

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: P903091

Luminaire Tested: DFN2DIP-PN3F0-080D030US830-RLLONL

Issue Date: 11/21/2024

**Test Information**

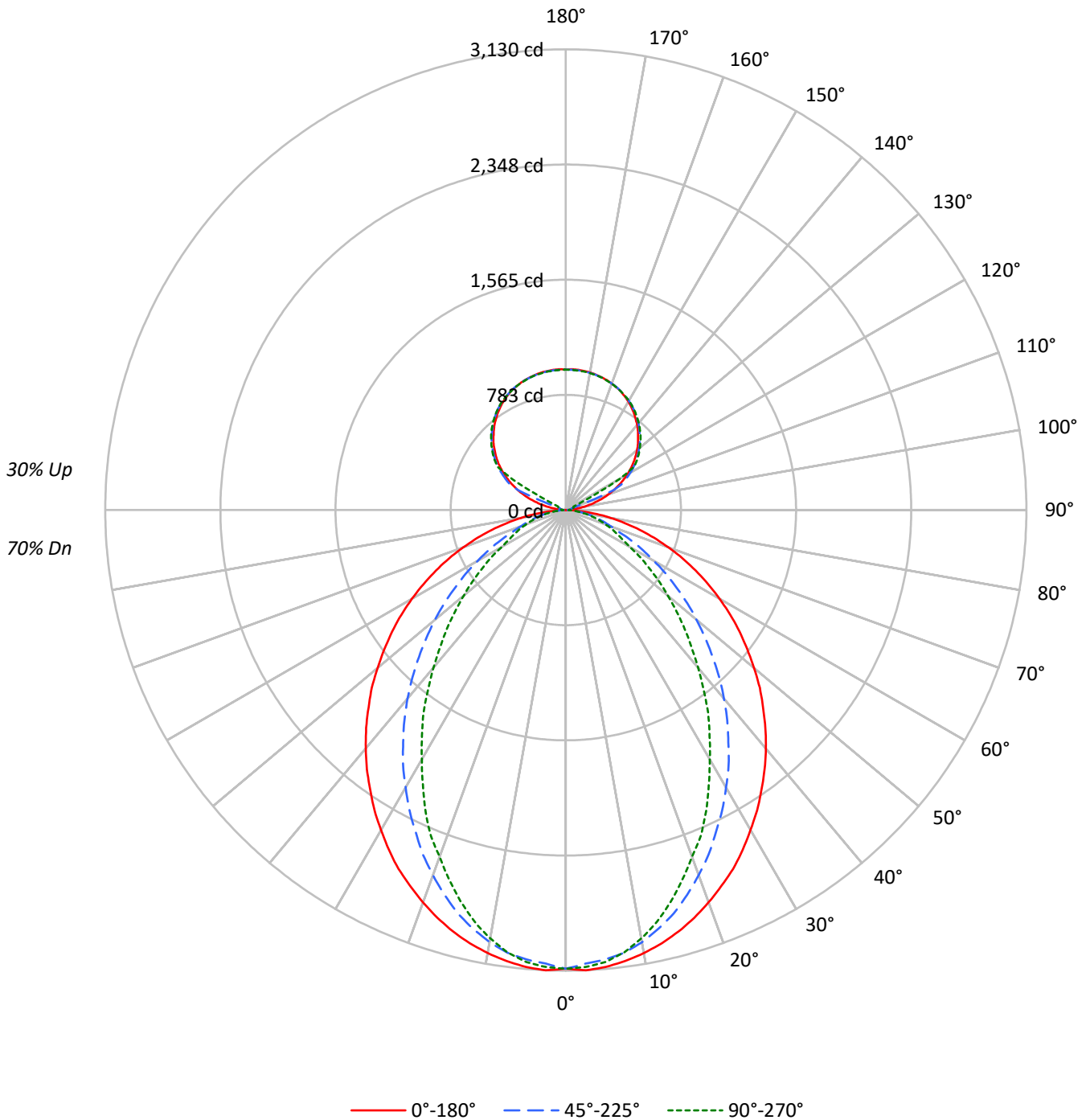
Test Method: LM-79-2019  
Report Number: P903091  
REPORT IS A COMBINATION OF REPORTS P901042 AND P897955  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN3F0-080D030US830-RLONL  
Description: 3 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 9208.7 lumens  
Efficiency: N/A  
Efficacy: 89.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.96' x L: 3.11' x H: 0.1')  
CIE Type: Semi-Direct  
  
