Indoor Distribution Test Report

Spectrum Lighting Inc.

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Spectrum Lighting Photometric Lab

Luminaire

CF04XXPC 20L 35K XW XX CL XX

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

Test Number

SP-01071

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	1468
Efficacy	113.82 lm/W

Luminous Dimensions

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

Spacing Criterion

Two luminaires, plane 0°	0.98
Two luminaires, plane 90°	1
Four luminaires	0.88

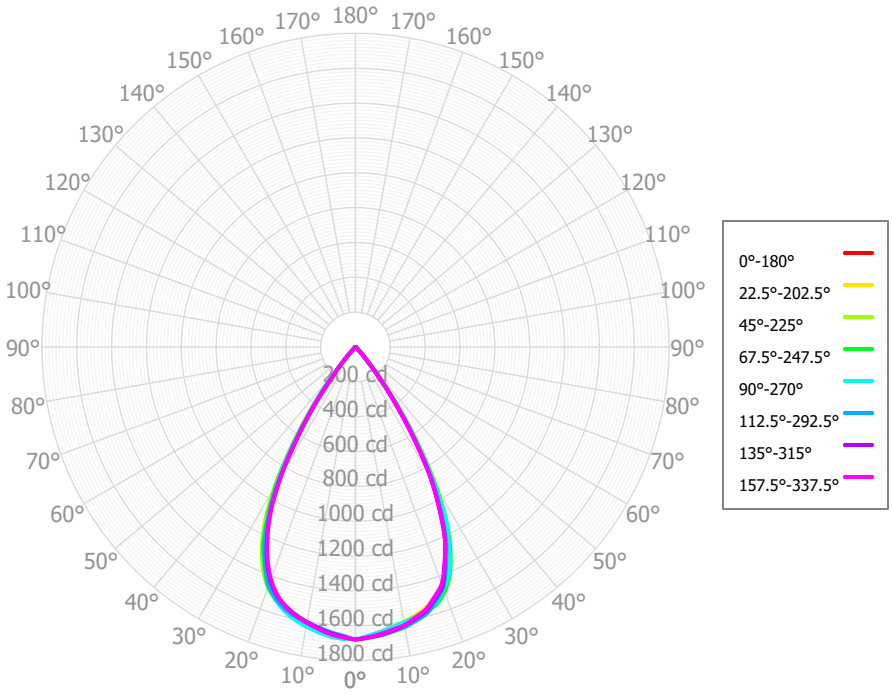
Full Beam Angle

0° - 180°	61°
90° - 270°	61°

IES File Header Contents

Keyword	Value
TEST	SP-01071
TESTLAB	Spectrum Lighting Photometric Lab, VLS-245-981
MANUFAC	Spectrum Lighting
TESTDATE	1/31/2020
ISSUEDATE	12/8/2020
LUMCAT	CF04XXPC 20L 35K XW XX CL XX
LUMINAIRE	Nom 4" diam Gamma Cylinder, XW optic, clear glass lens
OTHER	Beam Angle: 61.1 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°	158.92	10.82%	90.00° - 100.00°	0.11	0.01%
10.00° - 20.00°	436.88	29.76%	100.00° - 110.00°	0.00	0.00%
20.00° - 30.00°	553.88	37.72%	100.00° - 120.00°	0.00	0.00%
30.00° - 40.00°	281.92	19.20%	120.00° - 130.00°	0.00	0.00%
40.00° - 50.00°	27.02	1.84%	130.00° - 140.00°	0.00	0.00%
50.00° - 60.00°	3.46	0.24%	140.00° - 150.00°	0.00	0.00%
60.00° - 70.00°	2.33	0.16%	150.00° - 160.00°	0.00	0.00%
70.00° - 80.00°	2.08	0.14%	160.00° - 170.00°	0.00	0.00%
80.00° - 90.00°	1.62	0.11%	170.00° - 180.00°	0.00	0.00%
0.00° - 90.00°	1468.11	99.99%	0.00° - 180.00°	1468.22	100.00%

SPECTRUM LIGHTING INC.

