

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: P922227

Luminaire Tested: DFN2DIP-PN3F0-090D060US940-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922227  
REPORT IS A COMBINATION OF REPORTS P901086 AND P897955  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN3F0-090D060US940-RLLONL  
Description: 3 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

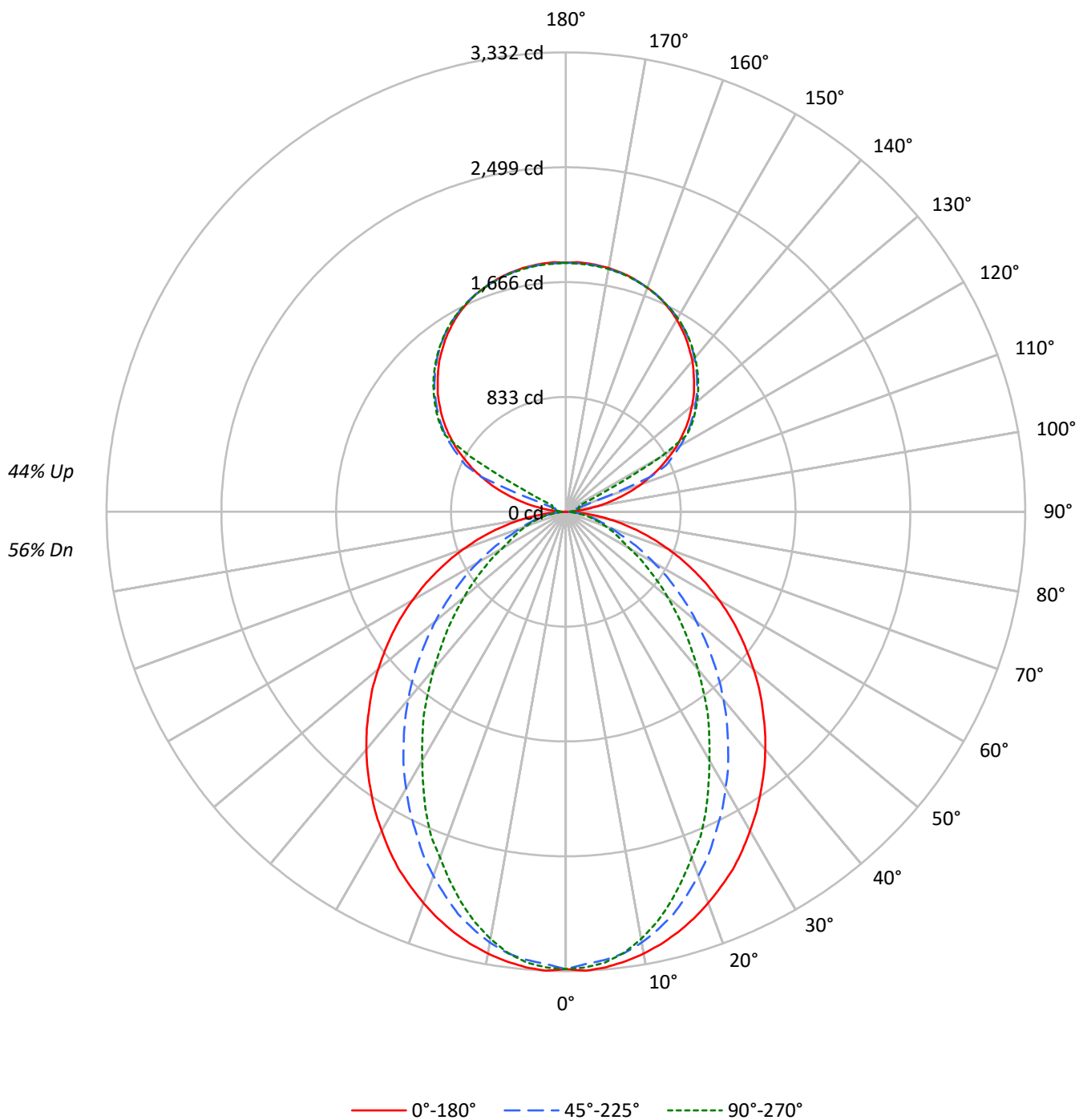
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 12118.3 lumens  
Efficiency: N/A  
Efficacy: 87.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.96' x L: 3.11' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 139  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9954  
Total Harmonic Distortion (THDi): 0.076  
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   | 109 | 109 | 109 | 109 |  | 101 | 101 | 101 | 101 |  | 87 | 87 | 87 |  | 74 | 74 | 74 |  | 62 | 62 | 62 |
| 1   | 100 | 96  | 92  | 88  |  | 93  | 89  | 86  | 83  |  | 77 | 75 | 72 |  | 66 | 64 | 63 |  | 56 | 54 | 53 |
| 2   | 91  | 84  | 78  | 73  |  | 85  | 79  | 73  | 69  |  | 68 | 64 | 61 |  | 58 | 56 | 53 |  | 50 | 48 | 46 |
| 3   | 84  | 74  | 67  | 62  |  | 78  | 70  | 63  | 58  |  | 61 | 56 | 52 |  | 52 | 49 | 46 |  | 44 | 42 | 40 |
| 4   | 77  | 66  | 59  | 53  |  | 71  | 62  | 55  | 50  |  | 54 | 49 | 45 |  | 47 | 43 | 40 |  | 40 | 37 | 35 |
| 5   | 71  | 59  | 51  | 46  |  | 66  | 56  | 49  | 43  |  | 49 | 43 | 39 |  | 42 | 38 | 35 |  | 36 | 33 | 31 |
| 6   | 65  | 54  | 46  | 40  |  | 61  | 50  | 43  | 38  |  | 44 | 39 | 34 |  | 39 | 34 | 31 |  | 33 | 30 | 27 |
| 7   | 61  | 49  | 41  | 35  |  | 56  | 46  | 39  | 34  |  | 40 | 35 | 30 |  | 35 | 31 | 27 |  | 30 | 27 | 24 |
| 8   | 56  | 44  | 37  | 31  |  | 52  | 42  | 35  | 30  |  | 37 | 31 | 27 |  | 32 | 28 | 25 |  | 28 | 25 | 22 |
| 9   | 53  | 41  | 33  | 28  |  | 49  | 38  | 32  | 27  |  | 34 | 28 | 25 |  | 30 | 25 | 22 |  | 26 | 23 | 20 |
| 10  | 49  | 37  | 30  | 25  |  | 46  | 35  | 29  | 24  |  | 31 | 26 | 22 |  | 28 | 23 | 20 |  | 24 | 21 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3877 | 3877 | 3877 |
| 5°  | 3881 | 3813 | 3839 |
| 10° | 3841 | 3736 | 3712 |
| 15° | 3785 | 3610 | 3517 |
| 20° | 3713 | 3437 | 3279 |
| 25° | 3639 | 3244 | 3049 |
| 30° | 3541 | 3046 | 2758 |
