.4	11	83	95	-12%	(0.3421, 0.3526)	(0.2090, 0.4847)	0.0017

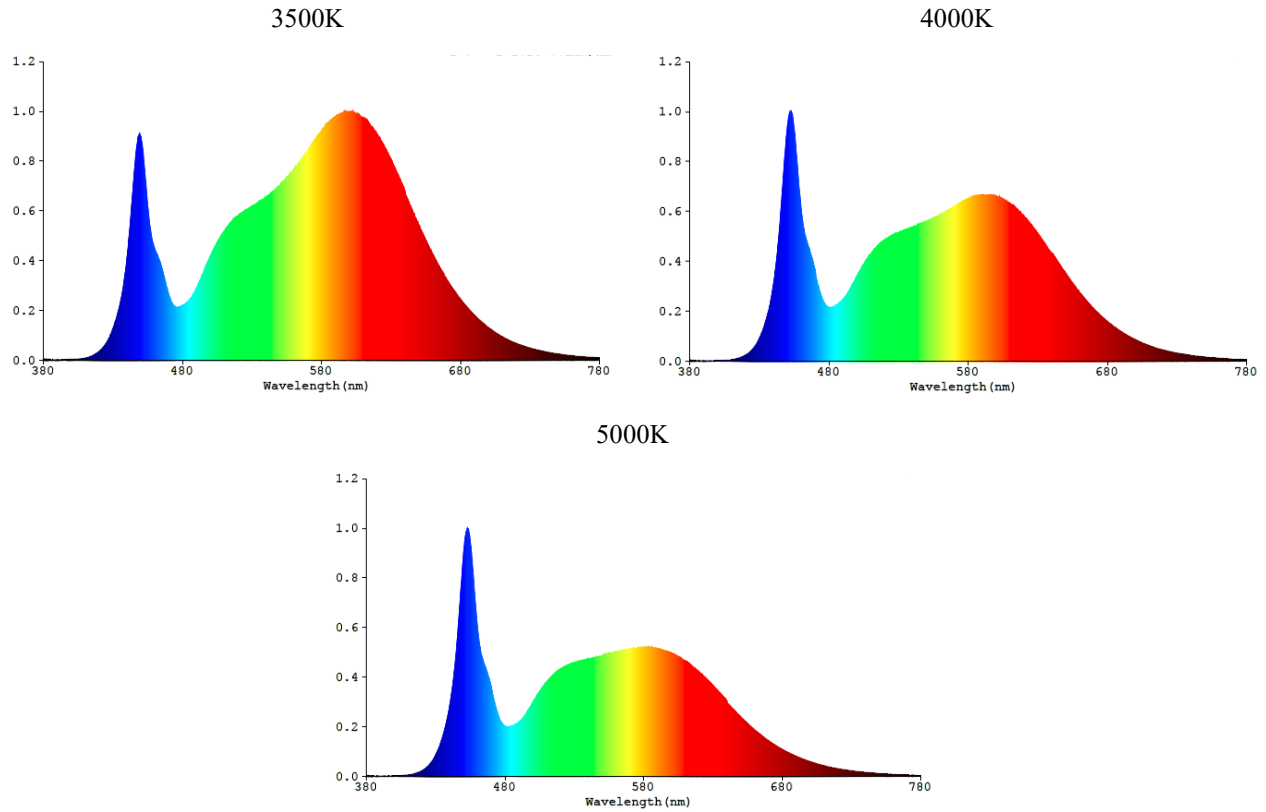
Specify Color Rendering

Rated CCT	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
3500K	82	90	96	83	83	87	85	63	11	77	83	69	84	98	76
4000K	84	91	94	84	84	86	88	70	20	77	83	60	86	97	80
5000K	82	89	92	83	82	84	87	68	11	72	82	58	84	96	77

Output Data:

Rated CCT (K)	Light output (lm)	Efficacy (lm/W)
3500K	3815.9	131.09
4000K	4167.6	135.97
5000K	4064.4	134.27

Spectrum Diagram:



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

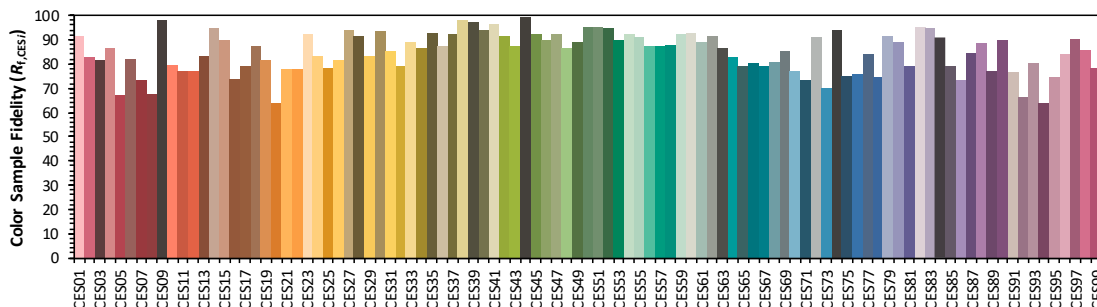
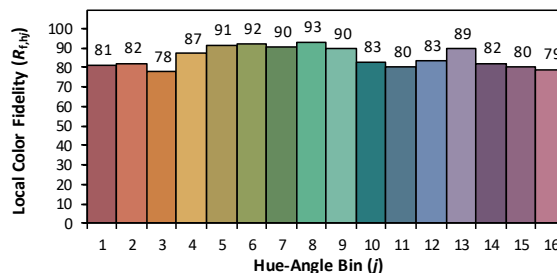
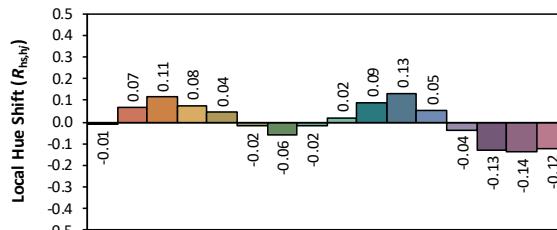
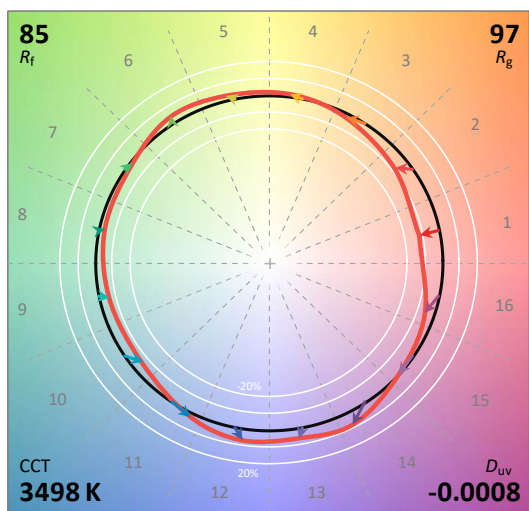
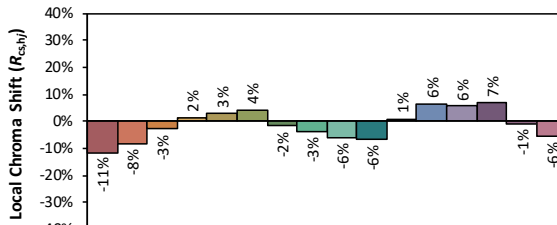
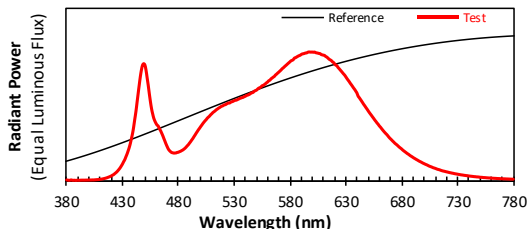
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Date: 2021/4/30

