

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: P908049

Luminaire Tested: DFN2DIP-HX3F0-060D030US840-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P908049  
REPORT IS A COMBINATION OF REPORTS P900728 AND P897645  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX3F0-060D030US840-RLLONL  
Description: 3 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

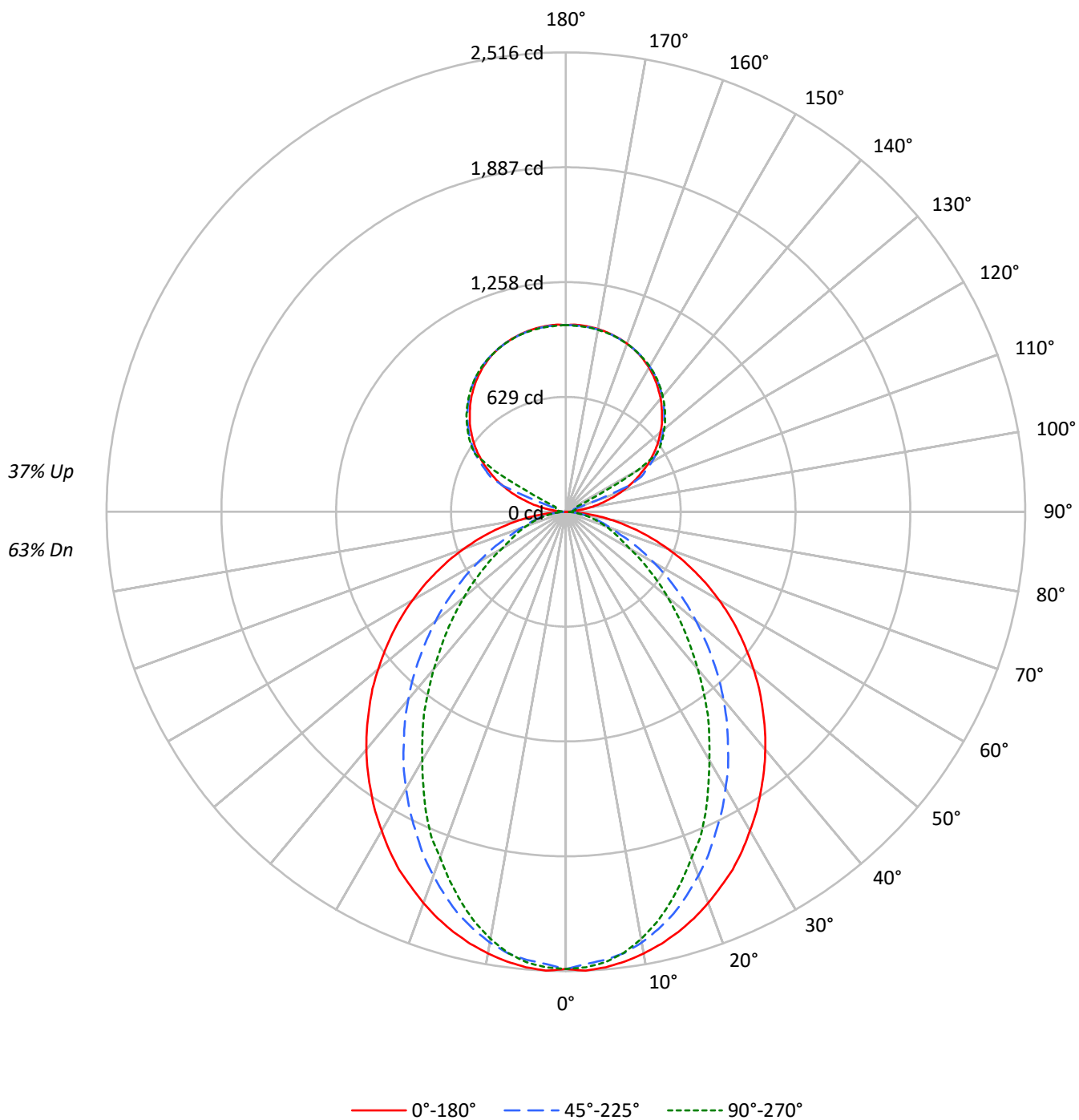
Lumens per Lamp: N/A  
Luminaire Lumens: 8149.7 lumens  
Efficiency: N/A  
Efficacy: 102.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.84' x L: 3.28' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 79.6  
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 | 103 | 103 | 103 | 103 | 91 | 91 | 91 | 79 | 79 | 79 | 68 | 68 | 68 |
| 1   | 101 | 97  | 93  | 90  | 95  | 91  | 88  | 85  | 80 | 78 | 76 | 71 | 69 | 67 | 61 | 60 | 59 |
| 2   | 93  | 86  | 80  | 75  | 87  | 81  | 75  | 71  | 71 | 67 | 64 | 63 | 60 | 57 | 55 | 52 | 51 |
| 3   | 85  | 76  | 69  | 63  | 80  | 72  | 65  | 60  | 63 | 58 | 54 | 56 | 52 | 49 | 49 | 46 | 44 |
| 4   | 78  | 68  | 60  | 54  | 73  | 64  | 57  | 52  | 57 | 51 | 47 | 50 | 46 | 43 | 44 | 41 | 38 |
| 5   | 72  | 61  | 53  | 47  | 67  | 57  | 50  | 45  | 51 | 45 | 41 | 46 | 41 | 37 | 40 | 37 | 34 |
| 6   | 67  | 55  | 47  | 41  | 62  | 52  | 45  | 39  | 46 | 41 | 36 | 41 | 37 | 33 | 37 | 33 | 30 |
| 7   | 62  | 50  | 42  | 36  | 58  | 47  | 40  | 35  | 42 | 36 | 32 | 38 | 33 | 30 | 34 | 30 | 27 |
| 8   | 58  | 45  | 38  | 32  | 54  | 43  | 36  | 31  | 39 | 33 | 29 | 35 | 30 | 27 | 31 | 27 | 24 |
| 9   | 54  | 42  | 34  | 29  | 51  | 40  | 33  | 28  | 36 | 30 | 26 | 32 | 27 | 24 | 29 | 25 | 22 |
| 10  | 50  | 38  | 31  | 26  | 47  | 37  | 30  | 25  | 33 | 28 | 24 | 30 | 25 | 22 | 27 | 23 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2901 | 2901 | 2901 |
| 5°  | 2904 | 2853 | 2871 |
| 10° | 2874 | 2795 | 2776 |
| 15° | 2833 | 2700 | 2630 |
| 20° | 2780 | 2571 | 2452 |
| 25° | 2725 | 2427 | 2280 |
| 30° | 2651 | 2279 | 2062 |
| 35° | 2579 | 2120 | 1870 |
| 40° | 2506 | 1956 | 1651 |
| 45° | 2421 | 1774 | 1452 |
| 50° | 2333 | 1590 | 1258 |
| 55° | 2241 | 1395 | 1072 |
| 60° | 2134 | 1190 | 881  |
| 65° | 2011 | 983  | 791  |
