

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: P922337

Luminaire Tested: DFN2DIP-PN4F0-060D100US940-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922337  
REPORT IS A COMBINATION OF REPORTS P901241 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-060D100US940-FLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

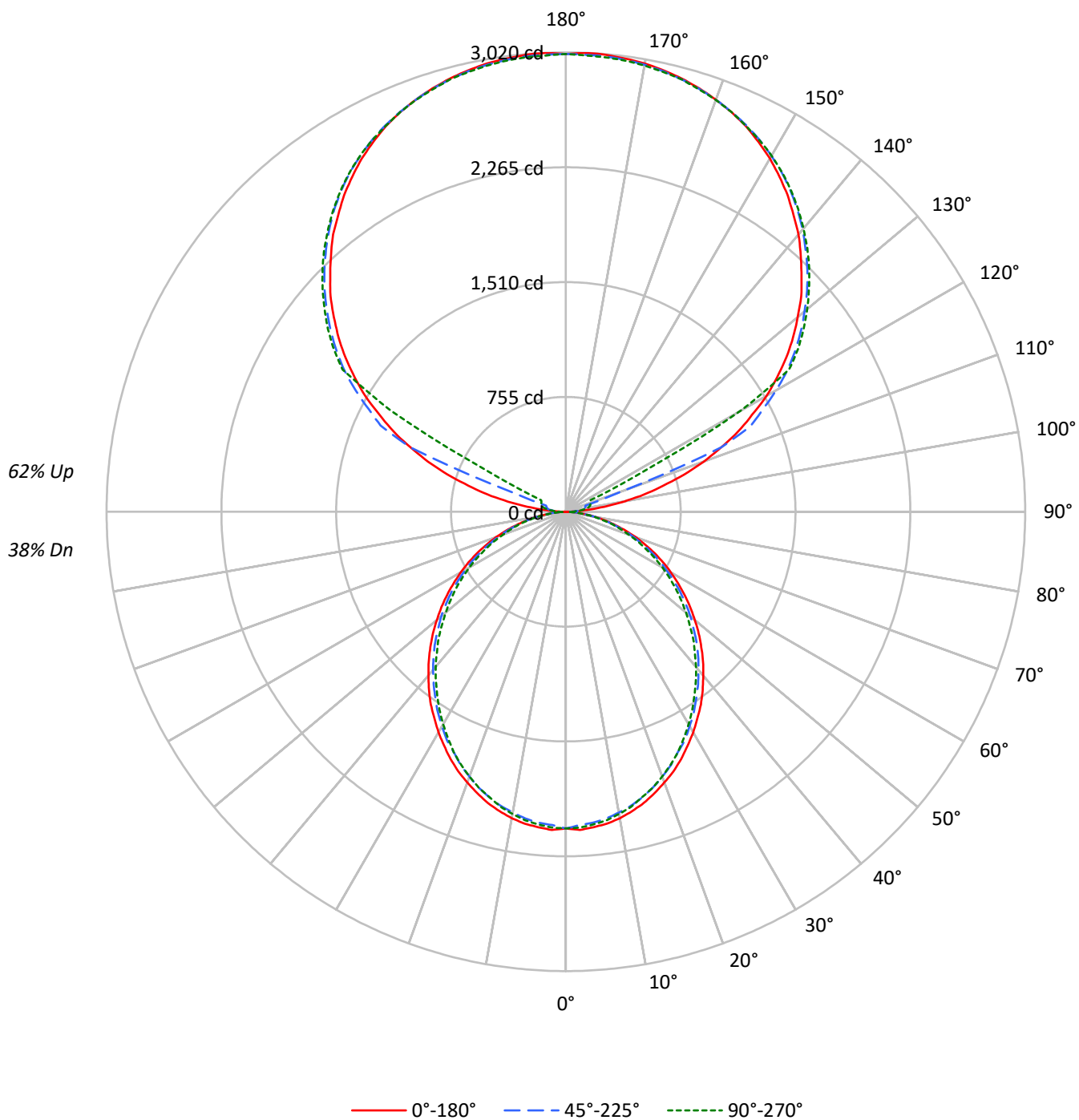
Lumens per Lamp: N/A  
Luminaire Lumens: 14124.8 lumens  
Efficiency: N/A  
Efficacy: 109.1 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 129.5  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
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   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 76 | 76 | 76 | 60 | 60 | 60 | 45 | 45 | 45 |
| 1   | 95  | 91  | 87  | 83  | 86 | 82 | 79 | 76 | 67 | 65 | 63 | 53 | 51 | 50 | 39 | 39 | 38 |
| 2   | 86  | 79  | 73  | 68  | 78 | 72 | 67 | 63 | 59 | 55 | 52 | 46 | 44 | 42 | 35 | 33 | 32 |
| 3   | 79  | 70  | 62  | 57  | 71 | 63 | 57 | 52 | 52 | 47 | 44 | 41 | 38 | 35 | 31 | 29 | 27 |
| 4   | 72  | 62  | 54  | 48  | 65 | 56 | 49 | 44 | 46 | 41 | 37 | 36 | 33 | 30 | 27 | 25 | 23 |
| 5   | 66  | 55  | 47  | 41  | 60 | 50 | 43 | 38 | 41 | 36 | 32 | 33 | 29 | 26 | 25 | 22 | 20 |
| 6   | 61  | 49  | 41  | 35  | 55 | 45 | 38 | 33 | 37 | 32 | 28 | 29 | 26 | 23 | 22 | 20 | 18 |
| 7   | 56  | 44  | 36  | 31  | 51 | 40 | 34 | 29 | 33 | 28 | 24 | 27 | 23 | 20 | 20 | 18 | 16 |
| 8   | 52  | 40  | 32  | 27  | 47 | 37 | 30 | 25 | 30 | 25 | 22 | 24 | 21 | 18 | 19 | 16 | 14 |
| 9   | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 23 | 28 | 23 | 19 | 22 | 19 | 16 | 17 | 15 | 13 |
| 10  | 45  | 33  | 26  | 22  | 41 | 31 | 24 | 20 | 26 | 21 | 17 | 21 | 17 | 14 | 16 | 13 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1520 | 1520 | 1520 |
| 5°  | 1522 | 1499 | 1509 |
| 10° | 1510 | 1479 | 1489 |
| 15° | 1487 | 1455 | 1457 |
| 20° | 1457 | 1421 | 1425 |
| 25° | 1428 | 1381 | 1387 |
| 30° | 1390 | 1343 | 1339 |
| 35° | 1355 | 1299 | 1289 |
| 40° | 1311 | 1254 | 1241 |
| 45° | 1268 | 1210 | 1192 |
| 50° | 1220 | 1163 | 1135 |
| 55° | 1170 | 1109 | 1082 |
| 60° | 1114 | 1044 | 1022 |
| 65° | 1053 | 977  | 952  |
| 70° | 975  | 896  | 876  |
| 75° | 866  | 799  | 806  |
