

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: P913269

Luminaire Tested: DFN2DIP-4P4F0-060D050US927-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P913269  
REPORT IS A COMBINATION OF REPORTS P900630 AND P897523  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-060D050US927-RLLONL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open  
No Lens  
Light Source: -  
Ballast/Driver: -

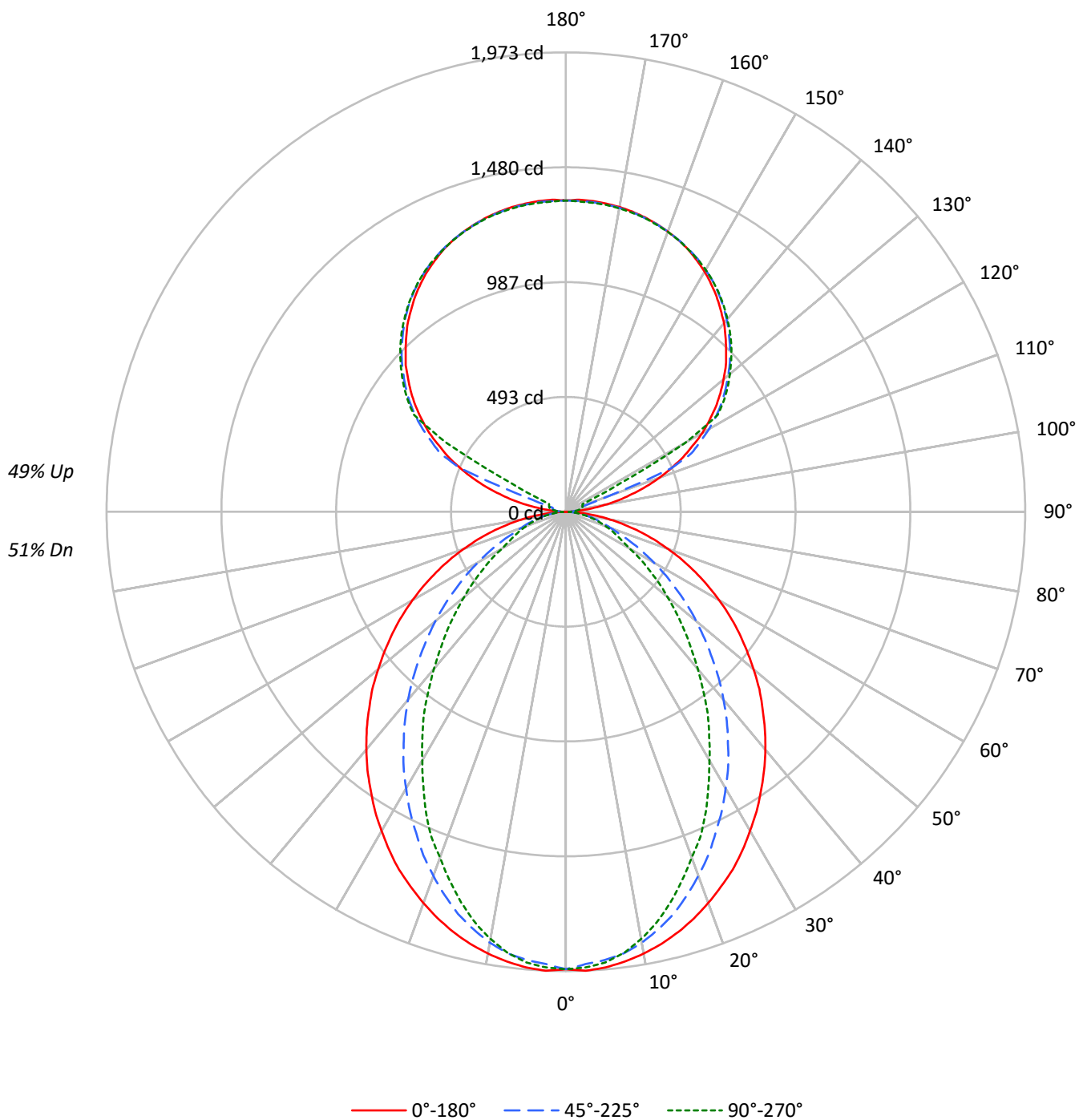
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 7961.4 lumens  
Efficiency: N/A  
Efficacy: 78.3 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): 101.7  
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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 84 | 84 | 84 | 70 | 70 | 70 | 57 | 57 | 57 |
| 1   | 98  | 94  | 91  | 87  | 91 | 87 | 84 | 81 | 74 | 72 | 70 | 62 | 61 | 59 | 51 | 50 | 49 |
| 2   | 90  | 83  | 77  | 72  | 83 | 77 | 72 | 67 | 66 | 62 | 59 | 55 | 52 | 50 | 45 | 44 | 42 |
| 3   | 82  | 73  | 66  | 61  | 76 | 68 | 62 | 57 | 58 | 54 | 50 | 49 | 46 | 43 | 41 | 38 | 36 |
| 4   | 76  | 65  | 58  | 52  | 70 | 61 | 54 | 49 | 52 | 47 | 43 | 44 | 40 | 37 | 37 | 34 | 32 |
| 5   | 70  | 58  | 50  | 45  | 64 | 54 | 47 | 42 | 47 | 41 | 37 | 40 | 36 | 33 | 33 | 30 | 28 |
| 6   | 64  | 53  | 45  | 39  | 59 | 49 | 42 | 37 | 42 | 37 | 33 | 36 | 32 | 29 | 30 | 27 | 25 |
| 7   | 60  | 48  | 40  | 34  | 55 | 45 | 38 | 33 | 39 | 33 | 29 | 33 | 29 | 26 | 28 | 25 | 22 |
| 8   | 55  | 43  | 36  | 31  | 51 | 41 | 34 | 29 | 35 | 30 | 26 | 30 | 26 | 23 | 26 | 23 | 20 |
| 9   | 52  | 40  | 32  | 27  | 48 | 37 | 31 | 26 | 32 | 27 | 23 | 28 | 24 | 21 | 24 | 21 | 18 |
| 10  | 48  | 36  | 29  | 25  | 45 | 34 | 28 | 24 | 30 | 25 | 21 | 26 | 22 | 19 | 22 | 19 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1274 | 1274 | 1274 |
| 5°  | 1277 | 1255 | 1263 |
| 10° | 1264 | 1230 | 1222 |
| 15° | 1247 | 1190 | 1159 |
| 20° | 1224 | 1134 | 1081 |
| 25° | 1200 | 1072 | 1006 |
| 30° | 1169 | 1008 | 911  |
| 35° | 1138 | 939  | 828  |
| 40° | 1106 | 867  | 732  |
| 45° | 1070 | 788  | 645  |
| 50° | 1032 | 708  | 560  |
| 55° | 993  | 623  | 478  |
| 60° | 947  | 533  | 394  |
| 65° | 895  | 442  | 355  |
| 70° | 831  | 357  | 322  |
