

## **Indoor Distribution Test Report**

# **Spectrum Lighting Inc.**

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## **Spectrum Lighting Photometric Lab**

### **Luminaire**

CF04XXPC 20L 35K ND XX NL XX  
Nom 4" diam Gamma Cylinder, ND optic, no lens

### **Test Number**

SP-01069\_1

### **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
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#### Lumen Output

Output Lumens	1576
Efficacy	122.15 lm/W

#### Luminous Dimensions

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

#### Spacing Criterion

Two luminaires, plane 0°	0.32
Two luminaires, plane 90°	0.32
Four luminaires	0.33

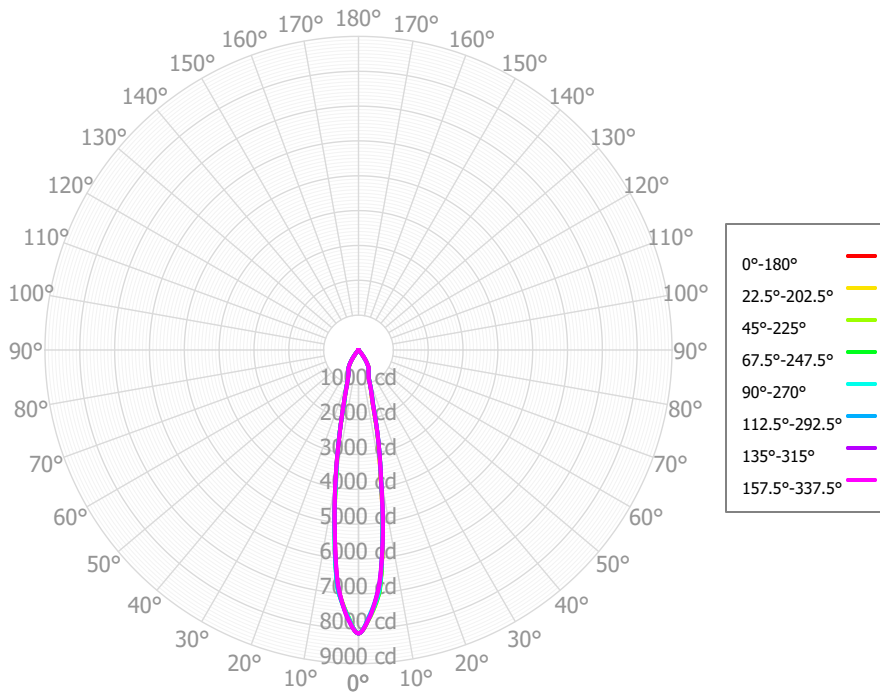
#### Full Beam Angle

0° - 180°	19°
90° - 270°	19°

### IES File Header Contents

Keyword	Value
TEST	SP-01069_1
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 NL XX
LUMINAIRE	Nom 4" diam Gamma Cylinder, ND optic, no lens
OTHER	Beam Angle: 18.9 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°	544.36	34.55%	90.00° - 100.00°	0.06	0.00%
10.00° - 20.00°	493.94	31.35%	100.00° - 110.00°	0.00	0.00%
20.00° - 30.00°	319.19	20.26%	100.00° - 120.00°	0.00	0.00%
30.00° - 40.00°	197.58	12.54%	120.00° - 130.00°	0.00	0.00%
40.00° - 50.00°	14.77	0.94%	130.00° - 140.00°	0.00	0.00%
50.00° - 60.00°	1.25	0.08%	140.00° - 150.00°	0.00	0.00%
60.00° - 70.00°	1.70	0.11%	150.00° - 160.00°	0.00	0.00%
70.00° - 80.00°	1.65	0.10%	160.00° - 170.00°	0.00	0.00%
80.00° - 90.00°	1.26	0.08%	170.00° - 180.00°	0.00	0.00%
0.00° - 90.00°	1575.70	100.00%	0.00° - 180.00°	1575.77	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°	8134.95	8134.95	8134.95	8134.95	8134.95	8134.95	8134.95	8134.95	8134.95	8134.95	8134.95	8134.95	8134.95	8134.95	8134.95	8134.95	8134.95
2.50°	7634.10	7644.73	7679.50	7646.49	7642.29	7627.50	7672.69	7645.74	7610.50	7607.83	7572.64	7590.75	7593.68	7587.69	7647.06	7645.31	7634.10
5.00°	6917.51	6926.41	6966.14	6954.86	6915.65	6852.04	6763.99	6772.39	6820.31	6802.51	6841.57	6884.16	6884.85	6825.22	6762.38	6812.33	6917.51
7.50°	5314.94	5324.48	5282.48	5289.52	5275.84	5258.22	5215.26	5214.36	5226.25	5216.02	5247.81	5260.31	5268.70	5291.30	5355.71	5355.22	5314.94
10.00°	3615.32	3610.11	3734.31	3723.07	3751.54	3787.75	3802.31	3796.07	3762.14	3757.44	3632.18	3694.10	3673.21	3680.04	3724.64	3698.95	3615.32
12.50°	2543.28	2539.56	2546.11	2572.47	2585.86	2579.37	2510.00	2534.84	2564.72	2545.18	2556.22	2574.82	2588.53	2607.11	2600.52	2581.98	2543.28
15.00°	1522.25	1521.80	1619.51	1618.67	1651.78	1665.80	1682.79	1681.82	1664.08	1646.89	1556.39	1592.59	1598.35	1584.96	1622.04	1571.16	1522.25
17.50°	1172.66	1170.75	1176.76	1198.01	1207.42	1199.10	1156.70	1165.15	1199.29	1183.51	1192.77	1201.50	1204.88	1207.61	1191.44	1176.59	1172.66
20.00°	856.26	849.91	873.14	882.50	889.82	892.37	892.54	885.48	894.97	886.97	876.92	884.25	873.23	867.67	856.90	843.32	856.26
