

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: P910826

Luminaire Tested: DFN2DIP-HX3F0-080D040US850-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P910826  
REPORT IS A COMBINATION OF REPORTS P899225 AND P896089  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX3F0-080D040US850-FLLFLL  
Description: 3 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

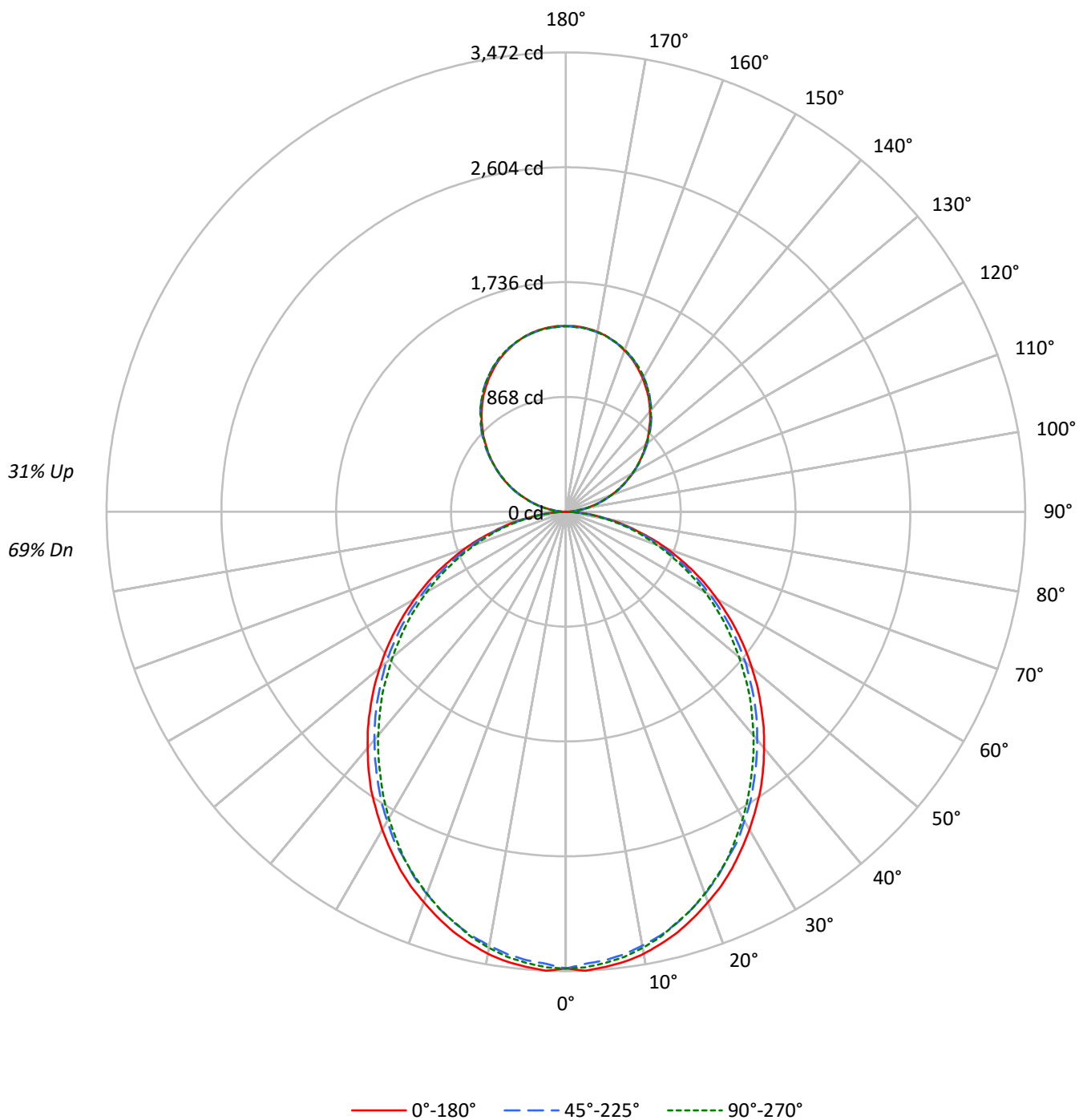
Lumens per Lamp: N/A  
Luminaire Lumens: 12709.1 lumens  
Efficiency: N/A  
Efficacy: 115.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.84' x L: 3.28' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 109.7  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9971  
Total Harmonic Distortion (THDi): 0.049  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P910826

