

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: P912055

Luminaire Tested: DFN2DIP-SQ3F0-110D050US850-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P912055  
REPORT IS A COMBINATION OF REPORTS P901414 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-110D050US850-RLLONL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

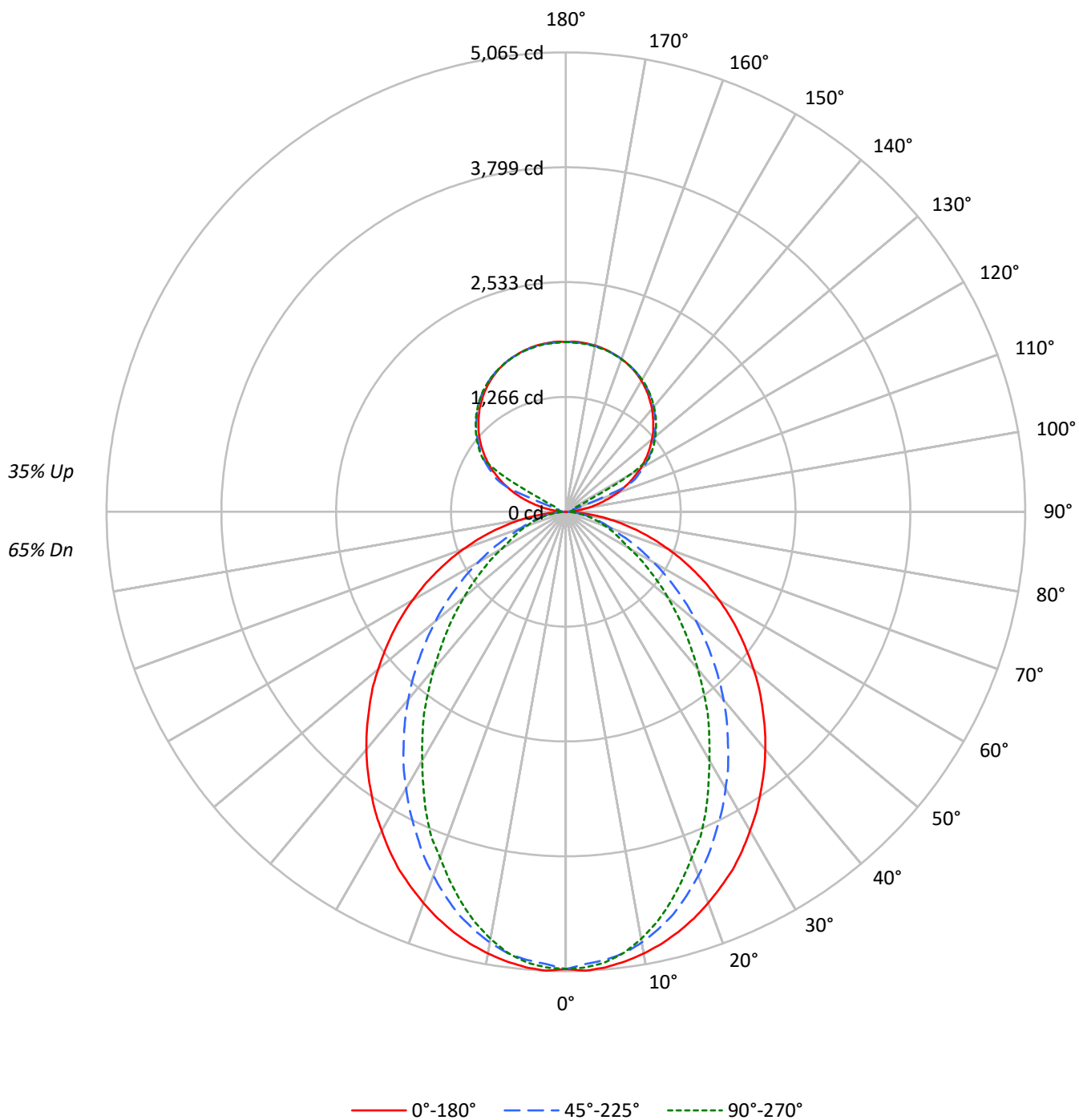
Lumens per Lamp: N/A  
Luminaire Lumens: 15858.7 lumens  
Efficiency: N/A  
Efficacy: 106.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: Semi-Direct

