

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: STREETWORKS

Report Number: P256819

Luminaire Tested: **ULA-A5-D-U-SYM-VMx-7030-BK**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-79-08  
Report Number: P256819  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G2-1804-729-3)  
Test Lab: INNOVATION CENTER(G2)  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: STREETWORKS  
Catalog Number: ULA-A5-D-U-SYM-VMx-7030-BK  
Description: UTILITY LIGHT ACORN TYPE V SYMMETRIC  
Light Source: (90) 3000K CCT, 70 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4827.8 lumens  
Efficiency: N/A  
Efficacy: 134.5 lumens/watt  
Luminous Opening: Vertical Cylinder (Dia: 1.17' x H: 2.17')  
IES Classification: Type V - Short - Non-Cutoff  
BUG Rating: B1 - U5 - G3

Input Watts (W): 35.9  
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



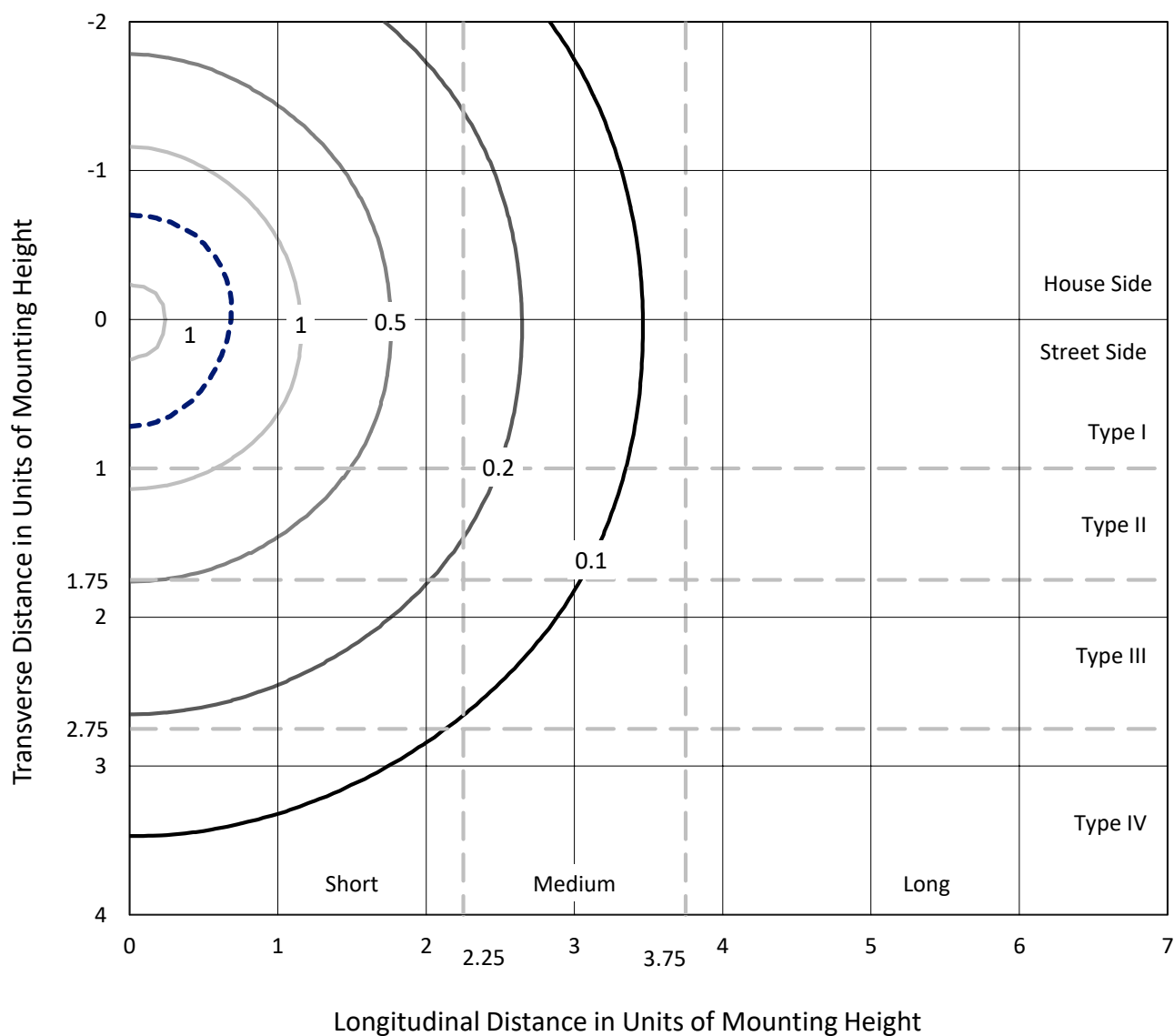
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## Iso-Footcandle Lines of Horizontal Illumination