22.50°	761.68	759.16	757.83	767.87	766.32	762.47	751.09	749.67	765.12	759.47	772.45	771.12	768.33	768.80	756.30	755.89	761.68
25.00°	678.49	678.40	681.34	684.62	681.52	681.89	681.90	679.14	682.71	679.51	681.96	681.08	680.57	681.13	674.01	674.38	678.49
27.50°	638.77	640.16	643.31	644.52	639.93	641.84	635.73	636.61	638.09	635.33	630.90	635.26	634.42	635.13	630.94	633.95	638.77
30.00°	580.66	583.89	575.67	574.99	566.10	561.74	549.89	547.68	550.74	545.39	555.16	559.03	562.64	568.55	581.72	583.17	580.66
32.50°	475.63	478.24	486.58	475.84	465.90	457.77	456.07	445.46	438.34	430.60	430.59	440.31	446.38	451.44	461.38	467.99	475.63
35.00°	356.96	360.46	360.89	351.48	339.65	327.62	316.22	308.82	307.83	298.33	300.88	311.65	319.87	326.82	338.35	347.86	356.96
37.50°	213.92	219.26	215.83	208.27	197.69	186.45	171.81	166.16	169.85	159.45	163.90	172.85	180.51	189.00	200.83	209.78	213.92
40.00°	104.38	109.20	116.65	109.41	101.76	95.60	88.61	86.52	86.07	80.48	70.94	80.99	84.49	87.21	84.59	95.45	104.38
42.50°	38.06	42.31	34.32	34.44	25.42	19.12	10.92	12.13	17.41	16.52	24.30	24.26	28.39	31.15	37.79	39.31	38.06
45.00°	4.26	6.71	11.51	9.08	5.49	5.03	5.65	6.55	4.65	5.32	3.17	3.09	4.27	3.40	4.86	3.27	4.26
47.50°	1.63	2.86	2.76	2.64	1.58	1.51	1.12	1.40	1.03	1.50	1.70	1.40	1.95	2.35	2.98	1.83	1.63
50.00°	0.74	1.33	1.77	1.35	0.94	1.17	1.20	1.16	1.00	1.17	1.34	1.00	1.23	1.80	1.73	1.09	0.74
52.50°	1.07	1.56	1.80	1.33	0.87	1.08	1.30	0.98	1.21	1.01	1.60	1.09	1.30	1.59	1.49	1.24	1.07
55.00°	1.25	1.56	1.46	1.43	0.94	1.51	1.49	1.09	1.41	1.24	1.53	1.41	1.59	1.51	1.52	1.36	1.25
57.50°	1.35	1.43	1.12	1.54	1.02	1.89	1.63	1.26	1.57	1.42	1.34	1.80	1.96	1.50	1.86	1.46	1.35
60.00°	1.55	1.16	1.27	1.57	1.22	1.57	1.63	1.62	1.40	1.22	1.83	1.34	1.89	1.52	2.01	1.75	1.55
62.50°	1.79	0.84	1.47	1.58	1.38	1.30	1.81	2.18	1.26	1.09	2.50	0.77	1.73	1.54	2.00	2.16	1.79
65.00°	1.56	0.89	1.96	1.36	1.16	1.26	2.30	3.21	1.27	1.30	2.95	1.39	2.03	1.37	1.87	2.22	1.56
67.50°	1.21	1.04	2.27	1.17	0.99	1.30	2.55	3.69	1.20	1.40	3.36	2.03	2.37	1.17	1.66	2.09	1.21
70.00°	1.11	1.19	1.97	1.09	1.05	1.57	2.53	3.41	0.96	1.26	2.85	1.82	1.84	1.24	1.55	2.37	1.11
72.50°	1.07	1.35	1.92	1.16	1.09	1.48	2.27	2.65	0.96	1.39	2.43	1.73	1.50	1.40	1.49	2.71	1.07
75.00°	1.19	1.59	2.18	1.45	1.08	1.08	1.91	1.73	1.17	1.77	2.32	1.90	1.74	1.86	1.64	1.96	1.19
77.50°	0.98	1.51	1.50	0.96	1.28	0.90	1.55	1.59	1.05	1.46	1.85	1.68	1.95	1.63	1.67	1.48	0.98
80.00°	0.64	1.30	1.29	1.02	1.05	0.91	1.12	1.33	0.91	1.53	1.36	1.40	1.93	1.16	1.49	1.33	0.64
82.50°	0.77	1.24	1.53	1.41	0.77	0.87	1.54	1.09	1.40	1.65	1.18	1.31	1.47	1.34	1.37	1.40	0.77
85.00°	1.18	1.41	1.30	1.27	0.99	1.03	1.81	1.15	1.61	1.23	1.36	0.75	1.68	1.39	1.08	1.24	1.18
87.50°	1.17	1.03	1.40	1.39	1.11	1.20	1.26	1.61	0.92	0.83	1.38	1.11	1.55	1.20	1.00	1.22	1.17
90.00°	0.79	0.74	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	1.12	0.91	0.93	1.19	0.93	0.79
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.

