

Indoor Distribution Test Report

Spectrum Lighting Inc.

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Spectrum Lighting Photometric Lab

Luminaire

TSRA31 21L 35K XW E1 BET xx
Nominal 3.1" Diameter Track Spot Luminaire with Recessed Arm

Test Number

SP-15009_3

Test Date

9/15/2023

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

Summary of Results

Power

Input Watts	20 W
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Lumen Output

Output Lumens	2265
Efficacy	113.26 lm/W

Luminous Dimensions

0° - 180° Size	0.06
90° - 270° Size	0.06
Height	0.22

Spacing Criterion

Two luminaires, plane 0°	0.95
Two luminaires, plane 90°	0.95
Four luminaires	0.87

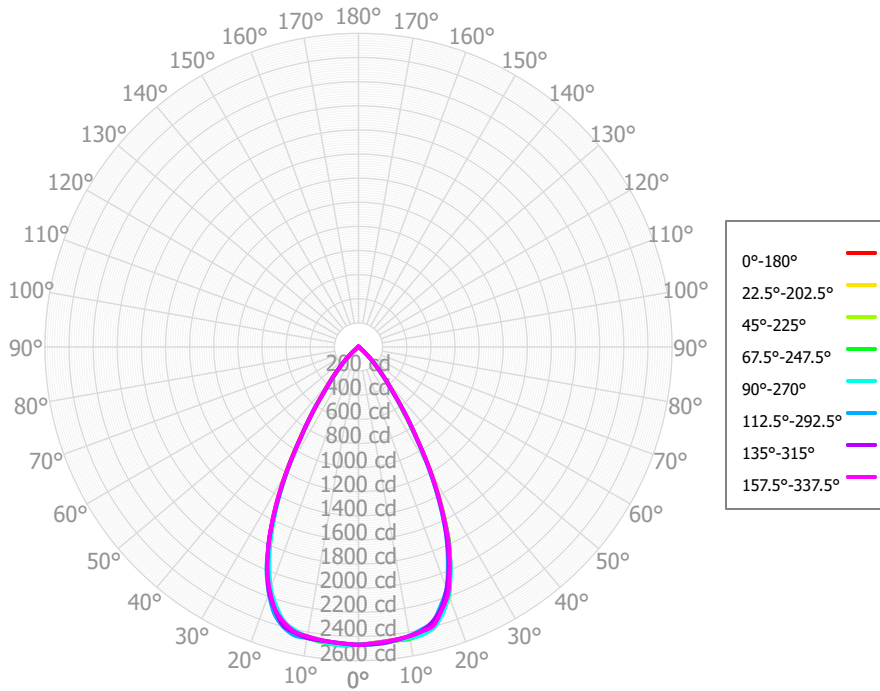
Full Beam Angle

0° - 180°	59°
90° - 270°	59°

IES File Header Contents

Keyword	Value
TEST	SP-15009_3
TESTLAB	Spectrum Lighting Potometric Lab, VLS-245-981
MANUFAC	Spectrum Lighting
TESTDATE	9/15/2023
ISSUEDATE	9/15/2023
LUMCAT	TSRA31 21L 35K XW E1 BET xx
LUMINAIRE	Nominal 3.1" Diameter Track Spot Luminaire with Recessed Arm
OTHER	Xtra Wide Beam
OTHER	60 Degree Beam Angle
OTHER	This report prepared by Spectrum Lighting
_CRI	80+
_CCTMULT	30K x .93

