

itl boulder

THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

PHONE: (303) 442-1255

FAX: (970) 535-3114

E-MAIL: itl@itlboulder.com

WEBSITE: www.itlboulder.com

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 12 foot mounting height.



REPORT NUMBER: ITL79970

ISSUE DATE: 11/20/13

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PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: CLED52N OR PLED52N (W/
CLEAR FLAT GLASS LENS - CEILING OR
PENDENT MOUNT)

LUMINAIRE: CAST 2-PIECE BROWN PAINTED
FINNED METAL HOUSING, 4 CAST METAL
HEAT SINKS/CIRCUIT BOARD MOUNTING
BRACKETS, 4 CIRCUIT BOARDS EACH WITH 1
LED AND MOLDED PLASTIC CIRCUIT BOARD
PERIMETER OVERLAY WITH SPECULAR
FINISH, MOLDED PLASTIC REFLECTOR WITH
SPECULAR FINISH AND 1 APERTURE PER
LED, CLEAR FLAT GLASS LENS IN CAST
BROWN PAINTED METAL FRAME.

LAMPS: FOUR WHITE MULTI-CHIP LIGHT
EMITTING DIODES (LEDs), AIMED AT THE
HORIZON.

TOTAL INPUT WATTS = 59.4 AT 120.0 VOLTS

LED DRIVERS: TWO RAB RD26S

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

TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE = 20.0 FEET

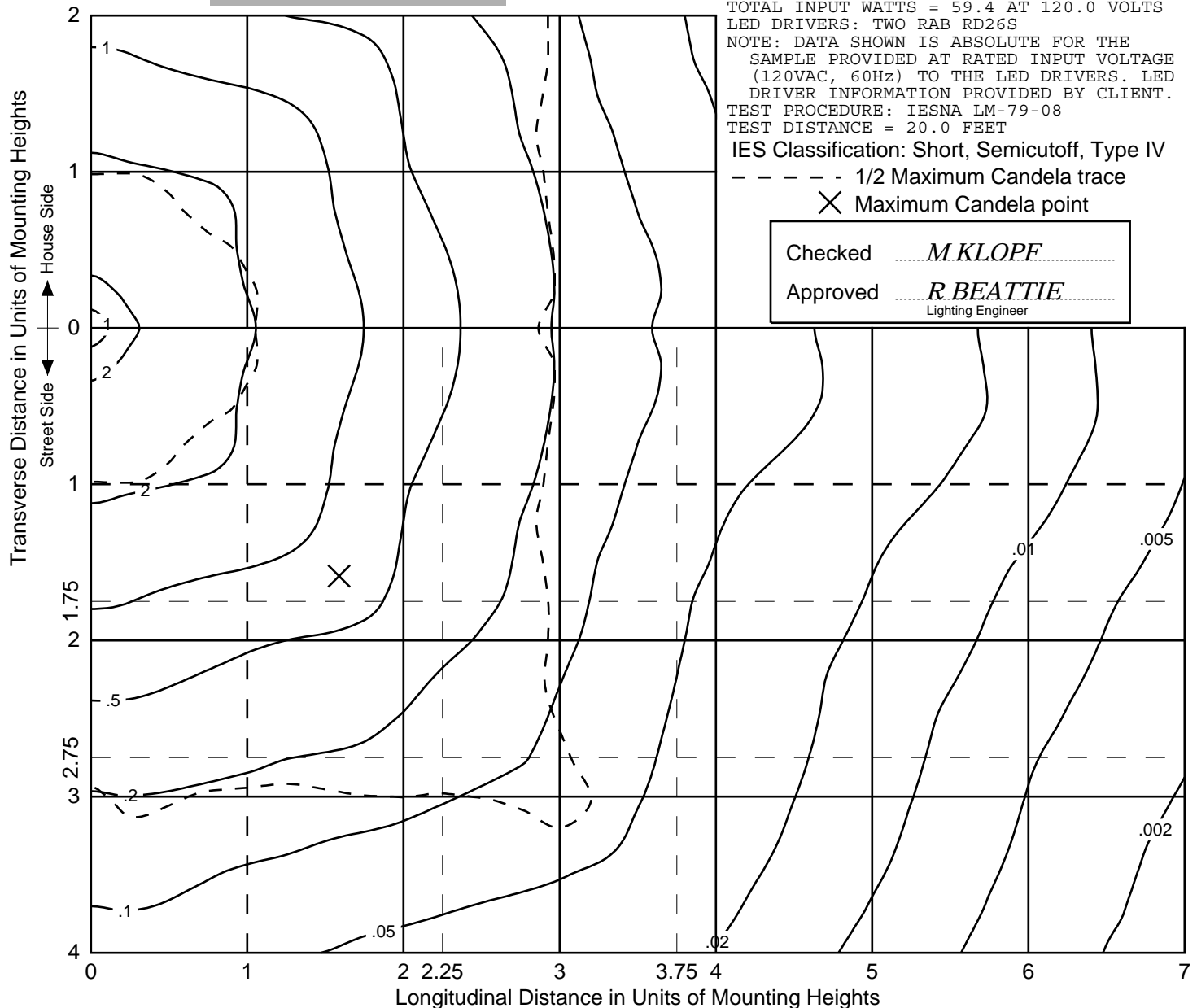
IES Classification: Short, Semicutoff, Type IV

