

Photometric Test Report

Relevant Standards

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

Prepared For

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Report Number

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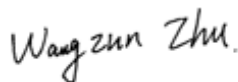
Test Date

2023/10/23

Issue Date

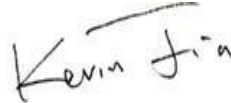
2023/10/24

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		5316
Lumen/ft (Goniophotometer - Section 4.2)	IES LM-79-2008	≥375		1329
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 115	Premium 130	145.6
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		36.5
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	5.67%
		20.00%	277V	11.65%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.997
		0.9	277V	0.970
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3465±245	3477
		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		12
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%		97.37%
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≥40%		82.34%
Zonal Lumen Requirement (20°-50°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≥30%		54.08%
Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	<22 <25		24.7
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		0.134
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		36.5
(Goniophotometer - Section 4.2)		Non-Wrost Case		35.9

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023/10/23	CS4 @100% Power /3500K	Y1
2	Goniophotometer Test	2023/10/23	CS4 @100% Power /3500K	Y1
3	THD and PF Test	2023/10/23	CS4 @100% Power /3500K	Y1

Remark(If any)

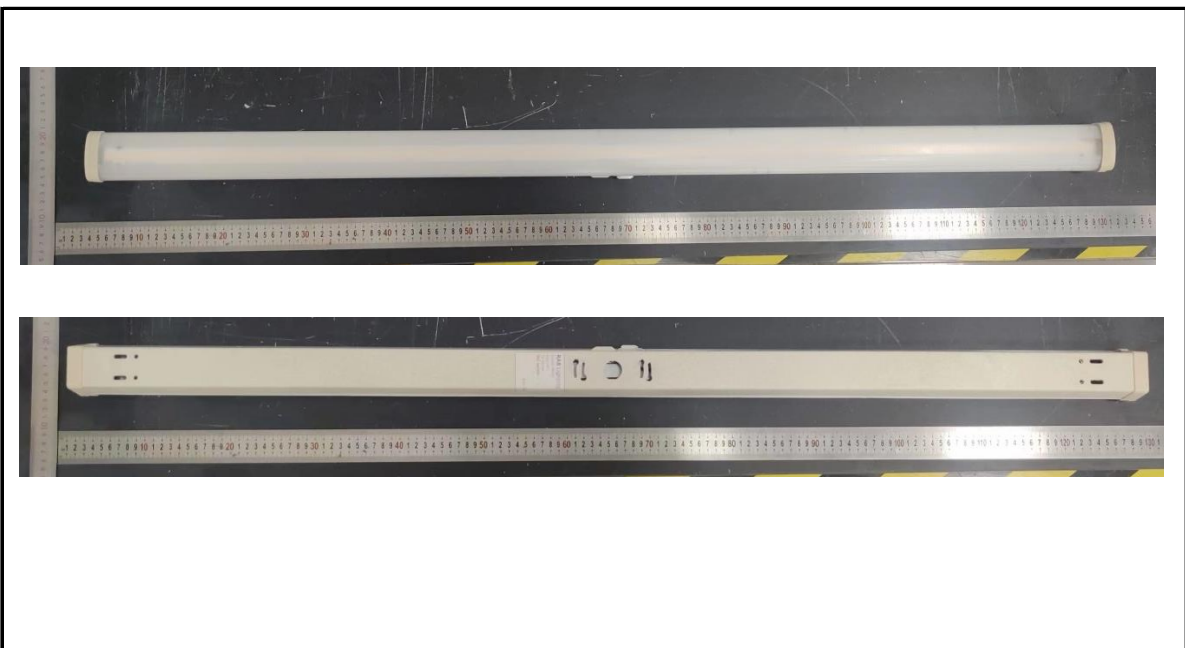
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3.0 Production Description

Luminaire Description: CS4 @100% 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 @100% Power /3500K	Sample ID.	Y1
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

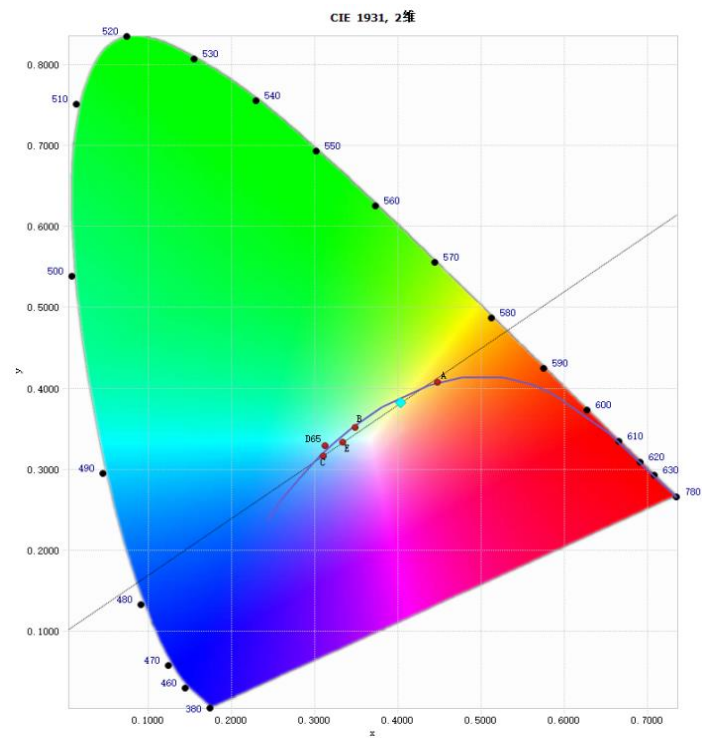
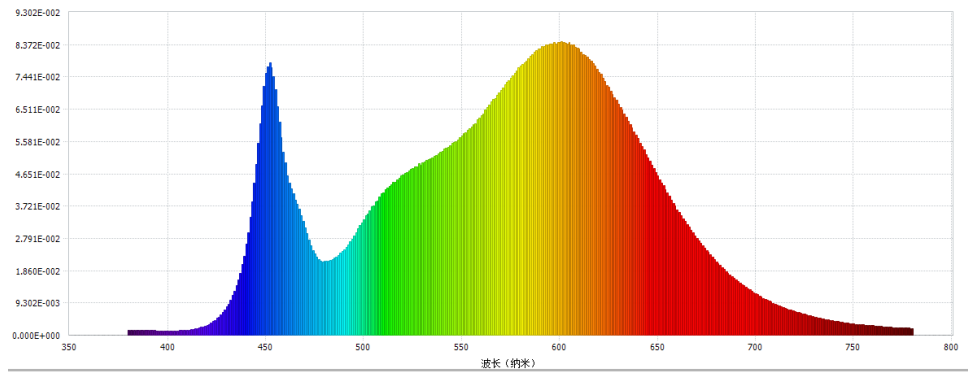
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.02	60	0.305	36.5	0.997
277.05	60	0.134	35.9	0.970

