Test Report

Report number: KYR240506036-TRA0

Product name: LED lamp

Size of product: P10035(BR30-7-9CCT-DIM)

Client: Technical Department

Brand name: RAB

Statement

1. To The inspection agencies ensure the impartiality, independence and integrity of the test data responsible for the commission to provide the Confidentiality and protection of ownership test samples
2. The report ownerless inspection, review, approval and other personnel signature, altered or copied, not stamped seal of the agency test is invalid.
3. The commissioning party disagrees with the report, it is timely to our bodie.
4. The agency received the commission to send samples tested, the test report issued by the inspection data and results of sample submission only responsible forthe authenticity and representativeness of the sample by the commission responsible.
5. Pages of this report are an integral part of the test report, the user singled out some of the pages can lead to misunderstandings or used for other purposes and consequences, the agency pays the corresponding legal responsibility.
6. Test report commissioned by the release and disposal of samples: Principal shall after receiving notification of the completion operations after 30 working days, according to the contract completion inspection reports and sample collection. Overdue Principal will abandon this body, this body on behalf of disposal in accordance with the relevant provisions.
7. The report of the test findings do not prove untested items (functional or performance), compliance with the requirements.

Test Report

Sample Name	LED lamp	Test categories	LM-79
Specifications/level	P10035(BR30-7-9CCT-DIM)	Trademark	RAB
Entrust unit	Technical Department	Entrust unit address	/
Entrust the date	2024.05.06	Date received	2024.05.06
The sample quantity	1	The sample description	Intact appearance
Detection of address	/	Testing environment	25.1℃，60%
Starting test time	2024.05.06	Detection of completion time	2024.05.14
Detection based on	IESNA LM-79-2019 Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products		
	Special requirements：		
Test items	/		
Test Conclusion	The test items are qualified.Please refer to Technical Specifications for results. Special seal for test report. Date of issue 2024.05.14		
Note and subcontract information	/		
Opinions and explain	/		

The principal(unit) Communication data	Address	/	Zip code	/
	Mailbox	/	Telephone	/

Photos of the sample

Type: P10035(BR30-7-9CCT-DIM)

Test Equipment List

Serial number	device name	Number	specifications	Calibration Date	Calibration Due date
1	Spectral analysis system	2030070003-008	HAAS-2000	2024/1/4	2025/1/3
2	Precision digital display DC power supply	2020180039-002	WY305	2023/12/25	2024/12/24
3	Intelligent AC test power supply	2020180074-005	DPS1010	2023/12/26	2024/12/25
4	Temperature and humidity meter	2080190001-002	C0S03	2023/12/25	2024/12/24
5	Integrate Sphere system	2030100001-017	（1.5M）	2024/1/4	2025/1/3
6	Electrical parameter measuring instrument	2020090011-018	PF310A	2023/12/26	2024/12/25
7	Intelligent AC test power supply	2020180103-998	DPS1005	2023/12/25	2024/12/24
8	Precision digital display DC power supply	2020180128-001	WY3010	2023/12/25	2024/12/24
9	Electrical parameter measuring instrument	2020090015-999	PF9811	2023/12/25	2024/12/24
10	Calibration lamp	2030030004-029	D204	2024/4/15	2025/4/14
11	Horizontal distribution photometer	2030060006-001	GO-2000	2024/1/4	2025/1/3

Test Summary

Sample Tested: P10035(BR30-7-9CCT-DIM)

Luminous Efficacy (Lumens /Watt)	Total Luminous Flux (Lumens)	Power (Watts)	Power Factor
92.85	650	7	0.7
CCT (K)	**CRI**	**Stabilization Time (Min)**	
2700/3000/3500/4000/5000	90	85	

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 6, 2024

Date of Test : May 6, 2024

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

Reference Standard : IESNA LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

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

Equipment Under Test (EUT)

Name : LED Lamp

Model : P10035(BR30-7-9CCT-DIM)

Electrical Ratings : 120V, 60Hz, 7.0W

Product Description : E26 base, 2700K/3000K/3500K/4000K/5000K

TEST RESULTS

Test ambient temperature was 25.1℃.

Base orientation was base up. Test was conducted without a dimmer in the circuit.

The stabilization time of the sample was 85 minutes, and the total operating time including stabilization was 120 minutes.

Sphere-Spectroradiometer Method(2700K)

Parameter	Result
Test Voltage (V)	120.1
Voltage frequency (Hz)	60
Test Current (A)	0.06778
Power Factor	0.8376
Test Power (W)	6.819
Luminous Efficacy (lm/W)	97.67
Total Luminous Flux (lm)	666.04
Color Rendering Index (CRI)	92.1
R9	60
Correlated Color Temperature (CCT) (K)	2765
Chromaticity (Chroma x, Chroma y)	(0.4579, 0.4155)
Chromaticity (Chroma u, Chroma v)	(0.2591, 0.5289)
Duv	0.00196

Special Color Rendering Indices	
R1	94
R2	94
R3	92
R4	94
R5	92
R6	93
R7	94
R8	84
R9	60
R10	83
R11	94
R12	76
R13	93
R14	94
R15	90

(3000K)

Parameter	Result
Test Voltage (V)	120.1
Voltage frequency (Hz)	60
Test Current (A)	0.06814
Power Factor	0.8447
Test Power (W)	6.914
Luminous Efficacy (lm/W)	100.4
Total Luminous Flux (lm)	694.16
Color Rendering Index (CRI)	94.4
R9	70
Correlated Color Temperature (CCT) (K)	3019
Chromaticity (Chroma x, Chroma y)	(0.4355, 0.4035)
Chromaticity (Chroma u, Chroma v)	(0.2591, 0.5289)
Duv	-0.000051

Special Color Rendering Indices	
R1	97
R2	96
R3	93
R4	96
R5	95
R6	95
R7	95
R8	88
R9	70
R10	88
R11	96
R12	77
R13	96
R14	95
R15	93

(3500K)

Parameter	Result
Test Voltage (V)	120.1
Voltage frequency (Hz)	60
Test Current (A)	0.0684
Power Factor	0.8556
Test Power (W)	7.031
Luminous Efficacy (lm/W)	104.08
Total Luminous Flux (lm)	731.82
Color Rendering Index (CRI)	96.1
R9	81
Correlated Color Temperature (CCT) (K)	3493
Chromaticity (Chroma x, Chroma y)	(0.4046, 0.3878)
Chromaticity (Chroma u, Chroma v)	(0.2364, 0.5099)
Duv	-0.000051

Special Color Rendering Indices	
R1	99
R2	98
R3	94
R4	98
R5	97
R6	95
R7	96
R8	93
R9	81
R10	91
R11	96
R12	75
R13	98
R14	95
R15	97

(4000K)

Parameter	Result
Test Voltage (V)	120.1
Voltage frequency (Hz)	60
Test Current (A)	0.06835
Power Factor	0.8512
Test Power (W)	6.99
Luminous Efficacy (lm/W)	103.52
Total Luminous Flux (lm)	723.65
Color Rendering Index (CRI)	96.4
R9	85
Correlated Color Temperature (CCT) (K)	4031
Chromaticity (Chroma x, Chroma y)	(0.4046, 0.3878)
Chromaticity (Chroma u, Chroma v)	(0.3788, 0.3747)
Duv	0.5004

Special Color Rendering Indices	
R1	99
R2	98
R3	94
R4	98
R5	96
R6	95
R7	97
R8	95
R9	85
R10	91
R11	97
R12	72
R13	99
R14	95
R15	97

(5000K)

Parameter	Result
Test Voltage (V)	120.1
Voltage frequency (Hz)	60
Test Current (A)	0.06775
Power Factor	0.8374
Test Power (W)	6.815
Luminous Efficacy (lm/W)	99.37
Total Luminous Flux (lm)	677.15
Color Rendering Index (CRI)	94.6
R9	79
Correlated Color Temperature (CCT) (K)	5057
Chromaticity (Chroma x, Chroma y)	(0.3441, 0.3576)
Chromaticity (Chroma u, Chroma v)	(0.2085, 0.4874)
Duv	0.00337

Special Color Rendering Indices	
R1	96
R2	96
R3	93
R4	96
R5	94
R6	93
R7	97
R8	93
R9	79
R10	87
R11	95
R12	71
R13	96
R14	95
R15	95

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

The photometric distance is 9.91m.

Luminous data was taken at 1°vertical intervals and 22.5°horizontal intervals.**(2700K)**

Parameter	Result
Test Voltage (V)	120.1
Voltage frequency (Hz)	60
Test Current (A)	0.0715
Power Factor	0.81053
Test Power (W)	6.96215
Luminous Efficacy (lm/W)	99.97
Total Luminous Flux (lm)	696.04
Beam Angle (°)	116.5
Max Beam Candle Power (cd)	195.8
Spacing Criteria	116.5(0°-180°)/ 116.5 (90°-270°)
Zonal Lumens in the 0°-60°Zone	64.1%
Zonal Lumens in the 60°-90°Zone	25.8%
Zonal Lumens in the 90°-180°Zone	10.1%

(3000K)

Parameter	Result
Test Voltage (V)	120.1
Voltage frequency (Hz)	60
Test Current (A)	0.0718
Power Factor	0.8169
Test Power (W)	7.0442
Luminous Efficacy (lm/W)	103.622

Total Luminous Flux (lm)	729.92
Beam Angle (°)	116.5
Max Beam Candle Power (cd)	205.5
Spacing Criteria	116.6(0°-180°)/ 116.5 (90°-270°)
Zonal Lumens in the 0°-60°Zone	64.0%
Zonal Lumens in the 60°-90°Zone	24.9%
Zonal Lumens in the 90°-180°Zone	11.1%

(3500K)

Parameter	Result
Test Voltage (V)	120.1
Voltage frequency (Hz)	60
Test Current (A)	0.0722
Power Factor	0.8279
Test Power (W)	7.1760
Luminous Efficacy (lm/W)	107.49
Total Luminous Flux (lm)	771.32
Beam Angle (°)	116.6
Max Beam Candle Power (cd)	217.0
Spacing Criteria	116.5(0°-180°)/ 116.7 (90°-270°)
Zonal Lumens in the 0°-60°Zone	64.0%
Zonal Lumens in the 60°-90°Zone	24.9%
Zonal Lumens in the 90°-180°Zone	11.1%

(4000K)

Parameter	Result
Test Voltage (V)	120.1
Voltage frequency (Hz)	60
Test Current (A)	0.0720
Power Factor	0.8234
Test Power (W)	7.1204
Luminous Efficacy (lm/W)	107.58
Total Luminous Flux (lm)	766.04
Beam Angle (°)	116.7
Max Beam Candle Power (cd)	215.1
Spacing Criteria	116.7(0°-180°)/ 116.7 (90°-270°)
Zonal Lumens in the 0°-60°Zone	64.0%
Zonal Lumens in the 60°-90°Zone	24.9%
Zonal Lumens in the 90°-180°Zone	11.1%

