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Test report of

IES LM-79-08

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

Rendered to:
Beyond LED Technology

For products:
Horizontal Refrigerated Case Luminaires

Models No.:
ZS-T8V1532T-50

Test Date:	Jan. 6, 2021 to Jan. 8, 2021
Test Lab.:	**LCTECH Guangdong Testing Services Co., Ltd.** 2/F., Technology and Enterprise Development Center, Guangyuan Road, Xiaolan, Zhongshan, Guangdong, China Tel:+86-760-22833366 Fax:+86-760-22833399 E-mail:Service@lccert.com http://www.lccert.com
Test Sites:	1/F., Building I, Technology and Enterprise Development Center, Guangyuan Road, Xiaolan, Zhongshan, Guangdong, China
Template No.:	LC-RT-PL-046 Rev.1.3
Test Note:	

Complied by:	**Reviewed by:**
Pengkang Liang	**Lin Qiu**
Jan. 8, 2021	**Jan. 8, 2021**

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1. General

1.1 Product Information

Brand Name	Beyond LED Technology
Category	Indoor
General Application	Case Lighting
Primary Use	Horizontal Refrigerated Case Luminaires
Model Number	ZS-T8V1532T-50
Rated Inputs	AC100-277V, 50/60Hz
Rated Power	32W
Rated Light output	4160lm
Declared CCT	3000K
Power Supply	ZY-TQN36-ZA
LED Package, Array or Module	HL-AS-2835DW-3C-S1-08-PCT-HR3(R9), Hongli Zhihui Group Co.,Ltd. Guangzhou Branch
Dimming	Continuous Dimming
Integral Controls	No
Controls Controllability	No
Receipt Samples	1 unit
Sample Code of lab.	201208107005
Date of Receipt Samples	Dec. 8, 2020
Note	-

1.2 Standards or methods

The following standards are partly or totally used or referenced for test:

No.	Name
ANSI/NEMA/ ANSLG C78.377- 2017	Specifications for the Chromaticity of Solid State Lighting Products
ANSI/IES TM-30-18*	IES Method for Evaluating Light Source Color Rendition
ANSI C82.77-2002	Harmonic Emission Limits—Related Power Quality Requirements for Lighting Equipment
CIE Pub. No. 13.3-1995	Method of Measuring and Specifying Color Rendering of Light Sources
CIE Pub. No. 15:2004	Colorimetry
IES LM-79-08	Electrical and Photometric Measurements of Solid-State Lighting Products

Note:

**For reference only and not in the scope of NVLAP.*

1.3 Equipment list

Instrument	ID	Model name	Cal. date	Next cal. Date
AC Power supply	LC-I-987	APW-120N	2020-12-23	2021-12-22
AC Power supply	LC-I-989	APW-120N	2020-12-23	2021-12-22
Power analyzer	LC-I-928	WT210	2020-12-25	2021-12-24
Power analyzer	LC-I-954	WT210	2020-12-25	2021-12-24
Multimeter	LC-I-972	FLUKE	2020-07-20	2021-07-19
Photometric colorimetric electric system** (2 meter sphere)	LC-I-956	HAAS-2000	Before use	Before use
Standard lamp***	LC-PL-I-011	D204C	2020-07-14	2021-07-13
Luminous Flux Standard Lamp****	LC-PL-I-003	24V/100W	2020-07-14	2021-07-13
Goniophotometer(with mirror)	LC-I-902	GMS-2000	2020-04-23	2021-04-22
Wireless temperature transmitter	LC-I-PL-009	DWLR-DLR	2020-12-24	2021-12-23
Wireless temperature transmitter	LC-I-PL-008	DWLR-DLR	2020-12-24	2021-12-23

Note:

** Bandwidth of spectroradiometer is 1 nm.*

*** halogen lamp, 100W, omni-directional type, and its traceability to NIM.*

**** halogen lamp, 100W, omni-directional type, and its traceability to NIM.*

2. Test conducted and method

The luminaire was operated at least 2 hours to reach stabilization and temperature equilibrium before test.

2.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at 25 °C ± 1°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 Electrical Instrumentation

The calibration uncertainties of the instruments for AC voltage and current were less than 0.2 percent, and the calibration uncertainty of the AC power meter was less than 0.5 percent(95 % confidence interval, k=2).

