



Model # LED8E26A1927K
 PO# TCP-7635
 LP Type: LED A Lamp

SPHERE: Zoot
 Rated Life: 25,000
 Cal File: ALAMP_856-028_11-23-11.cal

Technician: Tyler Thompson

Date: 11/28/11

Approved Signatory: Angela Benton-Smith

Date: 12/6/11



NVLAP Lab Code 200571-0

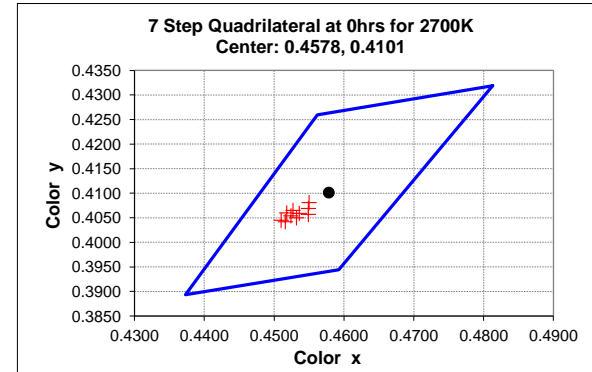
0 HOUR RESULTS

	Lp. #	Volts	Amps	Watts	pf (≥.7)	0 Hr. Lumens	CCT	CRI (≥80)	Sph Temp	x Value	y Value	u' Value	v' Value	Duv	7-Step Color Compliance	LPW (>40)	Stabilization Time	R9
Base Up	P-7635-1	120.02	0.0724	8.11	0.932	505	2780	81	76.6	0.4510	0.4045	0.2595	0.5237	-0.0015	PASS	62.3	1:00	2
	P-7635-2	120.02	0.0728	8.19	0.937	497	2749	81	76.6	0.4550	0.4081	0.2605	0.5256	-0.0005	PASS	60.7	0:30	1
	P-7635-3	120.02	0.0727	8.15	0.934	505	2752	81	76.6	0.4536	0.4059	0.2606	0.5246	-0.0012	PASS	62.0	0:30	1
	P-7635-4	120.02	0.0724	8.12	0.935	498	2751	81	76.6	0.4532	0.4050	0.2607	0.5242	-0.0015	PASS	61.3	0:30	1
	P-7635-5	120.02	0.0730	8.21	0.937	498	2741	81	76.6	0.4549	0.4069	0.2610	0.5252	-0.0009	PASS	60.7	0:30	1

	Lp. #	Volts	Amps	Watts	pf (≥.7)	0 Hr. Lumens	CCT	CRI (≥80)	Sph Temp	x Value	y Value	u' Value	v' Value	Duv	7-Step Color Compliance	LPW (>40)	Stabilization Time	R9
Base Down	P-7635-6	120.02	0.0718	8.06	0.935	484	2779	81	76.3	0.4518	0.4060	0.2594	0.5244	-0.0010	PASS	60.0	0:30	2
	P-7635-7	120.01	0.0718	8.04	0.933	467	2732	81	76.4	0.4549	0.4057	0.2615	0.5247	-0.0014	PASS	58.1	0:30	1
	P-7635-8	120.01	0.0714	8.04	0.937	475	2766	81	76.5	0.4524	0.4054	0.2600	0.5242	-0.0013	PASS	59.1	0:30	2
	P-7635-9	120.01	0.0724	8.10	0.933	471	2770	81	76.5	0.4527	0.4065	0.2597	0.5247	-0.0009	PASS	58.1	0:30	1
	P-7635-10	120.01	0.0737	8.28	0.937	470	2768	81	76.4	0.4516	0.4042	0.2600	0.5236	-0.0017	PASS	56.8	0:30	2
Grand AVG.		120.02	0.0724	8.13	0.935	487	2759	81	76.5	0.4531	0.4058	0.2603	0.5245	-0.0012		59.9	0:33	1.5
Compliance					Complies	Complies	Complies	Complies						Complies	Complies	Complies		

LUMEN & COLOR MAINTENANCE

	Date:								
	Lp. #	3000 Hr. Lumens	3000 Hr. Lumen Maint.	3000 Hr. u' Color Maint.	3000 Hr. v' Color Maint.	6000 Hr. Lumens	6000 Hr. Lumen Maint.	6000 Hr. u' Color Maint.	6000 Hr. v' Color Maint.
Base Up	P-7635-1								
	P-7635-2								
	P-7635-3								
	P-7635-4								
	P-7635-5								
Base Down	P-7635-6								
	P-7635-7								
	P-7635-8								
	P-7635-9								
	P-7635-10								
Grand AVG.									
Compliance		TBD	TBD	TBD		TBD	TBD	TBD	





