

Photometric Test Report

Relevant Standards

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

Prepared For

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Report Number

DLF2310103-22a

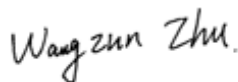
Test Date

2023/10/23

Issue Date

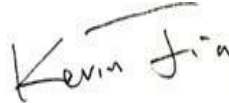
2023/10/24

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		3979
Lumen/ft (Goniophotometer - Section 4.2)	IES LM-79-2008	≥375		995
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 115	Premium 130	150.2
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		26.5
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	5.10%
		20.00%	277V	7.32%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.996
		0.9	277V	0.961
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3465±245	3467
		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		83
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%		97.40%
Zonal Lumen Requirement (0°-60°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≥40%		82.47%
Zonal Lumen Requirement (20°-50°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≥30%		54.19%
Corrected UGR (X=4H, Y=8H, 70/50/20%) (Goniophotometer - Section 4.2)	CIE 190-2010	<22 <25		23.7
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		0.100
(Goniophotometer - Section 4.2)		Non-Wrost Case		0.222
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Wrost Case		26.5
(Goniophotometer - Section 4.2)		Non-Wrost Case		26.5

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023/10/23	CS4 @75% Power /3500K	V1
2	Goniophotometer Test	2023/10/23	CS4 @75% Power /3500K	V1
3	THD and PF Test	2023/10/23	CS4 @75% Power /3500K	V1

Remark(If any)

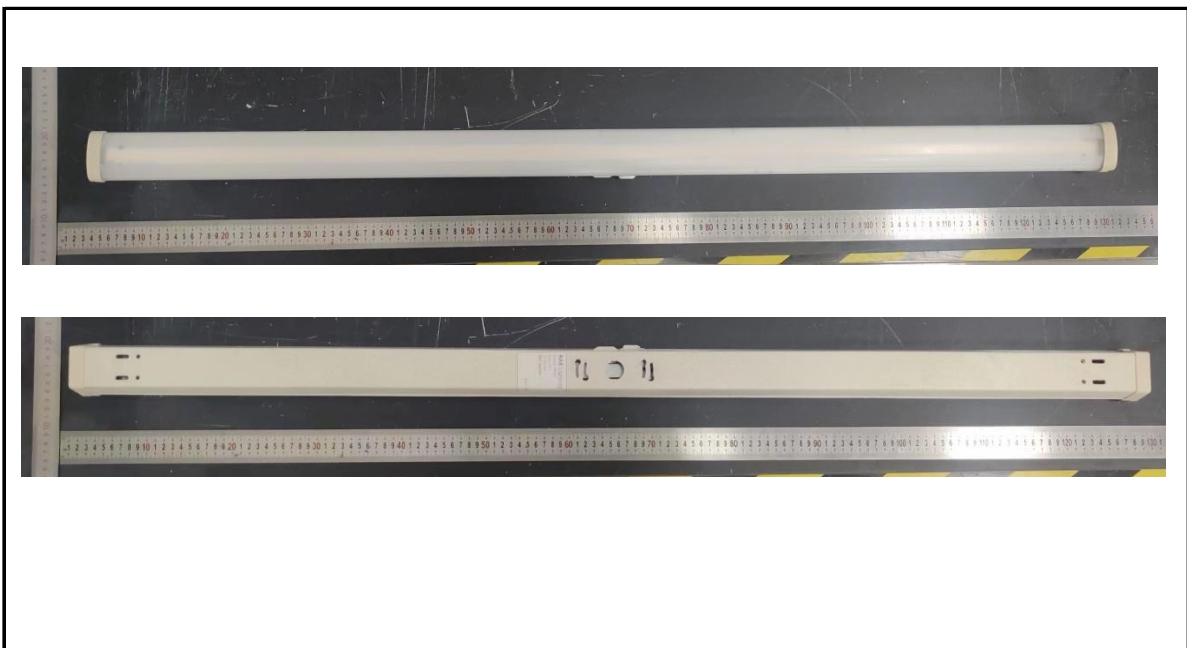
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3.0 Production Description

Luminaire Description: CS4 @75% 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 @75% Power /3500K	Sample ID.	V1
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

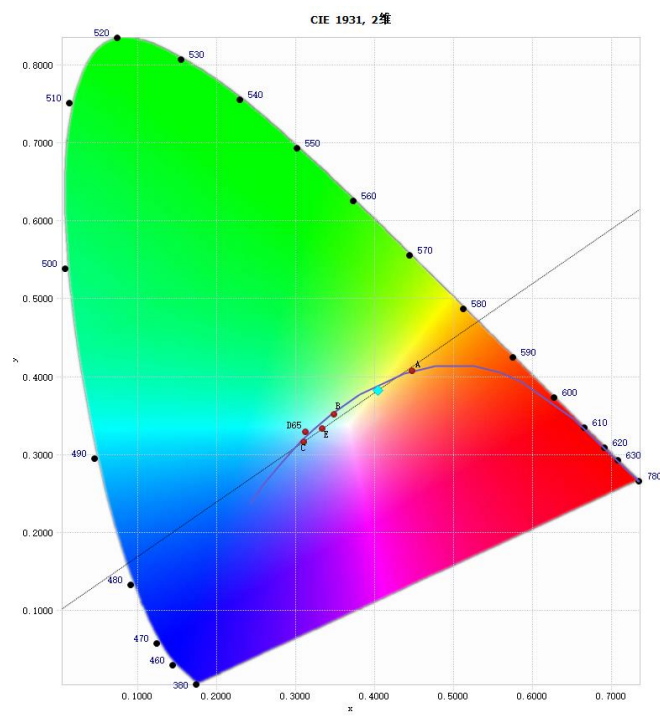
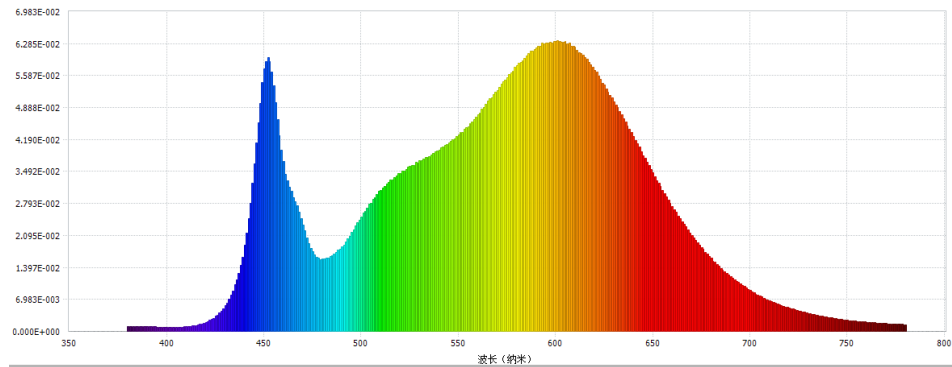
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.09	60	0.222	26.5	0.996
277.06	60	0.100	26.5	0.961

