itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955
INDEPENDENT TESTING LABORATORIES, INC.
4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA
PHONE: (303)442-1255 • FAX: (970)535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

NVLAP LAB CODE: 200925-0

REPORT NUMBER: ITL86247
DATE: 01/19/16
PREPARED FOR: B-K LIGHTING, INC.
CATALOG NUMBER: MM-LED-e71-NSP-12-C, RM-MM-LED-e71-NSP-12-C, SN-MM-LED-e71-NSP-12-C, ST-MM-LED-e71-NSP-12-C, SF-MM-LED-e71-NSP-12-C, TF-MM-LED-e71-NSP-12-C, YM-LED-e71-NSP-12-C, OM-LED-e71-NSP-12-C, SM-MM-LED-e71-NSP-12, PM-MM-LED-e71-NSP-12-C, WM-MM-LED-e71-NSP-12-C, UL-MM-LED-e71-NSP-12, DM-LED-e71-NSP-12

ADDRESS: 40429 BRICKYARD DRIVE
MADERA, CA 93636-9515

LUMINAIRE: MACHINED CYLINDRICAL METAL HOUSING, 1 BLACK CIRCUIT BOARD WITH ONE LED, CLEAR PLASTIC OPTIC IN MOLDED WHITE PLASTIC FRAME, CLEAR MICRO-PRISMATIC FLAT GLASS LENS IN MACHINED BLACK PAINTED CYLINDRICAL METAL FRAME WITH UNFINISHED INTERIOR. LENS PRISMS OUT. LUMINAIRE AIMED AT THE HORIZON FOR THIS TEST.

LAMP: ONE WHITE LIGHT EMITTING DIODE (LED), AIMED AT THE HORIZON.

DRIVER: B-K LIGHTING 518801/400187-F

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (12VAC, 60Hz) TO THE DRIVER.

INSTRUMENTS:		Calibration Due:
	Associated Power Technologies APT5020 AC Power Source	N/A
	Yokogawa WT210 Digital Power Meter #9	01/31/16
	Ocean Optics QE65000 Spectroradiometer	09/23/16
	ITL 1.5m Diameter Integrating Sphere S15-2, 4PI Geometry	09/23/16

OBJECT OF TEST: Measure the Absolute Flux in lumens*, Spectral Power Distribution (SPD), Correlated Color Temperature (CCT), Color Rendering Index (CRIa,1-14), Chromaticity Coordinates (x,y; u',v'), ANSI C78.377 Duv, Total Radiant Flux*, Scotopic / Photopic Lumen Ratio, and electrical data including ANSI C82.77-2002 Power Factor (PF) and Total Harmonic Distortion (THD) to the test sample.

PROCEDURE: The test sample was provided by the customer and had an unknown number of operating hours. The test sample was mounted inside the integrating sphere and allowed to stabilize. After stabilization occurred, measurements were taken. In order to measure mean performance, multiple data sets were recorded and averaged. Readings were taken with the test sample operating at 12VAC input in a 25 +/-1 degree Celsius free air ambient and in accordance with IESNA LM-79-08. All data are traceable to the National Institute of Standards and Technology.

RESULTS: (continued subsequent pages)

Checked *N WHITE*
Approved *P O'CONNOR*
Sphere Lab Supervisor

itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955
NVLAP LAB CODE: 200925-0
INDEPENDENT TESTING LABORATORIES, INC.
4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA
PHONE: (303)442-1255 • FAX: (970)535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL86247
DATE: 01/19/16
PREPARED FOR: B-K LIGHTING, INC.
CATALOG NUMBER: MM-LED-e71-NSP-12-C, RM-MM-LED-e71-NSP-12-C, SN-MM-LED-e71-NSP-12-C, ST-MM-LED-e71-NSP-12-C, SF-MM-LED-e71-NSP-12-C, TF-MM-LED-e71-NSP-12-C, YM-LED-e71-NSP-12-C, OM-LED-e71-NSP-12-C, SM-MM-LED-e71-NSP-12, PM-MM-LED-e71-NSP-12-C, WM-MM-LED-e71-NSP-12-C, UL-MM-LED-e71-NSP-12, DM-LED-e71-NSP-12

RESULTS:

PHOTOMETRIC	
Total Integrated Flux (lumens)	203 *
SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3957
Chromaticity Ordinate y	0.3949
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2278
Chromaticity Ordinate v'	0.5116
Correlated Color Temp CCT (K)	3751
ANSI C78.377-2008 Duv	0.004
Total Radiant Flux (milliWatts)	606 *
Scotopic / Photopic Lumen Ratio	1.592
ELECTRICAL	
Input Voltage (Volts AC)	12.0
Input Current (Amps AC)	0.343
Input Power (Watts)	2.65
Input Power Factor (%)	64.4
Input Current THD (%)	92.1
Input Voltage THD (%)	1.3
EFFICACY (lumens/Watt)	76.6

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	81
R1 Light greyish red	78
R2 Dark greyish yellow	86
R3 Strong yellowish green	92
R4 Moderate yellowish green	81
R5 Light bluish green	78
R6 Light blue	81
R7 Light violet	87
R8 Light reddish purple	63
R9 Strong red	4
R10 Strong yellow	66
R11 Strong green	78
R12 Strong blue	58
R13 Light yellowish pink (skin)	80
R14 Moderate olive green (leaf)	95

