

## Indoor Distribution Test Report

### Spectrum Lighting Inc.

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### Spectrum Lighting Photometric Lab

**Luminaire**

TSRA25 13L 35K ND E1 BET xx  
Nominal 2.4" Diameter Track Spot Luminaire with Recessed Arm

**Test Number**

SP-15008\_1

**Test Date**

9/14/2023

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

### Summary of Results

#### Power

Input Watts	15 W
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#### Lumen Output

Output Lumens	1288
Efficacy	85.84 lm/W

#### Luminous Dimensions

0° - 180° Size	0.04
90° - 270° Size	0.04
Height	0.18

#### Spacing Criterion

Two luminaires, plane 0°	0.39
Two luminaires, plane 90°	0.39
Four luminaires	0.39

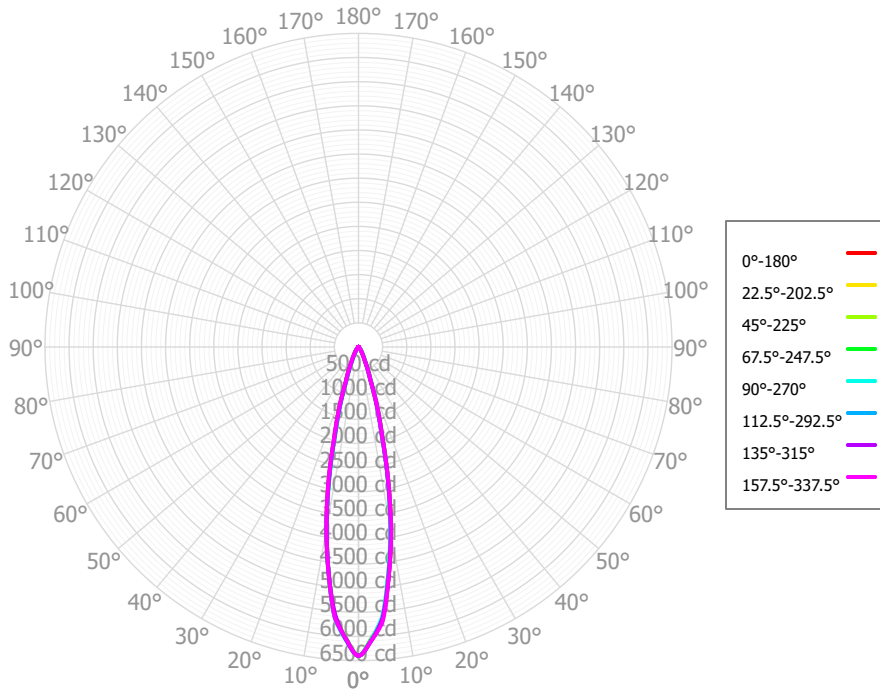
#### Full Beam Angle

0° - 180°	23°
90° - 270°	23°

### IES File Header Contents

Keyword	Value
TEST	SP-15008_1
TESTLAB	Spectrum Lighting Potometric Lab, VLS-245-981
MANUFAC	Spectrum Lighting
TESTDATE	9/14/2023
ISSUEDATE	9/15/2023
LUMCAT	TSRA25 13L 35K ND E1 BET xx
LUMINAIRE	Nominal 2.4" Diameter Track Spot Luminaire with Recessed Arm
OTHER	Narrow Beam
OTHER	24 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°	478.16	37.14%	90.00° - 100.00°	1.28	0.10%
10.00° - 20.00°	532.01	41.32%	100.00° - 110.00°	1.14	0.09%
20.00° - 30.00°	166.29	12.92%	100.00° - 120.00°	2.34	0.18%
30.00° - 40.00°	60.75	4.72%	120.00° - 130.00°	1.10	0.09%
40.00° - 50.00°	26.08	2.03%	130.00° - 140.00°	1.05	0.08%
50.00° - 60.00°	10.02	0.78%	140.00° - 150.00°	0.88	0.07%
60.00° - 70.00°	3.53	0.27%	150.00° - 160.00°	0.74	0.06%
70.00° - 80.00°	1.41	0.11%	160.00° - 170.00°	0.43	0.03%
80.00° - 90.00°	1.36	0.11%	170.00° - 180.00°	0.14	0.01%
0.00° - 90.00°	1279.61	99.38%	0.00° - 180.00°	1287.57	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°	6401.20	6401.20	6401.20	6401.20	6401.20	6401.20	6401.20	6401.20	6401.20	6401.20	6401.20	6401.20	6401.20	6401.20	6401.20	6401.20	6401.20
2.50°	6078.75	6069.61	6058.21	6057.89	6077.02	6053.28	6065.72	6049.51	6043.03	6046.69	6044.58	6041.40	6078.45	6091.48	6095.09	6094.00	6078.75
5.00°	5685.17	5663.93	5648.91	5648.41	5614.72	5620.41	5567.02	5630.70	5598.97	5600.11	5602.41	5628.42	5644.84	5680.22	5661.06	5718.71	5685.17
