

REPORT NUMBER: ITL79693

PAGE: 1 OF 7

ISSUE DATE: 11/07/13

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: BAYLED78N (FLAT GLASS LENS - CEILING AND/OR PENDENT MOUNT - STANDARD DISTRIBUTION)

LUMINAIRE: CAST 2-PIECE WHITE PAINTED FINNED METAL HOUSING, 3 FLAT METAL HEAT SINKS WITH 3 EXTRUDED METAL HEAT SINKS, 3 CIRCUIT BOARDS EACH WITH 1 LED AND MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH AND 1 APERTURE PER LED, CLEAR FLAT GLASS LENS IN CAST WHITE PAINTED METAL LENS FRAME.

LAMPS: THREE WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), TILTED 30-DEGREES FROM VERTICAL BASE-UP POSITION.

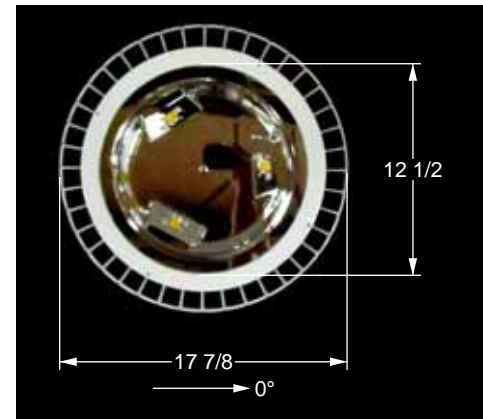
TOTAL INPUT WATTS = 88.8 AT 120.0 VOLTS

LED DRIVERS: THREE RAB RDF25U7-02

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

TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE = 20.0 FEET



CANDELA DISTRIBUTION

FLUX

	0.0	45.0	90.0	135.0	180.0	
0	2905	2905	2905	2905	2905	
5	2880	2885	2883	2886	2928	277
15	2801	2894	2789	2786	2934	809
25	2697	2568	2676	2729	2758	1242
35	2291	2475	2445	2282	2331	1482
45	1786	1877	1754	1808	1745	1412
55	1405	1228	1325	1332	1154	1169
65	881	817	841	833	825	838
75	417	441	397	385	463	442
85	4	4	4	3	5	34
90	0	0	0	0	0	
95	0	0	0	0	0	0
105	0	0	0	0	0	0
115	0	0	0	0	0	0
125	0	0	0	0	0	0
135	0	0	0	0	0	0
145	0	0	0	0	0	0
155	0	0	0	0	0	0
165	0	0	0	0	0	0
175	0	0	0	0	0	0
180	0	0	0	0	0	0

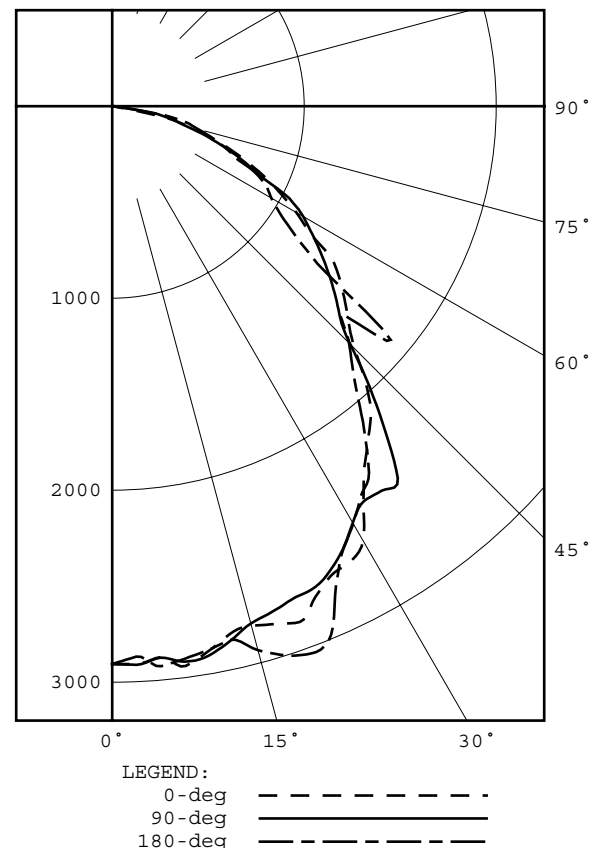
ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	2327	30.2
0- 40	3809	49.4
0- 60	6390	82.9
0- 90	7704	100.0
90-120	0	0.0
90-130	0	0.0
90-150	0	0.0
90-180	0	0.0
0-180	7704	100.0

