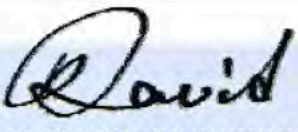
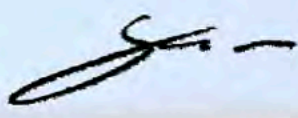




ENERGY STAR (3000 Hours) TEST REPORT

ENERGY STAR® Program Requirements Product Specification for Lamps (Light Bulbs) Eligibility Criteria Version 1.1

Applicant's name	P.Q.L., Inc.	
Address	2285 Ward Avenue / Simi Valley, CA 93065	
Brand Name	Superior Life®	
Report No.	BTR66.181.15.0023.45	
Basic Model	90931	
Tested by (printed name and signature)	David Zhang Test Engineer	
Approved by (printed name and signature)	Steven Su Approved Signature	
Test Date	Aug 09, 2015 to Dec 14, 2015	
Date of issue	Dec 14, 2015	
Testing Laboratory Name	BEST Test Service Shenzhen Co., Ltd. 1 st Floor, 1 st Building, Weitai Industrial Park, Yingrenshi, Shiyan, Baoan, Shenzhen, China	
Address	TEL: + 86-755-28236006; FAX: + 86-755-23467087, email: admin@bestcert.cn	
Accreditation	UL/ELI/NVLAP/EPA	
Test specification		
Standard	Lamps V1.1	
Test procedure	Energy Star Test Procedure-Lamps 1.1(BEST-SOP-Lamps1.1)	
Non-standard test method	No	
Test Report Form No.	BEST_ Lamps Report Form(April 01,2015)	
TRF originator	BEST Test Service Shenzhen Co., Ltd. Mr Chris Tseng.	
Master TRF	BEST_ Lamps V1.1.doc	

Note:

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Lamp Information			
Product Name.....:	LED		
Lamp Classification.....:	<input checked="" type="checkbox"/> Directional	<input type="checkbox"/> Omni directional	<input type="checkbox"/> Decorative
Dimmable?	<input checked="" type="checkbox"/> Yes		<input type="checkbox"/> No
If Yes, Select Dimming Mechanism	<input checked="" type="checkbox"/> Continuous dimming		<input type="checkbox"/> Step dimming
If Yes, Min Dimming Level	10%		
If Yes, Select Dimming Technology	<input checked="" type="checkbox"/> Forward phase cut off	<input type="checkbox"/> Reverse phase cut off	<input type="checkbox"/> Non-phase cut off
If Yes, Dimmer Information	<input checked="" type="checkbox"/> See the Dimming Data Collection Form		
Transformer1# manufacturer name	B+L Technologies		
Transformer1# model number	FX95100		
Transformer2# manufacturer name	HATCH		
Transformer2# model number	RS12-30M-LED		
Transformer3# manufacturer name	HATCH		
Transformer3# model number	RS12-15M-LED		
Transformer4# manufacturer name	LIGHTECH		
Transformer4# model number	LET60		
Transformer5# manufacturer name	LIGHTECH		
Transformer5# model number	LVT-60		
Applicant Exceptions	<input checked="" type="checkbox"/> Not for use in enclosed fixtures		<input type="checkbox"/> Not for use in recessed fixtures
	<input type="checkbox"/> No restrict		
Restricted Position	<input checked="" type="checkbox"/> Universal - Not Position Restricted		<input type="checkbox"/> Horizontal Only
	<input type="checkbox"/> Vertical - Base Up Only	<input type="checkbox"/> Vertical - Base Down Only	

Product Family and Allowable Variations				
General information	Basic Model	Allowable Variations	Allowable Variations	Allowable Variations
Model Number	909XX	90931	909XX	909XX
Rated Input	AC 12V/60Hz	AC 12V/60Hz	AC 12V/60Hz	AC 12V/60Hz
CCT(K)	2700	3000	4000	5000
Nominal Lamp Power(W)	6.5	6.5	6.5	6.5
Nominal Light Output(lm)	500	500	500	500
Nominal CRI(Ra)	80	80	80	80
Nominal Lamp Life(hrs)	25000	25000	25000	25000
Beam Angle (solid-state only)	38	38	38	38
Target Lamp	MR16 50W	MR16 50W	MR16 50W	MR16 50W
Overall length(mm)* Diameter(mm)	48*50	48*50	48*50	48*50
Heat Sink Paint Color (solid-state only)	White	White	White	White
Lamp Base	GU5.3	GU5.3	GU5.3	GU5.3
Envelope Shape (Decorative shapes only)	N.A	N.A	N.A	N.A
Envelope Finish (Decorative shapes only)	N.A	N.A	N.A	N.A

Product Family and Allowable Variations (Continue)				
General information	Allowable Variations	Allowable Variations	Allowable Variations	Allowable Variations
Model Number	909XX	909XX	909XX	909XX
Rated Input	AC 12V/60Hz	AC 12V/60Hz	AC 12V/60Hz	AC 12V/60Hz
CCT(K)	2700	3000	4000	5000
Nominal Lamp Power(W)	6.5	6.5	6.5	6.5
Nominal Light Output(lm)	500	500	500	500
Nominal CRI(Ra)	80	80	80	80
Nominal Lamp Life(hrs)	25000	25000	25000	25000
Beam Angle (solid-state only)	25	25	25	25
Target Lamp	MR16 50W	MR16 50W	MR16 50W	MR16 50W
Overall length(mm)* Diameter(mm)	48*50	48*50	48*50	48*50
Heat Sink Paint Color (solid-state only)	White	White	White	White
Lamp Base	GU5.3	GU5.3	GU5.3	GU5.3
Envelope Shape (Decorative shapes only)	N.A	N.A	N.A	N.A
Envelope Finish (Decorative shapes only)	N.A	N.A	N.A	N.A

Reference Docuemnts

ENERGY STAR® Program Requirements Product Specification for Lamps Version 1.0: Ambient Temperature Life Testing Test Method

