

Photometric Test Report

Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77:2014

Prepared For

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Report Number

DLF2310103-19a

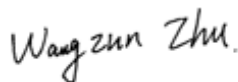
Test Date

2023/10/23

Issue Date

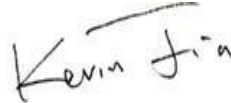
2023/10/23

Prepared By



Wangzun Zhu

Approved By



Kevin Jia

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1.0 Test Summary

DLC Technical Requirements v5.1

Outdoor - Stairwell and Passageway Luminaires				
Indoor - Direct Linear Ambient Luminaires/Low Bay				
Requirement Category	Test Method	Requirements		Test value
Luminaire Output (lm) (Goniophotometer - Section 4.2)	IES LM-79-2008	5000		2748
Lumen/ft (Goniophotometer - Section 4.2)	IES LM-79-2008	≥375		687
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 115	Premium 130	152.7
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		18.0
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	5.65%
		20.00%	277V	8.85%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.995
		0.9	277V	0.930
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3465±245	3454
		4 step	3465±124	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥80		84
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥0		13
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥70		85
Minimum Rg (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥89		96
Minimum IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	-12%≤IES Rcs,h1≤+23%		-11%
Zonal Lumen Requirement (0°-90°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≥85%		97.43%
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≥40%		82.59%
Zonal Lumen Requirement (20°-50°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≥30%		54.29%
Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	<22 <25		22.4
Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		277
(Goniophotometer - Section 4.2)		Non-Wrost Case		120
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		0.070
(Goniophotometer - Section 4.2)		Non-Wrost Case		0.149
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		18.0
(Goniophotometer - Section 4.2)		Non-Wrost Case		17.8

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023/10/23	CS4 @50% Power /3500K	S1
2	Goniophotometer Test	2023/10/23	CS4 @50% Power /3500K	S1
3	THD and PF Test	2023/10/23	CS4 @50% Power /3500K	S1

Remark(If any)

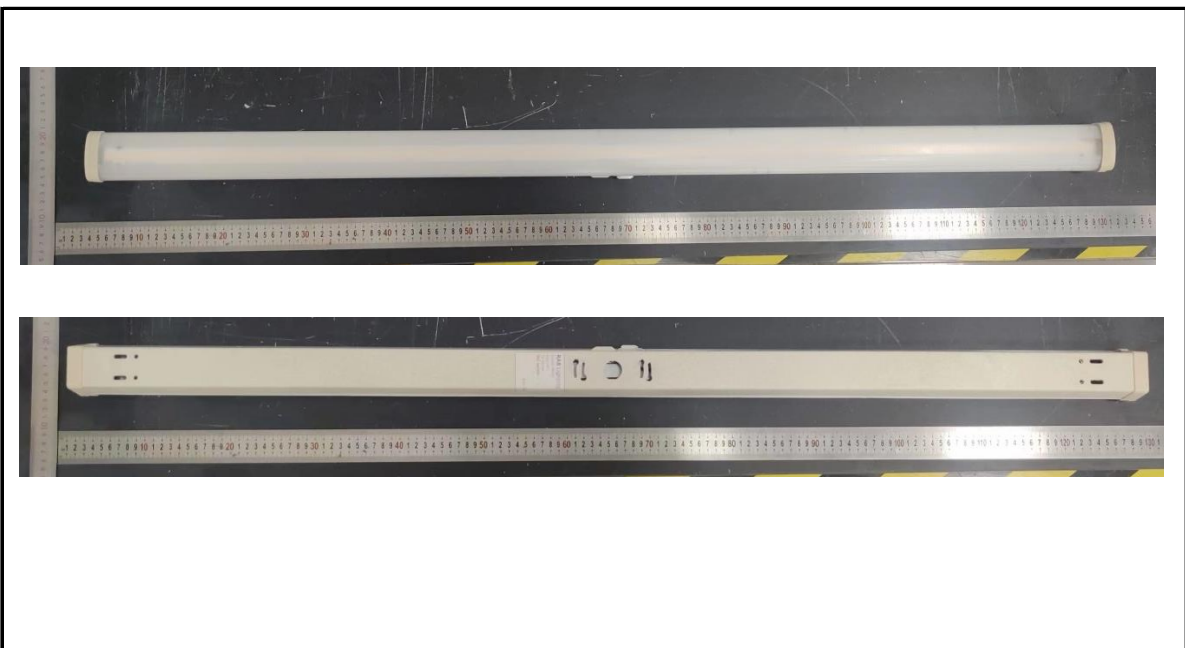
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3.0 Production Description

Luminaire Description: CS4 @50% Power /3500K

Electrical Specification: 120V-277V,50/60HZ

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	CS4 @50% Power /3500K	Sample ID.	S1
Operate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.1	Humidity (%RH)	57.0

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

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 voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.

The sample was measured using 4π geometry and operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Test Result

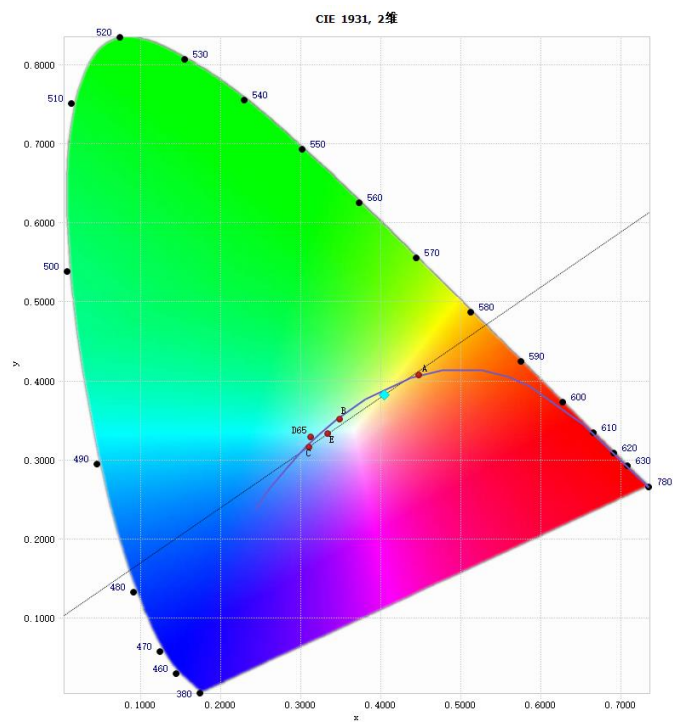
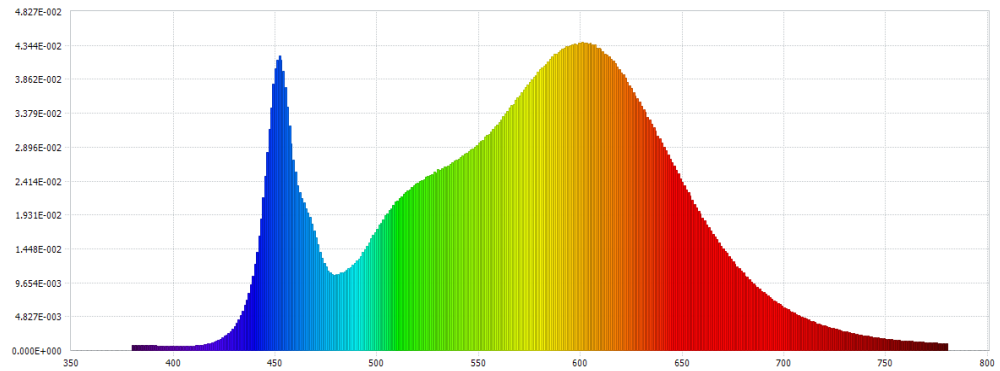
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.03	60	0.149	17.8	0.995
277.08	60	0.070	18.0	0.930