Candela Polar Plot



Zonal Lumen Summary

Zone	Lumens	% Fixture	Zone	Lumens	% Fixture
0.00° - 10.00°	237.96	10.50%	90.00° - 100.00°	1.26	0.06%
10.00° - 20.00°	661.37	29.20%	100.00° - 110.00°	1.28	0.06%
20.00° - 30.00°	777.75	34.33%	100.00° - 120.00°	2.64	0.12%
30.00° - 40.00°	424.46	18.74%	120.00° - 130.00°	1.28	0.06%
40.00° - 50.00°	128.73	5.68%	130.00° - 140.00°	1.21	0.05%
50.00° - 60.00°	19.79	0.87%	140.00° - 150.00°	1.10	0.05%
60.00° - 70.00°	3.46	0.15%	150.00° - 160.00°	0.82	0.04%
70.00° - 80.00°	1.38	0.06%	160.00° - 170.00°	0.51	0.02%
80.00° - 90.00°	1.39	0.06%	170.00° - 180.00°	0.17	0.01%
0.00° - 90.00°	2256.29	99.60%	0.00° - 180.00°	2265.28	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°	2469.88	2469.88	2469.88	2469.88	2469.88	2469.88	2469.88	2469.88	2469.88	2469.88	2469.88	2469.88	2469.88	2469.88	2469.88	2469.88	2469.88
2.50°	2460.30	2459.07	2463.16	2467.68	2461.97	2463.85	2463.86	2462.67	2468.63	2472.25	2473.75	2478.74	2474.35	2469.36	2467.37	2460.16	2460.30
5.00°	2451.43	2452.34	2454.52	2456.50	2452.95	2457.90	2456.92	2457.95	2466.79	2467.73	2472.77	2474.59	2474.45	2465.20	2462.39	2453.57	2451.43
7.50°	2445.67	2448.68	2455.33	2454.18	2452.24	2453.91	2453.32	2448.05	2456.31	2459.74	2461.25	2464.37	2457.90	2449.40	2449.18	2445.22	2445.67
10.00°	2438.47	2448.99	2456.17	2456.79	2450.18	2451.30	2449.56	2436.07	2443.03	2445.85	2446.04	2446.53	2439.88	2431.69	2433.10	2436.57	2438.47
12.50°	2425.21	2430.41	2434.05	2437.92	2444.92	2450.46	2428.50	2421.60	2419.30	2430.97	2424.63	2424.74	2408.31	2401.36	2412.19	2417.53	2425.21
15.00°	2389.79	2395.62	2401.26	2411.68	2407.21	2404.61	2396.85	2369.97	2374.15	2369.89	2373.51	2364.68	2362.35	2365.81	2360.81	2394.15	2389.79
17.50°	2299.66	2301.74	2294.30	2310.14	2321.11	2320.71	2292.07	2287.86	2280.54	2300.79	2288.78	2292.16	2259.08	2257.29	2275.86	2291.50	2299.66
20.00°	2173.48	2174.79	2168.44	2194.31	2185.45	2174.30	2167.71	2149.95	2151.55	2141.18	2145.49	2130.41	2129.08	2134.72	2136.86	2174.86	2173.48
22.50°	1991.13	1984.33	1978.71	1987.93	1999.66	1993.39	1976.17	1982.25	1971.48	1969.19	1958.34	1953.80	1935.59	1936.07	1957.29	1977.90	1991.13
25.00°	1763.66	1771.19	1757.74	1772.61	1753.98	1743.52	1754.90	1745.30	1748.82	1731.88	1724.01	1709.36	1714.37	1719.87	1726.14	1760.07	1763.66
27.50°	1489.89	1488.22	1473.67	1471.15	1468.34	1469.43	1471.84	1485.83	1484.39	1481.26	1466.16	1459.90	1451.35	1453.39	1470.04	1477.60	1489.89
30.00°	1201.49	1191.88	1183.94	1172.61	1175.89	1178.17	1186.75	1191.89	1202.00	1193.13	1185.81	1173.12	1178.56	1179.73	1186.02	1193.71	1201.49
32.50°	902.87	911.65	886.61	891.79	880.56	883.71	898.95	891.88	908.00	921.07	898.73	895.38	896.03	893.19	893.80	907.15	902.87
35.00°	670.07	636.81	645.79	637.99	659.99	666.82	662.59	670.06	677.81	677.89	674.68	665.70	660.82	648.91	668.15	664.31	670.07