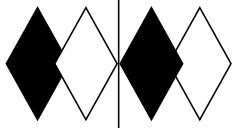
--- 1/2 Maximum Candela trace

X Maximum Candela point

Checked *M. KLOPF*

Approved *R. BEATTIE*
Lighting Engineer





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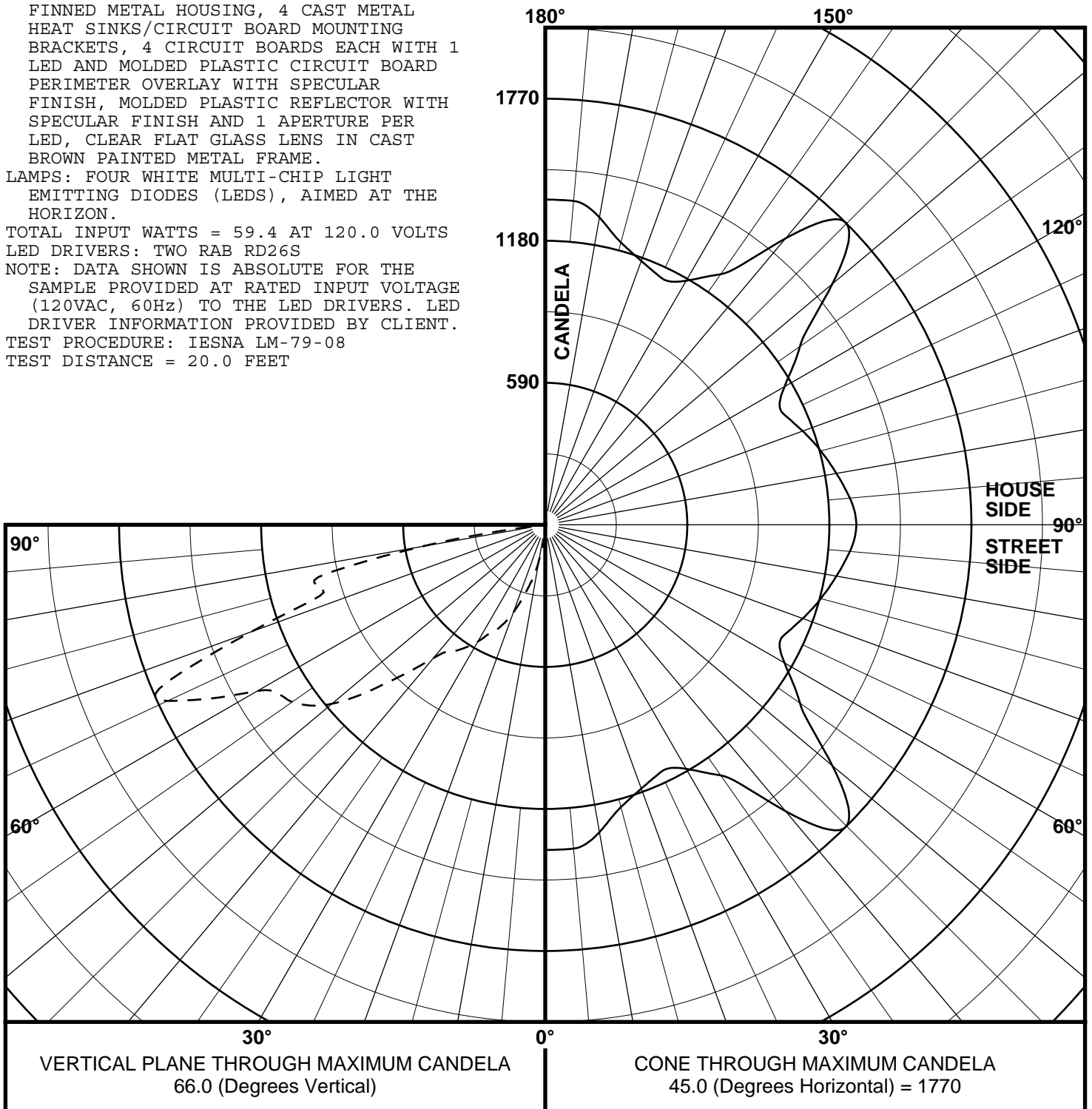
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TEST PROCEDURE: IESNA LM-79-08

