Lab Code: 200707-0

IES LM-79-08

MEASUREMENT AND TEST REPORT

For

Eiko Limited

23220 W. 84th Street， Shawnee, KS, USA

Model: LEDP-12WA19/830-DIM

Report Type:	Electrical and Photometric tests including: Luminous Flux, Luminous Intensity Distribution, Spatial Non-uniformity of Chromaticity
Test Engineer:	Daniel Duan
Report Number:	RSZ130517503-10
Test Date:	2013-04-26 to 2013-04-28
Report Date:	2013-05-17
Reviewed By:	Jeanne Han/Safety Manager
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008
Test Facility	Test facility was located at Pu Long Cun 69, Puxinghu Industrial Area, Tangxia Town, Dongguan, Guangdong, P.R.China.
Accreditation:	The NVLAP Lab Code is 200707-0.

1. Product Description

General Information:

Model:	LEDP-12WA19/830-DIM
Brand Name:	EiKO
Product Designation:	LED LAMP
Burning Time Before Test:	0 hour (For New Products)

Rated Values:

Rated Voltage/Frequency:	120VAC 60Hz
Nominal CCT:	3000K

Differences declaration

Eiko Limited declare that their products with **model LEDP-12WA19/830-DIM are the same** to products in report # RSZ130424516-10 and is authorized by original applicant to use their test data. (See attachment A- Manufacturer declared letter)

Note:
All test data in previous report (#RSZ130424516-10) is shared in this report.

2. Standards Used

- IESNA LM-79-08: Approved Method: Electrical & Photometric Measurement of Solid-state Lighting Products
- ANSI C82.77-2002: Harmonic Emission Limits – Related Power Quality Requirements for Lighting

3. Description of Test Equipment

Device	Manufacture	Model No	Serial No	Test Range	Calibration date
2.0m integrating sphere	EVERFINE	R98	11010018	N/A	2013-03-08
Rapid Recording Photometer	EVERFINE	PHOTO-2000F	1007010	0.1lm—200klm	2013-03-08
Plus UV-VIS-Near IR Spectrophoto Colorimeter	EVERFINE	PMS-50(380nm-800nm)	506006	380nm~800nm	2013-12-02
Digital CC&CV DC Power Supply	EVERFINE	WY305	1101047	30V/5A	2013-03-25
Special zero-voltage synchronous switching AC	EVERFINE	DPS1010	1011001T	N/A	2013-03-25
AC POWER SUPPLY	EVERFINE	VPS1060 PWM	1101006	0-150V， 0-300V	2013-03-25
Digital CC&CV DC Power Supply	EVERFINE	WY12010	1009009	30V/5A	2013-03-25
Electrical parameter tester	YOKOGAWA	WT-210	91KB35700	15/30/60/150/300/600 V	2013-03-25
full-field speed goniophotometer	EVERFINE	GO-R5000	YG108492N10120001	1600mm,3000W/10A	2013-03-08
Standard Light Source	SENSING	D908	1012004	N/A	2013-03-20

4. Test Method

Product was tested with no seasoning. All stabilization and measurements were made in compliance with IES LM-79-08. The product was operated at rated voltage or at voltage required by manufacturer. The ambient temperature of the sample was maintained at 25°C±1°C during measurement. And relative humidity is less than 65%.

Integrating Sphere System

The system includes AC power source, digital power meter, DC power supply, spectrophotometer, and integrating sphere. The integrating sphere system is calibrated by standard light source before measurement. The system and standard light source has been calibrated regularly and traceable to the National Primary Standards.

4π geometry was used during measurement. The product was operated in its intended orientation in application and was recorded in this report.

Goniophotometer System

The goniophotometer system is calibrated by standard light source before measurement. The standard light source has been calibrated regularly and traceable to the National Primary Standards.

Type C goniophotometer was used for measuring total luminous flux, luminous intensity distribution, and color spatial uniformity. The product was operated in its intended orientation in application and was recorded in this report.

