

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: NEO-RAY

Report Number: P912054

Luminaire Tested: DFN2DIP-SQ3F0-110D050US850-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912054  
REPORT IS A COMBINATION OF REPORTS P899894 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-110D050US850-RLLFLL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

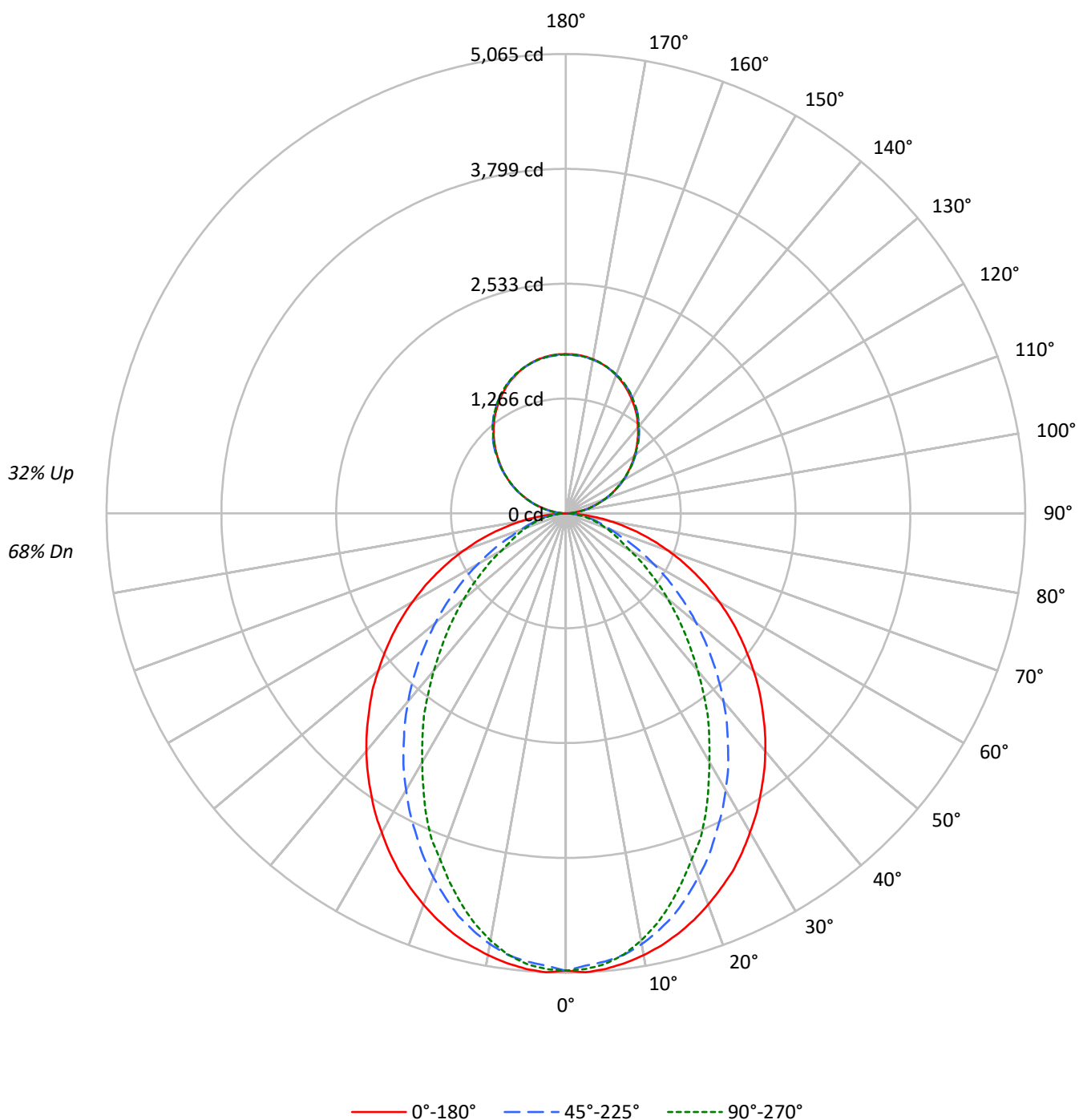
Lumens per Lamp: N/A  
Luminaire Lumens: 15276.5 lumens  
Efficiency: N/A  
Efficacy: 102.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 148.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
Total Harmonic Distortion (THDi): 0.049  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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### Luminous Intensity Polar Plot



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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 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
| 0   | 111 | 111 | 111 | 111 | 105 | 105 | 105 | 105 | 93 | 93 | 93 | 82 | 82 | 82 | 73 | 73 | 73 |
| 1   | 102 | 98  | 94  | 91  | 97  | 93  | 90  | 87  | 83 | 80 | 78 | 74 | 72 | 70 | 65 | 64 | 63 |
| 2   | 94  | 87  | 81  | 76  | 88  | 82  | 77  | 72  | 73 | 69 | 66 | 66 | 62 | 60 | 58 | 56 | 54 |
| 3   | 86  | 77  | 70  | 64  | 81  | 73  | 66  | 61  | 65 | 60 | 56 | 59 | 55 | 51 | 52 | 49 | 47 |
| 4   | 79  | 68  | 61  | 55  | 74  | 65  | 58  | 53  | 59 | 53 | 49 | 53 | 48 | 45 | 47 | 44 | 41 |
| 5   | 73  | 61  | 53  | 47  | 69  | 58  | 51  | 46  | 53 | 47 | 42 | 48 | 43 | 39 | 43 | 39 | 36 |
| 6   | 68  | 56  | 47  | 42  | 64  | 53  | 46  | 40  | 48 | 42 | 37 | 43 | 38 | 35 | 39 | 35 | 32 |
| 7   | 63  | 50  | 42  | 37  | 59  | 48  | 41  | 36  | 44 | 38 | 33 | 40 | 35 | 31 | 36 | 32 | 29 |
| 8   | 58  | 46  | 38  | 33  | 55  | 44  | 37  | 32  | 40 | 34 | 30 | 37 | 32 | 28 | 33 | 29 | 26 |
| 9   | 55  | 42  | 35  | 30  | 52  | 40  | 34  | 29  | 37 | 31 | 27 | 34 | 29 | 25 | 31 | 27 | 24 |
| 10  | 51  | 39  | 32  | 27  | 48  | 37  | 31  | 26  | 34 | 29 | 25 | 31 | 27 | 23 | 29 | 25 | 22 |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 5777 | 5777 | 5777 |
| 5°  | 5782 | 5681 | 5720 |
| 10° | 5722 | 5566 | 5532 |
| 15° | 5639 | 5378 | 5242 |
| 20° | 5531 | 5121 | 4888 |
| 25° | 5421 | 4834 | 4545 |
| 30° | 5274 | 4539 | 4112 |
| 35° | 5129 | 4223 | 3731 |
| 40° | 4982 | 3896 | 3295 |
| 45° | 4812 | 3534 | 2900 |
| 50° | 4635 | 3169 | 2514 |
