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

High Bay

Model Name(s):
638021##-YY

Representative (Tested) Model:
63802161

Model Difference:

1. **##= 31 identifies 3500K, 41 identifies 4000K, 61 identifies 5000K;**
2. **YY stands for function, can be blank for dimming, I for dimming with sensor, EM for dimming with Back up power, I-EM for dimming with sensor and Back up power;**
3. **All is the same construction, except CCT and function.**

Prepare by:

Alan Wang

Engineer: Alan Wang
Date: 2021-01-27

Review by:

Vincent Yuan

Technical Lead: Vincent Yuan
Issue Date: 2021-01-29
Revised Date: N/A

Note:
1. The results contained in this report pertain only to the tested samples.
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3. This report does not imply product certification, approval, or endorsement by NVLAP, or any agency of the Federal Government.

Laboratory: Dongguan New Testing Centre Co., Ltd
Address: 3F, No. 1 the 1st North Industry Road, Songshan Lake Science & Technology Park, Dongguan, Guangdong, China
Tel: 86-769-22212079
Website: http://www.ntc-cert.com

Client Information:

Client Name:	ETI Solid State Lighting (Zhuhai) Ltd
Brand Name:	ETI
Factory Name:	ETI Solid State Lighting (Zhuhai) Ltd
Factory Address:	No.1, Zhongzhu Road South, Science & Technology Innovation Coast, High Tech District, Zhuhai City, Guangdong Prov., China 519085

Product Information:

Model Number:	638021##, 638021##-I, 638021##-EM, 638021##-I-EM
Product Type:	High-Bay Luminaires for Commercial and Industrial Buildings
Rating Input:	120-277Vac, 50/60Hz, 120W
Declared CCT:	5000K
Declared Light Output:	16200 lm
LED Manufacturer:	LUMILEDS
LED Model:	LUXEON 3030 2D
Driver Manufacturer:	SOSEN
Driver model:	SS-120CNL-130B

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:	2021-01-26
Quantity of Receipt Samples:	1 pc
Sample Number:	210126002-S1

Laboratory Information:

Test Laboratory:	Dongguan New Testing Centre Co., Ltd
Laboratory Address:	3F, No. 1 the 1st 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:	2021-01-29
Revised Date of Test Report:	N/A
Test Report No.:	NTCLR21010121
Remark *(If applicable)*:	N/A

Test Specification:	
Date of Test	2021-01-26
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

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° horizonal 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:

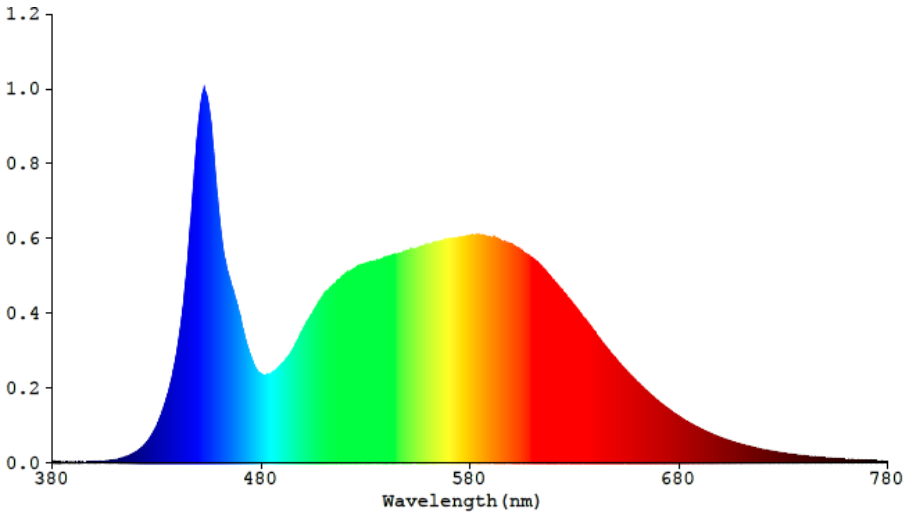
Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	1.0051	120.31	0.9952

Color Data:

Parameter	Result
CCT(K)	4922
Ra	82.2
R_f	83
R_g	94
$R_{cs,\ h1}$	-13%
Chromaticity, (x, y)	(0.3482, 0.3635)
Chromaticity, (u', v')	(0.2090, 0.4908)
Duv	0.0046

Specify Color Rendering			
R1	80	R9	4
R2	88	R10	71
R3	94	R11	79
R4	80	R12	53
R5	80	R13	82
R6	83	R14	97
R7	88	R15	74
R8	66	-	-