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MAXIMUM PLANE AND MAXIMUM CONE PLOTS OF CANDELA





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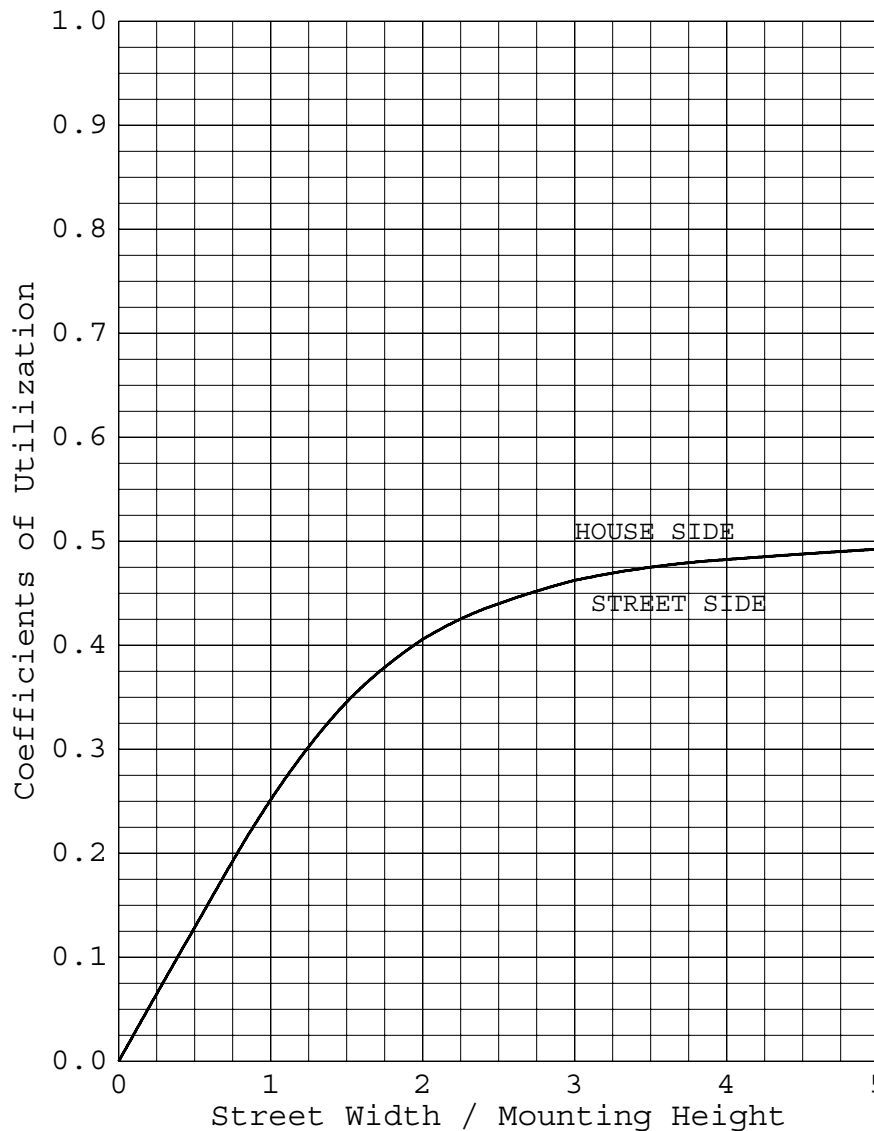
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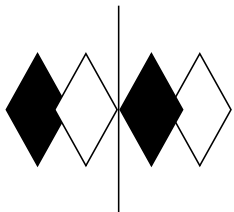
COEFFICIENTS OF UTILIZATION AND FLUX DISTRIBUTION



