LM-79-08 TEST REPORT

for

RAB Lighting INC

170 Ludlow Avenue, Northvale, New Jersey 07647 USA

LED Tube

Model: T8-13-U1G-830-SD-HYB

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ20090061a

The laboratory that conducted the testing detailed in this report has been accredited for SSL by NVLAP.

Review by: April Zou

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Sep. 29, 2020

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Manager: Jim Zhang
Sep. 29, 2020

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

TEST SUMMARY

Sample Tested: **T8-13-U1G-830-SD-HYB**

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)/2	Power Factor
129.6	1995.0	15.40	0.9974

CCT (K)	CRI	Stabilization Time (Light & Power)
2912	81.2	60

Table 1: Executive Data Summary

Note: The above results are recorded/ derived from measurements made using an Integrating Sphere.

Test specifications:

Date of Receipt : May 15, 2018

Date of Test : May 16, 2018- Jul. 14, 2020

Test item : Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters

Reference Standard : IESNA LM-79-2008 Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI/IES TM-30-18 IES Method for Evaluating Light Source Color Rendition

TABLE OF CONTENT

SAMPLE PHOTO

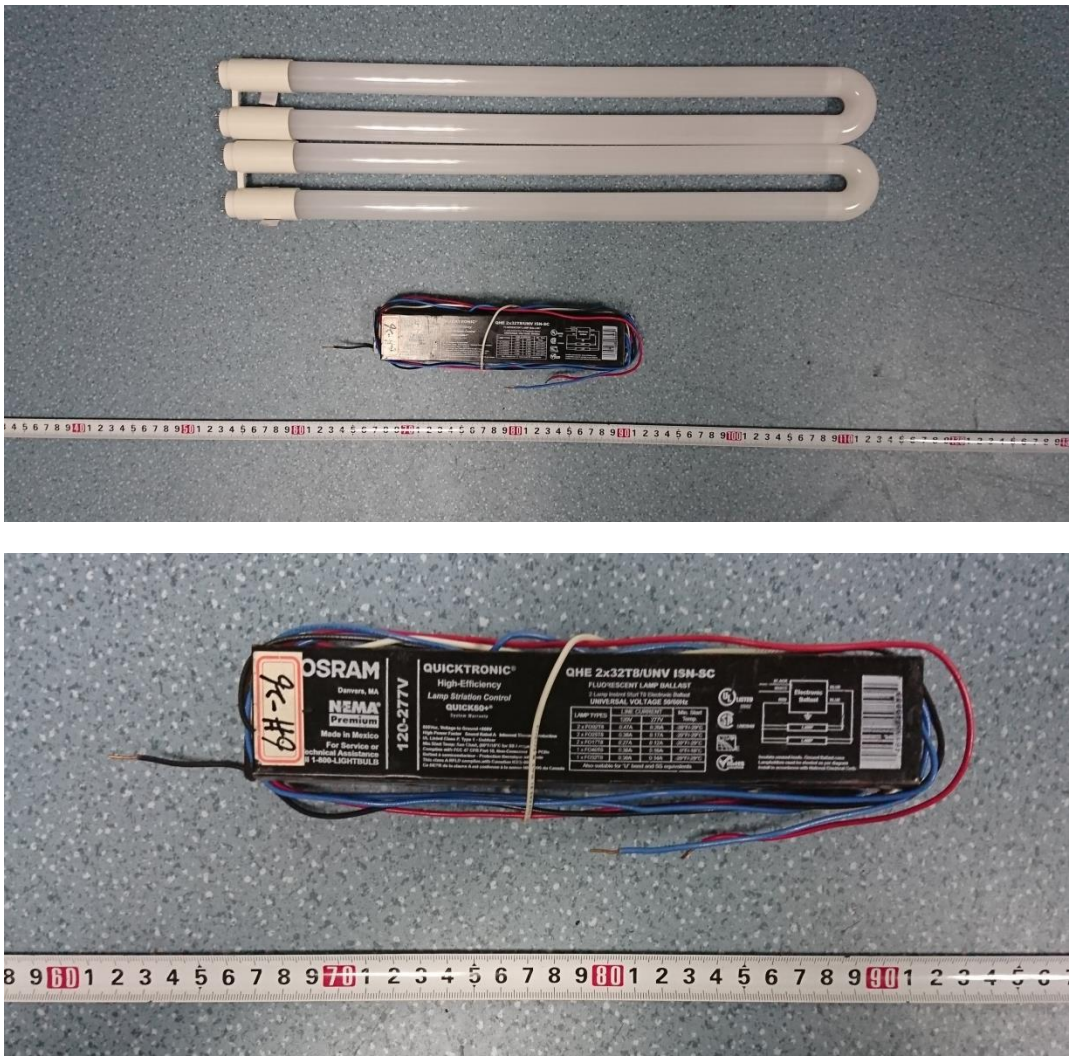


Figure 1- Overview of the sample

Equipment Under Test(EUT)	
Name	: LED Tube
Model	: T8-13-U1G-830-SD-HYB
Electrical Ratings	: 120-277V, 50/60Hz
Product Description	: 2G13 base, 3000K LED Tubes supplied by a high frequency fluorescent lamp ballast: QHE 2x32T8/UNV ISN-SC

TEST RESULTS

Test ambient temperature was 25.0 ℃.

Base orientation was light down. Test was conducted without a dimmer in the circuit.

The stabilization time of the sample was 60 minutes, and the total operating time including stabilization was 65 minutes.