Manufacturer: VENAS Co., LIMITED

Model: P7-30W DXYYZZ



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

x 0.4046
 y 0.3886
 u' 0.2361
 v' 0.5103

CIE 13.3-1995
(CRI)

R_a 84
 R_9 11

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	0.0043	447	0.8621	514	0.5498	581	0.9307	648	0.5674	715	0.0797
381	0.0031	448	0.8976	515	0.5555	582	0.9344	649	0.5552	716	0.0768
382	0.0016	449	0.9079	516	0.5623	583	0.9401	650	0.5421	717	0.0742
383	0.0023	450	0.8989	517	0.5672	584	0.9516	651	0.5292	718	0.0724
384	0.0046	451	0.8611	518	0.5735	585	0.9547	652	0.5175	719	0.0703
385	0.0024	452	0.8021	519	0.5781	586	0.9601	653	0.5059	720	0.0679
386	0.0015	453	0.7424	520	0.5813	587	0.9652	654	0.4937	721	0.0661
387	0.0023	454	0.6758	521	0.5877	588	0.9699	655	0.4822	722	0.0637
388	0.0010	455	0.6133	522	0.5893	589	0.9732	656	0.4696	723	0.0615
389	0.0015	456	0.5587	523	0.5939	590	0.9788	657	0.4588	724	0.0600
390	0.0024	457	0.5186	524	0.5993	591	0.9837	658	0.4468	725	0.0578
391	0.0015	458	0.4846	525	0.6022	592	0.9853	659	0.4370	726	0.0564
392	0.0023	459	0.4622	526	0.6027	593	0.9880	660	0.4247	727	0.0541
393	0.0028	460	0.4442	527	0.6091	594	0.9911	661	0.4152	728	0.0524
394	0.0029	461	0.4306	528	0.6124	595	0.9921	662	0.4041	729	0.0509
395	0.0029	462	0.4229	529	0.6154	596	0.9969	663	0.3930	730	0.0493
396	0.0027	463	0.4034	530	0.6203	597	0.9991	664	0.3825	731	0.0476
397	0.0033	464	0.3891	531	0.6236	598	0.9982	665	0.3726	732	0.0462
398	0.0033	465	0.3698	532	0.6248	599	0.9980	666	0.3635	733	0.0444
399	0.0036	466	0.3499	533	0.6292	600	0.9984	667	0.3546	734	0.0433
400	0.0036	467	0.3275	534	0.6330	601	0.9970	668	0.3436	735	0.0421
401	0.0040	468	0.3057	535	0.6379	602	0.9984	669	0.3331	736	0.0405
402	0.0040	469	0.2833	536	0.6408	603	0.9939	670	0.3242	737	0.0394
403	0.0046	470	0.2638	537	0.6444	604	0.9918	671	0.3158	738	0.0381
404	0.0044	471	0.2453	538	0.6464	605	0.9900	672	0.3066	739	0.0373
405	0.0051	472	0.2333	539	0.6517	606	0.9874	673	0.2984	740	0.0356
406	0.0059	473	0.2247	540	0.6548	607	0.9860	674	0.2892	741	0.0344
407	0.0067	474	0.2180	541	0.6608	608	0.9791	675	0.2824	742	0.0335
408	0.0072	475	0.2155	542	0.6636	609	0.9767	676	0.2752	743	0.0324
409	0.0079	476	0.2132	543	0.6670	610	0.9741	677	0.2668	744	0.0315
410	0.0092	477	0.2139	544	0.6717	611	0.9718	678	0.2589	745	0.0302
411	0.0105	478	0.2147	545	0.6781	612	0.9640	679	0.2521	746	0.0297
412	0.0122	479	0.2184	546	0.6822	613	0.9593	680	0.2452	747	0.0283
413	0.0141	480	0.2198	547	0.6852	614	0.9515	681	0.2369	748	0.0279
414	0.0162	481	0.2241	548	0.6940	615	0.9434	682	0.2301	749	0.0271
415	0.0186	482	0.2274	549	0.6983	616	0.9378	683	0.2234	750	0.0258
416	0.0213	483	0.2326	550	0.7025	617	0.9325	684	0.2170	751	0.0249
417	0.0247	484	0.2372	551	0.7106	618	0.9230	685	0.2100	752	0.0246
418	0.0280	485	0.2438	552	0.7178	619	0.9170	686	0.2047	753	0.0232
419	0.0316	486	0.2509	553	0.7216	620	0.9068	687	0.1981	754	0.0227
420	0.0358	487	0.2599	554	0.7272	621	0.8968	688	0.1917	755	0.0223
421	0.0414	488	0.2699	555	0.7360	622	0.8922	689	0.1866	756	0.0213
422	0.0458	489	0.2788	556	0.7394	623	0.8793	690	0.1807	757	0.0207
423	0.0531	490	0.2908	557	0.7451	624	0.8699	691	0.1749	758	0.0200
424	0.0603	491	0.3019	558	0.7518	625	0.8593	692	0.1700	759	0.0195
425	0.0682	492	0.3148	559	0.7596	626	0.8493	693	0.1644	760	0.0190
426	0.0780	493	0.3265	560	0.7660	627	0.8389	694	0.1598	761	0.0184
427	0.0885	494	0.3408	561	0.7756	628	0.8283	695	0.1544	762	0.0176
428	0.1002	495	0.3538	562	0.7798	629	0.8188	696	0.1494	763	0.0170
429	0.1142	496	0.3680	563	0.7900	630	0.8059	697	0.1452	764	0.0167
430	0.1287	497	0.3810	564	0.7963	631	0.7930	698	0.1406	765	0.0160
431	0.1463	498	0.3946	565	0.8036	632	0.7807	699	0.1356	766	0.0155
432	0.1616	499	0.4061	566	0.8093	633	0.7692	700	0.1316	767	0.0152
433	0.1834	500	0.4190	567	0.8200	634	0.7558	701	0.1274	768	0.0147
434	0.2045	501	0.4307	568	0.8268	635	0.7441	702	0.1236	769	0.0141
435	0.2294	502	0.4431	569	0.8354	636	0.7317	703	0.1199	770	0.0137
436	0.2558	503	0.4542	570	0.8426	637	0.7187	704	0.1151	771	0.0134
437	0.2879	504	0.4646	571	0.8510	638	0.7074	705	0.1111	772	0.0130
438	0.3266	505	0.4738	572	0.8590	639	0.6935	706	0.1079	773	0.0127
439	0.3659	506	0.4852	573	0.8688	640	0.6794	707	0.1046	774	0.0121
440	0.4170	507	0.4932	574	0.8757	641	0.6565	708	0.1004	775	0.0120
441	0.4774	508	0.5014	575	0.8841	642	0.6447	709	0.0975	776	0.0115
442	0.5344	509	0.5115	576	0.8919	643	0.6320	710	0.0948	777	0.0112
443	0.6051	510	0.5194	577	0.8995	644	0.6192	711	0.0914	778	0.0107
444	0.6747	511	0.5288	578	0.9076	645	0.6059	712	0.0878	779	0.0106
445	0.7438	512	0.5349	579	0.9152	646	0.5923	713	0.0855	780	0.0106
446	0.8088	513	0.5420	580	0.9228	647	0.5805	714	0.0831	N/A	N/A