Test Result

CCT (K)	CRI	R9	Duv
3454	84	13	-0.0034

Rf	Rg	IES Rcs,h1
85	96	-11%

4.1 Integrating Sphere Test



4.1 Integrating Sphere Test

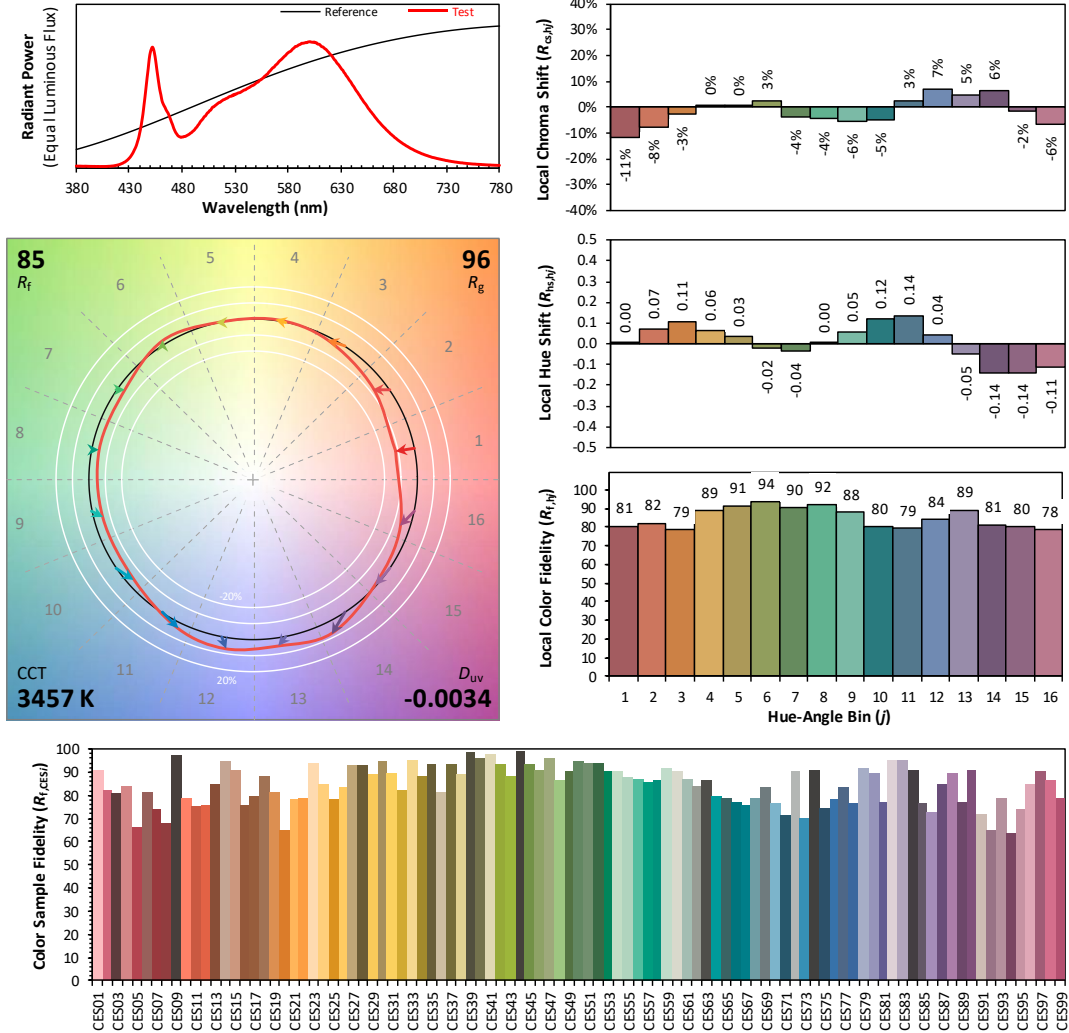
IES TM-30-18 Color Rendition Report

Source: DLF2310103-19a

Manufacturer: RAB Lighting Inc.

Date: 2023/10/23

Model: CS4 @50% Power /3500K



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

x 0.4042
 y 0.3826
 u' 0.2384
 v' 0.5077

CIE 13.3-1995
(CRI)

R_a 85
 R_g 17

4.1 Integrating Sphere Test

Spectral Distribution over Visible Wavelength							
WL (nm)	Radiant (Watts/nm)	WL (nm)	Radiant (Watts/nm)	WL (nm)	Radiant (Watts/nm)	WL (nm)	Radiant (Watts/nm)
380	7.70E-04	485	1.14E-02	590	4.27E-02	695	7.11E-03
385	7.07E-04	490	1.28E-02	595	4.34E-02	700	6.12E-03
390	6.87E-04	495	1.49E-02	600	4.38E-02	705	5.31E-03
395	6.40E-04	500	1.73E-02	605	4.38E-02	710	4.58E-03
400	6.13E-04	505	1.94E-02	610	4.29E-02	715	3.96E-03
405	6.11E-04	510	2.13E-02	615	4.14E-02	720	3.48E-03
410	6.59E-04	515	2.28E-02	620	3.95E-02	725	3.06E-03
415	8.07E-04	520	2.38E-02	625	3.73E-02	730	2.66E-03
420	1.20E-03	525	2.49E-02	630	3.48E-02	735	2.33E-03
425	2.01E-03	530	2.57E-02	635	3.22E-02	740	2.06E-03
430	3.47E-03	535	2.63E-02	640	2.96E-02	745	1.86E-03
435	6.43E-03	540	2.72E-02	645	2.67E-02	750	1.63E-03
440	1.23E-02	545	2.84E-02	650	2.40E-02	755	1.46E-03
445	2.48E-02	550	2.95E-02	655	2.14E-02	760	1.35E-03
450	4.01E-02	555	3.08E-02	660	1.89E-02	765	1.24E-03
455	3.75E-02	560	3.25E-02	665	1.65E-02	770	1.13E-03
460	2.54E-02	565	3.45E-02	670	1.45E-02	775	1.05E-03
465	2.02E-02	570	3.62E-02	675	1.27E-02	780	1.01E-03
470	1.60E-02	575	3.82E-02	680	1.10E-02		
475	1.19E-02	580	4.00E-02	685	9.51E-03		
480	1.08E-02	585	4.15E-02	690	8.25E-03		

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	CS4 @50% Power /3500K	Sample ID.	S1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	54.0

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric paramters were measured using a type C 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 voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ±0.2 percent under load.

The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5° vertical intervals and 10° horizontal intervals.

Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WROST CASE	277.04	60	0.070	18.0	0.930
NON-WROST CASE	120.01	60	0.149	17.8	0.995

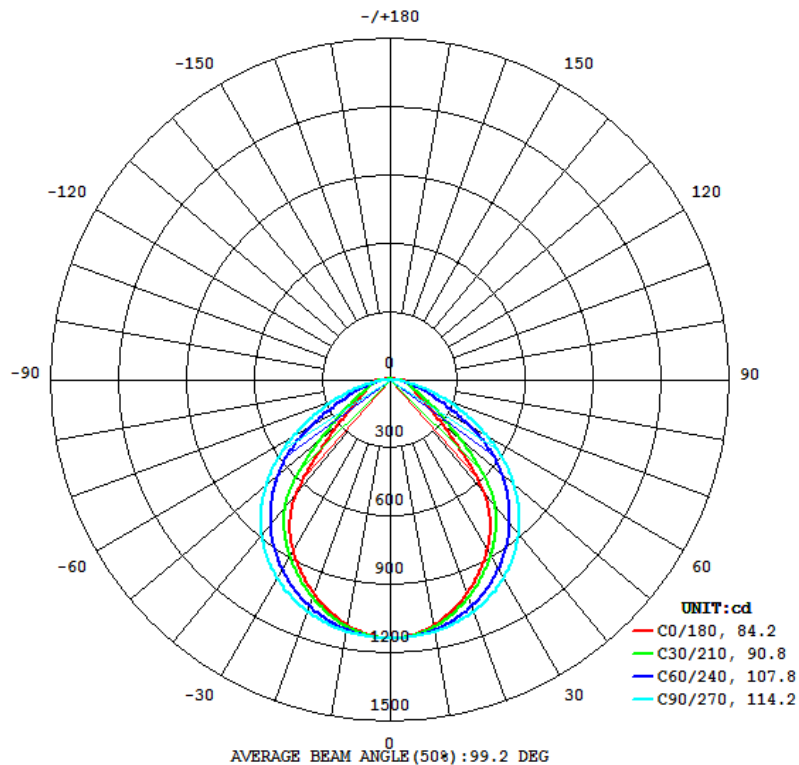
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
2748	136.6	156.2	84.2	114.2	152.7

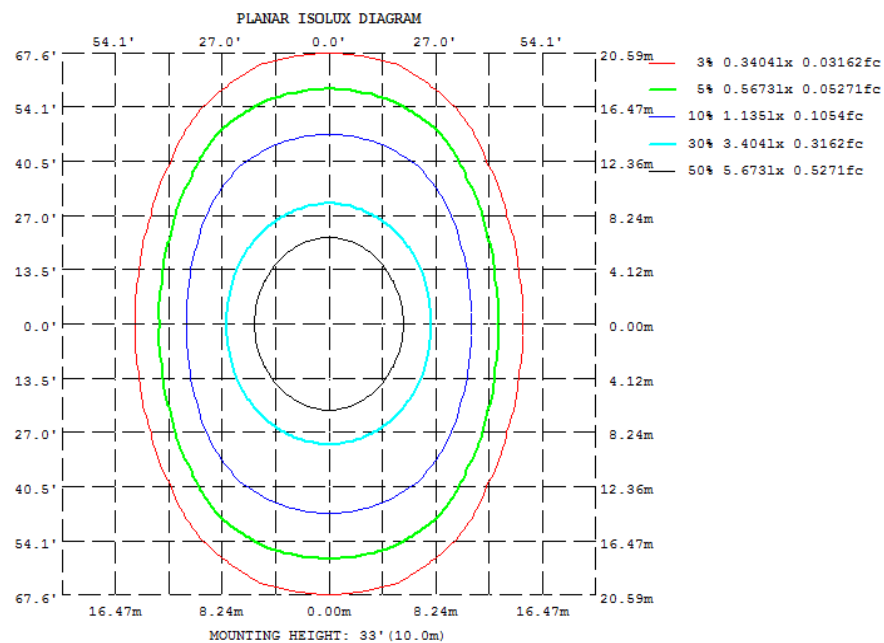
Zonal Lumen Requirement (0°-90°)	Zonal Lumen Requirement (0°-60°)	BUG rating	UGR (X=4H, Y=8H, 70/50/20%)
97.43%	82.59%	B1-U2-G1	22.4
Zonal Lumen Requirement (20°-50°)	Length(ft)	Lumen/ft	
54.29%	4	687	

