

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: **FLDSQ4C65D010 FEU4C659040 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: FLDSQ4C65D010 FEU4C659040 F4LC-SQ-LI
 Description: 4 INCH 6500 LUMEN FAIL-SAFE LED DOWNLIGHT WITH, 4000K, 90CRI LEDS AND F4LC-SQ TRIM WITH LI FINISH
 Light Source: -
 Ballast/Driver: -

Summary

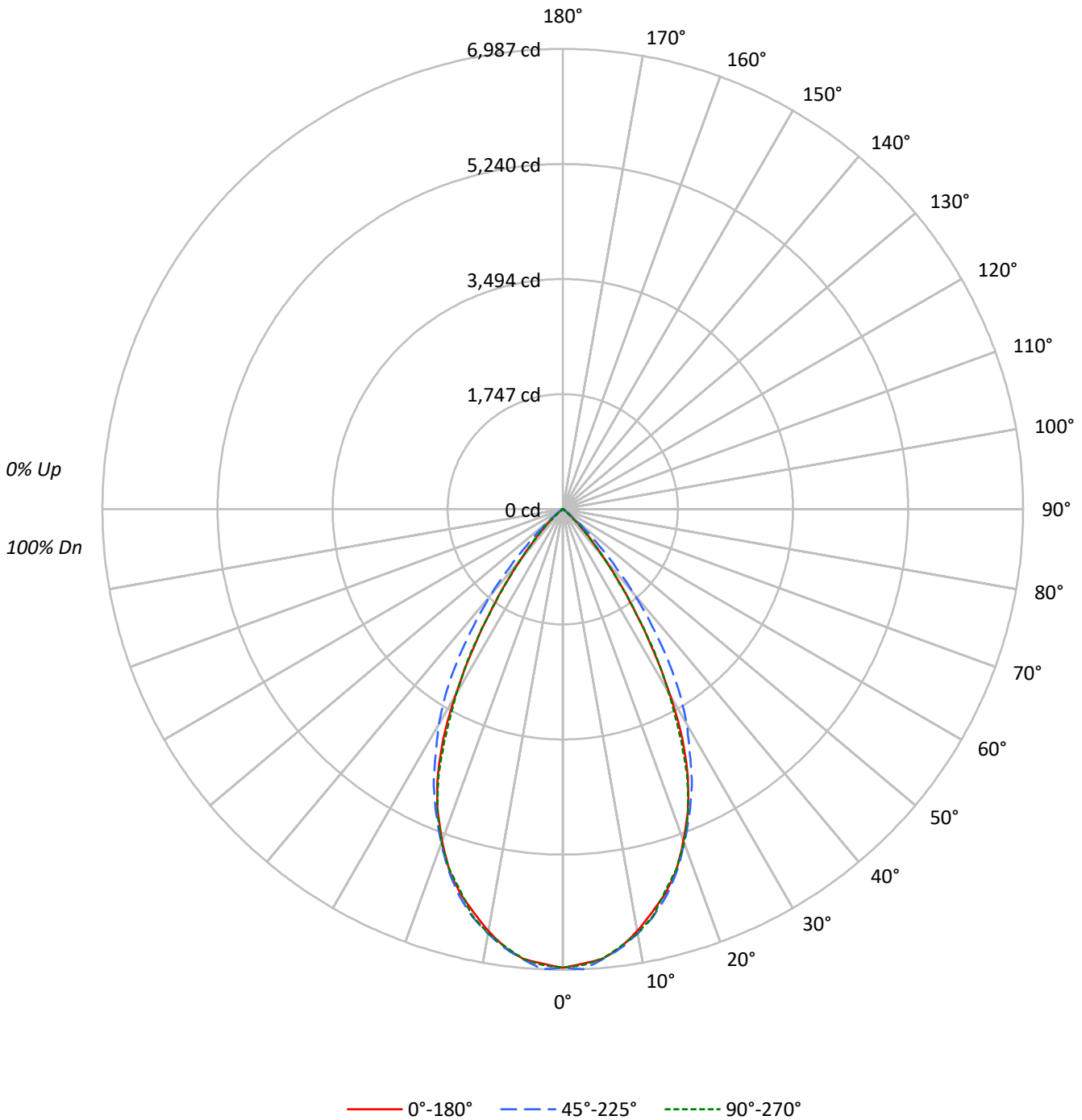
Lumens per Lamp: N/A
 Luminaire Lumens: 6422.0 lumens
 Efficiency: N/A
 Efficacy: 88.7 lumens/watt
 Spacing Criteria (0/90/45): 0.91 / 0.9 / 0.94
 Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')
 CIE Type: Direct