EFFICACY = 86.8 lm/W

CIE TYPE - DIRECT

PLANE : 0-DEG 90-DEG 180-DEG
SPACING CRITERIA : 1.28 1.29 1.27
BEAM ANGLE (50%) : 103.7 X 99.8 DEGREES
FIELD ANGLE (10%) : 157.2 X 156.1 DEGREES



Checked M KLOPF
Approved R BEATTIE
Lighting Engineer



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

REPORT NUMBER: ITL79693
ISSUE DATE: 11/07/13
PREPARED FOR: RAB LIGHTING, INC.

PAGE: 2 OF 7

LUMINOUS DIAMETER: 12.500

LUMINANCE DATA IN CANDELA/SQ M			
ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 90-DEG	AVERAGE 180-DEG
45	31902.	31330.	31170.
55	30939.	29177.	25412.
65	26330.	25134.	24656.
75	20350.	19374.	22595.
85	580.	580.	725.



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: ITL79693

PAGE: 3 OF 7

ISSUE DATE: 11/07/13

PREPARED FOR: RAB LIGHTING, INC.

CANDELA DISTRIBUTION LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0
0.0	2905	2905	2905	2905	2905	2905	2905	2905	2905
5.0	2880	2875	2885	2878	2883	2888	2886	2910	2928
10.0	2883	2913	2910	2850	2905	2899	2919	2920	2876
15.0	2801	2792	2894	2888	2789	2807	2786	2918	2934
20.0	2859	2765	2833	2936	2734	2802	2854	2799	3033
25.0	2697	2743	2568	2661	2676	2724	2729	2691	2758
30.0	2614	2488	2500	2617	2506	2551	2504	2527	2510
35.0	2291	2335	2475	2383	2445	2298	2282	2519	2331
40.0	2096	2156	2143	2073	2215	2089	2116	2306	1995
45.0	1786	1791	1877	1831	1754	1787	1808	1821	1745
50.0	1583	1520	1542	1717	1512	1548	1549	1495	1893
55.0	1405	1361	1228	1202	1325	1326	1332	1284	1154
60.0	1106	1169	1068	1028	1148	1069	1123	1094	958
65.0	881	858	817	843	841	841	833	814	825
70.0	650	628	596	651	621	613	601	581	623
75.0	417	405	441	504	397	405	385	390	463
80.0	29	214	277	320	243	62	115	235	283
85.0	4	4	4	6	4	3	3	3	5
90.0	0	0	0	0	0	0	0	0	0
95.0	0	0	0	0	0	0	0	0	0
100.0	0	0	0	0	0	0	0	0	0
105.0	0	0	0	0	0	0	0	0	0
110.0	0	0	0	0	0	0	0	0	0
115.0	0	0	0	0	0	0	0	0	0
120.0	0	0	0	0	0	0	0	0	0
125.0	0	0	0	0	0	0	0	0	0
130.0	0	0	0	0	0	0	0	0	0
135.0	0	0	0	0	0	0	0	0	0
140.0	0	0	0	0	0	0	0	0	0
145.0	0	0	0	0	0	0	0	0	0
150.0	0	0	0	0	0	0	0	0	0
155.0	0	0	0	0	0	0	0	0	0
160.0	0	0	0	0	0	0	0	0	0
165.0	0	0	0	0	0	0	0	0	0
170.0	0	0	0	0	0	0	0	0	0
175.0	0	0	0	0	0	0	0	0	0
180.0	0	0	0	0	0	0	0	0	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: ITL79693
ISSUE DATE: 11/07/13
PREPARED FOR: RAB LIGHTING, INC.

