LightLab INTERNATIONAL ALLENTOWN LLC

Report of Test

LLIA002373-001

Indoor Distribution Radiometry Test Report

Catalog Number: Far-UV Sabre
Molded plastic housing, no enclosure. Two fans installed in the back of housing.
One cylindrical excimer lamp
One external AC power supply

Prepared For:
Sterilray, Inc.
30 Centre Road
Suite 6
Somersworth, NH 03878, USA

Performance Summary					
Input Voltage	120.0	Vac	Radiant Power	480.4	mW_{UV-C}
Input Current	0.8145	A	Radiant Efficiency	0.51%	W_{UV-C}/W_{elec}
Input Power	94.48	W	Downward Flux	480.4	mW_{UV-C}
Frequency	60.00	Hz	Upward	0.0	mW_{UV-C}
Power Factor	0.967				
Current THD	22.3	%			

This test report was issued by LightLab International Allentown, LLC without alterations or erasures.

Test date: 04/22/2024
Report date: 04/23/2024

Signed: Michael L. Grather Digitally signed by Michael L. Grather Date: 2024.04.24 16:41:26 -04'00'

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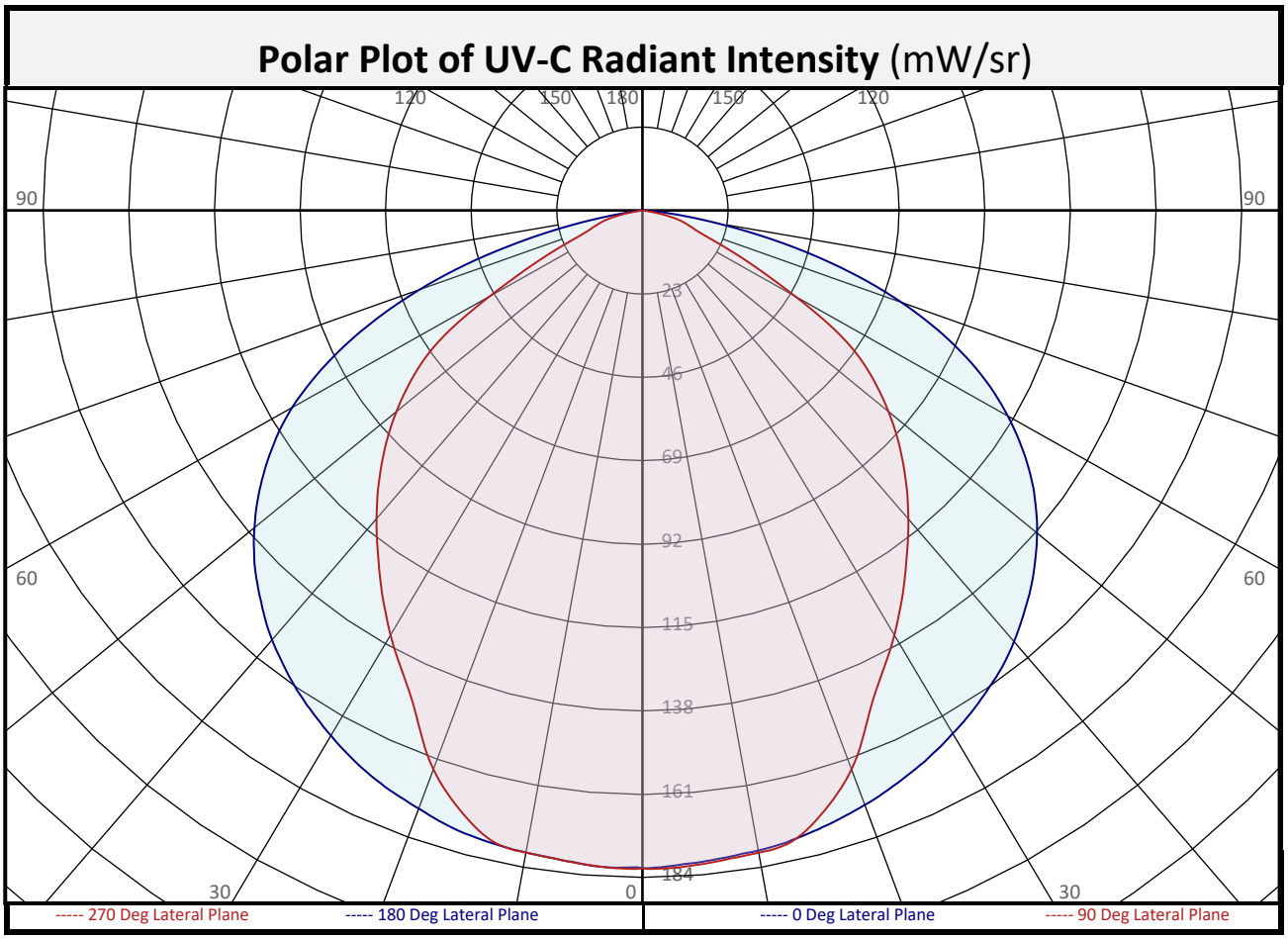

