

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: P926944

Luminaire Tested: DFN2DIP-HX4F0-060D040US830-FLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P926944  
REPORT IS A COMBINATION OF REPORTS P900823 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-060D040US830-FLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

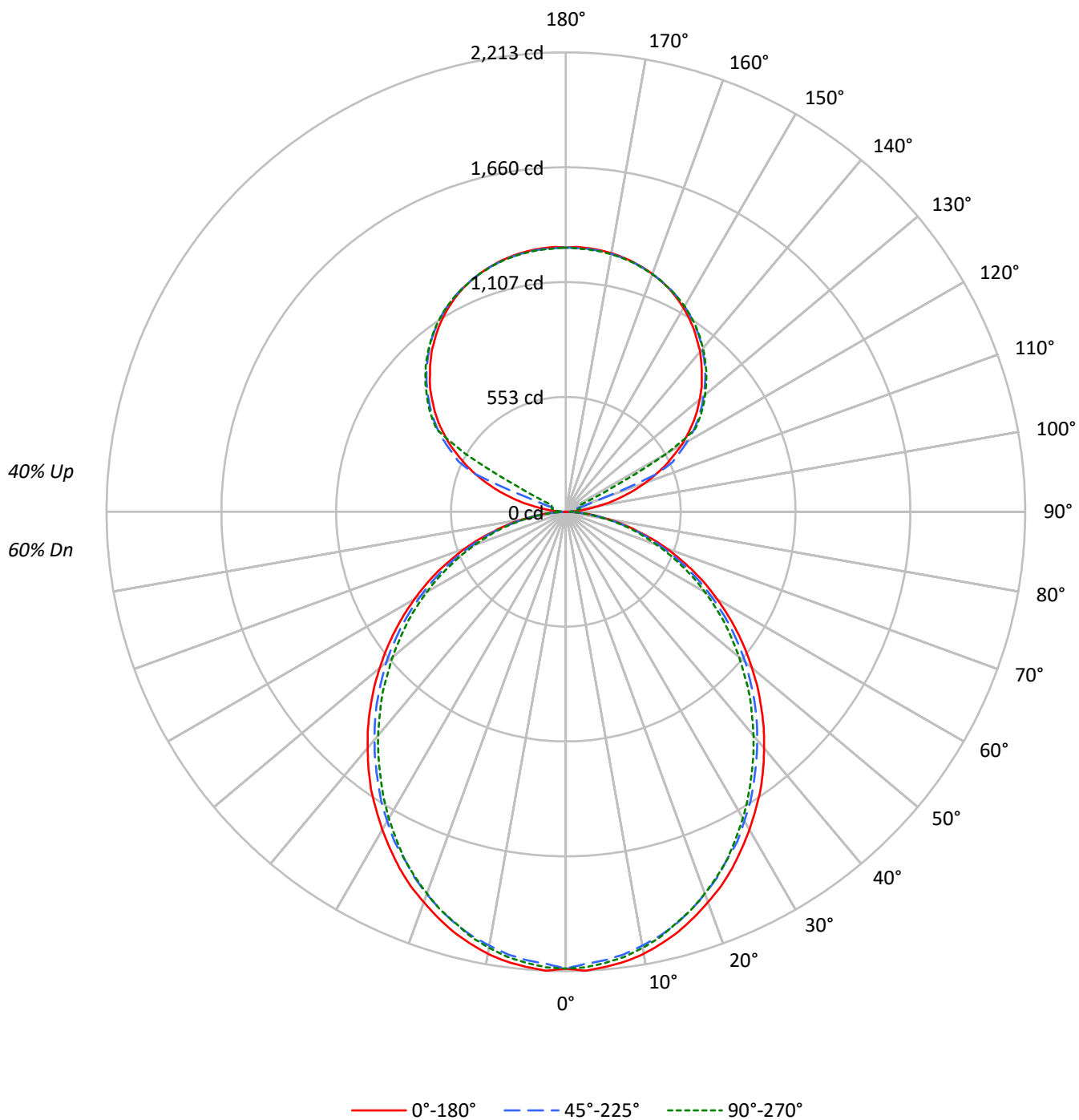
Lumens per Lamp: N/A  
Luminaire Lumens: 9330.7 lumens  
Efficiency: N/A  
Efficacy: 110.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 84.3  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.099  
Total Harmonic Distortion (THDi): 0.979  
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   | 110 | 110 | 110 | 110 | 102 | 102 | 102 | 102 | 89 | 89 | 89 | 77 | 77 | 77 | 65 | 65 | 65 |
| 1   | 100 | 96  | 92  | 88  | 93  | 90  | 86  | 83  | 78 | 75 | 73 | 67 | 66 | 64 | 58 | 56 | 55 |
| 2   | 91  | 84  | 77  | 72  | 85  | 78  | 73  | 68  | 68 | 64 | 61 | 59 | 56 | 53 | 51 | 49 | 47 |
| 3   | 83  | 73  | 66  | 60  | 77  | 69  | 62  | 57  | 60 | 55 | 51 | 52 | 48 | 45 | 45 | 42 | 40 |
| 4   | 76  | 65  | 57  | 51  | 71  | 61  | 54  | 48  | 54 | 48 | 44 | 47 | 42 | 39 | 40 | 37 | 34 |
| 5   | 70  | 58  | 50  | 44  | 65  | 55  | 47  | 42  | 48 | 42 | 38 | 42 | 37 | 34 | 36 | 33 | 30 |
| 6   | 64  | 52  | 44  | 38  | 60  | 49  | 42  | 36  | 43 | 37 | 33 | 38 | 33 | 30 | 33 | 29 | 26 |
| 7   | 60  | 47  | 39  | 33  | 56  | 44  | 37  | 32  | 39 | 33 | 29 | 35 | 30 | 26 | 30 | 26 | 23 |
| 8   | 55  | 43  | 35  | 30  | 52  | 40  | 33  | 28  | 36 | 30 | 26 | 32 | 27 | 23 | 28 | 24 | 21 |
| 9   | 52  | 39  | 32  | 26  | 48  | 37  | 30  | 25  | 33 | 27 | 23 | 29 | 24 | 21 | 26 | 22 | 19 |
| 10  | 48  | 36  | 29  | 24  | 45  | 34  | 27  | 23  | 30 | 25 | 21 | 27 | 22 | 19 | 24 | 20 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1636 | 1636 | 1636 |
| 5°  | 1639 | 1613 | 1624 |
| 10° | 1626 | 1592 | 1602 |
| 15° | 1602 | 1566 | 1568 |
| 20° | 1570 | 1530 | 1533 |
| 25° | 1538 | 1486 | 1492 |
| 30° | 1498 | 1446 | 1441 |