PAGE: 4 OF 7

5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	69
5- 10	208
10- 15	340
15- 20	469
20- 25	580
25- 30	661
30- 35	721
35- 40	760
40- 45	730
45- 50	682
50- 55	619
55- 60	550
60- 65	472
65- 70	365
70- 75	270
75- 80	172
80- 85	33
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	277
0- 20	1086
0- 30	2327
0- 40	3809
0- 50	5221
0- 60	6390
0- 70	7228
0- 80	7670
0- 90	7704
0-100	7704
0-110	7704
0-120	7704
0-130	7704
0-140	7704
0-150	7704
0-160	7704
0-170	7704
0-180	7704



REPORT NUMBER: ITL79693

PAGE: 5 OF 7

ISSUE DATE: 11/07/13

PREPARED FOR: RAB LIGHTING, INC.

COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	110	105	101	98	107	103	99	96	99	96	93	95	93	90	91	89	88	86
2	100	92	86	81	98	91	85	80	87	82	78	84	80	76	81	77	74	72
3	92	82	74	68	89	80	73	67	77	71	66	74	69	65	72	67	64	62
4	84	73	64	58	82	71	63	57	69	62	57	67	61	56	64	59	55	53
5	78	65	56	50	75	64	56	50	62	55	49	60	54	49	58	53	48	46
6	72	59	50	44	70	58	50	44	56	49	43	54	48	43	53	47	43	41
7	67	53	45	39	65	53	44	39	51	44	38	50	43	38	48	42	38	36
8	62	49	40	35	60	48	40	35	47	40	34	46	39	34	44	38	34	32
9	58	45	37	31	57	44	37	31	43	36	31	42	36	31	41	35	31	29
10	54	41	34	28	53	41	33	28	40	33	28	39	33	28	38	32	28	26

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



REPORT NUMBER: ITL79693

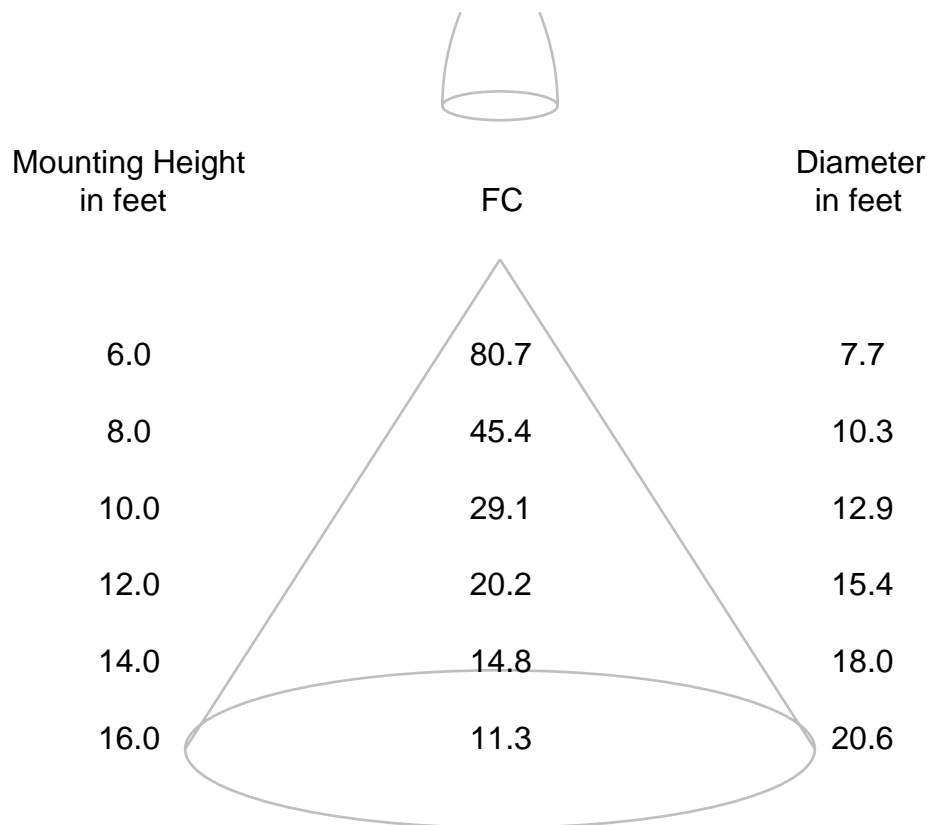
PAGE: 6 OF 7

ISSUE DATE: 11/07/13

PREPARED FOR: RAB LIGHTING, INC.

