

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):

P7-50W DXYYZZ

Representative (Tested) Model:

P7-50W DXYYZZ (0%, 3500K)

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

P7-50W DXYYZZ (100%, 5000K)

Model Difference: N/A

Prepare by:



Engineer: Alan Wang

Date: 2021-04-09

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:	P7-50W DXYYZZ
Product Type:	2x4 Luminaires for Ambient Lighting of Interior Commercial Spaces
Rating Input:	120-277Vac, 50/60Hz, 36/40/50W
Declared CCT:	3500K/4000K/5000K
Declared Light Output:	6100 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-SE50B-380125-105095-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:	2021-01-30
Quantity of Receipt Samples:	1 pc
Sample Number:	210130007-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.:	NTCLR21030382
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	2021-02-01
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:
1. Photometric and Electrical Measurements – Light Distribution Method: 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.
2. Photometric and Electrical Measurements – Integrating Sphere Method: 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.
3. THD and PF Measurements: 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.

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	0.4098	48.91	0.9946
4000K	120.0	60	0.4022	48.02	0.9949
5000K	120.0	60	0.3954	47.21	0.9950

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	3503	83.9	12	85	97	-11%	(0.4042, 0.3879)	(0.2361, 0.5099)	-0.0010
4000K	4168	83.9	15	84	96	-11%	(0.3734, 0.3724)	(0.2222, 0.4986)	0.0001
5000K	5182	83.8	13	83	96	-12%	(0.3406, 0.3509)	(0.2086, 0.4837)	0.0015

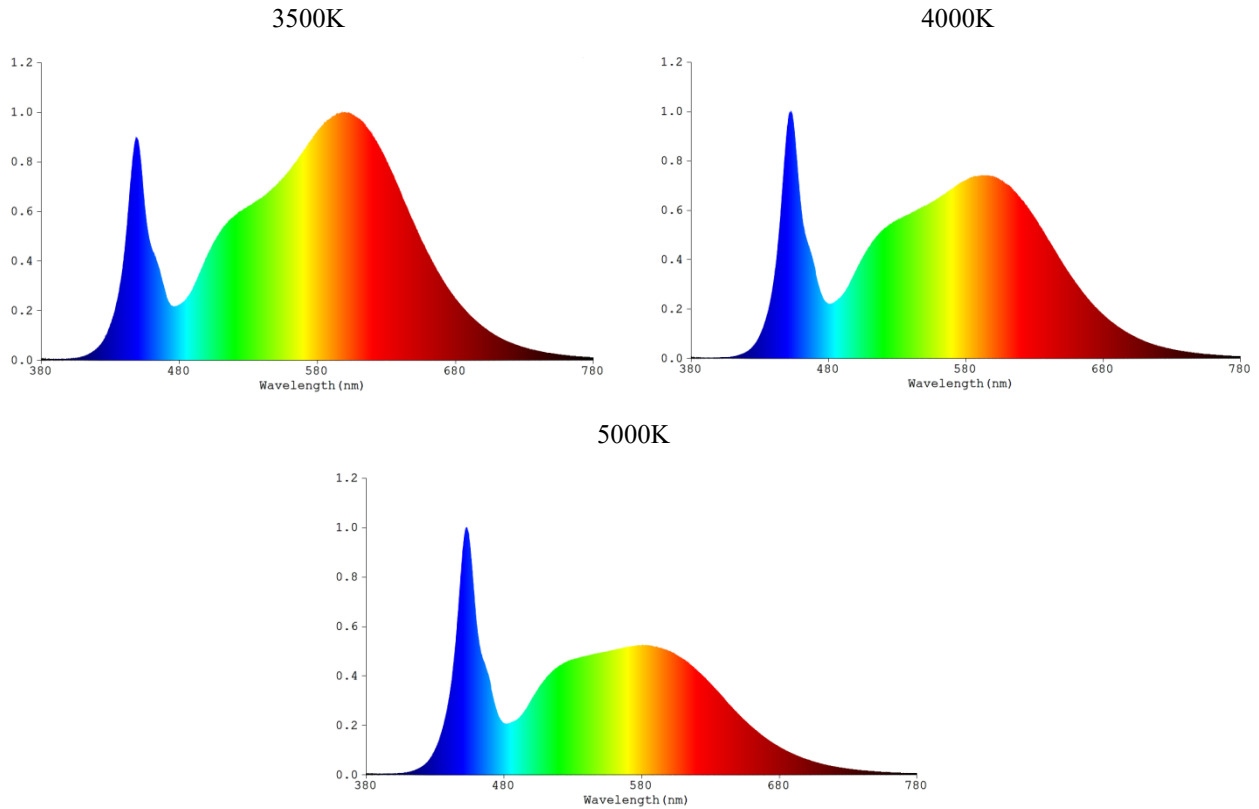
Specify Color Rendering

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	64	12	77	83	69	84	98	76
4000K	83	90	94	83	82	85	87	67	15	75	81	59	85	97	77
5000K	83	89	92	83	83	84	88	69	13	73	82	59	84	96	78

Output Data:

Rated CCT (K)	Light output (lm)	Efficacy (lm/W)
3500K	6120.1	125.13
4000K	6255.9	130.28
5000K	6168.3	130.66

Spectrum Diagram:



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

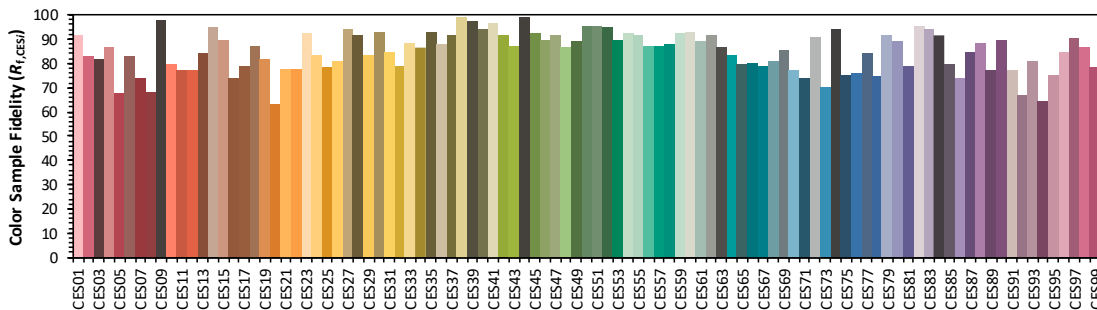
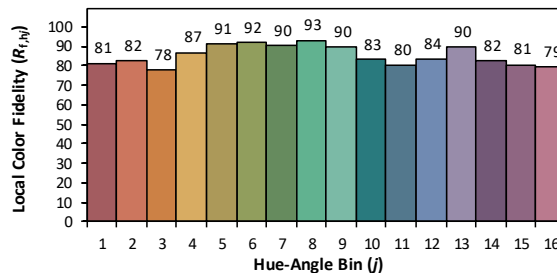
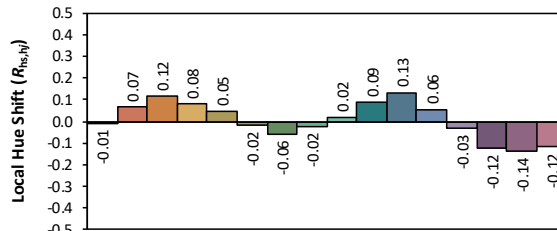
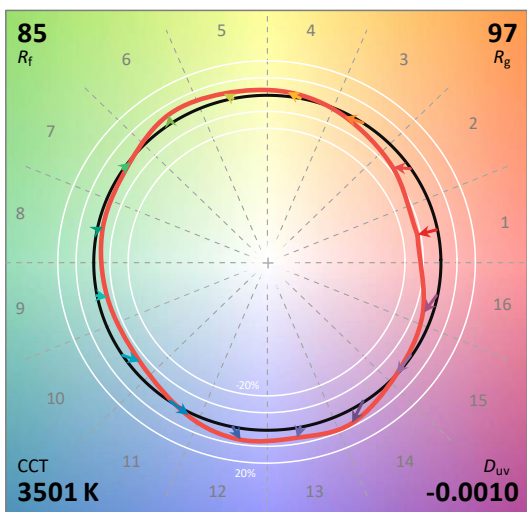
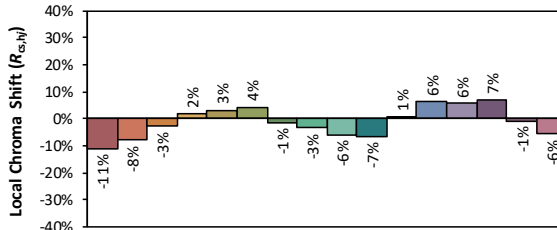
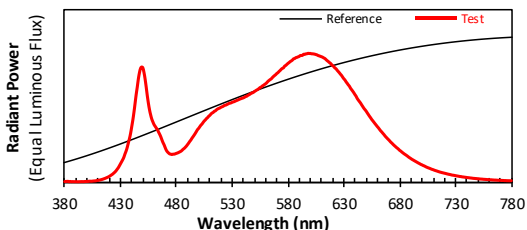
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Date: 2021/4/9