Sphere-Spectroradiometer Method

Parameter	Result	
Test Voltage (V)	120.0	277.0
Voltage frequency (Hz)	60	60
Test Current (A)	0.257	0.116
Power Factor	0.9974	0.9633
Test Power (W)/2	15.40	15.52
THD A%	4.85	10.80
Luminous Efficacy (lm/W)	129.6	128.6
Total Luminous Flux (lm)	1995.0	1995.0
Color Rendering Index (CRI)	81.2	
R9	1.1	
Correlated Color Temperature (CCT)(K)	2912	
Chromaticity Chroma x	0.4416	
Chromaticity Chroma y	0.4031	
Chromaticity Chroma u	0.2540	
Chromaticity Chroma v	0.3478	
Duv	-0.0010	
Chromaticity Chroma u ’	0.2540	
Chromaticity Chroma v’	0.5217	

Special Color Rendering Indices	
R1	79.9
R2	91.7
R3	94.1
R4	78.1
R5	80.3
R6	90.3
R7	80.1
R8	55
R9	1.1
R10	81.5
R11	77.4
R12	72.4
R13	82.8
R14	97.5

Table 2: Test data per Sphere-Spectroradiometer Method

Note: According to CIE 1976 (u’,v’) diagram, u’ = u = 4x/(-2x+12y+3), v’ = 3v/2 = 9y/(-2x+12y+3).

Goniophotometer Method

Test ambient temperature was 24.9 ℃.

The photometric distance is 30 m.

Luminous data was taken at 0.5 °vertical intervals and 10 °horizontal intervals.

Parameter	Result
Test Voltage (V)	120.0
Voltage frequency (Hz)	60
Test Current (A)	0.258
Power Factor	0.9969
Power (W)/2	15.43
Luminous Efficacy (lm/W)	127.6
Total Luminous Flux (lm)	1967.8
Beam Angle (°)	107.7 (0^o-180^o) / 144.8 (90^o-270^o)
Center Beam Candle Power (cd)	438
Maximum Beam Candle Power (cd)	438.4 (At: C=130.0, Gamma=1.0)
Spacing Criteria	1.24 (0^o-180^o) / 1.40 (90^o-270^o)
Zonal Lumens in the 0 °-60 °Zone	54.76%
Zonal Lumens in the 60 °-90 °Zone	24.74%
Zonal Lumens in the 90 °-120 °Zone	10.73%
Zonal Lumens in the 120 °-180 °Zone	9.77%

Table 3: Test data per Goniophotometer Method

Spectral Power Distribution - Sphere Spectroradiometer Method

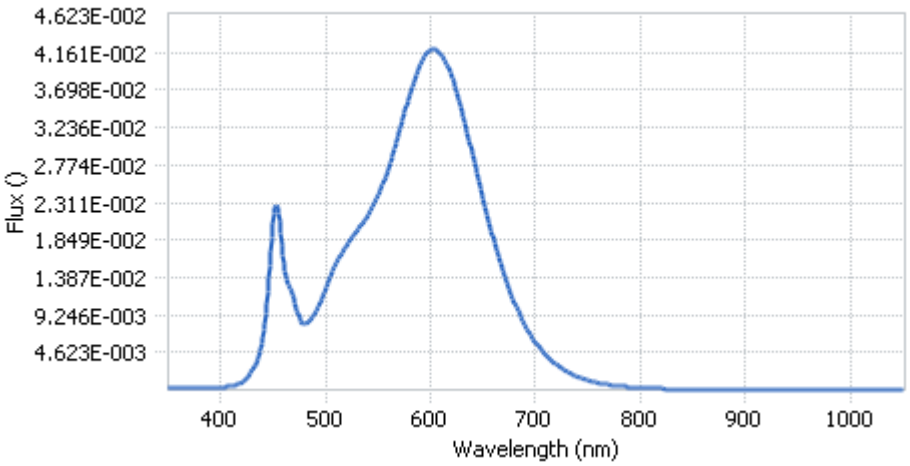
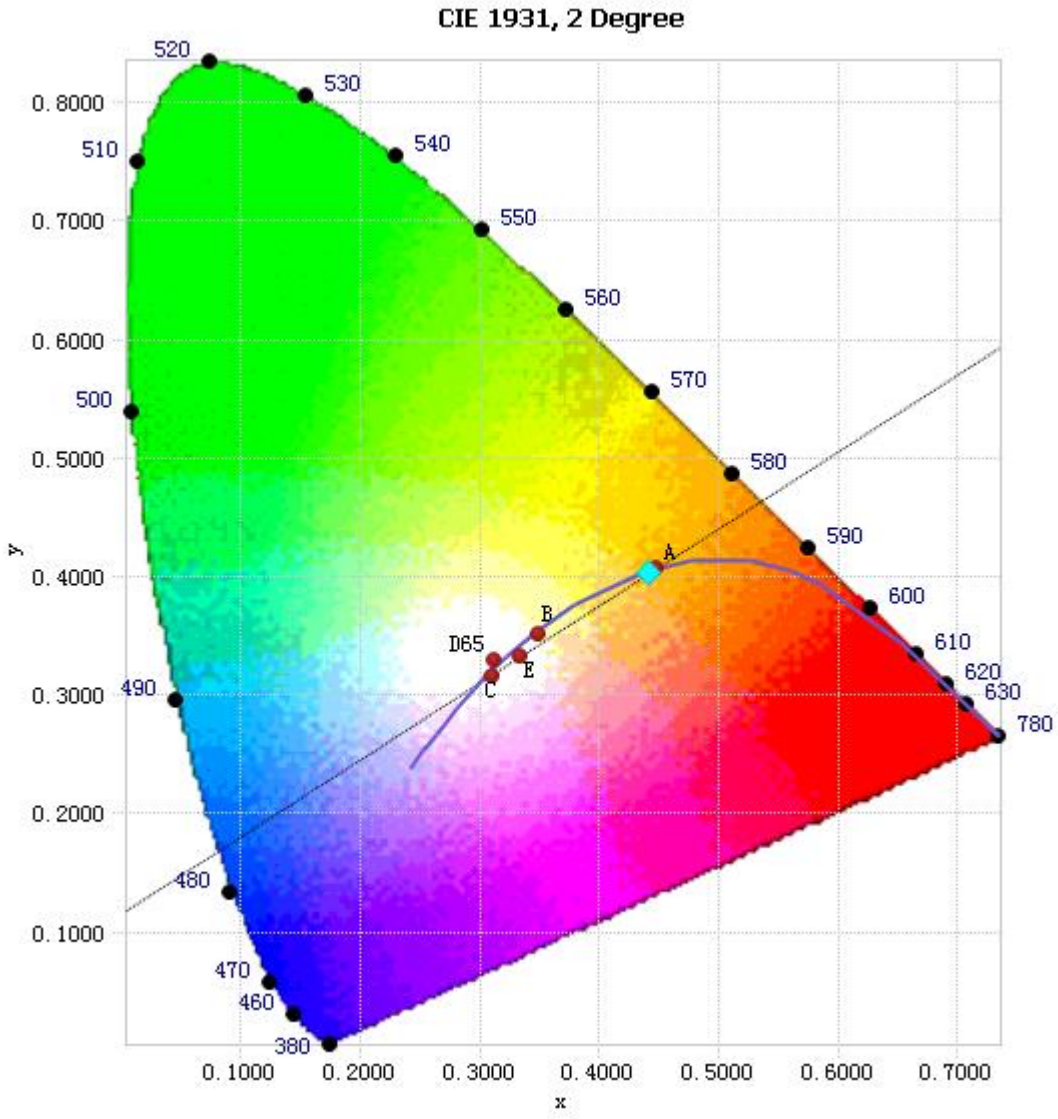


