

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: P923945

Luminaire Tested: DFN2DIP-TR4F0-120D080US940-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P923945  
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-TR4F0-120D080US940-RLLONL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

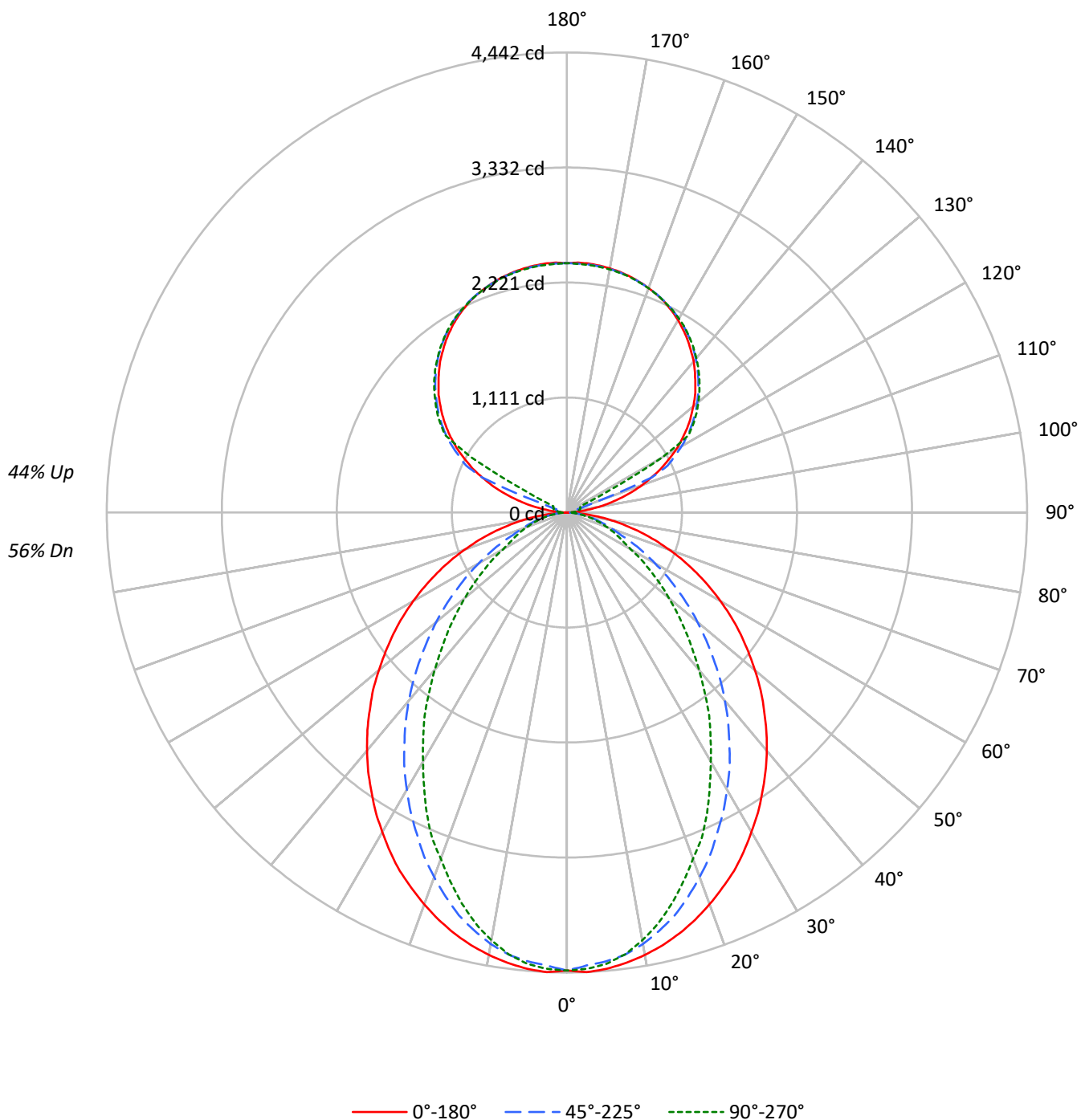
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 16157.8 lumens  
Efficiency: N/A  
Efficacy: 87.4 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°  | 3513 | 3513 | 3513 |
| 5°  | 3519 | 3458 | 3480 |
| 10° | 3484 | 3390 | 3366 |
| 15° | 3436 | 3278 | 3191 |
| 20° | 3373 | 3123 | 2976 |
| 25° | 3308 | 2950 | 2769 |
| 30° | 3221 | 2773 | 2506 |
| 35° | 3135 | 2582 | 2274 |
| 40° | 3048 | 2384 | 2009 |
| 45° | 2947 | 2165 | 1769 |
| 50° | 2843 | 1944 | 1535 |
| 55° | 2734 | 1707 | 1309 |
| 60° | 2608 | 1460 | 1078 |
| 65° | 2462 | 1209 | 970  |
| 70° | 2286 | 975  | 877  |
| 75° | 2065 | 859  | 798  |
| 80° | 1745 | 721  | 692  |
| 85° | 1216 | 481  | 519  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2947 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 414.5   | 2.6       |
| 10°-20°   | 1137.8  | 7.0       |
| 20°-30°   | 1597.5  | 9.9       |
| 30°-40°   | 1741.4  | 10.8      |
| 40°-50°   | 1600.5  | 9.9       |
| 50°-60°   | 1256.9  | 7.8       |
| 60°-70°   | 818.2   | 5.1       |
| 70°-80°   | 421.2   | 2.6       |
| 80°-90°   | 111.7   | 0.7       |
| 90°-100°  | 79.4    | 0.5       |
| 100°-110° | 295.9   | 1.8       |
| 110°-120° | 784.9   | 4.9       |
| 120°-130° | 1301.8  | 8.1       |
| 130°-140° | 1382.8  | 8.6       |
| 140°-150° | 1285.1  | 8.0       |
| 150°-160° | 1033.2  | 6.4       |
| 160°-170° | 665.8   | 4.1       |
| 170°-180° | 229.2   | 1.4       |
| 0°-30°    | 3149.8  | 19.5      |
| 0°-40°    | 4891.2  | 30.3      |
| 0°-60°    | 7748.6  | 48.0      |
| 0°-90°    | 9099.7  | 56.3      |
| 90°-120°  | 1160.2  | 7.2       |
| 90°-150°  | 5129.9  | 31.7      |
| 90°-180°  | 7058.0  | 43.7      |
| 0°-180°   | 16157.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4422 | 4422  | 4422 | 4422  | 4422 |      |
| 5°   | 4422 | 4403  | 4350 | 4386  | 4375 | 419  |
| 15°  | 4206 | 4162  | 4026 | 3950  | 3910 | 1185 |
| 25°  | 3818 | 3690  | 3426 | 3262  | 3202 | 1756 |