× Max cd

--- 1/2 Max cd

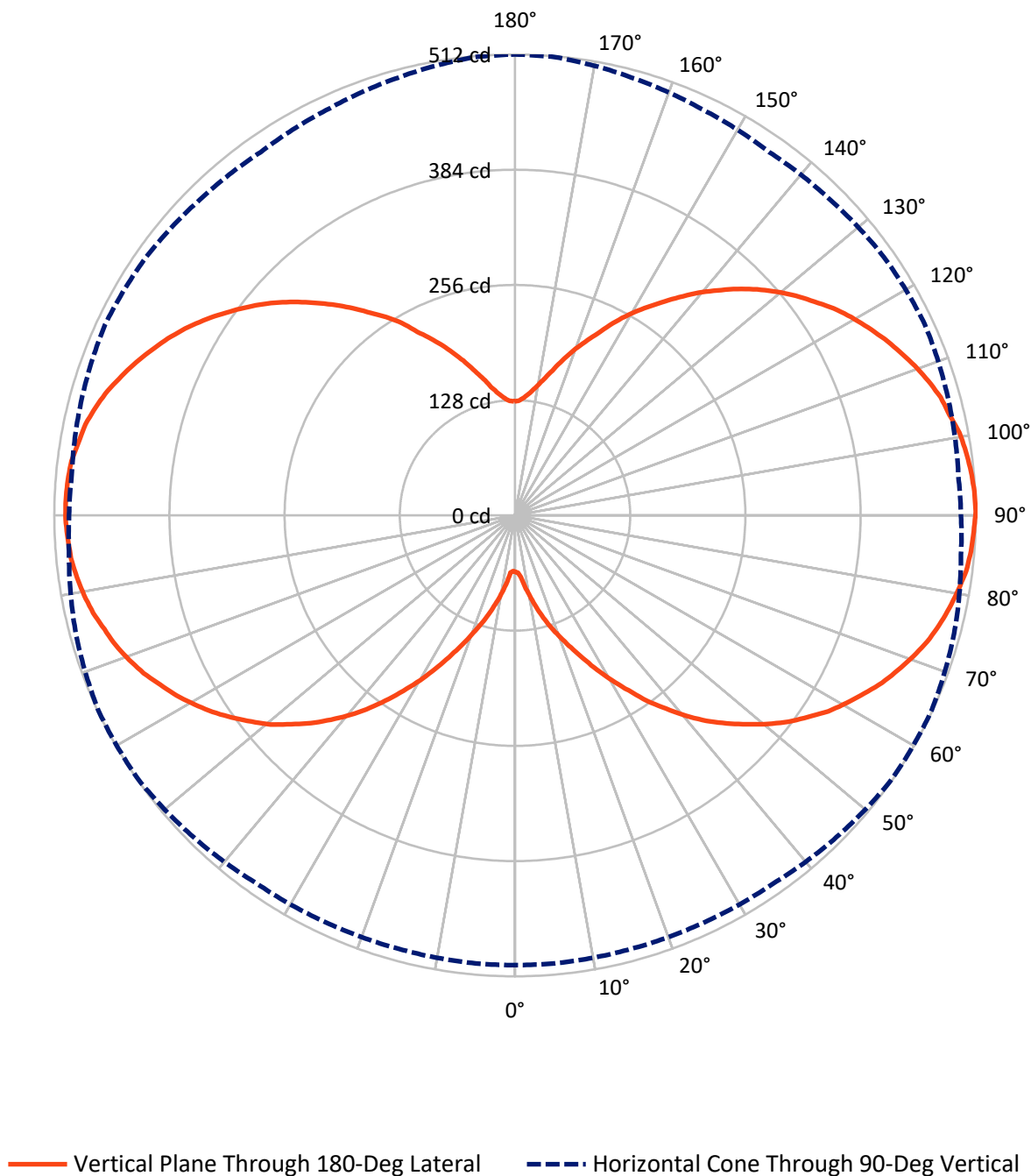


Based on 10 foot mounting height. Maximum calculated value = 1.5 fc  
Type V - Short - Non-Cutoff

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## Luminous Intensity Polar Plot



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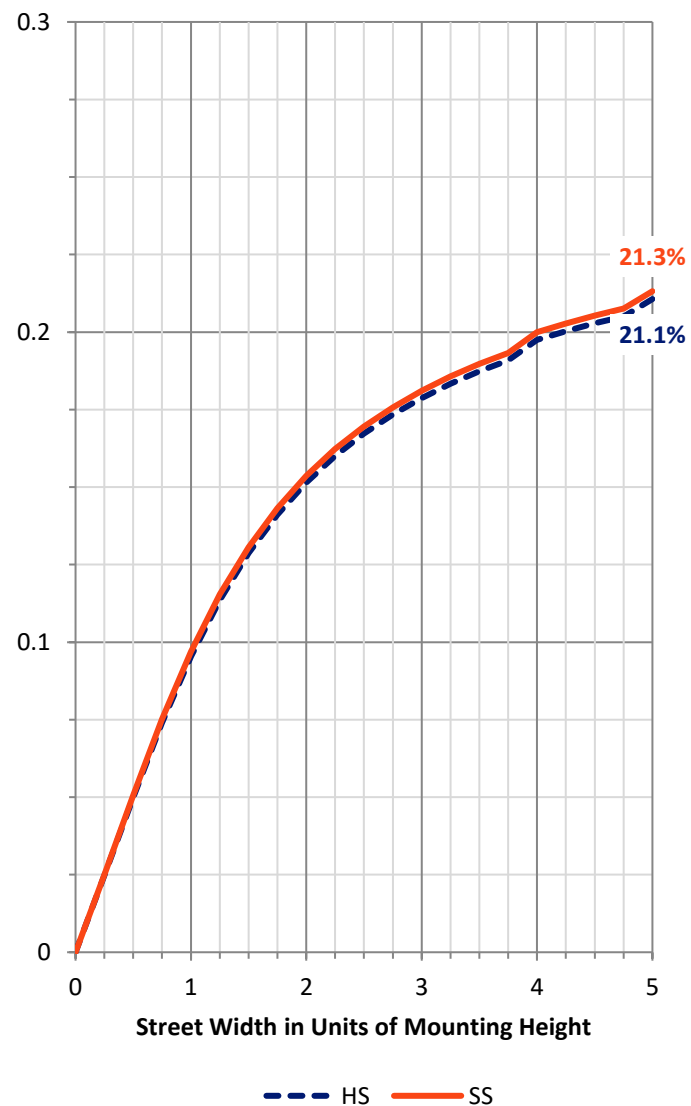
**FLUX DISTRIBUTION:**