Manufacturer: VENAS Co., LIMITED

Model: P7-50W DXYYZZ



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

x 0.4042
 y 0.3878
 u' 0.2362
 v' 0.5099

CIE 13.3-1995
(CRI)
 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 3500K:

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	0.0045	447	0.8510	514	0.5502	581	0.9284	648	0.5734	715	0.0816
381	0.0056	448	0.8841	515	0.5537	582	0.9360	649	0.5627	716	0.0790
382	0.0061	449	0.8937	516	0.5623	583	0.9414	650	0.5516	717	0.0764
383	0.0064	450	0.8876	517	0.5682	584	0.9479	651	0.5379	718	0.0741
384	0.0035	451	0.8525	518	0.5726	585	0.9575	652	0.5250	719	0.0722
385	0.0056	452	0.8023	519	0.5759	586	0.9596	653	0.5119	720	0.0699
386	0.0036	453	0.7389	520	0.5818	587	0.9663	654	0.5000	721	0.0680
387	0.0044	454	0.6711	521	0.5855	588	0.9687	655	0.4869	722	0.0655
388	0.0040	455	0.6114	522	0.5892	589	0.9726	656	0.4760	723	0.0633
389	0.0038	456	0.5611	523	0.5958	590	0.9758	657	0.4648	724	0.0612
390	0.0040	457	0.5223	524	0.5977	591	0.9827	658	0.4534	725	0.0597
391	0.0036	458	0.4901	525	0.6014	592	0.9834	659	0.4428	726	0.0574
392	0.0032	459	0.4680	526	0.6059	593	0.9846	660	0.4316	727	0.0551
393	0.0038	460	0.4478	527	0.6106	594	0.9929	661	0.4218	728	0.0540
394	0.0039	461	0.4341	528	0.6133	595	0.9921	662	0.4100	729	0.0524
395	0.0044	462	0.4209	529	0.6155	596	0.9957	663	0.3987	730	0.0507
396	0.0043	463	0.4083	530	0.6199	597	0.9966	664	0.3896	731	0.0490
397	0.0041	464	0.3903	531	0.6231	598	1.0000	665	0.3790	732	0.0474
398	0.0050	465	0.3731	532	0.6257	599	0.9985	666	0.3694	733	0.0458
399	0.0054	466	0.3539	533	0.6302	600	0.9992	667	0.3579	734	0.0440
400	0.0059	467	0.3307	534	0.6337	601	0.9966	668	0.3485	735	0.0433
401	0.0061	468	0.3084	535	0.6373	602	0.9963	669	0.3391	736	0.0412
402	0.0074	469	0.2907	536	0.6412	603	0.9951	670	0.3304	737	0.0404
403	0.0075	470	0.2687	537	0.6453	604	0.9934	671	0.3214	738	0.0389
404	0.0072	471	0.2486	538	0.6485	605	0.9906	672	0.3114	739	0.0379
405	0.0083	472	0.2358	539	0.6516	606	0.9880	673	0.3036	740	0.0366
406	0.0093	473	0.2271	540	0.6546	607	0.9830	674	0.2946	741	0.0352
407	0.0099	474	0.2198	541	0.6587	608	0.9802	675	0.2861	742	0.0344
408	0.0110	475	0.2176	542	0.6646	609	0.9769	676	0.2786	743	0.0331
409	0.0130	476	0.2148	543	0.6669	610	0.9736	677	0.2703	744	0.0322
410	0.0142	477	0.2174	544	0.6735	611	0.9701	678	0.2635	745	0.0310
411	0.0158	478	0.2175	545	0.6781	612	0.9645	679	0.2562	746	0.0298
412	0.0178	479	0.2201	546	0.6833	613	0.9601	680	0.2474	747	0.0291
413	0.0203	480	0.2236	547	0.6894	614	0.9520	681	0.2415	748	0.0282
414	0.0227	481	0.2264	548	0.6930	615	0.9439	682	0.2338	749	0.0275
415	0.0260	482	0.2304	549	0.6973	616	0.9373	683	0.2271	750	0.0265
416	0.0290	483	0.2349	550	0.7037	617	0.9293	684	0.2203	751	0.0258
417	0.0327	484	0.2395	551	0.7095	618	0.9229	685	0.2145	752	0.0247
418	0.0365	485	0.2461	552	0.7151	619	0.9132	686	0.2086	753	0.0240
419	0.0405	486	0.2551	553	0.7201	620	0.9044	687	0.2023	754	0.0235
420	0.0452	487	0.2616	554	0.7268	621	0.8974	688	0.1953	755	0.0224
421	0.0510	488	0.2704	555	0.7344	622	0.8867	689	0.1893	756	0.0220
422	0.0569	489	0.2800	556	0.7382	623	0.8806	690	0.1836	757	0.0213
423	0.0630	490	0.2913	557	0.7462	624	0.8693	691	0.1775	758	0.0207
424	0.0709	491	0.3030	558	0.7514	625	0.8593	692	0.1727	759	0.0199
425	0.0787	492	0.3160	559	0.7582	626	0.8492	693	0.1675	760	0.0196
426	0.0885	493	0.3272	560	0.7642	627	0.8382	694	0.1626	761	0.0187
427	0.1003	494	0.3412	561	0.7720	628	0.8282	695	0.1576	762	0.0185
428	0.1120	495	0.3532	562	0.7819	629	0.8151	696	0.1526	763	0.0176
429	0.1273	496	0.3659	563	0.7892	630	0.8027	697	0.1476	764	0.0170
430	0.1430	497	0.3793	564	0.7961	631	0.7933	698	0.1432	765	0.0163
431	0.1588	498	0.3938	565	0.8018	632	0.7793	699	0.1380	766	0.0162
432	0.1749	499	0.4081	566	0.8117	633	0.7680	700	0.1345	767	0.0156
433	0.1932	500	0.4177	567	0.8202	634	0.7556	701	0.1298	768	0.0150
434	0.2191	501	0.4303	568	0.8277	635	0.7452	702	0.1263	769	0.0145
435	0.2413	502	0.4422	569	0.8348	636	0.7297	703	0.1218	770	0.0143
436	0.2695	503	0.4514	570	0.8437	637	0.7179	704	0.1173	771	0.0140
437	0.3040	504	0.4635	571	0.8501	638	0.7062	705	0.1136	772	0.0134
438	0.3377	505	0.4748	572	0.8592	639	0.6935	706	0.1102	773	0.0131
439	0.3772	506	0.4834	573	0.8672	640	0.6796	707	0.1071	774	0.0123
440	0.4280	507	0.4938	574	0.8765	641	0.6670	708	0.1031	775	0.0124
441	0.4800	508	0.5013	575	0.8835	642	0.6498	709	0.0996	776	0.0116
442	0.5398	509	0.5117	576	0.8878	643	0.6375	710	0.0970	777	0.0116
443	0.6083	510	0.5188	577	0.9007	644	0.6256	711	0.0934	778	0.0112
444	0.6781	511	0.5288	578	0.9059	645	0.6143	712	0.0904	779	0.0112
445	0.7374	512	0.5367	579	0.9142	646	0.6001	713	0.0876	780	0.0113
446	0.8018	513	0.5413	580	0.9219	647	0.5869	714	0.0846	N/A	N/A