| 75° | 751  | 316  | 294  |
| 80° | 635  | 266  | 257  |
| 85° | 444  | 180  | 196  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1070 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 184.1  | 2.3       |
| 10°-20°   | 505.4  | 6.3       |
| 20°-30°   | 709.6  | 8.9       |
| 30°-40°   | 773.5  | 9.7       |
| 40°-50°   | 710.9  | 8.9       |
| 50°-60°   | 558.3  | 7.0       |
| 60°-70°   | 363.4  | 4.6       |
| 70°-80°   | 187.1  | 2.3       |
| 80°-90°   | 50.1   | 0.6       |
| 90°-100°  | 44.1   | 0.6       |
| 100°-110° | 164.3  | 2.1       |
| 110°-120° | 435.8  | 5.5       |
| 120°-130° | 722.8  | 9.1       |
| 130°-140° | 767.8  | 9.6       |
| 140°-150° | 713.6  | 9.0       |
| 150°-160° | 573.7  | 7.2       |
| 160°-170° | 369.7  | 4.6       |
| 170°-180° | 127.2  | 1.6       |
| 0°-30°    | 1399.1 | 17.6      |
| 0°-40°    | 2172.6 | 27.3      |
| 0°-60°    | 3441.9 | 43.2      |
| 0°-90°    | 4042.5 | 50.8      |
| 90°-120°  | 644.2  | 8.1       |
| 90°-150°  | 2848.4 | 35.8      |
| 90°-180°  | 3919.0 | 49.2      |
| 0°-180°   | 7961.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1964 | 1964  | 1964 | 1964  | 1964 |      |
| 5°   | 1964 | 1956  | 1932 | 1948  | 1943 | 186  |
| 15°  | 1868 | 1849  | 1788 | 1755  | 1737 | 527  |
| 25°  | 1696 | 1639  | 1522 | 1449  | 1422 | 780  |
| 35°  | 1461 | 1371  | 1214 | 1102  | 1063 | 915  |
| 45°  | 1195 | 1076  | 889  | 763   | 720  | 923  |
| 55°  | 908  | 770   | 578  | 471   | 437  | 812  |
| 65°  | 613  | 469   | 309  | 249   | 244  | 608  |
| 75°  | 327  | 203   | 142  | 130   | 128  | 346  |
| 85°  | 76   | 39    | 34   | 34    | 34   | 88   |
| 90°  | 1    | 12    | 19   | 24    | 26   | 7    |
| 95°  | 63   | 31    | 38   | 43    | 42   | 74   |
| 105° | 294  | 323   | 59   | 70    | 74   | 314  |
| 115° | 556  | 573   | 597  | 149   | 79   | 548  |
| 125° | 786  | 799   | 817  | 824   | 827  | 701  |
| 135° | 973  | 989   | 997  | 1007  | 1005 | 752  |
| 145° | 1129 | 1128  | 1144 | 1151  | 1146 | 706  |
| 155° | 1243 | 1234  | 1246 | 1252  | 1244 | 573  |
| 165° | 1310 | 1304  | 1307 | 1314  | 1307 | 370  |
| 175° | 1340 | 1333  | 1335 | 1342  | 1332 | 127  |