Input Watts (W): 72.4
 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#
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COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

| RF | 20 | | | | 20 | | | | 20 | | | | 20 | | | | 20 | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| RC | 80 | | | | 70 | | | | 50 | | | | 30 | | | | 10 | | | |
| RW | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR | | | | | | | | | | | | | | | | | | | | |
| 0 | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 | 100 | 100 | 100 |
| 1 | 113 | 111 | 108 | 106 | 111 | 108 | 106 | 104 | 104 | 103 | 101 | 101 | 99 | 98 | 97 | 96 | 95 | 93 | 93 | 93 |
| 2 | 108 | 103 | 99 | 95 | 105 | 101 | 97 | 94 | 98 | 95 | 92 | 95 | 92 | 90 | 92 | 90 | 88 | 87 | 87 | 87 |
| 3 | 102 | 96 | 91 | 87 | 100 | 94 | 90 | 86 | 92 | 88 | 84 | 89 | 86 | 83 | 87 | 84 | 82 | 80 | 80 | 80 |
| 4 | 97 | 89 | 84 | 79 | 95 | 88 | 83 | 79 | 86 | 81 | 78 | 84 | 80 | 77 | 82 | 79 | 76 | 75 | 75 | 75 |
| 5 | 92 | 83 | 77 | 73 | 90 | 82 | 77 | 73 | 81 | 76 | 72 | 79 | 75 | 71 | 77 | 74 | 71 | 69 | 69 | 69 |
| 6 | 87 | 78 | 72 | 68 | 86 | 77 | 71 | 67 | 76 | 71 | 67 | 74 | 70 | 66 | 73 | 69 | 66 | 64 | 64 | 64 |
| 7 | 83 | 73 | 67 | 63 | 81 | 73 | 67 | 63 | 71 | 66 | 62 | 70 | 65 | 62 | 69 | 65 | 62 | 60 | 60 | 60 |
| 8 | 79 | 69 | 63 | 59 | 77 | 68 | 62 | 58 | 67 | 62 | 58 | 66 | 61 | 58 | 65 | 61 | 58 | 56 | 56 | 56 |
| 9 | 75 | 65 | 59 | 55 | 74 | 64 | 59 | 55 | 63 | 58 | 55 | 63 | 58 | 54 | 62 | 57 | 54 | 53 | 53 | 53 |
| 10 | 71 | 61 | 55 | 51 | 70 | 61 | 55 | 51 | 60 | 55 | 51 | 59 | 54 | 51 | 58 | 54 | 51 | 50 | 50 | 50 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|--------|--------|--------|
| 0° | 671177 | 671177 | 671177 |
| 5° | 663474 | 664326 | 663474 |
| 10° | 636931 | 640841 | 639979 |
| 15° | 602153 | 606568 | 599056 |
| 20° | 549540 | 553606 | 552261 |
| 25° | 478501 | 493555 | 475201 |
| 30° | 363862 | 418522 | 358458 |
| 35° | 229045 | 325351 | 231118 |
| 40° | 123577 | 214871 | 121347 |
| 45° | 58499 | 106135 | 57885 |
| 50° | 21901 | 39794 | 21901 |
| 55° | 10413 | 12650 | 9673 |
| 60° | 6812 | 5982 | 6812 |
| 65° | 4041 | 4041 | 4041 |
| 70° | 2483 | 3752 | 2483 |
| 75° | 1678 | 1678 | 1678 |
| 80° | 2500 | 2500 | 2500 |
| 85° | 0 | 0 | 0 |

