

PHONE: (303) 442-1255 • FAX: (970) 535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL81582

PAGE: 1 OF 7

ISSUE DATE: 05/05/14

REVISED: 09/23/14

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: HBLED13 (WIDE FLOOD)

LUMINAIRE: CAST METAL HOUSING, BROWN PAINTED FLAT METAL HEAT SINK MOUNTING PLATE, CAST BROWN PAINTED FINNED METAL HEAT SINK, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH, 1 CIRCUIT BOARD EACH WITH 1 LED, CLEAR FLAT GLASS LENS IN CAST BROWN PAINTED METAL FRAME.

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

TOTAL INPUT WATTS = 14.2 AT 120.0 VOLTS

LED DRIVER: RAB LIGHTING RD12-36-A0350

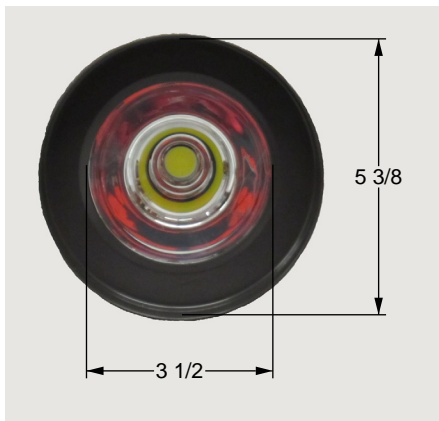
NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120VAC, 60Hz) TO THE DRIVER.

TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE = 35.0 FEET

FLOODLIGHT CHARACTERISTICS

IES TYPE	5H X 5V	AXIAL CANDLEPOWER			
	AT 0.0 H, 3.0 V		HORIZ.	DEG	VERT.
MAXIMUM CANDLEPOWER	2010.				
HORIZONTAL BEAM ANGLE (50%)	54.2 deg				
VERTICAL BEAM ANGLE (50%)	54.2 deg				
HORIZONTAL FIELD ANGLE (10%)	79.9 deg				
VERTICAL FIELD ANGLE (10%)	80.2 deg				
BEAM LUMENS (% FIXTURE)	1005. (67.4 %)				
FIELD LUMENS (% FIXTURE)	1453. (97.5 %)				
TOTAL LUMENS (% FIXTURE)	1490. (100.0 %)				
EFFICACY = 104.9 lm/W					
		90.0	0.	90.0	0.
		85.0	0.	85.0	0.
		75.0	0.	75.0	0.
		65.0	1.	65.0	1.
		55.0	1.	55.0	1.
		47.5	11.	47.5	12.
		42.5	70.	42.5	65.
		37.5	329.	37.5	340.
		33.0	563.	33.0	665.
		29.0	918.	29.0	915.
		25.5	1079.	25.5	1087.
		22.5	1215.	22.5	1248.
		19.5	1351.	19.5	1413.
		17.0	1467.	17.0	1565.
		15.0	1559.	15.0	1641.
		13.0	1633.	13.0	1716.
		11.0	1729.	11.0	1768.
		9.0	1837.	9.0	1873.
		7.0	1932.	7.0	1940.
		5.0	1989.	5.0	1990.
		3.0	2000.	3.0	2010.
		1.0	2005.	1.0	2003.
		0.0	2001.	0.0	2001.
		-1.0	2005.	-1.0	2003.
		-3.0	2000.	-3.0	2000.
		-5.0	1989.	-5.0	1991.
		-7.0	1932.	-7.0	1945.
		-9.0	1837.	-9.0	1884.
		-11.0	1729.	-11.0	1794.
		-13.0	1633.	-13.0	1739.
		-15.0	1559.	-15.0	1667.
		-17.0	1467.	-17.0	1605.
		-19.5	1351.	-19.5	1453.
		-22.5	1215.	-22.5	1258.
		-25.5	1079.	-25.5	1084.
		-29.0	918.	-29.0	894.
		-33.0	563.	-33.0	648.
		-37.5	329.	-37.5	341.
		-42.5	70.	-42.5	74.
		-47.5	11.	-47.5	12.
		-55.0	1.	-55.0	1.
		-65.0	1.	-65.0	1.
		-75.0	0.	-75.0	0.
		-85.0	0.	-85.0	0.
		-90.0	0.	-90.0	0.



