

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: **FLDSQ4C90D010 FEU4C909040 F4LC-SQ-LI**

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: FLDSQ4C90D010 FEU4C909040 F4LC-SQ-LI
 Description: 4 INCH 9000 LUMEN FAIL-SAFE LED DOWNLIGHT WITH, 4000K, 90CRI LEDS AND F4LC-SQ TRIM WITH LI FINISH
 Light Source: -
 Ballast/Driver: -

Summary

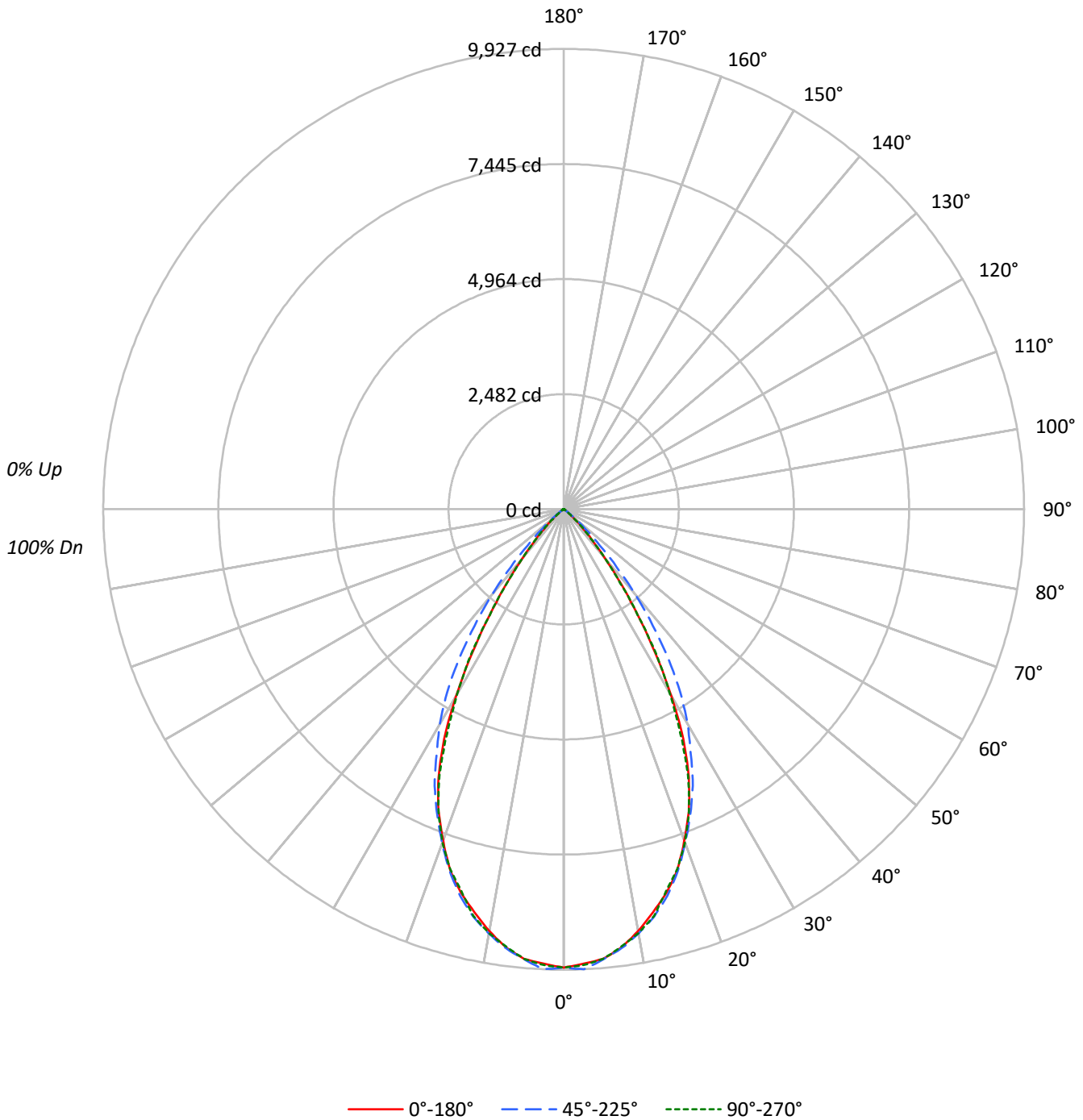
Lumens per Lamp: N/A
 Luminaire Lumens: 9124.0 lumens
 Efficiency: N/A
 Efficacy: 94.0 lumens/watt
 Spacing Criteria (0/90/45): 0.91 / 0.9 / 0.94
 Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')
 CIE Type: Direct

