

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: P924208

Luminaire Tested: DFN2DIP-4P4F0-070D060US950-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P924208  
REPORT IS A COMBINATION OF REPORTS P899124 AND P895967  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-070D060US950-RLLFLL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

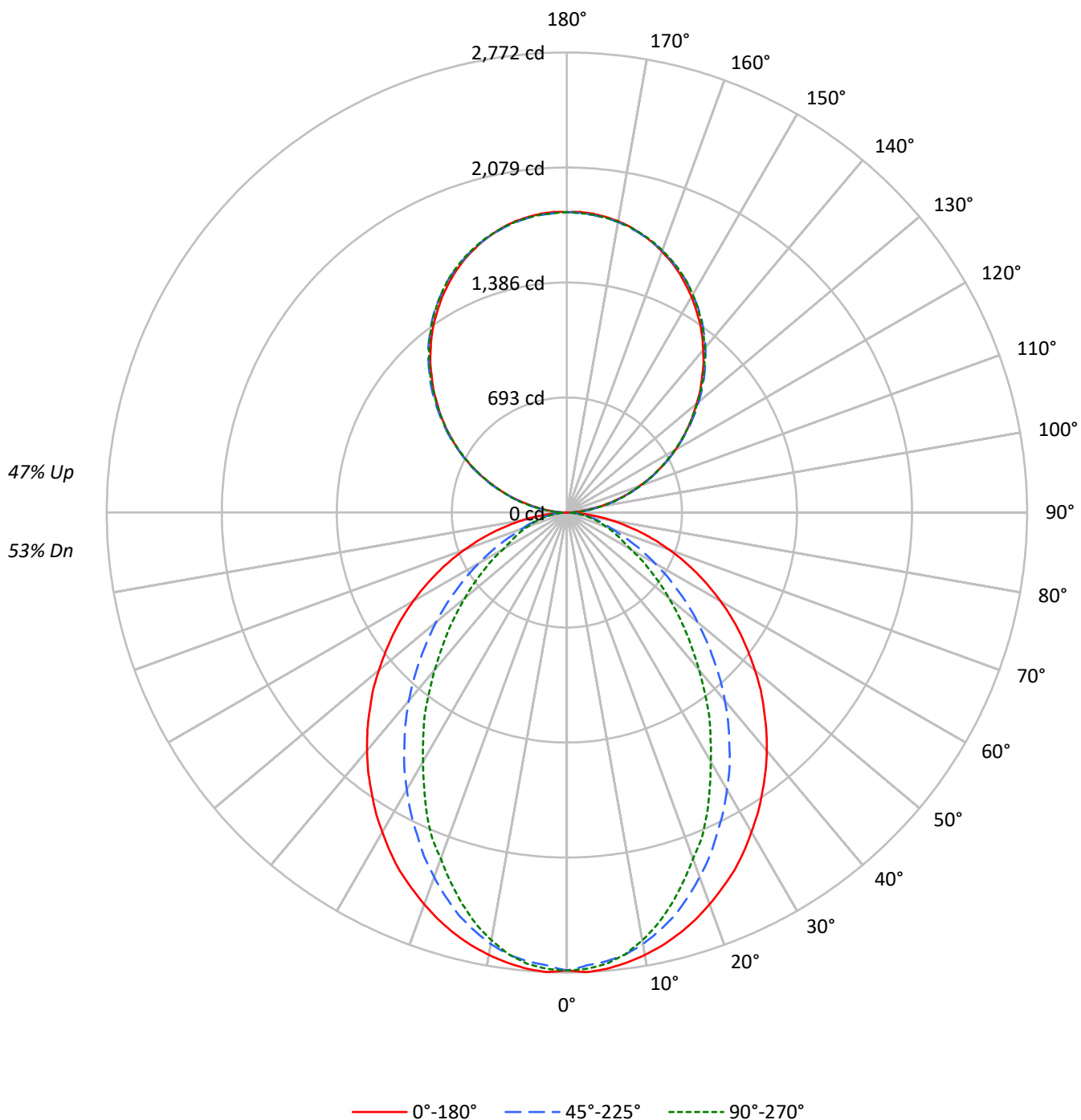
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 10742.0 lumens  
Efficiency: N/A  
Efficacy: 86.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 124.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P924208

