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IES INDOOR REPORT

PHOTOMETRIC FILENAME : FSN-8635-OPAL.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] LM-79-08
[TESTLAB] Orb Optronix, Inc.
[ISSUE DATE] 07-22-2019
[MANUFAC] Justice Design
[LUMINAIRE] FSN-8635-OPAL-MBLK

CHARACTERISTICS

Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	780
Total Luminaire Efficiency	N.A.
Luminaire Efficacy Rating (LER)	23
Total Luminaire Watts	33.78
Ballast Factor	1.00
CIE Type	General Diffuse
Spacing Criterion (0-180)	N.A.
Spacing Criterion (90-270)	N.A.
Spacing Criterion (Diagonal)	N.A.
Basic Luminous Shape	Rectangular w/Sides
Luminous Length (0-180)	0.21 ft
Luminous Width (90-270)	2.38 ft
Luminous Height	0.38 ft

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	1370	1297	868
55	1546	1474	1126
65	1720	1661	1513
75	1905	1874	2195
85	2125	2133	3853

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CANDELA TABULATION

	<u>0.0</u>	<u>22.5</u>	<u>45.0</u>	<u>67.5</u>	<u>90.0</u>	<u>112.5</u>	<u>135.0</u>	<u>157.5</u>	<u>180.0</u>	<u>202.5</u>
0.0	8.100	8.100	8.100	8.100	8.100	8.100	8.100	8.100	8.100	8.100
2.5	7.160	8.220	8.130	7.920	8.660	8.600	12.690	10.140	10.270	11.090
5.0	12.990	14.480	13.600	11.890	11.710	12.710	14.990	15.440	15.560	14.820
7.5	21.620	21.890	19.430	16.350	14.250	14.720	14.140	14.900	15.310	14.510
10.0	28.450	30.200	25.960	19.580	14.670	13.840	14.320	14.450	14.070	14.040
12.5	43.090	44.120	36.510	25.570	16.820	14.130	14.730	14.010	13.160	13.430
15.0	53.170	53.500	45.560	31.750	19.170	14.930	15.340	13.670	12.830	13.020
17.5	61.560	61.270	51.930	36.630	21.230	15.680	15.470	13.580	13.270	12.900
20.0	69.660	69.220	58.320	40.740	23.010	16.420	15.520	13.830	13.810	13.130
22.5	77.710	75.960	63.810	44.300	24.430	17.420	15.440	14.080	14.640	13.830
25.0	84.540	82.440	68.870	47.630	25.840	17.970	15.440	14.670	15.910	14.540
27.5	90.860	88.240	74.080	51.000	27.050	18.160	15.200	15.320	17.330	15.090
30.0	96.610	93.920	78.950	54.460	28.070	18.300	14.910	16.090	18.540	15.770
32.5	101.900	98.250	82.850	57.460	28.970	18.630	14.430	16.860	19.510	16.090
35.0	107.570	103.230	86.380	59.850	29.650	19.040	13.930	17.380	20.460	16.360
37.5	113.010	108.290	90.710	62.510	30.490	19.170	13.690	17.770	21.520	16.770
40.0	117.590	112.680	94.880	65.120	31.380	19.510	13.420	18.090	22.480	17.090
42.5	121.940	116.800	98.580	67.900	32.260	19.910	13.270	18.600	23.420	17.360
45.0	126.520	120.990	101.960	70.440	33.080	20.190	13.150	18.980	24.160	17.770
47.5	131.400	125.560	105.540	72.720	34.030	20.380	13.060	19.250	24.980	18.030
50.0	136.810	130.430	109.350	75.220	35.100	20.660	12.960	19.520	25.790	18.190