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°	1677.80	1677.80	1677.80	1677.80	1677.80	1677.80	1677.80	1677.80	1677.80	1677.80	1677.80	1677.80	1677.80	1677.80	1677.80	1677.80	1677.80
2.50°	1670.86	1672.02	1665.46	1660.52	1659.46	1659.33	1663.74	1668.65	1669.70	1673.39	1674.41	1674.96	1677.28	1669.44	1669.60	1668.52	1670.86
5.00°	1656.49	1653.46	1645.74	1642.99	1641.41	1643.40	1649.22	1655.10	1656.29	1659.51	1664.62	1667.17	1665.28	1661.94	1659.02	1653.21	1656.49
7.50°	1635.41	1630.27	1624.34	1622.76	1622.12	1623.84	1627.21	1632.42	1634.96	1638.51	1643.96	1647.69	1650.73	1647.53	1641.85	1637.03	1635.41
10.00°	1613.27	1606.36	1602.78	1605.10	1605.84	1604.25	1603.33	1608.42	1611.41	1614.59	1621.02	1625.52	1630.06	1632.61	1623.28	1620.73	1613.27
12.50°	1586.06	1579.58	1582.86	1591.59	1589.89	1584.57	1576.36	1581.51	1583.38	1584.75	1592.39	1594.29	1604.64	1609.29	1596.58	1591.01	1586.06
15.00°	1558.42	1552.59	1562.30	1573.19	1566.26	1558.32	1541.90	1545.13	1549.19	1551.50	1561.02	1561.83	1570.57	1583.50	1568.81	1560.17	1558.42
17.50°	1508.78	1507.75	1524.91	1548.62	1540.93	1517.03	1497.86	1492.86	1505.76	1513.03	1524.56	1514.73	1522.52	1531.39	1516.66	1506.18	1508.78
20.00°	1455.88	1459.90	1481.51	1495.57	1476.90	1455.00	1426.57	1420.12	1443.12	1456.96	1469.16	1466.35	1455.32	1470.21	1461.97	1447.74	1455.88
22.50°	1353.27	1364.68	1387.81	1415.06	1406.24	1357.94	1328.69	1321.41	1358.62	1380.08	1387.45	1362.86	1357.32	1356.09	1339.93	1336.18	1353.27
25.00°	1243.20	1260.78	1281.84	1289.77	1273.31	1232.49	1200.79	1196.96	1241.26	1267.35	1272.01	1254.49	1227.20	1229.58	1213.62	1215.79	1243.20
27.50°	1077.47	1097.24	1114.62	1131.60	1124.82	1070.80	1050.58	1047.60	1094.52	1122.30	1120.88	1086.97	1068.19	1057.54	1037.73	1043.20	1077.47
30.00°	899.34	920.27	929.71	917.45	896.81	872.58	853.53	857.92	898.55	922.20	925.72	911.09	885.51	870.95	853.91	858.61	899.34
32.50°	666.74	687.71	687.06	671.41	668.66	637.76	629.45	637.65	669.10	683.80	694.00	685.36	677.66	647.20	623.99	629.51	666.74
35.00°	446.51	466.03	459.85	449.90	440.03	426.51	425.65	432.26	455.27	464.63	475.32	468.23	454.20	437.90	407.23	414.82	446.51
37.50°	262.82	276.16	268.35	238.67	243.59	233.26	230.48	235.38	249.38	255.65	264.87	284.65	279.96	256.44	238.77	238.63	262.82
40.00°	117.83	126.82	122.97	126.91	124.08	117.22	122.92	123.19	131.36	135.29	140.05	133.05	128.39	122.43	102.48	103.88	117.83
42.50°	57.64	62.70	58.81	44.55	40.46	45.68	41.70	46.71	47.01	49.21	55.33	67.30	60.47	57.02	51.18	49.61	57.64
45.00°	17.74	20.32	18.63	20.94	20.98	17.66	19.20	20.20	20.54	21.41	23.89	20.94	21.18	18.93	15.43	15.11	17.74
