

LM-79-08 Test Report

For

RAB LIGHTING INC

(Brand Name : RAB)

170 Ludlow Ave , PO BOX 970, Northvale, NJ 07647-2305 USA

Model name (s) :

DLG0010(G2)

Report Type: Testing and Report According to IES LM-79-2008

Type of Luminaire: Downlights

Report Date: 2023-6-17

1.1 Rated Values:	
Rated Voltage / Frequency	120V, 60HZ
Nominal Power	6W
Rated Initial Lamp Lumen	350lm (2700k) , 400lm (3000k)
Declared CCT	2700k/3000k/3500k/4000k/5000k

1.2 Test Specifications:

Test item	<ol style="list-style-type: none"> 1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	<ol style="list-style-type: none"> 1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2015 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

1.3 Test Methods

<p>1) Photometric and Light Distribution Measurement – Goniophotometer Method:</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 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1°vertical intervals and 22.5°horizontal intervals.</p>
<p>2) Chromaticity Measurement – Sphere-Spectroradiometer Method:</p> <p>Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained 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 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.</p>
<p>3) Electrical Measurements:</p> <p>Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at 25°C±1°C. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.</p>

2.1.1 Electrical, Photometric and Chromaticity Measurements

Test date	2023-6-17	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	DLG0010 (G2)	CCT Setting	2700k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120	60	0.05186	6.013	0.9624

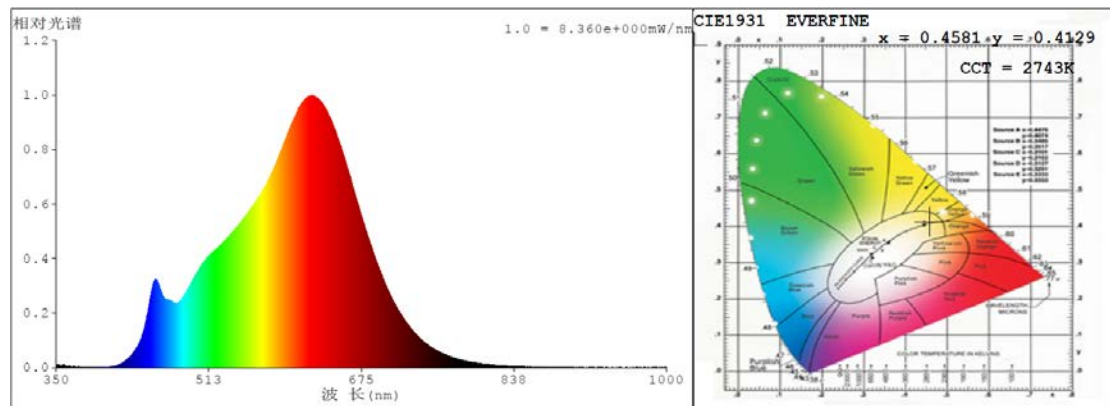
Chromaticity Measurement – Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	95	R9	63
Frequency (Hz)	60	R2	99	R10	98
CCT (K)	2743	R3	97	R11	97
Duv	0.000996	R4	95	R12	88
Chromaticity (x, y)	x=0.4581, y=0.4129	R5	96	R13	97
Chromaticity (u', v')	u' =0.2603, v' =0.5280	R6	97	R14	99
Color Rendering Index (CRI)	94.1	R7	91	R15	90
R9	63	R8	82	--	--

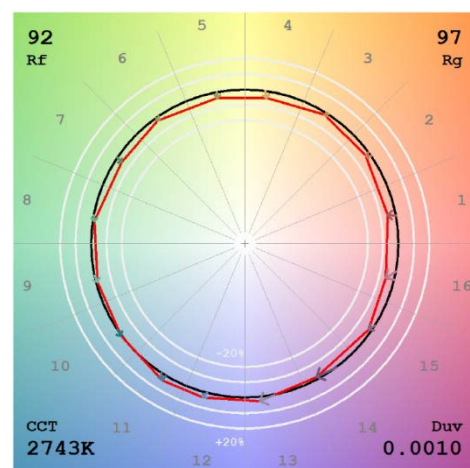
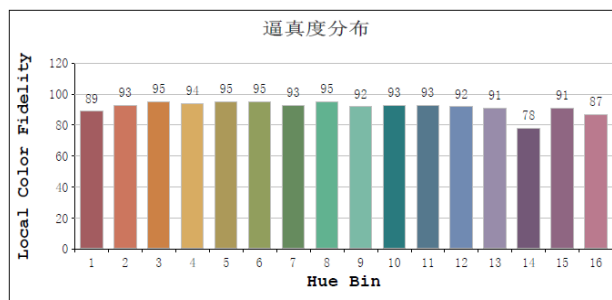
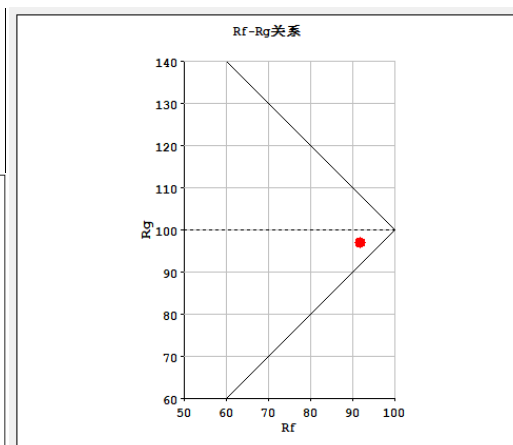
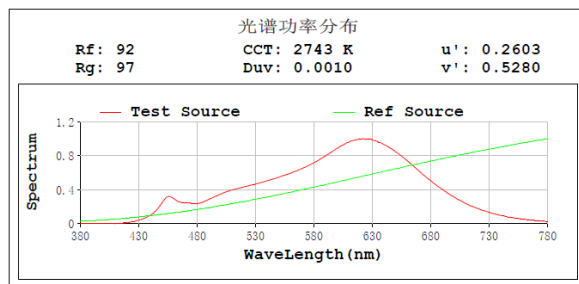
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	381.17
Luminous Efficacy (lm/W)	63.47
Beam Angle (°)	37.8
Center Beam Candle Power (cd)	806.3