| 35° | 1460 | 1398 | 1386 |
| 40° | 1413 | 1350 | 1334 |
| 45° | 1366 | 1302 | 1281 |
| 50° | 1315 | 1251 | 1219 |
| 55° | 1262 | 1193 | 1163 |
| 60° | 1201 | 1123 | 1098 |
| 65° | 1136 | 1051 | 1021 |
| 70° | 1052 | 964  | 939  |
| 75° | 935  | 859  | 863  |
| 80° | 796  | 725  | 718  |
| 85° | 577  | 494  | 478  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1366 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 207.1  | 2.2       |
| 10°-20°   | 582.7  | 6.2       |
| 20°-30°   | 856.3  | 9.2       |
| 30°-40°   | 994.6  | 10.7      |
| 40°-50°   | 993.4  | 10.6      |
| 50°-60°   | 866.2  | 9.3       |
| 60°-70°   | 640.3  | 6.9       |
| 70°-80°   | 362.3  | 3.9       |
| 80°-90°   | 97.9   | 1.0       |
| 90°-100°  | 41.9   | 0.4       |
| 100°-110° | 156.4  | 1.7       |
| 110°-120° | 414.8  | 4.4       |
| 120°-130° | 688.0  | 7.4       |
| 130°-140° | 730.8  | 7.8       |
| 140°-150° | 679.2  | 7.3       |
| 150°-160° | 546.0  | 5.9       |
| 160°-170° | 351.9  | 3.8       |
| 170°-180° | 121.1  | 1.3       |
| 0°-30°    | 1646.2 | 17.6      |
| 0°-40°    | 2640.7 | 28.3      |
| 0°-60°    | 4500.3 | 48.2      |
| 0°-90°    | 5600.7 | 60.0      |
| 90°-120°  | 613.1  | 6.6       |
| 90°-150°  | 2711.1 | 29.1      |
| 90°-180°  | 3730.0 | 40.0      |
| 0°-180°   | 9330.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2200 | 2200  | 2200 | 2200  | 2200 |      |
| 5°   | 2200 | 2192  | 2169 | 2186  | 2182 | 209  |
| 15°  | 2095 | 2082  | 2054 | 2063  | 2052 | 590  |
| 25°  | 1896 | 1879  | 1843 | 1847  | 1843 | 872  |
| 35°  | 1636 | 1614  | 1581 | 1568  | 1557 | 1021 |
| 45°  | 1331 | 1316  | 1284 | 1261  | 1253 | 1027 |
| 55°  | 1007 | 994   | 969  | 944   | 933  | 901  |
| 65°  | 679  | 666   | 645  | 626   | 616  | 672  |
| 75°  | 355  | 351   | 340  | 328   | 332  | 379  |
| 85°  | 87   | 85    | 83   | 76    | 74   | 97   |
| 90°  | 1    | 11    | 18   | 23    | 25   | 9    |
| 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  | 667  |