Zonal Flux Summary									
Zone (Deg Vert)	Radiant Power (mW_{UV-C})	Percent of Total	Zone (Deg Vert)	Radiant Power (mW_{UV-C})	Percent of Total	Zone (Deg Vert)	Radiant Power (mW_{UV-C})	Percent of Total
0-10	17.2	3.6%	90-100	0.0	0.0%	0-20	67.2	14.0%
10-20	50.0	10.4%	100-110	0.0	0.0%	0-30	141.9	29.5%
20-30	74.7	15.6%	110-120	0.0	0.0%	0-40	230.6	48.0%
30-40	88.7	18.5%	120-130	0.0	0.0%	0-60	403.6	84.0%
40-50	91.6	19.1%	130-140	0.0	0.0%	0-80	478.7	99.7%
50-60	81.4	16.9%	140-150	0.0	0.0%	10-90	463.2	96.4%
60-70	53.4	11.1%	150-160	0.0	0.0%	20-50	255.0	53.1%
70-80	21.7	4.5%	160-170	0.0	0.0%	40-90	249.8	52.0%
80-90	1.7	0.3%	170-180	0.0	0.0%	60-90	76.8	16.0%
0-90	480.4	100.0%	90-180	0.0	0.0%	0-180	480.4	100.0%

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UV-C Radiant Intensity (mW/sr) Table

Vertical (Gamma) Angles - Data was acquired in 0.5° increments, 2.5° increments shown.	Lateral (C-Plane) Angles									
	0	22.5	45	67.5	90	112.5	135	157.5	180
0	182	182	182	182	182	182	182	182	182
2.5	181	181	181	181	182	181	181	181	182
5	180	180	181	181	181	181	181	181	181
7.5	180	180	180	180	180	181	181	181	180
10	179	179	179	179	180	180	180	180	180
12.5	179	178	178	179	179	180	179	179	179
15	177	177	177	177	176	178	179	178	179
17.5	176	176	176	172	170	173	178	177	177
20	175	174	173	167	164	168	175	176	176
22.5	173	172	169	160	156	161	171	174	174
25	171	171	164	152	148	153	166	173	172
27.5	169	169	158	144	141	145	160	171	170
30	167	167	151	138	135	139	152	168	167
32.5	164	164	144	132	129	133	145	165	165
35	162	160	137	126	123	127	138	161	162
37.5	159	155	131	120	117	121	132	156	158
40	155	150	125	114	111	115	125	150	155
42.5	152	144	119	108	105	109	119	144	151
45	148	138	112	102	99	103	113	137	146
47.5	143	130	106	96	93	96	106	130	141
50	138	122	100	89	86	90	99	121	136
52.5	133	115	93	83	79	83	93	113	130
55	127	108	87	75	72	75	86	105	124
57.5	121	100	80	67	61	67	78	97	117
60	113	92	72	56	47	56	71	89	109
62.5	105	83	64	42	35	42	62	81	99
65	96	75	55	31	26	30	52	72	88
67.5	86	66	41	22	18	21	39	62	76
70	74	57	28	16	15	15	26	53	63
72.5	61	48	18	13	12	12	17	43	50
75	47	37	12	11	10	10	11	32	35
77.5	33	24	9	8	7	7	8	20	22
80	20	12	6	4	3	4	5	9	10
82.5	10	5	2	0	0	0	2	4	2
85	4	2	0	0	0	0	0	1	0
87.5	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0

16 lateral half-planes of data were acquired, 22.5 degree increments shown.