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	2.94E-04	485	8.60E-03	590	4.00E-02	695	6.85E-03
385	2.97E-04	490	9.48E-03	595	4.13E-02	700	5.88E-03
390	2.97E-04	495	1.08E-02	600	4.19E-02	705	5.02E-03
395	3.29E-04	500	1.26E-02	605	4.20E-02	710	4.28E-03
400	3.29E-04	505	1.42E-02	610	4.14E-02	715	3.66E-03
405	3.75E-04	510	1.56E-02	615	4.03E-02	720	3.13E-03
410	4.74E-04	515	1.69E-02	620	3.87E-02	725	2.67E-03
415	6.44E-04	520	1.79E-02	625	3.66E-02	730	2.28E-03
420	9.52E-04	525	1.88E-02	630	3.43E-02	735	1.93E-03
425	1.47E-03	530	1.97E-02	635	3.17E-02	740	1.64E-03
430	2.38E-03	535	2.05E-02	640	2.90E-02	745	1.40E-03
435	3.84E-03	540	2.16E-02	645	2.63E-02	750	1.19E-03
440	6.51E-03	545	2.27E-02	650	2.36E-02	755	1.03E-03
445	1.22E-02	550	2.40E-02	655	2.09E-02	760	8.77E-04
450	2.05E-02	555	2.55E-02	660	1.86E-02	765	7.53E-04
455	2.17E-02	560	2.74E-02	665	1.63E-02	770	6.42E-04
460	1.55E-02	565	2.96E-02	670	1.43E-02	775	5.50E-04
465	1.28E-02	570	3.18E-02	675	1.24E-02	780	4.71E-04
470	1.13E-02	575	3.41E-02	680	1.08E-02		
475	8.82E-03	580	3.64E-02	685	9.31E-03		
480	8.07E-03	585	3.85E-02	690	8.00E-03		

Table 4: Spectral Power Distribution Numerical Data per Sphere - Spectroradiometer Method

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y): (0.4416, 0.4031)

Chart 2: Chromaticity Diagram per Sphere - Spectroradiometer Method

Note: The location on the diagram of the tristimulus coordinates are indicated by the blue diamond.