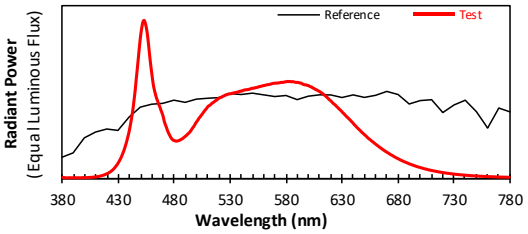
Spectrum Diagram:

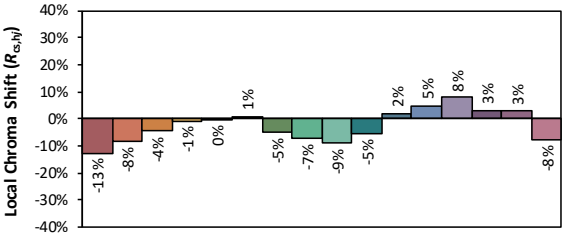


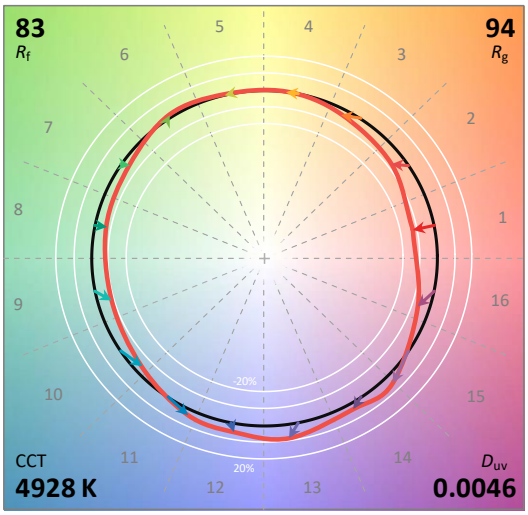
IES TM-30-18 Color Rendition Result:

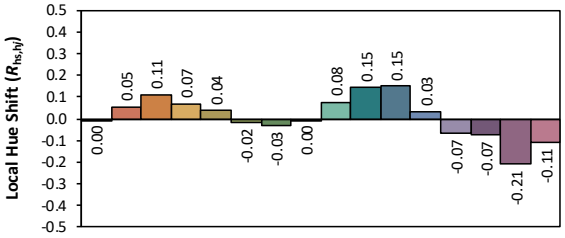
ANSI/IES TM-30-18 Color Rendition Report

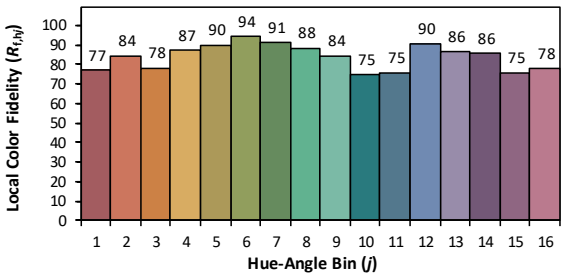
Source:	1 CIE F1	Manufacturer:	ETI Solid State Lighting (Z
Date:	2021/1/27	Model:	63802161

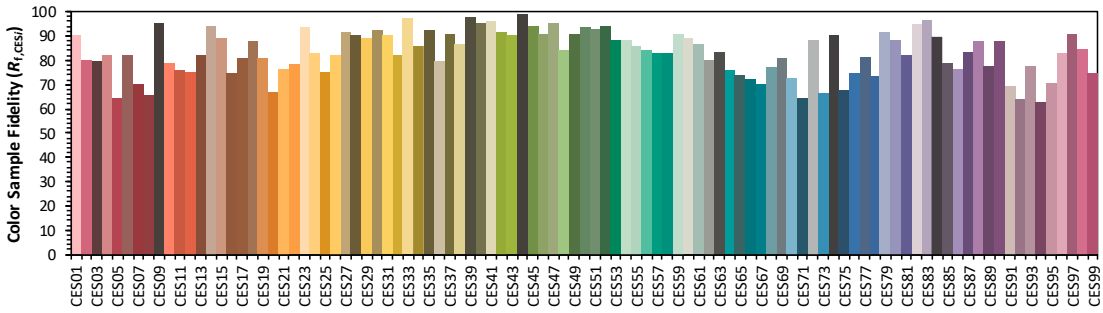












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3482
y	0.3633
u'	0.2090
v'	0.4907

CIE 13.3-1995 (CRI)

R_a	82
R_9	4

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

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Spectrum Data:

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	0.0045	447	0.7016	514	0.4727	581	0.6096	648	0.2887	715	0.0422
381	0.0041	448	0.7750	515	0.4777	582	0.6086	649	0.2826	716	0.0404
382	0.0030	449	0.8467	516	0.4827	583	0.6094	650	0.2761	717	0.0391
383	0.0023	450	0.9090	517	0.4890	584	0.6085	651	0.2697	718	0.0384
384	0.0015	451	0.9542	518	0.4924	585	0.6070	652	0.2637	719	0.0368
385	0.0024	452	0.9876	519	0.4988	586	0.6086	653	0.2561	720	0.0357
386	0.0025	453	0.9940	520	0.5036	587	0.6067	654	0.2497	721	0.0345
387	0.0028	454	0.9766	521	0.5076	588	0.6051	655	0.2447	722	0.0338
388	0.0022	455	0.9450	522	0.5097	589	0.6036	656	0.2390	723	0.0327
389	0.0024	456	0.8990	523	0.5133	590	0.6035	657	0.2327	724	0.0314
390	0.0023	457	0.8342	524	0.5176	591	0.6033	658	0.2276	725	0.0307
391	0.0028	458	0.7660	525	0.5201	592	0.6003	659	0.2216	726	0.0298
392	0.0025	459	0.7040	526	0.5247	593	0.5995	660	0.2159	727	0.0289
393	0.0024	460	0.6492	527	0.5257	594	0.5971	661	0.2105	728	0.0277
394	0.0025	461	0.5967	528	0.5293	595	0.5925	662	0.2051	729	0.0269
395	0.0023	462	0.5592	529	0.5306	596	0.5899	663	0.1996	730	0.0260
396	0.0023	463	0.5313	530	0.5315	597	0.5880	664	0.1944	731	0.0254
397	0.0030	464	0.5056	531	0.5326	598	0.5881	665	0.1893	732	0.0244
398	0.0030	465	0.4864	532	0.5353	599	0.5848	666	0.1844	733	0.0237
399	0.0032	466	0.4656	533	0.5361	600	0.5837	667	0.1790	734	0.0232
400	0.0029	467	0.4494	534	0.5387	601	0.5797	668	0.1746	735	0.0223
401	0.0032	468	0.4283	535	0.5397	602	0.5762	669	0.1692	736	0.0216
402	0.0036	469	0.4103	536	0.5415	603	0.5743	670	0.1653	737	0.0210
403	0.0042	470	0.3884	537	0.5430	604	0.5681	671	0.1603	738	0.0203
404	0.0045	471	0.3580	538	0.5452	605	0.5663	672	0.1567	739	0.0197
405	0.0048	472	0.3371	539	0.5486	606	0.5607	673	0.1518	740	0.0192
406	0.0055	473	0.3183	540	0.5476	607	0.5579	674	0.1475	741	0.0183
407	0.0062	474	0.2978	541	0.5515	608	0.5541	675	0.1437	742	0.0180
408	0.0067	475	0.2819	542	0.5533	609	0.5498	676	0.1398	743	0.0173
409	0.0077	476	0.2678	543	0.5561	610	0.5462	677	0.1350	744	0.0166
410	0.0082	477	0.2548	544	0.5570	611	0.5416	678	0.1314	745	0.0163
411	0.0092	478	0.2463	545	0.5573	612	0.5370	679	0.1273	746	0.0156
412	0.0108	479	0.2391	546	0.5591	613	0.5317	680	0.1241	747	0.0153
413	0.0124	480	0.2372	547	0.5592	614	0.5259	681	0.1206	748	0.0148
414	0.0138	481	0.2342	548	0.5630	615	0.5200	682	0.1166	749	0.0143
415	0.0159	482	0.2336	549	0.5646	616	0.5143	683	0.1132	750	0.0141
416	0.0178	483	0.2347	550	0.5670	617	0.5073	684	0.1101	751	0.0134
417	0.0202	484	0.2373	551	0.5661	618	0.5006	685	0.1062	752	0.0130
418	0.0228	485	0.2395	552	0.5690	619	0.4935	686	0.1038	753	0.0126
419	0.0261	486	0.2442	553	0.5707	620	0.4879	687	0.1005	754	0.0122
420	0.0293	487	0.2477	554	0.5718	621	0.4810	688	0.0976	755	0.0119
421	0.0330	488	0.2528	555	0.5738	622	0.4730	689	0.0950	756	0.0117
422	0.0369	489	0.2589	556	0.5769	623	0.4671	690	0.0915	757	0.0112
423	0.0416	490	0.2648	557	0.5778	624	0.4621	691	0.0891	758	0.0108
424	0.0471	491	0.2702	558	0.5798	625	0.4543	692	0.0863	759	0.0104
425	0.0533	492	0.2781	559	0.5816	626	0.4478	693	0.0839	760	0.0102
426	0.0606	493	0.2841	560	0.5837	627	0.4405	694	0.0811	761	0.0101
427	0.0690	494	0.2920	561	0.5844	628	0.4336	695	0.0787	762	0.0095
428	0.0783	495	0.3013	562	0.5868	629	0.4272	696	0.0763	763	0.0094
429	0.0876	496	0.3121	563	0.5883	630	0.4199	697	0.0736	764	0.0089
430	0.0991	497	0.3221	564	0.5895	631	0.4115	698	0.0716	765	0.0088
431	0.1122	498	0.3322	565	0.5902	632	0.4054	699	0.0694	766	0.0086
432	0.1256	499	0.3450	566	0.5925	633	0.3974	700	0.0674	767	0.0082
433	0.1413	500	0.3555	567	0.5940	634	0.3898	701	0.0656	768	0.0079
434	0.1591	501	0.3654	568	0.5969	635	0.3834	702	0.0633	769	0.0077
435	0.1775	502	0.3766	569	0.5974	636	0.3769	703	0.0612	770	0.0074
436	0.1997	503	0.3854	570	0.5984	637	0.3698	704	0.0594	771	0.0073
437	0.2229	504	0.3951	571	0.5990	638	0.3624	705	0.0577	772	0.0070
438	0.2503	505	0.4040	572	0.5988	639	0.3545	706	0.0560	773	0.0068
439	0.2783	506	0.4139	573	0.6004	640	0.3479	707	0.0540	774	0.0066
440	0.3111	507	0.4234	574	0.6005	641	0.3384	708	0.0521	775	0.0063
441	0.3498	508	0.4322	575	0.6028	642	0.3317	709	0.0509	776	0.0064
442	0.3915	509	0.4405	576	0.6036	643	0.3238	710	0.0489	777	0.0062
443	0.4384	510	0.4509	577	0.6034	644	0.3166	711	0.0476	778	0.0060
444	0.4966	511	0.4564	578	0.6046	645	0.3098	712	0.0462	779	0.0057
445	0.5582	512	0.4601	579	0.6068	646	0.3033	713	0.0449	780	0.0057
446	0.6320	513	0.4673	580	0.6071	647	0.2962	714	0.0434	N/A	N/A

