

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: **FLDSQ4C60D010 FEU4C609027 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: FLDSQ4C60D010 FEU4C609027 F4LC-SQ-LI  
 Description: 4 INCH 6000 LUMEN FAIL-SAFE LED DOWNLIGHT WITH, 2700K, 90CRI LEDS AND F4LC-SQ TRIM WITH LI FINISH  
 Light Source: -  
 Ballast/Driver: -

**Summary**

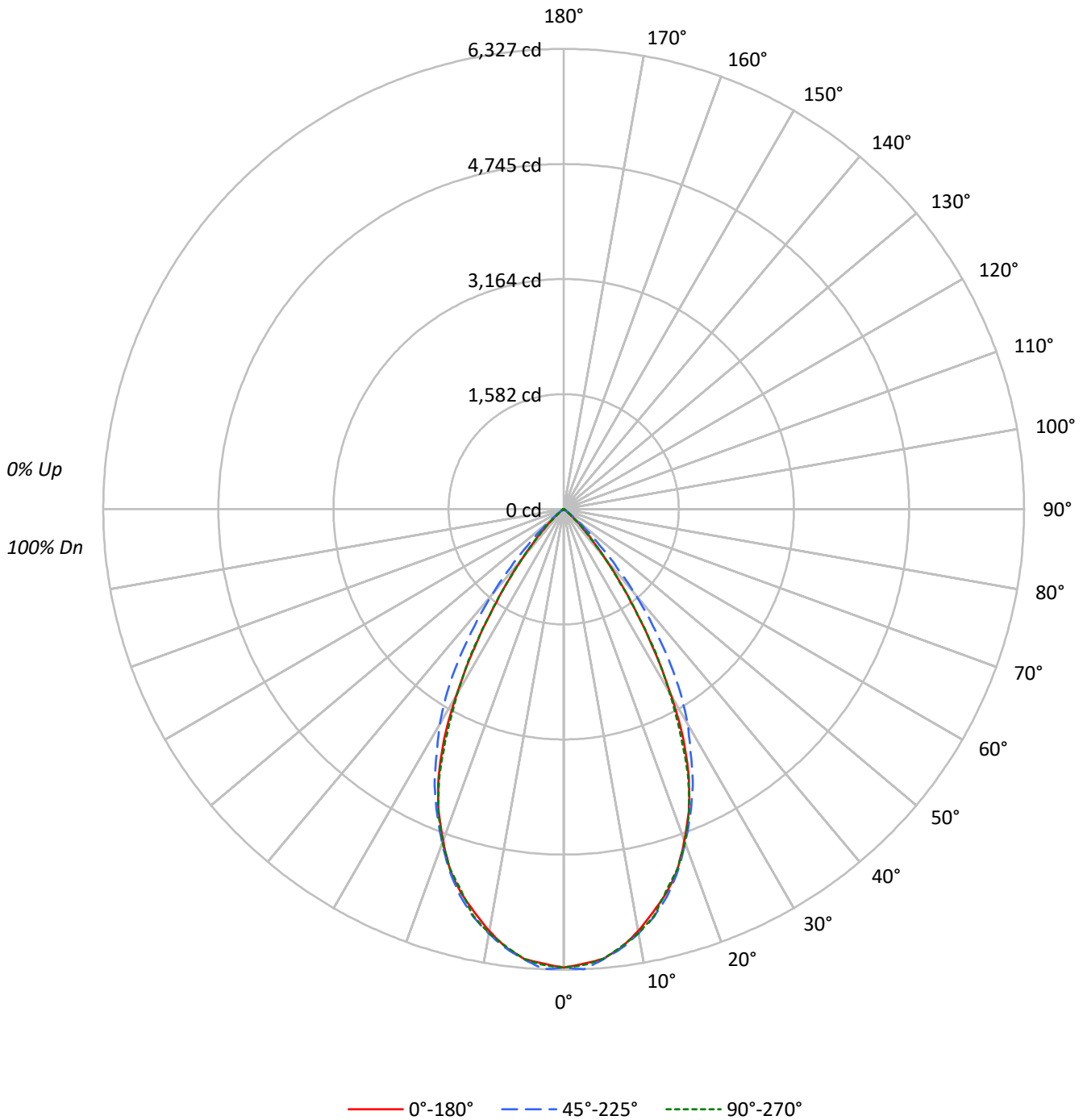
Lumens per Lamp: N/A  
 Luminaire Lumens: 5815.0 lumens  
 Efficiency: N/A  
 Efficacy: 80.8 lumens/watt  
 Spacing Criteria (0/90/45): 0.91 / 0.9 / 0.94  
 Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
 CIE Type: Direct

Input Watts (W): 72  
 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#  
CATALOG NUMBER: FLDSQ4C60D010 FEU4C609027 F4LC-SQ-LI