5. Test Result

[Integrating Sphere System]

Total operating time for integrating sphere test: **1.5 hours**

Test orientation: **Base up**

Electrical Measurement

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	0.1102	13.11	0.992

Photometric Measurement

Luminous Flux (lm)	Radiant Flux (W)	Efficacy (lm/W)	CCT (K)	Duv
851.14	2.762	64.88	2892	-3.40E-03

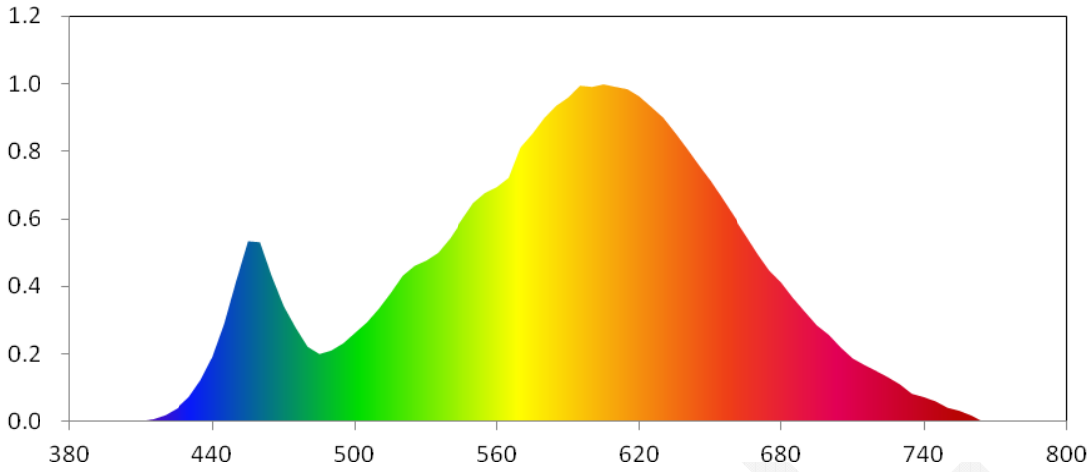
Chromaticity Coordinate

x	y	u	v	u'	v'
0.4396	0.3964	0.2557	0.3458	0.2557	0.5187

Color Rendering Index

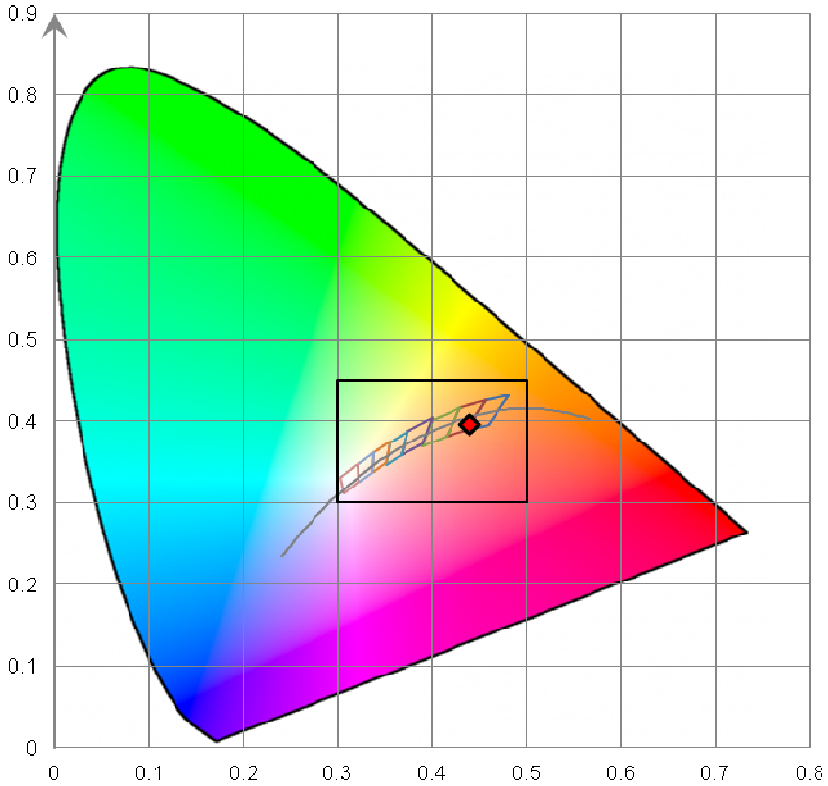
Ra			
83.2			
R1	R2	R3	R4
82	92	96	78
R5	R6	R7	R8
81	89	83	63
R9	R10	R11	R12
21	81	75	71
R13	R14	R15	
85	98	77	