Test Result

CCT (K)	CRI	R9	Duv
3477	84	12	-0.0033

Rf	Rg	IES Rcs,h1
84	96	-12%

4.1 Integrating Sphere Test



4.1 Integrating Sphere Test

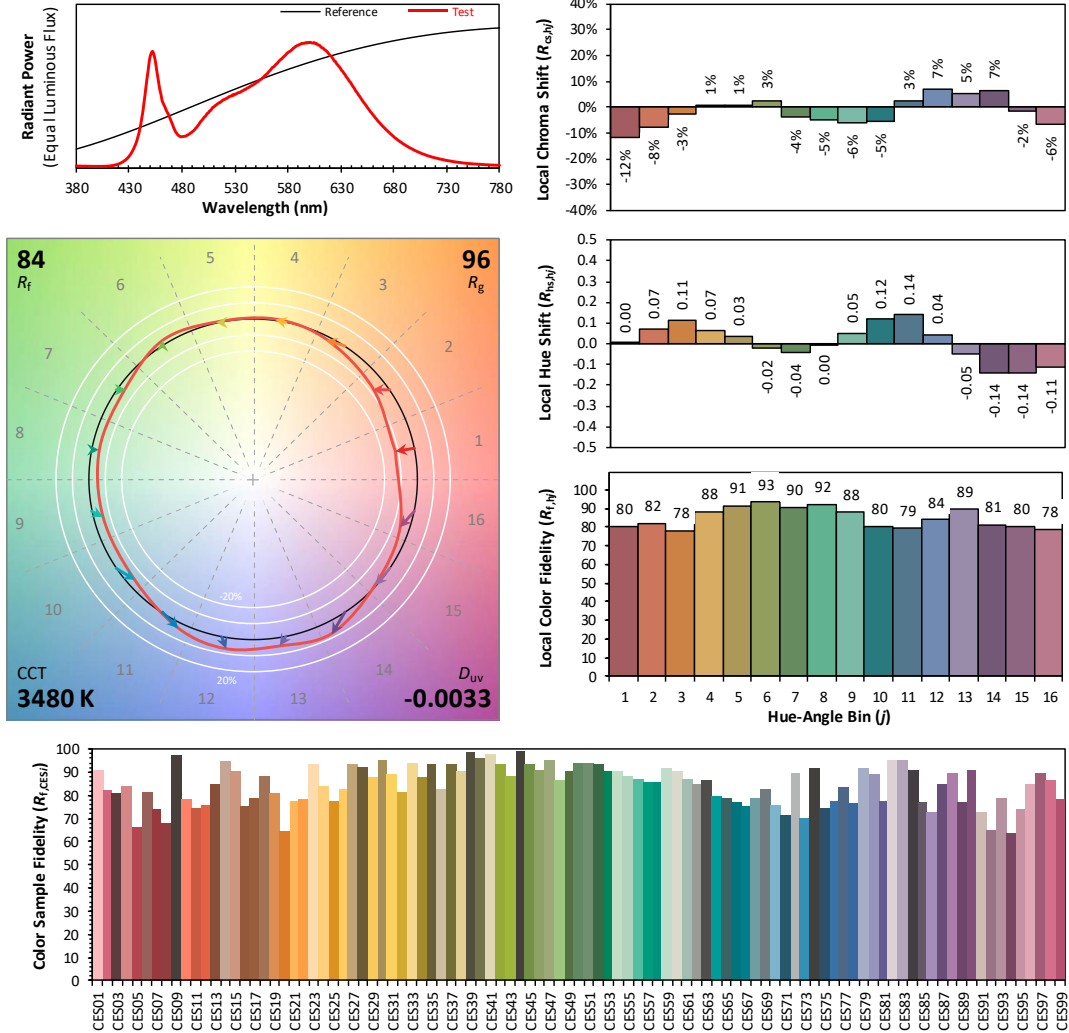
IES TM-30-18 Color Rendition Report

Source: DLF2310103-25a

Manufacturer: RAB Lighting Inc.

Date: 2023/10/23

Model: CS4 @100% Power /3500K



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

x 0.4030
 y 0.3820
 u' 0.2378
 v' 0.5072

CIE 13.3-1995
(CRI)

R_a 85
 R_g 16

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	1.52E-03	485	2.22E-02	590	8.26E-02	695	1.38E-02
385	1.38E-03	490	2.47E-02	595	8.39E-02	700	1.19E-02
390	1.35E-03	495	2.87E-02	600	8.43E-02	705	1.04E-02
395	1.27E-03	500	3.33E-02	605	8.43E-02	710	8.98E-03
400	1.21E-03	505	3.73E-02	610	8.24E-02	715	7.81E-03
405	1.26E-03	510	4.10E-02	615	7.94E-02	720	6.83E-03
410	1.43E-03	515	4.40E-02	620	7.57E-02	725	6.01E-03
415	1.87E-03	520	4.61E-02	625	7.15E-02	730	5.25E-03
420	2.87E-03	525	4.81E-02	630	6.66E-02	735	4.64E-03
425	4.83E-03	530	4.98E-02	635	6.16E-02	740	4.09E-03
430	8.13E-03	535	5.10E-02	640	5.67E-02	745	3.59E-03
435	1.44E-02	540	5.29E-02	645	5.11E-02	750	3.23E-03
440	2.62E-02	545	5.52E-02	650	4.59E-02	755	2.93E-03
445	4.93E-02	550	5.74E-02	655	4.09E-02	760	2.70E-03
450	7.54E-02	555	5.99E-02	660	3.62E-02	765	2.46E-03
455	7.07E-02	560	6.32E-02	665	3.18E-02	770	2.21E-03
460	4.97E-02	565	6.74E-02	670	2.79E-02	775	2.09E-03
465	3.89E-02	570	7.05E-02	675	2.44E-02	780	1.97E-03
470	3.10E-02	575	7.41E-02	680	2.12E-02		
475	2.34E-02	580	7.76E-02	685	1.84E-02		
480	2.13E-02	585	8.04E-02	690	1.60E-02		

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	CS4 @100% Power /3500K	Sample ID.	Y1
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	120.10	60	0.305	36.5	0.997
NON-WROST CASE	277.04	60	0.134	35.9	0.970

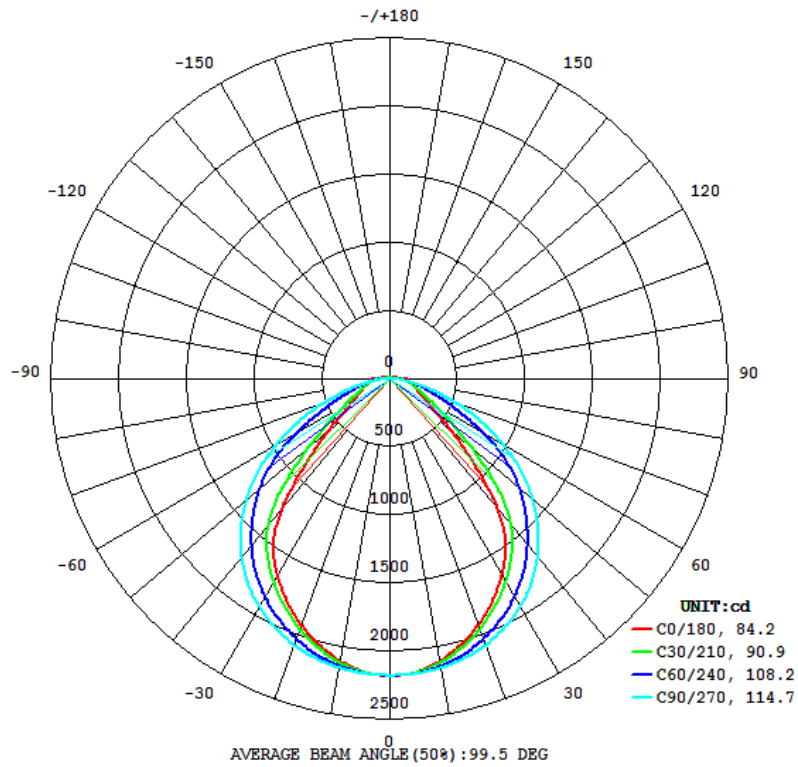
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
5316	138.0	156.5	84.2	114.7	145.6

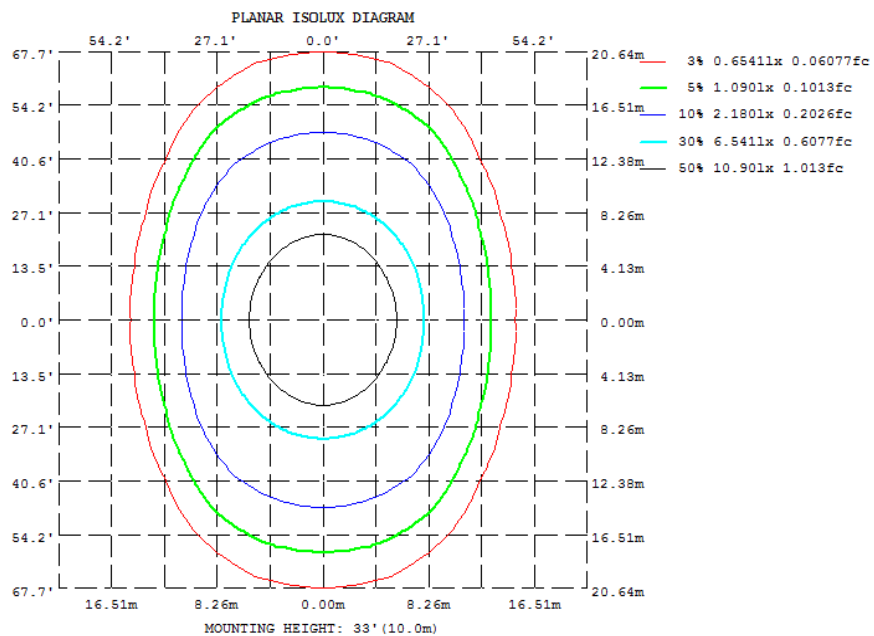
Zonal Lumen Requirement (0°-90°)	Zonal Lumen Requirement (0°-60°)	BUG rating	UGR (X=4H, Y=8H, 70/50/20%)
97.37%	82.34%	B2-U3-G1	24.7
Zonal Lumen Requirement (20°-50°)	Length(ft)	Lumen/ft	
54.08%	4	1329	