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Vertical (Gamma) Angles - Data was acquired in 0.5° increments, 2.5° increments shown.	Lateral (C-Plane) Angles									
		0	22.5	45	67.5	90	112.5	135	157.5	180
	90	0	0	0	0	0	0	0	0	0
	92.5	0	0	0	0	0	0	0	0	0
	95	0	0	0	0	0	0	0	0	0
	97.5	0	0	0	0	0	0	0	0	0
	100	0	0	0	0	0	0	0	0	0
	102.5	0	0	0	0	0	0	0	0	0
	105	0	0	0	0	0	0	0	0	0
	107.5	0	0	0	0	0	0	0	0	0
	110	0	0	0	0	0	0	0	0	0
	112.5	0	0	0	0	0	0	0	0	0
	115	0	0	0	0	0	0	0	0	0
	117.5	0	0	0	0	0	0	0	0	0
	120	0	0	0	0	0	0	0	0	0
	122.5	0	0	0	0	0	0	0	0	0
	125	0	0	0	0	0	0	0	0	0
	127.5	0	0	0	0	0	0	0	0	0
	130	0	0	0	0	0	0	0	0	0
	132.5	0	0	0	0	0	0	0	0	0
	135	0	0	0	0	0	0	0	0	0
	137.5	0	0	0	0	0	0	0	0	0
	140	0	0	0	0	0	0	0	0	0
	142.5	0	0	0	0	0	0	0	0	0
	145	0	0	0	0	0	0	0	0	0
	147.5	0	0	0	0	0	0	0	0	0
	150	0	0	0	0	0	0	0	0	0
	152.5	0	0	0	0	0	0	0	0	0
	155	0	0	0	0	0	0	0	0	0
	157.5	0	0	0	0	0	0	0	0	0
	160	0	0	0	0	0	0	0	0	0
	162.5	0	0	0	0	0	0	0	0	0
	165	0	0	0	0	0	0	0	0	0
	167.5	0	0	0	0	0	0	0	0	0
	170	0	0	0	0	0	0	0	0	0
	172.5	0	0	0	0	0	0	0	0	0
	175	0	0	0	0	0	0	0	0	0
	177.5	0	0	0	0	0	0	0	0	0
	180	0	0	0	0	0	0	0	0	0

16 lateral half-planes of data were acquired, 22.5 degree increments shown.

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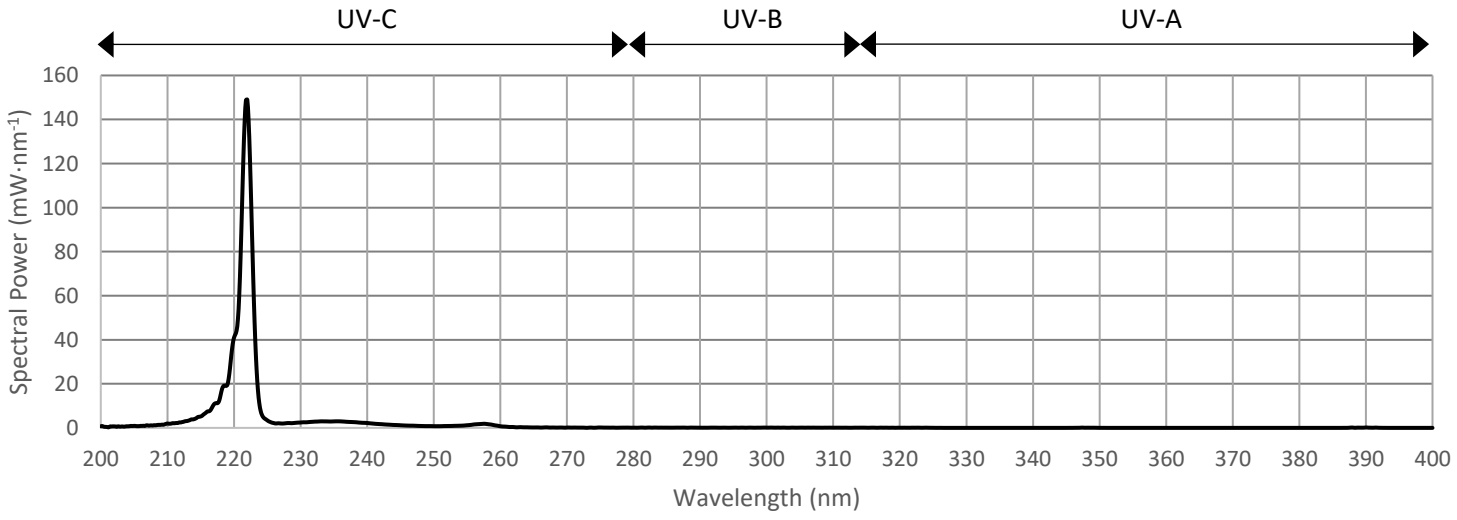
Spectral Radiant Flux Summary

