

LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State
Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: FAIL-SAFE

Report Number: P#

Luminaire Tested: **FLDSQ4C15D010 FEU4C159027 F4LC-CSSQ-MW**

Issue Date: 12/13/2022

Tested By:

Approved By:



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Test Information

Test Method: LM-79-08
 Report Number: P#
 Test Lab: INNOVATION CENTER
 Issue Date: 12/13/2022
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
 Product Line: FAIL-SAFE
 Catalog Number: FLDSQ4C15D010 FEU4C159027 F4LC-CSSQ-MW
 Description: 4 INCH 1500 LUMEN FAIL-SAFE LED DOWNLIGHT WITH, 2700K, 90CRI LEDS AND F4LC-CSSQ TRIM WITH MW FINISH
 Light Source: -
 Ballast/Driver: -

Summary

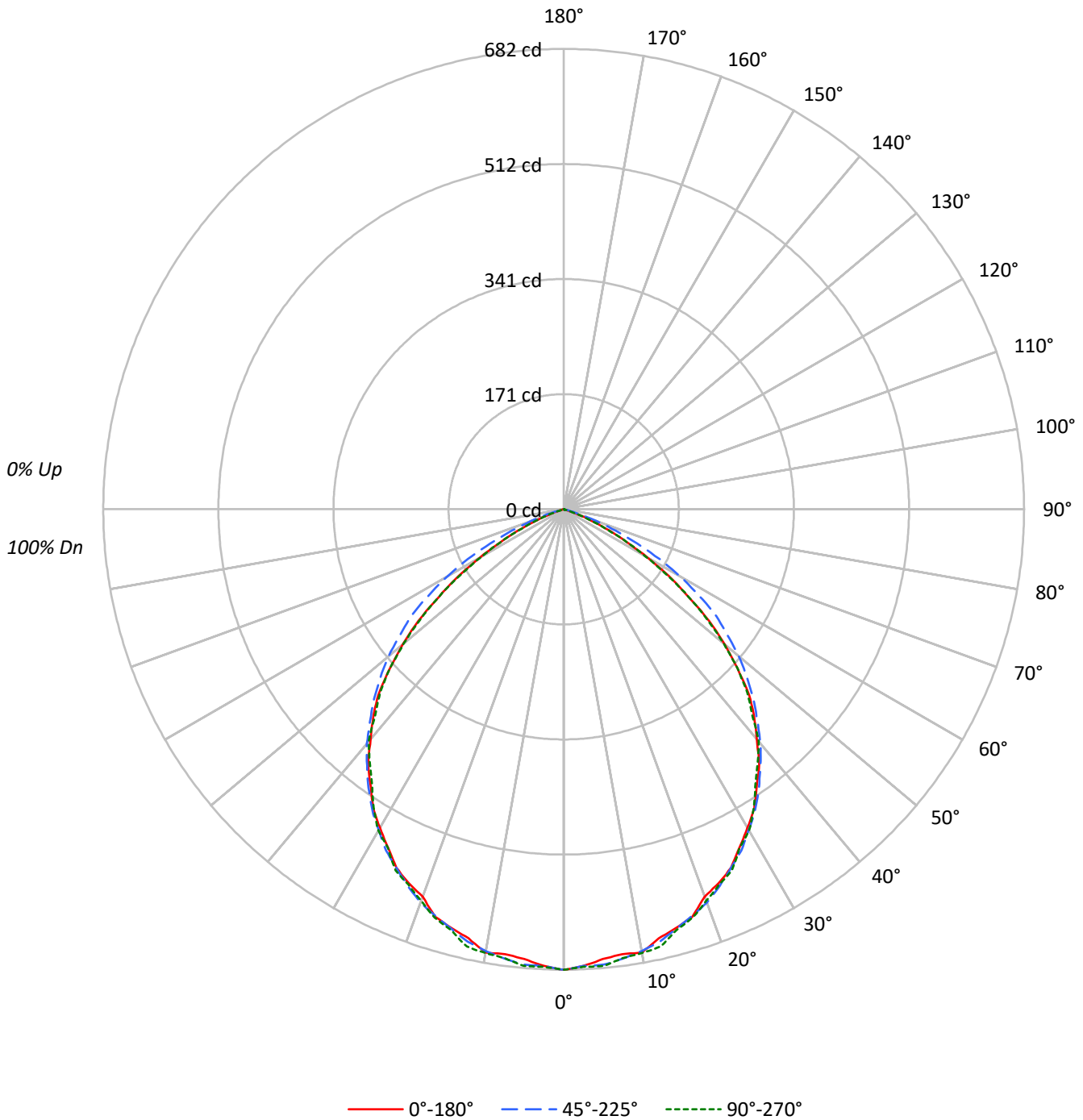
Lumens per Lamp: N/A
 Luminaire Lumens: 1457.0 lumens
 Efficiency: N/A
 Efficacy: 92.2 lumens/watt
 Spacing Criteria (0/90/45): 1.19 / 1.2 / 1.29
 Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')
 CIE Type: Direct