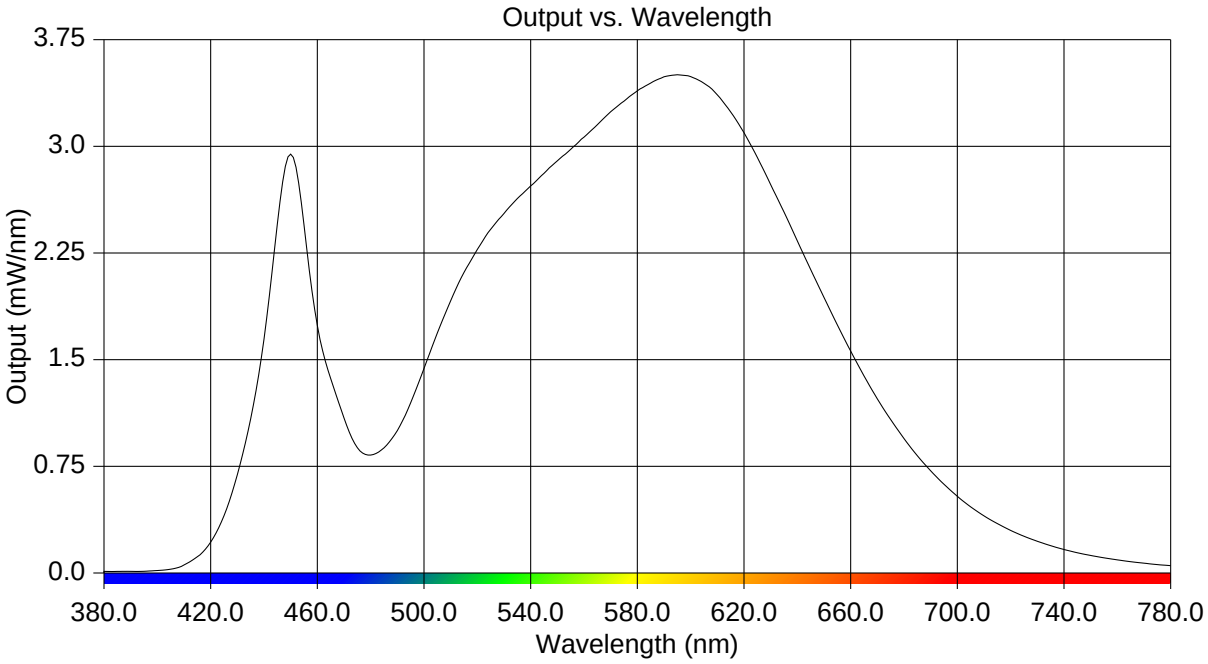
*NOTE: Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even when these effects are compensated for, are likely to have a greater variation in results compared to the flux output calculated from a goniophotometric exploration since these artifacts do not affect the goniophotometric results.

itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955
NVLAP LAB CODE: 200925-0
INDEPENDENT TESTING LABORATORIES, INC.
4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA
PHONE: (303)442-1255 • FAX: (970)535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL86247
DATE: 01/19/16
PREPARED FOR: B-K LIGHTING, INC.
CATALOG NUMBER: MM-LED-e71-NSP-12-C, RM-MM-LED-e71-NSP-12-C, SN-MM-LED-e71-NSP-12-C, ST-MM-LED-e71-NSP-12-C, SF-MM-LED-e71-NSP-12-C, TF-MM-LED-e71-NSP-12-C, YM-LED-e71-NSP-12-C, OM-LED-e71-NSP-12-C, SM-MM-LED-e71-NSP-12, PM-MM-LED-e71-NSP-12-C, WM-MM-LED-e71-NSP-12-C, UL-MM-LED-e71-NSP-12, DM-LED-e71-NSP-12

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.011	515	2.113	650	1.937
385	0.011	520	2.275	655	1.745
390	0.011	525	2.417	660	1.561
395	0.012	530	2.528	665	1.386
400	0.017	535	2.633	670	1.224
405	0.027	540	2.722	675	1.079
410	0.056	545	2.810	680	0.945
415	0.114	550	2.898	685	0.825
420	0.217	555	2.979	690	0.719
425	0.403	560	3.065	695	0.624
430	0.691	565	3.152	700	0.539
435	1.084	570	3.243	705	0.465
440	1.644	575	3.318	710	0.402
445	2.453	580	3.390	715	0.347
450	2.945	585	3.445	720	0.299
455	2.448	590	3.489	725	0.258
460	1.741	595	3.503	730	0.223
465	1.368	600	3.490	735	0.192
470	1.090	605	3.443	740	0.165
475	0.881	610	3.362	745	0.142
480	0.829	615	3.242	750	0.123
485	0.880	620	3.096	755	0.107
490	1.001	625	2.922	760	0.092
495	1.197	630	2.731	765	0.079
500	1.438	635	2.538	770	0.069
505	1.688	640	2.335	775	0.059
510	1.914	645	2.134	780	0.052



itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955
NVLAP LAB CODE: 200925-0
INDEPENDENT TESTING LABORATORIES, INC.
4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA
PHONE: (303)442-1255 • FAX: (970)535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL86247
DATE: 01/19/16
PREPARED FOR: B-K LIGHTING, INC.
CATALOG NUMBER: MM-LED-e71-NSP-12-C, RM-MM-LED-e71-NSP-12-C, SN-MM-LED-e71-NSP-12-C, ST-MM-LED-e71-NSP-12-C, SF-MM-LED-e71-NSP-12-C, TF-MM-LED-e71-NSP-12-C, YM-LED-e71-NSP-12-C, OM-LED-e71-NSP-12-C, SM-MM-LED-e71-NSP-12, PM-MM-LED-e71-NSP-12-C, WM-MM-LED-e71-NSP-12-C, UL-MM-LED-e71-NSP-12, DM-LED-e71-NSP-12

CIE Chromaticity Diagram