Relative Spectral Power Distribution

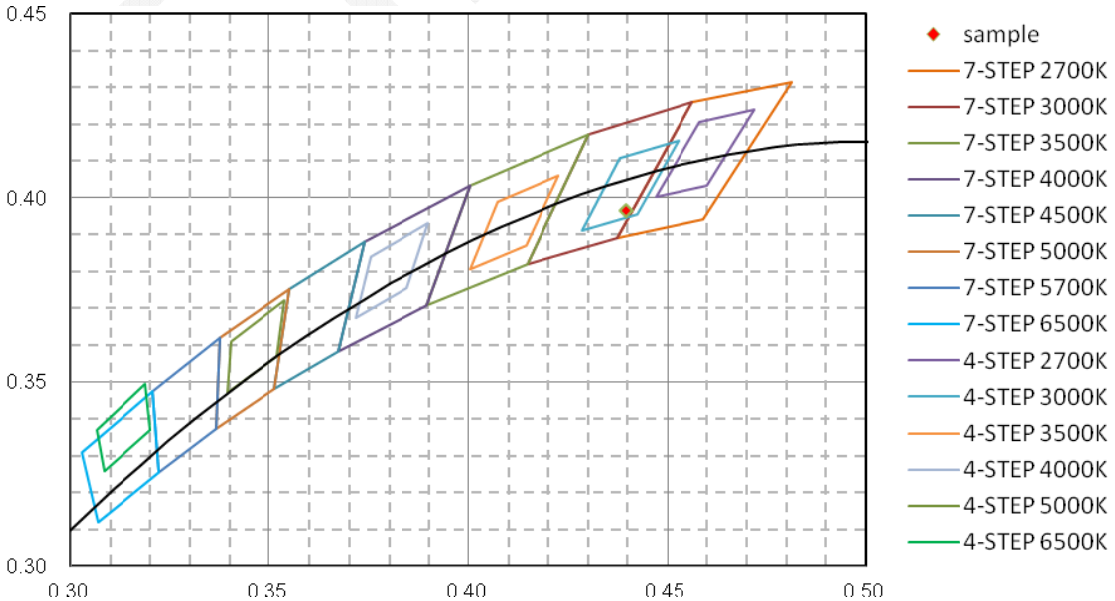


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	0.000E+00	465	7.371E+00	550	1.110E+01	635	1.468E+01	720	2.581E+00
385	0.000E+00	470	5.867E+00	555	1.161E+01	640	1.387E+01	725	2.261E+00
390	0.000E+00	475	4.773E+00	560	1.191E+01	645	1.303E+01	730	1.900E+00
395	0.000E+00	480	3.811E+00	565	1.238E+01	650	1.222E+01	735	1.425E+00
400	0.000E+00	485	3.437E+00	570	1.393E+01	655	1.133E+01	740	1.254E+00
405	0.000E+00	490	3.616E+00	575	1.462E+01	660	1.040E+01	745	1.036E+00
410	3.738E-02	495	3.978E+00	580	1.543E+01	665	9.477E+00	750	7.130E-01
415	1.354E-01	500	4.512E+00	585	1.604E+01	670	8.533E+00	755	5.546E-01
420	3.376E-01	505	5.047E+00	590	1.646E+01	675	7.678E+00	760	3.189E-01
425	6.908E-01	510	5.736E+00	595	1.706E+01	680	7.071E+00	765	0.000E+00
430	1.252E+00	515	6.534E+00	600	1.700E+01	685	6.284E+00	770	0.000E+00
435	2.125E+00	520	7.410E+00	605	1.713E+01	690	5.585E+00	775	0.000E+00
440	3.296E+00	525	7.914E+00	610	1.700E+01	695	4.897E+00	780	0.000E+00
445	4.988E+00	530	8.187E+00	615	1.688E+01	700	4.419E+00	785	0.000E+00
450	7.143E+00	535	8.580E+00	620	1.651E+01	705	3.781E+00	790	0.000E+00
455	9.167E+00	540	9.308E+00	625	1.598E+01	710	3.221E+00	795	0.000E+00
460	9.114E+00	545	1.021E+01	630	1.544E+01	715	2.884E+00	800	0.000E+00

CIE 1931 x y Chromaticity Diagram



7-Step & 4-Step Chromaticity Quadrangles



[Goniophotometer System]

