

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: P902919

Luminaire Tested: DFN2DIP-PN2F0-050D040US830-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P902919  
REPORT IS A COMBINATION OF REPORTS P901008 AND P897905  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN2F0-050D040US830-RLLONL  
Description: 2 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

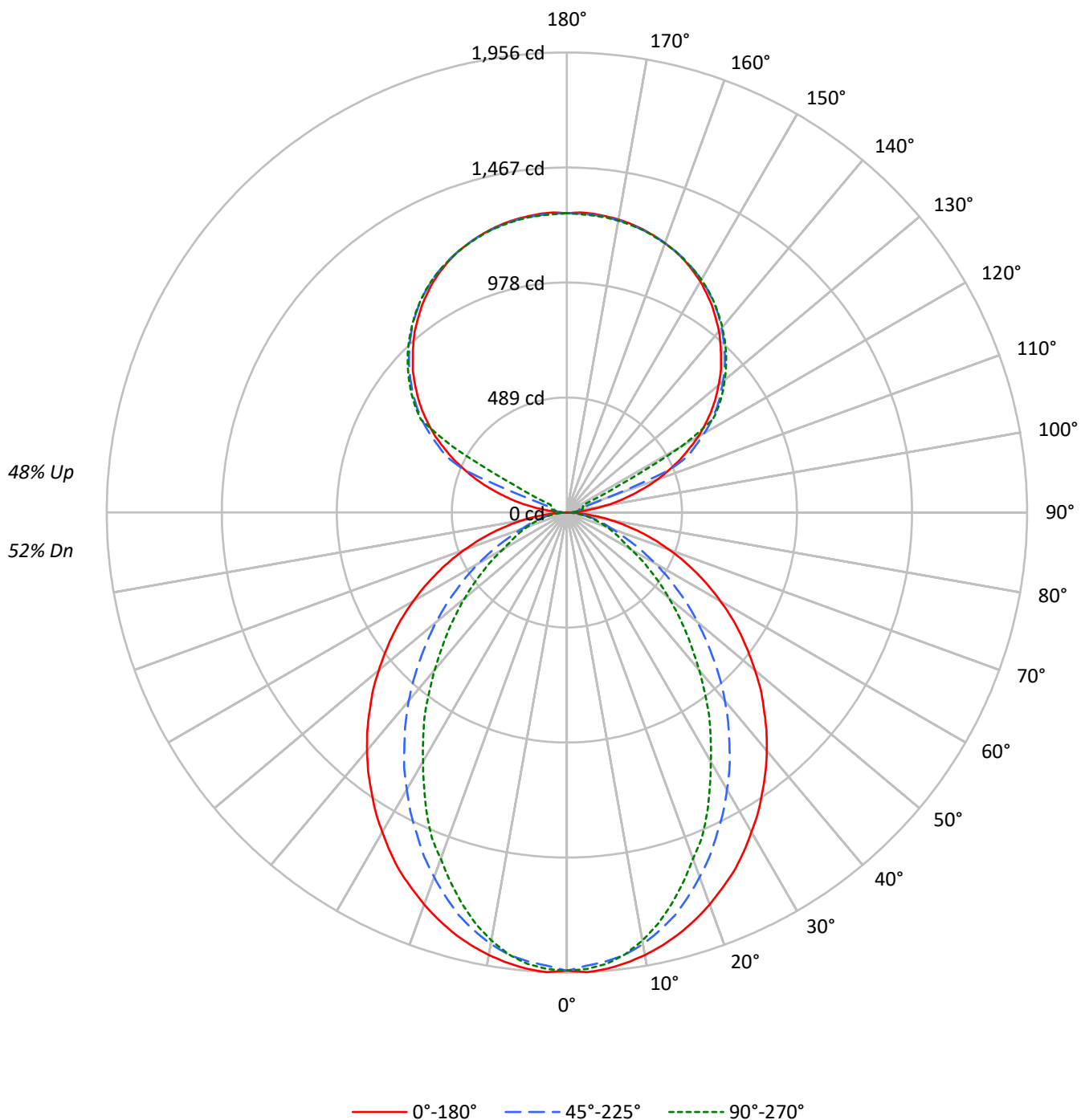
Lumens per Lamp: N/A  
Luminaire Lumens: 7738.3 lumens  
Efficiency: N/A  
Efficacy: 94.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.17' x L: 2.29' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 82  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9821  
Total Harmonic Distortion (THDi): 0.08  
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   | 108 | 108 | 108 | 108 | 99 | 99 | 99 | 99 | 84 | 84 | 84 | 70 | 70 | 70 | 58 | 58 | 58 |
| 1   | 99  | 95  | 91  | 87  | 91 | 88 | 84 | 82 | 75 | 72 | 70 | 63 | 61 | 60 | 52 | 51 | 50 |
| 2   | 90  | 83  | 77  | 72  | 83 | 77 | 72 | 68 | 66 | 62 | 59 | 56 | 53 | 51 | 46 | 44 | 43 |
| 3   | 83  | 74  | 66  | 61  | 76 | 68 | 62 | 57 | 59 | 54 | 50 | 50 | 46 | 43 | 41 | 39 | 37 |
| 4   | 76  | 65  | 58  | 52  | 70 | 61 | 54 | 49 | 52 | 47 | 43 | 45 | 41 | 38 | 37 | 35 | 32 |
| 5   | 70  | 59  | 51  | 45  | 64 | 55 | 48 | 42 | 47 | 42 | 38 | 40 | 36 | 33 | 34 | 31 | 28 |
| 6   | 65  | 53  | 45  | 39  | 60 | 49 | 42 | 37 | 43 | 37 | 33 | 37 | 32 | 29 | 31 | 28 | 25 |
| 7   | 60  | 48  | 40  | 35  | 55 | 45 | 38 | 33 | 39 | 33 | 29 | 33 | 29 | 26 | 28 | 25 | 23 |
| 8   | 56  | 44  | 36  | 31  | 51 | 41 | 34 | 29 | 36 | 30 | 26 | 31 | 26 | 23 | 26 | 23 | 20 |
| 9   | 52  | 40  | 32  | 28  | 48 | 37 | 31 | 26 | 33 | 27 | 24 | 28 | 24 | 21 | 24 | 21 | 19 |
| 10  | 48  | 37  | 30  | 25  | 45 | 34 | 28 | 24 | 30 | 25 | 21 | 26 | 22 | 19 | 23 | 19 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4219 | 4219 | 4219 |
| 5°  | 4219 | 4143 | 4172 |
| 10° | 4170 | 4052 | 4030 |
| 15° | 4106 | 3910 | 3815 |
| 20° | 4023 | 3717 | 3552 |
| 25° | 3938 | 3502 | 3299 |
| 30° | 3827 | 3283 | 2980 |
| 35° | 3717 | 3048 | 2700 |
| 40° | 3605 | 2806 | 2380 |
| 45° | 3476 | 2539 | 2090 |
| 50° | 3342 | 2270 | 1808 |
| 55° | 3201 | 1983 | 1537 |