CATALOG NUMBER: DFN2DIP-HX3F0-080D040US850-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P910826

CATALOG NUMBER: DFN2DIP-HX3F0-080D040US850-FLLFL

**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   | 112 | 112 | 112 | 112 | 106 | 106 | 106 | 106 | 94 | 94 | 94 | 83 | 83 | 83 | 74 | 74 | 74 |
| 1   | 102 | 98  | 94  | 90  | 96  | 92  | 89  | 86  | 83 | 80 | 77 | 74 | 71 | 70 | 65 | 64 | 62 |
| 2   | 93  | 85  | 79  | 74  | 88  | 81  | 75  | 70  | 72 | 68 | 64 | 65 | 61 | 58 | 57 | 55 | 52 |
| 3   | 85  | 75  | 67  | 61  | 80  | 71  | 64  | 59  | 64 | 58 | 54 | 57 | 53 | 49 | 51 | 48 | 45 |
| 4   | 78  | 67  | 58  | 52  | 73  | 63  | 56  | 50  | 57 | 51 | 46 | 51 | 46 | 42 | 46 | 42 | 39 |
| 5   | 71  | 59  | 51  | 45  | 67  | 56  | 49  | 43  | 51 | 45 | 40 | 46 | 41 | 37 | 41 | 37 | 34 |
| 6   | 66  | 53  | 45  | 39  | 62  | 51  | 43  | 38  | 46 | 40 | 35 | 41 | 36 | 32 | 37 | 33 | 30 |
| 7   | 61  | 48  | 40  | 34  | 58  | 46  | 39  | 33  | 42 | 36 | 31 | 38 | 33 | 29 | 34 | 30 | 26 |
| 8   | 57  | 44  | 36  | 31  | 54  | 42  | 35  | 30  | 38 | 32 | 28 | 35 | 29 | 26 | 31 | 27 | 24 |
| 9   | 53  | 40  | 33  | 27  | 50  | 39  | 31  | 26  | 35 | 29 | 25 | 32 | 27 | 23 | 29 | 25 | 21 |
| 10  | 50  | 37  | 30  | 25  | 47  | 36  | 29  | 24  | 32 | 27 | 22 | 30 | 25 | 21 | 27 | 23 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3999 | 3999 | 3999 |
| 5°  | 4003 | 3940 | 3967 |
| 10° | 3969 | 3884 | 3912 |
| 15° | 3909 | 3818 | 3825 |
| 20° | 3828 | 3726 | 3737 |
| 25° | 3748 | 3617 | 3636 |
| 30° | 3648 | 3516 | 3507 |
| 35° | 3553 | 3396 | 3372 |
| 40° | 3436 | 3275 | 3242 |
| 45° | 3319 | 3154 | 3110 |
| 50° | 3192 | 3026 | 2956 |
| 55° | 3058 | 2879 | 2815 |
| 60° | 2907 | 2705 | 2653 |
| 65° | 2741 | 2523 | 2462 |
| 70° | 2531 | 2303 | 2255 |
| 75° | 2240 | 2038 | 2061 |
| 80° | 1888 | 1699 | 1697 |
| 85° | 1340 | 1125 | 1101 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3319 cd/sqm