ENERGY STAR® Program Requirements Product Specification for Lamps Version 1.0: Elevated Temperature Life Testing Test Method August-2013

ENERGY STAR® Program Requirements Product Specification for Lamps Version 1.0: Elevated Temperature Light Output Ratio Test Method August-2013

ENERGY STAR® Program Requirements Product Specification for Lamps Version 1.0: Start Time Test Method August-2013

ENERGY STAR® Program Requirements Product Specification for Lamps Version 1.0: Run-Up Time Test Method August-2013

ENERGY STAR® Program Requirements Product Specification for Lamps Version 1.0: Light Output on a Dimmer Recommended Practice August-2013

ENERGY STAR® Program Requirements Product Specification for Lamps Version 1.0: Light Source Flicker Recommended Practice August-2013

ENERGY STAR® Program Requirements Product Specification for Lamps Version 1.0: Noise Recommended Practice August-2013

ANSI/IEEE C62.41.2-2002 IEEE Recommended Practice on Characterization of Surges in Low Voltage (1000V and Less) AC Power Circuits

ANSI C78.20-2003 Electric Lamps—A, G, PS and Similar Shapes with E26 Medium Screw Bases

ANSI C78.21-2011 Electric Lamps—PAR and R Shapes

ANSI C78.50-2014 Electric Lamps—Electric Lamps - Assigned LED Lamp Codes

ANSI C78.79-2014 Electric Lamps - Nomenclature for Envelope Shapes Intended for Use with Electric Lamps

ANSI C78.23-1995 (R2003) Incandescent Lamps—Miscellaneous Types

ANSI/ANSLG C78.357-2010 For Incandescent Lamps: Tungsten Halogen Lamps (non-vehicle)

ANSI C78.376-2001 Specifications for the Chromaticity of Fluorescent Lamps

ANSI/ANSLG C78.377-2011 Specifications for the Chromaticity of Solid State Lighting Products

ANSI C79.1-2002 Nomenclature for Glass Bulbs Intended for Use with Electric Lamps

ANSI/ANSLG C81.61-2009 Specifications for Bases (Caps) for Electric Lamps

ANSI/NEMA C82.2-2002 Fluorescent Lamp Ballasts, Methods of Measurement of (includes supplements)

ANSI C82.77-2002 Harmonic Emission Limits—Related Power Quality Requirements for Lighting Equipment

ANSI/IES RP-16-10 Nomenclature and Definitions for Illuminating Engineering

ANSI/UL 1993-2012 Standard for Safety of Self-Ballasted Lamps and Lamp Adapters

ANSI/UL 8750-2009 Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products

ASA S12.55-2006 / ISO3745:2003 Determination of Sound Power Levels of Noise Sources Using Sound Pressure - Precision Methods Anechoic and Hemi-Anechoic Rooms

CIE Pub. No. 13.3-1995 Method of Measuring and Specifying Color Rendering of Light Sources

CIE Pub. No. 15:2004 Colorimetry

Commission of the European Communities (EC) No 244/2009 Commission Regulation (EC) No 244/2009 of 18 March 2009 Implementing Directive 2005/32/EC of the European Parliament and of the Council

DOE 10 CFR 429 Certification, Compliance, and Enforcement for Consumer Products and Commercial and Industrial Equipment

DOE 10 CFR 430 Energy Conservation Program for Consumer Products

IES LM-20-13 Photometric Testing of Reflector-Type Lamps

IES LM-54-12 Guide to Lamp Seasoning

IES LM-65-10 Life Testing of Compact Fluorescent Lamps

IES LM-66-11 Electrical and Photometric Measurements of Single-Ended Compact Fluorescent Lamps

IES LM-79-08 Electrical and Photometric Measurements of Solid-State Lighting Products

IES LM-80-08 Measuring Lumen Maintenance of LED Light Sources

IES TM-21-11 Projecting Long Term Lumen Maintenance of LED Light Sources

ISO 7574-4 B.2.1 Statistical Methods for Determining and Verifying Stated Noise Emission Values of Machinery and Equipment

Test Method

Photometric and Electrical Measurement

Total light output (luminous flux) for the $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ ambient temperature conditions is measured using a 1.6m Φ geometry integrating sphere. Temperature is measured at a position inside the sphere. Spectral radiant flux measurements are made using Integral Sphere to the detector port of the integrating sphere. Each lamp is operated at rated voltage in its designated orientation. Each lamp should be stable before measurements are made as below:

Step 1 Take 3 measurements of the lamp light output at 15 minute interval (total time=30mintues.)This time period is in addition to the recommended pre-burning time.

Step 2 Calculate the percent difference between the maximum measured value and the minimum measured value for the three consecutive measurements.

Step 3 if the value calculated in Step 2 does not exceed 0.5 percent, the lamp is considered stable.

Luminous flux, chromaticity coordinates, correlated color temperature and color rendering index for each lamp are calculated from the spectral radiant flux measurements taken at 2 nm intervals over the range 380 to 780 nm. The calibration of the sphere photometer-spectrometer system is traceable to the NIST USA. Lamp efficacy (lumens per watts) for each lamp model is computed based on the revised luminous flux result. Electrical measurements including voltage, current, power and power factor are measured using the digital power Meter.

The total uncertainty of the light output measurements is estimated, at the 95% confidence level, not to exceed $\pm 1.12\%$ over the wavelength range 380-780 nm.

Starting Time Test at Ambient Temperature

The starting time test at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ ambient temperature after seasoning is performed on each lamp sample and cool down for 16 hours. The Digital Oscilloscope is used to measure the starting time. Each sample is operated its designated rated input, and the Lamp orientation is vertical base up.

Transient Protection Test at Ambient Temperature

The transient protection test at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ ambient temperature after seasoning is performed on each sample. Each sample is operated at its designated rated input in base up orientation during the test. Seven strikes of 2500V (0.5us—100 kHz Ring Wave) are applied across the lamp base contacts. After the transient protection test, estimate the lamp can be operated normal or not.

