

REPORT NUMBER: ITL83099

PAGE: 1 OF 6

ISSUE DATE: 10/06/14

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: SK9SY (SQUARE - SURFACE MOUNT)

LUMINAIRE: CAST FINNED METAL HOUSING WITH WHITE PAINTED INTERIOR FINISH, 1 WHITE CIRCUIT BOARD WITH 42 LEDS, FROSTED HOLOGRAPHIC PLASTIC DROP LENS. LENS FROSTED BOTH SIDES.

LAMPS: FORTY-TWO WHITE LIGHT EMITTING DIODES (LEDS), VERTICAL BASE-UP POSITION.

INPUT ELECTRICAL: 120.0 VOLTS, 9.35 WATTS, 0.0787 AMPS

MOUNTING: SURFACE

LED DRIVER: INTEGRAL

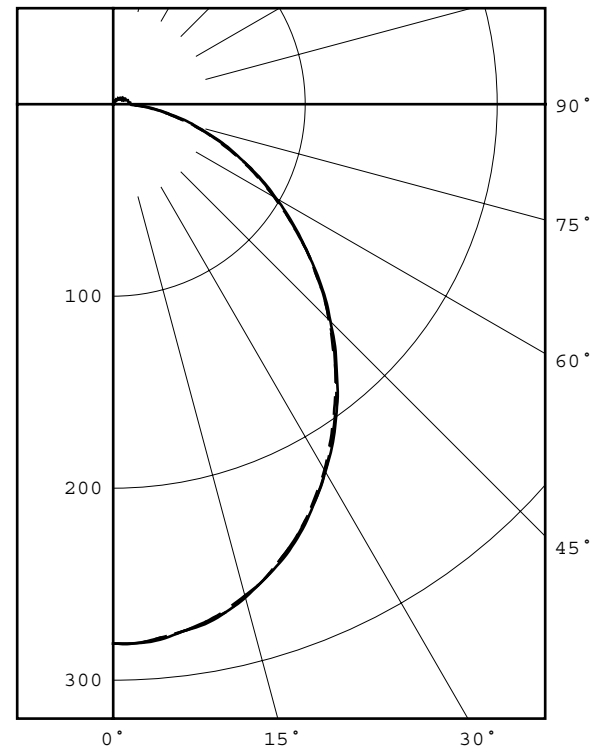
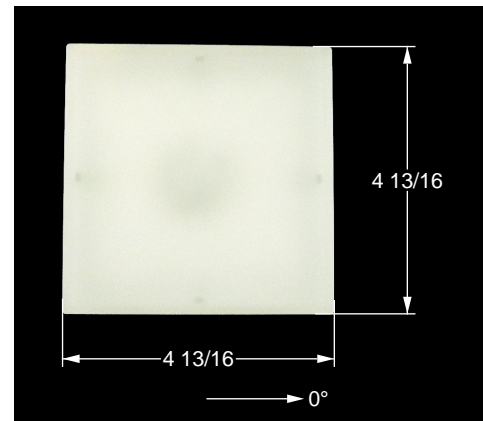
NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120VAC, 60Hz) TO THE LED ASSEMBLY.

TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE = 20.0 FEET

#### CANDELA DISTRIBUTION

	0.0	22.5	45.0	67.5	90.0	FLUX
0	281	281	281	281	281	
5	279	280	280	279	279	27
15	265	266	266	266	265	75
25	238	239	239	239	238	110
35	200	201	202	202	201	126
45	159	160	160	160	159	123
55	117	119	118	118	117	105
65	78	79	79	79	79	78
75	44	45	45	45	44	48
85	17	18	18	18	17	20
90	8	9	9	9	8	
95	7	8	9	8	7	9
105	6	7	8	7	6	7
115	5	6	7	6	5	6
125	5	5	6	5	5	5
135	4	4	4	4	4	3
145	3	3	3	3	3	2
155	2	2	2	2	2	1
165	1	1	1	1	1	0
175	0	0	0	0	0	0
180	0	0	0	0	0	