Input Watts (W): 97.1
 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 |

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Luminous Intensity Polar Plot



TEST NUMBER: P#
 CATALOG NUMBER: FLDSQ4C90D010 FEU4C909040 F4LC-SQ-LI

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 | 113 | 111 | 108 | 106 | 111 | 108 | 106 | 104 | 104 | 103 | 101 | | 101 | 99 | 98 | | 97 | 96 | 95 | 93 |
| 2 | 108 | 103 | 99 | 95 | 105 | 101 | 97 | 94 | 98 | 95 | 92 | | 95 | 92 | 90 | | 92 | 90 | 88 | 87 |
| 3 | 102 | 96 | 91 | 87 | 100 | 94 | 90 | 86 | 92 | 88 | 84 | | 89 | 86 | 83 | | 87 | 84 | 82 | 80 |
| 4 | 97 | 89 | 84 | 79 | 95 | 88 | 83 | 79 | 86 | 81 | 78 | | 84 | 80 | 77 | | 82 | 79 | 76 | 75 |
| 5 | 92 | 83 | 77 | 73 | 90 | 82 | 77 | 73 | 81 | 76 | 72 | | 79 | 75 | 71 | | 77 | 74 | 71 | 69 |
| 6 | 87 | 78 | 72 | 68 | 86 | 77 | 71 | 67 | 76 | 71 | 67 | | 74 | 70 | 66 | | 73 | 69 | 66 | 64 |
| 7 | 83 | 73 | 67 | 63 | 81 | 73 | 67 | 63 | 71 | 66 | 62 | | 70 | 65 | 62 | | 69 | 65 | 62 | 60 |
| 8 | 79 | 69 | 63 | 59 | 77 | 68 | 62 | 58 | 67 | 62 | 58 | | 66 | 61 | 58 | | 65 | 61 | 58 | 56 |
| 9 | 75 | 65 | 59 | 55 | 74 | 64 | 59 | 55 | 63 | 58 | 55 | | 63 | 58 | 54 | | 62 | 57 | 54 | 53 |
| 10 | 71 | 61 | 55 | 51 | 70 | 61 | 55 | 51 | 60 | 55 | 51 | | 59 | 54 | 51 | | 58 | 54 | 51 | 50 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|--------|--------|--------|
| 0° | 953571 | 953571 | 953571 |
| 5° | 942627 | 943837 | 942627 |
| 10° | 904919 | 910465 | 909240 |
| 15° | 855501 | 861774 | 851095 |
| 20° | 780748 | 786539 | 784619 |
| 25° | 679824 | 701213 | 675140 |
| 30° | 516958 | 594604 | 509282 |
| 35° | 325410 | 462248 | 328366 |
| 40° | 175559 | 305270 | 172398 |
| 45° | 83102 | 150797 | 82228 |
| 50° | 31118 | 56531 | 31118 |
| 55° | 14787 | 17966 | 13744 |
| 60° | 9687 | 8510 | 9687 |
| 65° | 5731 | 5731 | 5731 |
| 70° | 3555 | 5360 | 3555 |
| 75° | 2386 | 2386 | 2386 |
| 80° | 3556 | 3556 | 3556 |
| 85° | 0 | 0 | 0 |

