

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: P910305

Luminaire Tested: DFN2DIP-TR4F0-120D080US840-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P910305  
REPORT IS A COMBINATION OF REPORTS P901978 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-120D080US840-RLLONL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

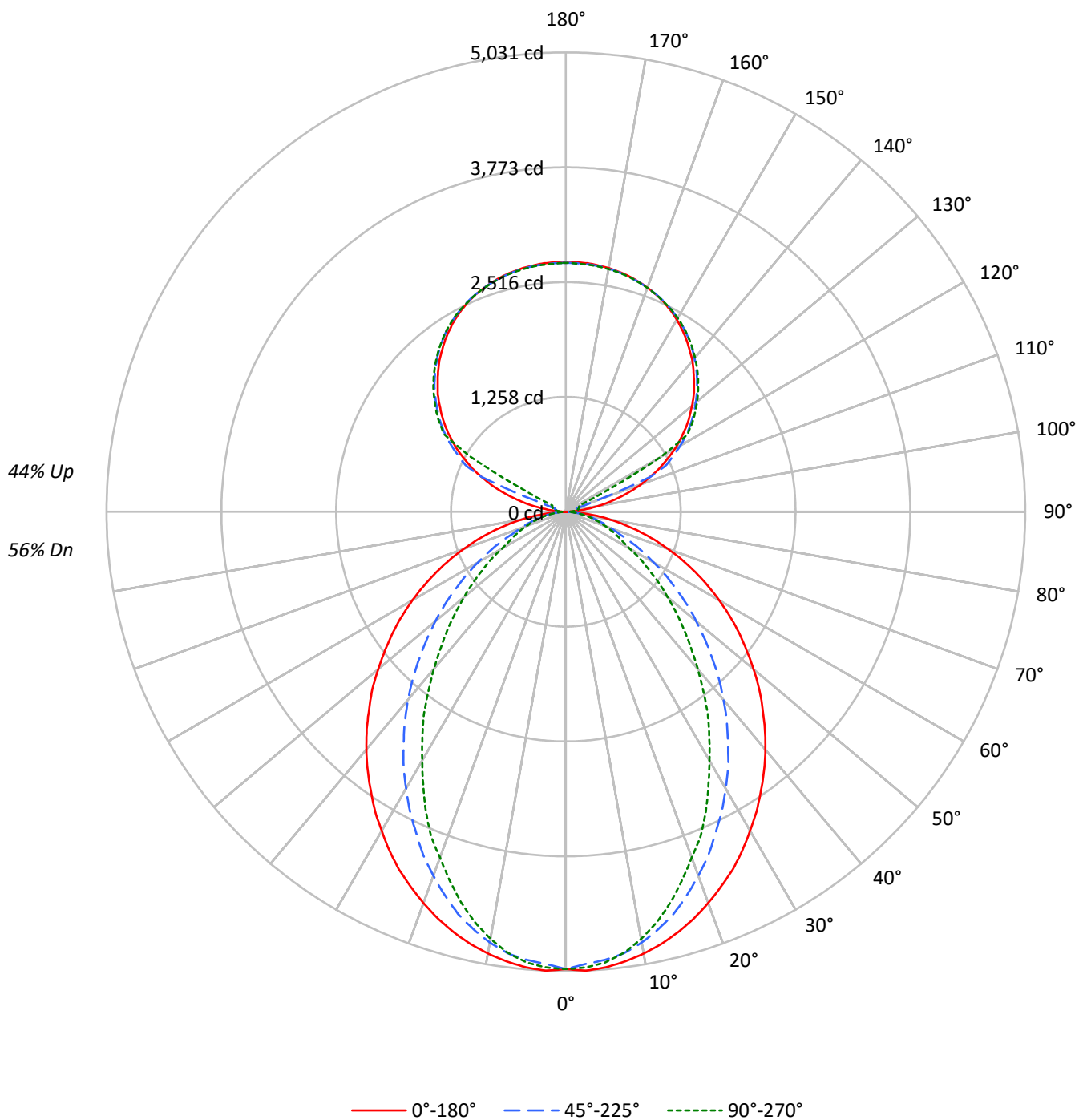
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 18298.7 lumens  
Efficiency: N/A  
Efficacy: 99.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: General Diffuse  
  
Input Watts (W): 184.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9821  
Total Harmonic Distortion (THDi): 0.08  
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   | 109 | 109 | 109 | 109 | 101 | 101 | 101 | 101 | 87 | 87 | 87 | 74 | 74 | 74 | 62 | 62 | 62 |
| 1   | 100 | 96  | 92  | 88  | 93  | 89  | 86  | 83  | 77 | 75 | 72 | 66 | 64 | 63 | 56 | 54 | 53 |
| 2   | 91  | 84  | 78  | 73  | 85  | 79  | 73  | 69  | 68 | 64 | 61 | 58 | 56 | 53 | 50 | 48 | 46 |
| 3   | 84  | 74  | 67  | 62  | 78  | 70  | 63  | 58  | 61 | 56 | 52 | 52 | 49 | 46 | 44 | 42 | 40 |
| 4   | 77  | 66  | 59  | 53  | 71  | 62  | 55  | 50  | 54 | 49 | 45 | 47 | 43 | 40 | 40 | 37 | 35 |
| 5   | 71  | 59  | 51  | 46  | 66  | 56  | 49  | 43  | 49 | 43 | 39 | 42 | 38 | 35 | 36 | 33 | 31 |
| 6   | 65  | 54  | 46  | 40  | 61  | 50  | 43  | 38  | 44 | 39 | 34 | 39 | 34 | 31 | 33 | 30 | 27 |
| 7   | 61  | 49  | 41  | 35  | 56  | 46  | 39  | 34  | 40 | 35 | 30 | 35 | 31 | 27 | 30 | 27 | 24 |
| 8   | 56  | 44  | 37  | 31  | 52  | 42  | 35  | 30  | 37 | 31 | 27 | 32 | 28 | 25 | 28 | 25 | 22 |
| 9   | 53  | 41  | 33  | 28  | 49  | 38  | 32  | 27  | 34 | 28 | 25 | 30 | 25 | 22 | 26 | 23 | 20 |
| 10  | 49  | 37  | 30  | 25  | 46  | 35  | 29  | 24  | 31 | 26 | 22 | 28 | 23 | 20 | 24 | 21 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3979 | 3979 | 3979 |
| 5°  | 3985 | 3916 | 3941 |
| 10° | 3946 | 3839 | 3812 |
| 15° | 3892 | 3712 | 3614 |
| 20° | 3820 | 3537 | 3371 |
| 25° | 3746 | 3341 | 3136 |
| 30° | 3647 | 3140 | 2838 |
| 35° | 3551 | 2924 | 2576 |
| 40° | 3452 | 2700 | 2276 |
| 45° | 3338 | 2452 | 2004 |
| 50° | 3219 | 2201 | 1738 |
| 55° | 3096 | 1934 | 1483 |
