



Shenzhen Belling Efficiency Testing Lab



Report No.:BL170606012-9

Date of issue 2017-06-20
Version 1.0
Total pages 13

Test report of

IES LM-79-08

**Approved Method: Electrical and Photometric
Measurements of Solid-State Lighting Products**

Applicant:

Beyond LED Technology

Address:

1939 Parker Ct, Stone Mountain, GA 30087, USA

For Product:

Vertical Refrigerated Case Luminaires-center

Model No.:

BLT-CLP28L1750

Test laboratory: Shenzhen Belling Efficiency Testing Lab., 1/F., Building 1, 1F, No.1 building, Meibaohe industrial park, Dalang street, Shenzhen, Guangdong Prov.518101, China.

Cherie Tang

Jason Zhou

Complied by: Cherie Tang

Review by: Jason Zhou

Project Engineer

Technical Manager

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or use in part without prior written consent from Shenzhen Belling Efficiency Testing Lab. This report must not be used by the customer to claim product certification, approval, or endorsement By NVLAP, NIST, or any agency of the Federal Government.



1 General

1.1 Product Information

Manufacturer	Shenzhen XinShengYang OptoElectronics Technology Co., Ltd
Manufacturer Address	10-11/F, No. 2 Building, Hengchangrong High Tech Ind Park, Shangnan East Road, Hongtian, Shajing Town, Bao'an District, SHENZHEN Guangdong 518125 CHINA
Brand Name	XSY
Luminaire Type	Vertical Refrigerated Case Luminaires-center
Model Number	XSY-CLP28L1750
Rated Inputs	AC 100-277V 50/60Hz
Rated Power	28 W
Nominal CCT	5000K
Date of Receipt Samples	2017-05-23

1.2 Standards or methods

- ANSI C78.377-2015: Specifications for the Chromaticity of Solid State Lighting Products
- ANSI C82.77-2002: Harmonic Emission Limits-Related Power Quality Requirements for Lighting Equipment
- CIE Publication No.13.3-1995: Method of Measuring and Specifying Color Rendering of Light Sources
- IESNA LM-79-08 Approved Method: Electric & Photometric Measurement of Solid-state Lighting Products



1.3 Equipment list

Device	Manufacture	Model No.	Serial No.	Calibration due date
Goniophotometric System	SENSING	GMS-3000	N.A	2017-09-21
AC Power Source	ALL POWER	APW-110N	992257	2017-08-27
Total Luminous Flux Standard Lamp	SENSING	110V/100W	S13100234	2017-09-15
Digital Power Meter	YOKOGAWA	WT310	C2QM02030V	2017-08-29
Integral Sphere	SENSING	SPR-600M	N.A	2017-08-27
Digital Power Meter	YOKOGAWA	WT210	91L929742	2017-08-29
Optical Color and Electrical Measurement System	SENSING	SPR-3000	N.A	2017-08-27
Temperature/humidity/clock	VICTOR	VC230	57636	2017-09-13
Digital Anemometer	TECMAN	TD8901	026141	2017-09-13

Statement of Traceability: Shenzhen Belling Efficiency Testing Lab attests that all calibration has been performed using suitable standards traceable to national primary standards and International System of Unit (SI).



2 Test conducted and method

2.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, the air flow around the sample(s) being tested did not affect the performance.

2.2 Power Supply Characteristics

The AC power supply had a sinusoidal voltage wave shape at the prescribed frequency (60 Hz) such that the RMS summation of the harmonic components does not exceed 3 percent of the fundamental during operation of the test item.

The voltage of AC power supply (RMS voltage) applied to the device under test was regulated to within ± 0.2 percent under load.

2.3 Seasoning and Stabilization

No seasoning was performed in accordance with IESNA LM-79-08. And before the measurement, the sample was stabilized until the light output and power variations were less than 0.5% in 30 minutes intervals (3 readings, 15 minutes apart).

2.4 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.

2.5 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. The method according to IESNA LM-79-08 following chapter.