| 70° | 1862 | 789  | 714  |
| 75° | 1675 | 691  | 646  |
| 80° | 1404 | 574  | 555  |
| 85° | 960  | 373  | 407  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2421 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 234.7  | 2.9       |
| 10°-20°   | 644.3  | 7.9       |
| 20°-30°   | 904.6  | 11.1      |
| 30°-40°   | 986.1  | 12.1      |
| 40°-50°   | 906.3  | 11.1      |
| 50°-60°   | 711.7  | 8.7       |
| 60°-70°   | 463.3  | 5.7       |
| 70°-80°   | 238.5  | 2.9       |
| 80°-90°   | 62.7   | 0.8       |
| 90°-100°  | 33.7   | 0.4       |
| 100°-110° | 125.7  | 1.5       |
| 110°-120° | 333.3  | 4.1       |
| 120°-130° | 552.9  | 6.8       |
| 130°-140° | 587.3  | 7.2       |
| 140°-150° | 545.8  | 6.7       |
| 150°-160° | 438.8  | 5.4       |
| 160°-170° | 282.8  | 3.5       |
| 170°-180° | 97.3   | 1.2       |
| 0°-30°    | 1783.6 | 21.9      |
| 0°-40°    | 2769.6 | 34.0      |
| 0°-60°    | 4387.7 | 53.8      |
| 0°-90°    | 5152.1 | 63.2      |
| 90°-120°  | 492.7  | 6.0       |
| 90°-150°  | 2178.7 | 26.7      |
| 90°-180°  | 2998.0 | 36.8      |
| 0°-180°   | 8149.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2504 | 2504  | 2504 | 2504  | 2504 |      |
| 5°   | 2504 | 2493  | 2463 | 2484  | 2477 | 237  |
| 15°  | 2382 | 2357  | 2280 | 2237  | 2214 | 671  |
| 25°  | 2162 | 2090  | 1940 | 1847  | 1813 | 994  |
| 35°  | 1863 | 1747  | 1548 | 1405  | 1355 | 1166 |
| 45°  | 1523 | 1371  | 1133 | 972   | 918  | 1176 |
| 55°  | 1158 | 981   | 736  | 601   | 558  | 1035 |
| 65°  | 782  | 598   | 394  | 317   | 310  | 775  |
| 75°  | 417  | 258   | 181  | 165   | 163  | 441  |
| 85°  | 97   | 50    | 43   | 43    | 43   | 112  |
| 90°  | 1    | 9     | 15   | 19    | 20   | 8    |
| 95°  | 48   | 24    | 29   | 33    | 32   | 57   |
| 105° | 225  | 247   | 45   | 53    | 56   | 240  |
| 115° | 425  | 438   | 456  | 114   | 61   | 419  |
| 125° | 602  | 611   | 625  | 630   | 633  | 536  |
| 135° | 744  | 756   | 763  | 770   | 769  | 575  |
| 145° | 863  | 863   | 875  | 880   | 877  | 540  |
| 155° | 951  | 944   | 953  | 957   | 952  | 438  |
| 165° | 1002 | 997   | 1000 | 1005  | 1000 | 283  |
| 175° | 1025 | 1020  | 1021 | 1026  | 1019 | 98   |