| 60° | 2953 | 1654 | 1221 |
| 65° | 2789 | 1369 | 1098 |
| 70° | 2589 | 1104 | 994  |
| 75° | 2339 | 973  | 904  |
| 80° | 1976 | 816  | 783  |
| 85° | 1378 | 544  | 588  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 3338 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 469.4   | 2.6       |
| 10°-20°   | 1288.6  | 7.0       |
| 20°-30°   | 1809.2  | 9.9       |
| 30°-40°   | 1972.1  | 10.8      |
| 40°-50°   | 1812.6  | 9.9       |
| 50°-60°   | 1423.5  | 7.8       |
| 60°-70°   | 926.6   | 5.1       |
| 70°-80°   | 476.9   | 2.6       |
| 80°-90°   | 126.6   | 0.7       |
| 90°-100°  | 89.9    | 0.5       |
| 100°-110° | 335.1   | 1.8       |
| 110°-120° | 888.9   | 4.9       |
| 120°-130° | 1474.3  | 8.1       |
| 130°-140° | 1566.0  | 8.6       |
| 140°-150° | 1455.4  | 8.0       |
| 150°-160° | 1170.1  | 6.4       |
| 160°-170° | 754.0   | 4.1       |
| 170°-180° | 259.5   | 1.4       |
| 0°-30°    | 3567.2  | 19.5      |
| 0°-40°    | 5539.3  | 30.3      |
| 0°-60°    | 8775.3  | 48.0      |
| 0°-90°    | 10305.4 | 56.3      |
| 90°-120°  | 1314.0  | 7.2       |
| 90°-150°  | 5809.7  | 31.7      |
| 90°-180°  | 7993.0  | 43.7      |
| 0°-180°   | 18298.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 5008 | 5008  | 5008 | 5008  | 5008 |      |
| 5°   | 5008 | 4986  | 4927 | 4968  | 4954 | 475  |
| 15°  | 4764 | 4714  | 4560 | 4474  | 4429 | 1342 |
| 25°  | 4324 | 4179  | 3880 | 3694  | 3626 | 1989 |
| 35°  | 3726 | 3495  | 3096 | 2810  | 2710 | 2332 |
| 45°  | 3046 | 2742  | 2266 | 1944  | 1836 | 2352 |
| 55°  | 2316 | 1963  | 1473 | 1201  | 1115 | 2070 |
| 65°  | 1564 | 1196  | 789  | 635   | 621  | 1550 |
| 75°  | 834  | 516   | 363  | 331   | 326  | 882  |
| 85°  | 195  | 100   | 86   | 86    | 86   | 224  |
| 90°  | 2    | 24    | 39   | 49    | 53   | 17   |
| 95°  | 128  | 63    | 77   | 87    | 85   | 152  |
| 105° | 600  | 659   | 120  | 142   | 150  | 641  |
| 115° | 1134 | 1168  | 1217 | 304   | 162  | 1117 |
| 125° | 1604 | 1630  | 1667 | 1681  | 1687 | 1430 |
| 135° | 1985 | 2016  | 2034 | 2054  | 2050 | 1533 |
| 145° | 2302 | 2300  | 2334 | 2348  | 2338 | 1440 |
| 155° | 2535 | 2518  | 2541 | 2553  | 2537 | 1168 |
| 165° | 2671 | 2660  | 2665 | 2679  | 2665 | 755  |