3 Test Result Summary

3.1 Integrating Sphere System

3.1.1 Electrical data

Model Number	Input Voltage(V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
XSY-CLP28L1750	120.02	60	0.239	28.06	0.978

3.1.2 Additional Test

Test Item	Model	Test Voltage (V)	Frequency (Hz)	Test Result
Power factor	XSY-CLP28L1750	120	60	0.978
		277	60	0.904
Total harmonic distortion	XSY-CLP28L1750	120	60	10.6%
		277	60	13.6%
Off state power (W)	XSY-CLP28L1750	120	60	0
	XSY-CLP28L1750	277	60	0

3.1.3 Photometric data

Model Number	Luminous Flux (lm)	Efficacy (lm/W)	CCT (K)	CRI	R9
XSY-CLP28L1750	3454.412	123.108	5222	83.7	14

3.1.4 Chromaticity Coordinate

Model Number	Duv	x	y	u'	v'
XSY-CLP28L1750	0.0003	0.3392	0.3473	0.2091	0.4817



3.2 Goniophotometer System

3.2.1 Electrical data

Model Number	Input Voltage(V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
XSY-CLP28L1750	120.02	60	0.2389	28.0460	0.9777

3.2.2 Photometric data

Luminous Flux (lm)	Efficacy (lm/W)	Zonal Lumen in 10-90°(%lm)
3500.35	124.81	92.403



4 Test Data

XSJ-CLP28L1750

Test Condition

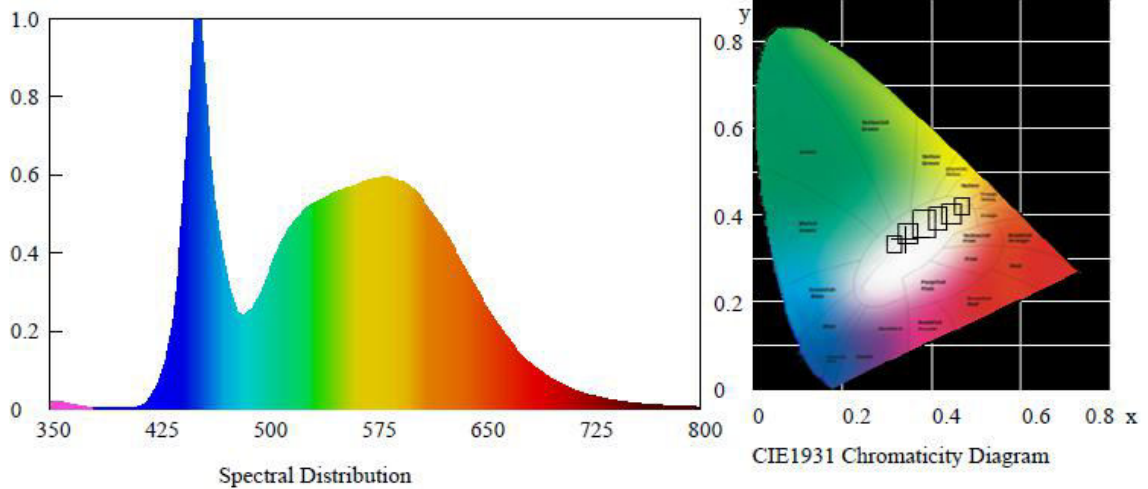
Temperature: 25°C

RH: 58%

Spectrum Range: 350-800 nm

Scan Step: 5 nm

Spectroradiometric Parameters

Chromaticity Coordinates: $x=0.3392$ $y=0.3473$ $u'=0.2091$ $v'=0.4817$

Correlated Color Temperature: 5222 K

Dominant Wavelength: 567.0 nm(E)

Luminous Flux: 3454.412 lm

Purity: 0.0597

Chromaticity Difference: 0.0003Duv

Peak Wavelength: 439.9 nm

Color Ratio: $K_r=33.6\%$ $K_g=55.2\%$ $K_b=11.2\%$

Bandwidth: -433.4nm

Radiant Flux: 8.156 W

Rendering Index: $R_a=83.7$ $R_1=83$ $R_2=89$ $R_3=92$ $R_4=83$ $R_5=83$ $R_6=83$ $R_7=87$ $R_8=69$ $R_9=14$ $R_{10}=73$ $R_{11}=82$ $R_{12}=60$ $R_{13}=85$ $R_{14}=95$ $R_{15}=79$