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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   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 71 | 71 | 71 | 59 | 59 | 59 |
| 1   | 99  | 95  | 91  | 88  | 92  | 88  | 85  | 82  | 75 | 73 | 71 | 64 | 62 | 60 | 53 | 52 | 51 |
| 2   | 91  | 83  | 77  | 72  | 84  | 78  | 72  | 68  | 67 | 63 | 59 | 56 | 54 | 51 | 47 | 45 | 43 |
| 3   | 83  | 74  | 67  | 61  | 77  | 69  | 62  | 57  | 59 | 54 | 51 | 50 | 47 | 44 | 42 | 40 | 38 |
| 4   | 76  | 66  | 58  | 52  | 70  | 61  | 54  | 49  | 53 | 48 | 44 | 45 | 41 | 38 | 38 | 35 | 33 |
| 5   | 70  | 59  | 51  | 45  | 65  | 55  | 48  | 43  | 48 | 42 | 38 | 41 | 37 | 33 | 34 | 31 | 29 |
| 6   | 65  | 53  | 45  | 39  | 60  | 50  | 42  | 37  | 43 | 38 | 33 | 37 | 33 | 30 | 31 | 28 | 26 |
| 7   | 60  | 48  | 40  | 35  | 56  | 45  | 38  | 33  | 39 | 34 | 30 | 34 | 30 | 26 | 29 | 26 | 23 |
| 8   | 56  | 44  | 36  | 31  | 52  | 41  | 34  | 29  | 36 | 30 | 27 | 31 | 27 | 24 | 27 | 23 | 21 |
| 9   | 52  | 40  | 33  | 28  | 48  | 38  | 31  | 26  | 33 | 28 | 24 | 29 | 24 | 21 | 25 | 21 | 19 |
| 10  | 49  | 37  | 30  | 25  | 45  | 35  | 28  | 24  | 31 | 25 | 22 | 27 | 22 | 19 | 23 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1791 | 1791 | 1791 |
| 5°  | 1794 | 1763 | 1774 |
| 10° | 1776 | 1729 | 1717 |
| 15° | 1752 | 1672 | 1628 |
| 20° | 1719 | 1594 | 1519 |
| 25° | 1686 | 1506 | 1414 |
| 30° | 1642 | 1416 | 1280 |
| 35° | 1599 | 1319 | 1163 |
| 40° | 1554 | 1219 | 1028 |
| 45° | 1503 | 1107 | 906  |
| 50° | 1450 | 995  | 786  |
| 55° | 1395 | 875  | 672  |
| 60° | 1331 | 749  | 553  |
| 65° | 1257 | 621  | 499  |
| 70° | 1167 | 501  | 452  |
| 75° | 1055 | 443  | 413  |
| 80° | 893  | 374  | 361  |
| 85° | 624  | 253  | 276  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1503 cd/sqm