|                    |           | Downward | Upward | Total  |
|--------------------|-----------|----------|--------|--------|
| <b>House Side</b>  | Lumens    | 1176.9   | 1224.0 | 2400.9 |
|                    | % Fixture | 24.4     | 25.4   | 49.7   |
| <b>Street Side</b> | Lumens    | 1192.8   | 1234.1 | 2426.9 |
|                    | % Fixture | 24.7     | 25.6   | 50.3   |
| <b>Total</b>       | Lumens    | 2369.7   | 2458.1 | 4827.8 |
|                    | % Fixture | 49.1     | 50.9   | 100.0  |

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 7.1    | 0.1       |
| 10°-20°   | 33.6   | 0.7       |
| 20°-30°   | 82.9   | 1.7       |
| 30°-40°   | 160.5  | 3.3       |
| 40°-50°   | 254.8  | 5.3       |
| 50°-60°   | 350.1  | 7.3       |
| 60°-70°   | 435.7  | 9.0       |
| 70°-80°   | 503.2  | 10.4      |
| 80°-90°   | 541.9  | 11.2      |
| 90°-100°  | 544.4  | 11.3      |
| 100°-110° | 508.6  | 10.5      |
| 110°-120° | 441.9  | 9.2       |
| 120°-130° | 358.0  | 7.4       |
| 130°-140° | 265.9  | 5.5       |
| 140°-150° | 176.5  | 3.7       |
| 150°-160° | 102.0  | 2.1       |
| 160°-170° | 47.8   | 1.0       |
| 170°-180° | 12.9   | 0.3       |
| 0°-90°    | 2369.7 | 49.1      |
| 0°-180°   | 4827.8 | 100.0     |

**Coefficient of Utilization**



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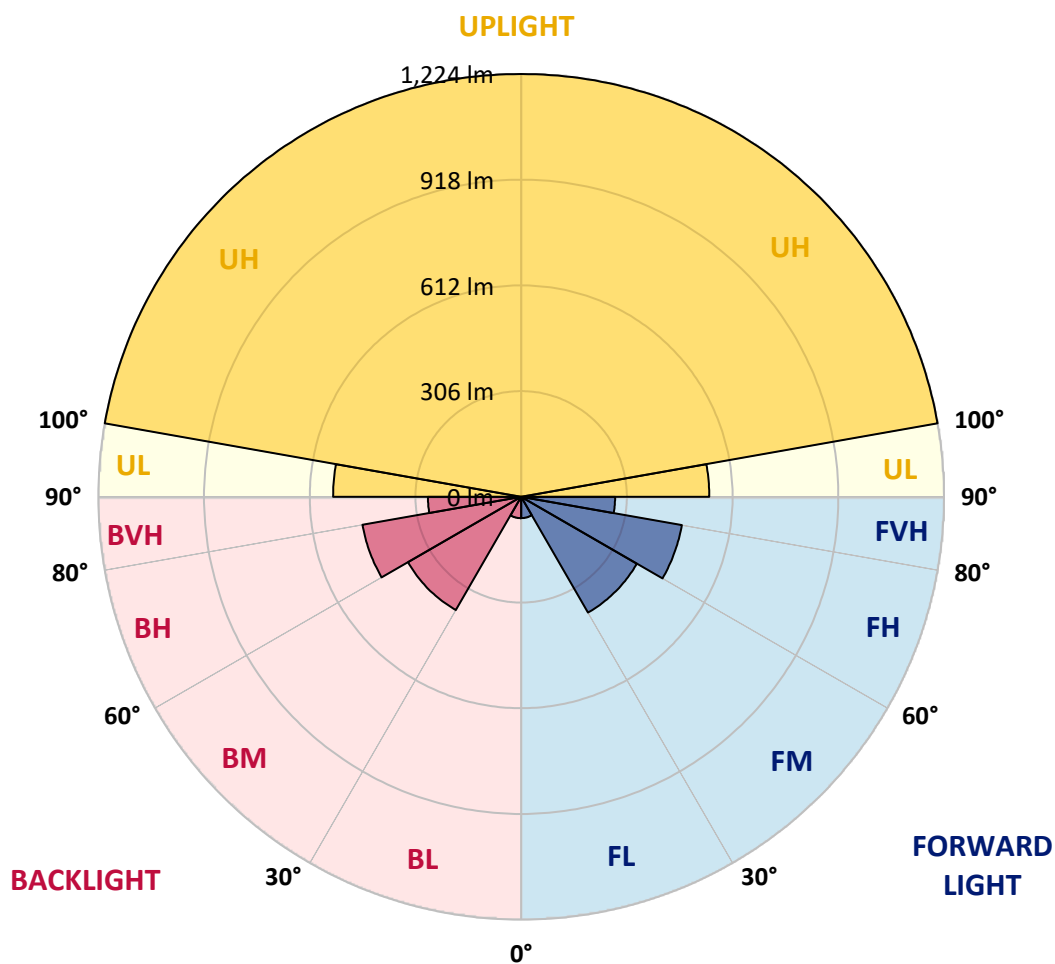
CATALOG NUMBER: ULA-A5-D-U-SYM-VMx-7030-BK

