

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: P913936

Luminaire Tested: DFN2DIP-PN3F0-050D080US927-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P913936  
REPORT IS A COMBINATION OF REPORTS P899585 AND P896399  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN3F0-050D080US927-FLLFLL  
Description: 3 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

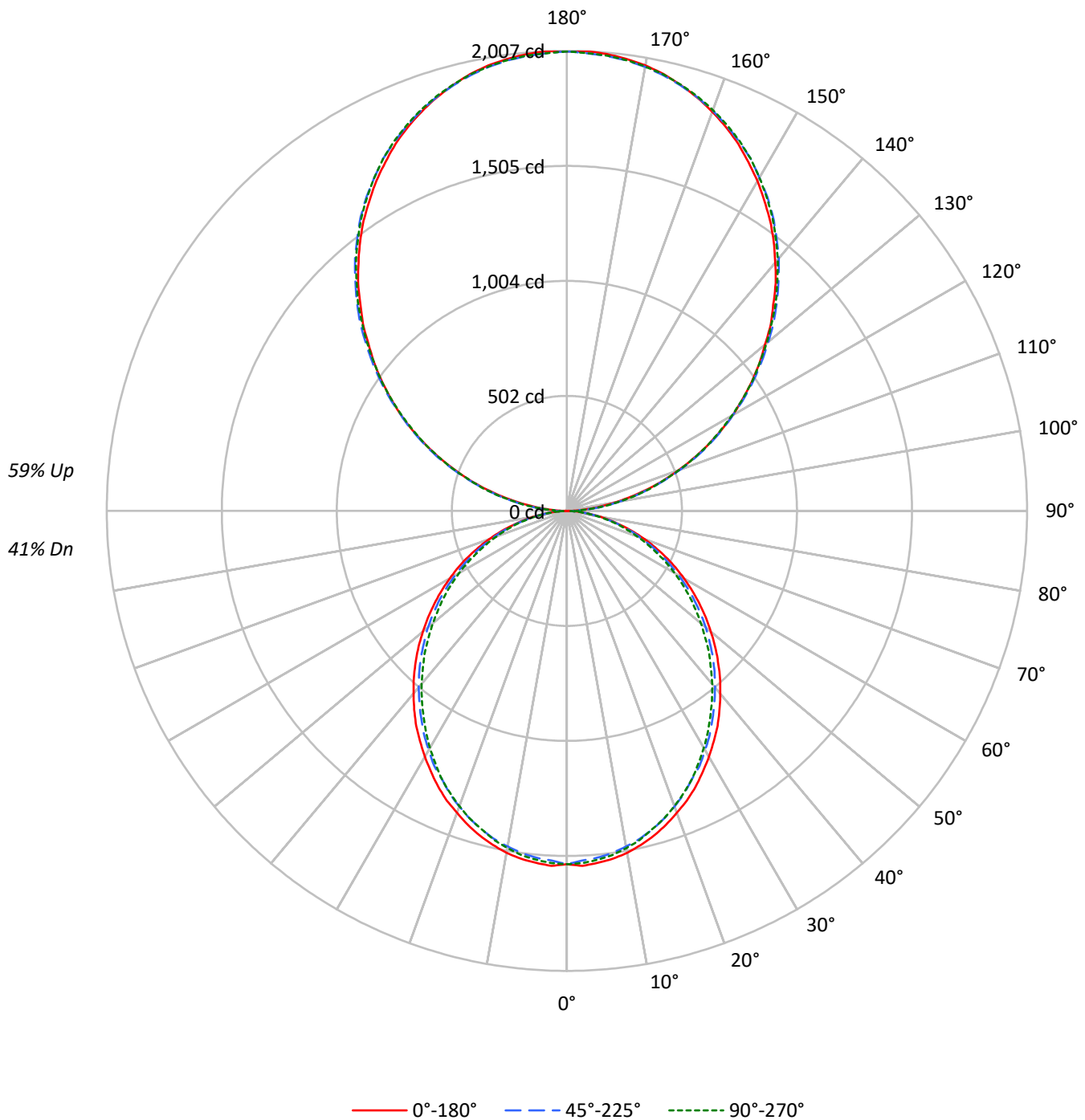
Lumens per Lamp: N/A  
Luminaire Lumens: 9529.9 lumens  
Efficiency: N/A  
Efficacy: 89.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.96' x L: 3.11' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 106.4  
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

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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   | 105 | 105 | 105 | 105 | 96 | 96 | 96 | 96 | 78 | 78 | 78 | 63 | 63 | 63 | 48 | 48 | 48 |
| 1   | 96  | 92  | 88  | 84  | 87 | 84 | 80 | 77 | 69 | 66 | 64 | 55 | 53 | 52 | 42 | 41 | 41 |
| 2   | 87  | 80  | 74  | 69  | 79 | 73 | 68 | 63 | 60 | 56 | 53 | 48 | 46 | 43 | 37 | 36 | 34 |
| 3   | 80  | 70  | 63  | 57  | 72 | 64 | 58 | 53 | 53 | 48 | 45 | 43 | 39 | 37 | 33 | 31 | 29 |
| 4   | 73  | 62  | 54  | 48  | 66 | 57 | 50 | 45 | 47 | 42 | 38 | 38 | 34 | 31 | 30 | 27 | 25 |
| 5   | 67  | 55  | 47  | 41  | 61 | 51 | 44 | 38 | 42 | 37 | 33 | 34 | 30 | 27 | 27 | 24 | 22 |
| 6   | 61  | 50  | 42  | 36  | 56 | 46 | 38 | 33 | 38 | 33 | 29 | 31 | 27 | 24 | 24 | 21 | 19 |
| 7   | 57  | 45  | 37  | 31  | 52 | 41 | 34 | 29 | 34 | 29 | 25 | 28 | 24 | 21 | 22 | 19 | 17 |
| 8   | 53  | 40  | 33  | 28  | 48 | 37 | 31 | 26 | 31 | 26 | 22 | 26 | 22 | 19 | 20 | 17 | 15 |
| 9   | 49  | 37  | 30  | 25  | 45 | 34 | 27 | 23 | 29 | 23 | 20 | 24 | 20 | 17 | 19 | 16 | 14 |
| 10  | 46  | 34  | 27  | 22  | 42 | 31 | 25 | 21 | 26 | 21 | 18 | 22 | 18 | 15 | 17 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1802 | 1802 | 1802 |
| 5°  | 1803 | 1775 | 1788 |
| 10° | 1788 | 1750 | 1763 |
| 15° | 1760 | 1720 | 1724 |
| 20° | 1724 | 1679 | 1685 |
| 25° | 1687 | 1630 | 1639 |
| 30° | 1642 | 1584 | 1582 |
| 35° | 1599 | 1530 | 1521 |
| 40° | 1546 | 1475 | 1463 |
| 45° | 1493 | 1421 | 1403 |
| 50° | 1435 | 1363 | 1334 |
| 55° | 1375 | 1297 | 1271 |
