

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: P919697

Luminaire Tested: DFN2DIP-PN4F0-090D050US935-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P919697  
REPORT IS A COMBINATION OF REPORTS P901157 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-090D050US935-FLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

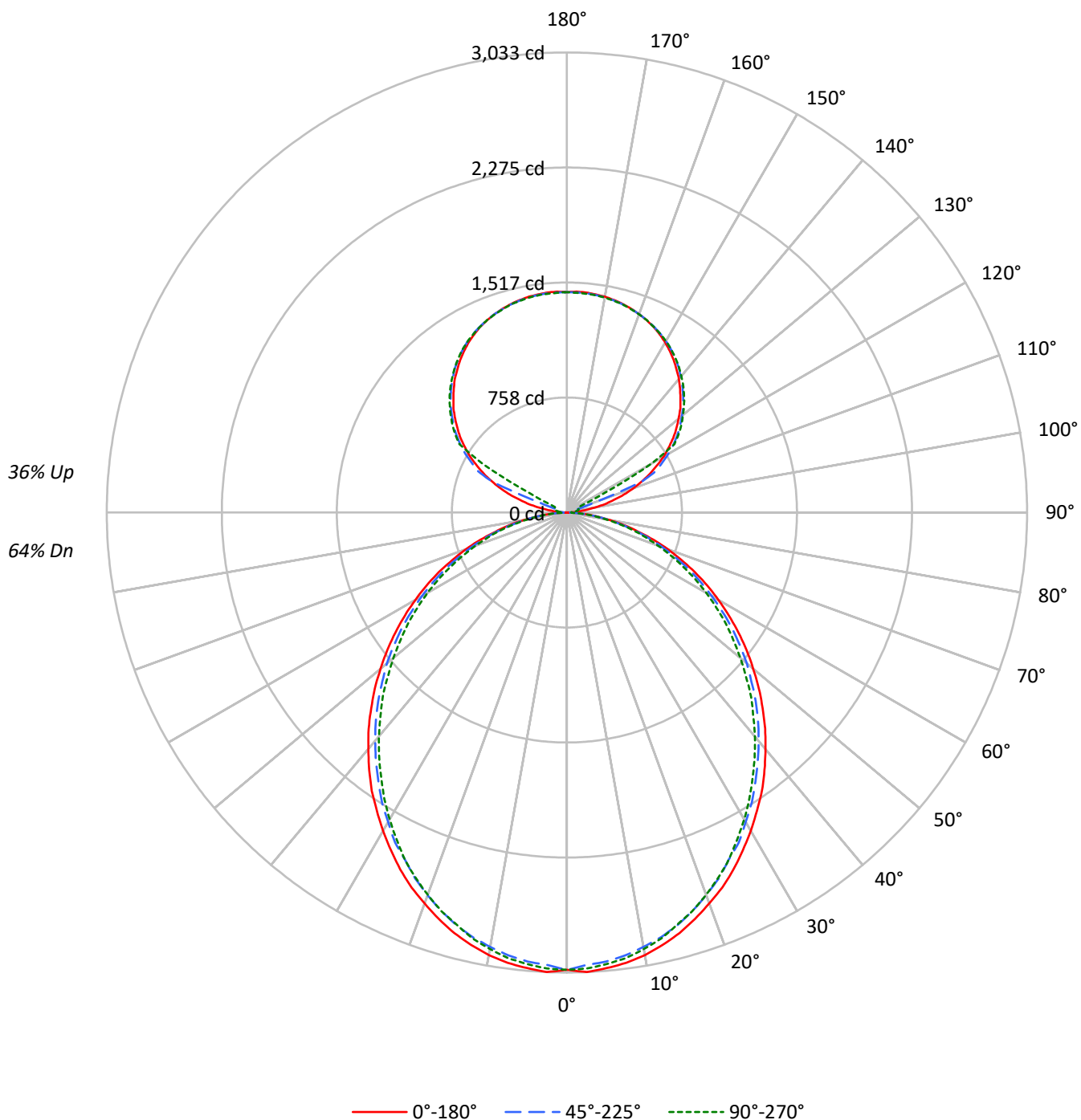
Lumens per Lamp: N/A  
Luminaire Lumens: 11933.5 lumens  
Efficiency: N/A  
Efficacy: 94.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 126  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9963  
Total Harmonic Distortion (THDi): 0.065  
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 | 91 | 91 | 91 | 80 | 80 | 80 | 69 | 69 | 69 |
| 1   | 101 | 97  | 93  | 89  | 95  | 91  | 87  | 84  | 80 | 78 | 75 | 70 | 68 | 67 | 61 | 60 | 59 |
| 2   | 92  | 84  | 78  | 73  | 86  | 79  | 74  | 69  | 70 | 66 | 62 | 62 | 59 | 56 | 54 | 51 | 49 |
| 3   | 84  | 74  | 67  | 61  | 79  | 70  | 63  | 58  | 62 | 57 | 52 | 55 | 51 | 47 | 48 | 45 | 42 |
| 4   | 77  | 66  | 58  | 51  | 72  | 62  | 55  | 49  | 55 | 49 | 45 | 49 | 44 | 40 | 43 | 39 | 36 |
| 5   | 71  | 59  | 50  | 44  | 66  | 55  | 48  | 42  | 49 | 43 | 39 | 44 | 39 | 35 | 39 | 35 | 32 |
| 6   | 65  | 53  | 44  | 38  | 61  | 50  | 42  | 37  | 45 | 38 | 34 | 40 | 35 | 31 | 35 | 31 | 28 |
| 7   | 60  | 48  | 40  | 34  | 57  | 45  | 38  | 33  | 41 | 34 | 30 | 36 | 31 | 27 | 32 | 28 | 25 |
| 8   | 56  | 43  | 35  | 30  | 53  | 41  | 34  | 29  | 37 | 31 | 27 | 33 | 28 | 24 | 29 | 25 | 22 |
| 9   | 52  | 40  | 32  | 27  | 49  | 38  | 31  | 26  | 34 | 28 | 24 | 30 | 26 | 22 | 27 | 23 | 20 |
| 10  | 49  | 37  | 29  | 24  | 46  | 35  | 28  | 23  | 31 | 26 | 22 | 28 | 23 | 20 | 25 | 21 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2201 | 2201 | 2201 |
| 5°  | 2204 | 2171 | 2185 |
| 10° | 2187 | 2142 | 2156 |
| 15° | 2154 | 2107 | 2110 |
| 20° | 2111 | 2058 | 2063 |
| 25° | 2068 | 2000 | 2009 |
| 30° | 2014 | 1945 | 1940 |
| 35° | 1962 | 1881 | 1867 |
| 40° | 1899 | 1817 | 1797 |
| 45° | 1836 | 1752 | 1726 |
| 50° | 1767 | 1684 | 1643 |
| 55° | 1695 | 1605 | 1568 |
| 60° | 1613 | 1512 | 1481 |
| 65° | 1525 | 1416 | 1378 |
| 70° | 1411 | 1298 | 1269 |
| 75° | 1255 | 1157 | 1168 |
| 80° | 1066 | 977  | 974  |
| 85° | 770  | 667  | 651  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1836 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 283.8   | 2.4       |
