

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: P908856

Luminaire Tested: DFN2DIP-PN4F0-110D050US840-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P908856  
REPORT IS A COMBINATION OF REPORTS P899641 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-110D050US840-FLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

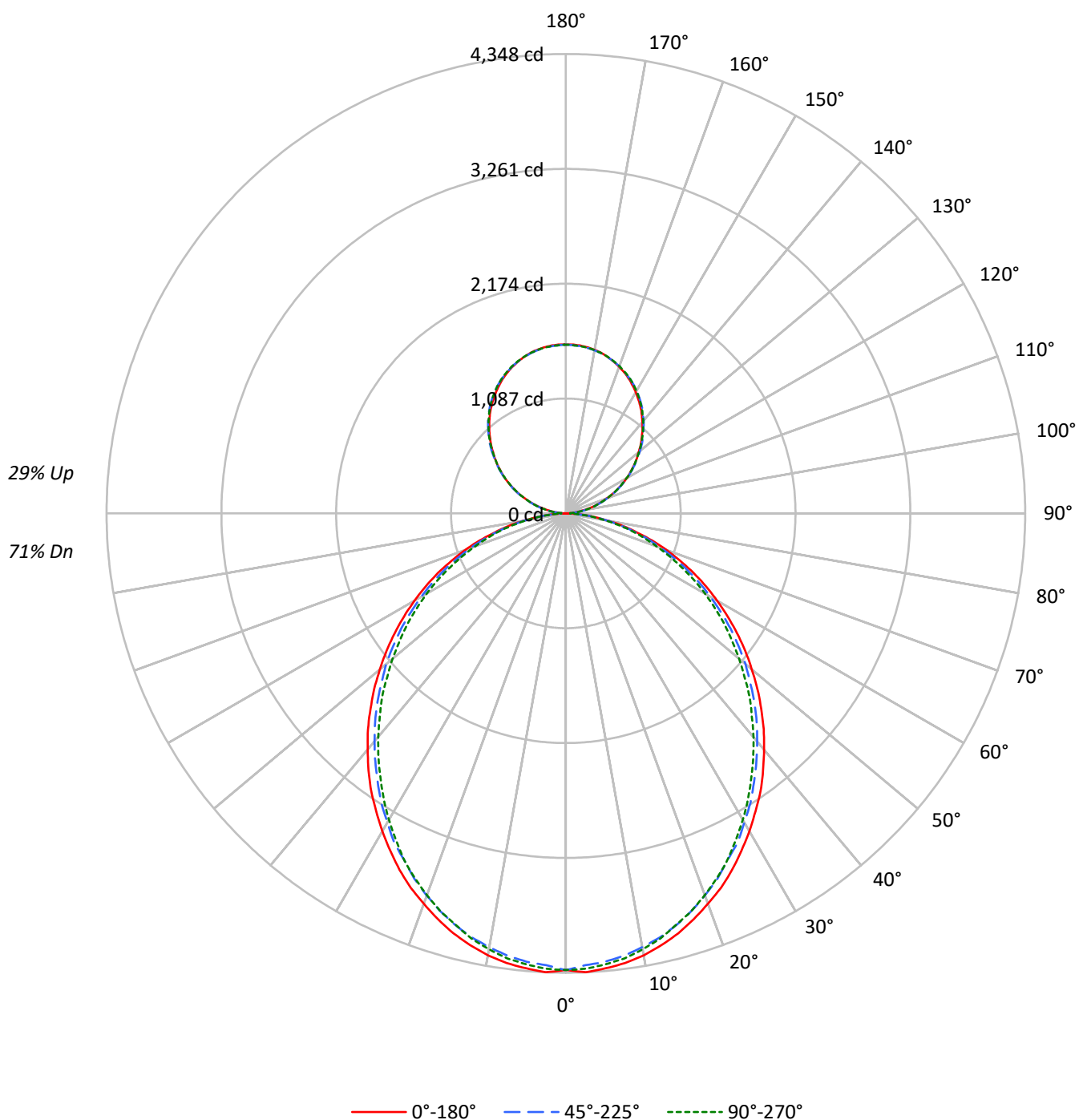
Lumens per Lamp: N/A  
Luminaire Lumens: 15466.1 lumens  
Efficiency: N/A  
Efficacy: 101.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 151.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.996  
Total Harmonic Distortion (THDi): 0.064  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-PN4F0-110D050US840-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P908856

CATALOG NUMBER: DFN2DIP-PN4F0-110D050US840-FLLFL

**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   | 112 | 112 | 112 | 112 | 106 | 106 | 106 | 106 | 95 | 95 | 95 | 85 | 85 | 85 | 76 | 76 | 76 |
| 1   | 103 | 98  | 94  | 90  | 97  | 93  | 89  | 86  | 84 | 81 | 78 | 75 | 73 | 71 | 67 | 65 | 64 |
| 2   | 93  | 86  | 79  | 74  | 88  | 81  | 76  | 71  | 73 | 69 | 65 | 66 | 62 | 59 | 59 | 56 | 54 |
| 3   | 85  | 75  | 68  | 62  | 80  | 72  | 65  | 59  | 65 | 59 | 55 | 58 | 54 | 50 | 52 | 49 | 46 |
| 4   | 78  | 67  | 59  | 52  | 74  | 64  | 56  | 50  | 58 | 51 | 47 | 52 | 47 | 43 | 47 | 43 | 40 |
| 5   | 72  | 60  | 51  | 45  | 68  | 57  | 49  | 43  | 52 | 45 | 40 | 47 | 41 | 37 | 42 | 38 | 34 |
| 6   | 66  | 54  | 45  | 39  | 63  | 51  | 44  | 38  | 47 | 40 | 35 | 42 | 37 | 33 | 38 | 34 | 30 |
| 7   | 61  | 49  | 40  | 35  | 58  | 46  | 39  | 33  | 42 | 36 | 31 | 39 | 33 | 29 | 35 | 30 | 27 |
| 8   | 57  | 44  | 36  | 31  | 54  | 42  | 35  | 30  | 39 | 32 | 28 | 35 | 30 | 26 | 32 | 28 | 24 |
| 9   | 53  | 41  | 33  | 28  | 50  | 39  | 32  | 27  | 36 | 29 | 25 | 33 | 27 | 24 | 30 | 25 | 22 |
| 10  | 50  | 37  | 30  | 25  | 47  | 36  | 29  | 24  | 33 | 27 | 23 | 30 | 25 | 21 | 28 | 23 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3155 | 3155 | 3155 |
| 5°  | 3160 | 3112 | 3133 |
| 10° | 3135 | 3070 | 3091 |
| 15° | 3088 | 3020 | 3025 |
| 20° | 3026 | 2950 | 2958 |
| 25° | 2964 | 2867 | 2880 |
| 30° | 2887 | 2789 | 2781 |
| 35° | 2813 | 2697 | 2676 |
| 40° | 2722 | 2605 | 2576 |