4.2 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.2 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	1095	1109	1123	1109	1095	1109	1123	1109
20	995.7	1034	1082	1034	995.7	1034	1082	1034
30	861.8	922.8	1006	922.8	861.8	922.8	1006	922.8
40	643.5	777.1	886.5	777.1	643.5	777.1	886.5	777.1
50	304.0	552.0	717.8	552.0	304.0	552.0	717.8	552.0
60	158.5	268.1	501.9	268.1	158.5	268.1	501.9	268.1
70	108.2	133.0	270.9	133.0	108.2	133.0	270.9	133.0
80	84.35	67.21	84.90	67.21	84.35	67.21	84.90	67.21
90	58.70	29.88	0.5066	29.88	58.70	29.88	0.5066	29.88
100	31.29	14.22	0.7060	14.22	31.29	14.22	0.7060	14.22
110	22.36	11.04	2.335	11.04	22.36	11.04	2.335	11.04
120	18.70	9.791	3.572	9.791	18.70	9.791	3.572	9.791
130	13.66	8.079	4.618	8.079	13.66	8.079	4.618	8.079
140	9.756	6.271	5.337	6.271	9.756	6.271	5.337	6.271
150	7.109	5.208	5.670	5.208	7.109	5.208	5.670	5.208
160	5.605	4.771	5.537	4.771	5.605	4.771	5.537	4.771
170	5.720	6.463	5.743	6.463	5.720	6.463	5.743	6.463
180	2.817	6.302	6.918	6.302	2.817	6.302	6.918	6.302
DEG	LUMINOUS INTENSITY:cd							

UGR Table - Corrected

UGR Table - Corrected										
Reflectances										
Ceiling Cavity	70	70	50	50	30	70	70	50	50	30
Walls	50	30	50	30	30	50	30	50	30	30
Floor Cavity	20	20	20	20	20	20	20	20	20	20
Room Size										
X=2H Y=2H	UGR Viewed Crosswise					UGR Viewed Endwise				
	20.2	21.7	20.7	22.1	22.5	14.3	15.8	14.7	16.2	16.6
3H	21.5	22.8	21.9	23.2	23.7	15.8	17.2	16.3	17.6	18.0
4H	21.9	23.1	22.3	23.5	24.0	16.7	18.0	17.2	18.4	18.8
6H	22.0	23.2	22.5	23.6	24.1	17.8	18.9	18.3	19.4	19.8
8H	22.0	23.1	22.5	23.6	24.0	18.4	19.5	18.9	19.9	20.4
12H	22.0	23.1	22.5	23.5	24.0	19.1	20.1	19.6	20.6	21.1
4H 2H	20.2	21.5	20.7	21.9	22.3	15.1	16.4	15.6	16.8	17.2
3H	21.7	22.7	22.2	23.2	23.6	16.8	17.8	17.2	18.2	18.7
4H	22.1	23.0	22.6	23.5	24.0	17.7	18.6	18.2	19.1	19.6
6H	22.4	23.2	22.9	23.7	24.2	18.9	19.7	19.4	20.2	20.7
8H	22.4	23.2	22.9	23.7	24.2	19.6	20.3	20.1	20.8	21.4
12H	22.4	23.1	22.9	23.6	24.2	20.4	21.0	20.9	21.6	22.1
8H 4H	22.1	22.9	22.6	23.4	23.9	18.1	18.8	18.6	19.3	19.8
6H	22.4	23.0	23.0	23.6	24.1	19.3	20.0	19.9	20.5	21.1
8H	22.5	23.1	23.1	23.6	24.2	20.1	20.7	20.7	21.2	21.8
12H	22.5	23.0	23.1	23.6	24.2	21.1	21.6	21.6	22.1	22.7
12H 4H	22.1	22.8	22.6	23.3	23.9	18.1	18.8	18.6	19.3	19.8
6H	22.4	23.0	23.0	23.5	24.1	19.4	20.0	20.0	20.5	21.1
8H	22.5	23.0	23.1	23.6	24.2	20.2	20.7	20.8	21.3	21.9
Maximum UGR = 24.2										

4.2 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	107.12	0 - 10	107.12	3.90%
10-20	303.96	0 - 20	411.08	14.96%
20-30	454.54	0 - 30	865.62	31.50%
30-40	535.96	0 - 40	1401.58	51.01%
40-50	501.22	0 - 50	1902.80	69.25%
50-60	366.49	0 - 60	2269.29	82.59%
60-70	228.96	0 - 70	2498.25	90.92%
70-80	123.88	0 - 80	2622.13	95.43%
80-90	55.06	0 - 90	2677.19	97.43%
90-100	23.54	0 - 100	2700.73	98.29%
100-110	13.68	0 - 110	2714.41	98.78%
110-120	10.80	0 - 120	2725.21	99.18%
120-130	8.31	0 - 130	2733.52	99.48%
130-140	5.72	0 - 140	2739.24	99.69%
140-150	3.84	0 - 150	2743.08	99.83%
150-160	2.56	0 - 160	2745.64	99.92%
160-170	1.56	0 - 170	2747.20	99.98%
170-180	0.61	0 - 180	2747.81	100.00%

4.2 Goniophotometer Test

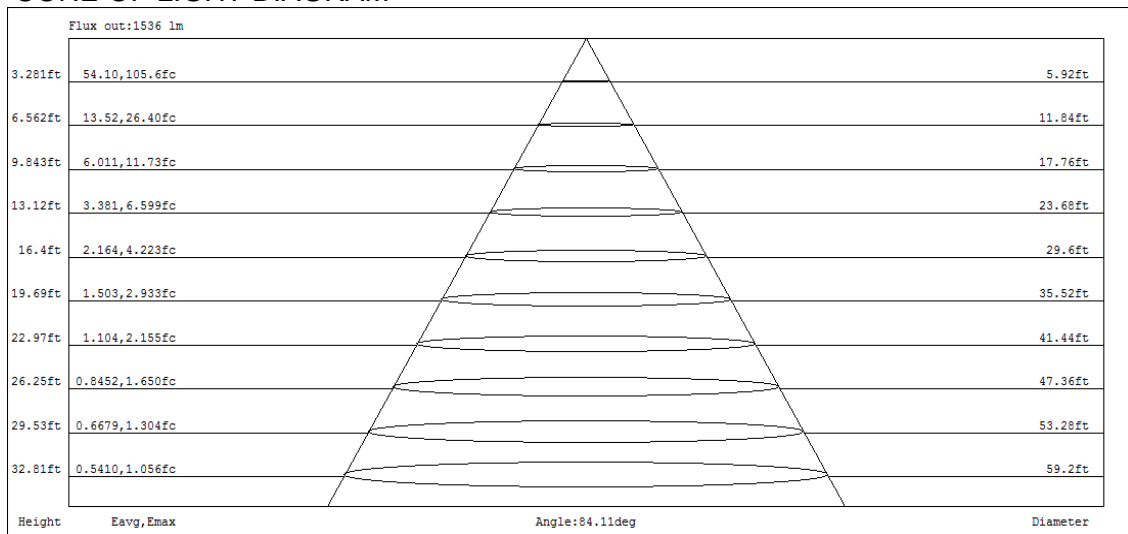
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 0.20

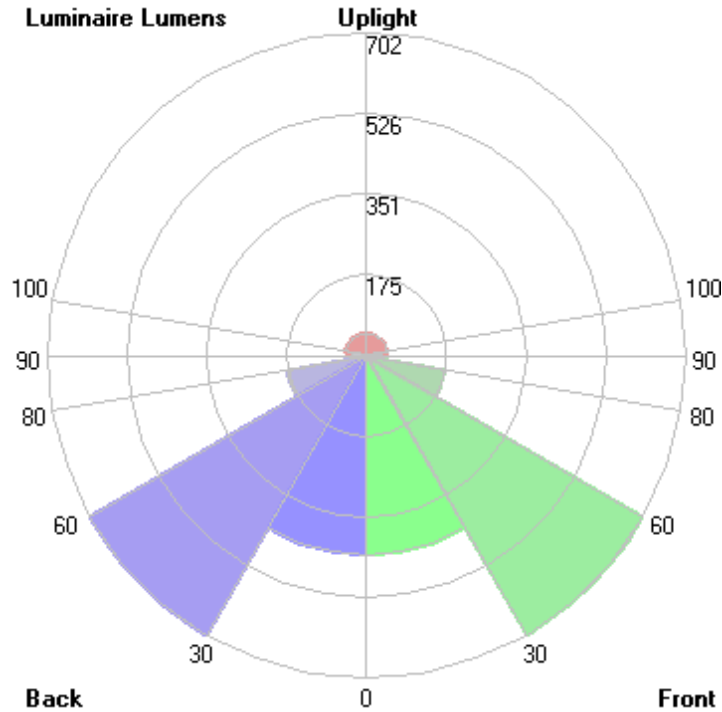
RC	80				70				50			30			10			0
R/W	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	118	118	118	118	115	115	115	115	110	110	110	104	104	104	100	100	100	97
1	109	105	101	97	106	102	98	95	97	94	92	93	91	89	89	87	85	83
2	100	92	86	81	97	90	84	80	86	82	77	83	79	75	79	76	73	71
3	92	82	74	68	89	80	73	68	77	71	66	74	69	65	71	67	63	61
4	85	73	65	59	82	72	64	58	69	62	57	67	61	56	64	59	55	53
5	78	66	58	51	76	65	57	51	62	55	50	60	54	49	58	53	49	47
6	72	60	51	45	70	59	51	45	57	50	44	55	49	44	53	48	43	41
7	67	54	46	40	65	54	46	40	52	45	40	50	44	39	49	43	39	37
8	63	50	42	36	61	49	41	36	48	41	36	46	40	35	45	39	35	33
9	59	46	38	33	57	45	38	33	44	37	32	43	36	32	41	36	32	30
10	55	42	35	30	54	42	35	30	41	34	29	40	33	29	39	33	29	27

