

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: P914069

Luminaire Tested: DFN2DIP-PN4F0-040D070US927-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P914069  
REPORT IS A COMBINATION OF REPORTS P901183 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-040D070US927-FLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

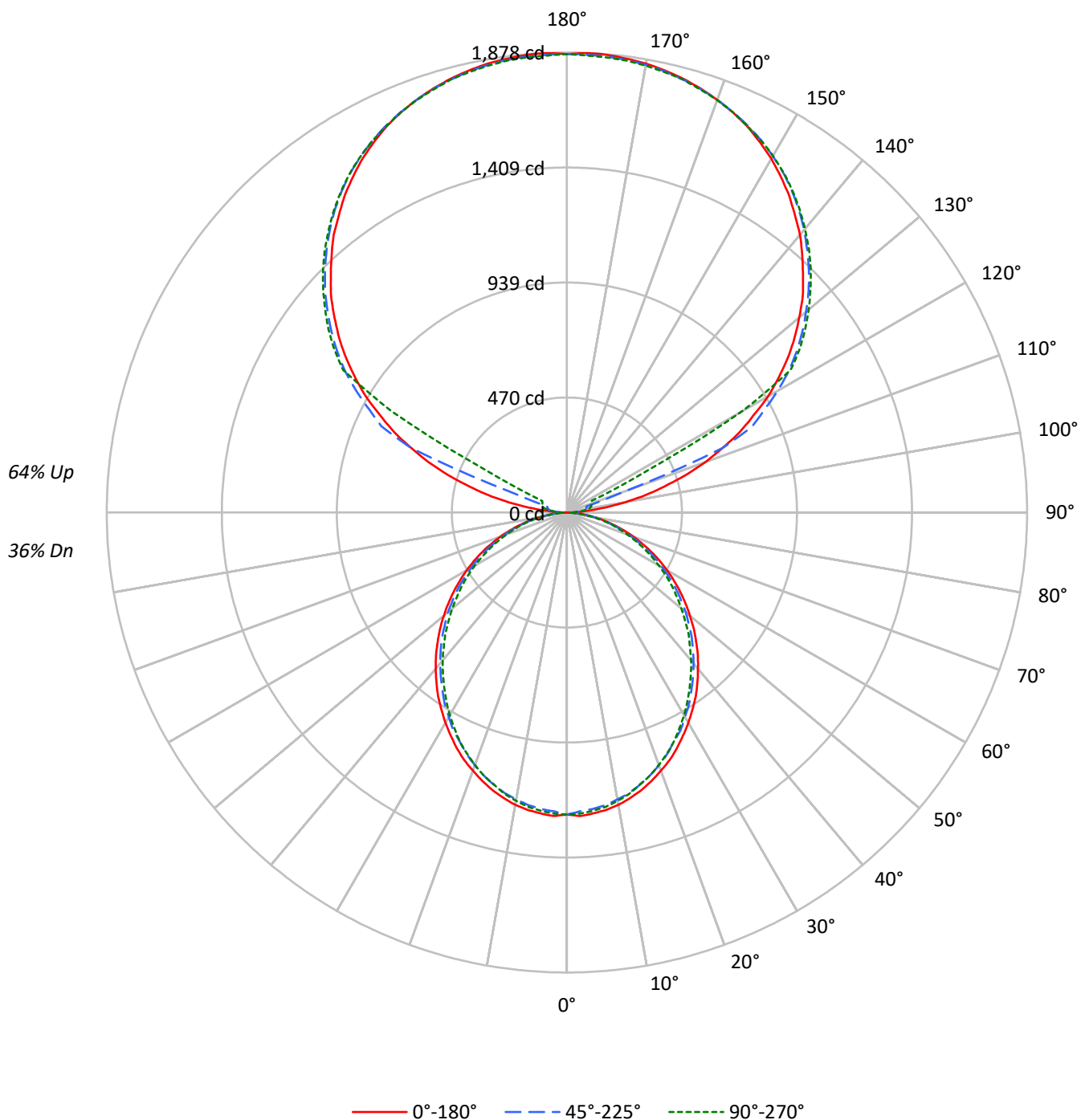
Lumens per Lamp: N/A  
Luminaire Lumens: 8626.8 lumens  
Efficiency: N/A  
Efficacy: 100.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 85.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9968  
Total Harmonic Distortion (THDi): 0.064  
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 | 59 | 59 | 59 | 44 | 44 | 44 |
| 1   | 95  | 90  | 87  | 83  | 86 | 82 | 79 | 76 | 66 | 64 | 62 | 52 | 50 | 49 | 39 | 38 | 37 |
| 2   | 86  | 79  | 73  | 68  | 78 | 72 | 67 | 62 | 58 | 54 | 51 | 46 | 43 | 41 | 34 | 32 | 31 |
| 3   | 79  | 69  | 62  | 57  | 71 | 63 | 57 | 52 | 51 | 47 | 43 | 40 | 37 | 35 | 30 | 28 | 26 |
| 4   | 72  | 61  | 54  | 48  | 65 | 56 | 49 | 44 | 45 | 41 | 37 | 36 | 32 | 30 | 27 | 25 | 23 |
| 5   | 66  | 55  | 47  | 41  | 59 | 50 | 43 | 38 | 41 | 35 | 32 | 32 | 28 | 26 | 24 | 22 | 20 |
| 6   | 61  | 49  | 41  | 35  | 55 | 45 | 38 | 33 | 37 | 31 | 27 | 29 | 25 | 22 | 22 | 19 | 17 |
| 7   | 56  | 44  | 36  | 31  | 51 | 40 | 33 | 29 | 33 | 28 | 24 | 26 | 23 | 20 | 20 | 17 | 15 |
| 8   | 52  | 40  | 32  | 27  | 47 | 37 | 30 | 25 | 30 | 25 | 21 | 24 | 20 | 18 | 18 | 16 | 14 |
| 9   | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 22 | 28 | 23 | 19 | 22 | 18 | 16 | 17 | 14 | 12 |
| 10  | 45  | 33  | 26  | 21  | 41 | 31 | 24 | 20 | 25 | 20 | 17 | 20 | 17 | 14 | 16 | 13 | 11 |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 900 | 900 | 900 |
| 5°  | 901 | 888 | 894 |
| 10° | 894 | 876 | 882 |
| 15° | 881 | 861 | 863 |
| 20° | 863 | 842 | 844 |
| 25° | 846 | 818 | 822 |
| 30° | 823 | 796 | 793 |
| 35° | 802 | 769 | 763 |
| 40° | 777 | 743 | 735 |
| 45° | 751 | 716 | 706 |
| 50° | 723 | 689 | 672 |
| 55° | 693 | 657 | 641 |
| 60° | 660 | 618 | 606 |
| 65° | 623 | 579 | 564 |
| 70° | 577 | 531 | 519 |
| 75° | 513 | 473 | 478 |
| 80° | 436 | 400 | 398 |