Total operating time for luminous intensity distribution: **1.5 hours**

Test orientation: **Base up**

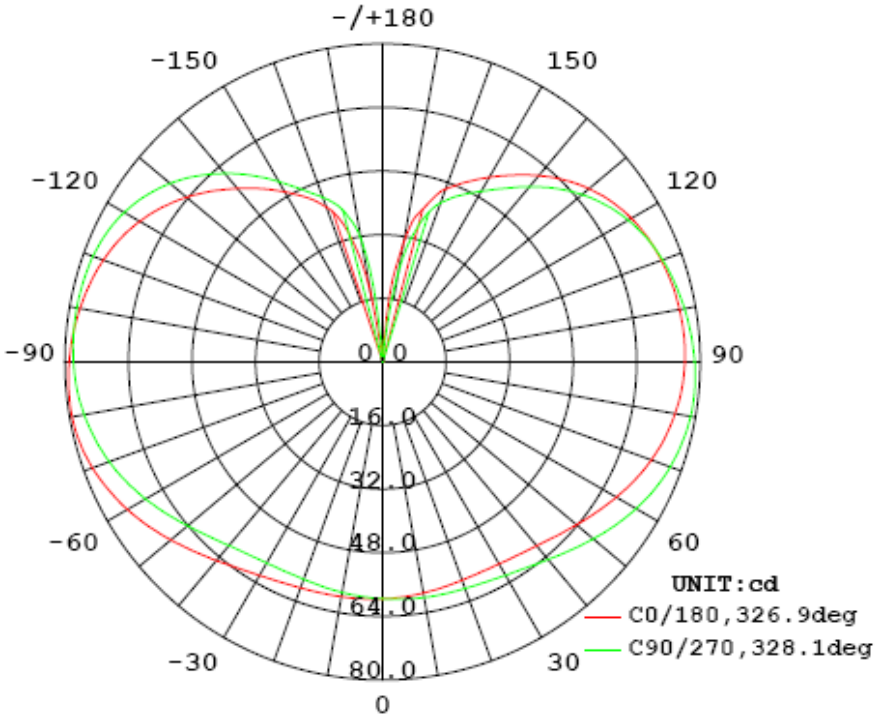
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.0	60	0.1085	12.91	0.9915

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	CBCP (cd)	S/MH (C0/180)	S/MH (C90/270)
858.703	66.51	60	1.65	1.53

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% Imax):	326.9	327.1	328.1	329.1	327.8
Field Angle (10% Imax):	346.9	346.3	347.8	347.2	347.1

Luminous Intensity (cd) Distribution Data

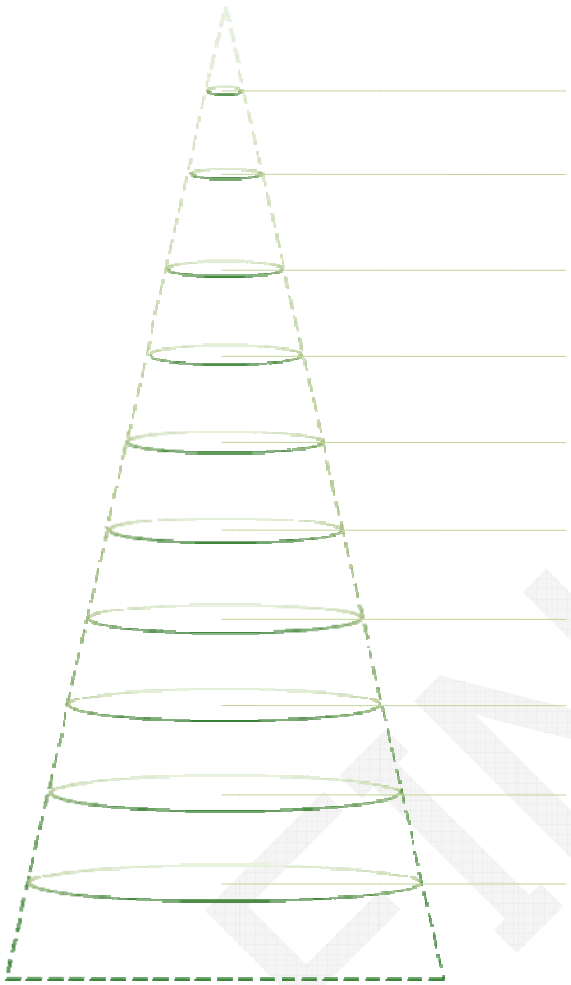
C / γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	60	60	60	60	60	60	60	60
5.0°	60	60	59	59	59	59	59	59
10.0°	60	60	59	59	59	59	59	59
15.0°	60	60	59	59	58	58	58	58
20.0°	60	60	59	59	58	58	58	58
25.0°	61	60	60	59	58	58	58	58
30.0°	62	61	60	59	58	58	58	58
35.0°	63	62	61	60	59	58	58	59
40.0°	65	64	63	61	60	59	59	60
45.0°	67	66	65	63	62	61	61	61
50.0°	70	69	67	66	64	63	63	63
55.0°	72	71	70	68	66	65	65	65
60.0°	74	74	72	71	69	67	67	67
65.0°	76	76	75	73	71	70	69	69
70.0°	78	77	76	75	73	72	71	71
75.0°	79	79	78	77	75	74	73	73
80.0°	79	79	79	78	76	75	74	74
85.0°	79	80	79	78	77	76	75	75
90.0°	79	79	79	78	78	77	76	76
95.0°	78	79	79	78	78	77	76	76
100.0°	77	78	79	78	78	77	76	76
105.0°	76	78	78	78	78	77	76	76
110.0°	75	76	78	77	78	77	75	76
115.0°	73	75	76	76	77	76	74	75
120.0°	71	72	74	74	75	74	73	74
125.0°	68	69	71	72	73	72	71	72
130.0°	64	66	68	69	70	69	69	69
135.0°	61	62	64	65	66	66	66	66
140.0°	57	58	59	62	62	62	62	62
145.0°	53	53	54	57	57	58	58	58
150.0°	49	49	50	53	52	54	55	53
155.0°	46	45	47	49	48	50	51	49
160.0°	41	41	43	45	44	46	47	45
165.0°	34	36	38	39	40	42	43	41
170.0°	18	22	25	27	31	32	33	35
175.0°	0	0	0	2	6	9	11	13
180.0°	0	0	0	0	0	0	0	0