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	2106	2129	2154	2129	2106	2129	2154	2129
20	1920	1989	2076	1989	1920	1989	2076	1989
30	1664	1778	1931	1778	1664	1778	1931	1778
40	1239	1497	1703	1497	1239	1497	1703	1497
50	597.7	1064	1383	1064	597.7	1064	1383	1064
60	310.9	527.3	971.9	527.3	310.9	527.3	971.9	527.3
70	212.0	261.6	528.0	261.6	212.0	261.6	528.0	261.6
80	165.5	132.5	166.9	132.5	165.5	132.5	166.9	132.5
90	116.7	59.91	1.106	59.91	116.7	59.91	1.106	59.91
100	65.68	28.39	1.800	28.39	65.68	28.39	1.800	28.39
110	43.69	21.70	4.421	21.70	43.69	21.70	4.421	21.70
120	36.18	19.33	6.755	19.33	36.18	19.33	6.755	19.33
130	26.62	15.60	8.781	15.60	26.62	15.60	8.781	15.60
140	18.83	11.88	10.12	11.88	18.83	11.88	10.12	11.88
150	13.43	9.641	10.73	9.641	13.43	9.641	10.73	9.641
160	10.30	8.918	10.36	8.918	10.30	8.918	10.36	8.918
170	13.09	12.96	10.73	12.96	13.09	12.96	10.73	12.96
180	6.821	11.72	12.83	11.72	6.821	11.72	12.83	11.72
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	22.5	24.0	23.0	24.4	24.8	16.7	18.2	17.1	18.6	19.0
	3H	23.8	25.2	24.3	25.6	26.0	18.2	19.6	18.7	20.0	20.4
	4H	24.2	25.4	24.6	25.8	26.3	19.1	20.4	19.6	20.8	21.2
	6H	24.3	25.5	24.8	25.9	26.4	20.2	21.3	20.7	21.8	22.2
	8H	24.3	25.4	24.8	25.9	26.4	20.8	21.9	21.3	22.3	22.8
	12H	24.3	25.4	24.8	25.8	26.3	21.5	22.5	22.0	23.0	23.5
4H	2H	22.6	23.8	23.0	24.2	24.7	17.5	18.8	18.0	19.2	19.6
	3H	24.0	25.0	24.5	25.5	26.0	19.2	20.2	19.6	20.7	21.1
	4H	24.4	25.4	24.9	25.8	26.4	20.1	21.1	20.6	21.5	22.0
	6H	24.7	25.5	25.2	26.0	26.5	21.3	22.1	21.8	22.6	23.1
	8H	24.7	25.5	25.2	26.0	26.5	22.0	22.7	22.5	23.2	23.8
	12H	24.7	25.4	25.3	26.0	26.5	22.8	23.5	23.3	24.0	24.5
8H	4H	24.4	25.2	24.9	25.7	26.2	20.4	21.2	21.0	21.7	22.3
	6H	24.7	25.4	25.3	25.9	26.5	21.7	22.4	22.3	22.9	23.5
	8H	24.8	25.4	25.4	26.0	26.5	22.5	23.1	23.1	23.6	24.2
	12H	24.9	25.4	25.4	25.9	26.5	23.5	24.0	24.0	24.5	25.1
12H	4H	24.4	25.1	25.0	25.6	26.2	20.5	21.2	21.0	21.7	22.2
	6H	24.8	25.3	25.3	25.8	26.5	21.8	22.4	22.4	22.9	23.5
	8H	24.9	25.4	25.4	25.9	26.5	22.6	23.1	23.2	23.7	24.3
Maximum UGR = 26.5											

4.2 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	205.61	0 - 10	205.61	3.87%
10-20	584.05	0 - 20	789.66	14.86%
20-30	874.52	0 - 30	1664.18	31.31%
30-40	1032.58	0 - 40	2696.76	50.73%
40-50	967.66	0 - 50	3664.42	68.94%
50-60	712.56	0 - 60	4376.98	82.34%
60-70	447.20	0 - 70	4824.18	90.75%
70-80	243.06	0 - 80	5067.24	95.33%
80-90	108.68	0 - 90	5175.92	97.37%
90-100	47.59	0 - 100	5223.51	98.27%
100-110	27.50	0 - 110	5251.01	98.78%
110-120	21.12	0 - 120	5272.13	99.18%
120-130	16.10	0 - 130	5288.23	99.48%
130-140	10.97	0 - 140	5299.20	99.69%
140-150	7.40	0 - 150	5306.60	99.83%
150-160	4.88	0 - 160	5311.48	99.92%
160-170	3.04	0 - 170	5314.52	99.98%
170-180	1.18	0 - 180	5315.70	100.00%

4.2 Goniophotometer Test

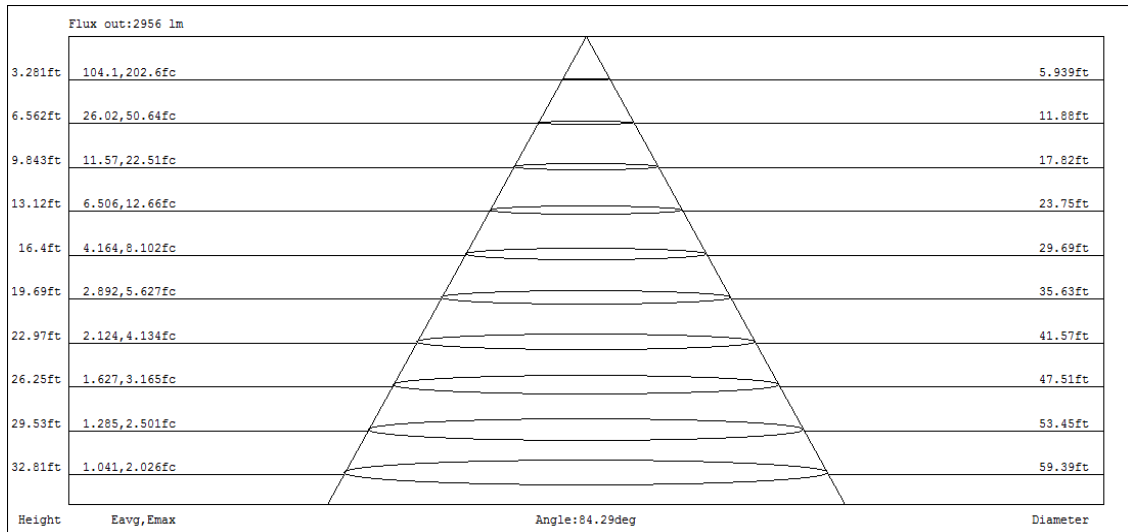
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 0.20

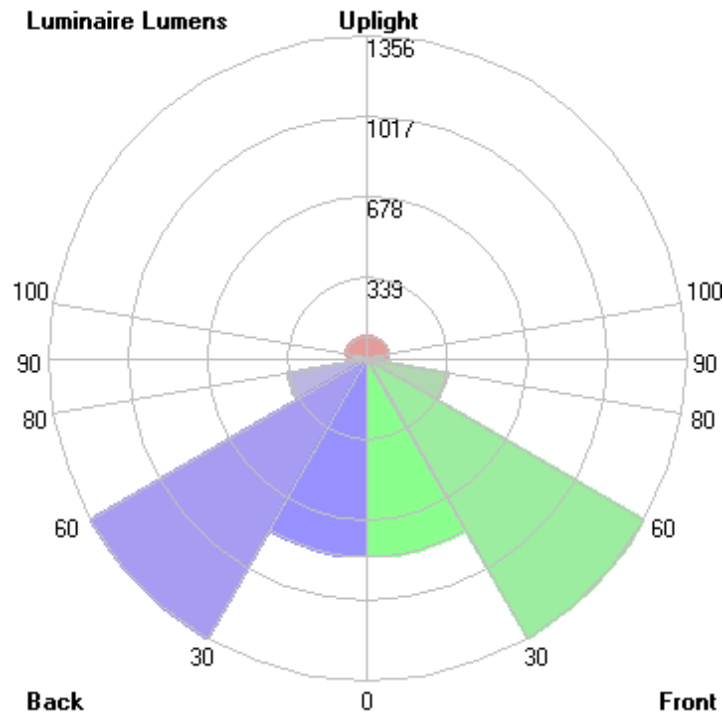
RC	80				70				50			30			10			0
R/W	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	118	118	118	118	115	115	115	115	110	110	110	104	104	104	100	100	100	97
1	109	104	101	97	106	102	98	95	97	94	92	93	91	88	89	87	85	83
2	100	92	86	81	97	90	84	79	86	81	77	83	79	75	79	76	73	71
3	92	82	74	68	89	80	73	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	38	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	42	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



