

Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: INVUE

Report Number: P597168

Luminaire Tested: **MSA-SA4D-835-U-SLL**

Issue Date: 5/27/2021

**Test Information**

Test Method: LM-79-08  
Report Number: P597168  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1910-543-24)  
Test Lab: INNOVATIONS CENTER  
Issue Date: 5/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: INVUE  
Catalog Number: MSA-SA4D-835-U-SLL  
Description: MESA POST TOP DECORATIVE LUMINAIRE. (4) LIGHTSQUARES WITH 16 LEDS EACH AND SPILL LIGHT ELIMINATOR LEFT OPTICS.  
Light Source: -  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 18579 lumens  
Efficiency: N/A  
Efficacy: 71.7 lumens/watt  
Luminous Opening: Rectangular (W 1' x L: 1' x H: 0')  
IES Classification: Type IV - Short  
BUG Rating: B3 - U0 - G4

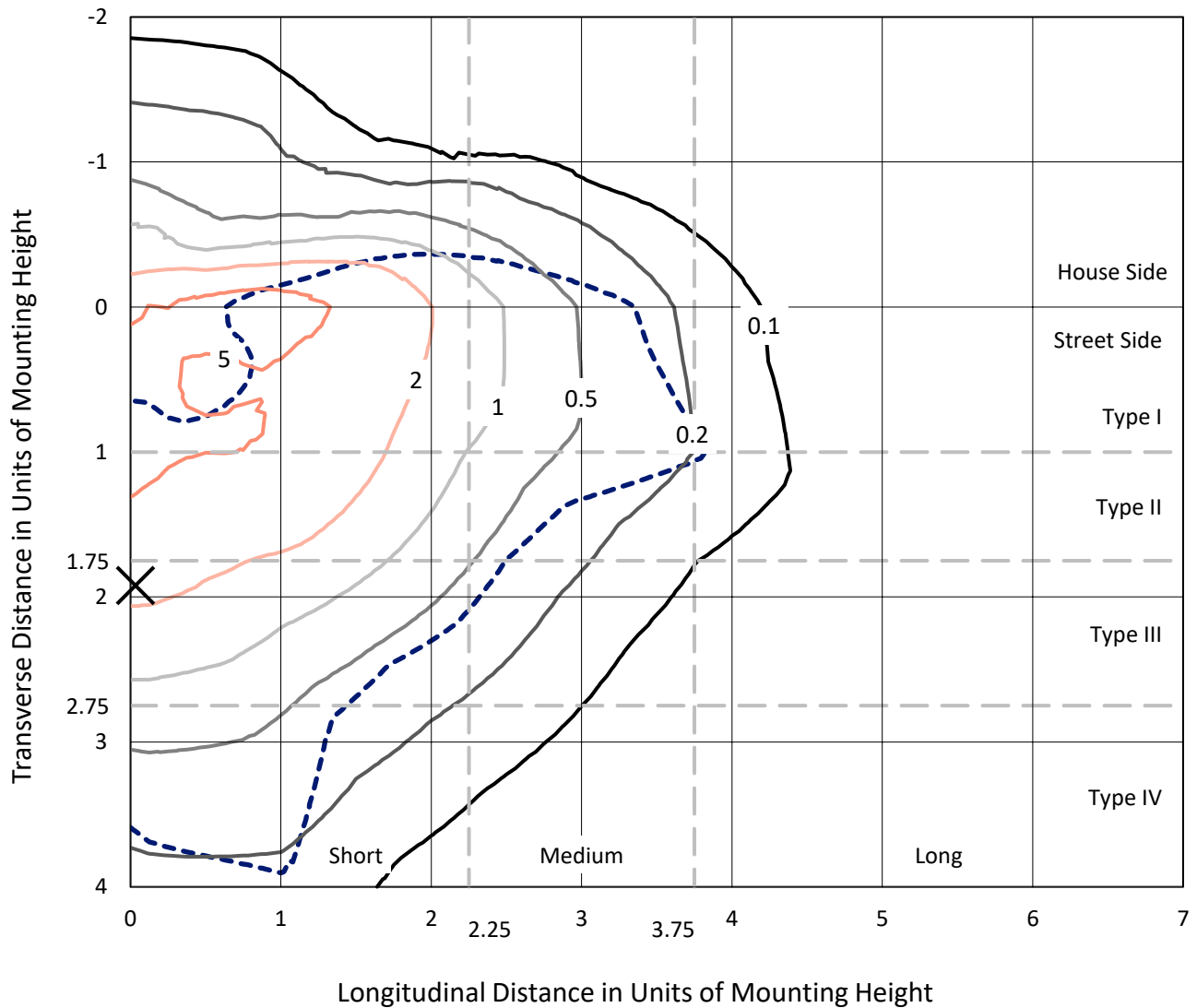
Input Watts (W): 259  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 28.75 FT



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### Iso-Footcandle Lines of Horizontal Illumination