| 60° | 3038 | 1685 | 1259 |
| 65° | 2849 | 1384 | 1127 |
| 70° | 2621 | 1102 | 1010 |
| 75° | 2333 | 954  | 907  |
| 80° | 1920 | 775  | 768  |
| 85° | 1256 | 483  | 546  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3476 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 182.5  | 2.4       |
| 10°-20°   | 501.1  | 6.5       |
| 20°-30°   | 703.6  | 9.1       |
| 30°-40°   | 766.9  | 9.9       |
| 40°-50°   | 704.9  | 9.1       |
| 50°-60°   | 553.6  | 7.2       |
| 60°-70°   | 360.3  | 4.7       |
| 70°-80°   | 185.5  | 2.4       |
| 80°-90°   | 49.6   | 0.6       |
| 90°-100°  | 41.9   | 0.5       |
| 100°-110° | 156.4  | 2.0       |
| 110°-120° | 414.8  | 5.4       |
| 120°-130° | 688.0  | 8.9       |
| 130°-140° | 730.8  | 9.4       |
| 140°-150° | 679.2  | 8.8       |
| 150°-160° | 546.1  | 7.1       |
| 160°-170° | 351.9  | 4.5       |
| 170°-180° | 121.1  | 1.6       |
| 0°-30°    | 1387.2 | 17.9      |
| 0°-40°    | 2154.2 | 27.8      |
| 0°-60°    | 3412.7 | 44.1      |
| 0°-90°    | 4008.1 | 51.8      |
| 90°-120°  | 613.2  | 7.9       |
| 90°-150°  | 2711.2 | 35.0      |
| 90°-180°  | 3730.0 | 48.2      |
| 0°-180°   | 7738.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1948 | 1948  | 1948 | 1948  | 1948 |      |
| 5°   | 1948 | 1939  | 1916 | 1932  | 1927 | 185  |
| 15°  | 1853 | 1833  | 1773 | 1740  | 1722 | 522  |
| 25°  | 1682 | 1625  | 1509 | 1437  | 1410 | 773  |
| 35°  | 1449 | 1359  | 1204 | 1093  | 1054 | 907  |
| 45°  | 1185 | 1066  | 881  | 756   | 714  | 915  |
| 55°  | 901  | 763   | 573  | 467   | 434  | 805  |
| 65°  | 608  | 465   | 307  | 247   | 242  | 603  |
| 75°  | 324  | 201   | 141  | 129   | 127  | 343  |
| 85°  | 76   | 39    | 34   | 34    | 34   | 87   |
| 90°  | 1    | 11    | 18   | 23    | 25   | 7    |
| 95°  | 60   | 29    | 36   | 40    | 40   | 71   |
| 105° | 280  | 308   | 56   | 66    | 70   | 299  |
| 115° | 529  | 545   | 568  | 142   | 76   | 521  |
| 125° | 748  | 760   | 778  | 784   | 787  | 668  |
| 135° | 926  | 941   | 949  | 958   | 957  | 715  |
| 145° | 1074 | 1074  | 1089 | 1096  | 1091 | 672  |
| 155° | 1183 | 1175  | 1186 | 1191  | 1184 | 545  |
| 165° | 1247 | 1241  | 1244 | 1250  | 1244 | 352  |
| 175° | 1275 | 1269  | 1270 | 1277  | 1268 | 121  |