Nominal CCT Quadrangles – Sphere Spectroradiometer Method

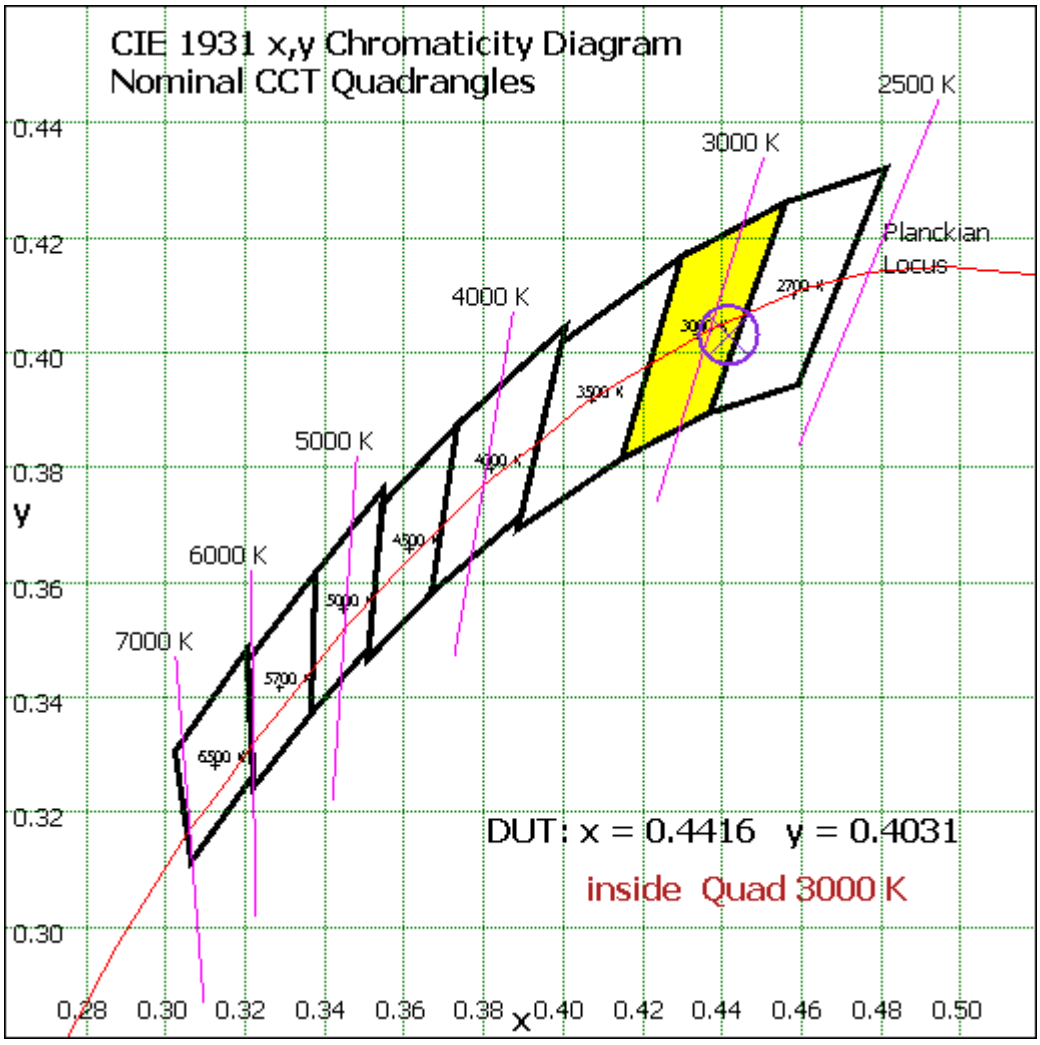


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

Color Rendition Report – Sphere Spectroradiometer Method

ANSI/IES TM-30-18 Color Rendition Report

Source: LED **Manufacturer:** RAB Lighting INC

Date: 2018/05/16 **Model:** T8-13-U1G-830-SD-HYB

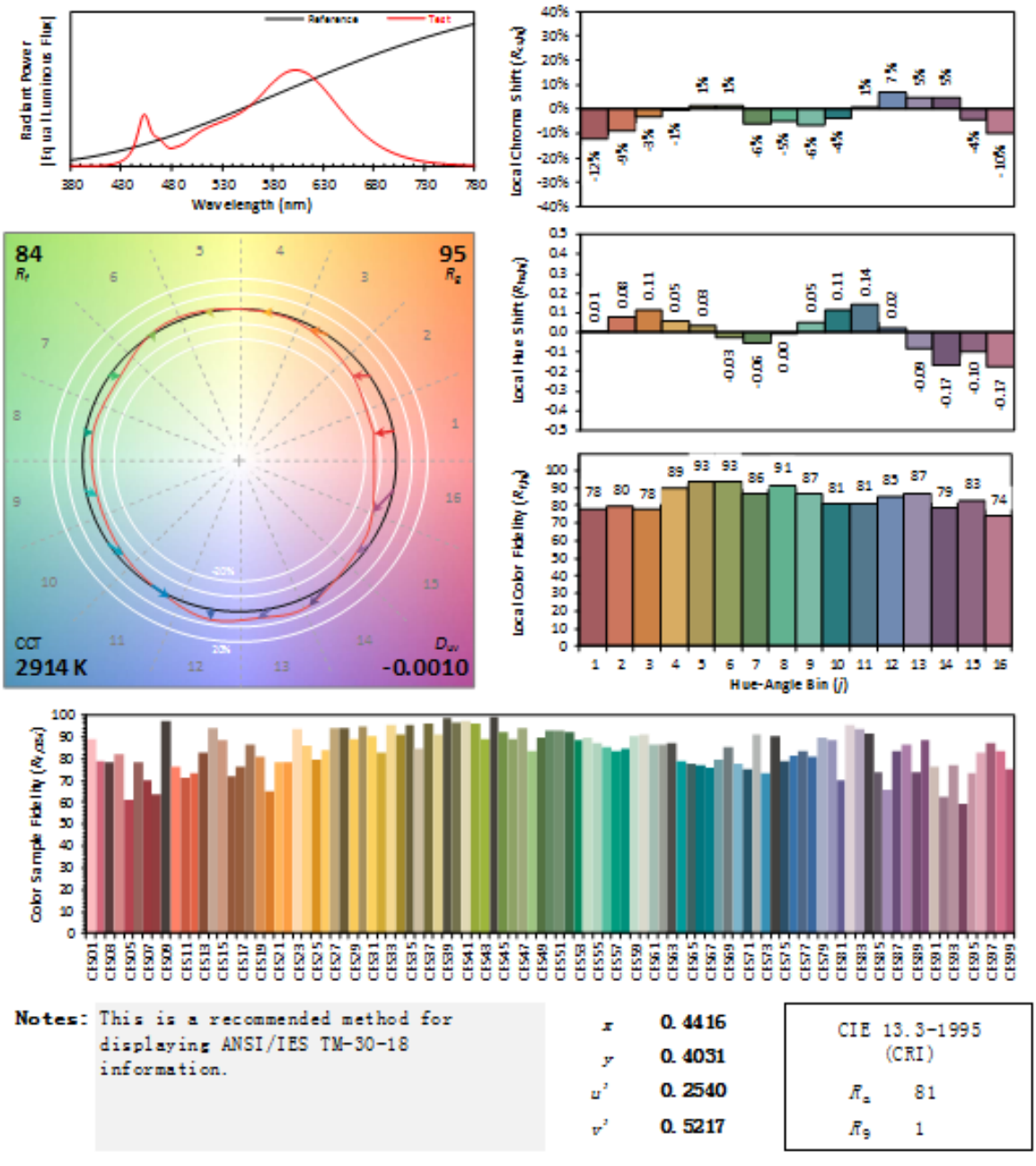


Chart 4: Full Report Created with the IES TM-30 Calculator

Note: The values in this diagram might be a little different from the values in Table 2 due to rounding.