Input Watts (W): 15.8
 Input Voltage (V):
 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: 25 FT

| Measurement and Test Equipment | | | |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument | Identification Number | Calibration Date | Calibration Due Date |
| Photometer | GONIO 1 IN0055 | 4/22/2021 | 10/22/2021 |
| Power Meter | XITRON 2801 IN0197 | 12/1/2020 | 12/1/2021 |
| AC Power Source | CHROMA 61505 IN0196 | 12/1/2020 | 12/1/2021 |
| DC Power Supply | AGILENT E3634A IN0198 | 11/30/2020 | 11/30/2021 |
| Room Thermometer | ONSET IN0143 | 12/1/2020 | 12/1/2021 |

TEST NUMBER: P#
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Luminous Intensity Polar Plot



TEST NUMBER: P#

CATALOG NUMBER: FLDSQ4C15D010 FEU4C159027 F4LC-CSSQ-MW

COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

| | | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|-----|-----|-----|--|-----|-----|-----|-----|
| RF | 20 | | | | 20 | | | | 20 | | | | 20 | | | | 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 |
| RCR | | | | | | | | | | | | | | | | | | | | |
| 0 | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | | 106 | 106 | 106 | | 102 | 102 | 102 | 100 |
| 1 | 111 | 108 | 104 | 101 | 109 | 105 | 102 | 100 | 101 | 99 | 96 | | 97 | 95 | 94 | | 94 | 92 | 91 | 89 |
| 2 | 103 | 96 | 91 | 86 | 100 | 94 | 89 | 85 | 91 | 87 | 83 | | 88 | 84 | 81 | | 85 | 82 | 79 | 77 |
| 3 | 95 | 86 | 79 | 74 | 93 | 85 | 78 | 73 | 82 | 76 | 72 | | 79 | 74 | 71 | | 77 | 73 | 69 | 67 |
| 4 | 88 | 77 | 70 | 64 | 86 | 76 | 69 | 63 | 74 | 67 | 63 | | 71 | 66 | 62 | | 69 | 65 | 61 | 59 |
| 5 | 81 | 70 | 62 | 56 | 79 | 69 | 61 | 56 | 67 | 60 | 55 | | 65 | 59 | 54 | | 63 | 58 | 54 | 52 |
| 6 | 75 | 63 | 55 | 49 | 73 | 62 | 55 | 49 | 61 | 54 | 49 | | 59 | 53 | 48 | | 57 | 52 | 48 | 46 |
| 7 | 70 | 58 | 50 | 44 | 68 | 57 | 49 | 44 | 55 | 49 | 44 | | 54 | 48 | 43 | | 53 | 47 | 43 | 41 |
| 8 | 65 | 53 | 45 | 40 | 64 | 52 | 45 | 39 | 51 | 44 | 39 | | 50 | 44 | 39 | | 49 | 43 | 39 | 37 |
| 9 | 61 | 49 | 41 | 36 | 60 | 48 | 41 | 36 | 47 | 40 | 36 | | 46 | 40 | 35 | | 45 | 39 | 35 | 33 |
| 10 | 57 | 45 | 38 | 33 | 56 | 44 | 37 | 33 | 44 | 37 | 32 | | 43 | 37 | 32 | | 42 | 36 | 32 | 31 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|-------|-------|-------|
| 0° | 65815 | 65815 | 65815 |
| 5° | 64749 | 65592 | 65776 |
| 10° | 65312 | 65116 | 65400 |
| 15° | 64161 | 64261 | 64451 |
| 20° | 62677 | 63662 | 63375 |
| 25° | 62398 | 62398 | 62814 |
| 30° | 60666 | 61089 | 61201 |
| 35° | 58766 | 59343 | 58318 |
| 40° | 56013 | 57109 | 56618 |
| 45° | 53013 | 54200 | 52481 |
| 50° | 46684 | 50752 | 46399 |
| 55° | 37817 | 46446 | 37968 |
| 60° | 27673 | 38518 | 27113 |
| 65° | 16804 | 27420 | 16370 |
| 70° | 6545 | 14755 | 6291 |
| 75° | 708 | 3989 | 708 |
| 80° | 556 | 556 | 556 |
| 85° | 0 | 0 | 0 |