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

| Zone |             | Lumens | % Fixture | Zone Rating/Lumen Limit |         |        |
|------|-------------|--------|-----------|-------------------------|---------|--------|
|      |             |        |           | B                       | U       | G      |
| FL   | (0°-30°)    | 61.6   | 1.3       |                         |         |        |
| FM   | (30°-60°)   | 386.9  | 8.0       |                         |         |        |
| FH   | (60°-80°)   | 472.4  | 9.8       |                         |         | G0/660 |
| FVH  | (80°-90°)   | 271.9  | 5.6       |                         |         | G3/500 |
| BL   | (0°-30°)    | 61.9   | 1.3       | B0/110                  |         |        |
| BM   | (30°-60°)   | 378.5  | 7.8       | B1/1000                 |         |        |
| BH   | (60°-80°)   | 466.5  | 9.7       | B1/500                  |         | G0/660 |
| BVH  | (80°-90°)   | 269.9  | 5.6       |                         |         | G3/500 |
| UL   | (90°-100°)  | 544.4  | 11.3      |                         | U4/1000 |        |
| UH   | (100°-180°) | 1224.0 | 25.4      |                         | U5      |        |

**BUG Rating: B1-U5-G3**

Type V Short





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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 5°    | 15°   | 25°   | 35°   | 45°   | 55°   | 65°   | 75°   | 85°   | 90°   |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°     | 62.8  | 62.8  | 62.8  | 62.8  | 62.8  | 62.8  | 62.8  | 62.8  | 62.8  | 62.8  | 62.8  |
| 2.5°   | 61.8  | 61.8  | 61.8  | 60.9  | 60.9  | 60.9  | 60.9  | 60.9  | 60.9  | 61.8  | 61.8  |
| 5°     | 63.7  | 63.7  | 63.7  | 63.7  | 63.7  | 63.7  | 63.7  | 64.7  | 65.7  | 65.7  | 66.6  |
| 7.5°   | 75.3  | 74.4  | 74.4  | 74.4  | 74.4  | 74.4  | 74.4  | 75.3  | 76.3  | 77.3  | 77.3  |
| 10°    | 86.9  | 86.0  | 86.0  | 86.9  | 86.9  | 87.9  | 86.9  | 88.9  | 88.9  | 89.8  | 90.8  |
| 12.5°  | 98.5  | 97.6  | 98.5  | 99.5  | 100.5 | 100.5 | 101.4 | 102.4 | 102.4 | 103.4 | 103.4 |
| 15°    | 111.1 | 110.1 | 111.1 | 112.0 | 113.0 | 114.0 | 114.9 | 115.9 | 116.9 | 116.9 | 115.9 |
| 17.5°  | 124.6 | 123.6 | 124.6 | 125.6 | 126.5 | 127.5 | 129.4 | 130.4 | 130.4 | 130.4 | 130.4 |
| 20°    | 138.1 | 137.2 | 138.1 | 140.1 | 141.0 | 142.0 | 144.9 | 145.8 | 144.9 | 144.9 | 143.9 |
| 22.5°  | 153.6 | 152.6 | 153.6 | 155.5 | 158.4 | 159.4 | 161.3 | 162.3 | 161.3 | 161.3 | 160.3 |
| 25°    | 170.0 | 170.0 | 171.0 | 172.9 | 175.8 | 177.7 | 180.6 | 181.6 | 179.7 | 179.7 | 178.7 |
| 27.5°  | 188.3 | 188.3 | 189.3 | 192.2 | 194.1 | 197.0 | 200.9 | 200.9 | 199.9 | 199.0 | 198.0 |
| 30°    | 207.7 | 206.7 | 208.6 | 211.5 | 214.4 | 217.3 | 221.2 | 223.1 | 222.2 | 219.3 | 217.3 |
| 32.5°  | 227.0 | 226.0 | 228.0 | 231.8 | 235.7 | 238.6 | 242.4 | 243.4 | 242.4 | 239.5 | 237.6 |
| 35°    | 247.3 | 248.2 | 249.2 | 252.1 | 256.9 | 259.8 | 263.7 | 264.7 | 262.7 | 260.8 | 257.9 |