Checked *B HYRE*
Approved *N WHITE*
Lighting Engineer

ALL CANDELA AND LUMEN VALUES IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY.

THIS REPORT IS BASED ON PUBLISHED INDUSTRY PROCEDURES. FIELD PERFORMANCE MAY DIFFER FROM LABORATORY PERFORMANCE.



INDEPENDENT TESTING LABORATORIES, INC.
4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

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PAGE: 3 OF 7
REVISED: 09/23/14

CANDELA TABULATION - FIELD ONLY

AVERAGE OF RIGHT AND LEFT SIDES

	0.0	1.0	3.0	5.0	7.0	9.0	11.0	13.0	15.0	17.0	19.5	22.5	25.5	29.0	33.0	37.5	42.5	47.5	55.0	65.0	75.0	85.0	90.0	
90.0																								
85.0																								
75.0																								
65.0																								
55.0																								
47.5																								
42.5																								
37.5	340.	332.	328.	313.	290.	269.	250.	219.																
33.0	665.	657.	649.	636.	612.	582.	541.	497.	450.	368.	323.	253.												
29.0	915.	914.	907.	895.	871.	840.	797.	751.	705.	647.	563.	447.	306.											
25.5	1087.	1094.	1085.	1067.	1043.	1013.	977.	935.	890.	835.	754.	635.	465.	289.										
22.5	1248.	1253.	1246.	1233.	1206.	1163.	1108.	1058.	1013.	962.	886.	774.	634.	419.	228.									
19.5	1413.	1420.	1406.	1381.	1343.	1294.	1239.	1189.	1132.	1069.	992.	891.	758.	569.	302.									
17.0	1565.	1572.	1554.	1521.	1478.	1421.	1350.	1279.	1220.	1160.	1071.	967.	841.	655.	343.									
15.0	1641.	1642.	1636.	1619.	1585.	1526.	1441.	1361.	1287.	1217.	1132.	1018.	898.	717.	400.	208.								
13.0	1716.	1711.	1710.	1688.	1647.	1605.	1530.	1439.	1356.	1275.	1181.	1065.	946.	770.	464.	253.								
11.0	1768.	1770.	1759.	1749.	1715.	1658.	1589.	1510.	1420.	1334.	1223.	1111.	985.	815.	492.	273.								
9.0	1873.	1872.	1844.	1800.	1762.	1703.	1630.	1561.	1476.	1380.	1261.	1150.	1018.	852.	525.	291.								
7.0	1940.	1939.	1927.	1891.	1823.	1740.	1672.	1590.	1521.	1420.	1296.	1175.	1041.	879.	541.	306.								
5.0	1990.	1985.	1970.	1940.	1875.	1787.	1696.	1620.	1551.	1447.	1322.	1193.	1059.	898.	553.	317.								
