

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 FEU4C159040 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 FEU4C159040 F4LC-CSSQ-MW
 Description: 4 INCH 1500 LUMEN FAIL-SAFE LED DOWNLIGHT WITH, 4000K, 90CRI LEDS AND F4LC-CSSQ TRIM WITH MW FINISH
 Light Source: -
 Ballast/Driver: -

Summary

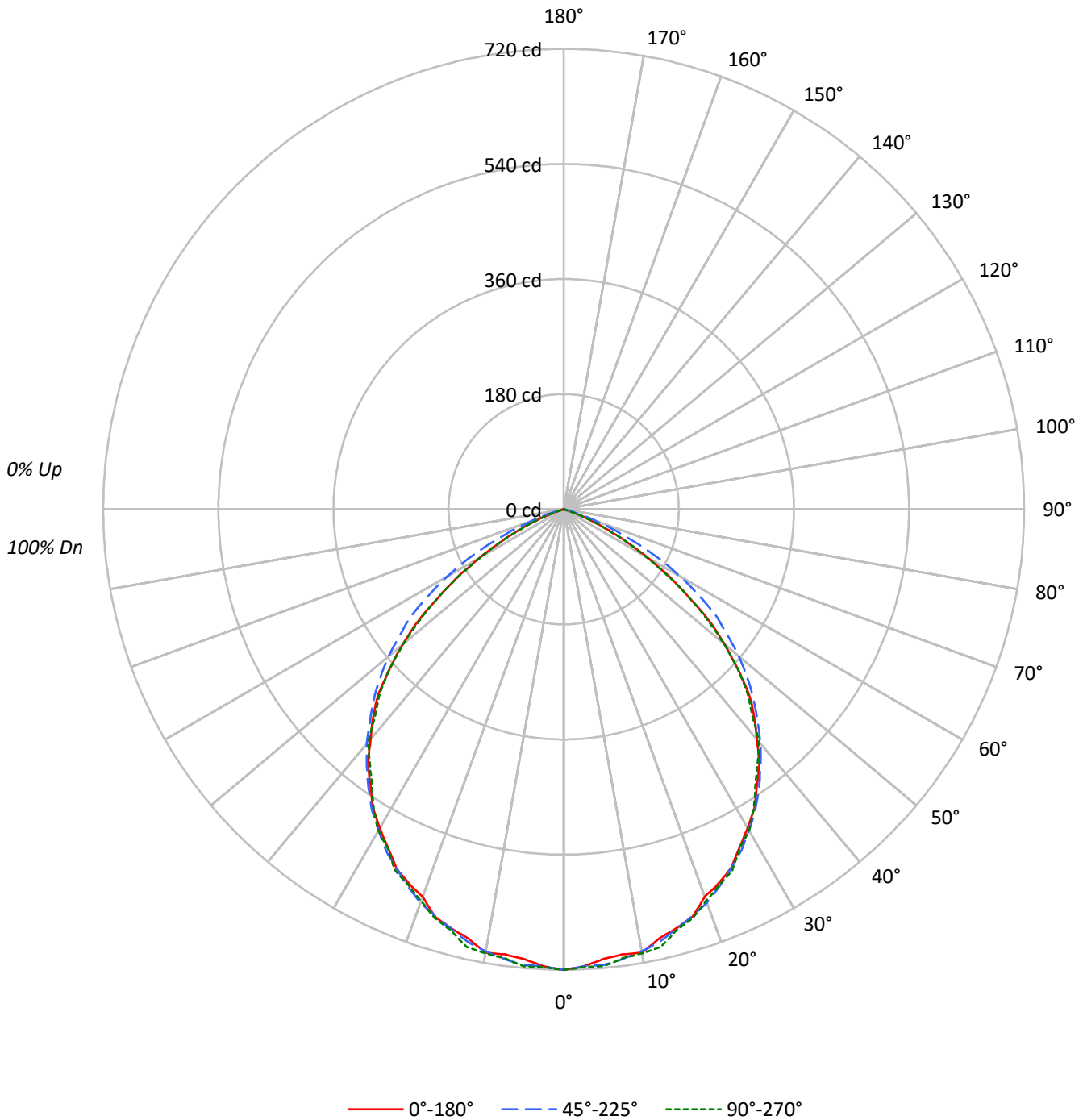
Lumens per Lamp: N/A
 Luminaire Lumens: 1539.0 lumens
 Efficiency: N/A
 Efficacy: 97.4 lumens/watt
 Spacing Criteria (0/90/45): 1.19 / 1.2 / 1.29
 Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')
 CIE Type: Direct

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 FEU4C159040 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 | 34 |
| 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° | 69520 | 69520 | 69520 |
| 5° | 68391 | 69282 | 69486 |
| 10° | 68986 | 68780 | 69084 |
| 15° | 67777 | 67877 | 68077 |
| 20° | 66199 | 67246 | 66938 |
| 25° | 65912 | 65912 | 66348 |
| 30° | 64075 | 64532 | 64643 |
| 35° | 62076 | 62677 | 61593 |
| 40° | 59162 | 60321 | 59805 |
| 45° | 56002 | 57257 | 55442 |
| 50° | 49311 | 53619 | 49011 |
| 55° | 39936 | 49054 | 40121 |
| 60° | 29217 | 40680 | 28638 |
| 65° | 17763 | 28973 | 17283 |
| 70° | 6940 | 15601 | 6630 |
| 75° | 746 | 4213 | 746 |
| 80° | 556 | 556 | 556 |
| 85° | 0 | 0 | 0 |

TEST NUMBER: P#
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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 68.0 | 4.4 |
| 10°-20° | 192.4 | 12.5 |
| 20°-30° | 285.5 | 18.6 |
| 30°-40° | 330.8 | 21.5 |
| 40°-50° | 317.2 | 20.6 |
| 50°-60° | 233.2 | 15.2 |
| 60°-70° | 100.7 | 6.5 |
| 70°-80° | 10.9 | 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° | 546.0 | 35.5 |
| 0°-40° | 876.8 | 57.0 |
| 0°-60° | 1427.3 | 92.7 |
| 0°-90° | 1539.0 | 100.0 |
| 90°-120° | 0.0 | 0.0 |
| 90°-150° | 0.0 | 0.0 |
| 90°-180° | 0.0 | 0.0 |
| 0°-180° | 1539.0 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|-----|-----|-------|-----|-------|-----|------|
| 0° | 720 | 720 | 720 | 720 | 720 | |
| 5° | 706 | 713 | 715 | 716 | 717 | 67 |
| 15° | 678 | 683 | 680 | 680 | 682 | 191 |