| 60° | 1306 | 1218 | 1198 |
| 65° | 1231 | 1137 | 1112 |
| 70° | 1136 | 1037 | 1020 |
| 75° | 1004 | 918  | 933  |
| 80° | 844  | 765  | 770  |
| 85° | 595  | 506  | 502  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1986 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 145.1  | 1.5       |
| 10°-20°   | 408.1  | 4.3       |
| 20°-30°   | 599.8  | 6.3       |
| 30°-40°   | 696.6  | 7.3       |
| 40°-50°   | 695.8  | 7.3       |
| 50°-60°   | 606.7  | 6.4       |
| 60°-70°   | 448.5  | 4.7       |
| 70°-80°   | 253.7  | 2.7       |
| 80°-90°   | 72.7   | 0.8       |
| 90°-100°  | 124.0  | 1.3       |
| 100°-110° | 394.1  | 4.1       |
| 110°-120° | 674.4  | 7.1       |
| 120°-130° | 886.9  | 9.3       |
| 130°-140° | 995.5  | 10.4      |
| 140°-150° | 976.2  | 10.2      |
| 150°-160° | 818.9  | 8.6       |
| 160°-170° | 543.1  | 5.7       |
| 170°-180° | 189.8  | 2.0       |
| 0°-30°    | 1153.0 | 12.1      |
| 0°-40°    | 1849.6 | 19.4      |
| 0°-60°    | 3152.1 | 33.1      |
| 0°-90°    | 3927.0 | 41.2      |
| 90°-120°  | 1192.5 | 12.5      |
| 90°-150°  | 4051.1 | 42.5      |
| 90°-180°  | 5603.0 | 58.8      |
| 0°-180°   | 9529.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1541 | 1541  | 1541 | 1541  | 1541 |      |
| 5°   | 1541 | 1535  | 1519 | 1531  | 1528 | 146  |
| 15°  | 1467 | 1458  | 1439 | 1445  | 1438 | 413  |
| 25°  | 1328 | 1316  | 1291 | 1294  | 1291 | 611  |
| 35°  | 1146 | 1131  | 1107 | 1098  | 1091 | 715  |
| 45°  | 932  | 922   | 900  | 883   | 877  | 719  |
| 55°  | 706  | 697   | 679  | 661   | 654  | 631  |
| 65°  | 476  | 467   | 452  | 439   | 431  | 470  |
| 75°  | 249  | 246   | 238  | 230   | 233  | 266  |
| 85°  | 61   | 59    | 58   | 53    | 52   | 68   |
| 90°  | 2    | 22    | 59   | 56    | 57   | 9    |
| 95°  | 88   | 105   | 108  | 108   | 105  | 98   |
| 105° | 364  | 369   | 372  | 375   | 375  | 384  |
| 115° | 677  | 686   | 683  | 682   | 677  | 669  |
| 125° | 984  | 999   | 995  | 989   | 987  | 880  |
| 135° | 1273 | 1292  | 1296 | 1294  | 1289 | 984  |
| 145° | 1546 | 1558  | 1567 | 1569  | 1563 | 966  |
| 155° | 1767 | 1772  | 1778 | 1786  | 1781 | 813  |
| 165° | 1923 | 1921  | 1921 | 1933  | 1924 | 542  |
| 175° | 2001 | 1996  | 1992 | 2004  | 1994 | 190  |
