

## Indoor Distribution Test Report

### Spectrum Lighting Inc.

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### Spectrum Lighting Photometric Lab

#### Luminaire

TS - RA31 - 21L - 35HK - XN - xx - xx - MW

Track light for accent, display and general illumination.

#### Test Number

TSRA31-3

#### Test Date

2/18/25

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

## Summary of Results

### Power

Input Watts	20.07 W
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### Lumen Output

Output Lumens	1963
Efficacy	97.83 lm/W

### Luminous Dimensions

0° - 180° Size	0
90° - 270° Size	0.2
Height	0.59

### Spacing Criterion

Two luminaires, plane 0°	0.35
Two luminaires, plane 90°	0.35
Four luminaires	0.34

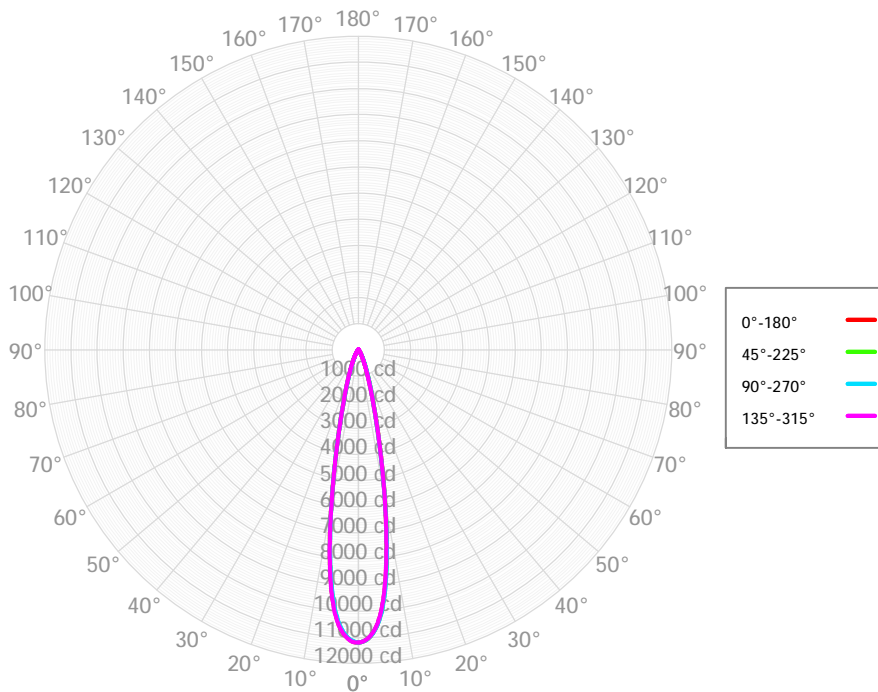
### Full Beam Angle

0° - 180°	21°
90° - 270°	21°

## IES File Header Contents

Keyword	Value
TEST	TSRA31-3
TESTLAB	Spectrum Lighting Photometric Lab.
MANUFAC	Spectrum Lighting
TESTDATE	2/18/25
ISSUEDATE	2/18/25
LUMCAT	TS - RA31 - 21L - 35HK - XN - xx - xx - MW
LUMINAIRE	Track light for accent, display and general illumination.

### Candela Polar Plot



### Zonal Lumen Summary

Zone	Lumens	% Fixture	Zone	Lumens	% Fixture
0.00° - 10.00°	823.03	41.92%	90.00° - 100.00°	4.79	0.24%
10.00° - 20.00°	711.60	36.24%	100.00° - 110.00°	4.71	0.24%
20.00° - 30.00°	242.22	12.34%	100.00° - 120.00°	9.55	0.49%
30.00° - 40.00°	86.09	4.38%	120.00° - 130.00°	4.63	0.24%
40.00° - 50.00°	35.52	1.81%	130.00° - 140.00°	4.22	0.21%
50.00° - 60.00°	15.54	0.79%	140.00° - 150.00°	3.59	0.18%
60.00° - 70.00°	6.88	0.35%	150.00° - 160.00°	2.74	0.14%
70.00° - 80.00°	5.07	0.26%	160.00° - 170.00°	2.00	0.10%
80.00° - 90.00°	5.20	0.26%	170.00° - 180.00°	0.78	0.04%
0.00° - 90.00°	1931.15	98.35%	0.00° - 180.00°	1963.46	100.00%