7.50°	4793.24	4780.80	4755.58	4747.73	4735.72	4724.36	4739.32	4739.76	4735.13	4740.41	4734.50	4730.89	4745.21	4773.30	4794.28	4804.73	4793.24
10.00°	3880.28	3870.95	3839.47	3809.79	3785.51	3817.62	3801.11	3844.65	3823.91	3815.80	3801.19	3821.26	3820.82	3829.56	3871.73	3885.24	3880.28
12.50°	2846.31	2838.42	2819.44	2822.74	2817.04	2826.34	2860.12	2879.33	2875.86	2868.09	2840.93	2817.16	2792.69	2815.26	2817.89	2856.20	2846.31
15.00°	1879.99	1886.37	1877.16	1832.71	1845.78	1883.87	1918.28	1939.36	1924.24	1917.27	1876.99	1865.21	1849.91	1797.06	1889.83	1836.43	1879.99
17.50°	1265.60	1265.33	1260.02	1261.81	1260.76	1282.16	1304.04	1340.46	1330.65	1317.57	1286.04	1261.19	1236.55	1228.03	1240.08	1259.37	1265.60
20.00°	721.10	727.69	726.44	708.66	726.45	735.88	783.04	774.25	764.63	759.45	738.03	713.08	708.24	675.59	724.56	694.91	721.10
22.50°	499.44	506.22	507.73	508.13	506.95	524.23	532.62	555.77	543.78	533.05	514.09	498.82	483.47	475.05	483.98	492.51	499.44
25.00°	305.32	315.66	319.74	317.58	323.56	332.74	353.45	350.57	344.34	339.10	322.26	306.62	293.78	282.61	298.10	296.18	305.32
27.50°	227.82	233.54	238.86	240.99	242.47	250.95	258.85	266.17	258.58	253.51	240.08	230.09	217.92	214.94	217.85	223.48	227.82
30.00°	158.15	161.78	167.15	165.72	171.02	175.93	184.76	186.31	178.21	176.82	167.05	160.36	151.78	148.68	152.75	153.07	158.15
32.50°	118.99	123.11	125.17	127.66	129.87	133.55	139.00	142.38	139.30	135.42	129.22	123.10	115.01	114.10	115.27	116.38	118.99
35.00°	84.22	88.86	88.96	89.96	91.11	95.10	99.38	101.26	101.60	96.38	93.65	89.35	83.57	79.89	84.16	81.21	84.22
37.50°	64.90	67.77	69.84	70.85	71.60	73.88	76.21	79.03	79.02	76.10	73.88	70.57	66.84	63.78	63.83	64.31	64.90
40.00°	47.95	49.68	52.80	52.03	53.31	54.99	56.29	58.34	56.62	56.72	54.89	53.48	52.06	47.98	47.89	48.17	47.95
42.50°	38.75	39.77	41.39	41.79	43.81	45.33	44.75	46.87	45.57	45.55	43.36	43.04	42.32	39.91	38.99	39.37	38.75
45.00°	30.39	30.98	31.31	31.70	34.71	35.99	34.67	35.98	34.57	34.62	32.07	33.25	33.06	31.81	30.87	30.82	30.39
47.50°	24.53	25.08	24.60	24.55	26.28	27.84	27.31	28.16	27.03	27.53	25.90	25.82	24.91	23.21	23.94	24.36	24.53