(5000K)

Parameter	Result
Test Voltage (V)	120.1
Voltage frequency (Hz)	60
Test Current (A)	0.0715
Power Factor	0.8106

Test Power (W)	6.9569
Luminous Efficacy (lm/W)	103.45
Total Luminous Flux (lm)	719.66
Beam Angle (°)	116.7
Max Beam Candle Power (cd)	202.2
Spacing Criteria	116.7(0°-180°)/ 116.8 (90°-270°)
Zonal Lumens in the 0°-60°Zone	64.0%
Zonal Lumens in the 60°-90°Zone	24.9%
Zonal Lumens in the 90°-180°Zone	11.1%

Table 3: Test data per Goniophotometer Method

Zonal Lumen Tabulation- Goniophotometer Method(2700K)

γ(°)	Lumens	% Total
0-30	151.8	21.8
0-40	248.8	35.7
0-60	445.9	64.1
0-90	619.1	88.9
0-120	672.3	96.6
0-180	696.0	100.0
60-90	173.2	24.9
90-120	53.2	7.6
90-130	62.4	9.0
90-150	72.9	10.5
90-180	76.9	11.0

(3000K)

γ(°)	Lumens	% Total
0-30	159.1	21.8
0-40	260.8	35.7
0-60	467.5	64.0
0-90	649.2	88.9
0-120	705.0	96.6
0-180	729.9	100.0
60-90	181.7	24.9
90-120	56.2	7.7
90-130	65.5	9.0
90-150	76.5	10.5
90-180	80.7	11.1

(3500K)

γ(°)	Lumens	% Total
0-30	168.0	21.8
0-40	275.5	35.7
0-60	493.9	64.0
0-90	685.9	88.9
0-120	745.0	96.6
0-180	771.3	100.0
60-90	192.0	24.9
90-120	59.1	7.7
90-130	69.3	9.0
90-150	80.9	10.5
90-180	80.7	11.8

γ(°)	Lumens	% Total

(4000K)

0-30	166.8	21.8
0-40	273.5	35.7
0-60	490.4	64.0
0-90	681.2	88.9
0-120	739.9	96.6
0-180	766.0	100.0
60-90	190.8	24.9
90-120	58.7	7.7
90-130	68.9	9.0
90-150	80.4	10.5
90-180	84.8	11.1

(5000K)

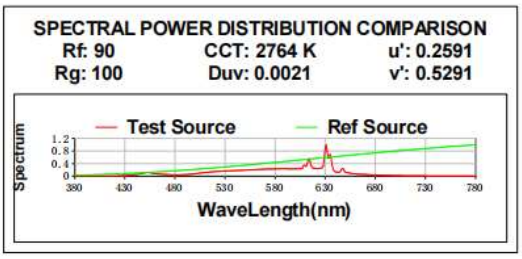
γ(°)	Lumens	% Total
0-30	156.6	21.8
0-40	256.8	35.7
0-60	460.6	64.0
0-90	639.9	88.9
0-120	695.1	96.6
0-180	719.7	100.0
60-90	179.3	24.9
90-120	55.2	7.7
90-130	64.7	9.0
90-150	75.6	10.5
90-180	79.8	11.1

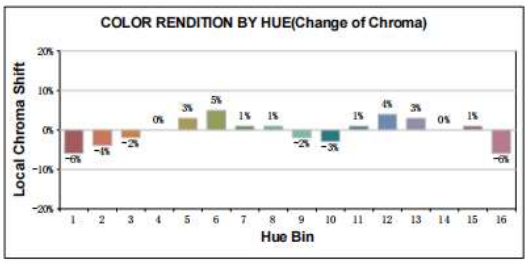
Table 4: Zonal Lumen Data

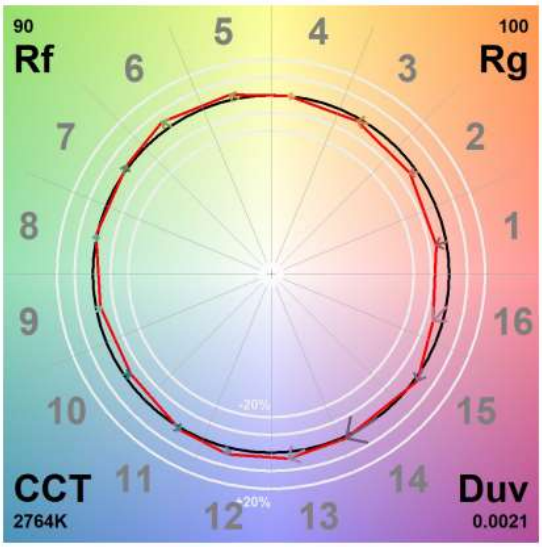
Color Rendition Report-Sphere Spectroradiometer Method(2700K)

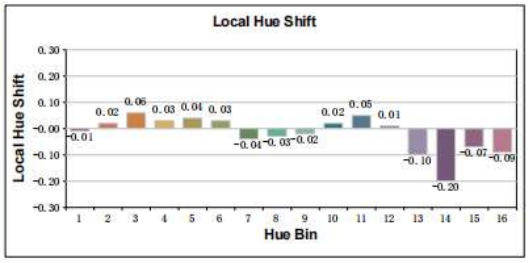
TM30

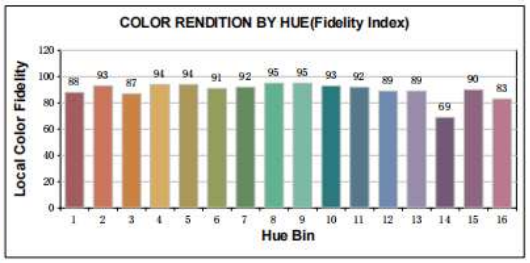
View Angle:2 Deg

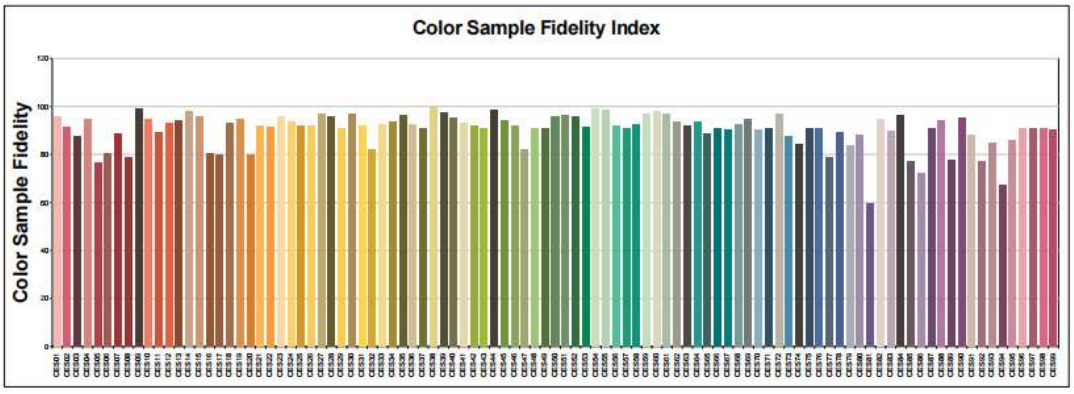












(3000K)

TM30

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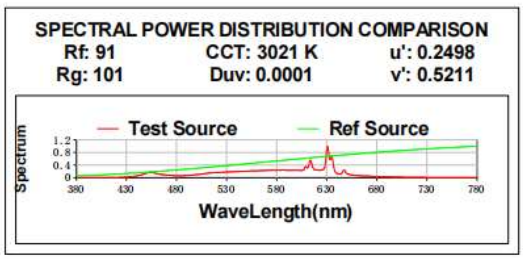

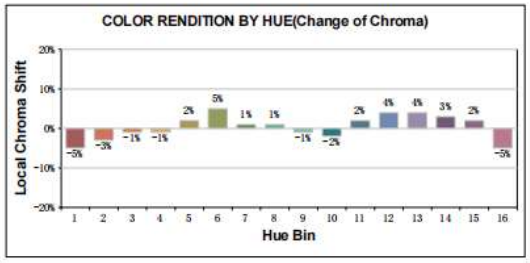

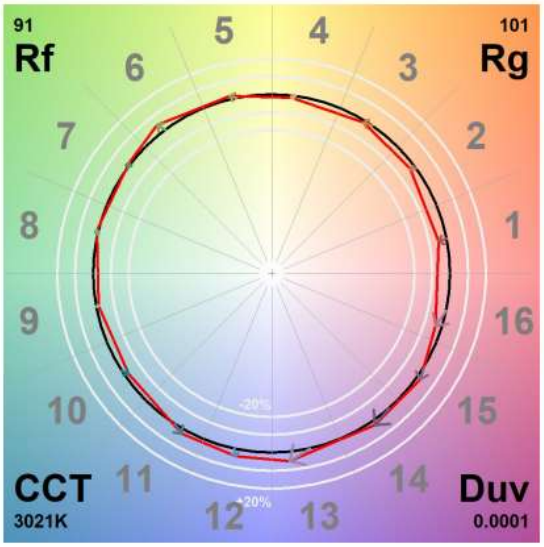

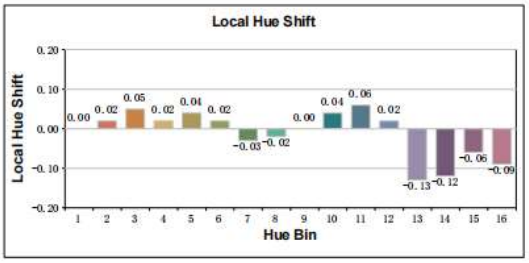

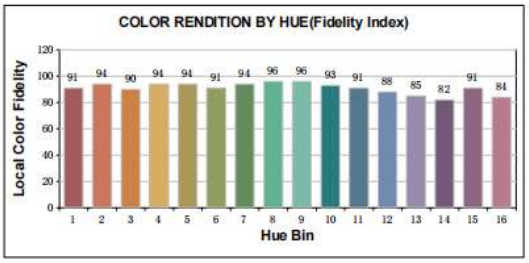

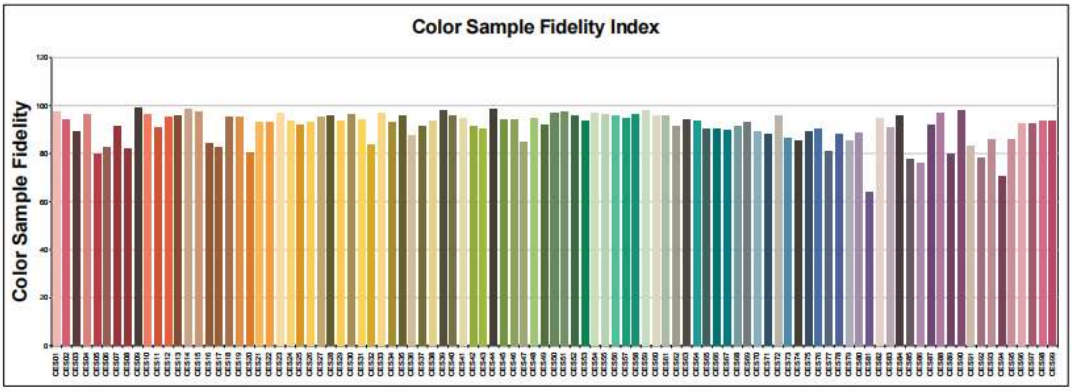

(3500K)