| 180° | 1022 | 1022  | 1022 | 1022  | 1022 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2504.3 | 2504.3 | 2504.3 | 2504.3 | 2504.3 |
| 2.5°   | 2515.6 | 2504.3 | 2479.2 | 2502.0 | 2497.5 |
| 5°     | 2504.3 | 2493.0 | 2463.4 | 2483.9 | 2477.1 |
| 7.5°   | 2483.9 | 2470.3 | 2438.6 | 2447.5 | 2436.2 |
| 10°    | 2456.6 | 2440.7 | 2395.6 | 2388.6 | 2375.1 |
| 12.5°  | 2422.8 | 2402.3 | 2341.0 | 2327.5 | 2302.5 |
| 15°    | 2381.9 | 2356.8 | 2279.9 | 2236.9 | 2214.2 |
| 17.5°  | 2334.3 | 2297.9 | 2202.7 | 2152.9 | 2116.7 |
| 20°    | 2279.9 | 2234.4 | 2121.2 | 2064.7 | 2014.7 |
| 22.5°  | 2221.0 | 2168.8 | 2037.3 | 1960.4 | 1926.4 |
| 25°    | 2162.1 | 2089.5 | 1940.0 | 1847.1 | 1813.0 |
| 27.5°  | 2091.9 | 2014.7 | 1849.3 | 1742.7 | 1690.6 |
| 30°    | 2017.1 | 1930.8 | 1749.5 | 1634.1 | 1572.8 |
| 32.5°  | 1944.5 | 1840.2 | 1654.6 | 1518.4 | 1461.7 |
| 35°    | 1863.0 | 1747.4 | 1548.0 | 1405.1 | 1355.1 |
| 37.5°  | 1783.6 | 1658.8 | 1448.2 | 1291.7 | 1235.2 |
| 40°    | 1699.7 | 1563.9 | 1343.8 | 1183.0 | 1124.1 |
| 42.5°  | 1613.7 | 1468.6 | 1239.7 | 1071.9 | 1015.4 |
| 45°    | 1523.0 | 1371.0 | 1133.3 | 972.1  | 917.8  |
| 47.5°  | 1436.9 | 1276.1 | 1031.3 | 870.2  | 820.4  |
| 50°    | 1341.7 | 1180.8 | 931.5  | 775.0  | 727.6  |
| 52.5°  | 1248.6 | 1078.6 | 836.3  | 686.7  | 643.7  |
| 55°    | 1158.0 | 981.3  | 736.5  | 600.7  | 557.5  |
| 57.5°  | 1065.2 | 883.8  | 648.2  | 521.3  | 484.9  |
| 60°    | 970.0  | 788.7  | 555.2  | 439.8  | 403.4  |
| 62.5°  | 877.2  | 695.9  | 475.8  | 367.2  | 349.1  |
| 65°    | 781.9  | 598.2  | 394.4  | 317.4  | 310.4  |
| 67.5°  | 691.3  | 507.6  | 317.4  | 278.7  | 272.0  |
| 70°    | 596.0  | 419.3  | 262.8  | 240.2  | 231.1  |
| 72.5°  | 505.4  | 337.6  | 219.7  | 201.8  | 197.1  |
| 75°    | 417.0  | 258.2  | 181.3  | 165.4  | 163.3  |
| 77.5°  | 328.7  | 183.5  | 142.8  | 133.7  | 129.2  |
| 80°    | 246.9  | 131.5  | 108.7  | 99.8   | 99.8   |
| 82.5°  | 172.2  | 88.5   | 74.7   | 70.2   | 70.2   |
| 85°    | 97.4   | 49.8   | 43.0   | 43.0   | 43.0   |
| 87.5°  | 36.4   | 18.1   | 18.1   | 15.9   | 15.9   |
| 90°    | 0.7    | 8.9    | 14.7   | 18.6   | 19.9   |
| 92.5°  | 18.6   | 15.6   | 17.8   | 19.3   | 19.9   |
| 95°    | 48.1   | 23.6   | 28.8   | 32.6   | 31.8   |