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

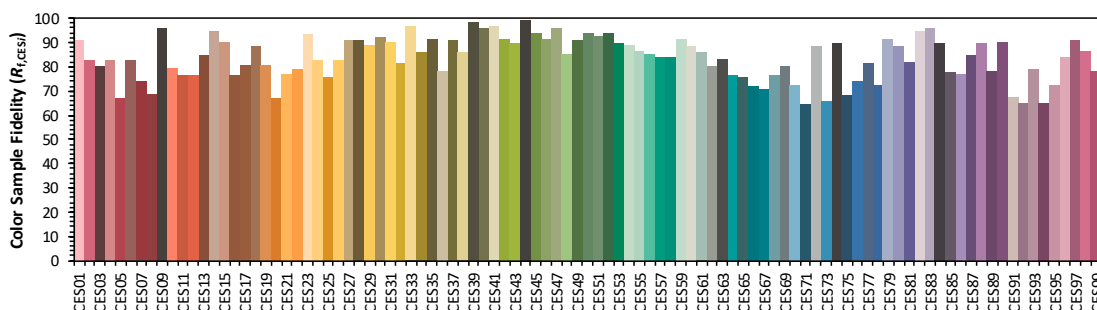
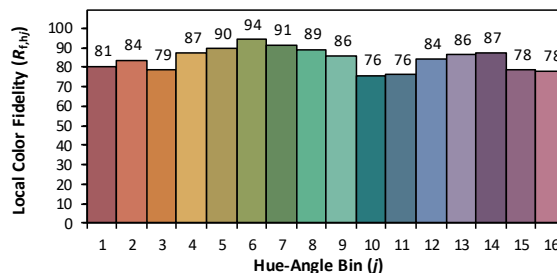
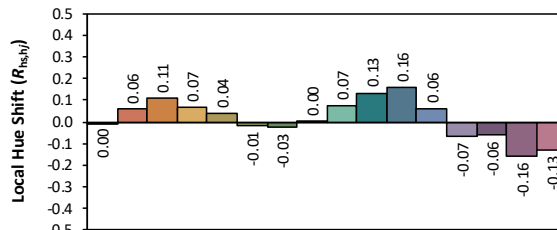
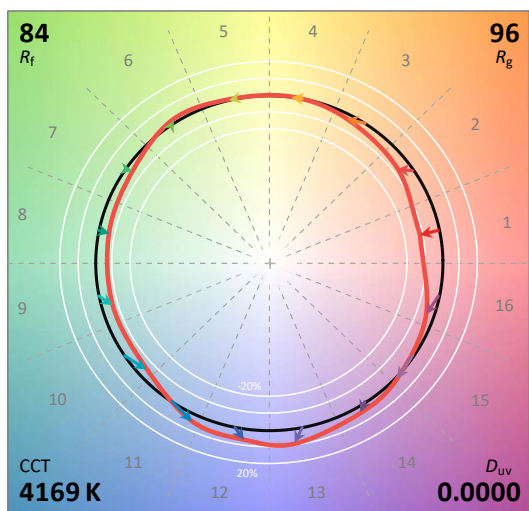
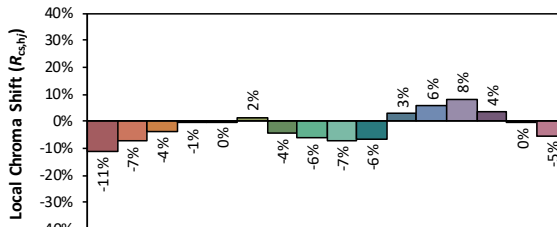
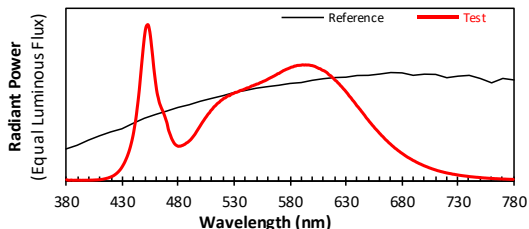
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: VENAS Co., LIMITED