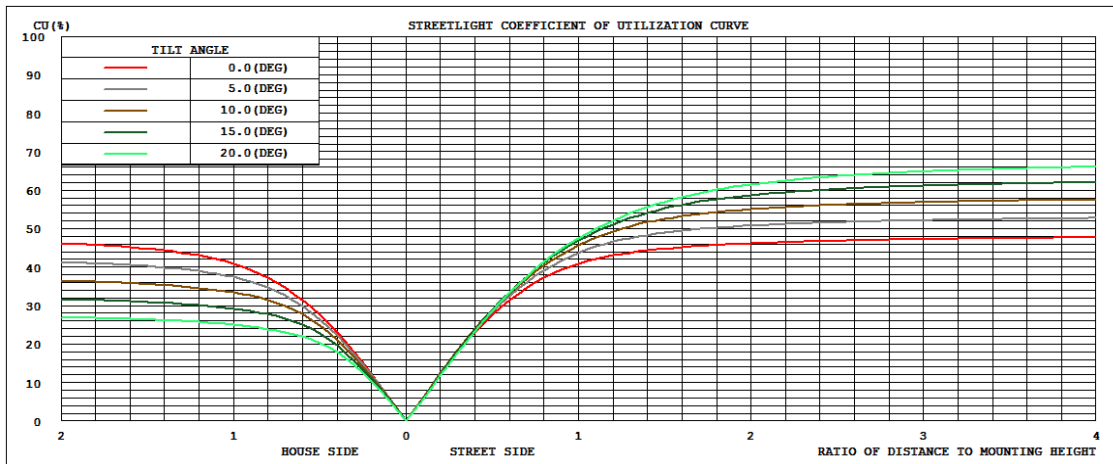
4.2 Goniophotometer Test

LCS/BUG

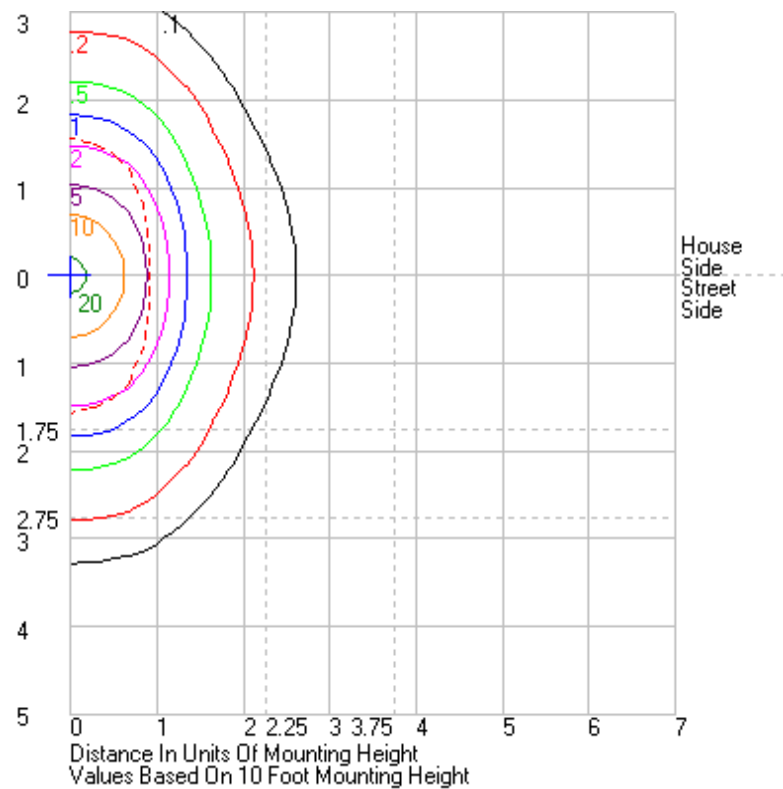


	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	832.1	N.A.	15.7
FM - Front-Medium (30-60)	1356.4	N.A.	25.5
FH - Front-High (60-80)	345.1	N.A.	6.5
FVH - Front-Very High (80-90)	54.3	N.A.	1.0
BL - Back-Low (0-30)	832.1	N.A.	15.7
BM - Back-Medium (30-60)	1356.4	N.A.	25.5
BH - Back-High (60-80)	345.1	N.A.	6.5
BVH - Back-Very High (80-90)	54.3	N.A.	1.0
UL - Uplight-Low (90-100)	47.6	N.A.	0.9
UH - Uplight-High (100-180)	92.2	N.A.	1.7
Total	5315.6	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	2178.64	2178.64	2178.64	2178.64	2178.64	2178.64	2178.64	2178.64	2178.64	2178.64	2178.64	2178.64	2178.64	2178.64	2178.64	2178.64	2178.64	2178.64	2178.64	2178.64	2178.64	2178.64	2178.64	2178.64	2178.64
1	2177.13	2178.4	2178.64	2177.81	2178	2178.54	2179.69	2178.54	2178	2177.81	2178.64	2178.4	2177.13	2178.4	2178.64	2177.81	2178	2178.54	2179.69	2178.54	2178	2177.81	2178.64	2178.4	2177.13
2	2176.64	2177.56	2177.26	2176.38	2176.11	2176.22	2177.18	2176.22	2176.11	2176.38	2177.26	2177.56	2176.64	2177.56	2177.26	2176.38	2176.11	2176.22	2177.18	2176.22	2176.11	2176.38	2177.26	2177.56	2176.64
3	2175.22	2175.76	2175.75	2173.67	2172.89	2172.5	2173.46	2172.5	2172.89	2173.67	2175.75	2175.76	2175.22	2175.76	2175.75	2173.67	2172.89	2172.5	2173.46	2172.5	2172.89	2173.67	2175.75	2175.76	2175.22
4	2173.49	2173.66	2172.8	2170.05	2168.78	2167.58	2168.34	2167.58	2168.78	2170.05	2172.8	2173.66	2173.49	2173.66	2172.8	2170.05	2168.78	2167.58	2168.34	2167.58	2168.78	2170.05	2172.8	2173.66	2173.49
5	2171.73	2171.11	2169.26	2166.03	2163.38	2161.25	2160.91	2161.25	2163.38	2166.03	2169.26	2171.11	2171.73	2171.11	2169.26	2166.03	2163.38	2161.25	2160.91	2161.25	2163.38	2166.03	2169.26	2171.11	2171.73
6	2168.94	2167.8	2165.37	2160.45	2156	2153.2	2152.41	2153.2	2156	2160.45	2165.37	2167.8	2168.94	2167.8	2165.37	2160.45	2156	2153.2	2152.41	2153.2	2156	2160.45	2165.37	2167.8	2168.94
7	2165.62	2164.51	2160.68	2153.76	2148.26	2143.95	2143.23	2143.95	2148.26	2153.76	2160.68	2164.51	2165.62	2164.51	2160.68	2153.76	2148.26	2143.95	2143.23	2143.95	2148.26	2153.76	2160.68	2164.51	2165.62
8	2162.21	2160.81	2154.97	2146.45	2139.04	2133.91	2132.62	2133.91	2139.04	2146.45	2154.97	2160.81	2162.21	2160.81	2154.97	2146.45	2139.04	2133.91	2132.62	2133.91	2139.04	2146.45	2154.97	2160.81	2162.21
9	2158.17	2155.61	2148.82	2138.08	2128.99	2122.21	2119.8	2122.21	2128.99	2138.08	2148.82	2155.61	2158.17	2155.61	2148.82	2138.08	2128.99	2122.21	2119.8	2122.21	2128.99	2138.08	2148.82	2155.61	2158.17
10	2153.73	2150.35	2141.6	2129.26	2117.5	2108.96	2106.21	2108.96	2117.5	2129.26	2141.6	2150.35	2153.73	2150.35	2141.6	2129.26	2117.5	2108.96	2106.21	2108.96	2117.5	2129.26	2141.6	2150.35	2153.73
11	2148.7	2144.17	2133.64	2118.92	2104.87	2094.84	2091.67	2094.84	2104.87	2118.92	2133.64	2144.17	2148.7	2144.17	2133.64	2118.92	2104.87	2094.84	2091.67	2094.84	2104.87	2118.92	2133.64	2144.17	2148.7
12	2142.55	2137.8	2125.14	2107.88	2091.1	2079.59	2076.09	2079.59	2091.1	2107.88	2125.14	2137.8	2142.55	2137.8	2125.14	2107.88	2091.1	2079.59	2076.09	2079.59	2091.1	2107.88	2125.14	2137.8	2142.55
13	2136.49	2130.61	2115.84	2096.27	2077.02	2063.83	2059.37	2063.83	2077.02	2096.27	2115.84	2130.61	2136.49	2130.61	2115.84	2096.27	2077.02	2063.83	2059.37	2063.83	2077.02	2096.27	2115.84	2130.61	2136.49
14	2129.35	2122.58	2105.34	2082.83	2061.22	2046.58	2041.73	2046.58	2061.22	2082.83	2105.34	2122.58	2129.35	2122.58	2105.34	2082.83	2061.22	2046.58	2041.73	2046.58	2061.22	2082.83	2105.34	2122.58	2129.35
15	2121.96	2114.79	2095.09	2069.46	2045.54	2028.74	2023.28	2028.74	2045.54	2069.46	2095.09	2114.79	2121.96	2114.79	2095.09	2069.46	2045.54	2028.74	2023.28	2028.74	2045.54	2069.46	2095.09	2114.79	2121.96
16	2113.67	2105.66	2082.88	2054.84	2028.54	2010.11	2004.07	2010.11	2028.54	2054.84	2082.88	2105.66	2113.67	2105.66	2082.88	2054.84	2028.54	2010.11	2004.07	2010.11	2028.54	2054.84	2082.88	2105.66	2113.67
17	2105.38	2095.71	2070.71	2039.39	2010.31	1990.61	1984.28	1990.61	2010.31	2039.39	2070.71	2095.71	2105.38	2095.71	2070.71	2039.39	2010.31	1990.61	1984.28	1990.61	2010.31	2039.39	2070.71	2095.71	2105.38