LEGEND:  
0-deg -----  
45-deg =====  
90-deg -----

#### ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	211	28.4
0- 40	337	45.3
0- 60	566	76.1
0- 90	711	95.6
90-120	22	3.0
90-130	27	3.6
90-150	32	4.3
90-180	33	4.4
0-180	744	100.0

EFFICACY = 79.6 lm/W

CIE TYPE - DIRECT

PLANE : 0-DEG 90-DEG

SPACING CRITERIA : 1.17 1.18

Checked B. HYRE  
Approved N. WHITE  
Lighting Engineer



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

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PLANE : 0-DEG 90-DEG  
LUMINOUS LENGTH : 4.813 4.813  
HEIGHT OF SIDE : 0.250 0.250

LUMINANCE DATA IN CANDELA/SQ M  
ANGLE AVERAGE AVERAGE AVERAGE  
IN DEG 0-DEG 45-DEG 90-DEG  
45 14399. 14285. 14399.  
55 12791. 12616. 12791.  
65 11186. 10939. 11330.  
75 9592. 9239. 9592.  
85 8244. 7589. 8244.



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

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CANDELA DISTRIBUTION  
 LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0
0.0	281	281	281	281	281
5.0	279	280	280	279	279
10.0	274	274	275	274	274
15.0	265	266	266	266	265
20.0	253	254	254	254	253
25.0	238	239	239	239	238
30.0	220	221	221	221	221
35.0	200	201	202	202	201
40.0	180	181	181	181	180
45.0	159	160	160	160	159
50.0	138	138	139	139	138
55.0	117	119	118	118	117
60.0	97	98	98	98	97
65.0	78	79	79	79	79
70.0	60	61	62	62	61
75.0	44	45	45	45	44
80.0	29	30	30	30	29
85.0	17	18	18	18	17
90.0	8	9	9	9	8
95.0	7	8	9	8	7
100.0	7	8	8	8	7
105.0	6	7	8	7	6
110.0	6	7	7	7	6
115.0	5	6	7	6	5
120.0	5	6	6	6	5
125.0	5	5	6	5	5
130.0	4	5	5	5	4
135.0	4	4	4	4	4
140.0	3	4	4	4	3
145.0	3	3	3	3	3
150.0	2	2	2	2	2
155.0	2	2	2	2	2
160.0	1	1	1	1	1
165.0	1	1	1	1	1
170.0	0	0	0	0	0
175.0	0	0	0	0	0
180.0	0	0	0	0	0



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5-DEGREE  
ZONAL LUMEN SUMMARY

0- 5	7
5- 10	20
10- 15	32
15- 20	43
20- 25	52
25- 30	58
30- 35	62
35- 40	64
40- 45	63
45- 50	60
50- 55	56
55- 60	50
60- 65	43
65- 70	35
70- 75	28
75- 80	20
80- 85	13
85- 90	7
90- 95	4
95-100	4
100-105	4
105-110	4
110-115	3
115-120	3
120-125	2
125-130	2
130-135	2
135-140	1
140-145	1
145-150	1
150-155	1
155-160	0
160-165	0
165-170	0
170-175	0
175-180	0

10-DEGREE  
ZONAL LUMEN SUMMARY

0- 10	27
0- 20	101
0- 30	211
0- 40	337
0- 50	460
0- 60	566
0- 70	644
0- 80	691
0- 90	711
0-100	720
0-110	727
0-120	733
0-130	738
0-140	741
0-150	743
0-160	744
0-170	744
0-180	744



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# COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20

RC RW	80				70				50			30			10			0
	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	118	118	118	118	115	115	115	115	109	109	109	103	103	103	98	98	98	96
1	108	103	99	95	105	100	96	93	95	92	89	90	88	86	86	84	82	80
2	98	90	83	78	95	88	82	76	83	78	74	80	75	72	76	72	69	67
3	90	79	71	65	87	77	70	64	74	67	62	70	65	61	67	63	59	57
4	82	70	62	55	80	69	61	55	66	59	53	63	57	52	60	55	51	49
5	76	63	54	48	73	62	54	47	59	52	46	57	51	46	55	49	45	42
6	70	57	48	42	68	56	48	42	54	46	41	52	45	40	50	44	40	37
7	65	52	43	37	63	51	43	37	49	42	36	47	41	36	45	40	35	33
8	61	47	39	33	59	47	39	33	45	38	33	43	37	32	42	36	32	30
9	57	44	36	30	55	43	35	30	41	34	29	40	34	29	39	33	29	27
10	53	40	33	27	52	40	32	27	38	32	27	37	31	27	36	30	26	24

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.