| 180° | 2004 | 2004  | 2004 | 2004  | 2004 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1541.2 | 1541.2 | 1541.2 | 1541.2 | 1541.2 |
| 2.5°   | 1550.1 | 1542.8 | 1526.5 | 1541.2 | 1538.4 |
| 5°     | 1541.2 | 1535.4 | 1519.0 | 1530.8 | 1528.0 |
| 7.5°   | 1530.8 | 1522.0 | 1505.7 | 1517.7 | 1514.7 |
| 10°    | 1514.7 | 1504.3 | 1486.5 | 1498.3 | 1493.9 |
| 12.5°  | 1492.3 | 1483.5 | 1465.8 | 1473.1 | 1470.1 |
| 15°    | 1467.1 | 1458.3 | 1439.0 | 1445.0 | 1437.6 |
| 17.5°  | 1436.0 | 1427.2 | 1407.9 | 1415.2 | 1407.9 |
| 20°    | 1401.9 | 1393.1 | 1372.4 | 1376.7 | 1370.9 |
| 22.5°  | 1367.9 | 1354.6 | 1335.2 | 1335.2 | 1332.2 |
| 25°    | 1327.9 | 1316.1 | 1290.9 | 1293.7 | 1290.9 |
| 27.5°  | 1283.3 | 1273.0 | 1253.8 | 1249.3 | 1242.0 |
| 30°    | 1239.0 | 1227.1 | 1204.9 | 1200.5 | 1194.5 |
| 32.5°  | 1191.5 | 1182.7 | 1159.0 | 1150.0 | 1144.1 |
| 35°    | 1145.6 | 1130.8 | 1107.1 | 1098.1 | 1090.8 |
| 37.5°  | 1093.7 | 1080.4 | 1056.6 | 1046.2 | 1038.9 |
| 40°    | 1040.5 | 1028.5 | 1004.7 | 991.5  | 985.6  |
| 42.5°  | 988.6  | 976.6  | 953.0  | 938.0  | 929.2  |
| 45°    | 932.2  | 921.9  | 899.5  | 883.4  | 877.3  |
| 47.5°  | 877.3  | 867.0  | 843.3  | 826.9  | 818.1  |
| 50°    | 819.5  | 812.1  | 791.4  | 770.6  | 763.2  |
| 52.5°  | 763.2  | 752.8  | 733.6  | 717.3  | 706.9  |
| 55°    | 705.5  | 696.6  | 678.7  | 661.0  | 653.6  |
| 57.5°  | 647.6  | 640.2  | 620.9  | 603.2  | 597.1  |
| 60°    | 589.8  | 584.0  | 563.2  | 546.8  | 542.5  |
| 62.5°  | 533.5  | 523.2  | 508.3  | 493.5  | 487.6  |
| 65°    | 475.8  | 466.8  | 452.0  | 438.7  | 431.3  |
| 67.5°  | 416.5  | 409.0  | 395.8  | 385.4  | 379.4  |
| 70°    | 361.6  | 355.7  | 342.3  | 331.9  | 326.1  |
| 72.5°  | 305.4  | 299.4  | 292.0  | 281.6  | 277.2  |
| 75°    | 248.9  | 246.1  | 238.5  | 229.7  | 232.7  |
| 77.5°  | 198.6  | 192.6  | 189.6  | 185.2  | 180.9  |
| 80°    | 148.3  | 146.7  | 143.7  | 139.3  | 136.3  |
| 82.5°  | 100.8  | 100.8  | 99.3   | 93.4   | 93.4   |
| 85°    | 60.7   | 59.3   | 57.8   | 53.3   | 51.9   |
| 87.5°  | 26.7   | 23.8   | 20.8   | 16.3   | 14.8   |
| 90°    | 1.8    | 21.8   | 59.3   | 55.6   | 57.4   |
| 92.5°  | 37.5   | 50.8   | 52.6   | 54.3   | 54.3   |
