LCTECH

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Test report of

IES LM-79-08

Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Rendered to:

Beyond LED Technology
1939 Parker Court, Stone Mountain, GA 30087

For products:

Linear Replacement Lamps

Models No.: DYU-TTBTWC-8M____
(Where "ZZ" denotes commercial code, it can be number or A, B, C, D)

Test Date:	Apr. 28, 2025 to May. 6, 2025
Test Lab.:	**LCTECH Guangdong Testing Services Co., Ltd.** 1/F., Building I, & 2, 3, 4/F., Building II, Technology and Enterprise Development Center, Guangyuan Road, Xiaolan, Zhongshan, Guangdong, China Tel:+86-760-22833366 E-mail:Service@lccert.com http://www.lccert.com
Test Sites:	2/F., Building II & 1/F., Building I, Technology and Enterprise Development Center, Guangyuan Road, Xiaolan, Zhongshan, Guangdong, China
Template No.:	LC-RT-PL-049 Rev.1.4
Test Note:	*N/A*

Compiled by:		**Reviewed by:**	
Kargel Yuan	Kargel Yuan	**Lin Qiu**	Lin Qiu
May. 12, 2025		**May. 12, 2025**	

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1. General

1.1 Product Information

Brand Name	Beyond LED Technology
Category	Linear Replacement Lamps
General Application	8’ T8 Lamps
Primary Use	Internal Driver/Line Voltage (UL Type B) Lamps
Model Number	DYU-TTBTWC-8M
Rated Inputs	120-277VAC, 50/60Hz
Rated Power	36W/48W/60W
Rated Light output	7200lm
Declared CCT	4000K/5000K/6500K
Power Supply	DYP-LTWC-B.60
LED Package, Array or Module	Model: SMD2835-3V-0.2W, manufactured by Shenzhen CHANGFANG GROUP Co., LTD
Dimming	Dimmable
Integral Controls	No
Controls Controllability	No
Receipt Samples	2 units
Sample Code of lab.	The half of model DYU-TTBTWC-ZZ: 250429105001 DYU-TTBTWC-ZZ: 241030102005
Date of Receipt Samples	Oct. 30, 2024, Apr. 29, 2025
Note	This is a color tunable and multi-power product, 4000K, 5000K and 6500K at 30W/60W are selected for the test.

1.2 Standards or methods

The following standards are partly or totally used or referenced for test:

No.	Name
ANSI/NEMA/ ANSLG C78.377- 2017	Specifications for the Chromaticity of Solid State Lighting Products
ANSI/IES TM-30-18[1]	IES Method for Evaluating Light Source Color Rendition
ANSI C82.77-2002	Harmonic Emission Limits—Related Power Quality Requirements for Lighting Equipment
CIE Pub. No. 13.3-1995	Method of Measuring and Specifying Color Rendering of Light Sources
CIE Pub. No. 15:2004	Colorimetry
IES LM-79-08	Electrical and Photometric Measurements of Solid-State Lighting Products

Note:

1, For reference only and not in the scope of NVLAP.

1.3 Equipment list

Instrument	ID	Model name	Cal. date	Next cal. Date
AC Power supply	LC-I-987	APW-120N	2024-12-09	2025-12-08
AC Power supply	LC-I-989	APW-120N	2024-12-09	2025-12-08
Power analyzer	LC-I-PL-024	WT310E	2024-12-11	2025-12-10
Power analyzer	LC-I-954	WT210	2024-12-09	2025-12-08
Multimeter	LC-I-972	Fluke 17B	2024-06-26	2025-06-25
Photometric colorimetric electric system[2]	LC-I-956	HAAS-2000	Before use	Before use
Standard lamp[3]	LC-I-963	24V50W	2024-06-26	2025-06-25
Luminous Flux Lamp[4]	LC-I-PL-043	D204	2024-11-29	2025-11-28
Goniophotometer(with mirror)	LC-I-902	GMS2000	2025-03-01	2026-02-28
Wireless temperature transmitter	LC-I-PL-009	DWLR-DLR	2024-12-12	2025-12-11
Wireless temperature transmitter	LC-I-PL-008	DWLR-DLR	2024-12-12	2025-12-11

Note:

2, Bandwidth of spectroradiometer is 1 nm.

3, Halogen lamp, 50W, omni-directional type, and its traceability to NIM.

4, Incandescent lamp, 80W, omni-directional type, and its traceability to NIM.

