

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: P927556

Luminaire Tested: DFN2DIP-HX4F0-050D040US840-FLLONL

Issue Date: 12/12/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P927556  
REPORT IS A COMBINATION OF REPORTS P900821 AND P896187  
Test Lab: INNOVATION CENTER  
Issue Date: 12/12/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX4F0-050D040US840-FLLONL  
Description: 4 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

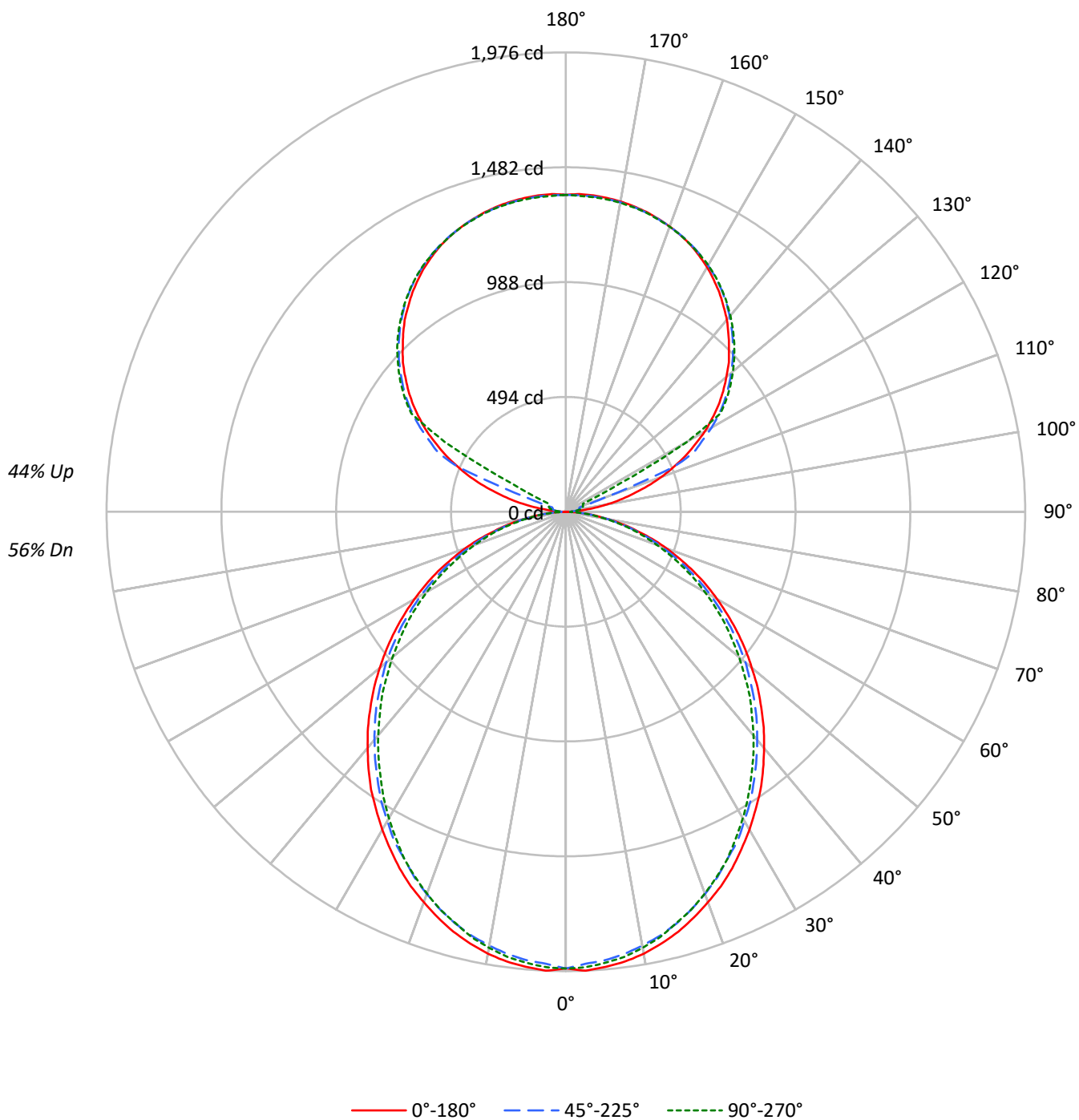
Lumens per Lamp: N/A  
Luminaire Lumens: 8997.3 lumens  
Efficiency: N/A  
Efficacy: 121.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 73.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9957  
Total Harmonic Distortion (THDi): 0.049  
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 | 101 | 101 | 101 | 101 | 86 | 86 | 86 | 73 | 73 | 73 | 61 | 61 | 61 |
| 1   | 99  | 95  | 91  | 87  | 92  | 88  | 85  | 82  | 76 | 73 | 71 | 65 | 63 | 61 | 54 | 53 | 52 |
| 2   | 90  | 83  | 76  | 71  | 84  | 77  | 72  | 67  | 66 | 62 | 59 | 57 | 54 | 51 | 48 | 46 | 44 |
| 3   | 82  | 73  | 65  | 59  | 76  | 68  | 61  | 56  | 59 | 54 | 50 | 50 | 46 | 43 | 42 | 39 | 37 |
| 4   | 75  | 64  | 56  | 50  | 70  | 60  | 53  | 48  | 52 | 47 | 42 | 45 | 40 | 37 | 38 | 35 | 32 |
| 5   | 69  | 57  | 49  | 43  | 64  | 54  | 46  | 41  | 47 | 41 | 36 | 40 | 36 | 32 | 34 | 31 | 28 |
| 6   | 64  | 52  | 43  | 37  | 59  | 48  | 41  | 36  | 42 | 36 | 32 | 36 | 32 | 28 | 31 | 27 | 25 |
| 7   | 59  | 47  | 39  | 33  | 55  | 44  | 36  | 31  | 38 | 32 | 28 | 33 | 28 | 25 | 28 | 25 | 22 |
| 8   | 55  | 42  | 34  | 29  | 51  | 40  | 33  | 28  | 35 | 29 | 25 | 30 | 26 | 22 | 26 | 22 | 20 |
| 9   | 51  | 39  | 31  | 26  | 47  | 36  | 29  | 25  | 32 | 26 | 22 | 28 | 23 | 20 | 24 | 20 | 18 |
| 10  | 48  | 35  | 28  | 23  | 44  | 33  | 27  | 22  | 29 | 24 | 20 | 26 | 21 | 18 | 22 | 19 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1461 | 1461 | 1461 |
| 5°  | 1463 | 1441 | 1450 |
| 10° | 1451 | 1421 | 1431 |
| 15° | 1430 | 1398 | 1400 |
| 20° | 1402 | 1366 | 1369 |
| 25° | 1373 | 1327 | 1332 |
| 30° | 1337 | 1291 | 1286 |
| 35° | 1303 | 1248 | 1238 |
| 40° | 1261 | 1205 | 1191 |
| 45° | 1220 | 1162 | 1144 |
| 50° | 1174 | 1117 | 1089 |