Zonal Lumen Tabulation- Goniophotometer Method

γ(°)	Lumens	% Total
0- 10	41.537	2.11%
10- 20	119.831	6.09%
20- 30	184.684	9.39%
30- 40	229.799	11.68%
40- 50	252.161	12.81%
50- 60	249.493	12.68%
60- 70	218.084	11.08%
70- 80	164.627	8.37%
80- 90	104.148	5.29%
90-100	73.011	3.71%
100-110	69.542	3.53%
110-120	68.507	3.48%
120-130	62.894	3.20%
130-140	50.785	2.58%
140-150	37.226	1.89%
150-160	24.77	1.26%
160-170	13.225	0.67%
170-180	3.432	0.17%
Total	1967.8	100%

γ(°)	Lumens	% Total
0- 60	1077.505	54.76%
60- 90	486.859	24.74%
0-90	1564.364	79.50%
90- 180	403.392	20.50%
0- 180	1967.8	100%

Table 5: Zonal Lumen

Illuminance Plots- Goniophotometer Method

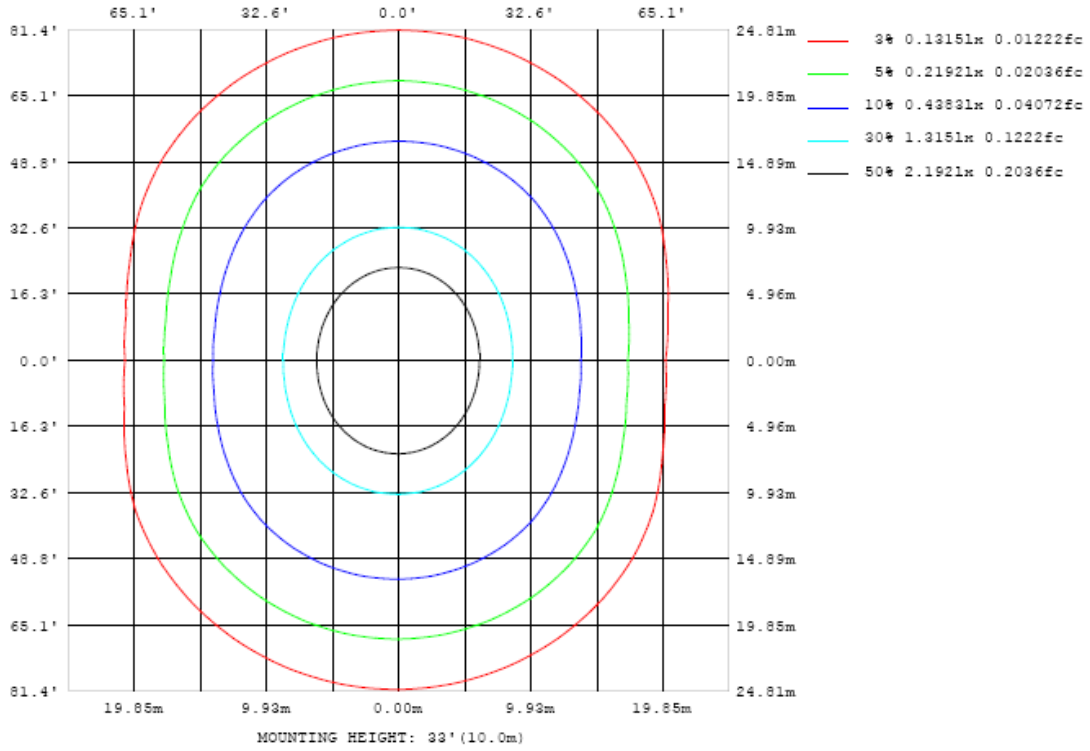


Chart 5: Illuminance Plot (Footcandles)

