

## 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

### UVC Disinfection High Bay

Model Name(s):

558041###

Representative (Tested) Model:

558041410

#### Model Difference:

1. The first and second # represents 5000K, can be 41-70;
2. The third # represents factory code, can be 0-9;
3. All is the same construction, except model design.

Prepare by:



Engineer: Alan Wang

Date: 2021-06-03

Review by:



Technical Lead: Vincent Yuan

Issue Date: 2021-06-07

Revised Date: N/A

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

**Client Information:**

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

**Product Information:**

Model Number:	558041### (###=410-719)
Product Type:	High Bay Luminaires for Commercial and Industrial Buildings
Rating Input:	120-277Vac, 50/60Hz, 171W for Luminaire, 185W for total Luminaire with UVC
Declared CCT:	5000K
Declared Light Output:	22500 lm
LED Manufacturer:	Samsung Electronics Co., Ltd.
LED Model:	SPMWH1229AQ5XXRXXX
LED Quantity:	Main Light: 368 pcs Blue Light: 24 pcs UVC Light: 8 pcs

**Test Information:**

Standard Lamp:	Total Spectral Radiant Flux Standard Lamp, trace to NIST. 1. D908S for Gonio 2. D215S for Integrating Sphere
Date of Receipt Samples:	2021-05-20
Quantity of Receipt Samples:	1 pc
Sample Number:	210520027-S1

**Laboratory Information:**

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

**Report Information:**

Issued Date of Test Report:	2021-06-07
Revised Date of Test Report:	N/A
Test Report No.:	NTCLR21060025
Remark (If applicable):	1. The product contains with UVC Light, only Main Light was tested in this report.

<b>Test Specification:</b>	
Date of Test	2021-05-20
Test Item	1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Correlated Color Temperature 4. Color Rendering Index 5. Chromaticity Coordinate 6. Fidelity Index 7. Gamut Index 8. Local Chroma Shift 9. 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

<b>Test Methods:</b>
<p><b>1. Photometric and Electrical Measurements – Light Distribution Method:</b></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><b>2. Photometric and Electrical Measurements – Integrating Sphere Method:</b></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><b>3. THD and PF Measurements:</b></p> <p>The sample was tested according to the ANSI C82.77-10-2014, 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)
25.2	41.0	Face Down	90	10

**Electrical Data:**

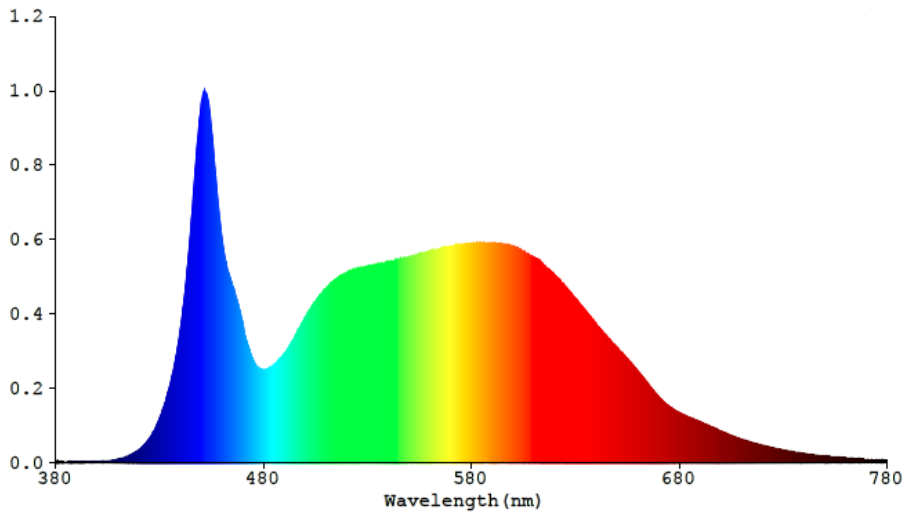
Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	1.4228	171.22	0.9986

**Color Data:**

Parameter	Result
CCT(K)	4969
R <sub>a</sub>	85.6
R <sub>r</sub>	86
R <sub>g</sub>	97
R <sub>cs, h1</sub>	-11%
Chromaticity, (x, y)	(0.3467, 0.3587)
Chromaticity, (u', v')	(0.2098, 0.4883)
Duv	0.0029