2. Test conducted and method

The lamps were operated at least 2 hours to reach stabilization and temperature equilibrium before test.

2.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at 25°C ± 1°C; the air flow around the sample(s) being tested did not affect the performance.

2.2 Power Supply Characteristics

The AC/DC power supply had a sinusoidal voltage wave shape at the prescribed frequency (60 Hz) such that the RMS summation of the harmonic components does not exceed 3 percent of the fundamental during operation of the test item.

The voltage of AC power supply (RMS voltage) applied to the device under test was regulated to within±0.2 percent under load.

2.3 Seasoning and Stabilization

No seasoning was performed in accordance with IESNA LM-79-08. And before the measurement, the sample was stabilized until the light output and power variations were less than 0.5% in 30 minutes intervals (3 readings, 15 minutes apart).

2.4 Electrical Instrumentation

The calibration uncertainties of the instruments for AC/DC voltage and current were less than 0.2 percent, and the calibration uncertainty of the AC/DC power meter was less than 0.5 percent(95 % confidence interval, k=2).

2.5 Color Measurement Method

Spectral radiant flux was measured by a sphere -spectroradiometer system, and the color characteristics (Color rendering index, correlated color temperature, chromaticity coordinate) were calculated from these by software automatically.

2.6 Total Luminous Flux Measurement Method

Total luminous flux was measured by both sphere-spectroradiometer system.

Spectral radiant flux was measured by a sphere-spectroradiometer system, and the total luminous flux was calculated from these by software automatically.

2.7 Luminous Intensity Distribution Measurement Method

Luminous intensity distribution was measured by a mirror-type goniophotometer (Type C) which can keep the sample in burn position when the tests conduct, and the kinds of graph were generated by software automatically.

2.8 Spatial Non-uniformity of Chromaticity

The customer did not require this measurement.

3. Test Result Summary

3.1 Electrical data of half of model DYU-TTBTWC-ZZ

Criteria Item	Result		
	4000K	5000K	6500K
Input Voltage & Frequency	120.03 V~60Hz	120.04 V~60Hz	120.03 V~60Hz
Input Current(A)	0.256	0.244	0.256
Total Power(W)	29.56	28.35	29.57
Power Factor	0.962	0.966	0.963
I-THD	23.01 %	23.00 %	22.84 %
Off-state Power(W)	-	-	-

3.2 Electrical data of model DYU-TTBTWC-ZZ

Criteria Item	Result		
	4000K	5000K	6500K
Input Voltage & Frequency	119.99 V~60Hz	120.01 V~60Hz	119.99 V~60Hz
Input Current(A)	0.512	0.489	0.512
Total Power(W)	59.18	56.72	59.20
Power Factor	0.963	0.967	0.963
I-THD	23.51 %	23.03 %	23.61 %
Off-state Power(W)	-	-	-

3.3 Photometric data of half of model DYU-TTBTWC-ZZ

Criteria Item	Result		
	4000K	5000K	6500K
Total Lumens(lm)	3551.09	3848.75	3563.25
Luminaire Efficacy(lm/W)	120.13	135.76	120.50
Beam Angle	153.2°	-	-

3.4 Lumen and Color Characteristic data of model DYU-TTBTWC-ZZ

Criteria Item	Result		
	4000K	5000K	6500K
Total Lumens(lm)[1]	7102.18	7697.50	7126.50
Luminaire Efficacy(lm/W)[1]	120.01	135.71	120.38
Correlated Color Temperature (CCT)(K)	3981	4881	6287
Color Rendering Index (CRI)	82.4	83.7	83.9
R9	7	14	16
R_f	84	83	83
R_g	96	97	96
$R_{cs,h1}$	-12%	-12%	-12%
Chromaticity Coordinate (x,y)	0.4367, 0.4003	0.3697, 0.3620	0.3225, 0.3348

Chromaticity Coordinate (u',v')	0.2520, 0.5199	0.2239, 0.4933	0.2024, 0.4728
Duv	0.0007	-0.0017	0.0010
Beam Angle[2]	153.2°	-	-

3.5 Color Rendering Details of model DYU-TTBTWC-ZZ

CCT	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
4000K	81	88	94	82	81	84	86	64	7	71	81	61	82	96	75
5000K	83	89	93	83	82	84	87	69	14	73	81	57	85	96	78
6500K	83	88	89	84	83	82	89	73	16	69	83	58	84	94	80