18	2096.1	2085.39	2057.68	2023.36	1992.23	1970.8	1963.54	1970.8	1992.23	2023.36	2057.68	2085.39	2096.1	2085.39	2057.68	2023.36	1992.23	1970.8	1963.54	1970.8	1992.23	2023.36	2057.68	2085.39	2096.1
19	2085.97	2074.22	2043.79	2006.77	1973.14	1950.13	1942.63	1950.13	1973.14	2006.77	2043.79	2074.22	2085.97	2074.22	2043.79	2006.77	1973.14	1950.13	1942.63	1950.13	1973.14	2006.77	2043.79	2074.22	2085.97
20	2075.65	2062.26	2029.14	1989.33	1953.3	1928.55	1919.97	1928.55	1953.3	1989.33	2029.14	2062.26	2075.65	2062.26	2029.14	1989.33	1953.3	1928.55	1919.97	1928.55	1953.3	1989.33	2029.14	2062.26	2075.65
21	2064.19	2049.94	2013.71	1970.93	1932.18	1906.01	1897.28	1906.01	1932.18	1970.93	2013.71	2049.94	2064.19	2049.94	2013.71	1970.93	1932.18	1906.01	1897.28	1906.01	1932.18	1970.93	2013.71	2049.94	2064.19
22	2052.16	2037.02	1997.86	1952.07	1911.25	1883.42	1874.49	1883.42	1911.25	1952.07	1997.86	2037.02	2052.16	2037.02	1997.86	1952.07	1911.25	1883.42	1874.49	1883.42	1911.25	1952.07	1997.86	2037.02	2052.16
23	2039.45	2022.84	1981.33	1932.17	1889.54	1860.26	1850.43	1860.26	1889.54	1932.17	1981.33	2022.84	2039.45	2022.84	1981.33	1932.17	1889.54	1860.26	1850.43	1860.26	1889.54	1932.17	1981.33	2022.84	2039.45
24	2026.56	2008.7	1963.67	1912.21	1867.3	1836.37	1825.77	1836.37	1867.3	1912.21	1963.67	2008.7	2026.56	2008.7	1963.67	1912.21	1867.3	1836.37	1825.77	1836.37	1867.3	1912.21	1963.67	2008.7	2026.56
25	2012.53	1993.55	1945.73	1891.19	1843.41	1810.63	1799.38	1810.63	1843.41	1891.19	1945.73	1993.55	2012.53	1993.55	1945.73	1891.19	1843.41	1810.63	1799.38	1810.63	1843.41	1891.19	1945.73	1993.55	2012.53
26	1997.86	1977.52	1927.51	1870.23	1819.69	1785.25	1773.86	1785.25	1819.69	1870.23	1927.51	1977.52	1997.86	1977.52	1927.51	1870.23	1819.69	1785.25	1773.86	1785.25	1819.69	1870.23	1927.51	1977.52	1997.86
27	1982.49	1960.8	1908.05	1848.19	1795.33	1759.88	1747.62	1759.88	1795.33	1848.19	1908.05	1960.8	1982.49	1960.8	1908.05	1848.19	1795.33	1759.88	1747.62	1759.88	1795.33	1848.19	1908.05	1960.8	1982.49
28	1966.27	1943.47	1888.05	1824.87	1770.14	1732.73	1719.95	1732.73	1770.14	1824.87	1888.05	1943.47	1966.27	1943.47	1888.05	1824.87	1770.14	1732.73	1719.95	1732.73	1770.14	1824.87	1888.05	1943.47	1966.27
29	1948.73	1925.01	1867.18	1801.74	1744.14	1705.2	1692.74	1705.2	1744.14	1801.74	1867.18	1925.01	1948.73	1925.01	1867.18	1801.74	1744.14	1705.2	1692.74	1705.2	1744.14	1801.74	1867.18	1925.01	1948.73
30	1930.79	1905.78	1845.68	1777.69	1717.01	1677.15	1663.6	1677.15	1717.01	1777.69	1845.68	1905.78	1930.79	1905.78	1845.68	1777.69	1717.01	1677.15	1663.6	1677.15	1717.01	1777.69	1845.68	1905.78	1930.79
31	1912.05	1886.39	1824	1752.74	1690.35	1648.92	1635.53	1648.92	1690.35	1752.74	1824	1886.39	1912.05	1886.39	1824	1752.74	1690.35	1648.92	1635.53	1648.92	1690.35	1752.74	1824	1886.39	1912.05
32	1892.47	1865.08	1801.12	1727.52	1662.49	1620.29	1606.18	1620.29	1662.49	1727.52	1801.12	1865.08	1892.47	1865.08	1801.12	1727.52	1662.49	1620.29	1606.18	1620.29	1662.49	1727.52	1801.12	1865.08	1892.47
33	1871.87	1843.66	1777.24	1700.89	1633.72	1590.08	1574.81	1590.08	1633.72	1700.89	1777.24	1843.66	1871.87	1843.66	1777.24	1700.89	1633.72	1590.08	1574.81	1590.08	1633.72	1700.89	1777.24	1843.66	1871.87
34	1850.86	1820.9	1752.81	1673.81	1605.1	1558.71	1541.73	1558.71	1605.1	1673.81	1752.81	1820.9	1850.86	1820.9	1752.81	1673.81	1605.1	1558.71	1541.73	1558.71	1605.1	1673.81	1752.81	1820.9	1850.86
35	1828.21	1797.47	1728.08	1646.31	1575.16	1525.87	1506.12	1525.87	1575.16	1646.31	1728.08	1797.47	1828.21	1797.47	1728.08	1646.31	1575.16	1525.87	1506.12	1525.87	1575.16	1646.31	1728.08	1797.47	1828.21
36	1805.16	1773.47	1701.95	1618.03	1544.66	1488.98	1463.09	1488.98	1544.66	1618.03	1701.95	1773.47	1805.16	1773.47	1701.95	1618.03	1544.66	1488.98	1463.09	1488.98	1544.66	1618.03	1701.95	1773.47	1805.16
37	1780.8	1748.08	1675.25	1588.45	1513.44	1446.87	1416.74	1446.87	1513.44	1588.45	1675.25	1748.08	1780.8	1748.08	1675.25	1588.45	1513.44	1446.87	1416.74	1446.87	1513.44	1588.45	1675.25	1748.08	1780.8
38	1756.36	1722.09	1647.72	1559.61	1478.63	1401.32	1363.88	1401.32	1478.63	1559.61	1647.72	1722.09	1756.36	1722.09</											

