LIGHT LABORATORY INC.
8165 E Kaiser Blvd. Anaheim, CA 92808
www.lightlaboratory.com

NVLAP TESTING
NVLAP LAB CODE 200927-0

Report No: L032113403 **Issue Date: 4/20/2021**

Report Prepared For: Light and Green
2340 E Olympic Blvd. Unit E, Los Angeles, CA 90021

Model Number: 9022 - 24 deg

Test: Photometric/Electrical Test

Standards Used: Appropriate part or all test guidelines were used for test performed:

IESNA LM79: 2008 Approved Methods for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI NEMA ANSLG C78.377: 2008 Specification of the Chromaticity of Solid State Lighting Products

ANSI C82.77:2002: Harmonic Emission Limits-Related Quality Requirements for Lighting Equipment

Description of Sample: Client submitted the sample. Received in working and undamaged condition. No modifications were necessary.

Special Test Condition: Fixture is tested with no special conditions.

Sample Arrival Date: 4/15/21

Date of Tests: 4/16/21 - 4/20/21

Seasoning of Sample: No seasoning was performed in accordance with IESNA LM-79.

Equipment List

Equipment Used	Model No	Stock No	Calibration Due Date
Chroma Programmable AC Source	61604	PS-AC02	--
Yokogawa Digital Power Meter	WT210	MT-EL06-S4	4/7/23
HP Power Supply	6032A	PS-DC05-S2	--
Fluke Digital Thermometer	52K/J	MT-TP05	3/17/23
LLI Type C Goniophotometer System	RMG-C-MKII	CD-LL04-GC	--
LLI 2M Sphere	2MR97	CD-SN03-S2	--
LLI Spectroradiometer	SPR-3000	MT-SC01-S2	Before Use

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General Information	
Manufacturer:	Light and Green
Model Number:	9022 - 24 deg
Driver Model Number:	L.T.F. DIMMABLE LED DRIER DA10W250C2040-3001

Photometric & Electrical Test Results	
Total Lumens:	1856.76
Efficacy:	80.24
Input Voltage (VAC/60Hz):	120.01
Input Current (Amp):	0.2288
Input Power (W):	23.14
Input Power Factor:	0.8427
Current ATHD (%):	6.4%

Test Condition	
Ambient Temperature (°C):	25.0
Stabilization Time (Hours):	0:35
Total Operating Time (Hours):	1:25

