

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: P928964

Luminaire Tested: DFN2DIP-HX4F0-080D050US935-FLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P928964  
REPORT IS A COMBINATION OF REPORTS P900845 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-080D050US935-FLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

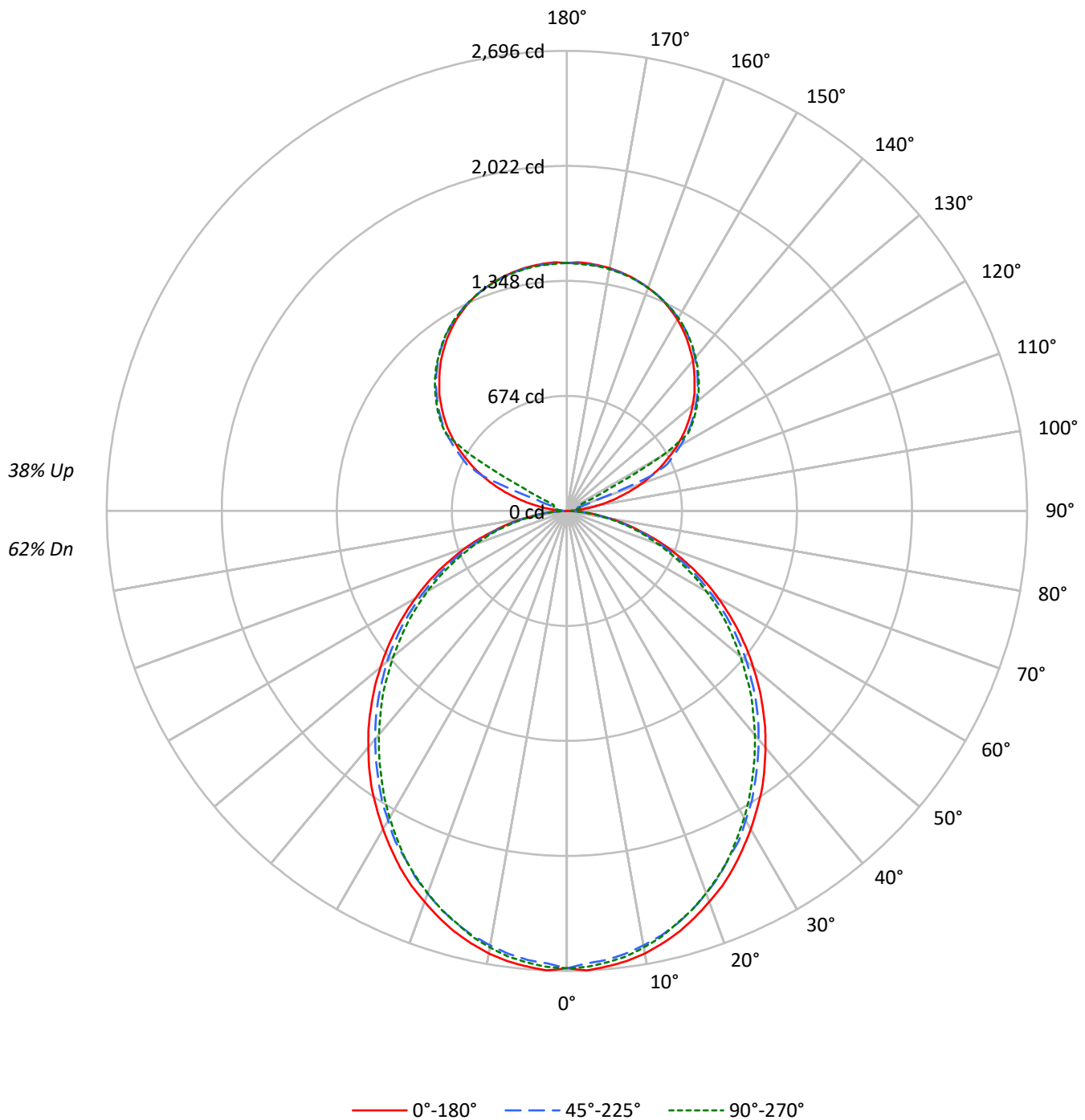
Lumens per Lamp: N/A  
Luminaire Lumens: 11081.1 lumens  
Efficiency: N/A  
Efficacy: 96.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 114.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9613  
Total Harmonic Distortion (THDi): 0.083  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P928964