52.5	142.530	135.630	113.420	77.670	36.040	20.870	12.720	19.790	26.470	18.450
55.0	147.690	140.400	117.470	80.220	36.850	21.180	12.720	20.050	26.880	18.780
57.5	152.490	144.710	121.050	82.580	37.530	21.400	12.510	20.100	27.490	18.810
60.0	156.770	148.620	124.080	84.660	38.350	21.670	12.420	20.170	28.030	18.990
62.5	160.880	152.400	127.120	86.630	39.090	21.860	12.180	20.380	28.560	19.130
65.0	164.880	156.010	130.010	88.300	39.890	22.270	12.250	20.700	29.100	19.540
67.5	168.070	158.780	132.260	89.740	40.370	22.270	12.270	20.900	29.780	19.720
70.0	170.950	161.690	134.580	91.290	40.980	22.560	12.360	21.050	30.250	19.820
72.5	174.460	164.990	137.440	93.000	41.580	23.090	12.540	21.290	30.930	20.140
75.0	177.650	167.690	139.680	94.630	42.130	23.530	12.600	21.550	31.530	20.460
77.5	180.220	169.130	141.760	95.930	42.810	23.920	12.870	21.740	31.870	20.640
80.0	182.630	171.620	143.480	97.070	43.290	24.360	13.010	21.910	32.550	20.780
82.5	184.930	173.720	145.160	98.090	43.760	24.580	13.090	21.990	32.880	20.930
85.0	186.620	175.350	146.140	98.850	44.090	24.840	13.180	21.990	33.150	20.840
87.5	187.580	176.450	146.730	99.150	44.300	24.960	13.210	21.920	33.350	20.840
90.0	188.120	176.760	146.850	99.060	44.380	24.890	13.180	21.740	33.350	20.750
92.5	187.770	176.440	146.390	99.110	44.360	24.810	13.100	21.550	33.350	20.380
95.0	186.900	175.740	145.810	98.740	44.380	24.550	13.180	21.340	33.080	20.190
97.5	185.750	174.780	144.980	98.210	44.240	24.390	13.100	21.240	33.000	19.910
100.0	184.390	173.480	143.790	97.460	44.030	24.060	13.130	21.180	33.000	19.950
102.5	182.350	171.590	142.080	96.400	43.560	23.810	12.750	20.590	32.240	19.160
105.0	180.050	169.370	140.450	95.420	43.290	23.070	12.360	20.050	31.930	18.860
107.5	177.630	167.190	138.680	94.200	43.170	22.650	12.240	19.810	31.430	18.600
110.0	174.970	164.790	136.410	92.970	42.900	22.030	11.950	19.480	30.760	18.370
112.5	171.650	161.770	133.710	91.250	42.350	21.470	11.650	19.190	30.160	17.890
115.0	167.870	158.310	130.900	89.500	41.880	21.440	11.350	18.840	29.620	17.620
117.5	164.370	154.940	128.120	87.820	41.270	21.340	11.410	18.460	29.010	17.230
120.0	160.500	151.460	124.930	85.860	40.530	21.210	11.710	18.100	28.200	16.950
122.5	156.400	147.620	121.700	83.800	39.920	20.870	12.070	18.090	27.530	16.890
125.0	152.600	143.890	118.270	81.640	39.300	20.590	12.300	18.010	26.840	16.800
127.5	147.750	139.450	114.350	79.340	38.360	20.350	12.390	18.030	25.730	16.450
130.0	142.970	134.950	112.370	80.490	37.760	20.080	12.600	17.950	24.740	15.880
132.5	139.390	131.930	111.720	77.510	37.000	19.840	12.500	17.530	23.660	15.970

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CANDELA TABULATION - (Cont.)

