

Photometric Test Report

Relevant Standards

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

Prepared For RAB Lighting Inc.

Room 6A33, No.1388, Wuzhong road, Shanghai, China

Xiao Xiang, 15921313292, Gary.Xiao@rabweb.com

Prepared By

Deliver Co., Ltd.

Block 11, 78 Keling Road, SSTP, Suzhou, China

0512-66801950, kevin.jia@szdeliver.com

Project Number

DLF2310103

Report Number

DLF2310103-27a

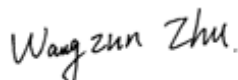
Test Date

2023/10/23

Issue Date

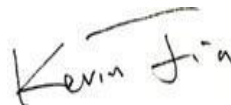
2023/10/24

Prepared By



Wangzun Zhu

Approved By



Kevin Jia

The results contained in this report pertain only to the tested sample.

This report shall not be reproduced, except in full, without written approval of Deliver Co., Ltd.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP.

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		5425
Lumen/ft (Goniophotometer - Section 4.2)	IES LM-79-2008	≥375		1356
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 115	Premium 130	149.0
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		36.4
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	5.83%
		20.00%	277V	11.45%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.996
		0.9	277V	0.971
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	5029±355	5134
		4 step	5029±220	
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		84
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%		-12%
Zonal Lumen Requirement (0°-90°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≥85%		97.38%
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≥40%		82.36%
Zonal Lumen Requirement (20°-50°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≥30%		54.11%
Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	<22 <25		24.8
Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		120
(Goniophotometer - Section 4.2)		Non-Wrost Case		277
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		0.305
(Goniophotometer - Section 4.2)		Non-Wrost Case		0.133
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		36.4
(Goniophotometer - Section 4.2)		Non-Wrost Case		35.8

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023/10/23	CS4 @100% Power /5000K	AA1
2	Goniophotometer Test	2023/10/23	CS4 @100% Power /5000K	AA1
3	THD and PF Test	2023/10/23	CS4 @100% Power /5000K	AA1

Remark(If any)

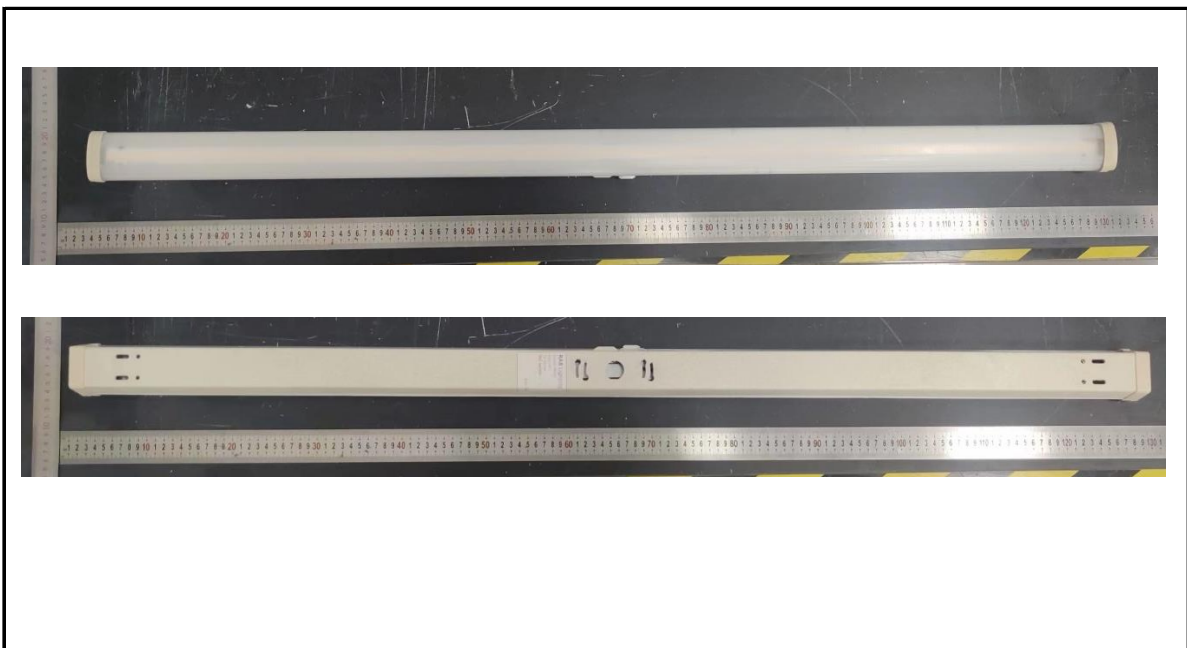
- 1、 This report shall not be used by the client to claim product endorsement by NVLAP, NIST or any agency of the US government.
- 2、 The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products. This report does not imply that the product(s) has met the criteria for certification.

3.0 Production Description

Luminaire Description: CS4 @100% Power /5000K

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 @100% Power /5000K	Sample ID.	AA1
Opreate 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 paramters 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

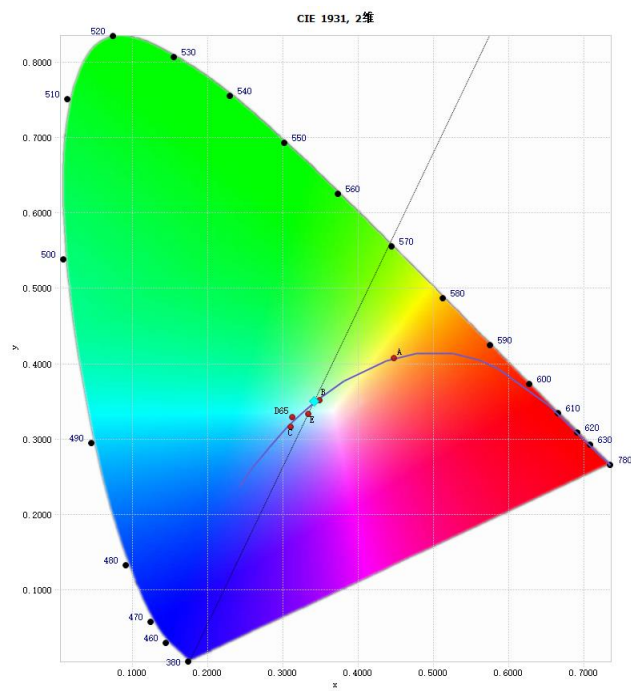
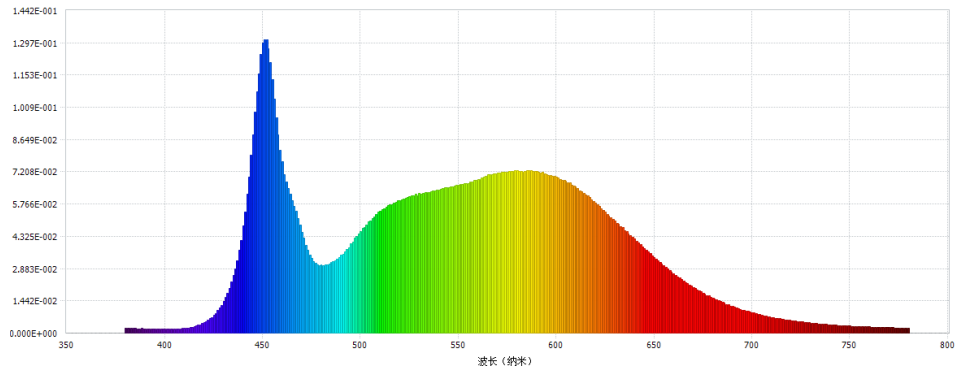
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.05	60	0.304	36.4	0.996
277.05	60	0.133	35.8	0.971