| 55° | 1126 | 1065 | 1038 |
| 60° | 1073 | 1003 | 980  |
| 65° | 1014 | 939  | 912  |
| 70° | 939  | 860  | 839  |
| 75° | 835  | 767  | 771  |
| 80° | 711  | 648  | 641  |
| 85° | 516  | 441  | 426  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1220 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 184.9  | 2.1       |
| 10°-20°   | 520.3  | 5.8       |
| 20°-30°   | 764.6  | 8.5       |
| 30°-40°   | 888.0  | 9.9       |
| 40°-50°   | 886.9  | 9.9       |
| 50°-60°   | 773.4  | 8.6       |
| 60°-70°   | 571.7  | 6.4       |
| 70°-80°   | 323.4  | 3.6       |
| 80°-90°   | 87.8   | 1.0       |
| 90°-100°  | 44.9   | 0.5       |
| 100°-110° | 167.6  | 1.9       |
| 110°-120° | 444.4  | 4.9       |
| 120°-130° | 737.1  | 8.2       |
| 130°-140° | 783.0  | 8.7       |
| 140°-150° | 727.7  | 8.1       |
| 150°-160° | 585.0  | 6.5       |
| 160°-170° | 377.0  | 4.2       |
| 170°-180° | 129.8  | 1.4       |
| 0°-30°    | 1469.7 | 16.3      |
| 0°-40°    | 2357.8 | 26.2      |
| 0°-60°    | 4018.0 | 44.7      |
| 0°-90°    | 5000.9 | 55.6      |
| 90°-120°  | 656.9  | 7.3       |
| 90°-150°  | 2904.6 | 32.3      |
| 90°-180°  | 3996.0 | 44.4      |
| 0°-180°   | 8997.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1965 | 1965  | 1965 | 1965  | 1965 |      |
| 5°   | 1965 | 1957  | 1936 | 1951  | 1948 | 186  |
| 15°  | 1870 | 1859  | 1834 | 1842  | 1832 | 527  |
| 25°  | 1693 | 1678  | 1646 | 1649  | 1646 | 779  |
| 35°  | 1460 | 1442  | 1411 | 1400  | 1390 | 912  |
| 45°  | 1188 | 1175  | 1147 | 1126  | 1118 | 917  |
| 55°  | 899  | 888   | 865  | 843   | 833  | 804  |
| 65°  | 606  | 595   | 576  | 559   | 550  | 600  |
| 75°  | 317  | 314   | 304  | 293   | 297  | 339  |
| 85°  | 77   | 76    | 74   | 68    | 66   | 86   |
| 90°  | 1    | 12    | 20   | 25    | 27   | 8    |
| 95°  | 64   | 32    | 38   | 43    | 42   | 76   |
| 105° | 300  | 330   | 60   | 71    | 75   | 320  |
| 115° | 567  | 584   | 609  | 152   | 81   | 558  |
| 125° | 802  | 815   | 834  | 840   | 843  | 715  |
| 135° | 992  | 1008  | 1017 | 1027  | 1025 | 767  |
| 145° | 1151 | 1150  | 1167 | 1174  | 1169 | 720  |
| 155° | 1268 | 1259  | 1270 | 1276  | 1268 | 584  |
| 165° | 1336 | 1330  | 1333 | 1340  | 1333 | 377  |