Model # LED8E26A1927K
PO# TCP-7635
LP Type: LED A Lamp
Board #

SPHERE: Zoot
Rated Life: 25,000
Cal File:

Technician: Bipin Rao

Date: 11/30/11

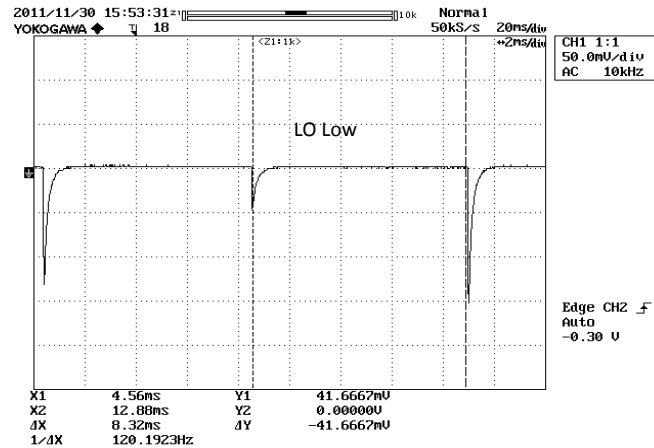
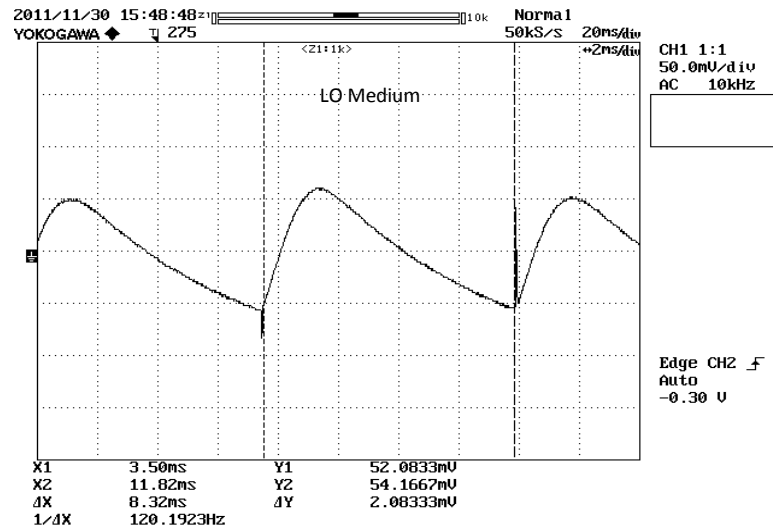
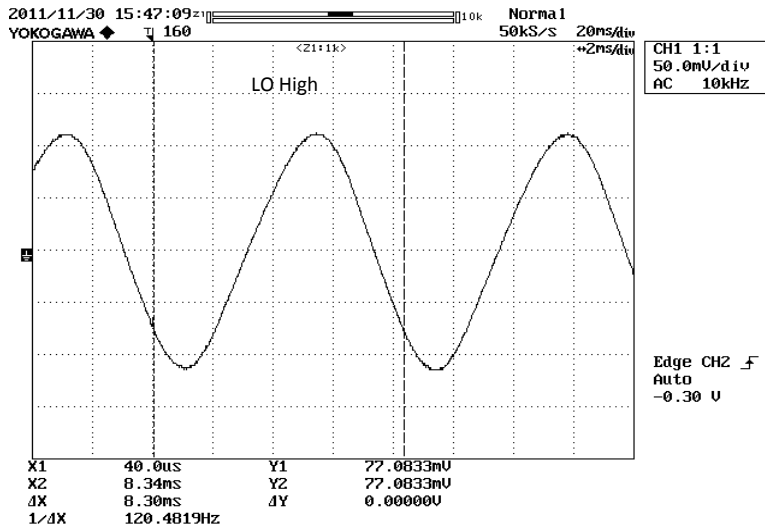
Approved Signatory: Angela Benton-Smith

Date: 11/30/11



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Date: 11/30/11			
Lp. #	L.O. = Hi Ballast Freq (≥120 Hz)	L.O. = Med Ballast Freq (≥120 Hz)	L.O. = Lo Ballast Freq (≥120 Hz)
TCP-7635	120.5	120.2	120.2
Compliance	Complies	Complies	Complies