| 37.5°  | 267.6 | 267.6 | 269.5 | 272.4 | 277.2 | 280.1 | 284.0 | 284.9 | 284.0 | 280.1 | 278.2 |
| 40°    | 286.9 | 286.9 | 288.8 | 291.7 | 295.6 | 299.4 | 303.3 | 305.2 | 302.3 | 299.4 | 296.5 |
| 42.5°  | 305.2 | 305.2 | 307.2 | 309.1 | 312.9 | 317.8 | 321.6 | 323.6 | 321.6 | 316.8 | 313.9 |
| 45°    | 323.6 | 323.6 | 325.5 | 327.4 | 331.3 | 335.2 | 340.0 | 341.0 | 338.1 | 333.2 | 331.3 |
| 47.5°  | 340.0 | 340.0 | 341.9 | 343.9 | 347.7 | 352.6 | 356.4 | 357.4 | 354.5 | 349.7 | 346.8 |
| 50°    | 357.4 | 356.4 | 358.3 | 360.3 | 364.1 | 369.0 | 372.8 | 372.8 | 369.9 | 364.1 | 361.2 |
| 52.5°  | 371.9 | 372.8 | 372.8 | 374.8 | 378.6 | 382.5 | 387.3 | 388.3 | 384.4 | 377.7 | 375.7 |
| 55°    | 386.4 | 387.3 | 387.3 | 388.3 | 392.2 | 397.0 | 402.8 | 401.8 | 397.9 | 392.2 | 388.3 |
| 57.5°  | 400.8 | 400.8 | 401.8 | 401.8 | 404.7 | 410.5 | 416.3 | 415.3 | 411.5 | 404.7 | 401.8 |
| 60°    | 413.4 | 413.4 | 413.4 | 415.3 | 417.3 | 422.1 | 427.9 | 428.9 | 423.1 | 416.3 | 413.4 |
| 62.5°  | 426.0 | 426.0 | 426.0 | 426.9 | 428.9 | 433.7 | 440.4 | 440.4 | 433.7 | 426.9 | 424.0 |
| 65°    | 436.6 | 437.5 | 437.5 | 437.5 | 440.4 | 446.2 | 451.1 | 451.1 | 446.2 | 437.5 | 435.6 |
| 67.5°  | 448.2 | 448.2 | 447.2 | 447.2 | 450.1 | 454.9 | 461.7 | 461.7 | 455.9 | 447.2 | 445.3 |
| 70°    | 457.8 | 457.8 | 456.9 | 456.9 | 459.8 | 465.6 | 472.3 | 471.4 | 464.6 | 457.8 | 454.9 |
| 72.5°  | 466.5 | 467.5 | 465.6 | 465.6 | 468.5 | 474.3 | 481.0 | 480.0 | 473.3 | 465.6 | 463.6 |
| 75°    | 473.3 | 475.2 | 473.3 | 472.3 | 475.2 | 481.0 | 487.8 | 487.8 | 481.0 | 472.3 | 470.4 |
| 77.5°  | 481.0 | 482.0 | 480.0 | 480.0 | 482.0 | 488.7 | 494.5 | 494.5 | 488.7 | 480.0 | 477.2 |
| 80°    | 486.8 | 487.8 | 486.8 | 485.8 | 487.8 | 493.6 | 500.3 | 500.3 | 494.5 | 485.8 | 482.9 |
| 82.5°  | 491.6 | 491.6 | 490.7 | 490.7 | 492.6 | 498.4 | 504.2 | 504.2 | 498.4 | 490.7 | 488.7 |
| 85°    | 495.5 | 496.5 | 495.5 | 494.5 | 496.5 | 502.3 | 508.1 | 508.1 | 502.3 | 493.6 | 491.6 |
| 87.5°  | 497.4 | 498.4 | 497.4 | 497.4 | 498.4 | 504.2 | 510.0 | 509.0 | 504.2 | 495.5 | 493.6 |
| 90°    | 499.4 | 499.4 | 498.4 | 498.4 | 499.4 | 505.2 | 511.0 | 511.0 | 505.2 | 497.4 | 495.5 |
| 92.5°  | 499.4 | 500.3 | 499.4 | 499.4 | 500.3 | 504.2 | 510.0 | 511.0 | 505.2 | 497.4 | 495.5 |
| 95°    | 498.4 | 498.4 | 498.4 | 497.4 | 498.4 | 503.2 | 509.0 | 509.0 | 504.2 | 495.5 | 493.6 |
| 97.5°  | 496.5 | 496.5 | 495.5 | 495.5 | 496.5 | 501.3 | 506.1 | 506.1 | 501.3 | 493.6 | 491.6 |
| 100°   | 491.6 | 492.6 | 492.6 | 491.6 | 492.6 | 496.5 | 502.3 | 502.3 | 496.5 | 489.7 | 487.8 |
| 102.5° | 487.8 | 486.8 | 486.8 | 486.8 | 486.8 | 490.7 | 496.5 | 495.5 | 490.7 | 483.9 | 482.0 |
| 105°   | 481.0 | 481.0 | 480.0 | 480.0 | 481.0 | 484.9 | 490.7 | 489.7 | 483.9 | 477.2 | 475.2 |
| 107.5° | 473.3 | 473.3 | 472.3 | 472.3 | 473.3 | 477.2 | 482.9 | 482.0 | 476.2 | 469.4 | 467.5 |