### Luminous Intensity Polar Plot



TEST NUMBER: P#  
 CATALOG NUMBER: FLDSQ4C60D010 FEU4C609027 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°  | 607745 | 607745 | 607745 |
| 5°  | 600758 | 601533 | 600758 |
| 10° | 576734 | 580271 | 579487 |
| 15° | 545234 | 549230 | 542427 |
| 20° | 497594 | 501280 | 500058 |
| 25° | 433275 | 446903 | 430284 |
| 30° | 329479 | 378958 | 324576 |
| 35° | 207395 | 294608 | 209280 |
| 40° | 111888 | 194554 | 109873 |
| 45° | 52972  | 96106  | 52413  |
| 50° | 19830  | 36026  | 19830  |
| 55° | 9421   | 11456  | 8764   |
| 60° | 6175   | 5423   | 6175   |
| 65° | 3653   | 3653   | 3653   |
| 70° | 2257   | 3414   | 2257   |
| 75° | 1528   | 1528   | 1528   |
| 80° | 2278   | 2278   | 2278   |
| 85° | 0      | 0      | 0      |

TEST NUMBER: P#  
 CATALOG NUMBER: FLDSQ4C60D010 FEU4C609027 F4LC-SQ-LI

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 584.0  | 10.0      |
| 10°-20°   | 1530.5 | 26.3      |
| 20°-30°   | 1869.6 | 32.2      |
| 30°-40°   | 1307.7 | 22.5      |
| 40°-50°   | 428.5  | 7.4       |
| 50°-60°   | 68.1   | 1.2       |
| 60°-70°   | 18.6   | 0.3       |
| 70°-80°   | 6.2    | 0.1       |
| 80°-90°   | 1.7    | 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°    | 3984.1 | 68.5      |
| 0°-40°    | 5291.8 | 91.0      |
| 0°-60°    | 5788.4 | 99.5      |
| 0°-90°    | 5815.0 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 5815.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----|------|-------|------|-------|------|------|
| 0°  | 6299 | 6299  | 6299 | 6299  | 6299 |      |
| 5°  | 6202 | 6204  | 6210 | 6172  | 6202 | 582  |
| 15° | 5458 | 5480  | 5498 | 5462  | 5430 | 1523 |
| 25° | 4070 | 4132  | 4198 | 4122  | 4042 | 1828 |
| 35° | 1761 | 2079  | 2501 | 2047  | 1777 | 1124 |
| 45° | 388  | 478   | 704  | 472   | 384  | 326  |
| 55° | 56   | 60    | 68   | 60    | 52   | 55   |
| 65° | 16   | 20    | 16   | 20    | 16   | 18   |
| 75° | 4    | 4     | 4    | 4     | 4    | 6    |
| 85° | 0    | 0     | 0    | 0     | 0    | 2    |
| 90° | 0    | 0     | 0    | 0     | 0    |      |