3.6 Electrical data on 277V of model DYU-TTBTWC-ZZ

Criteria Item	Result		
	4000K	5000K	6500K
Input Voltage & Frequency	276.97 V~60Hz	276.98 V~60Hz	276.98 V~60Hz
Power Factor	0.960	0.958	0.960
I-THD	16.59 %	16.63 %	16.71 %

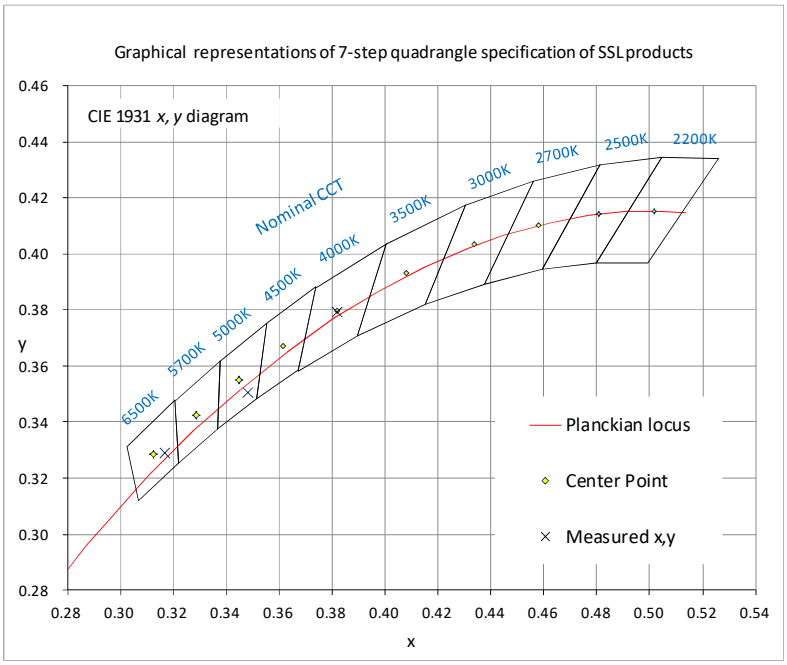
Note:

1, The Total Lumens is based on the test data of half of model DYU-TTBTWC-ZZ multiplied by 2, the luminaire efficacy is equal to total lumens divided by total power.

2, Beam Angle is shared from a shorter version of the product, because the optic is the same.

4. Test Data

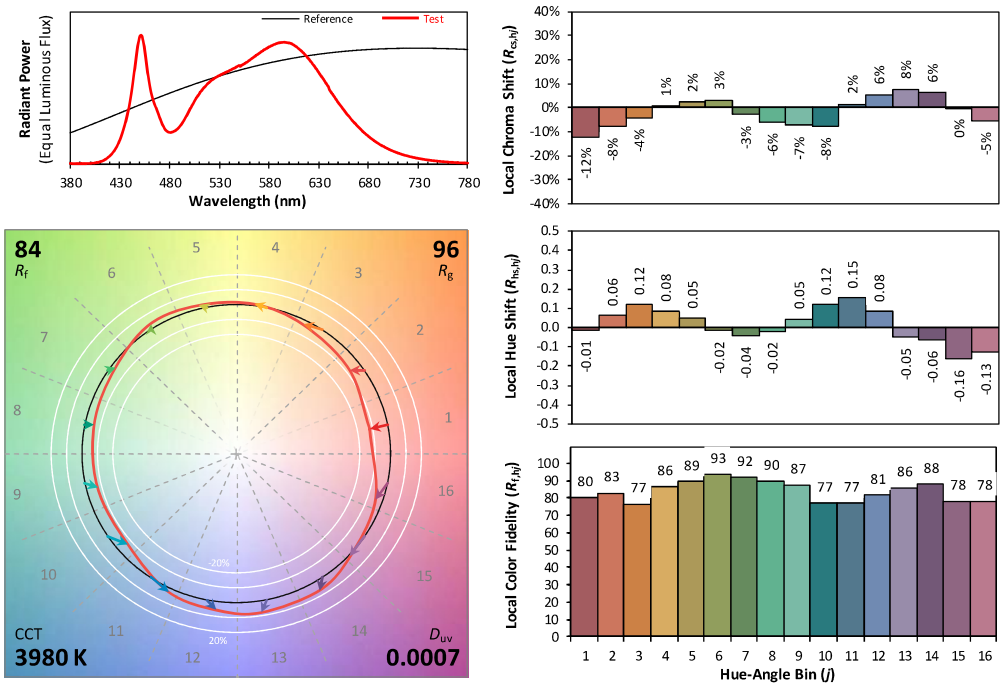
4.1 ANSI Chromaticity Quadrangles Diagram

