Indoor Distribution Test Report

Spectrum Lighting Inc.

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Spectrum Lighting Photometric Lab

Luminaire

CF04XXPC 20L 35K ND XX CL XX

Nom 4" diam Gamma Cylinder, ND optic, clear glass lens

Test Number

SP-01069

Test Date

1/31/2020

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

Summary of Results

Power

Input Watts	12.9 W

Lumen Output

Output Lumens	1439
Efficacy	111.54 lm/W

Luminous Dimensions

0° - 180° Size	-0.33
90° - 270° Size	-0.33
Height	0

Spacing Criterion

Two luminaires, plane 0°	0.33
Two luminaires, plane 90°	0.33
Four luminaires	0.34

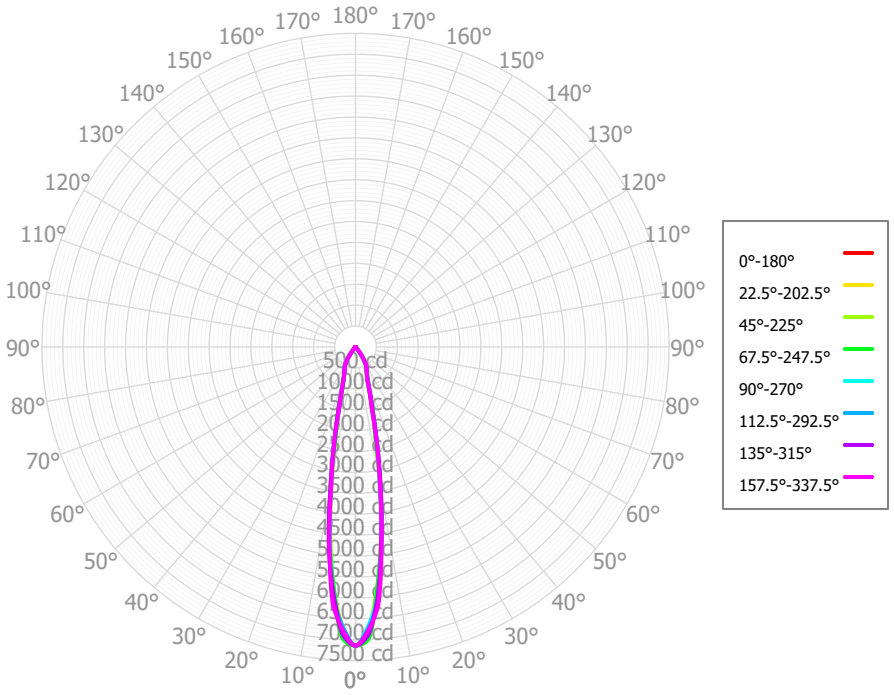
Full Beam Angle

0° - 180°	20°
90° - 270°	19°

IES File Header Contents

Keyword	Value
TEST	SP-01069
TESTLAB	Spectrum Lighting Photometric Lab, VLS-245-981
MANUFAC	Spectrum Lighting
TESTDATE	1/31/2020
ISSUEDATE	12/7/2020
LUMCAT	CF04XXPC 20L 35K ND XX CL XX
LUMINAIRE	Nom 4" diam Gamma Cylinder, ND optic, clear glass lens
OTHER	Beam Angle: 19.6 deg
LAMPCAT	N/A
LAMP	N/A
OTHER	CCT Output Multipliers: 27K x 0.972, 30K x 0.981, 40K x 1.04, 27HK x 0.89, 30HK x 0.83
OTHER	Total luminaire wattage is approximate
OTHER	This report prepared by Spectrum Lighting
_CRI	80
_CCTMULT	27K x 0.972, 30K x 0.981, 40K x 1.04
_CCTMULTA	27HK x 0.89, 30HK x 0.83
_LAMPMULT	10L x 0.5, 15L x 0.74