| 45° | 2632 | 2512 | 2474 |
| 50° | 2533 | 2414 | 2356 |
| 55° | 2430 | 2302 | 2247 |
| 60° | 2313 | 2168 | 2123 |
| 65° | 2186 | 2029 | 1976 |
| 70° | 2023 | 1861 | 1818 |
| 75° | 1798 | 1659 | 1674 |
| 80° | 1528 | 1401 | 1396 |
| 85° | 1105 | 957  | 934  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2632 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 406.8   | 2.6       |
| 10°-20°   | 1144.7  | 7.4       |
| 20°-30°   | 1682.2  | 10.9      |
| 30°-40°   | 1953.7  | 12.6      |
| 40°-50°   | 1951.3  | 12.6      |
| 50°-60°   | 1701.5  | 11.0      |
| 60°-70°   | 1257.8  | 8.1       |
| 70°-80°   | 711.6   | 4.6       |
| 80°-90°   | 192.4   | 1.2       |
| 90°-100°  | 98.8    | 0.6       |
| 100°-110° | 314.0   | 2.0       |
| 110°-120° | 537.3   | 3.5       |
| 120°-130° | 706.6   | 4.6       |
| 130°-140° | 793.2   | 5.1       |
| 140°-150° | 777.8   | 5.0       |
| 150°-160° | 652.5   | 4.2       |
| 160°-170° | 432.7   | 2.8       |
| 170°-180° | 151.2   | 1.0       |
| 0°-30°    | 3233.7  | 20.9      |
| 0°-40°    | 5187.4  | 33.5      |
| 0°-60°    | 8840.2  | 57.2      |
| 0°-90°    | 11002.0 | 71.1      |
| 90°-120°  | 950.1   | 6.1       |
| 90°-150°  | 3227.7  | 20.9      |
| 90°-180°  | 4464.0  | 28.9      |
| 0°-180°   | 15466.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4322 | 4322  | 4322 | 4322  | 4322 |      |
| 5°   | 4322 | 4306  | 4260 | 4293  | 4285 | 410  |
| 15°  | 4115 | 4090  | 4036 | 4052  | 4032 | 1159 |
| 25°  | 3724 | 3691  | 3620 | 3628  | 3620 | 1714 |
| 35°  | 3213 | 3172  | 3105 | 3080  | 3059 | 2006 |
| 45°  | 2614 | 2585  | 2523 | 2477  | 2461 | 2018 |
| 55°  | 1979 | 1954  | 1904 | 1854  | 1833 | 1769 |
| 65°  | 1334 | 1309  | 1268 | 1230  | 1210 | 1319 |
| 75°  | 698  | 690   | 669  | 644   | 653  | 745  |
| 85°  | 170  | 166   | 162  | 150   | 146  | 190  |
| 90°  | 1    | 17    | 47   | 44    | 46   | 15   |
| 95°  | 70   | 84    | 86   | 86    | 84   | 78   |
| 105° | 290  | 294   | 297  | 299   | 299  | 306  |
| 115° | 539  | 547   | 544  | 543   | 539  | 533  |
| 125° | 784  | 796   | 792  | 788   | 787  | 701  |
| 135° | 1014 | 1029  | 1032 | 1031  | 1027 | 784  |
| 145° | 1232 | 1241  | 1249 | 1250  | 1245 | 769  |
| 155° | 1408 | 1412  | 1416 | 1423  | 1419 | 648  |
