

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):

638022##-YY

Representative (Tested) Model:

63802261

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:



Engineer: Alan Wang

Date: 2021-01-27

Review by:



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.
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:

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:	638022##, 638022##-I, 638022##-EM, 638022##-I-EM
Product Type:	High-Bay Luminaires for Commercial and Industrial Buildings
Rating Input:	120-277Vac, 50/60Hz, 150W
Declared CCT:	5000K
Declared Light Output:	20250 lm
LED Manufacturer:	LUMILEDS
LED Model:	LUXEON 3030 2D
Driver Manufacturer:	SOSEN
Driver model:	SS-150CNL-260B

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:	210126004-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:	2021-01-29
Revised Date of Test Report:	N/A
Test Report No.:	NTCLR21010124
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 $25\text{ }^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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 $25\text{ }^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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:

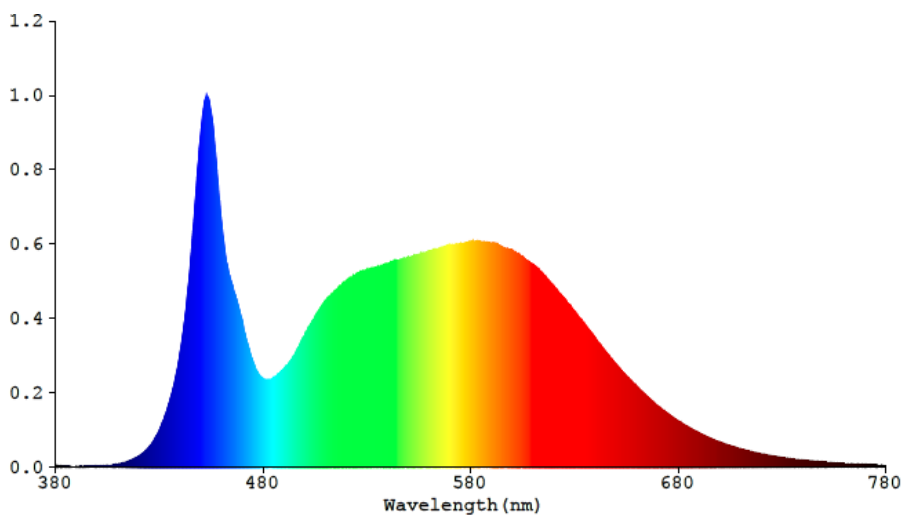
Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	1.2528	150.48	0.9990

Color Data:

Parameter	Result
CCT(K)	4942
R _a	82.4
R _f	83
R _g	94
R _{cs, h1}	-13%
Chromaticity, (x, y)	(0.3480, 0.3630)
Chromaticity, (u', v')	(0.2090, 0.4905)
Duv	0.0045

Specify Color Rendering			
R1	80	R9	5
R2	88	R10	72
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:

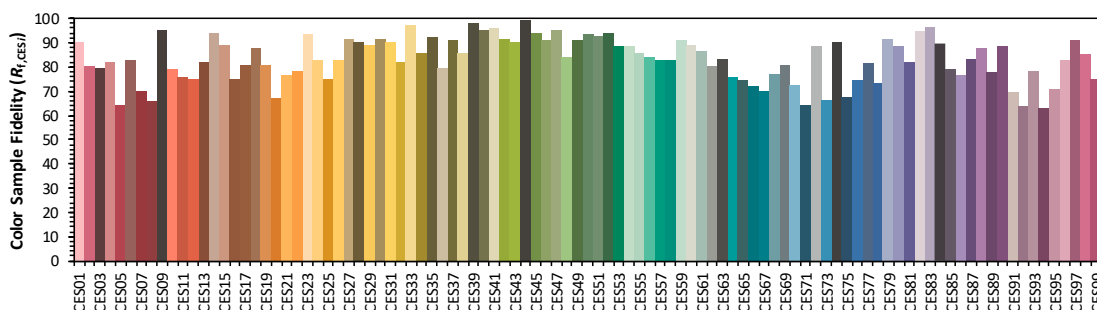
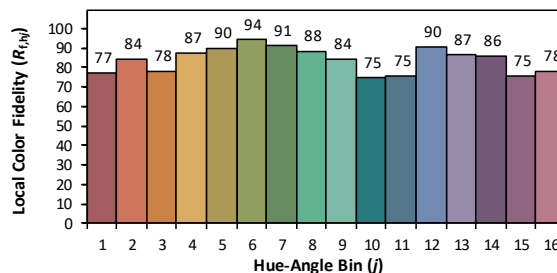
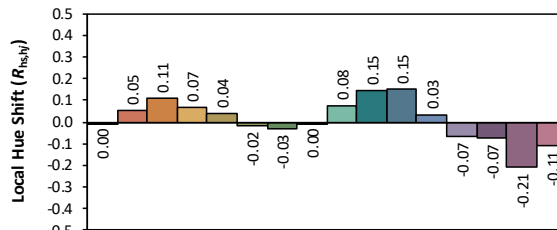
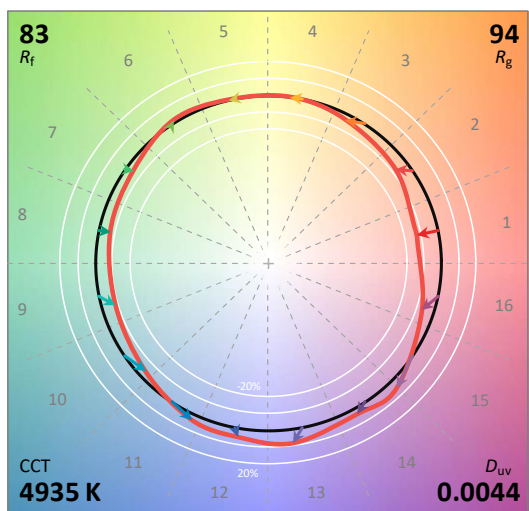
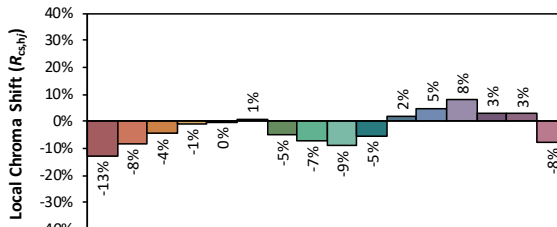
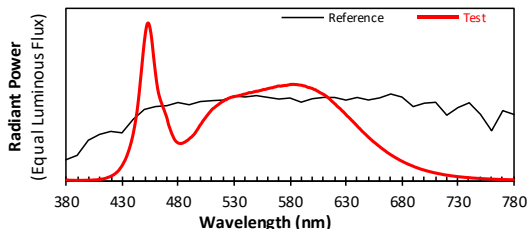
ANSI/IES TM-30-18 Color Rendition Report

Source: 1 CIE F1

Manufacturer: ETI Solid State Lighting (2

Date: 2021/1/27

Model: 63802261



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

x 0.3479
 y 0.3628
 u' 0.2090
 v' 0.4904

CIE 13.3-1995
(CRI)

R_a 82
 R_9 5

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

Spectrum Data:

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	0.0041	447	0.6979	514	0.4708	581	0.6085	648	0.2904	715	0.0421
381	0.0044	448	0.7720	515	0.4763	582	0.6067	649	0.2833	716	0.0406
382	0.0035	449	0.8423	516	0.4809	583	0.6081	650	0.2765	717	0.0391
383	0.0027	450	0.9033	517	0.4875	584	0.6075	651	0.2700	718	0.0379
384	0.0030	451	0.9533	518	0.4915	585	0.6066	652	0.2635	719	0.0367
385	0.0026	452	0.9867	519	0.4976	586	0.6065	653	0.2571	720	0.0356
386	0.0028	453	0.9952	520	0.5005	587	0.6055	654	0.2510	721	0.0347
387	0.0025	454	0.9822	521	0.5050	588	0.6040	655	0.2447	722	0.0335
388	0.0020	455	0.9495	522	0.5094	589	0.6036	656	0.2397	723	0.0324
389	0.0020	456	0.9031	523	0.5111	590	0.6023	657	0.2339	724	0.0315
390	0.0022	457	0.8394	524	0.5158	591	0.6018	658	0.2279	725	0.0304
391	0.0023	458	0.7728	525	0.5199	592	0.5983	659	0.2222	726	0.0297
392	0.0028	459	0.7111	526	0.5226	593	0.5984	660	0.2168	727	0.0288
393	0.0021	460	0.6533	527	0.5254	594	0.5955	661	0.2110	728	0.0275
394	0.0025	461	0.6028	528	0.5277	595	0.5923	662	0.2053	729	0.0269
395	0.0026	462	0.5612	529	0.5283	596	0.5891	663	0.2004	730	0.0260
396	0.0030	463	0.5328	530	0.5309	597	0.5875	664	0.1950	731	0.0252
397	0.0029	464	0.5085	531	0.5318	598	0.5866	665	0.1900	732	0.0245
398	0.0031	465	0.4890	532	0.5335	599	0.5836	666	0.1847	733	0.0238
399	0.0033	466	0.4680	533	0.5346	600	0.5823	667	0.1787	734	0.0232
400	0.0034	467	0.4513	534	0.5364	601	0.5779	668	0.1746	735	0.0224
401	0.0034	468	0.4312	535	0.5386	602	0.5746	669	0.1697	736	0.0216
402	0.0039	469	0.4119	536	0.5394	603	0.5736	670	0.1650	737	0.0209
403	0.0041	470	0.3907	537	0.5422	604	0.5672	671	0.1606	738	0.0203
404	0.0046	471	0.3598	538	0.5441	605	0.5650	672	0.1564	739	0.0200
405	0.0052	472	0.3389	539	0.5464	606	0.5596	673	0.1518	740	0.0191
406	0.0054	473	0.3191	540	0.5468	607	0.5553	674	0.1478	741	0.0188
407	0.0058	474	0.2994	541	0.5493	608	0.5524	675	0.1437	742	0.0181
408	0.0065	475	0.2836	542	0.5516	609	0.5484	676	0.1392	743	0.0173
409	0.0079	476	0.2682	543	0.5550	610	0.5446	677	0.1357	744	0.0167
410	0.0082	477	0.2558	544	0.5560	611	0.5407	678	0.1311	745	0.0163
411	0.0098	478	0.2477	545	0.5551	612	0.5357	679	0.1278	746	0.0159
412	0.0108	479	0.2416	546	0.5572	613	0.5310	680	0.1238	747	0.0153
413	0.0121	480	0.2375	547	0.5586	614	0.5242	681	0.1211	748	0.0150
414	0.0139	481	0.2354	548	0.5618	615	0.5188	682	0.1167	749	0.0145
415	0.0159	482	0.2347	549	0.5624	616	0.5125	683	0.1135	750	0.0141
416	0.0182	483	0.2354	550	0.5651	617	0.5051	684	0.1102	751	0.0139
417	0.0208	484	0.2373	551	0.5638	618	0.4989	685	0.1069	752	0.0132
418	0.0232	485	0.2409	552	0.5664	619	0.4928	686	0.1040	753	0.0129
419	0.0262	486	0.2443	553	0.5683	620	0.4863	687	0.1007	754	0.0124
420	0.0294	487	0.2496	554	0.5705	621	0.4801	688	0.0980	755	0.0121
421	0.0336	488	0.2537	555	0.5714	622	0.4717	689	0.0954	756	0.0116
422	0.0372	489	0.2592	556	0.5755	623	0.4655	690	0.0923	757	0.0114
423	0.0422	490	0.2652	557	0.5756	624	0.4599	691	0.0891	758	0.0110
424	0.0473	491	0.2719	558	0.5763	625	0.4542	692	0.0862	759	0.0106
425	0.0538	492	0.2768	559	0.5786	626	0.4465	693	0.0839	760	0.0102
426	0.0604	493	0.2847	560	0.5811	627	0.4393	694	0.0812	761	0.0100
427	0.0685	494	0.2915	561	0.5821	628	0.4335	695	0.0790	762	0.0096
428	0.0787	495	0.3005	562	0.5842	629	0.4255	696	0.0761	763	0.0095
429	0.0883	496	0.3113	563	0.5858	630	0.4184	697	0.0738	764	0.0092
430	0.0996	497	0.3217	564	0.5859	631	0.4097	698	0.0711	765	0.0089
431	0.1128	498	0.3328	565	0.5884	632	0.4037	699	0.0695	766	0.0087
432	0.1258	499	0.3453	566	0.5905	633	0.3974	700	0.0677	767	0.0084
433	0.1408	500	0.3550	567	0.5924	634	0.3905	701	0.0651	768	0.0082
434	0.1587	501	0.3647	568	0.5941	635	0.3825	702	0.0631	769	0.0077
435	0.1782	502	0.3764	569	0.5969	636	0.3761	703	0.0612	770	0.0075
436	0.1991	503	0.3856	570	0.5975	637	0.3690	704	0.0596	771	0.0073
437	0.2226	504	0.3948	571	0.5973	638	0.3617	705	0.0576	772	0.0072
438	0.2488	505	0.4044	572	0.5960	639	0.3544	706	0.0559	773	0.0070
439	0.2774	506	0.4132	573	0.5994	640	0.3471	707	0.0541	774	0.0068
440	0.3117	507	0.4224	574	0.5989	641	0.3384	708	0.0523	775	0.0066
441	0.3490	508	0.4309	575	0.6011	642	0.3322	709	0.0506	776	0.0065
442	0.3908	509	0.4394	576	0.6011	643	0.3250	710	0.0491	777	0.0063
443	0.4362	510	0.4482	577	0.6013	644	0.3170	711	0.0480	778	0.0061
444	0.4947	511	0.4547	578	0.6036	645	0.3099	712	0.0462	779	0.0060
445	0.5571	512	0.4593	579	0.6048	646	0.3037	713	0.0447	780	0.0060
446	0.6283	513	0.4652	580	0.6059	647	0.2968	714	0.0435	N/A	N/A