Rapid Cycle Stress Test at Ambient Temperature

The EUT was powered by its designated rated input, 3 units base up and 3 units base down, 6 units base up are tested. Cycle times are 5 minutes on, 5 minutes off; 2 minutes on, 2 minutes off. Lamps are cycle once for every hour of rated lamp life or 15000 times or manufacturer specified requirement. Samples are unique for this test only.

Color Spatial Uniformity

A Everfine GOR-5000 Goniophotometer + Everfine HASS2000 colorimeter was used to measure the CCT and $u'v'$ at each angle of distribution for each sample. The spatial distribution of chromaticity coordination $u'v'$ were measured within two vertical planes(CIE), 0° and 90° in vertical 5° increments until the light output dropped to below 50% of the maximum light output for beam angles 15° or greater; 0° and 90° in vertical 2° increments until the light output dropped to below 50% of the maximum light output for beam angles less than 15° . The average weighted chromaticity coordinate was calculated from these points. The data was analyzed to check for the data color difference of the $u'v'$ chromaticity coordinates.

Elevated Temperature Light Output Ratio

The EUT was put in a thermal chamber with base up orientation, and the temperature meter sensor was 1 inch below the base of the lamp and 2 inches from the base of the lamp toward the enclosure wall, and put the intensity meter's sensor under the lamp, used a flat-black-painted tube that extends from the photo detector to the base of the lamp. Turn on the chamber and adjust the thermal chamber temperature until the temperature meter is $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and maintained within this range, record the photometric intensity, temperature and electrical data when the lamp is stable.

Then adjust the temperature controller of thermal chamber, until the temperature meter achieve the Elevated temperature(45 $\pm 5^{\circ}\text{C}$; 55 $\pm 5^{\circ}\text{C}$) and maintained within this range, re-measure the intensity, temperature and electrical data after the lamp be stable.

Calculate the intensity ratio, light output at the elevated temperature condition divided by the light output at the ambient condition, expressed as a percentage.

Color Maintenance at 3000/6000 Hours

Ten lamps will be placed on the life racks in their designated positions for an elapsed period of 3000 hours, See life time section clear description of season. The lamp will then be re-measured for color Coordinate of CIE 1976 at environment temperature is 25°C; 45°C; 55°C, calculate the deviation of u'v' between 3000 hours data and initial data.

Elevated(45°C) Temperature Lumen Maintenance and Life Test

Life test was conducted in Ambient Temperature; Elevated Temperature Testing Apparatus (Optional C) which specified in energy star test method, Life test of 710133 lamps is conducted at BEST Test Service Shenzhen Co., Ltd. beginning at Aug 09, 2015 AM 9:00. The lamps were at its designated rated input and the environment temperature is 25°C, 45°C, 55°C. All lamps are operated steady state (no cycling). The samples are inspected at regular intervals throughout the life test. Number of hours of operation before failure and failure description are recorded; the actual elapsed time for each lamp is in hour.

When the life time achieved 3000 Hours, take down the lamp and re-measure the photometric and electrical parameters according to "photometric and electrical measure" section of this chapter, and calculate the lumen maintenance, the lumen output at 3000 Hours divided by the initial lumen flux, express as a percentage; and continue the life test after the lumen maintenance test.

The image shows the logo for BEST, which consists of the letters "BEST" in a bold, white, sans-serif font. The letters are set against a light blue, rounded rectangular background. The logo is centered horizontally and vertically within the page.

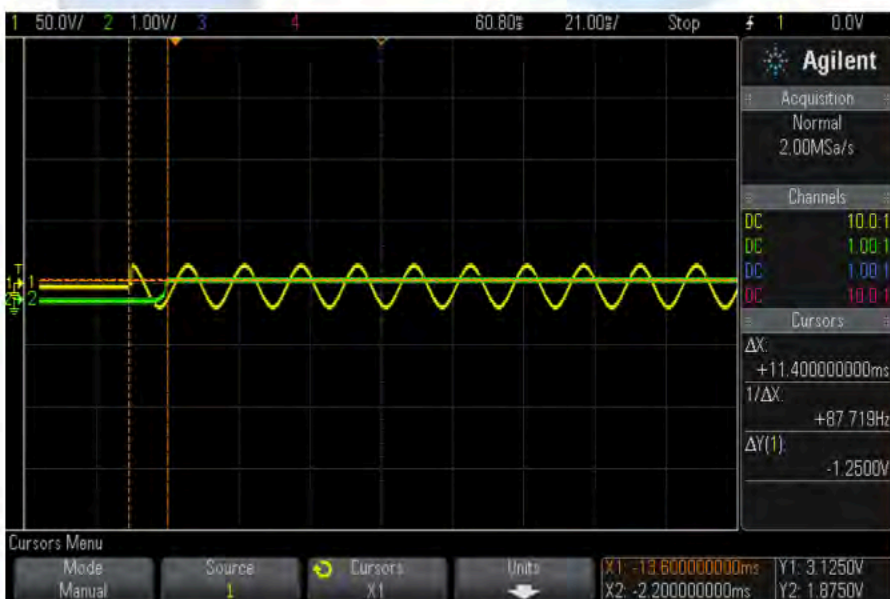
Starting Time /Transient Protection Test Data

Sample No.	Base Orientation	Starting Time(mS)	Sample No.	Base Orientation	Transient Protection
T1	VBU	11.4	T1	VBU	Survival
T2	VBU	12.8	T2	VBU	Survival
T3	VBU	13.0	T3	VBU	Survival
AV	/	12.4	T4	VBU	Survival
/	/	/	T5	VBU	Survival