CONE OF LIGHT DIAGRAM



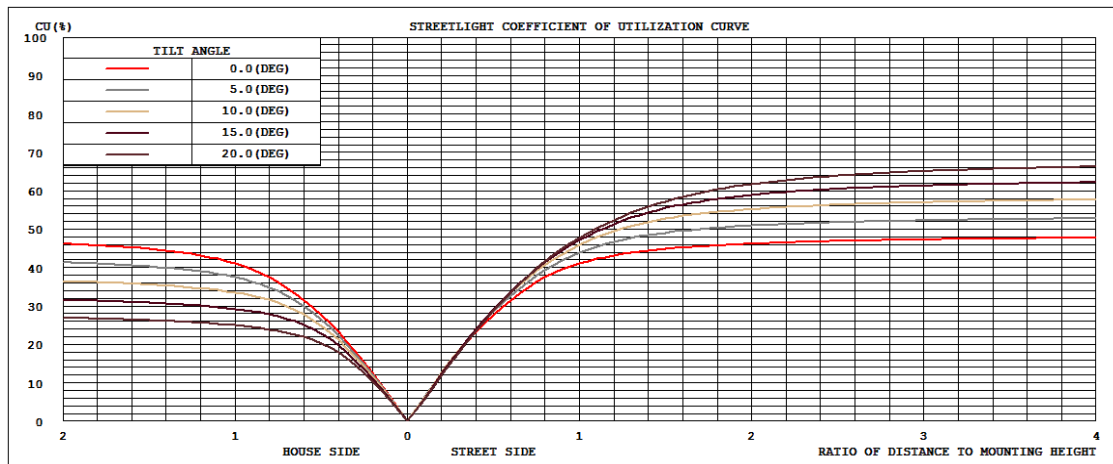
4.2 Goniophotometer Test

LCS/BUG

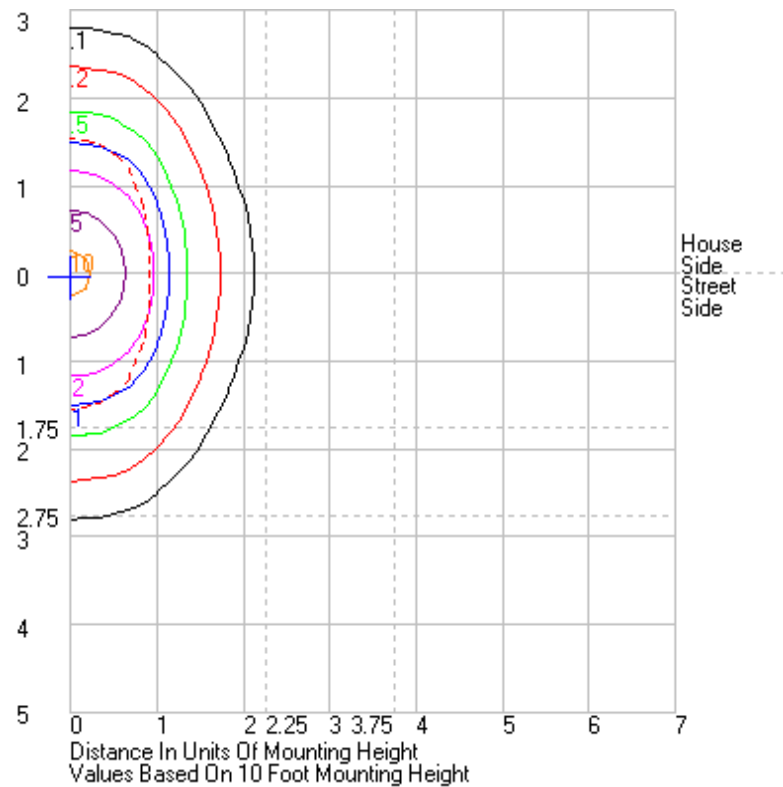


	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	432.8	N.A.	15.8
FM - Front-Medium (30-60)	701.8	N.A.	25.5
FH - Front-High (60-80)	176.4	N.A.	6.4
FVH - Front-Very High (80-90)	27.5	N.A.	1.0
BL - Back-Low (0-30)	432.8	N.A.	15.8
BM - Back-Medium (30-60)	701.8	N.A.	25.5
BH - Back-High (60-80)	176.4	N.A.	6.4
BVH - Back-Very High (80-90)	27.5	N.A.	1.0
UL - Uplight-Low (90-100)	23.5	N.A.	0.9
UH - Uplight-High (100-180)	47.1	N.A.	1.7
Total	2747.6	N.A.	100.0
BUG Rating	B1-U2-G1		