| 55° | 4450 | 2779 | 2143 |
| 60° | 4236 | 2372 | 1762 |
| 65° | 3989 | 1959 | 1583 |
| 70° | 3689 | 1573 | 1430 |
| 75° | 3313 | 1378 | 1297 |
| 80° | 2768 | 1144 | 1119 |
| 85° | 1878 | 745  | 829  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 4812 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 472.5   | 3.1       |
| 10°-20°   | 1297.2  | 8.5       |
| 20°-30°   | 1821.2  | 11.9      |
| 30°-40°   | 1985.2  | 13.0      |
| 40°-50°   | 1824.6  | 11.9      |
| 50°-60°   | 1433.0  | 9.4       |
| 60°-70°   | 932.7   | 6.1       |
| 70°-80°   | 480.1   | 3.1       |
| 80°-90°   | 127.6   | 0.8       |
| 90°-100°  | 108.5   | 0.7       |
| 100°-110° | 344.8   | 2.3       |
| 110°-120° | 590.1   | 3.9       |
| 120°-130° | 776.0   | 5.1       |
| 130°-140° | 871.0   | 5.7       |
| 140°-150° | 854.2   | 5.6       |
| 150°-160° | 716.5   | 4.7       |
| 160°-170° | 475.2   | 3.1       |
| 170°-180° | 166.1   | 1.1       |
| 0°-30°    | 3590.9  | 23.5      |
| 0°-40°    | 5576.1  | 36.5      |
| 0°-60°    | 8833.7  | 57.8      |
| 0°-90°    | 10374.1 | 67.9      |
| 90°-120°  | 1043.4  | 6.8       |
| 90°-150°  | 3544.6  | 23.2      |
| 90°-180°  | 4902.0  | 32.1      |
| 0°-180°   | 15276.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 5042 | 5042  | 5042 | 5042  | 5042 |      |
| 5°   | 5042 | 5019  | 4960 | 5001  | 4987 | 478  |
| 15°  | 4795 | 4745  | 4590 | 4504  | 4458 | 1351 |
| 25°  | 4353 | 4207  | 3906 | 3719  | 3650 | 2002 |
| 35°  | 3751 | 3518  | 3117 | 2829  | 2728 | 2348 |
| 45°  | 3066 | 2760  | 2282 | 1957  | 1848 | 2368 |
| 55°  | 2331 | 1976  | 1483 | 1209  | 1123 | 2083 |
| 65°  | 1574 | 1204  | 794  | 639   | 625  | 1561 |
| 75°  | 839  | 520   | 365  | 333   | 329  | 888  |
| 85°  | 196  | 100   | 87   | 87    | 87   | 225  |
| 90°  | 2    | 19    | 52   | 49    | 50   | 15   |
| 95°  | 77   | 92    | 95   | 95    | 92   | 86   |
| 105° | 318  | 322   | 326  | 328   | 328  | 336  |
| 115° | 592  | 601   | 598  | 596   | 592  | 586  |
| 125° | 861  | 874   | 870  | 866   | 864  | 770  |
| 135° | 1114 | 1130  | 1134 | 1132  | 1128 | 861  |
| 145° | 1352 | 1363  | 1371 | 1373  | 1367 | 845  |
| 155° | 1546 | 1551  | 1555 | 1563  | 1558 | 712  |
| 165° | 1682 | 1681  | 1681 | 1691  | 1684 | 475  |
| 175° | 1751 | 1746  | 1743 | 1754  | 1745 | 166  |
| 180° | 1754 | 1754  | 1754 | 1754  | 1754 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 5041.8 | 5041.8 | 5041.8 | 5041.8 | 5041.8 |