TM30

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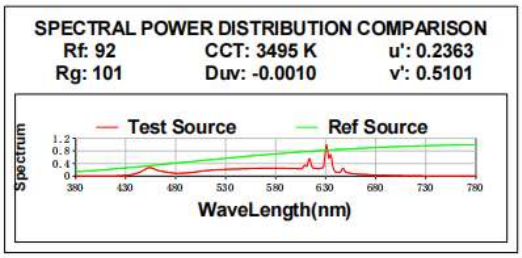
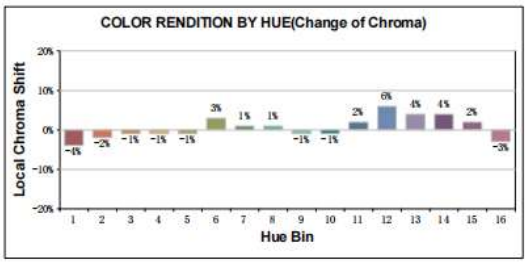
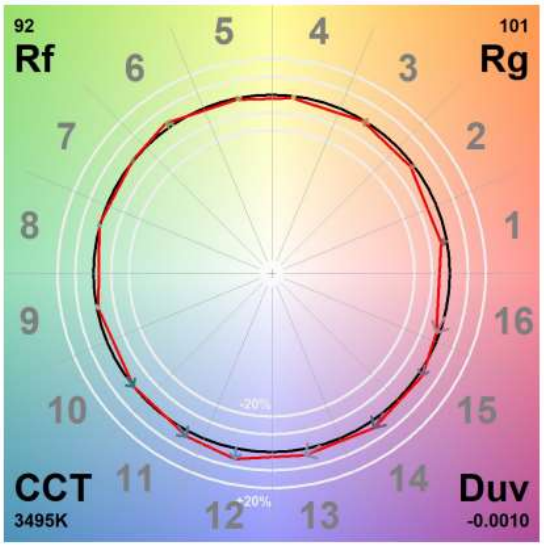
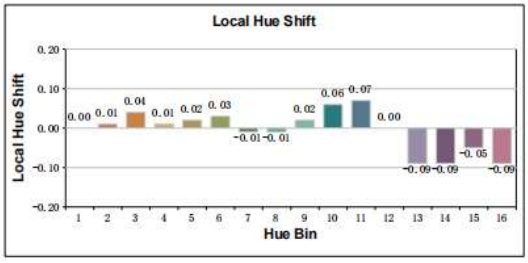
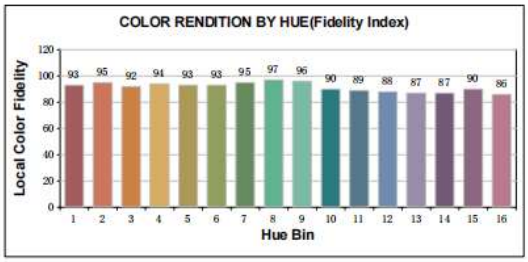
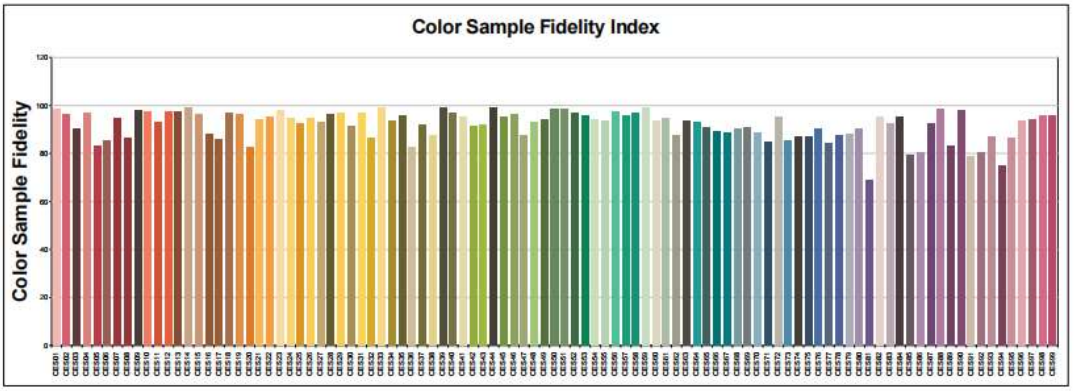








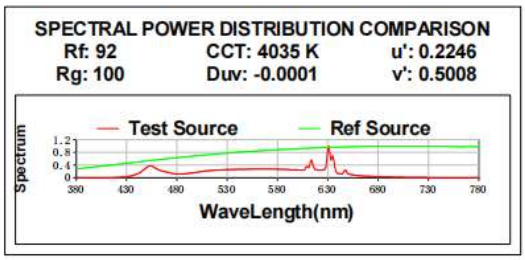


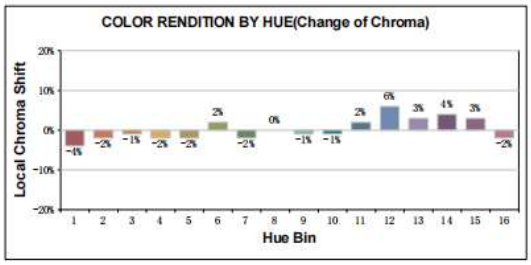


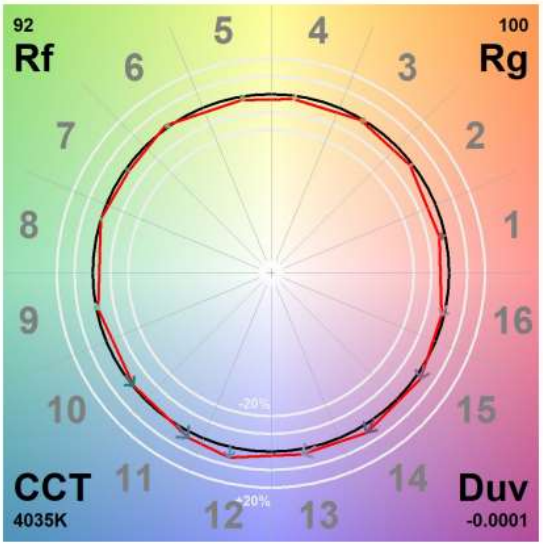
(4000K)

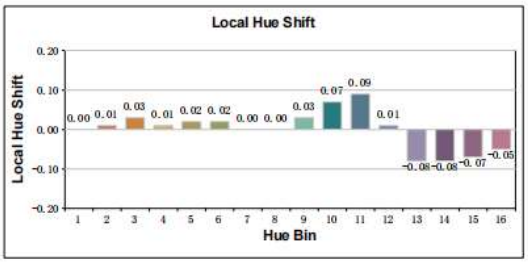
TM30

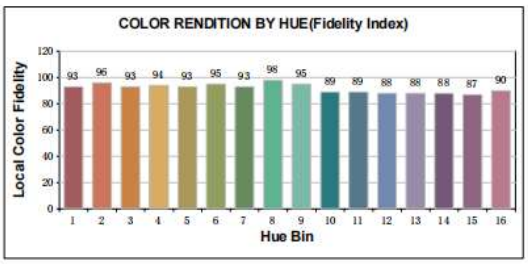
View Angle:2 Deg

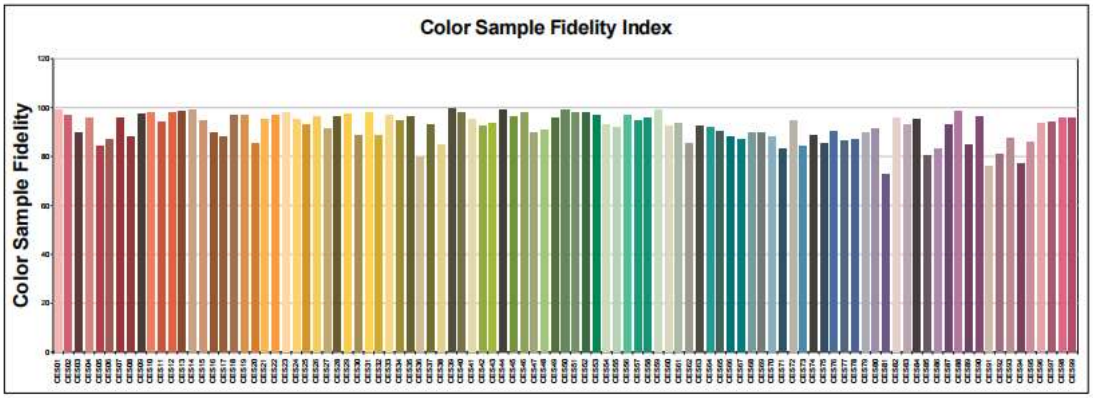












(5000K)