135.0	135.880	128.390	104.820	73.240	36.050	19.390	12.540	17.330	22.800	15.190
137.5	132.030	124.810	101.210	70.530	35.180	19.280	12.420	17.260	21.380	14.170
140.0	127.000	120.370	96.980	68.070	33.860	18.430	12.090	15.550	18.950	12.540
142.5	120.910	114.870	94.070	63.330	32.200	17.980	11.480	13.330	17.350	11.290
145.0	106.630	105.890	87.310	62.250	31.630	17.410	10.520	11.950	15.680	9.970
147.5	108.140	104.030	86.040	58.080	29.810	16.020	9.550	10.800	13.240	8.420
150.0	100.800	96.720	79.490	53.340	27.920	14.630	8.130	8.760	10.320	5.890
152.5	94.210	89.800	73.360	49.470	26.220	13.100	5.980	6.380	7.150	4.130
155.0	88.890	84.340	68.670	46.660	23.740	10.650	4.880	4.490	4.520	2.920
157.5	83.040	79.430	64.410	42.630	20.410	7.130	4.050	3.450	2.870	2.270
160.0	74.460	72.350	58.510	36.940	16.270	5.120	3.400	2.840	2.180	1.680
162.5	66.570	64.350	51.480	29.210	11.090	3.960	2.300	1.890	1.600	1.340
165.0	55.390	54.590	39.390	18.390	8.280	2.770	1.660	1.280	0.950	1.100
167.5	36.450	34.990	25.450	13.670	5.500	1.930	1.180	0.940	0.770	0.970
170.0	23.570	23.510	17.710	8.080	3.050	1.270	0.940	0.800	0.760	0.880
172.5	13.830	14.140	9.430	3.850	2.050	1.060	0.710	0.740	0.600	0.910
175.0	5.060	5.850	4.280	1.420	0.740	0.660	0.570	0.540	0.680	0.910
177.5	0.680	1.440	0.820	0.600	0.800	0.710	0.680	0.800	0.760	0.980
180.0	0.845	0.845	0.845	0.845	0.845	0.845	0.845	0.845	0.845	0.845

Vert. Angles **Horizontal Angles**

	<u>225.0</u>	<u>247.5</u>	<u>270.0</u>	<u>292.5</u>	<u>315.0</u>	<u>337.5</u>	<u>360.0</u>
0.0	8.100	8.100	8.100	8.100	8.100	8.100	8.100
2.5	10.000	9.490	9.080	7.250	6.500	7.040	6.470
5.0	14.230	13.330	12.280	11.270	11.770	13.390	13.950
7.5	14.140	14.050	14.510	15.880	18.030	21.430	22.530
10.0	14.140	14.130	15.810	19.300	23.650	29.010	30.140
12.5	14.460	14.810	18.040	24.900	33.030	41.820	44.740
15.0	15.090	15.470	19.570	29.950	40.890	50.620	54.380
17.5	15.250	15.850	20.930	34.060	46.830	57.840	62.270
20.0	15.130	16.490	21.990	37.470	52.900	65.520	70.670
22.5	15.200	17.100	23.030	40.370	58.100	72.330	78.420
25.0	15.140	17.770	24.010	43.150	62.900	78.510	85.210
27.5	15.140	18.240	24.770	46.160	67.930	83.950	91.320
30.0	15.020	18.780	25.290	49.020	72.300	89.240	97.190
32.5	14.990	19.250	25.850	51.720	76.290	94.330	102.320
35.0	14.670	19.790	26.610	54.210	80.460	99.570	108.020
37.5	14.660	20.130	27.300	56.690	84.800	104.550	113.320
40.0	14.520	20.810	27.950	59.130	88.510	108.940	117.930
42.5	14.460	21.410	28.630	61.560	92.160	113.070	122.440
45.0	14.400	21.680	29.310	63.900	95.870	117.830	127.140
47.5	14.380	22.290	30.080	66.150	99.910	122.650	132.210
50.0	14.320	22.920	30.750	68.640	103.880	127.790	137.710
52.5	14.260	23.440	31.470	71.180	108.130	133.060	143.380
55.0	14.250	24.040	32.200	73.480	112.120	138.030	148.580
57.5	14.130	24.580	32.640	75.730	115.710	142.250	153.280
60.0	13.990	25.050	33.150	77.650	118.810	146.140	157.450
62.5	13.860	25.450	33.770	79.600	121.980	150.070	161.560
65.0	13.860	25.900	34.310	81.190	124.880	153.680	165.610
67.5	13.840	25.970	34.690	82.490	127.260	156.630	168.640
70.0	13.920	26.320	35.010	83.710	129.420	159.240	171.450
72.5	13.980	26.740	35.460	85.310	131.910	162.390	174.850
75.0	13.980	27.270	35.750	86.500	134.270	165.260	177.950
77.5	14.050	27.610	36.230	87.730	136.160	167.540	180.530
80.0	14.190	28.210	36.660	88.740	137.910	169.760	182.940

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CANDELA TABULATION - (Cont.)