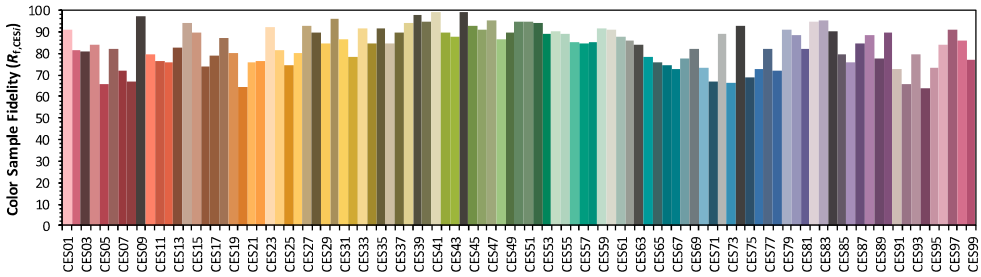


4.2 ANSI/IES TM-30-18 Color Rendition

ANSI/IES TM-30-18 Color Rendition Report

Source: SPD
Manufacturer: Huizhou Virtutech Co., Ltd
Date: 2025/5/12
Model: DYU-TTBTWC-ZZ(4000K)





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

x	0.3818
y	0.3790
u'	0.2251
v'	0.5028

CIE 13.3-1995 (CRI)

R_a	82
R_9	7

Note:

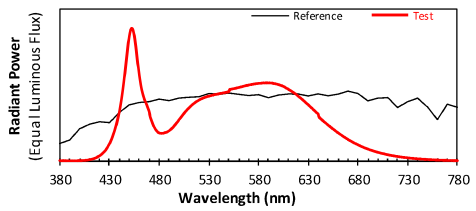
Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

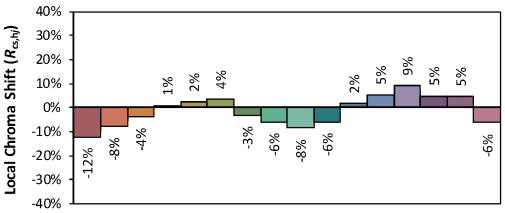
4.2 ANSI/IES TM-30-18 Color Rendition – Cont.

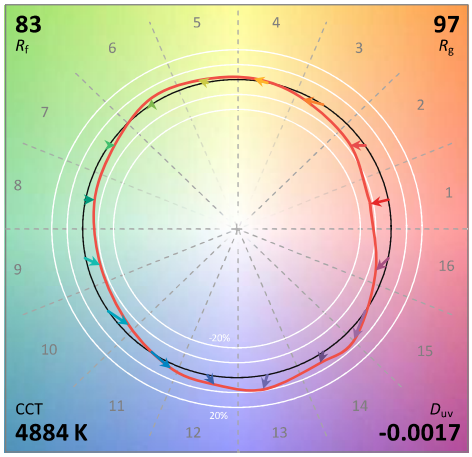
ANSI/IES TM-30-18 Color Rendition Report

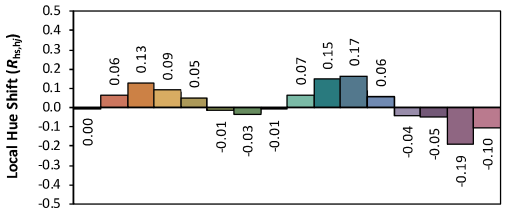
Source: SPD **Manufacturer:** Shenzhen Sunpzone lighting electronic co., ltd

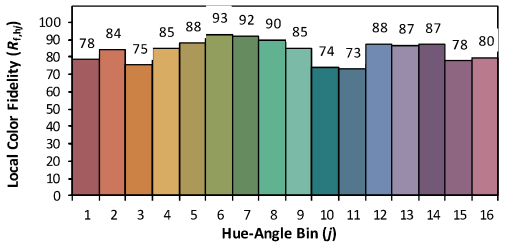
Date: 2025/5/12 **Model:** DYU-TTBTWC-ZZ(5000K)