Date: 2021/4/9

Model: P7-50W DXYYZZ



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

x 0.3733
 y 0.3722
 u' 0.2222
 v' 0.4985

CIE 13.3-1995
(CRI)
 R_a 84
 R_9 15

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	0.0058	447	0.7321	514	0.4853	581	0.7251	648	0.4055	715	0.0585
381	0.0030	448	0.8068	515	0.4931	582	0.7265	649	0.3964	716	0.0567
382	0.0026	449	0.8788	516	0.4980	583	0.7283	650	0.3886	717	0.0550
383	0.0023	450	0.9401	517	0.5034	584	0.7327	651	0.3785	718	0.0530
384	0.0037	451	0.9807	518	0.5114	585	0.7326	652	0.3704	719	0.0515
385	0.0027	452	0.9950	519	0.5159	586	0.7357	653	0.3617	720	0.0496
386	0.0020	453	0.9962	520	0.5215	587	0.7370	654	0.3528	721	0.0483
387	0.0025	454	0.9700	521	0.5274	588	0.7370	655	0.3454	722	0.0467
388	0.0025	455	0.9249	522	0.5292	589	0.7378	656	0.3358	723	0.0455
389	0.0026	456	0.8609	523	0.5346	590	0.7382	657	0.3286	724	0.0444
390	0.0025	457	0.7954	524	0.5402	591	0.7403	658	0.3209	725	0.0427
391	0.0022	458	0.7235	525	0.5436	592	0.7400	659	0.3133	726	0.0408
392	0.0026	459	0.6629	526	0.5430	593	0.7390	660	0.3045	727	0.0405
393	0.0019	460	0.6079	527	0.5510	594	0.7404	661	0.2974	728	0.0388
394	0.0024	461	0.5603	528	0.5536	595	0.7391	662	0.2890	729	0.0378
395	0.0024	462	0.5303	529	0.5563	596	0.7396	663	0.2828	730	0.0364
396	0.0023	463	0.4994	530	0.5594	597	0.7392	664	0.2752	731	0.0353
397	0.0025	464	0.4798	531	0.5644	598	0.7376	665	0.2671	732	0.0339
398	0.0024	465	0.4614	532	0.5642	599	0.7362	666	0.2598	733	0.0331
399	0.0027	466	0.4461	533	0.5671	600	0.7356	667	0.2542	734	0.0319
400	0.0027	467	0.4283	534	0.5704	601	0.7331	668	0.2464	735	0.0311
401	0.0028	468	0.4087	535	0.5747	602	0.7313	669	0.2397	736	0.0301
402	0.0032	469	0.3869	536	0.5771	603	0.7279	670	0.2338	737	0.0293
403	0.0031	470	0.3645	537	0.5787	604	0.7240	671	0.2269	738	0.0284
404	0.0037	471	0.3298	538	0.5809	605	0.7206	672	0.2207	739	0.0275
405	0.0040	472	0.3081	539	0.5844	606	0.7166	673	0.2148	740	0.0266
406	0.0045	473	0.2892	540	0.5870	607	0.7159	674	0.2078	741	0.0255
407	0.0046	474	0.2695	541	0.5909	608	0.7106	675	0.2033	742	0.0248
408	0.0053	475	0.2555	542	0.5935	609	0.7063	676	0.1974	743	0.0242
409	0.0057	476	0.2424	543	0.5939	610	0.7037	677	0.1915	744	0.0235
410	0.0060	477	0.2330	544	0.5980	611	0.7007	678	0.1868	745	0.0227
411	0.0075	478	0.2268	545	0.6024	612	0.6960	679	0.1808	746	0.0221
412	0.0083	479	0.2226	546	0.6059	613	0.6912	680	0.1761	747	0.0213
413	0.0098	480	0.2195	547	0.6066	614	0.6843	681	0.1711	748	0.0210
414	0.0114	481	0.2205	548	0.6113	615	0.6764	682	0.1662	749	0.0203
415	0.0130	482	0.2207	549	0.6126	616	0.6727	683	0.1609	750	0.0195
416	0.0150	483	0.2236	550	0.6171	617	0.6674	684	0.1561	751	0.0190
417	0.0166	484	0.2257	551	0.6179	618	0.6589	685	0.1513	752	0.0181
418	0.0195	485	0.2298	552	0.6208	619	0.6539	686	0.1470	753	0.0177
419	0.0218	486	0.2330	553	0.6252	620	0.6456	687	0.1434	754	0.0169
420	0.0248	487	0.2396	554	0.6280	621	0.6393	688	0.1389	755	0.0167
421	0.0282	488	0.2432	555	0.6308	622	0.6342	689	0.1351	756	0.0160
422	0.0317	489	0.2486	556	0.6347	623	0.6247	690	0.1302	757	0.0156
423	0.0368	490	0.2550	557	0.6371	624	0.6195	691	0.1269	758	0.0150
424	0.0419	491	0.2615	558	0.6401	625	0.6097	692	0.1235	759	0.0146
425	0.0479	492	0.2699	559	0.6439	626	0.6029	693	0.1189	760	0.0144
426	0.0546	493	0.2789	560	0.6480	627	0.5948	694	0.1156	761	0.0137
427	0.0622	494	0.2882	561	0.6522	628	0.5864	695	0.1119	762	0.0135
428	0.0706	495	0.2977	562	0.6558	629	0.5792	696	0.1083	763	0.0130
429	0.0806	496	0.3096	563	0.6596	630	0.5704	697	0.1056	764	0.0123
430	0.0921	497	0.3209	564	0.6627	631	0.5618	698	0.1020	765	0.0124
431	0.1045	498	0.3324	565	0.6667	632	0.5529	699	0.0989	766	0.0119
432	0.1180	499	0.3434	566	0.6700	633	0.5421	700	0.0954	767	0.0115
433	0.1341	500	0.3549	567	0.6745	634	0.5345	701	0.0928	768	0.0113
434	0.1506	501	0.3666	568	0.6781	635	0.5261	702	0.0898	769	0.0107
435	0.1698	502	0.3774	569	0.6838	636	0.5155	703	0.0873	770	0.0103
436	0.1907	503	0.3876	570	0.6848	637	0.5079	704	0.0841	771	0.0099
437	0.2151	504	0.3986	571	0.6897	638	0.4986	705	0.0813	772	0.0098
438	0.2430	505	0.4079	572	0.6942	639	0.4886	706	0.0790	773	0.0097
439	0.2735	506	0.4186	573	0.6982	640	0.4782	707	0.0761	774	0.0092
440	0.3098	507	0.4281	574	0.7032	641	0.4712	708	0.0738	775	0.0089
441	0.3532	508	0.4352	575	0.7060	642	0.4616	709	0.0713	776	0.0087
442	0.3963	509	0.4470	576	0.7095	643	0.4535	710	0.0692	777	0.0083
443	0.4539	510	0.4541	577	0.7127	644	0.4434	711	0.0668	778	0.0083
444	0.5124	511	0.4627	578	0.7151	645	0.4349	712	0.0642	779	0.0081
445	0.5778	512	0.4722	579	0.7184	646	0.4254	713	0.0624	780	0.0081
446	0.6541	513	0.4777	580	0.7211	647	0.4163	714	0.0605	N/A	N/A