TEST NUMBER: P924208

CATALOG NUMBER: DFN2DIP-4P4F0-070D060US950-RLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 258.7   | 2.4       |
| 10°-20°   | 710.1   | 6.6       |
| 20°-30°   | 997.0   | 9.3       |
| 30°-40°   | 1086.8  | 10.1      |
| 40°-50°   | 998.8   | 9.3       |
| 50°-60°   | 784.4   | 7.3       |
| 60°-70°   | 510.6   | 4.8       |
| 70°-80°   | 262.8   | 2.4       |
| 80°-90°   | 72.2    | 0.7       |
| 90°-100°  | 112.0   | 1.0       |
| 100°-110° | 355.9   | 3.3       |
| 110°-120° | 609.1   | 5.7       |
| 120°-130° | 801.1   | 7.5       |
| 130°-140° | 899.2   | 8.4       |
| 140°-150° | 881.7   | 8.2       |
| 150°-160° | 739.6   | 6.9       |
| 160°-170° | 490.5   | 4.6       |
| 170°-180° | 171.4   | 1.6       |
| 0°-30°    | 1965.7  | 18.3      |
| 0°-40°    | 3052.5  | 28.4      |
| 0°-60°    | 4835.8  | 45.0      |
| 0°-90°    | 5681.4  | 52.9      |
| 90°-120°  | 1077.0  | 10.0      |
| 90°-150°  | 3659.0  | 34.1      |
| 90°-180°  | 5061.0  | 47.1      |
| 0°-180°   | 10742.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2760 | 2760  | 2760 | 2760  | 2760 |      |
| 5°   | 2760 | 2748  | 2715 | 2738  | 2730 | 262  |
| 15°  | 2625 | 2598  | 2513 | 2465  | 2440 | 740  |
| 25°  | 2383 | 2303  | 2138 | 2036  | 1998 | 1096 |
| 35°  | 2053 | 1926  | 1706 | 1549  | 1494 | 1285 |
| 45°  | 1679 | 1511  | 1249 | 1071  | 1012 | 1296 |
| 55°  | 1276 | 1082  | 812  | 662   | 615  | 1140 |
| 65°  | 862  | 659   | 435  | 350   | 342  | 854  |
| 75°  | 460  | 285   | 200  | 182   | 180  | 486  |
| 85°  | 107  | 55    | 47   | 47    | 47   | 123  |
| 90°  | 2    | 20    | 54   | 50    | 52   | 11   |
| 95°  | 80   | 95    | 98   | 98    | 95   | 89   |
| 105° | 329  | 333   | 336  | 339   | 339  | 347  |
| 115° | 611  | 620   | 617  | 616   | 611  | 605  |
| 125° | 889  | 903   | 898  | 893   | 892  | 794  |
| 135° | 1150 | 1167  | 1170 | 1168  | 1164 | 889  |
| 145° | 1396 | 1407  | 1416 | 1417  | 1411 | 872  |
| 155° | 1596 | 1601  | 1606 | 1613  | 1608 | 735  |
| 165° | 1737 | 1735  | 1735 | 1746  | 1738 | 490  |
| 175° | 1807 | 1803  | 1799 | 1810  | 1801 | 172  |
| 180° | 1810 | 1810  | 1810 | 1810  | 1810 |      |

TEST NUMBER: P924208

CATALOG NUMBER: DFN2DIP-4P4F0-070D060US950-RLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2760.0 | 2760.0 | 2760.0 | 2760.0 | 2760.0 |
| 2.5°   | 2772.4 | 2760.0 | 2732.4 | 2757.6 | 2752.6 |
| 5°     | 2760.0 | 2747.5 | 2715.0 | 2737.5 | 2730.1 |
| 7.5°   | 2737.5 | 2722.6 | 2687.7 | 2697.4 | 2685.0 |
| 10°    | 2707.5 | 2690.1 | 2640.2 | 2632.6 | 2617.7 |
| 12.5°  | 2670.2 | 2647.6 | 2580.1 | 2565.2 | 2537.6 |
| 15°    | 2625.1 | 2597.6 | 2512.7 | 2465.3 | 2440.4 |
| 17.5°  | 2572.7 | 2532.7 | 2427.7 | 2372.8 | 2332.8 |
| 20°    | 2512.7 | 2462.7 | 2337.9 | 2275.6 | 2220.4 |
| 22.5°  | 2447.9 | 2390.3 | 2245.3 | 2160.5 | 2123.2 |
| 25°    | 2382.9 | 2302.9 | 2138.0 | 2035.7 | 1998.2 |
| 27.5°  | 2305.5 | 2220.4 | 2038.1 | 1920.8 | 1863.3 |
| 30°    | 2223.1 | 2128.0 | 1928.1 | 1801.0 | 1733.4 |
| 32.5°  | 2143.1 | 2028.1 | 1823.5 | 1673.5 | 1610.9 |
| 35°    | 2053.2 | 1925.7 | 1706.1 | 1548.7 | 1493.6 |
| 37.5°  | 1965.8 | 1828.2 | 1596.1 | 1423.6 | 1361.4 |
| 40°    | 1873.3 | 1723.6 | 1481.1 | 1303.8 | 1238.9 |
| 42.5°  | 1778.4 | 1618.7 | 1366.3 | 1181.3 | 1119.1 |
| 45°    | 1678.6 | 1511.0 | 1249.0 | 1071.4 | 1011.5 |
| 47.5°  | 1583.6 | 1406.4 | 1136.6 | 959.1  | 904.2  |
| 50°    | 1478.7 | 1301.4 | 1026.6 | 854.1  | 801.9  |
| 52.5°  | 1376.1 | 1188.8 | 921.7  | 756.8  | 709.4  |
| 55°    | 1276.3 | 1081.5 | 811.7  | 662.0  | 614.6  |
| 57.5°  | 1174.0 | 974.1  | 714.5  | 574.5  | 534.5  |
| 60°    | 1069.1 | 869.2  | 611.9  | 484.7  | 444.7  |
| 62.5°  | 966.7  | 766.9  | 524.4  | 404.7  | 384.7  |
| 65°    | 861.7  | 659.3  | 434.6  | 349.8  | 342.1  |
| 67.5°  | 761.9  | 559.4  | 349.8  | 307.1  | 299.7  |
| 70°    | 656.9  | 462.1  | 289.6  | 264.7  | 254.6  |
| 72.5°  | 557.0  | 372.1  | 242.2  | 222.4  | 217.3  |
| 75°    | 459.5  | 284.6  | 199.8  | 182.3  | 179.9  |
| 77.5°  | 362.2  | 202.2  | 157.4  | 147.3  | 142.3  |
| 80°    | 272.2  | 144.9  | 119.8  | 110.0  | 110.0  |
| 82.5°  | 189.8  | 97.5   | 82.4   | 77.4   | 77.4   |
| 85°    | 107.3  | 54.9   | 47.4   | 47.4   | 47.4   |
| 87.5°  | 40.0   | 19.8   | 19.8   | 17.5   | 17.5   |
| 90°    | 1.6    | 19.7   | 53.5   | 50.2   | 51.8   |
| 92.5°  | 33.9   | 45.9   | 47.5   | 49.1   | 49.1   |
| 95°    | 79.7   | 94.9   | 97.7   | 97.7   | 94.9   |
| 97.5°  | 132.6  | 146.8  | 152.8  | 152.8  | 152.8  |
| 100°   | 193.8  | 206.3  | 210.6  | 210.6  | 209.0  |
| 102.5° | 258.2  | 267.4  | 273.4  | 275.0  | 273.4  |
| 105°   | 328.6  | 332.9  | 336.2  | 339.0  | 339.0  |
| 107.5° | 398.4  | 405.0  | 405.0  | 406.0  | 398.4  |
| 110°   | 466.1  | 474.8  | 474.8  | 474.8  | 470.4  |