| 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°     | 2200.4 | 2200.4 | 2200.4 | 2200.4 | 2200.4 |
| 2.5°   | 2213.2 | 2202.6 | 2179.2 | 2200.4 | 2196.3 |
| 5°     | 2200.4 | 2192.1 | 2168.7 | 2185.6 | 2181.5 |
| 7.5°   | 2185.6 | 2173.0 | 2149.7 | 2166.7 | 2162.5 |
| 10°    | 2162.5 | 2147.7 | 2122.2 | 2139.1 | 2132.8 |
| 12.5°  | 2130.6 | 2118.0 | 2092.6 | 2103.2 | 2098.9 |
| 15°    | 2094.6 | 2082.1 | 2054.5 | 2063.0 | 2052.5 |
| 17.5°  | 2050.2 | 2037.7 | 2010.1 | 2020.5 | 2010.1 |
| 20°    | 2001.5 | 1989.0 | 1959.3 | 1965.6 | 1957.3 |
| 22.5°  | 1953.0 | 1933.9 | 1906.3 | 1906.3 | 1902.1 |
| 25°    | 1895.7 | 1879.0 | 1843.0 | 1847.0 | 1843.0 |
| 27.5°  | 1832.2 | 1817.4 | 1790.0 | 1783.8 | 1773.2 |
| 30°    | 1769.0 | 1751.8 | 1720.3 | 1713.9 | 1705.4 |
| 32.5°  | 1701.1 | 1688.6 | 1654.7 | 1641.8 | 1633.4 |
| 35°    | 1635.6 | 1614.5 | 1580.6 | 1567.8 | 1557.2 |
| 37.5°  | 1561.5 | 1542.4 | 1508.6 | 1493.7 | 1483.1 |
| 40°    | 1485.4 | 1468.3 | 1434.5 | 1415.6 | 1407.1 |
| 42.5°  | 1411.3 | 1394.2 | 1360.6 | 1339.3 | 1326.7 |
| 45°    | 1331.0 | 1316.1 | 1284.3 | 1261.2 | 1252.6 |
| 47.5°  | 1252.6 | 1237.8 | 1203.9 | 1180.6 | 1167.9 |
| 50°    | 1170.0 | 1159.5 | 1129.9 | 1100.2 | 1089.6 |
| 52.5°  | 1089.6 | 1074.8 | 1047.4 | 1024.1 | 1009.3 |
| 55°    | 1007.2 | 994.4  | 969.1  | 943.7  | 933.2  |
| 57.5°  | 924.7  | 914.1  | 886.5  | 861.2  | 852.6  |
| 60°    | 842.0  | 833.7  | 804.1  | 780.8  | 774.5  |
| 62.5°  | 761.6  | 746.8  | 725.7  | 704.6  | 696.1  |
| 65°    | 679.3  | 666.5  | 645.4  | 626.3  | 615.7  |
| 67.5°  | 594.6  | 583.9  | 565.0  | 550.2  | 541.7  |
| 70°    | 516.3  | 507.8  | 488.7  | 473.9  | 465.6  |
| 72.5°  | 435.9  | 427.4  | 416.9  | 402.1  | 395.8  |
| 75°    | 355.3  | 351.4  | 340.5  | 328.0  | 332.2  |
| 77.5°  | 283.5  | 275.0  | 270.7  | 264.5  | 258.2  |
| 80°    | 211.7  | 209.4  | 205.2  | 198.9  | 194.6  |
| 82.5°  | 143.9  | 143.9  | 141.8  | 133.4  | 133.4  |
| 85°    | 86.6   | 84.6   | 82.6   | 76.1   | 74.1   |
| 87.5°  | 38.2   | 33.9   | 29.6   | 23.4   | 21.1   |