Test Result

CCT (K)	CRI	R9	Duv
3467	84	13	-0.0034

Rf	Rg	IES Rcs,h1
83	96	-12%

4.1 Integrating Sphere Test



4.1 Integrating Sphere Test

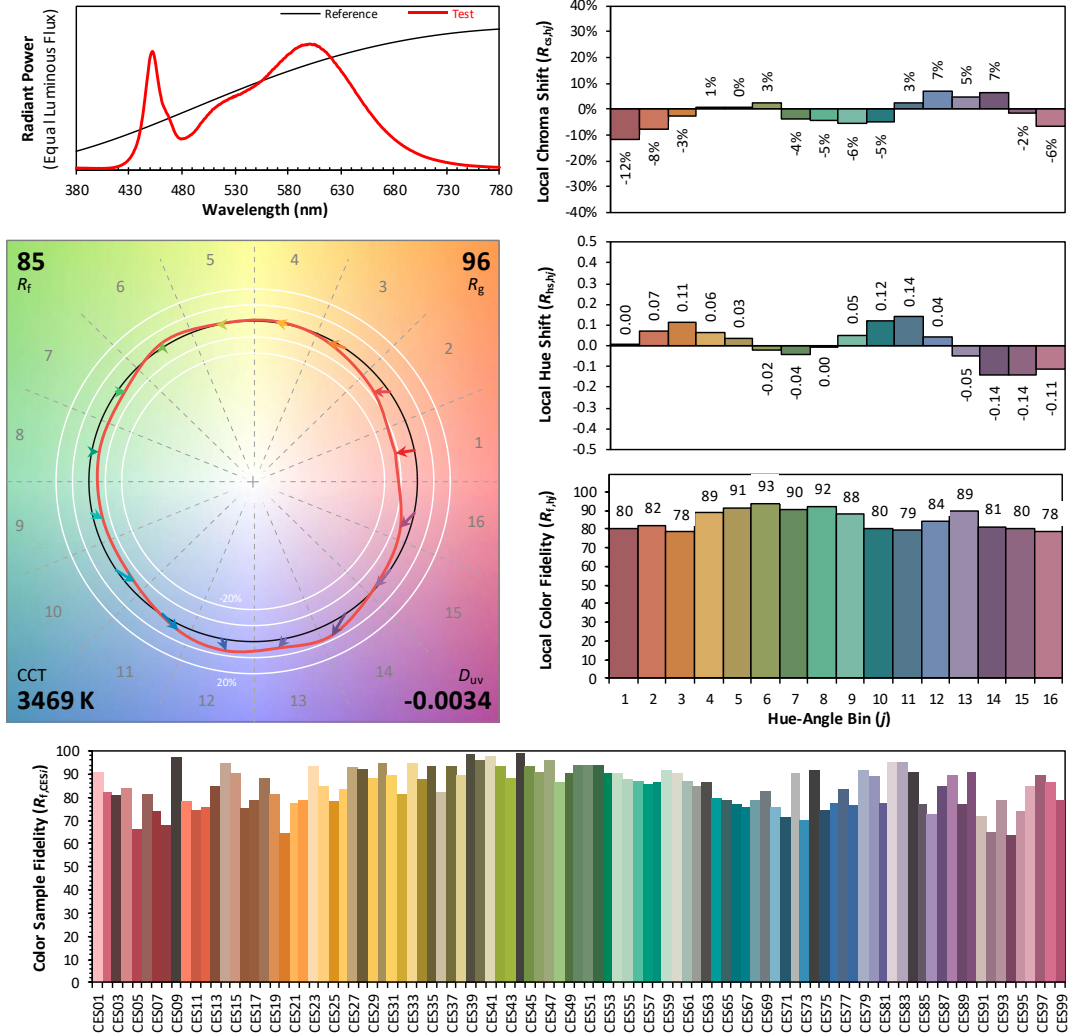
IES TM-30-18 Color Rendition Report

Source: DLF2310103-22a

Manufacturer: RAB Lighting Inc.

Date: 2023/10/23

Model: CS4 @75% Power /3500K



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

x 0.4035
 y 0.3823
 u' 0.2381
 v' 0.5074

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	1.14E-03	485	1.66E-02	590	6.19E-02	695	1.03E-02
385	1.06E-03	490	1.85E-02	595	6.30E-02	700	8.92E-03
390	1.02E-03	495	2.16E-02	600	6.34E-02	705	7.73E-03
395	9.51E-04	500	2.50E-02	605	6.34E-02	710	6.66E-03
400	9.03E-04	505	2.80E-02	610	6.20E-02	715	5.81E-03
405	9.24E-04	510	3.08E-02	615	5.98E-02	720	5.09E-03
410	1.03E-03	515	3.30E-02	620	5.70E-02	725	4.48E-03
415	1.30E-03	520	3.45E-02	625	5.38E-02	730	3.94E-03
420	1.96E-03	525	3.61E-02	630	5.01E-02	735	3.44E-03
425	3.28E-03	530	3.74E-02	635	4.64E-02	740	3.04E-03
430	5.58E-03	535	3.81E-02	640	4.26E-02	745	2.70E-03
435	1.01E-02	540	3.96E-02	645	3.84E-02	750	2.42E-03
440	1.88E-02	545	4.12E-02	650	3.46E-02	755	2.18E-03
445	3.65E-02	550	4.29E-02	655	3.08E-02	760	2.00E-03
450	5.73E-02	555	4.48E-02	660	2.73E-02	765	1.82E-03
455	5.37E-02	560	4.73E-02	665	2.39E-02	770	1.68E-03
460	3.71E-02	565	5.02E-02	670	2.10E-02	775	1.56E-03
465	2.92E-02	570	5.27E-02	675	1.83E-02	780	1.48E-03
470	2.33E-02	575	5.54E-02	680	1.59E-02		
475	1.74E-02	580	5.80E-02	685	1.38E-02		
480	1.58E-02	585	6.02E-02	690	1.20E-02		

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	CS4 @75% Power /3500K	Sample ID.	V1
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	277.05	60	0.100	26.5	0.961
NON-WROST CASE	119.99	60	0.222	26.5	0.996

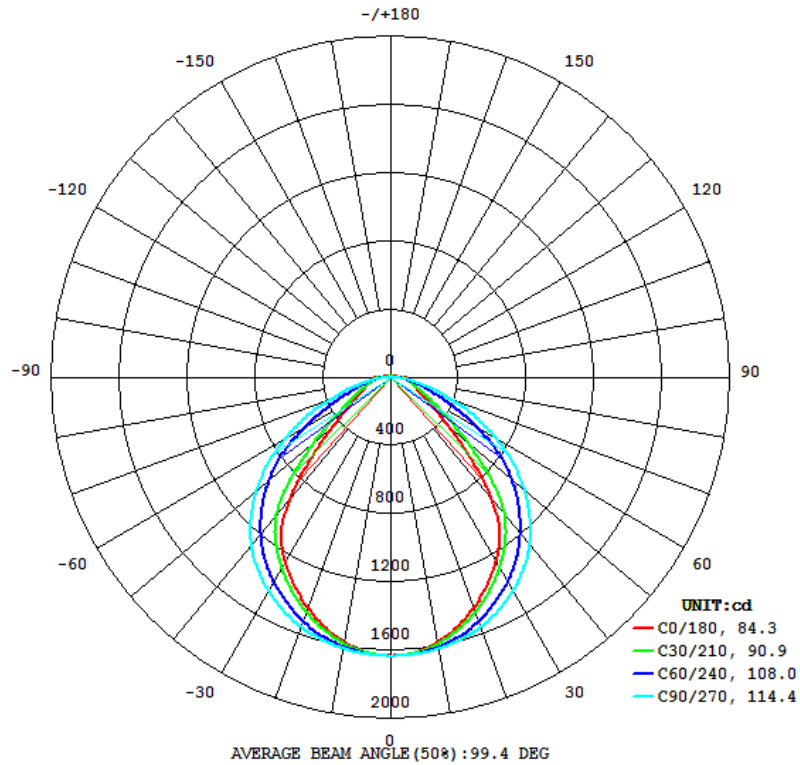
Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
3979	137.5	156.4	84.3	114.4	150.2

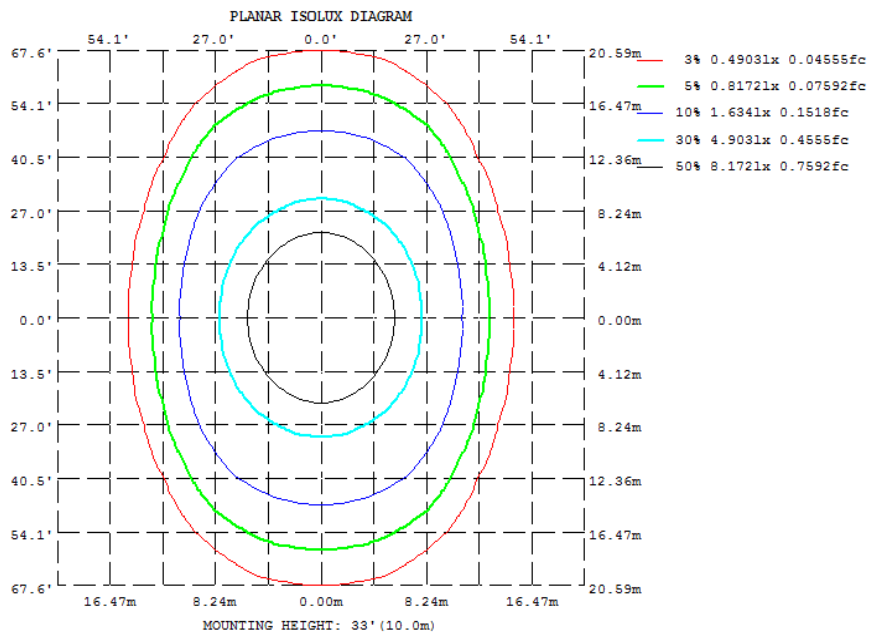
Zonal Lumen Requirement (0°-90°)	Zonal Lumen Requirement (0°-60°)	BUG rating	UGR (X=4H, Y=8H, 70/50/20%)
97.40%	82.47%	B2-U3-G1	23.7
Zonal Lumen Requirement (20°-50°)	Length(ft)	Lumen/ft	
54.19%	4	995	