Test Result

CCT (K)	CRI	R9	Duv
5134	84	13	0.0007

Rf	Rg	IES Rcs,h1
84	96	-12%

4.1 Integrating Sphere Test



4.1 Integrating Sphere Test

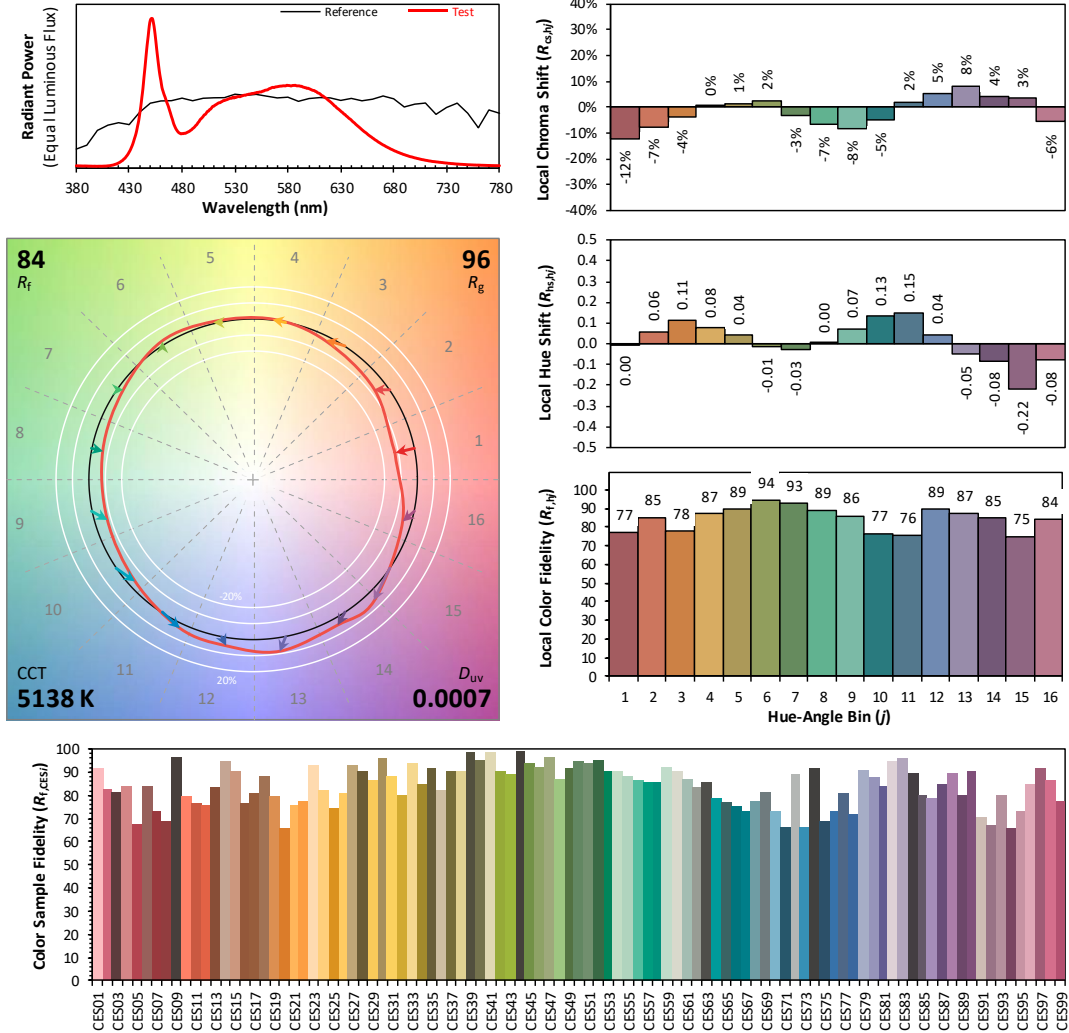
IES TM-30-18 Color Rendition Report

Source: DLF2310103-27a

Manufacturer: RAB Lighting Inc.

Date: 2023/10/23

Model: CS4 @100% Power /5000K



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

x 0.3414
 y 0.3501
 u' 0.2095
 v' 0.4834

CIE 13.3-1995
(CRI)

R_a 85
 R_g 18

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	2.15E-03	485	3.15E-02	590	7.21E-02	695	1.03E-02
385	2.00E-03	490	3.47E-02	595	7.09E-02	700	9.08E-03
390	1.94E-03	495	3.98E-02	600	6.97E-02	705	7.97E-03
395	1.79E-03	500	4.54E-02	605	6.80E-02	710	7.01E-03
400	1.73E-03	505	5.00E-02	610	6.53E-02	715	6.24E-03
405	1.81E-03	510	5.43E-02	615	6.19E-02	720	5.59E-03
410	2.11E-03	515	5.74E-02	620	5.83E-02	725	5.03E-03
415	2.85E-03	520	5.93E-02	625	5.41E-02	730	4.53E-03
420	4.64E-03	525	6.11E-02	630	5.00E-02	735	4.08E-03
425	8.11E-03	530	6.24E-02	635	4.59E-02	740	3.66E-03
430	1.42E-02	535	6.27E-02	640	4.21E-02	745	3.39E-03
435	2.59E-02	540	6.39E-02	645	3.78E-02	750	3.09E-03
440	4.78E-02	545	6.52E-02	650	3.37E-02	755	2.88E-03
445	8.86E-02	550	6.61E-02	655	3.01E-02	760	2.75E-03
450	1.30E-01	555	6.69E-02	660	2.65E-02	765	2.57E-03
455	1.13E-01	560	6.85E-02	665	2.33E-02	770	2.43E-03
460	7.66E-02	565	7.06E-02	670	2.04E-02	775	2.31E-03
465	5.92E-02	570	7.14E-02	675	1.79E-02	780	2.25E-03
470	4.51E-02	575	7.21E-02	680	1.56E-02		
475	3.33E-02	580	7.25E-02	685	1.37E-02		
480	3.04E-02	585	7.25E-02	690	1.19E-02		

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	CS4 @100% Power /5000K	Sample ID.	AA1
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	120.02	60	0.305	36.4	0.996
NON-WROST CASE	277.00	60	0.133	35.8	0.971

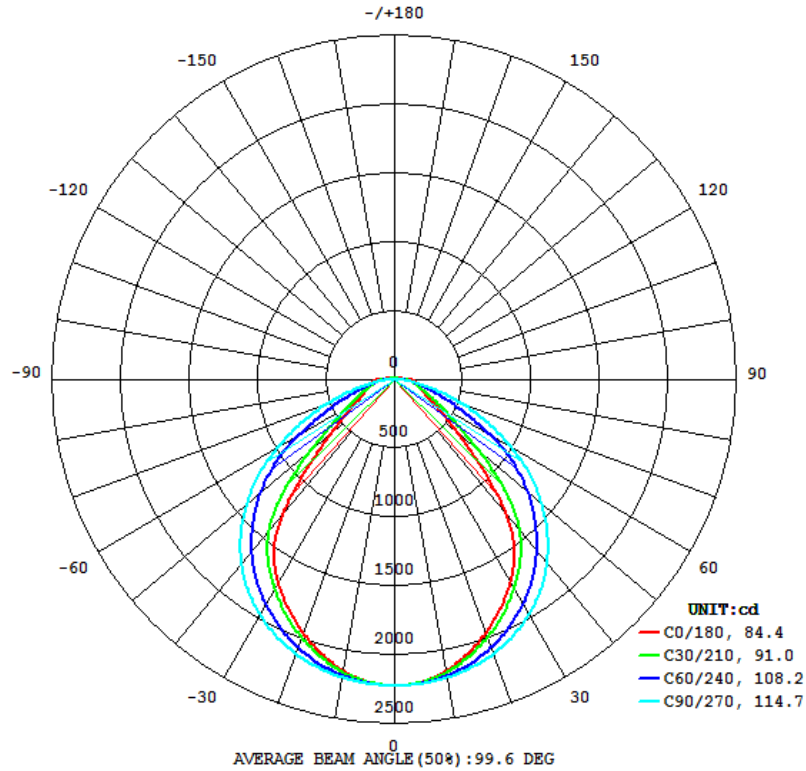
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
5425	138.4	156.5	84.4	114.7	149.0

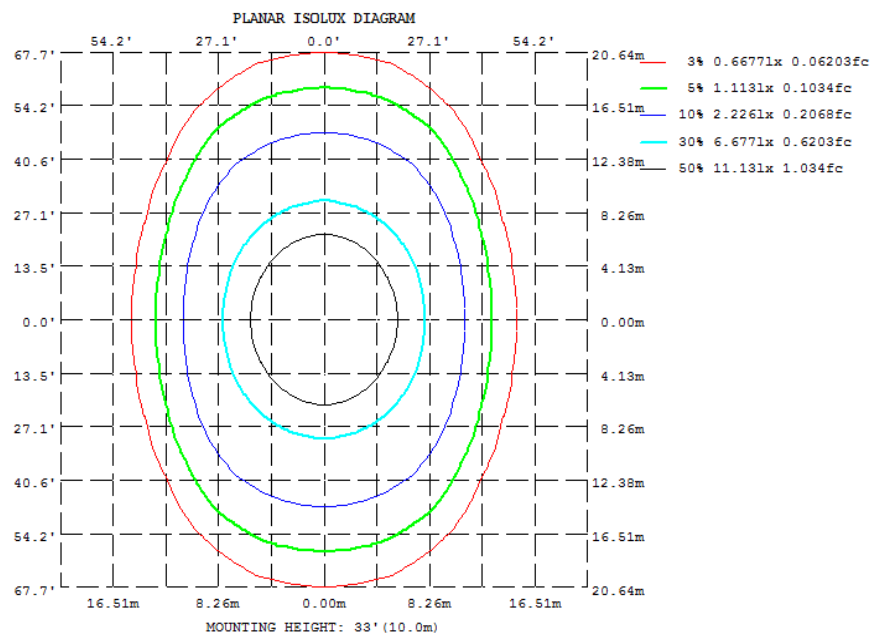
Zonal Lumen Requirement (0°-90°)	Zonal Lumen Requirement (0°-60°)	BUG rating	UGR (X=4H, Y=8H, 70/50/20%)
97.38%	82.36%	B2-U3-G1	24.8
Zonal Lumen Requirement (20°-50°)	Length(ft)	Lumen/ft	
54.11%	4	1356	