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LP Type: LED A Lamp

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Rated Life: 25,000
Cal File:

Technician: Tyler Thompson

Date: 11/28/11

Approved Signatory: Angela Benton-Smith

Date: 12/6/11



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Date: 11/23/11	
Lp. #	Transient Protection PASS/FAIL
T-7635-1	PASS
T-7635-2	PASS
T-7635-3	PASS
T-7635-4	PASS
T-7635-5	PASS
Compliance	Complies

Date: 12/1/11	
Lp. #	Noise (dbA)
N-7635-1	15.9

Date:		
Lp. #	Rapid Cycles Endured (25K)	Rapid Cycles Endured (50K)
RC-7635-1		
RC-7635-2		
RC-7635-3		
RC-7635-4		
RC-7635-5		
RC-7635-6		
RC-7635-7		
RC-7635-8		
RC-7635-9		
RC-7635-10		
Compliance	TBD	TBD



NVLAP Lab Code 200571-0

327 Campus Drive, Aurora, Ohio 44202 Phone: 330-995-1335 Fax: 330-995-1343

Test Report

PO Number: TCP-7635

Model No. LED8E26A1927K

SUBMITTED TO

Technical Consumer Products
325 Campus Drive
Aurora, OH 44202

Customer Information

Requestor's Name Tammie Madden Company Name TCP

Address 325 Campus Drive

City Aurora

State OH

Zip Code 44202

Telephone: 330-995-1337

Fax: 330-995-6188

Email: tmadden@tcpi.com

Date of Receipt: 11/22/11

Date of this Report: 12/6/11

This Test Report covers the Lamp Model Numbers shown below.

Quantity	Model No.
27	LED8E26A1927K

At the customers request this report has been generated to provide test data for the following tests: Electrical, photometric and colorimetric tests, transient test, operating frequency, noise, dimensional, lumen maintenance at 1000, 3000 and 6000 hours, rapid cycle stress test, color maintenance at 6000 hours, electromagnetic and radio frequency interference, 120 degree zonal lumen percentage, color spatial uniformity and center beam intensity testing. The tests as requested are in compliance with ISO 17025, NVLAP and Energy Star requirements. The Photometric measurements are in compliance with LM79:2008. Aurora International Testing Laboratory is only responsible for the validity of the test data. The test results relate only to the lamps tested.

*** THIS REPORT CONTAINS DATA THAT IS NOT COVERED BY THE NVLAP ACCREDITATION**

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327 Campus Drive, Aurora, Ohio 44202 Phone: 330-995-1335 Fax: 330-995-1343

Test Report

PO Number: TCP-7635

The following standards and specifications were used in part or totally for each test sample:

1. IES NA LM 16 -1995 Practical guide to Colorimetry of Light Sources
2. IESNA LM-58 : Spectroradiometric Measurements
3. IES NA LM79:2008 (Sections 9 & 12) Approved Method: Electrical and Photometric Measurements of Solid State Lighting Products
4. ANSI C78.377-2008: Specifications for the Chromaticity of Solid State Lighting products
5. ANSI Chromaticity Final PC.xls Worksheet
6. CIE Publication 13.3:1995 Method of Measuring and Specifying Color Rendering Index
7. CIE Publication 15:2004 Method of Measuring and Specifying Color Rendering Index
8. Energy Star® Program Requirements for Integral LED Lamps V1: 12/03/09

TEST METHODS

Electrical Photometric and Colorimetric Measurements

Total light output (luminous flux) was measured using an integrating sphere, a spectroradiometer and software. The spectral luminous flux measurements were made using the spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Each lamp was operated in the designated orientation at its rated voltage. Each lamp preburned for 5 hours on a test rack adjacent to the sphere. After transfer to the sphere the lamps were allowed to stabilize before measurements were made. The chromaticity coordinates, correlated color temperature and color rendering index for each lamp are calculated from the spectral radiant flux measurements taken at 0.4 nm intervals over the range of 380-780 nm. The calibration of the sphere spectroradiometer system is traceable to the National Institute of Standards and Technology. Electrical measurements including voltage, current, power and power factor are measured using a power analyzer. The ambient temperature condition inside the sphere was maintained at 77 °F ± 1.8 °F and was measured at a position inside the sphere. The operating frequency was measured with an oscilloscope, at an ambient temperature of 77 °F +/- 1.8 °F.