Goniophotometer Test Results:

Test Condition:

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
25.0	47.9	Face Down	90	25

Electrical Data:

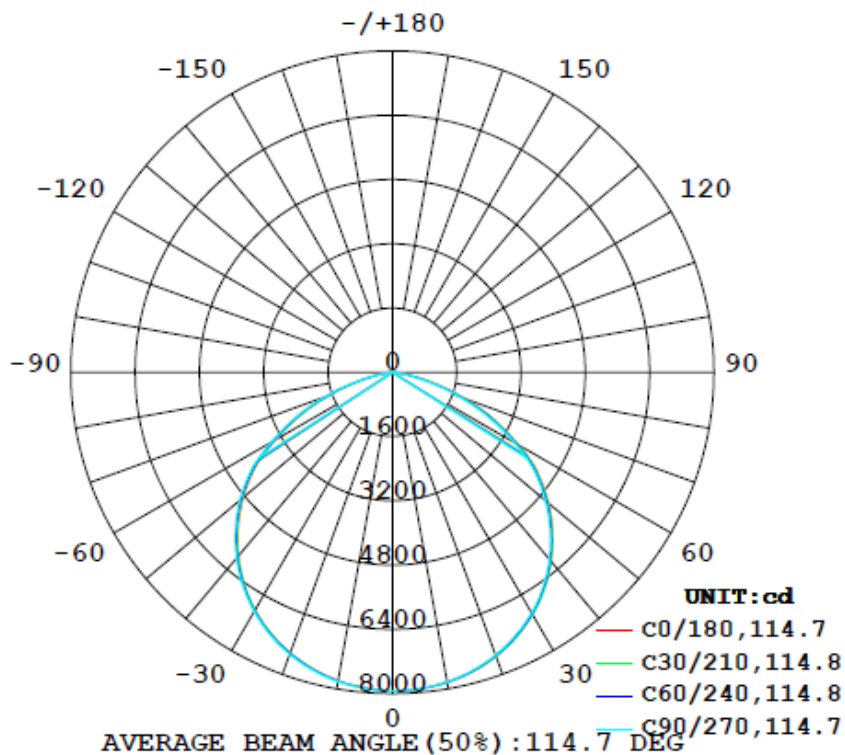
Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	1.2528	150.48	0.9990

Goniophotometer Data:

Parameter	Results	
Total Luminous (lm)	22242.1	
Luminous Efficacy (lm/w)	147.81	
Zonal Lumens Distribution (20-50°)	52.5%	
Beam Angle (°)	114.7	
UGR	Crosswise	35.5
	Endwise	35.0

Luminous Intensity Distribution Diagram:

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM

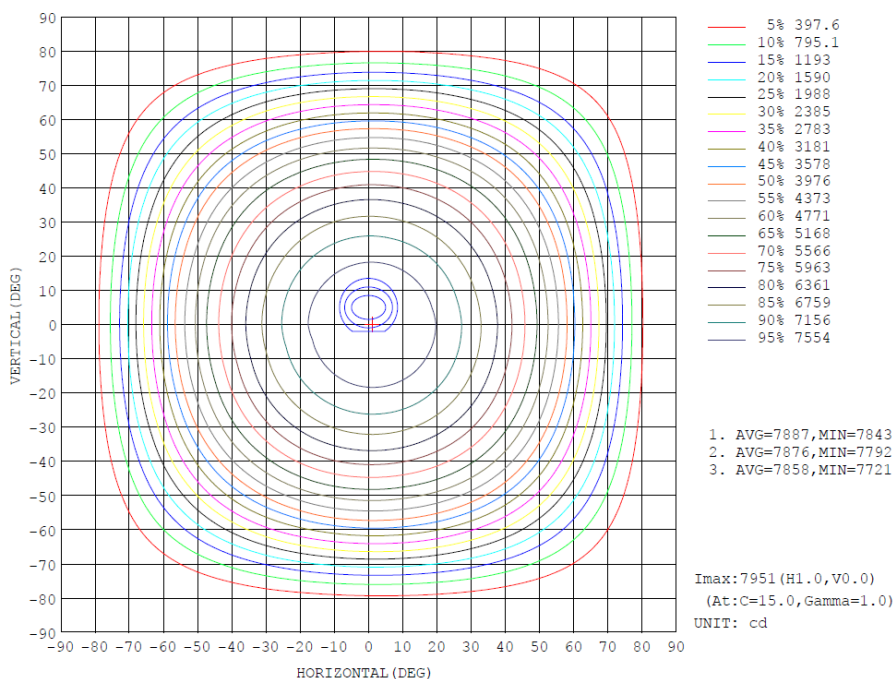


Zonal Flux Diagram:

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	zone	total	lum, lamp
10	7838	7836	7817	7799	7799	7800	7819	7836	0- 10	751.5	751.5	3.38,3.38
20	7526	7516	7483	7445	7435	7445	7477	7509	10- 20	2168	2920	13.1,13.1
30	6959	6954	6915	6859	6837	6845	6883	6918	20- 30	3328	6248	28.1,28.1
40	6140	6124	6064	6008	5961	5994	6050	6091	30- 40	4070	10319	46.4,46.4
50	5074	5041	4958	4878	4845	4898	4968	5037	40- 50	4270	14588	65.6,65.6
60	3630	3595	3501	3383	3361	3417	3498	3587	50- 60	3832	18421	82.8,82.8
70	1903	1847	1744	1674	1654	1724	1810	1878	60- 70	2612	21032	94.6,94.6
80	420.8	383.8	328.3	291.3	310.6	325.2	382.6	424.1	70- 80	1060	22092	99.3,99.3
90	7.438	13.54	4.276	5.858	1.364	1.513	3.154	17.55	80- 90	128.3	22220	99.9,99.9
100	1.025	1.060	1.115	1.145	2.284	2.264	2.213	2.133	90-100	1.942	22222	99.9,99.9
110	1.525	1.520	1.642	1.715	2.832	2.876	2.880	2.755	100-110	2.069	22224	99.9,99.9
120	2.386	2.307	2.398	2.539	3.528	3.477	3.437	3.310	110-120	2.503	22227	99.9,99.9
130	3.428	3.294	3.380	3.505	4.816	4.858	4.909	4.487	120-130	3.093	22230	99.9,99.9
140	4.296	4.235	4.359	4.394	5.847	6.250	5.953	5.809	130-140	3.619	22233	100,100
150	4.572	4.605	4.603	4.777	6.594	6.827	6.664	6.605	140-150	3.388	22237	100,100
160	5.485	5.277	4.826	5.474	7.212	7.358	6.845	6.813	150-160	2.728	22240	100,100
170	6.149	6.294	5.903	6.083	7.336	7.524	7.103	6.786	160-170	1.830	22241	100,100
180	7.285	7.332	7.121	7.080	7.284	7.396	7.052	6.934	170-180	0.6527	22242	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	22.0	23.6	22.3	23.9	24.2	21.7	23.4	22.1	23.7	24.0
3H	23.4	24.8	23.7	25.1	25.5	23.0	24.5	23.4	24.8	25.2
4H	23.7	25.1	24.1	25.4	25.8	23.3	24.7	23.7	25.0	25.4
6H	23.9	25.1	24.3	25.5	25.9	23.4	24.7	23.8	25.0	25.4
8H	23.9	25.1	24.3	25.5	25.9	23.4	24.6	23.8	25.0	25.4
12H	23.9	25.0	24.3	25.4	25.8	23.4	24.5	23.8	24.9	25.4
4H 2H	22.5	23.9	22.9	24.2	24.6	22.3	23.6	22.7	24.0	24.4
3H	24.1	25.2	24.5	25.6	26.0	23.7	24.9	24.1	25.2	25.7
4H	24.5	25.5	24.9	25.9	26.4	24.1	25.1	24.5	25.5	26.0
6H	24.7	25.6	25.2	26.0	26.5	24.2	25.1	24.7	25.5	26.0
8H	24.7	25.5	25.2	26.0	26.4	24.2	25.0	24.7	25.5	25.9
12H	24.7	25.4	25.2	25.9	26.4	24.2	24.9	24.7	25.4	25.9
8H 4H	24.6	25.5	25.1	25.9	26.4	24.2	25.0	24.7	25.5	25.9
6H	24.9	25.5	25.3	26.0	26.5	24.4	25.0	24.8	25.5	26.0
8H	24.9	25.5	25.4	26.0	26.5	24.3	25.0	24.8	25.5	25.9
12H	24.9	25.4	25.4	25.9	26.5	24.3	24.9	24.9	25.4	25.9
12H 4H	24.6	25.4	25.1	25.8	26.3	24.2	24.9	24.7	25.4	25.9
6H	24.8	25.5	25.4	25.9	26.5	24.3	25.0	24.8	25.4	25.9
8H	24.9	25.4	25.4	25.9	26.5	24.3	24.9	24.9	25.4	25.9