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	2151	2173	2199	2173	2151	2173	2199	2173
20	1961	2029	2117	2029	1961	2029	2117	2029
30	1700	1815	1971	1815	1700	1815	1971	1815
40	1270	1529	1740	1529	1270	1529	1740	1529
50	609.9	1088	1409	1088	609.9	1088	1409	1088
60	318.6	538.7	992.6	538.7	318.6	538.7	992.6	538.7
70	217.5	267.2	537.1	267.2	217.5	267.2	537.1	267.2
80	169.4	135.2	169.0	135.2	169.4	135.2	169.0	135.2
90	118.5	60.77	1.054	60.77	118.5	60.77	1.054	60.77
100	65.38	28.97	1.762	28.97	65.38	28.97	1.762	28.97
110	44.72	22.20	4.656	22.20	44.72	22.20	4.656	22.20
120	37.16	19.69	6.862	19.69	37.16	19.69	6.862	19.69
130	27.32	15.97	8.708	15.97	27.32	15.97	8.708	15.97
140	19.36	12.18	10.05	12.18	19.36	12.18	10.05	12.18
150	13.85	9.939	10.79	9.939	13.85	9.939	10.79	9.939
160	10.66	9.183	10.71	9.183	10.66	9.183	10.71	9.183
170	12.80	13.11	10.86	13.11	12.80	13.11	10.86	13.11
180	5.406	11.88	13.04	11.88	5.406	11.88	13.04	11.88
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		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	22.6	24.1	23.1	24.5	24.9	16.8	18.3	17.2	18.7	19.1
	3H	23.9	25.3	24.4	25.6	26.1	18.4	19.7	18.8	20.1	20.5
	4H	24.3	25.5	24.7	25.9	26.4	19.3	20.5	19.7	20.9	21.4
	6H	24.4	25.6	24.9	26.0	26.5	20.3	21.5	20.8	21.9	22.4
	8H	24.4	25.5	24.9	26.0	26.5	20.9	22.0	21.4	22.5	22.9
	12H	24.4	25.5	24.9	25.9	26.4	21.6	22.6	22.1	23.1	23.6
4H	2H	22.7	23.9	23.1	24.3	24.8	17.6	18.9	18.1	19.3	19.7
	3H	24.1	25.1	24.5	25.6	26.1	19.3	20.3	19.7	20.8	21.2
	4H	24.5	25.5	25.0	25.9	26.4	20.2	21.2	20.7	21.6	22.2
	6H	24.8	25.6	25.3	26.1	26.6	21.4	22.2	21.9	22.7	23.3
	8H	24.8	25.6	25.3	26.1	26.6	22.1	22.9	22.6	23.4	23.9
	12H	24.8	25.5	25.4	26.0	26.6	22.9	23.6	23.4	24.1	24.6
8H	4H	24.5	25.3	25.0	25.8	26.3	20.6	21.3	21.1	21.8	22.4
	6H	24.8	25.5	25.4	26.0	26.6	21.8	22.5	22.4	23.0	23.6
	8H	24.9	25.5	25.5	26.0	26.6	22.6	23.2	23.2	23.8	24.3
	12H	24.9	25.4	25.5	26.0	26.6	23.6	24.1	24.1	24.6	25.3
12H	4H	24.5	25.2	25.1	25.7	26.3	20.6	21.3	21.1	21.8	22.4
	6H	24.9	25.4	25.4	25.9	26.5	21.9	22.5	22.5	23.0	23.6
	8H	24.9	25.4	25.5	26.0	26.6	22.7	23.2	23.3	23.8	24.4
Maximum UGR = 26.6											

4.2 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	209.88	0 - 10	209.88	3.87%
10-20	596	0 - 20	805.88	14.85%
20-30	892.59	0 - 30	1698.47	31.31%
30-40	1054.57	0 - 40	2753.04	50.74%
40-50	988.43	0 - 50	3741.47	68.96%
50-60	727.03	0 - 60	4468.50	82.36%
60-70	456.25	0 - 70	4924.75	90.77%
70-80	247.75	0 - 80	5172.50	95.34%
80-90	110.62	0 - 90	5283.12	97.38%
90-100	48.16	0 - 100	5331.28	98.27%
100-110	27.89	0 - 110	5359.17	98.78%
110-120	21.58	0 - 120	5380.75	99.18%
120-130	16.47	0 - 130	5397.22	99.48%
130-140	11.22	0 - 140	5408.44	99.69%
140-150	7.54	0 - 150	5415.98	99.83%
150-160	4.99	0 - 160	5420.97	99.92%
160-170	3.10	0 - 170	5424.07	99.98%
170-180	1.20	0 - 180	5425.27	100.00%

4.2 Goniophotometer Test

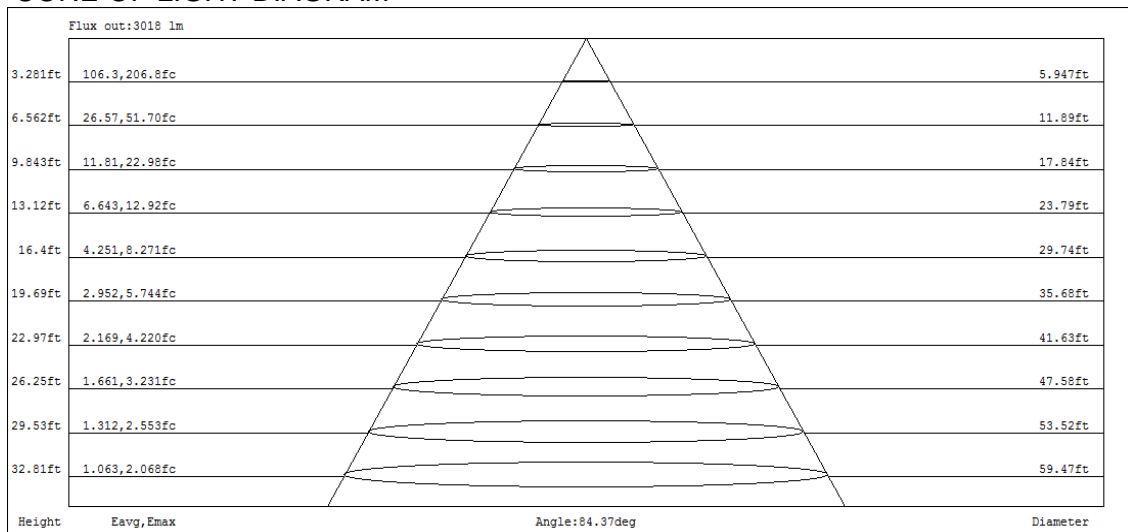
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 0.20

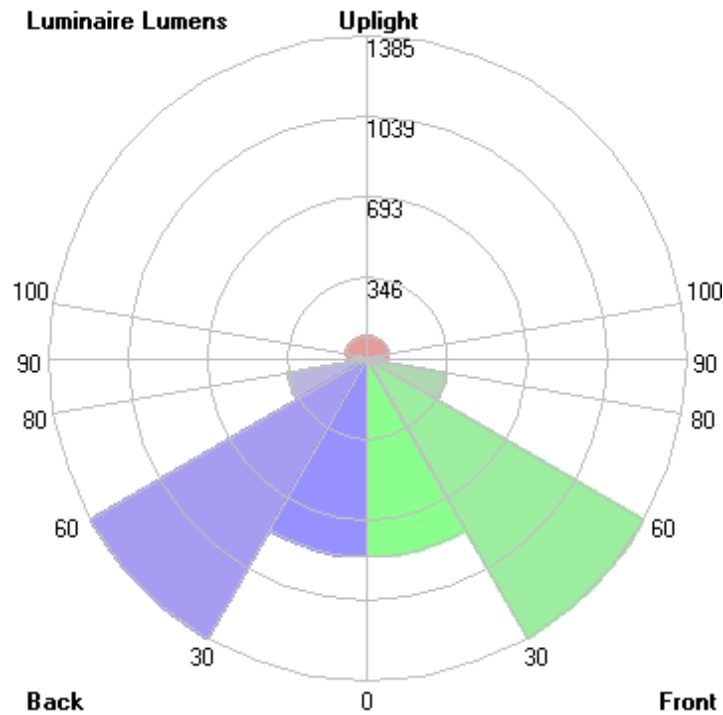
RC	80				70				50			30			10			0
Rw	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	118	118	118	118	115	115	115	115	110	110	110	104	104	104	100	100	100	97
1	109	105	101	97	106	102	98	95	97	94	92	93	91	88	89	87	85	83
2	100	92	86	81	97	90	84	79	86	81	77	83	79	75	79	76	73	71
3	92	82	74	68	89	80	73	67	77	71	66	74	69	65	71	67	63	61
4	84	73	65	59	82	72	64	58	69	62	57	66	61	56	64	59	55	53
5	78	66	57	51	76	65	57	51	62	55	50	60	54	49	58	53	48	46
6	72	60	51	45	70	59	51	45	57	49	44	55	48	44	53	47	43	41
7	67	54	46	40	65	53	45	40	52	45	39	50	44	39	48	43	39	37
8	63	50	42	36	61	49	41	36	47	40	35	46	40	35	45	39	35	33
9	59	46	38	33	57	45	38	32	44	37	32	43	36	32	41	36	31	30
10	55	42	35	30	54	42	34	29	41	34	29	39	33	29	38	33	29	27