82.5	14.190	28.470	36.840	89.720	139.720	171.850	185.100
85.0	14.320	28.880	36.990	90.360	140.730	173.130	186.610
87.5	14.320	29.010	37.080	90.810	141.540	174.010	187.550
90.0	14.250	29.180	37.170	90.980	141.990	174.280	187.800
92.5	14.050	29.060	37.110	91.040	141.850	173.890	187.350
95.0	13.860	28.950	37.020	90.600	141.080	172.860	186.460
97.5	13.580	28.830	36.840	90.090	140.280	171.730	185.170
100.0	13.450	28.590	36.630	89.500	139.250	170.290	183.690
102.5	12.900	28.230	36.290	88.450	137.740	168.300	181.580
105.0	12.570	27.710	35.920	87.370	135.930	165.970	179.220
107.5	12.160	27.380	35.610	86.280	133.970	163.730	176.790
110.0	11.970	26.880	35.770	84.960	131.850	161.030	174.050
112.5	11.620	26.380	35.490	83.560	129.340	157.750	170.620
115.0	11.420	26.500	35.160	82.000	126.700	154.350	167.030
117.5	11.360	26.520	34.740	80.580	124.010	151.080	163.350
120.0	11.630	26.400	34.420	78.920	121.150	147.350	159.440
122.5	12.040	26.170	33.910	77.300	118.250	143.760	155.540
125.0	12.300	25.820	33.570	75.350	115.060	139.920	151.600
127.5	12.310	25.260	33.090	73.460	111.600	135.330	146.720
130.0	12.410	24.810	32.610	73.630	108.900	131.340	142.120
132.5	12.410	23.960	31.960	71.110	107.400	128.270	138.860
135.0	12.860	23.450	31.220	67.710	103.560	124.400	135.220
137.5	12.510	22.540	30.490	65.400	98.700	120.640	131.410
140.0	10.950	22.470	29.390	62.860	94.570	115.670	126.300
142.5	10.030	20.840	29.060	60.050	89.240	107.920	120.170
145.0	9.140	19.240	27.550	56.740	85.600	102.370	109.290
147.5	8.070	17.230	25.670	53.870	79.520	97.600	107.420
150.0	6.470	14.870	23.690	50.940	74.250	90.920	99.790
152.5	5.360	12.070	20.990	47.940	69.700	85.420	93.240
155.0	4.370	8.690	17.540	44.800	65.490	80.780	87.860
157.5	3.840	5.850	14.540	40.420	59.610	74.550	81.780
160.0	2.950	4.800	11.630	35.510	52.690	66.450	70.640
162.5	2.090	3.780	8.700	27.210	45.150	58.080	58.400
165.0	1.650	2.920	6.920	18.930	33.410	46.340	48.460
167.5	1.390	2.190	4.550	15.350	22.470	28.950	32.890
170.0	1.130	1.710	2.780	9.760	14.640	19.010	21.170
172.5	1.090	1.560	2.090	5.380	7.540	9.930	11.830
175.0	1.180	1.190	1.360	3.140	3.520	4.490	4.800
177.5	1.130	1.280	1.410	1.340	1.090	0.790	0.830
180.0	0.845	0.845	0.845	0.845	0.845	0.845	0.845

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ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	9.40	N.A.	1.20
0-30	27.69	N.A.	3.50
0-40	58.01	N.A.	7.40
0-60	158.17	N.A.	20.30
0-80	306.20	N.A.	39.20
0-90	391.20	N.A.	50.10
10-90	389.76	N.A.	49.90
20-40	48.61	N.A.	6.20
20-50	91.83	N.A.	11.80
40-70	169.32	N.A.	21.70
60-80	148.03	N.A.	19.00
70-80	78.87	N.A.	10.10
80-90	85.01	N.A.	10.90
90-110	164.37	N.A.	21.10
90-120	234.08	N.A.	30.00
90-130	291.91	N.A.	37.40
90-150	367.09	N.A.	47.00
90-180	389.23	N.A.	49.90
110-180	224.86	N.A.	28.80
0-180	780.43	N.A.	100.00