CATALOG NUMBER: DFN2DIP-HX4F0-080D050US935-FLLONL

### Luminous Intensity Polar Plot



TEST NUMBER: P928964

CATALOG NUMBER: DFN2DIP-HX4F0-080D050US935-FLLONL

**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   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 90 | 90 | 90 | 78 | 78 | 78 | 67 | 67 | 67 |
| 1   | 100 | 96  | 92  | 88  | 94  | 90  | 87  | 83  | 79 | 76 | 74 | 69 | 67 | 65 | 59 | 58 | 56 |
| 2   | 91  | 84  | 78  | 72  | 85  | 79  | 73  | 69  | 69 | 65 | 61 | 60 | 57 | 54 | 52 | 50 | 48 |
| 3   | 83  | 74  | 66  | 60  | 78  | 69  | 63  | 57  | 61 | 56 | 51 | 53 | 49 | 46 | 46 | 43 | 40 |
| 4   | 76  | 65  | 57  | 51  | 71  | 61  | 54  | 49  | 54 | 48 | 44 | 47 | 43 | 39 | 41 | 38 | 35 |
| 5   | 70  | 58  | 50  | 44  | 65  | 55  | 47  | 42  | 49 | 43 | 38 | 43 | 38 | 34 | 37 | 33 | 30 |
| 6   | 65  | 52  | 44  | 38  | 60  | 49  | 42  | 36  | 44 | 38 | 33 | 39 | 34 | 30 | 34 | 30 | 27 |
| 7   | 60  | 47  | 39  | 34  | 56  | 45  | 37  | 32  | 40 | 34 | 29 | 35 | 30 | 27 | 31 | 27 | 24 |
| 8   | 56  | 43  | 35  | 30  | 52  | 41  | 34  | 29  | 36 | 30 | 26 | 32 | 27 | 24 | 28 | 24 | 21 |
| 9   | 52  | 39  | 32  | 27  | 49  | 37  | 30  | 26  | 33 | 28 | 23 | 30 | 25 | 21 | 26 | 22 | 19 |
| 10  | 49  | 36  | 29  | 24  | 45  | 34  | 28  | 23  | 31 | 25 | 21 | 27 | 23 | 19 | 24 | 20 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1993 | 1993 | 1993 |
| 5°  | 1996 | 1965 | 1978 |
| 10° | 1980 | 1939 | 1952 |
| 15° | 1951 | 1907 | 1910 |
| 20° | 1912 | 1863 | 1867 |
| 25° | 1873 | 1810 | 1818 |
| 30° | 1824 | 1761 | 1755 |
| 35° | 1778 | 1703 | 1688 |
| 40° | 1721 | 1645 | 1625 |
| 45° | 1664 | 1586 | 1560 |
| 50° | 1602 | 1524 | 1485 |
| 55° | 1537 | 1453 | 1416 |
| 60° | 1463 | 1368 | 1337 |
| 65° | 1383 | 1281 | 1244 |
| 70° | 1281 | 1174 | 1144 |
| 75° | 1139 | 1046 | 1052 |
| 80° | 970  | 883  | 875  |
| 85° | 704  | 602  | 582  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1664 cd/sqm