Input Watts (W): 103.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9967  
Total Harmonic Distortion (THDi): 0.063  
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 |    |    |    | 20 |
| RC  | 80  |     |     |     | 70  |     |     |     | 50 |    |    |    | 30 |    |    |    | 10 |    |    |    | 0  |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0  |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 112 | 112 | 112 | 112 | 106 | 106 | 106 | 106 | 94 | 94 | 94 | 84 | 84 | 84 | 74 | 74 | 74 | 74 | 74 | 74 | 74 |
| 1   | 103 | 99  | 95  | 92  | 97  | 93  | 90  | 87  | 84 | 81 | 79 | 75 | 73 | 71 | 67 | 65 | 64 | 64 | 64 | 64 | 60 |
| 2   | 94  | 87  | 81  | 76  | 89  | 83  | 77  | 73  | 74 | 70 | 67 | 67 | 63 | 61 | 59 | 57 | 55 | 55 | 55 | 55 | 51 |
| 3   | 86  | 77  | 70  | 64  | 82  | 73  | 67  | 62  | 66 | 61 | 57 | 59 | 55 | 52 | 53 | 50 | 48 | 48 | 48 | 48 | 44 |
| 4   | 79  | 69  | 61  | 55  | 75  | 65  | 58  | 53  | 59 | 54 | 49 | 53 | 49 | 45 | 48 | 45 | 42 | 42 | 42 | 42 | 39 |
| 5   | 73  | 62  | 54  | 48  | 69  | 59  | 52  | 46  | 53 | 47 | 43 | 48 | 44 | 40 | 44 | 40 | 37 | 37 | 37 | 37 | 34 |
| 6   | 68  | 56  | 48  | 42  | 64  | 53  | 46  | 41  | 49 | 42 | 38 | 44 | 39 | 35 | 40 | 36 | 33 | 33 | 33 | 33 | 30 |
| 7   | 63  | 51  | 43  | 37  | 60  | 49  | 41  | 36  | 44 | 38 | 34 | 40 | 35 | 32 | 37 | 32 | 29 | 29 | 29 | 29 | 27 |
| 8   | 59  | 46  | 39  | 33  | 56  | 44  | 37  | 32  | 41 | 35 | 30 | 37 | 32 | 28 | 34 | 30 | 27 | 27 | 27 | 27 | 24 |
| 9   | 55  | 43  | 35  | 30  | 52  | 41  | 34  | 29  | 37 | 32 | 27 | 34 | 29 | 26 | 31 | 27 | 24 | 24 | 24 | 24 | 22 |
| 10  | 51  | 39  | 32  | 27  | 49  | 38  | 31  | 26  | 35 | 29 | 25 | 32 | 27 | 24 | 29 | 25 | 22 | 22 | 22 | 22 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3643 | 3643 | 3643 |
| 5°  | 3647 | 3583 | 3607 |
| 10° | 3608 | 3510 | 3488 |
| 15° | 3557 | 3391 | 3305 |
| 20° | 3489 | 3229 | 3081 |
| 25° | 3419 | 3048 | 2865 |
| 30° | 3327 | 2862 | 2591 |
| 35° | 3236 | 2662 | 2351 |
| 40° | 3143 | 2456 | 2076 |
| 45° | 3036 | 2227 | 1827 |
| 50° | 2924 | 1997 | 1583 |
| 55° | 2808 | 1751 | 1349 |
| 60° | 2673 | 1495 | 1109 |
| 65° | 2518 | 1234 | 996  |
| 70° | 2330 | 991  | 899  |
| 75° | 2093 | 868  | 815  |
| 80° | 1750 | 720  | 701  |
| 85° | 1189 | 468  | 518  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 3036 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 292.1  | 3.2       |
| 10°-20°   | 801.8  | 8.7       |
| 20°-30°   | 1125.7 | 12.2      |
| 30°-40°   | 1227.1 | 13.3      |
| 40°-50°   | 1127.8 | 12.2      |
| 50°-60°   | 885.7  | 9.6       |
| 60°-70°   | 576.5  | 6.3       |
| 70°-80°   | 296.8  | 3.2       |
| 80°-90°   | 77.4   | 0.8       |
| 90°-100°  | 31.5   | 0.3       |
| 100°-110° | 117.3  | 1.3       |
| 110°-120° | 311.1  | 3.4       |
| 120°-130° | 516.0  | 5.6       |
| 130°-140° | 548.1  | 6.0       |
| 140°-150° | 509.4  | 5.5       |
| 150°-160° | 409.6  | 4.4       |
| 160°-170° | 263.9  | 2.9       |
| 170°-180° | 90.8   | 1.0       |
| 0°-30°    | 2219.6 | 24.1      |
| 0°-40°    | 3446.7 | 37.4      |
| 0°-60°    | 5460.2 | 59.3      |
| 0°-90°    | 6411.0 | 69.6      |
| 90°-120°  | 459.9  | 5.0       |
| 90°-150°  | 2033.4 | 22.1      |
| 90°-180°  | 2798.0 | 30.4      |
| 0°-180°   | 9208.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3116 | 3116  | 3116 | 3116  | 3116 |      |
| 5°   | 3116 | 3102  | 3066 | 3091  | 3083 | 296  |
| 15°  | 2964 | 2933  | 2837 | 2784  | 2756 | 835  |
| 25°  | 2691 | 2600  | 2414 | 2299  | 2256 | 1237 |
| 35°  | 2318 | 2174  | 1926 | 1749  | 1686 | 1451 |
| 45°  | 1895 | 1706  | 1410 | 1210  | 1142 | 1464 |
| 55°  | 1441 | 1221  | 916  | 747   | 694  | 1288 |
| 65°  | 973  | 744   | 491  | 395   | 386  | 965  |
| 75°  | 519  | 321   | 226  | 206   | 203  | 549  |
| 85°  | 121  | 62    | 54   | 54    | 54   | 139  |
| 90°  | 1    | 8     | 14   | 17    | 19   | 9    |
| 95°  | 45   | 22    | 27   | 30    | 30   | 53   |
| 105° | 210  | 231   | 42   | 50    | 52   | 224  |
| 115° | 397  | 409   | 426  | 106   | 57   | 391  |
| 125° | 561  | 570   | 584  | 588   | 590  | 501  |
| 135° | 695  | 706   | 712  | 719   | 718  | 537  |
| 145° | 806  | 805   | 817  | 822   | 818  | 504  |
| 155° | 887  | 881   | 889  | 894   | 888  | 409  |
| 165° | 935  | 931   | 933  | 938   | 933  | 264  |
| 175° | 956  | 952   | 953  | 958   | 951  | 91   |
| 180° | 954  | 954   | 954  | 954   | 954  |      |