| 175° | 1366 | 1359  | 1361 | 1368  | 1358 | 130  |
| 180° | 1363 | 1363  | 1363 | 1363  | 1363 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1964.6 | 1964.6 | 1964.6 | 1964.6 | 1964.6 |
| 2.5°   | 1976.0 | 1966.6 | 1945.8 | 1964.6 | 1961.0 |
| 5°     | 1964.6 | 1957.2 | 1936.3 | 1951.3 | 1947.8 |
| 7.5°   | 1951.3 | 1940.1 | 1919.3 | 1934.6 | 1930.7 |
| 10°    | 1930.7 | 1917.5 | 1894.9 | 1909.8 | 1904.3 |
| 12.5°  | 1902.3 | 1891.1 | 1868.4 | 1877.8 | 1874.0 |
| 15°    | 1870.1 | 1858.9 | 1834.3 | 1842.0 | 1832.5 |
| 17.5°  | 1830.5 | 1819.3 | 1794.6 | 1804.0 | 1794.6 |
| 20°    | 1787.0 | 1775.8 | 1749.4 | 1754.9 | 1747.6 |
| 22.5°  | 1743.7 | 1726.7 | 1702.0 | 1702.0 | 1698.2 |
| 25°    | 1692.6 | 1677.6 | 1645.5 | 1649.1 | 1645.5 |
| 27.5°  | 1635.9 | 1622.6 | 1598.2 | 1592.6 | 1583.2 |
| 30°    | 1579.3 | 1564.2 | 1535.9 | 1530.3 | 1522.7 |
| 32.5°  | 1518.8 | 1507.6 | 1477.3 | 1465.9 | 1458.4 |
| 35°    | 1460.3 | 1441.5 | 1411.2 | 1399.8 | 1390.4 |
| 37.5°  | 1394.1 | 1377.2 | 1346.9 | 1333.6 | 1324.3 |
| 40°    | 1326.3 | 1311.0 | 1280.7 | 1263.9 | 1256.3 |
| 42.5°  | 1260.1 | 1244.9 | 1214.8 | 1195.7 | 1184.5 |
| 45°    | 1188.3 | 1175.1 | 1146.6 | 1126.0 | 1118.4 |
| 47.5°  | 1118.4 | 1105.1 | 1074.9 | 1054.0 | 1042.8 |
| 50°    | 1044.6 | 1035.2 | 1008.8 | 982.3  | 972.8  |
| 52.5°  | 972.8  | 959.6  | 935.2  | 914.4  | 901.1  |
| 55°    | 899.3  | 887.9  | 865.2  | 842.6  | 833.2  |
| 57.5°  | 825.5  | 816.1  | 791.5  | 768.9  | 761.2  |
| 60°    | 751.8  | 744.4  | 718.0  | 697.1  | 691.5  |
| 62.5°  | 680.1  | 666.9  | 648.0  | 629.1  | 621.5  |
| 65°    | 606.5  | 595.1  | 576.2  | 559.2  | 549.7  |
| 67.5°  | 531.0  | 521.4  | 504.5  | 491.3  | 483.6  |
| 70°    | 461.0  | 453.4  | 436.3  | 423.1  | 415.7  |
| 72.5°  | 389.3  | 381.6  | 372.2  | 359.0  | 353.3  |
| 75°    | 317.3  | 313.6  | 304.1  | 292.8  | 296.7  |
| 77.5°  | 253.2  | 245.5  | 241.7  | 236.1  | 230.5  |
| 80°    | 189.0  | 187.0  | 183.2  | 177.6  | 173.8  |
| 82.5°  | 128.4  | 128.4  | 126.6  | 119.1  | 119.1  |
| 85°    | 77.4   | 75.5   | 73.7   | 68.0   | 66.1   |
| 87.5°  | 34.0   | 30.3   | 26.5   | 20.8   | 18.9   |
| 90°    | 0.9    | 11.8   | 19.7   | 24.7   | 26.6   |
| 92.5°  | 24.7   | 20.7   | 23.6   | 25.6   | 26.6   |