| 175° | 2732 | 2719  | 2723 | 2736  | 2717 | 260  |
| 180° | 2726 | 2726  | 2726 | 2726  | 2726 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 5008.5 | 5008.5 | 5008.5 | 5008.5 | 5008.5 |
| 2.5°   | 5031.2 | 5008.5 | 4958.5 | 5004.2 | 4995.0 |
| 5°     | 5008.5 | 4985.9 | 4926.7 | 4967.6 | 4954.2 |
| 7.5°   | 4967.6 | 4940.7 | 4877.2 | 4895.0 | 4872.4 |
| 10°    | 4913.3 | 4881.6 | 4791.1 | 4777.2 | 4750.3 |
| 12.5°  | 4845.4 | 4804.6 | 4681.9 | 4655.1 | 4605.1 |
| 15°    | 4763.7 | 4713.7 | 4559.8 | 4473.7 | 4428.6 |
| 17.5°  | 4668.5 | 4595.9 | 4405.4 | 4306.0 | 4233.4 |
| 20°    | 4559.8 | 4469.0 | 4242.4 | 4129.4 | 4029.4 |
| 22.5°  | 4442.0 | 4337.7 | 4074.6 | 3920.7 | 3852.9 |
| 25°    | 4324.2 | 4178.9 | 3879.8 | 3694.2 | 3625.9 |
| 27.5°  | 4183.8 | 4029.4 | 3698.5 | 3485.6 | 3381.1 |
| 30°    | 4034.2 | 3861.6 | 3499.0 | 3268.1 | 3145.5 |
| 32.5°  | 3889.0 | 3680.3 | 3309.0 | 3036.9 | 2923.4 |
| 35°    | 3726.0 | 3494.6 | 3095.9 | 2810.4 | 2710.3 |
| 37.5°  | 3567.2 | 3317.7 | 2896.4 | 2583.3 | 2470.3 |
| 40°    | 3399.4 | 3127.8 | 2687.8 | 2366.0 | 2248.2 |
| 42.5°  | 3227.2 | 2937.3 | 2479.5 | 2143.8 | 2030.8 |
| 45°    | 3046.0 | 2742.1 | 2266.4 | 1944.3 | 1835.5 |
| 47.5°  | 2873.8 | 2552.1 | 2062.5 | 1740.4 | 1640.8 |
| 50°    | 2683.4 | 2361.7 | 1863.0 | 1549.9 | 1455.2 |
| 52.5°  | 2497.3 | 2157.3 | 1672.5 | 1373.4 | 1287.4 |
| 55°    | 2316.0 | 1962.6 | 1473.0 | 1201.2 | 1115.2 |
| 57.5°  | 2130.3 | 1767.8 | 1296.5 | 1042.6 | 970.0  |
| 60°    | 1940.0 | 1577.3 | 1110.3 | 879.6  | 807.0  |
| 62.5°  | 1754.3 | 1391.7 | 951.7  | 734.4  | 698.2  |
| 65°    | 1563.9 | 1196.5 | 788.7  | 634.8  | 620.9  |
| 67.5°  | 1382.6 | 1015.1 | 634.8  | 557.3  | 543.9  |
| 70°    | 1192.1 | 838.7  | 525.6  | 480.4  | 462.1  |
| 72.5°  | 1010.9 | 675.2  | 439.5  | 403.4  | 394.4  |
| 75°    | 833.8  | 516.4  | 362.6  | 330.8  | 326.5  |
| 77.5°  | 657.4  | 366.9  | 285.7  | 267.4  | 258.2  |
| 80°    | 493.9  | 263.1  | 217.3  | 199.5  | 199.5  |
| 82.5°  | 344.4  | 176.9  | 149.6  | 140.4  | 140.4  |
| 85°    | 194.8  | 99.6   | 86.0   | 86.0   | 86.0   |
| 87.5°  | 72.6   | 36.1   | 36.1   | 31.7   | 31.7   |
| 90°    | 1.9    | 23.6   | 39.4   | 49.4   | 53.2   |
| 92.5°  | 49.4   | 41.5   | 47.4   | 51.3   | 53.2   |