| 10°-20°   | 798.5   | 6.7       |
| 20°-30°   | 1173.4  | 9.8       |
| 30°-40°   | 1362.9  | 11.4      |
| 40°-50°   | 1361.2  | 11.4      |
| 50°-60°   | 1186.9  | 9.9       |
| 60°-70°   | 877.4   | 7.4       |
| 70°-80°   | 496.4   | 4.2       |
| 80°-90°   | 133.6   | 1.1       |
| 90°-100°  | 47.9    | 0.4       |
| 100°-110° | 178.6   | 1.5       |
| 110°-120° | 473.7   | 4.0       |
| 120°-130° | 785.6   | 6.6       |
| 130°-140° | 834.5   | 7.0       |
| 140°-150° | 775.6   | 6.5       |
| 150°-160° | 623.5   | 5.2       |
| 160°-170° | 401.8   | 3.4       |
| 170°-180° | 138.3   | 1.2       |
| 0°-30°    | 2255.7  | 18.9      |
| 0°-40°    | 3618.6  | 30.3      |
| 0°-60°    | 6166.7  | 51.7      |
| 0°-90°    | 7674.1  | 64.3      |
| 90°-120°  | 700.2   | 5.9       |
| 90°-150°  | 3095.8  | 25.9      |
| 90°-180°  | 4259.0  | 35.7      |
| 0°-180°   | 11933.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3015 | 3015  | 3015 | 3015  | 3015 |      |
| 5°   | 3015 | 3004  | 2972 | 2995  | 2989 | 286  |
| 15°  | 2870 | 2853  | 2815 | 2827  | 2812 | 808  |
| 25°  | 2598 | 2575  | 2526 | 2531  | 2526 | 1195 |
| 35°  | 2241 | 2212  | 2166 | 2148  | 2134 | 1400 |
| 45°  | 1824 | 1804  | 1760 | 1728  | 1716 | 1408 |
| 55°  | 1380 | 1363  | 1328 | 1293  | 1279 | 1234 |
| 65°  | 931  | 913   | 884  | 858   | 844  | 920  |
| 75°  | 487  | 481   | 467  | 449   | 455  | 520  |
| 85°  | 119  | 116   | 113  | 104   | 102  | 132  |
| 90°  | 1    | 13    | 21   | 26    | 28   | 11   |
| 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 | 622  |
| 165° | 1423 | 1417  | 1420 | 1428  | 1420 | 402  |
| 175° | 1456 | 1449  | 1451 | 1458  | 1448 | 139  |
| 180° | 1453 | 1453  | 1453 | 1453  | 1453 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3015.1 | 3015.1 | 3015.1 | 3015.1 | 3015.1 |
| 2.5°   | 3032.7 | 3018.2 | 2986.3 | 3015.1 | 3009.6 |
| 5°     | 3015.1 | 3003.8 | 2971.8 | 2994.9 | 2989.3 |
| 7.5°   | 2994.9 | 2977.7 | 2945.6 | 2969.1 | 2963.2 |
| 10°    | 2963.2 | 2942.9 | 2908.1 | 2931.2 | 2922.6 |
| 12.5°  | 2919.5 | 2902.3 | 2867.6 | 2881.9 | 2876.2 |
| 15°    | 2870.3 | 2853.1 | 2815.2 | 2826.9 | 2812.4 |
| 17.5°  | 2809.3 | 2792.1 | 2754.3 | 2768.8 | 2754.3 |
| 20°    | 2742.6 | 2725.4 | 2684.8 | 2693.4 | 2682.0 |
| 22.5°  | 2676.2 | 2650.1 | 2612.2 | 2612.2 | 2606.3 |
| 25°    | 2597.7 | 2574.6 | 2525.5 | 2531.0 | 2525.5 |
