

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: P908673

Luminaire Tested: DFN2DIP-PN4F0-060D040US840-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P908673  
REPORT IS A COMBINATION OF REPORTS P901133 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-060D040US840-FLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

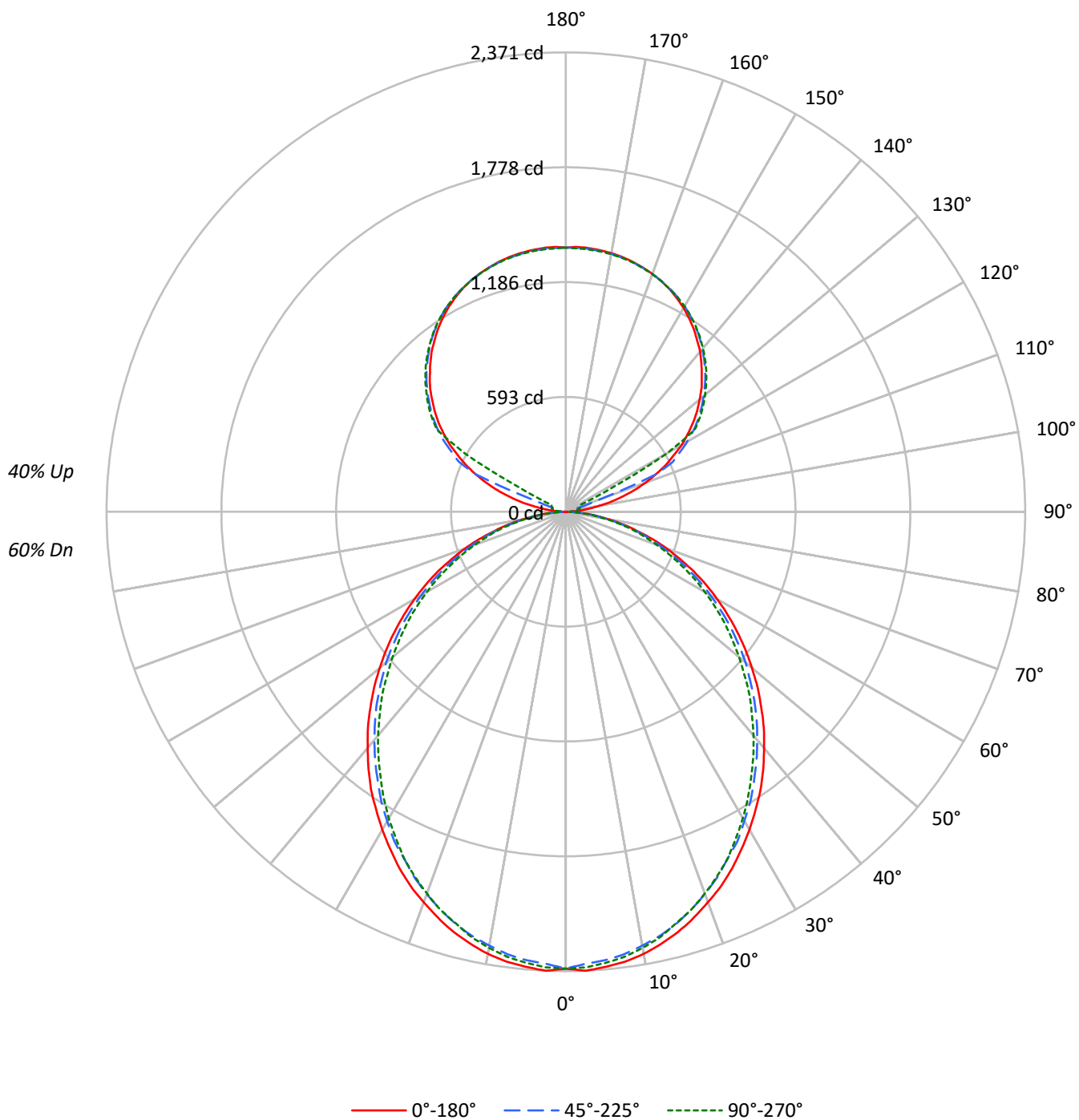
Lumens per Lamp: N/A  
Luminaire Lumens: 9997.6 lumens  
Efficiency: N/A  
Efficacy: 117.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 84.9  
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   | 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°  | 1721 | 1721 | 1721 |
| 5°  | 1724 | 1697 | 1709 |
| 10° | 1710 | 1675 | 1686 |
| 15° | 1685 | 1647 | 1650 |
| 20° | 1651 | 1609 | 1613 |
| 25° | 1617 | 1564 | 1571 |
| 30° | 1575 | 1521 | 1517 |
| 35° | 1534 | 1471 | 1460 |
| 40° | 1485 | 1421 | 1405 |
| 45° | 1436 | 1370 | 1349 |
| 50° | 1382 | 1317 | 1285 |
| 55° | 1325 | 1255 | 1226 |
| 60° | 1262 | 1182 | 1158 |
| 65° | 1192 | 1107 | 1078 |
| 70° | 1104 | 1015 | 992  |
| 75° | 981  | 905  | 913  |
| 80° | 833  | 764  | 761  |
| 85° | 602  | 522  | 509  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1436 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 221.9  | 2.2       |
| 10°-20°   | 624.4  | 6.2       |
| 20°-30°   | 917.5  | 9.2       |
| 30°-40°   | 1065.7 | 10.7      |
| 40°-50°   | 1064.4 | 10.6      |
| 50°-60°   | 928.1  | 9.3       |
| 60°-70°   | 686.1  | 6.9       |
| 70°-80°   | 388.2  | 3.9       |
| 80°-90°   | 104.8  | 1.0       |
| 90°-100°  | 44.9   | 0.4       |
| 100°-110° | 167.6  | 1.7       |
| 110°-120° | 444.4  | 4.4       |
| 120°-130° | 737.1  | 7.4       |
| 130°-140° | 783.0  | 7.8       |
| 140°-150° | 727.7  | 7.3       |
| 150°-160° | 585.1  | 5.9       |
| 160°-170° | 377.0  | 3.8       |
| 170°-180° | 129.8  | 1.3       |
| 0°-30°    | 1763.8 | 17.6      |
| 0°-40°    | 2829.5 | 28.3      |
| 0°-60°    | 4821.9 | 48.2      |
| 0°-90°    | 6001.0 | 60.0      |
| 90°-120°  | 656.9  | 6.6       |
| 90°-150°  | 2904.8 | 29.1      |
| 90°-180°  | 3997.0 | 40.0      |
| 0°-180°   | 9997.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2358 | 2358  | 2358 | 2358  | 2358 |      |
| 5°   | 2358 | 2349  | 2324 | 2342  | 2337 | 224  |