TEST NUMBER: P910826

CATALOG NUMBER: DFN2DIP-HX3F0-080D040US850-FLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 324.9   | 2.6       |
| 10°-20°   | 914.2   | 7.2       |
| 20°-30°   | 1343.5  | 10.6      |
| 30°-40°   | 1560.4  | 12.3      |
| 40°-50°   | 1558.4  | 12.3      |
| 50°-60°   | 1358.9  | 10.7      |
| 60°-70°   | 1004.5  | 7.9       |
| 70°-80°   | 568.4   | 4.5       |
| 80°-90°   | 154.0   | 1.2       |
| 90°-100°  | 86.8    | 0.7       |
| 100°-110° | 275.8   | 2.2       |
| 110°-120° | 472.0   | 3.7       |
| 120°-130° | 620.8   | 4.9       |
| 130°-140° | 696.8   | 5.5       |
| 140°-150° | 683.3   | 5.4       |
| 150°-160° | 573.2   | 4.5       |
| 160°-170° | 380.1   | 3.0       |
| 170°-180° | 132.9   | 1.0       |
| <hr/>     |         |           |
| 0°-30°    | 2582.6  | 20.3      |
| 0°-40°    | 4143.0  | 32.6      |
| 0°-60°    | 7060.4  | 55.6      |
| 0°-90°    | 8787.3  | 69.1      |
| 90°-120°  | 834.7   | 6.6       |
| 90°-150°  | 2835.6  | 22.3      |
| 90°-180°  | 3922.0  | 30.9      |
| 0°-180°   | 12709.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3452 | 3452  | 3452 | 3452  | 3452 |      |
| 5°   | 3452 | 3439  | 3402 | 3429  | 3423 | 328  |
| 15°  | 3286 | 3267  | 3223 | 3237  | 3220 | 926  |
| 25°  | 2974 | 2948  | 2892 | 2898  | 2892 | 1369 |
| 35°  | 2566 | 2533  | 2480 | 2460  | 2443 | 1602 |
| 45°  | 2088 | 2065  | 2015 | 1979  | 1965 | 1612 |
| 55°  | 1580 | 1560  | 1520 | 1481  | 1464 | 1413 |
| 65°  | 1066 | 1046  | 1012 | 983   | 966  | 1054 |
| 75°  | 558  | 551   | 534  | 515   | 521  | 595  |
| 85°  | 136  | 133   | 130  | 119   | 116  | 152  |
| 90°  | 1    | 15    | 42   | 39    | 40   | 12   |
| 95°  | 62   | 74    | 76   | 76    | 74   | 69   |
| 105° | 255  | 258   | 260  | 263   | 263  | 269  |
| 115° | 474  | 480   | 478  | 477   | 474  | 469  |
| 125° | 689  | 700   | 696  | 692   | 691  | 616  |
| 135° | 891  | 904   | 907  | 906   | 902  | 689  |
| 145° | 1082 | 1090  | 1097 | 1098  | 1094 | 676  |
| 155° | 1237 | 1240  | 1244 | 1250  | 1246 | 569  |
| 165° | 1346 | 1345  | 1345 | 1353  | 1347 | 380  |
| 175° | 1400 | 1397  | 1394 | 1403  | 1396 | 133  |
| 180° | 1403 | 1403  | 1403 | 1403  | 1403 |      |