| 180° | 1337 | 1337  | 1337 | 1337  | 1337 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1964.5 | 1964.5 | 1964.5 | 1964.5 | 1964.5 |
| 2.5°   | 1973.3 | 1964.5 | 1944.8 | 1962.7 | 1959.1 |
| 5°     | 1964.5 | 1955.6 | 1932.4 | 1948.4 | 1943.1 |
| 7.5°   | 1948.4 | 1937.8 | 1913.0 | 1919.9 | 1911.1 |
| 10°    | 1927.1 | 1914.6 | 1879.2 | 1873.7 | 1863.1 |
| 12.5°  | 1900.5 | 1884.4 | 1836.4 | 1825.8 | 1806.2 |
| 15°    | 1868.4 | 1848.8 | 1788.4 | 1754.7 | 1736.9 |
| 17.5°  | 1831.1 | 1802.6 | 1727.9 | 1688.9 | 1660.4 |
| 20°    | 1788.4 | 1752.8 | 1664.0 | 1619.6 | 1580.4 |
| 22.5°  | 1742.2 | 1701.3 | 1598.1 | 1537.8 | 1511.2 |
| 25°    | 1696.1 | 1639.1 | 1521.8 | 1449.0 | 1422.2 |
| 27.5°  | 1641.0 | 1580.4 | 1450.6 | 1367.1 | 1326.2 |
| 30°    | 1582.3 | 1514.6 | 1372.4 | 1281.8 | 1233.7 |
| 32.5°  | 1525.3 | 1443.5 | 1297.9 | 1191.1 | 1146.6 |
| 35°    | 1461.4 | 1370.7 | 1214.3 | 1102.2 | 1063.0 |
| 37.5°  | 1399.2 | 1301.2 | 1136.1 | 1013.3 | 968.9  |
| 40°    | 1333.3 | 1226.8 | 1054.2 | 928.0  | 881.8  |
| 42.5°  | 1265.8 | 1152.1 | 972.5  | 840.8  | 796.5  |
| 45°    | 1194.7 | 1075.5 | 889.0  | 762.6  | 719.9  |
| 47.5°  | 1127.2 | 1001.0 | 809.0  | 682.6  | 643.6  |
| 50°    | 1052.5 | 926.3  | 730.7  | 607.9  | 570.8  |
| 52.5°  | 979.5  | 846.1  | 656.0  | 538.7  | 504.9  |
| 55°    | 908.4  | 769.8  | 577.7  | 471.2  | 437.4  |
| 57.5°  | 835.6  | 693.3  | 508.5  | 408.9  | 380.4  |
| 60°    | 760.9  | 618.7  | 435.5  | 345.0  | 316.5  |
| 62.5°  | 688.1  | 545.9  | 373.3  | 288.0  | 273.9  |
| 65°    | 613.4  | 469.3  | 309.3  | 249.0  | 243.5  |
| 67.5°  | 542.2  | 398.2  | 249.0  | 218.6  | 213.3  |
| 70°    | 467.5  | 328.9  | 206.1  | 188.5  | 181.3  |
| 72.5°  | 396.5  | 264.8  | 172.4  | 158.3  | 154.6  |
| 75°    | 327.1  | 202.6  | 142.2  | 129.8  | 128.1  |
| 77.5°  | 257.9  | 143.9  | 112.0  | 104.9  | 101.3  |
| 80°    | 193.7  | 103.1  | 85.2   | 78.3   | 78.3   |
| 82.5°  | 135.1  | 69.4   | 58.6   | 55.1   | 55.1   |
| 85°    | 76.4   | 39.1   | 33.7   | 33.7   | 33.7   |
| 87.5°  | 28.5   | 14.2   | 14.2   | 12.4   | 12.4   |
| 90°    | 1.0    | 11.6   | 19.3   | 24.2   | 26.1   |
| 92.5°  | 24.2   | 20.4   | 23.2   | 25.2   | 26.1   |