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	1577	1596	1615	1596	1577	1596	1615	1596
20	1437	1490	1555	1490	1437	1490	1555	1490
30	1249	1334	1446	1334	1249	1334	1446	1334
40	929.4	1124	1278	1124	929.4	1124	1278	1124
50	450.4	796.3	1036	796.3	450.4	796.3	1036	796.3
60	232.9	394.4	724.0	394.4	232.9	394.4	724.0	394.4
70	157.5	195.1	392.2	195.1	157.5	195.1	392.2	195.1
80	121.8	98.19	123.2	98.19	121.8	98.19	123.2	98.19
90	85.16	44.11	0.5917	44.11	85.16	44.11	0.5917	44.11
100	47.88	21.02	1.347	21.02	47.88	21.02	1.347	21.02
110	32.16	16.12	3.630	16.12	32.16	16.12	3.630	16.12
120	26.73	14.17	5.280	14.17	26.73	14.17	5.280	14.17
130	19.75	11.57	6.788	11.57	19.75	11.57	6.788	11.57
140	14.03	8.832	7.835	8.832	14.03	8.832	7.835	8.832
150	10.02	7.244	8.348	7.244	10.02	7.244	8.348	7.244
160	7.775	6.792	8.082	6.792	7.775	6.792	8.082	6.792
170	10.12	9.958	8.302	9.958	10.12	9.958	8.302	9.958
180	5.169	9.265	10.12	9.265	5.169	9.265	10.12	9.265
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				
3H	21.5	23.0	21.9	23.4	23.8	15.7	17.2	16.2	17.6	18.0
4H	22.8	24.1	23.2	24.5	25.0	17.2	18.6	17.7	19.0	19.4
6H	23.2	24.4	23.6	24.8	25.3	18.1	19.3	18.6	19.8	20.2
8H	23.3	24.5	23.8	24.9	25.3	19.1	20.3	19.6	20.7	21.2
12H	23.3	24.4	23.8	24.9	25.3	19.7	20.8	20.2	21.3	21.7
4H 2H	23.3	24.4	23.8	24.8	25.3	20.4	21.5	20.9	21.9	22.4
4H 3H	21.5	22.8	22.0	23.2	23.6	16.5	17.8	17.0	18.2	18.6
4H 4H	23.0	24.0	23.5	24.5	24.9	18.2	19.2	18.6	19.6	20.1
4H 6H	23.4	24.3	23.9	24.8	25.3	19.1	20.0	19.6	20.5	21.0
4H 8H	23.7	24.5	24.2	25.0	25.5	20.3	21.1	20.8	21.6	22.1
4H 12H	23.7	24.5	24.2	25.0	25.5	20.9	21.7	21.4	22.2	22.7
8H 4H	23.7	24.4	24.2	24.9	25.5	21.7	22.4	22.2	22.9	23.4
8H 6H	23.4	24.2	23.9	24.7	25.2	19.4	20.2	20.0	20.7	21.2
8H 8H	23.7	24.4	24.3	24.9	25.4	20.7	21.3	21.2	21.9	22.4
8H 12H	23.8	24.4	24.4	24.9	25.5	21.5	22.0	22.0	22.6	23.1
12H 4H	23.8	24.3	24.4	24.9	25.5	22.4	22.9	22.9	23.4	24.1
12H 6H	23.4	24.1	23.9	24.6	25.2	19.5	20.1	20.0	20.7	21.2
12H 8H	23.7	24.3	24.3	24.8	25.4	20.8	21.3	21.3	21.8	22.4
	23.8	24.3	24.4	24.9	25.5	21.6	22.1	22.1	22.6	23.2
Maximum UGR = 25.5										

4.2 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	154.14	0 - 10	154.14	3.87%
10-20	437.64	0 - 20	591.78	14.87%
20-30	655.32	0 - 30	1247.10	31.35%
30-40	774.86	0 - 40	2021.96	50.82%
40-50	725.79	0 - 50	2747.75	69.06%
50-60	533.21	0 - 60	3280.96	82.47%
60-70	333.71	0 - 70	3614.67	90.85%
70-80	180.31	0 - 80	3794.98	95.38%
80-90	80.05	0 - 90	3875.03	97.40%
90-100	34.93	0 - 100	3909.96	98.27%
100-110	20.28	0 - 110	3930.24	98.78%
110-120	15.66	0 - 120	3945.90	99.18%
120-130	11.98	0 - 130	3957.88	99.48%
130-140	8.19	0 - 140	3966.07	99.69%
140-150	5.56	0 - 150	3971.63	99.82%
150-160	3.71	0 - 160	3975.34	99.92%
160-170	2.34	0 - 170	3977.68	99.98%
170-180	0.92	0 - 180	3978.60	100.00%

4.2 Goniophotometer Test

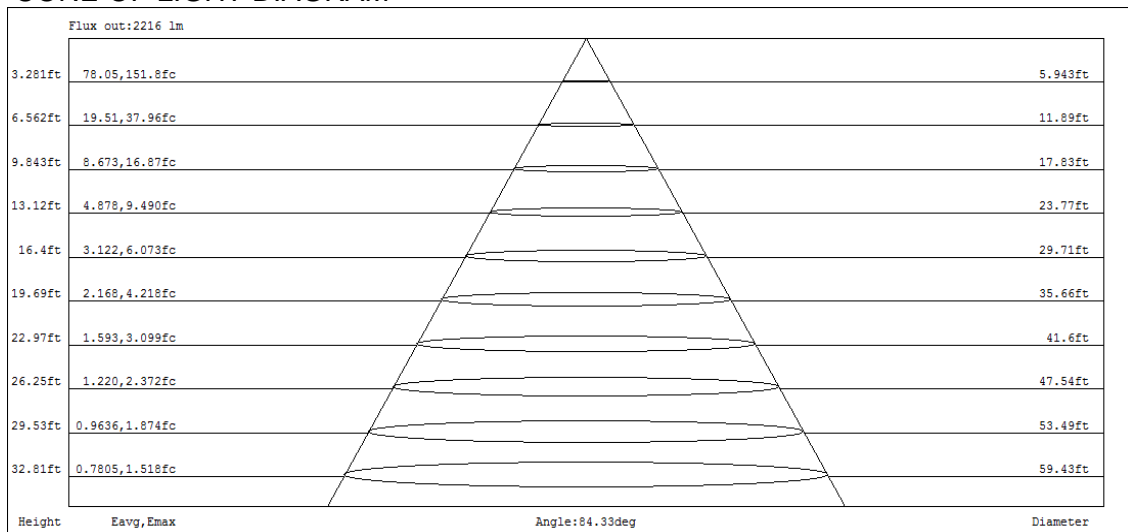
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 0.20

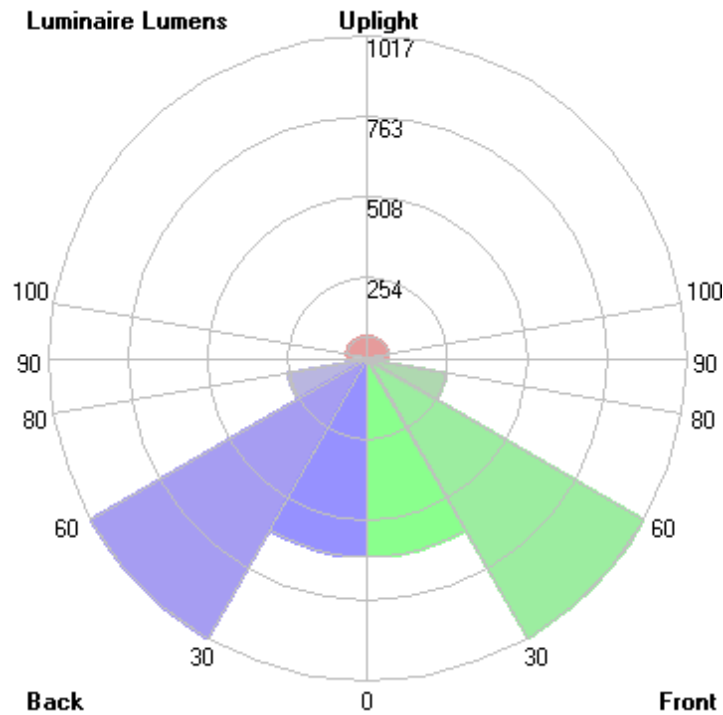
RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	118	118	118	118	115	115	115	115	110	110	110	104	104	104	100	100	100	97
1	109	105	101	97	106	102	98	95	97	94	92	93	91	88	89	87	85	83
2	100	92	86	81	97	90	84	80	86	81	77	83	79	75	79	76	73	71
3	92	82	74	68	89	80	73	68	77	71	66	74	69	65	71	67	63	61
4	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	49	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	46	40	52	45	39	50	44	39	49	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	32	30
10	55	42	35	30	54	42	34	30	41	34	29	39	33	29	38	33	29	27