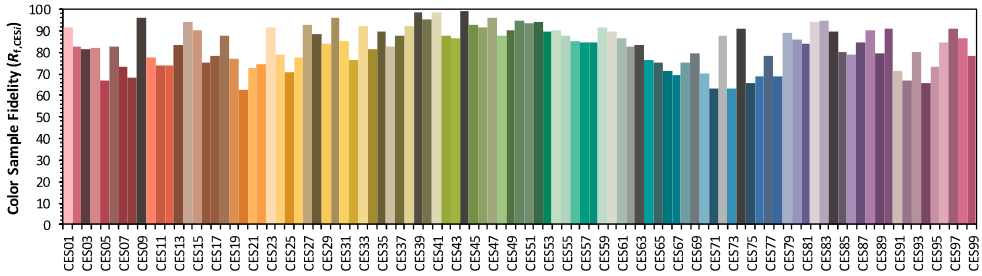












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3480
y	0.3505
u'	0.2138
v'	0.4846

CIE 13.3-1995 (CRI)

R_a	84
R_9	14

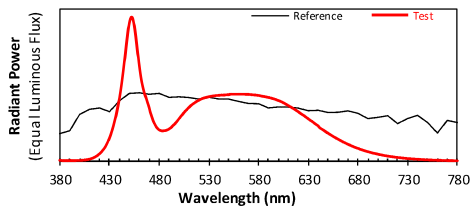
Note:

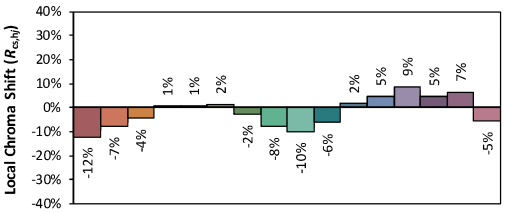
Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

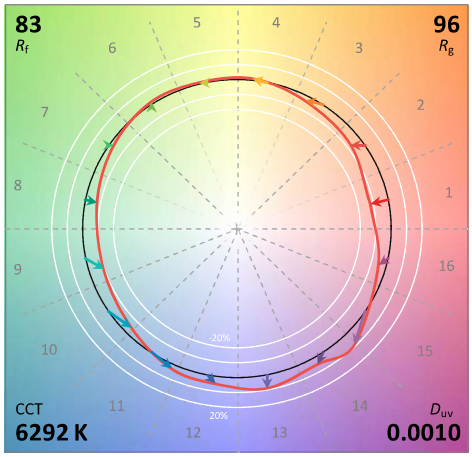
4.2 ANSI/IES TM-30-18 Color Rendition – Cont.

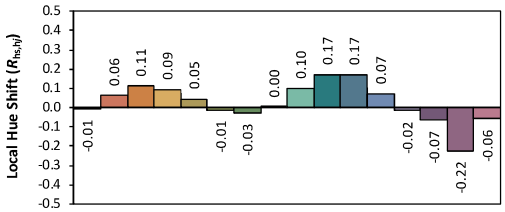
ANSI/IES TM-30-18 Color Rendition Report

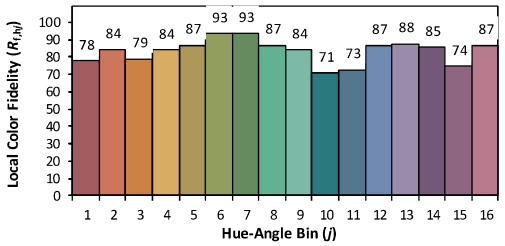
Source: SPD
Manufacturer: Shenzhen Sunpzone lighting electronic co., ltd
Date: 2025/5/12
Model: DYU-TTBTWC-ZZ(6500K)

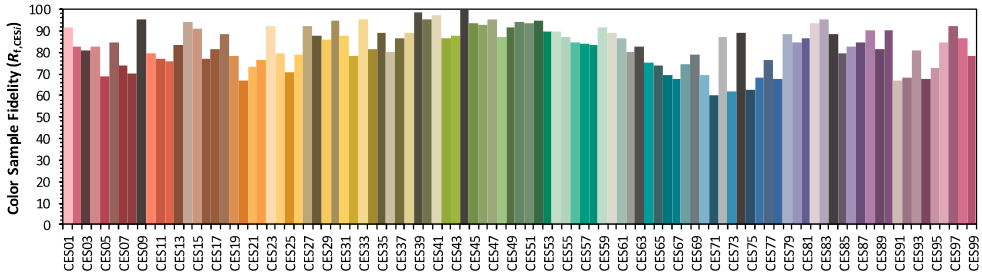












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x	0.3167
y	0.3287
u'	0.2007
v'	0.4687