Goniophotometer Test Results:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
24.8	48.2	Face Down	90	25

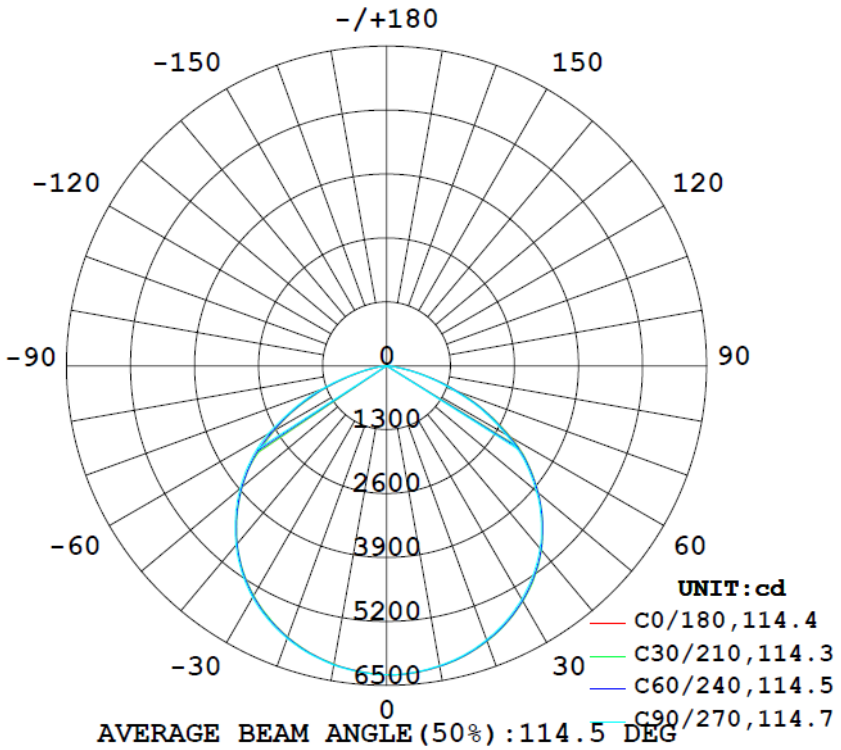
Electrical Data:

Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	1.0051	120.31	0.9952

Goniophotometer Data:

Parameter	Results	
Total Luminous (lm)	17651.1	
Luminous Efficacy (lm/w)	146.71	
Zonal Lumens Distribution (20-50°)	52.4%	
Beam Angle (°)	114.5	
UGR	Crosswise	Endwise
	34.7	34.4

Luminous Intensity Distribution Diagram:

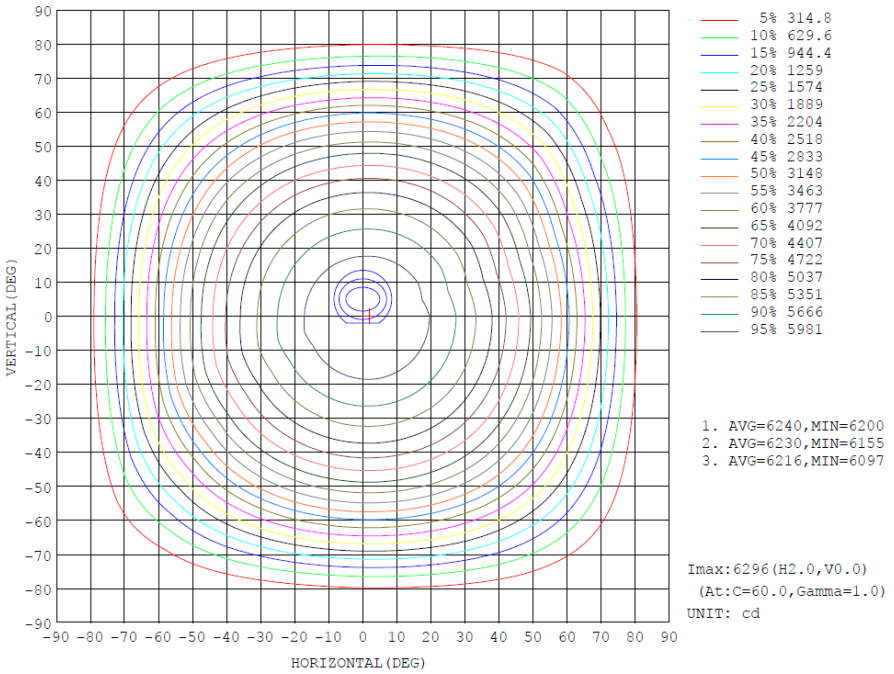


Zonal Flux Diagram:

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	6206	6202	6192	6169	6161	6161	6179	6199	0- 10	594.8	594.8	3.37,3.37
20	5959	5956	5931	5892	5874	5874	5902	5937	10- 20	1715	2310	13.1,13.1
30	5528	5522	5484	5429	5403	5403	5443	5493	20- 30	2634	4944	28,28
40	4879	4890	4845	4775	4736	4717	4758	4840	30- 40	3229	8173	46.3,46.3
50	4019	4020	3972	3870	3837	3824	3889	3980	40- 50	3385	11559	65.5,65.5
60	2916	2888	2803	2691	2636	2658	2799	2874	50- 60	3031	14589	82.7,82.7
70	1540	1513	1444	1342	1320	1333	1427	1522	60- 70	2088	16677	94.5,94.5
80	350.1	345.4	296.6	242.9	241.2	247.4	301.4	346.5	70- 80	857.3	17534	99.3,99.3
90	7.416	11.31	4.754	4.271	1.103	1.095	1.129	4.931	80- 90	99.72	17634	99.9,99.9
100	0.8064	0.8213	0.8743	0.9138	1.834	1.832	1.796	1.710	90-100	1.432	17635	99.9,99.9
110	1.200	1.183	1.290	1.364	2.267	2.314	2.318	2.192	100-110	1.649	17637	99.9,99.9
120	1.884	1.801	1.886	2.004	2.829	2.796	2.765	2.638	110-120	1.992	17639	99.9,99.9
130	2.705	2.577	2.670	2.774	3.848	3.892	3.935	3.570	120-130	2.461	17641	99.9,99.9
140	3.398	3.324	3.439	3.469	4.660	4.982	4.734	4.606	130-140	2.872	17644	100,100
150	3.619	3.627	3.635	3.772	5.223	5.417	5.309	5.226	140-150	2.683	17647	100,100
160	4.351	4.171	3.816	4.333	5.712	5.828	5.447	5.417	150-160	2.161	17649	100,100
170	4.878	4.988	4.699	4.825	5.787	5.963	5.640	5.386	160-170	1.451	17651	100,100
180	5.770	5.805	5.646	5.611	5.777	5.866	5.578	5.470	170-180	0.5171	17651	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	21.9	23.5	22.3	23.8	24.1	21.8	23.4	22.1	23.7	24.0
	3H	23.3	24.7	23.7	25.1	25.4	23.1	24.6	23.5	24.9	25.3
	4H	23.7	25.0	24.1	25.4	25.7	23.5	24.8	23.9	25.2	25.6
	6H	23.8	25.1	24.2	25.4	25.8	23.6	24.9	24.0	25.2	25.6
	8H	23.8	25.0	24.2	25.4	25.8	23.6	24.8	24.0	25.2	25.6
	12H	23.8	24.9	24.2	25.3	25.7	23.6	24.7	24.0	25.1	25.5
4H	2H	22.5	23.8	22.9	24.2	24.5	22.3	23.7	22.7	24.0	24.4
	3H	24.0	25.2	24.4	25.6	26.0	23.8	25.0	24.2	25.4	25.8
	4H	24.5	25.5	24.9	25.9	26.3	24.2	25.3	24.7	25.7	26.1
	6H	24.7	25.6	25.1	26.0	26.5	24.4	25.3	24.9	25.7	26.2
	8H	24.7	25.5	25.1	25.9	26.4	24.4	25.2	24.9	25.7	26.1
	12H	24.7	25.4	25.1	25.9	26.4	24.4	25.1	24.9	25.6	26.1
8H	4H	24.6	25.5	25.1	25.9	26.4	24.4	25.2	24.8	25.6	26.1
	6H	24.9	25.5	25.3	26.0	26.5	24.6	25.2	25.0	25.7	26.2
	8H	24.9	25.5	25.4	26.0	26.5	24.5	25.2	25.1	25.7	26.2
	12H	24.9	25.4	25.4	25.9	26.5	24.6	25.1	25.1	25.6	26.1
12H	4H	24.6	25.4	25.1	25.8	26.3	24.3	25.1	24.8	25.6	26.0
	6H	24.8	25.5	25.4	25.9	26.5	24.5	25.2	25.1	25.6	26.2
	8H	24.9	25.4	25.4	25.9	26.5	24.6	25.1	25.1	25.6	26.2