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

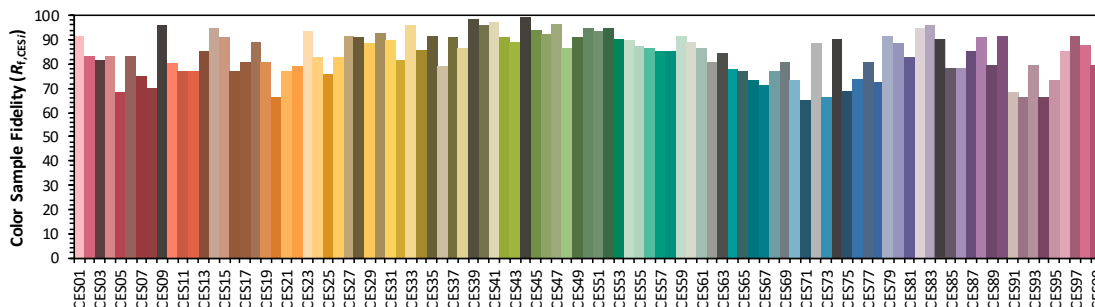
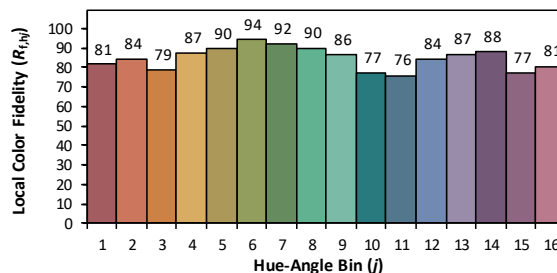
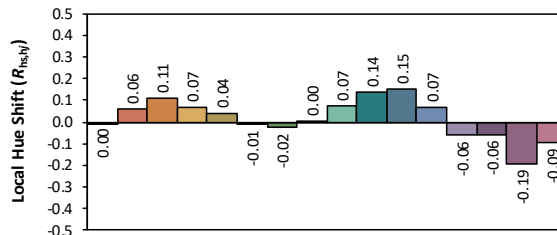
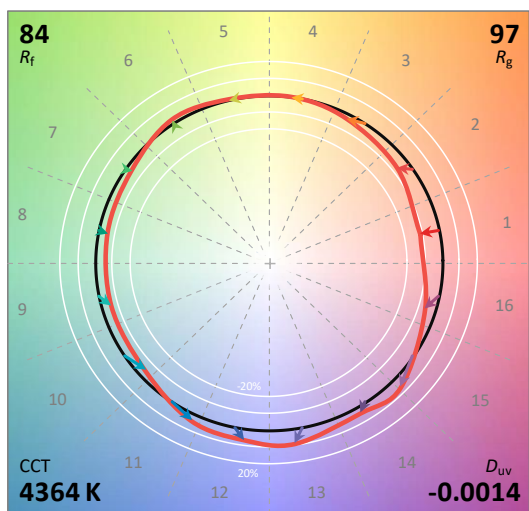
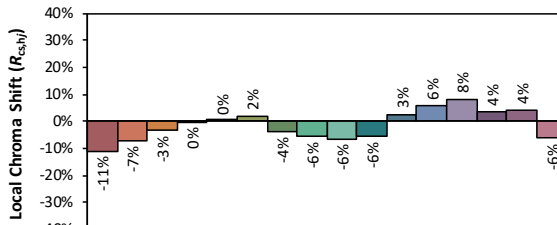
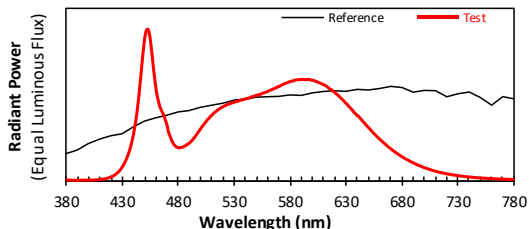
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Date: 2021/4/30

Manufacturer: VENAS Co., LIMITED

Model: P7-30W DXYYZZ



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

x 0.3651
 y 0.3638
 u' 0.2201
 v' 0.4934

CIE 13.3-1995
(CRI)