50.00°	19.18	19.42	18.57	17.65	17.87	20.27	20.37	20.74	19.57	20.51	19.83	19.11	17.80	15.04	18.19	18.31	19.18
52.50°	15.25	14.33	14.17	14.54	14.08	14.71	15.03	15.28	14.59	14.74	14.49	14.77	13.00	12.82	14.11	15.11	15.25
55.00°	11.49	10.24	10.27	11.48	10.35	10.04	9.90	10.45	9.73	9.04	9.21	10.86	9.04	10.63	10.77	11.80	11.49
57.50°	8.16	8.37	7.48	8.88	7.70	8.12	7.84	8.33	7.68	8.29	7.89	8.27	6.83	8.84	8.39	7.86	8.16
60.00°	5.46	6.44	5.50	6.36	5.08	6.40	6.13	6.36	5.68	7.50	6.57	5.99	5.28	7.02	6.31	4.48	5.46
62.50°	4.25	4.41	5.18	4.76	4.03	5.27	4.54	4.94	4.25	5.01	5.28	4.58	5.00	5.01	4.59	4.14	4.25
65.00°	3.20	2.91	4.56	3.23	3.00	3.99	2.95	3.55	2.87	2.61	4.00	3.29	4.38	3.11	3.07	3.69	3.20
67.50°	2.49	2.42	3.36	2.32	2.48	2.35	2.28	2.30	1.97	1.98	2.73	2.29	3.14	2.18	1.78	2.70	2.49
70.00°	1.91	1.92	2.33	1.49	1.97	1.21	1.69	1.39	1.16	1.39	1.54	1.49	2.28	1.33	1.10	1.83	1.91
72.50°	1.58	1.39	1.62	1.30	1.53	1.34	1.36	1.63	1.26	1.26	1.62	1.14	2.08	1.08	1.10	1.49	1.58
75.00°	1.39	1.02	1.19	1.12	1.13	1.44	1.05	1.70	1.34	1.16	1.69	0.97	1.82	0.88	1.12	1.19	1.39
77.50°	1.45	0.93	1.25	1.10	1.29	1.50	0.98	1.30	1.21	1.45	1.49	1.17	1.43	1.08	1.14	1.05	1.45
80.00°	1.35	0.98	1.25	1.11	1.42	1.54	0.92	1.06	1.11	1.72	1.32	1.29	1.15	1.24	1.15	1.01	1.35
82.50°	0.96	1.25	1.18	1.40	1.11	1.57	1.18	1.30	1.19	1.82	1.35	1.24	1.02	1.18	1.14	1.35	0.96
85.00°	0.81	1.34	1.14	1.62	0.85	1.56	1.45	1.39	1.26	1.86	1.36	1.23	0.94	1.13	1.12	1.60	0.81
87.50°	1.05	1.15	1.15	1.54	1.08	1.50	1.23	1.07	1.27	1.44	1.12	1.32	0.94	1.11	1.08	1.50	1.05
90.00°	1.24	1.00	1.23	1.44	1.30	1.38	1.01	0.93	1.26	1.06	0.90	1.31	1.01	1.11	1.11	1.45	1.24
92.50°	1.34	0.92	1.40	1.22	1.48	1.17	0.96	1.21	1.15	1.06	0.84	1.13	1.19	1.21	1.18	1.57	1.34
95.00°	1.29	0.99	1.36	1.02	1.63	1.13	0.91	1.41	1.06	1.05	0.78	1.06	1.24	1.29	1.22	1.64	1.29
97.50°	0.99	1.25	1.03	0.90	1.59	1.37	0.85	1.40	1.05	1.00	0.79	1.17	1.12	1.32	1.23	1.53	0.99
100.00°	0.87	1.24	0.91	0.83	1.53	1.47	0.80	1.43	1.02	0.94	0.81	1.10	0.97	1.33	1.12	1.38	0.87
102.50°	0.99	0.87	1.06	0.97	1.43	1.33	1.06	1.53	0.90	0.92	0.84	0.72	0.77	1.22	0.93	1.12	0.99
105.00°	1.03	0.95	1.15	1.06	1.32	1.16	1.30	1.47	0.83	0.94	0.91	0.62	0.82	1.17	0.86	0.98	1.03