TEST NUMBER: P#
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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 916.3 | 10.0 |
| 10°-20° | 2401.4 | 26.3 |
| 20°-30° | 2933.5 | 32.2 |
| 30°-40° | 2051.8 | 22.5 |
| 40°-50° | 672.4 | 7.4 |
| 50°-60° | 106.9 | 1.2 |
| 60°-70° | 29.2 | 0.3 |
| 70°-80° | 9.8 | 0.1 |
| 80°-90° | 2.7 | 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° | 6251.2 | 68.5 |
| 0°-40° | 8303.0 | 91.0 |
| 0°-60° | 9082.3 | 99.5 |
| 0°-90° | 9124.0 | 100.0 |
| 90°-120° | 0.0 | 0.0 |
| 90°-150° | 0.0 | 0.0 |
| 90°-180° | 0.0 | 0.0 |
| 0°-180° | 9124.0 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|-----|------|-------|------|-------|------|------|
| 0° | 9883 | 9883 | 9883 | 9883 | 9883 | |
| 5° | 9732 | 9735 | 9745 | 9685 | 9732 | 913 |
| 15° | 8564 | 8599 | 8627 | 8570 | 8520 | 2389 |
| 25° | 6386 | 6483 | 6586 | 6467 | 6342 | 2868 |
| 35° | 2763 | 3262 | 3924 | 3212 | 2788 | 1763 |
| 45° | 609 | 750 | 1105 | 741 | 603 | 511 |
| 55° | 88 | 94 | 107 | 94 | 82 | 87 |
| 65° | 25 | 32 | 25 | 32 | 25 | 28 |
| 75° | 6 | 6 | 6 | 6 | 6 | 9 |
| 85° | 0 | 0 | 0 | 0 | 0 | 3 |
| 90° | 0 | 0 | 0 | 0 | 0 | |