| 85° | 315 | 273 | 266 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 998 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 116.0  | 1.3       |
| 10°-20°   | 326.5  | 3.8       |
| 20°-30°   | 479.8  | 5.6       |
| 30°-40°   | 557.3  | 6.5       |
| 40°-50°   | 556.6  | 6.5       |
| 50°-60°   | 485.3  | 5.6       |
| 60°-70°   | 358.8  | 4.2       |
| 70°-80°   | 203.0  | 2.4       |
| 80°-90°   | 56.9   | 0.7       |
| 90°-100°  | 61.7   | 0.7       |
| 100°-110° | 230.0  | 2.7       |
| 110°-120° | 610.1  | 7.1       |
| 120°-130° | 1011.9 | 11.7      |
| 130°-140° | 1074.9 | 12.5      |
| 140°-150° | 999.0  | 11.6      |
| 150°-160° | 803.2  | 9.3       |
| 160°-170° | 517.5  | 6.0       |
| 170°-180° | 178.1  | 2.1       |
| 0°-30°    | 922.4  | 10.7      |
| 0°-40°    | 1479.7 | 17.2      |
| 0°-60°    | 2521.7 | 29.2      |
| 0°-90°    | 3140.3 | 36.4      |
| 90°-120°  | 901.9  | 10.5      |
| 90°-150°  | 3987.7 | 46.2      |
| 90°-180°  | 5487.0 | 63.6      |
| 0°-180°   | 8626.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1233 | 1233  | 1233 | 1233  | 1233 |      |
| 5°   | 1233 | 1228  | 1215 | 1225  | 1222 | 117  |
| 15°  | 1174 | 1167  | 1151 | 1156  | 1150 | 331  |
| 25°  | 1062 | 1053  | 1033 | 1035  | 1033 | 489  |
| 35°  | 916  | 905   | 886  | 878   | 873  | 572  |
| 45°  | 746  | 738   | 720  | 707   | 702  | 576  |
| 55°  | 564  | 557   | 543  | 529   | 523  | 505  |
| 65°  | 381  | 373   | 362  | 351   | 345  | 376  |
| 75°  | 199  | 197   | 191  | 184   | 186  | 213  |
| 85°  | 49   | 48    | 46   | 43    | 42   | 54   |
| 90°  | 1    | 16    | 27   | 34    | 36   | 8    |
| 95°  | 88   | 43    | 53   | 60    | 58   | 104  |
| 105° | 412  | 452   | 83   | 97    | 103  | 440  |
| 115° | 779  | 802   | 836  | 209   | 111  | 767  |
| 125° | 1101 | 1119  | 1144 | 1154  | 1158 | 982  |
| 135° | 1362 | 1384  | 1396 | 1410  | 1407 | 1052 |
| 145° | 1580 | 1579  | 1602 | 1612  | 1605 | 988  |
| 155° | 1740 | 1728  | 1744 | 1752  | 1742 | 802  |
| 165° | 1834 | 1826  | 1830 | 1839  | 1830 | 518  |
| 175° | 1876 | 1866  | 1869 | 1878  | 1865 | 178  |
| 180° | 1871 | 1871  | 1871 | 1871  | 1871 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1233.0 | 1233.0 | 1233.0 | 1233.0 | 1233.0 |