| 95°    | 64.0   | 31.5   | 38.4   | 43.4   | 42.4   |
| 97.5°  | 115.4  | 34.5   | 50.3   | 53.3   | 54.2   |
| 100°   | 174.6  | 39.5   | 56.2   | 64.0   | 66.0   |
| 102.5° | 239.6  | 237.8  | 58.2   | 69.0   | 72.0   |
| 105°   | 299.8  | 329.5  | 60.2   | 71.0   | 74.9   |
| 107.5° | 369.9  | 394.5  | 62.2   | 73.0   | 76.9   |
| 110°   | 437.0  | 457.6  | 172.7  | 74.0   | 77.9   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 500.2  | 517.8  | 501.1  | 75.9   | 79.0   |
| 115°   | 567.1  | 583.9  | 608.6  | 151.9  | 81.0   |
| 117.5° | 625.4  | 645.1  | 661.9  | 520.8  | 262.3  |
| 120°   | 690.5  | 705.2  | 723.0  | 734.9  | 601.7  |
| 122.5° | 745.6  | 761.5  | 781.3  | 787.1  | 788.1  |
| 125°   | 801.9  | 814.8  | 833.5  | 840.5  | 843.4  |
| 127.5° | 853.2  | 867.0  | 881.9  | 891.8  | 892.7  |
| 130°   | 901.5  | 917.4  | 928.1  | 939.0  | 938.1  |
| 132.5° | 950.8  | 963.8  | 974.6  | 983.4  | 982.5  |
| 135°   | 992.3  | 1008.2 | 1017.0 | 1026.9 | 1024.9 |
| 137.5° | 1035.7 | 1047.5 | 1057.5 | 1067.3 | 1064.3 |
| 140°   | 1078.1 | 1086.0 | 1096.8 | 1105.7 | 1100.8 |
| 142.5° | 1113.7 | 1120.6 | 1133.4 | 1141.2 | 1136.3 |
| 145°   | 1151.2 | 1150.2 | 1166.8 | 1173.8 | 1168.8 |
| 147.5° | 1183.6 | 1180.7 | 1197.4 | 1202.4 | 1198.5 |
| 150°   | 1215.2 | 1208.3 | 1224.2 | 1230.0 | 1225.1 |
| 152.5° | 1241.9 | 1234.0 | 1248.7 | 1254.7 | 1247.8 |
| 155°   | 1267.5 | 1258.7 | 1270.5 | 1276.4 | 1268.5 |
| 157.5° | 1288.2 | 1280.3 | 1289.3 | 1296.2 | 1288.2 |
| 160°   | 1306.0 | 1300.0 | 1306.0 | 1311.8 | 1305.0 |
| 162.5° | 1321.7 | 1315.9 | 1320.8 | 1327.7 | 1318.8 |
| 165°   | 1335.6 | 1329.7 | 1332.6 | 1339.5 | 1332.6 |
| 167.5° | 1346.5 | 1340.4 | 1343.5 | 1350.4 | 1341.5 |
| 170°   | 1355.4 | 1349.4 | 1351.3 | 1358.3 | 1349.4 |
| 172.5° | 1361.2 | 1355.4 | 1357.4 | 1364.2 | 1355.4 |
| 175°   | 1366.1 | 1359.2 | 1361.2 | 1368.1 | 1358.3 |
| 177.5° | 1368.1 | 1361.2 | 1362.2 | 1369.2 | 1360.3 |
| 180°   | 1363.2 | 1363.2 | 1363.2 | 1363.2 | 1363.2 |

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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 | 9.09             | 10.00 | 10.00 | 10.93 | 12.12 | 8.66           | 9.57  | 9.57  | 10.50 | 11.69 |