R_a 85
 R_9 20

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	0.0048	447	0.7349	514	0.4578	581	0.6551	648	0.3674	715	0.0524
381	0.0034	448	0.8134	515	0.4634	582	0.6553	649	0.3596	716	0.0509
382	0.0028	449	0.8829	516	0.4684	583	0.6566	650	0.3519	717	0.0496
383	0.0025	450	0.9430	517	0.4731	584	0.6610	651	0.3434	718	0.0480
384	0.0034	451	0.9806	518	0.4786	585	0.6618	652	0.3357	719	0.0466
385	0.0025	452	0.9960	519	0.4831	586	0.6637	653	0.3276	720	0.0447
386	0.0023	453	0.9955	520	0.4859	587	0.6642	654	0.3192	721	0.0434
387	0.0024	454	0.9689	521	0.4913	588	0.6646	655	0.3113	722	0.0422
388	0.0017	455	0.9237	522	0.4932	589	0.6654	656	0.3041	723	0.0412
389	0.0023	456	0.8593	523	0.4981	590	0.6664	657	0.2972	724	0.0396
390	0.0019	457	0.7927	524	0.5010	591	0.6665	658	0.2885	725	0.0382
391	0.0010	458	0.7222	525	0.5042	592	0.6652	659	0.2824	726	0.0371
392	0.0021	459	0.6618	526	0.5046	593	0.6648	660	0.2746	727	0.0361
393	0.0023	460	0.6044	527	0.5092	594	0.6659	661	0.2685	728	0.0350
394	0.0023	461	0.5596	528	0.5119	595	0.6652	662	0.2614	729	0.0340
395	0.0024	462	0.5289	529	0.5132	596	0.6665	663	0.2555	730	0.0327
396	0.0025	463	0.4986	530	0.5158	597	0.6655	664	0.2479	731	0.0318
397	0.0027	464	0.4782	531	0.5195	598	0.6656	665	0.2423	732	0.0304
398	0.0026	465	0.4595	532	0.5202	599	0.6613	666	0.2352	733	0.0299
399	0.0029	466	0.4457	533	0.5224	600	0.6609	667	0.2294	734	0.0289
400	0.0030	467	0.4258	534	0.5250	601	0.6595	668	0.2222	735	0.0280
401	0.0029	468	0.4074	535	0.5281	602	0.6577	669	0.2162	736	0.0272
402	0.0034	469	0.3854	536	0.5296	603	0.6531	670	0.2111	737	0.0261
403	0.0037	470	0.3629	537	0.5317	604	0.6525	671	0.2049	738	0.0254
404	0.0034	471	0.3259	538	0.5320	605	0.6488	672	0.1990	739	0.0248
405	0.0040	472	0.3038	539	0.5360	606	0.6450	673	0.1941	740	0.0238
406	0.0044	473	0.2849	540	0.5375	607	0.6425	674	0.1884	741	0.0233
407	0.0050	474	0.2653	541	0.5407	608	0.6391	675	0.1833	742	0.0225
408	0.0055	475	0.2508	542	0.5419	609	0.6356	676	0.1782	743	0.0216
409	0.0056	476	0.2377	543	0.5427	610	0.6322	677	0.1733	744	0.0212
410	0.0068	477	0.2299	544	0.5460	611	0.6284	678	0.1678	745	0.0204
411	0.0074	478	0.2226	545	0.5506	612	0.6250	679	0.1637	746	0.0199
412	0.0084	479	0.2190	546	0.5520	613	0.6205	680	0.1585	747	0.0190
413	0.0099	480	0.2162	547	0.5518	614	0.6143	681	0.1540	748	0.0185
414	0.0116	481	0.2157	548	0.5569	615	0.6076	682	0.1496	749	0.0182
415	0.0125	482	0.2170	549	0.5594	616	0.6029	683	0.1451	750	0.0174
416	0.0142	483	0.2192	550	0.5620	617	0.5995	684	0.1412	751	0.0167
417	0.0169	484	0.2204	551	0.5621	618	0.5924	685	0.1366	752	0.0165
418	0.0189	485	0.2255	552	0.5661	619	0.5869	686	0.1337	753	0.0157
419	0.0218	486	0.2273	553	0.5663	620	0.5809	687	0.1290	754	0.0155
420	0.0250	487	0.2336	554	0.5703	621	0.5732	688	0.1248	755	0.0150
421	0.0282	488	0.2372	555	0.5743	622	0.5695	689	0.1214	756	0.0144
422	0.0315	489	0.2420	556	0.5769	623	0.5616	690	0.1180	757	0.0140
423	0.0369	490	0.2485	557	0.5781	624	0.5550	691	0.1140	758	0.0134
424	0.0419	491	0.2551	558	0.5812	625	0.5480	692	0.1111	759	0.0134
425	0.0478	492	0.2621	559	0.5847	626	0.5401	693	0.1075	760	0.0128
426	0.0542	493	0.2703	560	0.5863	627	0.5336	694	0.1043	761	0.0125
427	0.0617	494	0.2803	561	0.5919	628	0.5261	695	0.1007	762	0.0121
428	0.0702	495	0.2886	562	0.5946	629	0.5180	696	0.0982	763	0.0115
429	0.0809	496	0.2993	563	0.5964	630	0.5110	697	0.0948	764	0.0112
430	0.0924	497	0.3095	564	0.6007	631	0.5037	698	0.0922	765	0.0109
431	0.1046	498	0.3206	565	0.6032	632	0.4949	699	0.0888	766	0.0105
432	0.1178	499	0.3311	566	0.6064	633	0.4863	700	0.0864	767	0.0104
433	0.1342	500	0.3419	567	0.6108	634	0.4793	701	0.0835	768	0.0100
434	0.1513	501	0.3522	568	0.6123	635	0.4716	702	0.0807	769	0.0095
435	0.1704	502	0.3619	569	0.6180	636	0.4621	703	0.0784	770	0.0093
436	0.1913	503	0.3703	570	0.6189	637	0.4531	704	0.0760	771	0.0092
437	0.2159	504	0.3812	571	0.6233	638	0.4455	705	0.0733	772	0.0088
438	0.2440	505	0.3895	572	0.6263	639	0.4384	706	0.0711	773	0.0086
439	0.2754	506	0.4005	573	0.6318	640	0.4287	707	0.0686	774	0.0083
440	0.3106	507	0.4078	574	0.6332	641	0.4267	708	0.0662	775	0.0082
441	0.3539	508	0.4146	575	0.6380	642	0.4189	709	0.0645	776	0.0078
442	0.3986	509	0.4248	576	0.6411	643	0.4097	710	0.0621	777	0.0076
443	0.4531	510	0.4300	577	0.6430	644	0.4005	711	0.0597	778	0.0074
444	0.5147	511	0.4385	578	0.6458	645	0.3933	712	0.0583	779	0.0071
445	0.5823	512	0.4457	579	0.6495	646	0.3844	713	0.0562	780	0.0071
446	0.6576	513	0.4513	580	0.6512	647	0.3768	714	0.0540	N/A	N/A

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

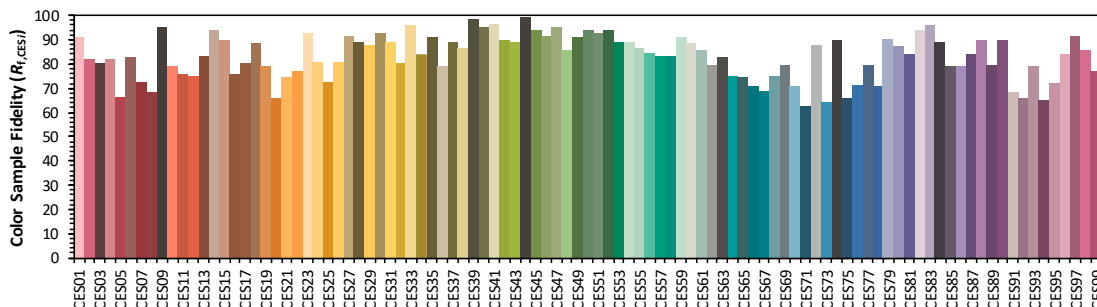
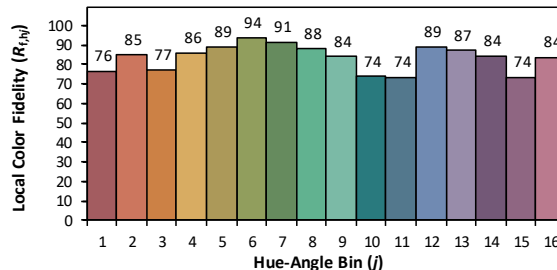
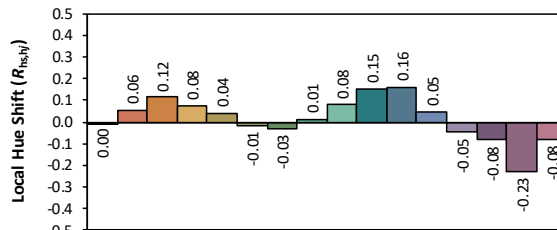
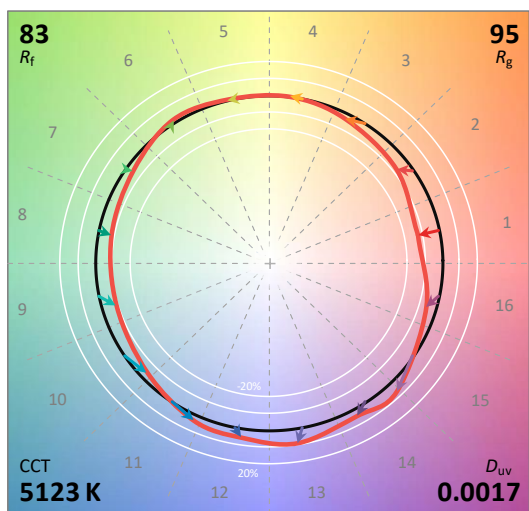
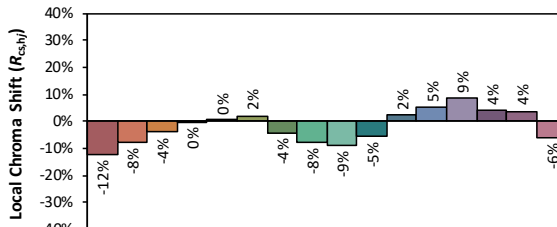
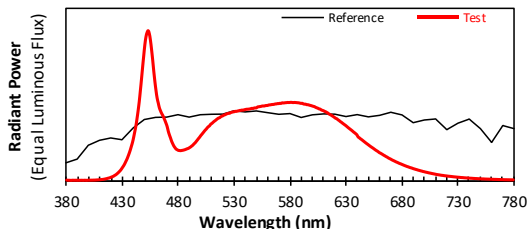
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: VENAS Co., LIMITED