| 80° | 736  | 675  | 672  |
| 85° | 532  | 460  | 450  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1605 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 195.9   | 1.4       |
| 10°-20°   | 551.3   | 3.9       |
| 20°-30°   | 810.2   | 5.7       |
| 30°-40°   | 941.0   | 6.7       |
| 40°-50°   | 939.8   | 6.7       |
| 50°-60°   | 819.5   | 5.8       |
| 60°-70°   | 605.8   | 4.3       |
| 70°-80°   | 342.7   | 2.4       |
| 80°-90°   | 95.8    | 0.7       |
| 90°-100°  | 99.2    | 0.7       |
| 100°-110° | 369.9   | 2.6       |
| 110°-120° | 981.1   | 6.9       |
| 120°-130° | 1627.2  | 11.5      |
| 130°-140° | 1728.5  | 12.2      |
| 140°-150° | 1606.5  | 11.4      |
| 150°-160° | 1291.5  | 9.1       |
| 160°-170° | 832.2   | 5.9       |
| 170°-180° | 286.4   | 2.0       |
| 0°-30°    | 1557.4  | 11.0      |
| 0°-40°    | 2498.4  | 17.7      |
| 0°-60°    | 4257.8  | 30.1      |
| 0°-90°    | 5302.1  | 37.5      |
| 90°-120°  | 1450.3  | 10.3      |
| 90°-150°  | 6412.5  | 45.4      |
| 90°-180°  | 8823.0  | 62.5      |
| 0°-180°   | 14124.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2082 | 2082  | 2082 | 2082  | 2082 |      |
| 5°   | 2082 | 2074  | 2052 | 2068  | 2064 | 198  |
| 15°  | 1982 | 1970  | 1944 | 1952  | 1942 | 558  |
| 25°  | 1794 | 1778  | 1744 | 1748  | 1744 | 825  |
| 35°  | 1548 | 1528  | 1495 | 1483  | 1473 | 966  |
| 45°  | 1259 | 1245  | 1215 | 1193  | 1185 | 972  |
| 55°  | 953  | 941   | 917  | 893   | 883  | 852  |
| 65°  | 643  | 631   | 611  | 592   | 583  | 635  |
| 75°  | 336  | 332   | 322  | 310   | 314  | 359  |
| 85°  | 82   | 80    | 78   | 72    | 70   | 91   |
| 90°  | 2    | 26    | 43   | 55    | 59   | 13   |
| 95°  | 141  | 70    | 85   | 96    | 94   | 168  |
| 105° | 662  | 727   | 133  | 157   | 166  | 707  |
| 115° | 1252 | 1289  | 1344 | 335   | 179  | 1233 |
| 125° | 1770 | 1799  | 1840 | 1855  | 1862 | 1579 |
| 135° | 2191 | 2226  | 2245 | 2267  | 2263 | 1692 |
| 145° | 2541 | 2539  | 2576 | 2591  | 2580 | 1589 |
| 155° | 2798 | 2779  | 2805 | 2818  | 2800 | 1289 |
| 165° | 2948 | 2935  | 2942 | 2957  | 2942 | 833  |
| 175° | 3016 | 3001  | 3005 | 3020  | 2999 | 287  |