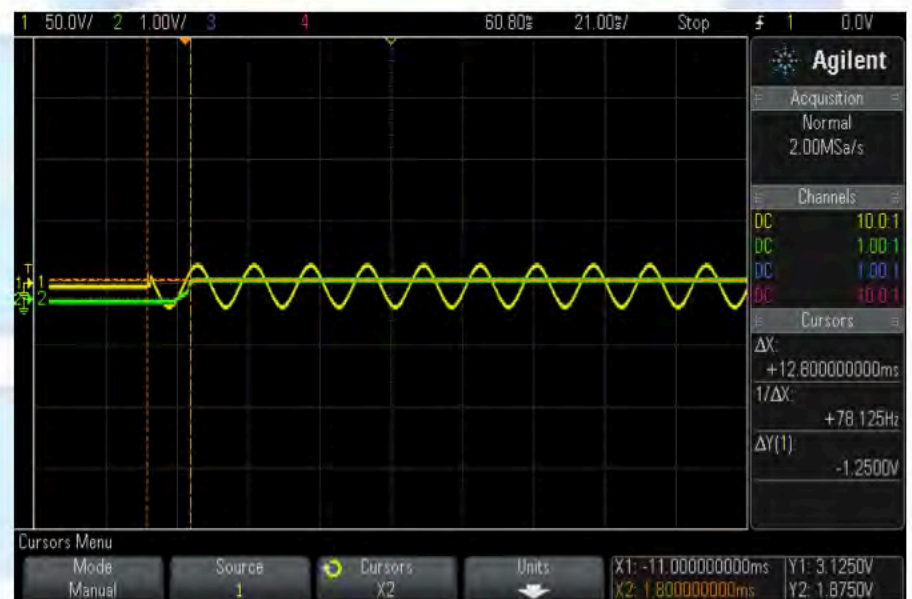
Operating Frequency/Lamp Size Test Data

Sample No	LED Operating Frequency (Hz)	Max Lamp Overall Length (mm)	Target Lamp Overall Length (mm)	Max Lamp Diameter (mm)	Target Lamp Diameter (mm)
T1	120.4	48.1	50.5	49.9	50.7

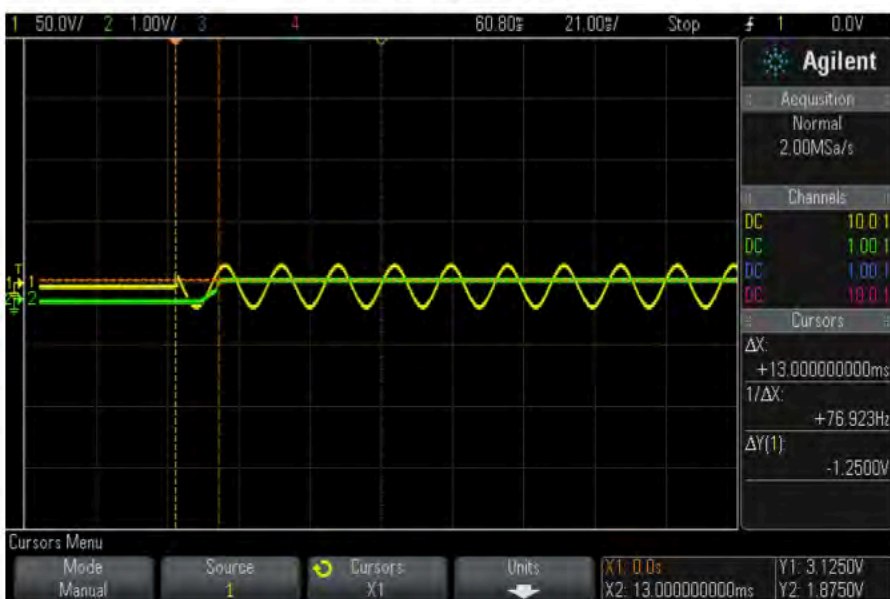
Starting Time Waveform:



Starting Time 1



Starting Time 2



Starting Time 3

Rapid Cycle Stress Test Data

Sample No.	Base Orientation	Rapid Cycle Stress (times)	Lamp Status
R1	VBU	15000	Survival
R2	VBU	15000	Survival
R3	VBU	15000	Survival
R4	VBD	15000	Survival
R5	VBD	15000	Survival
R6	VBD	15000	Survival