| 15°  | 2244 | 2231  | 2201 | 2210  | 2199 | 632  |
| 25°  | 2031 | 2013  | 1975 | 1979  | 1975 | 935  |
| 35°  | 1752 | 1730  | 1694 | 1680  | 1668 | 1094 |
| 45°  | 1426 | 1410  | 1376 | 1351  | 1342 | 1101 |
| 55°  | 1079 | 1066  | 1038 | 1011  | 1000 | 965  |
| 65°  | 728  | 714   | 692  | 671   | 660  | 720  |
| 75°  | 381  | 376   | 365  | 351   | 356  | 406  |
| 85°  | 93   | 91    | 88   | 82    | 79   | 104  |
| 90°  | 1    | 12    | 20   | 25    | 27   | 9    |
| 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  | 1271 | 1276  | 1269 | 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°     | 2357.6 | 2357.6 | 2357.6 | 2357.6 | 2357.6 |
| 2.5°   | 2371.4 | 2360.1 | 2335.0 | 2357.6 | 2353.3 |
| 5°     | 2357.6 | 2348.7 | 2323.7 | 2341.8 | 2337.4 |
| 7.5°   | 2341.8 | 2328.3 | 2303.3 | 2321.6 | 2317.0 |
| 10°    | 2317.0 | 2301.2 | 2273.9 | 2292.0 | 2285.2 |
| 12.5°  | 2282.9 | 2269.4 | 2242.2 | 2253.5 | 2249.0 |
| 15°    | 2244.3 | 2230.9 | 2201.3 | 2210.5 | 2199.2 |
| 17.5°  | 2196.8 | 2183.3 | 2153.7 | 2164.9 | 2153.7 |
| 20°    | 2144.6 | 2131.1 | 2099.3 | 2106.1 | 2097.2 |
| 22.5°  | 2092.6 | 2072.1 | 2042.6 | 2042.6 | 2038.0 |
| 25°    | 2031.2 | 2013.3 | 1974.7 | 1979.0 | 1974.7 |
| 27.5°  | 1963.2 | 1947.3 | 1917.9 | 1911.3 | 1900.0 |
| 30°    | 1895.4 | 1877.0 | 1843.2 | 1836.4 | 1827.3 |
| 32.5°  | 1822.7 | 1809.3 | 1772.9 | 1759.2 | 1750.1 |
| 35°    | 1752.5 | 1729.9 | 1693.5 | 1679.8 | 1668.5 |
| 37.5°  | 1673.1 | 1652.6 | 1616.4 | 1600.4 | 1589.1 |
| 40°    | 1591.5 | 1573.3 | 1537.0 | 1516.8 | 1507.6 |
| 42.5°  | 1512.2 | 1493.9 | 1457.8 | 1435.0 | 1421.5 |
| 45°    | 1426.1 | 1410.2 | 1376.0 | 1351.3 | 1342.1 |
| 47.5°  | 1342.1 | 1326.3 | 1290.0 | 1265.0 | 1251.4 |
| 50°    | 1253.6 | 1242.3 | 1210.6 | 1178.8 | 1167.5 |
| 52.5°  | 1167.5 | 1151.7 | 1122.3 | 1097.3 | 1081.5 |
| 55°    | 1079.2 | 1065.5 | 1038.3 | 1011.2 | 999.9  |
| 57.5°  | 990.8  | 979.5  | 949.9  | 922.7  | 913.5  |
| 60°    | 902.2  | 893.3  | 861.6  | 836.6  | 829.8  |
| 62.5°  | 816.1  | 800.2  | 777.6  | 755.0  | 745.9  |
| 65°    | 727.8  | 714.2  | 691.6  | 671.1  | 659.7  |
| 67.5°  | 637.1  | 625.6  | 605.4  | 589.6  | 580.4  |
| 70°    | 553.2  | 544.1  | 523.6  | 507.8  | 498.9  |
| 72.5°  | 467.1  | 458.0  | 446.7  | 430.8  | 424.0  |
| 75°    | 380.7  | 376.5  | 364.9  | 351.4  | 356.0  |