| 95°    | 128.2  | 63.0   | 76.9   | 86.9   | 84.8   |
| 97.5°  | 230.8  | 69.1   | 100.5  | 106.6  | 108.5  |
| 100°   | 349.3  | 79.0   | 112.5  | 128.2  | 132.1  |
| 102.5° | 479.4  | 475.5  | 116.4  | 137.9  | 144.1  |
| 105°   | 599.8  | 659.0  | 120.4  | 142.0  | 150.0  |
| 107.5° | 739.8  | 789.0  | 124.4  | 145.9  | 153.9  |
| 110°   | 874.1  | 915.3  | 345.4  | 148.0  | 155.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1000.4 | 1035.7 | 1002.3 | 151.8  | 157.9  |
| 115°   | 1134.4 | 1167.9 | 1217.3 | 303.9  | 161.9  |
| 117.5° | 1250.8 | 1290.2 | 1323.9 | 1041.6 | 524.8  |
| 120°   | 1381.1 | 1410.6 | 1446.2 | 1469.9 | 1203.5 |
| 122.5° | 1491.4 | 1523.1 | 1562.7 | 1574.4 | 1576.5 |
| 125°   | 1603.9 | 1629.6 | 1667.1 | 1680.9 | 1686.8 |
| 127.5° | 1706.5 | 1734.1 | 1763.9 | 1783.5 | 1785.4 |
| 130°   | 1803.2 | 1834.8 | 1856.4 | 1878.2 | 1876.3 |
| 132.5° | 1901.9 | 1927.6 | 1949.2 | 1967.0 | 1965.1 |
| 135°   | 1984.8 | 2016.4 | 2034.0 | 2054.0 | 2049.9 |
| 137.5° | 2071.5 | 2095.2 | 2115.1 | 2134.8 | 2128.9 |
| 140°   | 2156.3 | 2172.2 | 2193.8 | 2211.6 | 2201.7 |
| 142.5° | 2227.6 | 2241.3 | 2266.8 | 2282.6 | 2272.7 |
| 145°   | 2302.5 | 2300.4 | 2333.9 | 2347.7 | 2337.8 |
| 147.5° | 2367.4 | 2361.6 | 2395.0 | 2404.9 | 2397.1 |
| 150°   | 2430.6 | 2416.8 | 2448.4 | 2460.1 | 2450.3 |
| 152.5° | 2483.9 | 2468.1 | 2497.6 | 2509.6 | 2495.8 |
| 155°   | 2535.2 | 2517.6 | 2541.2 | 2552.9 | 2537.3 |
| 157.5° | 2576.6 | 2560.9 | 2578.7 | 2592.5 | 2576.6 |
| 160°   | 2612.2 | 2600.3 | 2612.2 | 2623.9 | 2610.1 |
| 162.5° | 2643.6 | 2631.9 | 2641.7 | 2655.5 | 2637.8 |
| 165°   | 2671.3 | 2659.6 | 2665.4 | 2679.2 | 2665.4 |
| 167.5° | 2693.0 | 2681.1 | 2687.2 | 2701.0 | 2683.2 |
| 170°   | 2710.9 | 2698.9 | 2702.9 | 2716.7 | 2698.9 |
| 172.5° | 2722.6 | 2710.9 | 2714.8 | 2728.7 | 2710.9 |
| 175°   | 2732.4 | 2718.6 | 2722.6 | 2736.3 | 2716.7 |
| 177.5° | 2736.3 | 2722.6 | 2724.6 | 2738.5 | 2720.7 |
| 180°   | 2726.5 | 2726.5 | 2726.5 | 2726.5 | 2726.5 |

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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 | 12.51            | 13.40 | 13.42 | 14.32 | 15.50 | 8.48           | 9.37  | 9.39  | 10.29 | 11.47 |