CONE OF LIGHT DIAGRAM



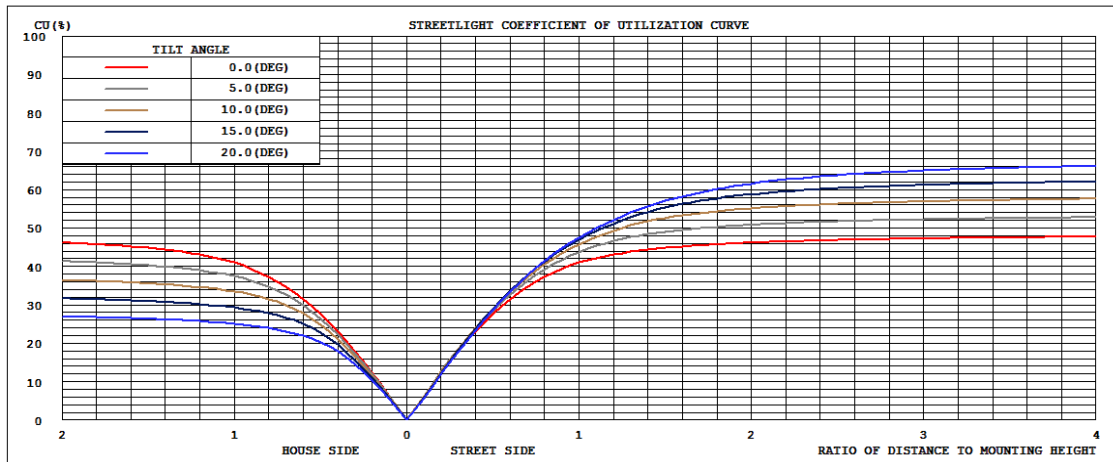
4.2 Goniophotometer Test

LCS/BUG

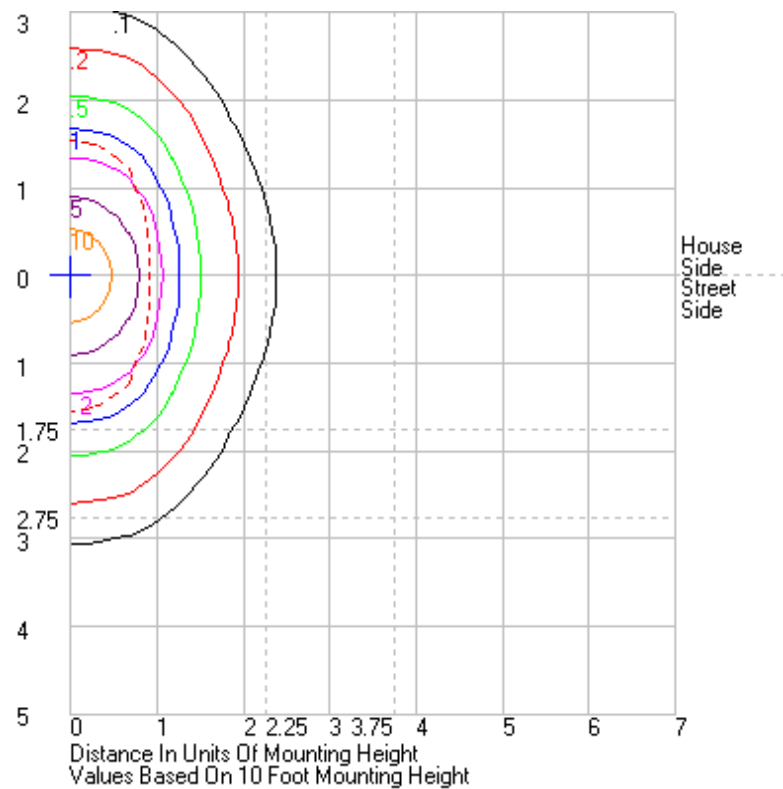


	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	623.5	N.A.	15.7
FM - Front-Medium (30-60)	1016.9	N.A.	25.6
FH - Front-High (60-80)	257.0	N.A.	6.5
FVH - Front-Very High (80-90)	40.0	N.A.	1.0
BL - Back-Low (0-30)	623.6	N.A.	15.7
BM - Back-Medium (30-60)	1016.9	N.A.	25.6
BH - Back-High (60-80)	257.0	N.A.	6.5
BVH - Back-Very High (80-90)	40.0	N.A.	1.0
UL - Uplight-Low (90-100)	34.9	N.A.	0.9
UH - Uplight-High (100-180)	68.6	N.A.	1.7
Total	3978.4	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	1633.96	1633.96	1633.96	1633.96	1633.96	1633.96	1633.96	1633.96	1633.96	1633.96	1633.96	1633.96	1633.96	1633.96	1633.96	1633.96	1633.96	1633.96	1633.96	1633.96	1633.96	1633.96	1633.96	1633.96	1633.96
1	1633.52	1633.46	1633.55	1632.64	1633.36	1632.99	1633.07	1632.99	1633.36	1632.64	1633.55	1633.46	1633.52	1633.46	1633.55	1632.64	1633.36	1632.99	1633.07	1632.99	1633.36	1632.64	1633.55	1633.46	1633.52
2	1632.42	1633.04	1632.54	1631.94	1631.86	1631.21	1631.09	1631.21	1631.86	1631.94	1632.54	1633.04	1632.42	1633.04	1632.54	1631.94	1631.86	1631.21	1631.09	1631.21	1631.86	1631.94	1632.54	1633.04	1632.42
3	1632.15	1632.07	1631.23	1630.16	1630.03	1628.86	1628.08	1628.86	1630.03	1630.16	1631.23	1632.07	1632.15	1632.07	1631.23	1630.16	1630.03	1628.86	1628.08	1628.86	1630.03	1630.16	1631.23	1632.07	1632.15
4	1630.6	1629.98	1628.97	1627.17	1626.23	1625.04	1624.21	1625.04	1626.23	1627.17	1628.97	1629.98	1630.6	1629.98	1628.97	1627.17	1626.23	1625.04	1624.21	1625.04	1626.23	1627.17	1628.97	1629.98	1630.6
5	1628.91	1628	1626.67	1623.99	1621.64	1619.97	1618.88	1619.97	1621.64	1623.99	1626.67	1628	1628.91	1628	1626.67	1623.99	1621.64	1619.97	1618.88	1619.97	1621.64	1623.99	1626.67	1628	1628.91
6	1627.01	1625.67	1623.45	1620.08	1616.96	1613.89	1612.89	1613.89	1616.96	1620.08	1623.45	1625.67	1627.01	1625.67	1623.45	1620.08	1616.96	1613.89	1612.89	1613.89	1616.96	1620.08	1623.45	1625.67	1627.01
7	1624.3	1622.83	1620.1	1614.44	1610.29	1606.93	1605.53	1606.93	1610.29	1614.44	1620.1	1622.83	1624.3	1622.83	1620.1	1614.44	1610.29	1606.93	1605.53	1606.93	1610.29	1614.44	1620.1	1622.83	1624.3
8	1621.16	1619.94	1615.24	1609.29	1603.46	1599.13	1597.73	1599.13	1603.46	1609.29	1615.24	1619.94	1621.16	1619.94	1615.24	1609.29	1603.46	1599.13	1597.73	1599.13	1603.46	1609.29	1615.24	1619.94	1621.16
9	1618.68	1616	1610.89	1603.25	1596.12	1590.43	1588.47	1590.43	1596.12	1603.25	1610.89	1616	1618.68	1616	1610.89	1603.25	1596.12	1590.43	1588.47	1590.43	1596.12	1603.25	1610.89	1616	1618.68
10	1614.6	1611.99	1605.31	1595.58	1587.21	1580.51	1577.48	1580.51	1587.21	1595.58	1605.31	1611.99	1614.6	1611.99	1605.31	1595.58	1587.21	1580.51	1577.48	1580.51	1587.21	1595.58	1605.31	1611.99	1614.6
11	1610.76	1607.75	1599.11	1588.59	1577.56	1569.68	1566.37	1569.68	1577.56	1588.59	1599.11	1607.75	1610.76	1607.75	1599.11	1588.59	1577.56	1569.68	1566.37	1569.68	1577.56	1588.59	1599.11	1607.75	1610.76
12	1606.69	1602.21	1593.09	1580.32	1567.4	1558.67	1555.14	1558.67	1567.4	1580.32	1593.09	1602.21	1606.69	1602.21	1593.09	1580.32	1567.4	1558.67	1555.14	1558.67	1567.4	1580.32	1593.09	1602.21	1606.69
13	1601.37	1597.04	1585.63	1570.71	1556.23	1545.97	1542.28	1545.97	1556.23	1570.71	1585.63	1597.04	1601.37	1597.04	1585.63	1570.71	1556.23	1545.97	1542.28	1545.97	1556.23	1570.71	1585.63	1597.04	1601.37
14	1596.12	1591.66	1578.62	1561.06	1544.63	1533.58	1529.05	1533.58	1544.63	1561.06	1578.62	1591.66	1596.12	1591.66	1578.62	1561.06	1544.63	1533.58	1529.05	1533.58	1544.63	1561.06	1578.62	1591.66	1596.12
15	1590.75	1584.75	1570.4	1551	1533.01	1519.98	1515.24	1519.98	1533.01	1551	1570.4	1584.75	1590.75	1584.75	1570.4	1551	1533.01	1519.98	1515.24	1519.98	1533.01	1551	1570.4	1584.75	1590.75
16	1584.34	1578.09	1561.5	1539.59	1519.6	1506.21	1500.22	1506.21	1519.6	1539.59	1561.5	1578.09	1584.34	1578.09	1561.5	1539.59	1519.6	1506.21	1500.22	1506.21	1519.6	1539.59	1561.5	1578.09	1584.34
17	1578.1	1570.65	1552.34	1527.9	1506.5	1491.33	1485.04	1491.33	1506.5	1527.9	1552.34	1570.65	1578.1	1570.65	1552.34	1527.9	1506.5	1491.33	1485.04	1491.33	1506.5	1527.9	1552.34	1570.65	1578.1