51	1348.16	1309.37	1218.68	1003.2	735.37	593.57	554.28	593.57	735.37	1003.2	1218.68	1309.37	1348.16	1309.37	1218.68	1003.2	735.37	593.57	554.28	593.57	735.37	1003.2	1218.68	1309.37	1348.16
52	1309.41	1270.87	1178.76	941.58	681.3	550.86	513.92	550.86	681.3	941.58	1178.76	1270.87	1309.41	1270.87	1178.76	941.58	681.3	550.86	513.92	550.86	681.3	941.58	1178.76	1270.87	1309.41
53	1270.2	1232.22	1138.05	880.85	631.52	512.25	478.75	512.25	631.52	880.85	1138.05	1232.22	1270.2	1232.22	1138.05	880.85	631.52	512.25	478.75	512.25	631.52	880.85	1138.05	1232.22	1270.2
54	1229.82	1192.25	1094.23	821.58	584.59	476.45	446.77	476.45	584.59	821.58	1094.23	1192.25	1229.82	1192.25	1094.23	821.58	584.59	476.45	446.77	476.45	584.59	821.58	1094.23	1192.25	1229.82
55	1189.24	1152.3	1049.16	764.34	543.66	444.75	417.72	444.75	543.66	764.34	1049.16	1152.3	1189.24	1152.3	1049.16	764.34	543.66	444.75	417.72	444.75	543.66	764.34	1049.16	1152.3	1189.24
56	1147.08	1111.27	1002.03	710.6	505.97	415.21	391.69	415.21	505.97	710.6	1002.03	1111.27	1147.08	1111.27	1002.03	710.6	505.97	415.21	391.69	415.21	505.97	710.6	1002.03	1111.27	1147.08
57	1104.38	1069.83	951.78	660.34	470.62	389.59	368.22	389.59	470.62	660.34	951.78	1069.83	1104.38	1069.83	951.78	660.34	470.62	389.59	368.22	389.59	470.62	660.34	951.78	1069.83	1104.38
58	1060.82	1027.61	900.62	611.67	438.85	366.76	347.02	366.76	438.85	611.67	900.62	1027.61	1060.82	1027.61	900.62	611.67	438.85	366.76	347.02	366.76	438.85	611.67	900.62	1027.61	1060.82
59	1015.94	985.11	848.05	566.86	409.93	344.71	328.05	344.71	409.93	566.86	848.05	985.11	1015.94	985.11	848.05	566.86	409.93	344.71	328.05	344.71	409.93	566.86	848.05	985.11	1015.94
60	971.85	942.31	796.14	527.34	384.19	325.96	310.91	325.96	384.19	527.34	796.14	942.31	971.85	942.31	796.14	527.34	384.19	325.96	310.91	325.96	384.19	527.34	796.14	942.31	971.85
61	926.2	898.33	743.68	489.9	360.1	308.63	295.53	308.63	360.1	489.9	743.68	898.33	926.2	898.33	743.68	489.9	360.1	308.63	295.53	308.63	360.1	489.9	743.68	898.33	926.2
62	881.22	854.72	695.11	455.02	338.41	292.89	282.16	292.89	338.41	455.02	695.11	854.72	881.22	854.72	695.11	455.02	338.41	292.89	282.16	292.89	338.41	455.02	695.11	854.72	881.22
63	836.36	810.81	646.15	423.74	318.69	279.03	269.74	279.03	318.69	423.74	646.15	810.81	836.36	810.81	646.15	423.74	318.69	279.03	269.74	279.03	318.69	423.74	646.15	810.81	836.36
64	790.92	767.04	597.87	394.15	300.52	266.38	258.91	266.38	300.52	394.15	597.87	767.04	790.92	767.04	597.87	394.15	300.52	266.38	258.91	266.38	300.52	394.15	597.87	767.04	790.92
65	746.05	723.31	552.98	367.88	284.16	254.98	249.01	254.98	284.16	367.88	552.98	723.31	746.05	723.31	552.98	367.88	284.16	254.98	249.01	254.98	284.16	367.88	552.98	723.31	746.05
66	701	679.43	510.94	343.25	268.89	244.68	239.94	244.68	268.89	343.25	510.94	679.43	701	679.43	510.94	343.25	268.89	244.68	239.94	244.68	268.89	343.25	510.94	679.43	701
67	656.91	636.24	471.96	320.31	255.3	235.34	232.01	235.34	255.3	320.31	471.96	636.24	656.91	636.24	471.96	320.31	255.3	235.34	232.01	235.34	255.3	320.31	471.96	636.24	656.91
68	613.37	592.75	434.85	299.34	242.46	226.66	224.8	226.66	242.46	299.34	434.85	592.75	613.37	592.75	434.85	299.34	242.46	226.66	224.8	226.66	242.46	299.34	434.85	592.75	613.37
69	570.56	550.99	400.83	279.94	230.79	219.03	218.13	219.03	230.79	279.94	400.83	550.99	570.56	550.99	400.83	279.94	230.79	219.03	218.13	219.03	230.79	279.94	400.83	550.99	570.56
70	527.97	509.41	369.01	261.64	219.86	211.75	212.02	211.75	219.86	261.64	369.01	509.41	527.97	509.41	369.01	261.64	219.86	211.75	212.02	211.75	219.86	261.64	369.01	509.41	527.97
71	485.51	468.02	339.14	244.78	209.96	205.14	206.46	205.14	209.96	244.78	339.14	468.02	485.51	468.02	339.14	244.78	209.96	205.14	206.46	205.14	209.96	244.78	339.14	468.02	485.51
72	444.54	428.14	311.74	229	200.62	199.02	201.23	199.02	200.62	229	311.74	428.14	444.54	428.14	311.74	229	200.62	199.02	201.23	199.02	200.62	229	311.74	428.14	444.54
73	404.61	389.19	285.79	214.19	191.79	193.12	196.24	193.12	191.79	214.19	285.79	389.19	404.61	389.19	285.79	214.19	191.79	193.12	196.24	193.12	191.79	214.19	285.79	389.19	404.61
74	366.1	352.36	261.54	200.44	183.65	187.7	191.64	187.7	183.65	200.44	261.54	352.36	366.1	352.36	261.54	200.44	183.65	187.7	191.64	187.7	183.65	200.44	261.54	352.36	366.1
75	328.84	316.86	238.91	187.31	175.82	182.49	187.14	182.49	175.82	187.31	238.91	316.86	328.84	316.86	238.91	187.31	175.82	182.49	187.14	182.49	175.82	187.31	238.91	316.86	328.84
76	293.32	283.63	217.65	175.11	168.54	177.38	182.78	177.38	168.54	175.11	217.65	283.63	293.32	283.63	217.65	175.11	168.54	177.38	182.78	177.38	168.54	175.11	217.65	283.63	293.32
77	258.9	251.95	197.88	163.46	161.48	172.56	178.39	172.56	161.48	163.46	197.88	251.95	258.9	251.95	197.88	163.46	161.48	172.56	178.39	172.56	161.48	163.46	197.88	251.95	258.9
78	226.24	222.38	179.24	152.61	154.57	167.67	174.06	167.67	154.57	152.61	179.24	222.38	226.24	222.38	179.24	152.61	154.57	167.67	174.06	167.67	154.57	152.61	179.24	222.38	226.24
79	195.96	194.73	161.53	142.38	148.09	162.77	169.78	162.77	148.09	142.38	161.53	194.73	195.96	194.73	161.53	142.38	148.09	162.77	169.78	162.77	148.09	142.38	161.53	194.73	195.96
80	166.94	168.54	145.11	132.55	141.78	158.03	165.5	158.03	141.78	132.55	145.11	168.54	166.94	168.54	145.11	132.55	141.78	158.03	165.5	158.03	141.78	132.55	145.11	168.54	166.94
81	139.03	144.02	129.56	123.26	135.61	153.3	161.18	153.3	135.61	123.26	129.56	144.02	139.03	144.02	129.56	123.26	135.61	153.3	161.18	153.3	135.61	123.26	129.56	144.02	139.03
82	113.75	121.47	115.35	114.42	129.52	148.44	156.65	148.44	129.52	114.42	115.35	121.47	113.75	121.47	115.35	114.42	129.52	148.44	156.65	148.44	129.52	114.42	115.35	121.47	113.75
83	90.44	101.01	102.23	106.11	123.53	143.59	152.22	143.59	123.53	106.11	102.23	101.01	90.44	101.01	102.23	106.11	123.53	143.59	152.22	143.59	123.53	106.11	102.23	101.01	90.44
84	69.07	82.33	89.98	98.22	117.71	138.77	147.55	138.77	117.71	98.22	89.98	82.33	69.07	82.33	89.98	98.22	117.71	138.77	147.55	138.77	117.71	98.22	89.98	82.33	69.07
85	50.57	65.72	78.69	90.77	112.11	133.83	142.78	133.83	112.11	90.77	78.69	65.72	50.57	65.72	78.69	90.77	112.11	133.83	142.78	133.83	112.11	90.77	78.69	65.72	50.57
86	35.03	51.38	68.71	83.74	106.57	128.75	137.99	128.75	106.57	83.74	68.71	51.38	35.03	51.38	68.71	83.74	106.57	128.75	137.99	128.75	106.57	83.74	68.71	51.38	35.03
87	20.63	39.01	59.64	77.17	101.1	123.53	132.88	123.53	101.1	77.17	59.64	39.01	20.63	39.01	59.64	77.17	101.1	123.53	132.88	123.53	101.1	77.17	59.64	39.01	20.63
88	8.94	28.71	51.59	71.04	95.7	118.41	127.53	118.41	95.7	71.04	51.59	28.71	8.94	28.71	51.59	71.04	95.7	118.41	127.53	118.41	95.7	71.04	51.59	28.71	8.94
89	3.26	21	44.64	65.31	90.4	113.06	122.13	113.06	90.4	65.31	44.64	21	3.26	21	44.64	65.31	90.4	113.06	122.13	113.06	90.4	65.31	44.64	21	3.26
90	1.11	15.84	38.51	59.91	85.1	107.6	116.69	107.6	85.1	59.91	38.51	15.84	1.11	15.84	38.51	59.91	85.1	107.6	116.69	107.6	85.1	59.91	38.51	15.84	1.11
91	0.16	11.96	33.56	54.97	79.91	102.09	110.97	102.09	79.91	54.97	33.56	11.96	0.16	11.96	33.56	54.97	79.91	102.09	110.97	102.09	79.91	54.97	33.56	11.96	0.16
92	0.17	9.58	29.43	50.38	74.75	96.51	105.23	96.51	74.75	50.38	29.43	9.58	0.17	9.58	29.43	50.38	74.75	96.51	105.23	96.51	74.75	50.38	29.43	9.58	0.17
93	0.19	8.27	26.19	46.2	69.98	91.08	99.59	91.08	69.98	46.2	26.19	8.27	0.19	8.27	26.19	46.2	69.98	91.08	99.59	91.08	69.98	46.2	26.19	8.27	0.19
94	0.23	7.47	23.64	42.49	65.28																				