| 95°    | 62.8   | 30.9   | 37.7   | 42.6   | 41.6   |
| 97.5°  | 113.1  | 33.9   | 49.3   | 52.3   | 53.2   |
| 100°   | 171.3  | 38.7   | 55.1   | 62.8   | 64.8   |
| 102.5° | 235.0  | 233.1  | 57.1   | 67.7   | 70.7   |
| 105°   | 294.1  | 323.1  | 59.0   | 69.6   | 73.5   |
| 107.5° | 362.7  | 386.8  | 61.0   | 71.5   | 75.5   |
| 110°   | 428.6  | 448.8  | 169.3  | 72.6   | 76.4   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 490.4  | 507.8  | 491.4  | 74.5   | 77.4   |
| 115°   | 556.2  | 572.6  | 596.8  | 149.0  | 79.4   |
| 117.5° | 613.2  | 632.6  | 649.1  | 510.6  | 257.3  |
| 120°   | 677.1  | 691.6  | 709.0  | 720.6  | 590.0  |
| 122.5° | 731.2  | 746.7  | 766.1  | 771.9  | 772.9  |
| 125°   | 786.3  | 799.0  | 817.4  | 824.1  | 827.0  |
| 127.5° | 836.6  | 850.2  | 864.8  | 874.4  | 875.4  |
| 130°   | 884.1  | 899.6  | 910.1  | 920.8  | 920.0  |
| 132.5° | 932.5  | 945.1  | 955.6  | 964.4  | 963.5  |
| 135°   | 973.1  | 988.6  | 997.2  | 1007.0 | 1005.0 |
| 137.5° | 1015.6 | 1027.2 | 1037.0 | 1046.6 | 1043.8 |
| 140°   | 1057.2 | 1065.0 | 1075.5 | 1084.3 | 1079.5 |
| 142.5° | 1092.1 | 1098.9 | 1111.4 | 1119.1 | 1114.3 |
| 145°   | 1128.9 | 1127.8 | 1144.2 | 1151.0 | 1146.2 |
| 147.5° | 1160.7 | 1157.8 | 1174.3 | 1179.1 | 1175.3 |
| 150°   | 1191.7 | 1184.9 | 1200.4 | 1206.2 | 1201.3 |
| 152.5° | 1217.7 | 1210.1 | 1224.6 | 1230.4 | 1223.6 |
| 155°   | 1242.9 | 1234.3 | 1245.9 | 1251.6 | 1244.0 |
| 157.5° | 1263.2 | 1255.5 | 1264.2 | 1271.1 | 1263.2 |
| 160°   | 1280.7 | 1274.9 | 1280.7 | 1286.4 | 1279.7 |
| 162.5° | 1296.1 | 1290.4 | 1295.1 | 1301.9 | 1293.2 |
| 165°   | 1309.6 | 1303.9 | 1306.8 | 1313.5 | 1306.8 |
| 167.5° | 1320.3 | 1314.5 | 1317.5 | 1324.2 | 1315.5 |
| 170°   | 1329.0 | 1323.2 | 1325.2 | 1331.9 | 1323.2 |
| 172.5° | 1334.8 | 1329.0 | 1331.0 | 1337.8 | 1329.0 |
| 175°   | 1339.7 | 1332.8 | 1334.8 | 1341.6 | 1331.9 |
| 177.5° | 1341.6 | 1334.8 | 1335.9 | 1342.6 | 1333.9 |
| 180°   | 1336.7 | 1336.7 | 1336.7 | 1336.7 | 1336.7 |

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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 | 8.08             | 8.92  | 9.04  | 9.89  | 11.15 | 4.04           | 4.88 | 5.00 | 5.85 | 7.11  |