3.0	2010.	2007.	1999.	1969.	1915.	1820.	1719.	1638.	1555.	1465.	1338.	1205.	1070.	910.	560.	324.								
1.0	2003.	2004.	1999.	1985.	1932.	1839.	1724.	1624.	1556.	1469.	1349.	1214.	1077.	917.	564.	328.								
0.0	2001.	2005.	2000.	1989.	1932.	1837.	1729.	1633.	1559.	1467.	1351.	1215.	1079.	918.	563.	329.								
-1.0	2003.	2005.	2000.	1987.	1934.	1837.	1726.	1631.	1557.	1466.	1350.	1215.	1079.	917.	563.	329.								
-3.0	2000.	2000.	1997.	1971.	1924.	1828.	1719.	1625.	1551.	1466.	1342.	1210.	1073.	911.	559.	326.								
-5.0	1991.	1987.	1978.	1942.	1884.	1795.	1705.	1633.	1551.	1450.	1327.	1198.	1061.	899.	551.	319.								
-7.0	1945.	1945.	1930.	1901.	1831.	1751.	1673.	1598.	1520.	1424.	1305.	1178.	1040.	878.	538.	308.								
-9.0	1884.	1890.	1865.	1823.	1767.	1709.	1645.	1567.	1488.	1388.	1273.	1151.	1013.	852.	521.	294.								
-11.0	1794.	1793.	1783.	1762.	1734.	1671.	1604.	1527.	1442.	1347.	1235.	1116.	982.	817.	489.	276.								
-13.0	1739.	1742.	1736.	1720.	1676.	1628.	1557.	1471.	1381.	1297.	1190.	1067.	944.	775.	461.	256.								
-15.0	1667.	1677.	1664.	1650.	1616.	1566.	1484.	1396.	1316.	1234.	1139.	1015.	899.	724.	401.	212.								
-17.0	1605.	1607.	1598.	1575.	1529.	1466.	1395.	1315.	1239.	1169.	1076.	962.	845.	664.	344.									
-19.5	1453.	1462.	1445.	1424.	1387.	1333.	1273.	1207.	1146.	1074.	989.	890.	762.	575.	305.									
-22.5	1258.	1266.	1254.	1240.	1216.	1176.	1124.	1067.	1013.	955.	882.	777.	644.	419.	248.									
-25.5	1084.	1087.	1082.	1071.	1042.	1006.	974.	936.	888.	831.	753.	639.	505.	296.										
-29.0	894.	896.	894.	889.	865.	836.	799.	762.	707.	646.	570.	454.	336.											
-33.0	648.	652.	649.	643.	616.	592.	549.	514.	462.	370.	330.	264.												
-37.5	341.	349.	346.	349.	309.	287.	268.	248.	204.															
-42.5																								
-47.5																								
-55.0																								
-65.0																								
-75.0																								
-85.0																								
-90.0																								