| 110°   | 463.6 | 463.6 | 462.7 | 461.7 | 464.6 | 468.5 | 474.3 | 473.3 | 467.5 | 460.7 | 458.8 |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 5°    | 15°   | 25°   | 35°   | 45°   | 55°   | 65°   | 75°   | 85°   | 90°   |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 112.5° | 454.0 | 454.0 | 454.0 | 453.0 | 455.9 | 459.8 | 464.6 | 463.6 | 457.8 | 451.1 | 450.1 |
| 115°   | 443.3 | 443.3 | 442.4 | 442.4 | 446.2 | 450.1 | 454.9 | 453.0 | 447.2 | 441.4 | 439.5 |
| 117.5° | 432.7 | 432.7 | 430.8 | 430.8 | 434.7 | 439.5 | 444.3 | 442.4 | 436.6 | 430.8 | 428.9 |
| 120°   | 421.1 | 421.1 | 419.2 | 419.2 | 424.0 | 428.9 | 433.7 | 431.8 | 426.0 | 419.2 | 418.2 |
| 122.5° | 408.6 | 408.6 | 406.6 | 407.6 | 412.4 | 417.3 | 422.1 | 420.2 | 414.4 | 408.6 | 406.6 |
| 125°   | 395.1 | 395.1 | 394.1 | 395.1 | 399.9 | 404.7 | 409.5 | 407.6 | 401.8 | 397.0 | 394.1 |
| 127.5° | 381.5 | 381.5 | 381.5 | 382.5 | 387.3 | 392.2 | 397.0 | 394.1 | 389.3 | 383.5 | 382.5 |
| 130°   | 368.0 | 368.0 | 367.0 | 369.0 | 373.8 | 378.6 | 382.5 | 381.5 | 375.7 | 370.9 | 369.0 |
| 132.5° | 353.5 | 353.5 | 353.5 | 354.5 | 359.3 | 364.1 | 369.0 | 367.0 | 362.2 | 356.4 | 354.5 |
| 135°   | 338.1 | 338.1 | 339.0 | 340.0 | 344.8 | 349.7 | 353.5 | 351.6 | 347.7 | 341.9 | 339.0 |
| 137.5° | 322.6 | 323.6 | 323.6 | 325.5 | 329.4 | 334.2 | 337.1 | 336.1 | 331.3 | 326.5 | 324.5 |
| 140°   | 307.2 | 307.2 | 308.1 | 310.1 | 313.9 | 317.8 | 319.7 | 318.7 | 315.8 | 311.0 | 308.1 |
| 142.5° | 291.7 | 291.7 | 292.7 | 294.6 | 297.5 | 300.4 | 303.3 | 302.3 | 299.4 | 295.6 | 292.7 |
| 145°   | 276.2 | 276.2 | 277.2 | 279.1 | 282.0 | 284.0 | 286.9 | 285.9 | 283.0 | 279.1 | 276.2 |
| 147.5° | 262.7 | 261.8 | 262.7 | 264.7 | 267.6 | 268.5 | 270.5 | 270.5 | 267.6 | 263.7 | 261.8 |
| 150°   | 248.2 | 248.2 | 249.2 | 250.2 | 252.1 | 254.0 | 255.0 | 255.0 | 252.1 | 248.2 | 246.3 |
| 152.5° | 230.8 | 230.8 | 231.8 | 234.7 | 235.7 | 238.6 | 239.5 | 237.6 | 235.7 | 230.8 | 229.9 |
| 155°   | 217.3 | 217.3 | 217.3 | 219.3 | 220.2 | 221.2 | 222.2 | 221.2 | 219.3 | 216.4 | 215.4 |
| 157.5° | 204.8 | 203.8 | 203.8 | 205.7 | 206.7 | 206.7 | 207.7 | 206.7 | 205.7 | 202.8 | 201.9 |
| 160°   | 191.2 | 191.2 | 191.2 | 192.2 | 192.2 | 194.1 | 194.1 | 193.2 | 191.2 | 190.3 | 188.3 |
| 162.5° | 178.7 | 178.7 | 178.7 | 178.7 | 179.7 | 179.7 | 179.7 | 178.7 | 177.7 | 176.8 | 175.8 |
| 165°   | 166.1 | 166.1 | 166.1 | 166.1 | 166.1 | 167.1 | 167.1 | 166.1 | 165.2 | 164.2 | 164.2 |
| 167.5° | 155.5 | 155.5 | 154.5 | 154.5 | 155.5 | 155.5 | 155.5 | 154.5 | 154.5 | 153.6 | 153.6 |
| 170°   | 144.9 | 145.8 | 145.8 | 144.9 | 144.9 | 144.9 | 144.9 | 144.9 | 144.9 | 143.9 | 143.9 |
| 172.5° | 137.2 | 137.2 | 137.2 | 137.2 | 137.2 | 137.2 | 137.2 | 137.2 | 137.2 | 136.2 | 136.2 |
| 175°   | 131.4 | 131.4 | 131.4 | 130.4 | 131.4 | 131.4 | 131.4 | 130.4 | 130.4 | 130.4 | 130.4 |
| 177.5° | 127.5 | 127.5 | 127.5 | 127.5 | 127.5 | 127.5 | 127.5 | 127.5 | 127.5 | 127.5 | 127.5 |
| 180°   | 126.5 | 126.5 | 126.5 | 126.5 | 126.5 | 126.5 | 126.5 | 126.5 | 126.5 | 126.5 | 126.5 |