|                 | 3H   | 9.76             | 10.51 | 10.73 | 11.49 | 12.78 | 5.23           | 5.98 | 6.20 | 6.96 | 8.24  |
|                 | 4H   | 10.38            | 11.08 | 11.36 | 12.07 | 13.36 | 5.68           | 6.39 | 6.67 | 7.37 | 8.67  |
|                 | 6H   | 10.80            | 11.45 | 11.80 | 12.44 | 13.75 | 6.01           | 6.66 | 7.00 | 7.64 | 8.95  |
|                 | 8H   | 10.93            | 11.55 | 11.93 | 12.56 | 13.86 | 6.10           | 6.72 | 7.10 | 7.72 | 9.02  |
|                 | 12H  | 11.00            | 11.59 | 12.00 | 12.58 | 13.91 | 6.14           | 6.73 | 7.15 | 7.73 | 9.06  |
| 4H              | 2H   | 8.10             | 8.81  | 9.09  | 9.79  | 11.08 | 4.64           | 5.35 | 5.63 | 6.33 | 7.62  |
|                 | 3H   | 9.94             | 10.52 | 10.93 | 11.53 | 12.84 | 5.99           | 6.58 | 6.99 | 7.59 | 8.90  |
|                 | 4H   | 10.63            | 11.17 | 11.64 | 12.17 | 13.50 | 6.54           | 7.08 | 7.55 | 8.08 | 9.42  |
|                 | 6H   | 11.15            | 11.61 | 12.17 | 12.64 | 13.97 | 6.97           | 7.43 | 7.98 | 8.45 | 9.78  |
|                 | 8H   | 11.33            | 11.76 | 12.35 | 12.78 | 14.13 | 7.10           | 7.53 | 8.11 | 8.55 | 9.89  |
|                 | 12H  | 11.43            | 11.82 | 12.47 | 12.86 | 14.20 | 7.16           | 7.55 | 8.20 | 8.59 | 9.93  |
| 8H              | 4H   | 10.60            | 11.03 | 11.62 | 12.05 | 13.39 | 6.83           | 7.26 | 7.85 | 8.28 | 9.62  |
|                 | 6H   | 11.17            | 11.53 | 12.22 | 12.59 | 13.93 | 7.35           | 7.70 | 8.39 | 8.77 | 10.11 |
|                 | 8H   | 11.39            | 11.71 | 12.44 | 12.75 | 14.11 | 7.54           | 7.86 | 8.59 | 8.90 | 10.26 |
|                 | 12H  | 11.54            | 11.81 | 12.59 | 12.85 | 14.26 | 7.66           | 7.94 | 8.72 | 8.98 | 10.38 |
| 12H             | 4H   | 10.55            | 10.94 | 11.59 | 11.98 | 13.33 | 6.83           | 7.22 | 7.87 | 8.26 | 9.61  |
|                 | 6H   | 11.15            | 11.46 | 12.20 | 12.51 | 13.87 | 7.40           | 7.71 | 8.45 | 8.76 | 10.12 |
|                 | 8H   | 11.37            | 11.65 | 12.43 | 12.69 | 14.09 | 7.61           | 7.89 | 8.67 | 8.93 | 10.33 |