| 25° | 619 | 618 | 619 | 620 | 623 | 283 |
| 35° | 527 | 530 | 532 | 531 | 523 | 330 |
| 45° | 410 | 411 | 420 | 413 | 406 | 312 |
| 55° | 237 | 262 | 292 | 261 | 238 | 214 |
| 65° | 78 | 97 | 127 | 96 | 76 | 80 |
| 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 FEU4C159040 F4LC-CSSQ-MW

CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 10° | 15° | 20° | 22.5° | 25° | 30° | 35° | 40° | 45° |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0° | 720.5 | 720.5 | 720.5 | 720.5 | 720.5 | 720.5 | 720.5 | 720.5 | 720.5 | 720.5 | 720.5 |
| 2.5° | 715.3 | 723.5 | 724.5 | 719.4 | 717.4 | 714.3 | 721.5 | 716.4 | 718.4 | 716.4 | 715.3 |
| 5° | 706.1 | 715.3 | 716.4 | 716.4 | 714.3 | 713.3 | 716.4 | 715.3 | 714.3 | 712.3 | 715.3 |
| 7.5° | 702.0 | 707.1 | 712.3 | 706.1 | 709.2 | 708.2 | 715.3 | 712.3 | 711.2 | 711.2 | 709.2 |
| 10° | 704.1 | 703.0 | 707.1 | 701.0 | 703.0 | 701.0 | 707.1 | 707.1 | 705.1 | 703.0 | 702.0 |
| 12.5° | 687.7 | 695.9 | 695.9 | 694.9 | 692.8 | 689.7 | 695.9 | 700.0 | 693.8 | 693.8 | 692.8 |
| 15° | 678.5 | 680.5 | 681.5 | 681.5 | 680.5 | 682.6 | 685.6 | 681.5 | 682.6 | 677.4 | 679.5 |
| 17.5° | 668.3 | 664.2 | 667.2 | 665.2 | 666.2 | 668.3 | 672.4 | 672.4 | 666.2 | 665.2 | 667.2 |
| 20° | 644.7 | 657.0 | 658.0 | 651.9 | 652.9 | 652.9 | 660.1 | 653.9 | 658.0 | 652.9 | 654.9 |
| 22.5° | 633.4 | 641.6 | 642.7 | 634.5 | 639.6 | 633.4 | 640.6 | 631.4 | 641.6 | 634.5 | 637.5 |
| 25° | 619.1 | 618.1 | 621.2 | 617.1 | 618.1 | 618.1 | 623.2 | 619.1 | 622.2 | 618.1 | 619.1 |
| 27.5° | 595.6 | 603.8 | 602.8 | 598.7 | 600.7 | 599.7 | 609.9 | 598.7 | 604.8 | 599.7 | 601.7 |
| 30° | 575.1 | 582.3 | 580.2 | 576.2 | 576.2 | 573.1 | 584.3 | 581.2 | 580.2 | 580.2 | 579.2 |
| 32.5° | 554.7 | 555.7 | 553.6 | 554.7 | 555.7 | 551.6 | 560.8 | 556.7 | 555.7 | 556.7 | 557.7 |
| 35° | 527.0 | 527.0 | 529.1 | 526.0 | 530.1 | 530.1 | 538.3 | 533.1 | 532.1 | 529.1 | 532.1 |
| 37.5° | 502.5 | 499.4 | 500.4 | 500.4 | 502.5 | 504.5 | 508.6 | 506.6 | 506.6 | 503.5 | 505.5 |
| 40° | 469.7 | 467.7 | 470.7 | 470.7 | 473.8 | 473.8 | 477.9 | 475.9 | 478.9 | 478.9 | 478.9 |