Electric Parameters

Voltage: 120.02 V

Current: 0.239 A

Power Factor: 0.978

Power: 28.06 W

Luminous Efficacy: 123.108 lm/W



Zonal Flux Diagram

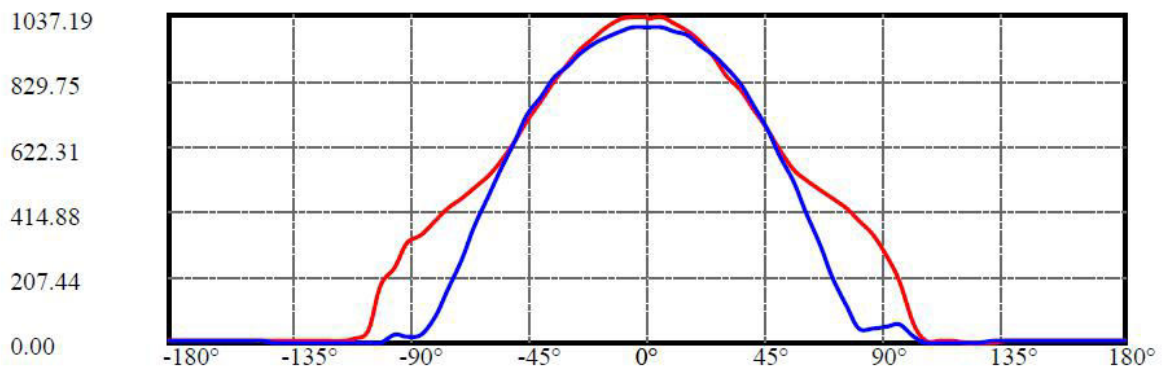
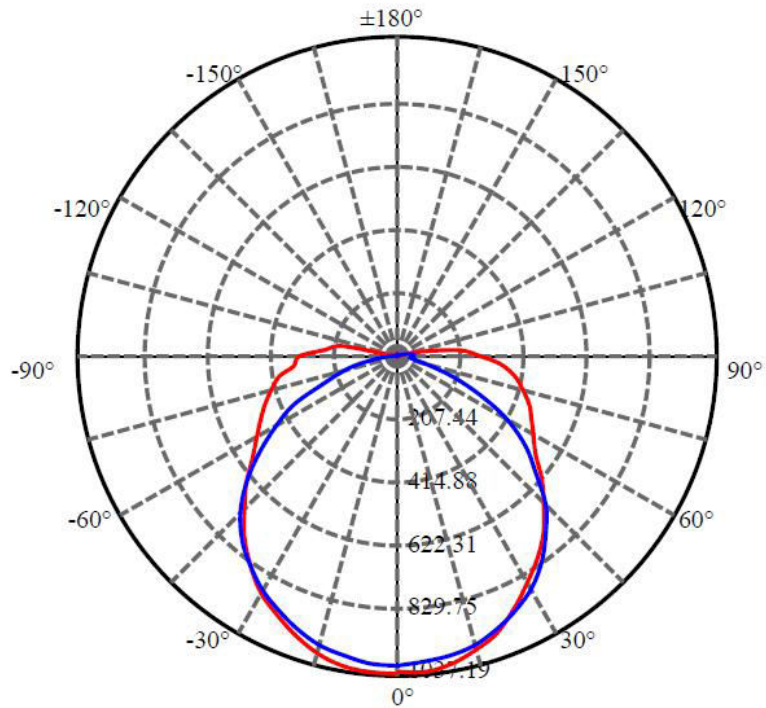
Zonal flux distribution table