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**CANDELA DISTRIBUTION (continued):**

|        | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°     | 62.8  | 62.8  | 62.8  | 62.8  | 62.8  | 62.8  | 62.8  | 62.8  | 62.8  | 62.8  |
| 2.5°   | 61.8  | 61.8  | 62.8  | 62.8  | 63.7  | 63.7  | 63.7  | 63.7  | 63.7  | 63.7  |
| 5°     | 66.6  | 66.6  | 67.6  | 67.6  | 67.6  | 68.6  | 68.6  | 68.6  | 68.6  | 68.6  |
| 7.5°   | 78.2  | 79.2  | 80.2  | 79.2  | 79.2  | 80.2  | 79.2  | 79.2  | 80.2  | 80.2  |
| 10°    | 89.8  | 90.8  | 91.8  | 91.8  | 91.8  | 91.8  | 91.8  | 91.8  | 91.8  | 90.8  |
| 12.5°  | 103.4 | 103.4 | 103.4 | 104.3 | 104.3 | 104.3 | 104.3 | 104.3 | 105.3 | 104.3 |
| 15°    | 115.9 | 115.9 | 115.9 | 116.9 | 116.9 | 116.9 | 116.9 | 117.8 | 118.8 | 117.8 |
| 17.5°  | 129.4 | 129.4 | 129.4 | 129.4 | 129.4 | 129.4 | 130.4 | 131.4 | 132.3 | 131.4 |
| 20°    | 143.9 | 143.9 | 143.0 | 143.0 | 143.0 | 143.0 | 143.9 | 144.9 | 144.9 | 144.9 |
| 22.5°  | 160.3 | 158.4 | 158.4 | 157.4 | 157.4 | 158.4 | 159.4 | 160.3 | 160.3 | 159.4 |
| 25°    | 177.7 | 175.8 | 173.9 | 174.8 | 173.9 | 174.8 | 175.8 | 176.8 | 176.8 | 175.8 |
| 27.5°  | 196.1 | 194.1 | 192.2 | 192.2 | 191.2 | 192.2 | 192.2 | 194.1 | 195.1 | 194.1 |
| 30°    | 215.4 | 213.5 | 210.6 | 210.6 | 209.6 | 209.6 | 211.5 | 212.5 | 213.5 | 212.5 |
| 32.5°  | 235.7 | 231.8 | 230.8 | 229.9 | 228.0 | 228.0 | 229.9 | 230.8 | 232.8 | 231.8 |
| 35°    | 256.9 | 254.0 | 250.2 | 248.2 | 248.2 | 249.2 | 250.2 | 251.1 | 254.0 | 253.1 |
| 37.5°  | 276.2 | 272.4 | 269.5 | 267.6 | 267.6 | 267.6 | 270.5 | 271.4 | 273.3 | 272.4 |
| 40°    | 294.6 | 290.7 | 287.8 | 285.9 | 285.9 | 285.9 | 288.8 | 289.8 | 292.7 | 292.7 |
| 42.5°  | 312.0 | 308.1 | 307.2 | 304.3 | 303.3 | 304.3 | 306.2 | 309.1 | 312.0 | 312.0 |
| 45°    | 328.4 | 325.5 | 323.6 | 321.6 | 320.7 | 321.6 | 323.6 | 327.4 | 330.3 | 329.4 |
| 47.5°  | 344.8 | 341.9 | 340.0 | 338.1 | 337.1 | 337.1 | 340.0 | 343.9 | 347.7 | 346.8 |
| 50°    | 360.3 | 357.4 | 355.4 | 354.5 | 353.5 | 353.5 | 356.4 | 360.3 | 365.1 | 364.1 |
| 52.5°  | 373.8 | 371.9 | 370.9 | 369.9 | 368.0 | 368.0 | 370.9 | 375.7 | 379.6 | 380.6 |
| 55°    | 387.3 | 385.4 | 385.4 | 383.5 | 382.5 | 382.5 | 385.4 | 390.2 | 394.1 | 395.1 |
| 57.5°  | 400.8 | 398.9 | 399.9 | 397.9 | 396.0 | 395.1 | 398.9 | 404.7 | 408.6 | 410.5 |
| 60°    | 412.4 | 411.5 | 411.5 | 410.5 | 408.6 | 407.6 | 411.5 | 417.3 | 422.1 | 423.1 |
| 62.5°  | 424.0 | 423.1 | 424.0 | 423.1 | 420.2 | 419.2 | 423.1 | 428.9 | 434.7 | 435.6 |
| 65°    | 434.7 | 433.7 | 436.6 | 434.7 | 431.8 | 430.8 | 434.7 | 441.4 | 447.2 | 448.2 |
| 67.5°  | 444.3 | 444.3 | 446.2 | 445.3 | 441.4 | 440.4 | 444.3 | 451.1 | 457.8 | 458.8 |
| 70°    | 454.0 | 454.9 | 457.8 | 455.9 | 452.0 | 451.1 | 454.0 | 461.7 | 468.5 | 469.4 |
| 72.5°  | 461.7 | 463.6 | 467.5 | 465.6 | 460.7 | 458.8 | 463.6 | 471.4 | 478.1 | 479.1 |
| 75°    | 470.4 | 471.4 | 474.3 | 473.3 | 469.4 | 466.5 | 471.4 | 479.1 | 485.8 | 486.8 |
| 77.5°  | 477.2 | 479.1 | 482.9 | 481.0 | 476.2 | 474.3 | 479.1 | 486.8 | 493.6 | 493.6 |
| 80°    | 482.9 | 485.8 | 488.7 | 487.8 | 482.9 | 480.0 | 484.9 | 492.6 | 499.4 | 499.4 |
| 82.5°  | 487.8 | 490.7 | 493.6 | 492.6 | 487.8 | 484.9 | 488.7 | 496.5 | 504.2 | 505.2 |
| 85°    | 491.6 | 494.5 | 498.4 | 497.4 | 491.6 | 488.7 | 492.6 | 501.3 | 507.1 | 508.1 |
| 87.5°  | 492.6 | 496.5 | 501.3 | 498.4 | 494.5 | 490.7 | 495.5 | 502.3 | 509.0 | 510.0 |
| 90°    | 494.5 | 498.4 | 502.3 | 500.3 | 495.5 | 492.6 | 496.5 | 503.2 | 511.0 | 511.9 |
| 92.5°  | 494.5 | 498.4 | 502.3 | 501.3 | 496.5 | 492.6 | 496.5 | 504.2 | 510.0 | 511.0 |
| 95°    | 493.6 | 497.4 | 501.3 | 500.3 | 494.5 | 491.6 | 495.5 | 502.3 | 509.0 | 509.0 |
| 97.5°  | 490.7 | 494.5 | 498.4 | 497.4 | 492.6 | 488.7 | 492.6 | 499.4 | 506.1 | 506.1 |
| 100°   | 486.8 | 490.7 | 495.5 | 494.5 | 488.7 | 485.8 | 488.7 | 496.5 | 502.3 | 502.3 |
| 102.5° | 481.0 | 484.9 | 489.7 | 488.7 | 483.9 | 480.0 | 482.9 | 490.7 | 495.5 | 495.5 |
| 105°   | 475.2 | 478.1 | 482.9 | 482.0 | 477.2 | 473.3 | 477.2 | 483.9 | 489.7 | 490.7 |
| 107.5° | 467.5 | 470.4 | 475.2 | 475.2 | 470.4 | 466.5 | 469.4 | 477.2 | 482.0 | 482.9 |
| 110°   | 458.8 | 461.7 | 465.6 | 465.6 | 461.7 | 457.8 | 460.7 | 467.5 | 474.3 | 474.3 |



