

**itl boulder**  
THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

PHONE: (303) 442-1255

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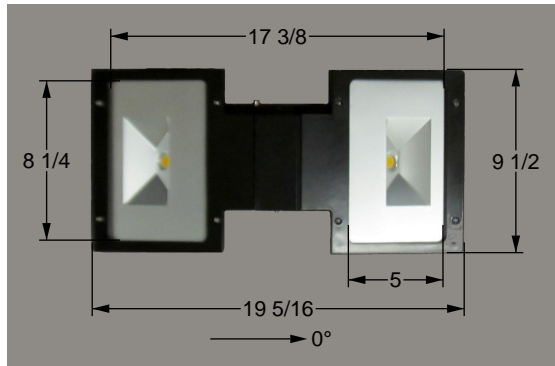
**NVLAP**  
NVLAP LAB CODE: 200925-0

INDEPENDENT TESTING LABORATORIES, INC.

4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

## ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINATION

Values based on 20 foot mounting height.



REPORT NUMBER: ITL81184

ISSUE DATE: 04/07/14

PAGE: 1 OF 7

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: CLED2X18N - PLED2X18N -  
PLED2X18N/UP (SURFACE, PENDENT,  
PENDENT INDIRECT)

LUMINAIRE: ONE LUMINAIRE CONSISTING OF  
TWO OPPOSING LIGHT HEADS, EACH LIGHT  
HEAD CONSISTING OF: CAST FINNED METAL  
HOUSING, MACHINED METAL HEAT SINK, 1  
CIRCUIT BOARD WITH 1 LED, MOLDED  
PLASTIC REFLECTOR WITH SEMI-SPECULAR  
FINISH, CLEAR FLAT GLASS LENS IN CAST  
BROWN PAINTED METAL FRAME.

TOTAL INPUT WATTS = 40.0 AT 120.0 VOLTS

LAMPS: TWO WHITE MULTI-CHIP LIGHT

EMITTING DIODES (LED'S), TILTED 35-  
DEGREES FROM VERTICAL BASE-UP  
POSITION.

LED DRIVERS: TWO RAB RD12-36-A0500

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

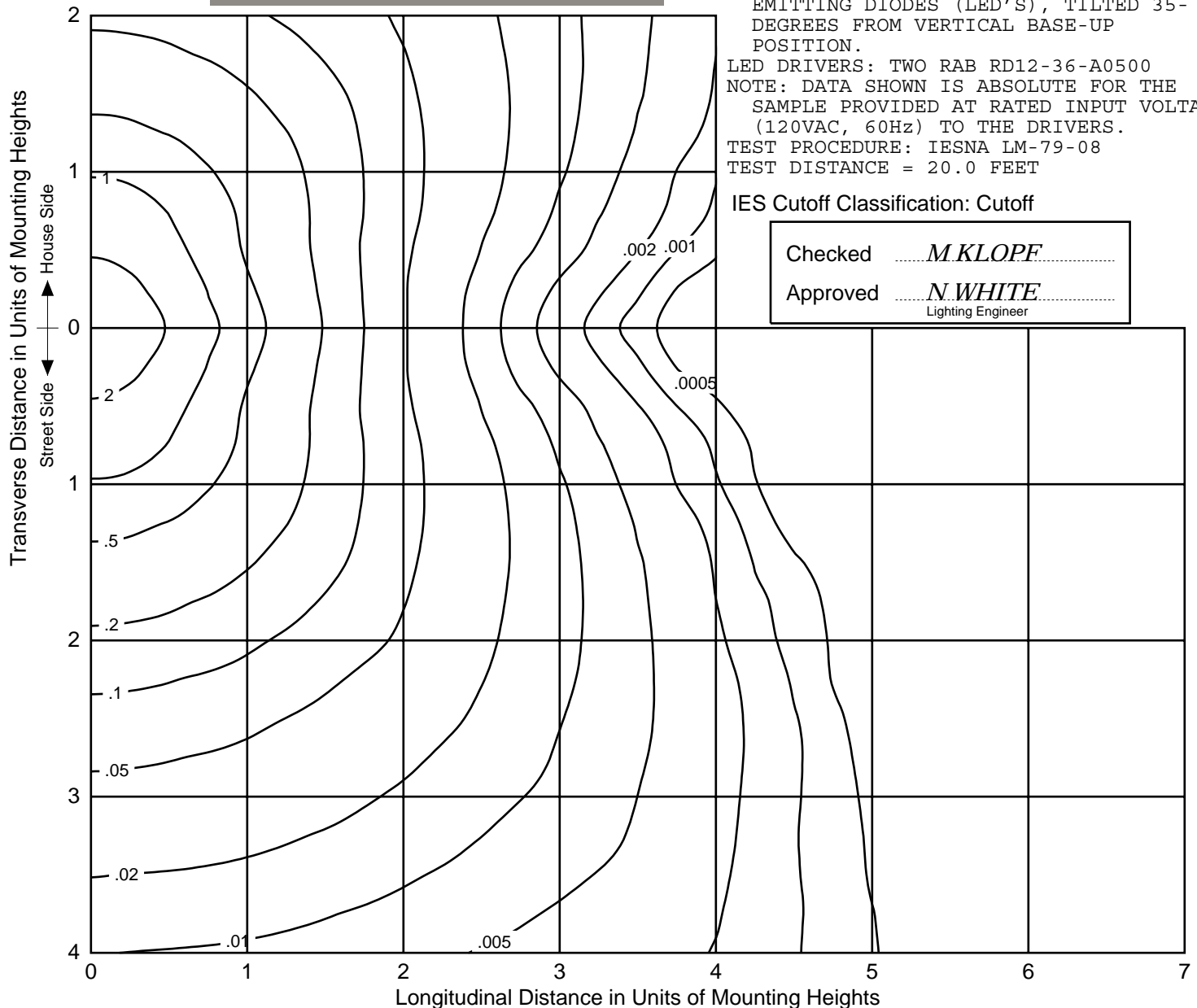
TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE = 20.0 FEET