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	1024.982	.000	.000	.000%	.000%
5.0	1021.306	24.463	24.463	.699%	.699%
10.0	1008.008	72.595	97.058	2.074%	2.773%
15.0	986.266	118.299	215.357	3.380%	6.152%
20.0	958.580	160.283	375.639	4.579%	10.731%
25.0	918.671	196.889	572.528	5.625%	16.356%
30.0	873.525	226.804	799.332	6.479%	22.836%
35.0	820.721	249.490	1048.822	7.128%	29.963%
40.0	761.690	264.013	1312.835	7.542%	37.506%
45.0	697.604	270.200	1583.035	7.719%	45.225%
50.0	622.488	266.744	1849.779	7.620%	52.846%
55.0	550.612	255.071	2104.850	7.287%	60.133%
60.0	483.454	239.021	2343.872	6.828%	66.961%
65.0	420.258	219.694	2563.566	6.276%	73.237%
70.0	361.747	198.009	2761.574	5.657%	78.894%
75.0	311.026	175.852	2937.427	5.024%	83.918%
80.0	263.511	153.730	3091.157	4.392%	88.310%
85.0	221.403	131.763	3222.920	3.764%	92.074%
90.0	175.131	108.574	3331.494	3.102%	95.176%
95.0	118.853	80.495	3411.989	2.300%	97.476%
100.0	58.109	48.085	3460.074	1.374%	98.849%
105.0	12.290	18.837	3478.910	.538%	99.388%
110.0	5.473	4.643	3483.553	.133%	99.520%
115.0	4.080	2.419	3485.972	.069%	99.589%
120.0	3.509	1.845	3487.817	.053%	99.642%
125.0	3.274	1.568	3489.385	.045%	99.687%
130.0	3.526	1.478	3490.864	.042%	99.729%
135.0	3.475	1.415	3492.279	.040%	99.769%
140.0	3.492	1.290	3493.569	.037%	99.806%
145.0	3.744	1.207	3494.776	.034%	99.841%
150.0	4.130	1.160	3495.935	.033%	99.874%
155.0	4.718	1.120	3497.055	.032%	99.906%
160.0	5.272	1.048	3498.103	.030%	99.936%
165.0	5.776	.910	3499.013	.026%	99.962%
170.0	6.212	.711	3499.724	.020%	99.982%
175.0	6.733	.463	3500.187	.013%	99.995%
180.0	6.850	.162	3500.350	.005%	100.000%



Luminous Intensity Distribution Diagram

Light Distribution Curve [Unit:cd]



C0/C180: 

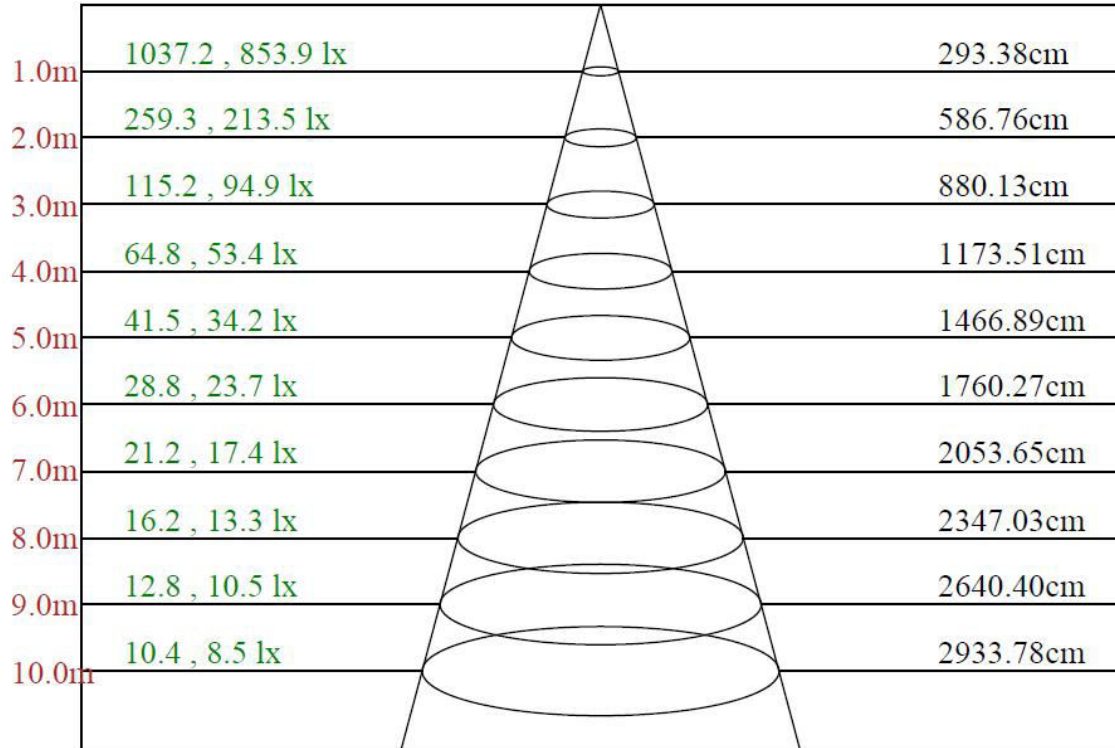
C90/C270: 