CIE 13.3-1995 (CRI)

R_a	84
R_9	16

Note:

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

4.3 Goniometry Test Data of half of model DYU-TTBTWC-ZZ(4000K)

CIE Type	Semi-Direct	Basic Luminous Shape	Rectangular w/Sides
Spacing Criteria (0-180)	1.26	Luminous Length	1.14 m
Spacing Criteria (90-270)	1.36	Luminous Width	0.03 m
Spacing Criteria (Diagonal)	1.44	Luminous Height	0.02 m
Test Distance	29.95 m	-	-

4.4 Zonal Lumen Summary of half of model DYU-TTBTWC-ZZ(4000K)

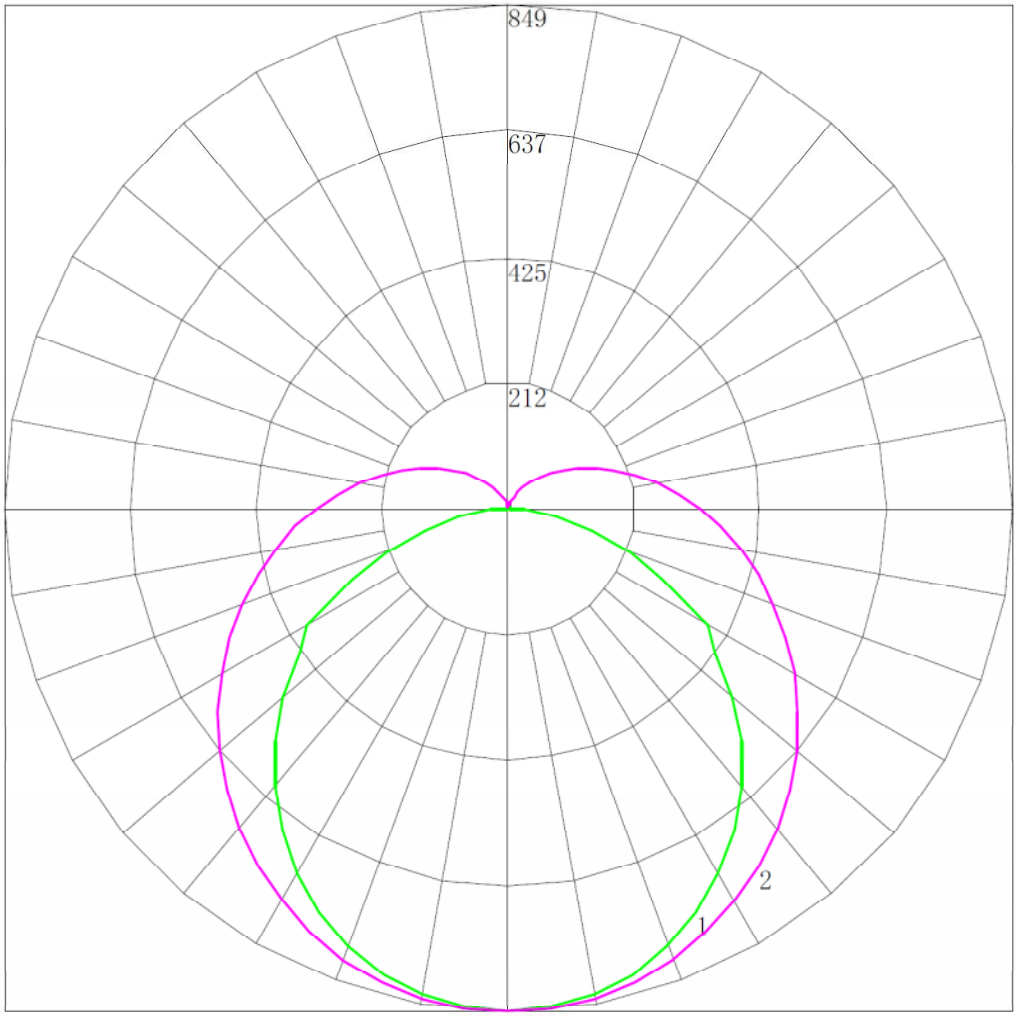
Zone	Lumens	%Lamp	%Fixt
0-20	312.36	8.80	8.80
0-30	668.26	18.80	18.80
0-40	1107.82	31.20	31.20
0-60	2047.89	57.70	57.70
0-80	2797.06	78.80	78.80
0-90	3049.97	85.90	85.90
10-90	2969.5	83.60	83.60
20-40	795.45	22.40	22.40
20-50	1270.98	35.80	35.80
40-70	1353.41	38.10	38.10
60-80	749.17	21.10	21.10
70-80	335.84	9.50	9.50
80-90	252.91	7.10	7.10
90-110	311.74	8.80	8.80
90-120	397.01	11.20	11.20
90-130	449.62	12.70	12.70
90-150	493.01	13.90	13.90
90-180	501.12	14.10	14.10
110-180	189.38	5.30	5.30
0-180	3551.09	100.00	100.00