| 2.5°   | 5064.6 | 5041.8 | 4991.5 | 5037.5 | 5028.3 |
| 5°     | 5041.8 | 5019.1 | 4959.6 | 5000.7 | 4987.2 |
| 7.5°   | 5000.7 | 4973.5 | 4909.7 | 4927.6 | 4904.8 |
| 10°    | 4946.0 | 4914.0 | 4823.0 | 4809.0 | 4781.9 |
| 12.5°  | 4877.7 | 4836.6 | 4713.1 | 4686.0 | 4635.6 |
| 15°    | 4795.4 | 4745.1 | 4590.2 | 4503.5 | 4458.0 |
| 17.5°  | 4699.6 | 4626.5 | 4434.8 | 4334.5 | 4261.4 |
| 20°    | 4590.2 | 4498.7 | 4270.6 | 4156.9 | 4056.2 |
| 22.5°  | 4471.6 | 4366.5 | 4101.7 | 3946.8 | 3878.5 |
| 25°    | 4352.9 | 4206.8 | 3905.7 | 3718.8 | 3650.1 |
| 27.5°  | 4211.6 | 4056.2 | 3723.1 | 3508.7 | 3403.6 |
| 30°    | 4061.0 | 3887.3 | 3522.3 | 3289.8 | 3166.4 |
| 32.5°  | 3914.9 | 3704.7 | 3331.0 | 3057.1 | 2942.8 |
| 35°    | 3750.7 | 3517.9 | 3116.6 | 2829.1 | 2728.4 |
| 37.5°  | 3591.1 | 3339.8 | 2915.7 | 2600.5 | 2486.8 |
| 40°    | 3422.0 | 3148.6 | 2705.6 | 2381.7 | 2263.1 |
| 42.5°  | 3248.7 | 2956.8 | 2496.0 | 2158.1 | 2044.3 |
| 45°    | 3066.3 | 2760.3 | 2281.5 | 1957.2 | 1847.8 |
| 47.5°  | 2892.9 | 2569.1 | 2076.3 | 1751.9 | 1651.7 |
| 50°    | 2701.2 | 2377.4 | 1875.4 | 1560.3 | 1464.9 |
| 52.5°  | 2513.9 | 2171.6 | 1683.7 | 1382.6 | 1295.9 |
| 55°    | 2331.3 | 1975.6 | 1482.7 | 1209.3 | 1122.6 |
| 57.5°  | 2144.6 | 1779.5 | 1305.1 | 1049.6 | 976.4  |
| 60°    | 1952.8 | 1587.9 | 1117.8 | 885.4  | 812.3  |
| 62.5°  | 1766.0 | 1401.0 | 958.1  | 739.3  | 702.9  |
| 65°    | 1574.2 | 1204.4 | 793.9  | 639.0  | 624.9  |
| 67.5°  | 1391.8 | 1021.9 | 639.0  | 561.0  | 547.5  |
| 70°    | 1200.0 | 844.3  | 529.1  | 483.6  | 465.2  |
| 72.5°  | 1017.5 | 679.7  | 442.5  | 406.1  | 396.9  |
| 75°    | 839.4  | 519.9  | 365.0  | 333.0  | 328.7  |
| 77.5°  | 661.7  | 369.4  | 287.6  | 269.2  | 259.9  |
| 80°    | 497.2  | 264.8  | 218.8  | 201.0  | 201.0  |
| 82.5°  | 346.6  | 178.1  | 150.6  | 141.4  | 141.4  |
| 85°    | 196.1  | 100.3  | 86.6   | 86.6   | 86.6   |
| 87.5°  | 73.1   | 36.3   | 36.3   | 31.9   | 31.9   |
| 90°    | 1.6    | 19.1   | 51.8   | 48.7   | 50.2   |
| 92.5°  | 32.8   | 44.4   | 46.0   | 47.6   | 47.6   |
| 95°    | 77.2   | 92.0   | 94.6   | 94.6   | 92.0   |
| 97.5°  | 128.4  | 142.2  | 148.1  | 148.1  | 148.1  |
| 100°   | 187.6  | 199.8  | 204.1  | 204.1  | 202.5  |
| 102.5° | 250.1  | 259.1  | 264.8  | 266.5  | 264.8  |
| 105°   | 318.3  | 322.5  | 325.7  | 328.3  | 328.3  |
| 107.5° | 385.9  | 392.3  | 392.3  | 393.4  | 385.9  |