Coefficients of Utilization



Isolines



4.2 Goniophotometer Test

	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330	345	360
0	1135.41	1135.41	1135.41	1135.41	1135.41	1135.41	1135.41	1135.41	1135.41	1135.41	1135.41	1135.41	1135.41	1135.41	1135.41	1135.41	1135.41	1135.41	1135.41	1135.41	1135.41	1135.41	1135.41	1135.41	1135.41
1	1135.48	1135.59	1135.79	1135.61	1135.38	1134.71	1134.9	1134.71	1135.38	1135.61	1135.79	1135.59	1135.48	1135.59	1135.79	1135.61	1135.38	1134.71	1134.9	1134.71	1135.38	1135.61	1135.79	1135.59	1135.48
2	1134.14	1135.68	1136.03	1134.67	1133.83	1133.41	1134.84	1133.41	1133.83	1134.67	1136.03	1135.68	1134.14	1135.68	1136.03	1134.67	1133.83	1133.41	1134.84	1133.41	1133.83	1134.67	1136.03	1135.68	1134.14
3	1135.69	1133.67	1132.99	1132.9	1132.65	1132.41	1130.73	1132.41	1132.65	1132.9	1132.99	1133.67	1135.69	1133.67	1132.99	1132.9	1132.65	1132.41	1130.73	1132.41	1132.65	1132.9	1132.99	1133.67	1135.69
4	1133.48	1132.51	1131.97	1131.44	1130.05	1129.45	1127.59	1129.45	1130.05	1131.44	1131.97	1132.51	1133.48	1132.51	1131.97	1131.44	1130.05	1129.45	1127.59	1129.45	1130.05	1131.44	1131.97	1132.51	1133.48
5	1131.04	1132.56	1131.55	1129.2	1126.94	1125.05	1125.73	1125.05	1126.94	1129.2	1131.55	1132.56	1131.04	1132.56	1131.55	1129.2	1126.94	1125.05	1125.73	1125.05	1126.94	1129.2	1131.55	1132.56	1131.04
6	1131.18	1130.19	1128.34	1125.74	1123.29	1121.79	1120.03	1121.79	1123.29	1125.74	1128.34	1130.19	1131.18	1130.19	1128.34	1125.74	1123.29	1121.79	1120.03	1121.79	1123.29	1125.74	1128.34	1130.19	1131.18
7	1129.84	1127.42	1124.99	1122.38	1119.45	1116.86	1114.12	1116.86	1119.45	1122.38	1124.99	1127.42	1129.84	1127.42	1124.99	1122.38	1119.45	1116.86	1114.12	1116.86	1119.45	1122.38	1124.99	1127.42	1129.84
8	1126.37	1126.83	1123.69	1118.42	1113.84	1110.29	1109.78	1110.29	1113.84	1118.42	1123.69	1126.83	1126.37	1126.83	1123.69	1118.42	1113.84	1110.29	1109.78	1110.29	1113.84	1118.42	1123.69	1126.83	1126.37
9	1125.21	1124.25	1119.9	1113.99	1108.39	1104.17	1104	1104.17	1108.39	1113.99	1119.9	1124.25	1125.21	1124.25	1119.9	1113.99	1108.39	1104.17	1104	1104.17	1108.39	1113.99	1119.9	1124.25	1125.21
10	1123.48	1120.08	1114.57	1108.69	1102.66	1098.56	1095.01	1098.56	1102.66	1108.69	1114.57	1120.08	1123.48	1120.08	1114.57	1108.69	1102.66	1098.56	1095.01	1098.56	1102.66	1108.69	1114.57	1120.08	1123.48
11	1119.18	1117.74	1111.81	1103.64	1095.77	1089.73	1087.46	1089.73	1095.77	1103.64	1111.81	1117.74	1119.18	1117.74	1111.81	1103.64	1095.77	1089.73	1087.46	1089.73	1095.77	1103.64	1111.81	1117.74	1119.18
12	1116.2	1114.81	1107.91	1097.81	1088.61	1081.73	1080.2	1081.73	1088.61	1097.81	1107.91	1114.81	1116.2	1114.81	1107.91	1097.81	1088.61	1081.73	1080.2	1081.73	1088.61	1097.81	1107.91	1114.81	1116.2
13	1114.03	1109.92	1101.19	1091.17	1080.73	1074.28	1069.76	1074.28	1080.73	1091.17	1101.19	1109.92	1114.03	1109.92	1101.19	1091.17	1080.73	1074.28	1069.76	1074.28	1080.73	1091.17	1101.19	1109.92	1114.03
14	1109.33	1105.26	1096.61	1084.25	1072.58	1064.29	1059.98	1064.29	1072.58	1084.25	1096.61	1105.26	1109.33	1105.26	1096.61	1084.25	1072.58	1064.29	1059.98	1064.29	1072.58	1084.25	1096.61	1105.26	1109.33
15	1104.45	1102.25	1091.98	1077.29	1064.02	1054.65	1051.82	1054.65	1064.02	1077.29	1091.98	1102.25	1104.45	1102.25	1091.98	1077.29	1064.02	1054.65	1051.82	1054.65	1064.02	1077.29	1091.98	1102.25	1104.45
16	1101.46	1097.12	1084.48	1069.08	1055.11	1045.36	1041.31	1045.36	1055.11	1069.08	1084.48	1097.12	1101.46	1097.12	1084.48	1069.08	1055.11	1045.36	1041.31	1045.36	1055.11	1069.08	1084.48	1097.12	1101.46
17	1097.18	1091.03	1077.14	1061.07	1045.67	1035.54	1029.46	1035.54	1045.67	1061.07	1077.14	1091.03	1097.18	1091.03	1077.14	1061.07	1045.67	1035.54	1029.46	1035.54	1045.67	1061.07	1077.14	1091.03	1097.18
18	1091.4	1086.43	1071.67	1052.72	1035.95	1023.78	1020.18	1023.78	1035.95	1052.72	1071.67	1086.43	1091.4	1086.43	1071.67	1052.72	1035.95	1023.78	1020.18	1023.78	1035.95	1052.72	1071.67	1086.43	1091.4
19	1086.08	1081.21	1064.12	1043.6	1025.58	1013.01	1009.41	1013.01	1025.58	1043.6	1064.12	1081.21	1086.08	1081.21	1064.12	1043.6	1025.58	1013.01	1009.41	1013.01	1025.58	1043.6	1064.12	1081.21	1086.08
20	1081.69	1073.59	1055.1	1034.42	1014.95	1002.52	995.72	1002.52	1014.95	1034.42	1055.1	1073.59	1081.69	1073.59	1055.1	1034.42	1014.95	1002.52	995.72	1002.52	1014.95	1034.42	1055.1	1073.59	1081.69
21	1074.75	1066.84	1048.28	1024.73	1004.49	990.39	984.04	990.39	1004.49	1024.73	1048.28	1066.84	1074.75	1066.84	1048.28	1024.73	1004.49	990.39	984.04	990.39	1004.49	1024.73	1048.28	1066.84	1074.75
22	1067.84	1061.91	1040.39	1014.85	992.71	977.44	973.29	977.44	992.71	1014.85	1040.39	1061.91	1067.84	1061.91	1040.39	1014.85	992.71	977.44	973.29	977.44	992.71	1014.85	1040.39	1061.91	1067.84
23	1062.18	1053.73	1029.81	1004.36	981.56	966.71	959.85	966.71	981.56	1004.36	1029.81	1053.73	1062.18	1053.73	1029.81	1004.36	981.56	966.71	959.85	966.71	981.56	1004.36	1029.81	1053.73	1062.18
24	1055.12	1044.68	1021.83	994.19	969.82	953.43	945.4	953.43	969.82	994.19	1021.83	1044.68	1055.12	1044.68	1021.83	994.19	969.82	953.43	945.4	953.43	969.82	994.19	1021.83	1044.68	1055.12
25	1047.26	1037.94	1012.4	983.03	957.71	939.69	933.95	939.69	957.71	983.03	1012.4	1037.94	1047.26	1037.94	1012.4	983.03	957.71	939.69	933.95	939.69	957.71	983.03	1012.4	1037.94	1047.26
26	1040.08	1029.94	1001.89	971.83	944.62	926.73	919.89	926.73	944.62	971.83	1001.89	1029.94	1040.08	1029.94	1001.89	971.83	944.62	926.73	919.89	926.73	944.62	971.83	1001.89	1029.94	1040.08
27	1032.69	1020	991.81	960.21	932.69	913.72	904.7	913.72	932.69	960.21	991.81	1020	1032.69	1020	991.81	960.21	932.69	913.72	904.7	913.72	932.69	960.21	991.81	1020	1032.69
28	1023.12	1010.63	982.25	948.09	918.63	898.93	892.06	898.93	918.63	948.09	982.25	1010.63	1023.12	1010.63	982.25	948.09	918.63	898.93	892.06	898.93	918.63	948.09	982.25	1010.63	1023.12
29	1013.92	1002.17	970.84	935.95	905.09	884.71	878.31	884.71	905.09	935.95	970.84	1002.17	1013.92	1002.17	970.84	935.95	905.09	884.71	878.31	884.71	905.09	935.95	970.84	1002.17	1013.92
30	1006.26	991.41	958.73	922.83	891.42	870.84	861.77	870.84	891.42	922.83	958.73	991.41	1006.26	991.41	958.73	922.83	891.42	870.84	861.77	870.84	891.42	922.83	958.73	991.41	1006.26
31	994.87	980.55	948.48	909.91	877.22	855.87	847.48	855.87	877.22	909.91	948.48	980.55	994.87	980.55	948.48	909.91	877.22	855.87	847.48	855.87	877.22	909.91	948.48	980.55	994.87
32	984.11	970.26	936.14	897.07	862.58	839.82	832.15	839.82	862.58	897.07	936.14	970.26	984.11	970.26	936.14	897.07	862.58	839.82	832.15	839.82	862.58	897.07	936.14	970.26	984.11
33	975.19	959.27	922.74	882.79	847.86	824.83	814.13	824.83	847.86	882.79	922.74	959.27	975.19	959.27	922.74	882.79	847.86	824.83	814.13	824.83	847.86	882.79	922.74	959.27	975.19
34	963.17	946.87	910.59	868.94	833.01	808.34	796.91	808.34	833.01	868.94	910.59	946.87	963.17	946.87	910.59	868.94	833.01	808.34	796.91	808.34	833.01	868.94	910.59	946.87	963.17
35	950.07	934.74	898.02	854.72	817.21	788.98	778.59	788.98	817.21	854.72	898.02	934.74	950.07	934.74	898.02	854.72	817.21	788.98	778.59	788.98	817.21	854.72	898.02	934.74	950.07
36	939.27	921.9	883.53	839.64	800.24	770.55	757.22	770.55	800.24	839.64	883.53	921.9	939.27	921.9	883.53	839.64	800.24	770.55	757.22	770.55	800.24	839.64	883.53	921.9	939.27
37	927.13	908.73	869.71	824.97	783.86	749.35	732.09	749.35	783.86	824.97	869.71	908.73	927.13	908.73	869.71	824.97	783.86	749.35	732.09	749.35	783.86	824.97	869.71	908.73	927.13
38	911.91	895.27	855.88	808.87	766.17	724.56	707.01	724.56	766.17	808.87	855.88	895.27	911.91	895.27	855.88	808.87	766.17	724.56	707.01	724.56	766.17	808.87	855.88	895.27	911.91
39	899.3	881.03	840.38	792.99	745.72	698.55	677.67	698.55	745.72	792.99	840.38	881.03	899.3												