Candela Polar Plot



Zonal Lumen Summary

Zone	Lumens	% Fixture	Zone	Lumens	% Fixture
0.00° - 10.00°	486.07	33.78%	90.00° - 100.00°	0.09	0.01%
10.00° - 20.00°	459.05	31.90%	100.00° - 110.00°	0.00	0.00%
20.00° - 30.00°	294.99	20.50%	100.00° - 120.00°	0.00	0.00%
30.00° - 40.00°	167.85	11.67%	120.00° - 130.00°	0.00	0.00%
40.00° - 50.00°	16.36	1.14%	130.00° - 140.00°	0.00	0.00%
50.00° - 60.00°	7.41	0.51%	140.00° - 150.00°	0.00	0.00%
60.00° - 70.00°	3.36	0.23%	150.00° - 160.00°	0.00	0.00%
70.00° - 80.00°	2.13	0.15%	160.00° - 170.00°	0.00	0.00%
80.00° - 90.00°	1.58	0.11%	170.00° - 180.00°	0.00	0.00%
0.00° - 90.00°	1438.78	99.99%	0.00° - 180.00°	1438.87	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°	7143.11	7143.11	7143.11	7143.11	7143.11	7143.11	7143.11	7143.11	7143.11	7143.11	7143.11	7143.11	7143.11	7143.11	7143.11	7143.11	7143.11
2.50°	6968.59	6773.26	6817.88	7007.42	6711.62	6737.08	6897.30	6791.36	6951.55	6725.46	6792.35	6987.29	6729.91	6764.01	6908.82	6798.01	6968.59
5.00°	5957.07	6061.18	5843.07	5849.30	6034.42	6022.95	5975.75	6184.89	5907.36	5921.60	5900.59	5857.37	6114.02	6131.34	6033.80	6218.07	5957.07
7.50°	4690.82	4664.26	4731.77	4689.07	4729.35	4755.34	4865.91	4791.58	4798.24	4722.59	4613.27	4719.09	4726.34	4739.86	4714.18	4775.35	4690.82
10.00°	3454.43	3386.02	3378.72	3452.37	3337.78	3344.02	3462.47	3327.58	3440.17	3301.24	3409.77	3451.02	3380.61	3421.13	3492.94	3362.42	3454.43
12.50°	2226.82	2338.42	2266.46	2215.10	2403.93	2374.67	2321.07	2381.31	2229.95	2297.43	2257.89	2181.24	2409.19	2421.25	2340.37	2399.19	2226.82
15.00°	1566.99	1508.13	1591.12	1643.69	1538.64	1523.99	1598.01	1487.28	1606.36	1534.28	1541.66	1598.09	1496.51	1534.03	1585.10	1471.54	1566.99
17.50°	1082.94	1117.94	1075.66	1081.02	1152.15	1120.27	1067.41	1122.60	1066.88	1093.98	1100.20	1027.91	1142.08	1159.27	1117.84	1137.79	1082.94
20.00°	856.78	820.23	862.27	888.87	840.93	843.27	851.40	814.93	873.06	844.27	848.32	857.80	810.97	830.95	843.82	816.17	856.78
22.50°	712.94	714.62	701.59	705.12	723.97	715.59	692.28	708.96	704.18	704.97	720.71	699.09	716.69	727.75	713.11	720.55	712.94
25.00°	638.36	627.01	642.95	646.96	639.01	631.64	629.88	626.09	644.10	633.47	638.49	642.09	625.43	632.17	628.85	626.65	638.36
27.50°	586.56	577.74	578.25	592.38	573.82	566.16	562.84	563.80	579.75	562.54	586.72	588.59	568.56	575.09	579.83	572.38	586.56
30.00°	496.74	508.74	501.50	500.06	512.14	506.27	487.72	504.01	496.10	491.99	499.74	492.52	506.92	508.04	497.29	515.66	496.74
32.50°	393.79	395.86	407.24	406.44	396.18	396.31	394.98	389.50	404.33	387.08	388.57	394.73	386.36	388.56	388.35	393.52	393.79
35.00°	275.41	281.56	276.74	280.08	270.18	270.43	270.80	267.71	274.40	260.06	271.47	269.63	266.86	270.33	272.49	271.84	275.41
37.50°	151.56	164.05	162.54	152.26	163.75	163.80	161.93	164.08	154.09	155.40	150.13	143.15	161.55	159.13	151.06	164.65	151.56
40.00°	79.87	71.19	82.95	85.66	61.10	63.47	81.48	63.00	82.03	65.70	73.93	80.32	61.00	60.20	73.36	59.24	79.87
42.50°	27.28	36.09	25.28	22.16	28.58	26.98	25.15	31.42	20.42	23.12	30.69	21.09	35.12	33.56	31.68	34.71	27.28
45.00°	11.06	10.61	15.37	13.06	10.52	12.04	14.73	10.45	13.46	12.81	10.80	13.39	10.56	10.53	11.17	10.55	11.06