Specify Color Rendering			
R1	84	R9	21
R2	90	R10	77
R3	95	R11	84
R4	85	R12	59
R5	84	R13	86
R6	86	R14	97
R7	90	R15	79
R8	72	-	-

**Spectrum Diagram:**

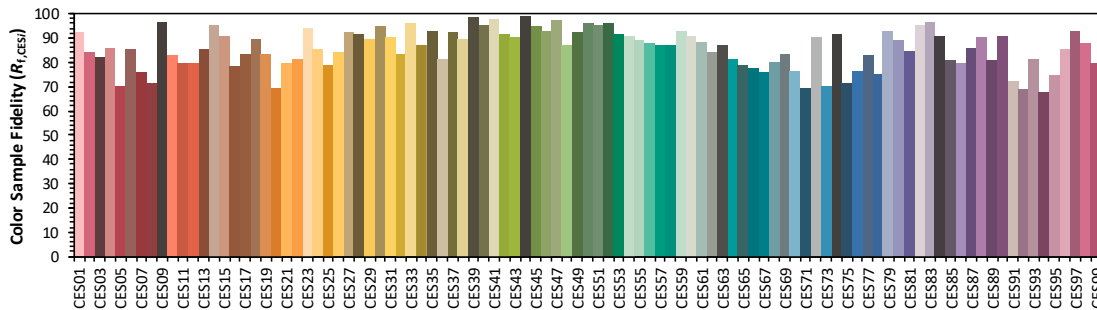
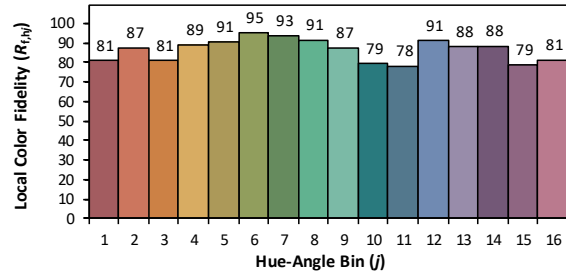
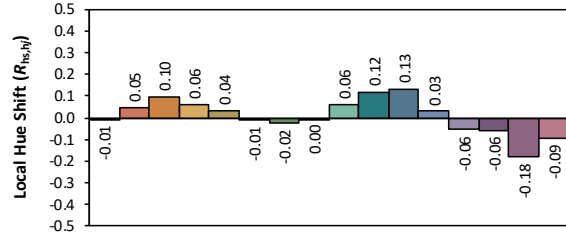
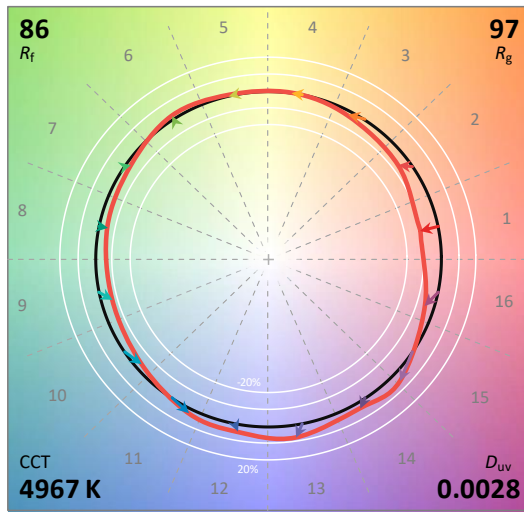
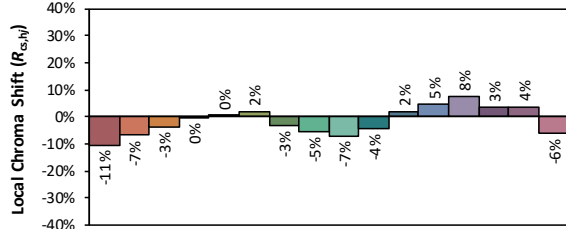
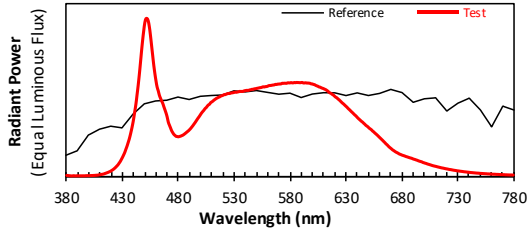