TEST NUMBER: P928964

CATALOG NUMBER: DFN2DIP-HX4F0-080D050US935-FLLONL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 252.3   | 2.3       |
| 10°-20°   | 709.8   | 6.4       |
| 20°-30°   | 1043.1  | 9.4       |
| 30°-40°   | 1211.4  | 10.9      |
| 40°-50°   | 1210.0  | 10.9      |
| 50°-60°   | 1055.0  | 9.5       |
| 60°-70°   | 779.9   | 7.0       |
| 70°-80°   | 441.2   | 4.0       |
| 80°-90°   | 119.0   | 1.1       |
| 90°-100°  | 47.9    | 0.4       |
| 100°-110° | 178.6   | 1.6       |
| 110°-120° | 473.7   | 4.3       |
| 120°-130° | 785.6   | 7.1       |
| 130°-140° | 834.5   | 7.5       |
| 140°-150° | 775.6   | 7.0       |
| 150°-160° | 623.5   | 5.6       |
| 160°-170° | 401.8   | 3.6       |
| 170°-180° | 138.3   | 1.2       |
| 0°-30°    | 2005.1  | 18.1      |
| 0°-40°    | 3216.5  | 29.0      |
| 0°-60°    | 5481.5  | 49.5      |
| 0°-90°    | 6821.7  | 61.6      |
| 90°-120°  | 700.2   | 6.3       |
| 90°-150°  | 3095.8  | 27.9      |
| 90°-180°  | 4259.0  | 38.4      |
| 0°-180°   | 11081.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2680 | 2680  | 2680 | 2680  | 2680 |      |
| 5°   | 2680 | 2670  | 2642 | 2662  | 2657 | 254  |
| 15°  | 2551 | 2536  | 2502 | 2513  | 2500 | 719  |
| 25°  | 2309 | 2289  | 2245 | 2250  | 2245 | 1063 |
| 35°  | 1992 | 1966  | 1925 | 1910  | 1897 | 1244 |
| 45°  | 1621 | 1603  | 1564 | 1536  | 1526 | 1251 |
| 55°  | 1227 | 1211  | 1180 | 1150  | 1137 | 1097 |
| 65°  | 827  | 812   | 786  | 763   | 750  | 818  |
| 75°  | 433  | 428   | 415  | 400   | 405  | 462  |
| 85°  | 106  | 103   | 101  | 93    | 90   | 118  |
| 90°  | 1    | 13    | 21   | 26    | 28   | 10   |
| 95°  | 68   | 34    | 41   | 46    | 45   | 81   |
| 105° | 320  | 351   | 64   | 76    | 80   | 342  |
| 115° | 604  | 622   | 649  | 162   | 86   | 595  |
| 125° | 855  | 868   | 888  | 896   | 899  | 762  |
| 135° | 1058 | 1074  | 1084 | 1094  | 1092 | 817  |
| 145° | 1227 | 1226  | 1244 | 1251  | 1246 | 767  |
| 155° | 1351 | 1342  | 1354 | 1360  | 1352 | 623  |
| 165° | 1423 | 1417  | 1420 | 1428  | 1420 | 402  |
| 175° | 1456 | 1449  | 1451 | 1458  | 1448 | 139  |
| 180° | 1453 | 1453  | 1453 | 1453  | 1453 |      |

TEST NUMBER: P928964

CATALOG NUMBER: DFN2DIP-HX4F0-080D050US935-FLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2680.1 | 2680.1 | 2680.1 | 2680.1 | 2680.1 |
| 2.5°   | 2695.7 | 2682.9 | 2654.5 | 2680.1 | 2675.2 |
| 5°     | 2680.1 | 2670.0 | 2641.6 | 2662.1 | 2657.2 |
| 7.5°   | 2662.1 | 2646.8 | 2618.4 | 2639.1 | 2634.0 |
| 10°    | 2634.0 | 2615.9 | 2585.0 | 2605.5 | 2597.9 |
| 12.5°  | 2595.1 | 2579.8 | 2548.9 | 2561.7 | 2556.6 |
| 15°    | 2551.4 | 2536.1 | 2502.4 | 2512.8 | 2500.0 |
| 17.5°  | 2497.2 | 2481.9 | 2448.3 | 2461.2 | 2448.3 |
| 20°    | 2437.9 | 2422.6 | 2386.5 | 2394.2 | 2384.0 |
| 22.5°  | 2378.9 | 2355.6 | 2321.9 | 2321.9 | 2316.8 |
| 25°    | 2309.1 | 2288.6 | 2244.9 | 2249.8 | 2244.9 |
| 27.5°  | 2231.7 | 2213.7 | 2180.3 | 2172.6 | 2159.8 |
| 30°    | 2154.7 | 2133.8 | 2095.3 | 2087.7 | 2077.2 |
| 32.5°  | 2072.1 | 2056.8 | 2015.4 | 1999.8 | 1989.5 |
| 35°    | 1992.2 | 1966.5 | 1925.2 | 1909.6 | 1896.8 |
| 37.5°  | 1901.9 | 1878.7 | 1837.5 | 1819.4 | 1806.6 |
| 40°    | 1809.3 | 1788.5 | 1747.2 | 1724.2 | 1713.8 |
| 42.5°  | 1719.1 | 1698.2 | 1657.3 | 1631.3 | 1616.0 |
| 45°    | 1621.2 | 1603.1 | 1564.3 | 1536.1 | 1525.8 |
| 47.5°  | 1525.8 | 1507.7 | 1466.4 | 1438.0 | 1422.6 |
| 50°    | 1425.1 | 1412.3 | 1376.1 | 1340.1 | 1327.2 |
| 52.5°  | 1327.2 | 1309.2 | 1275.8 | 1247.4 | 1229.3 |
| 55°    | 1226.8 | 1211.3 | 1180.4 | 1149.5 | 1136.6 |
| 57.5°  | 1126.3 | 1113.4 | 1079.8 | 1048.9 | 1038.5 |
| 60°    | 1025.6 | 1015.5 | 979.4  | 951.0  | 943.3  |
| 62.5°  | 927.7  | 909.7  | 884.0  | 858.3  | 847.9  |
| 65°    | 827.4  | 811.8  | 786.1  | 762.8  | 750.0  |
| 67.5°  | 724.3  | 711.2  | 688.2  | 670.2  | 659.8  |
| 70°    | 628.9  | 618.5  | 595.3  | 577.2  | 567.1  |
| 72.5°  | 531.0  | 520.6  | 507.7  | 489.7  | 482.1  |
| 75°    | 432.8  | 427.9  | 414.8  | 399.5  | 404.7  |
| 77.5°  | 345.3  | 334.9  | 329.8  | 322.1  | 314.4  |
| 80°    | 257.9  | 255.1  | 249.9  | 242.3  | 237.0  |
| 82.5°  | 175.3  | 175.3  | 172.8  | 162.4  | 162.4  |
| 85°    | 105.6  | 103.1  | 100.7  | 92.7   | 90.2   |
| 87.5°  | 46.5   | 41.3   | 36.1   | 28.4   | 25.7   |
| 90°    | 1.0    | 12.6   | 21.0   | 26.3   | 28.3   |
| 92.5°  | 26.3   | 22.1   | 25.2   | 27.4   | 28.3   |
| 95°    | 68.3   | 33.6   | 41.0   | 46.3   | 45.2   |
| 97.5°  | 123.0  | 36.9   | 53.6   | 56.8   | 57.8   |
| 100°   | 186.1  | 42.1   | 59.9   | 68.3   | 70.4   |
| 102.5° | 255.5  | 253.4  | 62.1   | 73.5   | 76.8   |
| 105°   | 319.6  | 351.2  | 64.1   | 75.7   | 79.9   |
| 107.5° | 394.3  | 420.4  | 66.3   | 77.7   | 82.1   |
| 110°   | 465.8  | 487.8  | 184.0  | 78.9   | 83.0   |