| 180° | 3009 | 3009  | 3009 | 3009  | 3009 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2081.8 | 2081.8 | 2081.8 | 2081.8 | 2081.8 |
| 2.5°   | 2093.9 | 2083.9 | 2061.8 | 2081.8 | 2078.0 |
| 5°     | 2081.8 | 2073.9 | 2051.8 | 2067.8 | 2064.0 |
| 7.5°   | 2067.8 | 2055.9 | 2033.8 | 2050.0 | 2045.9 |
| 10°    | 2045.9 | 2031.9 | 2007.9 | 2023.8 | 2017.9 |
| 12.5°  | 2015.8 | 2003.9 | 1979.9 | 1989.9 | 1985.8 |
| 15°    | 1981.7 | 1969.9 | 1943.8 | 1951.9 | 1941.9 |
| 17.5°  | 1939.7 | 1927.9 | 1901.8 | 1911.6 | 1901.8 |
| 20°    | 1893.6 | 1881.8 | 1853.7 | 1859.7 | 1851.8 |
| 22.5°  | 1847.8 | 1829.7 | 1803.6 | 1803.6 | 1799.6 |
| 25°    | 1793.6 | 1777.7 | 1743.7 | 1747.5 | 1743.7 |
| 27.5°  | 1733.5 | 1719.5 | 1693.5 | 1687.7 | 1677.7 |
| 30°    | 1673.7 | 1657.4 | 1627.5 | 1621.6 | 1613.5 |
| 32.5°  | 1609.4 | 1597.6 | 1565.5 | 1553.4 | 1545.3 |
| 35°    | 1547.5 | 1527.5 | 1495.4 | 1483.3 | 1473.3 |
| 37.5°  | 1477.4 | 1459.3 | 1427.3 | 1413.2 | 1403.2 |
| 40°    | 1405.3 | 1389.2 | 1357.2 | 1339.3 | 1331.2 |
| 42.5°  | 1335.2 | 1319.1 | 1287.3 | 1267.1 | 1255.2 |
| 45°    | 1259.3 | 1245.2 | 1215.0 | 1193.2 | 1185.1 |
| 47.5°  | 1185.1 | 1171.1 | 1139.1 | 1117.0 | 1105.0 |
| 50°    | 1107.0 | 1097.0 | 1069.0 | 1040.9 | 1030.9 |
| 52.5°  | 1030.9 | 1016.9 | 991.0  | 968.9  | 954.9  |
| 55°    | 953.0  | 940.8  | 916.9  | 892.9  | 882.9  |
| 57.5°  | 874.9  | 864.9  | 838.7  | 814.8  | 806.6  |
| 60°    | 796.7  | 788.8  | 760.8  | 738.7  | 732.7  |
| 62.5°  | 720.6  | 706.6  | 686.6  | 666.6  | 658.6  |
| 65°    | 642.7  | 630.6  | 610.6  | 592.5  | 582.6  |
| 67.5°  | 562.6  | 552.4  | 534.6  | 520.6  | 512.5  |
| 70°    | 488.5  | 480.5  | 462.4  | 448.4  | 440.5  |
| 72.5°  | 412.4  | 404.4  | 394.4  | 380.4  | 374.4  |
| 75°    | 336.2  | 332.4  | 322.2  | 310.3  | 314.3  |
| 77.5°  | 268.2  | 260.2  | 256.1  | 250.2  | 244.2  |
| 80°    | 200.3  | 198.1  | 194.1  | 188.2  | 184.1  |
| 82.5°  | 136.2  | 136.2  | 134.2  | 126.2  | 126.2  |
| 85°    | 81.9   | 80.1   | 78.1   | 72.0   | 70.1   |
| 87.5°  | 36.1   | 32.1   | 28.0   | 22.1   | 20.0   |
| 90°    | 2.1    | 26.1   | 43.4   | 54.6   | 58.7   |
| 92.5°  | 54.6   | 45.7   | 52.3   | 56.6   | 58.7   |
| 95°    | 141.4  | 69.6   | 84.8   | 95.9   | 93.6   |