| 77.5°  | 303.8  | 294.7  | 290.0  | 283.4  | 276.6  |
| 80°    | 226.8  | 224.4  | 219.8  | 213.1  | 208.5  |
| 82.5°  | 154.2  | 154.2  | 152.0  | 142.9  | 142.9  |
| 85°    | 92.8   | 90.7   | 88.5   | 81.5   | 79.4   |
| 87.5°  | 40.9   | 36.4   | 31.7   | 25.0   | 22.6   |
| 90°    | 0.9    | 11.8   | 19.7   | 24.7   | 26.6   |
| 92.5°  | 24.7   | 20.7   | 23.6   | 25.7   | 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  | 394.6  | 62.2   | 73.0   | 77.0   |
| 110°   | 437.1  | 457.7  | 172.7  | 74.0   | 77.9   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 500.2  | 517.9  | 501.1  | 75.9   | 79.0   |
| 115°   | 567.1  | 583.9  | 608.6  | 151.9  | 81.0   |
| 117.5° | 625.4  | 645.1  | 662.0  | 520.8  | 262.4  |
| 120°   | 690.5  | 705.3  | 723.1  | 735.0  | 601.8  |
| 122.5° | 745.7  | 761.5  | 781.3  | 787.2  | 788.2  |
| 125°   | 801.9  | 814.9  | 833.5  | 840.5  | 843.4  |
| 127.5° | 853.2  | 867.1  | 881.9  | 891.8  | 892.7  |
| 130°   | 901.6  | 917.5  | 928.2  | 939.1  | 938.2  |
| 132.5° | 950.9  | 963.8  | 974.6  | 983.5  | 982.6  |
| 135°   | 992.4  | 1008.2 | 1017.0 | 1026.9 | 1025.0 |
| 137.5° | 1035.7 | 1047.5 | 1057.5 | 1067.3 | 1064.4 |
| 140°   | 1078.1 | 1086.1 | 1096.9 | 1105.8 | 1100.9 |
| 142.5° | 1113.8 | 1120.6 | 1133.5 | 1141.2 | 1136.4 |
| 145°   | 1151.2 | 1150.2 | 1166.9 | 1173.9 | 1168.9 |
| 147.5° | 1183.7 | 1180.7 | 1197.5 | 1202.4 | 1198.6 |
| 150°   | 1215.3 | 1208.4 | 1224.3 | 1230.1 | 1225.2 |
| 152.5° | 1241.9 | 1234.1 | 1248.8 | 1254.8 | 1247.9 |
| 155°   | 1267.6 | 1258.8 | 1270.6 | 1276.5 | 1268.6 |
| 157.5° | 1288.3 | 1280.4 | 1289.4 | 1296.3 | 1288.3 |
| 160°   | 1306.1 | 1300.1 | 1306.1 | 1311.9 | 1305.0 |
| 162.5° | 1321.8 | 1316.0 | 1320.9 | 1327.8 | 1318.9 |
| 165°   | 1335.6 | 1329.8 | 1332.7 | 1339.6 | 1332.7 |
| 167.5° | 1346.6 | 1340.5 | 1343.6 | 1350.5 | 1341.6 |
| 170°   | 1355.4 | 1349.5 | 1351.4 | 1358.4 | 1349.5 |
| 172.5° | 1361.3 | 1355.4 | 1357.5 | 1364.3 | 1355.4 |
| 175°   | 1366.1 | 1359.3 | 1361.3 | 1368.2 | 1358.4 |
| 177.5° | 1368.2 | 1361.3 | 1362.3 | 1369.3 | 1360.4 |
| 180°   | 1363.3 | 1363.3 | 1363.3 | 1363.3 | 1363.3 |

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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 | 10.04            | 11.00 | 10.91 | 11.89 | 13.01 | 9.60           | 10.56 | 10.47 | 11.45 | 12.57 |