47.50°	8.77	8.27	8.28	7.04	7.77	8.11	7.67	7.27	7.48	8.40	8.35	8.93	9.01	9.76	8.74	8.74	8.77
50.00°	8.73	7.03	7.59	7.41	8.30	8.09	7.16	6.93	6.87	8.12	7.81	8.82	7.57	9.32	7.97	6.96	8.73
52.50°	9.56	8.58	7.56	8.20	8.52	7.41	7.11	7.93	6.57	8.27	8.76	9.03	7.92	11.13	8.66	8.55	9.56
55.00°	9.68	9.21	9.03	9.84	8.67	6.48	7.98	9.15	8.13	8.72	9.10	9.13	8.21	12.25	8.97	10.14	9.68
57.50°	9.49	7.48	9.31	11.55	7.63	5.62	7.77	7.82	9.08	7.91	8.96	9.22	7.07	8.52	8.93	9.66	9.49
60.00°	7.89	5.67	6.70	7.69	6.32	4.77	5.32	6.06	6.25	6.15	7.38	6.83	5.91	5.04	7.51	9.17	7.89
62.50°	5.69	3.60	4.39	3.38	4.50	3.56	3.30	4.68	3.66	4.36	4.61	4.22	4.33	3.47	4.82	6.27	5.69
65.00°	4.18	2.12	2.78	2.42	2.56	2.21	2.12	3.37	2.39	2.54	2.88	2.81	2.79	2.15	3.47	3.36	4.18
67.50°	2.98	2.10	1.73	1.75	2.02	1.73	1.52	3.15	1.49	1.95	1.97	1.50	2.45	2.55	3.39	3.45	2.98
70.00°	2.13	1.95	1.72	2.11	1.72	1.49	1.67	2.97	1.67	2.11	2.11	1.81	2.21	2.79	3.16	3.53	2.13
72.50°	1.37	1.60	1.56	2.04	1.65	1.41	1.67	2.36	1.56	2.01	2.77	2.13	2.60	2.55	2.83	3.67	1.37
75.00°	1.69	1.35	1.28	1.12	1.71	1.67	1.62	1.87	1.25	1.76	2.50	2.32	2.83	2.29	2.50	3.68	1.69
77.50°	1.83	1.21	2.15	1.26	1.86	2.30	1.58	1.56	1.47	1.18	2.07	2.55	2.87	2.04	2.15	3.50	1.83
80.00°	1.73	1.34	2.45	1.38	1.54	1.39	1.36	1.64	1.51	1.23	1.57	2.67	2.81	2.18	1.75	2.29	1.73
82.50°	1.64	1.68	2.12	1.34	1.68	1.47	1.43	1.86	1.58	1.24	1.63	2.27	2.96	2.10	1.89	1.34	1.64
85.00°	1.73	0.94	1.63	1.25	1.25	0.76	1.80	1.26	1.04	1.58	0.74	1.72	2.33	1.89	1.63	1.09	1.73
87.50°	1.04	1.74	1.88	1.15	0.94	1.38	1.10	0.96	0.93	1.52	1.27	1.58	1.86	1.90	1.14	1.69	1.04
90.00°	1.46	1.06	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	1.57	1.48	0.96	1.08	1.46
92.50°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95.00°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
97.50°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
102.50°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
105.00°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
107.50°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
110.00°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.50°	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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%
RCR	0	1713	1713	1713	1713	1673	1673	1673	1673	1599	1599	1599	1531	1531	1531	1468	1468	1468	1439
	1	1649	1616	1586	1560	1615	1585	1559	1535	1528	1507	1488	1475	1459	1444	1426	1414	1402	1386
	2	1588	1531	1484	1445	1558	1507	1465	1429	1462	1427	1398	1420	1393	1368	1381	1360	1340	1334
	3	1530	1457	1400	1354	1504	1437	1385	1344	1401	1358	1323	1368	1332	1302	1337	1308	1283	1284
	4	1476	1390	1328	1280	1452	1375	1317	1273	1346	1297	1258	1319	1278	1244	1294	1259	1230	1236
	5	1424	1331	1266	1218	1404	1318	1258	1212	1295	1242	1202	1273	1227	1192	1252	1213	1182	1192
	6	1377	1278	1211	1163	1358	1267	1205	1160	1248	1193	1152	1229	1181	1145	1212	1170	1138	1151
	7	1332	1229	1162	1116	1315	1220	1158	1113	1204	1148	1108	1189	1139	1102	1174	1130	1097	1112
	8	1290	1185	1119	1073	1275	1177	1115	1071	1164	1107	1067	1151	1100	1063	1138	1093	1059	1077
	9	1250	1144	1079	1035	1237	1138	1076	1034	1126	1070	1031	1115	1064	1028	1105	1059	1025	1043
	10	1213	1107	1043	1001	1201	1102	1041	1000	1091	1036	997	1082	1031	995	1073	1026	993	1012