| 2.5°   | 1240.2 | 1234.2 | 1221.1 | 1233.0 | 1230.7 |
| 5°     | 1233.0 | 1228.3 | 1215.2 | 1224.6 | 1222.4 |
| 7.5°   | 1224.6 | 1217.6 | 1204.5 | 1214.1 | 1211.7 |
| 10°    | 1211.7 | 1203.4 | 1189.2 | 1198.6 | 1195.1 |
| 12.5°  | 1193.8 | 1186.8 | 1172.6 | 1178.5 | 1176.1 |
| 15°    | 1173.7 | 1166.6 | 1151.2 | 1156.0 | 1150.1 |
| 17.5°  | 1148.8 | 1141.8 | 1126.3 | 1132.2 | 1126.3 |
| 20°    | 1121.5 | 1114.4 | 1097.9 | 1101.4 | 1096.8 |
| 22.5°  | 1094.3 | 1083.6 | 1068.2 | 1068.2 | 1065.8 |
| 25°    | 1062.2 | 1052.8 | 1032.7 | 1035.0 | 1032.7 |
| 27.5°  | 1026.7 | 1018.3 | 1003.1 | 999.5  | 993.6  |
| 30°    | 991.2  | 981.7  | 963.9  | 960.4  | 955.6  |
| 32.5°  | 953.2  | 946.2  | 927.2  | 920.0  | 915.2  |
| 35°    | 916.5  | 904.7  | 885.7  | 878.5  | 872.6  |
| 37.5°  | 875.0  | 864.3  | 845.3  | 837.0  | 831.1  |
| 40°    | 832.3  | 822.8  | 803.7  | 793.2  | 788.5  |
| 42.5°  | 790.8  | 781.2  | 762.4  | 750.4  | 743.4  |
| 45°    | 745.8  | 737.5  | 719.6  | 706.7  | 701.9  |
| 47.5°  | 701.9  | 693.6  | 674.6  | 661.6  | 654.5  |
| 50°    | 655.6  | 649.7  | 633.1  | 616.5  | 610.5  |
| 52.5°  | 610.5  | 602.3  | 586.9  | 573.9  | 565.5  |
| 55°    | 564.4  | 557.2  | 543.0  | 528.8  | 522.9  |
| 57.5°  | 518.1  | 512.2  | 496.7  | 482.5  | 477.8  |
| 60°    | 471.8  | 467.1  | 450.6  | 437.5  | 434.0  |
| 62.5°  | 426.8  | 418.5  | 406.7  | 394.8  | 390.1  |
| 65°    | 380.6  | 373.4  | 361.6  | 350.9  | 345.1  |
| 67.5°  | 333.2  | 327.2  | 316.6  | 308.3  | 303.6  |
| 70°    | 289.3  | 284.6  | 273.9  | 265.5  | 260.9  |
| 72.5°  | 244.3  | 239.5  | 233.6  | 225.3  | 221.7  |
| 75°    | 199.2  | 196.9  | 190.8  | 183.8  | 186.2  |
| 77.5°  | 158.8  | 154.1  | 151.7  | 148.1  | 144.7  |
| 80°    | 118.6  | 117.3  | 114.9  | 111.5  | 109.1  |
| 82.5°  | 80.6   | 80.6   | 79.5   | 74.7   | 74.7   |
| 85°    | 48.6   | 47.5   | 46.3   | 42.6   | 41.5   |
| 87.5°  | 21.4   | 19.0   | 16.6   | 13.1   | 11.8   |
| 90°    | 1.3    | 16.2   | 27.0   | 33.9   | 36.5   |
| 92.5°  | 33.9   | 28.4   | 32.5   | 35.3   | 36.5   |
| 95°    | 87.9   | 43.3   | 52.8   | 59.7   | 58.2   |