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

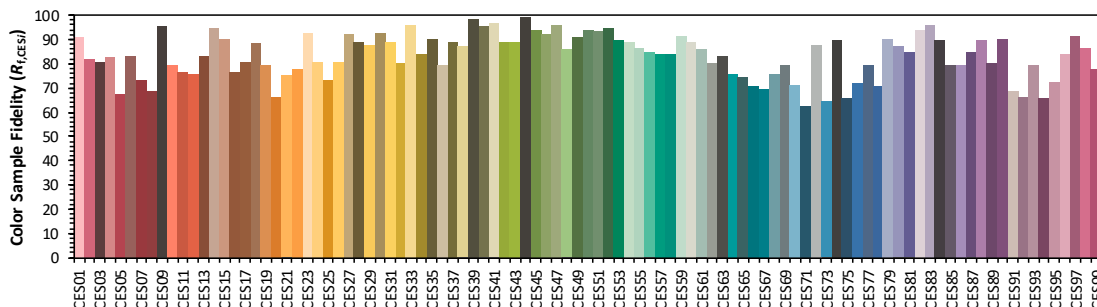
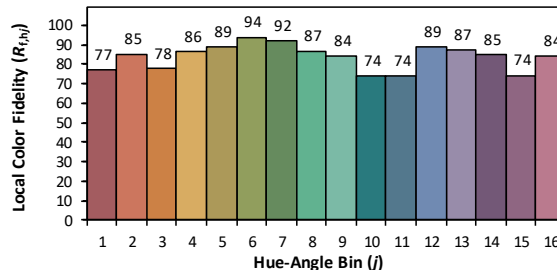
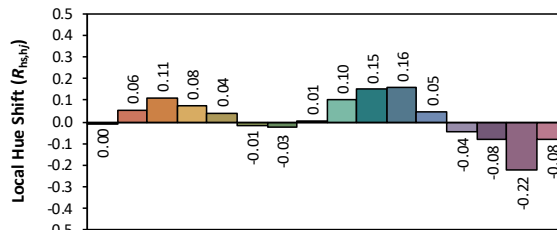
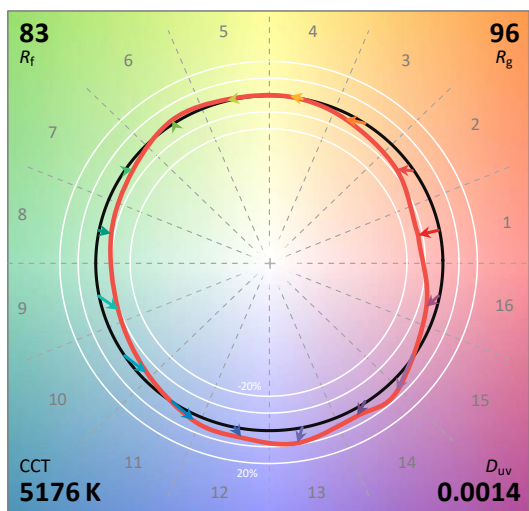
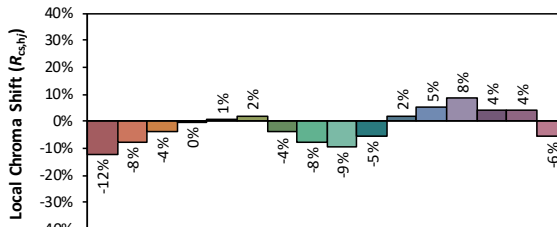
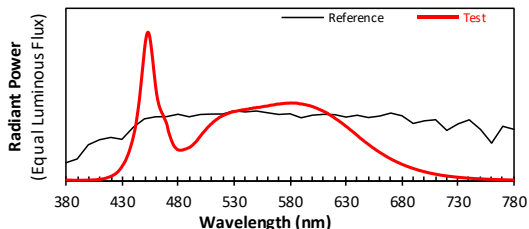
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Date: 2021/4/9

Manufacturer: VENAS Co., LIMITED

Model: P7-50W DXYYZZ



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

x 0.3405
 y 0.3507
 u' 0.2087
 v' 0.4836

CIE 13.3-1995
(CRI)
 R_a 84
 R_9 13

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

Spectrum Data for 5000K:

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	0.0062	447	0.6818	514	0.4121	581	0.5238	648	0.2576	715	0.0382
381	0.0045	448	0.7572	515	0.4160	582	0.5227	649	0.2523	716	0.0367
382	0.0048	449	0.8307	516	0.4217	583	0.5230	650	0.2460	717	0.0358
383	0.0037	450	0.9040	517	0.4278	584	0.5228	651	0.2408	718	0.0349
384	0.0046	451	0.9562	518	0.4305	585	0.5230	652	0.2348	719	0.0337
385	0.0032	452	0.9914	519	0.4347	586	0.5222	653	0.2294	720	0.0332
386	0.0037	453	0.9999	520	0.4387	587	0.5212	654	0.2236	721	0.0317
387	0.0033	454	0.9813	521	0.4426	588	0.5191	655	0.2187	722	0.0307
388	0.0033	455	0.9415	522	0.4447	589	0.5173	656	0.2137	723	0.0299
389	0.0036	456	0.8826	523	0.4487	590	0.5171	657	0.2082	724	0.0289
390	0.0035	457	0.8176	524	0.4517	591	0.5171	658	0.2026	725	0.0284
391	0.0033	458	0.7459	525	0.4542	592	0.5141	659	0.1983	726	0.0271
392	0.0033	459	0.6787	526	0.4568	593	0.5126	660	0.1931	727	0.0261
393	0.0036	460	0.6150	527	0.4605	594	0.5119	661	0.1882	728	0.0255
394	0.0040	461	0.5673	528	0.4625	595	0.5094	662	0.1837	729	0.0247
395	0.0038	462	0.5287	529	0.4640	596	0.5083	663	0.1792	730	0.0242
396	0.0039	463	0.5003	530	0.4661	597	0.5060	664	0.1747	731	0.0232
397	0.0044	464	0.4796	531	0.4672	598	0.5049	665	0.1692	732	0.0226
398	0.0043	465	0.4612	532	0.4685	599	0.5019	666	0.1655	733	0.0218
399	0.0041	466	0.4474	533	0.4701	600	0.4993	667	0.1605	734	0.0211
400	0.0050	467	0.4288	534	0.4722	601	0.4977	668	0.1567	735	0.0207
401	0.0050	468	0.4122	535	0.4736	602	0.4935	669	0.1525	736	0.0199
402	0.0054	469	0.3951	536	0.4746	603	0.4914	670	0.1481	737	0.0193
403	0.0057	470	0.3727	537	0.4769	604	0.4885	671	0.1442	738	0.0187
404	0.0060	471	0.3372	538	0.4774	605	0.4849	672	0.1401	739	0.0182
405	0.0063	472	0.3126	539	0.4782	606	0.4812	673	0.1365	740	0.0176
406	0.0068	473	0.2905	540	0.4791	607	0.4787	674	0.1329	741	0.0172
407	0.0075	474	0.2689	541	0.4814	608	0.4741	675	0.1291	742	0.0167
408	0.0085	475	0.2514	542	0.4815	609	0.4718	676	0.1257	743	0.0162
409	0.0090	476	0.2359	543	0.4825	610	0.4674	677	0.1221	744	0.0157
410	0.0102	477	0.2263	544	0.4862	611	0.4647	678	0.1192	745	0.0150
411	0.0110	478	0.2187	545	0.4861	612	0.4601	679	0.1154	746	0.0146
412	0.0125	479	0.2108	546	0.4873	613	0.4567	680	0.1120	747	0.0141
413	0.0137	480	0.2079	547	0.4892	614	0.4524	681	0.1088	748	0.0140
414	0.0155	481	0.2058	548	0.4908	615	0.4462	682	0.1060	749	0.0133
415	0.0173	482	0.2055	549	0.4909	616	0.4421	683	0.1030	750	0.0130
416	0.0199	483	0.2068	550	0.4930	617	0.4371	684	0.0999	751	0.0125
417	0.0222	484	0.2070	551	0.4937	618	0.4331	685	0.0969	752	0.0121
418	0.0248	485	0.2102	552	0.4941	619	0.4283	686	0.0945	753	0.0120
419	0.0279	486	0.2130	553	0.4945	620	0.4223	687	0.0913	754	0.0114
420	0.0312	487	0.2148	554	0.4962	621	0.4165	688	0.0886	755	0.0111
421	0.0346	488	0.2176	555	0.4977	622	0.4120	689	0.0863	756	0.0108
422	0.0391	489	0.2211	556	0.4995	623	0.4076	690	0.0837	757	0.0105
423	0.0433	490	0.2245	557	0.5010	624	0.4017	691	0.0814	758	0.0103
424	0.0483	491	0.2288	558	0.5016	625	0.3963	692	0.0788	759	0.0099
425	0.0547	492	0.2356	559	0.5023	626	0.3917	693	0.0771	760	0.0097
426	0.0618	493	0.2413	560	0.5029	627	0.3856	694	0.0742	761	0.0093
427	0.0703	494	0.2497	561	0.5052	628	0.3795	695	0.0720	762	0.0089
428	0.0792	495	0.2567	562	0.5080	629	0.3736	696	0.0693	763	0.0088
429	0.0899	496	0.2644	563	0.5086	630	0.3678	697	0.0678	764	0.0085
430	0.1015	497	0.2733	564	0.5096	631	0.3620	698	0.0655	765	0.0083
431	0.1135	498	0.2840	565	0.5101	632	0.3567	699	0.0638	766	0.0078
432	0.1265	499	0.2937	566	0.5110	633	0.3502	700	0.0613	767	0.0078
433	0.1406	500	0.3030	567	0.5142	634	0.3430	701	0.0600	768	0.0076
434	0.1595	501	0.3125	568	0.5145	635	0.3382	702	0.0583	769	0.0073
435	0.1771	502	0.3221	569	0.5168	636	0.3319	703	0.0558	770	0.0071
436	0.1975	503	0.3303	570	0.5161	637	0.3256	704	0.0542	771	0.0069
437	0.2218	504	0.3388	571	0.5170	638	0.3197	705	0.0525	772	0.0067
438	0.2472	505	0.3477	572	0.5186	639	0.3136	706	0.0508	773	0.0064
439	0.2741	506	0.3566	573	0.5189	640	0.3072	707	0.0493	774	0.0063
440	0.3062	507	0.3644	574	0.5202	641	0.3001	708	0.0479	775	0.0060
441	0.3394	508	0.3716	575	0.5208	642	0.2933	709	0.0461	776	0.0059
442	0.3794	509	0.3799	576	0.5212	643	0.2862	710	0.0450	777	0.0057
443	0.4298	510	0.3850	577	0.5224	644	0.2814	711	0.0435	778	0.0056
444	0.4819	511	0.3938	578	0.5219	645	0.2756	712	0.0420	779	0.0056
445	0.5392	512	0.3996	579	0.5224	646	0.2694	713	0.0407	780	0.0056
446	0.6093	513	0.4051	580	0.5231	647	0.2630	714	0.0394	N/A	N/A