<b>RCR</b>	<b>pfc</b>	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	0%
	<b>pcc</b>	80%	80%	80%	80%	70%	70%	70%	70%	50%	50%	50%	30%	30%	30%	10%	10%	0%
	<b>pw</b>	70%	50%	30%	10%	70%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	30%
	<b>0</b>	1876	1876	1876	1876	1832	1832	1832	1832	1751	1751	1751	1676	1676	1676	1608	1608	1576
	<b>1</b>	1807	1771	1739	1710	1769	1738	1709	1683	1675	1652	1632	1617	1599	1583	1563	1550	1520
	<b>2</b>	1741	1680	1629	1586	1708	1653	1608	1569	1604	1567	1535	1558	1528	1502	1516	1492	1464
	<b>3</b>	1678	1599	1537	1488	1650	1578	1522	1477	1539	1492	1454	1502	1464	1431	1468	1437	1410
	<b>4</b>	1620	1527	1460	1408	1594	1510	1448	1400	1479	1426	1384	1449	1404	1368	1422	1384	1359
	<b>5</b>	1564	1463	1392	1340	1542	1449	1383	1334	1423	1366	1323	1399	1350	1312	1376	1335	1312
	<b>6</b>	1512	1405	1333	1281	1492	1393	1326	1277	1372	1313	1269	1352	1300	1261	1333	1288	1267
	<b>7</b>	1463	1352	1280	1229	1445	1342	1274	1226	1324	1264	1220	1308	1254	1214	1292	1245	1225
	<b>8</b>	1417	1303	1232	1183	1401	1295	1228	1180	1280	1219	1176	1266	1212	1172	1253	1204	1186
	<b>9</b>	1374	1259	1189	1141	1360	1252	1185	1139	1240	1179	1136	1228	1172	1133	1216	1166	1149
	<b>10</b>	1334	1218	1149	1103	1321	1213	1147	1102	1202	1141	1099	1191	1136	1097	1181	1131	1115