CONE OF LIGHT DIAGRAM



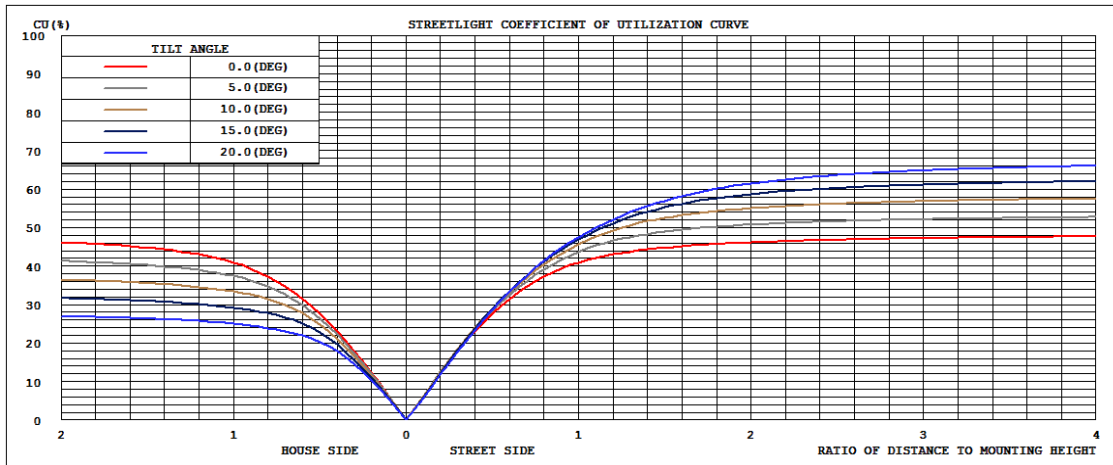
4.2 Goniophotometer Test

LCS/BUG

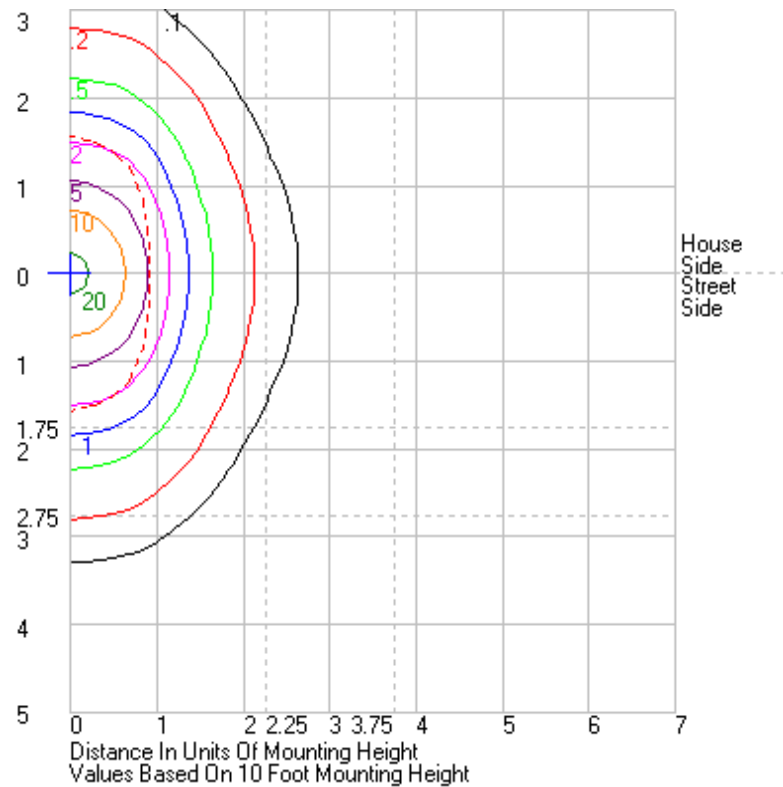


	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	849.2	N.A.	15.7
FM - Front-Medium (30-60)	1385.0	N.A.	25.5
FH - Front-High (60-80)	352.0	N.A.	6.5
FVH - Front-Very High (80-90)	55.3	N.A.	1.0
BL - Back-Low (0-30)	849.2	N.A.	15.7
BM - Back-Medium (30-60)	1385.0	N.A.	25.5
BH - Back-High (60-80)	352.0	N.A.	6.5
BVH - Back-Very High (80-90)	55.3	N.A.	1.0
UL - Uplight-Low (90-100)	48.2	N.A.	0.9
UH - Uplight-High (100-180)	94.0	N.A.	1.7
Total	5425.2	N.A.	100.0
BUG Rating	B2-U3-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	2223.96	2223.96	2223.96	2223.96	2223.96	2223.96	2223.96	2223.96	2223.96	2223.96	2223.96	2223.96	2223.96	2223.96	2223.96	2223.96	2223.96	2223.96	2223.96	2223.96	2223.96	2223.96	2223.96	2223.96	2223.96
1	2223.03	2223.39	2223.87	2223.64	2223.09	2223.73	2225.14	2223.73	2223.09	2223.64	2223.87	2223.39	2223.03	2223.39	2223.87	2223.64	2223.09	2223.73	2225.14	2223.73	2223.09	2223.64	2223.87	2223.39	2223.03
2	2222.58	2222.58	2222.63	2221.93	2221.24	2221.46	2222.61	2221.46	2221.24	2221.93	2222.63	2222.58	2222.58	2222.58	2222.63	2221.93	2221.24	2221.46	2222.61	2221.46	2221.24	2221.93	2222.63	2222.58	2222.58
3	2221.36	2221.23	2220.77	2219.42	2218.08	2218.03	2219.16	2218.03	2218.08	2219.42	2220.77	2221.23	2221.36	2221.23	2220.77	2219.42	2218.08	2218.03	2219.16	2218.03	2218.08	2219.42	2220.77	2221.23	2221.36
4	2219.76	2219.38	2217.93	2215.66	2213.36	2212.46	2213.93	2212.46	2213.36	2215.66	2217.93	2219.38	2219.76	2219.38	2217.93	2215.66	2213.36	2212.46	2213.93	2212.46	2213.36	2215.66	2217.93	2219.38	2219.76
5	2217.74	2216.82	2214.5	2211.26	2207.71	2205.97	2206.54	2205.97	2207.71	2211.26	2214.5	2216.82	2217.74	2216.82	2214.5	2211.26	2207.71	2205.97	2206.54	2205.97	2207.71	2211.26	2214.5	2216.82	2217.74
6	2214.63	2213.42	2210.06	2205.21	2200.79	2197.89	2198.43	2197.89	2200.79	2205.21	2210.06	2213.42	2214.63	2213.42	2210.06	2205.21	2200.79	2197.89	2198.43	2197.89	2200.79	2205.21	2210.06	2213.42	2214.63
7	2211.38	2209.5	2205.49	2198.93	2192.4	2188.45	2188.5	2188.45	2192.4	2198.93	2205.49	2209.5	2211.38	2209.5	2205.49	2198.93	2192.4	2188.45	2188.5	2188.45	2192.4	2198.93	2205.49	2209.5	2211.38
8	2207.63	2205.34	2199.29	2191.23	2183.62	2177.82	2177.6	2177.82	2183.62	2191.23	2199.29	2205.34	2207.63	2205.34	2199.29	2191.23	2183.62	2177.82	2177.6	2177.82	2183.62	2191.23	2199.29	2205.34	2207.63
9	2203.74	2200.08	2192.86	2182.69	2172.81	2165.88	2164.29	2165.88	2172.81	2182.69	2192.86	2200.08	2203.74	2200.08	2192.86	2182.69	2172.81	2165.88	2164.29	2165.88	2172.81	2182.69	2192.86	2200.08	2203.74
10	2198.86	2194.33	2185.91	2172.95	2161.24	2152.39	2150.8	2152.39	2161.24	2172.95	2185.91	2194.33	2198.86	2194.33	2185.91	2172.95	2161.24	2152.39	2150.8	2152.39	2161.24	2172.95	2185.91	2194.33	2198.86
11	2192.77	2188.54	2177.61	2162.79	2148.41	2138.12	2136.2	2138.12	2148.41	2162.79	2177.61	2188.54	2192.77	2188.54	2177.61	2162.79	2148.41	2138.12	2136.2	2138.12	2148.41	2162.79	2177.61	2188.54	2192.77
12	2186.52	2182.18	2168.81	2151.14	2134.29	2122.47	2119.8	2122.47	2134.29	2151.14	2168.81	2182.18	2186.52	2182.18	2168.81	2151.14	2134.29	2122.47	2119.8	2122.47	2134.29	2151.14	2168.81	2182.18	2186.52
13	2180.2	2174.43	2159.29	2138.97	2119.81	2105.34	2102.85	2105.34	2119.81	2138.97	2159.29	2174.43	2180.2	2174.43	2159.29	2138.97	2119.81	2105.34	2102.85	2105.34	2119.81	2138.97	2159.29	2174.43	2180.2
14	2172.94	2166.39	2148.47	2125.21	2104.14	2088.57	2084.94	2088.57	2104.14	2125.21	2148.47	2166.39	2172.94	2166.39	2148.47	2125.21	2104.14	2088.57	2084.94	2088.57	2104.14	2125.21	2148.47	2166.39	2172.94
15	2165.46	2157.98	2137.92	2111.53	2087.22	2069.95	2065.93	2069.95	2087.22	2111.53	2137.92	2157.98	2165.46	2157.98	2137.92	2111.53	2087.22	2069.95	2065.93	2069.95	2087.22	2111.53	2137.92	2157.98	2165.46
16	2157.01	2148.47	2125.89	2096.18	2070.03	2050.73	2045.99	2050.73	2070.03	2096.18	2125.89	2148.47	2157.01	2148.47	2125.89	2096.18	2070.03	2050.73	2045.99	2050.73	2070.03	2096.18	2125.89	2148.47	2157.01
17	2148.12	2138.29	2113.08	2080.4	2051.93	2031.01	2025.67	2031.01	2051.93	2080.4	2113.08	2138.29	2148.12	2138.29	2113.08	2080.4	2051.93	2031.01	2025.67	2031.01	2051.93	2080.4	2113.08	2138.29	2148.12