IES Cutoff Classification: Cutoff

Checked M. KLOPF

Approved N. WHITE  
Lighting Engineer





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TOTAL INPUT WATTS = 40.0 AT 120.0 VOLTS

LAMPS: TWO WHITE MULTI-CHIP LIGHT  
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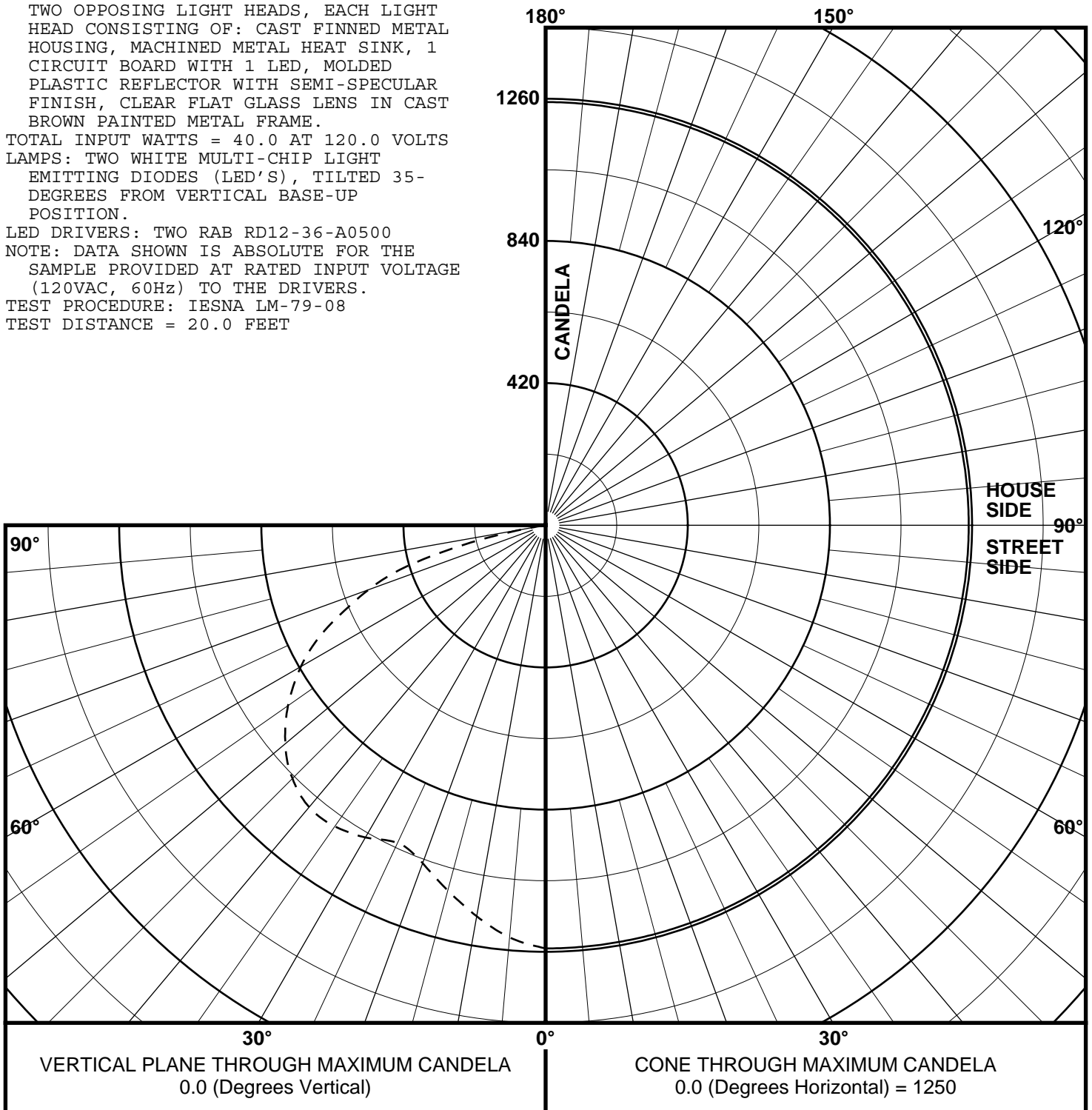
LED DRIVERS: TWO RAB RD12-36-A0500