TEST NUMBER: P924208

CATALOG NUMBER: DFN2DIP-4P4F0-070D060US950-RLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 539.2  | 548.5  | 546.8  | 542.4  | 539.2  |
| 115°   | 611.2  | 620.0  | 617.2  | 615.6  | 611.2  |
| 117.5° | 682.8  | 694.8  | 687.1  | 682.8  | 678.4  |
| 120°   | 754.8  | 766.8  | 754.8  | 754.8  | 749.8  |
| 122.5° | 820.2  | 835.5  | 827.9  | 823.6  | 820.2  |
| 125°   | 889.0  | 902.7  | 898.3  | 893.4  | 891.8  |
| 127.5° | 956.2  | 973.1  | 967.1  | 960.6  | 956.2  |
| 130°   | 1019.0 | 1038.6 | 1035.9 | 1032.6 | 1026.6 |
| 132.5° | 1089.4 | 1104.6 | 1105.7 | 1098.1 | 1093.7 |
| 135°   | 1150.0 | 1166.8 | 1170.1 | 1168.5 | 1164.1 |
| 137.5° | 1217.6 | 1231.2 | 1234.0 | 1232.9 | 1226.4 |
| 140°   | 1277.1 | 1290.8 | 1298.4 | 1298.4 | 1292.4 |
| 142.5° | 1338.2 | 1351.8 | 1356.2 | 1357.8 | 1351.8 |
| 145°   | 1396.1 | 1407.0 | 1415.7 | 1417.4 | 1411.3 |
| 147.5° | 1447.9 | 1461.5 | 1468.1 | 1470.8 | 1464.8 |
| 150°   | 1501.4 | 1510.7 | 1516.7 | 1521.5 | 1516.7 |
| 152.5° | 1548.8 | 1558.2 | 1565.8 | 1571.8 | 1565.8 |
| 155°   | 1596.3 | 1600.7 | 1605.6 | 1613.3 | 1608.3 |
| 157.5° | 1637.3 | 1640.6 | 1643.3 | 1654.2 | 1646.6 |
| 160°   | 1673.9 | 1677.1 | 1678.8 | 1688.0 | 1681.5 |
| 162.5° | 1707.7 | 1707.7 | 1709.3 | 1719.7 | 1712.0 |
| 165°   | 1736.6 | 1734.9 | 1734.9 | 1745.9 | 1738.3 |
| 167.5° | 1762.8 | 1757.9 | 1757.9 | 1768.8 | 1761.2 |
| 170°   | 1782.5 | 1778.1 | 1776.4 | 1787.3 | 1778.1 |
| 172.5° | 1796.1 | 1791.7 | 1790.1 | 1801.0 | 1791.7 |
| 175°   | 1807.0 | 1802.7 | 1799.3 | 1810.3 | 1801.0 |
| 177.5° | 1813.0 | 1808.7 | 1805.3 | 1814.6 | 1805.3 |
| 180°   | 1810.3 | 1810.3 | 1810.3 | 1810.3 | 1810.3 |