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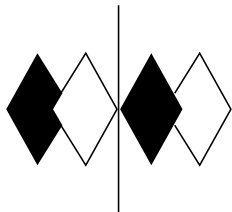
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ADDRESS: 170 LUDLOW AVE  
NORTHVALE, NJ 07647

INSTRUMENTS:

Kikusui PCR4000LA AC Power Source	Calibration Due:
Yokogawa WT210 Digital Power Meter #5	N/A
ITL Moving Mirror Goniophotometer - 20.0' Test Distance	02/28/15
	05/13/15

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REPORT NUMBER: ITL83105  
DATE: 10/07/14  
PREPARED FOR: RAB LIGHTING, INC.  
CATALOG NUMBER: SK9SY (SQUARE - SURFACE MOUNT)

ADDRESS: 170 LUDLOW AVE  
NORTHVALE, NJ 07647

LUMINAIRE: CAST FINNED METAL HOUSING WITH WHITE PAINTED INTERIOR FINISH, 1  
WHITE CIRCUIT BOARD WITH 42 LEDS, FROSTED HOLOGRAPHIC PLASTIC DROP  
LENS. LENS FROSTED BOTH SIDES.

LAMP: FORTY-TWO WHITE LIGHT EMITTING DIODES (LEDS), VERTICAL BASE-UP  
POSITION.

DRIVER: INTEGRAL

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

INSTRUMENTS:	Associated Power Technologies APT5010 AC Power Source	Calibration Due:
	Yokogawa WT210 Digital Power Meter #6	N/A
	Ocean Optics QE65000 Spectroradiometer	10/31/14
	ITL 1.5m Diameter Integrating Sphere S15-2, 4PI Geometry	07/14/15

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, Scotopic /  
Photopic Ratio, and electrical data including ANSI C82.77-2002 Power  
Factor (PF) and Total Harmonic Distortion (THD) to the test sample.  
Report Off-State Power.

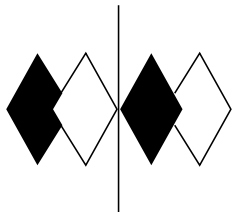
PROCEDURE: The test sample was provided by the customer and had an unknown number  
of operating hours. The test sample was mounted inside the integrating  
sphere and allowed to stabilize. After stabilization occurred,  
measurements were taken. In order to measure mean performance, multiple  
data sets were recorded and averaged. Readings were taken with the test  
sample operating at 120.0 VAC input. 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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PRODUCT CERTIFICATION, APPROVAL, OR ENDORSEMENT BY NVLAP, NIST, OR ANY AGENCY OF THE  
FEDERAL GOVERNMENT.