2.5 Color Measurement Method

Spectral radiant flux was measured by a sphere (2 meter)-spectroradiometer system, and the color characteristics (Color rendering index, correlated color temperature, chromaticity coordinate) were calculated from these by software automatically.

2.6 Total Luminous Flux Measurement Method

Total luminous flux was measured by both sphere-spectroradiometer system and type C goniophotometer system.

Light intensity distribution was measured by a type C goniophotometer (with mirror) which can keep the sample in burn position when the tests conduct, and the total luminous flux was calculated from the intensity data by software automatically.

Spectral radiant flux was measured by a sphere (2 meter)-spectroradiometer system, and the total luminous flux was calculated from these by software automatically.

2.7 Luminous Intensity Distribution Measurement Method

Luminous intensity distribution was measured by a mirror-type goniophotometer (Type C) which can keep the sample in burn position when the tests conduct, and the kinds of graph were generated by software automatically.

2.8 Spatial Non-uniformity of Chromaticity

The customer did not require this measurement.

3. Test Result Summary

3.1 Electrical data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Input Voltage & Frequency	120.02V~60Hz	119.99V~60Hz
Input Current(A)	0.277	0.277
Total Power(W)	32.04	32.04
Power Factor	0.964	0.964
I-THD	22.6%	-
Off-state Power(W)	-	-

3.2 Photometric data

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Total Lumens(lm)	4475.50*	4484.28
Luminaire Length(ft)	5	5
Lumens per Foot(lm/ft)	895.10	896.86
Luminaire Efficacy(lm/W)	139.68	139.96
Correlated Color Temperature (CCT)(K)	3092	-
Color Rendering Index (CRI)	83	-
R9	7	-
R_f	85	-
R_g	95	-
$R_{cs,h1}$	-11%	-
Chromaticity Coordinate (x,y)	x = 0.4311 y = 0.4029	-
Chromaticity Coordinate (u',v')	u' = 0.2473 v' = 0.5200	-
Duv	0.0004	-
Zone Lumens between 0-90 °	-	92.09%