Date: 2021/4/30

Model: P7-30W DXYYZZ



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

x 0.3420
 y 0.3524
 u' 0.2090
 v' 0.4846

CIE 13.3-1995
(CRI)

R_a 83
 R_9 11

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	0.0034	447	0.6756	514	0.4058	581	0.5215	648	0.2508	715	0.0366
381	0.0027	448	0.7553	515	0.4117	582	0.5206	649	0.2452	716	0.0354
382	0.0024	449	0.8316	516	0.4167	583	0.5199	650	0.2398	717	0.0347
383	0.0022	450	0.9048	517	0.4192	584	0.5208	651	0.2341	718	0.0333
384	0.0016	451	0.9570	518	0.4255	585	0.5202	652	0.2285	719	0.0323
385	0.0026	452	0.9863	519	0.4294	586	0.5195	653	0.2233	720	0.0315
386	0.0025	453	0.9987	520	0.4323	587	0.5187	654	0.2184	721	0.0305
387	0.0023	454	0.9796	521	0.4373	588	0.5181	655	0.2131	722	0.0294
388	0.0026	455	0.9362	522	0.4393	589	0.5160	656	0.2075	723	0.0287
389	0.0024	456	0.8747	523	0.4438	590	0.5146	657	0.2023	724	0.0280
390	0.0021	457	0.8055	524	0.4462	591	0.5150	658	0.1976	725	0.0271
391	0.0026	458	0.7294	525	0.4483	592	0.5111	659	0.1927	726	0.0262
392	0.0021	459	0.6603	526	0.4490	593	0.5095	660	0.1867	727	0.0253
393	0.0025	460	0.6003	527	0.4534	594	0.5092	661	0.1831	728	0.0246
394	0.0024	461	0.5502	528	0.4557	595	0.5061	662	0.1787	729	0.0238
395	0.0020	462	0.5177	529	0.4576	596	0.5058	663	0.1742	730	0.0231
396	0.0028	463	0.4856	530	0.4590	597	0.5037	664	0.1693	731	0.0224
397	0.0023	464	0.4659	531	0.4616	598	0.5014	665	0.1653	732	0.0218
398	0.0021	465	0.4483	532	0.4614	599	0.4996	666	0.1604	733	0.0209
399	0.0028	466	0.4352	533	0.4635	600	0.4970	667	0.1567	734	0.0204
400	0.0029	467	0.4187	534	0.4649	601	0.4947	668	0.1518	735	0.0200
401	0.0029	468	0.4011	535	0.4674	602	0.4926	669	0.1477	736	0.0191
402	0.0031	469	0.3814	536	0.4679	603	0.4881	670	0.1441	737	0.0186
403	0.0031	470	0.3601	537	0.4699	604	0.4851	671	0.1398	738	0.0181
404	0.0035	471	0.3289	538	0.4694	605	0.4823	672	0.1359	739	0.0175
405	0.0036	472	0.3049	539	0.4718	606	0.4781	673	0.1325	740	0.0171
406	0.0041	473	0.2844	540	0.4735	607	0.4764	674	0.1288	741	0.0164
407	0.0047	474	0.2624	541	0.4753	608	0.4712	675	0.1250	742	0.0159
408	0.0051	475	0.2456	542	0.4756	609	0.4682	676	0.1219	743	0.0156
409	0.0056	476	0.2305	543	0.4764	610	0.4656	677	0.1185	744	0.0149
410	0.0063	477	0.2198	544	0.4774	611	0.4615	678	0.1148	745	0.0146
411	0.0072	478	0.2103	545	0.4795	612	0.4585	679	0.1122	746	0.0139
412	0.0078	479	0.2059	546	0.4815	613	0.4542	680	0.1091	747	0.0137
413	0.0090	480	0.2016	547	0.4806	614	0.4496	681	0.1058	748	0.0133
414	0.0103	481	0.2006	548	0.4839	615	0.4437	682	0.1027	749	0.0128
415	0.0121	482	0.1997	549	0.4844	616	0.4398	683	0.0996	750	0.0125
416	0.0138	483	0.2010	550	0.4850	617	0.4354	684	0.0968	751	0.0120
417	0.0160	484	0.2023	551	0.4908	618	0.4306	685	0.0938	752	0.0114
418	0.0178	485	0.2041	552	0.4919	619	0.4258	686	0.0916	753	0.0116
419	0.0203	486	0.2064	553	0.4933	620	0.4202	687	0.0885	754	0.0110
420	0.0235	487	0.2095	554	0.4944	621	0.4149	688	0.0862	755	0.0106
421	0.0264	488	0.2125	555	0.4967	622	0.4120	689	0.0841	756	0.0104
422	0.0298	489	0.2150	556	0.4973	623	0.4053	690	0.0811	757	0.0101
423	0.0348	490	0.2197	557	0.4972	624	0.4006	691	0.0787	758	0.0099
424	0.0391	491	0.2244	558	0.4996	625	0.3940	692	0.0765	759	0.0096
425	0.0452	492	0.2305	559	0.5004	626	0.3890	693	0.0742	760	0.0093
426	0.0518	493	0.2363	560	0.5009	627	0.3831	694	0.0721	761	0.0089
427	0.0593	494	0.2448	561	0.5038	628	0.3775	695	0.0696	762	0.0088
428	0.0671	495	0.2515	562	0.5045	629	0.3720	696	0.0678	763	0.0083
429	0.0768	496	0.2608	563	0.5057	630	0.3666	697	0.0653	764	0.0083
430	0.0880	497	0.2700	564	0.5072	631	0.3602	698	0.0637	765	0.0080
431	0.0991	498	0.2799	565	0.5074	632	0.3539	699	0.0613	766	0.0078
432	0.1123	499	0.2886	566	0.5090	633	0.3479	700	0.0598	767	0.0074
433	0.1280	500	0.2991	567	0.5108	634	0.3421	701	0.0577	768	0.0073
434	0.1434	501	0.3079	568	0.5114	635	0.3364	702	0.0560	769	0.0069
435	0.1623	502	0.3171	569	0.5133	636	0.3303	703	0.0545	770	0.0069
436	0.1824	503	0.3265	570	0.5131	637	0.3236	704	0.0525	771	0.0066
437	0.2049	504	0.3357	571	0.5151	638	0.3182	705	0.0509	772	0.0063
438	0.2305	505	0.3433	572	0.5142	639	0.3118	706	0.0495	773	0.0061
439	0.2560	506	0.3527	573	0.5182	640	0.3045	707	0.0477	774	0.0061
440	0.2892	507	0.3600	574	0.5173	641	0.2913	708	0.0462	775	0.0058
441	0.3267	508	0.3656	575	0.5181	642	0.2859	709	0.0447	776	0.0058
442	0.3645	509	0.3759	576	0.5191	643	0.2796	710	0.0432	777	0.0055
443	0.4133	510	0.3808	577	0.5197	644	0.2744	711	0.0415	778	0.0054
444	0.4668	511	0.3876	578	0.5207	645	0.2685	712	0.0402	779	0.0053
445	0.5272	512	0.3943	579	0.5201	646	0.2626	713	0.0390	780	0.0053
446	0.5993	513	0.3996	580	0.5209	647	0.2566	714	0.0379	N/A	N/A