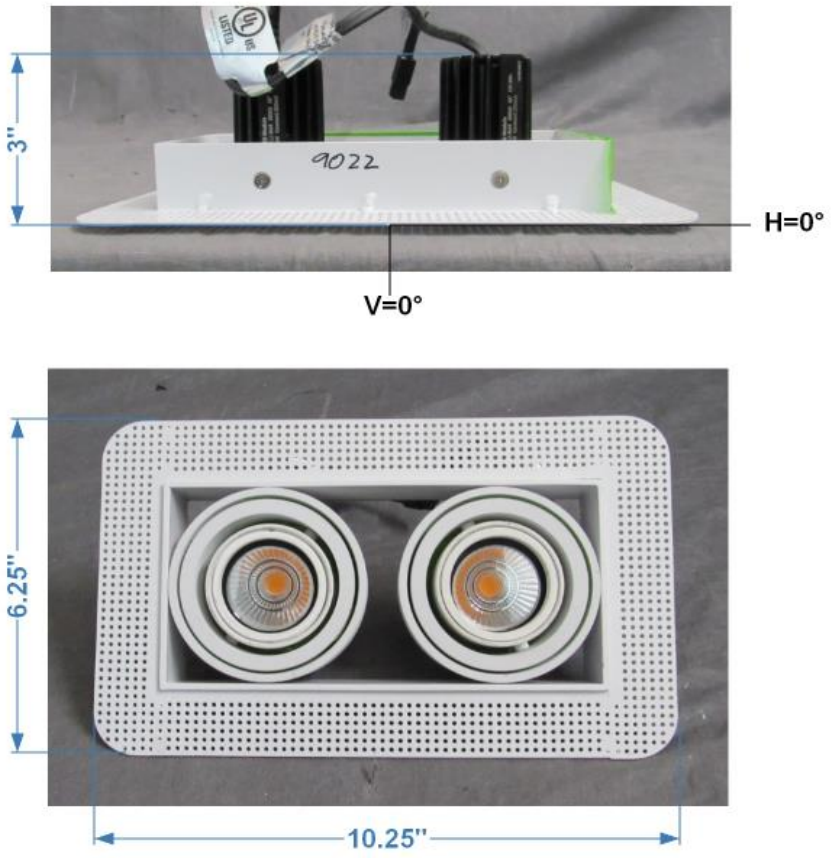

FIG. 1 LUMINAIRE

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Test Methods

Photometric Measurements - Goniophotometer

A Custom Light Laboratory Type C Rotating Mirror Goniophotometer was used to measure candelas(intensity) at each angle of distribution as defined by IESNA for the appropriate fixture type.

Ambient temperature is set to 25^{o}C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25^{o}C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Spectral Measurements - Integrating Sphere

A Sensing Spectroradiometer SPR-3000, in conjunction with Light Laboratory 2 meter integrating sphere was used to measure chromaticity coordinates, correlated color temperature(CCT) and the color rendering index(CRI) for each sample.

Ambient temperature is set to 25^{o}C and is measured from the center of the fixture, within 1ft from the outside of the fixture. Temperature is maintained at 25^{o}C throughout the testing process and the sample is stabilized for at least 30mins and longer as necessary for the sample to achieve stabilization.

Electrical measurements are measured using the listed equipment.

Disclaimers:

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

Report Prepared by : Keyur Patel

Test Report Reviewed by:

Steve Kang
Quality Assurance

**Attached are photometric data reports. Total number of pages: 10*

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Photometric Test Report

IES INDOOR REPORT
PHOTOMETRIC FILENAME : L032113403.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] L032113403
[TESTLAB] LIGHT LABORATORY, INC. (www.lightlaboratory.com)
[ISSUEDATE] 4/20/2021
[MANUFAC] Light and Green
[LUMCAT] 9022 - 24 deg
[LUMINAIRE] LED LUMINAIRE
[BALLASTCAT] L.T.F. DIMMABLE LED DRIER DA10W250C2040-3001
[OTHER] INDICATING THE CANDELA VALUES ARE ABSOLUTE AND
[MORE] SHOULD NOT BE FACTORED FOR DIFFERENT LAMP RATINGS.
[INPUT] 120.01VAC, 23.14W
[TEST PROCEDURE] IESNA:LM-79-08

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	1857
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	80
Total Luminaire Watts	23.14
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	0.40
Spacing Criterion (90-270)	0.40
Spacing Criterion (Diagonal)	0.46
Basic Luminous Shape	Rectangular
Luminous Length (0-180)	0.48 ft
Luminous Width (90-270)	0.15 ft
Luminous Height	0.00 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	24502	24713	24713
55	13020	13020	13020
65	12016	12016	12369
75	15004	15004	15581
85	23992	23992	25706