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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 644.9 | 10.0 |
| 10°-20° | 1690.2 | 26.3 |
| 20°-30° | 2064.8 | 32.2 |
| 30°-40° | 1444.2 | 22.5 |
| 40°-50° | 473.3 | 7.4 |
| 50°-60° | 75.3 | 1.2 |
| 60°-70° | 20.5 | 0.3 |
| 70°-80° | 6.9 | 0.1 |
| 80°-90° | 1.9 | 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° | 4400.0 | 68.5 |
| 0°-40° | 5844.1 | 91.0 |
| 0°-60° | 6392.7 | 99.5 |
| 0°-90° | 6422.0 | 100.0 |
| 90°-120° | 0.0 | 0.0 |
| 90°-150° | 0.0 | 0.0 |
| 90°-180° | 0.0 | 0.0 |
| 0°-180° | 6422.0 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|-----|------|-------|------|-------|------|------|
| 0° | 6956 | 6956 | 6956 | 6956 | 6956 | |
| 5° | 6850 | 6852 | 6859 | 6817 | 6850 | 642 |
| 15° | 6028 | 6052 | 6072 | 6032 | 5997 | 1681 |
| 25° | 4494 | 4563 | 4636 | 4552 | 4464 | 2019 |
| 35° | 1944 | 2296 | 2762 | 2260 | 1962 | 1241 |
| 45° | 429 | 528 | 778 | 522 | 424 | 360 |
| 55° | 62 | 66 | 75 | 66 | 58 | 61 |
| 65° | 18 | 22 | 18 | 22 | 18 | 20 |
| 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: FLDSQ4C65D010 FEU4C659040 F4LC-SQ-LI

CANDELA DISTRIBUTION (FULL):