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|        | 95°   | 105°  | 115°  | 125°  | 135°  | 145°  | 155°  | 165°  | 175°  | 180°  |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 112.5° | 449.1 | 452.0 | 455.9 | 455.9 | 451.1 | 448.2 | 451.1 | 458.8 | 464.6 | 464.6 |
| 115°   | 439.5 | 441.4 | 445.3 | 445.3 | 441.4 | 438.5 | 442.4 | 449.1 | 454.9 | 454.9 |
| 117.5° | 428.9 | 430.8 | 433.7 | 434.7 | 430.8 | 427.9 | 431.8 | 437.5 | 444.3 | 444.3 |
| 120°   | 417.3 | 419.2 | 422.1 | 422.1 | 419.2 | 417.3 | 420.2 | 426.9 | 432.7 | 433.7 |
| 122.5° | 406.6 | 407.6 | 409.5 | 409.5 | 406.6 | 405.7 | 408.6 | 416.3 | 421.1 | 422.1 |
| 125°   | 394.1 | 394.1 | 397.0 | 396.0 | 394.1 | 393.1 | 397.0 | 402.8 | 408.6 | 408.6 |
| 127.5° | 381.5 | 381.5 | 382.5 | 382.5 | 380.6 | 379.6 | 384.4 | 390.2 | 395.1 | 396.0 |
| 130°   | 368.0 | 367.0 | 368.0 | 368.0 | 367.0 | 367.0 | 370.9 | 376.7 | 381.5 | 382.5 |
| 132.5° | 353.5 | 352.6 | 352.6 | 352.6 | 352.6 | 352.6 | 356.4 | 362.2 | 367.0 | 368.0 |
| 135°   | 338.1 | 337.1 | 337.1 | 337.1 | 336.1 | 338.1 | 341.9 | 346.8 | 351.6 | 352.6 |
| 137.5° | 323.6 | 321.6 | 321.6 | 320.7 | 321.6 | 323.6 | 326.5 | 331.3 | 336.1 | 336.1 |
| 140°   | 307.2 | 304.3 | 304.3 | 304.3 | 306.2 | 308.1 | 311.0 | 315.8 | 319.7 | 320.7 |
| 142.5° | 291.7 | 288.8 | 287.8 | 288.8 | 289.8 | 291.7 | 295.6 | 300.4 | 303.3 | 303.3 |
| 145°   | 275.3 | 272.4 | 271.4 | 272.4 | 274.3 | 277.2 | 280.1 | 284.0 | 286.9 | 286.9 |
| 147.5° | 260.8 | 257.9 | 256.9 | 256.9 | 259.8 | 262.7 | 265.6 | 269.5 | 271.4 | 271.4 |
| 150°   | 245.3 | 242.4 | 241.5 | 242.4 | 245.3 | 247.3 | 251.1 | 254.0 | 256.0 | 256.0 |
| 152.5° | 228.9 | 226.0 | 225.1 | 226.0 | 228.0 | 230.8 | 234.7 | 237.6 | 240.5 | 239.5 |
| 155°   | 214.4 | 211.5 | 210.6 | 211.5 | 213.5 | 216.4 | 218.3 | 221.2 | 223.1 | 222.2 |
| 157.5° | 200.9 | 199.0 | 198.0 | 199.0 | 200.9 | 202.8 | 204.8 | 206.7 | 208.6 | 207.7 |
| 160°   | 188.3 | 186.4 | 186.4 | 186.4 | 187.4 | 190.3 | 191.2 | 193.2 | 194.1 | 194.1 |
| 162.5° | 175.8 | 173.9 | 173.9 | 174.8 | 175.8 | 177.7 | 178.7 | 179.7 | 179.7 | 179.7 |
| 165°   | 164.2 | 162.3 | 162.3 | 163.2 | 163.2 | 165.2 | 165.2 | 166.1 | 167.1 | 166.1 |
| 167.5° | 153.6 | 152.6 | 151.6 | 152.6 | 153.6 | 154.5 | 154.5 | 154.5 | 155.5 | 154.5 |
| 170°   | 143.9 | 143.9 | 143.0 | 143.0 | 143.9 | 144.9 | 144.9 | 144.9 | 144.9 | 144.9 |
| 172.5° | 136.2 | 136.2 | 136.2 | 136.2 | 137.2 | 137.2 | 137.2 | 137.2 | 137.2 | 137.2 |
| 175°   | 130.4 | 130.4 | 130.4 | 130.4 | 131.4 | 131.4 | 131.4 | 131.4 | 131.4 | 131.4 |
| 177.5° | 127.5 | 127.5 | 127.5 | 127.5 | 127.5 | 127.5 | 127.5 | 127.5 | 127.5 | 127.5 |
| 180°   | 126.5 | 126.5 | 126.5 | 126.5 | 126.5 | 126.5 | 126.5 | 126.5 | 126.5 | 126.5 |

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