18	1570.79	1562.59	1542.43	1516.35	1491.98	1476.3	1470.09	1476.3	1491.98	1516.35	1542.43	1562.59	1570.79	1562.59	1542.43	1516.35	1491.98	1476.3	1470.09	1476.3	1491.98	1516.35	1542.43	1562.59	1570.79
19	1563.1	1554.23	1531.56	1503.46	1477.49	1460.4	1453.8	1460.4	1477.49	1503.46	1531.56	1554.23	1563.1	1554.23	1531.56	1503.46	1477.49	1460.4	1453.8	1460.4	1477.49	1503.46	1531.56	1554.23	1563.1
20	1554.79	1545.43	1520.75	1490.31	1462.39	1444.53	1437	1444.53	1462.39	1490.31	1520.75	1545.43	1554.79	1545.43	1520.75	1490.31	1462.39	1444.53	1437	1444.53	1462.39	1490.31	1520.75	1545.43	1554.79
21	1547.13	1535.83	1509.32	1476.73	1447.81	1427.71	1420.46	1427.71	1447.81	1476.73	1509.32	1535.83	1547.13	1535.83	1509.32	1476.73	1447.81	1427.71	1420.46	1427.71	1447.81	1476.73	1509.32	1535.83	1547.13
22	1537.67	1526.02	1497.31	1461.8	1431.45	1410.97	1402.36	1410.97	1431.45	1461.8	1497.31	1526.02	1537.67	1526.02	1497.31	1461.8	1431.45	1410.97	1402.36	1410.97	1431.45	1461.8	1497.31	1526.02	1537.67
23	1527.72	1515.67	1484.66	1447.74	1415.24	1393.46	1384.52	1393.46	1415.24	1447.74	1484.66	1515.67	1527.72	1515.67	1484.66	1447.74	1415.24	1393.46	1384.52	1393.46	1415.24	1447.74	1484.66	1515.67	1527.72
24	1518.05	1504.58	1471.85	1432.61	1398.27	1376.67	1365.64	1376.67	1398.27	1432.61	1471.85	1504.58	1518.05	1504.58	1471.85	1432.61	1398.27	1376.67	1365.64	1376.67	1398.27	1432.61	1471.85	1504.58	1518.05
25	1507.64	1493.12	1458.09	1416.55	1380.82	1358.19	1346.54	1358.19	1380.82	1416.55	1458.09	1493.12	1507.64	1493.12	1458.09	1416.55	1380.82	1358.19	1346.54	1358.19	1380.82	1416.55	1458.09	1493.12	1507.64
26	1496.72	1481.23	1444.3	1401.1	1364.21	1338.79	1327.17	1338.79	1364.21	1401.1	1444.3	1481.23	1496.72	1481.23	1444.3	1401.1	1364.21	1338.79	1327.17	1338.79	1364.21	1401.1	1444.3	1481.23	1496.72
27	1485.45	1468.48	1429.57	1385.1	1346.16	1319.93	1307.48	1319.93	1346.16	1385.1	1429.57	1468.48	1485.45	1468.48	1429.57	1385.1	1346.16	1319.93	1307.48	1319.93	1346.16	1385.1	1429.57	1468.48	1485.45
28	1472.91	1455.52	1414.07	1368.81	1327.09	1299.78	1288.1	1299.78	1327.09	1368.81	1414.07	1455.52	1472.91	1455.52	1414.07	1368.81	1327.09	1299.78	1288.1	1299.78	1327.09	1368.81	1414.07	1455.52	1472.91
29	1460.07	1441.86	1398.43	1351.85	1308.73	1280.41	1269.08	1280.41	1308.73	1351.85	1398.43	1441.86	1460.07	1441.86	1398.43	1351.85	1308.73	1280.41	1269.08	1280.41	1308.73	1351.85	1398.43	1441.86	1460.07
30	1446.4	1427.27	1383.47	1333.54	1289.62	1259.95	1248.86	1259.95	1289.62	1333.54	1383.47	1427.27	1446.4	1427.27	1383.47	1333.54	1289.62	1259.95	1248.86	1259.95	1289.62	1333.54	1383.47	1427.27	1446.4
31	1432.25	1412.11	1367.3	1315.14	1269.78	1238.5	1227.32	1238.5	1269.78	1315.14	1367.3	1412.11	1432.25	1412.11	1367.3	1315.14	1269.78	1238.5	1227.32	1238.5	1269.78	1315.14	1367.3	1412.11	1432.25
32	1417.87	1396.95	1350.73	1297	1248.92	1216.67	1205.23	1216.67	1248.92	1297	1350.73	1396.95	1417.87	1396.95	1350.73	1297	1248.92	1216.67	1205.23	1216.67	1248.92	1297	1350.73	1396.95	1417.87
33	1401.53	1380.8	1333.67	1277.82	1226.62	1194.23	1181.56	1194.23	1226.62	1277.82	1333.67	1380.8	1401.53	1380.8	1333.67	1277.82	1226.62	1194.23	1181.56	1194.23	1226.62	1277.82	1333.67	1380.8	1401.53
34	1385.39	1364.75	1315.3	1257.47	1204.97	1170.34	1156.58	1170.34	1204.97	1257.47	1315.3	1364.75	1385.39	1364.75	1315.3	1257.47	1204.97	1170.34	1156.58	1170.34	1204.97	1257.47	1315.3	1364.75	1385.39
35	1369.24	1348.25	1296.81	1236.86	1182.86	1144.82	1129.59	1144.82	1182.86	1236.86	1296.81	1348.25	1369.24	1348.25	1296.81	1236.86	1182.86	1144.82	1129.59	1144.82	1182.86	1236.86	1296.81	1348.25	1369.24
36	1352.87	1330.51	1278.43	1214.99	1159.83	1117.22	1098.2	1117.22	1159.83	1214.99	1278.43	1330.51	1352.87	1330.51	1278.43	1214.99	1159.83	1117.22	1098.2	1117.22	1159.83	1214.99	1278.43	1330.51	1352.87
37	1336.74	1312.17	1257.88	1193.11	1135.49	1086.16	1063.17	1086.16	1135.49	1193.11	1257.88	1312.17	1336.74	1312.17	1257.88	1193.11	1135.49	1086.16	1063.17	1086.16	1135.49	1193.11	1257.88	1312.17	1336.74
38	1318.39	1293.24	1236.72	1171.3	1109.87	1051.07	1023.21	1051.07	1109.87	1171.3	1236.72	1293.24	1318.39	1293.24	1236.72	1171.3	1109.87	1							