### Coefficients of Utilization – Zonal Cavity Method

Values are lumens delivered to the workplane.

<b>RCR</b>	<b>ptc</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%	10%
	<b>0</b>	1531	1531	1531	1531	1494	1494	1494	1494	1426	1426	1426	1364	1364	1364	1307	1307	1280
	<b>1</b>	1477	1449	1424	1401	1446	1421	1399	1378	1368	1351	1335	1320	1306	1294	1275	1265	1240
	<b>2</b>	1427	1379	1340	1307	1400	1357	1322	1292	1316	1287	1263	1278	1255	1235	1242	1224	1209
	<b>3</b>	1380	1319	1271	1233	1356	1301	1258	1223	1268	1233	1203	1238	1208	1184	1209	1186	1163
	<b>4</b>	1336	1266	1214	1174	1316	1251	1204	1167	1225	1185	1153	1200	1166	1139	1177	1149	1128
	<b>5</b>	1296	1218	1164	1124	1277	1207	1157	1119	1185	1142	1109	1165	1128	1099	1146	1115	1095
	<b>6</b>	1258	1176	1121	1082	1241	1166	1115	1078	1149	1104	1071	1132	1093	1063	1116	1083	1065
	<b>7</b>	1222	1138	1083	1045	1208	1130	1078	1042	1115	1069	1036	1101	1061	1031	1088	1052	1036
	<b>8</b>	1189	1103	1049	1011	1176	1096	1045	1009	1083	1038	1005	1072	1031	1001	1061	1024	1009
	<b>9</b>	1157	1071	1017	982	1146	1065	1014	980	1054	1009	977	1044	1003	974	1035	998	983
	<b>10</b>	1128	1041	989	954	1118	1036	987	953	1027	982	951	1018	977	948	1010	973	959

### Cone of Light

Mtg Height	Light Level	Beam Diameter
5.5 ft	211.6 fc	2.3 ft
6.5 ft	151.5 fc	2.7 ft
7.5 ft	113.8 fc	3.1 ft
8.0 ft	100.0 fc	3.3 ft
10.0 ft	64.0 fc	4.1 ft
12.0 ft	44.5 fc	4.9 ft
14.0 ft	32.7 fc	5.8 ft
16.0 ft	25.0 fc	6.6 ft
20.0 ft	16.0 fc	8.2 ft
24.0 ft	11.1 fc	9.9 ft
28.0 ft	8.2 fc	11.5 ft

### Average Luminaire Luminance [cd/m²]

	0.00°	45.00°	90.00°
<b>0.00°</b>	43063687	43063687	43063687
<b>45.00°</b>	52570	40453	60045
<b>55.00°</b>	18140	11940	16351
<b>65.00°</b>	4783	4951	4479
<b>75.00°</b>	2031	1248	1653
<b>85.00°</b>	1187	1190	1250

### 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	9.6	10.5	10.0	10.9	11.2	9.6	10.5	10.0	10.8	11.2
	3H	9.8	10.6	10.2	10.9	11.3	9.7	10.5	10.1	10.9	11.3
	4H	9.8	10.5	10.2	10.9	11.3	9.7	10.5	10.2	10.8	11.2
	6H	9.8	10.5	10.2	10.9	11.3	9.8	10.4	10.2	10.8	11.3
	8H	9.8	10.4	10.2	10.8	11.3	9.8	10.4	10.2	10.8	11.3
	12H	9.8	10.4	10.2	10.8	11.2	9.8	10.4	10.2	10.8	11.2
4H	2H	9.6	10.3	10.0	10.7	11.1	9.5	10.2	9.9	10.6	11.0
	3H	9.8	10.4	10.2	10.8	11.2	9.7	10.3	10.1	10.7	11.1
	4H	9.8	10.3	10.2	10.7	11.2	9.7	10.2	10.1	10.7	11.1
	6H	9.8	10.3	10.3	10.8	11.3	9.8	10.3	10.3	10.7	11.2
	8H	9.9	10.3	10.4	10.8	11.3	9.9	10.3	10.4	10.8	11.2
	12H	9.9	10.3	10.4	10.8	11.3	9.9	10.3	10.4	10.8	11.3
8H	4H	9.6	10.1	10.1	10.5	11.0	9.6	10.0	10.1	10.5	11.0
	6H	9.8	10.1	10.3	10.6	11.1	9.8	10.1	10.3	10.6	11.1
	8H	9.9	10.2	10.4	10.7	11.2	9.9	10.2	10.4	10.7	11.2
	12H	10.0	10.3	10.5	10.8	11.4	10.1	10.3	10.6	10.8	11.4
12H	4H	9.6	10.0	10.1	10.5	11.0	9.5	9.9	10.0	10.4	10.9
	6H	9.7	10.0	10.3	10.5	11.1	9.7	10.0	10.3	10.5	11.1
	8H	9.9	10.1	10.4	10.6	11.2	9.9	10.2	10.5	10.7	11.3

Corrected UGR values based on total output energy  
 SHR = 1.0

Corrected UGR values based on total output lumens

SHR = 1.0