Luminous Intensity (cd) Distribution Data (cont.)

C / γ	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	60	60	60	60	60	60	60	60
5.0°	59	59	60	60	60	60	60	60
10.0°	59	59	60	60	60	60	60	60
15.0°	59	59	60	60	60	61	61	60
20.0°	58	59	60	60	61	61	61	61
25.0°	58	59	60	61	61	62	62	61
30.0°	59	59	60	61	62	62	63	62
35.0°	59	60	61	62	63	64	64	64
40.0°	60	61	63	64	65	66	66	66
45.0°	62	63	64	66	67	68	68	68
50.0°	64	65	67	68	69	70	70	70
55.0°	66	67	69	70	72	72	72	72
60.0°	68	70	71	73	74	74	75	75
65.0°	70	72	73	75	76	76	76	77
70.0°	72	74	75	76	77	78	78	78
75.0°	74	75	76	77	78	79	79	79
80.0°	75	76	77	78	79	79	79	79
85.0°	76	77	78	78	79	79	79	79
90.0°	76	77	78	78	79	79	78	79
95.0°	76	77	77	77	78	78	78	78
100.0°	76	76	77	76	77	77	77	77
105.0°	75	76	76	75	76	76	75	77
110.0°	75	75	75	74	75	75	74	75
115.0°	74	74	74	73	73	73	72	73
120.0°	72	72	73	71	71	71	70	71
125.0°	70	70	70	68	69	68	67	68
130.0°	68	67	67	66	65	65	64	65
135.0°	65	64	64	62	62	61	61	61
140.0°	61	60	60	59	58	57	57	56
145.0°	57	57	56	55	53	52	53	51
150.0°	54	53	51	52	50	48	49	47
155.0°	50	49	46	48	46	44	46	43
160.0°	46	46	43	44	43	41	41	39
165.0°	40	41	39	36	36	35	35	34
170.0°	30	25	27	23	23	23	19	16
175.0°	11	7	3	2	1	0	0	0
180.0°	0	0	0	0	0	0	0	0

Average Area Illumination Figure

Angle: 90.0°. Flux out: 112.3 lm.