| 97.5°  | 254.7  | 76.2   | 110.9  | 117.6  | 119.8  |
| 100°   | 385.6  | 87.1   | 124.1  | 141.4  | 145.9  |
| 102.5° | 529.1  | 524.9  | 128.5  | 152.3  | 159.0  |
| 105°   | 662.0  | 727.4  | 133.0  | 156.7  | 165.5  |
| 107.5° | 816.6  | 870.9  | 137.3  | 161.1  | 169.9  |
| 110°   | 964.7  | 1010.3 | 381.1  | 163.5  | 171.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1104.1 | 1143.2 | 1106.3 | 167.6  | 174.3  |
| 115°   | 1252.1 | 1289.1 | 1343.6 | 335.4  | 178.7  |
| 117.5° | 1380.5 | 1424.1 | 1461.2 | 1149.7 | 579.3  |
| 120°   | 1524.4 | 1556.9 | 1596.3 | 1622.4 | 1328.4 |
| 122.5° | 1646.2 | 1681.1 | 1724.7 | 1737.7 | 1740.0 |
| 125°   | 1770.3 | 1798.8 | 1840.1 | 1855.4 | 1861.8 |
| 127.5° | 1883.6 | 1914.1 | 1946.9 | 1968.6 | 1970.7 |
| 130°   | 1990.3 | 2025.3 | 2049.1 | 2073.0 | 2071.0 |
| 132.5° | 2099.2 | 2127.6 | 2151.4 | 2171.0 | 2169.0 |
| 135°   | 2190.8 | 2225.6 | 2245.1 | 2267.0 | 2262.6 |
| 137.5° | 2286.4 | 2312.6 | 2334.5 | 2356.3 | 2349.7 |
| 140°   | 2380.0 | 2397.6 | 2421.4 | 2441.1 | 2430.2 |
| 142.5° | 2458.6 | 2473.9 | 2502.1 | 2519.3 | 2508.6 |
| 145°   | 2541.4 | 2539.1 | 2576.1 | 2591.3 | 2580.4 |
| 147.5° | 2613.0 | 2606.6 | 2643.5 | 2654.4 | 2645.9 |
| 150°   | 2682.8 | 2667.6 | 2702.5 | 2715.4 | 2704.6 |
| 152.5° | 2741.5 | 2724.2 | 2756.8 | 2769.9 | 2754.7 |
| 155°   | 2798.2 | 2778.7 | 2804.9 | 2817.8 | 2800.5 |
| 157.5° | 2843.9 | 2826.6 | 2846.3 | 2861.5 | 2843.9 |
| 160°   | 2883.3 | 2870.1 | 2883.3 | 2896.2 | 2880.9 |
| 162.5° | 2917.9 | 2904.9 | 2915.8 | 2931.1 | 2911.4 |
| 165°   | 2948.4 | 2935.4 | 2941.9 | 2957.2 | 2941.9 |
| 167.5° | 2972.4 | 2959.2 | 2966.0 | 2981.3 | 2961.5 |
| 170°   | 2992.0 | 2978.9 | 2983.3 | 2998.6 | 2978.9 |
| 172.5° | 3005.0 | 2992.0 | 2996.5 | 3011.8 | 2992.0 |
| 175°   | 3015.9 | 3000.6 | 3005.0 | 3020.3 | 2998.6 |
| 177.5° | 3020.3 | 3005.0 | 3007.4 | 3022.6 | 3002.9 |
| 180°   | 3009.4 | 3009.4 | 3009.4 | 3009.4 | 3009.4 |

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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 | 7.46             | 8.22  | 8.52  | 9.28  | 10.72 | 7.02           | 7.78  | 8.07  | 8.84  | 10.28 |
|                 | 3H   | 9.11             | 9.79  | 10.18 | 10.86 | 12.32 | 8.63           | 9.31  | 9.70  | 10.38 | 11.84 |