18	2138.7	2127.66	2099.93	2064.16	2032.81	2010.53	2004.93	2010.53	2032.81	2064.16	2099.93	2127.66	2138.7	2127.66	2099.93	2064.16	2032.81	2010.53	2004.93	2010.53	2032.81	2064.16	2099.93	2127.66	2138.7
19	2128.09	2116.32	2085.52	2046.88	2013.63	1989.37	1982.22	1989.37	2013.63	2046.88	2085.52	2116.32	2128.09	2116.32	2085.52	2046.88	2013.63	1989.37	1982.22	1989.37	2013.63	2046.88	2085.52	2116.32	2128.09
20	2117.48	2104.51	2070.37	2029.18	1992.7	1967.51	1960.83	1967.51	1992.7	2029.18	2070.37	2104.51	2117.48	2104.51	2070.37	2029.18	1992.7	1967.51	1960.83	1967.51	1992.7	2029.18	2070.37	2104.51	2117.48
21	2106.04	2091.86	2055.19	2010.76	1972.35	1945.17	1937.65	1945.17	1972.35	2010.76	2055.19	2091.86	2106.04	2091.86	2055.19	2010.76	1972.35	1945.17	1937.65	1945.17	1972.35	2010.76	2055.19	2091.86	2106.04
22	2093.69	2078.25	2038.62	1991.7	1950.77	1922.18	1912.79	1922.18	1950.77	1991.7	2038.62	2078.25	2093.69	2078.25	2038.62	1991.7	1950.77	1922.18	1912.79	1922.18	1950.77	1991.7	2038.62	2078.25	2093.69
23	2080.84	2064.35	2021.81	1971.8	1928.38	1898.03	1889.5	1898.03	1928.38	1971.8	2021.81	2064.35	2080.84	2064.35	2021.81	1971.8	1928.38	1898.03	1889.5	1898.03	1928.38	1971.8	2021.81	2064.35	2080.84
24	2067.66	2049.61	2004.19	1951.75	1905.69	1873.53	1864.04	1873.53	1905.69	1951.75	2004.19	2049.61	2067.66	2049.61	2004.19	1951.75	1905.69	1873.53	1864.04	1873.53	1905.69	1951.75	2004.19	2049.61	2067.66
25	2053.68	2034.18	1985.59	1930.28	1881.73	1848.76	1838	1848.76	1881.73	1930.28	1985.59	2034.18	2053.68	2034.18	1985.59	1930.28	1881.73	1848.76	1838	1848.76	1881.73	1930.28	1985.59	2034.18	2053.68
26	2038.96	2018	1966.61	1908.75	1858.03	1822.33	1812.15	1822.33	1858.03	1908.75	1966.61	2018	2038.96	2018	1966.61	1908.75	1858.03	1822.33	1812.15	1822.33	1858.03	1908.75	1966.61	2018	2038.96
27	2022.79	2000.88	1947.09	1886.58	1832.74	1795.66	1784.61	1795.66	1832.74	1886.58	1947.09	2000.88	2022.79	2000.88	1947.09	1886.58	1832.74	1795.66	1784.61	1795.66	1832.74	1886.58	1947.09	2000.88	2022.79
28	2006.45	1983.01	1926.81	1863.41	1807.23	1768.94	1756.84	1768.94	1807.23	1863.41	1926.81	1983.01	2006.45	1983.01	1926.81	1863.41	1807.23	1768.94	1756.84	1768.94	1807.23	1863.41	1926.81	1983.01	2006.45
29	1988.58	1964.92	1905.86	1839.77	1781.24	1741.27	1729.46	1741.27	1781.24	1839.77	1905.86	1964.92	1988.58	1964.92	1905.86	1839.77	1781.24	1741.27	1729.46	1741.27	1781.24	1839.77	1905.86	1964.92	1988.58
30	1970.7	1945.35	1883.96	1815.04	1754.02	1713.54	1699.67	1713.54	1754.02	1815.04	1883.96	1945.35	1970.7	1945.35	1883.96	1815.04	1754.02	1713.54	1699.67	1713.54	1754.02	1815.04	1883.96	1945.35	1970.7
31	1952.1	1925.26	1861.33	1789.77	1726.62	1684.42	1670.64	1684.42	1726.62	1789.77	1861.33	1925.26	1952.1	1925.26	1861.33	1789.77	1726.62	1684.42	1670.64	1684.42	1726.62	1789.77	1861.33	1925.26	1952.1
32	1932.39	1904.52	1838.02	1763.88	1698.57	1655.02	1641.12	1655.02	1698.57	1763.88	1838.02	1904.52	1932.39	1904.52	1838.02	1763.88	1698.57	1655.02	1641.12	1655.02	1698.57	1763.88	1838.02	1904.52	1932.39
33	1911.69	1881.99	1813.78	1736.63	1669.57	1624.49	1608.65	1624.49	1669.57	1736.63	1813.78	1881.99	1911.69	1881.99	1813.78	1736.63	1669.57	1624.49	1608.65	1624.49	1669.57	1736.63	1813.78	1881.99	1911.69
34	1890.45	1859.18	1789.15	1709.53	1639.94	1592.32	1574.68	1592.32	1639.94	1709.53	1789.15	1859.18	1890.45	1859.18	1789.15	1709.53	1639.94	1592.32	1574.68	1592.32	1639.94	1709.53	1789.15	1859.18	1890.45
35	1867.5	1836.2	1763.41	1681.31	1609.87	1557.99	1537.87	1557.99	1609.87	1681.31	1763.41	1836.2	1867.5	1836.2	1763.41	1681.31	1609.87	1557.99	1537.87	1557.99	1609.87	1681.31	1763.41	1836.2	1867.5
36	1843.55	1811.54	1737.34	1652.09	1578.09	1520.31	1495.48	1520.31	1578.09	1652.09	1737.34	1811.54	1843.55	1811.54	1737.34	1652.09	1578.09	1520.31	1495.48	1520.31	1578.09	1652.09	1737.34	1811.54	1843.55
37	1820.1	1786.16	1709.98	1622.99	1545.22	1478.34	1448.43	1478.34	1545.22	1622.99	1709.98	1786.16	1820.1	1786.16	1709.98	1622.99	1545.22	1478.34	1448.43	1478.34	1545.22	1622.99	1709.98	1786.16	1820.1
38	1794.42	1759.45	1681.95	1592.55	1510.27	1430.57	1394.73	1430.57	1510.27	1592.55	1681.95	1759													