| | 0° | 5° | 10° | 15° | 20° | 25° | 30° | 35° | 40° | 45° | 50° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 6956.0 | 6956.0 | 6956.0 | 6956.0 | 6956.0 | 6956.0 | 6956.0 | 6956.0 | 6956.0 | 6956.0 | 6956.0 |
| 2.5° | 6903.0 | 6951.7 | 6938.4 | 6969.4 | 6969.4 | 6934.0 | 6942.9 | 6956.0 | 6973.7 | 6987.0 | 6880.8 |
| 5° | 6850.0 | 6894.2 | 6854.3 | 6898.5 | 6872.0 | 6832.3 | 6898.5 | 6863.2 | 6885.3 | 6858.8 | 6876.5 |
| 7.5° | 6708.6 | 6779.3 | 6699.8 | 6752.8 | 6735.1 | 6712.9 | 6739.4 | 6730.6 | 6743.9 | 6721.8 | 6673.2 |
| 10° | 6500.8 | 6558.4 | 6505.3 | 6580.4 | 6545.0 | 6523.0 | 6545.0 | 6567.2 | 6562.7 | 6540.7 | 6567.2 |
| 12.5° | 6262.2 | 6328.4 | 6301.9 | 6346.1 | 6306.4 | 6306.4 | 6359.4 | 6346.1 | 6350.6 | 6332.9 | 6363.8 |
| 15° | 6028.0 | 6076.7 | 6036.8 | 6094.3 | 6076.7 | 6028.0 | 6050.0 | 6050.0 | 6085.5 | 6072.2 | 6036.8 |
| 17.5° | 5736.4 | 5776.0 | 5731.9 | 5745.2 | 5727.5 | 5718.7 | 5811.4 | 5749.5 | 5784.9 | 5758.4 | 5762.9 |
| 20° | 5351.9 | 5369.5 | 5356.2 | 5391.5 | 5369.5 | 5396.1 | 5387.2 | 5378.4 | 5378.4 | 5391.5 | 5360.7 |
| 22.5° | 4962.9 | 4962.9 | 4976.2 | 4985.1 | 5002.7 | 4976.2 | 5029.2 | 4985.1 | 4989.4 | 5020.4 | 5011.6 |
| 25° | 4494.5 | 4481.2 | 4512.2 | 4556.4 | 4574.0 | 4551.9 | 4622.6 | 4587.2 | 4613.7 | 4635.9 | 4587.2 |
| 27.5° | 3924.4 | 3924.4 | 3955.3 | 4030.5 | 4043.7 | 4070.2 | 4167.4 | 4167.4 | 4202.7 | 4171.9 | 4207.2 |
| 30° | 3265.8 | 3314.5 | 3354.2 | 3451.4 | 3482.4 | 3540.0 | 3641.5 | 3690.2 | 3769.7 | 3756.4 | 3738.7 |
| 32.5° | 2589.7 | 2656.1 | 2660.4 | 2762.1 | 2846.0 | 2943.2 | 3080.3 | 3195.1 | 3252.7 | 3292.4 | 3248.2 |
| 35° | 1944.5 | 1984.3 | 2019.7 | 2090.4 | 2231.8 | 2360.0 | 2483.7 | 2633.9 | 2735.6 | 2762.1 | 2722.3 |
| 37.5° | 1423.1 | 1431.9 | 1467.3 | 1533.5 | 1639.5 | 1763.4 | 1913.6 | 2077.0 | 2183.2 | 2222.9 | 2178.7 |
| 40° | 981.1 | 989.9 | 1007.6 | 1065.1 | 1153.5 | 1241.8 | 1361.2 | 1529.1 | 1626.3 | 1705.9 | 1648.3 |
| 42.5° | 658.4 | 667.3 | 684.9 | 729.1 | 777.8 | 861.7 | 954.6 | 1060.6 | 1153.5 | 1188.8 | 1157.8 |
| 45° | 428.7 | 428.7 | 437.5 | 468.5 | 495.0 | 561.2 | 627.6 | 693.8 | 755.6 | 777.8 | 755.6 |
| 47.5° | 251.9 | 256.3 | 265.1 | 287.3 | 318.1 | 344.6 | 393.3 | 437.5 | 455.2 | 472.9 | 464.0 |
| 50° | 145.9 | 145.9 | 159.1 | 172.4 | 194.4 | 212.1 | 229.8 | 247.4 | 256.3 | 265.1 | 256.3 |
| 52.5° | 79.5 | 84.0 | 88.4 | 92.9 | 101.7 | 119.4 | 132.6 | 132.6 | 137.1 | 141.4 | 137.1 |
| 55° | 61.9 | 61.9 | 61.9 | 61.9 | 66.4 | 66.4 | 66.4 | 70.7 | 70.7 | 75.2 | 70.7 |
| 57.5° | 44.2 | 44.2 | 44.2 | 48.7 | 48.7 | 48.7 | 44.2 | 44.2 | 44.2 | 44.2 | 44.2 |
| 60° | 35.3 | 35.3 | 35.3 | 35.3 | 35.3 | 35.3 | 35.3 | 31.0 | 31.0 | 31.0 | 31.0 |
| 62.5° | 26.5 | 26.5 | 26.5 | 26.5 | 26.5 | 26.5 | 26.5 | 26.5 | 26.5 | 26.5 | 26.5 |
| 65° | 17.7 | 17.7 | 22.2 | 22.2 | 22.2 | 22.2 | 22.2 | 17.7 | 17.7 | 17.7 | 17.7 |
| 67.5° | 13.3 | 13.3 | 13.3 | 13.3 | 17.7 | 17.7 | 13.3 | 13.3 | 13.3 | 13.3 | 13.3 |
| 70° | 8.8 | 8.8 | 8.8 | 13.3 | 13.3 | 13.3 | 13.3 | 13.3 | 13.3 | 13.3 | 13.3 |
| 72.5° | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 |
| 75° | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| 77.5° | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| 80° | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| 82.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.5 | 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° | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

