Indoor Distribution Test Report

Spectrum Lighting Inc.

994 Jefferson Street
Fall River, MA 02721
+1.508.678.2303

Spectrum Lighting Photometric Lab

Luminaire

CK0407PC 20L 35K ND xx SO xx MW

Nom. 4.5" Diam x 7"H Round Cylinder, Narrow Beam

Test Number

SP-01442_M-20L

Test Date

11/22/2022

The results contained in this report pertain only to this IES file.

Summary of Results

Power

Input Watts	13.2 W

Lumen Output

Output Lumens	1357
Efficacy	102.78 lm/W

Luminous Dimensions

0° - 180° Size	-0.38
90° - 270° Size	-0.38
Height	0

Spacing Criterion

Two luminaires, plane 0°	0.43
Two luminaires, plane 90°	0.43
Four luminaires	0.48

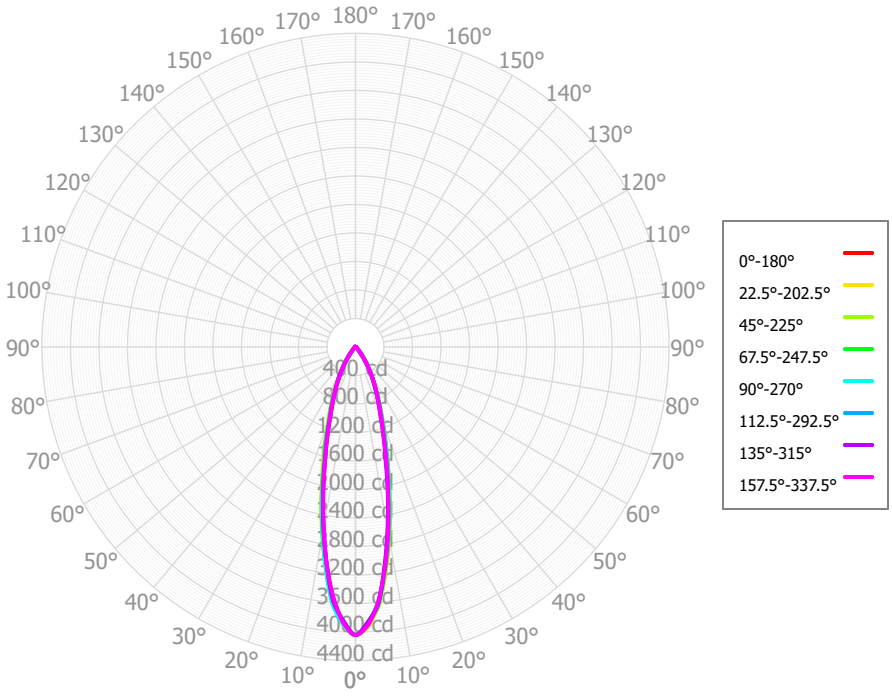
Full Beam Angle

0° - 180°	26°
90° - 270°	27°

IES File Header Contents

Keyword	Value
TEST	SP-01442_M-20L
TESTLAB	Spectrum Lighting Photometric Lab, VLS-245-981
MANUFAC	Spectrum Lighting
TESTDATE	11/22/2022
ISSUEDATE	11/22/2022
LUMCAT	CK0407PC 20L 35K ND xx SO xx MW
LUMINAIRE	Nom. 4.5" Diam x 7"H Round Cylinder, Narrow Beam
OTHER	Solite lens, Matte White finish
OTHER	27 Degree Beam Angle
OTHER	Reference Project SL378
LAMP	N/A
LAMPCAT	N/A, Min. 80 CRI
OTHER	Total Luminaire Watts is approximate
OTHER	CCT Multipliers: 27K x 0.95, 30K x 0.97, 40K x 1.03
OTHER	This report prepared by Spectrum Lighting

Candela Polar Plot



Zonal Lumen Summary

Zone	Lumens	% Fixture	Zone	Lumens	% Fixture
0.00° - 10.00°	314.09	23.15%	90.00° - 100.00°	2.20	0.16%
10.00° - 20.00°	473.32	34.89%	100.00° - 110.00°	2.16	0.16%
20.00° - 30.00°	317.90	23.43%	100.00° - 120.00°	4.14	0.30%
30.00° - 40.00°	146.01	10.76%	120.00° - 130.00°	1.81	0.13%
40.00° - 50.00°	46.37	3.42%	130.00° - 140.00°	1.72	0.13%
50.00° - 60.00°	22.15	1.63%	140.00° - 150.00°	1.44	0.11%
60.00° - 70.00°	13.64	1.01%	150.00° - 160.00°	1.12	0.08%
70.00° - 80.00°	7.07	0.52%	160.00° - 170.00°	0.68	0.05%
80.00° - 90.00°	2.85	0.21%	170.00° - 180.00°	0.22	0.02%
0.00° - 90.00°	1343.39	99.02%	0.00° - 180.00°	1356.72	100.00%