51	697.2	677.87	629.71	520.29	376.05	302.53	281.86	302.53	376.05	520.29	629.71	677.87	697.2	677.87	629.71	520.29	376.05	302.53	281.86	302.53	376.05	520.29	629.71	677.87	697.2
52	677.33	657.59	608.37	487.05	347.34	279.97	261.63	279.97	347.34	487.05	608.37	657.59	677.33	657.59	608.37	487.05	347.34	279.97	261.63	279.97	347.34	487.05	608.37	657.59	677.33
53	657.58	637.16	587.16	455.03	321.11	260.58	243.17	260.58	321.11	455.03	587.16	637.16	657.58	637.16	587.16	455.03	321.11	260.58	243.17	260.58	321.11	455.03	587.16	637.16	657.58
54	635.84	616.76	565.56	422.74	297.6	242.26	226.98	242.26	297.6	422.74	565.56	616.76	635.84	616.76	565.56	422.74	297.6	242.26	226.98	242.26	297.6	422.74	565.56	616.76	635.84
55	614.29	595.88	541.81	391.71	276.36	225.83	212.5	225.83	276.36	391.71	541.81	595.88	614.29	595.88	541.81	391.71	276.36	225.83	212.5	225.83	276.36	391.71	541.81	595.88	614.29
56	593.01	574.09	517.77	363.53	256.53	211.35	199.06	211.35	256.53	363.53	517.77	574.09	593.01	574.09	517.77	363.53	256.53	211.35	199.06	211.35	256.53	363.53	517.77	574.09	593.01
57	570.77	552.56	492.59	336.12	238.96	198.28	187.24	198.28	238.96	336.12	492.59	552.56	570.77	552.56	492.59	336.12	238.96	198.28	187.24	198.28	238.96	336.12	492.59	552.56	570.77
58	547.18	531	466.04	311.06	223.1	186.17	176.74	186.17	223.1	311.06	466.04	531	547.18	531	466.04	311.06	223.1	186.17	176.74	186.17	223.1	311.06	466.04	531	547.18
59	524.67	508.57	438.46	289.19	208.3	175.46	166.85	175.46	208.3	289.19	438.46	508.57	524.67	508.57	438.46	289.19	208.3	175.46	166.85	175.46	208.3	289.19	438.46	508.57	524.67
60	501.91	485.96	411.09	268.07	195.08	165.98	158.49	165.98	195.08	268.07	411.09	485.96	501.91	485.96	411.09	268.07	195.08	165.98	158.49	165.98	195.08	268.07	411.09	485.96	501.91
61	478.1	463.4	383.16	248.55	183.01	157.07	150.65	157.07	183.01	248.55	383.16	463.4	478.1	463.4	383.16	248.55	183.01	157.07	150.65	157.07	183.01	248.55	383.16	463.4	478.1
62	454.59	441.16	356.15	231.47	172.15	149.35	143.66	149.35	172.15	231.47	356.15	441.16	454.59	441.16	356.15	231.47	172.15	149.35	143.66	149.35	172.15	231.47	356.15	441.16	454.59
63	431.85	418.04	330.27	215.36	162	142.1	137.36	142.1	162	215.36	330.27	418.04	431.85	418.04	330.27	215.36	162	142.1	137.36	142.1	162	215.36	330.27	418.04	431.85
64	408.13	395.59	305.58	200.5	153.01	135.48	131.91	135.48	153.01	200.5	305.58	395.59	408.13	395.59	305.58	200.5	153.01	135.48	131.91	135.48	153.01	200.5	305.58	395.59	408.13
65	384.66	372.91	282.24	187.03	144.66	129.7	126.99	129.7	144.66	187.03	282.24	372.91	384.66	372.91	282.24	187.03	144.66	129.7	126.99	129.7	144.66	187.03	282.24	372.91	384.66
66	361.73	350.28	260.2	174.3	124.61	112.26	124.61	136.7	174.3	260.2	350.28	361.73	350.28	260.2	174.3	124.61	112.26	124.61	136.7	174.3	260.2	350.28	361.73	350.28	361.73
67	338.65	327.57	240.39	162.99	129.75	119.84	118.48	119.84	129.75	162.99	240.39	327.57	338.65	327.57	240.39	162.99	129.75	119.84	118.48	119.84	129.75	162.99	240.39	327.57	338.65
68	315.3	305	221.31	152.43	123.37	115.44	114.73	115.44	123.37	152.43	221.31	305	315.3	305	221.31	152.43	123.37	115.44	114.73	115.44	123.37	152.43	221.31	305	315.3
69	292.99	282.94	203.84	142.29	117.37	111.62	111.24	111.62	117.37	142.29	203.84	282.94	292.99	282.94	203.84	142.29	117.37	111.62	111.24	111.62	117.37	142.29	203.84	282.94	292.99
70	270.85	261.31	187.89	132.97	111.86	107.95	108.21	107.95	111.86	132.97	187.89	261.31	270.85	261.31	187.89	132.97	111.86	107.95	108.21	107.95	111.86	132.97	187.89	261.31	270.85
71	249.02	239.83	172.75	124.32	106.87	104.5	105.49	104.5	106.87	124.32	172.75	239.83	249.02	239.83	172.75	124.32	106.87	104.5	105.49	104.5	106.87	124.32	172.75	239.83	249.02
72	228.02	219.19	158.6	116.39	102.03	101.47	102.61	101.47	102.03	116.39	158.6	219.19	228.02	219.19	158.6	116.39	102.03	101.47	102.61	101.47	102.03	116.39	158.6	219.19	228.02
73	207.43	199.26	145.57	108.85	97.56	98.49	100.1	98.49	97.56	108.85	145.57	199.26	207.43	199.26	145.57	108.85	97.56	98.49	100.1	98.49	97.56	108.85	145.57	199.26	207.43
74	187.61	180.24	132.95	101.77	93.49	95.61	97.86	95.61	93.49	101.77	132.95	180.24	187.61	180.24	132.95	101.77	93.49	95.61	97.86	95.61	93.49	101.77	132.95	180.24	187.61
75	168.44	161.96	121.3	95.14	89.43	92.89	95.4	92.89	89.43	95.14	121.3	161.96	168.44	161.96	121.3	95.14	89.43	92.89	95.4	92.89	89.43	95.14	121.3	161.96	168.44
76	150.22	144.79	110.52	88.98	85.64	90.4	93.06	90.4	85.64	88.98	110.52	144.79	150.22	144.79	110.52	88.98	85.64	90.4	93.06	90.4	85.64	88.98	110.52	144.79	150.22
77	132.58	128.27	100.5	83.06	82.16	87.85	91.03	87.85	82.16	83.06	100.5	128.27	132.58	128.27	100.5	83.06	82.16	87.85	91.03	87.85	82.16	83.06	100.5	128.27	132.58
78	115.68	113.09	90.84	77.45	78.67	85.3	88.76	85.3	78.67	77.45	90.84	113.09	115.68	113.09	90.84	77.45	78.67	85.3	88.76	85.3	78.67	77.45	90.84	113.09	115.68
79	99.9	98.82	81.87	72.23	75.3	82.96	86.45	82.96	75.3	72.23	81.87	98.82	99.9	98.82	81.87	72.23	75.3	82.96	86.45	82.96	75.3	72.23	81.87	98.82	99.9
80	84.9	85.47	73.52	67.21	72.11	80.47	84.35	80.47	72.11	67.21	73.52	85.47	84.9	85.47	73.52	67.21	72.11	80.47	84.35	80.47	72.11	67.21	73.52	85.47	84.9
81	71.34	73.18	65.79	62.55	69	77.97	82.09	77.97	69	62.55	65.79	73.18	71.34	73.18	65.79	62.55	69	77.97	82.09	77.97	69	62.55	65.79	73.18	71.34
82	58.66	62.09	58.57	58.09	65.88	75.57	79.63	75.57	65.88	58.09	58.57	62.09	58.66	62.09	58.57	58.09	65.88	75.57	79.63	75.57	65.88	58.09	58.57	62.09	58.66
83	46.29	51.48	51.69	53.82	62.91	73.06	77.32	73.06	62.91	53.82	51.69	51.48	46.29	51.48	46.29	51.69	53.82	62.91	73.06	77.32	73.06	62.91	53.82	51.69	51.48
84	35.35	41.67	45.4	49.78	59.86	70.39	74.88	70.39	59.86	49.78	45.4	41.67	35.35	41.67	45.4	49.78	59.86	70.39	74.88	70.39	59.86	49.78	45.4	41.67	35.35
85	25.68	33.17	39.68	45.94	56.85	67.77	72.24	67.77	56.85	45.94	39.68	33.17	25.68	33.17	39.68	45.94	56.85	67.77	72.24	67.77	56.85	45.94	39.68	33.17	25.68
86	17.2	25.72	34.48	42.31	53.96	65.13	69.72	65.13	53.96	42.31	34.48	25.72	17.2	25.72	34.48	42.31	53.96	65.13	69.72	65.13	53.96	42.31	34.48	25.72	17.2
87	11.21	19.41	29.76	38.85	51.11	62.48	67.05	62.48	51.11	38.85	29.76	19.41	11.21	19.41	29.76	38.85	51.11	62.48	67.05	62.48	51.11	38.85	29.76	19.41	11.21
88	5.93	14.53	25.61	35.65	48.27	59.76	64.28	59.76	48.27	35.65	25.61	14.53	5.93	14.53	25.61	35.65	48.27	59.76	64.28	59.76	48.27	35.65	25.61	14.53	5.93
89	2.03	10.8	22	32.67	45.46	56.97	61.51	56.97	45.46	32.67	22	10.8	2.03	10.8	22	32.67	45.46	56.97	61.51	56.97	45.46	32.67	22	10.8	2.03
90	0.51	7.79	18.98	29.88	42.8	54.21	58.7	54.21	42.8	29.88	18.98	7.79	0.51	7.79	18.98	29.88	42.8	54.21	58.7	54.21	42.8	29.88	18.98	7.79	0.51
91	0.11	6.01	16.54	27.38	40.12	51.3	55.78	51.3	40.12	27.38	16.54	6.01	0.11	6.01	16.54	27.38	40.12	51.3	55.78	51.3	40.12	27.38	16.54	6.01	0.11
92	0.14	4.9	14.61	25.02	37.4	48.35	52.66	48.35	37.4	25.02	14.61	4.9	0.14	4.9	14.61	25.02	37.4	48.35	52.66	48.35	37.4	25.02	14.61	4.9	0.14
93	0.19	4.24	13.07	22.92	34.84	45.44	49.66	45.44	34.84	22.92	13.07	4.24	0.19	4.24	13.07	22.92	34.84	45.44	49.66	45.44	34.84	22.92	13.07	4.24	0.19
94	0.24	3.82	11.81	21.02	32.39	42.52	46.67	42.52	32.39	21.02	11.81	3.82	0.24	3.82	11.81	21.02	32.39	42.52	46.67	42.52	32.39	21.02	11.81	3.82	0.24
95	0.31	3.54	10.81	19.36	30	39.74	43.58	39.74	30	19.36	10.81	3.54	0.31	3.54	10.81	19.36	30	39.74	43.58	39.74	30	19.36	10.81	3.54	0.31