| 95°    | 88.2   | 105.1  | 108.1  | 108.1  | 105.1  |
| 97.5°  | 146.9  | 162.6  | 169.2  | 169.2  | 169.2  |
| 100°   | 214.5  | 228.4  | 233.2  | 233.2  | 231.4  |
| 102.5° | 285.8  | 296.1  | 302.7  | 304.5  | 302.7  |
| 105°   | 363.8  | 368.6  | 372.2  | 375.3  | 375.3  |
| 107.5° | 441.1  | 448.4  | 448.4  | 449.6  | 441.1  |
| 110°   | 516.0  | 525.7  | 525.7  | 525.7  | 520.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 597.0  | 607.3  | 605.5  | 600.6  | 597.0  |
| 115°   | 676.8  | 686.4  | 683.4  | 681.6  | 676.8  |
| 117.5° | 755.9  | 769.2  | 760.7  | 755.9  | 751.1  |
| 120°   | 835.7  | 849.0  | 835.7  | 835.7  | 830.2  |
| 122.5° | 908.2  | 925.1  | 916.6  | 911.8  | 908.2  |
| 125°   | 984.3  | 999.4  | 994.6  | 989.1  | 987.4  |
| 127.5° | 1058.7 | 1077.4 | 1070.7 | 1063.5 | 1058.7 |
| 130°   | 1128.1 | 1149.9 | 1146.8 | 1143.3 | 1136.6 |
| 132.5° | 1206.1 | 1223.0 | 1224.2 | 1215.8 | 1210.9 |
| 135°   | 1273.1 | 1291.9 | 1295.5 | 1293.7 | 1288.9 |
| 137.5° | 1348.1 | 1363.2 | 1366.2 | 1365.0 | 1357.7 |
| 140°   | 1414.0 | 1429.0 | 1437.5 | 1437.5 | 1430.8 |
| 142.5° | 1481.6 | 1496.7 | 1501.6 | 1503.4 | 1496.7 |
| 145°   | 1545.7 | 1557.7 | 1567.4 | 1569.2 | 1562.6 |
| 147.5° | 1603.1 | 1618.2 | 1625.4 | 1628.5 | 1621.8 |
| 150°   | 1662.3 | 1672.5 | 1679.2 | 1684.7 | 1679.2 |
| 152.5° | 1714.8 | 1725.1 | 1733.6 | 1740.3 | 1733.6 |
| 155°   | 1767.4 | 1772.3 | 1777.7 | 1786.1 | 1780.7 |
| 157.5° | 1812.7 | 1816.4 | 1819.4 | 1831.4 | 1823.0 |
| 160°   | 1853.2 | 1856.9 | 1858.7 | 1868.9 | 1861.7 |
| 162.5° | 1890.7 | 1890.7 | 1892.5 | 1904.0 | 1895.5 |
| 165°   | 1922.7 | 1920.9 | 1920.9 | 1933.0 | 1924.5 |
| 167.5° | 1951.7 | 1946.3 | 1946.3 | 1958.4 | 1949.9 |
| 170°   | 1973.5 | 1968.6 | 1966.8 | 1978.9 | 1968.6 |
| 172.5° | 1988.6 | 1983.8 | 1982.0 | 1994.0 | 1983.8 |
| 175°   | 2000.7 | 1995.8 | 1992.2 | 2004.3 | 1994.0 |
| 177.5° | 2007.3 | 2002.5 | 1998.8 | 2009.1 | 1998.8 |
| 180°   | 2004.3 | 2004.3 | 2004.3 | 2004.3 | 2004.3 |

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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 | 8.40             | 9.19  | 9.43  | 10.23 | 11.62 | 7.97           | 8.75  | 9.00  | 9.79  | 11.18 |