Spectral Power Distribution & Chromaticity Diagram



TM30

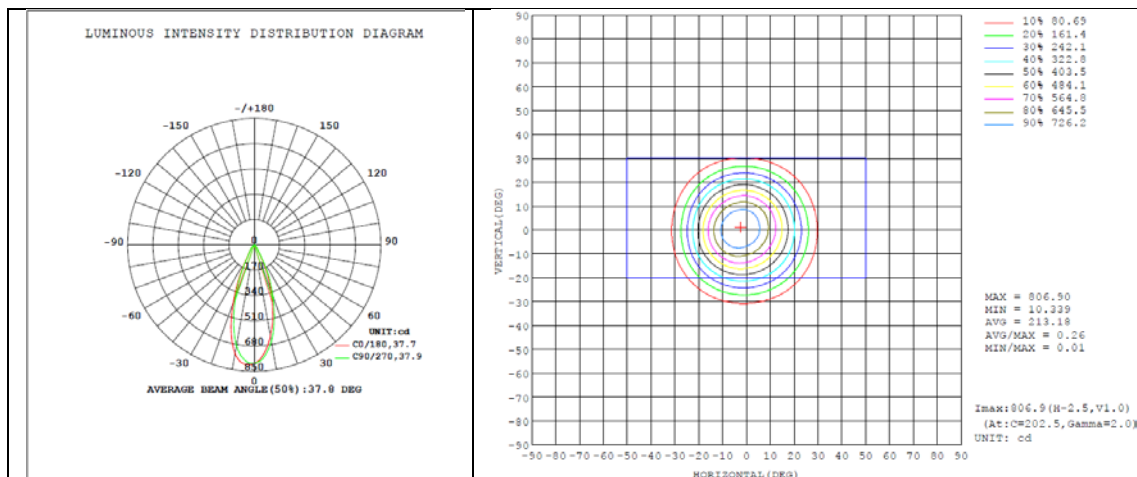


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	312.9	82.1%
0-40	344.2	90.3%
0-60	371.3	97.4%
60-90	9.9	2.5%
70-100	3.4	0.9%
90-120	0.0	0.0%
0-90	381.2	100.0%
90-180	0.0	0.0%
0-180	381.2	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	70.5	18.5%	90-100	0	0%
10-20	145.6	38.2%	100-110	0	0%
20-30	96.8	25.4%	110-120	0	0%
30-40	31.3	8.2%	120-130	0	0%
40-50	16.4	4.3%	130-140	0	0%
50-60	10.7	2.8%	140-150	0	0%
60-70	6.5	1.7%	150-160	0	0%
70-80	3.0	0.8%	160-170	0	0%
80-90	0.4	0.1%	170-180	0	0%

Photometric Data



2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2023-6-17	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	DLG0010 (G2)	CCT Setting	3000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120	60	0.05058	5.853	0.9604

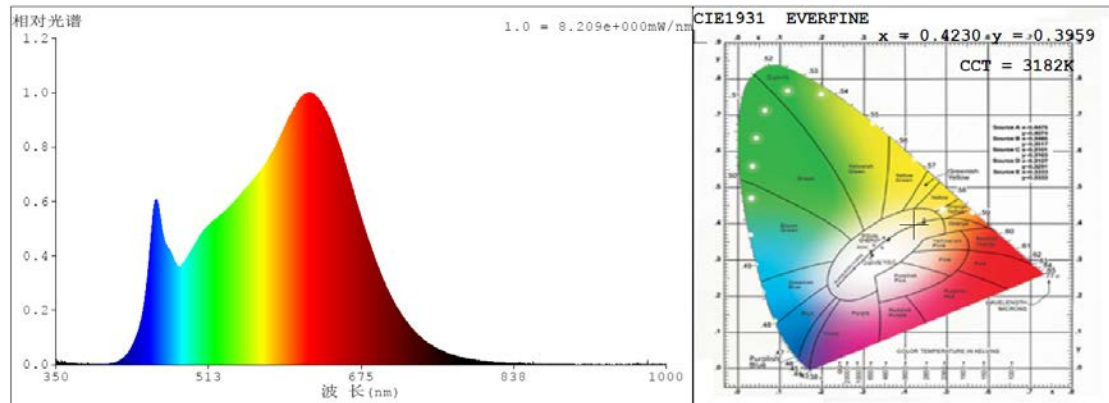
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	98	R9	72
Frequency (Hz)	60	R2	98	R10	98
CCT (K)	3182	R3	96	R11	97
Duv	-0.00120	R4	95	R12	83
Chromaticity (x, y)	x=0.4230, y=0.3959	R5	97	R13	99
Chromaticity (u', v')	u' =0.2450, v' =0.5161	R6	95	R14	99
Color Rendering Index (CRI)	94.4	R7	91	R15	94
R9	72	R8	86	--	--

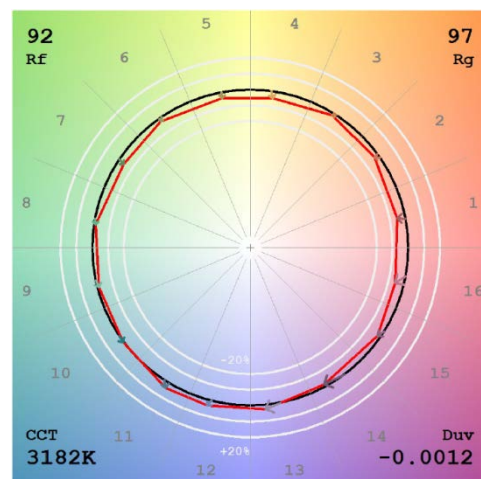
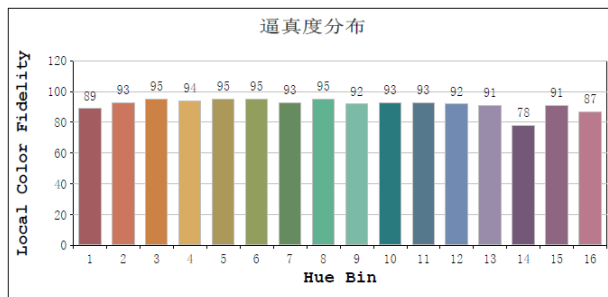
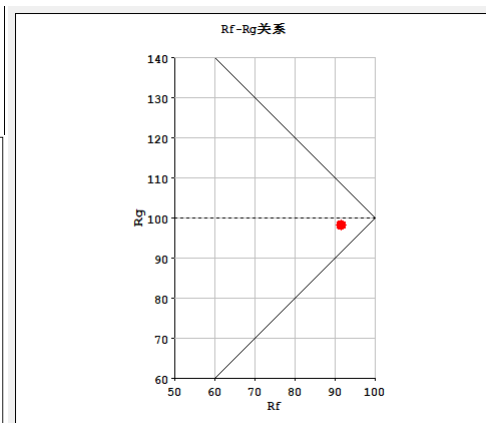
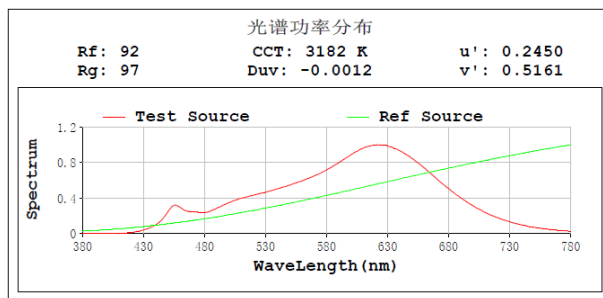
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	420.78
Luminous Efficacy (lm/W)	71.82
Beam Angle (°)	37.9
Center Beam Candle Power (cd)	886.9