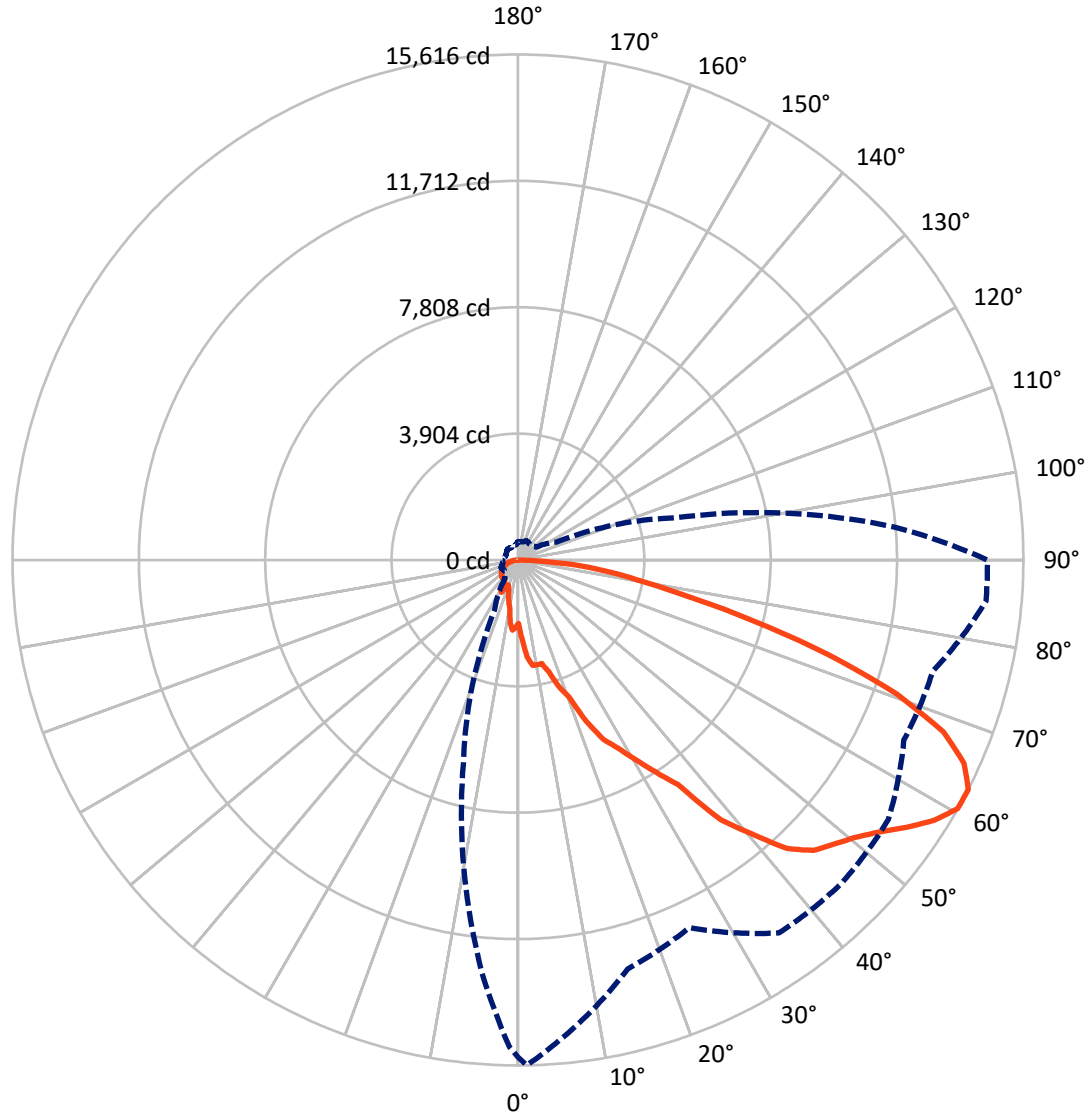
✕ Max cd  
 - - - 1/2 Max cd



Based on 25 foot mounting height. Maximum calculated value = 7.9 fc  
 Type IV - Short - N/A

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### Luminous Intensity Polar Plot



— Vertical Plane Through 1-Deg Lateral      - - - Horizontal Cone Through 62.5-Deg Vertical

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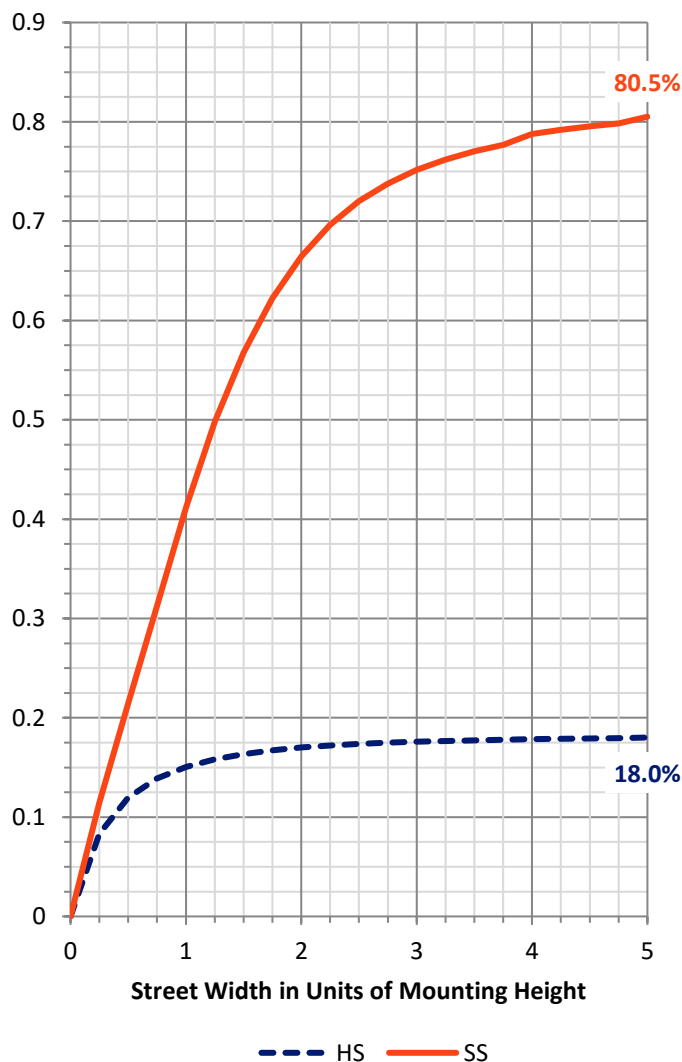
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total   |
|--------------------|-----------|----------|--------|---------|
| <b>House Side</b>  | Lumens    | 3383.1   | 0.0    | 3383.1  |
|                    | % Fixture | 18.2     | 0.0    | 18.2    |
| <b>Street Side</b> | Lumens    | 15195.9  | 0.0    | 15195.9 |
|                    | % Fixture | 81.8     | 0.0    | 81.8    |
| <b>Total</b>       | Lumens    | 18579.0  | 0.0    | 18579.0 |
|                    | % Fixture | 100.0    | 0.0    | 100.0   |