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

TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE = 20.0 FEET

## MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA





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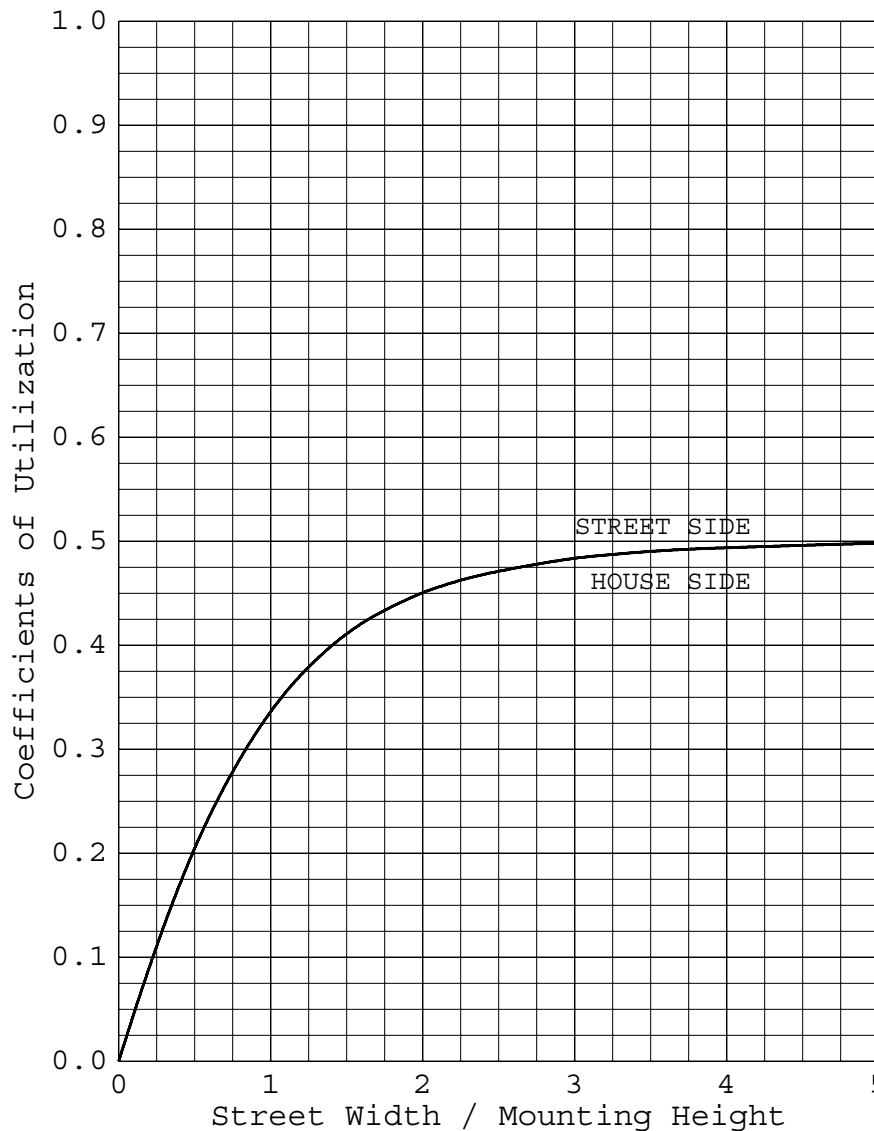
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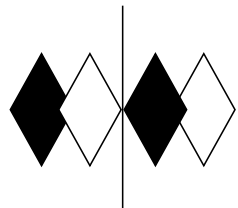
# COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	1780	50.0
DOWNWARD HOUSE SIDE	1780	50.0
DOWNWARD TOTAL	3561	100.0
UPWARD STREET SIDE	0	0.0
UPWARD HOUSE SIDE	0	0.0
UPWARD TOTAL	0	0.0
TOTAL FLUX	3561	100.0