Spectral Power Distribution & Chromaticity Diagram



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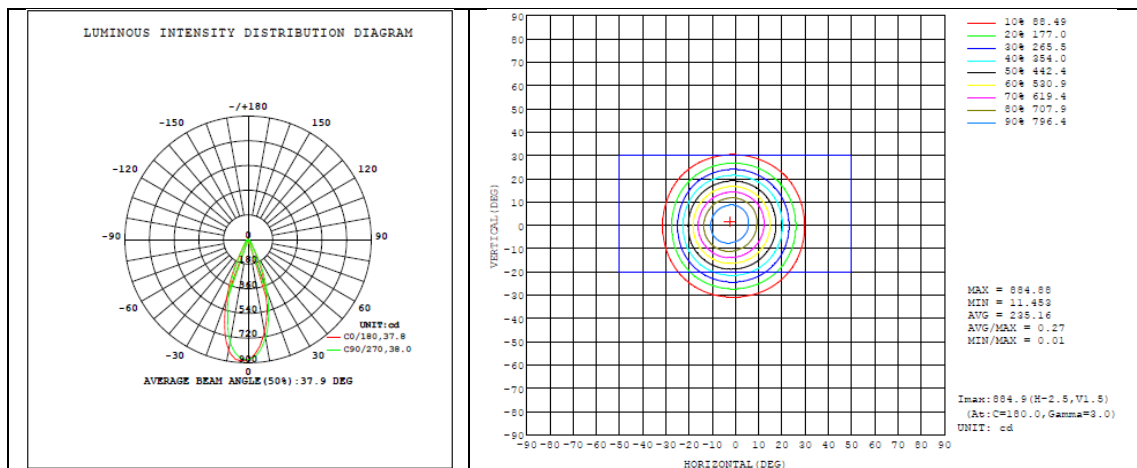


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	345.0	82.0%
0-40	380.0	90.3%
0-60	409.4	97.3%
60-90	11.4	2.6%
70-100	3.8	0.9%
90-120	0.0	0.0%
0-90	420.8	100.0%
90-180	0.0	0.0%
0-180	420.8	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	77.4	18.4%	90-100	0	0%
10-20	160.7	38.2%	100-110	0	0%
20-30	106.9	25.4%	110-120	0	0%
30-40	34.9	8.3%	120-130	0	0%
40-50	18.1	4.3%	130-140	0	0%
50-60	11.4	2.7%	140-150	0	0%
60-70	7.6	1.8%	150-160	0	0%
70-80	3.4	0.8%	160-170	0	0%
80-90	0.4	0.1%	170-180	0	0%

Photometric Data



2.1.3 Electrical, Photometric and Chromaticity Measurements

Test date	2023-6-17	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	DLG0010 (G2)	CCT Setting	3500k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120	60	0.04952	5.719	0.9587

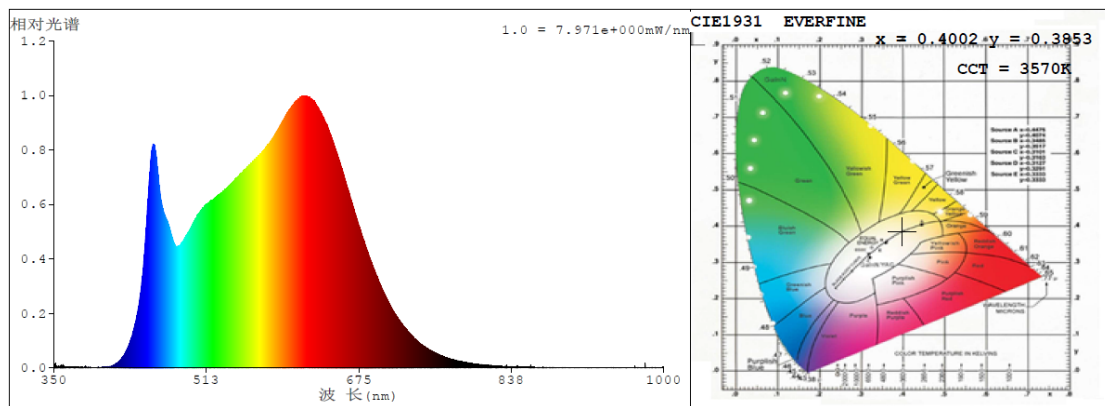
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	98	R9	74
Frequency (Hz)	60	R2	98	R10	98
CCT (K)	3570	R3	96	R11	97
Duv	-0.00127	R4	94	R12	80
Chromaticity (x, y)	x=0.4002, y=0.3853	R5	96	R13	99
Chromaticity (u', v')	u' =0.2346, v' =0.5082	R6	95	R14	99
Color Rendering Index (CRI)	94.5	R7	91	R15	94
R9	74	R8	87	--	--