Total Luminaire Efficiency = 100.00%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	80.47
10-20	231.90
20-30	355.90
30-40	439.55
40-50	475.53
50-60	464.55
60-70	413.33
70-80	335.84
80-90	252.91
90-100	183.24
100-110	128.50
110-120	85.27
120-130	52.61
130-140	29.26
140-150	14.13
150-160	5.74
160-170	1.90
170-180	0.47

4.5 Polar Curves of half of model DYU-TTBTWC-ZZ(4000K)



Maximum Candela = 849.332 Located At Horizontal Angle = 0, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)

4.6 Candela Tabulation of half of model DYU-TTBTWC-ZZ(4000K)

	0	15	30	45	60	75	90
0	849.332	849.332	849.332	849.332	849.332	849.332	849.332
5	846.167	845.256	845.528	845.292	846.640	847.320	848.451
10	833.051	833.705	835.435	835.870	837.680	839.273	840.962
15	814.509	814.002	818.165	820.617	824.689	826.759	828.628
20	786.921	789.314	798.022	799.525	802.727	809.994	811.888
25	751.646	754.661	761.863	772.608	780.790	787.645	789.862
30	710.490	715.931	724.406	740.076	753.023	761.715	764.311
35	663.456	671.087	682.907	702.835	720.091	731.988	736.558
40	612.804	631.014	636.249	661.329	684.924	698.684	705.281
45	554.463	565.997	586.677	617.135	644.614	663.371	671.801
50	494.313	506.203	533.734	572.048	604.514	626.494	635.678
55	428.736	445.276	478.761	523.807	561.293	587.607	596.912
60	390.295	380.048	421.776	475.586	518.508	548.491	557.264
65	287.633	316.177	366.811	427.577	476.183	508.034	517.617
70	219.795	251.628	312.954	380.915	432.282	467.359	476.648
75	146.530	189.797	262.720	334.705	391.969	427.573	437.001
80	82.310	144.936	215.820	293.205	351.877	388.909	398.235
85	28.492	90.594	175.440	253.721	313.799	350.015	360.350
90	3.618	58.433	141.561	218.954	276.849	314.257	324.226
95	2.714	37.823	111.497	185.303	241.900	277.821	288.103
100	2.261	26.272	92.838	155.241	208.976	244.743	253.742
105	1.809	19.024	69.994	130.341	180.083	212.114	221.144
110	1.809	14.268	56.311	107.909	152.536	182.610	191.188
115	1.809	11.098	44.867	89.513	128.345	155.117	163.435
120	1.357	8.606	35.892	73.135	107.065	130.755	137.003
125	1.809	7.021	28.713	59.449	87.357	107.734	114.096
130	1.809	5.662	22.658	47.111	71.005	87.842	93.391
135	1.809	4.077	17.496	37.017	56.222	69.959	74.008
140	1.809	3.171	13.461	28.490	46.127	53.868	57.709
145	2.261	2.718	10.320	21.311	32.702	40.902	43.612
150	3.166	3.171	8.077	15.704	23.968	29.951	32.158
155	3.166	3.397	5.833	11.217	17.023	21.010	22.026
160	4.070	4.077	4.713	7.851	11.422	15.192	14.978
165	4.975	4.530	4.713	5.159	6.945	8.494	9.251
170	4.975	4.983	4.936	4.935	4.928	5.140	5.286
175	5.427	5.436	5.384	5.384	5.376	5.364	5.286
180	2.690	2.690	2.690	2.690	2.690	2.690	2.690

Appendix A Product Photo

Picture 1

Picture 2

****End of test report****