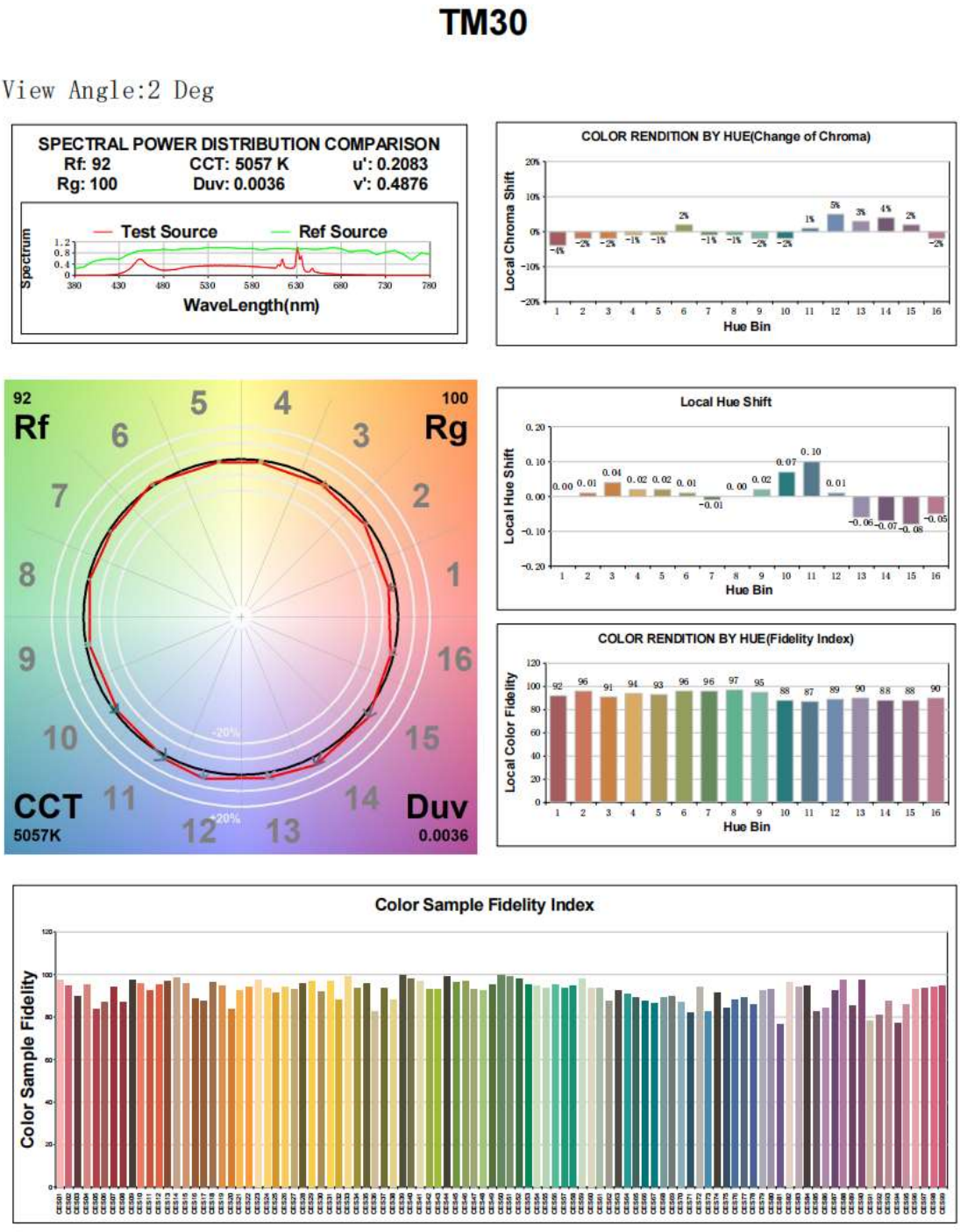
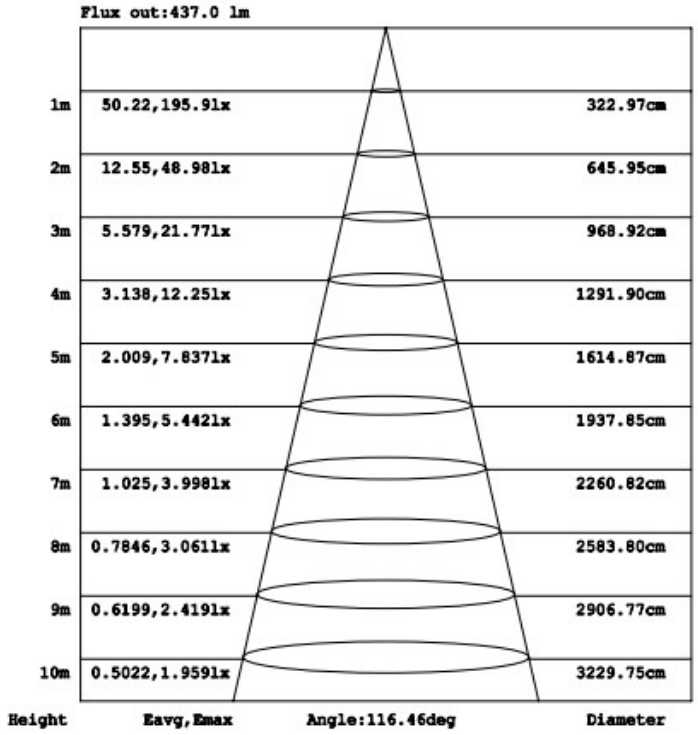
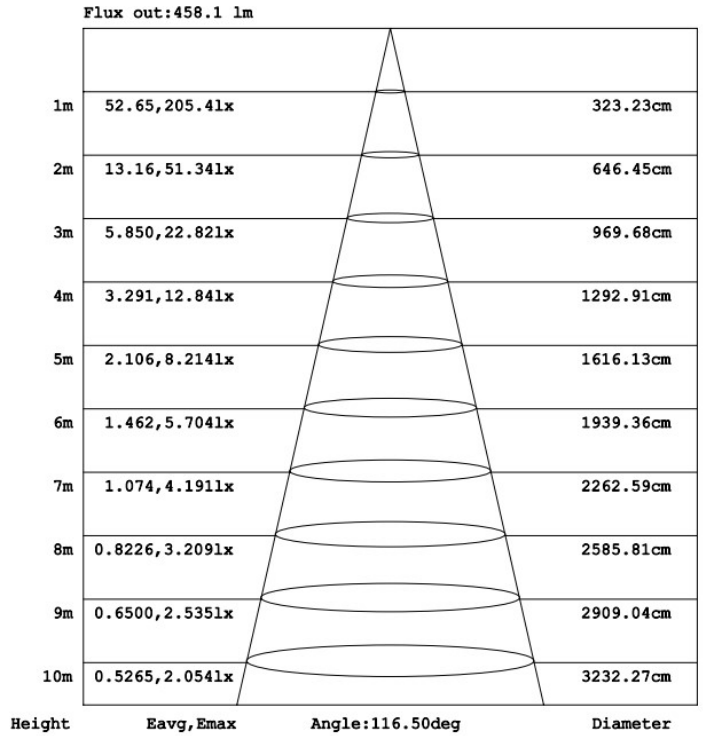


Chart 1: TM30

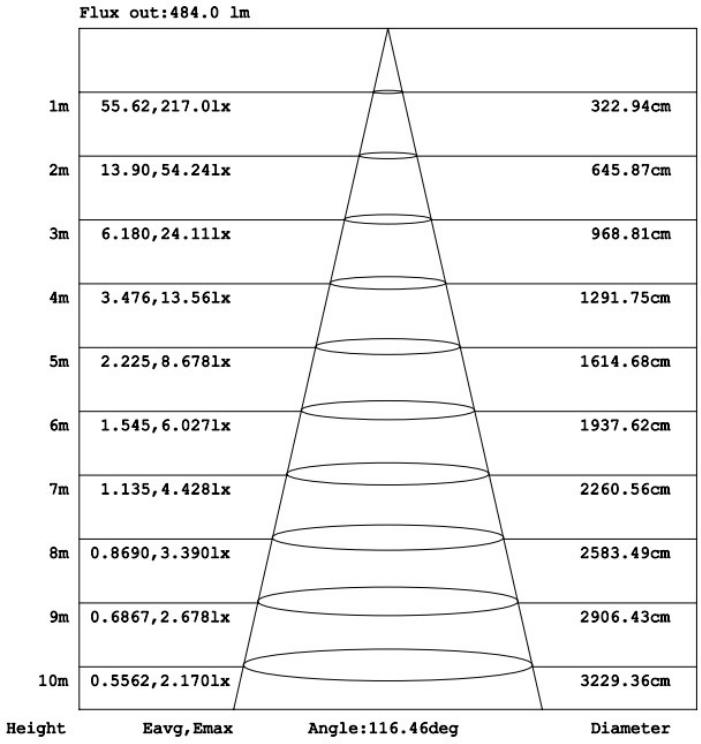
Illuminance Plots- Goniophotometer Method(2700K)



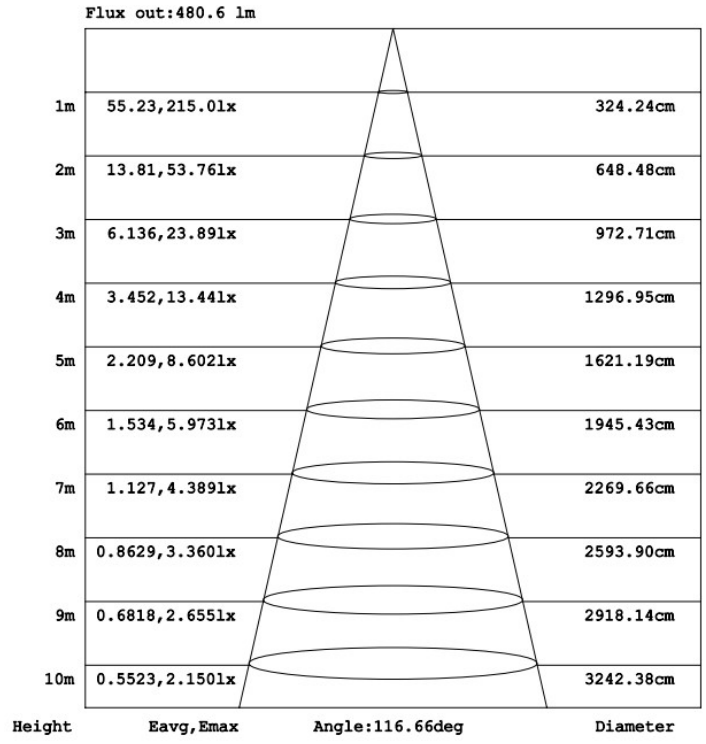
(3000K)



(3500K)


Flux out:484.0 lm
1m 55.62,217.01lx 322.94cm
2m 13.90,54.24lx 645.87cm
3m 6.180,24.11lx 968.81cm
4m 3.476,13.56lx 1291.75cm
5m 2.225,8.678lx 1614.68cm
6m 1.545,6.027lx 1937.62cm
7m 1.135,4.428lx 2260.56cm
8m 0.8690,3.390lx 2583.49cm
9m 0.6867,2.678lx 2906.43cm
10m 0.5562,2.170lx 3229.36cm
Height Eavg,Emax Angle:116.46deg Diameter

(4000K)