| 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  | 307.5  | 56.2   | 66.3   | 69.9   |
| 107.5° | 345.2  | 368.2  | 58.1   | 68.1   | 71.8   |
| 110°   | 407.9  | 427.1  | 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  | 568.0  | 141.8  | 75.6   |
| 117.5° | 583.7  | 602.1  | 617.8  | 486.0  | 244.9  |
| 120°   | 644.5  | 658.2  | 674.8  | 686.0  | 561.6  |
| 122.5° | 695.9  | 710.7  | 729.2  | 734.7  | 735.6  |
| 125°   | 748.4  | 760.5  | 777.9  | 784.4  | 787.2  |
| 127.5° | 796.3  | 809.2  | 823.1  | 832.3  | 833.2  |
| 130°   | 841.5  | 856.3  | 866.3  | 876.4  | 875.6  |
| 132.5° | 887.5  | 899.5  | 909.6  | 917.9  | 917.1  |
| 135°   | 926.2  | 941.0  | 949.2  | 958.4  | 956.6  |
| 137.5° | 966.6  | 977.7  | 987.0  | 996.1  | 993.4  |
| 140°   | 1006.2 | 1013.7 | 1023.7 | 1032.0 | 1027.4 |
| 142.5° | 1039.5 | 1045.9 | 1057.9 | 1065.1 | 1060.6 |
| 145°   | 1074.4 | 1073.5 | 1089.1 | 1095.6 | 1090.9 |
| 147.5° | 1104.7 | 1102.0 | 1117.6 | 1122.2 | 1118.7 |
| 150°   | 1134.2 | 1127.8 | 1142.6 | 1148.1 | 1143.4 |
| 152.5° | 1159.1 | 1151.7 | 1165.5 | 1171.1 | 1164.6 |
| 155°   | 1183.0 | 1174.8 | 1185.9 | 1191.3 | 1184.0 |
| 157.5° | 1202.3 | 1195.0 | 1203.4 | 1209.8 | 1202.3 |
| 160°   | 1218.9 | 1213.4 | 1218.9 | 1224.4 | 1218.0 |
| 162.5° | 1233.6 | 1228.2 | 1232.8 | 1239.2 | 1230.9 |
| 165°   | 1246.6 | 1241.1 | 1243.8 | 1250.2 | 1243.8 |
| 167.5° | 1256.7 | 1251.1 | 1254.0 | 1260.4 | 1252.1 |
| 170°   | 1265.0 | 1259.5 | 1261.3 | 1267.8 | 1259.5 |
| 172.5° | 1270.5 | 1265.0 | 1266.9 | 1273.3 | 1265.0 |
| 175°   | 1275.0 | 1268.6 | 1270.5 | 1276.9 | 1267.8 |
| 177.5° | 1276.9 | 1270.5 | 1271.4 | 1277.9 | 1269.6 |
| 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 | 9.86             | 10.82 | 10.73 | 11.71 | 12.83 | 9.43           | 10.39 | 10.29 | 11.28 | 12.40 |
|                 | 3H   | 11.53            | 12.39 | 12.41 | 13.29 | 14.43 | 11.06          | 11.92 | 11.93 | 12.81 | 13.96 |
|                 | 4H   | 12.12            | 12.94 | 13.02 | 13.84 | 14.99 | 11.65          | 12.46 | 12.54 | 13.36 | 14.52 |