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CANDELA TABULATION

	0	5	10	15	20	25	30	35	40	45
0	4828	4828	4828	4828	4828	4828	4828	4828	4828	4828
1	4736	4739	4744	4749	4761	4770	4780	4791	4803	4813
2	4670	4672	4678	4684	4695	4705	4714	4726	4738	4749
3	4543	4546	4552	4558	4571	4581	4591	4605	4616	4628
4	4365	4369	4374	4381	4395	4405	4414	4429	4439	4450
5	4148	4152	4157	4162	4173	4181	4188	4199	4209	4218
6	3910	3914	3918	3923	3933	3940	3946	3956	3965	3973
7	3649	3654	3658	3662	3670	3678	3685	3696	3704	3713
8	3363	3367	3372	3376	3383	3392	3399	3408	3418	3425
9	2988	2992	2998	3002	3010	3016	3022	3030	3037	3045
10	2779	2783	2788	2791	2800	2805	2810	2817	2824	2830
12	2255	2260	2262	2262	2267	2271	2274	2278	2286	2290
14	1860	1864	1867	1868	1874	1877	1878	1882	1886	1890
16	1572	1573	1576	1576	1581	1583	1583	1585	1590	1593
18	1339	1341	1343	1344	1347	1350	1350	1352	1355	1357
20	1162	1163	1165	1166	1169	1172	1172	1173	1176	1178
22	1028	1030	1033	1034	1038	1040	1040	1041	1044	1046
24	929	931	933	934	938	941	941	943	945	947
26	858	859	859	861	865	868	868	869	871	873
28	804	805	806	808	812	815	815	816	818	820
30	761	762	764	766	769	772	772	773	775	777
35	560	559	562	563	565	567	567	568	569	572
40	283	282	283	283	282	284	281	282	282	283
45	116	117	117	117	117	117	117	117	117	117
50	77	77	77	77	77	77	77	77	77	77
55	50	50	50	50	50	50	50	50	50	50
60	39	39	39	39	39	39	39	39	39	39
65	34	34	34	34	34	34	34	34	34	34
70	31	31	31	31	31	31	31	31	31	31
75	26	26	26	26	26	26	26	26	26	26
80	22	22	22	22	22	22	22	22	22	22
85	14	14	14	14	14	14	14	14	14	14
90	0	0	0	0	0	0	0	0	0	0

Vert. Angles	**Horizontal Angles**								
	50	**55**	**60**	**65**	**70**	**75**	**80**	**85**	**90**
0	4828	4828	4828	4828	4828	4828	4828	4828	4828
1	4824	4836	4847	4856	4865	4872	4878	4883	4884
2	4760	4774	4783	4792	4801	4809	4814	4819	4820
3	4641	4653	4664	4673	4682	4690	4696	4701	4703
4	4461	4470	4479	4486	4493	4499	4504	4508	4509
5	4228	4238	4246	4254	4260	4266	4270	4272	4273
6	3983	3992	3999	4009	4017	4022	4026	4029	4030
7	3719	3727	3735	3744	3752	3759	3764	3768	3769
8	3433	3440	3446	3454	3463	3470	3475	3478	3479
9	3052	3059	3064	3070	3076	3079	3083	3087	3087
10	2837	2844	2849	2853	2857	2860	2863	2864	2865
12	2293	2299	2302	2305	2311	2314	2318	2321	2320
14	1891	1898	1901	1904	1906	1907	1910	1911	1909
16	1596	1601	1603	1605	1606	1609	1612	1613	1613
18	1360	1364	1367	1369	1372	1374	1376	1377	1377
20	1180	1185	1190	1191	1193	1194	1197	1197	1198
22	1048	1053	1055	1057	1059	1060	1062	1062	1062

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CANDELA TABULATION - (Cont.)

24	949	953	956	957	958	960	962	962	962
26	877	880	883	884	884	886	887	888	887
28	824	827	829	830	831	833	833	834	833
30	780	783	785	786	786	788	789	789	789
35	574	576	578	578	579	579	580	581	582
40	286	287	290	290	290	292	293	295	296
45	117	117	117	117	117	117	117	117	117
50	77	77	77	77	77	77	77	77	77
55	50	50	50	50	50	50	50	50	50
60	39	39	39	39	39	39	39	39	39
65	34	34	35	35	35	35	35	35	35
70	31	31	32	32	32	32	32	32	32
75	26	26	27	27	27	27	27	27	27
80	22	22	22	22	22	22	22	22	22
85	14	14	15	15	15	15	15	15	15
90	0	0	0	0	0	0	0	0	0