Height (m)	Diameter (cm)	E_{avg}(lx)	E_{max}(lx)
0.5	100.0	142.9	238.5
1.0	200.0	35.7	59.6
1.5	300.0	15.9	26.5
2.0	400.0	8.9	14.9
2.5	500.0	5.7	9.5
3.0	600.0	4.0	6.6
3.5	700.0	2.9	4.9
4.0	800.0	2.2	3.7
4.5	900.0	1.8	2.9
5.0	1000.0	1.4	2.4

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	1.424	0.17
5-10	4.258	0.49
10-15	7.052	0.82
15-20	9.791	1.14
20-25	12.486	1.46
25-30	15.170	1.76
30-35	17.880	2.09
35-40	20.662	2.40
40-45	23.544	2.74
45-50	26.509	3.09
50-55	29.496	3.44
55-60	32.417	3.77
60-65	35.159	4.10
65-70	37.602	4.37
70-75	39.639	4.62
75-80	41.181	4.80
80-85	42.178	4.91
85-90	42.631	4.96
90-95	42.575	4.96
95-100	42.054	4.90
100-105	41.106	4.79
105-110	39.742	4.62
110-115	37.940	4.42
115-120	35.664	4.16
120-125	32.926	3.83
125-130	29.789	3.47
130-135	26.358	3.07
135-140	22.766	2.65
140-145	19.160	2.23
145-150	15.689	1.83
150-155	12.473	1.45
155-160	9.541	1.11
160-165	6.774	0.79
165-170	3.936	0.46
170-175	1.099	0.13
175-180	0.030	0.00

Deg	Flux (lm)	%
0-5	1.424	0.17
0-10	5.682	0.66
0-15	12.735	1.48
0-20	22.526	2.62
0-25	35.013	4.08
0-30	50.182	5.84
0-35	68.063	7.93
0-40	88.724	10.33
0-45	112.268	13.07
0-50	138.778	16.16
0-55	168.273	19.60
0-60	200.691	23.37
0-65	235.850	27.47
0-70	273.452	31.84
0-75	313.091	36.46
0-80	354.272	41.26
0-85	396.449	46.17
0-90	439.080	51.13
0-95	481.655	56.09
0-100	523.709	60.99
0-105	564.815	65.78
0-110	604.557	70.40
0-115	642.497	74.82
0-120	678.161	78.98
0-125	711.087	82.81
0-130	740.876	86.28
0-135	767.234	89.35
0-140	790.000	92.00
0-145	809.160	94.23
0-150	824.849	96.06
0-155	837.322	97.51
0-160	846.862	98.62
0-165	853.637	99.41
0-170	857.573	99.87
0-170	858.672	100.00
0-180	858.702	100.00

Color Spatial Uniformity

Average Weighted
u': 0.2520, v': 0.5175

γ \ C0-180	u'	v'	Du'v'
-170	0.2484	0.5163	0.0039
-165	0.2497	0.5168	0.0025
-160	0.2498	0.5169	0.0023
-155	0.2501	0.5170	0.0021
-150	0.2504	0.5172	0.0017
-145	0.2507	0.5174	0.0014
-140	0.2511	0.5176	0.0010
-135	0.2513	0.5177	0.0008
-130	0.2515	0.5179	0.0006
-125	0.2516	0.5180	0.0006
-120	0.2517	0.5182	0.0007
-115	0.2517	0.5180	0.0006
-110	0.2517	0.5181	0.0007
-105	0.2517	0.5182	0.0007
-100	0.2517	0.5182	0.0008
-95	0.2517	0.5183	0.0008
-90	0.2518	0.5184	0.0009
-85	0.2520	0.5186	0.0010
-80	0.2523	0.5187	0.0012
-75	0.2524	0.5189	0.0014
-70	0.2527	0.5190	0.0016
-65	0.2528	0.5190	0.0016
-60	0.2529	0.5190	0.0017
-55	0.2529	0.5189	0.0016
-50	0.2529	0.5189	0.0016
-45	0.2528	0.5187	0.0014
-40	0.2527	0.5186	0.0012
-35	0.2526	0.5184	0.0010
-30	0.2526	0.5183	0.0010
-25	0.2526	0.5181	0.0008
-20	0.2524	0.5181	0.0006
-15	0.2523	0.5179	0.0005
-10	0.2523	0.5178	0.0004
-5	0.2523	0.5177	0.0003
0	0.2522	0.5177	0.0003
5	0.2523	0.5177	0.0002
10	0.2522	0.5178	0.0003
15	0.2522	0.5176	0.0002
20	0.2524	0.5177	0.0004
25	0.2524	0.5177	0.0004
30	0.2525	0.5178	0.0005
35	0.2526	0.5178	0.0006
40	0.2528	0.5179	0.0008
45	0.2528	0.5180	0.0009
50	0.2529	0.5181	0.0011
55	0.2530	0.5182	0.0012
60	0.2531	0.5183	0.0013
65	0.2530	0.5183	0.0012
70	0.2531	0.5183	0.0013
75	0.2530	0.5182	0.0011
80	0.2527	0.5181	0.0009
85	0.2525	0.5180	0.0006