TEST NUMBER: P#
 CATALOG NUMBER: FLDSQ4C90D010 FEU4C909040 F4LC-SQ-LI

CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 10° | 15° | 20° | 25° | 30° | 35° | 40° | 45° | 50° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 9882.7 | 9882.7 | 9882.7 | 9882.7 | 9882.7 | 9882.7 | 9882.7 | 9882.7 | 9882.7 | 9882.7 | 9882.7 |
| 2.5° | 9807.4 | 9876.6 | 9857.6 | 9901.7 | 9901.7 | 9851.4 | 9864.0 | 9882.7 | 9907.8 | 9926.8 | 9775.9 |
| 5° | 9732.1 | 9794.8 | 9738.2 | 9801.0 | 9763.3 | 9706.9 | 9801.0 | 9750.8 | 9782.3 | 9744.6 | 9769.7 |
| 7.5° | 9531.2 | 9631.6 | 9518.6 | 9593.9 | 9568.8 | 9537.3 | 9575.0 | 9562.4 | 9581.4 | 9549.9 | 9481.0 |
| 10° | 9236.0 | 9317.7 | 9242.4 | 9349.0 | 9298.8 | 9267.5 | 9298.8 | 9330.3 | 9323.9 | 9292.6 | 9330.3 |
| 12.5° | 8897.0 | 8991.1 | 8953.4 | 9016.2 | 8959.8 | 8959.8 | 9035.1 | 9016.2 | 9022.6 | 8997.5 | 9041.3 |
| 15° | 8564.2 | 8633.4 | 8576.8 | 8658.5 | 8633.4 | 8564.2 | 8595.5 | 8595.5 | 8645.9 | 8627.0 | 8576.8 |
| 17.5° | 8149.9 | 8206.3 | 8143.5 | 8162.4 | 8137.3 | 8124.8 | 8256.5 | 8168.6 | 8218.8 | 8181.1 | 8187.5 |
| 20° | 7603.6 | 7628.7 | 7609.8 | 7660.0 | 7628.7 | 7666.4 | 7653.8 | 7641.3 | 7641.3 | 7660.0 | 7616.2 |
| 22.5° | 7051.0 | 7051.0 | 7069.9 | 7082.5 | 7107.6 | 7069.9 | 7145.2 | 7082.5 | 7088.6 | 7132.7 | 7120.1 |
| 25° | 6385.5 | 6366.6 | 6410.7 | 6473.4 | 6498.5 | 6467.0 | 6567.5 | 6517.2 | 6554.9 | 6586.4 | 6517.2 |
| 27.5° | 5575.6 | 5575.6 | 5619.4 | 5726.3 | 5745.0 | 5782.7 | 5920.8 | 5920.8 | 5971.0 | 5927.2 | 5977.4 |
| 30° | 4639.9 | 4709.1 | 4765.5 | 4903.6 | 4947.6 | 5029.4 | 5173.6 | 5242.8 | 5355.8 | 5336.8 | 5311.7 |
| 32.5° | 3679.3 | 3773.6 | 3779.8 | 3924.3 | 4043.4 | 4181.5 | 4376.3 | 4539.5 | 4621.2 | 4677.6 | 4614.8 |
| 35° | 2762.6 | 2819.2 | 2869.4 | 2969.9 | 3170.7 | 3352.9 | 3528.7 | 3742.1 | 3886.6 | 3924.3 | 3867.7 |
| 37.5° | 2021.8 | 2034.4 | 2084.6 | 2178.7 | 2329.3 | 2505.3 | 2718.8 | 2950.9 | 3101.8 | 3158.2 | 3095.4 |
| 40° | 1393.8 | 1406.4 | 1431.5 | 1513.2 | 1638.8 | 1764.3 | 1934.0 | 2172.5 | 2310.6 | 2423.6 | 2341.9 |
| 42.5° | 935.5 | 948.0 | 973.1 | 1035.9 | 1105.1 | 1224.2 | 1356.2 | 1506.8 | 1638.8 | 1689.0 | 1644.9 |
| 45° | 609.0 | 609.0 | 621.6 | 665.7 | 703.3 | 797.4 | 891.6 | 985.7 | 1073.6 | 1105.1 | 1073.6 |
| 47.5° | 357.9 | 364.1 | 376.6 | 408.2 | 452.0 | 489.6 | 558.8 | 621.6 | 646.7 | 671.8 | 659.3 |
| 50° | 207.3 | 207.3 | 226.0 | 244.9 | 276.2 | 301.3 | 326.4 | 351.5 | 364.1 | 376.6 | 364.1 |
| 52.5° | 113.0 | 119.4 | 125.5 | 132.0 | 144.5 | 169.6 | 188.3 | 188.3 | 194.7 | 200.9 | 194.7 |
| 55° | 87.9 | 87.9 | 87.9 | 87.9 | 94.3 | 94.3 | 94.3 | 100.4 | 100.4 | 106.8 | 100.4 |
| 57.5° | 62.8 | 62.8 | 62.8 | 69.2 | 69.2 | 69.2 | 62.8 | 62.8 | 62.8 | 62.8 | 62.8 |
| 60° | 50.2 | 50.2 | 50.2 | 50.2 | 50.2 | 50.2 | 50.2 | 44.1 | 44.1 | 44.1 | 44.1 |
| 62.5° | 37.7 | 37.7 | 37.7 | 37.7 | 37.7 | 37.7 | 37.7 | 37.7 | 37.7 | 37.7 | 37.7 |
| 65° | 25.1 | 25.1 | 31.5 | 31.5 | 31.5 | 31.5 | 31.5 | 25.1 | 25.1 | 25.1 | 25.1 |
| 67.5° | 19.0 | 19.0 | 19.0 | 19.0 | 25.1 | 25.1 | 19.0 | 19.0 | 19.0 | 19.0 | 19.0 |
| 70° | 12.6 | 12.6 | 12.6 | 19.0 | 19.0 | 19.0 | 19.0 | 19.0 | 19.0 | 19.0 | 19.0 |
| 72.5° | 12.6 | 12.6 | 12.6 | 12.6 | 12.6 | 12.6 | 12.6 | 12.6 | 12.6 | 12.6 | 12.6 |
| 75° | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 |
| 77.5° | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 |
| 80° | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 |
| 82.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.4 | 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° | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 |
| 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):