TEST NUMBER: P928964

CATALOG NUMBER: DFN2DIP-HX4F0-080D050US935-FLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 533.0  | 551.9  | 534.1  | 80.9   | 84.1   |
| 115°   | 604.5  | 622.3  | 648.7  | 162.0  | 86.3   |
| 117.5° | 666.5  | 687.5  | 705.5  | 555.0  | 279.7  |
| 120°   | 735.9  | 751.7  | 770.6  | 783.3  | 641.3  |
| 122.5° | 794.7  | 811.6  | 832.7  | 839.0  | 840.1  |
| 125°   | 854.6  | 868.4  | 888.4  | 895.7  | 898.9  |
| 127.5° | 909.3  | 924.0  | 940.0  | 950.4  | 951.4  |
| 130°   | 960.9  | 977.8  | 989.2  | 1000.8 | 999.9  |
| 132.5° | 1013.5 | 1027.2 | 1038.6 | 1048.2 | 1047.1 |
| 135°   | 1057.7 | 1074.5 | 1083.8 | 1094.5 | 1092.4 |
| 137.5° | 1103.8 | 1116.5 | 1127.0 | 1137.6 | 1134.5 |
| 140°   | 1149.0 | 1157.5 | 1169.0 | 1178.5 | 1173.3 |
| 142.5° | 1187.0 | 1194.4 | 1208.0 | 1216.3 | 1211.1 |
| 145°   | 1226.9 | 1225.8 | 1243.6 | 1251.0 | 1245.8 |
| 147.5° | 1261.5 | 1258.4 | 1276.3 | 1281.5 | 1277.4 |
| 150°   | 1295.2 | 1287.9 | 1304.7 | 1311.0 | 1305.7 |
| 152.5° | 1323.5 | 1315.2 | 1330.9 | 1337.3 | 1329.9 |
| 155°   | 1350.9 | 1341.5 | 1354.1 | 1360.4 | 1352.0 |
| 157.5° | 1373.0 | 1364.6 | 1374.1 | 1381.5 | 1373.0 |
| 160°   | 1392.0 | 1385.6 | 1392.0 | 1398.2 | 1390.9 |
| 162.5° | 1408.7 | 1402.5 | 1407.6 | 1415.1 | 1405.6 |
| 165°   | 1423.4 | 1417.2 | 1420.3 | 1427.6 | 1420.3 |
| 167.5° | 1435.0 | 1428.7 | 1431.9 | 1439.2 | 1429.8 |
| 170°   | 1444.5 | 1438.1 | 1440.3 | 1447.6 | 1438.1 |
| 172.5° | 1450.8 | 1444.5 | 1446.7 | 1454.0 | 1444.5 |
| 175°   | 1456.0 | 1448.6 | 1450.8 | 1458.1 | 1447.6 |
| 177.5° | 1458.1 | 1450.8 | 1451.9 | 1459.2 | 1449.8 |
| 180°   | 1452.9 | 1452.9 | 1452.9 | 1452.9 | 1452.9 |