3.3 Color Rendering Details

R1	R2	R3	R4	R5	R6	R7	R8
82	92	96	81	82	90	83	59
R9	R10	R11	R12	R13	R14	R15	-
7	81	81	70	84	99	74	-

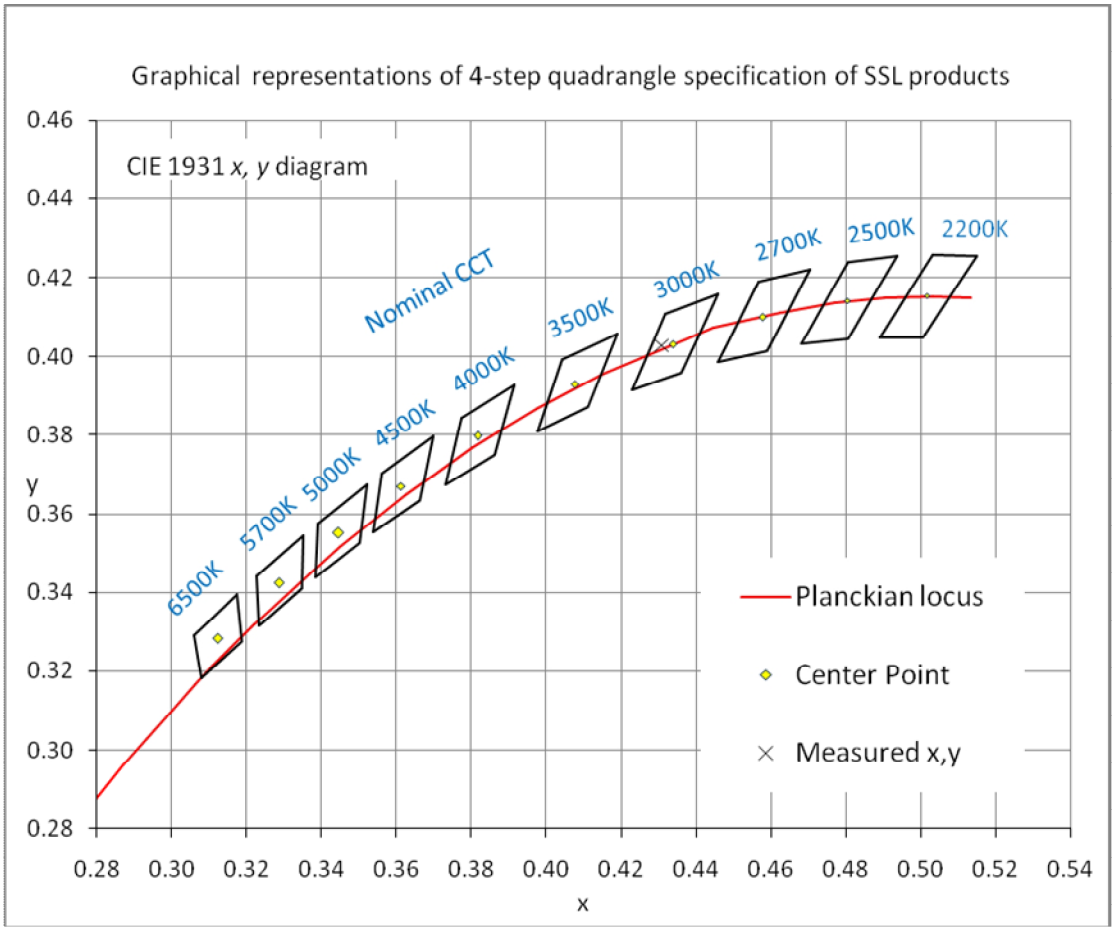
3.4 Electrical data on 277V

Criteria Item	Result(Sphere)	Result(Goniophotometer)
Input Voltage & Frequency	277.06V~60Hz	-
Power Factor	0.940	-
I-THD	21.0%	-

Note: * *Self-absorption is 1.*

4. Test Data

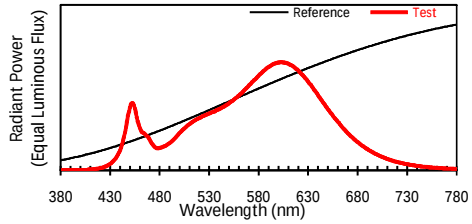
4.1 ANSI Chromaticity Quadrangles Diagram

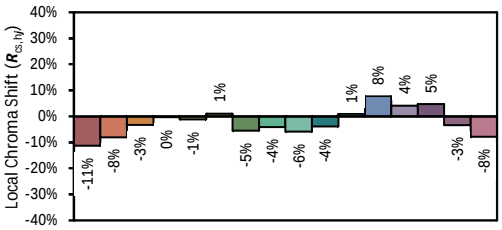


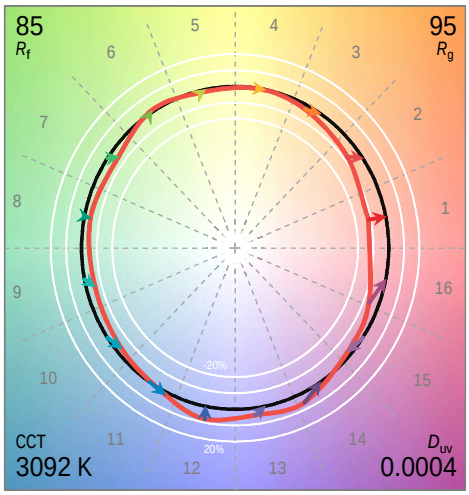
4.2 ANSI/IES TM-30-18 Color Rendition

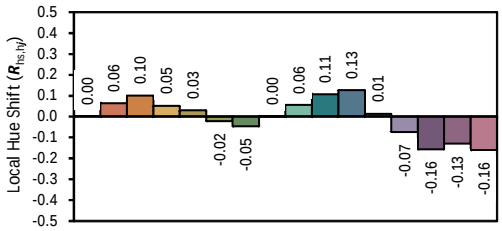
ANSI/IES TM-30-18 Color Rendition Report

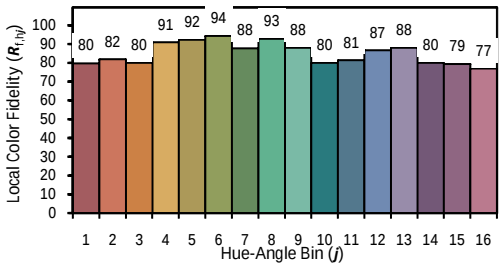
Source:	User SPD	**Manufacturer:**	Beyond LED Technology
Date:	2021/1/8	**Model:**	ZS-T8V1532T-50