| 110°   | 451.5  | 460.0  | 460.0  | 460.0  | 455.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 522.3  | 531.3  | 529.8  | 525.6  | 522.3  |
| 115°   | 592.1  | 600.6  | 598.0  | 596.4  | 592.1  |
| 117.5° | 661.4  | 673.1  | 665.6  | 661.4  | 657.2  |
| 120°   | 731.2  | 742.8  | 731.2  | 731.2  | 726.4  |
| 122.5° | 794.6  | 809.5  | 802.0  | 797.8  | 794.6  |
| 125°   | 861.2  | 874.4  | 870.2  | 865.5  | 863.9  |
| 127.5° | 926.2  | 942.6  | 936.9  | 930.5  | 926.2  |
| 130°   | 987.1  | 1006.1 | 1003.4 | 1000.3 | 994.4  |
| 132.5° | 1055.3 | 1070.1 | 1071.2 | 1063.8 | 1059.5 |
| 135°   | 1114.0 | 1130.3 | 1133.5 | 1132.0 | 1127.7 |
| 137.5° | 1179.5 | 1192.7 | 1195.4 | 1194.3 | 1188.0 |
| 140°   | 1237.1 | 1250.4 | 1257.7 | 1257.7 | 1252.0 |
| 142.5° | 1296.3 | 1309.6 | 1313.8 | 1315.4 | 1309.6 |
| 145°   | 1352.4 | 1363.0 | 1371.4 | 1373.1 | 1367.2 |
| 147.5° | 1402.7 | 1415.9 | 1422.2 | 1424.8 | 1419.0 |
| 150°   | 1454.5 | 1463.4 | 1469.2 | 1474.0 | 1469.2 |
| 152.5° | 1500.5 | 1509.5 | 1516.8 | 1522.7 | 1516.8 |
| 155°   | 1546.4 | 1550.6 | 1555.4 | 1562.8 | 1558.0 |
| 157.5° | 1586.1 | 1589.2 | 1591.9 | 1602.5 | 1595.1 |
| 160°   | 1621.5 | 1624.7 | 1626.2 | 1635.2 | 1628.9 |
| 162.5° | 1654.3 | 1654.3 | 1655.8 | 1665.9 | 1658.5 |
| 165°   | 1682.4 | 1680.7 | 1680.7 | 1691.3 | 1683.9 |
| 167.5° | 1707.6 | 1702.9 | 1702.9 | 1713.5 | 1706.1 |
| 170°   | 1726.7 | 1722.5 | 1720.9 | 1731.5 | 1722.5 |
| 172.5° | 1739.9 | 1735.7 | 1734.1 | 1744.7 | 1735.7 |
| 175°   | 1750.6 | 1746.2 | 1743.1 | 1753.7 | 1744.7 |
| 177.5° | 1756.3 | 1752.1 | 1748.9 | 1757.9 | 1748.9 |
| 180°   | 1753.7 | 1753.7 | 1753.7 | 1753.7 | 1753.7 |

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**CIE UGR TABLE:**

| Reflectances:   |      |                  |       |       |       |       |                |       |       |       |       |
|-----------------|------|------------------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|
| Ceiling         |      | 0.7              | 0.7   | 0.5   | 0.5   | 0.3   | 0.7            | 0.7   | 0.5   | 0.5   | 0.3   |
| Wall            |      | 0.5              | 0.3   | 0.5   | 0.3   | 0.3   | 0.5            | 0.3   | 0.5   | 0.3   | 0.3   |
| Reference plane |      | 0.2              | 0.2   | 0.2   | 0.2   | 0.2   | 0.2            | 0.2   | 0.2   | 0.2   | 0.2   |
| Room dimensions |      | Viewed crosswise |       |       |       |       | Viewed endwise |       |       |       |       |