| 165° | 1532 | 1530  | 1530 | 1540  | 1533 | 432  |
| 175° | 1594 | 1590  | 1587 | 1597  | 1589 | 151  |
| 180° | 1597 | 1597  | 1597 | 1597  | 1597 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4322.4 | 4322.4 | 4322.4 | 4322.4 | 4322.4 |
| 2.5°   | 4347.5 | 4326.8 | 4280.9 | 4322.4 | 4314.4 |
| 5°     | 4322.4 | 4306.1 | 4260.2 | 4293.2 | 4285.4 |
| 7.5°   | 4293.2 | 4268.6 | 4222.8 | 4256.3 | 4247.9 |
| 10°    | 4247.9 | 4218.7 | 4168.9 | 4201.9 | 4189.6 |
| 12.5°  | 4185.3 | 4160.5 | 4110.8 | 4131.5 | 4123.1 |
| 15°    | 4114.7 | 4090.0 | 4035.7 | 4052.5 | 4031.8 |
| 17.5°  | 4027.3 | 4002.7 | 3948.5 | 3969.2 | 3948.5 |
| 20°    | 3931.7 | 3907.0 | 3848.8 | 3861.1 | 3844.9 |
| 22.5°  | 3836.5 | 3798.9 | 3744.7 | 3744.7 | 3736.3 |
| 25°    | 3724.0 | 3691.0 | 3620.4 | 3628.3 | 3620.4 |
| 27.5°  | 3599.2 | 3570.1 | 3516.3 | 3503.9 | 3483.2 |
| 30°    | 3474.8 | 3441.3 | 3379.1 | 3366.8 | 3350.0 |
| 32.5°  | 3341.6 | 3317.0 | 3250.4 | 3225.2 | 3208.4 |
| 35°    | 3212.9 | 3171.5 | 3104.8 | 3079.7 | 3059.0 |
| 37.5°  | 3067.4 | 3029.9 | 2963.3 | 2934.2 | 2913.5 |
| 40°    | 2917.9 | 2884.4 | 2817.8 | 2780.8 | 2764.0 |
| 42.5°  | 2772.4 | 2738.9 | 2672.7 | 2630.8 | 2606.2 |
| 45°    | 2614.5 | 2585.4 | 2522.7 | 2477.4 | 2460.6 |
| 47.5°  | 2460.6 | 2431.6 | 2364.9 | 2319.1 | 2294.3 |
| 50°    | 2298.4 | 2277.7 | 2219.4 | 2161.2 | 2140.5 |
| 52.5°  | 2140.5 | 2111.3 | 2057.6 | 2011.7 | 1982.6 |
| 55°    | 1978.6 | 1953.5 | 1903.7 | 1853.8 | 1833.1 |
| 57.5°  | 1816.3 | 1795.6 | 1741.4 | 1691.5 | 1674.8 |
| 60°    | 1654.1 | 1637.8 | 1579.5 | 1533.7 | 1521.4 |
| 62.5°  | 1496.2 | 1467.1 | 1425.6 | 1384.2 | 1367.5 |
| 65°    | 1334.3 | 1309.2 | 1267.8 | 1230.3 | 1209.6 |
| 67.5°  | 1168.1 | 1147.0 | 1109.9 | 1080.9 | 1064.1 |
| 70°    | 1014.2 | 997.4  | 960.0  | 930.9  | 914.5  |
| 72.5°  | 856.4  | 839.6  | 818.9  | 789.8  | 777.4  |
| 75°    | 698.0  | 690.1  | 668.9  | 644.3  | 652.7  |
| 77.5°  | 556.9  | 540.2  | 531.8  | 519.5  | 507.2  |
| 80°    | 415.9  | 411.4  | 403.0  | 390.7  | 382.3  |
| 82.5°  | 282.7  | 282.7  | 278.7  | 262.0  | 262.0  |
| 85°    | 170.3  | 166.2  | 162.3  | 149.5  | 145.5  |
| 87.5°  | 74.9   | 66.6   | 58.2   | 45.8   | 41.4   |
| 90°    | 1.4    | 17.4   | 47.2   | 44.3   | 45.7   |