BEAM EDGE = 1005. CP = 50% OF MAX
FIELD EDGE = 201. CP = 10% OF MAX

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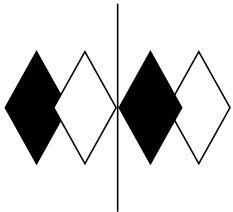
PAGE: 5 OF 7
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LUMEN TABULATION - FIELD ONLY

AVERAGE OF RIGHT AND LEFT SIDES

	0	2	4	6	8	10	12	14	16	18	21	24	27	31	35	40	45	50	60	70	80	90	TOTAL
90																							0.0
80																							0.0
70																							0.0
60																							0.0
50																							0.0
45																							0.0
40																							0.0
35	1.0	1.0	0.9	0.9	0.8	0.7	0.6																6.0
31	1.6	1.6	1.5	1.5	1.4	1.3	1.2	1.1	0.9	1.1	0.9												14.0
27	2.2	2.2	2.2	2.1	2.0	1.9	1.8	1.7	1.5	1.9	1.5	1.0											22.1
24	2.0	2.0	1.9	1.9	1.8	1.8	1.7	1.6	1.5	1.9	1.6	1.2	0.9										21.7
21	2.3	2.3	2.2	2.2	2.1	2.0	1.9	1.8	1.7	2.3	2.0	1.6	1.3	0.7									26.3
18	2.6	2.6	2.5	2.4	2.3	2.2	2.1	2.0	1.9	2.6	2.3	1.9	1.8	0.9									30.1
16	1.9	1.9	1.8	1.8	1.7	1.6	1.5	1.4	1.4	1.8	1.6	1.4	1.4	0.7									22.0
14	2.0	2.0	2.0	1.9	1.8	1.7	1.6	1.5	1.4	2.0	1.7	1.5	1.5	0.8	0.5								24.0
12	2.1	2.1	2.0	2.0	1.9	1.8	1.7	1.6	1.5	2.0	1.8	1.6	1.6	0.9	0.6								25.3
10	2.2	2.1	2.1	2.1	2.0	1.9	1.8	1.7	1.6	2.1	1.9	1.6	1.7	1.0	0.7								26.4
8	2.3	2.2	2.2	2.1	2.0	1.9	1.9	1.7	1.6	2.2	1.9	1.7	1.8	1.1	0.7								27.4
6	2.4	2.3	2.3	2.2	2.1	2.0	1.9	1.8	1.7	2.2	2.0	1.7	1.9	1.1	0.7								28.3
4	2.4	2.4	2.4	2.3	2.2	2.0	1.9	1.8	1.7	2.3	2.0	1.7	1.9	1.1	0.8								28.9
2	2.4	2.4	2.4	2.3	2.2	2.1	1.9	1.8	1.7	2.3	2.0	1.8	1.9	1.1	0.8								29.3
0	2.4	2.4	2.4	2.3	2.2	2.1	1.9	1.8	1.7	2.3	2.0	1.8	2.0	1.2	0.8								29.4
-2	2.4	2.4	2.4	2.3	2.2	2.1	1.9	1.8	1.7	2.3	2.1	1.8	2.0	1.2	0.8								29.4
-4	2.4	2.4	2.4	2.3	2.2	2.1	1.9	1.8	1.7	2.3	2.0	1.8	1.9	1.1	0.8								29.3
-6	2.4	2.4	2.4	2.3	2.2	2.0	1.9	1.8	1.7	2.3	2.0	1.8	1.9	1.1	0.8								29.0
-8	2.4	2.3	2.3	2.2	2.1	2.0	1.9	1.8	1.7	2.2	2.0	1.7	1.9	1.1	0.7								28.4
-10	2.3	2.3	2.2	2.1	2.1	2.0	1.9	1.8	1.6	2.2	1.9	1.7	1.8	1.1	0.7								27.6
-12	2.2	2.2	2.1	2.1	2.0	1.9	1.8	1.7	1.6	2.1	1.9	1.6	1.7	1.0	0.7								26.6
-14	2.1	2.1	2.1	2.0	2.0	1.9	1.7	1.6	1.5	2.0	1.8	1.6	1.7	0.9	0.6								25.7
-16	2.0	2.0	2.0	2.0	1.9	1.8	1.7	1.5	1.4	2.0	1.7	1.5	1.5	0.8	0.5								24.4
-18	2.0	1.9	1.9	1.8	1.8	1.7	1.6	1.5	1.4	1.9	1.6	1.4	1.4	0.7									22.5
-21	2.7	2.6	2.6	2.5	2.4	2.3	2.1	2.0	1.9	2.6	2.3	1.9	1.8	0.9									30.6
-24	2.3	2.3	2.3	2.2	2.1	2.0	1.9	1.8	1.7	2.3	2.0	1.6	1.3	0.8									26.5
-27	2.0	2.0	1.9	1.9	1.8	1.7	1.7	1.6	1.5	1.9	1.6	1.2	0.9										21.8
-31	2.2	2.2	2.2	2.1	2.0	1.9	1.8	1.7	1.5	2.0	1.5	1.1											22.1
-35	1.6	1.6	1.6	1.5	1.4	1.3	1.2	1.1	0.9	1.1	0.9												14.2
-40	1.1	1.1	1.1	0.9	0.9	0.8	0.7	0.6															7.1
-45																							0.0
-50																							0.0
-60																							0.0
-70																							0.0
-80																							0.0
-90																							0.0
	63.9	63.4	62.4	60.4	57.7	54.5	51.3	47.4	43.2	58.3	50.6	40.9	39.9	21.4	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	726.3