Elevated Temperature(45°C) 3000H/6000H Lumen Maintenance/Lamp Life Test Data

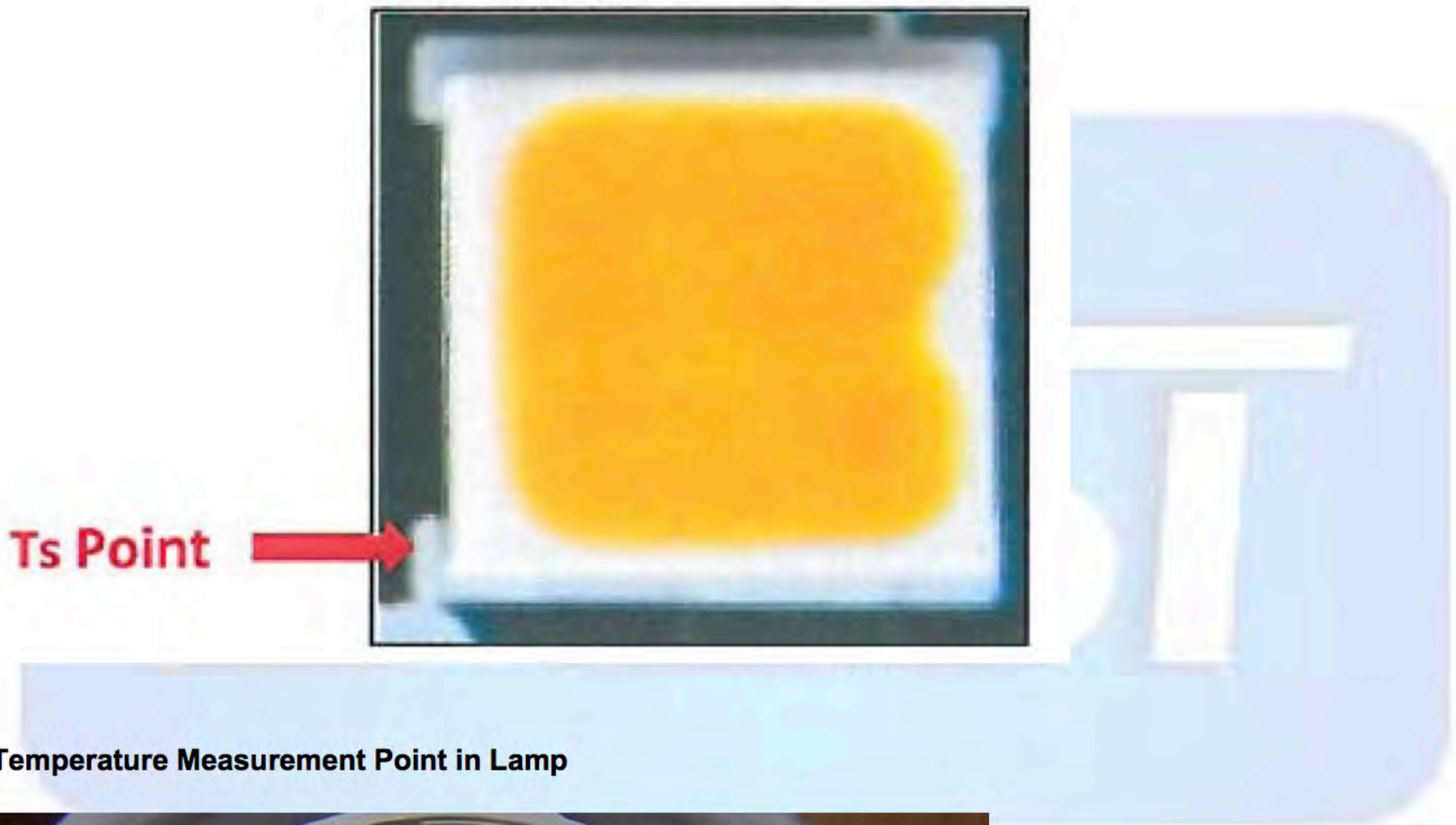
Sample No.	Base	3000Hours				6000Hours			
		Flux (Lumens)	Lumen Maintenance	Du'v'	Lamp Status	Flux (Lumens)	Lumen Maintenance	Du'v'	Lamp Status
L1	up	585.03	98.0%	0.0021	Survival	IP	IP	IP	IP
L2	up	589.94	97.9%	0.0020	Survival	IP	IP	IP	IP
L3	up	585.70	97.1%	0.0018	Survival	IP	IP	IP	IP
L4	up	585.84	98.2%	0.0022	Survival	IP	IP	IP	IP
L5	up	580.81	96.9%	0.0025	Survival	IP	IP	IP	IP
L6	down	589.49	97.8%	0.0023	Survival	IP	IP	IP	IP
L7	down	595.99	97.4%	0.0017	Survival	IP	IP	IP	IP
L8	down	612.77	98.3%	0.0024	Survival	IP	IP	IP	IP
L9	down	588.82	97.3%	0.0019	Survival	IP	IP	IP	IP
L10	down	582.28	97.0%	0.0017	Survival	IP	IP	IP	IP
AV	/	589.67	97.6%	/	/	IP	IP	/	/

Forward Current and In-Situ Maximum Measured LED Source Point Temperature Test Data