| 92.5°  | 29.9   | 40.4   | 41.9   | 43.3   | 43.3   |
| 95°    | 70.3   | 83.8   | 86.1   | 86.1   | 83.8   |
| 97.5°  | 116.9  | 129.5  | 134.8  | 134.8  | 134.8  |
| 100°   | 170.9  | 182.0  | 185.8  | 185.8  | 184.4  |
| 102.5° | 227.7  | 235.9  | 241.2  | 242.7  | 241.2  |
| 105°   | 289.8  | 293.7  | 296.6  | 298.9  | 298.9  |
| 107.5° | 351.4  | 357.2  | 357.2  | 358.2  | 351.4  |
| 110°   | 411.1  | 418.9  | 418.9  | 418.9  | 415.0  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 475.6  | 483.8  | 482.4  | 478.6  | 475.6  |
| 115°   | 539.2  | 546.9  | 544.5  | 543.1  | 539.2  |
| 117.5° | 602.3  | 612.9  | 606.1  | 602.3  | 598.4  |
| 120°   | 665.8  | 676.4  | 665.8  | 665.8  | 661.5  |
| 122.5° | 723.6  | 737.1  | 730.3  | 726.5  | 723.6  |
| 125°   | 784.3  | 796.3  | 792.4  | 788.1  | 786.7  |
| 127.5° | 843.4  | 858.4  | 853.1  | 847.3  | 843.4  |
| 130°   | 898.9  | 916.2  | 913.7  | 910.9  | 905.5  |
| 132.5° | 961.0  | 974.4  | 975.4  | 968.7  | 964.8  |
| 135°   | 1014.4 | 1029.3 | 1032.2 | 1030.8 | 1026.9 |
| 137.5° | 1074.1 | 1086.1 | 1088.5 | 1087.5 | 1081.8 |
| 140°   | 1126.5 | 1138.6 | 1145.3 | 1145.3 | 1140.0 |
| 142.5° | 1180.4 | 1192.6 | 1196.4 | 1197.8 | 1192.6 |
| 145°   | 1231.5 | 1241.1 | 1248.8 | 1250.3 | 1245.0 |
| 147.5° | 1277.3 | 1289.3 | 1295.1 | 1297.5 | 1292.1 |
| 150°   | 1324.4 | 1332.6 | 1337.9 | 1342.2 | 1337.9 |
| 152.5° | 1366.3 | 1374.5 | 1381.2 | 1386.5 | 1381.2 |
| 155°   | 1408.2 | 1412.0 | 1416.3 | 1423.1 | 1418.8 |
| 157.5° | 1444.3 | 1447.1 | 1449.6 | 1459.3 | 1452.5 |
| 160°   | 1476.5 | 1479.5 | 1480.9 | 1489.0 | 1483.3 |
| 162.5° | 1506.4 | 1506.4 | 1507.8 | 1517.0 | 1510.3 |
| 165°   | 1532.0 | 1530.5 | 1530.5 | 1540.1 | 1533.4 |
| 167.5° | 1555.0 | 1550.6 | 1550.6 | 1560.3 | 1553.6 |
| 170°   | 1572.4 | 1568.5 | 1567.1 | 1576.7 | 1568.5 |
| 172.5° | 1584.4 | 1580.5 | 1579.1 | 1588.7 | 1580.5 |
| 175°   | 1594.1 | 1590.1 | 1587.3 | 1596.9 | 1588.7 |
| 177.5° | 1599.3 | 1595.5 | 1592.6 | 1600.7 | 1592.6 |
| 180°   | 1596.9 | 1596.9 | 1596.9 | 1596.9 | 1596.9 |

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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 | 13.03            | 14.12 | 13.78 | 14.89 | 15.82 | 12.59          | 13.68 | 13.34 | 14.45 | 15.38 |