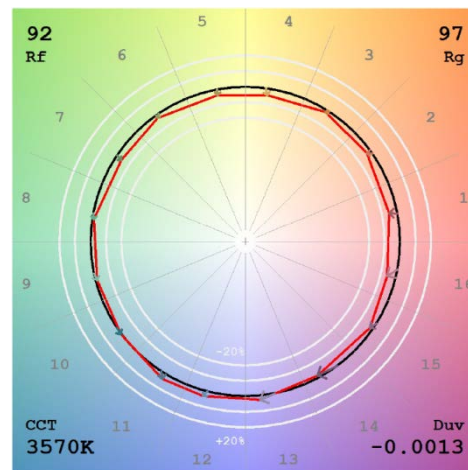
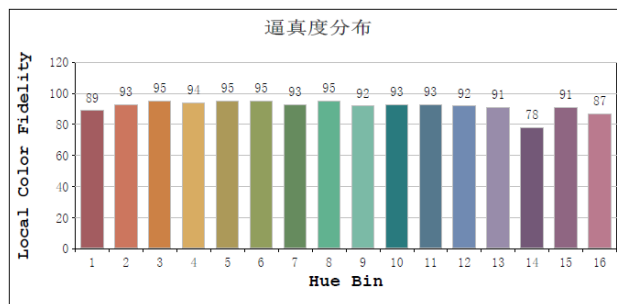
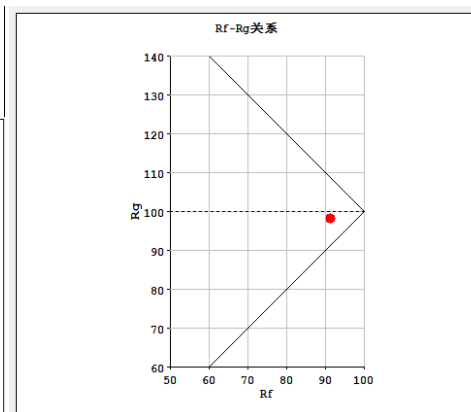
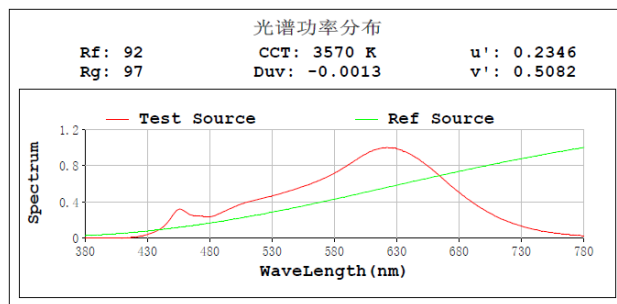
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	443.60
Luminous Efficacy (lm/W)	77.43
Beam Angle (°)	38.0
Center Beam Candle Power (cd)	934.5

Spectral Power Distribution & Chromaticity Diagram



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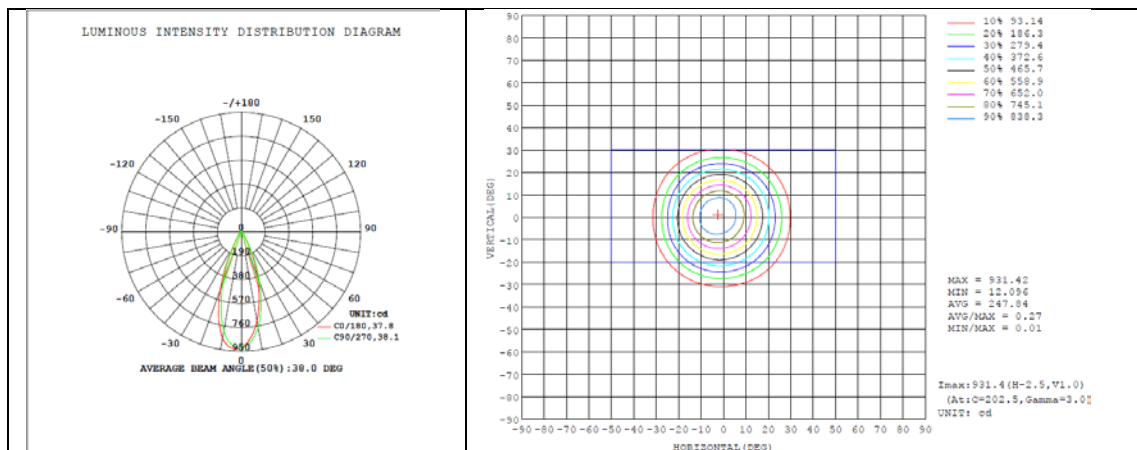


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	363.8	82.0%
0-40	400.1	90.2%
0-60	431.6	97.3%
60-90	12.0	2.6%
70-100	4.0	0.9%
90-120	0.0	0.0%
0-90	443.6	100.0%
90-180	0.0	0.0%
0-180	443.6	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	81.6	18.4%	90-100	0	0%
10-20	169.0	38.1%	100-110	0	0%
20-30	113.1	25.5%	110-120	0	0%
30-40	36.4	8.2%	120-130	0	0%
40-50	19.5	4.4%	130-140	0	0%
50-60	12.0	2.7%	140-150	0	0%
60-70	8.0	1.8%	150-160	0	0%
70-80	3.5	0.8%	160-170	0	0%
80-90	0.4	0.1%	170-180	0	0%