γ \ C90-270	u'	v'	Du'v'
-170	0.2492	0.5152	0.0037
-165	0.2496	0.5151	0.0035
-160	0.2498	0.5152	0.0033
-155	0.2501	0.5155	0.0028
-150	0.2504	0.5157	0.0025
-145	0.2507	0.5160	0.0021
-140	0.2510	0.5162	0.0017
-135	0.2513	0.5164	0.0014
-130	0.2513	0.5165	0.0013
-125	0.2515	0.5166	0.0011
-120	0.2515	0.5168	0.0009
-115	0.2515	0.5168	0.0009
-110	0.2515	0.5169	0.0008
-105	0.2516	0.5170	0.0007
-100	0.2515	0.5171	0.0007
-95	0.2517	0.5173	0.0004
-90	0.2519	0.5174	0.0002
-85	0.2520	0.5177	0.0001
-80	0.2522	0.5178	0.0003
-75	0.2525	0.5179	0.0006
-70	0.2526	0.5182	0.0009
-65	0.2528	0.5182	0.0010
-60	0.2528	0.5182	0.0010
-55	0.2529	0.5182	0.0011
-50	0.2528	0.5180	0.0009
-45	0.2528	0.5180	0.0008
-40	0.2527	0.5177	0.0007
-35	0.2526	0.5176	0.0006
-30	0.2525	0.5175	0.0005
-25	0.2524	0.5174	0.0004
-20	0.2523	0.5172	0.0004
-15	0.2522	0.5172	0.0004
-10	0.2521	0.5171	0.0004
-5	0.2521	0.5170	0.0005
0	0.2520	0.5170	0.0005
5	0.2520	0.5170	0.0005
10	0.2520	0.5169	0.0006
15	0.2521	0.5169	0.0006
20	0.2521	0.5170	0.0006
25	0.2521	0.5170	0.0005
30	0.2522	0.5171	0.0005
35	0.2523	0.5172	0.0005
40	0.2524	0.5172	0.0004
45	0.2525	0.5174	0.0005
50	0.2526	0.5174	0.0006
55	0.2527	0.5176	0.0007
60	0.2528	0.5177	0.0007
65	0.2528	0.5177	0.0008
70	0.2527	0.5178	0.0007
75	0.2527	0.5178	0.0007
80	0.2524	0.5176	0.0003
85	0.2522	0.5174	0.0002

γ \ C0-180	u'	v'	Du'v'
90	0.2523	0.5177	0.0003
95	0.2521	0.5175	0.0001
100	0.2519	0.5174	0.0002
105	0.2519	0.5172	0.0004
110	0.2519	0.5170	0.0005
115	0.2518	0.5170	0.0006
120	0.2518	0.5169	0.0007
125	0.2518	0.5168	0.0008
130	0.2517	0.5167	0.0009
135	0.2516	0.5166	0.0011
140	0.2515	0.5165	0.0012
145	0.2512	0.5163	0.0015
150	0.2510	0.5161	0.0018
155	0.2506	0.5158	0.0022
160	0.2503	0.5155	0.0026
165	0.2501	0.5153	0.0030
170	0.2498	0.5152	0.0032

γ \ C90-270	u'	v'	Du'v'
90	0.2519	0.5172	0.0004
95	0.2517	0.5171	0.0005
100	0.2517	0.5169	0.0008
105	0.2516	0.5168	0.0009
110	0.2516	0.5167	0.0010
115	0.2516	0.5167	0.0010
120	0.2517	0.5166	0.0010
125	0.2516	0.5165	0.0011
130	0.2515	0.5163	0.0013
135	0.2515	0.5163	0.0013
140	0.2513	0.5162	0.0016
145	0.2511	0.5160	0.0018
150	0.2508	0.5158	0.0021
155	0.2505	0.5156	0.0025
160	0.2502	0.5153	0.0029
165	0.2498	0.5150	0.0033
170	0.2496	0.5149	0.0036

6. Product Photo

**********END OF REPORT**********