Flux out:480.6 lm
1m 55.23,215.01lx 324.24cm
2m 13.81,53.76lx 648.48cm
3m 6.136,23.89lx 972.71cm
4m 3.452,13.44lx 1296.95cm
5m 2.209,8.602lx 1621.19cm
6m 1.534,5.973lx 1945.43cm
7m 1.127,4.389lx 2269.66cm
8m 0.8629,3.360lx 2593.90cm
9m 0.6818,2.655lx 2918.14cm
10m 0.5523,2.150lx 3242.38cm
Height Eavg,Emax Angle:116.66deg Diameter

(5000K)

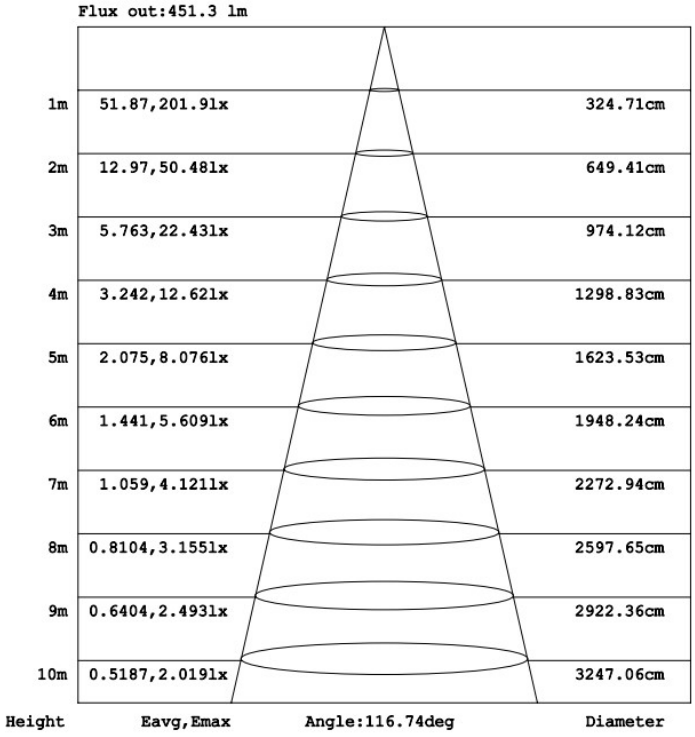
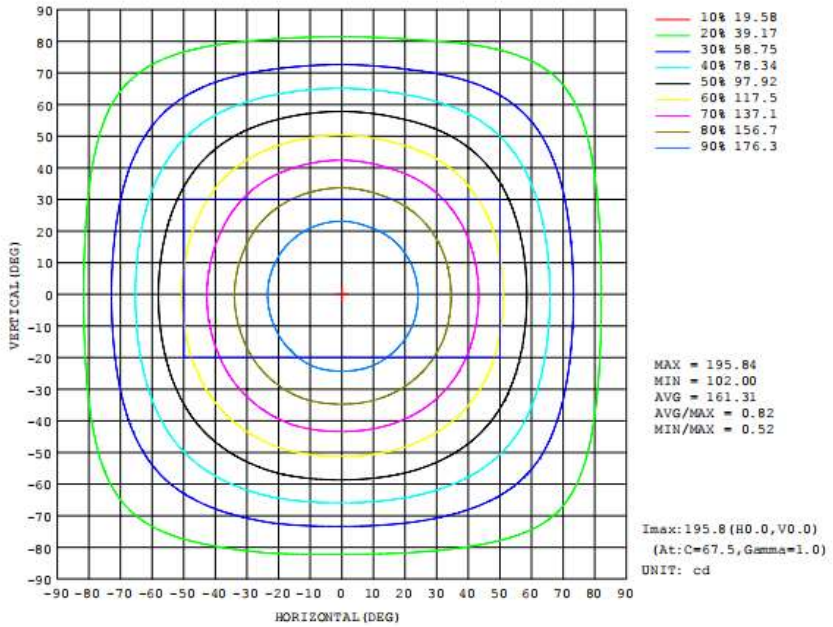
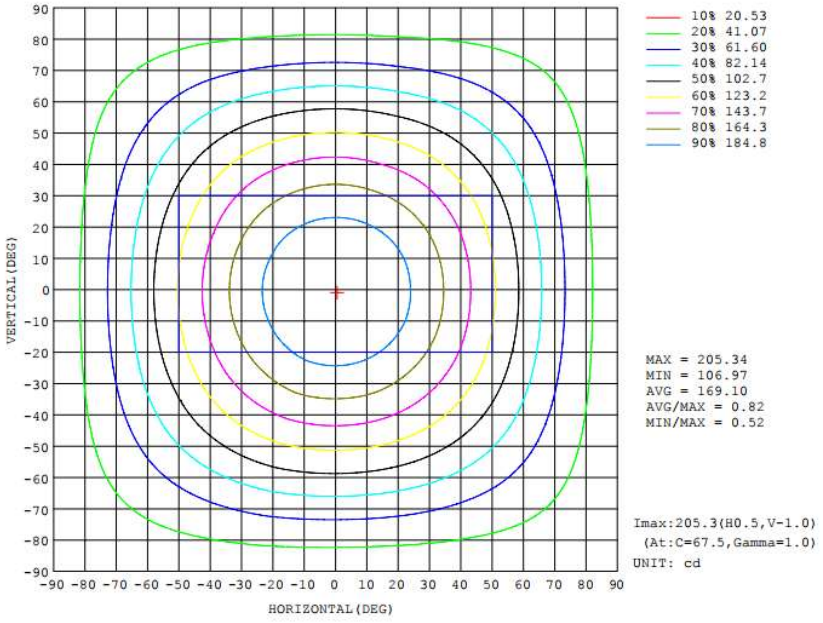


Chart 2: AAI Figure

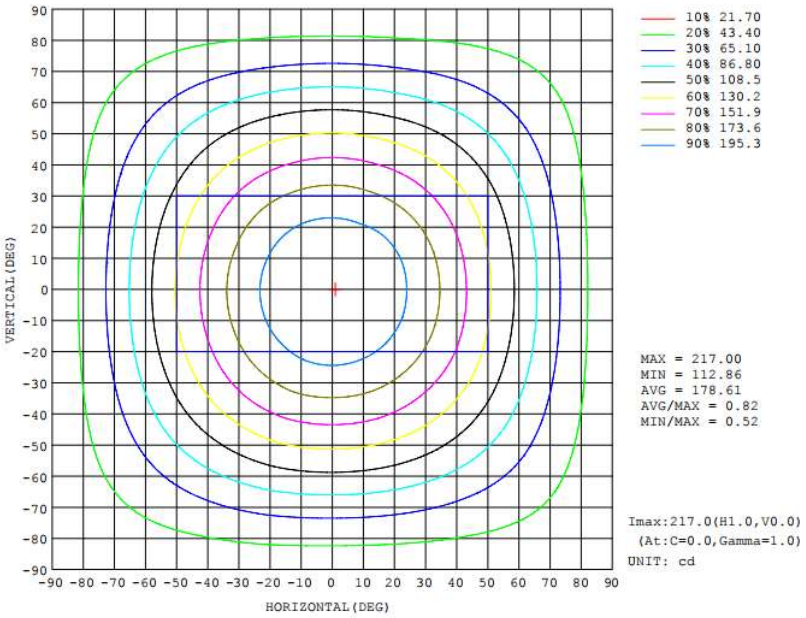
Luminous Intensity Distribution Plots- Goniophotometer Method(2700K)



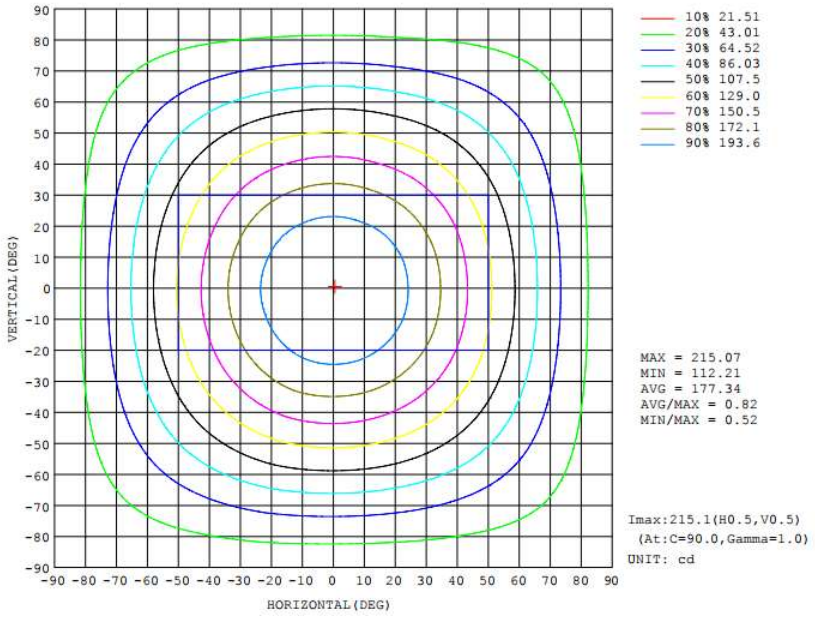
(3000K)



(3500K)


10% 21.70
20% 43.40
30% 65.10
40% 86.80
50% 108.5
60% 130.2
70% 151.9
80% 173.6
90% 195.3
MAX = 217.00
MIN = 112.86
AVG = 178.61
AVG/MAX = 0.82
MIN/MAX = 0.52
Imax:217.0(H1.0,V0.0)
(At:C=0.0,Gamma=1.0)
UNIT: cd
VERTICAL(DEG)
HORIZONTAL(DEG)

(4000K)


10% 21.51
20% 43.01
30% 64.52
40% 86.03
50% 107.5
60% 129.0
70% 150.5
80% 172.1
90% 193.6
MAX = 215.07
MIN = 112.21
AVG = 177.34
AVG/MAX = 0.82
MIN/MAX = 0.52
Imax:215.1(H0.5,V0.5)
(At:C=90.0,Gamma=1.0)
UNIT: cd
VERTICAL(DEG)
HORIZONTAL(DEG)

(5000K)