Field angle(10%Imax):C0/180Left:102.7 Right:98.4
:C90/270Left:79.0 Right:76.2

Beam Angle(50%Imax):C0/180Left:61.2 Right:59.4
:C90/270Left:57.8 Right:55.3



Lux distance Curve



Max , Ave

Beam angle of C67.5plane111.17

**Luminous Intensity Distribution Data**

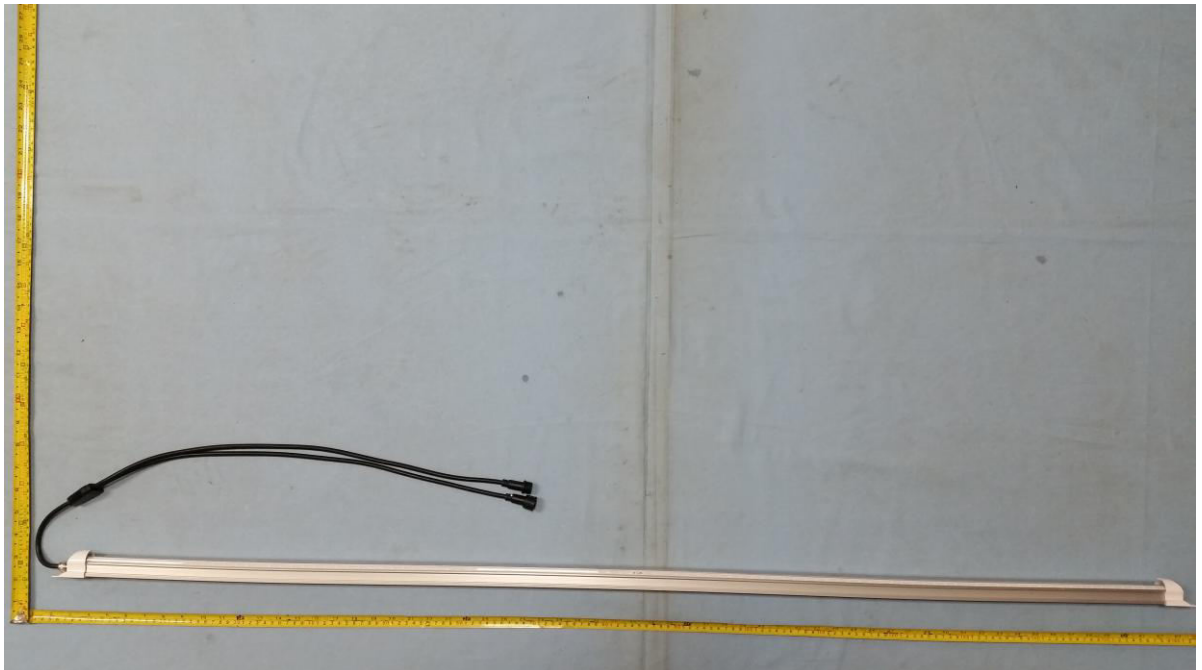
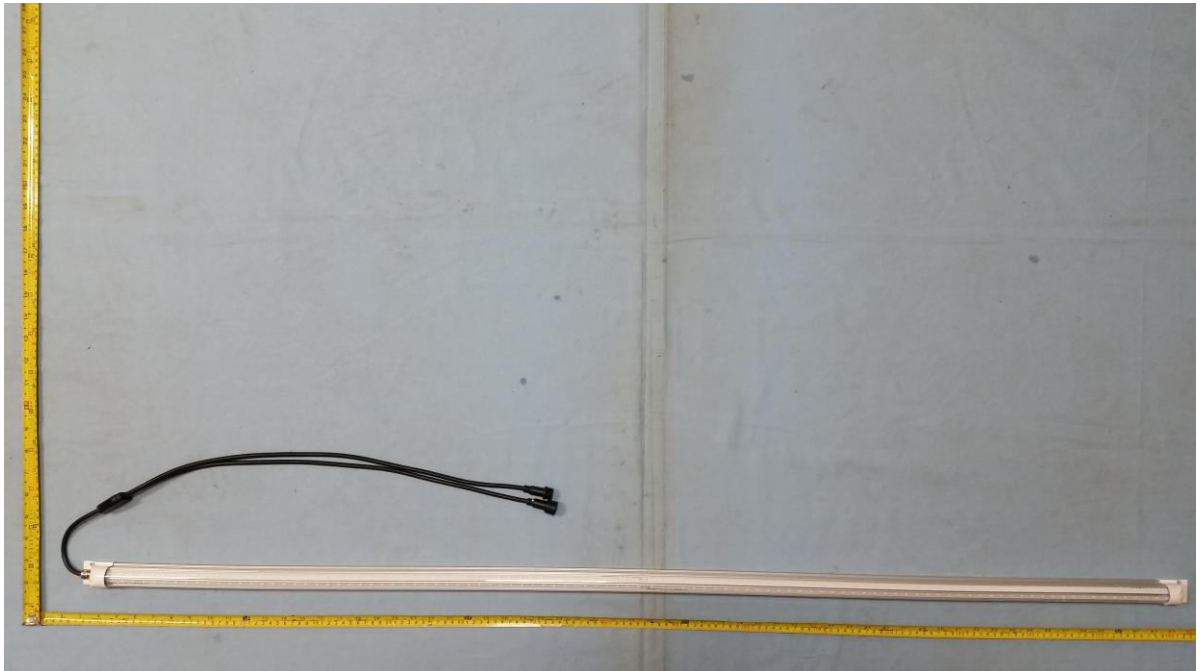
$C/\gamma(^{\circ})$	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0
0.0	1027.25	1027.79	1013.82	986.69	953.11	899.38	844.04	797.84	737.66
22.5	1023.76	1019.46	996.09	967.61	928.93	875.74	824.97	780.38	714.83
45.0	1017.04	1007.64	989.91	959.02	930.27	889.44	829.54	766.41	708.38
67.5	1037.19	1026.44	1008.45	989.91	959.02	916.57	873.86	817.45	748.68
90.0	1001.46	997.16	988.84	970.03	942.09	908.25	867.14	815.30	752.44
112.5	1025.91	1019.73	1008.71	988.30	954.45	909.59	865.26	817.45	755.66
135.0	1031.01	1020.27	1002.27	977.82	976.75	939.14	891.32	838.67	767.48
157.5	1033.16	1031.28	1016.24	997.16	965.20	927.32	883.80	825.24	769.63
180.0	1033.43	1029.67	1022.95	998.24	965.73	927.32	882.19	826.85	768.02
202.5	1023.76	1023.22	1015.43	997.70	971.91	932.42	892.40	810.19	787.09
225.0	1017.04	1017.85	1007.37	988.57	963.05	931.08	884.07	834.37	780.11
247.5	1037.19	1037.19	1021.88	1003.34	980.51	948.00	909.86	862.58	796.76
270.0	1001.46	998.24	986.15	968.96	943.97	912.28	875.74	834.64	781.18
292.5	1025.91	1021.88	1008.71	985.88	958.75	920.60	880.04	829.00	765.33
315.0	1031.01	1035.04	1031.01	1016.77	993.40	963.58	926.78	877.89	818.79
337.5	1033.16	1028.06	1010.33	984.27	950.15	898.04	845.39	797.30	734.98
360.0	1027.25	1027.79	1013.82	986.69	953.11	899.38	844.04	797.84	737.66
$C/\gamma(^{\circ})$	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0
0.0	673.46	615.17	547.20	512.55	483.81	456.41	424.98	386.83	339.01
22.5	647.40	584.28	511.48	477.63	446.74	417.99	387.10	345.19	287.97
45.0	692.27	572.72	503.15	436.53	379.85	348.15	312.96	272.12	216.25