51	1007.28	978.82	910.65	751.02	552.64	447.25	417.39	447.25	552.64	751.02	910.65	978.82	1007.28	978.82	910.65	751.02	552.64	447.25	417.39	447.25	552.64	751.02	910.65	978.82	1007.28	978.82	910.65	751.02	552.64	447.25	417.39	447.25	552.64	751.02	910.65	978.82	1007.28
52	978.68	950.24	880.35	705.79	512.2	414.14	386.67	414.14	512.2	705.79	880.35	950.24	978.68	950.24	880.35	705.79	512.2	414.14	386.67	414.14	512.2	705.79	880.35	950.24	978.68	950.24	880.35	705.79	512.2	414.14	386.67	414.14	512.2	705.79	880.35	950.24	978.68
53	948.76	920.7	849.44	660.71	474.29	384.8	359.8	384.8	474.29	660.71	849.44	920.7	948.76	920.7	849.44	660.71	474.29	384.8	359.8	384.8	474.29	660.71	849.44	920.7	948.76	920.7	849.44	660.71	474.29	384.8	359.8	384.8	474.29	660.71	849.44	920.7	948.76
54	917.9	890.4	817.46	615.83	439.37	357.97	335.85	357.97	439.37	615.83	817.46	890.4	917.9	890.4	817.46	615.83	439.37	357.97	335.85	357.97	439.37	615.83	817.46	890.4	917.9	890.4	817.46	615.83	439.37	357.97	335.85	357.97	439.37	615.83	817.46	890.4	917.9
55	887.81	860.67	783.41	572.05	407.96	333.88	313.67	333.88	407.96	572.05	783.41	860.67	887.81	860.67	783.41	572.05	407.96	333.88	313.67	333.88	407.96	572.05	783.41	860.67	887.81	860.67	783.41	572.05	407.96	333.88	313.67	333.88	407.96	572.05	783.41	860.67	887.81
56	855.97	829.46	748.35	531.74	379.04	312.24	294.13	312.24	379.04	531.74	748.35	829.46	855.97	829.46	748.35	531.74	379.04	312.24	294.13	312.24	379.04	531.74	748.35	829.46	855.97	829.46	748.35	531.74	379.04	312.24	294.13	312.24	379.04	531.74	748.35	829.46	855.97
57	823.1	798.09	713.42	494.02	352.6	292.48	276.42	292.48	352.6	494.02	713.42	798.09	823.1	798.09	713.42	494.02	352.6	292.48	276.42	292.48	352.6	494.02	713.42	798.09	823.1	798.09	713.42	494.02	352.6	292.48	276.42	292.48	352.6	494.02	713.42	798.09	823.1
58	791.19	766.95	674.49	457.85	328.84	274.37	260.17	274.37	328.84	457.85	674.49	766.95	791.19	766.95	674.49	457.85	328.84	274.37	260.17	274.37	328.84	457.85	674.49	766.95	791.19	766.95	674.49	457.85	328.84	274.37	260.17	274.37	328.84	457.85	674.49	766.95	791.19
59	757.68	734.41	634.77	424.56	307.18	258.57	245.66	258.57	307.18	424.56	634.77	734.41	757.68	734.41	634.77	424.56	307.18	258.57	245.66	258.57	307.18	424.56	634.77	734.41	757.68	734.41	634.77	424.56	307.18	258.57	245.66	258.57	307.18	424.56	634.77	734.41	757.68
60	723.97	702.15	595.24	394.4	287.44	244	232.91	244	287.44	394.4	595.24	702.15	723.97	702.15	595.24	394.4	287.44	244	232.91	244	287.44	394.4	595.24	702.15	723.97	702.15	595.24	394.4	287.44	244	232.91	244	287.44	394.4	595.24	702.15	723.97
61	690.67	669.26	556.39	365.92	269.4	230.7	221.02	230.7	269.4	365.92	556.39	669.26	690.67	669.26	556.39	365.92	269.4	230.7	221.02	230.7	269.4	365.92	556.39	669.26	690.67	669.26	556.39	365.92	269.4	230.7	221.02	230.7	269.4	365.92	556.39	669.26	690.67
62	657.55	637.45	519.14	340.21	253.17	219.3	210.94	219.3	253.17	340.21	519.14	637.45	657.55	637.45	519.14	340.21	253.17	219.3	210.94	219.3	253.17	340.21	519.14	637.45	657.55	637.45	519.14	340.21	253.17	219.3	210.94	219.3	253.17	340.21	519.14	637.45	657.55
63	624.13	605.44	482.08	316.58	238.18	208.49	201.6	208.49	238.18	316.58	482.08	605.44	624.13	605.44	482.08	316.58	238.18	208.49	201.6	208.49	238.18	316.58	482.08	605.44	624.13	605.44	482.08	316.58	238.18	208.49	201.6	208.49	238.18	316.58	482.08	605.44	624.13
64	591.19	573.13	446.07	294.66	224.52	198.85	193.19	198.85	224.52	294.66	446.07	573.13	591.19	573.13	446.07	294.66	224.52	198.85	193.19	198.85	224.52	294.66	446.07	573.13	591.19	573.13	446.07	294.66	224.52	198.85	193.19	198.85	224.52	294.66	446.07	573.13	591.19
65	557.26	540.27	412.77	274.68	212.26	190.29	185.7	190.29	212.26	274.68	412.77	540.27	557.26	540.27	412.77	274.68	212.26	190.29	185.7	190.29	212.26	274.68	412.77	540.27	557.26	540.27	412.77	274.68	212.26	190.29	185.7	190.29	212.26	274.68	412.77	540.27	557.26
66	523.47	507.34	380.47	256.11	200.73	182.33	178.85	182.33	200.73	256.11	380.47	507.34	523.47	507.34	380.47	256.11	200.73	182.33	178.85	182.33	200.73	256.11	380.47	507.34	523.47	507.34	380.47	256.11	200.73	182.33	178.85	182.33	200.73	256.11	380.47	507.34	523.47
67	490.27	474.86	351.33	239.1	190.36	175.34	172.76	175.34	190.36	239.1	351.33	474.86	490.27	474.86	351.33	239.1	190.36	175.34	172.76	175.34	190.36	239.1	351.33	474.86	490.27	474.86	351.33	239.1	190.36	175.34	172.76	175.34	190.36	239.1	351.33	474.86	490.27
68	456.75	442.09	323.84	223.49	180.9	168.78	167.2	168.78	180.9	223.49	323.84	442.09	456.75	442.09	323.84	223.49	180.9	168.78	167.2	168.78	180.9	223.49	323.84	442.09	456.75	442.09	323.84	223.49	180.9	168.78	167.2	168.78	180.9	223.49	323.84	442.09	456.75
69	424.33	410.09	298.12	208.79	172.05	162.9	162.18	162.9	172.05	208.79	298.12	410.09	424.33	410.09	298.12	208.79	172.05	162.9	162.18	162.9	172.05	208.79	298.12	410.09	424.33	410.09	298.12	208.79	172.05	162.9	162.18	162.9	172.05	208.79	298.12	410.09	424.33
70	392.23	378.74	274.45	195.13	163.86	157.47	157.47	157.47	163.86	195.13	274.45	378.74	392.23	378.74	274.45	195.13	163.86	157.47	157.47	157.47	163.86	195.13	274.45	378.74	392.23	378.74	274.45	195.13	163.86	157.47	157.47	157.47	163.86	195.13	274.45	378.74	392.23
71	360.65	347.61	252.24	182.42	156.28	152.24	153.23	152.24	156.28	182.42	252.24	347.61	360.65	347.61	252.24	182.42	156.28	152.24	153.23	152.24	156.28	182.42	252.24	347.61	360.65	347.61	252.24	182.42	156.28	152.24	153.23	152.24	156.28	182.42	252.24	347.61	360.65
72	330.13	317.78	231.75	170.67	149.14	147.56	149.24	147.56	149.14	170.67	231.75	317.78	330.13	317.78	231.75	170.67	149.14	147.56	149.24	147.56	149.14	170.67	231.75	317.78	330.13	317.78	231.75	170.67	149.14	147.56	149.24	147.56	149.14	170.67	231.75	317.78	330.13
73	300.22	288.98	212.52	159.51	142.47	143.13	145.36	143.13	142.47	159.51	212.52	288.98	300.22	288.98	212.52	159.51	142.47	143.13	145.36	143.13	142.47	159.51	212.52	288.98	300.22	288.98	212.52	159.51	142.47	143.13	145.36	143.13	142.47	159.51	212.52	288.98	300.22
74	271.48	261.29	194.62	149.09	136.42	139.01	141.86	139.01	136.42	149.09	194.62	261.29	271.48	261.29	194.62	149.09	136.42	139.01	141.86	139.01	136.42	149.09	194.62	261.29	271.48	261.29	194.62	149.09	136.42	139.01	141.86	139.01	136.42	149.09	194.62	261.29	271.48
75	243.65	234.92	177.62	139.36	130.48	135.03	138.44	135.03	130.48	139.36	177.62	234.92	243.65	234.92	177.62	139.36	130.48	135.03	138.44	135.03	130.48	139.36	177.62	234.92	243.65	234.92	177.62	139.36	130.48	135.03	138.44	135.03	130.48	139.36	177.62	234.92	243.65
76	217.22	210.15	161.77	130.15	124.78	131.1	134.91	131.1	124.78	130.15	161.77	210.15	217.22	210.15	161.77	130.15	124.78	131.1	134.91	131.1	124.78	130.15	161.77	210.15	217.22	210.15	161.77	130.15	124.78	131.1	134.91	131.1	124.78	130.15	161.77	210.15	217.22
77	191.95	186.61	146.78	121.45	119.55	127.28	131.56	127.28	119.55	121.45	146.78	186.61	191.95	186.61	146.78	121.45	119.55	127.28	131.56	127.28	119.55	121.45	146.78	186.61	191.95	186.61	146.78	121.45	119.55	127.28	131.56	127.28	119.55	121.45	146.78	186.61	191.95
78	167.6	164.68	132.91	113.16	114.4	123.66	128.28	123.66	114.4	113.16	132.91	164.68	167.6	164.68	132.91	113.16	114.4	123.66	128.28	123.66	114.4	113.16	132.91	164.68	167.6	164.68	132.91	113.16	114.4	123.66	128.28	123.66	114.4	113.16	132.91	164.68	167.6
79	145.08	143.99	119.71	105.49	109.53	119.97	125	119.97	109.53	105.49	119.71	143.99	145.08	143.99	119.71	105.49	109.53	119.97	125	119.97	109.53	105.49	119.71	143.99	145.08	143.99	119.71	105.49	109.53	119.97	125	119.97	109.53	105.49	119.71	143.99	145.08
80	123.15	124.49	107.36	98.19	104.77	116.39	121.8	116.39	104.77	98.19	107.36	124.49	123.15	124.49	107.36	98.19	104.77	116.39	121.8	116.39	104.77	98.19	107.36	124.49	123.15	124.49											