Goniophotometer Test Results (Test for 3500K):

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
24.7	45.2	Face Down	90	25

Electrical Data:

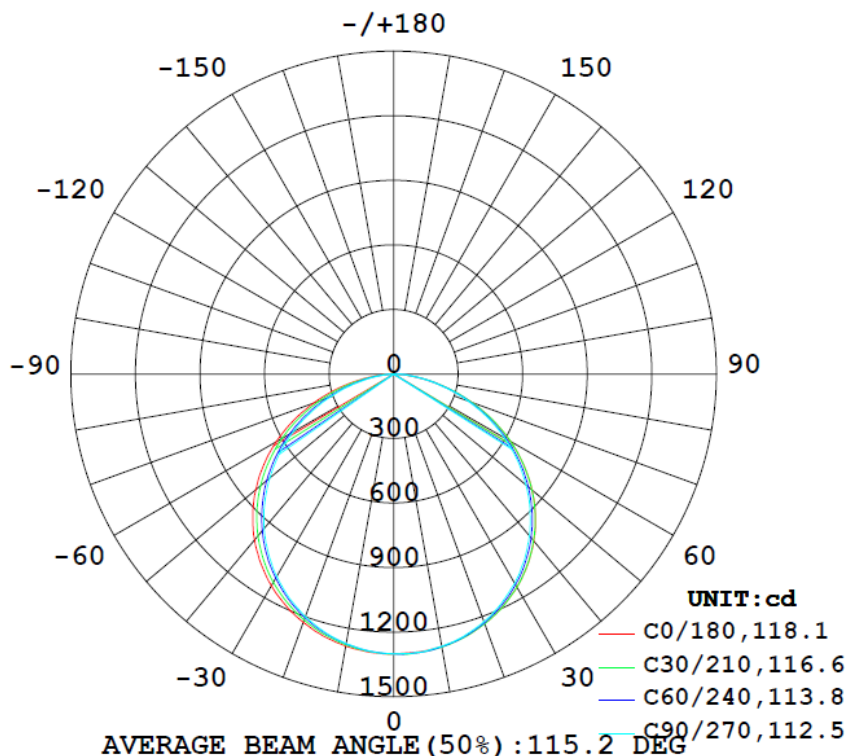
Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	0.2438	29.11	0.9952

Goniophotometer Data:

Parameter	Results	
Total Luminous (lm)	3815.9	
Luminous Efficacy (lm/w)	131.09	
Zonal Lumens Distribution (0-60°)	78.8%	
Beam Angle (°)	115.2	
Spacing Criterion	0-180°	90-270°
	1.32	1.30
UGR	Viewed Crosswise	Viewed Endwise
	18.9	18.8

Luminous Intensity Distribution Diagram:

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM

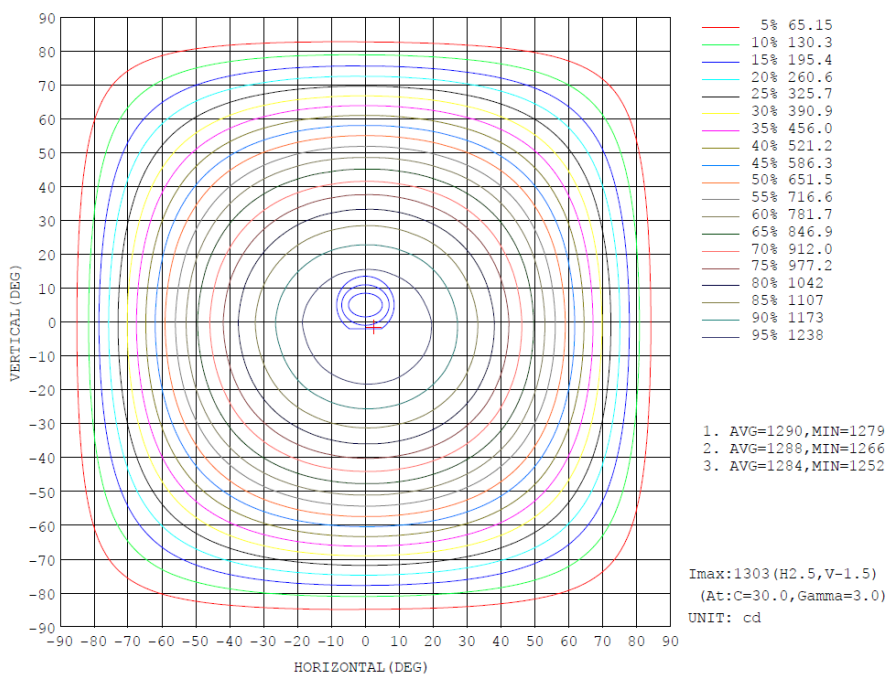


Zonal Flux Diagram:

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	Ilum, lamp
10	1286	1287	1285	1282	1284	1275	1273	1276	0- 10	123.2	123.2	3.23,3.23
20	1234	1232	1225	1226	1229	1210	1201	1214	10- 20	354.6	477.8	12.5,12.5
30	1145	1138	1124	1130	1137	1107	1087	1111	20- 30	542.2	1020	26.7,26.7
40	1014	1003	980.9	993.8	1007	965.7	937.1	969.7	30- 40	661.4	1681	44.1,44.1
50	839.6	828.1	803.6	821.3	837.5	788.6	752.8	790.1	40- 50	693.8	2375	62.2,62.2
60	627.3	618.0	595.7	614.6	631.0	579.3	542.1	576.7	50- 60	630.7	3006	78.8,78.8
70	384.2	382.6	367.8	383.8	396.7	350.3	315.7	342.2	60- 70	477.4	3483	91.3,91.3
80	147.0	153.8	149.7	159.6	163.6	132.8	109.1	121.6	70- 80	264.5	3748	98.2,98.2
90	0.4722	6.869	8.637	8.867	2.467	1.699	1.004	0.7274	80- 90	64.78	3813	99.9,99.9
100	0.2056	0.2245	0.2510	0.2254	0.3882	0.4051	0.4241	0.4152	90-100	0.7180	3813	99.9,99.9
110	0.2576	0.2309	0.2547	0.2704	0.4169	0.4279	0.4552	0.4504	100-110	0.3547	3814	99.9,99.9
120	0.3578	0.2824	0.3119	0.3647	0.4716	0.4656	0.4832	0.4720	110-120	0.3587	3814	100,100
130	0.4657	0.3780	0.4099	0.4680	0.5977	0.6556	0.6763	0.5974	120-130	0.4123	3814	100,100
140	0.5303	0.4868	0.5112	0.5444	0.6454	0.7151	0.7582	0.6803	130-140	0.4436	3815	100,100
150	0.5611	0.5024	0.4890	0.5451	0.7197	0.7315	0.7336	0.7219	140-150	0.3856	3815	100,100
160	0.6704	0.5607	0.4859	0.6192	0.8216	0.8091	0.7411	0.7385	150-160	0.2981	3816	100,100
170	0.8035	0.7215	0.6398	0.7599	0.8737	0.9193	0.8690	0.8076	160-170	0.2092	3816	100,100
180	0.8054	0.8054	0.8054	0.8054	0.8140	0.8140	0.8140	0.8140	170-180	0.0779	3816	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