| 97.5°  | 86.5   | 26.0   | 37.7   | 40.0   | 40.7   |
| 100°   | 131.0  | 29.6   | 42.2   | 48.1   | 49.6   |
| 102.5° | 179.8  | 178.3  | 43.6   | 51.7   | 54.0   |
| 105°   | 224.9  | 247.1  | 45.1   | 53.2   | 56.2   |
| 107.5° | 277.4  | 295.9  | 46.7   | 54.7   | 57.8   |
| 110°   | 327.8  | 343.3  | 129.5  | 55.5   | 58.5   |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 375.2  | 388.4  | 375.9  | 57.0   | 59.2   |
| 115°   | 425.4  | 438.0  | 456.5  | 113.9  | 60.7   |
| 117.5° | 469.1  | 483.8  | 496.4  | 390.6  | 196.8  |
| 120°   | 517.9  | 529.0  | 542.3  | 551.2  | 451.3  |
| 122.5° | 559.3  | 571.2  | 586.0  | 590.4  | 591.2  |
| 125°   | 601.5  | 611.1  | 625.2  | 630.4  | 632.6  |
| 127.5° | 640.0  | 650.3  | 661.5  | 668.8  | 669.5  |
| 130°   | 676.2  | 688.1  | 696.2  | 704.3  | 703.7  |
| 132.5° | 713.2  | 722.9  | 730.9  | 737.6  | 736.9  |
| 135°   | 744.3  | 756.2  | 762.8  | 770.2  | 768.7  |
| 137.5° | 776.8  | 785.7  | 793.1  | 800.5  | 798.3  |
| 140°   | 808.6  | 814.6  | 822.6  | 829.3  | 825.7  |
| 142.5° | 835.4  | 840.5  | 850.1  | 856.0  | 852.3  |
| 145°   | 863.4  | 862.6  | 875.3  | 880.4  | 876.7  |
| 147.5° | 887.8  | 885.6  | 898.2  | 901.8  | 898.9  |
| 150°   | 911.5  | 906.4  | 918.2  | 922.5  | 918.9  |
| 152.5° | 931.4  | 925.5  | 936.7  | 941.1  | 935.9  |
| 155°   | 950.7  | 944.1  | 952.9  | 957.4  | 951.5  |
| 157.5° | 966.2  | 960.4  | 967.0  | 972.2  | 966.2  |
| 160°   | 979.6  | 975.1  | 979.6  | 984.0  | 978.8  |
| 162.5° | 991.4  | 986.9  | 990.7  | 995.8  | 989.2  |
| 165°   | 1001.7 | 997.3  | 999.6  | 1004.7 | 999.6  |
| 167.5° | 1009.9 | 1005.4 | 1007.6 | 1012.9 | 1006.2 |
| 170°   | 1016.5 | 1012.1 | 1013.6 | 1018.8 | 1012.1 |
| 172.5° | 1021.0 | 1016.5 | 1018.0 | 1023.2 | 1016.5 |
| 175°   | 1024.6 | 1019.5 | 1021.0 | 1026.1 | 1018.8 |
| 177.5° | 1026.1 | 1021.0 | 1021.8 | 1026.9 | 1020.3 |
| 180°   | 1022.5 | 1022.5 | 1022.5 | 1022.5 | 1022.5 |

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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 | 11.96            | 12.91 | 12.80 | 13.77 | 14.84 | 7.93           | 8.88  | 8.77  | 9.74  | 10.81 |