	LUMENS	PERCENT OF FIXTURE
DOWNWARD STREET SIDE	2286	50.0
DOWNWARD HOUSE SIDE	2286	50.0
DOWNWARD TOTAL	4573	100.0
UPWARD STREET SIDE	0	0.0
UPWARD HOUSE SIDE	0	0.0
UPWARD TOTAL	0	0.0
TOTAL FLUX	4573	100.0

EFFICACY = 77.0 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	2286.	50.0	
FL (0- 30)	158.3	3.5	
FM (30- 60)	1047.3	22.9	
FH (60- 80)	1025.4	22.4	G1
FVH(80- 90)	55.4	1.2	G1
BACK LIGHT	2286.	50.0	
BL (0- 30)	158.3	3.5	B1
BM (30- 60)	1047.3	22.9	B2
BH (60- 80)	1025.4	22.4	B3 G1
BVH(80- 90)	55.4	1.2	G1
UPLIGHT	0.	0.0	
UL (90-100)	0.0	0.0	U0
UH (100-180)	0.0	0.0	U0
TRAPPED LIGHT	0.	0.0	
TOTAL FLUX	4573.	100.0	

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

BUG RATING: B3 U0 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



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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	1
5- 10	8
10- 15	28
15- 20	56
20- 25	90
25- 30	133
30- 35	175
35- 40	224
40- 45	293
45- 50	385
50- 55	473
55- 60	544
60- 65	610
65- 70	609
70- 75	482
75- 80	350
80- 85	107
85- 90	4

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	9
0- 20	94
0- 30	317
0- 40	716
0- 50	1394
0- 60	2411
0- 70	3630
0- 80	4462
0- 90	4573



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ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

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DATE: 11/27/13
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: CLED52N OR PLED52N (W/ CLEAR FLAT GLASS LENS - CEILING OR PENDENT MOUNT)

ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

LUMINAIRE: CAST 2-PIECE BROWN PAINTED FINNED METAL HOUSING, 4 CAST METAL HEAT SINKS/CIRCUIT BOARD MOUNTING BRACKETS, 4 CIRCUIT BOARDS EACH WITH 1 LED AND MOLDED PLASTIC CIRCUIT BOARD PERIMETER OVERLAY WITH SPECULAR FINISH, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH AND 1 APERTURE PER LED, CLEAR FLAT GLASS LENS IN CAST BROWN PAINTED METAL FRAME.

LAMP: FOUR WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), AIMED AT THE HORIZON.

DRIVERS: TWO RAB RD26S

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

INSTRUMENTS:	Associated Power Technologies APT5040 AC Power Source	Calibration Due: N/A
	Yokogawa WT210 Digital Power Meter #9	02/28/14
	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	<u>P O'CONNOR</u>
Approved	<u>L GRABA</u> Lighting Engineer