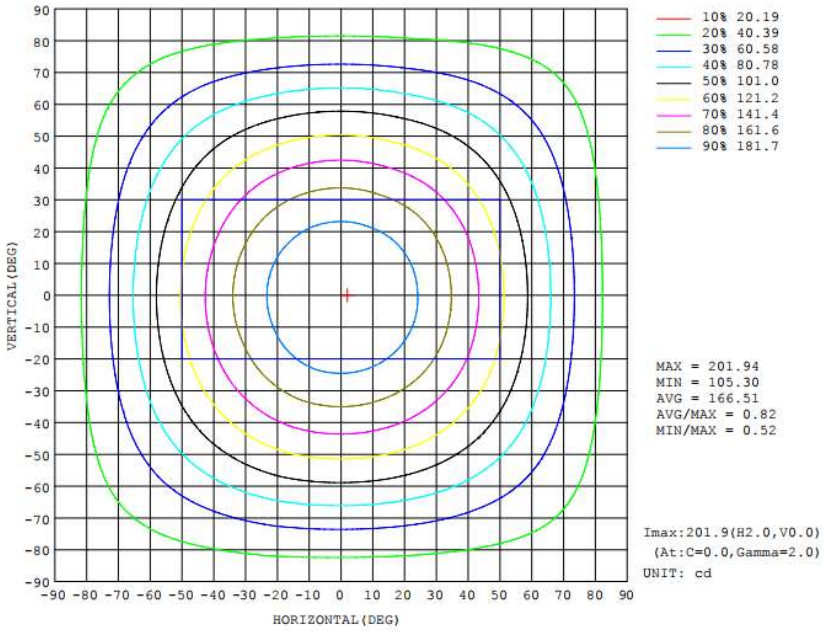
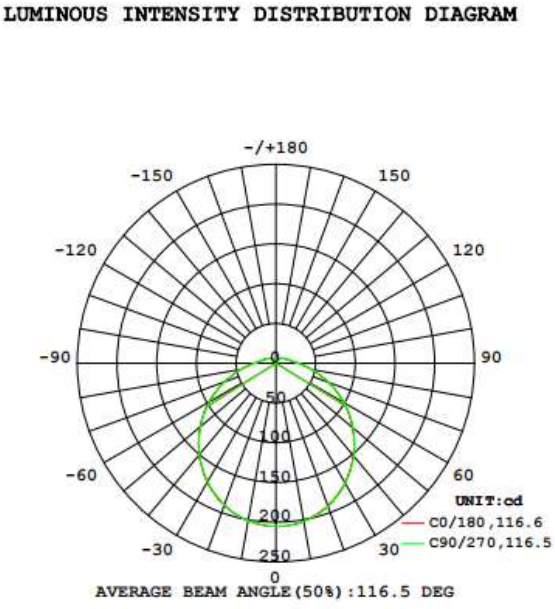


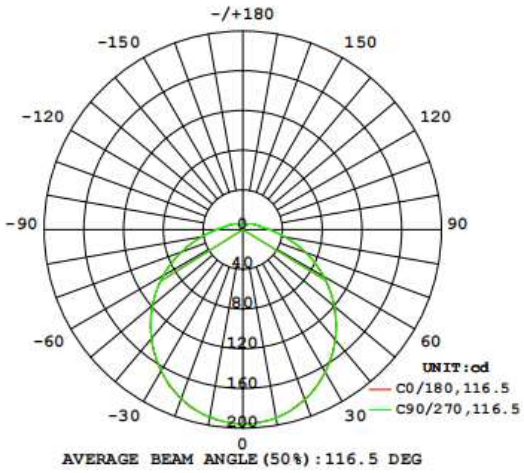
Chart 3: Isocandela Diagram

(2700K)



(3000K)

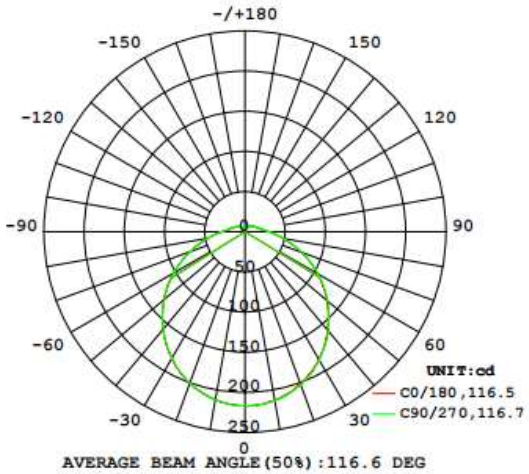
LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



AVERAGE BEAM ANGLE(50%):116.5 DEG

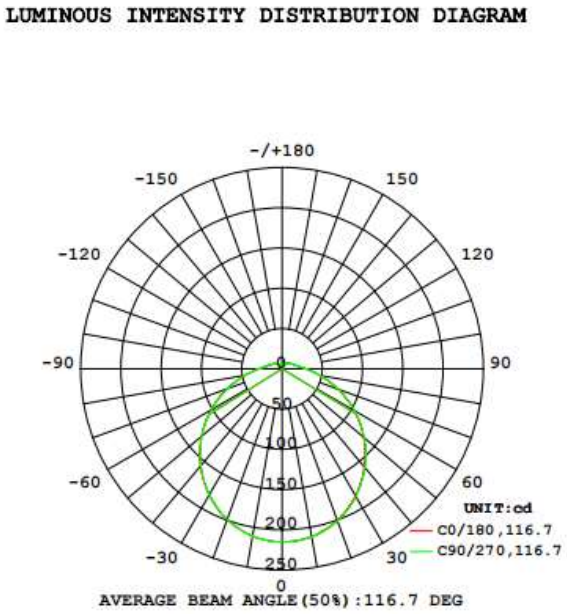
(3500K)

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



AVERAGE BEAM ANGLE(50%):116.6 DEG

(4000K)



(5000K)

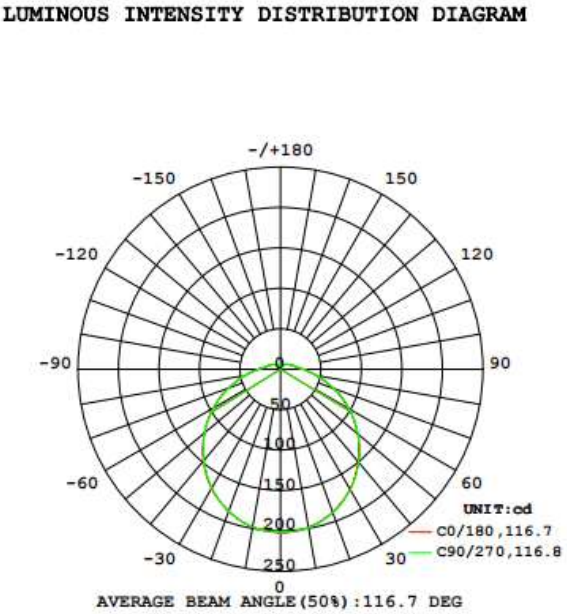


Chart 4: Luminous Intensity Distribution Diagram

Luminous Intensity Data- Goniophotometer Method(2700K)

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	196	196	196	196	196	196	196	196	196	196	196	196	196	196	196	196			
5	195	195	195	195	195	195	195	195	195	195	195	195	195	194	195	195			
10	193	192	193	193	193	193	192	192	192	192	192	192	192	192	192	192			
15	188	188	189	189	188	189	188	188	187	187	187	187	187	187	188	188			
20	182	183	183	183	183	183	182	181	181	181	181	181	181	181	181	182			
25	175	175	175	176	175	176	174	174	174	173	173	173	173	173	174	174			
30	166	166	166	166	166	167	166	165	165	164	164	164	164	164	165	166			
35	155	156	156	156	156	157	156	155	154	154	154	154	154	153	155	155			
40	145	145	145	145	145	146	144	143	143	142	143	143	143	142	143	144			
45	133	133	133	134	133	134	133	132	131	130	131	131	131	130	132	132			
50	120	121	121	121	121	121	120	119	119	118	118	118	118	118	119	120			
55	107	108	107	108	108	108	107	106	106	105	105	105	105	105	106	107			
60	93.8	94.5	94.3	94.6	94.4	95.0	93.6	92.7	92.5	91.8	91.8	91.8	92.0	91.4	92.8	93.7			
65	80.5	80.9	80.8	81.1	80.9	81.5	80.1	79.3	79.0	78.4	78.5	78.4	78.6	78.0	79.4	80.3			
70	67.1	67.6	67.5	67.7	67.5	68.1	66.9	66.0	65.9	65.2	65.5	65.1	65.5	64.8	66.1	66.9			
75	54.5	54.9	54.7	55.0	54.8	55.5	54.3	53.5	53.3	52.7	52.9	52.7	53.0	52.4	53.7	54.3			
80	43.3	43.7	43.6	43.7	43.6	44.2	43.2	42.5	42.3	41.8	41.9	41.8	42.0	41.6	42.5	43.1			
85	34.0	34.3	34.2	34.3	34.3	34.7	33.9	33.4	33.2	32.7	32.9	32.8	32.9	32.6	33.4	33.9			
90	26.7	27.0	26.8	27.0	26.9	27.3	26.7	26.3	26.1	25.9	26.0	25.8	26.0	25.7	26.4	26.7			
95	21.6	21.7	21.6	21.7	21.6	21.9	21.5	21.3	21.1	20.9	21.0	20.9	21.0	20.9	21.3	21.6			
100	18.2	18.2	18.0	18.1	18.1	18.3	18.1	17.9	17.8	17.7	17.7	17.7	17.8	17.7	18.0	18.1			
105	16.0	15.9	15.9	15.9	15.9	16.1	15.9	15.8	15.7	15.7	15.7	15.7	15.7	15.7	15.9	16.0			
110	14.3	14.3	14.3	14.3	14.3	14.4	14.3	14.2	14.1	14.0	14.0	14.1	14.1	14.1	14.2	14.3			
115	12.8	12.9	12.8	12.8	12.8	12.9	12.8	12.7	12.7	12.6	12.6	12.6	12.6	12.7	12.8	12.9			
120	11.5	11.5	11.5	11.5	11.5	11.6	11.5	11.4	11.3	11.3	11.3	11.3	11.3	11.4	11.5	11.6			
125	10.3	10.3	10.3	10.3	10.3	10.4	10.3	10.2	10.1	10.1	10.1	10.1	10.1	10.2	10.3	10.3			
130	9.29	9.28	9.27	9.24	9.25	9.30	9.23	9.14	9.07	9.04	9.05	9.08	9.07	9.10	9.19	9.26			
135	8.32	8.29	8.28	8.26	8.25	8.31	8.24	8.15	8.09	8.08	8.08	8.09	8.09	8.12	8.19	8.25			
140	7.40	7.37	7.40	7.35	7.35	7.41	7.34	7.25	7.21	7.20	7.18	7.20	7.19	7.23	7.29	7.35			
145	6.58	6.57	6.57	6.54	6.53	6.58	6.52	6.46	6.38	6.39	6.38	6.38	6.36	6.41	6.47	6.52			
150	5.84	5.86	5.85	5.82	5.83	5.84	5.79	5.72	5.68	5.68	5.67	5.68	5.67	5.70	5.73	5.80			
155	5.23	5.23	5.23	5.20	5.20	5.20	5.18	5.09	5.06	5.08	5.05	5.07	5.03	5.07	5.10	5.17			
160	4.72	4.73	4.74	4.70	4.71	4.69	4.67	4.63	4.58	4.60	4.56	4.58	4.55	4.58	4.59	4.65			
165	4.37	4.40	4.41	4.37	4.37	4.34	4.35	4.31	4.27	4.28	4.25	4.28	4.24	4.28	4.27	4.33			
170	4.23	4.26	4.26	4.26	4.25	4.23	4.24	4.23	4.24	4.22	4.23	4.20	4.22	4.20	4.19	4.22			
175	4.37	4.38	4.36	4.40	4.37	4.39	4.37	4.38	4.40	4.37	4.40	4.39	4.39	4.38	4.39	4.35			
180	4.52	4.52	4.51	4.53	4.53	4.52	4.51	4.52	4.52	4.52	4.52	4.53	4.52	4.52	4.52	4.52			

