

## **Indoor Distribution Test Report**

# **Spectrum Lighting Inc.**

994 Jefferson Street  
Fall River, MA 02721  
+1.508.678.2303

## **Spectrum Lighting Photometric Lab**

### **Luminaire**

SGx4LEDFX-20L35KDX-AR4223FX-MW-SO

Nom 4" diam recessed downlight

### **Test Number**

SP-00744\_M-20L

### **Test Date**

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

### Summary of Results

#### Power

Input Watts	17 W
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#### Lumen Output

Output Lumens	1242
Efficacy	73.06 lm/W

#### Luminous Dimensions

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

#### Spacing Criterion

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

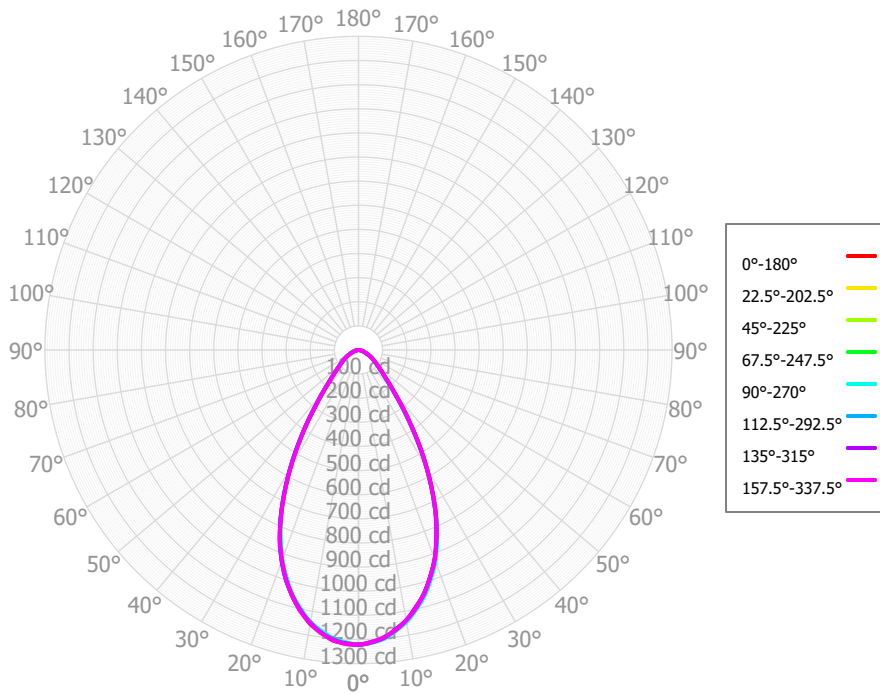
#### Full Beam Angle

0° - 180°	58°
90° - 270°	58°

### IES File Header Contents

Keyword	Value
TEST	SP-00744_M-20L
TESTLAB	Spectrum Lighting Photometric Lab
MANUFAC	Spectrum Lighting
ISSUEDATE	1/7/2019
UPDATE	3/4/2019
LUMCAT	SGx4LEDFX-20L35KDX-AR4223FX-MW-SO
LUMINAIRE	Nom 4" diam recessed downlight
OTHER	Trim: AR4223FX Matte White
OTHER	Regressed Integral Solite lens
OTHER	Data for New Construction: SGE4LEDFX-series w/AR4223FX-MW-SO
OTHER	Data for Retrofit: SGRTE4LEDFX-series w/AR4223FX-MW-SO
OTHER	Beam Angle: 58 deg
LAMPCAT	N/A
LAMP	N/A, Philips LED, Gen: 80G1
OTHER	CCT Tested: 3500K
OTHER	CCT Multipliers: 27K x 0.95, 30K x 1.0, 40K x 1.08
OTHER	This report prepared by Spectrum Lighting, scaled from 30L