106	1.67	2.93	6.81	11.7	17.39	22.48	24.54	22.48	17.39	11.7	6.81	2.93	1.67	2.93	6.81	11.7	17.39	22.48	24.54	22.48	17.39	11.7	6.81	2.93	1.67
107	1.84	2.91	6.69	11.49	17.01	21.96	24.01	21.96	17.01	11.49	6.69	2.91	1.84	2.91	6.69	11.49	17.01	21.96	24.01	21.96	17.01	11.49	6.69	2.91	1.84
108	2.01	2.9	6.62	11.3	16.65	21.43	23.44	21.43	16.65	11.3	6.62	2.9	2.01	2.9	6.62	11.3	16.65	21.43	23.44	21.43	16.65	11.3	6.62	2.9	2.01
109	2.18	2.88	6.55	11.16	16.31	20.95	22.87	20.95	16.31	11.16	6.55	2.88	2.18	2.88	6.55	11.16	16.31	20.95	22.87	20.95	16.31	11.16	6.55	2.88	2.18
110	2.33	2.86	6.5	11.04	16.03	20.5	22.36	20.5	16.03	11.04	6.5	2.86	2.33	2.86	6.5	11.04	16.03	20.5	22.36	20.5	16.03	11.04	6.5	2.86	2.33
111	2.49	2.85	6.44	10.93	15.79	20.06	21.81	20.06	15.79	10.93	6.44	2.85	2.49	2.85	6.44	10.93	15.79	20.06	21.81	20.06	15.79	10.93	6.44	2.85	2.49
112	2.62	2.84	6.37	10.84	15.58	19.68	21.27	19.68	15.58	10.84	6.37	2.84	2.62	2.84	6.37	10.84	15.58	19.68	21.27	19.68	15.58	10.84	6.37	2.84	2.62
113	2.75	2.83	6.31	10.72	15.44	19.36	20.88	19.36	15.44	10.72	6.31	2.83	2.75	2.83	6.31	10.72	15.44	19.36	20.88	19.36	15.44	10.72	6.31	2.83	2.75
114	2.87	2.83	6.25	10.6	15.33	19.1	20.54	19.1	15.33	10.6	6.25	2.83	2.87	2.83	6.25	10.6	15.33	19.1	20.54	19.1	15.33	10.6	6.25	2.83	2.87
115	3	2.83	6.19	10.44	15.23	18.91	20.26	18.91	15.23	10.44	6.19	2.83	3	2.83	6.19	10.44	15.23	18.91	20.26	18.91	15.23	10.44	6.19	2.83	3
116	3.12	2.84	6.14	10.27	15.09	18.73	20.08	18.73	15.09	10.27	6.14	2.84	3.12	2.84	6.14	10.27	15.09	18.73	20.08	18.73	15.09	10.27	6.14	2.84	3.12
117	3.23	2.85	6.08	10.15	14.91	18.48	19.92	18.48	14.91	10.15	6.08	2.85	3.23	2.85	6.08	10.15	14.91	18.48	19.92	18.48	14.91	10.15	6.08	2.85	3.23
118	3.35	2.86	6.02	10.03	14.7	18.17	19.59	18.17	14.7	10.03	6.02	2.86	3.35	2.86	6.02	10.03	14.7	18.17	19.59	18.17	14.7	10.03	6.02	2.86	3.35
119	3.46	2.88	5.96	9.91	14.45	17.8	19.18	17.8	14.45	9.91	5.96	2.88	3.46	2.88	5.96	9.91	14.45	17.8	19.18	17.8	14.45	9.91	5.96	2.88	3.46
120	3.57	2.91	5.89	9.79	14.19	17.39	18.7	17.39	14.19	9.79	5.89	2.91	3.57	2.91	5.89	9.79	14.19	17.39	18.7	17.39	14.19	9.79	5.89	2.91	3.57
121	3.69	2.94	5.81	9.68	13.92	16.97	18.14	16.97	13.92	9.68	5.81	2.94	3.69	2.94	5.81	9.68	13.92	16.97	18.14	16.97	13.92	9.68	5.81	2.94	3.69
122	3.8	2.97	5.73	9.56	13.61	16.52	17.58	16.52	13.61	9.56	5.73	2.97	3.8	2.97	5.73	9.56	13.61	16.52	17.58	16.52	13.61	9.56	5.73	2.97	3.8
123	3.9	3	5.65	9.41	13.29	16.09	17.08	16.09	13.29	9.41	5.65	3	3.9	3	5.65	9.41	13.29	16.09	17.08	16.09	13.29	9.41	5.65	3	3.9
124	4	3.04	5.57	9.24	12.98	15.65	16.65	15.65	12.98	9.24	5.57	3.04	4	3.04	5.57	9.24	12.98	15.65	16.65	15.65	12.98	9.24	5.57	3.04	4
125	4.11	3.08	5.49	9.06	12.64	15.2	16.05	15.2	12.64	9.06	5.49	3.08	4.11	3.08	5.49	9.06	12.64	15.2	16.05	15.2	12.64	9.06	5.49	3.08	4.11
126	4.22	3.12	5.41	8.87	12.25	14.75	15.57	14.75	12.25	8.87	5.41	3.12	4.22	3.12	5.41	8.87	12.25	14.75	15.57	14.75	12.25	8.87	5.41	3.12	4.22
127	4.33	3.17	5.33	8.67	11.87	14.32	15.1	14.32	11.87	8.67	5.33	3.17	4.33	3.17	5.33	8.67	11.87	14.32	15.1	14.32	11.87	8.67	5.33	3.17	4.33
128	4.44	3.21	5.25	8.48	11.52	13.87	14.61	13.87	11.52	8.48	5.25	3.21	4.44	3.21	5.25	8.48	11.52	13.87	14.61	13.87	11.52	8.48	5.25	3.21	4.44
129	4.53	3.24	5.16	8.28	11.19	13.41	14.12	13.41	11.19	8.28	5.16	3.24	4.53	3.24	5.16	8.28	11.19	13.41	14.12	13.41	11.19	8.28	5.16	3.24	4.53
130	4.62	3.3	5.09	8.08	10.87	12.98	13.66	12.98	10.87	8.08	5.09	3.3	4.62	3.3	5.09	8.08	10.87	12.98	13.66	12.98	10.87	8.08	5.09	3.3	4.62
131	4.7	3.35	5	7.88	10.56	12.54	13.2	12.54	10.56	7.88	5	3.35	4.7	3.35	5	7.88	10.56	12.54	13.2	12.54	10.56	7.88	5	3.35	4.7
132	4.78	3.39	4.93	7.68	10.24	12.13	12.73	12.13	10.24	7.68	4.93	3.39	4.78	3.39	4.93	7.68	10.24	12.13	12.73	12.13	10.24	7.68	4.93	3.39	4.78
133	4.86	3.44	4.88	7.48	9.93	11.73	12.29	11.73	9.93	7.48	4.88	3.44	4.86	3.44	4.88	7.48	9.93	11.73	12.29	11.73	9.93	7.48	4.88	3.44	4.86
134	4.94	3.5	4.82	7.28	9.63	11.34	11.89	11.34	9.63	7.28	4.82	3.5	4.94	3.5	4.82	7.28	9.63	11.34	11.89	11.34	9.63	7.28	4.82	3.5	4.94
135	5.01	3.57	4.77	7.09	9.31	10.97	11.47	10.97	9.31	7.09	4.77	3.57	5.01	3.57	4.77	7.09	9.31	10.97	11.47	10.97	9.31	7.09	4.77	3.57	5.01
136	5.08	3.64	4.72	6.91	9.01	10.61	11.1	10.61	9.01	6.91	4.72	3.64	5.08	3.64	4.72	6.91	9.01	10.61	11.1	10.61	9.01	6.91	4.72	3.64	5.08
137	5.14	3.72	4.69	6.74	8.72	10.27	10.75	10.27	8.72	6.74	4.69	3.72	5.14	3.72	4.69	6.74	8.72	10.27	10.75	10.27	8.72	6.74	4.69	3.72	5.14
138	5.2	3.8	4.65	6.58	8.45	9.93	10.4	9.93	8.45	6.58	4.65	3.8	5.2	3.8	4.65	6.58	8.45	9.93	10.4	9.93	8.45	6.58	4.65	3.8	5.2
139	5.26	3.88	4.63	6.42	8.18	9.59	10.07	9.59	8.18	6.42	4.63	3.88	5.26	3.88	4.63	6.42	8.18	9.59	10.07	9.59	8.18	6.42	4.63	3.88	5.26
140	5.34	3.96	4.61	6.27	7.93	9.26	9.76	9.26	7.93	6.27	4.61	3.96	5.34	3.96	4.61	6.27	7.93	9.26	9.76	9.26	7.93	6.27	4.61	3.96	5.34
141	5.41	4.06	4.59	6.13	7.7	8.95	9.46	8.95	7.7	6.13	4.59	4.06	5.41	4.06	4.59	6.13	7.7	8.95	9.46	8.95	7.7	6.13	4.59	4.06	5.41
142	5.48	4.15	4.58	5.99	7.48	8.66	9.16	8.66	7.48	5.99	4.58	4.15	5.48	4.15	4.58	5.99	7.48	8.66	9.16	8.66	7.48	5.99	4.58	4.15	5.48
143	5.54	4.25	4.57	5.85	7.27	8.4	8.87	8.4	7.27	5.85	4.57	4.25	5.54	4.25	4.57	5.85	7.27	8.4	8.87	8.4	7.27	5.85	4.57	4.25	5.54
144	5.59	4.35	4.56	5.72	7.08	8.15	8.59	8.15	7.08	5.72	4.56	4.35	5.59	4.35	4.56	5.72	7.08	8.15	8.59	8.15	7.08	5.72	4.56	4.35	5.59
145	5.62	4.45	4.55	5.61	6.9	7.91	8.33	7.91	6.9	5.61	4.55	4.45	5.62	4.45	4.55	5.61	6.9	7.91	8.33	7.91	6.9	5.61	4.55	4.45	5.62
146	5.65	4.57	4.55	5.52	6.72	7.68	8.06	7.68	6.72	5.52	4.55	4.57	5.65	4.57	4.55	5.52	6.72	7.68	8.06	7.68	6.72	5.52	4.55	4.57	5.65
147	5.66	4.71	4.55	5.43	6.55	7.45	7.81	7.45	6.55	5.43	4.55	4.71	5.66	4.71	4.55	5.43	6.55	7.45	7.81	7.45	6.55	5.43	4.55	4.71	5.66
148	5.67	4.87	4.55	5.34	6.37	7.23	7.56	7.23	6.37	5.34	4.55	4.87	5.67	4.87	4.55	5.34	6.37	7.23	7.56	7.23	6.37	5.34	4.55	4.87	5.67
149	5.67	5.08	4.55	5.27	6.2	7.01	7.32	7.01	6.2	5.27	4.55	5.08	5.67	5.08	4.55	5.27	6.2	7.01	7.32	7.01	6.2	5.27	4.55	5.08	5.67
150	5.67	5.31	4.54	5.21	6.05	6.81	7.11	6.81	6.05	5.21	4.54	5.31	5.67	5.31	4.54	5.21	6.05	6.81	7.11	6.81	6.05	5.21	4.54	5.31	5.67
151	5.67	5.49	4.54	5.15	5.91	6.6	6.9	6.6	5.91	5.15	4.54	5.49	5.67	5.49	4.54	5.15	5.91	6.6	6.9	6.6	5.91	5.15	4.54	5.49	5.67
152	5.68	5.68	4.54	5.09	5.78	6.41	6.7	6.41	5.78	5.09	4.54	5.68	5.68	5.68	4.54	5.09	5.78	6.41	6.7	6.41	5.78	5.09	4.54	5.68	5.68
153	5.7	5.85	4.56	5.03	5.68	6.24	6.51	6.24	5.68	5.03	4.56	5.85	5.7	5.85	4.56	5.03	5.68	6.24	6.51	6.24	5.68	5.03	4.56	5.85	5.7
154	5.74	6.02	4.59	5.01	5.58	6.08	6.33	6.08	5.58	5.01	4.59	6.02	5.74	6.02	4.59	5.01	5.58	6.08	6.33	6.08	5.58	5.01	4.59	6.02	5.74
155	5.74	6.13	4.64	4.98	5.49	5.95	6.18	5.95	5.49	4.98	4.64	6.13	5.74	6.13	4.64	4.98	5.49	5.95	6.18	5.95	5.49	4.98	4.64	6.13	5.74
156	5.72	6.22	4.69	4.93	5.4																				