106	3.44	5.6	13.47	23.13	34.6	45.1	49.59	45.1	34.6	23.13	13.47	5.6	3.44	5.6	13.47	23.13	34.6	45.1	49.59	45.1	34.6	23.13	13.47	5.6	3.44
107	3.69	5.55	13.19	22.69	33.7	43.64	47.86	43.64	33.7	22.69	13.19	5.55	3.69	5.55	13.19	22.69	33.7	43.64	47.86	43.64	33.7	22.69	13.19	5.55	3.69
108	3.94	5.51	13	22.31	32.9	42.38	46.28	42.38	32.9	22.31	13	5.51	3.94	5.51	13	22.31	32.9	42.38	46.28	42.38	32.9	22.31	13	5.51	3.94
109	4.19	5.46	12.87	21.99	32.24	41.25	44.9	41.25	32.24	21.99	12.87	5.46	4.19	5.46	12.87	21.99	32.24	41.25	44.9	41.25	32.24	21.99	12.87	5.46	4.19
110	4.42	5.41	12.73	21.7	31.68	40.29	43.69	40.29	31.68	21.7	12.73	5.41	4.42	5.41	12.73	21.7	31.68	40.29	43.69	40.29	31.68	21.7	12.73	5.41	4.42
111	4.64	5.37	12.58	21.44	31.21	39.49	42.7	39.49	31.21	21.44	12.58	5.37	4.64	5.37	12.58	21.44	31.21	39.49	42.7	39.49	31.21	21.44	12.58	5.37	4.64
112	4.86	5.34	12.43	21.22	30.84	38.87	41.93	38.87	30.84	21.22	12.43	5.34	4.86	5.34	12.43	21.22	30.84	38.87	41.93	38.87	30.84	21.22	12.43	5.34	4.86
113	5.1	5.32	12.29	20.99	30.47	38.34	41.34	38.34	30.47	20.99	12.29	5.32	5.1	5.32	12.29	20.99	30.47	38.34	41.34	38.34	30.47	20.99	12.29	5.32	5.1
114	5.35	5.3	12.16	20.74	30.12	37.84	40.86	37.84	30.12	20.74	12.16	5.3	5.35	5.3	12.16	20.74	30.12	37.84	40.86	37.84	30.12	20.74	12.16	5.3	5.35
115	5.6	5.29	12.03	20.48	29.76	37.29	40.4	37.29	29.76	20.48	12.03	5.29	5.6	5.29	12.03	20.48	29.76	37.29	40.4	37.29	29.76	20.48	12.03	5.29	5.6
116	5.84	5.29	11.9	20.24	29.37	36.65	39.75	36.65	29.37	20.24	11.9	5.29	5.84	5.29	11.9	20.24	29.37	36.65	39.75	36.65	29.37	20.24	11.9	5.29	5.84
117	6.09	5.3	11.76	20.01	28.97	36	38.96	36	28.97	20.01	11.76	5.3	6.09	5.3	11.76	20.01	28.97	36	38.96	36	28.97	20.01	11.76	5.3	6.09
118	6.31	5.31	11.62	19.8	28.54	35.3	38.04	35.3	28.54	19.8	11.62	5.31	6.31	5.31	11.62	19.8	28.54	35.3	38.04	35.3	28.54	19.8	11.62	5.31	6.31
119	6.53	5.34	11.46	19.58	28.08	34.56	37.1	34.56	28.08	19.58	11.46	5.34	6.53	5.34	11.46	19.58	28.08	34.56	37.1	34.56	28.08	19.58	11.46	5.34	6.53
120	6.75	5.38	11.27	19.33	27.6	33.82	36.18	33.82	27.6	19.33	11.27	5.38	6.75	5.38	11.27	19.33	27.6	33.82	36.18	33.82	27.6	19.33	11.27	5.38	6.75
121	6.97	5.42	11.06	19.04	27.07	33.04	35.26	33.04	27.07	19.04	11.06	5.42	6.97	5.42	11.06	19.04	27.07	33.04	35.26	33.04	27.07	19.04	11.06	5.42	6.97
122	7.17	5.48	10.91	18.72	26.5	32.22	34.34	32.22	26.5	18.72	10.91	5.48	7.17	5.48	10.91	18.72	26.5	32.22	34.34	32.22	26.5	18.72	10.91	5.48	7.17
123	7.36	5.54	10.76	18.4	25.89	31.39	33.44	31.39	25.89	18.4	10.76	5.54	7.36	5.54	10.76	18.4	25.89	31.39	33.44	31.39	25.89	18.4	10.76	5.54	7.36
124	7.58	5.61	10.6	18.04	25.25	30.54	32.47	30.54	25.25	18.04	10.6	5.61	7.58	5.61	10.6	18.04	25.25	30.54	32.47	30.54	25.25	18.04	10.6	5.61	7.58
125	7.81	5.68	10.42	17.67	24.54	29.67	31.52	29.67	24.54	17.67	10.42	5.68	7.81	5.68	10.42	17.67	24.54	29.67	31.52	29.67	24.54	17.67	10.42	5.68	7.81
126	8.04	5.76	10.26	17.28	23.76	28.81	30.55	28.81	23.76	17.28	10.26	5.76	8.04	5.76	10.26	17.28	23.76	28.81	30.55	28.81	23.76	17.28	10.26	5.76	8.04
127	8.25	5.83	10.08	16.87	23.07	27.94	29.56	27.94	23.07	16.87	10.08	5.83	8.25	5.83	10.08	16.87	23.07	27.94	29.56	27.94	23.07	16.87	10.08	5.83	8.25
128	8.44	5.89	9.91	16.45	22.42	27.06	28.57	27.06	22.42	16.45	9.91	5.89	8.44	5.89	9.91	16.45	22.42	27.06	28.57	27.06	22.42	16.45	9.91	5.89	8.44
129	8.62	5.96	9.74	16.02	21.78	26.16	27.6	26.16	21.78	16.02	9.74	5.96	8.62	5.96	9.74	16.02	21.78	26.16	27.6	26.16	21.78	16.02	9.74	5.96	8.62
130	8.78	6.05	9.58	15.6	21.16	25.27	26.62	25.27	21.16	15.6	9.58	6.05	8.78	6.05	9.58	15.6	21.16	25.27	26.62	25.27	21.16	15.6	9.58	6.05	8.78
131	8.93	6.12	9.41	15.18	20.55	24.41	25.67	24.41	20.55	15.18	9.41	6.12	8.93	6.12	9.41	15.18	20.55	24.41	25.67	24.41	20.55	15.18	9.41	6.12	8.93
132	9.07	6.21	9.26	14.76	19.93	23.57	24.77	23.57	19.93	14.76	9.26	6.21	9.07	6.21	9.26	14.76	19.93	23.57	24.77	23.57	19.93	14.76	9.26	6.21	9.07
133	9.2	6.31	9.1	14.34	19.34	22.78	23.89	22.78	19.34	14.34	9.1	6.31	9.2	6.31	9.1	14.34	19.34	22.78	23.89	22.78	19.34	14.34	9.1	6.31	9.2
134	9.33	6.44	8.94	13.94	18.72	22.01	23.07	22.01	18.72	13.94	8.94	6.44	9.33	6.44	8.94	13.94	18.72	22.01	23.07	22.01	18.72	13.94	8.94	6.44	9.33
135	9.46	6.58	8.85	13.58	18.11	21.28	22.28	21.28	18.11	13.58	8.85	6.58	9.46	6.58	8.85	13.58	18.11	21.28	22.28	21.28	18.11	13.58	8.85	6.58	9.46
136	9.59	6.72	8.76	13.21	17.56	20.57	21.53	20.57	17.56	13.21	8.76	6.72	9.59	6.72	8.76	13.21	17.56	20.57	21.53	20.57	17.56	13.21	8.76	6.72	9.59
137	9.71	6.9	8.67	12.85	17.01	19.86	20.83	19.86	17.01	12.85	8.67	6.9	9.71	6.9	8.67	12.85	17.01	19.86	20.83	19.86	17.01	12.85	8.67	6.9	9.71
138	9.85	7.09	8.59	12.52	16.47	19.16	20.13	19.16	16.47	12.52	8.59	7.09	9.85	7.09	8.59	12.52	16.47	19.16	20.13	19.16	16.47	12.52	8.59	7.09	9.85
139	9.99	7.3	8.53	12.2	15.96	18.45	19.48	18.45	15.96	12.2	8.53	7.3	9.99	7.3	8.53	12.2	15.96	18.45	19.48	18.45	15.96	12.2	8.53	7.3	9.99
140	10.12	7.55	8.49	11.88	15.45	17.82	18.83	17.82	15.45	11.88	8.49	7.55	10.12	7.55	8.49	11.88	15.45	17.82	18.83	17.82	15.45	11.88	8.49	7.55	10.12
141	10.27	7.89	8.45	11.57	14.97	17.23	18.21	17.23	14.97	11.57	8.45	7.89	10.27	7.89	8.45	11.57	14.97	17.23	18.21	17.23	14.97	11.57	8.45	7.89	10.27
142	10.38	8.33	8.42	11.28	14.52	16.68	17.62	16.68	14.52	11.28	8.42	8.33	10.38	8.33	8.42	11.28	14.52	16.68	17.62	16.68	14.52	11.28	8.42	8.33	10.38
143	10.47	8.9	8.38	11.01	14.06	16.15	17.03	16.15	14.06	11.01	8.38	8.9	10.47	8.9	8.38	11.01	14.06	16.15	17.03	16.15	14.06	11.01	8.38	8.9	10.47
144	10.52	9.49	8.35	10.76	13.63	15.63	16.47	15.63	13.63	10.76	8.35	9.49	10.52	9.49	8.35	10.76	13.63	15.63	16.47	15.63	13.63	10.76	8.35	9.49	10.52
145	10.57	10.01	8.32	10.53	13.21	15.14	15.92	15.14	13.21	10.53	8.32	10.01	10.57	10.01	8.32	10.53	13.21	15.14	15.92	15.14	13.21	10.53	8.32	10.01	10.57
146	10.59	10.46	8.29	10.3	12.79	14.67	15.39	14.67	12.79	10.3	8.29	10.46	10.59	10.46	8.29	10.3	12.79	14.67	15.39	14.67	12.79	10.3	8.29	10.46	10.59
147	10.6	10.84	8.26	10.1	12.42	14.19	14.88	14.19	12.42	10.1	8.26	10.84	10.6	10.84	8.26	10.1	12.42	14.19	14.88	14.19	12.42	10.1	8.26	10.84	10.6
148	10.62	11.19	8.25	9.93	12.06	13.73	14.38	13.73	12.06	9.93	8.25	11.19	10.62	11.19	8.25	9.93	12.06	13.73	14.38	13.73	12.06	9.93	8.25	11.19	10.62
149	10.66	11.5	8.23	9.77	11.72	13.27	13.9	13.27	11.72	9.77	8.23	11.5	10.66	11.5	8.23	9.77	11.72	13.27	13.9	13.27	11.72	9.77	8.23	11.5	10.66
150	10.73	11.76	8.23	9.64	11.41	12.84	13.43	12.84	11.41	9.64	8.23	11.76	10.73	11.76	8.23	9.64	11.41	12.84	13.43	12.84	11.41	9.64	8.23	11.76	10.73
151	10.78	11.96	8.27	9.52	11.1	12.43	13	12.43	11.1	9.52	8.27	11.96	10.78	11.96	8.27	9.52	11.1	12.43	13	12.43	11.1	9.52	8.27	11.96	10.78
152	10.82	12.14	8.33	9.42	10.82	12.06	12.6	12.06	10.82	9.42	8.33	12.14	10.82	12.14	8.33	9.42	10.82	12.06	12.6	12.06	10.82	9.42	8.33	12.14	10.82
153	10.84	12.24	8.39	9.32	10.58	11.71	12.21	11.71	10.58	9.32	8.39	12.24	10.84	12.24	8.39	9.32	10.58	11.71	12.21	11.71	10.58	9.32	8.39	12.24	10.84
154	10.82	12.28	8.53	9.21	10.36	11.39	11.85	11																	