51	1370.83	1335.02	1244.51	1026.27	748.41	604.8	565.93	604.8	748.41	1026.27	1244.51	1335.02	1370.83	1335.02	1244.51	1026.27	748.41	604.8	565.93	604.8	748.41	1026.27	1244.51	1335.02	1370.83
52	1332.91	1296.82	1203.83	962.71	693.81	562.07	524.48	562.07	693.81	962.71	1203.83	1296.82	1332.91	1296.82	1203.83	962.71	693.81	562.07	524.48	562.07	693.81	962.71	1203.83	1296.82	1332.91
53	1295.46	1257.82	1161.59	899.97	643.25	522.54	489.05	522.54	643.25	899.97	1161.59	1257.82	1295.46	1257.82	1161.59	899.97	643.25	522.54	489.05	522.54	643.25	899.97	1161.59	1257.82	1295.46
54	1254.68	1217.42	1116.8	837.93	596.19	486.8	456.56	486.8	596.19	837.93	1116.8	1217.42	1254.68	1217.42	1116.8	837.93	596.19	486.8	456.56	486.8	596.19	837.93	1116.8	1217.42	1254.68
55	1212.75	1175.95	1070.68	778.94	554.02	453.58	426.83	453.58	554.02	778.94	1070.68	1175.95	1212.75	1175.95	1070.68	778.94	554.02	453.58	426.83	453.58	554.02	778.94	1070.68	1175.95	1212.75
56	1169.83	1133.8	1022.01	723.65	514.96	424.99	400.29	424.99	514.96	723.65	1022.01	1133.8	1169.83	1133.8	1022.01	723.65	514.96	424.99	400.29	424.99	514.96	723.65	1022.01	1133.8	1169.83
57	1126.43	1091.69	971.5	672.03	479.7	398.44	376.52	398.44	479.7	672.03	971.5	1091.69	1126.43	1091.69	971.5	672.03	479.7	398.44	376.52	398.44	479.7	672.03	971.5	1091.69	1126.43
58	1082.42	1048.39	919.41	622.39	447.6	374.24	355.08	374.24	447.6	622.39	919.41	1048.39	1082.42	1048.39	919.41	622.39	447.6	374.24	355.08	374.24	447.6	622.39	919.41	1048.39	1082.42
59	1037.19	1005.12	866.07	576.95	418.43	352.9	335.73	352.9	418.43	576.95	866.07	1005.12	1037.19	1005.12	866.07	576.95	418.43	352.9	335.73	352.9	418.43	576.95	866.07	1005.12	1037.19
60	992.59	961.26	812.24	538.68	391.94	333.4	318.59	333.4	391.94	538.68	812.24	961.26	992.59	961.26	812.24	538.68	391.94	333.4	318.59	333.4	391.94	538.68	812.24	961.26	992.59
61	945.93	916.52	758.25	499.63	367.66	315.81	302.85	315.81	367.66	499.63	758.25	916.52	945.93	916.52	758.25	499.63	367.66	315.81	302.85	315.81	367.66	499.63	758.25	916.52	945.93
62	899.84	871.66	706.44	463.87	345.83	300.23	289.11	300.23	345.83	463.87	706.44	871.66	899.84	871.66	706.44	463.87	345.83	300.23	289.11	300.23	345.83	463.87	706.44	871.66	899.84
63	853.19	827.1	655.97	431.58	325.71	285.71	276.56	285.71	325.71	431.58	655.97	827.1	853.19	827.1	655.97	431.58	325.71	285.71	276.56	285.71	325.71	431.58	655.97	827.1	853.19
64	807.15	782.09	608.23	402.36	307.21	273.03	265.4	273.03	307.21	402.36	608.23	782.09	807.15	782.09	608.23	402.36	307.21	273.03	265.4	273.03	307.21	402.36	608.23	782.09	807.15
65	760.74	736.83	563.02	375.12	290.63	261.53	255.44	261.53	290.63	375.12	563.02	736.83	760.74	736.83	563.02	375.12	290.63	261.53	255.44	261.53	290.63	375.12	563.02	736.83	760.74
66	714.6	692.13	519.46	350.14	275.17	250.66	246.17	250.66	275.17	350.14	519.46	692.13	714.6	692.13	519.46	350.14	275.17	250.66	246.17	250.66	275.17	350.14	519.46	692.13	714.6
67	669.83	648.33	479.47	327.06	261.11	241.33	238.11	241.33	261.11	327.06	479.47	648.33	669.83	648.33	479.47	327.06	261.11	241.33	238.11	241.33	261.11	327.06	479.47	648.33	669.83
68	625.08	604.37	442.12	305.52	248.12	232.61	230.55	232.61	248.12	305.52	442.12	604.37	625.08	604.37	442.12	305.52	248.12	232.61	230.55	232.61	248.12	305.52	442.12	604.37	625.08
69	581.01	560.95	407.52	285.75	236.26	224.49	223.88	224.49	236.26	285.75	407.52	560.95	581.01	560.95	407.52	285.75	236.26	224.49	223.88	224.49	236.26	285.75	407.52	560.95	581.01
70	537.1	517.82	375.03	267.21	225.22	217.2	217.54	217.2	225.22	267.21	375.03	517.82	537.1	517.82	375.03	267.21	225.22	217.2	217.54	217.2	225.22	267.21	375.03	517.82	537.1
71	494	475.88	344.93	249.92	214.94	210.31	211.83	210.31	214.94	249.92	344.93	475.88	494	475.88	344.93	249.92	214.94	210.31	211.83	210.31	214.94	249.92	344.93	475.88	494
72	452.38	434.9	316.9	233.89	205.44	203.95	206.38	203.95	205.44	233.89	316.9	434.9	452.38	434.9	316.9	233.89	205.44	203.95	206.38	203.95	205.44	233.89	316.9	434.9	452.38
73	411.37	395.23	290.6	218.7	196.4	197.95	201.2	197.95	196.4	218.7	290.6	395.23	411.37	395.23	290.6	218.7	196.4	197.95	201.2	197.95	196.4	218.7	290.6	395.23	411.37
74	372.23	357.69	266.04	204.64	188.03	192.33	196.4	192.33	188.03	204.64	266.04	357.69	372.23	357.69	266.04	204.64	188.03	192.33	196.4	192.33	188.03	204.64	266.04	357.69	372.23
75	334.16	321.66	242.98	191.38	180.02	186.85	191.74	186.85	180.02	191.38	242.98	321.66	334.16	321.66	242.98	191.38	180.02	186.85	191.74	186.85	180.02	191.38	242.98	321.66	334.16
76	297.61	287.37	221.23	178.77	172.45	181.67	187.11	181.67	172.45	178.77	221.23	287.37	297.61	287.37	221.23	178.77	172.45	181.67	187.11	181.67	172.45	178.77	221.23	287.37	297.61
77	262.86	255.6	201.11	167.06	165.26	176.54	182.65	176.54	165.26	167.06	201.11	255.6	262.86	255.6	201.11	167.06	165.26	176.54	182.65	176.54	165.26	167.06	201.11	255.6	262.86
78	230.03	225.24	181.91	155.99	158.31	171.53	178.26	171.53	158.31	155.99	181.91	225.24	230.03	225.24	181.91	155.99	158.31	171.53	178.26	171.53	158.31	155.99	181.91	225.24	230.03
79	198.52	196.87	164.23	145.32	151.5	166.6	173.74	166.6	151.5	145.32	164.23	196.87	198.52	196.87	164.23	145.32	151.5	166.6	173.74	166.6	151.5	145.32	164.23	196.87	198.52
80	169	170.43	147.56	135.24	144.95	161.69	169.4	161.69	144.95	147.56	170.43	169	170.43	147.56	135.24	144.95	161.69	169.4	161.69	144.95	135.24	147.56	170.43	169	170.43
81	141.86	146.19	131.69	125.73	138.63	156.65	164.78	156.65	138.63	125.73	131.69	146.19	141.86	146.19	131.69	125.73	138.63	156.65	164.78	156.65	138.63	125.73	131.69	146.19	141.86
82	115.78	123.15	116.92	116.6	132.42	151.58	160.11	151.58	132.42	116.6	116.92	123.15	115.78	123.15	116.92	116.6	132.42	151.58	160.11	151.58	132.42	116.6	116.92	123.15	115.78
83	91.52	101.95	103.55	108.13	126.25	146.59	155.46	146.59	126.25	108.13	103.55	101.95	91.52	101.95	103.55	108.13	126.25	146.59	155.46	146.59	126.25	108.13	103.55	101.95	91.52
84	70.76	83.28	91.02	100.03	120.22	141.53	150.5	141.53	120.22	100.03	91.02	83.28	70.76	83.28	91.02	100.03	120.22	141.53	150.5	141.53	120.22	100.03	91.02	83.28	70.76
85	51.36	67	79.84	92.36	114.36	136.36	145.53	136.36	114.36	92.36	79.84	67	51.36	67	79.84	92.36	114.36	136.36	145.53	136.36	114.36	92.36	79.84	67	51.36
86	34.05	52	69.55	85.15	108.62	131.11	140.53	131.11	108.62	85.15	69.55	52	34.05	52	69.55	85.15	108.62	131.11	140.53	131.11	108.62	85.15	69.55	52	34.05
87	20.33	39.08	60.22	78.38	102.89	125.73	135.08	125.73	102.89	78.38	60.22	39.08	20.33	39.08	60.22	78.38	102.89	125.73	135.08	125.73	102.89	78.38	60.22	39.08	20.33
88	13.08	29	52	72.18	97.43	120.43	129.7	120.43	97.43	72.18	52	29	13.08	29	52	72.18	97.43	120.43	129.7	120.43	97.43	72.18	52	29	13.08
89	5.92	21.31	44.85	66.15	91.93	114.93	124.2	114.93	91.93	66.15	44.85	21.31	5.92	21.31	44.85	66.15	91.93	114.93	124.2	114.93	91.93	66.15	44.85	21.31	5.92
90	1.05	16.12	38.85	60.77	86.48	109.3	118.47	109.3	86.48	60.77	38.85	16.12	1.05	16.12	38.85	60.77	86.48	109.3	118.47	109.3	86.48	60.77	38.85	16.12	1.05
91	0.17	13	33.91	55.77	81.19	103.58	112.61	103.58	81.19	55.77	33.91	13	0.17	13	33.91	55.77	81.19	103.58	112.61	103.58	81.19	55.77	33.91	13	0.17
92	0.19	10.24	29.87	51.09	75.96	97.77	106.6	97.77	75.96	51.09	29.87	10.24	0.19	10.24	29.87	51.09	75.96	97.77	106.6	97.77	75.96	51.09	29.87	10.24	0.19
93	0.24	8.63	26.68	46.93	71	92.19	100.69	92.19	71	46.93	26.68	8.63	0.24	8.63	26.68	46.93	71	92.19	100.69	92.19	71	46.93	26.68	8.63	0.24
94	0.36	7.74	24.08	43.19	66.1	86.61	94.87	86.61	66.1	43.19	24.08	7.74	0.36												