| 35° | 3444 | 2833 | 2502 |
| 40° | 3345 | 2614 | 2209 |
| 45° | 3231 | 2371 | 1944 |
| 50° | 3113 | 2126 | 1685 |
| 55° | 2989 | 1864 | 1436 |
| 60° | 2845 | 1591 | 1180 |
| 65° | 2680 | 1313 | 1061 |
| 70° | 2479 | 1055 | 957  |
| 75° | 2227 | 924  | 867  |
| 80° | 1863 | 766  | 747  |
| 85° | 1264 | 499  | 551  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3231 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 310.9   | 2.6       |
| 10°-20°   | 853.4   | 7.0       |
| 20°-30°   | 1198.1  | 9.9       |
| 30°-40°   | 1306.0  | 10.8      |
| 40°-50°   | 1200.4  | 9.9       |
| 50°-60°   | 942.7   | 7.8       |
| 60°-70°   | 613.6   | 5.1       |
| 70°-80°   | 315.9   | 2.6       |
| 80°-90°   | 83.8    | 0.7       |
| 90°-100°  | 59.5    | 0.5       |
| 100°-110° | 222.0   | 1.8       |
| 110°-120° | 588.7   | 4.9       |
| 120°-130° | 976.3   | 8.1       |
| 130°-140° | 1037.1  | 8.6       |
| 140°-150° | 963.9   | 8.0       |
| 150°-160° | 774.9   | 6.4       |
| 160°-170° | 499.3   | 4.1       |
| 170°-180° | 171.9   | 1.4       |
| 0°-30°    | 2362.4  | 19.5      |
| 0°-40°    | 3668.4  | 30.3      |
| 0°-60°    | 5811.5  | 48.0      |
| 0°-90°    | 6824.8  | 56.3      |
| 90°-120°  | 870.2   | 7.2       |
| 90°-150°  | 3847.4  | 31.7      |
| 90°-180°  | 5294.0  | 43.7      |
| 0°-180°   | 12118.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3317 | 3317  | 3317 | 3317  | 3317 |      |
| 5°   | 3317 | 3302  | 3263 | 3290  | 3281 | 315  |
| 15°  | 3155 | 3122  | 3020 | 2963  | 2933 | 889  |
| 25°  | 2864 | 2768  | 2570 | 2446  | 2401 | 1317 |
| 35°  | 2468 | 2314  | 2050 | 1861  | 1795 | 1544 |
| 45°  | 2017 | 1816  | 1501 | 1288  | 1216 | 1558 |
| 55°  | 1534 | 1300  | 975  | 796   | 738  | 1371 |
| 65°  | 1036 | 792   | 522  | 420   | 411  | 1027 |
| 75°  | 552  | 342   | 240  | 219   | 216  | 584  |
| 85°  | 129  | 66    | 57   | 57    | 57   | 148  |
| 90°  | 1    | 16    | 26   | 33    | 35   | 11   |
| 95°  | 85   | 42    | 51   | 58    | 56   | 101  |
| 105° | 397  | 436   | 80   | 94    | 99   | 424  |
| 115° | 751  | 774   | 806  | 201   | 107  | 740  |
| 125° | 1062 | 1079  | 1104 | 1113  | 1117 | 947  |
| 135° | 1314 | 1335  | 1347 | 1360  | 1358 | 1015 |
| 145° | 1525 | 1523  | 1546 | 1555  | 1548 | 954  |