Maximum UGR = 26.5

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	31.9	33.5	32.3	33.8	34.1	31.8	33.4	32.1	33.7	34.0
	3H	33.3	34.7	33.7	35.1	35.4	33.1	34.6	33.5	34.9	35.3
	4H	33.7	35.0	34.1	35.4	35.7	33.5	34.8	33.9	35.2	35.6
	6H	33.8	35.1	34.2	35.4	35.8	33.6	34.9	34.0	35.2	35.6
	8H	33.8	35.0	34.2	35.4	35.8	33.6	34.8	34.0	35.2	35.6
	12H	33.8	34.9	34.2	35.3	35.7	33.6	34.7	34.0	35.1	35.5
4H	2H	32.5	33.8	32.9	34.2	34.5	32.3	33.7	32.7	34.0	34.4
	3H	34.0	35.2	34.4	35.6	36.0	33.8	35.0	34.2	35.4	35.8
	4H	34.5	35.5	34.9	35.9	36.3	34.2	35.3	34.7	35.7	36.1
	6H	34.7	35.6	35.1	36.0	36.5	34.4	35.3	34.9	35.7	36.2
	8H	34.7	35.5	35.1	35.9	36.4	34.4	35.2	34.9	35.7	36.1
	12H	34.7	35.4	35.1	35.9	36.4	34.4	35.1	34.9	35.6	36.1
8H	4H	34.6	35.5	35.1	35.9	36.4	34.4	35.2	34.8	35.6	36.1
	6H	34.9	35.5	35.3	36.0	36.5	34.6	35.2	35.0	35.7	36.2
	8H	34.9	35.5	35.4	36.0	36.5	34.5	35.2	35.1	35.7	36.2
	12H	34.9	35.4	35.4	35.9	36.5	34.6	35.1	35.1	35.6	36.1
12H	4H	34.6	35.4	35.1	35.8	36.3	34.3	35.1	34.8	35.6	36.0
	6H	34.8	35.5	35.4	35.9	36.5	34.5	35.2	35.1	35.6	36.2
	8H	34.9	35.4	35.4	35.9	36.5	34.6	35.1	35.1	35.6	36.2

Maximum UGR = 36.5

Luminous Distribution Intensity Data:

Table--1 UNIT: cd

γ (DEG) \ C(DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	6285	6285	6285	6285	6285	6285	6285	6285	6285	6285	6285	6285	6285	6285	6285	6285	6285	6285	6285
5	6268	6270	6270	6266	6265	6261	6257	6254	6251	6248	6244	6250	6239	6240	6241	6239	6245	6247	6249
10	6206	6207	6207	6202	6203	6197	6192	6186	6179	6169	6170	6179	6161	6164	6164	6161	6171	6170	6179
15	6108	6108	6107	6104	6103	6091	6085	6076	6065	6057	6050	6068	6043	6040	6040	6038	6050	6053	6060
20	5959	5961	5960	5956	5951	5942	5931	5919	5906	5892	5884	5911	5874	5870	5872	5874	5883	5888	5902
25	5765	5769	5768	5763	5756	5743	5730	5716	5698	5684	5673	5710	5661	5655	5655	5658	5674	5680	5694
30	5528	5530	5529	5522	5515	5501	5484	5470	5447	5429	5417	5461	5403	5398	5399	5403	5415	5426	5443
35	5233	5240	5242	5234	5224	5208	5191	5172	5149	5128	5112	5161	5097	5093	5089	5092	5102	5109	5129
40	4879	4887	4895	4890	4881	4867	4845	4822	4796	4775	4757	4815	4736	4728	4719	4717	4730	4735	4758
45	4470	4480	4484	4481	4479	4464	4440	4412	4381	4356	4335	4406	4313	4304	4295	4293	4308	4320	4345
50	4019	4022	4020	4020	4012	3993	3972	3936	3900	3870	3851	3938	3837	3828	3833	3824	3839	3862	3889
55	3519	3513	3516	3511	3494	3475	3449	3416	3374	3347	3326	3420	3289	3267	3283	3304	3323	3347	3382
60	2916	2897	2900	2888	2859	2835	2803	2765	2716	2691	2666	2765	2636	2640	2648	2658	2691	2745	2799
65	2237	2231	2238	2222	2206	2177	2149	2116	2075	2042	2020	2124	1990	1989	1990	2006	2035	2055	2097
70	1540	1531	1527	1513	1504	1467	1444	1405	1369	1342	1314	1423	1320	1318	1324	1333	1348	1376	1427
75	885	887	882	874	852	832	804	771	736	711	695	797	684	688	696	705	723	744	781
80	350	354	345	345	330	312	297	275	256	243	228	293	241	246	244	247	266	282	301
85	87.2	86.2	84.8	82.3	71.7	66.1	64.6	57.0	44.3	41.1	39.9	65.0	42.0	43.0	45.2	48.6	53.5	57.4	61.7
90	7.42	7.14	5.80	11.3	9.94	8.12	4.75	5.12	4.46	4.27	0.59	5.25	1.10	1.10	1.11	1.10	1.10	1.08	1.13
95	0.64	0.64	0.64	0.65	0.66	0.68	0.69	0.70	0.71	0.72	0.72	0.68	1.46	1.45	1.46	1.45	1.44	1.42	1.40
100	0.81	0.80	0.81	0.82	0.84	0.86	0.87	0.89	0.90	0.91	0.92	0.86	1.83	1.82	1.83	1.83	1.82	1.81	1.80
105	0.98	0.98	0.96	0.99	1.02	1.05	1.07	1.09	1.10	1.12	1.12	1.05	2.15	2.13	2.14	2.15	2.16	2.15	2.14
110	1.20	1.20	1.18	1.18	1.23	1.26	1.29	1.32	1.33	1.36	1.38	1.29	2.27	2.27	2.30	2.31	2.32	2.32	2.32
115	1.50	1.45	1.46	1.45	1.48	1.53	1.57	1.61	1.63	1.66	1.66	1.57	2.46	2.45	2.46	2.48	2.49	2.49	2.49
120	1.88	1.86	1.81	1.80	1.85	1.85	1.89	1.94	1.96	2.00	2.04	1.93	2.83	2.81	2.79	2.80	2.77	2.75	2.77
125	2.32	2.26	2.18	2.21	2.27	2.18	2.23	2.29	2.34	2.41	2.45	2.32	3.24	3.25	3.22	3.27	3.23	3.23	3.23
130	2.70	2.69	2.66	2.58	2.74	2.70	2.67	2.70	2.79	2.77	2.88	2.78	3.85	3.89	3.93	3.89	3.95	3.89	3.93
135	3.12	3.11	3.04	2.90	3.02	3.18	3.15	3.15	3.13	3.14	3.20	3.19	4.31	4.42	4.46	4.55	4.55	4.52	4.49
140	3.40	3.47	3.37	3.32	3.37	3.47	3.44	3.42	3.41	3.47	3.41	3.43	4.66	4.77	4.81	4.98	5.01	4.90	4.73
145	3.49	3.58	3.51	3.43	3.57	3.56	3.55	3.58	3.63	3.60	3.53	3.54	4.93	4.97	5.04	5.17	5.27	5.19	5.12
150	3.62	3.75	3.73	3.63	3.56	3.69	3.63	3.70	3.70	3.77	3.69	3.65	5.22	5.21	5.25	5.42	5.42	5.35	5.31
155	3.99	4.11	4.12	3.84	3.76	3.88	3.73	3.88	3.94	4.01	4.07	3.84	5.38	5.37	5.56	5.53	5.53	5.48	5.32
160	4.35	4.42	4.35	4.17	3.93	3.96	3.82	4.12	4.20	4.33	4.31	4.19	5.71	5.72	5.69	5.83	5.73	5.60	5.45
165	4.58	4.72	4.72	4.67	4.41	4.39	4.35	4.53	4.65	4.74	4.62	4.52	5.76	5.77	5.85	5.92	6.03	5.89	5.66
170	4.88	5.00	5.05	4.99	4.60	4.65	4.70	4.64	4.83	4.83	4.81	4.83	5.79	5.80	5.89	5.96	5.98	5.92	5.64
175	5.41	5.56	5.59	5.54	5.24	5.17	5.08	5.10	5.28	5.34	5.36	5.20	5.83	5.83	5.95	5.97	5.91	5.90	5.64
180	5.77	5.89	5.86	5.81	5.64	5.58	5.65	5.33	5.43	5.61	5.59	5.74	5.78	5.78	5.89	5.87	5.82	5.65	5.58