161	5.5	6.24	5.48	4.78	5.07	5.37	5.53	5.37	5.07	4.78	5.48	6.24	5.5	6.24	5.48	4.78	5.07	5.37	5.53	5.37	5.07	4.78	5.48	6.24	5.5
162	5.48	6.16	5.71	4.81	5	5.31	5.45	5.31	5	4.81	5.71	6.16	5.48	6.16	5.71	4.81	5	5.31	5.45	5.31	5	4.81	5.71	6.16	5.48
163	5.44	6.04	5.93	4.86	4.95	5.24	5.39	5.24	4.95	4.86	5.93	6.04	5.44	6.04	5.93	4.86	4.95	5.24	5.39	5.24	4.95	4.86	5.93	6.04	5.44
164	5.41	5.9	6.08	4.97	4.94	5.17	5.33	5.17	4.94	4.97	6.08	5.9	5.41	5.9	6.08	4.97	4.94	5.17	5.33	5.17	4.94	4.97	6.08	5.9	5.41
165	5.38	5.82	6.17	5.23	4.96	5.11	5.28	5.11	4.96	5.23	6.17	5.82	5.38	5.82	6.17	5.23	4.96	5.11	5.28	5.11	4.96	5.23	6.17	5.82	5.38
166	5.33	5.79	6.28	5.53	5.02	5.11	5.26	5.11	5.02	5.53	6.28	5.79	5.33	5.79	6.28	5.53	5.02	5.11	5.26	5.11	5.02	5.53	6.28	5.79	5.33
167	5.28	5.78	6.33	5.81	5.13	5.14	5.3	5.14	5.13	5.81	6.33	5.78	5.28	5.78	6.33	5.81	5.13	5.14	5.3	5.14	5.13	5.81	6.33	5.78	5.28
168	5.33	5.79	6.35	6.03	5.36	5.2	5.37	5.2	5.36	6.03	6.35	5.79	5.33	5.79	6.35	6.03	5.36	5.2	5.37	5.2	5.36	6.03	6.35	5.79	5.33
169	5.54	5.83	6.42	6.22	5.71	5.35	5.49	5.35	5.71	6.22	6.42	5.83	5.54	5.83	6.42	6.22	5.71	5.35	5.49	5.35	5.71	6.22	6.42	5.83	5.54
170	5.74	5.85	6.51	6.46	6.01	5.62	5.72	5.62	6.01	6.46	6.51	5.85	5.74	5.85	6.51	6.46	6.01	5.62	5.72	5.62	6.01	6.46	6.51	5.85	5.74
171	5.91	5.98	6.49	6.68	6.28	5.96	6.28	5.96	6.28	6.68	6.49	5.98	5.91	5.98	6.49	6.68	6.28	5.96	6.28	5.96	6.28	6.68	6.49	5.98	5.91
172	6.05	6.11	6.52	6.76	6.5	6.18	6.89	6.18	6.5	6.76	6.52	6.11	6.05	6.11	6.52	6.76	6.5	6.18	6.89	6.18	6.5	6.76	6.52	6.11	6.05
173	6.18	6.22	6.47	6.81	6.65	6.38	7.31	6.38	6.65	6.81	6.47	6.22	6.18	6.22	6.47	6.81	6.65	6.38	7.31	6.38	6.65	6.81	6.47	6.22	6.18
174	6.3	6.31	6.44	6.69	6.77	6.48	6.99	6.48	6.77	6.69	6.44	6.31	6.3	6.31	6.44	6.69	6.77	6.48	6.99	6.48	6.77	6.69	6.44	6.31	6.3
175	6.44	6.4	6.48	6.61	6.77	6.56	6.53	6.56	6.77	6.61	6.48	6.4	6.44	6.4	6.48	6.61	6.77	6.56	6.53	6.56	6.77	6.61	6.48	6.4	6.44
176	6.61	6.57	6.56	6.64	6.62	6.49	5.99	6.49	6.62	6.64	6.56	6.57	6.61	6.57	6.56	6.64	6.62	6.49	5.99	6.49	6.62	6.64	6.56	6.57	6.61
177	6.83	6.76	6.7	6.67	6.48	6.11	5.16	6.11	6.48	6.67	6.7	6.76	6.83	6.76	6.7	6.67	6.48	6.11	5.16	6.11	6.48	6.67	6.7	6.76	6.83
178	6.93	6.87	6.76	6.7	6.39	5.71	4.59	5.71	6.39	6.7	6.76	6.87	6.93	6.87	6.76	6.7	6.39	5.71	4.59	5.71	6.39	6.7	6.76	6.87	6.93
179	6.93	6.86	6.69	6.49	6.14	5.21	2.54	5.21	6.14	6.49	6.69	6.86	6.93	6.86	6.69	6.49	6.14	5.21	2.54	5.21	6.14	6.49	6.69	6.86	6.93
180	6.92	6.92	6.92	6.92	6.92	6.92	6.92	6.92	6.92	6.92	6.92	6.92	6.92	6.92	6.92	6.92	6.92	6.92	6.92	6.92	6.92	6.92	6.92	6.92	6.92

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	CS4 @50% Power /3500K	Sample ID.	S1
Temperature (°C)	25.1	Humidity (%RH)	57.0

Test Method

The samples were tested according to the ANSI C82.77:2014.

The total harmonic distortion shall be measured to the 40th order.

The ambient temperature condition was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
120.03	60	0.149	17.8	0.995	5.65%
277.08	60	0.070	18.0	0.930	8.85%

5.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
DLF107	Integrating Sphere System	2022/12/24	2023/12/23
DLF108	Auxiliary Lamp	2022/12/24	2023/12/23
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-directional	2022/12/24	2023/12/23
DLF116	AC Power Source	2022/12/16	2023/12/15
DLF516	Power Meter	2022/12/16	2023/12/15
DLF112	Temperature Recorder	2022/12/28	2023/12/27
DLF114	Temperature & Humidity Datalogger	2022/12/28	2023/12/27
DLF101	Goniophotometer	2022/12/24	2023/12/23
DLF511	AC Power Source	2022/12/16	2023/12/15
DLF512	AC Power Source	2022/12/16	2023/12/15
DLF513	AC Power Source	2022/12/16	2023/12/15
DLF507	DC Power Source	2022/12/16	2023/12/15
DLF111	Temperature & Humidity Datalogger	2022/12/28	2023/12/27
DLF119	Power Meter	2022/12/16	2023/12/15
DLF031	Temperature data logger	2023/6/22	2024/6/21
DLF073	Power Analyzer	2023/6/22	2024/6/21
DLF003	Temperature & Humidity Datalogger	2023/6/22	2024/6/21

***** End of Test Report*****