### Candela Distribution

	0.00°	45.00°	90.00°	135.00°	180.00°	225.00°	270.00°	315.00°	360.00°
0.00°	11199.10	11199.10	11199.10	11199.10	11199.10	11199.10	11199.10	11199.10	11199.10
1.00°	11155.51	11160.60	11161.50	11181.71	11177.52	11163.54	11147.44	11155.21	11155.51
2.00°	11042.53	11050.83	11048.13	11073.45	11065.80	11049.77	11033.26	11034.81	11042.53
3.00°	10836.75	10839.86	10854.46	10878.79	10878.30	10850.19	10821.79	10825.73	10836.75
4.00°	10517.93	10536.75	10549.25	10586.69	10573.41	10544.78	10504.50	10504.02	10517.93
5.00°	10057.26	10097.66	10113.30	10160.78	10124.49	10092.48	10044.83	10030.25	10057.26
6.00°	9433.01	9498.87	9510.19	9554.02	9510.17	9474.92	9420.39	9398.27	9433.01
7.00°	8644.20	8713.22	8743.21	8776.54	8736.89	8706.28	8655.19	8621.59	8644.20
8.00°	7757.96	7812.47	7834.47	7870.19	7844.07	7836.67	7777.63	7727.69	7757.96
9.00°	6814.63	6854.08	6858.05	6870.60	6872.79	6875.76	6825.42	6793.71	6814.63
10.00°	5867.86	5897.18	5864.33	5858.78	5884.27	5896.16	5857.41	5850.88	5867.86
11.00°	4975.29	4983.22	4949.20	4935.17	4946.29	4978.90	4951.17	4953.59	4975.29
12.00°	4177.07	4161.53	4121.38	4124.13	4129.35	4152.72	4137.80	4149.38	4177.07
13.00°	3483.29	3461.03	3420.32	3425.62	3427.99	3454.13	3435.96	3459.57	3483.29
14.00°	2897.92	2888.01	2853.19	2856.22	2846.99	2866.06	2858.71	2873.46	2897.92
15.00°	2409.04	2422.88	2397.64	2396.85	2377.53	2400.29	2379.75	2381.57	2409.04
16.00°	2023.50	2058.55	2035.39	2027.84	2000.25	2007.70	1998.09	1998.30	2023.50
17.00°	1701.68	1747.08	1730.78	1719.61	1689.37	1698.16	1679.70	1685.59	1701.68
18.00°	1439.60	1492.08	1487.51	1465.52	1424.77	1435.25	1415.07	1415.38	1439.60
19.00°	1226.57	1275.66	1275.00	1253.30	1211.37	1215.08	1193.58	1192.96	1226.57
20.00°	1047.86	1091.43	1099.66	1071.92	1034.84	1027.41	1008.38	1010.85	1047.86
21.00°	893.17	939.58	947.11	917.97	884.71	880.61	864.00	855.26	893.17
22.00°	768.50	813.47	820.84	794.76	764.02	758.71	744.78	740.73	768.50
23.00°	666.07	703.85	708.53	683.15	660.05	656.37	637.14	636.57	666.07
24.00°	570.68	605.40	614.08	589.15	568.11	562.79	556.32	553.24	570.68
25.00°	497.75	522.44	525.58	511.61	494.67	487.75	480.64	470.73	497.75
26.00°	426.12	454.29	455.51	443.24	421.93	419.78	409.68	411.37	426.12
27.00°	370.10	392.64	393.60	380.37	369.23	362.85	354.26	354.96	370.10
28.00°	314.57	340.07	339.40	334.63	319.89	320.66	313.29	306.40	314.57
29.00°	280.51	296.22	298.83	289.46	279.33	282.74	275.54	268.90	280.51
30.00°	248.32	265.17	263.94	256.85	241.20	247.57	243.16	243.92	248.32
31.00°	217.62	229.62	230.97	222.90	212.53	208.00	216.27	211.46	217.62
32.00°	190.15	197.87	200.59	188.59	186.47	180.56	186.73	185.02	190.15
33.00°	167.42	178.92	178.43	164.25	168.45	162.92	165.16	160.88	167.42
34.00°	144.84	156.12	157.76	142.89	144.98	140.67	143.26	143.02	144.84
35.00°	128.30	141.96	140.01	132.92	124.00	128.17	126.75	124.11	128.30
36.00°	116.82	123.58	119.20	112.24	108.91	113.96	109.92	111.38	116.82
37.00°	100.78	108.73	106.91	102.89	99.43	102.16	101.02	99.20	100.78
38.00°	86.48	95.76	95.45	91.20	91.90	91.95	88.54	91.10	86.48
39.00°	78.64	86.15	84.38	80.37	77.45	79.57	81.28	83.13	78.64
40.00°	73.27	76.54	79.11	74.56	74.69	69.38	72.84	72.28	73.27
41.00°	66.65	68.66	73.31	63.68	65.38	64.62	69.60	65.68	66.65
42.00°	63.86	65.70	65.32	55.09	53.77	61.03	61.53	61.91	63.86
43.00°	53.42	55.34	52.51	53.17	53.97	54.51	54.81	54.33	53.42

### Coefficients of Utilization – Zonal Cavity Method

Values are lumens delivered to the workplane.