**IES TM-30-18 Color Rendition Result:**

**ANSI/IES TM-30-18 Color Rendition Report**

Source: 1 CIE F1  
Date: 2021/6/3

Manufacturer: ETI Solid State Lighting (2)  
Model: 558041###



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

$x$  0.3466  
 $y$  0.3585  
 $u'$  0.2098  
 $v'$  0.4882

CIE 13.3-1995  
(CRI)  
 $R_a$  86  
 $R_9$  21

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



**Goniophotometer Test Results:**

**Test Condition:**

Test Ambient (°C)	Test Humidity (%)	Orientation	Stabilization Time (minute)	Test Time (minute)
25.1	40.6	Face Down	90	25

**Electrical Data:**

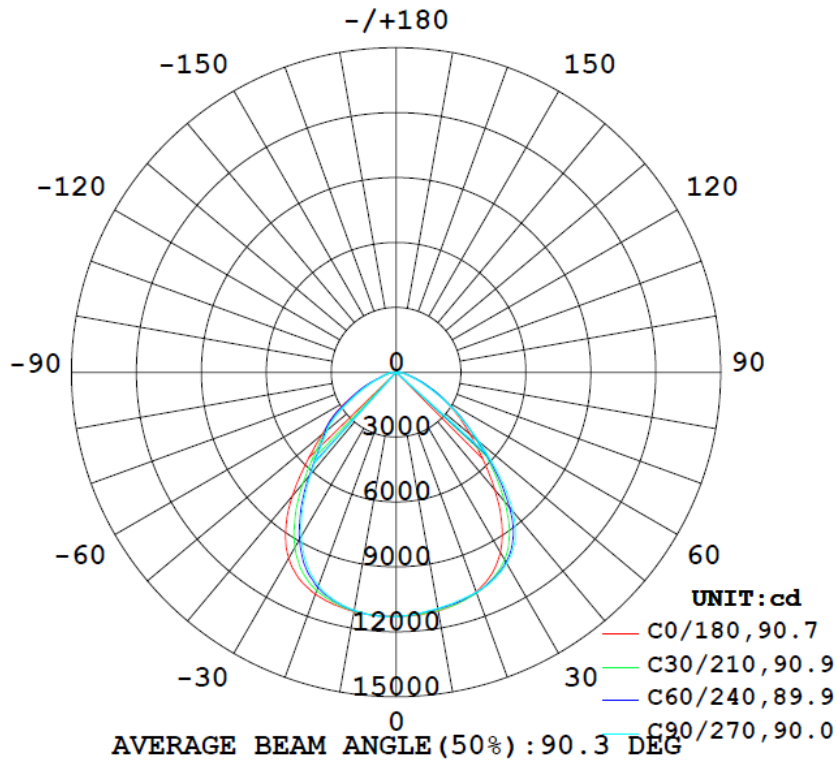
Voltage (V)	Frequency (Hz)	Current (A)	Wattage (W)	Power Factor
120.0	60	1.4288	171.22	0.9986

**Goniophotometer Data:**

Parameter	Results	
Total Luminous (lm)	24544.3	
Luminous Efficacy (lm/w)	143.35	
Zonal Lumens Distribution (20-50°)	59.4%	
Beam Angle (°)	90.3	
UGR	Viewed Crosswise	Viewed Endwise
	30.4	30.6