| | 55° | 60° | 65° | 70° | 75° | 80° | 85° | 90° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 9882.7 | 9882.7 | 9882.7 | 9882.7 | 9882.7 | 9882.7 | 9882.7 | 9882.7 |
| 2.5° | 9882.7 | 9775.9 | 9788.4 | 9845.0 | 9813.5 | 9845.0 | 9838.9 | 9838.9 |
| 5° | 9775.9 | 9744.6 | 9694.4 | 9675.4 | 9713.1 | 9794.8 | 9782.3 | 9732.1 |
| 7.5° | 9575.0 | 9493.5 | 9549.9 | 9575.0 | 9543.7 | 9593.9 | 9619.1 | 9512.2 |
| 10° | 9336.4 | 9305.2 | 9292.6 | 9305.2 | 9292.6 | 9342.9 | 9280.1 | 9280.1 |
| 12.5° | 8997.5 | 8947.2 | 8947.2 | 9022.6 | 8978.5 | 8940.8 | 8991.1 | 8984.9 |
| 15° | 8658.5 | 8557.8 | 8557.8 | 8582.9 | 8601.9 | 8576.8 | 8582.9 | 8520.1 |
| 17.5° | 8156.0 | 8124.8 | 8080.7 | 8149.9 | 8168.6 | 8143.5 | 8162.4 | 8130.9 |
| 20° | 7685.1 | 7685.1 | 7603.6 | 7634.9 | 7660.0 | 7679.0 | 7691.5 | 7641.3 |
| 22.5° | 7082.5 | 7095.0 | 7038.4 | 7101.2 | 7120.1 | 7057.4 | 7069.9 | 7057.4 |
| 25° | 6529.8 | 6523.6 | 6479.6 | 6454.5 | 6467.0 | 6441.9 | 6435.8 | 6341.5 |
| 27.5° | 5920.8 | 5858.0 | 5764.0 | 5789.1 | 5682.2 | 5594.3 | 5594.3 | 5449.8 |
| 30° | 5261.5 | 5154.9 | 5029.4 | 4903.6 | 4809.5 | 4709.1 | 4652.5 | 4571.0 |
| 32.5° | 4489.3 | 4345.0 | 4187.9 | 4018.3 | 3911.7 | 3761.1 | 3679.3 | 3723.4 |
| 35° | 3723.4 | 3509.7 | 3296.3 | 3126.9 | 2963.5 | 2875.6 | 2775.1 | 2787.7 |
| 37.5° | 2982.4 | 2681.1 | 2492.8 | 2310.6 | 2172.5 | 2059.5 | 2015.4 | 2002.9 |
| 40° | 2178.7 | 1940.1 | 1751.8 | 1619.8 | 1525.8 | 1437.9 | 1387.7 | 1368.7 |
| 42.5° | 1506.8 | 1337.5 | 1186.6 | 1080.0 | 1017.2 | 960.6 | 935.5 | 929.3 |
| 45° | 979.5 | 879.1 | 778.7 | 703.3 | 653.1 | 615.4 | 609.0 | 602.6 |
| 47.5° | 615.4 | 565.0 | 502.2 | 445.8 | 401.8 | 376.6 | 357.9 | 357.9 |
| 50° | 351.5 | 332.8 | 301.3 | 270.1 | 244.9 | 232.4 | 213.4 | 207.3 |
| 52.5° | 188.3 | 188.3 | 175.8 | 150.7 | 132.0 | 119.4 | 119.4 | 113.0 |
| 55° | 100.4 | 100.4 | 94.3 | 94.3 | 87.9 | 87.9 | 87.9 | 81.7 |
| 57.5° | 62.8 | 62.8 | 69.2 | 69.2 | 62.8 | 62.8 | 62.8 | 62.8 |
| 60° | 44.1 | 50.2 | 50.2 | 50.2 | 50.2 | 50.2 | 50.2 | 50.2 |
| 62.5° | 37.7 | 37.7 | 37.7 | 37.7 | 37.7 | 37.7 | 37.7 | 37.7 |
| 65° | 25.1 | 31.5 | 31.5 | 31.5 | 31.5 | 25.1 | 25.1 | 25.1 |
| 67.5° | 19.0 | 19.0 | 19.0 | 19.0 | 19.0 | 19.0 | 19.0 | 19.0 |
| 70° | 19.0 | 19.0 | 19.0 | 19.0 | 19.0 | 12.6 | 12.6 | 12.6 |
| 72.5° | 12.6 | 12.6 | 12.6 | 12.6 | 12.6 | 12.6 | 12.6 | 12.6 |
| 75° | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 |
| 77.5° | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 |
| 80° | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 |
| 82.5° | 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 |
| 87.5° | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 | 6.4 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

(END OF REPORT)