### Candela Polar Plot



### Zonal Lumen Summary

Zone	Lumens	% Fixture	Zone	Lumens	% Fixture
0.00° - 10.00°	114.41	9.21%	90.00° - 100.00°	0.00	0.00%
10.00° - 20.00°	292.69	23.57%	100.00° - 110.00°	0.00	0.00%
20.00° - 30.00°	343.32	27.64%	100.00° - 120.00°	0.00	0.00%
30.00° - 40.00°	236.86	19.07%	120.00° - 130.00°	0.00	0.00%
40.00° - 50.00°	120.37	9.69%	130.00° - 140.00°	0.00	0.00%
50.00° - 60.00°	72.19	5.81%	140.00° - 150.00°	0.00	0.00%
60.00° - 70.00°	40.82	3.29%	150.00° - 160.00°	0.00	0.00%
70.00° - 80.00°	17.75	1.43%	160.00° - 170.00°	0.00	0.00%
80.00° - 90.00°	3.57	0.29%	170.00° - 180.00°	0.00	0.00%
0.00° - 90.00°	1241.98	100.00%	0.00° - 180.00°	1241.98	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°	1221.64	1221.64	1221.64	1221.64	1221.64	1221.64	1221.64	1221.64	1221.64	1221.64	1221.64	1221.64	1221.64	1221.64	1221.64	1221.64	1221.64
2.50°	1211.49	1214.55	1212.10	1213.68	1214.82	1218.32	1217.38	1220.41	1217.26	1220.67	1214.99	1214.30	1213.82	1215.57	1212.47	1213.05	1211.49
5.00°	1198.47	1195.48	1197.10	1199.31	1202.86	1201.50	1207.81	1206.37	1209.22	1205.80	1202.88	1201.30	1201.41	1196.10	1199.07	1195.98	1198.47
7.50°	1169.59	1171.77	1172.09	1173.29	1175.23	1182.80	1182.13	1184.78	1182.93	1186.32	1177.85	1177.61	1174.79	1173.40	1169.16	1171.83	1169.59
10.00°	1139.68	1138.55	1144.80	1143.17	1144.85	1146.26	1151.82	1150.55	1153.89	1150.31	1146.89	1146.55	1147.33	1138.21	1137.57	1138.68	1139.68
12.50°	1094.19	1098.53	1098.94	1100.40	1102.52	1108.66	1106.88	1111.02	1108.00	1110.68	1104.14	1104.86	1101.08	1098.58	1093.24	1097.09	1094.19
15.00°	1047.15	1047.44	1050.21	1054.29	1056.15	1055.94	1057.74	1057.59	1059.00	1056.24	1054.42	1054.49	1053.79	1045.61	1048.20	1046.78	1047.15
17.50°	987.08	989.57	989.79	993.34	996.67	1002.25	998.43	999.62	996.58	999.57	993.31	993.98	990.84	988.73	986.29	988.08	987.08
20.00°	923.81	922.66	928.28	929.49	930.89	930.67	931.84	928.03	929.68	926.46	925.08	925.24	925.98	922.82	923.33	922.36	923.81
22.50°	843.56	845.51	846.46	845.97	849.22	856.85	851.21	853.15	848.37	851.87	847.49	848.46	845.76	848.16	843.07	844.38	843.56
25.00°	759.66	757.17	763.61	759.98	762.16	761.19	763.43	760.03	761.91	758.51	760.58	760.68	762.63	757.57	761.06	757.86	759.66
27.50°	662.03	663.45	664.67	664.00	664.43	664.99	664.45	663.80	662.79	664.46	663.72	664.19	664.60	664.08	663.63	663.46	662.03
30.00°	564.85	564.94	565.96	567.40	566.62	565.53	565.32	564.03	563.89	564.08	565.52	566.69	566.66	566.24	566.34	564.65	564.85
32.50°	468.98	470.19	470.40	469.73	468.65	467.72	466.00	463.88	465.41	464.48	466.12	468.53	469.11	470.26	469.82	469.99	468.98
35.00°	378.80	378.19	377.11	372.96	377.51	376.78	375.33	376.23	374.58	375.80	376.43	378.94	376.25	376.53	377.21	377.17	378.80
37.50°	301.43	302.30	301.69	299.34	295.30	293.11	293.66	289.26	295.90	290.93	293.77	293.86	296.71	297.12	299.60	301.55	301.43
40.00°	234.95	236.03	231.61	228.48	230.23	232.20	230.30	233.42	231.68	234.32	232.33	233.09	228.48	231.85	230.62	232.02	234.95
42.50°	187.90	189.99	188.64	186.77	183.36	180.32	182.64	178.96	186.01	181.90	183.21	182.38	185.19	183.96	187.41	188.23	187.90
45.00°	150.51	153.55	150.10	147.78	148.63	150.10	148.64	150.01	150.43	150.94	149.87	150.20	149.35	150.39	150.40	151.25	150.51
47.50°	127.38	128.50	127.94	126.24	124.67	124.01	124.11	122.35	125.52	122.97	124.04	124.02	126.93	125.94	127.63	128.14	127.38
50.00°	108.11	107.80	107.94	106.26	106.15	105.88	105.30	105.83	105.90	105.89	106.16	106.63	107.45	107.57	107.77	107.61	108.11
52.50°	93.47	92.86	94.01	93.03	91.54	90.54	89.73	90.19	90.88	90.51	91.22	91.38	92.24	92.90	93.21	93.43	93.47
55.00°	80.71	79.59	81.04	80.37	79.77	79.56	78.39	79.43	78.65	79.82	79.24	79.84	79.49	80.23	80.32	80.06	80.71
57.50°	69.80	69.60	70.17	69.56	69.64	69.07	68.99	68.75	68.39	69.22	68.11	68.93	69.64	69.59	69.96	69.88	69.80
60.00°	59.59	60.29	59.81	59.15	59.68	59.18	59.15	58.36	58.59	58.83	58.23	59.09	59.68	59.83	59.72	59.92	59.59
62.50°	49.95	50.57	50.35	49.73	49.81	49.77	49.17	48.31	49.05	48.85	48.61	49.37	49.63	50.17	49.63	50.15	49.95
65.00°	41.22	40.79	41.21	40.82	40.93	40.85	40.11	39.24	40.19	39.56	40.33	40.55	40.47	40.55	40.71	40.47	41.22
67.50°	33.09	34.60	32.51	32.91	32.40	33.85	31.29	31.63	31.62	31.76	32.27	32.06	31.98	33.13	32.92	32.87	33.09
70.00°	27.38	28.62	25.97	26.42	26.33	28.18	25.58	26.56	26.22	25.58	26.05	26.67	26.31	26.23	26.53	25.87	27.38
72.50°	22.67	22.25	21.32	21.50	20.84	22.27	20.43	21.25	21.30	20.84	20.41	21.46	21.66	21.28	21.04	21.39	22.67
75.00°	17.52	16.76	16.33	16.94	16.36	16.59	16.29	15.96	16.29	16.70	15.88	16.55	16.86	16.68	16.83	16.75	17.52
77.50°	12.73	12.52	11.76	12.57	11.99	11.69	11.91	11.81	11.28	12.94	11.93	11.43	11.91	12.73	13.00	11.99	12.73
80.00°	8.55	8.25	8.59	8.47	7.92	7.80	7.45	7.89	7.19	8.28	7.93	7.80	7.43	9.13	9.54	8.66	8.55
82.50°	5.62	4.96	4.85	5.39	4.96	4.97	4.38	4.34	4.63	4.37	4.31	5.42	4.48	5.66	5.59	4.87	5.62
85.00°	2.99	2.87	2.59	2.45	3.27	2.82	2.62	2.12	2.68	2.42	2.07	3.03	2.32	2.75	2.64	2.46	2.99
87.50°	1.71	1.43	1.22	1.40	1.23	1.65	1.05	1.16	1.08	0.93	1.01	1.44	1.50	1.09	1.40	1.20	1.71
90.00°	0.70	0.86	0.78	0.83	0.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.80	0.78	0.70