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 224.6   | 1.2       |
| 10°-20°   | 652.6   | 3.5       |
| 20°-30°   | 1152.2  | 6.2       |
| 30°-40°   | 1794.7  | 9.7       |
| 40°-50°   | 2955.2  | 15.9      |
| 50°-60°   | 4217.8  | 22.7      |
| 60°-70°   | 4472.5  | 24.1      |
| 70°-80°   | 2470.4  | 13.3      |
| 80°-90°   | 639.0   | 3.4       |
| 90°-100°  | 0.0     | 0.0       |
| 100°-110° | 0.0     | 0.0       |
| 110°-120° | 0.0     | 0.0       |
| 120°-130° | 0.0     | 0.0       |
| 130°-140° | 0.0     | 0.0       |
| 140°-150° | 0.0     | 0.0       |
| 150°-160° | 0.0     | 0.0       |
| 160°-170° | 0.0     | 0.0       |
| 170°-180° | 0.0     | 0.0       |
| 0°-90°    | 18579.0 | 100.0     |
| 0°-180°   | 18579.0 | 100.0     |

**Coefficient of Utilization**



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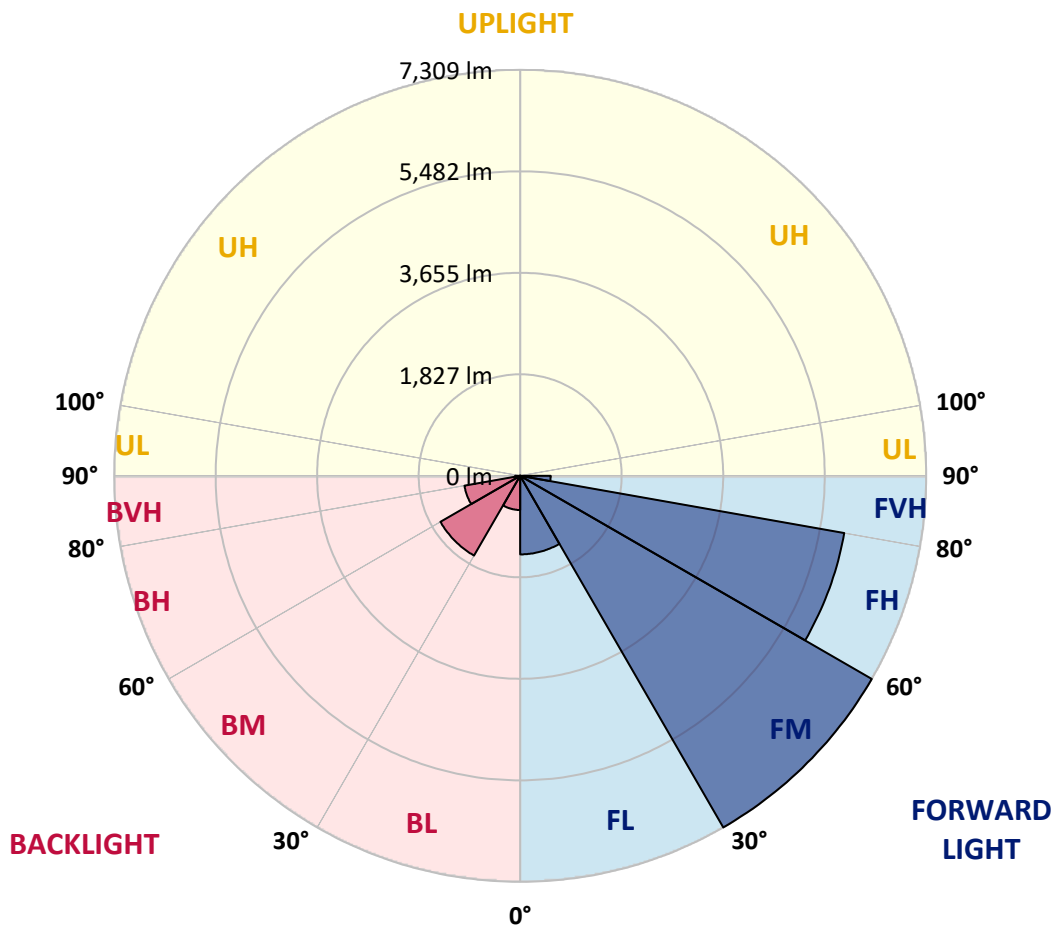
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**LUMINAIRE CLASSIFICATION SYSTEM LUMEN TABLE AND BUG RATING:**