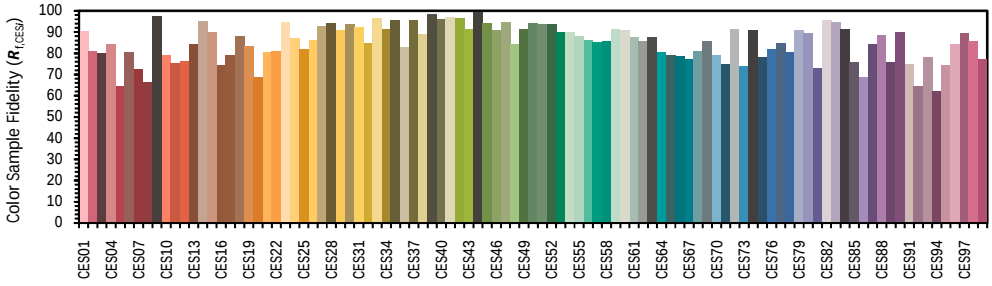












Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information, Created with the IES TM-30-18 Calculator Version 2.00.

x	**0.4311**
y	**0.4029**
u'	**0.2473**
v'	**0.5200**

CIE 13.3-1995 (CRI)

R_a	83
R_9	7

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2

4.3 Goniometry Test Data

CIE Type	Direct	Basic Luminous Shape	Rectangular w/Sides
Spacing Criteria (0-180)	1.26	Luminous Length	1.45m
Spacing Criteria (90-270)	1.26	Luminous Width	0.03m
Spacing Criteria (Diagonal)	1.40	Luminous Height	0.02m
Test Distance	30.13 m		

4.4 Zonal Lumen Summary

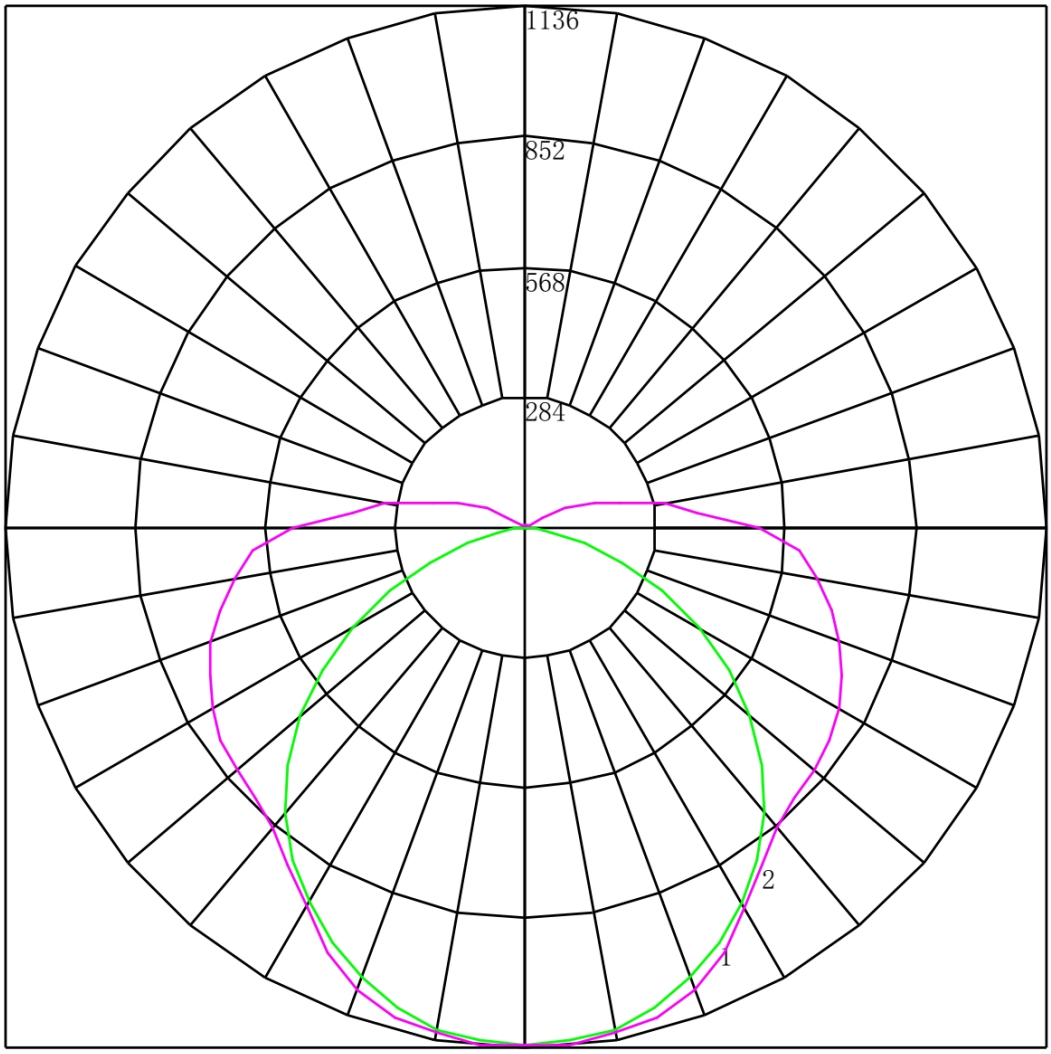
Zone	Lumens	%Lamp	%Fixt
0-20	415.82	9.30	9.30
0-30	884.59	19.70	19.70
0-40	1448.13	32.30	32.30
0-60	2661.2	59.30	59.30
0-80	3738.06	83.40	83.40
0-90	4129.72	92.10	92.10
10-90	4022.44	89.70	89.70
20-40	1032.31	23.00	23.00
20-50	1635.82	36.50	36.50
40-70	1787.32	39.90	39.90
60-80	1076.86	24.00	24.00
70-80	502.60	11.20	11.20
80-90	391.66	8.70	8.70
90-110	310.39	6.90	6.90
90-120	341.68	7.60	7.60
90-130	349.11	7.80	7.80
90-150	352.68	7.90	7.90
90-180	354.57	7.90	7.90
110-180	44.17	1.00	1.00
0-180	4484.28	100.00	100.00