TEST NUMBER: P#  
 CATALOG NUMBER: FLDSQ4C60D010 FEU4C609027 F4LC-SQ-LI

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 10°    | 15°    | 20°    | 25°    | 30°    | 35°    | 40°    | 45°    | 50°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 6298.6 | 6298.6 | 6298.6 | 6298.6 | 6298.6 | 6298.6 | 6298.6 | 6298.6 | 6298.6 | 6298.6 | 6298.6 |
| 2.5°  | 6250.5 | 6294.6 | 6282.5 | 6310.6 | 6310.6 | 6278.6 | 6286.6 | 6298.6 | 6314.6 | 6326.6 | 6230.5 |
| 5°    | 6202.5 | 6242.5 | 6206.5 | 6246.5 | 6222.5 | 6186.5 | 6246.5 | 6214.5 | 6234.5 | 6210.5 | 6226.5 |
| 7.5°  | 6074.5 | 6138.5 | 6066.5 | 6114.5 | 6098.5 | 6078.4 | 6102.4 | 6094.4 | 6106.5 | 6086.4 | 6042.5 |
| 10°   | 5886.4 | 5938.5 | 5890.5 | 5958.4 | 5926.4 | 5906.5 | 5926.4 | 5946.5 | 5942.4 | 5922.5 | 5946.5 |
| 12.5° | 5670.3 | 5730.3 | 5706.3 | 5746.3 | 5710.4 | 5710.4 | 5758.4 | 5746.3 | 5750.4 | 5734.4 | 5762.3 |
| 15°   | 5458.2 | 5502.3 | 5466.2 | 5518.3 | 5502.3 | 5458.2 | 5478.1 | 5478.1 | 5510.3 | 5498.2 | 5466.2 |
| 17.5° | 5194.2 | 5230.1 | 5190.1 | 5202.2 | 5186.2 | 5178.2 | 5262.1 | 5206.1 | 5238.1 | 5214.1 | 5218.2 |
| 20°   | 4846.0 | 4862.0 | 4849.9 | 4881.9 | 4862.0 | 4886.0 | 4878.0 | 4870.0 | 4870.0 | 4881.9 | 4854.0 |
| 22.5° | 4493.8 | 4493.8 | 4505.9 | 4513.9 | 4529.9 | 4505.9 | 4553.9 | 4513.9 | 4517.8 | 4545.9 | 4537.9 |
| 25°   | 4069.7 | 4057.6 | 4085.7 | 4125.7 | 4141.7 | 4121.6 | 4185.6 | 4153.6 | 4177.6 | 4197.7 | 4153.6 |
| 27.5° | 3553.5 | 3553.5 | 3581.4 | 3649.5 | 3661.5 | 3685.5 | 3773.5 | 3773.5 | 3805.5 | 3777.6 | 3809.6 |
| 30°   | 2957.2 | 3001.2 | 3037.2 | 3125.2 | 3153.3 | 3205.4 | 3297.3 | 3341.4 | 3413.4 | 3401.3 | 3385.3 |
| 32.5° | 2345.0 | 2405.0 | 2409.0 | 2501.1 | 2577.0 | 2665.0 | 2789.1 | 2893.1 | 2945.2 | 2981.2 | 2941.2 |
| 35°   | 1760.7 | 1796.8 | 1828.8 | 1892.8 | 2020.8 | 2136.9 | 2248.9 | 2385.0 | 2477.1 | 2501.1 | 2465.0 |
| 37.5° | 1288.6 | 1296.6 | 1328.6 | 1388.5 | 1484.5 | 1596.7 | 1732.7 | 1880.7 | 1976.9 | 2012.8 | 1972.8 |
| 40°   | 888.3  | 896.3  | 912.3  | 964.4  | 1044.5 | 1124.5 | 1232.6 | 1384.6 | 1472.6 | 1544.6 | 1492.5 |
| 42.5° | 596.2  | 604.2  | 620.2  | 660.2  | 704.3  | 780.2  | 864.3  | 960.4  | 1044.5 | 1076.5 | 1048.4 |
| 45°   | 388.2  | 388.2  | 396.2  | 424.2  | 448.2  | 508.2  | 568.3  | 628.2  | 684.2  | 704.3  | 684.2  |
| 47.5° | 228.1  | 232.0  | 240.0  | 260.1  | 288.1  | 312.1  | 356.2  | 396.2  | 412.2  | 428.2  | 420.2  |
| 50°   | 132.1  | 132.1  | 144.0  | 156.1  | 176.0  | 192.0  | 208.0  | 224.0  | 232.0  | 240.0  | 232.0  |
| 52.5° | 72.0   | 76.1   | 80.0   | 84.1   | 92.1   | 108.1  | 120.0  | 120.0  | 124.1  | 128.0  | 124.1  |
| 55°   | 56.0   | 56.0   | 56.0   | 56.0   | 60.1   | 60.1   | 60.1   | 64.0   | 64.0   | 68.1   | 64.0   |
| 57.5° | 40.0   | 40.0   | 40.0   | 44.1   | 44.1   | 44.1   | 40.0   | 40.0   | 40.0   | 40.0   | 40.0   |
| 60°   | 32.0   | 32.0   | 32.0   | 32.0   | 32.0   | 32.0   | 32.0   | 28.1   | 28.1   | 28.1   | 28.1   |
| 62.5° | 24.0   | 24.0   | 24.0   | 24.0   | 24.0   | 24.0   | 24.0   | 24.0   | 24.0   | 24.0   | 24.0   |
| 65°   | 16.0   | 16.0   | 20.1   | 20.1   | 20.1   | 20.1   | 20.1   | 16.0   | 16.0   | 16.0   | 16.0   |
| 67.5° | 12.1   | 12.1   | 12.1   | 12.1   | 16.0   | 16.0   | 12.1   | 12.1   | 12.1   | 12.1   | 12.1   |
| 70°   | 8.0    | 8.0    | 8.0    | 12.1   | 12.1   | 12.1   | 12.1   | 12.1   | 12.1   | 12.1   | 12.1   |
| 72.5° | 8.0    | 8.0    | 8.0    | 8.0    | 8.0    | 8.0    | 8.0    | 8.0    | 8.0    | 8.0    | 8.0    |
| 75°   | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    |
| 77.5° | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    |
| 80°   | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    |
| 82.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 4.1    | 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° | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    |
| 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#  
 CATALOG NUMBER: FLDSQ4C60D010 FEU4C609027 F4LC-SQ-LI