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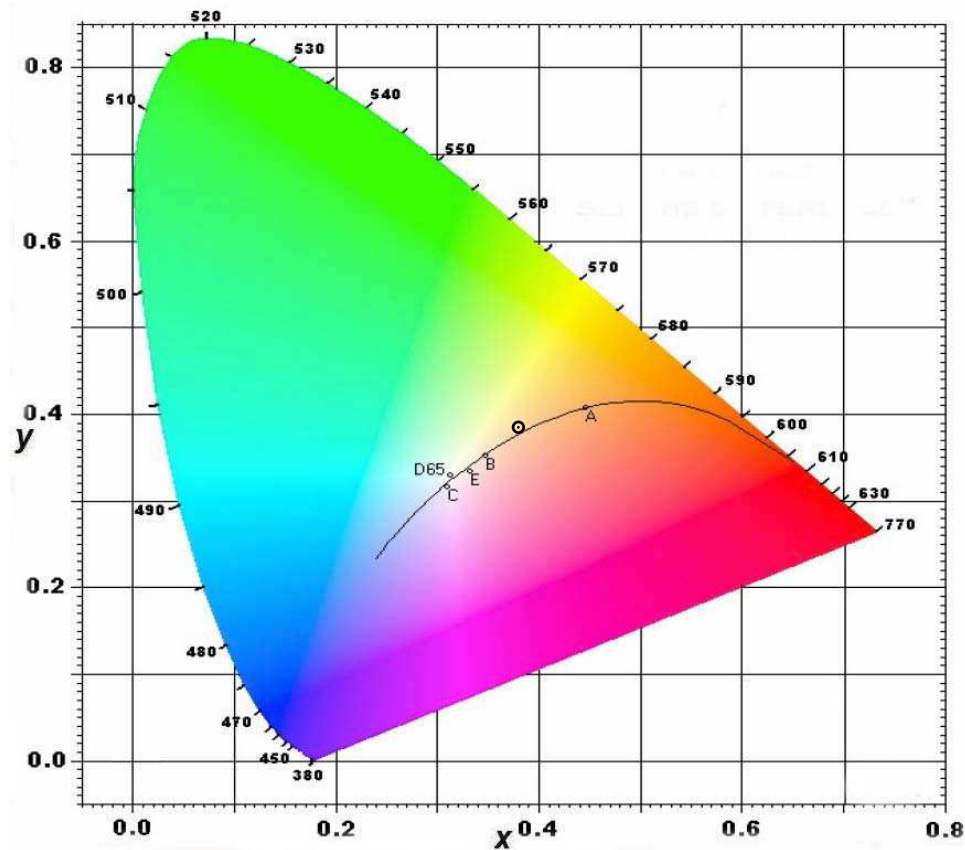
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CIE Chromaticity Diagram





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RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3796
Chromaticity Ordinate y	0.3846
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2215
Chromaticity Ordinate v'	0.5049
Correlated Color Temp CCT (K)	4077
ANSI C78.377-2008 Duv	0.004
Total Radiant Flux (milliWatts)	13641 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.498
Input Power (Watts)	59.5
Input Power Factor (%)	99.6
Input Current THD (%)	7.5
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)	0.236
Input Power (Watts)	59.3
Input Power Factor (%)	90.7
Input Current THD (%)	10.3
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	82
R1 Light greyish red	80
R2 Dark greyish yellow	85
R3 Strong yellowish green	90
R4 Moderate yellowish green	84
R5 Light bluish green	81
R6 Light blue	81
R7 Light violet	87
R8 Light reddish purple	66
R9 Strong red	5
R10 Strong yellow	66
R11 Strong green	84
R12 Strong blue	61
R13 Light yellowish pink (skin)	81
R14 Moderate olive green (leaf)	94

*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	0.321	515	55.349	650	38.974
385	0.339	520	59.013	655	34.567
390	0.374	525	61.302	660	30.498
395	0.463	530	62.720	665	26.741
400	0.628	535	63.288	670	23.309
405	0.961	540	63.628	675	20.232
410	1.658	545	63.886	680	17.508
415	3.107	550	64.291	685	15.113
420	6.106	555	64.938	690	13.001
425	11.992	560	66.026	695	11.146
430	21.872	565	67.730	700	9.551
435	37.078	570	69.635	705	8.163
440	60.447	575	71.649	710	6.966
445	81.768	580	73.725	715	5.940
450	75.745	585	75.495	720	5.067
455	52.158	590	76.753	725	4.309
460	35.867	595	77.332	730	3.677
465	25.947	600	76.990	735	3.127
470	18.881	605	75.686	740	2.665
475	15.715	610	73.521	745	2.278
480	15.775	615	70.618	750	1.958
485	18.169	620	66.867	755	1.672
490	22.869	625	62.713	760	1.435
495	29.423	630	58.017	765	1.224
500	36.856	635	53.241	770	1.056
505	44.059	640	48.415	775	0.905
510	50.373	645	43.624	780	0.780