| 155° | 1679 | 1667  | 1683 | 1691  | 1680 | 774  |
| 165° | 1769 | 1761  | 1765 | 1774  | 1765 | 500  |
| 175° | 1810 | 1800  | 1803 | 1812  | 1799 | 172  |
| 180° | 1806 | 1806  | 1806 | 1806  | 1806 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3316.9 | 3316.9 | 3316.9 | 3316.9 | 3316.9 |
| 2.5°   | 3331.9 | 3316.9 | 3283.7 | 3314.0 | 3308.0 |
| 5°     | 3316.9 | 3301.9 | 3262.8 | 3289.8 | 3280.9 |
| 7.5°   | 3289.8 | 3272.0 | 3230.0 | 3241.7 | 3226.7 |
| 10°    | 3253.9 | 3232.8 | 3173.0 | 3163.7 | 3145.9 |
| 12.5°  | 3208.9 | 3181.9 | 3100.7 | 3082.8 | 3049.6 |
| 15°    | 3154.8 | 3121.7 | 3019.8 | 2962.7 | 2932.8 |
| 17.5°  | 3091.7 | 3043.7 | 2917.5 | 2851.6 | 2803.5 |
| 20°    | 3019.8 | 2959.6 | 2809.5 | 2734.7 | 2668.4 |
| 22.5°  | 2941.8 | 2872.6 | 2698.4 | 2596.5 | 2551.6 |
| 25°    | 2863.7 | 2767.5 | 2569.5 | 2446.5 | 2401.3 |
| 27.5°  | 2770.7 | 2668.4 | 2449.4 | 2308.3 | 2239.2 |
| 30°    | 2671.7 | 2557.3 | 2317.2 | 2164.4 | 2083.1 |
| 32.5°  | 2575.4 | 2437.2 | 2191.4 | 2011.2 | 1936.0 |
| 35°    | 2467.5 | 2314.3 | 2050.3 | 1861.2 | 1794.9 |
| 37.5°  | 2362.4 | 2197.2 | 1918.2 | 1710.8 | 1636.0 |
| 40°    | 2251.3 | 2071.4 | 1779.9 | 1566.9 | 1488.9 |
| 42.5°  | 2137.3 | 1945.3 | 1642.0 | 1419.8 | 1344.9 |
| 45°    | 2017.2 | 1816.0 | 1500.9 | 1287.5 | 1215.6 |
| 47.5°  | 1903.2 | 1690.1 | 1365.9 | 1152.5 | 1086.6 |
| 50°    | 1777.1 | 1564.0 | 1233.8 | 1026.4 | 963.7  |
| 52.5°  | 1653.9 | 1428.7 | 1107.7 | 909.5  | 852.6  |
| 55°    | 1533.7 | 1299.7 | 975.4  | 795.6  | 738.5  |
| 57.5°  | 1410.9 | 1170.7 | 858.6  | 690.5  | 642.4  |
| 60°    | 1284.7 | 1044.5 | 735.4  | 582.5  | 534.4  |
| 62.5°  | 1161.8 | 921.7  | 630.3  | 486.3  | 462.4  |
| 65°    | 1035.6 | 792.4  | 522.3  | 420.4  | 411.2  |
| 67.5°  | 915.6  | 672.3  | 420.4  | 369.1  | 360.2  |
| 70°    | 789.5  | 555.4  | 348.1  | 318.2  | 306.0  |
| 72.5°  | 669.4  | 447.1  | 291.1  | 267.2  | 261.2  |
| 75°    | 552.2  | 342.1  | 240.1  | 219.1  | 216.2  |
| 77.5°  | 435.3  | 243.0  | 189.1  | 177.1  | 171.0  |
| 80°    | 327.1  | 174.2  | 143.9  | 132.2  | 132.2  |
| 82.5°  | 228.0  | 117.2  | 99.1   | 93.0   | 93.0   |
| 85°    | 128.9  | 65.9   | 57.0   | 57.0   | 57.0   |
| 87.5°  | 48.1   | 23.9   | 23.9   | 21.0   | 21.0   |
| 90°    | 1.2    | 15.7   | 26.0   | 32.7   | 35.2   |