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	32.8	34.4	33.1	34.7	35.0	32.5	34.2	32.9	34.5	34.8
3H	34.2	35.6	34.5	35.9	36.3	33.8	35.3	34.2	35.6	36.0
4H	34.5	35.9	34.9	36.2	36.6	34.1	35.5	34.5	35.8	36.2
6H	34.7	35.9	35.1	36.3	36.7	34.2	35.5	34.6	35.8	36.2
8H	34.7	35.9	35.1	36.3	36.7	34.2	35.4	34.6	35.8	36.2
12H	34.7	35.8	35.1	36.2	36.6	34.2	35.3	34.6	35.7	36.2
4H 2H	33.3	34.7	33.7	35.0	35.4	33.1	34.4	33.5	34.8	35.2
3H	34.9	36.0	35.3	36.4	36.8	34.5	35.7	34.9	36.0	36.5
4H	35.3	36.3	35.7	36.7	37.2	34.9	35.9	35.3	36.3	36.8
6H	35.5	36.4	36.0	36.8	37.3	35.0	35.9	35.5	36.3	36.8
8H	35.5	36.3	36.0	36.8	37.2	35.0	35.8	35.5	36.3	36.7
12H	35.5	36.2	36.0	36.7	37.2	35.0	35.7	35.5	36.2	36.7
8H 4H	35.4	36.3	35.9	36.7	37.2	35.0	35.8	35.5	36.3	36.7
6H	35.7	36.3	36.1	36.8	37.3	35.2	35.8	35.6	36.3	36.8
8H	35.7	36.3	36.2	36.8	37.3	35.1	35.8	35.6	36.3	36.7
12H	35.7	36.2	36.2	36.7	37.3	35.1	35.7	35.7	36.2	36.7
12H 4H	35.4	36.2	35.9	36.6	37.1	35.0	35.7	35.5	36.2	36.7
6H	35.6	36.3	36.2	36.7	37.3	35.1	35.8	35.6	36.2	36.7
8H	35.7	36.2	36.2	36.7	37.3	35.1	35.7	35.7	36.2	36.7

Maximum UGR = 37.3

Luminous Distribution Intensity Data:

Table--1
C (DEG)