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ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	849.88	N.A.	45.80
0-30	1276.62	N.A.	68.80
0-40	1618.38	N.A.	87.20
0-60	1780.44	N.A.	95.90
0-80	1842.95	N.A.	99.30
0-90	1856.76	N.A.	100.00
10-90	1501.08	N.A.	80.80
20-40	768.50	N.A.	41.40
20-50	882.38	N.A.	47.50
40-70	196.54	N.A.	10.60
60-80	62.50	N.A.	3.40
70-80	28.03	N.A.	1.50
80-90	13.81	N.A.	0.70
90-110	0.00	N.A.	0.00
90-120	0.00	N.A.	0.00
90-130	0.00	N.A.	0.00
90-150	0.00	N.A.	0.00
90-180	0.00	N.A.	0.00
110-180	0.00	N.A.	0.00
0-180	1856.76	N.A.	100.00

Total Luminaire Efficiency = N.A.%

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	355.67
10-20	494.21
20-30	426.74
30-40	341.76
40-50	113.88
50-60	48.19
60-70	34.48
70-80	28.03
80-90	13.81
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

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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	113	110	107	105	111	108	105	103	104	102	100	100	99	97	97	95	94	93
2	107	102	98	94	105	100	97	93	97	94	91	94	92	89	91	89	87	86
3	102	95	90	86	100	94	89	85	91	87	84	89	86	83	87	84	81	80
4	97	89	84	79	95	88	83	79	86	82	78	84	80	77	82	79	76	75
5	92	84	78	74	91	83	78	74	81	76	73	80	75	72	78	74	72	70
6	88	79	73	69	87	78	73	69	77	72	68	76	71	68	74	70	67	66
7	84	75	69	65	83	74	69	65	73	68	64	72	67	64	71	67	64	62
8	80	71	65	61	79	71	65	61	70	65	61	68	64	61	68	63	60	59
9	77	68	62	58	76	67	62	58	66	61	58	65	61	58	65	60	57	56
10	74	65	59	55	73	64	59	55	63	58	55	63	58	55	62	58	55	54

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UGR TABLE - CORRECTED

Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	14.9	16.0	15.2	16.3	16.6	14.9	16.0	15.2	16.3	16.6
	3H	17.1	18.1	17.5	18.4	18.8	17.2	18.2	17.6	18.5	18.9
	4H	18.2	19.1	18.6	19.4	19.8	18.3	19.2	18.8	19.6	20.0
	6H	19.4	20.2	19.8	20.6	21.0	19.5	20.3	19.9	20.7	21.1
	8H	19.9	20.7	20.4	21.1	21.5	20.0	20.8	20.5	21.2	21.6
	12H	20.4	21.1	20.8	21.5	21.9	20.5	21.3	21.0	21.7	22.1
4H	2H	15.4	16.3	15.9	16.7	17.1	15.4	16.3	15.9	16.7	17.1
	3H	18.0	18.7	18.4	19.1	19.5	18.1	18.8	18.5	19.2	19.7
	4H	19.3	19.9	19.7	20.4	20.8	19.4	20.1	19.9	20.5	21.0
	6H	20.7	21.2	21.1	21.7	22.1	20.8	21.3	21.3	21.8	22.3
	8H	21.3	21.8	21.7	22.2	22.7	21.4	21.9	21.9	22.4	22.8
	12H	21.8	22.3	22.3	22.8	23.3	22.0	22.5	22.5	23.0	23.4
8H	4H	19.8	20.3	20.2	20.7	21.2	19.9	20.4	20.4	20.9	21.3
	6H	21.4	21.8	21.9	22.3	22.8	21.5	21.9	22.0	22.4	22.9
	8H	22.1	22.5	22.6	23.0	23.5	22.2	22.6	22.8	23.1	23.6
	12H	22.9	23.2	23.4	23.7	24.3	23.0	23.4	23.6	23.9	24.4
12H	4H	19.9	20.3	20.4	20.8	21.3	20.0	20.5	20.5	20.9	21.4
	6H	21.5	21.9	22.1	22.4	22.9	21.6	22.0	22.2	22.5	23.0
	8H	22.4	22.7	22.9	23.2	23.8	22.5	22.8	23.0	23.3	23.9