Photometric Data



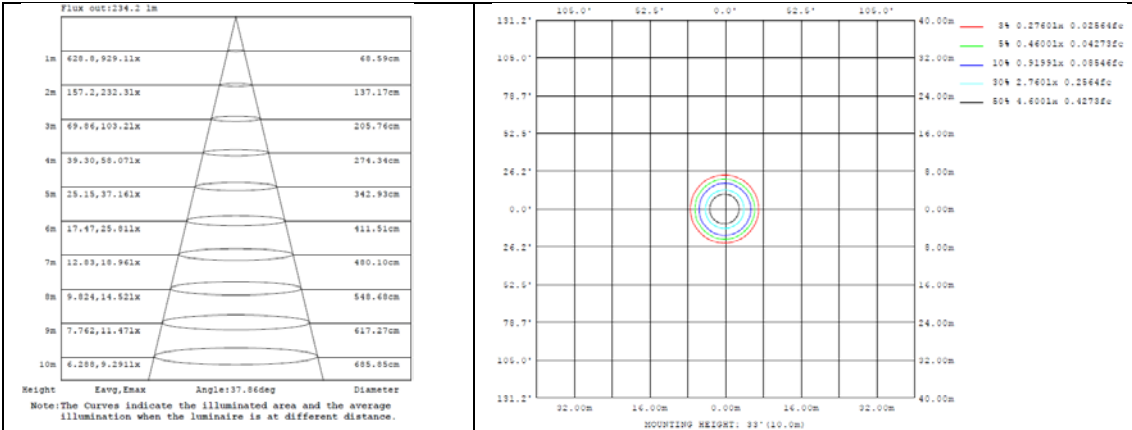


Table--1

UNIT: cd

Y (DEG)	C (DEG)																			
	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5				
0	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921	921				
5	848	851	854	863	877	890	906	921	927	929	919	908	898	881	867	856				
10	720	720	723	747	772	800	827	852	858	851	837	817	799	772	753	734				
15	552	556	567	585	609	642	667	691	697	688	667	645	621	595	579	561				
20	377	383	390	407	426	448	468	488	486	476	463	443	428	408	395	382				
25	216	221	234	246	261	275	284	290	279	274	269	255	240	230	219	215				
30	88.9	92.5	96.3	102	109	116	124	119	118	114	110	103	97.0	91.0	89.0	88.2				
35	48.7	49.5	50.1	51.9	54.3	57.3	59.7	62.0	62.3	62.1	60.7	58.1	55.7	52.5	50.8	49.6				
40	32.7	32.9	33.3	34.3	35.4	36.8	38.1	38.9	39.0	38.8	38.6	37.0	35.9	34.2	33.3	32.8				
45	22.7	22.8	23.1	23.7	24.3	25.2	25.9	26.4	26.1	26.0	25.9	25.0	24.4	23.4	22.9	22.7				
50	16.6	16.7	17.0	17.5	17.7	18.1	18.5	18.8	18.0	18.4	18.4	18.0	17.6	17.0	16.8	16.7				
55	12.9	13.1	13.1	13.5	13.6	13.8	14.0	14.2	14.0	13.9	14.0	13.7	13.5	13.1	13.0	12.9				
60	9.87	10.1	10.2	10.4	10.6	10.7	10.7	10.7	10.6	10.5	10.6	10.4	10.3	9.96	9.92	9.85				
65	7.26	7.43	7.60	7.86	7.99	8.07	8.04	8.00	7.88	7.76	7.71	7.57	7.46	7.22	7.18	7.21				
70	5.09	5.22	5.40	5.59	5.70	5.78	5.75	5.72	5.64	5.58	5.52	5.42	5.33	5.11	5.05	5.08				
75	3.08	3.18	3.33	3.53	3.66	3.78	3.81	3.84	3.80	3.74	3.65	3.52	3.36	3.14	3.05	3.08				
80	1.22	1.30	1.42	1.56	1.71	1.84	1.93	2.00	1.99	1.93	1.81	1.66	1.49	1.33	1.22	1.22				
85	0.15	0.13	0.21	0.20	0.31	0.34	0.44	0.45	0.46	0.44	0.31	0.27	0.19	0.18	0.12	0.15				
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				

2.1.4 Electrical, Photometric and Chromaticity Measurements

Test date	2023-6-17	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	DLG0010 (G2)	CCT Setting	4000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120	60	0.05008	5.789	0.9596

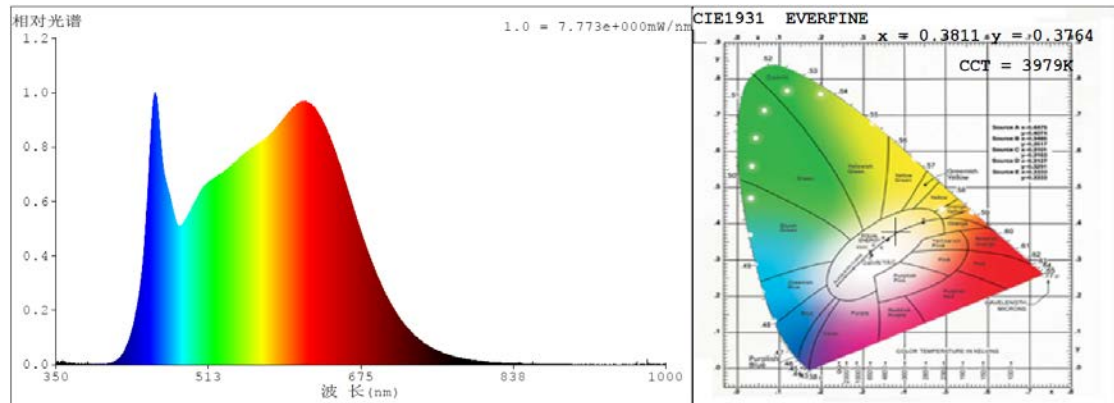
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	97	R9	73
Frequency (Hz)	60	R2	99	R10	99
CCT (K)	3979	R3	97	R11	95
Duv	-0.000379	R4	93	R12	77
Chromaticity (x, y)	x=0.3811, y=0.3764	R5	95	R13	99
Chromaticity (u', v')	u' =0.2257, v' =0.5015	R6	96	R14	99
Color Rendering Index (CRI)	94.4	R7	92	R15	94
R9	73	R8	87	--	--

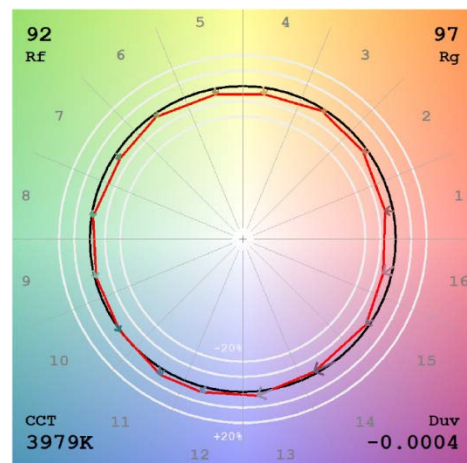
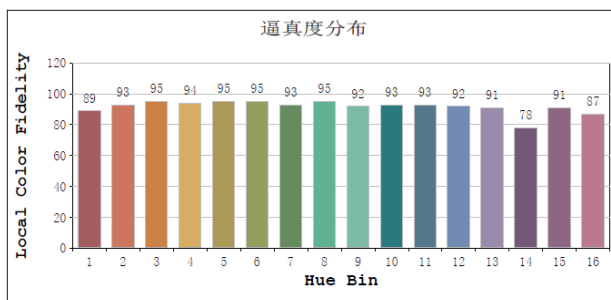
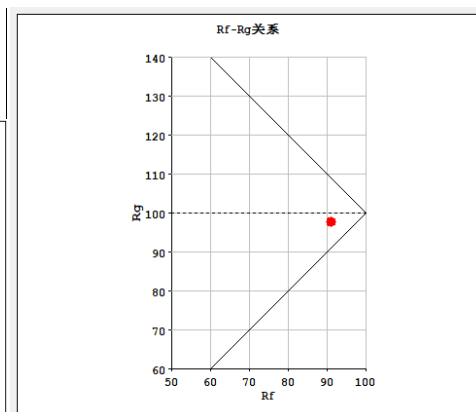
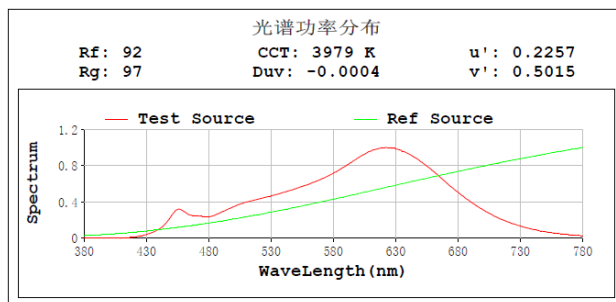
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	453.02
Luminous Efficacy (lm/W)	78.13
Beam Angle (°)	38.1
Center Beam Candle Power (cd)	949.7