Luminous Intensity Distribution Plots- Goniophotometer Method

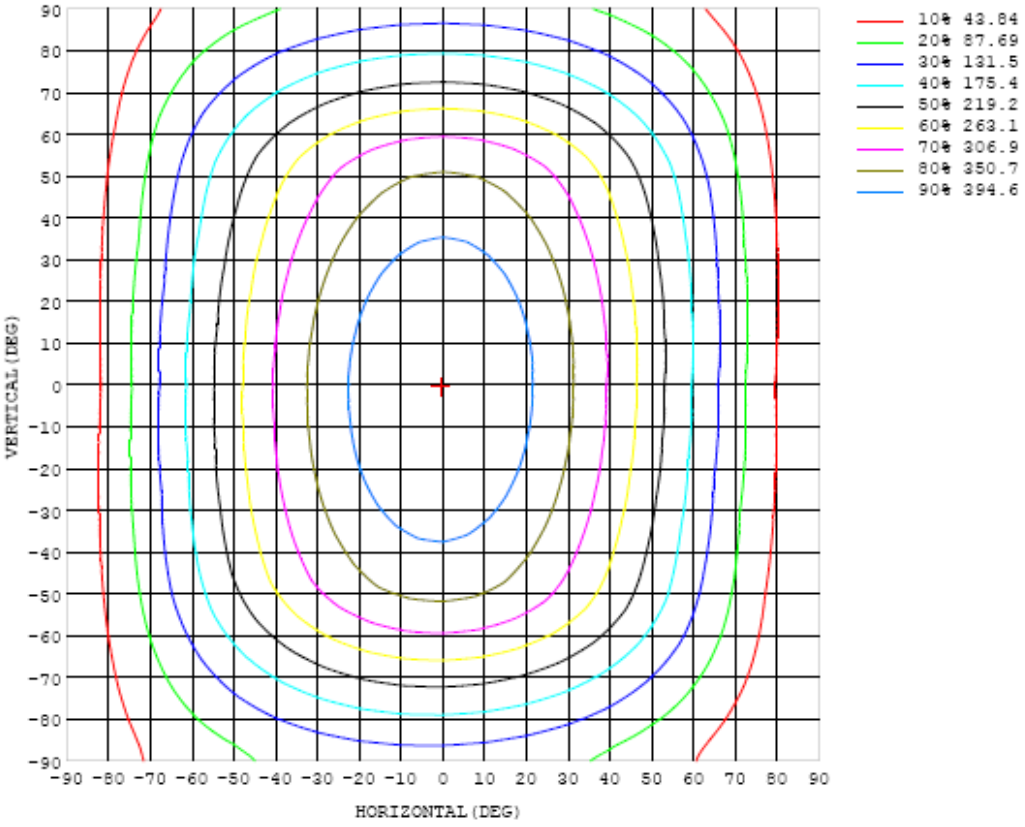


Chart 6: Isocandela Plot

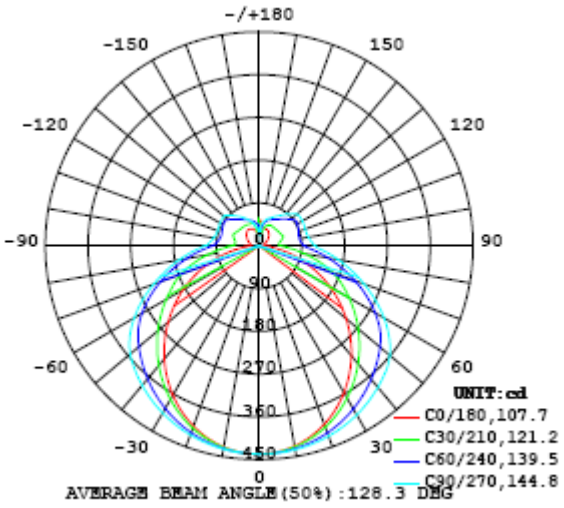


Chart 7: Polar Candela Distribution

Luminous Intensity Data- Goniophotometer Method

Table--1 UNIT: cd

γ (DEG) \ C (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438
5	435	436	436	436	436	437	437	437	438	438	438	438	438	437	437	437	437	436	436
10	428	428	429	430	431	432	433	434	435	436	436	435	435	434	433	432	431	430	430
15	416	417	418	420	422	425	427	429	431	432	432	431	429	427	425	423	421	419	419
20	400	401	403	406	410	415	419	423	425	426	426	425	422	418	414	410	407	405	404
25	380	381	385	389	396	402	409	414	417	419	419	417	412	407	401	395	390	386	385
30	357	358	363	370	379	388	396	403	408	411	410	407	401	393	385	377	370	365	363
35	330	332	339	348	359	371	382	391	397	400	400	395	388	378	367	357	347	340	338
40	302	304	312	324	338	353	367	378	385	389	388	382	373	361	348	334	322	314	311
45	271	274	284	298	316	334	350	363	372	376	374	368	357	343	327	310	296	285	281
50	239	243	254	272	293	313	332	346	355	359	358	352	340	324	305	286	268	255	250
55	206	210	224	245	269	293	310	323	330	334	333	328	318	304	283	261	240	224	217
60	172	177	194	219	245	266	282	293	300	303	303	298	289	277	260	236	211	192	185
65	137	144	164	192	217	235	249	259	266	270	269	265	257	245	230	210	183	160	151
70	103	111	136	164	184	201	214	225	231	235	234	230	222	212	198	180	156	129	117
75	71.0	80.6	108	131	150	166	180	191	198	201	201	197	189	178	164	147	127	100	83.8
80	41.0	52.7	77.6	97.3	116	133	147	158	165	169	169	164	156	145	132	115	95.7	73.8	53.7
85	17.1	28.0	46.4	66.8	85.2	102	117	128	135	139	139	134	126	115	101	85.2	66.7	46.7	29.6
90	1.81	7.86	25.2	45.1	64.2	81.2	94.9	106	114	118	117	113	105	94.3	81.1	64.8	46.8	29.0	17.3
95	2.93	9.64	23.7	41.6	59.2	75.3	88.6	98.9	106	110	110	106	98.1	88.2	75.1	59.9	43.5	28.1	17.4
100	5.85	12.9	29.0	43.7	59.1	73.5	86.0	95.1	102	105	105	101	94.4	85.4	73.5	59.9	45.8	30.5	18.7
105	8.75	16.1	33.9	49.0	62.3	74.9	86.0	94.1	100	103	103	99.7	93.6	85.5	74.8	63.0	49.7	31.3	20.8
110	11.9	18.8	34.2	53.7	66.7	78.1	87.9	95.1	100	103	103	100.0	94.4	87.3	77.7	66.6	50.1	32.3	23.4
115	15.1	21.4	35.0	53.2	70.3	81.3	90.4	96.9	102	104	104	101	96.0	89.5	80.5	67.7	48.9	33.6	26.3
120	18.4	23.3	36.0	51.6	69.2	83.8	92.5	98.3	103	105	105	102	97.3	91.3	80.8	64.1	48.1	35.3	29.3
125	21.8	25.8	37.3	50.6	65.3	80.6	93.1	99.1	103	105	105	102	97.7	89.2	75.6	61.2	47.7	37.3	32.2
130	25.3	28.8	38.8	49.8	62.3	74.9	86.7	95.1	101	103	103	99.1	91.7	82.5	70.9	58.8	47.8	39.4	35.0
135	28.6	31.6	40.5	49.3	59.8	70.2	79.7	87.0	92.0	94.4	93.8	90.2	84.7	76.4	66.8	57.0	48.1	41.3	37.6
140	31.9	33.4	41.3	49.3	57.6	65.9	73.6	79.9	84.2	86.4	85.7	82.8	77.8	71.1	63.5	55.8	48.7	43.1	39.9
145	34.7	34.2	42.2	49.5	56.0	62.5	68.4	73.3	76.8	78.5	78.1	75.7	71.8	66.7	60.9	54.8	49.2	43.3	41.0
150	37.0	34.1	43.0	49.3	54.7	59.8	64.2	67.8	70.4	71.7	71.4	69.7	66.8	63.1	58.8	54.2	48.3	41.2	40.4
155	37.9	32.0	39.4	48.2	53.6	57.5	61.0	63.4	65.3	66.2	66.0	64.8	62.8	60.1	57.1	53.4	46.4	39.3	39.1
160	38.3	29.5	36.0	45.2	49.4	54.8	58.3	60.1	61.1	61.7	61.5	60.7	59.4	57.7	55.2	49.9	41.6	36.2	37.0
165	37.9	27.8	31.0	37.8	44.9	49.8	52.9	55.4	57.1	57.6	57.6	57.0	56.0	54.3	50.3	44.8	38.0	33.4	34.2
170	41.1	26.1	25.3	26.9	32.1	40.0	44.7	47.9	49.8	50.9	51.3	50.5	47.2	41.1	36.0	32.0	30.6	30.5	31.8
175	52.0	23.7	23.6	23.6	23.6	24.4	27.9	34.4	38.4	36.5	30.5	25.9	25.7	25.6	26.3	27.1	27.8	28.2	28.3
180	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6