Candela Distribution

	0.00°	22.50°	45.00°	67.50°	90.00°	112.50°	135.00°	157.50°	180.00°	202.50°	225.00°	247.50°	270.00°	292.50°	315.00°	337.50°	360.00°
0.00°	4041.67	4041.67	4041.67	4041.67	4041.67	4041.67	4041.67	4041.67	4041.67	4041.67	4041.67	4041.67	4041.67	4041.67	4041.67	4041.67	4041.67
2.50°	3888.37	3936.33	3889.66	3874.56	3883.26	3855.03	3851.93	3878.81	3868.84	3897.23	3869.63	3867.86	3899.52	3889.27	3873.44	3914.72	3888.37
5.00°	3645.25	3638.26	3669.63	3619.05	3610.24	3575.99	3580.24	3533.91	3618.69	3571.29	3635.39	3606.21	3635.10	3635.28	3625.92	3602.41	3645.25
7.50°	3156.93	3209.70	3192.05	3166.98	3139.62	3085.28	3083.99	3088.11	3121.52	3150.24	3160.10	3156.30	3162.75	3134.43	3114.24	3142.78	3156.93
10.00°	2662.55	2713.23	2710.89	2693.54	2656.89	2575.04	2588.97	2565.52	2619.22	2645.77	2684.67	2659.25	2643.42	2628.85	2589.32	2635.05	2662.55
12.50°	2152.92	2190.99	2215.24	2194.77	2158.87	2107.57	2096.67	2092.61	2145.39	2181.57	2208.43	2185.38	2155.73	2114.05	2096.70	2105.69	2152.92
15.00°	1701.23	1764.76	1759.83	1764.97	1731.28	1652.90	1661.16	1646.29	1693.06	1742.44	1763.58	1714.58	1671.59	1669.27	1625.15	1688.94	1701.23
17.50°	1349.02	1360.78	1406.84	1393.59	1366.40	1334.69	1313.54	1316.07	1368.96	1404.73	1424.06	1389.87	1351.31	1318.85	1309.33	1305.20	1349.02
20.00°	1061.53	1099.34	1103.56	1110.08	1085.92	1038.73	1036.94	1027.73	1073.43	1109.79	1122.54	1076.18	1042.48	1044.98	1021.74	1059.86	1061.53
22.50°	851.51	854.55	885.26	878.54	858.85	849.26	837.42	836.54	873.22	894.18	904.37	877.68	855.87	844.80	842.84	837.01	851.51
25.00°	679.09	695.45	698.99	703.17	687.41	673.26	674.07	666.40	691.12	700.07	711.45	686.95	677.17	683.58	678.31	689.00	679.09
27.50°	538.87	541.12	551.47	550.14	540.27	536.35	538.81	533.18	548.57	554.41	556.37	543.65	541.05	548.71	549.02	545.96	538.87
30.00°	419.71	428.11	427.57	431.08	420.36	410.45	416.93	403.65	419.21	415.74	423.97	410.09	413.59	429.00	426.24	427.75	419.71
32.50°	313.15	320.11	323.81	320.58	307.99	305.58	302.26	304.78	309.86	315.02	315.44	310.24	313.51	316.32	314.40	313.21	313.15
35.00°	230.14	239.85	241.49	241.56	227.45	217.27	215.63	209.03	219.76	217.86	230.57	222.76	224.54	228.45	220.50	226.15	230.14
37.50°	156.79	167.94	172.13	166.72	151.67	150.90	139.17	148.32	150.13	161.28	163.48	162.67	158.40	148.11	147.62	147.74	156.79
40.00°	111.56	123.00	125.85	125.66	110.25	103.02	96.24	93.24	102.82	108.53	118.75	114.47	107.15	103.75	97.45	103.60	111.56