| 180° | 1272 | 1272  | 1272 | 1272  | 1272 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1947.8 | 1947.8 | 1947.8 | 1947.8 | 1947.8 |
| 2.5°   | 1956.5 | 1947.8 | 1928.3 | 1946.1 | 1942.5 |
| 5°     | 1947.8 | 1939.0 | 1916.0 | 1931.8 | 1926.7 |
| 7.5°   | 1931.8 | 1921.4 | 1896.7 | 1903.7 | 1894.8 |
| 10°    | 1910.7 | 1898.4 | 1863.2 | 1857.8 | 1847.3 |
| 12.5°  | 1884.3 | 1868.5 | 1820.8 | 1810.3 | 1790.8 |
| 15°    | 1852.6 | 1833.2 | 1773.3 | 1739.8 | 1722.2 |
| 17.5°  | 1815.5 | 1787.3 | 1713.3 | 1674.5 | 1646.2 |
| 20°    | 1773.3 | 1738.0 | 1649.8 | 1605.9 | 1567.0 |
| 22.5°  | 1727.5 | 1686.9 | 1584.6 | 1524.8 | 1498.4 |
| 25°    | 1681.6 | 1625.1 | 1508.8 | 1436.6 | 1410.0 |
| 27.5°  | 1627.0 | 1567.0 | 1438.3 | 1355.5 | 1314.9 |
| 30°    | 1568.9 | 1501.8 | 1360.7 | 1270.9 | 1223.2 |
| 32.5°  | 1512.4 | 1431.3 | 1286.9 | 1181.0 | 1136.9 |
| 35°    | 1449.0 | 1359.1 | 1204.0 | 1092.9 | 1054.0 |
| 37.5°  | 1387.2 | 1290.2 | 1126.4 | 1004.7 | 960.7  |
| 40°    | 1322.0 | 1216.4 | 1045.2 | 920.1  | 874.3  |
| 42.5°  | 1255.1 | 1142.3 | 964.2  | 833.7  | 789.8  |
| 45°    | 1184.6 | 1066.4 | 881.4  | 756.1  | 713.8  |
| 47.5°  | 1117.6 | 992.5  | 802.1  | 676.8  | 638.1  |
| 50°    | 1043.6 | 918.4  | 724.5  | 602.8  | 565.9  |
| 52.5°  | 971.2  | 839.0  | 650.4  | 534.1  | 500.7  |
| 55°    | 900.7  | 763.2  | 572.8  | 467.1  | 433.7  |
| 57.5°  | 828.5  | 687.5  | 504.2  | 405.5  | 377.2  |
| 60°    | 754.4  | 613.4  | 431.8  | 342.0  | 313.8  |
| 62.5°  | 682.2  | 541.2  | 370.1  | 285.6  | 271.5  |
| 65°    | 608.1  | 465.3  | 306.7  | 246.9  | 241.5  |
| 67.5°  | 537.6  | 394.8  | 246.9  | 216.8  | 211.5  |
| 70°    | 463.6  | 326.1  | 204.4  | 186.8  | 179.7  |
| 72.5°  | 393.1  | 262.6  | 171.0  | 156.9  | 153.4  |
| 75°    | 324.3  | 200.9  | 141.0  | 128.7  | 127.0  |
| 77.5°  | 255.6  | 142.7  | 111.1  | 104.0  | 100.4  |
| 80°    | 192.1  | 102.3  | 84.5   | 77.6   | 77.6   |
| 82.5°  | 133.9  | 68.8   | 58.2   | 54.6   | 54.6   |
| 85°    | 75.8   | 38.7   | 33.5   | 33.5   | 33.5   |
| 87.5°  | 28.3   | 14.0   | 14.0   | 12.3   | 12.3   |
| 90°    | 0.8    | 11.0   | 18.4   | 23.1   | 24.8   |
| 92.5°  | 23.1   | 19.3   | 22.1   | 23.9   | 24.8   |