UNIT: cd

Y (DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	7933	7933	7933	7933	7933	7933	7933	7933	7933	7933	7933	7933	7933	7933	7933	7933	7933	7933	7933
5	7915	7913	7910	7908	7907	7903	7901	7896	7895	7890	7889	7886	7890	7888	7887	7889	7892	7896	7898
10	7838	7838	7836	7836	7829	7823	7817	7811	7806	7799	7801	7792	7799	7796	7797	7800	7806	7810	7819
15	7712	7710	7709	7703	7697	7689	7681	7671	7665	7650	7648	7639	7645	7644	7646	7649	7657	7665	7676
20	7526	7526	7522	7516	7506	7495	7483	7474	7461	7445	7440	7430	7435	7436	7439	7445	7454	7466	7477
25	7275	7279	7275	7267	7256	7242	7226	7213	7197	7182	7173	7163	7168	7168	7170	7177	7187	7203	7211
30	6959	6969	6966	6954	6944	6932	6915	6896	6880	6859	6847	6833	6837	6834	6837	6845	6859	6872	6883
35	6579	6588	6588	6576	6561	6548	6528	6511	6492	6472	6454	6431	6432	6427	6436	6449	6463	6479	6494
40	6140	6140	6136	6124	6104	6084	6064	6050	6034	6008	5984	5958	5961	5960	5973	5994	6007	6025	6050
45	5638	5631	5624	5614	5587	5554	5537	5526	5507	5473	5454	5432	5427	5438	5457	5477	5492	5516	5541
50	5074	5064	5055	5041	5011	4973	4958	4940	4914	4878	4862	4846	4845	4855	4878	4898	4916	4941	4968
55	4438	4424	4418	4402	4368	4337	4314	4287	4258	4212	4191	4194	4198	4205	4234	4248	4270	4300	4328
60	3630	3613	3613	3595	3561	3534	3501	3452	3409	3383	3353	3336	3361	3380	3406	3417	3444	3475	3498
65	2785	2778	2763	2738	2698	2671	2626	2602	2589	2549	2511	2504	2515	2531	2556	2574	2620	2648	2669
70	1903	1888	1876	1847	1808	1775	1744	1714	1699	1674	1651	1632	1654	1670	1702	1724	1755	1785	1810
75	1077	1071	1053	1025	999	963	942	919	904	880	867	854	869	882	906	934	957	984	1013
80	421	411	402	384	367	350	328	314	304	291	282	275	311	317	313	325	342	361	383
85	96.8	92.7	91.2	89.3	89.5	84.7	80.6	74.0	76.2	74.0	72.8	71.1	68.0	69.6	71.9	74.4	77.5	83.1	89.8
90	7.44	5.18	15.0	13.5	11.4	8.74	4.28	7.92	6.71	5.86	5.50	5.47	1.36	1.42	1.64	1.51	1.42	1.86	3.15
95	0.81	0.82	0.83	0.84	0.85	0.86	0.88	0.88	0.89	0.90	0.90	0.89	1.81	1.80	1.79	1.78	1.76	1.74	1.72
100	1.03	1.03	1.04	1.06	1.08	1.10	1.11	1.12	1.13	1.14	1.15	1.12	2.28	2.27	2.27	2.26	2.25	2.23	2.21
105	1.25	1.26	1.24	1.27	1.31	1.35	1.36	1.38	1.39	1.40	1.40	1.38	2.69	2.66	2.66	2.67	2.67	2.66	2.65
110	1.53	1.53	1.51	1.52	1.57	1.61	1.64	1.67	1.68	1.71	1.72	1.68	2.83	2.83	2.87	2.88	2.88	2.88	2.88
115	1.91	1.86	1.87	1.86	1.89	1.95	2.00	2.04	2.05	2.10	2.08	2.05	3.07	3.06	3.07	3.09	3.09	3.09	3.09
120	2.39	2.37	2.31	2.31	2.36	2.36	2.40	2.45	2.47	2.54	2.57	2.52	3.53	3.51	3.48	3.48	3.44	3.42	3.44
125	2.94	2.88	2.78	2.82	2.88	2.78	2.84	2.89	2.94	3.04	3.10	3.03	4.05	4.06	4.02	4.07	4.02	4.03	4.03
130	3.43	3.42	3.38	3.29	3.48	3.42	3.38	3.41	3.51	3.50	3.63	3.62	4.82	4.86	4.90	4.86	4.93	4.86	4.91
135	3.95	3.96	3.87	3.71	3.85	4.04	3.99	3.98	3.96	3.98	4.05	4.10	5.40	5.53	5.58	5.71	5.70	5.66	5.63
140	4.30	4.40	4.28	4.24	4.29	4.41	4.36	4.32	4.33	4.39	4.32	4.36	5.85	5.99	6.04	6.25	6.29	6.16	5.95
145	4.40	4.53	4.45	4.37	4.54	4.52	4.52	4.55	4.60	4.57	4.47	4.49	6.20	6.26	6.34	6.50	6.62	6.52	6.43
150	4.57	4.73	4.71	4.60	4.53	4.67	4.60	4.69	4.70	4.78	4.66	4.65	6.59	6.57	6.62	6.83	6.82	6.71	6.66
155	5.03	5.18	5.20	4.86	4.78	4.92	4.73	4.92	4.99	5.08	5.15	4.94	6.81	6.80	7.02	6.97	6.95	6.88	6.70
160	5.49	5.57	5.50	5.28	4.97	5.01	4.83	5.19	5.29	5.47	5.44	5.34	7.21	7.21	7.16	7.36	7.22	7.04	6.85
165	5.78	5.95	5.95	5.91	5.58	5.55	5.46	5.69	5.86	5.98	5.82	5.78	7.27	7.29	7.39	7.47	7.60	7.42	7.12
170	6.15	6.29	6.36	6.29	5.80	5.88	5.90	5.83	6.06	6.08	6.07	6.09	7.34	7.35	7.45	7.52	7.54	7.46	7.10
175	6.84	7.02	7.06	7.01	6.60	6.53	6.37	6.41	6.66	6.72	6.76	6.82	7.37	7.37	7.50	7.53	7.46	7.44	7.11
180	7.29	7.44	7.39	7.33	7.12	7.06	7.12	6.73	6.89	7.08	7.10	7.27	7.28	7.28	7.42	7.40	7.34	7.15	7.05

Table--2
C (DEG)