Total Luminaire Efficiency = N.A. %

ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	1.44
10-20	7.95
20-30	18.30
30-40	30.31
40-50	43.22
50-60	56.94
60-70	69.16
70-80	78.87
80-90	85.01
90-100	85.02
100-110	79.35
110-120	69.71
120-130	57.83
130-140	44.97
140-150	30.21
150-160	16.35
160-170	5.38
170-180	0.40

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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	107	107	107	107	99	99	99	99	83	83	83	69	69	69	56	56	56	50
1	92	86	80	74	84	78	73	68	65	61	57	52	49	46	41	39	37	31
2	82	72	63	56	74	66	58	52	54	48	43	43	39	35	33	30	27	22
3	74	61	52	45	67	56	48	41	46	39	34	36	31	27	28	24	21	16
4	66	53	44	36	60	49	40	33	40	33	27	31	26	22	24	20	16	12
5	61	47	37	30	55	43	34	28	35	28	23	28	22	18	21	17	13	10
6	55	41	32	25	50	38	29	23	31	24	19	24	19	15	18	14	11	8
7	51	37	28	22	46	34	26	20	28	21	16	22	17	13	17	13	9	7
8	47	33	25	19	43	30	23	17	25	19	14	20	15	11	15	11	8	5
9	44	30	22	16	40	28	20	15	23	17	12	18	13	10	14	10	7	5
10	41	27	20	14	37	25	18	13	21	15	11	17	12	8	13	9	6	4

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UGR TABLE - CORRECTED

Reflectances

Ceiling Cavity	70	70	50	50	30	70	70	50	50	30
Walls	50	30	50	30	30	50	30	50	30	30
Floor Cavity	20	20	20	20	20	20	20	20	20	20

Room Size UGR Viewed Crosswise

X=2H	Y=2H	14.5	15.5	15.4	16.5	17.7	5.8	6.8	6.7	7.8	9.1
	3H	18.4	19.4	19.4	20.4	21.6	8.2	9.2	9.2	10.2	11.4
	4H	20.5	21.4	21.4	22.4	23.6	9.4	10.3	10.3	11.3	12.6
	6H	22.6	23.5	23.5	24.4	25.7	10.5	11.4	11.5	12.4	13.7
	8H	23.7	24.5	24.6	25.5	26.8	11.1	11.9	12.0	12.9	14.2
	12H	24.8	25.6	25.8	26.6	27.9	11.6	12.4	12.6	13.4	14.7