**CANDELA DISTRIBUTION (continued):**

|       | 55°    | 60°    | 65°    | 70°    | 75°    | 80°    | 85°    | 90°    |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0°    | 6298.6 | 6298.6 | 6298.6 | 6298.6 | 6298.6 | 6298.6 | 6298.6 | 6298.6 |
| 2.5°  | 6298.6 | 6230.5 | 6238.5 | 6274.5 | 6254.5 | 6274.5 | 6270.6 | 6270.6 |
| 5°    | 6230.5 | 6210.5 | 6178.5 | 6166.4 | 6190.4 | 6242.5 | 6234.5 | 6202.5 |
| 7.5°  | 6102.4 | 6050.5 | 6086.4 | 6102.4 | 6082.5 | 6114.5 | 6130.5 | 6062.4 |
| 10°   | 5950.4 | 5930.5 | 5922.5 | 5930.5 | 5922.5 | 5954.5 | 5914.5 | 5914.5 |
| 12.5° | 5734.4 | 5702.3 | 5702.3 | 5750.4 | 5722.3 | 5698.3 | 5730.3 | 5726.4 |
| 15°   | 5518.3 | 5454.1 | 5454.1 | 5470.1 | 5482.2 | 5466.2 | 5470.1 | 5430.1 |
| 17.5° | 5198.1 | 5178.2 | 5150.1 | 5194.2 | 5206.1 | 5190.1 | 5202.2 | 5182.1 |
| 20°   | 4897.9 | 4897.9 | 4846.0 | 4865.9 | 4881.9 | 4894.0 | 4902.0 | 4870.0 |
| 22.5° | 4513.9 | 4521.9 | 4485.8 | 4525.8 | 4537.9 | 4497.9 | 4505.9 | 4497.9 |
| 25°   | 4161.6 | 4157.7 | 4129.6 | 4113.6 | 4121.6 | 4105.6 | 4101.7 | 4041.6 |
| 27.5° | 3773.5 | 3733.5 | 3673.5 | 3689.5 | 3621.5 | 3565.4 | 3565.4 | 3473.3 |
| 30°   | 3353.3 | 3285.4 | 3205.4 | 3125.2 | 3065.3 | 3001.2 | 2965.2 | 2913.2 |
| 32.5° | 2861.1 | 2769.2 | 2669.1 | 2561.0 | 2493.1 | 2397.0 | 2345.0 | 2373.0 |
| 35°   | 2373.0 | 2236.9 | 2100.8 | 1992.9 | 1888.7 | 1832.7 | 1768.7 | 1776.7 |
| 37.5° | 1900.8 | 1708.7 | 1588.7 | 1472.6 | 1384.6 | 1312.6 | 1284.5 | 1276.5 |
| 40°   | 1388.5 | 1236.5 | 1116.5 | 1032.4 | 972.4  | 916.4  | 884.4  | 872.3  |
| 42.5° | 960.4  | 852.4  | 756.2  | 688.3  | 648.3  | 612.2  | 596.2  | 592.3  |
| 45°   | 624.3  | 560.3  | 496.3  | 448.2  | 416.2  | 392.2  | 388.2  | 384.1  |
| 47.5° | 392.2  | 360.1  | 320.1  | 284.1  | 256.1  | 240.0  | 228.1  | 228.1  |
| 50°   | 224.0  | 212.1  | 192.0  | 172.1  | 156.1  | 148.1  | 136.0  | 132.1  |
| 52.5° | 120.0  | 120.0  | 112.0  | 96.0   | 84.1   | 76.1   | 76.1   | 72.0   |
| 55°   | 64.0   | 64.0   | 60.1   | 60.1   | 56.0   | 56.0   | 56.0   | 52.1   |
| 57.5° | 40.0   | 40.0   | 44.1   | 44.1   | 40.0   | 40.0   | 40.0   | 40.0   |
| 60°   | 28.1   | 32.0   | 32.0   | 32.0   | 32.0   | 32.0   | 32.0   | 32.0   |
| 62.5° | 24.0   | 24.0   | 24.0   | 24.0   | 24.0   | 24.0   | 24.0   | 24.0   |
| 65°   | 16.0   | 20.1   | 20.1   | 20.1   | 20.1   | 16.0   | 16.0   | 16.0   |
| 67.5° | 12.1   | 12.1   | 12.1   | 12.1   | 12.1   | 12.1   | 12.1   | 12.1   |
| 70°   | 12.1   | 12.1   | 12.1   | 12.1   | 12.1   | 8.0    | 8.0    | 8.0    |
| 72.5° | 8.0    | 8.0    | 8.0    | 8.0    | 8.0    | 8.0    | 8.0    | 8.0    |
| 75°   | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    |
| 77.5° | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    |
| 80°   | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    |
| 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° | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    | 4.1    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

(END OF REPORT)