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



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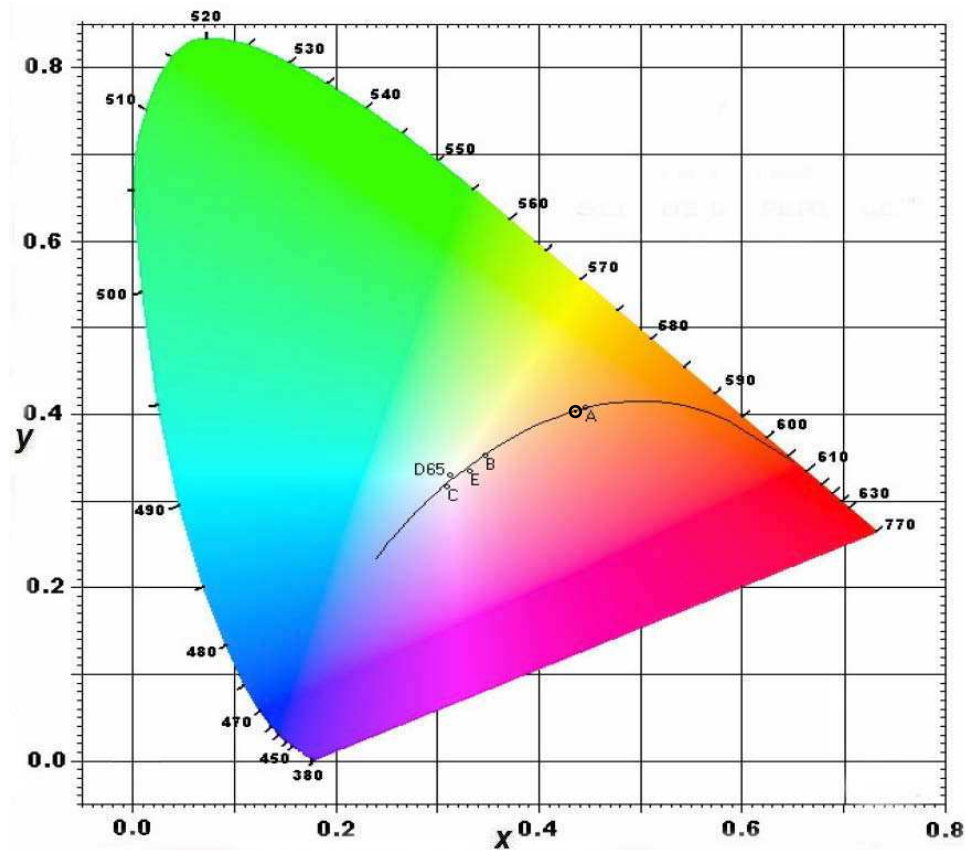
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## CIE Chromaticity Diagram







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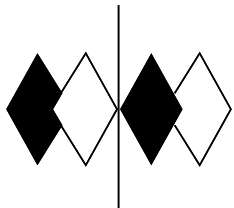
# RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.4358
Chromaticity Ordinate y	0.4027
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2504
Chromaticity Ordinate v'	0.5207
Correlated Color Temp CCT (K)	3007
ANSI C78.377-2008 Duv	0.000
Scotopic / Photopic Lumen Ratio	1.412
Total Radiant Flux (milliWatts)	2356 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	0.079
Input Power (Watts)	9.39
Input Power Factor (%)	99.1
Input Current THD (%)	13.7
Input Voltage THD (%)	0.1
Off-State Power (Watts)	0.0

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	85
R1 Light greyish red	83
R2 Dark greyish yellow	92
R3 Strong yellowish green	97
R4 Moderate yellowish green	83
R5 Light bluish green	84
R6 Light blue	91
R7 Light violet	84
R8 Light reddish purple	63
R9 Strong red	18
R10 Strong yellow	82
R11 Strong green	82
R12 Strong blue	75
R13 Light yellowish pink (skin)	85
R14 Moderate olive green (leaf)	99

## \*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	0.052	515	6.585	650	9.688
385	0.054	520	6.952	655	8.865
390	0.058	525	7.304	660	8.058
395	0.067	530	7.660	665	7.263
400	0.081	535	8.031	670	6.492
405	0.124	540	8.426	675	5.762
410	0.192	545	8.881	680	5.102
415	0.315	550	9.370	685	4.502
420	0.544	555	9.906	690	3.979
425	0.910	560	10.459	695	3.504
430	1.450	565	11.057	700	3.074
435	2.253	570	11.672	705	2.684
440	3.557	575	12.293	710	2.338
445	5.637	580	12.920	715	2.031
450	7.423	585	13.533	720	1.771
455	6.947	590	14.095	725	1.546
460	5.350	595	14.552	730	1.352
465	4.461	600	14.833	735	1.180
470	3.794	605	14.967	740	1.028
475	3.256	610	14.909	745	0.895
480	3.194	615	14.646	750	0.781
485	3.478	620	14.187	755	0.682
490	3.925	625	13.586	760	0.597
495	4.501	630	12.866	765	0.525
500	5.122	635	12.098	770	0.463
505	5.685	640	11.307	775	0.406
510	6.161	645	10.499	780	0.356