| Zone           | Lumens | % Fixture | Zone Rating/Lumen Limit |      |         |
|----------------|--------|-----------|-------------------------|------|---------|
|                |        |           | B                       | U    | G       |
| FL (0°-30°)    | 1414.1 | 7.6       |                         |      |         |
| FM (30°-60°)   | 7309.2 | 39.3      |                         |      |         |
| FH (60°-80°)   | 5923.7 | 31.9      |                         |      | G3/7500 |
| FVH (80°-90°)  | 548.9  | 3.0       |                         |      | G4/750  |
| BL (0°-30°)    | 615.3  | 3.3       | B2/1000                 |      |         |
| BM (30°-60°)   | 1658.5 | 8.9       | B2/2500                 |      |         |
| BH (60°-80°)   | 1019.2 | 5.5       | B3/2500                 |      | G3/2500 |
| BVH (80°-90°)  | 90.1   | 0.5       |                         |      | G1/100  |
| UL (90°-100°)  | 0.0    | 0.0       |                         | U0/0 |         |
| UH (100°-180°) | 0.0    | 0.0       |                         | U0/0 |         |

**BUG Rating: B3-U0-G4**

Type IV Short





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**CANDELA DISTRIBUTION (FULL):**

|       | 0°      | 1°      | 5°      | 15°     | 25°     | 35°     | 45°     | 55°     | 65°     | 75°     | 85°     |
|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 0°    | 1959.1  | 1959.1  | 1959.1  | 1959.1  | 1959.1  | 1959.1  | 1959.1  | 1959.1  | 1959.1  | 1959.1  | 1959.1  |
| 2.5°  | 2409.0  | 2429.8  | 2387.4  | 2339.6  | 2142.2  | 2332.4  | 2275.6  | 2381.1  | 2346.8  | 2117.8  | 2537.1  |
| 5°    | 2977.0  | 3014.9  | 2973.4  | 3116.8  | 3125.8  | 3162.7  | 2821.0  | 3033.8  | 2959.9  | 2941.0  | 3152.8  |
| 7.5°  | 3251.1  | 3289.9  | 3395.4  | 3650.5  | 3849.8  | 3669.4  | 3470.2  | 3426.0  | 3368.3  | 3217.7  | 3345.8  |
| 10°   | 3268.2  | 3289.9  | 3431.4  | 3972.4  | 4068.8  | 4196.9  | 4067.9  | 3764.1  | 3638.8  | 3311.5  | 3214.1  |
| 12.5° | 3216.8  | 3284.5  | 3467.5  | 4126.5  | 4413.2  | 4553.0  | 4584.5  | 4246.4  | 3939.0  | 3565.8  | 3516.2  |
| 15°   | 3562.1  | 3586.5  | 3848.9  | 4236.5  | 4434.0  | 4552.1  | 4654.9  | 4446.6  | 4350.1  | 4054.4  | 3656.8  |
| 17.5° | 4057.1  | 4124.7  | 4339.3  | 4482.7  | 4616.1  | 4638.6  | 4553.9  | 4472.7  | 4319.5  | 4714.4  | 4291.5  |
| 20°   | 4392.5  | 4523.2  | 4786.5  | 4813.5  | 4533.2  | 4582.7  | 4571.0  | 4576.4  | 4489.0  | 5219.3  | 4986.6  |
| 22.5° | 5279.7  | 5421.2  | 5457.3  | 5300.4  | 4772.1  | 4545.8  | 4590.9  | 4721.6  | 5066.0  | 5691.7  | 5954.9  |
| 25°   | 6083.0  | 6138.0  | 6467.0  | 6063.1  | 5221.1  | 4727.9  | 4654.0  | 4992.1  | 5553.7  | 6486.9  | 6674.4  |
| 27.5° | 6502.2  | 6573.4  | 6792.5  | 5913.5  | 5277.0  | 4493.5  | 4320.4  | 4835.2  | 5407.7  | 6112.7  | 6935.9  |
| 30°   | 7038.6  | 7152.2  | 7450.7  | 6063.1  | 5445.6  | 4646.8  | 4263.6  | 4755.8  | 5388.8  | 6358.0  | 7489.4  |