Maximum UGR = 24.4

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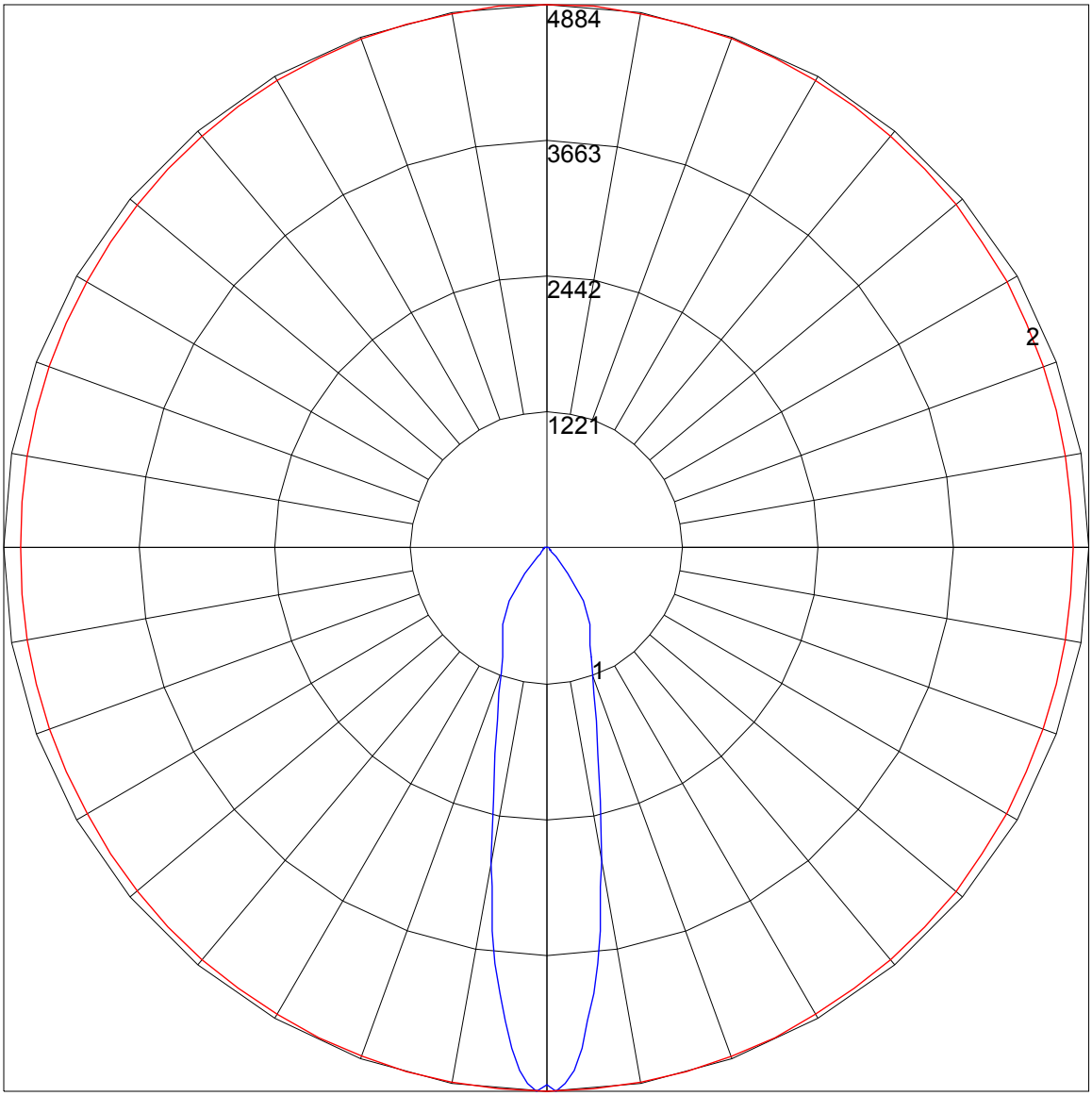
POLAR GRAPH



Maximum Candela = 4884 Located At Horizontal Angle = 90, Vertical Angle = 1
1 - Vertical Plane Through Horizontal Angles (90 - 270) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (1) (Through Max. Cd.)

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