TEST NUMBER: P#
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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 64.4 | 4.4 |
| 10°-20° | 182.2 | 12.5 |
| 20°-30° | 270.3 | 18.6 |
| 30°-40° | 313.2 | 21.5 |
| 40°-50° | 300.3 | 20.6 |
| 50°-60° | 220.8 | 15.2 |
| 60°-70° | 95.4 | 6.5 |
| 70°-80° | 10.3 | 0.7 |
| 80°-90° | 0.1 | 0.0 |
| 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°-30° | 516.9 | 35.5 |
| 0°-40° | 830.1 | 57.0 |
| 0°-60° | 1351.2 | 92.7 |
| 0°-90° | 1457.0 | 100.0 |
| 90°-120° | 0.0 | 0.0 |
| 90°-150° | 0.0 | 0.0 |
| 90°-180° | 0.0 | 0.0 |
| 0°-180° | 1457.0 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|-----|-----|-------|-----|-------|-----|------|
| 0° | 682 | 682 | 682 | 682 | 682 | |
| 5° | 668 | 675 | 677 | 678 | 679 | 64 |
| 15° | 642 | 646 | 643 | 644 | 645 | 181 |
| 25° | 586 | 585 | 586 | 587 | 590 | 268 |
| 35° | 499 | 502 | 504 | 503 | 495 | 312 |
| 45° | 388 | 390 | 397 | 391 | 385 | 295 |
| 55° | 225 | 248 | 276 | 247 | 226 | 202 |
| 65° | 74 | 92 | 120 | 91 | 72 | 76 |
| 75° | 2 | 3 | 11 | 2 | 2 | 6 |
| 85° | 0 | 0 | 0 | 0 | 0 | 0 |
| 90° | 0 | 0 | 0 | 0 | 0 | |