| 32.5° | 7591.3  | 7812.2  | 8034.0  | 6590.6  | 5422.1  | 4881.2  | 4626.9  | 4666.6  | 5560.1  | 6871.9  | 8062.8  |
| 35°   | 8323.4  | 8518.1  | 8709.3  | 6895.3  | 5894.5  | 5076.8  | 4824.4  | 5244.5  | 6000.0  | 7467.8  | 8862.5  |
| 37.5° | 9888.5  | 10196.9 | 9692.9  | 7762.6  | 6408.4  | 5958.6  | 5503.3  | 5752.1  | 6465.2  | 7964.6  | 10168.9 |
| 40°   | 10885.7 | 11117.4 | 10630.5 | 8353.2  | 7313.6  | 6552.7  | 6477.9  | 6498.6  | 7106.3  | 8390.1  | 11048.0 |
| 42.5° | 11876.5 | 12190.3 | 11415.8 | 9163.7  | 8408.2  | 7779.7  | 7393.9  | 7367.7  | 7823.9  | 9154.7  | 12047.8 |
| 45°   | 12615.8 | 12800.7 | 11685.4 | 9847.1  | 9582.0  | 9115.9  | 8826.5  | 8367.6  | 8767.0  | 9683.9  | 12666.3 |
| 47.5° | 12967.4 | 13118.0 | 12119.1 | 10244.7 | 10342.9 | 10367.3 | 10889.3 | 10106.7 | 9591.0  | 10041.8 | 12990.9 |
| 50°   | 13406.5 | 13477.7 | 12374.2 | 10594.5 | 11066.0 | 12135.3 | 12260.6 | 10934.4 | 10393.4 | 10432.2 | 13182.9 |
| 52.5° | 13931.2 | 13961.0 | 12746.6 | 10998.4 | 11797.2 | 13298.3 | 13104.5 | 12337.2 | 11157.1 | 11145.4 | 13544.5 |
| 55°   | 14591.2 | 14573.2 | 13213.6 | 11542.0 | 12319.2 | 13989.8 | 13842.9 | 13283.9 | 11989.2 | 11735.9 | 14107.0 |
| 57.5° | 15178.1 | 15167.3 | 13833.0 | 12042.4 | 12758.3 | 14345.1 | 14388.3 | 14240.5 | 12555.4 | 12158.7 | 14716.5 |
| 60°   | 15465.7 | 15603.7 | 14538.0 | 12589.7 | 12786.2 | 14505.5 | 14521.8 | 14286.5 | 13188.3 | 12701.5 | 14878.8 |
| 62.5° | 15353.9 | 15616.3 | 14884.2 | 13081.9 | 12529.3 | 14067.4 | 14135.0 | 13972.7 | 13159.5 | 13271.3 | 14516.4 |
| 65°   | 14845.4 | 15148.4 | 14584.0 | 13344.3 | 12371.5 | 13333.5 | 13350.6 | 12940.4 | 12747.5 | 13649.0 | 13667.1 |
| 67.5° | 13891.6 | 14175.6 | 13628.3 | 12926.0 | 11291.4 | 11355.4 | 11737.7 | 11771.0 | 11489.8 | 13364.1 | 12474.3 |
| 70°   | 12221.8 | 12422.0 | 12079.4 | 11892.8 | 9437.8  | 9062.7  | 9477.4  | 9655.0  | 9783.1  | 12335.4 | 11042.6 |
| 72.5° | 9675.8  | 10062.6 | 10116.6 | 10238.4 | 7598.5  | 6973.7  | 7281.2  | 7017.9  | 7851.9  | 10498.9 | 9022.1  |
| 75°   | 7158.6  | 7484.9  | 7835.6  | 8514.5  | 5989.2  | 5221.1  | 5183.2  | 5048.9  | 5827.8  | 8443.3  | 6691.5  |
| 77.5° | 5058.8  | 5267.0  | 5536.6  | 6801.5  | 4519.6  | 4021.1  | 4044.5  | 3908.4  | 4208.6  | 6381.4  | 4622.4  |
| 80°   | 3626.2  | 3735.3  | 3860.6  | 4480.9  | 3334.0  | 3469.3  | 3472.9  | 3344.0  | 3129.4  | 4333.9  | 3085.2  |
| 82.5° | 2583.9  | 2668.7  | 2812.0  | 2955.4  | 2485.7  | 2843.6  | 2840.9  | 2832.8  | 2481.2  | 2929.2  | 1930.3  |
| 85°   | 1438.9  | 1552.5  | 1801.4  | 2315.3  | 1795.0  | 2033.1  | 1787.8  | 1969.1  | 1821.2  | 1950.1  | 977.3   |
| 87.5° | 101.0   | 90.2    | 403.0   | 1341.6  | 837.6   | 612.2   | 321.0   | 635.6   | 815.0   | 1018.8  | 136.1   |
| 90°   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |



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**CANDELA DISTRIBUTION (continued):**

|       | 90°     | 95°     | 105°   | 115°   | 125°   | 135°   | 145°   | 155°   | 165°   | 175°   | 180°   |
|-------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1959.1  | 1959.1  | 1959.1 | 1959.1 | 1959.1 | 1959.1 | 1959.1 | 1959.1 | 1959.1 | 1959.1 | 1959.1 |
| 2.5°  | 2623.6  | 2655.2  | 2531.6 | 2345.9 | 2396.4 | 2341.4 | 2272.0 | 2163.8 | 1941.1 | 2079.0 | 2079.9 |
| 5°    | 3151.0  | 3031.1  | 2934.6 | 2843.6 | 2690.3 | 2458.6 | 2428.0 | 2242.2 | 2137.7 | 2192.6 | 2184.5 |
| 7.5°  | 3316.0  | 3145.6  | 3000.5 | 2675.0 | 2391.0 | 2031.3 | 1923.1 | 1813.1 | 1767.1 | 1900.5 | 1953.7 |
| 10°   | 3134.8  | 2957.2  | 2814.7 | 2418.9 | 2226.0 | 2001.5 | 1704.0 | 1551.6 | 1461.5 | 1496.6 | 1517.4 |
| 12.5° | 3280.9  | 3099.6  | 2651.6 | 2430.7 | 2112.4 | 1975.4 | 1714.8 | 1491.2 | 1357.8 | 1390.2 | 1351.5 |
| 15°   | 3421.5  | 3177.2  | 2729.1 | 2289.1 | 2031.3 | 1832.9 | 1621.9 | 1391.1 | 1234.3 | 1178.4 | 1148.6 |
| 17.5° | 3935.4  | 3529.7  | 2720.1 | 2209.8 | 1914.1 | 1686.0 | 1431.7 | 1179.3 | 1074.7 | 1017.0 | 967.4  |
| 20°   | 4562.0  | 3996.7  | 2768.8 | 2127.7 | 1789.6 | 1502.0 | 1225.2 | 990.8  | 917.8  | 879.9  | 866.4  |
| 22.5° | 5307.6  | 4595.4  | 3047.3 | 2116.0 | 1672.4 | 1367.7 | 1111.7 | 965.6  | 883.5  | 842.1  | 824.9  |
| 25°   | 5900.0  | 5214.7  | 3252.9 | 2195.4 | 1666.1 | 1256.8 | 1043.1 | 1072.9 | 1035.0 | 1047.6 | 947.6  |
| 27.5° | 6475.2  | 5383.3  | 3137.5 | 2160.2 | 1498.4 | 1060.3 | 1026.9 | 1089.1 | 1121.6 | 1131.5 | 1127.9 |
| 30°   | 6961.1  | 6095.6  | 3162.7 | 1961.8 | 1265.8 | 863.7  | 786.2  | 816.8  | 906.1  | 1047.6 | 1074.7 |
| 32.5° | 7672.5  | 6436.4  | 3378.2 | 1841.9 | 1131.5 | 772.7  | 686.1  | 674.4  | 695.1  | 746.5  | 790.7  |
| 35°   | 8504.6  | 7220.8  | 3438.6 | 1810.4 | 1038.6 | 732.1  | 671.7  | 644.6  | 655.4  | 694.2  | 703.2  |
| 37.5° | 10056.2 | 7792.4  | 3662.2 | 1771.6 | 1004.4 | 707.7  | 660.9  | 650.9  | 674.4  | 705.9  | 724.0  |
| 40°   | 10911.8 | 8820.2  | 3673.0 | 1738.2 | 960.2  | 697.8  | 668.1  | 663.6  | 678.0  | 721.3  | 732.1  |
| 42.5° | 12052.3 | 9406.2  | 3842.5 | 1699.5 | 944.9  | 711.3  | 682.5  | 680.7  | 693.3  | 718.6  | 738.4  |
| 45°   | 12747.5 | 9798.4  | 3851.6 | 1676.9 | 941.3  | 770.9  | 701.4  | 695.1  | 692.4  | 707.7  | 725.8  |
| 47.5° | 13195.5 | 10363.7 | 3961.5 | 1651.7 | 962.9  | 786.2  | 724.0  | 696.9  | 687.9  | 694.2  | 707.7  |
| 50°   | 13620.2 | 10815.4 | 4169.8 | 1648.1 | 985.4  | 770.9  | 763.6  | 696.0  | 678.0  | 675.3  | 685.2  |
| 52.5° | 14141.3 | 11558.3 | 4426.8 | 1682.4 | 980.0  | 748.3  | 793.4  | 692.4  | 660.0  | 653.6  | 663.6  |
| 55°   | 14899.5 | 12354.4 | 4699.9 | 1653.5 | 924.1  | 705.0  | 764.5  | 689.7  | 641.0  | 629.3  | 638.3  |
| 57.5° | 15390.9 | 12810.6 | 5005.6 | 1629.2 | 839.4  | 672.6  | 738.4  | 691.5  | 642.8  | 616.7  | 622.1  |
| 60°   | 15227.7 | 12565.3 | 5125.5 | 1480.4 | 759.1  | 647.3  | 676.2  | 677.1  | 626.6  | 602.3  | 606.8  |
| 62.5° | 14506.4 | 11677.3 | 5013.7 | 1307.3 | 699.6  | 611.3  | 612.2  | 650.0  | 579.7  | 562.6  | 569.8  |
| 65°   | 13498.5 | 10572.8 | 4561.1 | 1194.6 | 671.7  | 573.4  | 559.0  | 570.7  | 516.6  | 504.0  | 518.4  |
| 67.5° | 12261.5 | 9211.5  | 3887.6 | 1075.6 | 661.8  | 522.0  | 504.9  | 500.4  | 466.1  | 451.7  | 466.1  |
| 70°   | 10709.9 | 7713.0  | 3107.8 | 991.7  | 623.9  | 466.1  | 452.6  | 448.1  | 419.2  | 408.4  | 421.0  |
| 72.5° | 8608.3  | 6022.6  | 2398.2 | 927.7  | 582.4  | 414.7  | 403.0  | 397.6  | 373.3  | 357.9  | 373.3  |
| 75°   | 6122.6  | 4602.6  | 1781.5 | 829.5  | 523.8  | 362.4  | 348.9  | 341.7  | 319.2  | 304.7  | 318.3  |
| 77.5° | 4351.0  | 3454.9  | 1244.2 | 686.1  | 431.9  | 306.5  | 298.4  | 286.7  | 266.9  | 249.7  | 263.3  |
| 80°   | 3216.8  | 2468.5  | 802.4  | 529.2  | 330.0  | 245.2  | 240.7  | 232.6  | 213.7  | 192.9  | 202.9  |
| 82.5° | 2117.8  | 1779.7  | 459.8  | 358.8  | 239.8  | 176.7  | 180.3  | 174.9  | 156.9  | 135.2  | 140.6  |
| 85°   | 948.5   | 1053.9  | 244.3  | 197.4  | 156.0  | 106.4  | 116.3  | 112.7  | 99.2   | 78.4   | 80.2   |
| 87.5° | 91.1    | 177.6   | 74.8   | 72.1   | 57.7   | 33.4   | 41.5   | 35.2   | 29.8   | 18.9   | 14.4   |
| 90°   | 0.0     | 0.0     | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |





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**CANDELA DISTRIBUTION (continued):**

|       | 185°   | 195°   | 205°   | 215°   | 225°   | 235°   | 245°   | 255°   | 265°   | 270°   | 275°   |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 1959.1 | 1959.1 | 1959.1 | 1959.1 | 1959.1 | 1959.1 | 1959.1 | 1959.1 | 1959.1 | 1959.1 | 1959.1 |
| 2.5°  | 2111.5 | 1984.4 | 1857.3 | 1934.8 | 1936.6 | 1957.3 | 1960.0 | 1883.4 | 1944.7 | 1991.6 | 2040.3 |
| 5°    | 2144.9 | 2061.9 | 2066.4 | 1991.6 | 1951.0 | 2003.3 | 1992.5 | 1971.8 | 2008.7 | 2060.1 | 2122.3 |
| 7.5°  | 1903.2 | 1849.1 | 1840.1 | 1768.0 | 1593.1 | 1554.3 | 1586.8 | 1600.3 | 1649.9 | 1729.2 | 1796.0 |
| 10°   | 1485.8 | 1593.1 | 1472.3 | 1444.3 | 1398.4 | 1308.2 | 1255.9 | 1249.6 | 1355.1 | 1419.1 | 1475.0 |
| 12.5° | 1338.8 | 1311.8 | 1297.4 | 1220.7 | 1220.7 | 1125.2 | 1094.5 | 1122.5 | 1284.8 | 1330.7 | 1402.9 |
| 15°   | 1140.5 | 1120.7 | 1053.9 | 1016.1 | 998.1  | 959.3  | 991.7  | 1018.8 | 1170.3 | 1173.9 | 1249.6 |
| 17.5° | 946.7  | 934.9  | 871.8  | 864.6  | 846.6  | 829.5  | 859.2  | 924.1  | 1006.2 | 991.7  | 1026.9 |
| 20°   | 846.6  | 806.0  | 748.3  | 769.0  | 750.1  | 736.6  | 724.0  | 815.9  | 873.6  | 892.6  | 913.3  |
| 22.5° | 821.3  | 747.4  | 713.2  | 694.2  | 695.1  | 673.5  | 676.2  | 752.8  | 840.3  | 852.0  | 839.4  |
| 25°   | 938.5  | 806.9  | 696.0  | 641.0  | 620.3  | 613.1  | 633.8  | 701.4  | 806.9  | 832.2  | 842.1  |
| 27.5° | 1098.1 | 876.3  | 716.8  | 623.0  | 581.5  | 585.1  | 614.9  | 661.8  | 786.2  | 831.3  | 843.0  |
| 30°   | 1053.9 | 824.0  | 717.7  | 609.5  | 558.1  | 577.0  | 587.8  | 632.9  | 770.0  | 837.6  | 896.2  |
| 32.5° | 813.2  | 741.1  | 722.2  | 620.3  | 599.6  | 569.8  | 585.1  | 628.4  | 722.2  | 764.5  | 767.2  |
| 35°   | 688.8  | 633.8  | 621.2  | 595.9  | 567.1  | 554.5  | 571.6  | 609.5  | 670.8  | 696.9  | 693.3  |
| 37.5° | 683.4  | 623.0  | 573.4  | 562.6  | 550.9  | 547.3  | 557.2  | 592.3  | 654.5  | 700.5  | 690.6  |
| 40°   | 692.4  | 617.6  | 567.1  | 548.2  | 552.7  | 536.4  | 546.4  | 589.6  | 657.3  | 700.5  | 691.5  |
| 42.5° | 681.6  | 611.3  | 559.0  | 544.6  | 549.1  | 526.5  | 538.2  | 583.3  | 650.0  | 701.4  | 684.3  |
| 45°   | 660.0  | 596.8  | 554.5  | 530.1  | 550.9  | 517.5  | 531.9  | 567.1  | 628.4  | 684.3  | 664.5  |
| 47.5° | 638.3  | 579.7  | 535.5  | 520.2  | 540.9  | 508.5  | 514.8  | 545.5  | 606.8  | 661.8  | 644.6  |
| 50°   | 614.9  | 558.1  | 520.2  | 515.7  | 530.1  | 506.7  | 496.8  | 522.0  | 580.6  | 635.6  | 621.2  |
| 52.5° | 589.6  | 540.0  | 509.4  | 507.6  | 521.1  | 495.0  | 480.5  | 500.4  | 552.7  | 607.7  | 595.9  |
| 55°   | 565.3  | 520.2  | 495.9  | 500.4  | 515.7  | 485.1  | 467.0  | 479.6  | 522.9  | 577.0  | 560.8  |
| 57.5° | 540.9  | 497.7  | 477.8  | 490.5  | 502.2  | 472.4  | 449.9  | 457.1  | 492.3  | 545.5  | 526.5  |
| 60°   | 519.3  | 477.8  | 458.0  | 473.3  | 484.1  | 453.5  | 427.3  | 431.9  | 463.4  | 511.2  | 494.1  |
| 62.5° | 491.4  | 456.2  | 430.1  | 449.9  | 458.0  | 428.3  | 400.3  | 405.7  | 431.0  | 476.0  | 463.4  |
| 65°   | 451.7  | 429.2  | 404.8  | 418.3  | 429.2  | 398.5  | 372.4  | 378.7  | 397.6  | 440.0  | 431.0  |
| 67.5° | 417.4  | 395.8  | 379.6  | 390.4  | 392.2  | 368.7  | 345.3  | 348.9  | 364.2  | 403.9  | 394.0  |
| 70°   | 379.6  | 358.8  | 346.2  | 354.3  | 353.4  | 333.6  | 315.6  | 316.5  | 329.1  | 365.1  | 351.6  |