**Luminous Intensity Distribution Diagram:**

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM

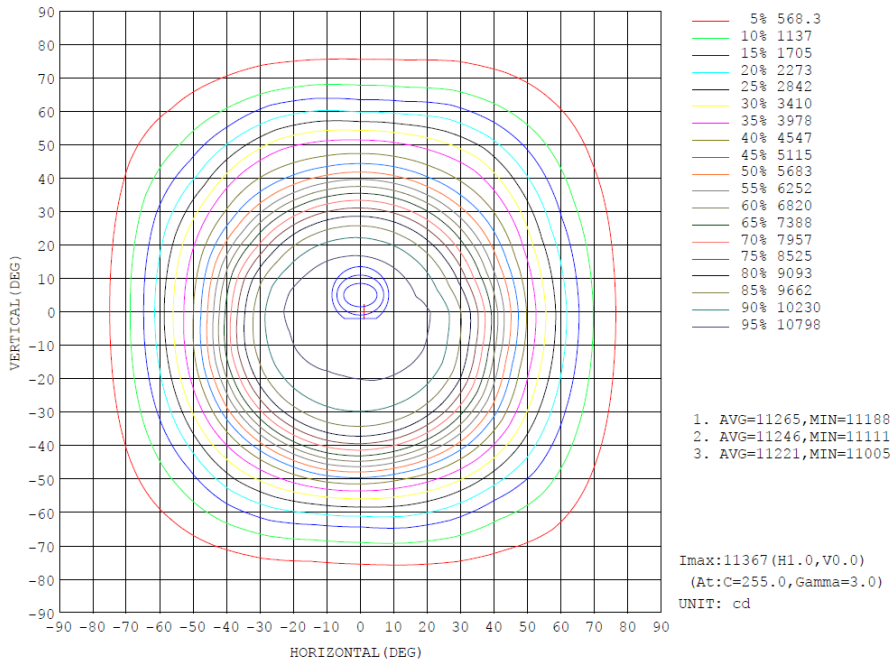


**Zonal Flux Diagram:**

ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	φ zone	φ total	lum,lamp
10	1119	1113	1107	1112	1123	1120	1116	1116	0- 10	1071	1071	4.36,4.36
20	1079	1084	1081	1090	1092	1065	1050	1055	10- 20	3108	4179	17,17
30	962.1	1010	1022	1026	993.1	914.6	877.1	889.7	20- 30	4736	8915	36.3,36.3
40	709.0	801.6	838.4	831.9	746.8	646.2	614.0	625.3	30- 40	5340	14255	58.1,58.1
50	446.2	492.7	500.7	499.7	448.5	432.3	416.5	426.5	40- 50	4508	18763	76.4,76.4
60	254.3	260.7	249.3	272.4	254.3	237.0	222.5	252.6	50- 60	3154	21917	89.3,89.3
70	108.9	107.9	102.8	111.6	97.20	89.76	89.37	103.9	60- 70	1686	23603	96.2,96.2
80	40.74	43.78	40.61	39.38	35.39	40.75	43.56	44.23	70- 80	681.1	24284	98.9,98.9
90	3.919	4.086	7.383	1.127	0.0881	0.0993	0.1113	0.0866	80- 90	225.0	24509	99.9,99.9
100	0.0873	0.1815	1.770	0.1940	0.1727	0.3631	4.225	0.2878	90-100	5.822	24515	99.9,99.9
110	0.1336	0.1877	0.1859	0.2020	0.2359	0.3105	0.2852	0.3213	100-110	6.666	24522	99.9,99.9
120	0.2272	0.2418	0.2362	0.2575	0.3416	0.4046	0.4098	0.4114	110-120	2.637	24524	99.9,99.9
130	0.3605	0.3547	0.3516	0.3678	0.5293	0.6192	0.6570	0.6096	120-130	3.525	24528	99.9,99.9
140	0.5047	0.5046	0.5087	0.5095	0.7100	0.8174	0.8381	0.7980	130-140	4.404	24532	100,100
150	0.6095	0.6184	0.6012	0.6132	0.8839	0.9597	0.9830	0.9670	140-150	4.494	24537	100,100
160	0.7750	0.7340	0.6867	0.7381	1.030	1.066	1.051	1.051	150-160	3.882	24541	100,100
170	0.8887	0.8964	0.8353	0.8694	1.086	1.117	1.078	1.039	160-170	2.661	24543	100,100
180	1.078	1.085	1.020	1.028	1.075	1.087	1.042	1.018	170-180	0.9566	24544	100,100
DEG	LUMINOUS INTENSITY:×10cd									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				
		17.2	18.7	17.6	19.0	19.3	17.6	19.1	18.0	19.4	19.7
	3H	18.1	19.4	18.4	19.7	20.1	18.4	19.7	18.7	20.0	20.4
	4H	18.3	19.5	18.7	19.9	20.2	18.6	19.8	19.0	20.1	20.5
	6H	18.5	19.6	18.9	20.0	20.4	18.7	19.9	19.1	20.2	20.6
	8H	18.6	19.6	19.0	20.0	20.4	18.8	19.9	19.2	20.3	20.7
	12H	18.6	19.6	19.0	20.0	20.4	18.9	19.9	19.3	20.3	20.7
4H	2H	17.5	18.8	17.9	19.1	19.5	17.9	19.1	18.3	19.5	19.9
	3H	18.6	19.6	19.0	20.0	20.4	18.9	19.9	19.3	20.3	20.7
	4H	18.9	19.8	19.3	20.2	20.6	19.1	20.0	19.6	20.4	20.9
	6H	19.2	20.0	19.6	20.4	20.9	19.4	20.2	19.8	20.6	21.1
	8H	19.3	20.0	19.7	20.5	20.9	19.5	20.2	20.0	20.7	21.2
	12H	19.3	20.0	19.8	20.5	20.9	19.6	20.3	20.1	20.8	21.2
8H	4H	19.0	19.7	19.5	20.2	20.6	19.2	19.9	19.7	20.4	20.9
	6H	19.4	20.0	19.9	20.5	21.0	19.6	20.2	20.1	20.7	21.1
	8H	19.5	20.1	20.0	20.6	21.1	19.7	20.3	20.3	20.8	21.3
	12H	19.7	20.1	20.2	20.6	21.2	20.0	20.5	20.5	20.9	21.5
12H	4H	19.0	19.6	19.5	20.1	20.6	19.2	19.9	19.7	20.3	20.8
	6H	19.4	20.0	19.9	20.4	21.0	19.6	20.1	20.1	20.6	21.1
	8H	19.6	20.1	20.1	20.6	21.2	19.8	20.3	20.3	20.8	21.4