### 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>	1479	1479	1479	1479	1444	1444	1444	1444	1380	1380	1380	1321	1321	1321	1267	1267	1242
	<b>1</b>	1397	1357	1321	1288	1365	1329	1297	1268	1279	1252	1229	1232	1211	1192	1189	1172	1149
	<b>2</b>	1314	1243	1185	1137	1285	1222	1169	1124	1181	1137	1099	1143	1106	1075	1108	1078	1056
	<b>3</b>	1236	1144	1073	1016	1210	1126	1060	1008	1092	1037	991	1061	1014	975	1032	993	973
	<b>4</b>	1164	1056	978	918	1140	1042	969	912	1014	951	901	988	934	890	964	918	900
	<b>5</b>	1097	980	898	837	1075	967	890	833	944	877	825	922	864	818	902	851	835
	<b>6</b>	1036	912	828	769	1016	901	823	766	882	812	760	863	802	755	846	792	778
	<b>7</b>	980	851	768	710	962	843	764	708	826	755	704	810	747	700	796	739	726
	<b>8</b>	928	797	715	659	912	790	712	658	776	705	655	762	698	652	750	692	680
	<b>9</b>	881	749	669	615	866	743	666	613	731	660	611	719	655	609	708	650	639
	<b>10</b>	837	706	628	575	824	700	625	574	690	620	573	680	616	571	670	611	602