TEST NUMBER: P903091

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3116.4 | 3116.4 | 3116.4 | 3116.4 | 3116.4 |
| 2.5°   | 3130.5 | 3116.4 | 3085.3 | 3113.7 | 3108.0 |
| 5°     | 3116.4 | 3102.4 | 3065.5 | 3091.0 | 3082.6 |
| 7.5°   | 3091.0 | 3074.2 | 3034.7 | 3045.8 | 3031.7 |
| 10°    | 3057.1 | 3037.4 | 2981.2 | 2972.5 | 2955.7 |
| 12.5°  | 3015.0 | 2989.6 | 2913.2 | 2896.4 | 2865.3 |
| 15°    | 2964.1 | 2933.0 | 2837.2 | 2783.7 | 2755.5 |
| 17.5°  | 2904.8 | 2859.7 | 2741.2 | 2679.3 | 2634.0 |
| 20°    | 2837.2 | 2780.7 | 2639.8 | 2569.5 | 2507.2 |
| 22.5°  | 2763.9 | 2699.0 | 2535.3 | 2439.6 | 2397.4 |
| 25°    | 2690.6 | 2600.3 | 2414.1 | 2298.7 | 2256.2 |
| 27.5°  | 2603.2 | 2507.2 | 2301.3 | 2168.8 | 2103.8 |
| 30°    | 2510.2 | 2402.7 | 2177.2 | 2033.5 | 1957.2 |
| 32.5°  | 2419.8 | 2290.0 | 2059.0 | 1889.6 | 1819.0 |
| 35°    | 2318.4 | 2174.4 | 1926.4 | 1748.7 | 1686.4 |
| 37.5°  | 2219.6 | 2064.4 | 1802.2 | 1607.4 | 1537.1 |
| 40°    | 2115.3 | 1946.2 | 1672.4 | 1472.2 | 1398.8 |
| 42.5°  | 2008.1 | 1827.7 | 1542.8 | 1334.0 | 1263.6 |
| 45°    | 1895.3 | 1706.2 | 1410.2 | 1209.8 | 1142.2 |
| 47.5°  | 1788.2 | 1588.0 | 1283.4 | 1082.9 | 1021.0 |
| 50°    | 1669.6 | 1469.5 | 1159.2 | 964.4  | 905.4  |
| 52.5°  | 1553.9 | 1342.3 | 1040.7 | 854.6  | 801.1  |
| 55°    | 1441.1 | 1221.2 | 916.5  | 747.4  | 693.9  |
| 57.5°  | 1325.6 | 1099.9 | 806.7  | 648.8  | 603.5  |
| 60°    | 1207.0 | 981.5  | 690.9  | 547.2  | 502.1  |
| 62.5°  | 1091.6 | 865.9  | 592.2  | 456.9  | 434.5  |
| 65°    | 973.1  | 744.4  | 490.7  | 395.0  | 386.3  |
| 67.5°  | 860.3  | 631.7  | 395.0  | 346.8  | 338.5  |
| 70°    | 741.8  | 521.9  | 327.1  | 298.9  | 287.6  |
| 72.5°  | 629.0  | 420.1  | 273.5  | 251.1  | 245.3  |
| 75°    | 518.9  | 321.4  | 225.6  | 205.9  | 203.2  |
| 77.5°  | 409.1  | 228.3  | 177.8  | 166.4  | 160.7  |
| 80°    | 307.3  | 163.7  | 135.3  | 124.1  | 124.1  |
| 82.5°  | 214.2  | 110.1  | 93.0   | 87.4   | 87.4   |
| 85°    | 121.2  | 61.9   | 53.5   | 53.5   | 53.5   |