| 95°    | 59.8   | 29.4   | 35.8   | 40.5   | 39.6   |
| 97.5°  | 107.7  | 32.2   | 46.9   | 49.8   | 50.6   |
| 100°   | 163.0  | 36.9   | 52.5   | 59.8   | 61.6   |
| 102.5° | 223.7  | 222.0  | 54.3   | 64.4   | 67.2   |
| 105°   | 279.8  | 307.6  | 56.2   | 66.3   | 69.9   |
| 107.5° | 345.3  | 368.3  | 58.1   | 68.1   | 71.8   |
| 110°   | 407.9  | 427.2  | 161.2  | 69.1   | 72.7   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 466.8  | 483.3  | 467.7  | 70.9   | 73.7   |
| 115°   | 529.3  | 545.0  | 568.1  | 141.8  | 75.6   |
| 117.5° | 583.7  | 602.1  | 617.8  | 486.1  | 244.9  |
| 120°   | 644.5  | 658.3  | 674.9  | 686.0  | 561.7  |
| 122.5° | 696.0  | 710.8  | 729.2  | 734.7  | 735.7  |
| 125°   | 748.5  | 760.5  | 778.0  | 784.5  | 787.2  |
| 127.5° | 796.4  | 809.3  | 823.1  | 832.4  | 833.2  |
| 130°   | 841.5  | 856.3  | 866.3  | 876.5  | 875.6  |
| 132.5° | 887.5  | 899.6  | 909.6  | 917.9  | 917.1  |
| 135°   | 926.2  | 941.0  | 949.2  | 958.5  | 956.7  |
| 137.5° | 966.7  | 977.7  | 987.0  | 996.2  | 993.4  |
| 140°   | 1006.3 | 1013.7 | 1023.8 | 1032.1 | 1027.5 |
| 142.5° | 1039.5 | 1045.9 | 1057.9 | 1065.2 | 1060.6 |
| 145°   | 1074.5 | 1073.6 | 1089.1 | 1095.6 | 1091.0 |
| 147.5° | 1104.8 | 1102.0 | 1117.7 | 1122.3 | 1118.7 |
| 150°   | 1134.3 | 1127.8 | 1142.6 | 1148.1 | 1143.5 |
| 152.5° | 1159.1 | 1151.8 | 1165.5 | 1171.1 | 1164.7 |
| 155°   | 1183.1 | 1174.9 | 1185.9 | 1191.4 | 1184.0 |
| 157.5° | 1202.4 | 1195.0 | 1203.4 | 1209.8 | 1202.4 |
| 160°   | 1219.0 | 1213.4 | 1219.0 | 1224.5 | 1218.0 |
| 162.5° | 1233.7 | 1228.2 | 1232.8 | 1239.3 | 1231.0 |
| 165°   | 1246.6 | 1241.1 | 1243.9 | 1250.3 | 1243.9 |
| 167.5° | 1256.8 | 1251.1 | 1254.1 | 1260.5 | 1252.2 |
| 170°   | 1265.1 | 1259.5 | 1261.3 | 1267.8 | 1259.5 |
| 172.5° | 1270.5 | 1265.1 | 1267.0 | 1273.4 | 1265.1 |
| 175°   | 1275.1 | 1268.7 | 1270.5 | 1277.0 | 1267.8 |
| 177.5° | 1277.0 | 1270.5 | 1271.5 | 1278.0 | 1269.7 |
| 180°   | 1272.4 | 1272.4 | 1272.4 | 1272.4 | 1272.4 |

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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 | 12.20            | 13.04 | 13.15 | 14.00 | 15.25 | 8.17           | 9.01  | 9.12  | 9.97  | 11.22 |