| 97.5°  | 158.4  | 47.5   | 69.0   | 73.2   | 74.5   |
| 100°   | 239.8  | 54.2   | 77.2   | 87.9   | 90.7   |
| 102.5° | 329.0  | 326.5  | 79.9   | 94.7   | 98.9   |
| 105°   | 411.7  | 452.3  | 82.6   | 97.4   | 102.9  |
| 107.5° | 507.8  | 541.6  | 85.4   | 100.2  | 105.7  |
| 110°   | 600.0  | 628.3  | 237.0  | 101.6  | 106.9  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 686.7  | 710.9  | 687.9  | 104.2  | 108.4  |
| 115°   | 778.6  | 801.6  | 835.5  | 208.6  | 111.1  |
| 117.5° | 858.6  | 885.6  | 908.7  | 714.9  | 360.2  |
| 120°   | 947.9  | 968.2  | 992.7  | 1008.9 | 826.1  |
| 122.5° | 1023.7 | 1045.4 | 1072.6 | 1080.6 | 1082.0 |
| 125°   | 1100.9 | 1118.6 | 1144.3 | 1153.8 | 1157.8 |
| 127.5° | 1171.3 | 1190.3 | 1210.7 | 1224.2 | 1225.5 |
| 130°   | 1237.7 | 1259.4 | 1274.2 | 1289.2 | 1287.9 |
| 132.5° | 1305.4 | 1323.1 | 1337.9 | 1350.1 | 1348.8 |
| 135°   | 1362.3 | 1384.0 | 1396.1 | 1409.8 | 1407.1 |
| 137.5° | 1421.8 | 1438.1 | 1451.8 | 1465.3 | 1461.3 |
| 140°   | 1480.0 | 1491.0 | 1505.8 | 1518.0 | 1511.2 |
| 142.5° | 1528.9 | 1538.4 | 1555.9 | 1566.7 | 1560.0 |
| 145°   | 1580.4 | 1579.0 | 1601.9 | 1611.5 | 1604.7 |
| 147.5° | 1624.9 | 1621.0 | 1643.9 | 1650.7 | 1645.4 |
| 150°   | 1668.3 | 1658.9 | 1680.6 | 1688.6 | 1681.9 |
| 152.5° | 1704.9 | 1694.1 | 1714.4 | 1722.5 | 1713.1 |
| 155°   | 1740.1 | 1728.0 | 1744.2 | 1752.3 | 1741.5 |
| 157.5° | 1768.5 | 1757.8 | 1770.0 | 1779.5 | 1768.5 |
| 160°   | 1793.0 | 1784.8 | 1793.0 | 1801.0 | 1791.5 |
| 162.5° | 1814.6 | 1806.5 | 1813.2 | 1822.7 | 1810.5 |
| 165°   | 1833.5 | 1825.5 | 1829.5 | 1839.0 | 1829.5 |
| 167.5° | 1848.5 | 1840.2 | 1844.4 | 1853.9 | 1841.7 |
| 170°   | 1860.7 | 1852.5 | 1855.2 | 1864.7 | 1852.5 |
| 172.5° | 1868.8 | 1860.7 | 1863.4 | 1872.9 | 1860.7 |
| 175°   | 1875.5 | 1866.0 | 1868.8 | 1878.2 | 1864.7 |
| 177.5° | 1878.2 | 1868.8 | 1870.2 | 1879.7 | 1867.4 |
| 180°   | 1871.4 | 1871.4 | 1871.4 | 1871.4 | 1871.4 |

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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 | 5.51             | 6.26 | 6.57  | 7.33  | 8.78  | 5.07           | 5.82 | 6.13  | 6.89  | 8.34  |
|                 | 3H   | 7.16             | 7.83 | 8.24  | 8.91  | 10.38 | 6.68           | 7.35 | 7.75  | 8.43  | 9.90  |