106	2.75	4.19	9.9	17.18	25.54	33.12	36.36	33.12	25.54	17.18	9.9	4.19	2.75	4.19	9.9	17.18	25.54	33.12	36.36	33.12	25.54	17.18	9.9	4.19	2.75
107	2.97	4.16	9.73	16.86	24.89	32.08	35.13	32.08	24.89	16.86	9.73	4.16	2.97	4.16	9.73	16.86	24.89	32.08	35.13	32.08	24.89	16.86	9.73	4.16	2.97
108	3.21	4.12	9.62	16.58	24.33	31.18	33.99	31.18	24.33	16.58	9.62	4.12	3.21	4.12	9.62	16.58	24.33	31.18	33.99	31.18	24.33	16.58	9.62	4.12	3.21
109	3.43	4.09	9.55	16.33	23.83	30.4	32.99	30.4	23.83	16.33	9.55	4.09	3.43	4.09	9.55	16.33	23.83	30.4	32.99	30.4	23.83	16.33	9.55	4.09	3.43
110	3.63	4.05	9.46	16.12	23.43	29.7	32.16	29.7	23.43	16.12	9.46	4.05	3.63	4.05	9.46	16.12	23.43	29.7	32.16	29.7	23.43	16.12	9.46	4.05	3.63
111	3.82	4.02	9.36	15.93	23.09	29.13	31.43	29.13	23.09	15.93	9.36	4.02	3.82	4.02	9.36	15.93	23.09	29.13	31.43	29.13	23.09	15.93	9.36	4.02	3.82
112	3.99	4	9.24	15.76	22.83	28.7	30.88	28.7	22.83	15.76	9.24	4	3.99	4	9.24	15.76	22.83	28.7	30.88	28.7	22.83	15.76	9.24	4	3.99
113	4.16	3.98	9.14	15.59	22.58	28.32	30.47	28.32	22.58	15.59	9.14	3.98	4.16	3.98	9.14	15.59	22.58	28.32	30.47	28.32	22.58	15.59	9.14	3.98	4.16
114	4.34	3.97	9.04	15.39	22.31	27.97	30.15	27.97	22.31	15.39	9.04	3.97	4.34	3.97	9.04	15.39	22.31	27.97	30.15	27.97	22.31	15.39	9.04	3.97	4.34
115	4.51	3.97	8.95	15.14	22.03	27.56	29.8	27.56	22.03	15.14	8.95	3.97	4.51	3.97	8.95	15.14	22.03	27.56	29.8	27.56	22.03	15.14	8.95	3.97	4.51
116	4.68	3.97	8.85	14.9	21.76	27.09	29.36	27.09	21.76	14.9	8.85	3.97	4.68	3.97	8.85	14.9	21.76	27.09	29.36	27.09	21.76	14.9	8.85	3.97	4.68
117	4.84	3.99	8.76	14.72	21.48	26.61	28.76	26.61	21.48	14.72	8.76	3.99	4.84	3.99	8.76	14.72	21.48	26.61	28.76	26.61	21.48	14.72	8.76	3.99	4.84
118	5	4.01	8.65	14.55	21.18	26.11	28.08	26.11	21.18	14.55	8.65	4.01	5	4.01	8.65	14.55	21.18	26.11	28.08	26.11	21.18	14.55	8.65	4.01	5
119	5.14	4.04	8.54	14.36	20.84	25.59	27.42	25.59	20.84	14.36	8.54	4.04	5.14	4.04	8.54	14.36	20.84	25.59	27.42	25.59	20.84	14.36	8.54	4.04	5.14
120	5.28	4.07	8.42	14.17	20.48	25.06	26.73	25.06	20.48	14.17	8.42	4.07	5.28	4.07	8.42	14.17	20.48	25.06	26.73	25.06	20.48	14.17	8.42	4.07	5.28
121	5.42	4.11	8.29	13.98	20.09	24.49	26.07	24.49	20.09	13.98	8.29	4.11	5.42	4.11	8.29	13.98	20.09	24.49	26.07	24.49	20.09	13.98	8.29	4.11	5.42
122	5.57	4.15	8.16	13.79	19.68	23.89	25.42	23.89	19.68	13.79	8.16	4.15	5.57	4.15	8.16	13.79	19.68	23.89	25.42	23.89	19.68	13.79	8.16	4.15	5.57
123	5.73	4.21	8.03	13.57	19.23	23.28	24.74	23.28	19.23	13.57	8.03	4.21	5.73	4.21	8.03	13.57	19.23	23.28	24.74	23.28	19.23	13.57	8.03	4.21	5.73
124	5.88	4.26	7.91	13.34	18.75	22.65	24.05	22.65	18.75	13.34	7.91	4.26	5.88	4.26	7.91	13.34	18.75	22.65	24.05	22.65	18.75	13.34	7.91	4.26	5.88
125	6.04	4.31	7.78	13.08	18.24	22.01	23.36	22.01	18.24	13.08	7.78	4.31	6.04	4.31	7.78	13.08	18.24	22.01	23.36	22.01	18.24	13.08	7.78	4.31	6.04
126	6.2	4.35	7.66	12.79	17.67	21.39	22.64	21.39	17.67	12.79	7.66	4.35	6.2	4.35	7.66	12.79	17.67	21.39	22.64	21.39	17.67	12.79	7.66	4.35	6.2
127	6.37	4.42	7.53	12.49	17.13	20.74	21.91	20.74	17.13	12.49	7.53	4.42	6.37	4.42	7.53	12.49	17.13	20.74	21.91	20.74	17.13	12.49	7.53	4.42	6.37
128	6.51	4.48	7.4	12.19	16.65	20.08	21.2	20.08	16.65	12.19	7.4	4.48	6.51	4.48	7.4	12.19	16.65	20.08	21.2	20.08	16.65	12.19	7.4	4.48	6.51
129	6.65	4.54	7.27	11.88	16.18	19.42	20.48	19.42	16.18	11.88	7.27	4.54	6.65	4.54	7.27	11.88	16.18	19.42	20.48	19.42	16.18	11.88	7.27	4.54	6.65
130	6.79	4.6	7.14	11.57	15.7	18.77	19.75	18.77	15.7	11.57	7.14	4.6	6.79	4.6	7.14	11.57	15.7	18.77	19.75	18.77	15.7	11.57	7.14	4.6	6.79
131	6.91	4.68	7.01	11.26	15.24	18.13	19.07	18.13	15.24	11.26	7.01	4.68	6.91	4.68	7.01	11.26	15.24	18.13	19.07	18.13	15.24	11.26	7.01	4.68	6.91
132	7.03	4.76	6.91	10.96	14.78	17.52	18.39	17.52	14.78	10.96	6.91	4.76	7.03	4.76	6.91	10.96	14.78	17.52	18.39	17.52	14.78	10.96	6.91	4.76	7.03
133	7.14	4.86	6.82	10.65	14.3	16.93	17.75	16.93	14.3	10.65	6.82	4.86	7.14	4.86	6.82	10.65	14.3	16.93	17.75	16.93	14.3	10.65	6.82	4.86	7.14
134	7.24	4.96	6.73	10.34	13.83	16.37	17.13	16.37	13.83	10.34	6.73	4.96	7.24	4.96	6.73	10.34	13.83	16.37	17.13	16.37	13.83	10.34	6.73	4.96	7.24
135	7.34	5.07	6.65	10.07	13.38	15.83	16.55	15.83	13.38	10.07	6.65	5.07	7.34	5.07	6.65	10.07	13.38	15.83	16.55	15.83	13.38	10.07	6.65	5.07	7.34
136	7.44	5.19	6.58	9.8	12.95	15.3	16.02	15.3	12.95	9.8	6.58	5.19	7.44	5.19	6.58	9.8	12.95	15.3	16.02	15.3	12.95	9.8	6.58	5.19	7.44
137	7.52	5.34	6.52	9.54	12.54	14.77	15.48	14.77	12.54	9.54	6.52	5.34	7.52	5.34	6.52	9.54	12.54	14.77	15.48	14.77	12.54	9.54	6.52	5.34	7.52
138	7.62	5.48	6.47	9.3	12.13	14.26	14.97	14.26	12.13	9.3	6.47	5.48	7.62	5.48	6.47	9.3	12.13	14.26	14.97	14.26	12.13	9.3	6.47	5.48	7.62
139	7.73	5.66	6.43	9.06	11.72	13.74	14.49	13.74	11.72	9.06	6.43	5.66	7.73	5.66	6.43	9.06	11.72	13.74	14.49	13.74	11.72	9.06	6.43	5.66	7.73
140	7.83	5.86	6.4	8.83	11.35	13.28	14.03	13.28	11.35	8.83	6.4	5.86	7.83	5.86	6.4	8.83	11.35	13.28	14.03	13.28	11.35	8.83	6.4	5.86	7.83
141	7.92	6.1	6.37	8.61	11	12.83	13.56	12.83	11	8.61	6.37	6.1	7.92	6.1	6.37	8.61	11	12.83	13.56	12.83	11	8.61	6.37	6.1	7.92
142	8.02	6.43	6.35	8.39	10.67	12.41	13.11	12.41	10.67	8.39	6.35	6.43	8.02	6.43	6.35	8.39	10.67	12.41	13.11	12.41	10.67	8.39	6.35	6.43	8.02
143	8.1	6.82	6.34	8.2	10.35	12.02	12.69	12.02	10.35	8.2	6.34	6.82	8.1	6.82	6.34	8.2	10.35	12.02	12.69	12.02	10.35	8.2	6.34	6.82	8.1
144	8.16	7.24	6.32	8.03	10.03	11.64	12.26	11.64	10.03	8.03	6.32	7.24	8.16	7.24	6.32	8.03	10.03	11.64	12.26	11.64	10.03	8.03	6.32	7.24	8.16
145	8.21	7.63	6.31	7.86	9.73	11.28	11.85	11.28	9.73	7.86	6.31	7.63	8.21	7.63	6.31	7.86	9.73	11.28	11.85	11.28	9.73	7.86	6.31	7.63	8.21
146	8.24	7.99	6.29	7.71	9.46	10.93	11.46	10.93	9.46	7.71	6.29	7.99	8.24	7.99	6.29	7.71	9.46	10.93	11.46	10.93	9.46	7.71	6.29	7.99	8.24
147	8.26	8.29	6.29	7.57	9.21	10.58	11.08	10.58	9.21	7.57	6.29	8.29	8.26	8.29	6.29	7.57	9.21	10.58	11.08	10.58	9.21	7.57	6.29	8.29	8.26
148	8.28	8.55	6.28	7.44	8.96	10.23	10.71	10.23	8.96	7.44	6.28	8.55	8.28	8.55	6.28	7.44	8.96	10.23	10.71	10.23	8.96	7.44	6.28	8.55	8.28
149	8.3	8.78	6.27	7.33	8.72	9.89	10.36	9.89	8.72	7.33	6.27	8.78	8.3	8.78	6.27	7.33	8.72	9.89	10.36	9.89	8.72	7.33	6.27	8.78	8.3
150	8.35	8.97	6.29	7.24	8.5	9.58	10.02	9.58	8.5	7.24	6.29	8.97	8.35	8.97	6.29	7.24	8.5	9.58	10.02	9.58	8.5	7.24	6.29	8.97	8.35
151	8.41	9.16	6.35	7.16	8.29	9.29	9.7	9.29	8.29	7.16	6.35	9.16	8.41	9.16	6.35	7.16	8.29	9.29	9.7	9.29	8.29	7.16	6.35	9.16	8.41
152	8.46	9.33	6.4	7.08	8.1	9.02	9.41	9.02	8.1	7.08	6.4	9.33	8.46	9.33	6.4	7.08	8.1	9.02	9.41	9.02	8.1	7.08	6.4	9.33	8.46
153	8.47	9.44	6.46	6.99	7.92	8.76	9.14	8.76	7.92	6.99	6.46	9.44	8.47	9.44	6.46	6.99	7.92	8.76	9.14	8.76	7.92	6.99	6.46	9.44	8.47
154	8.45	9.52	6.56	6.94	7.78	8.53	8.87	8.53	7.78	6.94	6.56	9.52	8.45	9.52	6.56	6.94	7.78	8.53	8.87	8.53	7.78	6.94	6.56	9.52	8.45
155	8.41	9.53	6.74	6.88	7.65	8.33	8.63	8.33	7.65	6.88															