TEST NUMBER: P#
 CATALOG NUMBER: FLDSQ4C15D010 FEU4C159027 F4LC-CSSQ-MW

CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 10° | 15° | 20° | 22.5° | 25° | 30° | 35° | 40° | 45° |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 |
| 2.5° | 677.2 | 685.0 | 685.9 | 681.1 | 679.1 | 676.3 | 683.0 | 678.2 | 680.1 | 678.2 | 677.2 |
| 5° | 668.5 | 677.2 | 678.2 | 678.2 | 676.3 | 675.3 | 678.2 | 677.2 | 676.3 | 674.3 | 677.2 |
| 7.5° | 664.6 | 669.5 | 674.3 | 668.5 | 671.4 | 670.4 | 677.2 | 674.3 | 673.3 | 673.3 | 671.4 |
| 10° | 666.6 | 665.6 | 669.5 | 663.6 | 665.6 | 663.6 | 669.5 | 669.5 | 667.5 | 665.6 | 664.6 |
| 12.5° | 651.0 | 658.8 | 658.8 | 657.8 | 655.9 | 653.0 | 658.8 | 662.7 | 656.8 | 656.8 | 655.9 |
| 15° | 642.3 | 644.3 | 645.2 | 645.2 | 644.3 | 646.2 | 649.1 | 645.2 | 646.2 | 641.4 | 643.3 |
| 17.5° | 632.7 | 628.8 | 631.7 | 629.7 | 630.7 | 632.7 | 636.5 | 636.5 | 630.7 | 629.7 | 631.7 |
| 20° | 610.4 | 622.0 | 623.0 | 617.2 | 618.1 | 618.1 | 624.9 | 619.1 | 623.0 | 618.1 | 620.0 |
| 22.5° | 599.7 | 607.4 | 608.4 | 600.7 | 605.5 | 599.7 | 606.5 | 597.8 | 607.4 | 600.7 | 603.6 |
| 25° | 586.1 | 585.2 | 588.1 | 584.2 | 585.2 | 585.2 | 590.0 | 586.1 | 589.1 | 585.2 | 586.1 |
| 27.5° | 563.9 | 571.6 | 570.6 | 566.8 | 568.7 | 567.7 | 577.4 | 566.8 | 572.6 | 567.7 | 569.7 |
| 30° | 544.5 | 551.3 | 549.3 | 545.5 | 545.5 | 542.5 | 553.2 | 550.3 | 549.3 | 549.3 | 548.3 |
| 32.5° | 525.1 | 526.1 | 524.1 | 525.1 | 526.1 | 522.2 | 530.9 | 527.0 | 526.1 | 527.0 | 528.0 |
| 35° | 498.9 | 498.9 | 500.9 | 498.0 | 501.9 | 501.9 | 509.6 | 504.7 | 503.8 | 500.9 | 503.8 |
| 37.5° | 475.7 | 472.8 | 473.8 | 473.8 | 475.7 | 477.6 | 481.5 | 479.6 | 479.6 | 476.7 | 478.6 |
| 40° | 444.7 | 442.8 | 445.6 | 445.6 | 448.6 | 448.6 | 452.4 | 450.5 | 453.4 | 453.4 | 453.4 |
| 42.5° | 417.6 | 417.6 | 415.6 | 418.5 | 419.5 | 418.5 | 425.3 | 424.3 | 425.3 | 423.4 | 424.3 |
| 45° | 388.5 | 388.5 | 386.6 | 385.6 | 390.4 | 389.5 | 397.2 | 394.3 | 398.2 | 396.2 | 397.2 |
| 47.5° | 348.8 | 353.6 | 350.7 | 353.6 | 359.4 | 360.4 | 365.2 | 363.3 | 367.2 | 364.3 | 368.2 |
| 50° | 311.0 | 311.0 | 313.9 | 317.8 | 323.6 | 324.6 | 330.4 | 334.3 | 336.2 | 337.1 | 338.1 |
| 52.5° | 271.3 | 270.3 | 273.2 | 278.0 | 282.9 | 286.8 | 292.6 | 298.4 | 302.3 | 308.1 | 305.2 |
| 55° | 224.8 | 226.7 | 229.6 | 235.4 | 243.2 | 248.0 | 252.9 | 260.6 | 267.4 | 270.3 | 276.1 |
| 57.5° | 185.0 | 183.1 | 185.0 | 192.8 | 201.5 | 205.4 | 212.2 | 219.9 | 229.6 | 235.4 | 237.4 |
| 60° | 143.4 | 144.4 | 146.3 | 153.1 | 159.9 | 165.7 | 168.6 | 181.2 | 189.9 | 195.7 | 199.6 |
| 62.5° | 105.6 | 107.6 | 109.5 | 115.3 | 122.1 | 126.9 | 131.7 | 142.4 | 150.2 | 156.0 | 159.9 |
| 65° | 73.6 | 74.6 | 77.5 | 80.4 | 87.2 | 92.0 | 95.9 | 104.6 | 112.4 | 117.2 | 120.1 |
| 67.5° | 45.5 | 46.5 | 48.4 | 52.3 | 57.2 | 61.0 | 64.9 | 70.7 | 77.5 | 82.3 | 83.3 |
| 70° | 23.2 | 24.2 | 25.2 | 28.1 | 32.0 | 33.9 | 36.8 | 41.7 | 46.5 | 50.4 | 52.3 |
| 72.5° | 7.7 | 7.7 | 8.7 | 10.7 | 12.6 | 14.5 | 15.5 | 20.4 | 24.2 | 26.2 | 27.1 |
| 75° | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.9 | 2.9 | 5.8 | 7.7 | 9.7 | 10.7 |
| 77.5° | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.9 | 1.9 |
| 80° | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| 82.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 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 |

TEST NUMBER: P#
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CANDELA DISTRIBUTION (continued):