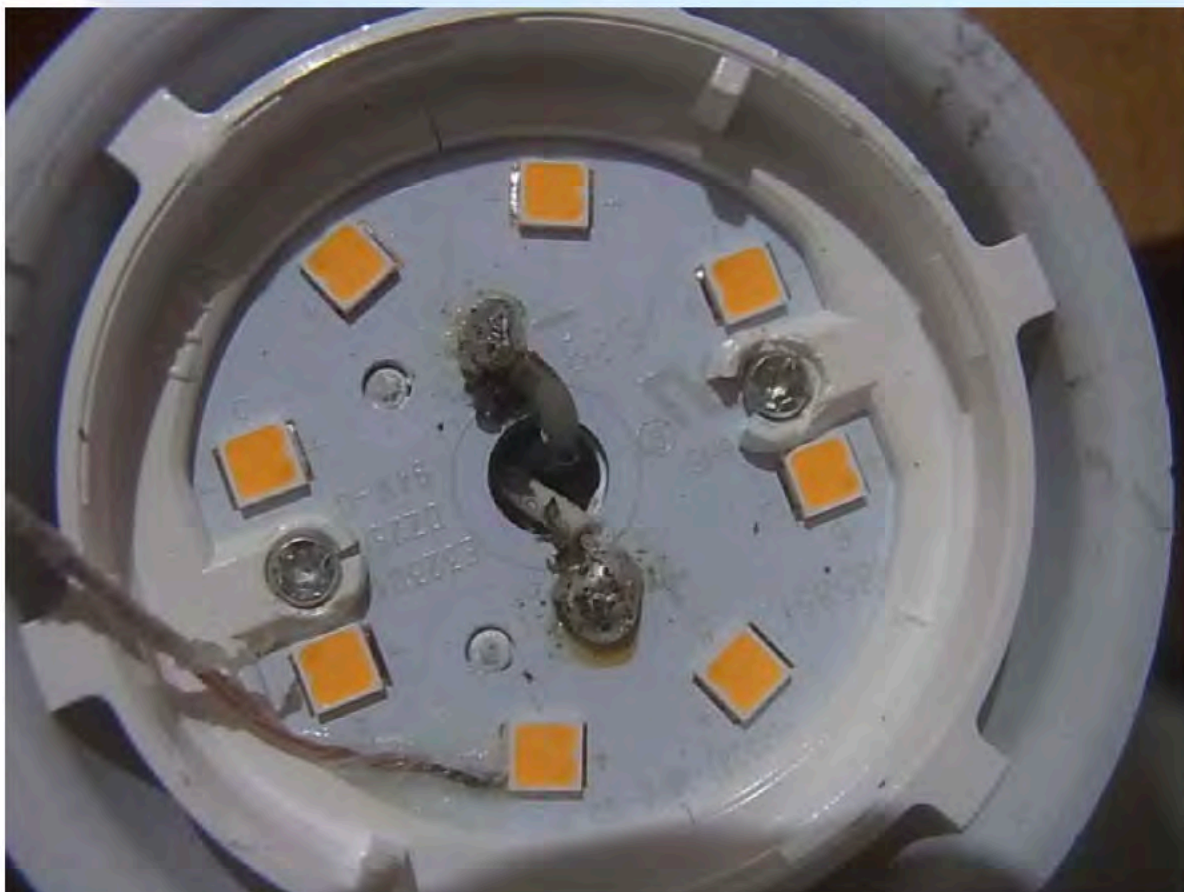
Temperature and Current Test Data

Sample No.	LED package Manufacture	LED package Model	LM-80 Reported Temperature (°C)	LM-80 Reported Current (mA)	Maximum Measured Source Temperature (°C)	Source Drive Current (mA)
TMP1	seoul semiconductor	STWxC2SB	85	200	71.8	89.5

Temperature Measurement Point in LM-80 Report



Temperature Measurement Point in Lamp



Lamp Photo

EUT – General Appearance View

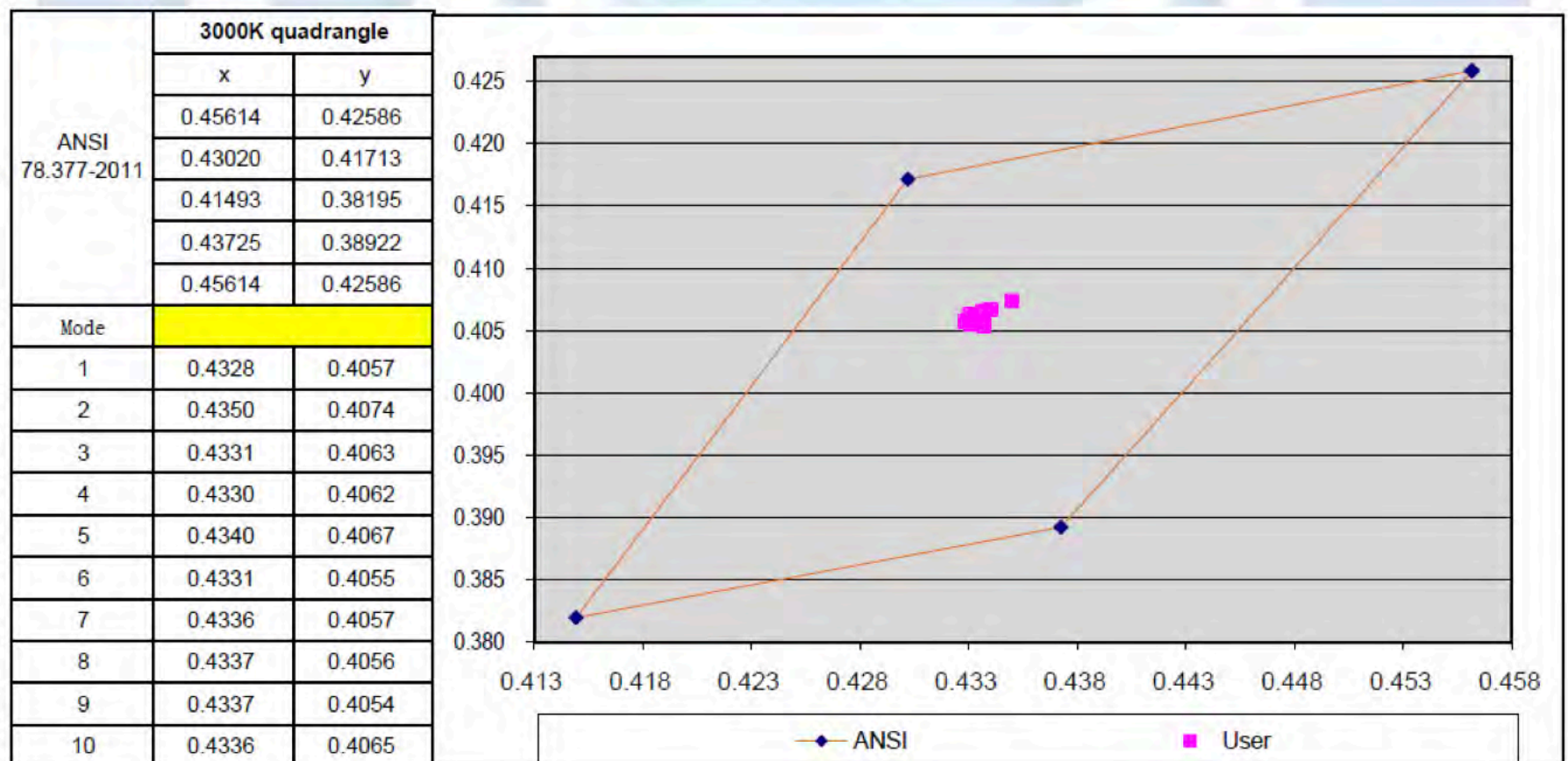


Test Data (90931)

Initial Photometric and Electrical Test Data

Sample No	Base Orientation	Voltage (V)	Current (A)	Power (W)	Power Factor	Luminous Flux (Lumens)	Efficiency (lm/W)	CCT (K)	CRI (Ra)	R9
LB1	VBU	12.0	0.7495	6.34	0.7054	604.58	95.30	3084	81.7	6
LB2	VBU	12.0	0.7619	6.49	0.7093	623.62	96.16	3061	81.7	6
LB3	VBU	12.0	0.7619	6.49	0.7103	614.70	94.66	3084	82.0	7
LB4	VBU	12.0	0.7988	6.91	0.7210	641.31	92.80	3085	81.9	7
LB5	VBU	12.0	0.7473	6.34	0.7071	610.41	96.26	3072	82.0	7
LB6	VBD	12.0	0.7666	6.35	0.6898	622.75	98.13	3078	82.2	8
LB7	VBD	12.0	0.7708	6.42	0.6944	630.99	98.24	3071	82.3	8
LB8	VBD	12.0	0.7580	6.27	0.6890	622.06	99.26	3067	82.3	9
LB9	VBD	12.0	0.7636	6.34	0.6915	618.56	97.63	3066	82.1	8
LB10	VBD	12.0	0.7529	6.23	0.6890	621.86	99.90	3077	82.0	7
/	AV	/	/	6.42	0.7007	621.08	96.83	3075	82.0	7