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CANDELA DISTRIBUTION (continued):

| | 55° | 60° | 65° | 70° | 75° | 80° | 85° | 90° |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0° | 6956.0 | 6956.0 | 6956.0 | 6956.0 | 6956.0 | 6956.0 | 6956.0 | 6956.0 |
| 2.5° | 6956.0 | 6880.8 | 6889.7 | 6929.5 | 6907.3 | 6929.5 | 6925.2 | 6925.2 |
| 5° | 6880.8 | 6858.8 | 6823.5 | 6810.1 | 6836.6 | 6894.2 | 6885.3 | 6850.0 |
| 7.5° | 6739.4 | 6682.1 | 6721.8 | 6739.4 | 6717.4 | 6752.8 | 6770.5 | 6695.3 |
| 10° | 6571.5 | 6549.5 | 6540.7 | 6549.5 | 6540.7 | 6576.0 | 6531.9 | 6531.9 |
| 12.5° | 6332.9 | 6297.6 | 6297.6 | 6350.6 | 6319.6 | 6293.1 | 6328.4 | 6324.1 |
| 15° | 6094.3 | 6023.5 | 6023.5 | 6041.1 | 6054.5 | 6036.8 | 6041.1 | 5997.0 |
| 17.5° | 5740.7 | 5718.7 | 5687.7 | 5736.4 | 5749.5 | 5731.9 | 5745.2 | 5723.0 |
| 20° | 5409.2 | 5409.2 | 5351.9 | 5373.9 | 5391.5 | 5404.9 | 5413.7 | 5378.4 |
| 22.5° | 4985.1 | 4993.9 | 4954.0 | 4998.2 | 5011.6 | 4967.4 | 4976.2 | 4967.4 |
| 25° | 4596.1 | 4591.7 | 4560.7 | 4543.0 | 4551.9 | 4534.2 | 4529.9 | 4463.5 |
| 27.5° | 4167.4 | 4123.2 | 4057.0 | 4074.7 | 3999.5 | 3937.6 | 3937.6 | 3835.9 |
| 30° | 3703.4 | 3628.3 | 3540.0 | 3451.4 | 3385.2 | 3314.5 | 3274.7 | 3217.3 |
| 32.5° | 3159.8 | 3058.3 | 2947.7 | 2828.3 | 2753.3 | 2647.3 | 2589.7 | 2620.7 |
| 35° | 2620.7 | 2470.3 | 2320.1 | 2200.9 | 2085.9 | 2024.0 | 1953.3 | 1962.1 |
| 37.5° | 2099.2 | 1887.1 | 1754.6 | 1626.3 | 1529.1 | 1449.6 | 1418.6 | 1409.7 |
| 40° | 1533.5 | 1365.6 | 1233.0 | 1140.1 | 1073.9 | 1012.1 | 976.7 | 963.4 |
| 42.5° | 1060.6 | 941.4 | 835.2 | 760.1 | 716.0 | 676.1 | 658.4 | 654.1 |
| 45° | 689.5 | 618.8 | 548.1 | 495.0 | 459.7 | 433.2 | 428.7 | 424.2 |
| 47.5° | 433.2 | 397.7 | 353.5 | 313.8 | 282.8 | 265.1 | 251.9 | 251.9 |
| 50° | 247.4 | 234.3 | 212.1 | 190.1 | 172.4 | 163.6 | 150.2 | 145.9 |
| 52.5° | 132.6 | 132.6 | 123.7 | 106.0 | 92.9 | 84.0 | 84.0 | 79.5 |
| 55° | 70.7 | 70.7 | 66.4 | 66.4 | 61.9 | 61.9 | 61.9 | 57.5 |
| 57.5° | 44.2 | 44.2 | 48.7 | 48.7 | 44.2 | 44.2 | 44.2 | 44.2 |
| 60° | 31.0 | 35.3 | 35.3 | 35.3 | 35.3 | 35.3 | 35.3 | 35.3 |
| 62.5° | 26.5 | 26.5 | 26.5 | 26.5 | 26.5 | 26.5 | 26.5 | 26.5 |
| 65° | 17.7 | 22.2 | 22.2 | 22.2 | 22.2 | 17.7 | 17.7 | 17.7 |
| 67.5° | 13.3 | 13.3 | 13.3 | 13.3 | 13.3 | 13.3 | 13.3 | 13.3 |
| 70° | 13.3 | 13.3 | 13.3 | 13.3 | 13.3 | 8.8 | 8.8 | 8.8 |
| 72.5° | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 | 8.8 |
| 75° | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| 77.5° | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| 80° | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| 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° | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

(END OF REPORT)