(3000K)

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	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205			
5	204	204	204	204	204	204	204	204	204	204	204	204	204	204	204	204			
10	202	202	202	202	202	202	201	201	201	201	201	201	201	201	201	202			
15	197	197	198	198	198	198	197	197	197	196	196	196	196	196	197	197			
20	191	191	191	192	192	191	191	190	190	189	190	190	190	189	190	191			
25	183	184	184	184	184	184	183	182	182	181	181	182	181	181	182	183			
30	174	174	174	175	175	174	174	173	173	172	172	172	172	171	173	174			
35	163	164	164	164	164	164	163	162	162	161	161	161	161	161	162	163			
40	152	152	152	152	152	153	151	150	150	149	150	149	149	149	150	152			
45	139	139	140	140	140	140	139	138	138	137	137	137	137	137	138	139			
50	126	126	126	127	127	127	126	125	124	124	124	124	124	124	125	126			
55	112	113	113	113	113	113	112	111	111	110	110	110	110	110	111	112			
60	98.6	99.0	98.8	99.1	99.2	99.4	98.1	97.2	97.1	96.4	96.5	96.2	96.3	95.9	97.5	98.4			
65	84.4	84.8	84.7	85.0	85.1	85.3	84.0	83.1	82.9	82.3	82.5	82.3	82.3	81.9	83.4	84.3			
70	70.5	70.8	70.6	71.0	71.0	71.3	70.0	69.2	69.1	68.3	68.6	68.3	68.5	68.0	69.5	70.3			
75	57.2	57.6	57.4	57.6	57.7	58.0	56.9	56.1	55.9	55.3	55.6	55.3	55.4	55.0	56.4	57.1			
80	45.5	45.8	45.6	45.8	45.9	46.2	45.2	44.6	44.3	43.8	43.9	43.9	43.9	43.6	44.7	45.4			
85	35.7	35.9	35.8	35.9	36.1	36.3	35.5	35.1	34.8	34.3	34.5	34.4	34.5	34.3	35.1	35.7			
90	28.1	28.3	28.1	28.3	28.4	28.5	27.9	27.6	27.5	27.1	27.3	27.1	27.2	27.0	27.7	28.1			
95	22.7	22.8	22.6	22.7	22.8	23.0	22.5	22.3	22.2	21.9	22.0	22.0	22.0	21.9	22.4	22.7			
100	19.1	19.0	19.0	19.0	19.1	19.2	19.0	18.8	18.7	18.6	18.6	18.6	18.6	18.6	18.9	19.1			
105	16.8	16.8	16.7	16.7	16.8	16.8	16.7	16.6	16.5	16.4	16.4	16.4	16.5	16.5	16.7	16.8			
110	15.1	15.0	15.0	15.0	15.0	15.1	15.0	14.9	14.8	14.7	14.7	14.7	14.8	14.8	14.9	15.1			
115	13.5	13.5	13.4	13.5	13.5	13.5	13.5	13.3	13.3	13.2	13.2	13.3	13.3	13.3	13.4	13.5			
120	12.1	12.1	12.0	12.1	12.1	12.1	12.1	12.0	11.9	11.9	11.8	11.9	11.9	11.9	12.1	12.1			
125	10.9	10.8	10.8	10.8	10.8	10.9	10.8	10.7	10.6	10.6	10.6	10.6	10.6	10.7	10.8	10.9			
130	9.76	9.70	9.71	9.68	9.72	9.73	9.68	9.56	9.52	9.50	9.50	9.53	9.51	9.57	9.67	9.74			
135	8.73	8.69	8.68	8.65	8.67	8.69	8.64	8.54	8.48	8.48	8.49	8.49	8.49	8.54	8.64	8.69			
140	7.77	7.74	7.74	7.71	7.72	7.72	7.69	7.60	7.55	7.54	7.55	7.56	7.56	7.60	7.67	7.74			
145	6.92	6.89	6.88	6.85	6.86	6.84	6.81	6.76	6.71	6.70	6.70	6.71	6.69	6.75	6.79	6.85			
150	6.15	6.12	6.13	6.07	6.09	6.09	6.06	5.99	5.96	5.95	5.96	5.96	5.96	5.97	6.02	6.08			
155	5.48	5.49	5.50	5.42	5.46	5.43	5.41	5.34	5.32	5.31	5.30	5.32	5.29	5.34	5.36	5.44			
160	4.96	4.96	4.98	4.93	4.94	4.89	4.90	4.84	4.81	4.81	4.80	4.82	4.78	4.81	4.83	4.89			
165	4.60	4.58	4.62	4.56	4.58	4.55	4.55	4.50	4.49	4.49	4.46	4.49	4.46	4.48	4.48	4.53			
170	4.42	4.45	4.46	4.46	4.45	4.42	4.42	4.44	4.45	4.42	4.44	4.42	4.42	4.39	4.42	4.42			
175	4.58	4.59	4.58	4.61	4.57	4.59	4.57	4.61	4.60	4.58	4.60	4.59	4.62	4.58	4.60	4.56			
180	4.74	4.72	4.74	4.74	4.75	4.74	4.74	4.74	4.74	4.73	4.73	4.74	4.75	4.74	4.75	4.74			

(3500K)

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	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217	217			
5	216	216	215	216	216	216	216	216	215	216	215	215	216	215	216	216			
10	213	214	213	213	214	213	213	212	212	213	212	212	213	212	213	212			
15	208	209	208	208	209	209	208	208	207	208	207	207	208	207	208	208			
20	202	202	202	202	203	203	201	201	201	201	200	200	200	200	201	201			
25	194	194	194	194	195	194	193	192	192	192	192	191	192	191	193	193			
30	184	184	184	184	184	184	183	182	182	182	181	181	182	181	183	183			
35	173	173	173	173	173	174	172	171	171	171	170	170	170	170	171	172			
40	160	161	160	161	161	161	160	159	158	158	158	158	158	158	159	160			
45	147	148	147	148	148	148	147	145	145	145	145	144	145	144	146	147			
50	133	134	134	134	134	134	133	132	132	131	131	131	131	131	132	133			
55	119	120	119	119	120	120	118	117	117	117	116	116	117	116	118	119			
60	104	105	104	105	105	105	104	103	103	102	102	101	102	101	103	104			
65	89.3	90.0	89.5	89.8	90.0	90.3	88.7	87.8	87.5	87.0	87.0	86.8	87.1	86.5	88.1	89.0			
70	74.5	75.2	74.7	74.9	75.2	75.5	74.1	73.0	72.9	72.4	72.4	72.1	72.5	72.0	73.5	74.1			
75	60.4	61.2	60.7	61.0	61.3	61.4	60.2	59.2	59.0	58.5	58.4	58.2	58.6	58.2	59.6	60.2			
80	48.1	48.7	48.2	48.5	48.7	49.0	47.8	47.0	46.8	46.4	46.3	46.3	46.5	46.2	47.3	47.9			
85	37.8	38.2	37.9	38.1	38.3	38.5	37.5	37.0	36.7	36.4	36.4	36.3	36.5	36.2	37.2	37.7			
90	29.8	30.1	29.8	29.9	30.0	30.2	29.5	29.2	28.9	28.6	28.7	28.6	28.7	28.5	29.3	29.7			
95	24.0	24.2	23.9	24.0	24.1	24.3	23.8	23.6	23.4	23.2	23.2	23.1	23.3	23.2	23.7	24.0			
100	20.2	20.2	20.1	20.1	20.2	20.3	20.1	19.8	19.8	19.7	19.6	19.6	19.7	19.7	20.0	20.1			
105	17.7	17.8	17.6	17.6	17.7	17.8	17.7	17.5	17.4	17.4	17.3	17.3	17.4	17.4	17.6	17.7			
110	15.9	16.0	15.8	15.8	15.9	16.0	15.9	15.7	15.6	15.6	15.6	15.6	15.7	15.7	15.9	15.9			
115	14.3	14.3	14.2	14.2	14.3	14.3	14.2	14.1	14.0	14.0	14.0	14.0	14.0	14.0	14.2	14.3			
120	12.9	12.9	12.8	12.8	12.8	12.9	12.8	12.6	12.6	12.5	12.5	12.5	12.6	12.6	12.8	12.8			
125	11.5	11.5	11.4	11.4	11.5	11.5	11.4	11.3	11.2	11.2	11.2	11.2	11.3	11.3	11.4	11.5			
130	10.3	10.3	10.2	10.2	10.2	10.3	10.2	10.1	10.1	10.0	10.0	10.0	10.0	10.1	10.2	10.3			
135	9.22	9.24	9.16	9.15	9.18	9.20	9.13	9.01	8.94	8.99	8.96	8.96	8.98	9.02	9.12	9.15			
140	8.22	8.22	8.17	8.11	8.16	8.18	8.14	8.02	7.99	8.01	7.94	8.00	7.98	8.04	8.10	8.14			
145	7.31	7.31	7.26	7.24	7.27	7.26	7.21	7.10	7.08	7.09	7.07	7.10	7.06	7.13	7.17	7.23			
150	6.50	6.49	6.46	6.42	6.45	6.44	6.39	6.32	6.28	6.30	6.27	6.29	6.28	6.31	6.37	6.44			
155	5.80	5.80	5.78	5.74	5.76	5.73	5.71	5.65	5.61	5.62	5.60	5.60	5.60	5.63	5.64	5.73			
160	5.22	5.25	5.24	5.18	5.21	5.18	5.16	5.09	5.08	5.10	5.05	5.07	5.05	5.09	5.10	5.16			
165	4.84	4.86	4.86	4.80	4.83	4.80	4.80	4.77	4.73	4.75	4.72	4.72	4.72	4.72	4.75	4.77			
170	4.68	4.71	4.70	4.69	4.70	4.66	4.66	4.68	4.69	4.68	4.67	4.65	4.67	4.65	4.66	4.66			
175	4.80	4.86	4.81	4.85	4.82	4.84	4.83	4.85	4.86	4.84	4.85	4.83	4.86	4.85	4.84	4.81			
180	5.00	5.02	4.98	4.99	5.00	5.00	4.99	4.99	4.99	5.01	4.99	4.99	5.01	5.00	5.00	4.99			