LUMEN TOTAL THIS PAGE = 726.3

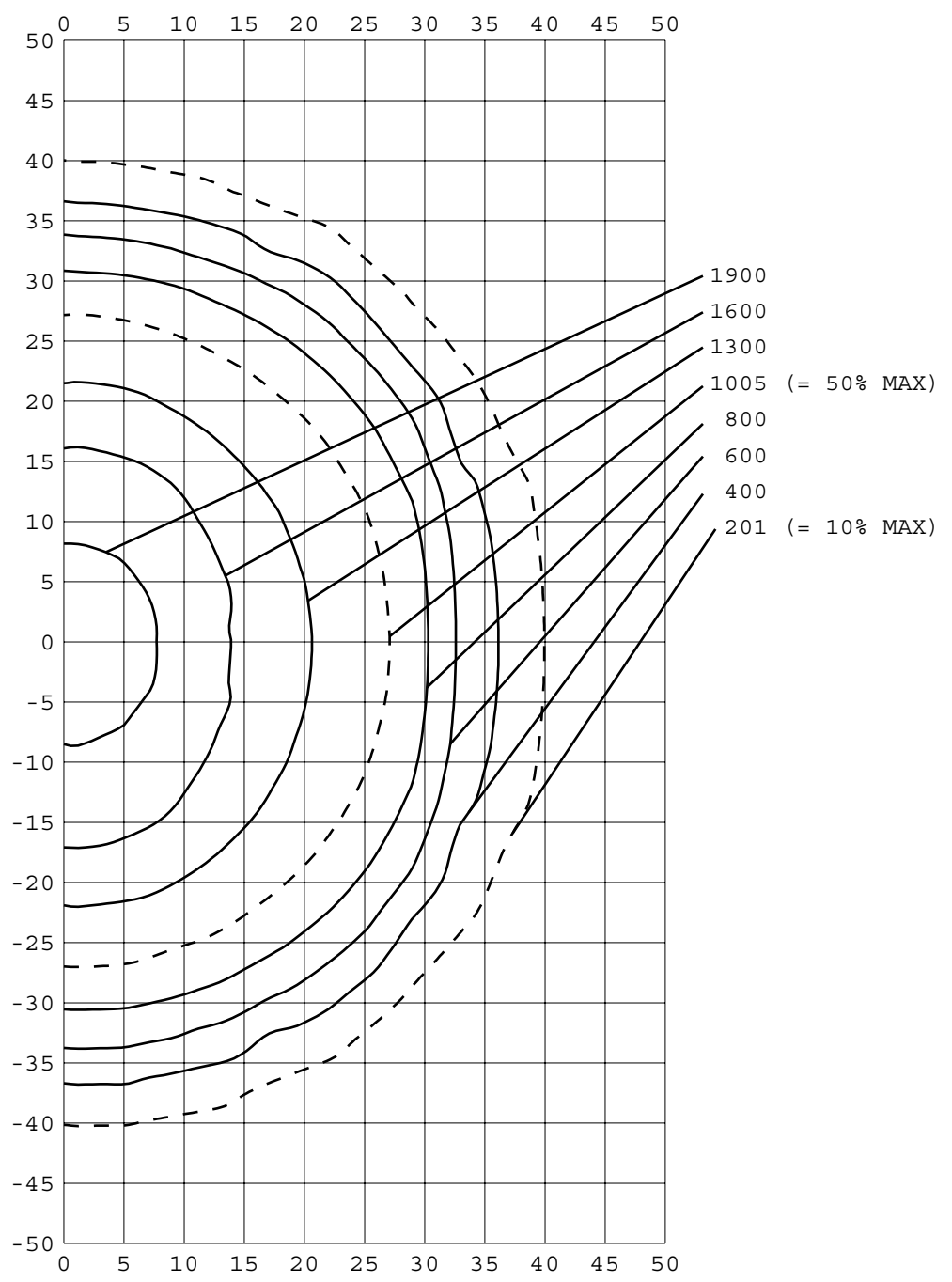


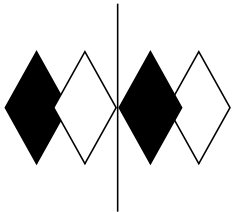
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ISOCANDELA CURVES

AVERAGE OF RIGHT AND LEFT SIDES





itl boulder
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955



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ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

THIS ITL REPORT WITH THE USE OF THE NVLAP LOGO SHALL NOT BE USED BY THE CLIENT TO CLAIM PRODUCT CERTIFICATION, APPROVAL, OR ENDORSEMENT BY NVLAP, NIST, OR ANY AGENCY OF THE FEDERAL GOVERNMENT.