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Test Report

PO Number: TCP-7635

Transient Protection Test

During the test, each lamp was operated at its rated voltage and in its designated orientation. The ambient room temperature was maintained at 77 °F ± 1.8 °F. An instrument with a surge simulator module was used to generate the 2500-volt ring wave across the lamp base contacts. Seven strikes were performed on each lamp sample.

Rapid Cycle Stress Test

Lamps were operated on a two-minutes on / two-minutes off time cycle at its rated voltage. The lamps are cycled once for every two hours of the required minimum rated life.

Lumen and Color Maintenance

The lamps were burned in their designated orientation at their rated voltage. After burning 1000 hours on a continuous duty cycle the lumen maintenance was measured. The lamps are then placed back on the life test rack in their designated orientation and burned to 3000 hours. The lumen maintenance was again measured. The lamps are then placed back on the life test rack in their designated orientation and burned to 6000 hours. The lumen maintenance was again measured at this final interval. The color maintenance was measured at the 6000 hour interval.

Noise Level

The noise level for each sample was determined by using a sound level meter. The sample was placed inside of a sound chamber with a sound floor level of ≤20 dbA. The dbA reading of each lamp was noted as pass/fail when read on the sound rating A range. Each sample was operated in its designated orientation at its rated voltage.

<u>Sound Ratings</u>	<u>Sound Ratings</u>
	<u>Average Noise Rating (dB)</u>
A	20-24
B	25-30
C	31-36

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Test Report

PO Number : TCP-7635

Equipment List :

Description	Manufacturer	Model
1.5 Meter Integrating Sphere	Everfine	Spektron
AC Power Source	California Instruments	2001L
AC Power Source	California Instruments	4500Ls
Spectroradiometer	Optronics Laboratories, Inc.	OL770
Radiometer/Photometer	Optronics Laboratories, Inc.	OL730/CV
Power Analyzer	Yokogawa, Inc.	WT210
Digital Thermocouple Meter	Extech	421509
High Voltage DC Power Source	Xantrax	XHR 150-7
Precision shunt	Guildline	9230A-30-0.1
6 1/2 Digit Multimeter	Agilent	34401A
Lamp Reference Standard	GE	100watt, 120volt
Oscilloscope	Yokogawa, Inc.	DL1520L
EMC Transient Test System	KeyTek	EMC Pro
Preburn test rack	AITL	na
Life Test rack	AITL	na
Rapid Cycle Test rack	AITL	na
Draft free enclosure	AITL	na
Thermal chamber	ESPEC	LU113
Elevated Temperature Life Test Rack	AITL	na
Sound Meter	Larson Davis	System 824
PC	Dell	various

Testing Technician: Tyler Thompson **Date:** 12/6/11

Approved Signatory: Angela Benton-Smith **Date:** 12/6/11

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U.S. Department of Energy
Lighting Facts^{CM} Uniform LM-79 Reporting Template



Laboratory Information

Name of test lab	Aurora International Laboratory
Date of test report	12/6/11
Test report number	TCP-7635
Laboratory contact name	Angela Benton-Smith
Laboratory contact signature*	<i>Angela Benton-Smith</i>

* By signing this form, the signatory is attesting that the information on the form is correct and the same as on the original, complete test report(s). The signatory also attests that all of the results on this form were measured entirely in accordance with IES LM-79-08.

Product Information

Manufacturer	TCP	
Brand name		
Model number	LED8E26A1927K	
SKU (if available)		
Type of luminaire (for integral lamps, list base type and lamp type)		
Luminaire aperture (downlights)		in.
Luminaire length		in.
Luminaire width		in.
Number of units (modular products)		

Electrical Measurements

	Integrating sphere output	Goniophotometer output	
Input wattage	8.13		W
Input current	0.07		A
Input voltage	120.02		V
Power factor	0.935		
Off-state power			W

Photometric Characteristics

Total initial lumen output	487		lm
Initial luminaire efficacy	59.9		lm/W
Correlated color temperature / CCT	2759	K	
Color rendering index / CRI	81		
R ₉ value	1.50		
Duv	-0.0012		

Luminous Intensity Distribution

		Goniophotometer output	
Center beam candlepower (if applicable)			cd
Beam angle (if applicable)			°
Zonal lumens in the 0°-60° zone			%
Zonal lumens in the 60°-90° zone			%
Zonal lumens in the 90°-120° zone			%
Zonal lumens in the 120°-180° zone			%