| 42.5° | 441.1 | 441.1 | 439.0 | 442.1 | 443.1 | 442.1 | 449.3 | 448.2 | 449.3 | 447.2 | 448.2 |
| 45° | 410.4 | 410.4 | 408.3 | 407.3 | 412.4 | 411.4 | 419.6 | 416.5 | 420.6 | 418.5 | 419.6 |
| 47.5° | 368.4 | 373.5 | 370.4 | 373.5 | 379.7 | 380.7 | 385.8 | 383.8 | 387.8 | 384.8 | 388.9 |
| 50° | 328.5 | 328.5 | 331.6 | 335.7 | 341.8 | 342.8 | 349.0 | 353.1 | 355.1 | 356.1 | 357.2 |
| 52.5° | 286.6 | 285.5 | 288.6 | 293.7 | 298.8 | 302.9 | 309.1 | 315.2 | 319.3 | 325.4 | 322.3 |
| 55° | 237.4 | 239.5 | 242.5 | 248.7 | 256.9 | 262.0 | 267.1 | 275.3 | 282.5 | 285.5 | 291.6 |
| 57.5° | 195.4 | 193.4 | 195.4 | 203.6 | 212.9 | 217.0 | 224.1 | 232.3 | 242.5 | 248.7 | 250.7 |
| 60° | 151.4 | 152.5 | 154.5 | 161.7 | 168.9 | 175.0 | 178.1 | 191.4 | 200.6 | 206.7 | 210.8 |
| 62.5° | 111.6 | 113.6 | 115.7 | 121.8 | 128.9 | 134.1 | 139.2 | 150.4 | 158.6 | 164.8 | 168.9 |
| 65° | 77.8 | 78.8 | 81.9 | 84.9 | 92.1 | 97.2 | 101.3 | 110.5 | 118.7 | 123.8 | 126.9 |
| 67.5° | 48.1 | 49.1 | 51.1 | 55.3 | 60.4 | 64.5 | 68.6 | 74.7 | 81.9 | 87.0 | 88.0 |
| 70° | 24.6 | 25.6 | 26.6 | 29.7 | 33.8 | 35.8 | 38.9 | 44.0 | 49.1 | 53.2 | 55.3 |
| 72.5° | 8.2 | 8.2 | 9.2 | 11.3 | 13.3 | 15.4 | 16.4 | 21.5 | 25.6 | 27.6 | 28.6 |
| 75° | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 3.1 | 3.1 | 6.1 | 8.2 | 10.2 | 11.3 |
| 77.5° | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 2.0 | 2.0 |
| 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° | 720.5 | 720.5 | 720.5 | 720.5 | 720.5 | 720.5 | 720.5 | 720.5 | 720.5 | 720.5 |
| 2.5° | 720.5 | 718.4 | 717.4 | 718.4 | 718.4 | 717.4 | 720.5 | 724.5 | 729.6 | 716.4 |
| 5° | 719.4 | 717.4 | 719.4 | 713.3 | 716.4 | 714.3 | 718.4 | 717.4 | 721.5 | 717.4 |
| 7.5° | 716.4 | 712.3 | 713.3 | 710.2 | 714.3 | 709.2 | 712.3 | 718.4 | 714.3 | 708.2 |
| 10° | 706.1 | 704.1 | 711.2 | 701.0 | 699.0 | 703.0 | 711.2 | 705.1 | 703.0 | 705.1 |
| 12.5° | 695.9 | 695.9 | 699.0 | 690.8 | 691.8 | 693.8 | 697.9 | 693.8 | 695.9 | 701.0 |
| 15° | 684.6 | 682.6 | 687.7 | 681.5 | 680.5 | 678.5 | 682.6 | 682.6 | 684.6 | 681.5 |
| 17.5° | 671.3 | 668.3 | 668.3 | 666.2 | 665.2 | 670.3 | 672.4 | 673.4 | 674.4 | 670.3 |