|                 | 3H   | 11.71            | 12.57 | 12.59 | 13.47 | 14.62 | 11.23          | 12.09 | 12.11 | 12.99 | 14.13 |
|                 | 4H   | 12.31            | 13.12 | 13.20 | 14.02 | 15.18 | 11.82          | 12.63 | 12.71 | 13.54 | 14.69 |
|                 | 6H   | 12.71            | 13.46 | 13.62 | 14.37 | 15.54 | 12.22          | 12.97 | 13.13 | 13.88 | 15.05 |
|                 | 8H   | 12.82            | 13.54 | 13.74 | 14.46 | 15.63 | 12.33          | 13.04 | 13.24 | 13.97 | 15.14 |
|                 | 12H  | 12.88            | 13.56 | 13.79 | 14.48 | 15.67 | 12.38          | 13.06 | 13.30 | 13.98 | 15.17 |
| 4H              | 2H   | 10.52            | 11.33 | 11.41 | 12.23 | 13.39 | 10.16          | 10.98 | 11.06 | 11.88 | 13.04 |
|                 | 3H   | 12.39            | 13.07 | 13.30 | 14.01 | 15.18 | 11.99          | 12.67 | 12.90 | 13.60 | 14.78 |
|                 | 4H   | 13.11            | 13.73 | 14.04 | 14.66 | 15.86 | 12.70          | 13.32 | 13.62 | 14.25 | 15.44 |
|                 | 6H   | 13.64            | 14.17 | 14.57 | 15.13 | 16.32 | 13.21          | 13.75 | 14.15 | 14.70 | 15.90 |
|                 | 8H   | 13.79            | 14.29 | 14.73 | 15.24 | 16.45 | 13.36          | 13.86 | 14.30 | 14.81 | 16.02 |
|                 | 12H  | 13.87            | 14.32 | 14.83 | 15.29 | 16.50 | 13.43          | 13.88 | 14.39 | 14.85 | 16.06 |
| 8H              | 4H   | 13.32            | 13.82 | 14.26 | 14.77 | 15.98 | 12.95          | 13.45 | 13.89 | 14.40 | 15.61 |
|                 | 6H   | 13.96            | 14.37 | 14.92 | 15.36 | 16.57 | 13.58          | 14.00 | 14.54 | 14.98 | 16.19 |
|                 | 8H   | 14.18            | 14.55 | 15.15 | 15.53 | 16.75 | 13.80          | 14.16 | 14.77 | 15.14 | 16.37 |
|                 | 12H  | 14.32            | 14.64 | 15.30 | 15.61 | 16.89 | 13.92          | 14.24 | 14.89 | 15.21 | 16.49 |
| 12H             | 4H   | 13.31            | 13.76 | 14.27 | 14.73 | 15.94 | 12.95          | 13.40 | 13.90 | 14.36 | 15.58 |
|                 | 6H   | 13.99            | 14.36 | 14.96 | 15.33 | 16.56 | 13.62          | 13.99 | 14.60 | 14.97 | 16.20 |
|                 | 8H   | 14.24            | 14.56 | 15.21 | 15.53 | 16.81 | 13.86          | 14.19 | 14.84 | 15.16 | 16.44 |