### Cone of Light

Mtg Height	Light Level	Beam Diameter
5.5 ft	268.9 fc	1.8 ft
6.5 ft	192.5 fc	2.2 ft
7.5 ft	144.6 fc	2.5 ft
8.0 ft	127.1 fc	2.7 ft
10.0 ft	81.3 fc	3.3 ft
12.0 ft	56.5 fc	4.0 ft
14.0 ft	41.5 fc	4.6 ft
16.0 ft	31.8 fc	5.3 ft
20.0 ft	20.3 fc	6.6 ft
24.0 ft	14.1 fc	8.0 ft
28.0 ft	10.4 fc	9.3 ft

### Average Luminaire Luminance [cd/m²]

	0.00°	45.00°	90.00°
<b>0.00°</b>	1023781	1023781	1023781
<b>45.00°</b>	758	2048	977
<b>55.00°</b>	273	320	207
<b>65.00°</b>	463	583	344
<b>75.00°</b>	580	1061	527
<b>85.00°</b>	1699	1884	1435

### UGR CIE 190:2010

<b>Ceiling reflectance</b>		<b>0.7</b>	<b>0.7</b>	<b>0.5</b>	<b>0.5</b>	<b>0.3</b>	<b>0.7</b>	<b>0.7</b>	<b>0.5</b>	<b>0.5</b>	<b>0.3</b>
<b>Wall reflectance</b>		<b>0.5</b>	<b>0.3</b>	<b>0.5</b>	<b>0.3</b>	<b>0.3</b>	<b>0.5</b>	<b>0.3</b>	<b>0.5</b>	<b>0.3</b>	<b>0.3</b>
<b>Plane reflectance</b>		<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>
<b>Room dimensions</b>		<b>Viewed crosswise</b>					<b>Viewed endwise</b>				
<b>2H</b>	<b>2H</b>	-9.6	-8.7	-9.2	-8.4	-8.0	-8.1	-7.2	-7.8	-6.9	-6.6
	<b>3H</b>	-6.0	-5.2	-5.6	-4.9	-4.5	-4.8	-4.0	-4.4	-3.7	-3.3
	<b>4H</b>	-4.2	-3.5	-3.8	-3.1	-2.7	-3.4	-2.7	-3.0	-2.3	-1.9
	<b>6H</b>	-3.1	-2.4	-2.7	-2.1	-1.7	-1.5	-0.8	-1.1	-0.4	0.0
	<b>8H</b>	-2.6	-1.9	-2.1	-1.5	-1.1	-0.7	-0.1	-0.3	0.3	0.7
	<b>12H</b>	-1.4	-0.8	-0.9	-0.4	0.0	0.2	0.8	0.7	1.2	1.7
<b>4H</b>	<b>2H</b>	-7.8	-7.1	-7.4	-6.7	-6.3	-6.0	-5.3	-5.6	-4.9	-4.5
	<b>3H</b>	-4.0	-3.4	-3.6	-3.0	-2.6	-2.9	-2.3	-2.5	-1.9	-1.5
	<b>4H</b>	-2.1	-1.6	-1.6	-1.1	-0.7	-1.5	-1.0	-1.1	-0.6	-0.1
	<b>6H</b>	-0.9	-0.4	-0.4	0.0	0.5	0.1	0.6	0.6	1.0	1.5
	<b>8H</b>	-0.3	0.2	0.2	0.6	1.1	0.9	1.3	1.4	1.8	2.2
	<b>12H</b>	0.9	1.2	1.4	1.7	2.2	1.9	2.2	2.4	2.7	3.2
<b>8H</b>	<b>4H</b>	-1.3	-0.9	-0.8	-0.4	0.1	-0.7	-0.3	-0.2	0.2	0.7
	<b>6H</b>	0.3	0.6	0.8	1.1	1.6	1.0	1.4	1.5	1.9	2.3
	<b>8H</b>	1.2	1.5	1.8	2.0	2.5	1.9	2.2	2.4	2.7	3.2
	<b>12H</b>	2.6	2.9	3.1	3.4	3.9	3.0	3.2	3.5	3.7	4.3
<b>12H</b>	<b>4H</b>	-1.2	-0.8	-0.7	-0.3	0.2	-0.6	-0.2	-0.1	0.3	0.8
	<b>6H</b>	0.6	0.9	1.2	1.4	1.9	1.3	1.5	1.8	2.0	2.6
	<b>8H</b>	1.7	2.0	2.2	2.5	3.0	2.2	2.5	2.8	3.0	3.6

Corrected UGR values based on total output energy  
 SHR = 1.0

Corrected UGR values based on total output lumens

SHR = 1.0