| | 50° | 55° | 60° | 65° | 67.5° | 70° | 75° | 80° | 85° | 90° |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 | 682.1 |
| 2.5° | 682.1 | 680.1 | 679.1 | 680.1 | 680.1 | 679.1 | 682.1 | 685.9 | 690.8 | 678.2 |
| 5° | 681.1 | 679.1 | 681.1 | 675.3 | 678.2 | 676.3 | 680.1 | 679.1 | 683.0 | 679.1 |
| 7.5° | 678.2 | 674.3 | 675.3 | 672.4 | 676.3 | 671.4 | 674.3 | 680.1 | 676.3 | 670.4 |
| 10° | 668.5 | 666.6 | 673.3 | 663.6 | 661.7 | 665.6 | 673.3 | 667.5 | 665.6 | 667.5 |
| 12.5° | 658.8 | 658.8 | 661.7 | 654.0 | 654.9 | 656.8 | 660.7 | 656.8 | 658.8 | 663.6 |
| 15° | 648.2 | 646.2 | 651.0 | 645.2 | 644.3 | 642.3 | 646.2 | 646.2 | 648.2 | 645.2 |
| 17.5° | 635.5 | 632.7 | 632.7 | 630.7 | 629.7 | 634.6 | 636.5 | 637.5 | 638.5 | 634.6 |
| 20° | 620.0 | 619.1 | 622.0 | 619.1 | 620.0 | 621.0 | 621.0 | 619.1 | 627.8 | 617.2 |
| 22.5° | 603.6 | 606.5 | 602.6 | 600.7 | 602.6 | 604.6 | 604.6 | 605.5 | 603.6 | 601.6 |
| 25° | 587.1 | 589.1 | 590.0 | 584.2 | 587.1 | 584.2 | 591.0 | 591.9 | 588.1 | 590.0 |
| 27.5° | 572.6 | 569.7 | 568.7 | 564.8 | 566.8 | 565.8 | 566.8 | 566.8 | 572.6 | 564.8 |
| 30° | 550.3 | 547.4 | 548.3 | 545.5 | 546.4 | 545.5 | 546.4 | 546.4 | 550.3 | 549.3 |
| 32.5° | 529.0 | 526.1 | 527.0 | 524.1 | 524.1 | 525.1 | 523.2 | 523.2 | 526.1 | 524.1 |
| 35° | 508.6 | 501.9 | 502.8 | 501.9 | 502.8 | 498.9 | 498.9 | 498.0 | 499.9 | 495.1 |
| 37.5° | 479.6 | 476.7 | 475.7 | 474.7 | 475.7 | 473.8 | 475.7 | 472.8 | 475.7 | 471.8 |
| 40° | 453.4 | 451.5 | 452.4 | 446.6 | 446.6 | 447.6 | 445.6 | 444.7 | 445.6 | 449.5 |
| 42.5° | 427.3 | 423.4 | 421.5 | 419.5 | 420.5 | 417.6 | 416.6 | 414.7 | 416.6 | 412.7 |
| 45° | 396.2 | 396.2 | 395.3 | 390.4 | 391.4 | 391.4 | 387.5 | 383.7 | 384.6 | 384.6 |
| 47.5° | 368.2 | 366.2 | 365.2 | 360.4 | 359.4 | 358.5 | 354.6 | 351.7 | 351.7 | 348.8 |
| 50° | 337.1 | 335.2 | 332.3 | 327.5 | 325.5 | 319.7 | 316.8 | 312.9 | 309.1 | 309.1 |
| 52.5° | 308.1 | 301.3 | 297.4 | 289.7 | 286.8 | 283.9 | 276.1 | 273.2 | 270.3 | 267.4 |
| 55° | 273.2 | 267.4 | 259.7 | 250.9 | 247.1 | 242.2 | 234.4 | 228.6 | 224.8 | 225.7 |
| 57.5° | 239.3 | 229.6 | 221.9 | 210.3 | 205.4 | 202.5 | 194.7 | 187.0 | 183.1 | 183.1 |
| 60° | 197.6 | 189.9 | 180.2 | 169.5 | 165.7 | 160.8 | 151.1 | 146.3 | 143.4 | 140.5 |
| 62.5° | 157.9 | 152.1 | 143.4 | 129.8 | 126.9 | 122.1 | 115.3 | 109.5 | 106.6 | 106.6 |
| 65° | 118.2 | 112.4 | 104.6 | 94.9 | 91.1 | 87.2 | 81.4 | 75.6 | 72.7 | 71.7 |
| 67.5° | 83.3 | 76.5 | 69.8 | 62.0 | 59.1 | 57.2 | 51.3 | 47.5 | 45.5 | 44.5 |
| 70° | 50.4 | 46.5 | 41.7 | 35.9 | 32.9 | 31.0 | 27.1 | 24.2 | 23.2 | 22.3 |
| 72.5° | 26.2 | 23.2 | 19.4 | 15.5 | 13.6 | 11.6 | 9.7 | 7.7 | 6.8 | 6.8 |
| 75° | 9.7 | 7.7 | 4.9 | 2.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 |
| 77.5° | 1.9 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| 80° | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| 82.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 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 |

(END OF REPORT)