Radiant Flux Tabulation			
Waveband (nm)	Radiant Flux (mW_r)	Percent of Total	Radiant Efficiency (W_r/W_e)
UV-C 200-250	465.1	95.9%	0.49%
UV-C 200-280	480.4	99.1%	0.51%
UV-B 280-315	3.1	0.6%	0.00%
UV-A 315-400	1.3	0.3%	0.00%
Total UV 200-400	484.8	100.0%	0.51%



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Coefficients of Utilization/Room 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
RCR																						
0	119	119	119	119		116	116	116	116		111	111	111		106	106	106		102	102	102	100
1	110	106	102	98		107	103	100	97		99	96	94		95	93	91		92	90	88	86
2	100	93	86	81		98	91	85	80		87	82	78		84	80	76		81	78	75	73
3	92	82	74	68		89	80	73	67		77	71	66		75	69	65		72	68	64	62
4	84	73	64	58		82	71	63	57		69	62	57		67	61	56		64	59	55	53
5	77	65	56	50		75	64	56	50		62	55	49		60	53	49		58	52	48	46
6	72	59	50	44		70	58	49	43		56	48	43		54	48	43		53	47	42	40
7	66	53	45	39		65	52	44	38		51	43	38		49	43	38		48	42	38	36
8	62	49	40	34		60	48	40	34		47	39	34		45	39	34		44	38	34	32
9	58	45	36	31		56	44	36	31		43	36	31		42	35	31		41	35	30	29
10	54	41	33	28		53	41	33	28		40	33	28		39	32	28		38	32	28	26

For absolute test reports, RUs are expressed as a percentage of total radiant flux output. For relative test reports, CUs are expressed as a percentage of total lamp output. Calculations were based on published IES procedures, and are based on the zonal cavity method. Basic assumptions: 1) Room surfaces are lambertian reflectors. 2) Incident flux on each surface is uniformly distributed. 3) The room is spectrally neutral. When luminaires are not evenly distributed throughout the room, or do not exhibit lateral symmetry, CU values may differ from actual performance.

Circle of Irradiance Plot

Height(m)	Irradiance at Nadir ($\mu W_{UV\text{-}C} \cdot cm^{-2}$)	Ground-level distance to half-of-nadir irradiance (m) 0-180 deg	90-270 deg
0.50	72.6	0.69	0.56
0.75	32.3	1.03	0.84
1.00	18.2	1.38	1.12
1.25	11.6	1.72	1.40
1.50	8.1	2.06	1.69
2.00	4.5	2.75	2.25