Cone of Light

Mtg Height	Light Level	Beam Diameter
5.5 ft	236.1 fc	1.9 ft
6.5 ft	169.1 fc	2.2 ft
7.5 ft	127.0 fc	2.6 ft
8.0 ft	111.6 fc	2.7 ft
10.0 ft	71.4 fc	3.4 ft
12.0 ft	49.6 fc	4.1 ft
14.0 ft	36.4 fc	4.8 ft
16.0 ft	27.9 fc	5.5 ft
20.0 ft	17.9 fc	6.8 ft
24.0 ft	12.4 fc	8.2 ft
28.0 ft	9.1 fc	9.5 ft

Average Luminaire Luminance [cd/m²]

	0.00°	45.00°	90.00°
0.00°	898959	898959	898959
45.00°	1969	2735	1873
55.00°	2123	1982	1902
65.00°	1245	829	762
75.00°	820	623	832
85.00°	2495	2356	1803

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	3.3	4.2	3.6	4.5	4.8	2.2	3.1	2.5	3.4	3.7
	3H	3.7	4.5	4.0	4.8	5.2	2.4	3.2	2.7	3.5	3.9
	4H	3.9	4.6	4.3	5.0	5.4	2.8	3.5	3.2	3.9	4.3
	6H	4.3	5.0	4.7	5.3	5.7	3.7	4.4	4.1	4.8	5.2
	8H	4.5	5.2	5.0	5.6	6.0	4.3	5.0	4.8	5.4	5.8
	12H	4.9	5.5	5.4	5.9	6.4	5.0	5.6	5.4	5.9	6.4
4H	2H	3.2	3.9	3.6	4.3	4.7	2.1	2.8	2.5	3.1	3.5
	3H	3.8	4.4	4.2	4.8	5.2	2.4	3.0	2.8	3.4	3.8
	4H	4.3	4.9	4.8	5.3	5.7	3.1	3.6	3.5	4.0	4.5
	6H	5.0	5.5	5.5	5.9	6.4	4.4	4.8	4.9	5.3	5.8
	8H	5.4	5.8	5.8	6.2	6.7	5.2	5.6	5.7	6.1	6.5
	12H	5.9	6.2	6.4	6.7	7.2	6.0	6.3	6.5	6.8	7.3
8H	4H	4.5	4.9	4.9	5.3	5.8	3.3	3.7	3.8	4.2	4.6
	6H	5.4	5.7	5.9	6.2	6.7	4.8	5.2	5.3	5.7	6.1
	8H	5.9	6.2	6.4	6.7	7.2	5.8	6.1	6.3	6.6	7.1
	12H	6.5	6.8	7.1	7.3	7.9	6.8	7.0	7.3	7.5	8.1
12H	4H	4.5	4.9	5.0	5.3	5.8	3.3	3.7	3.8	4.1	4.6
	6H	5.5	5.8	6.1	6.3	6.8	4.9	5.2	5.4	5.7	6.2
	8H	6.1	6.4	6.6	6.9	7.5	6.0	6.2	6.5	6.7	7.3

Corrected UGR values based on total output energy
SHR = 1.0

Corrected UGR values based on total output lumens

SHR = 1.0