|                 | 4H   | 7.75             | 8.38 | 8.83  | 9.46  | 10.94 | 7.26           | 7.90 | 8.34  | 8.98  | 10.45 |
|                 | 6H   | 8.14             | 8.73 | 9.24  | 9.81  | 11.30 | 7.65           | 8.24 | 8.75  | 9.32  | 10.81 |
|                 | 8H   | 8.24             | 8.80 | 9.34  | 9.90  | 11.38 | 7.75           | 8.31 | 8.85  | 9.41  | 10.89 |
|                 | 12H  | 8.29             | 8.82 | 9.39  | 9.91  | 11.42 | 7.79           | 8.32 | 8.89  | 9.41  | 10.92 |
| 4H              | 2H   | 5.95             | 6.59 | 7.05  | 7.67  | 9.15  | 5.60           | 6.24 | 6.70  | 7.32  | 8.80  |
|                 | 3H   | 7.81             | 8.35 | 8.91  | 9.45  | 10.94 | 7.41           | 7.94 | 8.51  | 9.05  | 10.54 |
|                 | 4H   | 8.53             | 9.01 | 9.63  | 10.11 | 11.62 | 8.11           | 8.60 | 9.21  | 9.69  | 11.20 |
|                 | 6H   | 9.04             | 9.46 | 10.15 | 10.58 | 12.08 | 8.61           | 9.03 | 9.73  | 10.15 | 11.65 |
|                 | 8H   | 9.19             | 9.58 | 10.30 | 10.69 | 12.21 | 8.76           | 9.15 | 9.87  | 10.26 | 11.78 |
|                 | 12H  | 9.25             | 9.61 | 10.38 | 10.73 | 12.26 | 8.81           | 9.17 | 9.94  | 10.29 | 11.82 |
| 8H              | 4H   | 8.71             | 9.11 | 9.83  | 10.22 | 11.74 | 8.34           | 8.73 | 9.45  | 9.84  | 11.36 |
|                 | 6H   | 9.34             | 9.67 | 10.48 | 10.82 | 12.34 | 8.97           | 9.29 | 10.10 | 10.44 | 11.96 |
|                 | 8H   | 9.56             | 9.85 | 10.70 | 10.98 | 12.52 | 9.18           | 9.46 | 10.32 | 10.60 | 12.13 |
|                 | 12H  | 9.69             | 9.94 | 10.84 | 11.07 | 12.64 | 9.29           | 9.54 | 10.44 | 10.67 | 12.24 |
| 12H             | 4H   | 8.69             | 9.05 | 9.82  | 10.17 | 11.70 | 8.33           | 8.69 | 9.46  | 9.81  | 11.33 |
|                 | 6H   | 9.37             | 9.66 | 10.51 | 10.79 | 12.33 | 9.01           | 9.29 | 10.15 | 10.42 | 11.96 |
|                 | 8H   | 9.61             | 9.86 | 10.76 | 10.99 | 12.56 | 9.24           | 9.49 | 10.38 | 10.62 | 12.19 |

END OF REPORT