EFFICACY = 89.0 lm/W

ALL CANDELA AND LUMENS IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY.  
THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE  
LUMEN OUTPUT OF THIS LUMINAIRE SAMPLE.



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### FLUX DISTRIBUTION BY SOLID ANGLE

(PER IESNA TM-15-11, LUMINAIRE CLASSIFICATION  
SYSTEM FOR OUTDOOR LUMINAIRES)

	LUMENS	PERCENT OF FIXTURE	BUG ZONE RATINGS
FORWARD LIGHT	1780.	50.0	
FL ( 0- 30)	456.8	12.8	
FM ( 30- 60)	937.8	26.3	
FH ( 60- 80)	379.2	10.6	G0
FVH( 80- 90)	6.6	0.2	G0
BACK LIGHT	1780.	50.0	
BL ( 0- 30)	456.8	12.8	B1
BM ( 30- 60)	937.8	26.3	B1
BH ( 60- 80)	379.2	10.6	B1 G1
BVH( 80- 90)	6.6	0.2	G0
UPLIGHT	0.	0.0	
UL ( 90-100)	0.0	0.0	U1
UH (100-180)	0.0	0.0	U0
TRAPPED LIGHT	0.	0.0	
TOTAL FLUX	3561.	100.0	

BACKLIGHT, UPLIGHT, AND GLARE (BUG) RATINGS  
(PER ADDENDUM A FOR IESNA TM-15-11)

BUG RATING: B1 U1 G1



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# CANDELA TABULATION

		LATERAL ANGLE										
		0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0	90.0
	180.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	175.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	165.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	155.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	145.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	135.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	125.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	115.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	105.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	95.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	92.5	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	90.0	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	87.5	2.	2.	2.	2.	2.	1.	1.	1.	0.	0.	0.
	85.0	6.	6.	6.	5.	5.	4.	2.	1.	1.	1.	0.
V	82.5	16.	15.	15.	16.	21.	36.	7.	3.	2.	1.	1.
E	80.0	64.	59.	73.	89.	121.	146.	58.	9.	3.	2.	2.
R	77.5	197.	188.	204.	225.	250.	260.	171.	66.	14.	4.	4.
T	75.0	345.	334.	350.	367.	366.	328.	251.	156.	61.	13.	7.
I	72.5	473.	471.	472.	463.	435.	416.	304.	216.	124.	42.	24.
C	70.0	557.	553.	544.	531.	516.	508.	369.	260.	168.	79.	64.
A	67.5	631.	626.	620.	612.	595.	567.	436.	312.	210.	129.	122.
L	65.0	709.	704.	697.	685.	657.	612.	489.	367.	255.	190.	190.
	62.5	778.	774.	764.	742.	707.	651.	530.	410.	300.	258.	262.
A	60.0	835.	831.	818.	793.	753.	688.	567.	444.	340.	327.	335.
N	57.5	884.	880.	866.	840.	793.	721.	601.	476.	384.	396.	406.
G	55.0	929.	925.	911.	884.	830.	752.	633.	507.	436.	463.	474.
L	52.5	969.	965.	951.	924.	862.	778.	660.	538.	490.	527.	543.
E	50.0	1004.	1000.	987.	959.	890.	800.	686.	570.	550.	594.	608.
	47.5	1035.	1030.	1018.	987.	912.	818.	709.	606.	608.	655.	668.
	45.0	1058.	1054.	1043.	1007.	929.	833.	731.	651.	667.	714.	725.
	42.5	1076.	1071.	1059.	1020.	941.	846.	751.	700.	726.	769.	782.
	40.0	1087.	1082.	1068.	1025.	948.	859.	772.	751.	782.	826.	836.
	37.5	1090.	1085.	1069.	1024.	951.	871.	804.	801.	834.	878.	886.
	35.0	1086.	1081.	1063.	1020.	954.	882.	845.	851.	885.	927.	932.
	32.5	1077.	1072.	1054.	1015.	953.	901.	889.	900.	934.	972.	978.
	30.0	1065.	1060.	1044.	1005.	955.	931.	933.	947.	979.	1015.	1020.
	25.0	1035.	1031.	1024.	1009.	995.	1001.	1016.	1031.	1061.	1088.	1092.
	20.0	1062.	1059.	1061.	1059.	1056.	1068.	1088.	1102.	1127.	1147.	1148.
	15.0	1117.	1115.	1117.	1117.	1116.	1129.	1149.	1161.	1180.	1192.	1193.
	10.0	1173.	1171.	1173.	1171.	1170.	1181.	1200.	1205.	1217.	1224.	1224.
	5.0	1222.	1220.	1219.	1216.	1213.	1219.	1234.	1233.	1240.	1245.	1243.
	0.0<<	1250.	1250.	1250.	1250.	1250.	1250.	1250.	1250.	1250.	1250.	1250.