42.50°	73.52	85.52	88.99	86.67	71.35	72.61	60.63	66.99	72.21	81.88	85.83	84.49	77.24	65.70	66.05	67.08	73.52
45.00°	55.18	63.90	65.67	64.44	54.76	53.04	47.16	45.45	52.33	58.43	65.59	61.72	55.85	51.44	47.65	49.38	55.18
47.50°	39.53	47.17	45.87	44.02	39.40	40.76	36.03	38.04	38.10	46.61	49.78	46.71	43.03	38.95	36.85	35.98	39.53
50.00°	33.79	37.56	36.76	34.69	32.70	33.10	31.14	31.58	30.70	36.11	39.35	37.04	34.56	33.58	30.38	29.87	33.79
52.50°	28.46	30.51	29.10	26.66	26.62	27.57	26.34	27.02	25.73	28.70	30.03	31.47	29.20	28.44	25.64	25.98	28.46
55.00°	24.38	26.07	25.51	23.11	22.82	24.26	22.10	23.02	23.47	23.28	26.15	26.86	24.39	25.21	23.18	24.71	24.38
57.50°	20.50	21.68	22.06	19.91	19.48	21.60	18.27	19.80	21.80	21.02	22.79	22.77	19.84	22.27	21.28	22.16	20.50
60.00°	17.89	17.33	18.56	17.52	17.27	18.56	16.66	17.33	19.22	18.63	19.23	19.76	17.75	20.57	18.87	18.53	17.89
62.50°	15.44	14.88	15.25	14.92	15.10	15.46	14.64	15.60	16.57	16.08	15.78	17.14	16.49	18.62	16.39	16.43	15.44
65.00°	13.54	13.41	13.28	11.99	13.00	14.05	11.38	13.38	13.40	13.37	13.71	14.25	14.70	15.96	14.37	15.24	13.54
67.50°	11.62	12.33	11.45	9.98	11.28	12.72	8.76	10.82	10.30	10.52	11.71	11.29	12.83	13.44	12.38	13.15	11.62
70.00°	9.62	11.37	10.14	8.97	9.99	10.48	7.42	8.49	8.01	8.66	10.00	10.14	11.34	11.17	10.66	10.70	9.62
72.50°	7.90	10.15	8.34	7.52	8.17	8.26	6.44	6.27	5.98	7.35	8.30	9.16	9.87	9.27	9.00	8.98	7.90
75.00°	6.60	8.87	5.47	5.71	5.91	6.24	5.96	4.83	5.27	6.16	6.63	7.17	7.79	7.83	7.70	7.44	6.60
77.50°	5.27	7.07	3.58	4.61	4.30	4.43	5.16	3.64	4.57	5.01	5.05	5.21	5.74	6.37	6.30	6.20	5.27
80.00°	3.91	5.21	3.22	3.88	3.04	3.48	4.04	2.84	3.90	4.05	3.63	3.74	4.00	4.88	4.53	4.99	3.91
82.50°	2.98	3.54	2.75	2.97	2.64	2.73	3.24	2.12	3.17	3.13	2.60	2.50	2.53	3.82	3.13	3.83	2.98
85.00°	2.38	2.03	2.18	1.99	2.57	2.53	2.68	1.82	2.33	2.79	2.08	2.37	2.31	3.04	2.52	2.72	2.38
87.50°	2.20	2.12	1.99	1.85	2.09	2.24	2.17	1.56	1.82	2.52	1.78	2.27	2.15	2.41	2.19	2.42	2.20
90.00°	2.26	2.17	2.09	1.88	1.52	1.83	1.69	1.74	1.73	2.30	1.68	2.24	2.14	1.85	2.28	2.15	2.26
92.50°	2.18	2.02	2.19	1.68	1.72	1.79	1.69	1.88	1.76	2.11	1.59	2.31	2.12	2.02	2.25	2.10	2.18
95.00°	2.05	1.93	2.30	1.45	2.02	2.20	1.84	1.72	1.91	2.29	1.50	2.55	2.08	2.39	2.09	2.07	2.05
97.50°	2.13	2.02	2.25	1.58	2.23	2.29	1.84	1.63	2.07	2.43	1.82	2.51	2.06	2.18	1.87	2.13	2.13
100.00°	2.26	2.19	2.15	1.71	2.42	2.10	1.81	1.83	2.23	2.36	2.33	2.07	2.05	1.89	1.60	2.17	2.26