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CATALOG NUMBER: DFN2DIP-4P4F0-070D060US950-RLLFLL

**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 | 9.45             | 10.31 | 10.39 | 11.26 | 12.49 | 5.42           | 6.27 | 6.35  | 7.22  | 8.45  |
|                 | 3H   | 11.14            | 11.90 | 12.09 | 12.86 | 14.12 | 6.61           | 7.37 | 7.56  | 8.33  | 9.59  |
|                 | 4H   | 11.75            | 12.48 | 12.72 | 13.44 | 14.70 | 7.06           | 7.78 | 8.02  | 8.75  | 10.01 |
|                 | 6H   | 12.18            | 12.85 | 13.16 | 13.82 | 15.09 | 7.38           | 8.05 | 8.36  | 9.02  | 10.30 |
|                 | 8H   | 12.31            | 12.94 | 13.29 | 13.93 | 15.20 | 7.48           | 8.11 | 8.46  | 9.09  | 10.37 |
|                 | 12H  | 12.38            | 12.98 | 13.36 | 13.96 | 15.26 | 7.52           | 8.12 | 8.51  | 9.10  | 10.40 |
| 4H              | 2H   | 9.48             | 10.20 | 10.45 | 11.16 | 12.43 | 6.02           | 6.74 | 6.99  | 7.70  | 8.97  |
|                 | 3H   | 11.31            | 11.91 | 12.29 | 12.91 | 14.19 | 7.37           | 7.97 | 8.35  | 8.97  | 10.24 |
|                 | 4H   | 12.01            | 12.56 | 13.00 | 13.55 | 14.85 | 7.92           | 8.47 | 8.91  | 9.46  | 10.76 |
|                 | 6H   | 12.53            | 13.00 | 13.53 | 14.02 | 15.32 | 8.34           | 8.81 | 9.34  | 9.83  | 11.13 |
|                 | 8H   | 12.71            | 13.15 | 13.71 | 14.16 | 15.47 | 8.47           | 8.91 | 9.48  | 9.92  | 11.23 |
|                 | 12H  | 12.81            | 13.21 | 13.83 | 14.23 | 15.55 | 8.54           | 8.94 | 9.56  | 9.96  | 11.28 |
| 8H              | 4H   | 11.98            | 12.42 | 12.98 | 13.43 | 14.74 | 8.21           | 8.65 | 9.21  | 9.65  | 10.97 |
|                 | 6H   | 12.55            | 12.92 | 13.58 | 13.96 | 15.28 | 8.73           | 9.09 | 9.75  | 10.14 | 11.45 |
|                 | 8H   | 12.77            | 13.09 | 13.81 | 14.13 | 15.46 | 8.92           | 9.24 | 9.96  | 10.27 | 11.61 |
|                 | 12H  | 12.92            | 13.20 | 13.96 | 14.23 | 15.60 | 9.04           | 9.33 | 10.08 | 10.35 | 11.73 |
| 12H             | 4H   | 11.93            | 12.33 | 12.95 | 13.35 | 14.67 | 8.21           | 8.61 | 9.23  | 9.63  | 10.95 |
|                 | 6H   | 12.53            | 12.85 | 13.56 | 13.88 | 15.21 | 8.78           | 9.10 | 9.81  | 10.13 | 11.46 |
|                 | 8H   | 12.76            | 13.04 | 13.79 | 14.06 | 15.44 | 8.99           | 9.28 | 10.03 | 10.30 | 11.68 |

END OF REPORT