||  
PLANE OF MAXIMUM CANDELA

CONE OF MAXIMUM CANDELA



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5-DEGREE  
ZONAL LUMEN SUMMARY

0- 5	30
5- 10	86
10- 15	138
15- 20	183
20- 25	221
25- 30	255
30- 35	284
35- 40	308
40- 45	324
45- 50	330
50- 55	323
55- 60	306
60- 65	277
65- 70	230
70- 75	169
75- 80	82
80- 85	12
85- 90	1
90- 95	0
95-100	0
100-105	0
105-110	0
110-115	0
115-120	0
120-125	0
125-130	0
130-135	0
135-140	0
140-145	0
145-150	0
150-155	0
155-160	0
160-165	0
165-170	0
170-175	0
175-180	0

10-DEGREE  
ZONAL LUMEN SUMMARY

0- 10	116
0- 20	438
0- 30	914
0- 40	1506
0- 50	2160
0- 60	2789
0- 70	3296
0- 80	3548
0- 90	3561
0-100	3561
0-110	3561
0-120	3561
0-130	3561
0-140	3561
0-150	3561
0-160	3561
0-170	3561
0-180	3561



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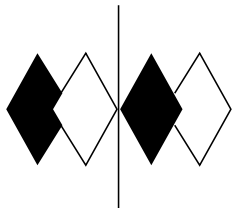
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ADDRESS: 170 LUDLOW AVE  
NORTHVALE, NJ 07647

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DATE: 04/15/14  
PREPARED FOR: RAB LIGHTING, INC.  
CATALOG NUMBER: CLED2X18N - PLED2X18N - PLED2X18N/UP (SURFACE, PENDENT, PENDENT INDIRECT)

ADDRESS: 170 LUDLOW AVE  
NORTHVALE, NJ 07647

LUMINAIRE: ONE LUMINAIRE CONSISTING OF TWO OPPOSING LIGHT HEADS, EACH LIGHT HEAD CONSISTING OF: CAST FINNED METAL HOUSING, MACHINED METAL HEAT SINK, 1 CIRCUIT BOARD WITH 1 LED, MOLDED PLASTIC REFLECTOR WITH SEMI-SPECULAR FINISH, CLEAR FLAT GLASS LENS IN CAST BROWN PAINTED METAL FRAME.

LAMP: TWO WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), TILTED 35-DEGREES FROM VERTICAL BASE-UP POSITION.

DRIVERS: TWO RAB RD12-36-A0500

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

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<sub>a</sub>,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