TEST NUMBER: P910826

CATALOG NUMBER: DFN2DIP-HX3F0-080D040US850-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3452.1 | 3452.1 | 3452.1 | 3452.1 | 3452.1 |
| 2.5°   | 3472.2 | 3455.6 | 3419.0 | 3452.1 | 3445.8 |
| 5°     | 3452.1 | 3439.1 | 3402.5 | 3428.9 | 3422.6 |
| 7.5°   | 3428.9 | 3409.2 | 3372.6 | 3399.3 | 3392.7 |
| 10°    | 3392.7 | 3369.4 | 3329.6 | 3355.9 | 3346.2 |
| 12.5°  | 3342.6 | 3322.9 | 3283.1 | 3299.6 | 3293.0 |
| 15°    | 3286.3 | 3266.6 | 3223.2 | 3236.6 | 3220.1 |
| 17.5°  | 3216.5 | 3196.8 | 3153.4 | 3170.1 | 3153.4 |
| 20°    | 3140.1 | 3120.4 | 3073.9 | 3083.8 | 3070.7 |
| 22.5°  | 3064.1 | 3034.1 | 2990.8 | 2990.8 | 2984.1 |
| 25°    | 2974.2 | 2947.8 | 2891.5 | 2897.8 | 2891.5 |
| 27.5°  | 2874.5 | 2851.3 | 2808.3 | 2798.5 | 2781.9 |
| 30°    | 2775.3 | 2748.4 | 2698.9 | 2689.0 | 2675.6 |
| 32.5°  | 2668.9 | 2649.2 | 2595.9 | 2575.9 | 2562.6 |
| 35°    | 2566.0 | 2533.0 | 2479.7 | 2459.7 | 2443.1 |
| 37.5°  | 2449.8 | 2419.8 | 2366.7 | 2343.4 | 2326.9 |
| 40°    | 2330.5 | 2303.6 | 2250.5 | 2220.9 | 2207.5 |
| 42.5°  | 2214.2 | 2187.4 | 2134.6 | 2101.1 | 2081.5 |
| 45°    | 2088.1 | 2064.8 | 2014.8 | 1978.6 | 1965.3 |
| 47.5°  | 1965.3 | 1942.0 | 1888.7 | 1852.1 | 1832.4 |
| 50°    | 1835.6 | 1819.1 | 1772.5 | 1726.0 | 1709.5 |
| 52.5°  | 1709.5 | 1686.2 | 1643.3 | 1606.7 | 1583.4 |
| 55°    | 1580.2 | 1560.1 | 1520.4 | 1480.6 | 1464.0 |
| 57.5°  | 1450.7 | 1434.2 | 1390.8 | 1351.0 | 1337.6 |
| 60°    | 1321.0 | 1308.1 | 1261.5 | 1224.9 | 1215.0 |
| 62.5°  | 1194.9 | 1171.8 | 1138.6 | 1105.6 | 1092.1 |
| 65°    | 1065.7 | 1045.7 | 1012.5 | 982.6  | 966.0  |
| 67.5°  | 932.9  | 916.0  | 886.4  | 863.2  | 849.8  |
| 70°    | 810.0  | 796.6  | 766.8  | 743.5  | 730.4  |
| 72.5°  | 683.9  | 670.6  | 654.0  | 630.8  | 620.9  |
| 75°    | 557.5  | 551.2  | 534.3  | 514.6  | 521.2  |
| 77.5°  | 444.8  | 431.4  | 424.7  | 414.9  | 405.0  |
| 80°    | 332.1  | 328.6  | 321.9  | 312.1  | 305.3  |
| 82.5°  | 225.8  | 225.8  | 222.6  | 209.2  | 209.2  |
| 85°    | 136.0  | 132.7  | 129.6  | 119.4  | 116.2  |
| 87.5°  | 59.9   | 53.2   | 46.5   | 36.6   | 33.2   |
| 90°    | 1.2    | 15.2   | 41.5   | 38.9   | 40.1   |
| 92.5°  | 26.2   | 35.5   | 36.8   | 38.0   | 38.0   |
| 95°    | 61.8   | 73.6   | 75.7   | 75.7   | 73.6   |
| 97.5°  | 102.8  | 113.8  | 118.4  | 118.4  | 118.4  |
| 100°   | 150.2  | 159.9  | 163.2  | 163.2  | 162.0  |
| 102.5° | 200.1  | 207.3  | 211.9  | 213.1  | 211.9  |
| 105°   | 254.6  | 258.0  | 260.5  | 262.6  | 262.6  |
| 107.5° | 308.7  | 313.8  | 313.8  | 314.6  | 308.7  |
| 110°   | 361.2  | 368.0  | 368.0  | 368.0  | 364.6  |

TEST NUMBER: P910826

CATALOG NUMBER: DFN2DIP-HX3F0-080D040US850-FLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 417.9  | 425.1  | 423.7  | 420.4  | 417.9  |
| 115°   | 473.7  | 480.5  | 478.3  | 477.1  | 473.7  |
| 117.5° | 529.1  | 538.4  | 532.5  | 529.1  | 525.8  |
| 120°   | 585.0  | 594.2  | 585.0  | 585.0  | 581.1  |
| 122.5° | 635.7  | 647.5  | 641.7  | 638.2  | 635.7  |
| 125°   | 689.0  | 699.6  | 696.2  | 692.3  | 691.1  |
| 127.5° | 741.0  | 754.1  | 749.5  | 744.4  | 741.0  |
| 130°   | 789.6  | 804.9  | 802.8  | 800.3  | 795.6  |
| 132.5° | 844.2  | 856.0  | 856.9  | 850.9  | 847.6  |
| 135°   | 891.2  | 904.3  | 906.8  | 905.5  | 902.2  |
| 137.5° | 943.6  | 954.2  | 956.3  | 955.4  | 950.4  |
| 140°   | 989.7  | 1000.3 | 1006.2 | 1006.2 | 1001.5 |
| 142.5° | 1037.1 | 1047.7 | 1051.0 | 1052.3 | 1047.7 |
| 145°   | 1081.9 | 1090.4 | 1097.1 | 1098.5 | 1093.8 |
| 147.5° | 1122.1 | 1132.6 | 1137.7 | 1139.8 | 1135.2 |
| 150°   | 1163.6 | 1170.8 | 1175.4 | 1179.2 | 1175.4 |
| 152.5° | 1200.4 | 1207.5 | 1213.5 | 1218.1 | 1213.5 |
| 155°   | 1237.1 | 1240.5 | 1244.3 | 1250.3 | 1246.4 |
| 157.5° | 1268.9 | 1271.4 | 1273.5 | 1282.0 | 1276.0 |
| 160°   | 1297.2 | 1299.7 | 1301.0 | 1308.2 | 1303.1 |
| 162.5° | 1323.4 | 1323.4 | 1324.7 | 1332.7 | 1326.8 |
| 165°   | 1345.9 | 1344.6 | 1344.6 | 1353.0 | 1347.1 |
| 167.5° | 1366.2 | 1362.3 | 1362.3 | 1370.8 | 1364.8 |
| 170°   | 1381.4 | 1377.9 | 1376.7 | 1385.1 | 1377.9 |
| 172.5° | 1391.9 | 1388.6 | 1387.2 | 1395.8 | 1388.6 |
| 175°   | 1400.4 | 1397.0 | 1394.5 | 1402.9 | 1395.8 |
| 177.5° | 1405.1 | 1401.7 | 1399.1 | 1406.3 | 1399.1 |
| 180°   | 1402.9 | 1402.9 | 1402.9 | 1402.9 | 1402.9 |