37.50°	466.57	471.13	455.19	467.85	458.35	458.99	473.15	457.12	473.63	482.90	459.81	462.04	457.51	454.87	452.27	475.04	466.57
40.00°	338.39	317.14	324.66	325.39	339.77	343.84	340.34	342.56	346.68	344.44	342.31	334.87	324.52	316.44	334.32	334.18	338.39
42.50°	230.52	234.59	230.14	236.73	230.35	234.70	241.40	234.45	238.33	240.56	231.33	228.48	221.69	221.79	222.52	233.71	230.52
45.00°	160.32	157.19	156.87	159.00	158.84	161.35	163.11	162.43	164.11	163.53	164.16	159.62	153.70	151.54	158.49	158.18	160.32
47.50°	94.76	96.43	91.55	95.05	91.06	96.33	92.79	98.39	93.48	103.99	101.29	101.68	94.67	94.13	98.52	96.21	94.76
50.00°	59.27	49.71	55.62	52.76	55.96	57.82	56.46	57.77	57.54	53.52	59.89	56.61	58.72	56.75	57.93	58.17	59.27
52.50°	26.43	30.38	25.70	29.09	26.52	29.06	27.38	28.03	24.76	30.94	27.37	30.20	25.41	25.76	26.12	28.40	26.43
55.00°	18.57	17.39	17.59	17.39	19.43	19.07	19.15	18.50	18.43	17.12	18.96	18.76	18.49	16.43	17.75	18.24	18.57
57.50°	11.66	12.67	11.30	12.42	13.03	12.02	12.60	11.50	12.58	11.87	12.45	12.34	11.89	10.59	11.40	11.66	11.66
60.00°	8.75	8.32	7.73	8.10	8.28	8.75	7.73	7.55	8.50	8.05	9.16	8.55	8.39	8.11	8.45	8.87	8.75
62.50°	5.92	4.30	4.38	4.00	4.54	5.70	3.34	4.47	4.99	4.90	5.89	5.37	5.19	5.78	5.57	6.30	5.92
65.00°	3.29	2.36	2.54	2.52	2.32	2.84	2.32	2.13	2.80	1.94	2.64	2.41	3.22	3.49	2.75	4.06	3.29
67.50°	1.67	1.59	1.17	1.55	1.29	1.65	1.49	1.21	1.46	1.52	1.30	1.81	1.76	1.52	1.47	2.07	1.67
70.00°	1.66	1.29	1.37	1.28	1.46	1.39	1.31	1.06	1.34	1.18	1.38	1.62	1.54	1.34	1.34	1.59	1.66
72.50°	1.50	1.16	1.45	1.07	1.47	1.26	1.20	1.12	1.35	1.36	1.35	1.55	1.30	1.24	1.23	1.24	1.50
75.00°	1.19	1.20	1.30	1.30	1.37	1.16	1.23	1.25	1.48	1.48	1.26	1.48	1.04	1.33	1.14	1.28	1.19
77.50°	1.05	1.27	1.28	1.49	1.27	1.41	1.25	1.25	1.49	1.43	1.33	1.36	1.00	1.41	1.18	1.27	1.05
80.00°	1.03	1.33	1.44	1.40	1.16	1.72	1.25	1.24	1.42	1.40	1.44	1.26	1.18	1.45	1.25	1.13	1.03
82.50°	1.11	1.37	1.38	1.38	1.23	1.53	1.22	1.22	1.32	1.37	1.38	1.37	1.28	1.55	1.24	1.17	1.11
85.00°	1.23	1.19	1.10	1.53	1.35	1.30	1.14	1.20	1.22	1.27	1.30	1.43	1.32	1.71	1.21	1.42	1.23
87.50°	1.26	1.03	1.03	1.54	1.38	1.15	1.06	1.12	1.12	1.10	1.23	1.31	1.19	1.58	1.07	1.55	1.26
90.00°	1.26	1.10	1.09	1.24	1.40	1.07	0.97	1.02	1.02	1.16	1.17	1.18	0.99	1.22	0.96	1.59	1.26
92.50°	1.28	1.12	1.01	1.17	1.23	1.37	0.98	0.84	1.03	1.42	1.27	1.03	1.01	1.10	1.25	1.34	1.28
95.00°	1.30	1.04	0.88	1.38	1.09	1.55	1.02	0.81	1.05	1.43	1.33	1.04	1.09	1.10	1.44	0.92	1.30
97.50°	1.30	1.04	1.03	1.34	1.20	1.34	1.00	1.25	1.09	1.31	1.16	1.24	0.99	1.04	1.17	0.92	1.30
100.00°	1.31	1.21	1.25	1.10	1.28	1.22	0.98	1.46	1.13	1.28	1.01	1.28	0.87	0.96	1.08	1.07	1.31
102.50°	1.33	1.30	1.30	1.12	1.21	1.26	1.00	1.25	1.21	1.28	0.90	1.21	1.00	0.98	1.44	0.98	1.33
105.00°	1.36	1.31	1.33	1.30	1.21	1.24	1.03	1.13	1.27	1.22	0.90	1.09	1.12	1.03	1.62	0.85	1.36