Total Luminaire Efficiency = 100.00%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	107.27
10-20	308.55
20-30	468.77
30-40	563.54
40-50	603.51
50-60	609.56
60-70	574.25
70-80	502.60
80-90	391.66
90-100	218.26
100-110	92.13
110-120	31.29
120-130	7.43
130-140	2.32
140-150	1.25
150-160	0.94
160-170	0.70
170-180	0.25

4.5 Polar Curves

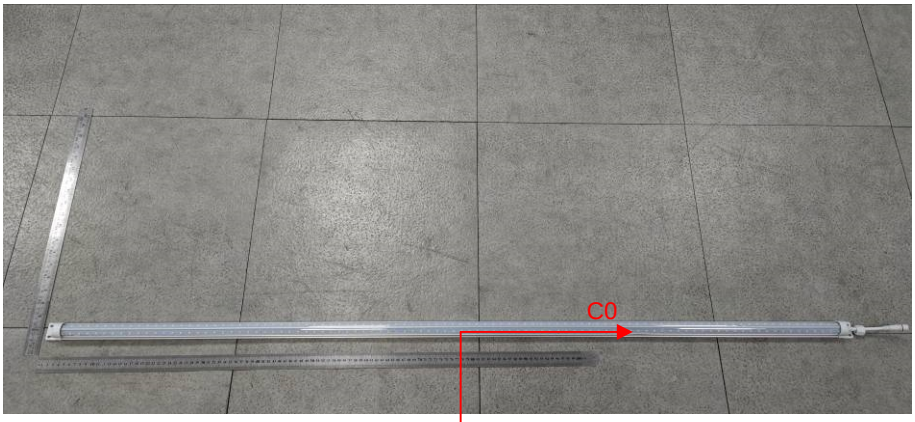


Maximum Candela = 1136.389 Located At Horizontal Angle = 90, Vertical Angle = 5
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)