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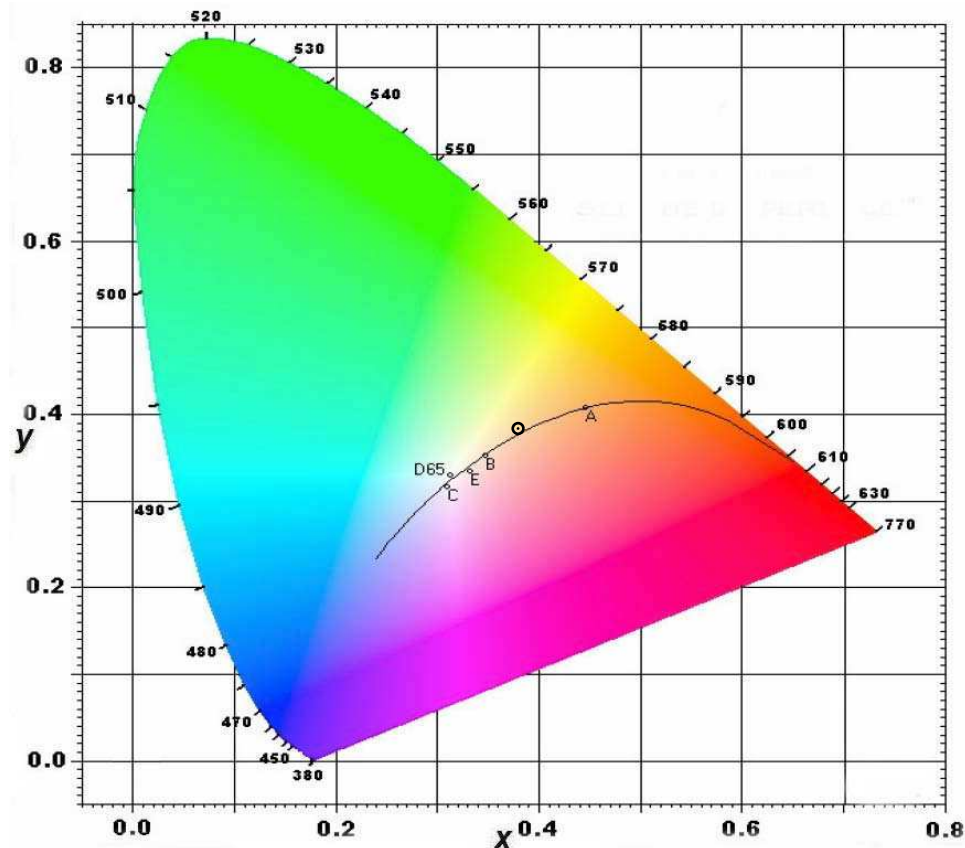
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## CIE Chromaticity Diagram





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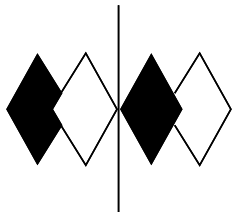
# RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3793
Chromaticity Ordinate y	0.3832
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2218
Chromaticity Ordinate v'	0.5042
Correlated Color Temp CCT (K)	4078
ANSI C78.377-2008 Duv	0.003
Total Radiant Flux (milliWatts)	10619 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.336
Input Power (Watts)	40.0
Input Power Factor (%)	99.2
Input Current THD (%)	10.2
Input Voltage THD (%)	0.1
Off-State Power (Watts)	
	0.0
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.162
Input Power (Watts)	41.0
Input Power Factor (%)	91.4
Input Current THD (%)	21.1
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	82
R1 Light greyish red	80
R2 Dark greyish yellow	87
R3 Strong yellowish green	93
R4 Moderate yellowish green	82
R5 Light bluish green	80
R6 Light blue	82
R7 Light violet	87
R8 Light reddish purple	64
R9 Strong red	4
R10 Strong yellow	69
R11 Strong green	81
R12 Strong blue	57
R13 Light yellowish pink (skin)	81
R14 Moderate olive green (leaf)	96

## \*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	0.240	515	40.776	650	30.195
385	0.236	520	43.798	655	26.817
390	0.248	525	45.901	660	23.678
395	0.274	530	47.392	665	20.767
400	0.347	535	48.316	670	18.154
405	0.490	540	48.944	675	15.790
410	0.778	545	49.568	680	13.709
415	1.371	550	50.282	685	11.863
420	2.606	555	51.130	690	10.242
425	5.067	560	52.239	695	8.821
430	9.623	565	53.689	700	7.583
435	17.153	570	55.267	705	6.515
440	29.546	575	56.856	710	5.601
445	49.572	580	58.316	715	4.797
450	65.966	585	59.560	720	4.116
455	59.090	590	60.353	725	3.522
460	41.130	595	60.553	730	3.012
465	29.847	600	60.157	735	2.576
470	22.634	605	59.069	740	2.211
475	17.393	610	57.209	745	1.906
480	15.358	615	54.729	750	1.640
485	15.972	620	51.872	755	1.415
490	18.286	625	48.567	760	1.216
495	22.135	630	44.941	765	1.047
500	27.085	635	41.276	770	0.901
505	32.230	640	37.458	775	0.783
510	36.960	645	33.736	780	0.679