Coefficients of Utilization – Zonal Cavity Method

Values are lumens delivered to the workplane.

RCR	ptc	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	0%
	pcc	80%	80%	80%	80%	70%	70%	70%	70%	50%	50%	50%	30%	30%	30%	10%	10%	0%
	pw	70%	50%	30%	10%	70%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	30%
	0	2695	2695	2695	2695	2631	2631	2631	2631	2512	2512	2512	2403	2403	2403	2303	2303	2256
	1	2571	2509	2454	2404	2514	2459	2410	2365	2366	2327	2290	2281	2249	2221	2202	2178	2133
	2	2447	2338	2249	2173	2396	2299	2217	2148	2224	2157	2100	2155	2101	2053	2092	2048	2007
	3	2326	2183	2073	1985	2280	2151	2050	1968	2091	2006	1936	2035	1964	1904	1983	1924	1887
	4	2211	2043	1920	1826	2170	2017	1903	1815	1967	1870	1792	1921	1838	1771	1878	1808	1773
	5	2101	1916	1786	1690	2064	1894	1773	1682	1852	1747	1666	1814	1723	1651	1778	1699	1668
	6	1998	1800	1667	1571	1964	1781	1656	1565	1747	1636	1554	1714	1617	1543	1684	1599	1570
	7	1901	1694	1560	1466	1870	1679	1552	1462	1649	1536	1454	1622	1521	1445	1596	1506	1480
	8	1810	1598	1465	1373	1782	1585	1458	1370	1560	1445	1363	1536	1433	1357	1514	1421	1398
	9	1725	1510	1378	1289	1700	1499	1373	1287	1477	1362	1282	1456	1352	1277	1437	1342	1321
	10	1646	1430	1300	1214	1623	1420	1296	1212	1401	1287	1208	1383	1278	1205	1366	1270	1251

Cone of Light

Mtg Height	Light Level	Beam Diameter
5.5 ft	81.6 fc	6.3 ft
6.5 ft	58.5 fc	7.4 ft
7.5 ft	43.9 fc	8.5 ft
8.0 ft	38.6 fc	9.1 ft
10.0 ft	24.7 fc	11.4 ft
12.0 ft	17.2 fc	13.7 ft
14.0 ft	12.6 fc	16.0 ft
16.0 ft	9.6 fc	18.2 ft
20.0 ft	6.2 fc	22.8 ft
24.0 ft	4.3 fc	27.3 ft
28.0 ft	3.2 fc	31.9 ft

Average Luminaire Luminance [cd/m²]

	0.00°	45.00°	90.00°
0.00°	7384877	7384877	7384877
45.00°	145261	107239	143926
55.00°	15522	10908	16239
65.00°	2623	1483	1856
75.00°	939	735	1078
85.00°	982	626	1080

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	8.2	9.2	8.6	9.5	9.8	8.3	9.3	8.7	9.6	9.9
	3H	8.1	8.9	8.5	9.3	9.7	8.2	9.0	8.6	9.4	9.7
	4H	8.0	8.8	8.5	9.2	9.6	8.1	8.9	8.5	9.3	9.7
	6H	8.0	8.7	8.4	9.1	9.5	8.1	8.8	8.5	9.2	9.6
	8H	8.0	8.6	8.4	9.0	9.5	8.0	8.7	8.5	9.1	9.5
	12H	7.9	8.6	8.4	9.0	9.4	8.0	8.7	8.5	9.1	9.5
4H	2H	8.0	8.8	8.4	9.1	9.5	8.0	8.8	8.5	9.2	9.6
	3H	7.9	8.5	8.3	8.9	9.3	7.9	8.6	8.4	9.0	9.4
	4H	7.8	8.4	8.3	8.8	9.3	7.9	8.5	8.3	8.9	9.3
	6H	7.8	8.3	8.3	8.7	9.2	7.9	8.4	8.4	8.8	9.3
	8H	7.8	8.2	8.3	8.7	9.2	7.9	8.3	8.4	8.8	9.3
	12H	7.8	8.2	8.3	8.7	9.2	7.9	8.3	8.4	8.8	9.3
8H	4H	7.7	8.1	8.2	8.6	9.1	7.7	8.2	8.2	8.6	9.1
	6H	7.7	8.0	8.2	8.5	9.0	7.8	8.1	8.3	8.6	9.1
	8H	7.7	8.0	8.2	8.6	9.1	7.8	8.1	8.4	8.7	9.2
	12H	7.8	8.1	8.3	8.6	9.2	7.9	8.2	8.5	8.7	9.3
12H	4H	7.6	8.0	8.1	8.5	9.0	7.7	8.1	8.2	8.6	9.1
	6H	7.6	8.0	8.2	8.4	9.0	7.7	8.1	8.3	8.5	9.1
	8H	7.7	8.0	8.2	8.5	9.1	7.8	8.1	8.3	8.6	9.2

Corrected UGR values based on total output energy
 SHR = 1.0

Corrected UGR values based on total output lumens

SHR = 1.0