| 92.5°  | 32.7   | 27.5   | 31.3   | 34.0   | 35.2   |
| 95°    | 84.9   | 41.7   | 50.9   | 57.6   | 56.2   |
| 97.5°  | 152.8  | 45.7   | 66.5   | 70.6   | 71.9   |
| 100°   | 231.3  | 52.3   | 74.5   | 84.9   | 87.5   |
| 102.5° | 317.4  | 315.0  | 77.1   | 91.4   | 95.4   |
| 105°   | 397.2  | 436.4  | 79.7   | 94.0   | 99.3   |
| 107.5° | 490.0  | 522.5  | 82.4   | 96.7   | 101.9  |
| 110°   | 578.9  | 606.2  | 228.7  | 98.1   | 103.2  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 662.5  | 685.9  | 663.7  | 100.5  | 104.6  |
| 115°   | 751.3  | 773.5  | 806.2  | 201.3  | 107.2  |
| 117.5° | 828.3  | 854.4  | 876.7  | 689.8  | 347.5  |
| 120°   | 914.6  | 934.2  | 957.8  | 973.4  | 797.0  |
| 122.5° | 987.7  | 1008.6 | 1034.8 | 1042.6 | 1044.0 |
| 125°   | 1062.2 | 1079.2 | 1104.0 | 1113.2 | 1117.0 |
| 127.5° | 1130.2 | 1148.4 | 1168.1 | 1181.2 | 1182.4 |
| 130°   | 1194.2 | 1215.1 | 1229.4 | 1243.8 | 1242.6 |
| 132.5° | 1259.5 | 1276.6 | 1290.8 | 1302.6 | 1301.4 |
| 135°   | 1314.5 | 1335.4 | 1347.0 | 1360.2 | 1357.5 |
| 137.5° | 1371.8 | 1387.5 | 1400.7 | 1413.7 | 1409.9 |
| 140°   | 1428.0 | 1438.6 | 1452.9 | 1464.6 | 1458.1 |
| 142.5° | 1475.2 | 1484.3 | 1501.3 | 1511.6 | 1505.1 |
| 145°   | 1524.8 | 1523.4 | 1545.6 | 1554.8 | 1548.3 |
| 147.5° | 1567.8 | 1563.9 | 1586.1 | 1592.6 | 1587.5 |
| 150°   | 1609.7 | 1600.5 | 1621.5 | 1629.2 | 1622.7 |
| 152.5° | 1644.9 | 1634.5 | 1654.0 | 1662.0 | 1652.8 |
| 155°   | 1678.9 | 1667.2 | 1682.9 | 1690.7 | 1680.2 |
| 157.5° | 1706.4 | 1695.9 | 1707.7 | 1716.9 | 1706.4 |
| 160°   | 1729.9 | 1722.0 | 1729.9 | 1737.7 | 1728.6 |
| 162.5° | 1750.7 | 1742.9 | 1749.4 | 1758.6 | 1746.9 |
| 165°   | 1769.1 | 1761.3 | 1765.1 | 1774.3 | 1765.1 |
| 167.5° | 1783.4 | 1775.6 | 1779.6 | 1788.8 | 1776.9 |
| 170°   | 1795.3 | 1787.3 | 1790.0 | 1799.1 | 1787.3 |
| 172.5° | 1803.0 | 1795.3 | 1797.9 | 1807.1 | 1795.3 |
| 175°   | 1809.5 | 1800.4 | 1803.0 | 1812.1 | 1799.1 |
| 177.5° | 1812.1 | 1803.0 | 1804.4 | 1813.6 | 1801.8 |
| 180°   | 1805.6 | 1805.6 | 1805.6 | 1805.6 | 1805.6 |

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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 | 12.39            | 13.27 | 13.30 | 14.19 | 15.37 | 8.35           | 9.24  | 9.26  | 10.16 | 11.34 |