106	3.52	5.75	13.61	23.68	35.27	45.75	50.22	45.75	35.27	23.68	13.61	5.75	3.52	5.75	13.61	23.68	35.27	45.75	50.22	45.75	35.27	23.68	13.61	5.75	3.52
107	3.83	5.7	13.45	23.23	34.4	44.4	48.69	44.4	34.4	23.23	13.45	5.7	3.83	5.7	13.45	23.23	34.4	44.4	48.69	44.4	34.4	23.23	13.45	5.7	3.83
108	4.13	5.65	13.32	22.84	33.62	43.19	47.24	43.19	33.62	22.84	13.32	5.65	4.13	5.65	13.32	22.84	33.62	43.19	47.24	43.19	33.62	22.84	13.32	5.65	4.13
109	4.41	5.6	13.2	22.51	32.93	42.12	45.94	42.12	32.93	22.51	13.2	5.6	4.41	5.6	13.2	22.51	32.93	42.12	45.94	42.12	32.93	22.51	13.2	5.6	4.41
110	4.66	5.55	13.05	22.2	32.34	41.16	44.72	41.16	32.34	22.2	13.05	5.55	4.66	5.55	13.05	22.2	32.34	41.16	44.72	41.16	32.34	22.2	13.05	5.55	4.66
111	4.88	5.51	12.89	21.91	31.85	40.32	43.65	40.32	31.85	21.91	12.89	5.51	4.88	5.51	12.89	21.91	31.85	40.32	43.65	40.32	31.85	21.91	12.89	5.51	4.88
112	5.08	5.48	12.73	21.63	31.45	39.62	42.79	39.62	31.45	21.63	12.73	5.48	5.08	5.48	12.73	21.63	31.45	39.62	42.79	39.62	31.45	21.63	12.73	5.48	5.08
113	5.31	5.46	12.58	21.32	31.12	39.06	42.1	39.06	31.12	21.32	12.58	5.46	5.31	5.46	12.58	21.32	31.12	39.06	42.1	39.06	31.12	21.32	12.58	5.46	5.31
114	5.54	5.44	12.45	20.97	30.8	38.59	41.57	38.59	30.8	20.97	12.45	5.44	5.54	5.44	12.45	20.97	30.8	38.59	41.57	38.59	30.8	20.97	12.45	5.44	5.54
115	5.78	5.44	12.32	20.64	30.47	38.1	41.13	38.1	30.47	20.64	12.32	5.44	5.78	5.44	12.32	20.64	30.47	38.1	41.13	38.1	30.47	20.64	12.32	5.44	5.78
116	6.01	5.44	12.19	20.42	30.1	37.53	40.64	37.53	30.1	20.42	12.19	5.44	6.01	5.44	12.19	20.42	30.1	37.53	40.64	37.53	30.1	20.42	12.19	5.44	6.01
117	6.25	5.46	12.06	20.28	29.72	36.9	39.98	36.9	29.72	20.28	12.06	5.46	6.25	5.46	12.06	20.28	29.72	36.9	39.98	36.9	29.72	20.28	12.06	5.46	6.25
118	6.47	5.48	11.92	20.1	29.29	36.19	39.12	36.19	29.29	20.1	11.92	5.48	6.47	5.48	11.92	20.1	29.29	36.19	39.12	36.19	29.29	20.1	11.92	5.48	6.47
119	6.67	5.51	11.76	19.92	28.8	35.45	38.15	35.45	28.8	19.92	11.76	5.51	6.67	5.51	11.76	19.92	28.8	35.45	38.15	35.45	28.8	19.92	11.76	5.51	6.67
120	6.86	5.55	11.6	19.69	28.28	34.68	37.16	34.68	28.28	19.69	11.6	5.55	6.86	5.55	11.6	19.69	28.28	34.68	37.16	34.68	28.28	19.69	11.6	5.55	6.86
121	7.03	5.6	11.42	19.39	27.72	33.85	36.16	33.85	27.72	19.39	11.42	5.6	7.03	5.6	11.42	19.39	27.72	33.85	36.16	33.85	27.72	19.39	11.42	5.6	7.03
122	7.22	5.66	11.24	19.08	27.1	33.01	35.16	33.01	27.1	19.08	11.24	5.66	7.22	5.66	11.24	19.08	27.1	33.01	35.16	33.01	27.1	19.08	11.24	5.66	7.22
123	7.39	5.72	11.06	18.78	26.45	32.15	34.21	32.15	26.45	18.78	11.06	5.72	7.39	5.72	11.06	18.78	26.45	32.15	34.21	32.15	26.45	18.78	11.06	5.72	7.39
124	7.56	5.79	10.89	18.43	25.71	31.27	33.23	31.27	25.71	18.43	10.89	5.79	7.56	5.79	10.89	18.43	25.71	31.27	33.23	31.27	25.71	18.43	10.89	5.79	7.56
125	7.72	5.87	10.71	18.05	24.93	30.39	32.23	30.39	24.93	18.05	10.71	5.87	7.72	5.87	10.71	18.05	24.93	30.39	32.23	30.39	24.93	18.05	10.71	5.87	7.72
126	7.92	5.94	10.54	17.65	24.24	29.51	31.26	29.51	24.24	17.65	10.54	5.94	7.92	5.94	10.54	17.65	24.24	29.51	31.26	29.51	24.24	17.65	10.54	5.94	7.92
127	8.13	6.02	10.37	17.24	23.59	28.62	30.27	28.62	23.59	17.24	10.37	6.02	8.13	6.02	10.37	17.24	23.59	28.62	30.27	28.62	23.59	17.24	10.37	6.02	8.13
128	8.31	6.1	10.19	16.82	22.95	27.71	29.29	27.71	22.95	16.82	10.19	6.1	8.31	6.1	10.19	16.82	22.95	27.71	29.29	27.71	22.95	16.82	10.19	6.1	8.31
129	8.51	6.18	10.01	16.39	22.3	26.79	28.3	26.79	22.3	16.39	10.01	6.18	8.51	6.18	10.01	16.39	22.3	26.79	28.3	26.79	22.3	16.39	10.01	6.18	8.51
130	8.71	6.27	9.84	15.97	21.64	25.9	27.32	25.9	21.64	15.97	9.84	6.27	8.71	6.27	9.84	15.97	21.64	25.9	27.32	25.9	21.64	15.97	9.84	6.27	8.71
131	8.88	6.35	9.67	15.54	20.99	25.01	26.37	25.01	20.99	15.54	9.67	6.35	8.88	6.35	9.67	15.54	20.99	25.01	26.37	25.01	20.99	15.54	9.67	6.35	8.88
132	9.04	6.45	9.51	15.12	20.3	24.15	25.42	24.15	20.3	15.12	9.51	6.45	9.04	6.45	9.51	15.12	20.3	24.15	25.42	24.15	20.3	15.12	9.51	6.45	9.04
133	9.19	6.57	9.38	14.69	19.6	23.34	24.52	23.34	19.6	14.69	9.38	6.57	9.19	6.57	9.38	14.69	19.6	23.34	24.52	23.34	19.6	14.69	9.38	6.57	9.19
134	9.32	6.69	9.26	14.28	18.94	22.56	23.69	22.56	18.94	14.28	9.26	6.69	9.32	6.69	9.26	14.28	18.94	22.56	23.69	22.56	18.94	14.28	9.26	6.69	9.32
135	9.44	6.83	9.15	13.88	18.32	21.79	22.88	21.79	18.32	13.88	9.15	6.83	9.44	6.83	9.15	13.88	18.32	21.79	22.88	21.79	18.32	13.88	9.15	6.83	9.44
136	9.56	6.96	9.04	13.52	17.76	21.03	22.12	21.03	17.76	13.52	9.04	6.96	9.56	6.96	9.04	13.52	17.76	21.03	22.12	21.03	17.76	13.52	9.04	6.96	9.56
137	9.67	7.11	8.96	13.16	17.24	20.27	21.4	20.27	17.24	13.16	8.96	7.11	9.67	7.11	8.96	13.16	17.24	20.27	21.4	20.27	17.24	13.16	8.96	7.11	9.67
138	9.79	7.3	8.89	12.82	16.73	19.54	20.69	19.54	16.73	12.82	8.89	7.3	9.79	7.3	8.89	12.82	16.73	19.54	20.69	19.54	16.73	12.82	8.89	7.3	9.79
139	9.92	7.52	8.83	12.49	16.22	18.88	20.03	18.88	16.22	12.49	8.83	7.52	9.92	7.52	8.83	12.49	16.22	18.88	20.03	18.88	16.22	12.49	8.83	7.52	9.92
140	10.05	7.74	8.78	12.18	15.72	18.26	19.36	18.26	15.72	12.18	8.78	7.74	10.05	7.74	8.78	12.18	15.72	18.26	19.36	18.26	15.72	12.18	8.78	7.74	10.05
141	10.17	7.97	8.74	11.87	15.24	17.69	18.74	17.69	15.24	11.87	8.74	7.97	10.17	7.97	8.74	11.87	15.24	17.69	18.74	17.69	15.24	11.87	8.74	7.97	10.17
142	10.29	8.23	8.71	11.58	14.78	17.14	18.12	17.14	14.78	11.58	8.71	8.23	10.29	8.23	8.71	11.58	14.78	17.14	18.12	17.14	14.78	11.58	8.71	8.23	10.29
143	10.39	8.55	8.68	11.31	14.32	16.6	17.51	16.6	14.32	11.31	8.68	8.55	10.39	8.55	8.68	11.31	14.32	16.6	17.51	16.6	14.32	11.31	8.68	8.55	10.39
144	10.47	9.04	8.65	11.06	13.87	16.09	16.95	16.09	13.87	11.06	8.65	9.04	10.47	9.04	8.65	11.06	13.87	16.09	16.95	16.09	13.87	11.06	8.65	9.04	10.47
145	10.54	9.59	8.63	10.83	13.45	15.58	16.37	15.58	13.45	10.83	8.63	9.59	10.54	9.59	8.63	10.83	13.45	15.58	16.37	15.58	13.45	10.83	8.63	9.59	10.54
146	10.59	10.11	8.62	10.61	13.04	15.07	15.84	15.07	13.04	10.61	8.62	10.11	10.59	10.11	8.62	10.61	13.04	15.07	15.84	15.07	13.04	10.61	8.62	10.11	10.59
147	10.62	10.54	8.62	10.41	12.68	14.58	15.33	14.58	12.68	10.41	8.62	10.54	10.62	10.54	8.62	10.41	12.68	14.58	15.33	14.58	12.68	10.41	8.62	10.54	10.62
148	10.66	10.92	8.61	10.22	12.35	14.09	14.79	14.09	12.35	10.22	8.61	10.92	10.66	10.92	8.61	10.22	12.35	14.09	14.79	14.09	12.35	10.22	8.61	10.92	10.66
149	10.72	11.25	8.59	10.06	12.01	13.63	14.31	13.63	12.01	10.06	8.59	11.25	10.72	11.25	8.59	10.06	12.01	13.63	14.31	13.63	12.01	10.06	8.59	11.25	10.72
150	10.79	11.55	8.6	9.94	11.7	13.19	13.85	13.19	11.7	9.94	8.6	11.55	10.79	11.55	8.6	9.94	11.7	13.19	13.85	13.19	11.7	9.94	8.6	11.55	10.79
151	10.8	11.82	8.65	9.81	11.4	12.78	13.4	12.78	11.4	9.81	8.65	11.82	10.8	11.82	8.65	9.81	11.4	12.78	13.4	12.78	11.4	9.81	8.65	11.82	10.8
152	10.78	11.99	8.69	9.71	11.12	12.4	13	12.4	11.12	9.71	8.69	11.99	10.78	11.99	8.69	9.71	11.12	12.4	13	12.4	11.12	9.71	8.69	11.99	10.78
153	10.73	12.09	8.73	9.59	10.89	12.03	12.61	12.03	10.89	9.59	8.73	12.09	10.73	12.09	8.73	9.59	10.89	12.03	12.61	12.03	10.89	9.59	8.73	12.09	10.73
154	10.7	12.29	8.83																						