Table 6: Luminous Intensity Data

Table--2 UNIT: cd

γ (DEG) \ C (DEG)	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340	350		
0	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438	438		
5	436	437	437	437	437	437	437	437	437	437	437	437	436	436	436	436	435		
10	430	431	431	432	432	433	434	434	434	434	433	433	432	431	430	429	428		
15	419	420	421	423	425	427	428	429	430	429	428	426	424	422	420	418	417		
20	405	406	409	412	415	418	421	423	423	423	421	418	414	410	407	403	401		
25	386	388	392	397	403	408	412	415	416	415	412	407	402	396	390	385	382		
30	364	367	373	380	388	395	401	405	406	405	401	395	387	379	371	364	359		
35	339	344	352	362	372	381	389	394	395	394	389	381	371	360	350	340	334		
40	312	319	329	341	354	365	375	381	383	381	375	366	354	340	326	315	306		
45	283	291	304	319	334	348	360	367	370	367	361	349	335	318	302	287	277		
50	252	263	278	296	314	330	343	352	354	352	345	332	315	296	276	259	246		
55	221	234	252	273	294	311	323	330	332	330	324	312	295	273	251	230	214		
60	190	204	226	250	271	285	295	301	304	302	296	285	271	250	225	201	183		
65	157	176	200	224	241	254	263	269	271	269	263	254	241	223	200	173	150		
70	124	147	175	194	209	221	229	235	236	234	229	220	207	192	173	145	118		
75	93.3	120	144	161	176	188	196	201	203	201	195	187	174	158	140	118	88.5		
80	65.5	91.1	111	129	143	155	164	170	171	169	163	154	141	125	107	86.5	62.0		
85	41.6	61.6	80.9	98.1	113	125	134	139	141	139	132	123	110	93.7	75.3	55.1	35.1		
90	23.9	39.7	56.8	72.6	86.5	97.8	106	112	113	111	105	95.3	82.4	66.9	49.3	30.4	12.5		
95	23.5	36.1	51.2	65.7	78.5	89.1	97.0	102	103	101	95.2	86.1	74.0	59.5	43.4	26.4	11.5		
100	24.9	38.5	50.8	63.4	74.9	84.5	91.7	96.1	97.3	95.2	89.9	81.6	70.6	57.6	43.4	29.5	17.2		
105	26.2	42.1	54.1	64.6	74.4	82.8	89.2	93.0	94.0	92.1	87.4	80.0	70.3	59.1	47.3	35.5	20.0		
110	27.8	42.1	58.1	67.8	76.3	83.6	89.1	92.5	93.3	91.7	87.4	80.9	72.6	63.0	52.4	38.4	22.2		
115	29.6	42.2	59.0	71.2	79.1	85.6	90.5	93.5	94.2	92.7	89.1	83.4	76.0	67.1	56.3	38.8	24.5		
120	31.8	42.4	56.7	72.3	81.6	87.6	92.2	94.9	95.6	94.3	91.0	85.8	79.0	70.3	54.5	39.2	27.0		
125	34.2	43.0	54.8	68.3	81.3	89.2	93.4	95.9	96.6	95.4	92.5	87.8	80.7	67.2	53.0	39.9	29.4		
130	36.5	43.8	53.5	64.6	75.8	85.7	92.8	96.1	97.0	95.9	92.7	86.0	75.6	63.8	51.9	40.6	31.8		
135	38.7	44.7	52.6	61.6	70.8	79.0	85.6	89.8	91.3	89.9	85.8	79.1	70.5	60.6	50.8	41.4	34.2		
140	40.5	45.9	52.1	59.2	66.4	73.1	78.4	81.8	83.0	81.9	78.4	72.9	65.7	57.5	49.6	42.1	36.6		
145	41.6	47.0	51.8	57.4	62.9	67.9	72.1	74.8	75.8	74.8	71.9	66.7	60.9	54.4	48.4	42.8	39.0		
150	42.6	47.7	51.2	55.9	60.0	63.7	66.7	68.7	69.1	68.5	65.3	60.6	56.0	51.2	47.2	43.4	41.3		
155	42.4	47.9	49.9	52.9	57.4	60.3	62.3	63.6	62.6	62.4	58.9	54.5	51.1	47.9	45.9	44.0	43.7		
160	40.7	46.2	49.7	50.7	53.2	57.3	57.9	58.6	56.0	56.2	52.4	48.3	46.2	44.6	44.5	44.4	46.1		
165	37.3	43.6	48.9	50.5	51.4	54.4	53.6	53.6	49.4	50.1	46.0	42.2	41.2	41.2	42.8	44.6	48.5		
170	32.3	33.4	36.8	45.4	53.7	50.9	49.2	48.5	42.8	43.9	39.7	36.1	36.0	37.4	40.7	44.4	50.4		
175	28.2	21.5	25.6	47.8	53.8	46.7	44.8	43.0	36.2	37.6	33.9	30.2	30.1	32.6	36.6	42.3	48.2		
180	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6	29.6		