| 27.5°  | 2510.7 | 2490.4 | 2452.9 | 2444.3 | 2429.8 |
| 30°    | 2424.0 | 2400.5 | 2357.2 | 2348.5 | 2336.9 |
| 32.5°  | 2331.1 | 2313.8 | 2267.4 | 2249.9 | 2238.2 |
| 35°    | 2241.3 | 2212.3 | 2165.8 | 2148.4 | 2133.9 |
| 37.5°  | 2139.8 | 2113.6 | 2067.1 | 2046.9 | 2032.4 |
| 40°    | 2035.4 | 2012.1 | 1965.6 | 1939.7 | 1928.1 |
| 42.5°  | 1933.9 | 1910.6 | 1864.4 | 1835.2 | 1818.0 |
| 45°    | 1823.8 | 1803.5 | 1759.8 | 1728.1 | 1716.5 |
| 47.5°  | 1716.5 | 1696.2 | 1649.7 | 1617.7 | 1600.5 |
| 50°    | 1603.3 | 1588.8 | 1548.2 | 1507.6 | 1493.1 |
| 52.5°  | 1493.1 | 1472.8 | 1435.3 | 1403.3 | 1383.0 |
| 55°    | 1380.3 | 1362.7 | 1327.9 | 1293.2 | 1278.8 |
| 57.5°  | 1267.0 | 1252.6 | 1214.8 | 1180.0 | 1168.3 |
| 60°    | 1153.8 | 1142.5 | 1101.8 | 1069.9 | 1061.3 |
| 62.5°  | 1043.7 | 1023.4 | 994.5  | 965.6  | 953.9  |
| 65°    | 930.8  | 913.3  | 884.3  | 858.2  | 843.8  |
| 67.5°  | 814.8  | 800.1  | 774.2  | 754.0  | 742.3  |
| 70°    | 707.5  | 695.8  | 669.7  | 649.4  | 638.0  |
| 72.5°  | 597.4  | 585.7  | 571.2  | 551.0  | 542.3  |
| 75°    | 487.0  | 481.4  | 466.7  | 449.4  | 455.3  |
| 77.5°  | 388.5  | 376.9  | 371.0  | 362.4  | 353.8  |
| 80°    | 290.1  | 287.0  | 281.1  | 272.5  | 266.7  |
| 82.5°  | 197.2  | 197.2  | 194.4  | 182.7  | 182.7  |
| 85°    | 118.7  | 116.0  | 113.2  | 104.3  | 101.5  |
| 87.5°  | 52.3   | 46.4   | 40.6   | 32.0   | 28.9   |
| 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   |

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**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  | 783.2  | 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  | 977.7  | 989.2  | 1000.8 | 999.9  |
| 132.5° | 1013.5 | 1027.2 | 1038.6 | 1048.2 | 1047.1 |
| 135°   | 1057.6 | 1074.5 | 1083.8 | 1094.5 | 1092.3 |
| 137.5° | 1103.8 | 1116.5 | 1127.0 | 1137.6 | 1134.5 |
| 140°   | 1149.0 | 1157.5 | 1169.0 | 1178.4 | 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 | 1258.3 | 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° | 1372.9 | 1364.6 | 1374.1 | 1381.5 | 1372.9 |
| 160°   | 1392.0 | 1385.6 | 1392.0 | 1398.2 | 1390.9 |
| 162.5° | 1408.7 | 1402.5 | 1407.6 | 1415.0 | 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 | 1446.6 | 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 | 1449.7 |
| 180°   | 1452.8 | 1452.8 | 1452.8 | 1452.8 | 1452.8 |