Spectral Power Distribution & Chromaticity Diagram



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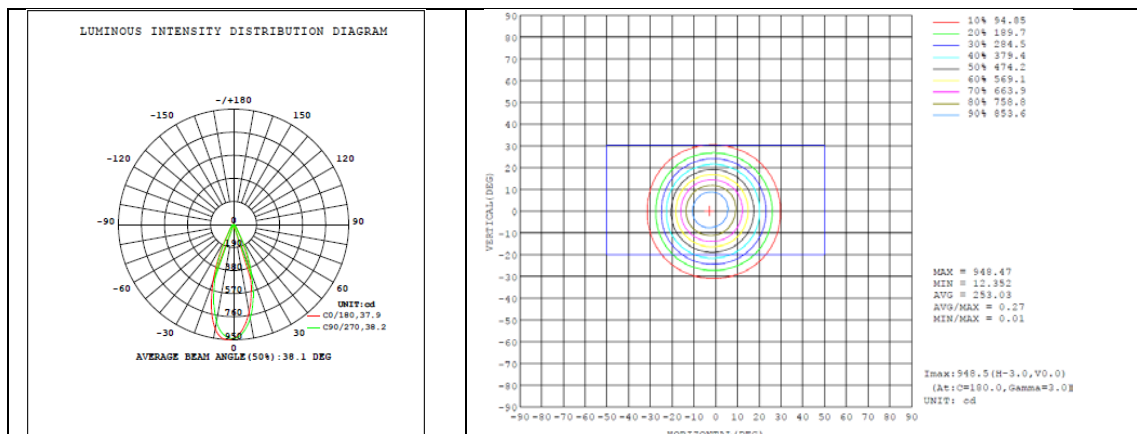


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	371.0	81.9%
0-40	408.6	90.2%
0-60	440.8	97.3%
60-90	12.2	2.6%
70-100	4.1	0.9%
90-120	0.0	0.0%
0-90	453.0	100.0%
90-180	0.0	0.0%
0-180	453.0	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	82.9	18.3%	90-100	0	0%
10-20	172.6	38.1%	100-110	0	0%
20-30	115.5	25.5%	110-120	0	0%
30-40	37.6	8.3%	120-130	0	0%
40-50	19.9	4.4%	130-140	0	0%
50-60	12.2	2.7%	140-150	0	0%
60-70	8.2	1.8%	150-160	0	0%
70-80	3.6	0.8%	160-170	0	0%
80-90	0.5	0.1%	170-180	0	0%

Photometric Data



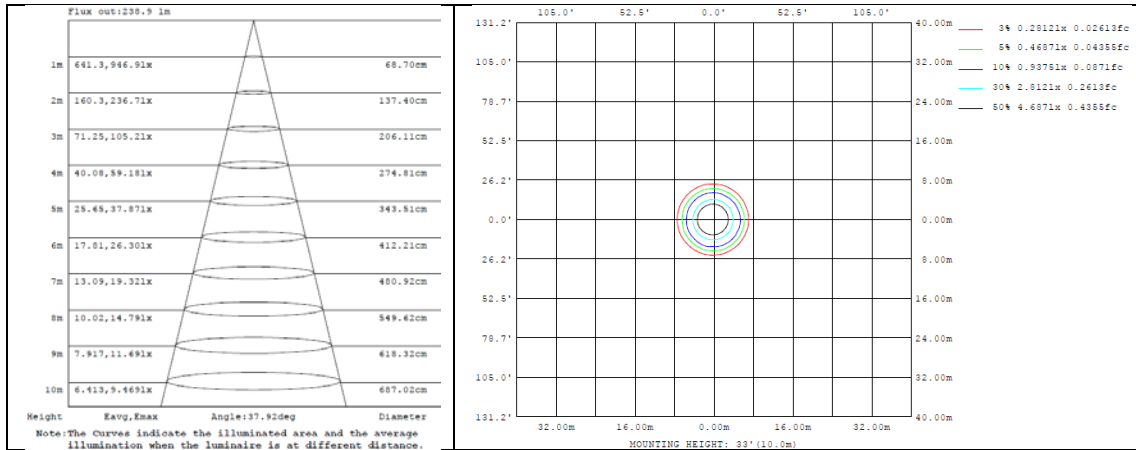


Table--1

UNIT: cd

γ (DEG)	C (DEG)																			
	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5				
0	938	938	938	938	938	938	938	938	938	938	938	938	938	938	938	938				
5	867	868	869	881	893	908	924	938	947	945	936	926	913	898	884	873				
10	736	733	742	764	787	814	843	866	874	866	854	837	814	786	769	748				
15	566	567	581	603	622	652	680	703	708	701	684	659	634	606	589	571				
20	388	391	401	418	435	457	477	496	496	486	473	452	436	416	404	390				
25	222	226	238	252	267	281	290	296	284	279	275	261	246	235	224	220				
30	91.3	94.6	98.6	105	111	119	126	122	120	117	113	106	99.7	92.9	91.2	90.1				
35	50.0	50.6	51.4	53.0	55.6	58.6	61.2	63.3	63.8	63.5	62.3	59.6	56.9	53.8	52.0	50.6				
40	33.6	33.7	34.1	35.2	36.2	37.6	38.9	39.8	39.9	39.7	39.6	38.1	36.7	35.0	34.1	33.5				
45	23.3	23.4	23.6	24.3	24.9	25.7	26.5	27.0	26.7	26.5	26.6	25.7	25.0	24.0	23.5	23.1				
50	17.0	17.2	17.4	17.8	18.1	18.7	18.9	19.2	18.9	18.8	18.8	18.5	18.0	17.5	17.2	17.0				
55	13.2	13.3	13.5	13.7	13.9	14.1	14.3	14.5	14.3	14.2	14.3	14.1	13.8	13.4	13.3	13.1				
60	10.1	10.3	10.4	10.7	10.8	10.9	11.0	11.0	10.9	10.8	10.8	10.6	10.5	10.2	10.2	10.1				
65	7.46	7.58	7.77	8.07	8.15	8.25	8.21	8.19	8.06	7.95	7.91	7.78	7.64	7.41	7.37	7.37				
70	5.23	5.34	5.52	5.73	5.84	5.90	5.88	5.86	5.76	5.70	5.65	5.56	5.45	5.25	5.17	5.19				
75	3.17	3.25	3.40	3.59	3.74	3.87	3.89	3.93	3.88	3.80	3.73	3.61	3.46	3.22	3.15	3.14				
80	1.26	1.34	1.46	1.60	1.75	1.89	1.98	2.06	2.04	1.97	1.85	1.71	1.52	1.36	1.27	1.24				
85	0.16	0.14	0.21	0.22	0.32	0.35	0.45	0.47	0.47	0.46	0.32	0.28	0.20	0.19	0.13	0.16				
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				