|                 | 3H   | 14.19            | 14.98 | 15.11 | 15.91 | 17.12 | 9.68           | 10.47 | 10.60 | 11.40 | 12.61 |
|                 | 4H   | 14.80            | 15.55 | 15.74 | 16.49 | 17.70 | 10.13          | 10.88 | 11.07 | 11.82 | 13.03 |
|                 | 6H   | 15.23            | 15.91 | 16.17 | 16.86 | 18.09 | 10.46          | 11.14 | 11.40 | 12.09 | 13.31 |
|                 | 8H   | 15.36            | 16.01 | 16.31 | 16.97 | 18.19 | 10.55          | 11.20 | 11.50 | 12.16 | 13.39 |
|                 | 12H  | 15.42            | 16.04 | 16.38 | 16.99 | 18.24 | 10.59          | 11.22 | 11.55 | 12.17 | 13.42 |
| 4H              | 2H   | 12.54            | 13.28 | 13.48 | 14.22 | 15.43 | 9.09           | 9.83  | 10.03 | 10.77 | 11.99 |
|                 | 3H   | 14.37            | 14.99 | 15.32 | 15.96 | 17.19 | 10.44          | 11.06 | 11.39 | 12.03 | 13.26 |
|                 | 4H   | 15.06            | 15.63 | 16.02 | 16.59 | 17.85 | 10.99          | 11.56 | 11.95 | 12.52 | 13.77 |
|                 | 6H   | 15.58            | 16.07 | 16.55 | 17.05 | 18.31 | 11.42          | 11.90 | 12.39 | 12.89 | 14.14 |
|                 | 8H   | 15.76            | 16.21 | 16.73 | 17.19 | 18.46 | 11.55          | 12.00 | 12.52 | 12.98 | 14.25 |
|                 | 12H  | 15.86            | 16.26 | 16.85 | 17.26 | 18.53 | 11.61          | 12.02 | 12.61 | 13.02 | 14.29 |
| 8H              | 4H   | 15.04            | 15.49 | 16.01 | 16.47 | 17.74 | 11.28          | 11.73 | 12.25 | 12.71 | 13.98 |
|                 | 6H   | 15.60            | 15.98 | 16.60 | 17.00 | 18.27 | 11.80          | 12.17 | 12.80 | 13.19 | 14.46 |
|                 | 8H   | 15.82            | 16.15 | 16.83 | 17.16 | 18.44 | 11.99          | 12.32 | 13.00 | 13.33 | 14.61 |
|                 | 12H  | 15.96            | 16.25 | 16.97 | 17.25 | 18.59 | 12.11          | 12.40 | 13.12 | 13.41 | 14.74 |
| 12H             | 4H   | 14.99            | 15.40 | 15.98 | 16.40 | 17.67 | 11.28          | 11.69 | 12.28 | 12.69 | 13.96 |
|                 | 6H   | 15.58            | 15.91 | 16.59 | 16.92 | 18.20 | 11.85          | 12.18 | 12.86 | 13.19 | 14.47 |
|                 | 8H   | 15.80            | 16.09 | 16.81 | 17.10 | 18.43 | 12.06          | 12.35 | 13.07 | 13.35 | 14.69 |