Table--2 UNIT: cd

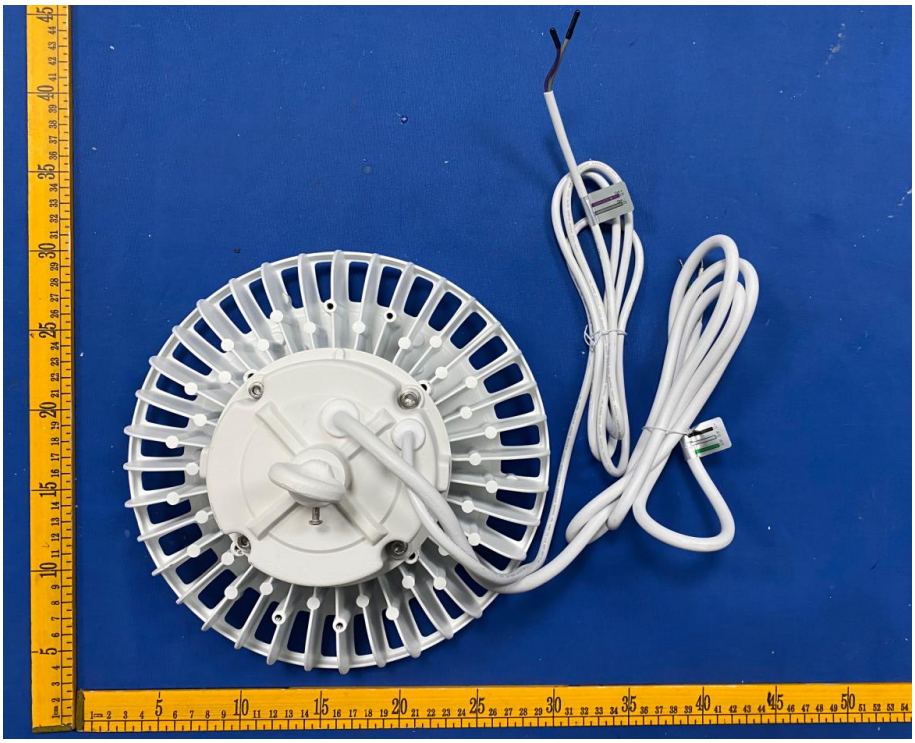
γ (DEG) \ C(DEG)	285	300	315	330	345
0	6285	6285	6285	6285	6285
5	6254	6258	6258	6265	6256
10	6187	6191	6199	6204	6190
15	6073	6079	6088	6097	6077
20	5913	5925	5937	5951	5920
25	5714	5727	5737	5753	5718
30	5462	5478	5493	5513	5470
35	5153	5177	5197	5217	5162
40	4791	4819	4840	4864	4796
45	4381	4406	4435	4456	4388
50	3927	3950	3980	4004	3930
55	3418	3446	3475	3503	3416
60	2818	2851	2874	2906	2781
65	2139	2178	2205	2231	2109
70	1463	1502	1522	1546	1425
75	819	849	874	892	779
80	311	330	347	360	297
85	66.7	72.6	78.4	82.9	61.4
90	1.58	3.01	4.93	7.18	1.12
95	1.38	1.35	1.33	1.30	1.36
100	1.77	1.74	1.71	1.68	1.73
105	2.11	2.07	2.03	2.02	2.01
110	2.28	2.24	2.19	2.15	2.12
115	2.46	2.41	2.37	2.31	2.34
120	2.74	2.67	2.64	2.61	2.68
125	3.17	3.06	3.02	2.95	3.15
130	3.81	3.73	3.57	3.64	3.83
135	4.30	4.10	4.10	4.20	4.30
140	4.58	4.60	4.61	4.61	4.73
145	4.87	4.95	4.88	4.83	4.98
150	5.17	5.11	5.23	5.18	5.25
155	5.29	5.31	5.27	5.54	5.53
160	5.40	5.43	5.42	5.74	5.73
165	5.60	5.60	5.57	5.74	5.84
170	5.63	5.61	5.39	5.67	5.82
175	5.50	5.57	5.44	5.73	5.73
180	5.58	5.34	5.47	5.59	5.61

THD and PF Measurement Test Results:

Electrical Measurement:

Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor	iTHD(%)
277.0	60	0.4537	117.98	0.9388	6.22

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************

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