161	8.04	9.14	9.04	6.98	7	7.43	7.65	7.43	7	6.98	9.04	9.14	8.04	9.14	9.04	6.98	7	7.43	7.65	7.43	7	6.98	9.04	9.14	8.04
162	8	9.01	9.24	7.36	6.94	7.32	7.54	7.32	6.94	7.36	9.24	9.01	8	9.01	9.24	7.36	6.94	7.32	7.54	7.32	6.94	7.36	9.24	9.01	8
163	7.96	8.8	9.39	7.79	6.98	7.22	7.43	7.22	6.98	7.79	9.39	8.8	7.96	8.8	9.39	7.79	6.98	7.22	7.43	7.22	6.98	7.79	9.39	8.8	7.96
164	7.91	8.65	9.48	8.26	7.08	7.15	7.37	7.15	7.08	8.26	9.48	8.65	7.91	8.65	9.48	8.26	7.08	7.15	7.37	7.15	7.08	8.26	9.48	8.65	7.91
165	7.86	8.56	9.55	8.69	7.39	7.16	7.37	7.16	7.39	8.69	9.55	8.56	7.86	8.56	9.55	8.69	7.39	7.16	7.37	7.16	7.39	8.69	9.55	8.56	7.86
166	7.8	8.55	9.57	9.09	7.84	7.28	7.42	7.28	7.84	9.09	9.57	8.55	7.8	8.55	9.57	9.09	7.84	7.28	7.42	7.28	7.84	9.09	9.57	8.55	7.8
167	7.74	8.51	9.49	9.37	8.39	7.62	7.63	7.62	8.39	9.37	9.49	8.51	7.74	8.51	9.49	9.37	8.39	7.62	7.63	7.62	8.39	9.37	9.49	8.51	7.74
168	7.76	8.5	9.41	9.53	8.87	8.31	8.12	8.31	8.87	9.53	9.41	8.5	7.76	8.5	9.41	9.53	8.87	8.31	8.12	8.31	8.87	9.53	9.41	8.5	7.76
169	7.99	8.56	9.48	9.71	9.27	8.94	9.16	8.94	9.27	9.71	9.48	8.56	7.99	8.56	9.48	9.71	9.27	8.94	9.16	8.94	9.27	9.71	9.48	8.56	7.99
170	8.3	8.6	9.6	9.96	9.55	9.4	10.12	9.4	9.55	9.96	9.6	8.6	8.3	8.6	9.6	9.96	9.55	9.4	10.12	9.4	9.55	9.96	9.6	8.6	8.3
171	8.62	8.75	9.51	10.13	9.88	9.57	10.86	9.57	9.88	10.13	9.51	8.75	8.62	8.75	9.51	10.13	9.88	9.57	10.86	9.57	9.88	10.13	9.51	8.75	8.62
172	8.85	8.94	9.55	10.12	10.08	9.61	11.44	9.61	10.08	10.12	9.55	8.94	8.85	8.94	9.55	10.12	10.08	9.61	11.44	9.61	10.08	10.12	9.55	8.94	8.85
173	9.04	9.13	9.53	10.1	10.13	9.8	11.69	9.8	10.13	10.1	9.53	9.13	9.04	9.13	9.53	10.1	10.13	9.8	11.69	9.8	10.13	10.1	9.53	9.13	9.04
174	9.24	9.28	9.49	9.87	10.17	9.83	10.86	9.83	10.17	9.87	9.49	9.28	9.24	9.28	9.49	9.87	10.17	9.83	10.86	9.83	10.17	9.87	9.49	9.28	9.24
175	9.44	9.41	9.53	9.76	10.03	9.82	9.98	9.82	10.03	9.76	9.53	9.41	9.44	9.41	9.53	9.76	10.03	9.82	9.98	9.82	10.03	9.76	9.53	9.41	9.44
176	9.72	9.64	9.65	9.78	9.74	9.61	8.89	9.61	9.74	9.78	9.65	9.64	9.72	9.64	9.65	9.78	9.74	9.61	8.89	9.61	9.74	9.78	9.65	9.64	9.72
177	10.01	9.92	9.83	9.8	9.49	8.97	7.6	8.97	9.49	9.8	9.83	9.92	10.01	9.92	9.83	9.8	9.49	8.97	7.6	8.97	9.49	9.8	9.83	9.92	10.01
178	10.16	10.07	9.93	9.84	9.4	8.42	6.42	8.42	9.4	9.84	9.93	10.07	10.16	10.07	9.93	9.84	9.4	8.42	6.42	8.42	9.4	9.84	9.93	10.07	10.16
179	10.14	10.05	9.81	9.53	9.04	7.62	3.6	7.62	9.04	9.53	9.81	10.05	10.14	10.05	9.81	9.53	9.04	7.62	3.6	7.62	9.04	9.53	9.81	10.05	10.14
180	10.12	10.12	10.12	10.12	10.12	10.12	10.12	10.12	10.12	10.12	10.12	10.12	10.12	10.12	10.12	10.12	10.12	10.12	10.12	10.12	10.12	10.12	10.12	10.12	10.12

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	CS4 @75% Power /3500K	Sample ID.	V1
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
120.09	60	0.222	26.5	0.996	5.10%
277.06	60	0.100	26.5	0.961	7.32%

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*****