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 | 104 | 104 | 104 | 104 | 92 | 92 | 92 | 81 | 81 | 81 | 70 | 70 | 70 |
| 1   | 102 | 98  | 94  | 91  | 96  | 92  | 89  | 86  | 82 | 79 | 77 | 72 | 70 | 69 | 63 | 62 | 61 |
| 2   | 93  | 86  | 80  | 75  | 88  | 81  | 76  | 72  | 72 | 68 | 65 | 64 | 61 | 58 | 56 | 54 | 52 |
| 3   | 86  | 76  | 69  | 63  | 80  | 72  | 66  | 61  | 64 | 59 | 55 | 57 | 53 | 50 | 50 | 48 | 45 |
| 4   | 79  | 68  | 60  | 54  | 74  | 64  | 57  | 52  | 58 | 52 | 48 | 51 | 47 | 43 | 46 | 42 | 39 |
| 5   | 72  | 61  | 53  | 47  | 68  | 58  | 51  | 45  | 52 | 46 | 42 | 46 | 42 | 38 | 41 | 38 | 35 |
| 6   | 67  | 55  | 47  | 41  | 63  | 52  | 45  | 40  | 47 | 41 | 37 | 42 | 37 | 34 | 38 | 34 | 31 |
| 7   | 62  | 50  | 42  | 37  | 59  | 48  | 40  | 35  | 43 | 37 | 33 | 39 | 34 | 30 | 35 | 31 | 28 |
| 8   | 58  | 46  | 38  | 33  | 55  | 44  | 36  | 32  | 39 | 34 | 29 | 36 | 31 | 27 | 32 | 28 | 25 |
| 9   | 54  | 42  | 34  | 29  | 51  | 40  | 33  | 28  | 36 | 31 | 27 | 33 | 28 | 25 | 30 | 26 | 23 |
| 10  | 51  | 39  | 31  | 27  | 48  | 37  | 30  | 26  | 34 | 28 | 24 | 31 | 26 | 23 | 28 | 24 | 21 |

**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   | 3.0       |
| 10°-20°   | 1297.2  | 8.2       |
| 20°-30°   | 1821.2  | 11.5      |
| 30°-40°   | 1985.2  | 12.5      |
| 40°-50°   | 1824.6  | 11.5      |
| 50°-60°   | 1433.0  | 9.0       |
| 60°-70°   | 932.7   | 5.9       |
| 70°-80°   | 480.1   | 3.0       |
| 80°-90°   | 125.9   | 0.8       |
| 90°-100°  | 61.7    | 0.4       |
| 100°-110° | 230.0   | 1.5       |
| 110°-120° | 610.1   | 3.8       |
| 120°-130° | 1011.9  | 6.4       |
| 130°-140° | 1074.8  | 6.8       |
| 140°-150° | 999.0   | 6.3       |
| 150°-160° | 803.1   | 5.1       |
| 160°-170° | 517.5   | 3.3       |
| 170°-180° | 178.1   | 1.1       |
| 0°-30°    | 3590.9  | 22.6      |
| 0°-40°    | 5576.1  | 35.2      |
| 0°-60°    | 8833.7  | 55.7      |
| 0°-90°    | 10372.5 | 65.4      |
| 90°-120°  | 901.9   | 5.7       |
| 90°-150°  | 3987.5  | 25.1      |
| 90°-180°  | 5486.0  | 34.6      |
| 0°-180°   | 15858.7 | 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°  | 1    | 16    | 27   | 34    | 36   | 15   |
| 95°  | 88   | 43    | 53   | 60    | 58   | 104  |
| 105° | 412  | 452   | 83   | 98    | 103  | 440  |
| 115° | 779  | 802   | 836  | 209   | 111  | 767  |
| 125° | 1101 | 1118  | 1144 | 1154  | 1158 | 982  |
| 135° | 1362 | 1384  | 1396 | 1410  | 1407 | 1052 |
| 145° | 1580 | 1579  | 1602 | 1611  | 1605 | 988  |
| 155° | 1740 | 1728  | 1744 | 1752  | 1742 | 802  |
| 165° | 1833 | 1825  | 1829 | 1839  | 1829 | 518  |
| 175° | 1875 | 1866  | 1869 | 1878  | 1865 | 178  |
| 180° | 1871 | 1871  | 1871 | 1871  | 1871 |      |