Table 7: Luminous Intensity Data

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Goniophotometer system	GO-R5000	HZTE011-01	Aug. 02, 2019	Aug. 01, 2020
Digital Power Meter	PF2010A	HZTE028-01	Aug. 02, 2019	Aug. 01, 2020
AC Power Supply	DPS1060	HZTE001-06	Aug. 02, 2019	Aug. 01, 2020
DC Power Supply	WY12010	HZTE004-03	Aug. 02, 2019	Aug. 01, 2020
Temperature recorder	JM624U	HZTE018-08	Aug. 02, 2019	Aug. 01, 2020
Temperature and humidity recorder	JR900	HZTE018-01	Aug. 02, 2019	Aug. 01, 2020
Standard source	D908	HZTE012-01	Aug. 02, 2019	Aug. 01, 2020
Integrate Sphere system	3M	HZTE015-04	Aug. 02, 2019	Aug. 01, 2020
Digital Power Meter	WT210	HZTE008-01	Aug. 02, 2019	Aug. 01, 2020
AC Power Supply	PCR 500L	HZTE001-07	Aug. 02, 2019	Aug. 01, 2020
DC Power Supply	IT6154	HZTE004-04	Aug. 02, 2019	Aug. 01, 2020
Standard source	SCL-1400	HZTE012-02	Aug. 02, 2019	Aug. 01, 2020
Temperature and humidity recorder	JR900	HZTE018-02	Aug. 02, 2019	Aug. 01, 2020
Temperature Meter	TES1310	HZTE017-01	Aug. 02, 2019	Aug. 01, 2020

Table 8: Test Equipment List

TEST METHODS

Seasoning of SSL Product

For the purpose of rating new SSL products, SSL products shall be tested with no seasoning.
Therefore, no seasoning was performed.

Sphere-Spectroradiometer Method- Photometric and Electrical Measurements

A Labsphere Model CDS 2100 Spectroradiometer and Two Meter Sphere was used to measure correlated color temperature, chromaticity coordinates, and the color rendering index for each SSL unit. The coating reflectance of each sphere is 98%. The measure geometry is 4π. Self-absorption correction is conducted in testing. Bandwidth of spectroradiometer is 350nm-1050nm.

Ambient temperature was measured at a position inside the sphere. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation.

The stabilization time typically ranges from 30 min (small integrated LED lamps) to 2 or more hours for large SSL luminaires). It can be judged that stability is reached when the variation (maximum – minimum) of at least 3 readings of the light output and electrical power over a period of 30 min, taken 15 minutes apart, is less than 0.5 %.

Electrical measurements including voltage, current, and power were measured using the Yokogawa Power Analyzer.

The standard reference of the integrated sphere system is halogen incandescent lamp, the intensity distribution type is omni-directional, and is traceable to the National Institute of Standards and Technology.

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The uncertainty of integrating sphere system reported in this document is expended uncertainty is 2.1% with a coverage factor k=2.

Goniophotometer Method

Photometric and Electrical Measurements

An EVERFINE Type C Model GO-R5000 Goniophotometer was used to measure the intensity at each angle of distribution for each sample. The photometric distance is 2.475m for near-field measurement or 30m for far-field measurement. Bandwidth of spectroradiometer is 380nm-780nm.
Ambient temperature was measured at the same height of the sample mounted on the Goniophotometer equipment. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation.
The stabilization time typically ranges from 30 min (small integrated LED lamps) to 2 or more hours for large SSL luminaires). It can be judged that stability is reached when the variation (maximum – minimum) of at least 3 readings of the light output and electrical power over a period of 30 min, taken 15 minutes apart, is less than 0.5 %.
Electrical measurements including voltage, current, and power were measured using the Everfine Digital Power Meter.
Some graphics were created with Photometric Plus software.
The standard reference of the Goniophotometer system is halogen incandescent lamp, the intensity distribution type is omni-directional, and is traceable to the National Institute of Metrology P.R. China.
The uncertainty of goniophotometer system reported in this document is expended uncertainty is 2.3% with a coverage factor k=2.

Color Characteristics Measurements

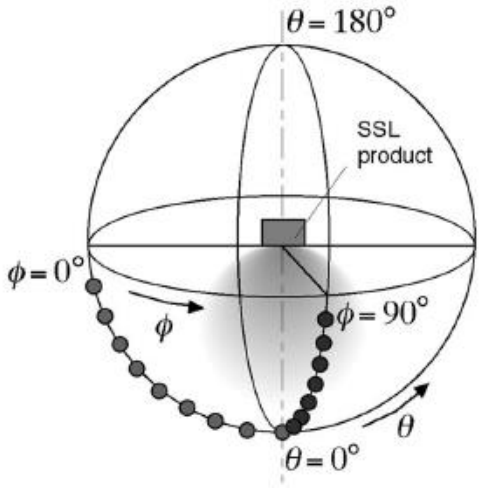
The color characteristics of SSL products include chromaticity coordinates, correlated color temperature, and color rendering index. These characteristics of SSL products may be spatially non-uniform, and thus, in order that they can be specified accurately, the color quantities shall be measured as values that are spatially average, weighted to intensity, over the angular range where light is intentionally emitted from the SSL product. The color characteristics measurements are using gonio-spectroradiometer.

Color Spatial Uniformity

The characteristics of SSL products may be spatially non-uniform, the chromaticity coordinate shall be measured at two vertical planes (C=0 °/180 ° and C=90 °/270 °) and at 10 ° or less intervals for vertical angle until the light output dropped to below 10% of the peak intensity. The averaged weighted chromaticity coordinate

was calculated from these points. The data was then analyzed to check for delta color differences of the u', v' chromaticity coordinates. The spatial non-uniformity of chromaticity, Δu'v', is determined as the maximum deviation (distance on the CIE (u', v') diagram) among all measured points from the spatially averaged chromaticity coordinate.

The geometry for the chromaticity measurement using gonio-spectroradiometer is shown as following.



*** End of Report ***