| 87.5°  | 45.1   | 22.4   | 22.4   | 19.8   | 19.8   |
| 90°    | 0.7    | 8.3    | 13.8   | 17.3   | 18.6   |
| 92.5°  | 17.3   | 14.5   | 16.6   | 18.0   | 18.6   |
| 95°    | 44.9   | 22.1   | 26.9   | 30.4   | 29.7   |
| 97.5°  | 80.8   | 24.2   | 35.2   | 37.3   | 38.0   |
| 100°   | 122.2  | 27.6   | 39.4   | 44.9   | 46.3   |
| 102.5° | 167.8  | 166.5  | 40.7   | 48.3   | 50.4   |
| 105°   | 209.9  | 230.6  | 42.1   | 49.7   | 52.5   |
| 107.5° | 258.9  | 276.2  | 43.5   | 51.1   | 53.9   |
| 110°   | 305.9  | 320.4  | 120.8  | 51.8   | 54.6   |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 350.2 | 362.5 | 350.8 | 53.2  | 55.2  |
| 115°   | 397.0 | 408.8 | 426.0 | 106.3 | 56.6  |
| 117.5° | 437.8 | 451.6 | 463.4 | 364.6 | 183.7 |
| 120°   | 483.3 | 493.7 | 506.1 | 514.4 | 421.2 |
| 122.5° | 522.0 | 533.1 | 547.0 | 551.0 | 551.8 |
| 125°   | 561.4 | 570.3 | 583.5 | 588.3 | 590.4 |
| 127.5° | 597.3 | 606.9 | 617.4 | 624.2 | 624.9 |
| 130°   | 631.1 | 642.2 | 649.8 | 657.3 | 656.8 |
| 132.5° | 665.6 | 674.7 | 682.2 | 688.4 | 687.8 |
| 135°   | 694.7 | 705.8 | 711.9 | 718.9 | 717.5 |
| 137.5° | 725.0 | 733.3 | 740.3 | 747.2 | 745.1 |
| 140°   | 754.7 | 760.3 | 767.8 | 774.0 | 770.6 |
| 142.5° | 779.7 | 784.5 | 793.4 | 798.9 | 795.5 |
| 145°   | 805.9 | 805.1 | 816.9 | 821.7 | 818.2 |
| 147.5° | 828.6 | 826.5 | 838.3 | 841.7 | 839.0 |
| 150°   | 850.7 | 845.9 | 857.0 | 861.0 | 857.6 |
| 152.5° | 869.3 | 863.8 | 874.2 | 878.4 | 873.5 |
| 155°   | 887.3 | 881.2 | 889.4 | 893.5 | 888.1 |
| 157.5° | 901.8 | 896.4 | 902.6 | 907.4 | 901.8 |
| 160°   | 914.3 | 910.1 | 914.3 | 918.4 | 913.5 |
| 162.5° | 925.3 | 921.1 | 924.6 | 929.4 | 923.2 |
| 165°   | 934.9 | 930.9 | 932.9 | 937.7 | 932.9 |
| 167.5° | 942.5 | 938.4 | 940.5 | 945.4 | 939.1 |
| 170°   | 948.8 | 944.6 | 946.0 | 950.8 | 944.6 |
| 172.5° | 952.9 | 948.8 | 950.2 | 955.0 | 948.8 |
| 175°   | 956.3 | 951.5 | 952.9 | 957.7 | 950.8 |
| 177.5° | 957.7 | 952.9 | 953.7 | 958.5 | 952.3 |
| 180°   | 954.3 | 954.3 | 954.3 | 954.3 | 954.3 |