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PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: HBLED13 (WIDE FLOOD)

ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

LUMINAIRE: CAST METAL HOUSING, BROWN PAINTED FLAT METAL HEAT SINK MOUNTING PLATE, CAST BROWN PAINTED FINNED METAL HEAT SINK, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH, 1 CIRCUIT BOARD EACH WITH 1 LED, CLEAR FLAT GLASS LENS IN CAST BROWN PAINTED METAL FRAME.

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

DRIVER: RAB LIGHTING RD12-36-A0350

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120.0 AND 277.0 VAC, 60Hz) TO THE DRIVER.

INSTRUMENTS:	Associated Power Technologies APT5040 AC Power Source	Calibration Due: N/A
	Yokogawa WT210 Digital Power Meter #8	12/31/14
	Ocean Optics QE65000 Spectroradiometer	10/16/14
	ITL 2.0m Diameter Integrating Sphere S20-2, 4PI Geometry	10/16/14

OBJECT OF TEST: Measure the Total Radiant Flux*, Spectral Power Distribution (SPD), Correlated Color Temperature (CCT), Color Rendering Indices (CRI_a,1-14), Chromaticity Coordinates (x,y; u'v'), ANSI C78.377 Duv, and electrical data including ANSI C82.77-2002 Power Factor (PF) and Total Harmonic Distortion (THD) to the test sample. Report Off-State Power. Measure electrical data including Total Harmonic Distortion (THD) at maximum rated voltage.

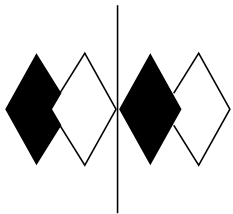
PROCEDURE: The test sample was provided by the customer and had an unknown number of operating hours. The test sample was mounted inside the integrating sphere and allowed to stabilize. After stabilization occurred, measurements were taken. In order to measure mean performance, multiple data sets were recorded and averaged. Readings were taken with the test sample operating at 120.0 VAC input. Electrical data was also recorded at maximum nominal rated input voltage (277.0 VAC). All testing performed 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. Off-State Power was reported with no voltage applied to the sample.

*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.

RESULTS: (continued subsequent pages)

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Checked	<i>N THOMAS</i>
Approved	<i>P.O'CONNOR</i> Sphere Lab Supervisor