Spacing Criterion

0 deg:	1.4
90 deg:	1.1
180 deg:	1.4
270 deg:	1.1

Beam and Field Angle

0-180 Degree Plane

Beam Angle:	130.7°
Field Angle:	158.7°

90-270 Degree Plane

Beam Angle:	96.5°
Field Angle:	135.0°

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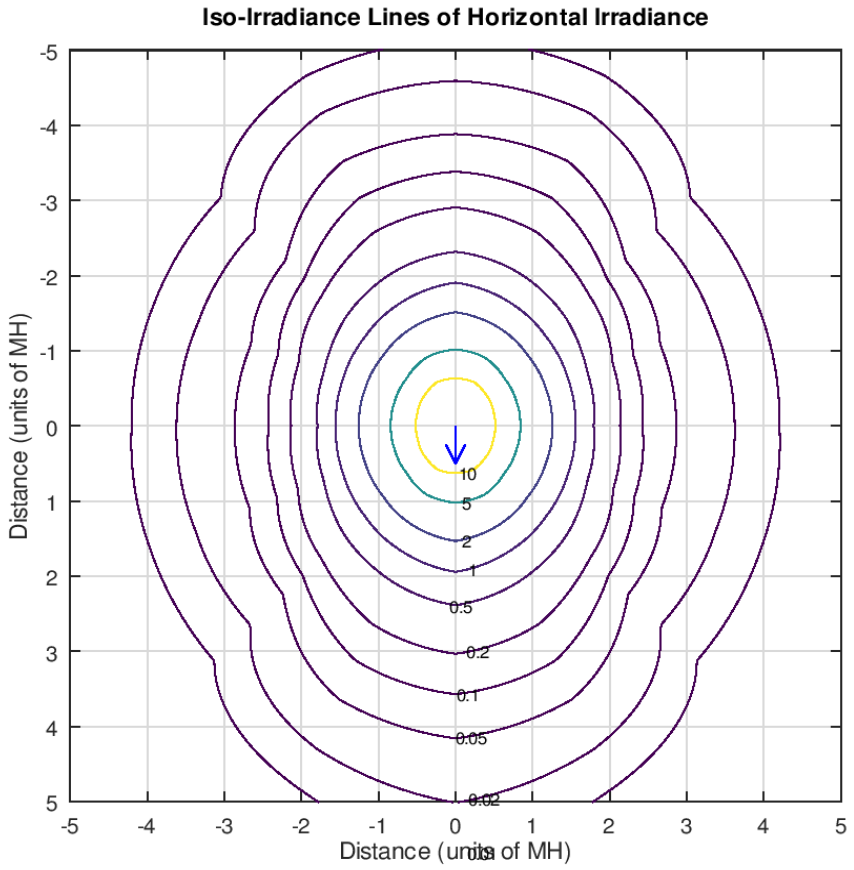
Iso-Irradiance Plot



The iso-irradiance values shown in the plot above are based on a mounting height of h = 1.00 meters. Grid values show multiples of mounting height. The iso-irradiance contour lines are expressed in units of uW/cm^2. The values expressed are based on the direct output from a single unit without the contribution of room reflections.

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Additional Pictures of Test Subject

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Test Distance	1.4 m
Ambient Temperature	25.0 °C

Notes

The laboratory has not participated in the selection of samples to be tested. All testing is performed on the understanding that the significance of the report is limited to the extent that the test sample is representative of production units.

This test was conducted in accordance with the applicable sections of IES LM-93-22. The signal-to-noise ratio may not have satisfied the minimum limits expressed in LM-93. Noise was removed based on angular limits and threshold values. Format of reports and angular increments based on IES LM-41-20 and LM-46-20. Spectral values presented in this report are based on spectral irradiance distribution measurements directly measured at the angle of peak intensity. Spectral irradiance measurements were acquired according to IES LM-58-20.

The radiant intensity values, and other derived quantities, contained in this report are based on the absolute data, as measured. Where the lateral half-planes measured do not coincide with typically presented lateral increments, interpolated values may be presented.

Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

Intensity values mere measured and are reported using the direct measurement Type "C" goniometer geometry (no mirror) and guidance from IES LM-75-19. Stray optical radiation reduction was employed in the testing environment and stray optical radiation measurement and removal techniques were employed.

This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the Federal Government. This report is free of erasures and corrections.