(4000K)

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	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215			
5	214	214	214	214	215	214	214	214	214	214	214	214	214	214	214	214			
10	211	212	212	212	212	212	211	211	211	211	211	211	211	210	211	211			
15	207	207	207	207	207	207	206	206	206	206	206	206	206	205	206	207			
20	200	201	201	201	201	201	200	199	199	199	199	199	199	198	199	200			
25	192	193	193	193	193	192	192	191	191	190	190	190	190	190	191	192			
30	182	183	183	183	183	183	182	181	181	180	180	180	180	180	181	182			
35	171	172	172	172	172	172	171	170	170	169	169	169	169	169	170	171			
40	159	160	160	160	160	160	159	158	157	157	157	157	157	156	158	159			
45	146	147	147	147	147	147	145	145	144	144	144	144	144	143	145	146			
50	132	133	133	133	133	133	132	131	131	130	130	130	130	130	131	132			
55	118	119	119	119	119	119	117	116	116	116	116	116	116	115	117	118			
60	103	104	104	104	104	104	103	102	102	101	101	101	101	101	102	103			
65	88.6	89.2	89.1	89.2	89.5	89.6	88.1	87.1	87.0	86.2	86.5	86.4	86.4	86.0	87.6	88.6			
70	74.0	74.6	74.3	74.5	74.7	74.8	73.4	72.5	72.5	71.7	72.0	71.8	72.0	71.5	73.1	74.0			
75	60.1	60.7	60.4	60.6	60.7	60.9	59.6	58.8	58.6	58.0	58.2	58.1	58.2	57.8	59.2	60.0			
80	47.8	48.2	48.0	48.2	48.3	48.4	47.4	46.7	46.5	46.0	46.1	46.0	46.2	45.9	47.0	47.7			
85	37.6	37.9	37.7	37.8	37.9	38.1	37.2	36.6	36.5	36.0	36.2	36.1	36.2	36.1	37.0	37.6			
90	29.6	29.8	29.7	29.8	29.8	30.0	29.3	28.9	28.8	28.4	28.6	28.5	28.6	28.4	29.2	29.6			
95	23.9	24.0	23.8	23.9	23.9	24.1	23.7	23.4	23.2	23.0	23.1	23.1	23.2	23.1	23.6	23.9			
100	20.1	20.1	20.0	20.0	20.1	20.2	19.9	19.7	19.6	19.5	19.5	19.5	19.6	19.6	19.9	20.1			
105	17.6	17.6	17.6	17.6	17.6	17.7	17.5	17.4	17.3	17.2	17.2	17.2	17.3	17.3	17.5	17.7			
110	15.8	15.8	15.8	15.8	15.8	15.9	15.7	15.6	15.5	15.5	15.5	15.5	15.5	15.6	15.7	15.9			
115	14.2	14.2	14.2	14.1	14.2	14.2	14.1	14.0	13.9	13.9	13.9	13.9	13.9	14.0	14.1	14.2			
120	12.8	12.8	12.7	12.7	12.7	12.8	12.7	12.5	12.5	12.4	12.5	12.5	12.5	12.6	12.7	12.8			
125	11.5	11.4	11.4	11.3	11.4	11.4	11.3	11.2	11.2	11.1	11.1	11.2	11.2	11.2	11.4	11.4			
130	10.2	10.2	10.2	10.1	10.2	10.2	10.1	10.0	9.96	9.96	9.96	9.97	10.00	10.0	10.1	10.2			
135	9.18	9.15	9.13	9.10	9.12	9.13	9.06	8.96	8.89	8.89	8.89	8.92	8.95	8.95	9.06	9.13			
140	8.17	8.13	8.11	8.08	8.10	8.11	8.05	7.97	7.92	7.92	7.92	7.95	7.95	7.98	8.06	8.13			
145	7.27	7.24	7.23	7.17	7.19	7.19	7.15	7.07	7.02	7.04	7.02	7.05	7.03	7.09	7.14	7.19			
150	6.45	6.43	6.43	6.37	6.37	6.37	6.33	6.26	6.24	6.25	6.25	6.27	6.22	6.28	6.32	6.38			
155	5.75	5.74	5.75	5.70	5.70	5.68	5.64	5.59	5.57	5.59	5.56	5.57	5.57	5.58	5.64	5.68			
160	5.19	5.20	5.21	5.14	5.15	5.11	5.11	5.06	5.03	5.04	5.01	5.06	5.03	5.04	5.05	5.12			
165	4.80	4.81	4.83	4.78	4.80	4.74	4.72	4.72	4.70	4.72	4.67	4.70	4.68	4.69	4.70	4.75			
170	4.64	4.67	4.67	4.66	4.64	4.62	4.61	4.64	4.65	4.62	4.64	4.62	4.64	4.61	4.61	4.62			
175	4.78	4.80	4.78	4.80	4.78	4.79	4.78	4.80	4.82	4.78	4.80	4.81	4.83	4.79	4.80	4.76			
180	4.95	4.96	4.98	4.96	4.96	4.95	4.96	4.95	4.95	4.98	4.95	4.97	4.97	4.96	4.96	4.96			

(5000K)

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	202	202	202	202	202	202	202	202	202	202	202	202	202	202	202	202			
5	201	201	201	201	201	201	201	201	201	200	201	201	201	201	201	201			
10	199	198	198	199	199	199	199	198	198	197	198	198	198	198	198	198			
15	194	194	194	194	195	194	194	194	193	193	193	193	193	193	194	194			
20	188	188	188	188	189	188	188	187	187	187	187	186	187	186	187	188			
25	181	180	181	181	181	181	180	179	179	178	179	179	179	178	180	180			
30	171	171	172	172	172	172	171	170	170	169	170	169	169	169	170	171			
35	161	161	161	161	162	161	161	159	160	159	159	159	159	159	160	161			
40	149	150	150	150	150	150	149	148	148	147	147	147	147	147	149	149			
45	137	138	138	138	138	138	137	136	135	134	135	135	135	134	136	137			
50	125	125	125	125	125	125	124	123	123	122	122	122	122	121	123	124			
55	111	112	111	112	112	112	111	109	109	108	109	109	109	108	110	111			
60	97.5	97.7	97.7	97.8	98.0	98.1	96.9	95.7	95.7	94.7	95.3	94.8	95.2	94.6	96.6	97.2			
65	83.4	83.8	83.7	83.8	84.0	84.0	82.9	81.7	81.8	81.0	81.2	80.9	81.3	80.8	82.5	83.2			
70	69.6	69.9	69.8	70.0	70.2	70.3	69.0	68.2	68.1	67.2	67.7	67.4	67.6	67.2	68.8	69.5			
75	56.6	57.0	56.7	56.9	57.1	57.2	56.0	55.3	55.1	54.3	54.7	54.5	54.7	54.3	55.8	56.5			
80	45.1	45.4	45.1	45.3	45.4	45.5	44.6	43.8	43.6	43.1	43.4	43.2	43.4	43.1	44.2	44.9			
85	35.4	35.7	35.5	35.5	35.7	35.8	35.0	34.5	34.3	33.8	34.1	33.9	34.1	33.9	34.8	35.4			
90	27.9	28.1	27.9	28.0	28.0	28.2	27.6	27.2	27.0	26.6	26.8	26.7	26.9	26.7	27.5	27.8			
95	22.5	22.5	22.4	22.5	22.5	22.6	22.2	21.9	21.9	21.6	21.7	21.6	21.8	21.7	22.3	22.5			
100	18.9	18.9	18.8	18.8	18.9	18.9	18.8	18.5	18.5	18.2	18.3	18.3	18.4	18.4	18.7	18.9			
105	16.6	16.6	16.6	16.5	16.6	16.6	16.6	16.3	16.3	16.2	16.2	16.2	16.3	16.3	16.6	16.6			
110	14.9	14.9	14.8	14.8	14.9	14.9	14.8	14.7	14.6	14.5	14.5	14.5	14.6	14.6	14.8	14.9			
115	13.4	13.4	13.3	13.3	13.4	13.4	13.3	13.1	13.1	13.0	13.0	13.0	13.1	13.1	13.3	13.4			
120	12.0	12.0	12.0	11.9	12.0	12.0	11.9	11.8	11.7	11.6	11.7	11.7	11.8	11.8	11.9	12.0			
125	10.8	10.7	10.7	10.6	10.7	10.7	10.7	10.5	10.5	10.4	10.5	10.5	10.5	10.5	10.7	10.8			
130	9.67	9.64	9.61	9.55	9.61	9.61	9.55	9.40	9.37	9.34	9.35	9.38	9.40	9.45	9.58	9.64			
135	8.62	8.60	8.58	8.53	8.56	8.57	8.51	8.42	8.33	8.34	8.36	8.37	8.39	8.43	8.52	8.57			
140	7.69	7.65	7.64	7.59	7.60	7.62	7.57	7.48	7.44	7.41	7.43	7.46	7.46	7.49	7.57	7.64			
145	6.83	6.80	6.78	6.73	6.76	6.74	6.72	6.61	6.57	6.59	6.59	6.60	6.60	6.64	6.70	6.76			
150	6.06	6.04	6.04	5.98	6.02	5.98	5.96	5.87	5.84	5.85	5.85	5.87	5.86	5.89	5.94	6.00			
155	5.39	5.39	5.39	5.33	5.36	5.33	5.31	5.23	5.21	5.22	5.23	5.24	5.20	5.24	5.28	5.34			
160	4.86	4.85	4.88	4.81	4.82	4.80	4.77	4.75	4.71	4.73	4.70	4.73	4.70	4.72	4.76	4.80			
165	4.50	4.49	4.53	4.47	4.49	4.43	4.45	4.41	4.40	4.40	4.38	4.38	4.38	4.38	4.40	4.44			
170	4.34	4.35	4.37	4.36	4.36	4.32	4.33	4.35	4.36	4.33	4.34	4.33	4.33	4.30	4.33	4.32			
175	4.46	4.50	4.49	4.50	4.48	4.48	4.48	4.52	4.51	4.48	4.52	4.48	4.51	4.50	4.50	4.46			
180	4.64	4.63	4.64	4.63	4.64	4.63	4.64	4.64	4.64	4.63	4.64	4.63	4.64	4.63	4.64	4.63			

Table 5: Luminous Intensity Data

---End of Report---