|                 | 3H   | 14.71            | 15.69 | 15.47 | 16.47 | 17.43 | 14.22          | 15.20 | 14.99 | 15.98 | 16.95 |
|                 | 4H   | 15.31            | 16.23 | 16.09 | 17.02 | 18.00 | 14.82          | 15.74 | 15.60 | 16.54 | 17.51 |
|                 | 6H   | 15.72            | 16.57 | 16.52 | 17.37 | 18.36 | 15.23          | 16.08 | 16.02 | 16.88 | 17.87 |
|                 | 8H   | 15.83            | 16.65 | 16.64 | 17.47 | 18.46 | 15.34          | 16.15 | 16.15 | 16.97 | 17.96 |
|                 | 12H  | 15.89            | 16.66 | 16.70 | 17.48 | 18.50 | 15.39          | 16.17 | 16.20 | 16.98 | 18.00 |
| 4H              | 2H   | 13.51            | 14.44 | 14.30 | 15.23 | 16.21 | 13.16          | 14.09 | 13.95 | 14.88 | 15.86 |
|                 | 3H   | 15.40            | 16.18 | 16.20 | 17.00 | 18.00 | 15.00          | 15.77 | 15.80 | 16.60 | 17.59 |
|                 | 4H   | 16.13            | 16.83 | 16.94 | 17.66 | 18.68 | 15.71          | 16.42 | 16.53 | 17.24 | 18.26 |
|                 | 6H   | 16.66            | 17.27 | 17.49 | 18.12 | 19.15 | 16.24          | 16.85 | 17.07 | 17.70 | 18.72 |
|                 | 8H   | 16.82            | 17.39 | 17.65 | 18.23 | 19.27 | 16.39          | 16.96 | 17.22 | 17.80 | 18.84 |
|                 | 12H  | 16.90            | 17.42 | 17.76 | 18.28 | 19.33 | 16.46          | 16.98 | 17.32 | 17.84 | 18.89 |
| 8H              | 4H   | 16.35            | 16.91 | 17.18 | 17.76 | 18.80 | 15.97          | 16.54 | 16.81 | 17.39 | 18.43 |
|                 | 6H   | 16.99            | 17.46 | 17.85 | 18.35 | 19.39 | 16.61          | 17.08 | 17.48 | 17.97 | 19.01 |
|                 | 8H   | 17.21            | 17.63 | 18.09 | 18.52 | 19.57 | 16.83          | 17.25 | 17.70 | 18.13 | 19.19 |
|                 | 12H  | 17.36            | 17.73 | 18.23 | 18.60 | 19.71 | 16.96          | 17.33 | 17.83 | 18.20 | 19.31 |
| 12H             | 4H   | 16.34            | 16.85 | 17.20 | 17.72 | 18.76 | 15.98          | 16.49 | 16.83 | 17.36 | 18.40 |
|                 | 6H   | 17.02            | 17.44 | 17.89 | 18.32 | 19.38 | 16.66          | 17.08 | 17.53 | 17.96 | 19.01 |
|                 | 8H   | 17.28            | 17.65 | 18.15 | 18.52 | 19.63 | 16.90          | 17.27 | 17.78 | 18.15 | 19.26 |

END OF REPORT