itl boulder
 THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

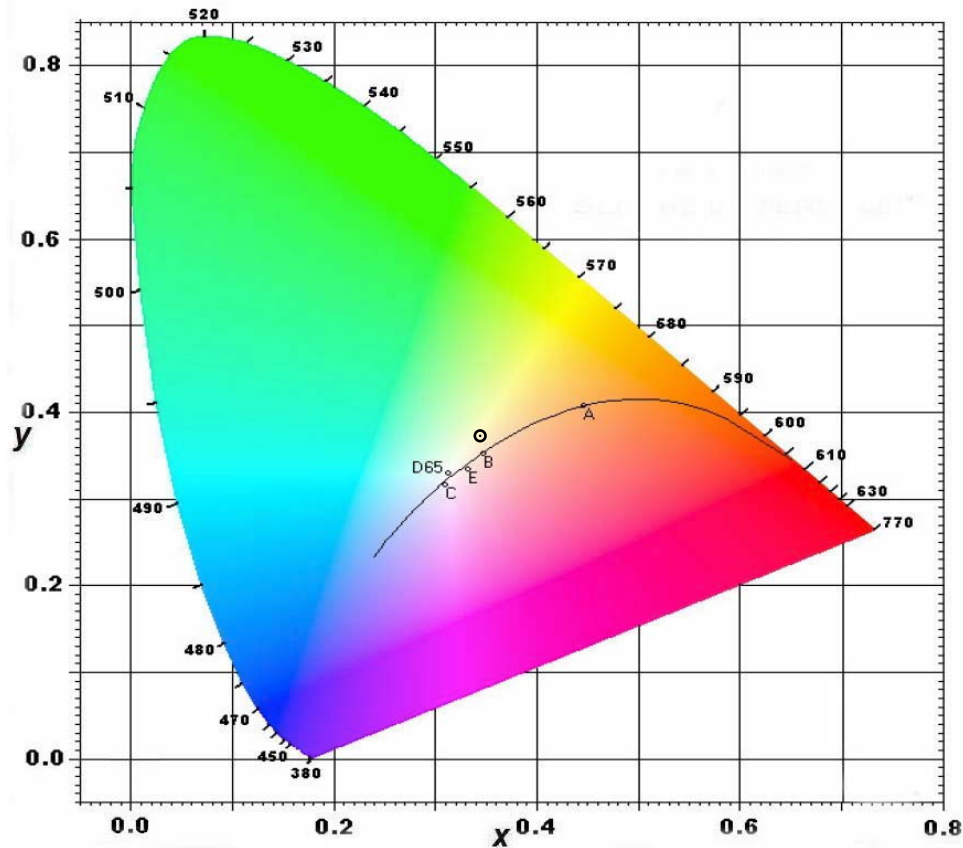
NVLAP
 NVLAP LAB CODE: 200925-0

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CIE Chromaticity Diagram





INDEPENDENT TESTING LABORATORIES, INC.
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 REPORT NUMBER: ITL81591
 DATE: 05/14/14
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 PREPARED FOR: RAB LIGHTING, INC.
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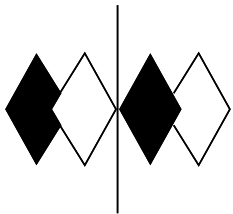
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3439
Chromaticity Ordinate y	0.3724
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2029
Chromaticity Ordinate v'	0.4943
Correlated Color Temp CCT (K)	5104
ANSI C78.377-2008 Duv	0.011
Total Radiant Flux (milliWatts)	4288 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.120
Input Power (Watts)	14.2
Input Power Factor (%)	98.6
Input Current THD (%)	10.0
Input Voltage THD (%)	0.1
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.063
Input Power (Watts)	15.1
Input Power Factor (%)	86.5
Input Current THD (%)	24.4
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	67
R1 Light greyish red	62
R2 Dark greyish yellow	71
R3 Strong yellowish green	77
R4 Moderate yellowish green	67
R5 Light bluish green	63
R6 Light blue	61
R7 Light violet	80
R8 Light reddish purple	53
R9 Strong red	-48
R10 Strong yellow	31
R11 Strong green	62
R12 Strong blue	32
R13 Light yellowish pink (skin)	63
R14 Moderate olive green (leaf)	87

*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.



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RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.127	515	16.135	650	8.640
385	0.136	520	19.115	655	7.764
390	0.158	525	21.487	660	6.954
395	0.205	530	23.283	665	6.218
400	0.296	535	24.497	670	5.529
405	0.486	540	25.286	675	4.915
410	0.905	545	25.722	680	4.360
415	1.724	550	25.898	685	3.862
420	3.223	555	25.889	690	3.411
425	5.776	560	25.740	695	3.011
430	9.707	565	25.487	700	2.660
435	14.980	570	25.028	705	2.342
440	22.255	575	24.456	710	2.065
445	31.510	580	23.782	715	1.812
450	34.864	585	23.012	720	1.598
455	26.617	590	22.092	725	1.402
460	16.783	595	21.090	730	1.228
465	11.133	600	19.963	735	1.080
470	7.475	605	18.818	740	0.950
475	5.032	610	17.618	745	0.835
480	3.827	615	16.425	750	0.738
485	3.459	620	15.191	755	0.648
490	3.723	625	13.983	760	0.571
495	4.797	630	12.791	765	0.501
500	6.798	635	11.678	770	0.443
505	9.573	640	10.611	775	0.388
510	12.835	645	9.593	780	0.343