### Cone of Light

Mtg Height	Light Level	Beam Diameter
5.5 ft	40.4 fc	6.1 ft
6.5 ft	28.9 fc	7.2 ft
7.5 ft	21.7 fc	8.3 ft
8.0 ft	19.1 fc	8.8 ft
10.0 ft	12.2 fc	11.0 ft
12.0 ft	8.5 fc	13.2 ft
14.0 ft	6.2 fc	15.4 ft
16.0 ft	4.8 fc	17.6 ft
20.0 ft	3.1 fc	22.0 ft
24.0 ft	2.1 fc	26.4 ft
28.0 ft	1.6 fc	30.8 ft

### Average Luminaire Luminance [cd/m²]

	0.00°	45.00°	90.00°
<b>0.00°</b>	153743	153743	153743
<b>45.00°</b>	26787	26714	26453
<b>55.00°</b>	17709	17782	17502
<b>65.00°</b>	12276	12271	12187
<b>75.00°</b>	8519	7939	7955
<b>85.00°</b>	4323	3738	4716

### 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>	17.8	19.0	18.2	19.3	19.6	17.8	19.0	18.1	19.3	19.6
	<b>3H</b>	18.8	19.8	19.2	20.2	20.5	18.7	19.7	19.1	20.1	20.4
	<b>4H</b>	19.1	20.1	19.5	20.4	20.8	19.0	20.0	19.4	20.3	20.7
	<b>6H</b>	19.3	20.1	19.7	20.5	20.9	19.1	20.0	19.5	20.4	20.8
	<b>8H</b>	19.3	20.1	19.7	20.5	20.9	19.1	20.0	19.6	20.4	20.8
	<b>12H</b>	19.3	20.1	19.7	20.5	20.9	19.1	19.9	19.6	20.3	20.7
<b>4H</b>	<b>2H</b>	18.1	19.1	18.5	19.5	19.8	18.1	19.0	18.5	19.4	19.8
	<b>3H</b>	19.3	20.0	19.7	20.5	20.9	19.2	20.0	19.6	20.4	20.8
	<b>4H</b>	19.6	20.4	20.1	20.8	21.2	19.5	20.2	20.0	20.7	21.1
	<b>6H</b>	19.9	20.5	20.3	20.9	21.4	19.7	20.3	20.2	20.8	21.3
	<b>8H</b>	19.9	20.5	20.4	20.9	21.4	19.8	20.3	20.2	20.8	21.2
	<b>12H</b>	19.9	20.4	20.4	20.9	21.4	19.8	20.3	20.2	20.7	21.2
<b>8H</b>	<b>4H</b>	19.7	20.3	20.2	20.7	21.2	19.6	20.2	20.1	20.6	21.1
	<b>6H</b>	20.0	20.5	20.5	21.0	21.4	19.9	20.3	20.4	20.8	21.3
	<b>8H</b>	20.1	20.5	20.6	21.0	21.5	19.9	20.3	20.4	20.8	21.3
	<b>12H</b>	20.1	20.5	20.6	21.0	21.5	19.9	20.3	20.5	20.8	21.4
<b>12H</b>	<b>4H</b>	19.7	20.2	20.2	20.7	21.1	19.6	20.1	20.1	20.6	21.0
	<b>6H</b>	20.0	20.4	20.5	20.9	21.4	19.8	20.2	20.4	20.7	21.3
	<b>8H</b>	20.1	20.4	20.6	20.9	21.5	19.9	20.3	20.4	20.8	21.3

Corrected UGR values based on total output energy  
 SHR = 1.0

Corrected UGR values based on total output lumens

SHR = 1.0