|                 | 3H   | 13.86            | 14.61 | 14.82 | 15.58 | 16.85 | 9.34           | 10.10 | 10.30 | 11.06 | 12.34 |
|                 | 4H   | 14.45            | 15.17 | 15.43 | 16.14 | 17.42 | 9.78           | 10.49 | 10.75 | 11.47 | 12.75 |
|                 | 6H   | 14.86            | 15.52 | 15.84 | 16.49 | 17.79 | 10.09          | 10.74 | 11.07 | 11.72 | 13.01 |
|                 | 8H   | 14.98            | 15.60 | 15.97 | 16.60 | 17.89 | 10.17          | 10.79 | 11.16 | 11.79 | 13.08 |
|                 | 12H  | 15.03            | 15.62 | 16.03 | 16.61 | 17.93 | 10.20          | 10.80 | 11.20 | 11.79 | 13.10 |
| 4H              | 2H   | 12.21            | 12.93 | 13.19 | 13.90 | 15.18 | 8.75           | 9.47  | 9.73  | 10.44 | 11.72 |
|                 | 3H   | 14.02            | 14.61 | 15.01 | 15.62 | 16.91 | 10.08          | 10.68 | 11.07 | 11.68 | 12.97 |
|                 | 4H   | 14.70            | 15.24 | 15.70 | 16.24 | 17.55 | 10.62          | 11.16 | 11.62 | 12.16 | 13.47 |
|                 | 6H   | 15.19            | 15.66 | 16.20 | 16.68 | 18.00 | 11.02          | 11.49 | 12.03 | 12.51 | 13.82 |
|                 | 8H   | 15.36            | 15.79 | 16.37 | 16.81 | 18.14 | 11.14          | 11.57 | 12.15 | 12.59 | 13.92 |
|                 | 12H  | 15.44            | 15.84 | 16.47 | 16.86 | 18.20 | 11.20          | 11.59 | 12.22 | 12.62 | 13.95 |
| 8H              | 4H   | 14.66            | 15.10 | 15.67 | 16.11 | 17.44 | 10.89          | 11.32 | 11.90 | 12.34 | 13.66 |
|                 | 6H   | 15.21            | 15.57 | 16.24 | 16.62 | 17.95 | 11.38          | 11.74 | 12.42 | 12.80 | 14.12 |
|                 | 8H   | 15.41            | 15.73 | 16.45 | 16.77 | 18.11 | 11.56          | 11.88 | 12.60 | 12.92 | 14.26 |
|                 | 12H  | 15.54            | 15.81 | 16.58 | 16.85 | 18.24 | 11.67          | 11.95 | 12.71 | 12.98 | 14.37 |
| 12H             | 4H   | 14.61            | 15.01 | 15.64 | 16.04 | 17.37 | 10.89          | 11.28 | 11.92 | 12.31 | 13.64 |
|                 | 6H   | 15.18            | 15.50 | 16.22 | 16.54 | 17.88 | 11.43          | 11.74 | 12.47 | 12.78 | 14.13 |
|                 | 8H   | 15.39            | 15.67 | 16.43 | 16.70 | 18.09 | 11.62          | 11.90 | 12.67 | 12.94 | 14.33 |