67.5	668.89	576.48	489.18	408.05	312.15	239.35	177.03	136.73	123.57
90.0	678.83	590.72	506.10	410.47	307.32	206.04	117.66	46.21	45.13
112.5	691.46	613.56	530.01	452.11	365.07	284.21	211.68	157.15	139.96
135.0	703.82	633.70	554.46	491.60	420.68	375.28	333.10	292.00	237.47
157.5	705.97	639.88	580.78	516.85	479.51	443.24	408.86	364.00	316.18
180.0	704.62	638.00	575.41	525.18	489.72	459.09	424.98	386.56	341.43
202.5	701.94	653.05	594.21	527.59	482.73	447.81	415.04	375.01	304.36
225.0	715.10	656.81	580.51	513.09	444.32	380.38	340.63	298.99	249.56
247.5	727.72	657.61	570.31	479.78	398.65	303.29	228.07	164.67	119.54
270.0	721.01	639.61	550.43	461.24	368.30	261.11	164.40	84.89	27.94
292.5	696.03	615.71	532.97	460.70	383.34	300.33	228.88	182.40	152.05
315.0	758.89	653.58	627.79	558.22	487.30	423.36	385.76	349.22	317.79
337.5	674.27	618.93	555.80	503.69	474.67	441.90	415.31	374.21	324.24
360.0	673.46	615.17	547.20	512.55	483.81	456.41	424.98	386.83	339.01
$C/\gamma(^{\circ})$	90.0	95.0	100.0	105.0	110.0	115.0	120.0	125.0	130.0
0.0	272.39	196.10	59.10	8.87	5.10	3.49	2.96	2.69	2.96
22.5	218.67	107.72	12.89	8.06	6.18	4.84	4.03	4.03	3.76
45.0	137.27	27.94	8.87	6.45	5.10	4.03	3.76	3.49	3.76
67.5	120.08	32.24	29.82	4.30	4.03	3.49	3.22	3.22	3.22
90.0	54.53	55.07	19.34	2.42	2.42	2.42	2.69	2.69	3.22
112.5	137.00	64.47	15.58	5.10	4.30	3.76	3.49	3.76	3.49
135.0	191.80	140.76	41.37	9.40	7.25	5.64	4.57	4.03	4.03
157.5	269.44	215.17	151.51	17.73	9.13	6.72	5.64	4.30	4.30
180.0	316.99	240.96	179.98	37.34	9.94	6.45	5.10	4.30	4.30
202.5	283.94	229.14	175.69	60.17	9.13	5.37	4.57	3.76	4.57
225.0	172.46	152.31	86.23	9.67	5.91	4.57	3.76	3.22	5.37
247.5	59.64	55.34	6.72	4.30	3.49	2.69	2.69	2.69	2.96
270.0	20.95	22.83	1.34	1.34	1.34	1.34	1.34	1.88	2.15
292.5	22.83	10.48	4.57	3.49	2.69	2.42	2.15	2.42	2.69
315.0	265.14	172.19	104.23	9.67	6.18	4.30	3.22	2.96	2.69
337.5	258.96	178.91	32.50	8.33	5.37	3.76	2.96	2.96	2.96
360.0	272.39	196.10	59.10	8.87	5.10	3.49	2.96	2.69	2.96