47.50°	10.84	11.97	10.27	9.17	8.61	8.76	8.80	9.15	9.43	9.25	11.02	12.41	10.15	10.89	9.62	9.39	10.84
50.00°	6.21	6.46	5.54	5.89	5.82	5.68	6.14	5.91	6.55	5.94	7.08	6.60	5.64	6.47	5.73	5.66	6.21
52.50°	4.37	4.41	4.48	3.55	4.22	4.41	4.37	4.26	5.05	4.20	5.26	4.87	4.78	5.18	4.61	4.20	4.37
55.00°	3.36	3.14	3.83	3.09	3.84	3.59	3.62	3.34	3.91	3.55	3.94	3.72	4.42	4.29	3.66	3.24	3.36
57.50°	3.13	2.58	3.52	2.70	3.25	2.87	2.93	2.50	2.80	3.00	2.70	3.25	3.65	3.67	2.90	2.72	3.13
60.00°	2.97	2.44	3.22	2.64	2.47	2.62	2.55	2.50	3.01	2.88	2.46	2.98	2.87	3.24	2.33	2.59	2.97
62.50°	2.84	2.60	2.93	2.57	2.05	2.42	2.18	2.52	3.20	2.76	2.29	2.90	2.56	2.90	1.94	2.72	2.84
65.00°	2.52	2.39	2.51	2.35	1.87	2.19	1.91	2.27	2.98	2.62	2.06	2.74	2.24	2.66	1.82	2.49	2.52
67.50°	2.08	1.98	2.03	2.15	1.74	2.00	1.69	2.07	2.66	2.49	1.86	2.53	1.88	2.46	1.87	2.06	2.08
70.00°	2.02	1.75	1.97	1.98	1.63	2.29	1.64	2.14	1.95	2.41	1.82	2.19	1.72	2.30	2.49	2.38	2.02
72.50°	2.08	1.58	1.98	1.82	1.50	2.37	1.58	2.20	1.60	2.15	1.74	1.79	2.30	2.23	3.33	2.88	2.08
75.00°	2.15	1.47	1.83	1.66	1.64	2.05	1.51	2.26	1.61	1.67	1.59	2.18	2.52	2.68	2.90	2.81	2.15
77.50°	2.02	1.60	1.91	1.64	2.00	1.82	1.85	1.70	1.39	1.43	1.54	2.49	2.37	2.19	2.35	2.29	2.02
80.00°	1.64	1.87	1.98	1.40	1.16	1.53	1.60	1.43	1.46	1.31	1.61	2.62	2.81	1.45	1.76	1.42	1.64
82.50°	1.25	1.66	1.47	1.18	1.43	1.20	1.38	1.47	1.56	1.52	1.57	2.31	2.72	1.60	1.89	1.00	1.25
85.00°	1.21	1.65	1.61	1.58	1.23	1.15	1.63	1.44	1.31	1.73	1.36	2.27	2.23	2.06	1.86	1.35	1.21
87.50°	1.17	1.46	1.77	1.50	1.11	1.59	1.58	1.57	1.35	1.75	1.41	1.67	2.03	1.61	1.44	1.19	1.17
90.00°	1.05	1.40	1.39	0.00	0.00	0.69	0.00	0.00	0.00	0.00	0.23	1.49	2.19	1.44	1.65	0.96	1.05
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	1748	1748	1748	1748	1707	1707	1707	1707	1631	1631	1631	1562	1562	1562	1498	1498	1498	1468
	1	1670	1630	1595	1563	1634	1599	1567	1539	1539	1514	1491	1485	1465	1447	1435	1419	1405	1391
	2	1592	1523	1467	1419	1560	1498	1447	1403	1451	1409	1373	1408	1373	1343	1367	1340	1315	1314
	3	1517	1427	1357	1302	1488	1406	1343	1291	1368	1315	1271	1333	1288	1251	1300	1263	1232	1239
	4	1445	1339	1262	1203	1419	1322	1251	1195	1291	1230	1181	1262	1210	1168	1235	1191	1154	1169
	5	1376	1259	1177	1117	1352	1245	1169	1112	1219	1153	1102	1195	1138	1092	1173	1123	1083	1103
	6	1311	1186	1102	1042	1290	1174	1096	1038	1153	1083	1031	1132	1071	1024	1113	1060	1017	1041
	7	1249	1119	1034	975	1230	1109	1029	972	1091	1019	967	1074	1010	962	1057	1001	957	984
	8	1191	1057	973	915	1174	1049	969	913	1033	961	909	1019	953	906	1005	946	902	931
	9	1137	1001	917	861	1121	994	914	860	980	908	857	967	901	854	955	895	851	882
	10	1086	949	867	812	1071	943	864	811	931	859	809	920	853	807	909	848	804	836