| 20° | 654.9 | 653.9 | 657.0 | 653.9 | 654.9 | 656.0 | 656.0 | 653.9 | 663.1 | 651.9 |
| 22.5° | 637.5 | 640.6 | 636.5 | 634.5 | 636.5 | 638.6 | 638.6 | 639.6 | 637.5 | 635.5 |
| 25° | 620.2 | 622.2 | 623.2 | 617.1 | 620.2 | 617.1 | 624.3 | 625.3 | 621.2 | 623.2 |
| 27.5° | 604.8 | 601.7 | 600.7 | 596.6 | 598.7 | 597.7 | 598.7 | 598.7 | 604.8 | 596.6 |
| 30° | 581.2 | 578.2 | 579.2 | 576.2 | 577.2 | 576.2 | 577.2 | 577.2 | 581.2 | 580.2 |
| 32.5° | 558.7 | 555.7 | 556.7 | 553.6 | 553.6 | 554.7 | 552.6 | 552.6 | 555.7 | 553.6 |
| 35° | 537.2 | 530.1 | 531.1 | 530.1 | 531.1 | 527.0 | 527.0 | 526.0 | 528.1 | 522.9 |
| 37.5° | 506.6 | 503.5 | 502.5 | 501.5 | 502.5 | 500.4 | 502.5 | 499.4 | 502.5 | 498.4 |
| 40° | 478.9 | 476.9 | 477.9 | 471.8 | 471.8 | 472.8 | 470.7 | 469.7 | 470.7 | 474.8 |
| 42.5° | 451.3 | 447.2 | 445.2 | 443.1 | 444.1 | 441.1 | 440.0 | 438.0 | 440.0 | 435.9 |
| 45° | 418.5 | 418.5 | 417.5 | 412.4 | 413.4 | 413.4 | 409.3 | 405.3 | 406.3 | 406.3 |
| 47.5° | 388.9 | 386.8 | 385.8 | 380.7 | 379.7 | 378.7 | 374.5 | 371.5 | 371.5 | 368.4 |
| 50° | 356.1 | 354.1 | 351.0 | 345.9 | 343.8 | 337.7 | 334.7 | 330.6 | 326.5 | 326.5 |
| 52.5° | 325.4 | 318.2 | 314.2 | 306.0 | 302.9 | 299.8 | 291.6 | 288.6 | 285.5 | 282.5 |
| 55° | 288.6 | 282.5 | 274.3 | 265.1 | 261.0 | 255.8 | 247.6 | 241.5 | 237.4 | 238.5 |
| 57.5° | 252.8 | 242.5 | 234.4 | 222.1 | 217.0 | 213.9 | 205.7 | 197.5 | 193.4 | 193.4 |
| 60° | 208.8 | 200.6 | 190.4 | 179.1 | 175.0 | 169.9 | 159.6 | 154.5 | 151.4 | 148.4 |
| 62.5° | 166.8 | 160.7 | 151.4 | 137.1 | 134.1 | 128.9 | 121.8 | 115.7 | 112.6 | 112.6 |
| 65° | 124.8 | 118.7 | 110.5 | 100.3 | 96.2 | 92.1 | 86.0 | 79.8 | 76.7 | 75.7 |
| 67.5° | 88.0 | 80.8 | 73.7 | 65.5 | 62.4 | 60.4 | 54.2 | 50.1 | 48.1 | 47.1 |
| 70° | 53.2 | 49.1 | 44.0 | 37.9 | 34.8 | 32.7 | 28.6 | 25.6 | 24.6 | 23.5 |
| 72.5° | 27.6 | 24.6 | 20.5 | 16.4 | 14.3 | 12.3 | 10.2 | 8.2 | 7.2 | 7.2 |
| 75° | 10.2 | 8.2 | 5.1 | 3.1 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| 77.5° | 2.0 | 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)