C/γ(°)	135.0	140.0	145.0	150.0	155.0	160.0	165.0	170.0	175.0
0.0	3.22	3.22	3.49	3.76	4.57	4.84	5.64	5.91	6.45
22.5	3.76	3.76	4.03	4.30	4.84	5.64	5.91	6.45	6.72
45.0	3.76	3.76	3.76	4.30	5.10	5.64	5.91	6.45	6.72
67.5	3.49	3.49	3.76	4.30	4.84	5.64	5.91	6.45	6.98
90.0	3.22	3.49	3.76	4.57	4.84	5.64	5.91	6.45	6.98
112.5	3.76	3.76	4.03	4.57	5.10	5.64	5.91	6.45	6.98
135.0	4.03	4.03	4.03	4.57	5.10	5.64	6.18	6.45	6.98
157.5	4.30	3.76	4.30	4.57	5.10	5.64	6.18	6.45	6.98
180.0	4.03	4.03	4.30	4.30	5.10	5.37	6.18	6.45	6.98
202.5	3.49	3.49	4.03	3.76	4.57	5.10	5.64	6.18	6.45
225.0	3.49	3.49	3.49	4.03	4.30	5.37	5.64	6.18	6.45
247.5	2.96	3.22	3.49	4.03	4.84	5.10	5.64	6.18	6.72
270.0	2.69	2.96	3.49	3.76	4.57	5.10	5.64	5.91	6.72
292.5	2.96	2.96	3.22	3.76	4.30	4.84	5.37	6.18	6.72
315.0	3.22	3.22	3.49	3.22	4.03	4.30	5.10	5.37	6.18
337.5	3.22	3.22	3.22	4.30	4.30	4.84	5.64	5.91	6.72
360.0	3.22	3.22	3.49	3.76	4.57	4.84	5.64	5.91	6.45
C/γ(°)	180.0								
0.0	6.72								
22.5	6.72								
45.0	6.98								
67.5	6.98								
90.0	7.25								
112.5	6.72								
135.0	6.45								
157.5	6.98								
180.0	6.72								
202.5	6.72								
225.0	6.98								
247.5	6.98								
270.0	7.25								
292.5	6.72								
315.0	6.45								
337.5	6.98								
360.0	6.72								



Photo Document



****End of test report****