|                 | 6H   | 12.53            | 13.28 | 13.43 | 14.19 | 15.36 | 12.05          | 12.80 | 12.96 | 13.71 | 14.88 |
|                 | 8H   | 12.63            | 13.35 | 13.55 | 14.28 | 15.45 | 12.16          | 12.87 | 13.07 | 13.80 | 14.97 |
|                 | 12H  | 12.69            | 13.37 | 13.61 | 14.29 | 15.48 | 12.21          | 12.89 | 13.13 | 13.81 | 15.00 |
| 4H              | 2H   | 10.33            | 11.15 | 11.23 | 12.05 | 13.21 | 9.99           | 10.80 | 10.89 | 11.71 | 12.86 |
|                 | 3H   | 12.21            | 12.89 | 13.12 | 13.82 | 15.00 | 11.82          | 12.50 | 12.73 | 13.43 | 14.60 |
|                 | 4H   | 12.93            | 13.55 | 13.85 | 14.48 | 15.68 | 12.52          | 13.14 | 13.44 | 14.07 | 15.27 |
|                 | 6H   | 13.45            | 13.99 | 14.39 | 14.94 | 16.14 | 13.04          | 13.58 | 13.98 | 14.53 | 15.73 |
|                 | 8H   | 13.60            | 14.10 | 14.54 | 15.05 | 16.26 | 13.19          | 13.69 | 14.13 | 14.64 | 15.85 |
|                 | 12H  | 13.68            | 14.13 | 14.64 | 15.10 | 16.32 | 13.26          | 13.71 | 14.22 | 14.68 | 15.89 |
| 8H              | 4H   | 13.13            | 13.63 | 14.07 | 14.58 | 15.79 | 12.77          | 13.27 | 13.71 | 14.22 | 15.43 |
|                 | 6H   | 13.77            | 14.19 | 14.73 | 15.17 | 16.38 | 13.41          | 13.82 | 14.37 | 14.81 | 16.02 |
|                 | 8H   | 13.99            | 14.36 | 14.97 | 15.34 | 16.57 | 13.62          | 13.99 | 14.60 | 14.97 | 16.20 |
|                 | 12H  | 14.13            | 14.45 | 15.11 | 15.42 | 16.70 | 13.75          | 14.07 | 14.72 | 15.04 | 16.32 |
| 12H             | 4H   | 13.13            | 13.58 | 14.08 | 14.54 | 15.76 | 12.77          | 13.22 | 13.73 | 14.19 | 15.41 |
|                 | 6H   | 13.80            | 14.17 | 14.78 | 15.15 | 16.38 | 13.45          | 13.82 | 14.42 | 14.80 | 16.02 |
|                 | 8H   | 14.05            | 14.37 | 15.03 | 15.34 | 16.62 | 13.69          | 14.02 | 14.67 | 14.99 | 16.26 |