Cone of Light

Mtg Height	Light Level	Beam Diameter
5.5 ft	55.5 fc	6.5 ft
6.5 ft	39.7 fc	7.7 ft
7.5 ft	29.8 fc	8.9 ft
8.0 ft	26.2 fc	9.5 ft
10.0 ft	16.8 fc	11.8 ft
12.0 ft	11.7 fc	14.2 ft
14.0 ft	8.6 fc	16.6 ft
16.0 ft	6.6 fc	19.0 ft
20.0 ft	4.2 fc	23.7 ft
24.0 ft	2.9 fc	28.4 ft
28.0 ft	2.1 fc	33.2 ft

Average Luminaire Luminance [cd/m²]

	0.00°	45.00°	90.00°
0.00°	211150	211150	211150
45.00°	3158	3315	3734
55.00°	737	841	844
65.00°	750	748	555
75.00°	1045	888	795
85.00°	1743	2321	1776

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	-4.9	-3.9	-4.5	-3.6	-3.3	-4.0	-3.0	-3.6	-2.7	-2.4
	3H	-2.5	-1.7	-2.1	-1.4	-1.0	-2.1	-1.3	-1.7	-1.0	-0.6
	4H	-0.8	-0.1	-0.4	0.3	0.7	-0.7	0.0	-0.3	0.4	0.8
	6H	0.7	1.4	1.1	1.7	2.1	1.2	1.9	1.6	2.3	2.7
	8H	1.2	1.8	1.6	2.2	2.6	2.3	2.9	2.7	3.3	3.7
	12H	1.8	2.4	2.2	2.8	3.2	3.3	3.9	3.7	4.2	4.7
4H	2H	-4.2	-3.5	-3.8	-3.1	-2.7	-3.6	-2.9	-3.2	-2.6	-2.2
	3H	-1.3	-0.7	-0.9	-0.3	0.1	-1.3	-0.7	-0.9	-0.3	0.1
	4H	0.5	1.1	1.0	1.5	1.9	0.4	0.9	0.8	1.4	1.8
	6H	2.1	2.6	2.6	3.0	3.5	2.6	3.0	3.1	3.5	4.0
	8H	2.7	3.1	3.2	3.6	4.1	3.7	4.1	4.2	4.6	5.1
	12H	3.4	3.8	3.9	4.3	4.7	4.8	5.2	5.3	5.7	6.2
8H	4H	1.3	1.7	1.8	2.2	2.6	0.8	1.3	1.3	1.7	2.2
	6H	3.0	3.4	3.5	3.9	4.4	3.3	3.6	3.8	4.1	4.6
	8H	3.7	4.0	4.3	4.6	5.1	4.6	4.9	5.1	5.4	5.9
	12H	4.7	5.0	5.2	5.5	6.0	6.0	6.2	6.5	6.7	7.3
12H	4H	1.4	1.7	1.9	2.2	2.7	0.9	1.3	1.4	1.8	2.3
	6H	3.2	3.5	3.8	4.0	4.6	3.5	3.8	4.0	4.2	4.8
	8H	4.1	4.4	4.6	4.9	5.4	4.9	5.1	5.4	5.6	6.2

Corrected UGR values based on total output energy
SHR = 1.0

Corrected UGR values based on total output lumens

SHR = 1.0