TEST NUMBER: P903091  
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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 | 13.26            | 14.28 | 14.04 | 15.08 | 16.04 | 9.23           | 10.25 | 10.01 | 11.04 | 12.01 |
|                 | 3H   | 14.95            | 15.86 | 15.74 | 16.66 | 17.66 | 10.43          | 11.34 | 11.22 | 12.14 | 13.14 |
|                 | 4H   | 15.56            | 16.42 | 16.37 | 17.23 | 18.24 | 10.88          | 11.74 | 11.69 | 12.55 | 13.56 |
|                 | 6H   | 15.99            | 16.78 | 16.81 | 17.60 | 18.62 | 11.21          | 12.00 | 12.03 | 12.82 | 13.84 |
|                 | 8H   | 16.12            | 16.87 | 16.95 | 17.71 | 18.73 | 11.30          | 12.05 | 12.13 | 12.89 | 13.91 |
|                 | 12H  | 16.18            | 16.90 | 17.02 | 17.73 | 18.78 | 11.35          | 12.07 | 12.18 | 12.90 | 13.94 |
| 4H              | 2H   | 13.30            | 14.16 | 14.11 | 14.97 | 15.98 | 9.84           | 10.71 | 10.66 | 11.52 | 12.52 |
|                 | 3H   | 15.14            | 15.86 | 15.96 | 16.70 | 17.72 | 11.21          | 11.92 | 12.03 | 12.76 | 13.79 |
|                 | 4H   | 15.84            | 16.49 | 16.67 | 17.33 | 18.38 | 11.76          | 12.40 | 12.59 | 13.25 | 14.30 |
|                 | 6H   | 16.36            | 16.92 | 17.21 | 17.78 | 18.84 | 12.18          | 12.74 | 13.03 | 13.61 | 14.66 |
|                 | 8H   | 16.53            | 17.05 | 17.39 | 17.92 | 18.98 | 12.31          | 12.83 | 13.16 | 13.69 | 14.76 |
|                 | 12H  | 16.63            | 17.10 | 17.51 | 17.98 | 19.06 | 12.38          | 12.85 | 13.25 | 13.73 | 14.80 |
| 8H              | 4H   | 15.82            | 16.34 | 16.67 | 17.20 | 18.27 | 12.05          | 12.57 | 12.90 | 13.43 | 14.50 |
|                 | 6H   | 16.38            | 16.82 | 17.27 | 17.72 | 18.79 | 12.56          | 12.99 | 13.45 | 13.90 | 14.97 |
|                 | 8H   | 16.60            | 16.98 | 17.49 | 17.88 | 18.96 | 12.75          | 13.13 | 13.64 | 14.03 | 15.12 |
|                 | 12H  | 16.74            | 17.08 | 17.63 | 17.97 | 19.10 | 12.87          | 13.21 | 13.77 | 14.10 | 15.24 |
| 12H             | 4H   | 15.78            | 16.25 | 16.65 | 17.13 | 18.20 | 12.06          | 12.53 | 12.93 | 13.41 | 14.48 |
|                 | 6H   | 16.36            | 16.74 | 17.25 | 17.64 | 18.72 | 12.61          | 12.99 | 13.50 | 13.89 | 14.98 |
|                 | 8H   | 16.58            | 16.92 | 17.48 | 17.81 | 18.95 | 12.82          | 13.16 | 13.72 | 14.05 | 15.19 |