2.1.5 Electrical, Photometric and Chromaticity Measurements

Test date	2023-6-17	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	DLG0010 (G2)	CCT Setting	5000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120	60	0.05181	6.007	0.9623

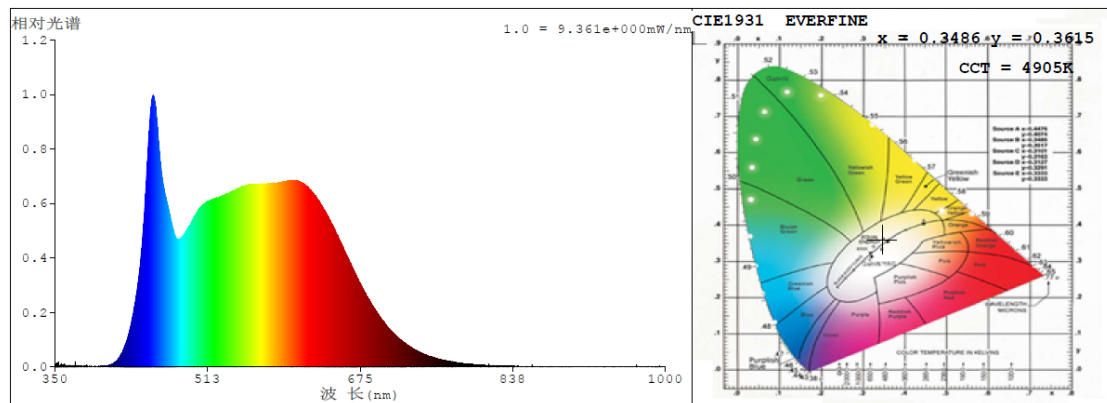
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	93	R9	60
Frequency (Hz)	60	R2	98	R10	94
CCT (K)	4905	R3	98	R11	90
Duv	0.00350	R4	89	R12	70
Chromaticity (x, y)	x=0.3486, y=0.3615	R5	91	R13	95
Chromaticity (u', v')	u' =0.2100, v' =0.4899	R6	95	R14	99
Color Rendering Index (CRI)	92.2	R7	91	R15	89
R9	60	R8	83	--	--

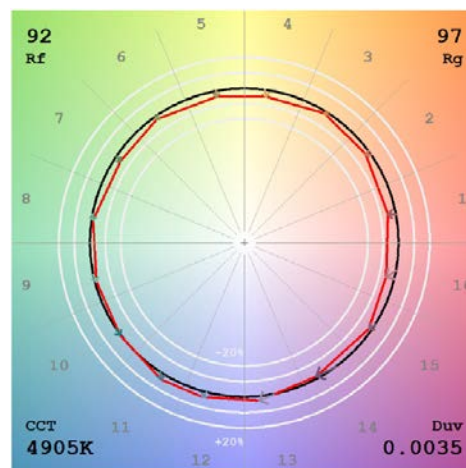
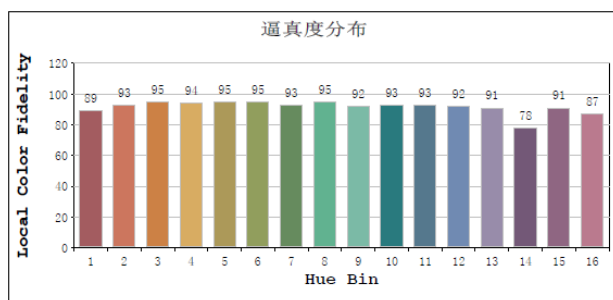
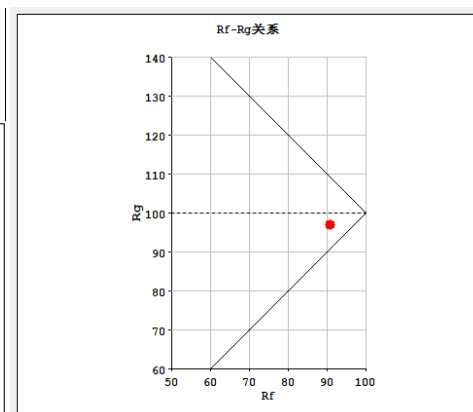
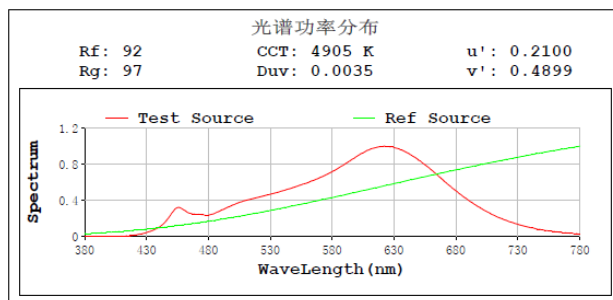
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	442.63
Luminous Efficacy (lm/W)	73.64
Beam Angle (°)	38.2
Center Beam Candle Power (cd)	922.8