CONE OF LIGHT DIAGRAM

(diameter shown is where fc value is half the fc at nadir)



Note: The candela values used to generate this diagram were obtained by averaging the photometric data into a single plane.



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

REPORT NUMBER: ITL79693
ISSUE DATE: 11/07/13
PREPARED FOR: RAB LIGHTING, INC.

PAGE: 7 OF 7

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.



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: ITL79696
DATE: 11/14/13
Page 1 of 4

PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: BAYLED78N (FLAT GLASS LENS - CEILING AND/OR PENDENT MOUNT - STANDARD DISTRIBUTION)

ADDRESS: 170 LUDLOW AVE
NORTHVALE, NJ 07647

LUMINAIRE: CAST 2-PIECE WHITE PAINTED FINNED METAL HOUSING, 3 FLAT METAL HEAT SINKS WITH 3 EXTRUDED METAL HEAT SINKS, 3 CIRCUIT BOARDS EACH WITH 1 LED AND MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH AND 1 APERTURE PER LED, CLEAR FLAT GLASS LENS IN CAST WHITE PAINTED METAL LENS FRAME.

LAMP: THREE WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), TILTED 30-DEGREES FROM VERTICAL BASE-UP POSITION.

DRIVERS: THREE RAB RDF25U7-02

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

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)

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.

Checked	<u>P O'CONNOR</u>
Approved	<u>L GRABA</u> Lighting Engineer



itl boulder

THE LIGHT CENTER OF THE INDUSTRY SINCE 1955

NVLAP
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

Page 4 of 4

REPORT NUMBER:

ITL79696

DATE:

11/14/13

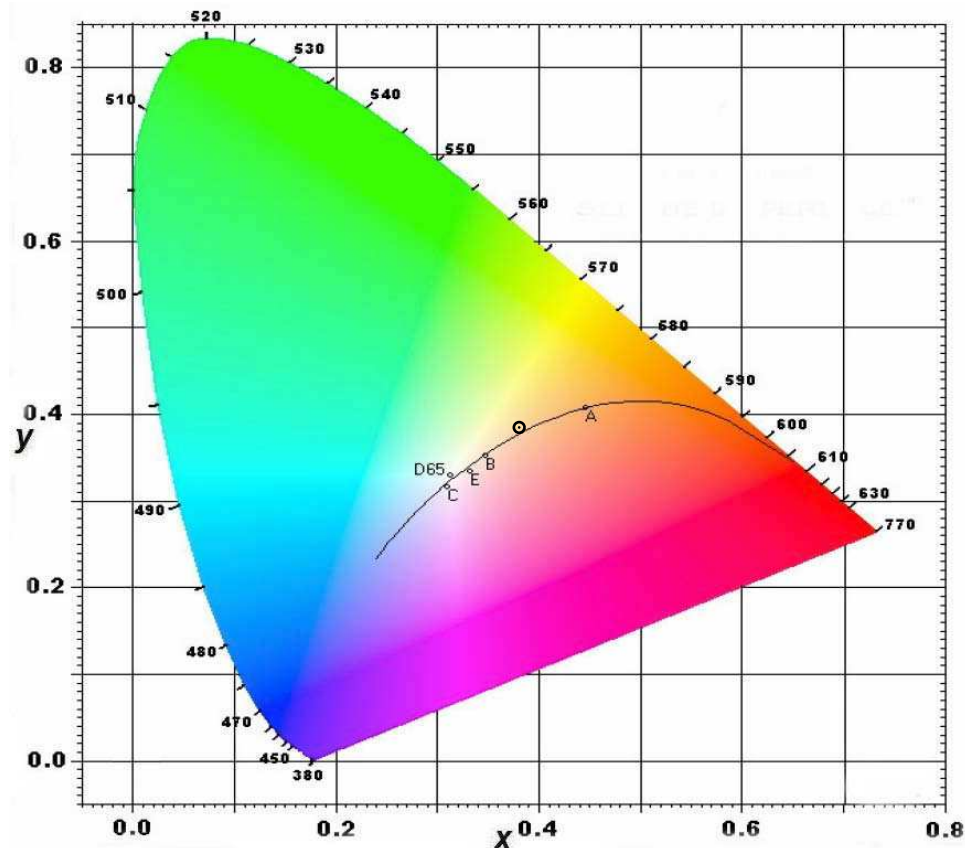
PREPARED FOR:

RAB LIGHTING, INC.

CATALOG NUMBER:

BAYLED78N (FLAT GLASS LENS - CEILING AND/OR PENDENT MOUNT - STANDARD DISTRIBUTION)

CIE Chromaticity Diagram





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

Page 2 of 4

REPORT NUMBER: ITL79696
DATE: 11/14/13
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: BAYLED78N (FLAT GLASS LENS - CEILING AND/OR PENDENT MOUNT - STANDARD DISTRIBUTION)

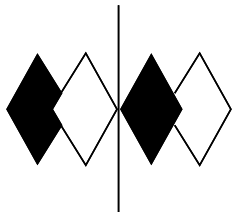
RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3804
Chromaticity Ordinate y	0.3844
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2221
Chromaticity Ordinate v'	0.5049
Correlated Color Temp CCT (K)	4056
ANSI C78.377-2008 Duv	0.004
Total Radiant Flux (milliWatts)	23033 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.749
Input Power (Watts)	88.9
Input Power Factor (%)	98.9
Input Current THD (%)	13.6
Input Voltage THD (%)	0.2
Off-State Power (Watts)	
	0.0
ELECTRICAL AT MAX NONIMAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.377
Input Power (Watts)	89.2
Input Power Factor (%)	85.4
Input Current THD (%)	21.6
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	82
R1 Light greyish red	81
R2 Dark greyish yellow	86
R3 Strong yellowish green	91
R4 Moderate yellowish green	84
R5 Light bluish green	81
R6 Light blue	82
R7 Light violet	87
R8 Light reddish purple	66
R9 Strong red	6
R10 Strong yellow	67
R11 Strong green	84
R12 Strong blue	61
R13 Light yellowish pink (skin)	81
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
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: ITL79696
DATE: 11/14/13
PREPARED FOR: RAB LIGHTING, INC.
CATALOG NUMBER: BAYLED78N (FLAT GLASS LENS - CEILING AND/OR PENDENT MOUNT - STANDARD DISTRIBUTION)

Page 3 of 4

RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.583	515	92.756	650	66.316
385	0.592	520	98.823	655	58.894
390	0.668	525	102.745	660	52.023
395	0.787	530	105.021	665	45.679
400	1.049	535	106.118	670	39.916
405	1.560	540	106.582	675	34.709
410	2.613	545	107.159	680	30.067
415	4.789	550	107.760	685	25.958
420	9.315	555	109.003	690	22.373
425	18.250	560	111.048	695	19.232
430	33.833	565	113.849	700	16.472
435	57.871	570	117.195	705	14.098
440	95.715	575	120.890	710	12.064
445	135.704	580	124.395	715	10.314
450	132.290	585	127.504	720	8.816
455	92.085	590	129.741	725	7.514
460	62.749	595	130.770	730	6.414
465	45.795	600	130.266	735	5.463
470	33.348	605	128.258	740	4.663
475	27.395	610	124.776	745	3.989
480	27.248	615	119.717	750	3.439
485	31.185	620	113.515	755	2.949
490	38.845	625	106.403	760	2.525
495	49.646	630	98.547	765	2.171
500	61.909	635	90.429	770	1.866
505	73.889	640	82.278	775	1.603
510	84.453	645	74.179	780	1.391