TEST NUMBER: P928964

CATALOG NUMBER: DFN2DIP-HX4F0-080D050US935-FLLONL

**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 | 10.67            | 11.65 | 11.52 | 12.52 | 13.62 | 10.24          | 11.22 | 11.09 | 12.09 | 13.18 |
|                 | 3H   | 12.34            | 13.22 | 13.21 | 14.10 | 15.22 | 11.87          | 12.74 | 12.73 | 13.63 | 14.75 |
|                 | 4H   | 12.93            | 13.76 | 13.81 | 14.65 | 15.78 | 12.46          | 13.29 | 13.34 | 14.18 | 15.31 |
|                 | 6H   | 13.34            | 14.11 | 14.23 | 15.00 | 16.15 | 12.87          | 13.63 | 13.76 | 14.52 | 15.67 |
|                 | 8H   | 13.45            | 14.18 | 14.35 | 15.09 | 16.24 | 12.97          | 13.70 | 13.87 | 14.62 | 15.76 |
|                 | 12H  | 13.50            | 14.20 | 14.41 | 15.10 | 16.27 | 13.02          | 13.71 | 13.93 | 14.62 | 15.79 |
| 4H              | 2H   | 11.15            | 11.98 | 12.03 | 12.86 | 14.00 | 10.80          | 11.63 | 11.69 | 12.52 | 13.65 |
|                 | 3H   | 13.03            | 13.72 | 13.92 | 14.64 | 15.78 | 12.63          | 13.32 | 13.53 | 14.24 | 15.39 |
|                 | 4H   | 13.75            | 14.38 | 14.65 | 15.29 | 16.47 | 13.34          | 13.97 | 14.25 | 14.89 | 16.06 |
|                 | 6H   | 14.27            | 14.81 | 15.19 | 15.75 | 16.93 | 13.86          | 14.40 | 14.78 | 15.34 | 16.52 |
|                 | 8H   | 14.42            | 14.93 | 15.34 | 15.86 | 17.05 | 14.01          | 14.52 | 14.93 | 15.45 | 16.64 |
|                 | 12H  | 14.50            | 14.96 | 15.44 | 15.91 | 17.11 | 14.08          | 14.54 | 15.02 | 15.49 | 16.68 |
| 8H              | 4H   | 13.95            | 14.46 | 14.88 | 15.39 | 16.58 | 13.59          | 14.10 | 14.52 | 15.03 | 16.22 |
|                 | 6H   | 14.59            | 15.01 | 15.54 | 15.99 | 17.17 | 14.23          | 14.65 | 15.18 | 15.62 | 16.81 |
|                 | 8H   | 14.81            | 15.18 | 15.77 | 16.15 | 17.36 | 14.44          | 14.82 | 15.40 | 15.78 | 16.99 |
|                 | 12H  | 14.95            | 15.28 | 15.91 | 16.24 | 17.49 | 14.56          | 14.89 | 15.53 | 15.85 | 17.11 |
| 12H             | 4H   | 13.94            | 14.40 | 14.89 | 15.35 | 16.55 | 13.59          | 14.05 | 14.53 | 15.00 | 16.20 |
|                 | 6H   | 14.62            | 14.99 | 15.58 | 15.96 | 17.17 | 14.27          | 14.64 | 15.23 | 15.61 | 16.81 |
|                 | 8H   | 14.87            | 15.20 | 15.83 | 16.16 | 17.41 | 14.51          | 14.84 | 15.47 | 15.80 | 17.05 |

END OF REPORT