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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°    | 1.3    | 16.2   | 27.1   | 33.9   | 36.5   |
| 92.5°  | 33.9   | 28.5   | 32.5   | 35.3   | 36.5   |
| 95°    | 87.9   | 43.3   | 52.8   | 59.7   | 58.2   |
| 97.5°  | 158.4  | 47.5   | 69.0   | 73.2   | 74.4   |
| 100°   | 239.8  | 54.2   | 77.2   | 87.9   | 90.7   |
| 102.5° | 329.0  | 326.4  | 80.0   | 94.7   | 98.9   |
| 105°   | 411.7  | 452.4  | 82.6   | 97.5   | 102.9  |
| 107.5° | 507.8  | 541.5  | 85.4   | 100.1  | 105.7  |
| 110°   | 600.0  | 628.2  | 237.0  | 101.6  | 106.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 686.6  | 710.9  | 687.9  | 104.2  | 108.3  |
| 115°   | 778.6  | 801.6  | 835.5  | 208.6  | 111.1  |
| 117.5° | 858.5  | 885.5  | 908.7  | 714.9  | 360.2  |
| 120°   | 947.9  | 968.2  | 992.6  | 1008.9 | 826.0  |
| 122.5° | 1023.6 | 1045.3 | 1072.5 | 1080.6 | 1082.1 |
| 125°   | 1100.8 | 1118.5 | 1144.3 | 1153.7 | 1157.8 |
| 127.5° | 1171.2 | 1190.2 | 1210.7 | 1224.1 | 1225.4 |
| 130°   | 1237.6 | 1259.4 | 1274.1 | 1289.1 | 1287.9 |
| 132.5° | 1305.4 | 1323.0 | 1337.8 | 1350.1 | 1348.8 |
| 135°   | 1362.3 | 1384.0 | 1396.0 | 1409.8 | 1407.0 |
| 137.5° | 1421.7 | 1438.0 | 1451.7 | 1465.2 | 1461.2 |
| 140°   | 1480.0 | 1490.9 | 1505.7 | 1517.9 | 1511.2 |
| 142.5° | 1528.9 | 1538.4 | 1555.9 | 1566.7 | 1559.9 |
| 145°   | 1580.3 | 1578.9 | 1601.8 | 1611.4 | 1604.6 |
| 147.5° | 1624.9 | 1620.8 | 1643.9 | 1650.6 | 1645.3 |
| 150°   | 1668.3 | 1658.8 | 1680.5 | 1688.6 | 1681.8 |
| 152.5° | 1704.8 | 1694.0 | 1714.3 | 1722.5 | 1713.0 |
| 155°   | 1740.0 | 1727.9 | 1744.1 | 1752.2 | 1741.5 |
| 157.5° | 1768.4 | 1757.7 | 1769.9 | 1779.4 | 1768.4 |
| 160°   | 1792.9 | 1784.7 | 1792.9 | 1800.9 | 1791.5 |
| 162.5° | 1814.4 | 1806.5 | 1813.1 | 1822.6 | 1810.4 |
| 165°   | 1833.4 | 1825.4 | 1829.4 | 1838.8 | 1829.4 |
| 167.5° | 1848.4 | 1840.2 | 1844.4 | 1853.8 | 1841.6 |
| 170°   | 1860.6 | 1852.4 | 1855.1 | 1864.6 | 1852.4 |
| 172.5° | 1868.7 | 1860.6 | 1863.3 | 1872.8 | 1860.6 |
| 175°   | 1875.4 | 1865.9 | 1868.7 | 1878.1 | 1864.6 |
| 177.5° | 1878.1 | 1868.7 | 1870.1 | 1879.5 | 1867.3 |
| 180°   | 1871.3 | 1871.3 | 1871.3 | 1871.3 | 1871.3 |