Isocandela Diagram:



Uncorrected UGR Table:

UGR Table - Uncorrected

Reflectances										
Ceiling Cavity	70	70	50	50	30	70	70	50	50	30
Walls	50	30	50	30	30	50	30	50	30	30
Floor Cavity	20	20	20	20	20	20	20	20	20	20
Room Size	UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H Y=2H	10.1	11.7	10.5	12.1	12.4	9.9	11.5	10.2	11.8	12.1
3H	11.9	13.4	12.3	13.7	14.1	11.7	13.1	12.0	13.5	13.8
4H	12.5	13.9	12.9	14.3	14.7	12.3	13.7	12.7	14.1	14.4
6H	13.0	14.3	13.4	14.6	15.0	12.8	14.1	13.2	14.4	14.8
8H	13.1	14.3	13.5	14.7	15.1	12.9	14.2	13.3	14.5	14.9
12H	13.1	14.3	13.6	14.7	15.1	13.0	14.2	13.4	14.6	15.0
4H 2H	10.7	12.1	11.1	12.4	12.8	10.5	12.0	10.9	12.3	12.7
3H	12.7	13.9	13.1	14.3	14.7	12.5	13.7	13.0	14.1	14.5
4H	13.4	14.5	13.9	14.9	15.4	13.3	14.4	13.7	14.8	15.2
6H	14.0	14.9	14.5	15.4	15.8	13.9	14.8	14.4	15.3	15.7
8H	14.2	15.0	14.6	15.5	15.9	14.1	15.0	14.6	15.4	15.9
12H	14.3	15.0	14.7	15.5	16.0	14.2	15.0	14.7	15.5	16.0
8H 4H	13.7	14.6	14.2	15.0	15.5	13.7	14.5	14.1	15.0	15.4
6H	14.4	15.1	14.9	15.6	16.1	14.4	15.1	14.9	15.6	16.0
8H	14.6	15.2	15.1	15.7	16.2	14.6	15.3	15.1	15.8	16.3
12H	14.7	15.3	15.2	15.8	16.3	14.8	15.4	15.3	15.9	16.4
12H 4H	13.7	14.5	14.2	15.0	15.5	13.7	14.5	14.2	15.0	15.4
6H	14.4	15.1	14.9	15.5	16.1	14.4	15.1	14.9	15.5	16.1
8H	14.7	15.2	15.2	15.7	16.3	14.7	15.3	15.2	15.8	16.4

Maximum UGR = 16.4

Corrected UGR Table:

UGR Table - Corrected

Reflectances										
Ceiling Cavity	70	70	50	50	30	70	70	50	50	30
Walls	50	30	50	30	30	50	30	50	30	30
Floor Cavity	20	20	20	20	20	20	20	20	20	20
Room Size	UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H Y=2H	14.8	16.4	15.2	16.8	17.1	14.6	16.2	14.9	16.5	16.8
3H	16.6	18.1	17.0	18.4	18.8	16.4	17.8	16.7	18.2	18.5
4H	17.2	18.6	17.6	19.0	19.4	17.0	18.4	17.4	18.8	19.1
6H	17.7	19.0	18.1	19.3	19.7	17.5	18.8	17.9	19.1	19.5
8H	17.8	19.0	18.2	19.4	19.8	17.6	18.9	18.0	19.2	19.6
12H	17.8	19.0	18.3	19.4	19.8	17.7	18.9	18.1	19.3	19.7
4H 2H	15.4	16.8	15.8	17.1	17.5	15.2	16.7	15.6	17.0	17.4
3H	17.4	18.6	17.8	19.0	19.4	17.2	18.4	17.7	18.8	19.2
4H	18.1	19.2	18.6	19.6	20.1	18.0	19.1	18.4	19.5	19.9
6H	18.7	19.6	19.2	20.1	20.5	18.6	19.5	19.1	20.0	20.4
8H	18.9	19.7	19.3	20.2	20.6	18.8	19.7	19.3	20.1	20.6
12H	19.0	19.7	19.4	20.2	20.7	18.9	19.7	19.4	20.2	20.7
8H 4H	18.4	19.3	18.9	19.7	20.2	18.4	19.2	18.8	19.7	20.1
6H	19.1	19.8	19.6	20.3	20.8	19.1	19.8	19.6	20.3	20.7
8H	19.3	19.9	19.8	20.4	20.9	19.3	20.0	19.8	20.5	21.0
12H	19.4	20.0	19.9	20.5	21.0	19.5	20.1	20.0	20.6	21.1
12H 4H	18.4	19.2	18.9	19.7	20.2	18.4	19.2	18.9	19.7	20.1
6H	19.1	19.8	19.6	20.2	20.8	19.1	19.8	19.6	20.2	20.8
8H	19.4	19.9	19.9	20.4	21.0	19.4	20.0	19.9	20.5	21.1

Maximum UGR = 21.1

Luminous Distribution Intensity Data:

Table--1

UNIT: cd

C (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
γ (DEG)	0	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300
5	1297	1301	1300	1300	1300	1298	1298	1297	1297	1295	1294	1298	1298	1296	1294	1294	1293	1292	1292
10	1286	1288	1289	1287	1287	1286	1285	1284	1283	1282	1281	1282	1284	1281	1278	1275	1273	1272	1273
15	1265	1267	1267	1265	1264	1260	1261	1259	1259	1259	1257	1258	1261	1257	1252	1248	1245	1241	1242
20	1234	1236	1236	1232	1231	1226	1225	1224	1224	1226	1225	1226	1229	1224	1217	1210	1206	1200	1201
25	1195	1196	1195	1190	1186	1181	1180	1179	1180	1183	1184	1185	1187	1181	1172	1163	1156	1150	1149
30	1145	1146	1144	1138	1131	1126	1124	1123	1125	1130	1132	1134	1137	1130	1119	1107	1097	1089	1087
35	1084	1085	1083	1076	1067	1060	1058	1057	1060	1066	1071	1074	1076	1068	1055	1040	1028	1018	1017
40	1014	1015	1011	1003	994	985	981	982	987	994	1001	1003	1007	997	981	966	951	940	937
45	931	934	930	920	910	900	897	899	904	912	919	924	927	917	900	882	864	852	848
50	840	843	839	828	817	808	804	805	812	821	830	834	837	827	808	789	770	758	753
55	739	741	737	727	716	707	703	705	712	722	730	735	739	727	707	687	669	655	651
60	627	630	627	618	607	599	596	598	605	615	623	628	631	620	600	579	560	547	542
65	508	512	510	502	493	486	484	486	492	501	510	514	516	505	486	466	447	434	429
70	384	389	388	383	375	370	368	370	376	384	391	394	397	386	368	350	333	321	316
75	262	266	267	264	260	256	254	257	262	268	274	276	278	268	253	238	223	212	207
80	147	152	155	154	152	150	150	152	156	160	163	164	164	156	145	133	122	114	109
85	49.7	54.7	58.8	61.1	62.3	62.0	62.4	64.7	66.4	67.5	67.9	67.6	66.6	61.0	53.8	46.7	40.4	38.0	34.0
90	0.47	1.71	3.27	6.87	7.92	8.40	8.64	8.97	9.26	8.87	8.38	7.46	2.47	2.30	1.90	1.70	1.46	1.30	1.00
95	0.18	0.18	0.20	0.24	0.28	0.30	0.31	0.31	0.29	0.24	0.20	0.17	0.33	0.33	0.35	0.37	0.39	0.40	0.41
100	0.21	0.20	0.20	0.22	0.24	0.25	0.25	0.25	0.24	0.23	0.21	0.20	0.39	0.39	0.40	0.41	0.41	0.42	0.42
105	0.23	0.23	0.22	0.23	0.24	0.25	0.25	0.25	0.25	0.24	0.24	0.23	0.43	0.42	0.43	0.43	0.44	0.45	0.45
110	0.26	0.25	0.24	0.23	0.24	0.25	0.25	0.26	0.27	0.27	0.27	0.26	0.42	0.41	0.42	0.43	0.44	0.45	0.46
115	0.30	0.27	0.26	0.25	0.25	0.26	0.27	0.29	0.30	0.31	0.30	0.29	0.41	0.40	0.41	0.42	0.44	0.45	0.46
120	0.36	0.32	0.29	0.28	0.29	0.30	0.31	0.33	0.35	0.36	0.36	0.35	0.47	0.46	0.47	0.47	0.46	0.47	0.48
125	0.41	0.37	0.34	0.33	0.33	0.33	0.36	0.38	0.41	0.42	0.42	0.41	0.55	0.55	0.55	0.56	0.55	0.56	0.56
130	0.47	0.43	0.40	0.38	0.39	0.39	0.41	0.43	0.46	0.47	0.47	0.46	0.60	0.61	0.63	0.66	0.66	0.67	0.68
135	0.51	0.49	0.45	0.43	0.43	0.46	0.48	0.49	0.50	0.51	0.51	0.50	0.63	0.64	0.67	0.70	0.73	0.73	0.74
140	0.53	0.53	0.50	0.49	0.48	0.50	0.51	0.51	0.54	0.54	0.53	0.53	0.65	0.65	0.67	0.72	0.74	0.75	0.76
145	0.54	0.54	0.52	0.49	0.49	0.51	0.51	0.52	0.55	0.54	0.54	0.54	0.67	0.67	0.68	0.71	0.74	0.75	0.76
150	0.56	0.56	0.53	0.50	0.47	0.49	0.49	0.50	0.52	0.55	0.53	0.54	0.72	0.71	0.70	0.73	0.74	0.74	0.73
155	0.59	0.60	0.58	0.52	0.49	0.51	0.48	0.51	0.55	0.57	0.58	0.58	0.74	0.74	0.76	0.76	0.76	0.75	0.71
160	0.67	0.66	0.62	0.56	0.50	0.52	0.49	0.53	0.58	0.62	0.63	0.65	0.82	0.82	0.81	0.81	0.80	0.78	0.74
165	0.75	0.74	0.70	0.65	0.59	0.59	0.55	0.60	0.67	0.71	0.73	0.75	0.84	0.85	0.87	0.88	0.88	0.86	0.81
170	0.80	0.80	0.78	0.72	0.65	0.65	0.64	0.66	0.72	0.76	0.79	0.81	0.87	0.87	0.89	0.92	0.93	0.92	0.87
175	0.86	0.85	0.84	0.79	0.75	0.75	0.74	0.72	0.76	0.80	0.81	0.82	0.87	0.87	0.88	0.90	0.90	0.91	0.87
180	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81

Table--2

UNIT: cd

C (DEG)	285	300	315	330	345														
γ (DEG)	0	1300	1300	1300	1300														
5	1292	1292	1293	1294	1294														
10	1273	1274	1276	1279	1281														
15	1243	1245	1250	1254	1258														
20	1202	1207	1214	1221	1227														
25	1152	1157	1168	1177	1186														
30	1091	1099	1111	1124	1134														
35	1020	1030	1045	1060	1073														
40	941	952	970	988	1002														
45	854	866	884	903	920														
50	758	771	790	810	829														
55	655	668	687	708	726														
60	546	558	577	597	616														
65	433	443	461	480	497														
70	318	327	342	359	375														
75	208	215	227	241	255														
80	109	114	122	131	141														
85	33.4	34.6	37.9	42.0	47.2														
90	0.88	0.85	0.73	0.52	0.55														
95	0.40	0.40	0.38	0.36	0.34														
100	0.42	0.42	0.42	0.41	0.39														
105	0.45	0.46	0.45	0.45	0.43														
110	0.45	0.46	0.45	0.44	0.42														
115	0.46	0.46	0.45	0.43	0.42														
120	0.48	0.48	0.47	0.47	0.47														
125	0.54	0.53	0.53	0.52	0.53														
130	0.65	0.63	0.60	0.59	0.58														
135	0.70	0.68	0.64	0.62	0.61														
140	0.72	0.70	0.68	0.66	0.63														
145	0.73	0.72	0.70	0.68	0.66														
150	0.73	0.72	0.72	0.70	0.70														
155	0.72	0.72	0.72	0.76	0.73														
160	0.73	0.73	0.74	0.79	0.77														
165	0.78	0.77	0.78	0.82	0.81														
170	0.85	0.82	0.81	0.85	0.83														
175	0.87	0.83	0.83	0.85	0.84														
180	0.81	0.81	0.81	0.81	0.81														

THD and PF Measurement Test Results:

Electrical Measurement:

Rated CCT	Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor	iTHD(%)
3500K	277.0	60	0.1041	28.56	0.9907	9.03
4000K	277.0	60	0.1105	30.18	0.9857	9.99
5000K	277.0	60	0.1080	29.56	0.9883	8.36

Annex:

ANSI CCT Quadrangle (omit any outside product range)/Worst-Case Value	Actual CCT (K)	Power Consumption (W)	Lumen Output (lm)	Efficacy (lm/W)	Input Control Signal Applied
3500K	3499	29.11	3815.9	131.09	Set Switch 0% to 3500K
4000K	4103	30.65	4167.6	135.97	Set Switch 50% to 4000K
5000K	5125	30.27	4064.4	134.27	Set Switch 100% to 5000K
Lowest Efficacy	131.09 lm/W (@3500K)				
Maximum Power	30.65 W				

Photo of Sample:



Equipment List:

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

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