|                 | 3H   | 14.06            | 14.85 | 14.98 | 15.79 | 16.99 | 9.54           | 10.33 | 10.46 | 11.26 | 12.47 |
|                 | 4H   | 14.67            | 15.42 | 15.61 | 16.35 | 17.57 | 9.99           | 10.74 | 10.92 | 11.67 | 12.89 |
|                 | 6H   | 15.09            | 15.78 | 16.04 | 16.72 | 17.95 | 10.31          | 11.00 | 11.25 | 11.94 | 13.17 |
|                 | 8H   | 15.21            | 15.87 | 16.17 | 16.83 | 18.05 | 10.40          | 11.05 | 11.35 | 12.01 | 13.24 |
|                 | 12H  | 15.28            | 15.90 | 16.23 | 16.85 | 18.10 | 10.44          | 11.06 | 11.40 | 12.01 | 13.26 |
| 4H              | 2H   | 12.41            | 13.16 | 13.35 | 14.09 | 15.31 | 8.95           | 9.70  | 9.89  | 10.64 | 11.85 |
|                 | 3H   | 14.24            | 14.86 | 15.19 | 15.83 | 17.05 | 10.30          | 10.92 | 11.25 | 11.89 | 13.12 |
|                 | 4H   | 14.93            | 15.49 | 15.89 | 16.45 | 17.71 | 10.85          | 11.41 | 11.81 | 12.37 | 13.63 |
|                 | 6H   | 15.44            | 15.93 | 16.41 | 16.91 | 18.17 | 11.26          | 11.75 | 12.23 | 12.73 | 13.99 |
|                 | 8H   | 15.61            | 16.07 | 16.59 | 17.05 | 18.31 | 11.39          | 11.84 | 12.36 | 12.82 | 14.09 |
|                 | 12H  | 15.71            | 16.12 | 16.70 | 17.11 | 18.38 | 11.45          | 11.86 | 12.44 | 12.86 | 14.13 |
| 8H              | 4H   | 14.90            | 15.35 | 15.87 | 16.33 | 17.60 | 11.13          | 11.58 | 12.10 | 12.56 | 13.83 |
|                 | 6H   | 15.46            | 15.83 | 16.46 | 16.85 | 18.12 | 11.64          | 12.01 | 12.64 | 13.03 | 14.30 |
|                 | 8H   | 15.67            | 16.00 | 16.68 | 17.01 | 18.30 | 11.82          | 12.16 | 12.83 | 13.16 | 14.45 |
|                 | 12H  | 15.81            | 16.10 | 16.82 | 17.10 | 18.43 | 11.94          | 12.23 | 12.95 | 13.23 | 14.57 |
| 12H             | 4H   | 14.85            | 15.26 | 15.84 | 16.26 | 17.53 | 11.13          | 11.54 | 12.13 | 12.54 | 13.81 |
|                 | 6H   | 15.43            | 15.77 | 16.44 | 16.77 | 18.06 | 11.69          | 12.02 | 12.69 | 13.03 | 14.31 |
|                 | 8H   | 15.65            | 15.94 | 16.66 | 16.95 | 18.28 | 11.89          | 12.19 | 12.90 | 13.19 | 14.52 |

END OF REPORT