Spectral Power Distribution & Chromaticity Diagram



TM30

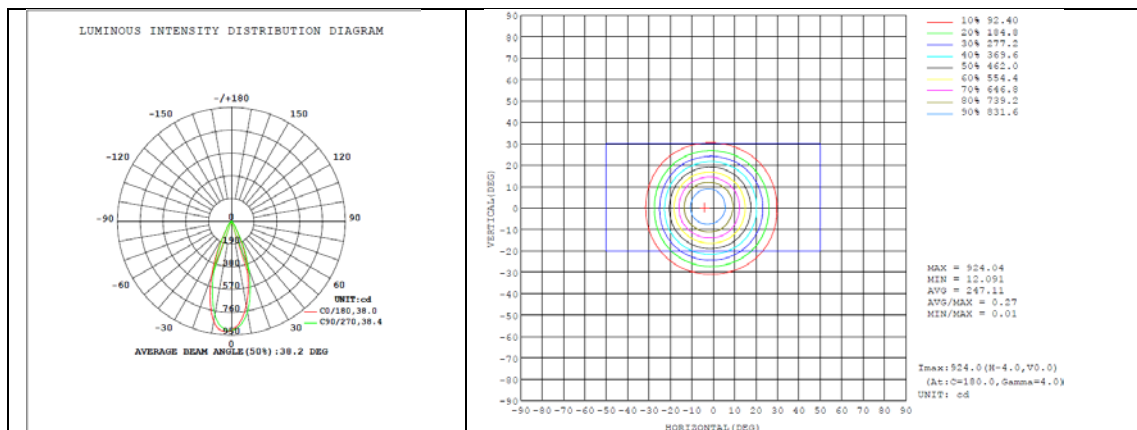


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	362.5	81.9%
0-40	399.3	90.2%
0-60	430.7	97.3%
60-90	12.0	2.6%
70-100	4.0	0.9%
90-120	0.0	0.0%
0-90	442.6	100.0%
90-180	0.0	0.0%
0-180	442.6	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	81.0	18.3%	90-100	0	0%
10-20	168.2	38.0%	100-110	0	0%
20-30	113.3	25.6%	110-120	0	0%
30-40	36.7	8.3%	120-130	0	0%
40-50	19.5	4.4%	130-140	0	0%
50-60	12.0	2.7%	140-150	0	0%
60-70	8.0	1.8%	150-160	0	0%
70-80	3.5	0.8%	160-170	0	0%
80-90	0.4	0.1%	170-180	0	0%

Photometric Data



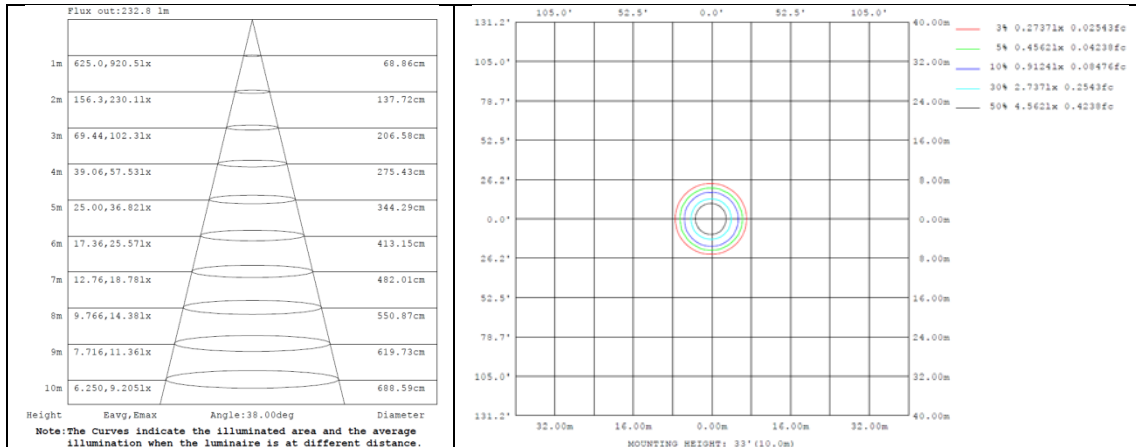


Table--1

UNIT: cd

C (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5			
0	911	911	911	911	911	911	911	911	911	911	911	911	911	911	911	911			
5	842	846	850	859	870	881	898	911	916	918	916	901	890	871	860	848			
10	715	715	730	752	772	792	820	842	849	845	837	816	794	762	745	726			
15	547	556	576	595	608	632	659	681	686	684	674	643	618	588	572	554			
20	379	383	393	410	426	445	465	485	484	477	464	443	429	406	394	381			
25	216	220	235	244	261	274	285	290	279	273	270	256	241	230	220	216			
30	89.5	93.3	97.8	104	110	117	124	119	117	115	111	104	98.2	91.0	89.2	88.6			
35	48.8	49.6	50.8	52.2	54.5	57.3	59.8	61.9	62.5	62.4	61.3	58.6	55.8	52.5	50.9	49.6			
40	32.8	33.0	33.6	34.5	35.5	36.8	38.1	39.1	39.0	38.9	39.1	37.4	36.0	34.2	33.4	32.8			
45	22.7	22.9	23.3	23.8	24.5	25.1	25.9	26.4	26.1	26.0	26.3	25.2	24.4	23.4	22.9	22.7			
50	16.6	16.8	17.1	17.5	17.7	18.1	18.5	18.8	18.5	18.5	18.5	18.1	17.6	17.1	16.8	16.7			
55	12.9	13.0	13.2	13.5	13.7	13.8	14.0	14.2	14.0	14.0	14.1	13.8	13.6	13.1	13.0	12.9			
60	9.91	10.1	10.2	10.5	10.6	10.7	10.7	10.7	10.6	10.5	10.6	10.4	10.3	9.97	9.92	9.86			
65	7.26	7.42	7.64	7.88	8.00	8.07	8.05	7.99	7.89	7.80	7.75	7.60	7.48	7.25	7.19	7.22			
70	5.10	5.22	5.42	5.60	5.72	5.78	5.77	5.71	5.65	5.56	5.53	5.43	5.33	5.14	5.06	5.08			
75	3.08	3.18	3.34	3.51	3.66	3.77	3.80	3.84	3.80	3.74	3.68	3.53	3.38	3.15	3.08	3.07			
80	1.23	1.29	1.41	1.56	1.71	1.84	1.94	2.01	1.99	1.93	1.83	1.68	1.50	1.32	1.23	1.21			
85	0.16	0.13	0.20	0.21	0.31	0.33	0.44	0.46	0.46	0.45	0.31	0.27	0.19	0.18	0.12	0.15			
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			

Model Number	CCT setting	Test Voltage(V)	Flux(lm)	P(W)	Luminous Efficacy lm/W
DLG0010 (G2)	2700K setting	120	381.17	6.01	63.47
	3000K setting	120	420.78	5.86	71.82
	3500K setting	120	443.60	5.73	77.43
	4000K setting	120	453.02	5.80	78.13
	5000K setting	120	442.63	6.01	73.64