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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 | 11.24            | 12.25 | 12.07 | 13.10 | 14.15 | 10.80          | 11.81 | 11.63 | 12.66 | 13.71 |
|                 | 3H   | 12.92            | 13.82 | 13.76 | 14.68 | 15.76 | 12.43          | 13.34 | 13.27 | 14.19 | 15.27 |
|                 | 4H   | 13.51            | 14.37 | 14.37 | 15.23 | 16.32 | 13.03          | 13.88 | 13.88 | 14.74 | 15.83 |
|                 | 6H   | 13.92            | 14.71 | 14.79 | 15.58 | 16.69 | 13.43          | 14.22 | 14.30 | 15.09 | 16.19 |
|                 | 8H   | 14.03            | 14.78 | 14.91 | 15.67 | 16.78 | 13.54          | 14.29 | 14.42 | 15.18 | 16.28 |
|                 | 12H  | 14.09            | 14.80 | 14.97 | 15.69 | 16.81 | 13.59          | 14.30 | 14.47 | 15.19 | 16.32 |
| 4H              | 2H   | 11.72            | 12.58 | 12.58 | 13.44 | 14.53 | 11.37          | 12.23 | 12.23 | 13.09 | 14.18 |
|                 | 3H   | 13.61            | 14.32 | 14.47 | 15.21 | 16.32 | 13.20          | 13.92 | 14.07 | 14.81 | 15.92 |
|                 | 4H   | 14.33            | 14.98 | 15.21 | 15.87 | 17.00 | 13.91          | 14.56 | 14.79 | 15.45 | 16.58 |
|                 | 6H   | 14.85            | 15.42 | 15.75 | 16.33 | 17.47 | 14.43          | 14.99 | 15.33 | 15.91 | 17.04 |
|                 | 8H   | 15.01            | 15.53 | 15.91 | 16.44 | 17.59 | 14.58          | 15.11 | 15.48 | 16.02 | 17.16 |
|                 | 12H  | 15.09            | 15.56 | 16.01 | 16.49 | 17.65 | 14.65          | 15.12 | 15.57 | 16.05 | 17.21 |
| 8H              | 4H   | 14.54            | 15.06 | 15.44 | 15.97 | 17.12 | 14.17          | 14.69 | 15.07 | 15.60 | 16.75 |
|                 | 6H   | 15.18            | 15.61 | 16.10 | 16.56 | 17.71 | 14.80          | 15.24 | 15.73 | 16.19 | 17.33 |
|                 | 8H   | 15.40            | 15.79 | 16.34 | 16.73 | 17.89 | 15.02          | 15.40 | 15.95 | 16.35 | 17.51 |
|                 | 12H  | 15.54            | 15.88 | 16.48 | 16.82 | 18.03 | 15.14          | 15.48 | 16.08 | 16.42 | 17.63 |
| 12H             | 4H   | 14.53            | 15.00 | 15.45 | 15.93 | 17.08 | 14.17          | 14.64 | 15.09 | 15.57 | 16.72 |
|                 | 6H   | 15.21            | 15.59 | 16.15 | 16.54 | 17.70 | 14.84          | 15.23 | 15.78 | 16.17 | 17.34 |
|                 | 8H   | 15.46            | 15.80 | 16.40 | 16.74 | 17.95 | 15.09          | 15.43 | 16.03 | 16.36 | 17.58 |

END OF REPORT