| X=2H            | Y=2H | 14.73            | 15.74 | 15.53 | 16.55 | 17.54 | 10.70          | 11.70 | 11.49 | 12.51 | 13.50 |
|                 | 3H   | 16.42            | 17.32 | 17.23 | 18.14 | 19.16 | 11.89          | 12.79 | 12.70 | 13.61 | 14.63 |
|                 | 4H   | 17.03            | 17.88 | 17.86 | 18.71 | 19.74 | 12.34          | 13.19 | 13.17 | 14.02 | 15.05 |
|                 | 6H   | 17.46            | 18.24 | 18.30 | 19.08 | 20.12 | 12.67          | 13.45 | 13.50 | 14.28 | 15.33 |
|                 | 8H   | 17.59            | 18.33 | 18.44 | 19.18 | 20.23 | 12.76          | 13.50 | 13.61 | 14.36 | 15.40 |
|                 | 12H  | 17.66            | 18.36 | 18.51 | 19.21 | 20.28 | 12.81          | 13.51 | 13.66 | 14.36 | 15.43 |
| 4H              | 2H   | 14.77            | 15.62 | 15.60 | 16.45 | 17.48 | 11.31          | 12.15 | 12.14 | 12.98 | 14.02 |
|                 | 3H   | 16.61            | 17.31 | 17.45 | 18.17 | 19.22 | 12.67          | 13.37 | 13.51 | 14.23 | 15.28 |
|                 | 4H   | 17.31            | 17.94 | 18.16 | 18.80 | 19.88 | 13.22          | 13.85 | 14.07 | 14.71 | 15.79 |
|                 | 6H   | 17.83            | 18.38 | 18.70 | 19.26 | 20.34 | 13.64          | 14.19 | 14.51 | 15.07 | 16.15 |
|                 | 8H   | 18.00            | 18.52 | 18.87 | 19.39 | 20.49 | 13.77          | 14.28 | 14.64 | 15.16 | 16.25 |
|                 | 12H  | 18.10            | 18.56 | 18.99 | 19.46 | 20.56 | 13.84          | 14.30 | 14.73 | 15.20 | 16.29 |
| 8H              | 4H   | 17.28            | 17.80 | 18.16 | 18.68 | 19.77 | 13.51          | 14.02 | 14.38 | 14.90 | 15.99 |
|                 | 6H   | 17.85            | 18.28 | 18.75 | 19.20 | 20.29 | 14.02          | 14.45 | 14.92 | 15.37 | 16.46 |
|                 | 8H   | 18.07            | 18.44 | 18.98 | 19.36 | 20.47 | 14.21          | 14.59 | 15.12 | 15.50 | 16.61 |
|                 | 12H  | 18.21            | 18.54 | 19.12 | 19.45 | 20.61 | 14.33          | 14.66 | 15.24 | 15.57 | 16.73 |
| 12H             | 4H   | 17.24            | 17.71 | 18.14 | 18.60 | 19.70 | 13.52          | 13.98 | 14.41 | 14.88 | 15.98 |
|                 | 6H   | 17.83            | 18.20 | 18.74 | 19.12 | 20.23 | 14.07          | 14.45 | 14.98 | 15.36 | 16.47 |
|                 | 8H   | 18.05            | 18.38 | 18.96 | 19.29 | 20.45 | 14.28          | 14.61 | 15.20 | 15.52 | 16.68 |

END OF REPORT