Maximum UGR = 21.5

**Corrected UGR Table:**

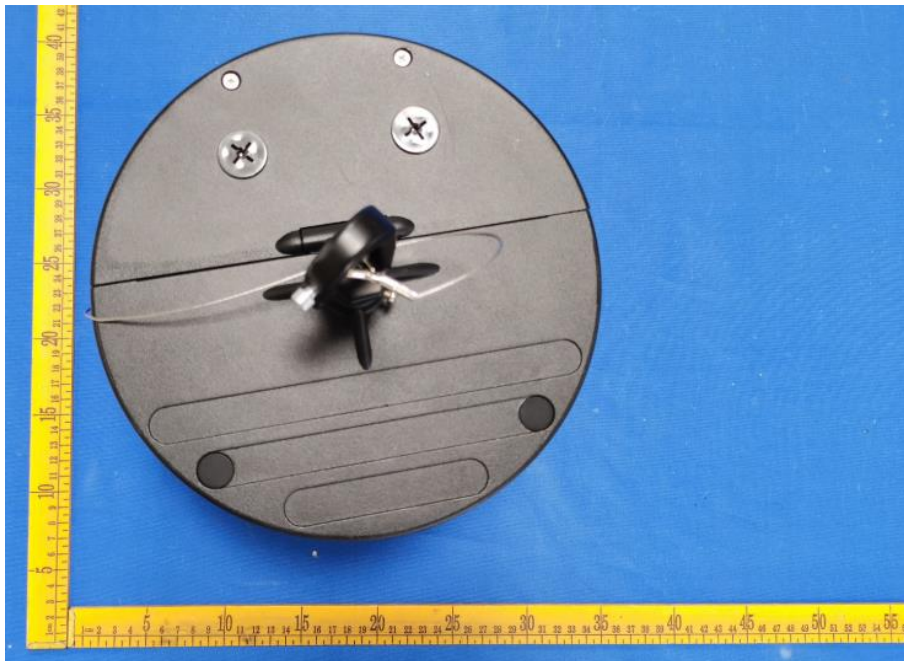
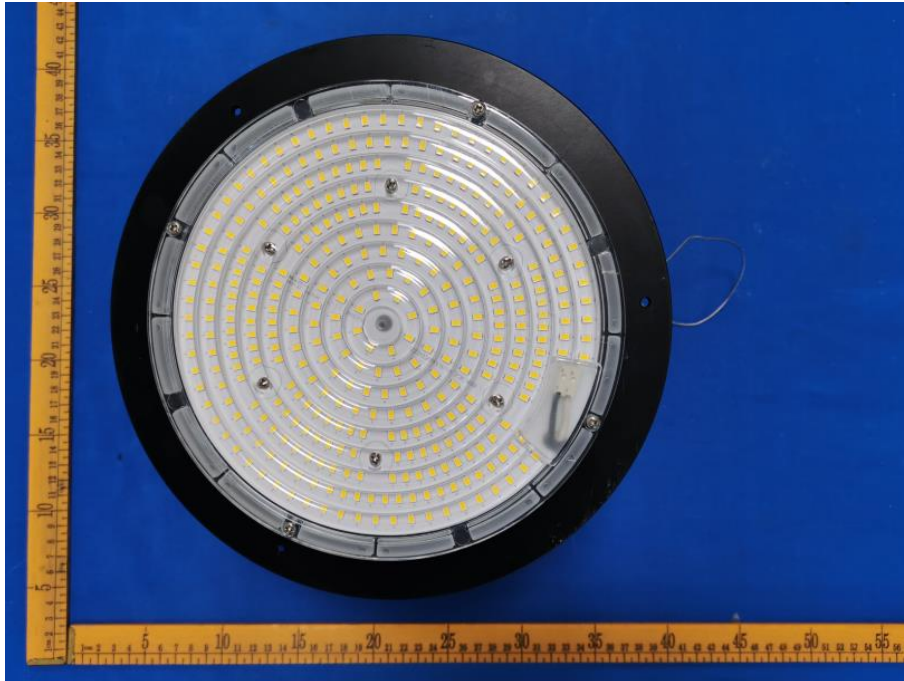
**UGR Table - Corrected**