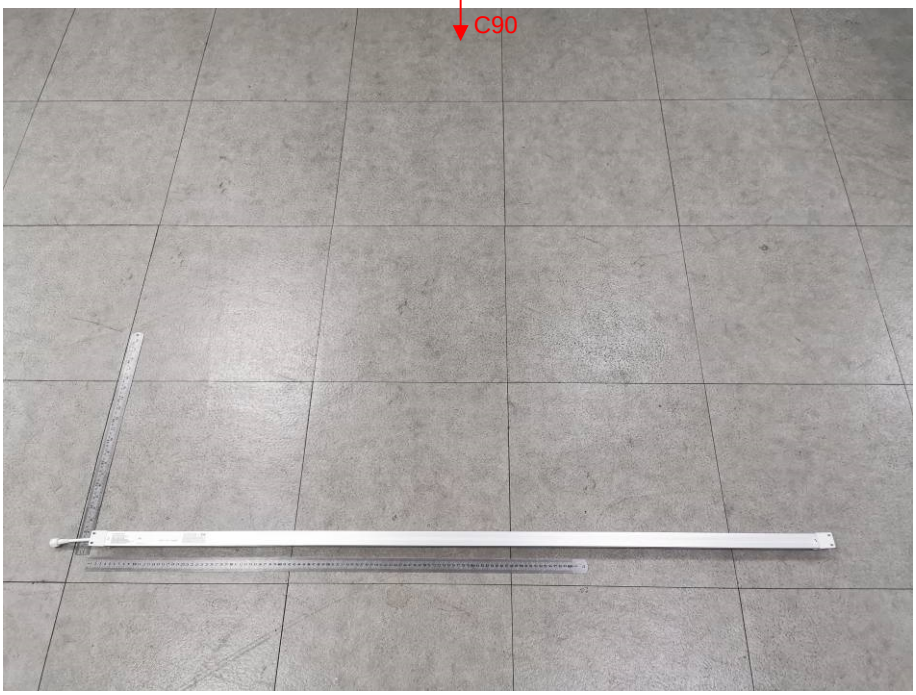
4.6 Candela Tabulation

	0	15	30	45	60	75	90
0	1132.804	1132.804	1132.804	1132.804	1132.804	1132.804	1132.804
5	1126.404	1127.318	1130.342	1126.667	1129.397	1127.821	1136.389
10	1112.690	1111.547	1116.269	1110.811	1116.237	1113.581	1119.809
15	1085.718	1085.942	1088.964	1088.384	1096.515	1099.353	1105.918
20	1047.775	1050.287	1056.907	1064.584	1071.806	1073.821	1074.999
25	1001.604	1003.884	1016.648	1025.837	1027.774	1020.006	1026.604
30	946.289	950.177	970.973	971.412	968.631	954.926	957.596
35	885.032	892.112	913.237	897.974	896.430	902.229	902.927
40	813.717	826.512	840.193	826.792	839.741	847.768	857.669
45	731.888	754.281	755.880	770.860	792.517	819.745	832.575
50	640.917	676.339	675.548	708.904	763.006	807.086	824.061
55	541.259	591.769	606.871	671.735	747.590	791.720	812.411
60	437.487	488.901	549.830	642.261	722.859	770.022	790.005
65	326.858	388.557	494.665	609.625	691.110	744.028	762.671
70	222.172	307.408	446.694	566.567	655.504	711.265	731.304
75	131.200	246.621	390.773	520.329	615.138	674.415	693.215
80	60.800	174.603	331.646	470.472	567.717	628.093	647.061
85	21.029	110.155	269.127	410.642	511.697	575.423	597.769
90	7.314	61.472	177.195	316.593	420.975	484.568	509.045
95	3.657	37.018	60.353	186.501	288.045	353.932	378.647
100	3.200	11.198	37.763	126.215	223.418	289.065	310.983
105	3.200	8.685	14.768	35.505	114.974	183.281	212.401
110	2.286	7.085	13.184	14.721	61.430	132.204	158.628
115	2.286	5.714	10.691	13.358	25.579	70.969	94.774
120	2.286	5.029	9.781	10.424	12.703	32.295	43.914
125	2.286	2.515	5.003	6.572	7.941	10.619	10.082
130	0.914	0.915	2.729	4.080	6.126	7.460	7.618
135	0.914	0.458	1.819	2.945	3.858	4.522	4.481
140	0.914	0.458	1.364	2.267	3.176	3.616	3.585
145	1.371	0.458	1.364	2.041	2.497	2.937	3.137
150	2.286	0.686	0.910	2.267	2.497	2.939	2.241
155	3.200	0.686	0.910	2.041	2.497	2.712	2.689
160	3.657	0.914	1.595	2.041	2.951	3.164	3.137
165	4.571	1.371	1.595	2.267	2.722	3.164	3.137
170	4.571	2.286	2.044	2.267	2.494	2.485	2.689
175	4.571	2.743	2.729	2.720	2.722	2.712	2.689
180	1.557	1.557	1.557	1.557	1.557	1.557	1.557

Appendix A Product Photo



Picture 1



Picture 2

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