Goniophotometer Test Results (Test for 3500K):

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
24.6	45.6	Face Down	90	25

Electrical Data:

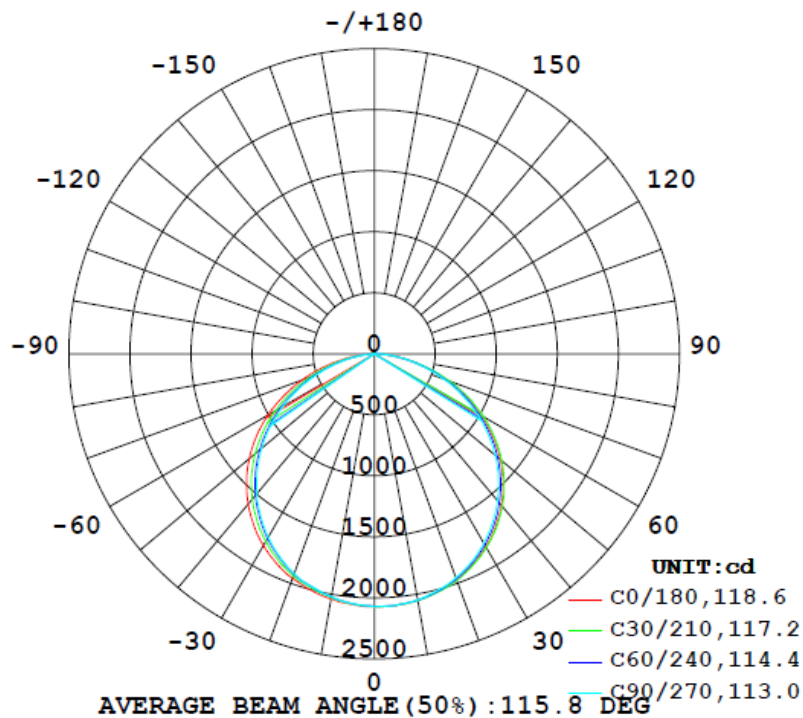
Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	0.4098	48.91	0.9946

Goniophotometer Data:

Parameter	Results	
Total Luminous (lm)	6120.1	
Luminous Efficacy (lm/w)	125.13	
Zonal Lumens Distribution (0-60°)	78.5%	
Beam Angle (°)	115.8	
Spacing Criterion	0-180°	90-270°
	1.32	1.30
UGR	Viewed Crosswise	Viewed Endwise
	20.5	20.6

Luminous Intensity Distribution Diagram:

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM

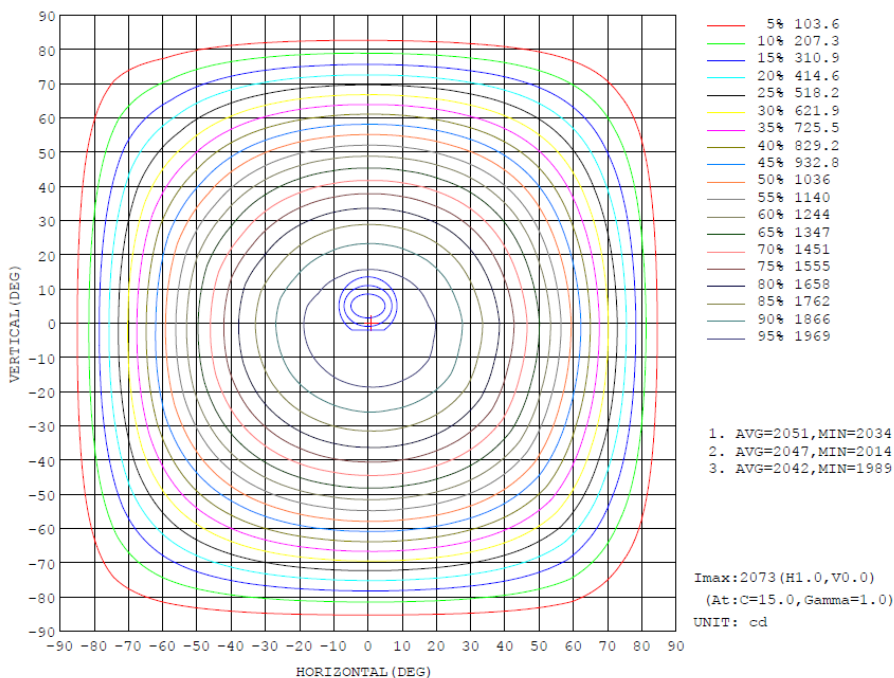


Zonal Flux Diagram:

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	zone	total	lum, lamp
10	2049	2050	2046	2042	2039	2027	2020	2030	0- 10	196.0	196.0	3.2,3.2
20	1967	1971	1952	1952	1958	1929	1917	1937	10- 20	564.7	760.6	12.4,12.4
30	1826	1824	1793	1802	1815	1760	1736	1774	20- 30	865.4	1626	26.6,26.6
40	1622	1615	1571	1591	1607	1533	1496	1547	30- 40	1057	2683	43.8,43.8
50	1351	1343	1294	1322	1337	1247	1203	1261	40- 50	1110	3793	62,62
60	1014	1014	960.5	995.6	1006	910.7	865.2	919.3	50- 60	1012	4805	78.5,78.5
70	631.8	643.7	604.6	632.5	630.7	542.9	503.8	543.7	60- 70	770.1	5575	91.1,91.1
80	250.4	274.6	254.6	270.8	260.3	198.5	172.3	190.9	70- 80	430.6	6006	98.1,98.1
90	6.838	14.04	14.03	13.23	3.717	1.327	1.704	1.002	80- 90	108.9	6115	99.9,99.9
100	0.3305	0.3640	0.4132	0.3703	0.6322	0.6694	0.6954	0.6753	90-100	1.497	6116	99.9,99.9
110	0.4145	0.3710	0.4156	0.4405	0.6830	0.7004	0.7410	0.7294	100-110	0.5779	6117	99.9,99.9
120	0.5727	0.4473	0.5068	0.5876	0.7635	0.7647	0.7865	0.7697	110-120	0.5829	6117	100,100
130	0.7450	0.5963	0.6561	0.7505	0.9670	1.075	1.098	0.9760	120-130	0.6674	6118	100,100
140	0.8491	0.7752	0.8153	0.8780	1.039	1.162	1.229	1.103	130-140	0.7159	6119	100,100
150	0.8974	0.8062	0.7856	0.8775	1.150	1.180	1.182	1.167	140-150	0.6214	6119	100,100
160	1.070	0.8978	0.7739	0.9918	1.313	1.304	1.189	1.179	150-160	0.4792	6120	100,100
170	1.284	1.192	1.021	1.233	1.392	1.485	1.389	1.273	160-170	0.3960	6120	100,100
180	1.338	1.358	1.287	1.267	1.349	1.371	1.328	1.282	170-180	0.1253	6120	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											
X=2H Y=2H	UGR Viewed Crosswise					UGR Viewed Endwise					
	10.1	11.7	10.4	12.0	12.3	9.9	11.6	10.3	11.9	12.2	
3H	11.9	13.4	12.3	13.7	14.1	11.8	13.2	12.1	13.6	13.9	
4H	12.5	14.0	12.9	14.3	14.7	12.4	13.8	12.8	14.2	14.6	
6H	13.0	14.3	13.4	14.7	15.1	12.9	14.2	13.3	14.6	15.0	
8H	13.1	14.4	13.6	14.8	15.2	13.1	14.3	13.5	14.7	15.1	
12H	13.2	14.4	13.6	14.8	15.2	13.2	14.4	13.6	14.8	15.2	
4H											
2H	10.7	12.1	11.1	12.4	12.8	10.6	12.0	11.0	12.4	12.8	
3H	12.7	13.9	13.1	14.3	14.7	12.7	13.9	13.1	14.3	14.7	
4H	13.5	14.6	13.9	15.0	15.4	13.5	14.5	13.9	15.0	15.4	
6H	14.1	15.0	14.5	15.4	15.9	14.1	15.0	14.6	15.5	15.9	
8H	14.2	15.1	14.7	15.6	16.0	14.3	15.2	14.8	15.6	16.1	
12H	14.3	15.1	14.8	15.6	16.1	14.5	15.2	14.9	15.7	16.2	
8H											
4H	13.8	14.7	14.2	15.1	15.6	13.8	14.7	14.3	15.2	15.6	
6H	14.5	15.2	15.0	15.7	16.2	14.6	15.3	15.1	15.8	16.3	
8H	14.7	15.3	15.2	15.8	16.3	14.8	15.5	15.4	16.0	16.5	
12H	14.8	15.4	15.3	15.9	16.5	15.1	15.7	15.6	16.2	16.7	
12H											
4H	13.8	14.6	14.3	15.1	15.5	13.9	14.7	14.4	15.1	15.6	
6H	14.5	15.2	15.0	15.6	16.2	14.7	15.3	15.2	15.8	16.3	
8H	14.8	15.4	15.3	15.8	16.4	15.0	15.6	15.5	16.1	16.6	

Maximum UGR = 16.7

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											
X=2H Y=2H	UGR Viewed Crosswise					UGR Viewed Endwise					
	16.4	18.0	16.7	18.3	18.6	16.2	17.9	16.6	18.2	18.5	
3H	18.2	19.7	18.6	20.0	20.4	18.1	19.5	18.4	19.9	20.2	
4H	18.8	20.3	19.2	20.6	21.0	18.7	20.1	19.1	20.5	20.9	
6H	19.3	20.6	19.7	21.0	21.4	19.2	20.5	19.6	20.9	21.3	
8H	19.4	20.7	19.9	21.1	21.5	19.4	20.6	19.8	21.0	21.4	
12H	19.5	20.7	19.9	21.1	21.5	19.5	20.7	19.9	21.1	21.5	
4H											
2H	17.0	18.4	17.4	18.7	19.1	16.9	18.3	17.3	18.7	19.1	
3H	19.0	20.2	19.4	20.6	21.0	19.0	20.2	19.4	20.6	21.0	
4H	19.8	20.9	20.2	21.3	21.7	19.8	20.8	20.2	21.3	21.7	
6H	20.4	21.3	20.8	21.7	22.2	20.4	21.3	20.9	21.8	22.2	
8H	20.5	21.4	21.0	21.9	22.3	20.6	21.5	21.1	21.9	22.4	
12H	20.6	21.4	21.1	21.9	22.4	20.8	21.5	21.2	22.0	22.5	
8H											
4H	20.1	21.0	20.5	21.4	21.9	20.1	21.0	20.6	21.5	21.9	
6H	20.8	21.5	21.3	22.0	22.5	20.9	21.6	21.4	22.1	22.6	
8H	21.0	21.6	21.5	22.1	22.6	21.1	21.8	21.7	22.3	22.8	
12H	21.1	21.7	21.6	22.2	22.8	21.4	22.0	21.9	22.5	23.0	
12H											
4H	20.1	20.9	20.6	21.4	21.8	20.2	21.0	20.7	21.4	21.9	
6H	20.8	21.5	21.3	21.9	22.5	21.0	21.6	21.5	22.1	22.6	
8H	21.1	21.7	21.6	22.1	22.7	21.3	21.9	21.8	22.4	22.9	

Maximum UGR = 23.0

Luminous Distribution Intensity Data:

C (DBG)		UNIT: cd																		
y	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	
0	2071	2072	2070	2070	2069	2070	2071	2068	2065	2064	2070	2065	2071	2072	2070	2070	2069	2070	2071	
5	2068	2066	2071	2067	2068	2069	2067	2063	2065	2062	2063	2058	2063	2061	2057	2055	2054	2054	2054	
10	2049	2048	2053	2050	2049	2047	2046	2042	2042	2042	2040	2037	2039	2037	2029	2027	2023	2020	2020	
15	2014	2016	2021	2017	2014	2009	2006	2004	2003	2007	2006	2006	2004	2000	1986	1982	1977	1976	1975	
20	1967	1976	1976	1971	1962	1957	1952	1950	1950	1952	1956	1953	1958	1955	1938	1929	1922	1918	1917	
25	1905	1905	1912	1905	1894	1884	1881	1880	1881	1886	1892	1892	1895	1889	1865	1852	1842	1836	1834	
30	1826	1826	1834	1824	1810	1797	1793	1791	1797	1802	1813	1816	1815	1808	1775	1760	1747	1739	1736	
35	1731	1731	1742	1727	1710	1697	1690	1688	1695	1704	1716	1721	1719	1710	1673	1655	1638	1627	1623	
40	1622	1621	1632	1615	1594	1580	1571	1571	1579	1591	1604	1616	1607	1596	1555	1533	1513	1500	1496	
45	1494	1491	1506	1486	1464	1447	1438	1437	1449	1464	1480	1491	1480	1469	1422	1397	1375	1360	1356	
50	1351	1348	1364	1343	1319	1300	1294	1293	1304	1322	1340	1351	1337	1325	1274	1247	1224	1208	1203	
55	1190	1187	1207	1185	1161	1142	1134	1135	1148	1165	1185	1196	1178	1168	1112	1084	1060	1044	1038	
60	1014	1012	1036	1014	989	972	961	966	978	996	1015	1027	1006	995	936	911	886	871	865	
65	829	828	854	834	813	796	789	791	802	819	837	849	821	812	753	728	706	691	685	
70	632	631	661	644	626	611	605	606	618	632	650	658	631	621	565	543	523	509	504	
75	435	436	467	454	439	428	423	425	434	447	460	469	441	433	381	362	346	334	329	
80	250	252	283	275	265	257	255	256	262	271	281	286	260	255	211	199	186	177	172	
85	91.0	93.4	122	120	116	112	111	112	115	120	125	126	103	99.8	68.2	62.2	57.3	52.8	49.8	
90	6.84	4.86	12.1	14.0	14.6	14.5	14.0	13.6	13.8	13.2	12.7	11.0	3.72	3.89	0.93	1.33	1.74	1.92	1.70	
95	0.28	0.28	0.33	0.41	0.48	0.51	0.53	0.52	0.48	0.40	0.33	0.27	0.54	0.54	0.58	0.61	0.64	0.66	0.67	
100	0.33	0.33	0.33	0.36	0.39	0.40	0.41	0.41	0.40	0.37	0.34	0.32	0.63	0.63	0.66	0.67	0.67	0.69	0.70	
105	0.37	0.37	0.35	0.37	0.39	0.40	0.40	0.41	0.41	0.39	0.38	0.37	0.70	0.69	0.70	0.71	0.72	0.73	0.74	
110	0.41	0.40	0.37	0.37	0.39	0.41	0.42	0.43	0.43	0.44	0.44	0.42	0.68	0.67	0.68	0.70	0.72	0.73	0.74	
115	0.48	0.43	0.40	0.39	0.40	0.43	0.44	0.47	0.49	0.51	0.49	0.47	0.67	0.66	0.67	0.69	0.71	0.73	0.75	
120	0.57	0.51	0.46	0.45	0.46	0.48	0.51	0.54	0.57	0.59	0.57	0.56	0.76	0.74	0.77	0.76	0.76	0.77	0.79	
125	0.66	0.60	0.53	0.52	0.52	0.54	0.58	0.61	0.65	0.68	0.66	0.64	0.88	0.88	0.91	0.93	0.90	0.90	0.91	
130	0.74	0.69	0.63	0.60	0.62	0.63	0.66	0.69	0.74	0.75	0.75	0.73	0.97	0.98	1.04	1.08	1.08	1.08	1.10	
135	0.82	0.79	0.70	0.69	0.68	0.73	0.76	0.78	0.81	0.82	0.82	0.80	1.02	1.04	1.08	1.15	1.18	1.18	1.20	
140	0.85	0.84	0.80	0.78	0.77	0.79	0.82	0.82	0.87	0.88	0.85	0.85	1.04	1.05	1.08	1.16	1.20	1.22	1.23	
145	0.87	0.87	0.83	0.78	0.79	0.81	0.82	0.84	0.88	0.86	0.87	0.87	1.07	1.07	1.10	1.15	1.19	1.21	1.23	
150	0.90	0.90	0.84	0.81	0.75	0.79	0.79	0.80	0.84	0.88	0.85	0.87	1.15	1.13	1.13	1.18	1.20	1.19	1.18	
155	0.95	0.97	0.93	0.83	0.78	0.82	0.77	0.82	0.88	0.91	0.93	0.90	1.19	1.18	1.22	1.21	1.21	1.21	1.14	
160	1.07	1.08	1.00	0.90	0.79	0.83	0.77	0.85	0.93	0.99	1.01	1.04	1.31	1.31	1.30	1.30	1.28	1.25	1.19	
165	1.20	1.20	1.12	1.06	0.93	0.94	0.88	0.96	1.08	1.14	1.16	1.20	1.35	1.35	1.41	1.42	1.42	1.38	1.30	
170	1.28	1.29	1.26	1.19	1.03	1.04	1.02	1.06	1.17	1.23	1.29	1.30	1.39	1.39	1.45	1.48	1.50	1.46	1.39	
175	1.35	1.38	1.34	1.32	1.19	1.19	1.18	1.15	1.26	1.30	1.30	1.32	1.39	1.39	1.42	1.44	1.44	1.47	1.39	
180	1.34	1.38	1.37	1.36	1.31	1.32	1.29	1.24	1.28	1.27	1.27	1.31	1.35	1.35	1.38	1.37	1.36	1.31	1.33	

Table--2

UNIT: cd

C (DBG)	285	300	315	330	345															
y (DBG)	0	2068	2065	2064	2070	2065														
5	2055	2052	2054	2057	2056															
10	2023	2024	2030	2036	2034															
15	1978	1982	1986	1996	1998															
20	1919	1926	1937	1950	1953															
25	1840	1848	1866	1878	1892															
30	1744	1756	1774	1793	1806															
35	1632	1645	1670	1690	1710															
40	1503	1523	1547	1571	1592															
45	1362	1384	1412	1438	1461															
50	1211	1232	1261	1289	1313															
55	1047	1066	1095	1126	1152															
60	873	891	919	947	973															
65	692	707	733	759	783															
70	509	522	544	565	587															
75	332	342	359	377	394															
80	175	180	191	204	216															
85	49.5	51.0	54.7	59.2	64.7															
90	1.51	1.21	1.00	0.71	0.60															
95	0.65	0.65	0.61	0.58	0.56															
100	0.69	0.69	0.68	0.67	0.65															
105	0.74	0.75	0.73	0.72	0.70															
110	0.74	0.74	0.73	0.71	0.69															
115	0.74	0.75	0.73	0.69	0.68															
120	0.78	0.78	0.77	0.76	0.78															
125	0.88	0.87	0.87	0.85	0.88															
130	1.06	1.02	0.98	0.96	0.96															
135	1.14	1.11	1.04	1.02	1.00															
140	1.17	1.14	1.10	1.07	1.04															
145	1.18	1.17	1.14	1.10	1.10															
150	1.17	1.15	1.17	1.13	1.16															
155	1.16	1.16	1.14	1.23	1.22															
160	1.18	1.17	1.18	1.27	1.29															
165	1.24	1.24	1.24	1.31	1.33															
170	1.36	1.33	1.27	1.35	1.38															
175	1.41	1.39	1.27	1.36	1.35															
180	1.30	1.24	1.28	1.27	1.27															

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	0.1755	47.89	0.9852	7.74
4000K	277.0	60	0.1804	48.96	0.9798	8.01
5000K	277.0	60	0.1728	47.07	0.9835	7.90

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	3503	48.91	6120.1	125.13	Set Switch 0% to 3500K
4000K	4168	48.02	6255.9	130.28	Set Switch 50% to 4000K
5000K	5182	47.21	6168.3	130.66	Set Switch 100% to 5000K
Lowest Efficacy	125.13 lm/W(@3500K)				
Maximum Power	48.91 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*******