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											
X=2H	Y=2H	UGR Viewed Crosswise					UGR Viewed Endwise				
		28.3	29.8	28.7	30.1	30.4	28.7	30.2	29.1	30.5	30.8
	3H	29.2	30.5	29.5	30.8	31.2	29.5	30.8	29.8	31.1	31.5
	4H	29.4	30.6	29.8	31.0	31.3	29.7	30.9	30.1	31.2	31.6
	6H	29.6	30.7	30.0	31.1	31.5	29.8	31.0	30.2	31.3	31.7
	8H	29.7	30.7	30.1	31.1	31.5	29.9	31.0	30.3	31.4	31.8
	12H	29.7	30.7	30.1	31.1	31.5	30.0	31.0	30.4	31.4	31.8
4H	2H	28.6	29.9	29.0	30.2	30.6	29.0	30.2	29.4	30.6	31.0
	3H	29.7	30.7	30.1	31.1	31.5	30.0	31.0	30.4	31.4	31.8
	4H	30.0	30.9	30.4	31.3	31.7	30.2	31.1	30.7	31.5	32.0
	6H	30.3	31.1	30.7	31.5	32.0	30.5	31.3	30.9	31.7	32.2
	8H	30.4	31.1	30.8	31.6	32.0	30.6	31.3	31.1	31.8	32.3
	12H	30.4	31.1	30.9	31.6	32.0	30.7	31.4	31.2	31.9	32.3
8H	4H	30.1	30.8	30.6	31.3	31.7	30.3	31.0	30.8	31.5	32.0
	6H	30.5	31.1	31.0	31.6	32.1	30.7	31.3	31.2	31.8	32.2
	8H	30.6	31.2	31.1	31.7	32.2	30.8	31.4	31.4	31.9	32.4
	12H	30.8	31.2	31.3	31.7	32.3	31.1	31.6	31.6	32.0	32.6
12H	4H	30.1	30.7	30.6	31.2	31.7	30.3	31.0	30.8	31.4	31.9
	6H	30.5	31.1	31.0	31.5	32.1	30.7	31.2	31.2	31.7	32.2
	8H	30.7	31.2	31.2	31.7	32.3	30.9	31.4	31.4	31.9	32.5

Maximum UGR = 32.6



**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\*\*\*\*\*