TEST NUMBER: P910826

CATALOG NUMBER: DFN2DIP-HX3F0-080D040US850-FLLFLL

**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 | 13.65            | 14.71 | 14.42 | 15.51 | 16.48 | 13.22          | 14.28 | 13.99 | 15.08 | 16.05 |
|                 | 3H   | 15.31            | 16.27 | 16.10 | 17.08 | 18.07 | 14.85          | 15.80 | 15.63 | 16.61 | 17.61 |
|                 | 4H   | 15.91            | 16.81 | 16.71 | 17.62 | 18.63 | 15.44          | 16.34 | 16.24 | 17.15 | 18.16 |
|                 | 6H   | 16.31            | 17.14 | 17.13 | 17.97 | 18.99 | 15.84          | 16.67 | 16.66 | 17.49 | 18.52 |
|                 | 8H   | 16.42            | 17.21 | 17.24 | 18.05 | 19.08 | 15.95          | 16.74 | 16.77 | 17.58 | 18.61 |
|                 | 12H  | 16.47            | 17.23 | 17.30 | 18.06 | 19.11 | 15.99          | 16.75 | 16.83 | 17.59 | 18.64 |
| 4H              | 2H   | 14.13            | 15.03 | 14.94 | 15.85 | 16.86 | 13.79          | 14.69 | 14.59 | 15.50 | 16.51 |
|                 | 3H   | 16.00            | 16.76 | 16.82 | 17.61 | 18.63 | 15.61          | 16.37 | 16.43 | 17.22 | 18.24 |
|                 | 4H   | 16.72            | 17.41 | 17.55 | 18.25 | 19.31 | 16.32          | 17.01 | 17.15 | 17.85 | 18.91 |
|                 | 6H   | 17.24            | 17.83 | 18.09 | 18.70 | 19.76 | 16.84          | 17.43 | 17.69 | 18.30 | 19.36 |
|                 | 8H   | 17.39            | 17.95 | 18.24 | 18.81 | 19.88 | 16.98          | 17.54 | 17.84 | 18.40 | 19.48 |
|                 | 12H  | 17.47            | 17.97 | 18.34 | 18.86 | 19.93 | 17.05          | 17.55 | 17.93 | 18.44 | 19.52 |
| 8H              | 4H   | 16.93            | 17.49 | 17.78 | 18.35 | 19.42 | 16.57          | 17.13 | 17.43 | 17.99 | 19.07 |
|                 | 6H   | 17.56            | 18.02 | 18.44 | 18.93 | 20.00 | 17.20          | 17.66 | 18.08 | 18.57 | 19.64 |
|                 | 8H   | 17.78            | 18.19 | 18.67 | 19.09 | 20.18 | 17.41          | 17.82 | 18.31 | 18.72 | 19.81 |
|                 | 12H  | 17.91            | 18.27 | 18.81 | 19.17 | 20.31 | 17.54          | 17.90 | 18.43 | 18.79 | 19.93 |
| 12H             | 4H   | 16.93            | 17.43 | 17.80 | 18.31 | 19.39 | 16.58          | 17.08 | 17.45 | 17.96 | 19.04 |
|                 | 6H   | 17.59            | 18.00 | 18.48 | 18.90 | 19.99 | 17.24          | 17.65 | 18.14 | 18.55 | 19.64 |
|                 | 8H   | 17.84            | 18.20 | 18.73 | 19.09 | 20.23 | 17.48          | 17.84 | 18.38 | 18.74 | 19.88 |