|                 | 3H   | 13.63            | 14.49 | 14.49 | 15.35 | 16.45 | 9.13           | 9.98  | 9.98  | 10.85 | 11.94 |
|                 | 4H   | 14.24            | 15.05 | 15.12 | 15.92 | 17.03 | 9.58           | 10.38 | 10.45 | 11.26 | 12.37 |
|                 | 6H   | 14.67            | 15.40 | 15.55 | 16.29 | 17.41 | 9.90           | 10.64 | 10.79 | 11.52 | 12.65 |
|                 | 8H   | 14.79            | 15.49 | 15.68 | 16.39 | 17.52 | 9.99           | 10.70 | 10.89 | 11.60 | 12.72 |
|                 | 12H  | 14.85            | 15.52 | 15.75 | 16.42 | 17.56 | 10.04          | 10.71 | 10.94 | 11.60 | 12.75 |
| 4H              | 2H   | 11.99            | 12.79 | 12.86 | 13.67 | 14.78 | 8.54           | 9.34  | 9.41  | 10.22 | 11.33 |
|                 | 3H   | 13.82            | 14.49 | 14.71 | 15.39 | 16.52 | 9.89           | 10.56 | 10.78 | 11.47 | 12.59 |
|                 | 4H   | 14.51            | 15.12 | 15.41 | 16.02 | 17.17 | 10.44          | 11.05 | 11.34 | 11.95 | 13.10 |
|                 | 6H   | 15.02            | 15.55 | 15.94 | 16.47 | 17.63 | 10.86          | 11.39 | 11.78 | 12.31 | 13.47 |
|                 | 8H   | 15.20            | 15.69 | 16.11 | 16.61 | 17.77 | 10.99          | 11.48 | 11.91 | 12.40 | 13.57 |
|                 | 12H  | 15.29            | 15.73 | 16.23 | 16.67 | 17.84 | 11.06          | 11.50 | 11.99 | 12.44 | 13.61 |
| 8H              | 4H   | 14.49            | 14.97 | 15.40 | 15.90 | 17.06 | 10.73          | 11.22 | 11.64 | 12.14 | 13.30 |
|                 | 6H   | 15.05            | 15.45 | 15.99 | 16.41 | 17.58 | 11.24          | 11.65 | 12.19 | 12.61 | 13.78 |
|                 | 8H   | 15.26            | 15.62 | 16.21 | 16.57 | 17.75 | 11.43          | 11.79 | 12.38 | 12.74 | 13.93 |
|                 | 12H  | 15.40            | 15.71 | 16.35 | 16.66 | 17.89 | 11.55          | 11.87 | 12.51 | 12.81 | 14.05 |
| 12H             | 4H   | 14.44            | 14.88 | 15.38 | 15.82 | 16.99 | 10.74          | 11.18 | 11.67 | 12.12 | 13.29 |
|                 | 6H   | 15.02            | 15.38 | 15.97 | 16.33 | 17.52 | 11.29          | 11.65 | 12.24 | 12.60 | 13.79 |
|                 | 8H   | 15.24            | 15.56 | 16.20 | 16.50 | 17.74 | 11.50          | 11.82 | 12.46 | 12.76 | 14.00 |