161	10.7	11.99	11.77	9.29	9.59	10.15	10.48	10.15	9.59	9.29	11.77	11.99	10.7	11.99	11.77	9.29	9.59	10.15	10.48	10.15	9.59	9.29	11.77	11.99	10.7
162	10.66	11.81	12.02	9.63	9.47	10.01	10.32	10.01	9.47	9.63	12.02	11.81	10.66	11.81	12.02	9.63	9.47	10.01	10.32	10.01	9.47	9.63	12.02	11.81	10.66
163	10.61	11.49	12.29	10.03	9.46	9.86	10.17	9.86	9.46	10.03	12.29	11.49	10.61	11.49	12.29	10.03	9.46	9.86	10.17	9.86	9.46	10.03	12.29	11.49	10.61
164	10.55	11.4	12.47	10.59	9.53	9.76	10.04	9.76	9.53	10.59	12.47	11.4	10.55	11.4	12.47	10.59	9.53	9.76	10.04	9.76	9.53	10.59	12.47	11.4	10.55
165	10.46	11.32	12.5	11.26	9.78	9.71	10.01	9.71	9.78	11.26	12.5	11.32	10.46	11.32	12.5	11.26	9.78	9.71	10.01	9.71	9.78	11.26	12.5	11.32	10.46
166	10.36	11.25	12.52	11.9	10.23	9.77	10.02	9.77	10.23	11.9	12.52	11.25	10.36	11.25	12.52	11.9	10.23	9.77	10.02	9.77	10.23	11.9	12.52	11.25	10.36
167	10.25	11.15	12.48	12.25	10.84	10.14	10.2	10.14	10.84	12.25	12.48	11.15	10.25	11.15	12.48	12.25	10.84	10.14	10.2	10.14	10.84	12.25	12.48	11.15	10.25
168	10.3	11.13	12.45	12.54	11.58	10.64	10.57	10.64	11.58	12.54	12.45	11.13	10.3	11.13	12.45	12.54	11.58	10.64	10.57	10.64	11.58	12.54	12.45	11.13	10.3
169	10.55	11.19	12.52	12.82	12.16	11.5	11.39	11.5	12.16	12.82	12.52	11.19	10.55	11.19	12.52	12.82	12.16	11.5	11.39	11.5	12.16	12.82	12.52	11.19	10.55
170	10.86	11.32	12.69	13.11	12.6	12.22	12.8	12.22	12.6	13.11	12.69	11.32	10.86	11.32	12.69	13.11	12.6	12.22	12.8	12.22	12.6	13.11	12.69	11.32	10.86
171	11.23	11.48	12.61	13.37	12.92	12.62	13.85	12.62	12.92	13.37	12.61	11.48	11.23	11.48	12.61	13.37	12.92	12.62	13.85	12.62	12.92	13.37	12.61	11.48	11.23
172	11.58	11.68	12.52	13.41	13.11	12.73	14.7	12.73	13.11	13.41	12.52	11.68	11.58	11.68	12.52	13.41	13.11	12.73	14.7	12.73	13.11	13.41	12.52	11.68	11.58
173	11.87	11.88	12.43	13.25	13.31	12.86	15.47	12.86	13.31	13.25	12.43	11.88	11.87	11.88	12.43	13.25	13.31	12.86	15.47	12.86	13.31	13.25	12.43	11.88	11.87
174	12.04	12.11	12.37	12.8	13.2	12.94	14.26	12.94	13.2	12.8	12.37	12.11	12.04	12.11	12.37	12.8	13.2	12.94	14.26	12.94	13.2	12.8	12.37	12.11	12.04
175	12.27	12.31	12.3	12.66	13.04	12.74	13.42	12.74	13.04	12.66	12.3	12.31	12.27	12.31	12.3	12.66	13.04	12.74	13.42	12.74	13.04	12.66	12.3	12.31	12.27
176	12.63	12.53	12.58	12.6	12.68	12.18	11.52	12.18	12.68	12.6	12.58	12.53	12.63	12.53	12.58	12.6	12.68	12.18	11.52	12.18	12.68	12.6	12.58	12.53	12.63
177	13.02	12.84	12.71	12.78	12.39	11.46	9.65	11.46	12.39	12.78	12.71	12.84	13.02	12.84	12.71	12.78	12.39	11.46	9.65	11.46	12.39	12.78	12.71	12.84	13.02
178	13.19	13.05	12.85	12.72	12.1	10.81	8.37	10.81	12.1	12.72	12.85	13.05	13.19	13.05	12.85	12.72	12.1	10.81	8.37	10.81	12.1	12.72	12.85	13.05	13.19
179	13.11	12.97	12.66	12.28	11.66	9.78	5.92	9.78	11.66	12.28	12.66	12.97	13.11	12.97	12.66	12.28	11.66	9.78	5.92	9.78	11.66	12.28	12.66	12.97	13.11
180	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.04	13.04

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	CS4 @100% Power /5000K	Sample ID.	AA1
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
120.05	60	0.304	36.4	0.996	5.83%
277.05	60	0.133	35.8	0.971	11.45%

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*****