|                 | 4H   | 9.70             | 10.34 | 10.78 | 11.41 | 12.88 | 9.21           | 9.86  | 10.29 | 10.93 | 12.39 |
|                 | 6H   | 10.09            | 10.69 | 11.18 | 11.76 | 13.24 | 9.60           | 10.20 | 10.69 | 11.27 | 12.75 |
|                 | 8H   | 10.20            | 10.76 | 11.29 | 11.85 | 13.32 | 9.70           | 10.27 | 10.80 | 11.36 | 12.83 |
|                 | 12H  | 10.24            | 10.78 | 11.34 | 11.87 | 13.36 | 9.74           | 10.28 | 10.84 | 11.37 | 12.86 |
| 4H              | 2H   | 7.91             | 8.55  | 8.99  | 9.62  | 11.09 | 7.56           | 8.20  | 8.64  | 9.27  | 10.74 |
|                 | 3H   | 9.77             | 10.31 | 10.86 | 11.40 | 12.88 | 9.36           | 9.90  | 10.46 | 11.00 | 12.48 |
|                 | 4H   | 10.48            | 10.97 | 11.58 | 12.06 | 13.56 | 10.06          | 10.56 | 11.16 | 11.64 | 13.14 |
|                 | 6H   | 10.99            | 11.42 | 12.10 | 12.53 | 14.02 | 10.57          | 10.99 | 11.67 | 12.10 | 13.59 |
|                 | 8H   | 11.14            | 11.54 | 12.24 | 12.64 | 14.15 | 10.71          | 11.11 | 11.82 | 12.21 | 13.72 |
|                 | 12H  | 11.21            | 11.57 | 12.33 | 12.68 | 14.20 | 10.77          | 11.13 | 11.89 | 12.24 | 13.76 |
| 8H              | 4H   | 10.67            | 11.06 | 11.77 | 12.17 | 13.67 | 10.30          | 10.69 | 11.40 | 11.80 | 13.30 |
|                 | 6H   | 11.30            | 11.62 | 12.42 | 12.77 | 14.27 | 10.92          | 11.25 | 12.05 | 12.39 | 13.90 |
|                 | 8H   | 11.52            | 11.81 | 12.65 | 12.93 | 14.46 | 11.13          | 11.42 | 12.27 | 12.55 | 14.07 |
|                 | 12H  | 11.65            | 11.90 | 12.79 | 13.02 | 14.58 | 11.25          | 11.50 | 12.38 | 12.62 | 14.18 |
| 12H             | 4H   | 10.65            | 11.01 | 11.77 | 12.12 | 13.64 | 10.29          | 10.64 | 11.41 | 11.76 | 13.27 |
|                 | 6H   | 11.33            | 11.61 | 12.46 | 12.74 | 14.26 | 10.96          | 11.25 | 12.10 | 12.38 | 13.90 |
|                 | 8H   | 11.57            | 11.82 | 12.70 | 12.94 | 14.50 | 11.19          | 11.45 | 12.33 | 12.57 | 14.13 |

END OF REPORT