Coefficients of Utilization – Zonal Cavity Method

Values are lumens delivered to the workplane.

	ρfc	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	0%
	ρcc	80%	80%	80%	80%	70%	70%	70%	70%	50%	50%	50%	30%	30%	30%	10%	10%	10%	0%
	ρw	70%	50%	30%	10%	70%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	30%
	0	1612	1612	1612	1612	1573	1573	1573	1573	1500	1500	1500	1433	1433	1433	1372	1372	1372	1343
	1	1543	1508	1477	1449	1509	1478	1450	1424	1421	1399	1378	1368	1351	1335	1320	1307	1294	1280
	2	1476	1416	1367	1325	1446	1392	1347	1309	1347	1310	1279	1305	1275	1249	1266	1243	1222	1217
	3	1414	1336	1275	1227	1386	1316	1261	1216	1279	1233	1196	1246	1207	1175	1214	1183	1156	1160
	4	1355	1264	1198	1147	1331	1248	1187	1140	1218	1166	1125	1191	1146	1111	1165	1128	1097	1106
RCR	5	1300	1200	1131	1080	1278	1187	1123	1074	1163	1107	1064	1140	1091	1054	1118	1077	1044	1057
	6	1248	1143	1073	1022	1229	1132	1066	1018	1112	1054	1010	1092	1042	1003	1074	1030	995	1012
	7	1200	1091	1021	971	1183	1082	1016	968	1065	1006	963	1049	996	957	1033	987	951	970
	8	1156	1044	974	926	1140	1037	970	924	1022	962	920	1008	954	915	995	947	911	932
	9	1114	1002	933	886	1100	995	929	885	982	923	881	970	916	878	959	910	874	896
	10	1075	962	895	850	1062	956	892	849	945	887	846	935	881	843	925	876	841	863

Cone of Light

Mtg Height	Light Level	Beam Diameter
5.5 ft	133.6 fc	2.6 ft
6.5 ft	95.7 fc	3.1 ft
7.5 ft	71.9 fc	3.5 ft
8.0 ft	63.2 fc	3.8 ft
10.0 ft	40.4 fc	4.7 ft
12.0 ft	28.1 fc	5.6 ft
14.0 ft	20.6 fc	6.6 ft
16.0 ft	15.8 fc	7.5 ft
20.0 ft	10.1 fc	9.4 ft
24.0 ft	7.0 fc	11.3 ft
28.0 ft	5.2 fc	13.1 ft

Average Luminaire Luminance [cd/m²]

	0.00°	45.00°	90.00°
0.00°	383596	383596	383596
45.00°	7406	8814	7351
55.00°	4034	4222	3775
65.00°	3041	2982	2920
75.00°	2419	2006	2168
85.00°	2591	2379	2799

UGR CIE 190:2010

Ceiling reflectance		0.7	0.7	0.5	0.5	0.3	0.7	0.7	0.5	0.5	0.3
Wall reflectance		0.5	0.3	0.5	0.3	0.3	0.5	0.3	0.5	0.3	0.3
Plane reflectance		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Room dimensions		Viewed crosswise					Viewed endwise				
2H	2H	8.6	9.6	9.0	9.9	10.3	8.7	9.6	9.0	10.0	10.3
	3H	9.9	10.8	10.3	11.1	11.5	9.9	10.8	10.3	11.1	11.5
	4H	10.4	11.2	10.8	11.6	12.0	10.4	11.2	10.8	11.6	12.0
	6H	10.7	11.5	11.2	11.9	12.3	10.6	11.4	11.1	11.8	12.2
	8H	10.8	11.5	11.3	11.9	12.4	10.7	11.4	11.2	11.8	12.2
	12H	10.9	11.6	11.4	12.0	12.4	10.8	11.4	11.2	11.8	12.3
4H	2H	8.9	9.7	9.4	10.1	10.5	8.9	9.7	9.3	10.0	10.5
	3H	10.5	11.2	10.9	11.6	12.0	10.4	11.0	10.8	11.5	11.9
	4H	11.2	11.8	11.6	12.2	12.7	11.0	11.5	11.4	12.0	12.5
	6H	11.7	12.2	12.2	12.6	13.1	11.3	11.8	11.8	12.3	12.8
	8H	11.8	12.3	12.3	12.8	13.3	11.4	11.9	11.9	12.3	12.8
	12H	12.0	12.4	12.5	12.9	13.4	11.5	11.9	12.1	12.4	12.9
8H	4H	11.3	11.8	11.8	12.2	12.7	11.0	11.5	11.5	12.0	12.5
	6H	12.0	12.3	12.5	12.9	13.4	11.5	11.9	12.0	12.4	12.9
	8H	12.2	12.6	12.8	13.1	13.6	11.7	12.0	12.2	12.5	13.0
	12H	12.5	12.8	13.0	13.3	13.9	11.9	12.2	12.5	12.7	13.3
12H	4H	11.3	11.7	11.8	12.2	12.7	11.0	11.4	11.5	11.9	12.4
	6H	12.0	12.3	12.5	12.8	13.4	11.5	11.8	12.1	12.3	12.9
	8H	12.3	12.6	12.8	13.1	13.7	11.7	12.0	12.3	12.5	13.1

Corrected UGR values based on total output energy
SHR = 1.0

Corrected UGR values based on total output lumens

SHR = 1.0