161	10.32	11.7	11.79	9.29	9.24	9.85	10.13	9.85	9.24	9.29	11.79	11.7	10.32	11.7	11.79	9.29	9.24	9.85	10.13	9.85	9.24	9.29	11.79	11.7	10.32
162	10.28	11.49	12	9.7	9.15	9.69	9.97	9.69	9.15	9.7	12	11.49	10.28	11.49	12	9.7	9.15	9.69	9.97	9.69	9.15	9.7	12	11.49	10.28
163	10.23	11.17	12.11	10.21	9.17	9.55	9.83	9.55	9.17	10.21	12.11	11.17	10.23	11.17	12.11	10.21	9.17	9.55	9.83	9.55	9.17	10.21	12.11	11.17	10.23
164	10.17	11	12.18	10.74	9.39	9.46	9.73	9.46	9.39	10.74	12.18	11	10.17	11	12.18	10.74	9.39	9.46	9.73	9.46	9.39	10.74	12.18	11	10.17
165	10.09	10.93	12.23	11.33	9.81	9.44	9.71	9.44	9.81	11.33	12.23	10.93	10.09	10.93	12.23	11.33	9.81	9.44	9.71	9.44	9.81	11.33	12.23	10.93	10.09
166	9.97	10.96	12.23	11.78	10.33	9.75	9.75	9.75	10.33	11.78	12.23	10.96	9.97	10.96	12.23	11.78	10.33	9.75	9.75	9.75	10.33	11.78	12.23	10.96	9.97
167	9.86	10.9	12.1	12.12	10.98	10.16	9.98	10.16	10.98	12.12	12.1	10.9	9.86	10.9	12.1	12.12	10.98	10.16	9.98	10.16	10.98	12.12	12.1	10.9	9.86
168	9.94	10.88	12.05	12.34	11.55	10.9	10.62	10.9	11.55	12.34	12.05	10.88	9.94	10.88	12.05	12.34	11.55	10.9	10.62	10.9	11.55	12.34	12.05	10.88	9.94
169	10.29	10.96	12.21	12.64	12.05	11.75	11.96	11.75	12.05	12.64	12.21	10.96	10.29	10.96	12.21	12.64	12.05	11.75	11.96	11.75	12.05	12.64	12.21	10.96	10.29
170	10.73	11.01	12.37	12.96	12.48	12.28	13.09	12.28	12.48	12.96	12.37	11.01	10.73	11.01	12.37	12.96	12.48	12.28	13.09	12.28	12.48	12.96	12.37	11.01	10.73
171	11.12	11.19	12.26	13.07	12.83	12.56	13.91	12.56	12.83	13.07	12.26	11.19	11.12	11.19	12.26	13.07	12.83	12.56	13.91	12.56	12.83	13.07	12.26	11.19	11.12
172	11.38	11.44	12.26	13	13.01	12.56	14.67	12.56	13.01	13	12.26	11.44	11.38	11.44	12.26	13	13.01	12.56	14.67	12.56	13.01	13	12.26	11.44	11.38
173	11.58	11.63	12.18	12.98	13.04	12.74	15.12	12.74	13.04	12.98	12.18	11.63	11.58	11.63	12.18	12.98	13.04	12.74	15.12	12.74	13.04	12.98	12.18	11.63	11.58
174	11.79	11.79	12.15	12.63	13.03	12.74	14.11	12.74	13.03	12.63	12.15	11.79	11.79	11.79	12.15	12.63	13.03	12.74	14.11	12.74	13.03	12.63	12.15	11.79	11.79
175	12.02	11.95	12.09	12.5	12.76	12.53	13.1	12.53	12.76	12.5	12.09	11.95	12.02	11.95	12.09	12.5	12.76	12.53	13.1	12.53	12.76	12.5	12.09	11.95	12.02
176	12.35	12.28	12.24	12.42	12.35	11.96	11.27	11.96	12.35	12.42	12.24	12.28	12.35	12.28	12.24	12.42	12.35	11.96	11.27	11.96	12.35	12.42	12.24	12.28	12.35
177	12.7	12.58	12.52	12.52	12.04	11.26	9.58	11.26	12.04	12.52	12.52	12.58	12.7	12.58	12.52	12.52	12.04	11.26	9.58	11.26	12.04	12.52	12.52	12.58	12.7
178	12.9	12.77	12.6	12.48	11.92	10.66	7.59	10.66	11.92	12.48	12.6	12.77	12.9	12.77	12.6	12.48	11.92	10.66	7.59	10.66	11.92	12.48	12.6	12.77	12.9
179	12.88	12.75	12.46	12.09	11.46	9.62	4.7	9.62	11.46	12.09	12.46	12.75	12.88	12.75	12.46	12.09	11.46	9.62	4.7	9.62	11.46	12.09	12.46	12.75	12.88
180	12.83	12.83	12.83	12.83	12.83	12.83	12.83	12.83	12.83	12.83	12.83	12.83	12.83	12.83	12.83	12.83	12.83	12.83	12.83	12.83	12.83	12.83	12.83	12.83	12.83

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	CS4 @100% Power /3500K	Sample ID.	Y1
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
120.02	60	0.305	36.5	0.997	5.67%
277.05	60	0.134	35.9	0.970	11.65%

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-derectional	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*****