UNIT: cd

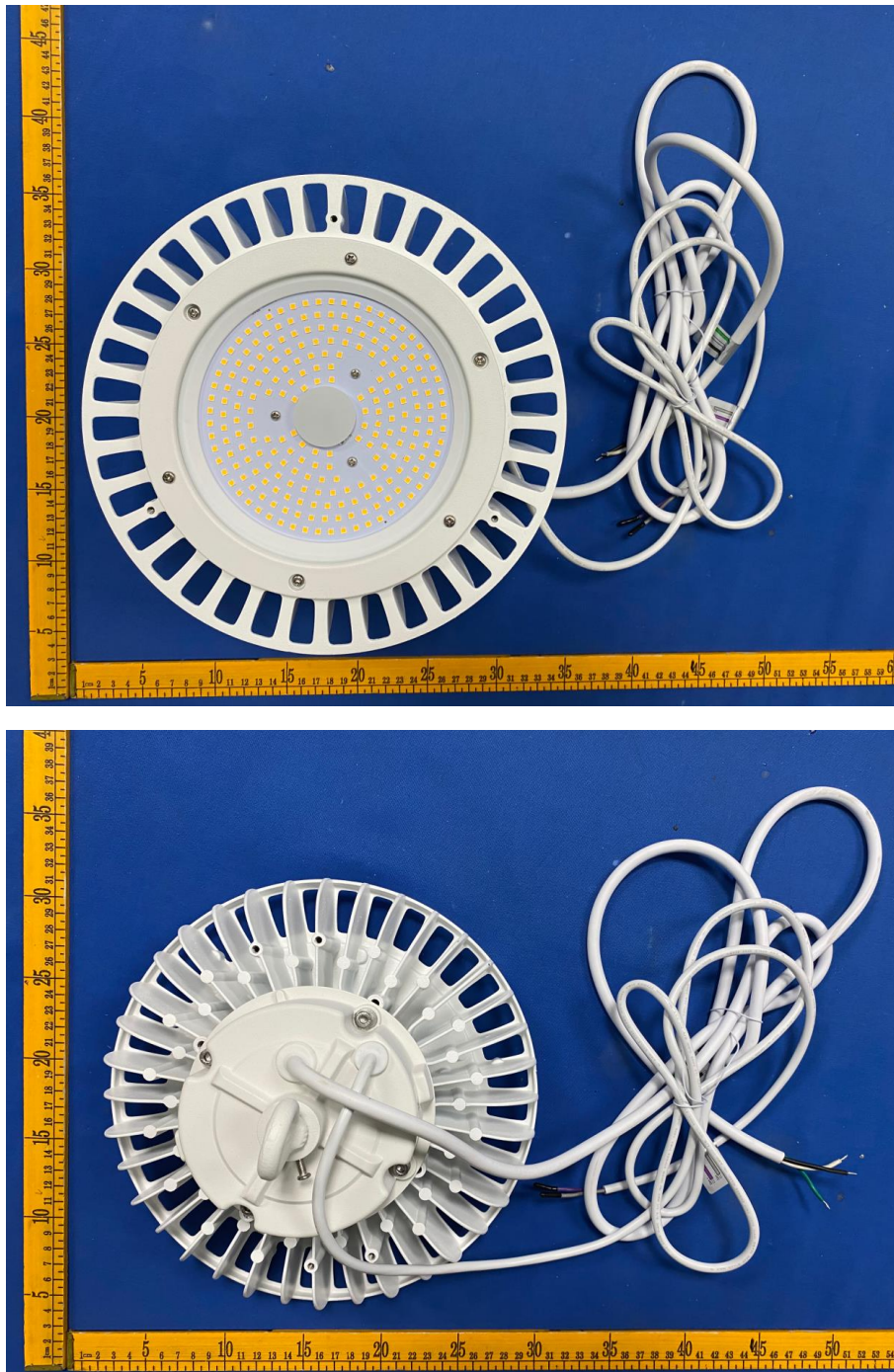
Y (DEG)	285	300	315	330	345														
0	7933	7933	7933	7933	7933														
5	7904	7906	7910	7912	7912														
10	7823	7830	7836	7842	7843														
15	7686	7696	7704	7709	7716														
20	7488	7500	7509	7521	7529														
25	7220	7235	7247	7263	7274														
30	6890	6900	6918	6935	6951														
35	6504	6513	6534	6550	6574														
40	6062	6077	6091	6115	6138														
45	5563	5579	5595	5619	5644														
50	5000	5016	5037	5060	5082														
55	4366	4385	4410	4428	4451														
60	3531	3552	3587	3612	3641														
65	2699	2712	2739	2764	2792														
70	1835	1849	1878	1904	1934														
75	1025	1040	1058	1083	1102														
80	397	407	424	435	439														
85	94.6	99.9	104	106	106														
90	15.4	16.5	17.5	17.6	17.3														
95	1.69	1.67	1.65	1.63	1.62														
100	2.19	2.16	2.13	2.11	2.09														
105	2.62	2.59	2.55	2.55	2.50														
110	2.85	2.81	2.75	2.71	2.65														
115	3.07	3.02	2.98	2.91	2.89														
120	3.42	3.35	3.31	3.29	3.31														
125	3.98	3.83	3.79	3.71	3.83														
130	4.78	4.69	4.49	4.57	4.64														
135	5.40	5.18	5.16	5.29	5.30														
140	5.77	5.82	5.81	5.81	5.88														
145	6.15	6.26	6.17	6.08	6.21														
150	6.51	6.46	6.61	6.53	6.56														
155	6.64	6.68	6.65	6.99	6.91														
160	6.77	6.83	6.81	7.23	7.18														
165	7.03	7.03	7.00	7.23	7.32														
170	7.08	7.06	6.79	7.12	7.32														
175	6.93	7.04	6.85	7.22	7.29														
180	7.04	6.74	6.93	7.06	7.09														

THD and PF Measurement Test Results:

Electrical Measurement:

Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor	iTHD(%)
277.0	60	0.5555	147.22	0.9567	7.89

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*******