RCR	pfc	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	2330	2330	2330	2330	2272	2272	2272	2272	2164	2164	2164	2065	2065	2065	1974	1974	1931
	1	2247	2204	2166	2131	2197	2159	2125	2094	2075	2049	2024	1998	1978	1959	1927	1912	1871
	2	2172	2099	2039	1989	2128	2064	2010	1964	1997	1954	1917	1936	1902	1872	1879	1853	1815
	3	2102	2009	1937	1880	2064	1981	1916	1863	1928	1874	1830	1879	1835	1798	1833	1798	1763
	4	2037	1931	1852	1793	2004	1908	1836	1781	1865	1805	1757	1825	1775	1734	1788	1746	1714
	5	1977	1861	1780	1720	1948	1843	1768	1712	1808	1744	1694	1775	1720	1678	1744	1698	1668
	6	1922	1800	1718	1659	1896	1784	1708	1652	1755	1689	1640	1728	1671	1627	1703	1653	1625
	7	1870	1744	1663	1605	1847	1731	1655	1600	1707	1640	1591	1684	1625	1581	1663	1611	1585
	8	1822	1694	1613	1558	1801	1683	1607	1554	1662	1595	1547	1643	1583	1539	1625	1572	1547
	9	1777	1648	1569	1516	1758	1639	1564	1513	1621	1554	1507	1604	1544	1501	1589	1535	1512
	10	1734	1606	1529	1477	1718	1598	1524	1475	1583	1516	1470	1568	1508	1465	1555	1500	1479

### Cone of Light

Mtg Height	Light Level	Beam Diameter
5.5 ft	370.2 fc	2.0 ft
6.5 ft	265.1 fc	2.4 ft
7.5 ft	199.1 fc	2.7 ft
8.0 ft	175.0 fc	2.9 ft
10.0 ft	112.0 fc	3.6 ft
12.0 ft	77.8 fc	4.4 ft
14.0 ft	57.1 fc	5.1 ft
16.0 ft	43.7 fc	5.8 ft
20.0 ft	28.0 fc	7.3 ft
24.0 ft	19.4 fc	8.7 ft
28.0 ft	14.3 fc	10.2 ft

### Average Luminaire Luminance [cd/m<sup>2</sup>]

	0.00°	45.00°	90.00°
0.00°	0	0	0
45.00°	5763	8607	102799964014989246464
55.00°	2013	2994	35984609549806772224
65.00°	644	968	12160946092155328512
75.00°	466	759	7221807758130459648
85.00°	452	577	5645512734438432768

### 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		Viewing C0-180					Viewing C90-270				
2H	2H	2.8	3.7	3.2	4.0	4.4	6.9	7.8	7.3	8.1	8.5
	3H	3.4	4.2	3.8	4.5	5.0	7.8	8.6	8.2	8.9	9.4
	4H	3.6	4.4	4.1	4.8	5.2	8.4	9.1	8.8	9.5	10.0
	6H	3.9	4.6	4.3	5.0	5.4	9.5	10.2	10.0	10.6	11.1
	8H	4.1	4.7	4.6	5.2	5.6	10.3	10.9	10.8	11.4	11.8
	12H	4.3	4.9	4.8	5.4	5.8	11.1	11.7	11.6	12.1	12.6
4H	2H	3.0	3.7	3.4	4.1	4.6	6.7	7.4	7.1	7.8	8.2
	3H	3.7	4.3	4.1	4.7	5.2	7.7	8.3	8.2	8.8	9.2
	4H	4.1	4.6	4.6	5.1	5.6	8.4	9.0	8.9	9.4	9.9
	6H	4.5	5.0	5.0	5.4	6.0	9.7	10.2	10.2	10.7	11.2
	8H	4.8	5.2	5.3	5.7	6.2	10.5	11.0	11.0	11.4	12.0
	12H	5.2	5.5	5.7	6.0	6.6	11.4	11.8	11.9	12.3	12.8
8H	4H	4.3	4.8	4.8	5.2	5.8	8.4	8.8	8.9	9.3	9.8
	6H	4.9	5.2	5.4	5.8	6.3	9.8	10.1	10.3	10.6	11.2
	8H	5.4	5.7	6.0	6.3	6.8	10.6	10.9	11.2	11.5	12.0
	12H	5.9	6.2	6.5	6.7	7.3	11.6	11.8	12.1	12.4	13.0
12H	4H	4.4	4.8	4.9	5.3	5.8	8.4	8.7	8.9	9.2	9.8
	6H	5.1	5.4	5.7	5.9	6.5	9.7	10.0	10.3	10.5	11.1
	8H	5.7	5.9	6.2	6.5	7.1	10.7	10.9	11.2	11.4	12.1

Corrected UGR values based on total output energy  
SHR = 1.0

Corrected UGR values based on total output lumens

SHR = 1.0