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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 | 14.54            | 15.51 | 15.36 | 16.35 | 17.38 | 10.50          | 11.47 | 11.32 | 12.31 | 13.34 |
|                 | 3H   | 16.22            | 17.09 | 17.05 | 17.94 | 19.00 | 11.69          | 12.56 | 12.52 | 13.41 | 14.47 |
|                 | 4H   | 16.83            | 17.65 | 17.68 | 18.51 | 19.58 | 12.14          | 12.96 | 12.99 | 13.82 | 14.89 |
|                 | 6H   | 17.26            | 18.01 | 18.12 | 18.88 | 19.96 | 12.46          | 13.22 | 13.33 | 14.08 | 15.17 |
|                 | 8H   | 17.39            | 18.11 | 18.26 | 18.98 | 20.07 | 12.56          | 13.28 | 13.43 | 14.16 | 15.24 |
|                 | 12H  | 17.45            | 18.14 | 18.33 | 19.01 | 20.12 | 12.60          | 13.29 | 13.48 | 14.16 | 15.27 |
| 4H              | 2H   | 14.57            | 15.39 | 15.42 | 16.25 | 17.32 | 11.11          | 11.93 | 11.96 | 12.78 | 13.86 |
|                 | 3H   | 16.41            | 17.09 | 17.27 | 17.98 | 19.07 | 12.46          | 13.15 | 13.33 | 14.03 | 15.12 |
|                 | 4H   | 17.10            | 17.72 | 17.98 | 18.61 | 19.72 | 13.01          | 13.63 | 13.89 | 14.52 | 15.63 |
|                 | 6H   | 17.62            | 18.15 | 18.51 | 19.06 | 20.18 | 13.43          | 13.97 | 14.32 | 14.87 | 15.99 |
|                 | 8H   | 17.79            | 18.29 | 18.69 | 19.20 | 20.33 | 13.56          | 14.06 | 14.46 | 14.96 | 16.09 |
|                 | 12H  | 17.89            | 18.34 | 18.81 | 19.26 | 20.40 | 13.63          | 14.08 | 14.54 | 15.00 | 16.14 |
| 8H              | 4H   | 17.08            | 17.58 | 17.97 | 18.48 | 19.61 | 13.30          | 13.80 | 14.19 | 14.70 | 15.83 |
|                 | 6H   | 17.64            | 18.06 | 18.57 | 19.00 | 20.13 | 13.81          | 14.23 | 14.74 | 15.17 | 16.30 |
|                 | 8H   | 17.86            | 18.22 | 18.79 | 19.16 | 20.31 | 14.00          | 14.37 | 14.93 | 15.30 | 16.45 |
|                 | 12H  | 18.00            | 18.32 | 18.93 | 19.25 | 20.45 | 14.12          | 14.44 | 15.06 | 15.37 | 16.57 |
| 12H             | 4H   | 17.04            | 17.48 | 17.95 | 18.41 | 19.54 | 13.31          | 13.76 | 14.22 | 14.68 | 15.82 |
|                 | 6H   | 17.62            | 17.98 | 18.55 | 18.92 | 20.07 | 13.86          | 14.23 | 14.80 | 15.17 | 16.31 |
|                 | 8H   | 17.84            | 18.16 | 18.78 | 19.09 | 20.29 | 14.07          | 14.40 | 15.01 | 15.32 | 16.53 |

END OF REPORT