7-Step Chromaticity Quadrangles Test Data



Elevated Temperature Light Output Ratio Test Data (All Directional Lamp)

/	Base Orientation	Temperature (°C)	Voltage (V)	Current (A)	Power (W)	Intensity (lx)
Ambient Temperature	VBU	24.3	12.0	0.7610	6.43	10576
Elevated Temperature	VBU	42.5	12.0	0.7610	6.31	10048
ETLOR	VBU	/	/	/	/	95.0%

Center Beam Intensity Test Data (ANSI Standard PAR/ MR and MRX Shape lamps)

Nominal Replaceable Lamp Type & Wattage (W)	Nominal Replaceable Beam Angle (Degree)	Centre Beam Intensity (Required) (cd)	Beam Angle Tested (Degree)	Centre Beam Intensity (Tested) (cd)
MR16 50W	38	1147	33.2	1302

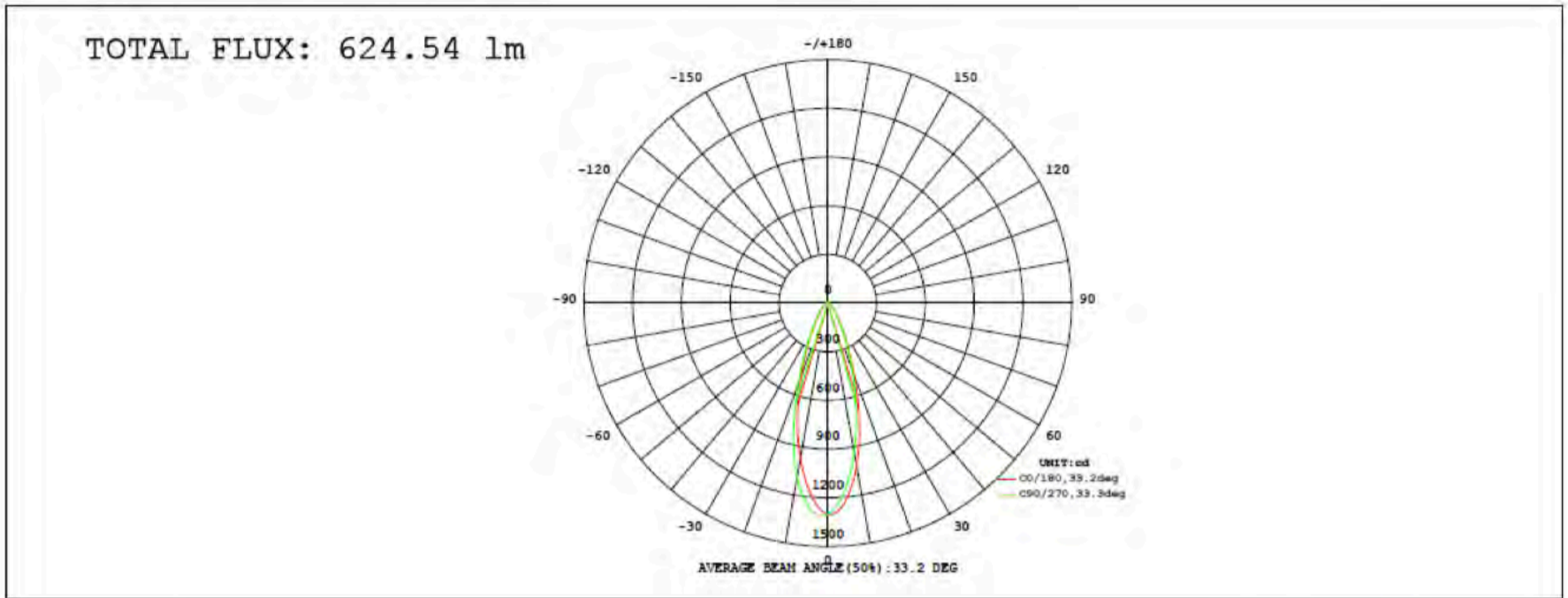
Color Spatial Uniformity Test Data(ANSI Standard PAR/ MR and MRX Shape lamps)

Vertical Angle	0° Plane (CIE 1976 u')	0° Plane (CIE 1976v')	0° Plane Deviation	90° Plane (CIE 1976 u')	90° Plane (CIE 1976 v')	90° Plane Deviation
-20	0.2491	0.5222	0.0034	0.2497	0.5231	0.0049
-15	0.2481	0.5214	0.0021	0.2488	0.5224	0.0038
-10	0.2466	0.5205	0.0004	0.2470	0.5208	0.0014
-5	0.2447	0.5188	0.0022	0.2447	0.5188	0.0017
0	0.2434	0.5177	0.0039	0.2434	0.5177	0.0034
5	0.2438	0.5180	0.0034	0.2431	0.5172	0.0039
10	0.2455	0.5194	0.0012	0.2443	0.5181	0.0025
15	0.2475	0.5212	0.0015	0.2460	0.5193	0.0005
20	0.2488	0.5222	0.0032	0.2477	0.5207	0.0019
Average	0.2464	0.5202	/	0.2461	0.5198	/

Luminous Intensity Distribution Plots

LAMP PHOTOMETRIC REPORT

Electrical: Voltage:12.00V Current:0.7211A Power:6.715W Factor:0.7725		
MODEL: 90931		
POWER: 6.5W	VOLTAGE: 12V	WORKING VOLTAGE: 12V
MANUFACTURER: P.Q.L., Inc.		Eff.: 93.01 lm/W



γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%
10	971.3	1053	1093	1055	1018	967.6	933.1	927.4	0- 10	109.1	109.1	17.5
20	485.0	524.6	539.2	509.9	480.1	451.7	443.6	450.6	10- 20	202.5	311.5	49.9
30	176.7	193.5	199.2	185.3	173.8	164.1	163.6	164.8	20- 30	138.1	449.6	72
40	71.20	82.25	87.13	78.72	73.32	68.84	66.40	66.89	30- 40	71.67	521.3	83.5
50	38.09	43.66	46.62	42.01	39.36	36.98	35.75	35.61	40- 50	41.73	563.0	90.1
60	23.59	26.16	27.53	25.29	24.20	23.06	22.58	22.25	50- 60	27.95	590.9	94.6
70	14.40	15.26	15.61	14.72	14.25	13.90	13.91	13.84	60- 70	19.04	610.0	97.7
80	6.593	6.716	6.659	6.269	6.180	6.198	6.370	6.413	70- 80	10.81	620.8	99.4
90	0.6542	0.6615	0.5966	0.5572	0.5987	0.5998	0.6175	0.6878	80- 90	3.609	624.4	100
100	0	0	0	0	0	0	0	0	90-100	0.1358	624.5	100
110	0	0	0	0	0	0	0	0	100-110	0	624.5	100
120	0	0	0	0	0	0	0	0	110-120	0	624.5	100
130	0	0	0.0042	0	0	0.0011	0.0061	0	120-130	0.0002	624.5	100
140	0	0.0029	0.0164	0.0033	0.0002	0.0040	0.0179	0.0054	130-140	0.0030	624.5	100
150	0.0011	0.0011	0.0004	0	0	0.0014	0.0029	0.0007	140-150	0.0032	624.5	100
160	0.0022	0.0013	0.0002	0	0.0007	0.0016	0.0036	0.0040	150-160	0.0005	624.5	100
170	0.0054	0.0047	0.0038	0.0036	0.0076	0.0085	0.0092	0.0099	160-170	0.0009	624.5	100
180	0	0	0	0	0	0	0	0	170-180	0.0005	624.5	100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

C Range: 0 - 360DEG
 C Interval: 22.5DEG
 Test Speed: HIGH
 Temperature:25.6DEG
 Operators:David

γ Range: 0 - 180DEG
 γ Interval: 1.0DEG
 Test System:EVERFINE GO-R5000_V2 SYSTEM V2.0.287
 Humidity:67.1%
 Test Distance:2.455m [K=1.0000]

LUMINOUS DISTRIBUTION INTENSITY DATA

Electrical: Voltage:12.00V Current:0.7211A Power:6.715W Factor:0.7725		
MODEL: 90931		
POWER: 6.5W	VOLTAGE: 12V	WORKING VOLTAGE: 12V
MANUFACTURER: P.Q.L., Inc.		Eff.: 93.01 lm/W

Table--1

UNIT: cd

C (DEG) γ (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338			
0	1302	1301	1294	1300	1300	1302	1302	1302	1302	1301	1294	1300	1300	1302	1302	1302			
5	1187	1212	1237	1265	1271	1265	1252	1236	1229	1213	1191	1183	1170	1162	1163	1176			
10	971	1014	1053	1089	1093	1080	1055	1031	1018	997	968	954	933	924	927	947			
15	727	765	793	823	823	813	787	760	747	722	697	687	675	672	677	699			
20	485	511	525	539	539	530	510	490	480	466	452	447	444	443	451	467			
25	297	311	321	328	327	319	309	296	289	281	275	272	270	270	276	286			
30	177	185	194	200	199	194	185	176	174	168	164	164	164	163	165	170			
35	108	115	123	127	128	124	117	111	109	106	103	101	100	99.9	101	104			
40	71.2	76.8	82.2	86.2	87.1	84.2	78.7	74.4	73.3	71.3	68.8	67.2	66.4	66.2	66.9	68.6			
45	50.6	54.7	58.8	61.8	62.3	60.8	56.0	53.1	52.3	50.8	48.9	47.7	47.3	47.1	47.4	48.5			
50	38.1	41.1	43.7	45.8	46.6	45.2	42.0	40.0	39.4	38.4	37.0	36.0	35.8	35.6	35.6	36.5			
55	29.8	31.8	33.7	35.0	35.8	34.7	32.4	31.0	30.7	30.0	28.9	28.3	28.3	28.1	28.0	28.5			
60	23.6	25.0	26.2	27.0	27.5	26.8	25.3	24.4	24.2	23.8	23.1	22.5	22.6	22.5	22.3	22.7			
65	19.2	19.6	20.5	20.7	21.2	20.7	20.3	19.1	20.0	18.8	18.8	18.3	18.5	18.1	18.1	18.1			
70	14.4	14.8	15.3	15.4	15.6	15.2	14.7	14.2	14.2	14.1	13.9	13.7	13.9	13.8	13.8	14.0			
75	10.3	10.6	10.7	10.7	10.8	10.5	10.1	9.87	9.88	9.90	9.75	9.74	9.93	9.92	9.95	10.1			
80	6.59	6.72	6.72	6.66	6.66	6.52	6.27	6.15	6.18	6.25	6.20	6.22	6.37	6.42	6.41	6.56			
85	3.35	3.41	3.35	3.29	3.24	3.15	3.00	2.96	3.04	3.11	3.08	3.13	3.25	3.31	3.34	3.47			
90	0.65	0.69	0.66	0.63	0.60	0.59	0.56	0.56	0.60	0.62	0.60	0.61	0.62	0.66	0.69	0.74			
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
125	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
130	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00			
135	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.01			
140	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.01			
145	0.01	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01			
150	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
155	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
160	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
165	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00			
170	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
175	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01			
180	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			

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