UGR Viewed Endwise

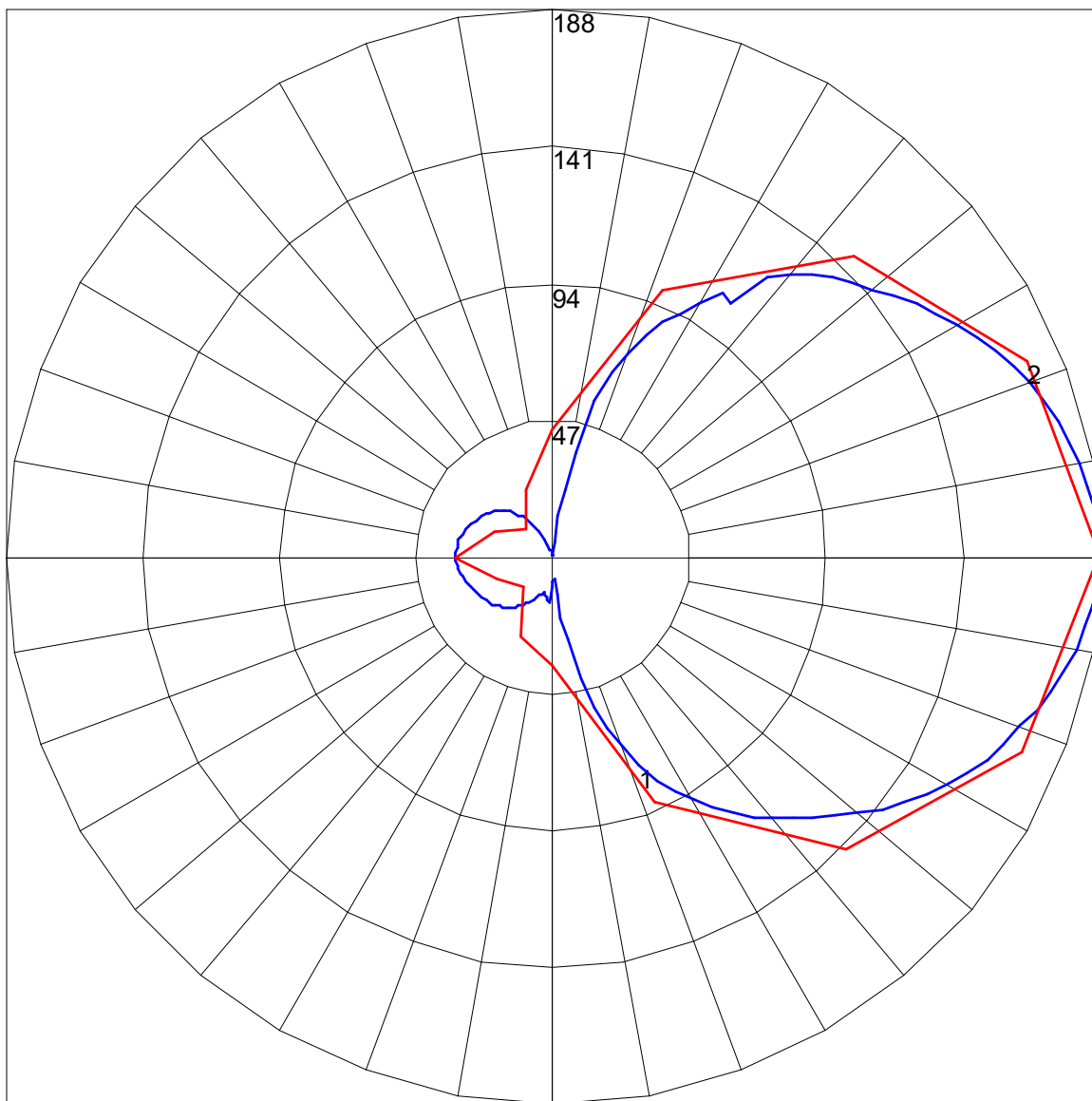
4H	2H	14.8	15.7	15.8	16.7	18.0	8.3	9.3	9.3	10.2	11.5
	3H	19.0	19.8	19.9	20.8	22.1	10.9	11.7	11.8	12.7	14.0
	4H	21.1	21.9	22.1	22.9	24.2	12.1	12.8	13.0	13.8	15.1
	6H	23.5	24.1	24.4	25.1	26.4	13.2	13.9	14.2	14.9	16.2
	8H	24.6	25.3	25.6	26.3	27.6	13.7	14.4	14.7	15.4	16.7
	12H	25.9	26.5	26.9	27.5	28.9	14.3	14.8	15.3	15.9	17.2

8H	4H	21.3	22.0	22.3	23.0	24.3	13.8	14.5	14.8	15.5	16.8
	6H	23.8	24.3	24.8	25.4	26.7	15.2	15.7	16.2	16.8	18.1
	8H	25.1	25.6	26.1	26.7	28.0	15.9	16.3	16.9	17.4	18.7
	12H	26.6	27.0	27.6	28.1	29.4	16.5	16.9	17.5	17.9	19.3

12H	4H	21.3	21.9	22.3	22.9	24.3	14.4	15.0	15.4	16.0	17.3
	6H	23.9	24.3	24.9	25.4	26.8	15.9	16.4	16.9	17.4	18.8
	8H	25.2	25.7	26.3	26.7	28.1	16.7	17.1	17.7	18.2	19.5

Maximum UGR = 29.4

POLAR GRAPH



Maximum Candela = 188.12 Located At Horizontal Angle = 0, Vertical Angle = 90

1 - Vertical Plane Through Horizontal Angles (0 - 180) (Through Max. Cd.)

2 - Horizontal Cone Through Vertical Angle (90) (Through Max. Cd.)