|                 | 3H   | 10.76            | 11.58 | 11.67 | 12.51 | 13.73 | 10.28          | 11.10 | 11.20 | 12.04 | 13.25 |
|                 | 4H   | 11.35            | 12.12 | 12.28 | 13.06 | 14.29 | 10.87          | 11.65 | 11.81 | 12.59 | 13.81 |
|                 | 6H   | 11.75            | 12.46 | 12.70 | 13.41 | 14.65 | 11.27          | 11.99 | 12.22 | 12.94 | 14.17 |
|                 | 8H   | 11.86            | 12.54 | 12.81 | 13.50 | 14.73 | 11.38          | 12.06 | 12.33 | 13.03 | 14.26 |
|                 | 12H  | 11.91            | 12.55 | 12.86 | 13.51 | 14.77 | 11.43          | 12.07 | 12.38 | 13.03 | 14.29 |
| 4H              | 2H   | 9.56             | 10.33 | 10.50 | 11.28 | 12.50 | 9.21           | 9.99  | 10.15 | 10.93 | 12.15 |
|                 | 3H   | 11.43            | 12.08 | 12.38 | 13.05 | 14.29 | 11.04          | 11.69 | 11.99 | 12.66 | 13.89 |
|                 | 4H   | 12.15            | 12.74 | 13.11 | 13.70 | 14.97 | 11.74          | 12.33 | 12.70 | 13.30 | 14.56 |
|                 | 6H   | 12.67            | 13.18 | 13.64 | 14.17 | 15.43 | 12.26          | 12.77 | 13.23 | 13.76 | 15.02 |
|                 | 8H   | 12.82            | 13.29 | 13.79 | 14.28 | 15.55 | 12.41          | 12.88 | 13.38 | 13.87 | 15.14 |
|                 | 12H  | 12.89            | 13.32 | 13.89 | 14.32 | 15.60 | 12.47          | 12.90 | 13.47 | 13.90 | 15.18 |
| 8H              | 4H   | 12.35            | 12.83 | 13.32 | 13.81 | 15.08 | 11.99          | 12.47 | 12.96 | 13.45 | 14.72 |
|                 | 6H   | 12.98            | 13.38 | 13.98 | 14.40 | 15.68 | 12.62          | 13.02 | 13.62 | 14.04 | 15.31 |
|                 | 8H   | 13.21            | 13.55 | 14.21 | 14.57 | 15.86 | 12.84          | 13.19 | 13.85 | 14.20 | 15.49 |
|                 | 12H  | 13.34            | 13.65 | 14.35 | 14.65 | 15.99 | 12.96          | 13.26 | 13.97 | 14.27 | 15.61 |
| 12H             | 4H   | 12.34            | 12.77 | 13.33 | 13.77 | 15.05 | 11.99          | 12.42 | 12.98 | 13.42 | 14.70 |
|                 | 6H   | 13.01            | 13.36 | 14.02 | 14.38 | 15.67 | 12.66          | 13.01 | 13.67 | 14.02 | 15.32 |
|                 | 8H   | 13.26            | 13.57 | 14.27 | 14.57 | 15.91 | 12.90          | 13.21 | 13.92 | 14.22 | 15.55 |