| 72.5° | 338.1  | 318.3  | 311.9  | 316.5  | 312.8  | 294.8  | 277.7  | 284.0  | 292.1  | 319.2  | 308.3  |
| 75°   | 293.9  | 275.9  | 272.3  | 276.8  | 271.4  | 254.2  | 238.9  | 245.2  | 252.4  | 275.0  | 261.5  |
| 77.5° | 247.9  | 231.7  | 232.6  | 233.5  | 226.3  | 214.6  | 199.2  | 205.6  | 210.1  | 225.4  | 211.9  |
| 80°   | 197.4  | 184.8  | 188.4  | 188.4  | 180.3  | 172.2  | 157.8  | 159.6  | 162.3  | 167.7  | 157.8  |
| 82.5° | 144.3  | 144.3  | 144.3  | 145.2  | 128.0  | 130.7  | 118.1  | 117.2  | 114.5  | 113.6  | 107.3  |
| 85°   | 85.7   | 89.3   | 91.1   | 93.8   | 69.4   | 81.1   | 70.3   | 67.6   | 62.2   | 56.8   | 55.0   |
| 87.5° | 18.9   | 24.3   | 24.3   | 23.4   | 0.0    | 9.0    | 4.5    | 7.2    | 1.8    | 0.0    | 0.0    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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| 22.5° | 827.7  | 786.2  | 895.3  | 1196.4 | 1656.2 | 2245.8 | 3225.9 | 4612.5  | 5152.5  | 5279.7  |
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| 27.5° | 812.3  | 835.8  | 857.4  | 941.3  | 1372.2 | 2200.8 | 3518.9 | 5665.5  | 6408.4  | 6502.2  |
| 30°   | 885.4  | 923.2  | 873.6  | 902.5  | 1241.5 | 2061.0 | 3676.6 | 6193.9  | 6880.9  | 7038.6  |
| 32.5° | 736.6  | 722.2  | 717.7  | 780.8  | 1110.7 | 1934.8 | 4007.5 | 6937.7  | 7393.0  | 7591.3  |
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| 40°   | 655.4  | 641.0  | 647.3  | 687.9  | 1045.8 | 1967.3 | 4662.1 | 9371.9  | 10621.5 | 10885.7 |
| 42.5° | 654.5  | 647.3  | 653.6  | 698.7  | 1021.5 | 1975.4 | 4899.2 | 10122.1 | 11668.3 | 11876.5 |
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| 47.5° | 639.2  | 660.9  | 696.0  | 705.0  | 966.5  | 2004.2 | 5236.4 | 11048.0 | 12725.8 | 12967.4 |
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| 52.5° | 601.4  | 653.6  | 732.1  | 651.8  | 946.7  | 1932.1 | 5790.9 | 12065.9 | 13745.5 | 13931.2 |
| 55°   | 570.7  | 637.4  | 698.7  | 616.7  | 916.0  | 1897.8 | 6285.8 | 12779.0 | 14464.1 | 14591.2 |
| 57.5° | 542.8  | 613.1  | 650.0  | 596.8  | 843.0  | 1905.0 | 6630.2 | 13360.5 | 15067.2 | 15178.1 |
| 60°   | 517.5  | 610.4  | 580.6  | 576.1  | 768.1  | 1808.6 | 6742.0 | 13354.2 | 15291.7 | 15465.7 |
| 62.5° | 490.5  | 576.1  | 531.9  | 548.2  | 702.3  | 1709.4 | 6504.9 | 12781.7 | 15049.2 | 15353.9 |
| 65°   | 455.3  | 494.1  | 491.4  | 528.3  | 704.1  | 1548.0 | 5961.3 | 11772.0 | 14444.2 | 14845.4 |
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| 70°   | 371.5  | 394.9  | 412.0  | 453.5  | 747.4  | 1365.0 | 4049.0 | 8851.7  | 11737.7 | 12221.8 |
| 72.5° | 328.2  | 352.5  | 366.0  | 402.1  | 719.5  | 1241.5 | 2996.9 | 6887.2  | 9421.5  | 9675.8  |
| 75°   | 283.1  | 306.5  | 317.4  | 350.7  | 624.8  | 1026.9 | 2069.1 | 5216.6  | 6900.7  | 7158.6  |
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| 80°   | 189.3  | 214.6  | 214.6  | 229.0  | 335.4  | 540.0  | 794.3  | 3018.5  | 3558.5  | 3626.2  |
| 82.5° | 136.1  | 163.2  | 161.4  | 162.3  | 231.7  | 334.5  | 459.8  | 2262.1  | 2571.3  | 2583.9  |
| 85°   | 80.2   | 99.2   | 98.3   | 90.2   | 137.0  | 180.3  | 248.8  | 1404.7  | 1435.3  | 1438.9  |
| 87.5° | 15.3   | 23.4   | 20.7   | 9.0    | 37.9   | 53.2   | 72.1   | 260.6   | 103.7   | 101.0   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0     | 0.0     | 0.0     |

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