|                 | 3H   | 10.05            | 10.76 | 11.09 | 11.80 | 13.22 | 9.57           | 10.28 | 10.61 | 11.32 | 12.73 |
|                 | 4H   | 10.63            | 11.30 | 11.68 | 12.35 | 13.77 | 10.15          | 10.82 | 11.20 | 11.87 | 13.28 |
|                 | 6H   | 11.03            | 11.64 | 12.09 | 12.69 | 14.12 | 10.54          | 11.15 | 11.60 | 12.20 | 13.63 |
|                 | 8H   | 11.13            | 11.71 | 12.19 | 12.78 | 14.21 | 10.64          | 11.22 | 11.70 | 12.29 | 13.71 |
|                 | 12H  | 11.17            | 11.73 | 12.24 | 12.79 | 14.24 | 10.67          | 11.23 | 11.74 | 12.29 | 13.74 |
| 4H              | 2H   | 8.85             | 9.52  | 9.91  | 10.57 | 11.99 | 8.50           | 9.17  | 9.56  | 10.22 | 11.64 |
|                 | 3H   | 10.71            | 11.26 | 11.77 | 12.34 | 13.77 | 10.30          | 10.86 | 11.37 | 11.94 | 13.37 |
|                 | 4H   | 11.41            | 11.92 | 12.48 | 12.99 | 14.44 | 11.00          | 11.51 | 12.07 | 12.57 | 14.03 |
|                 | 6H   | 11.92            | 12.36 | 13.00 | 13.45 | 14.89 | 11.49          | 11.93 | 12.57 | 13.02 | 14.47 |
|                 | 8H   | 12.06            | 12.47 | 13.14 | 13.55 | 15.02 | 11.64          | 12.05 | 12.72 | 13.13 | 14.59 |
|                 | 12H  | 12.13            | 12.50 | 13.23 | 13.60 | 15.06 | 11.69          | 12.06 | 12.79 | 13.16 | 14.63 |
| 8H              | 4H   | 11.60            | 12.01 | 12.68 | 13.09 | 14.55 | 11.23          | 11.64 | 12.31 | 12.72 | 14.18 |
|                 | 6H   | 12.22            | 12.56 | 13.32 | 13.68 | 15.14 | 11.84          | 12.18 | 12.95 | 13.31 | 14.77 |
|                 | 8H   | 12.43            | 12.73 | 13.55 | 13.84 | 15.32 | 12.05          | 12.35 | 13.16 | 13.46 | 14.94 |
|                 | 12H  | 12.56            | 12.82 | 13.67 | 13.92 | 15.44 | 12.16          | 12.42 | 13.27 | 13.52 | 15.04 |
| 12H             | 4H   | 11.58            | 11.95 | 12.68 | 13.05 | 14.51 | 11.22          | 11.59 | 12.32 | 12.68 | 14.15 |
|                 | 6H   | 12.25            | 12.54 | 13.36 | 13.65 | 15.13 | 11.88          | 12.18 | 12.99 | 13.29 | 14.77 |
|                 | 8H   | 12.48            | 12.74 | 13.59 | 13.84 | 15.36 | 12.11          | 12.37 | 13.22 | 13.47 | 14.99 |

END OF REPORT