| 35°  | 3290 | 3086  | 2734 | 2482  | 2393 | 2059 |
| 45°  | 2690 | 2421  | 2001 | 1717  | 1621 | 2077 |
| 55°  | 2045 | 1733  | 1301 | 1061  | 985  | 1827 |
| 65°  | 1381 | 1056  | 696  | 560   | 548  | 1369 |
| 75°  | 736  | 456   | 320  | 292   | 288  | 779  |
| 85°  | 172  | 88    | 76   | 76    | 76   | 197  |
| 90°  | 2    | 21    | 35   | 44    | 47   | 15   |
| 95°  | 113  | 56    | 68   | 77    | 75   | 134  |
| 105° | 530  | 582   | 106  | 125   | 132  | 566  |
| 115° | 1002 | 1031  | 1075 | 268   | 143  | 986  |
| 125° | 1416 | 1439  | 1472 | 1484  | 1489 | 1263 |
| 135° | 1753 | 1780  | 1796 | 1814  | 1810 | 1354 |
| 145° | 2033 | 2031  | 2061 | 2073  | 2064 | 1272 |
| 155° | 2238 | 2223  | 2244 | 2254  | 2240 | 1032 |
| 165° | 2359 | 2348  | 2354 | 2366  | 2354 | 666  |
| 175° | 2413 | 2400  | 2404 | 2416  | 2399 | 230  |
| 180° | 2408 | 2408  | 2408 | 2408  | 2408 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4422.5 | 4422.5 | 4422.5 | 4422.5 | 4422.5 |
| 2.5°   | 4442.5 | 4422.5 | 4378.4 | 4418.7 | 4410.6 |
| 5°     | 4422.5 | 4402.6 | 4350.3 | 4386.4 | 4374.6 |
| 7.5°   | 4386.4 | 4362.6 | 4306.6 | 4322.3 | 4302.3 |
| 10°    | 4338.4 | 4310.4 | 4230.5 | 4218.2 | 4194.5 |
| 12.5°  | 4278.5 | 4242.5 | 4134.1 | 4110.4 | 4066.3 |
| 15°    | 4206.4 | 4162.2 | 4026.3 | 3950.3 | 3910.4 |
| 17.5°  | 4122.3 | 4058.2 | 3890.0 | 3802.2 | 3738.0 |
| 20°    | 4026.3 | 3946.1 | 3746.1 | 3646.3 | 3557.9 |
| 22.5°  | 3922.3 | 3830.2 | 3597.9 | 3462.0 | 3402.1 |
| 25°    | 3818.3 | 3690.0 | 3425.9 | 3262.0 | 3201.7 |
| 27.5°  | 3694.3 | 3557.9 | 3265.8 | 3077.7 | 2985.5 |
| 30°    | 3562.2 | 3409.8 | 3089.6 | 2885.8 | 2777.5 |
| 32.5°  | 3434.0 | 3249.7 | 2921.9 | 2681.6 | 2581.3 |
| 35°    | 3290.1 | 3085.8 | 2733.7 | 2481.5 | 2393.2 |
| 37.5°  | 3149.9 | 2929.5 | 2557.5 | 2281.1 | 2181.3 |
| 40°    | 3001.7 | 2761.8 | 2373.3 | 2089.2 | 1985.1 |
| 42.5°  | 2849.6 | 2593.6 | 2189.4 | 1893.0 | 1793.2 |
| 45°    | 2689.6 | 2421.3 | 2001.3 | 1716.8 | 1620.8 |
| 47.5°  | 2537.5 | 2253.5 | 1821.2 | 1536.8 | 1448.9 |
| 50°    | 2369.5 | 2085.4 | 1645.0 | 1368.6 | 1285.0 |
| 52.5°  | 2205.1 | 1904.9 | 1476.9 | 1212.7 | 1136.8 |
| 55°    | 2045.0 | 1732.9 | 1300.6 | 1060.7 | 984.7  |
| 57.5°  | 1881.1 | 1560.9 | 1144.8 | 920.6  | 856.5  |
| 60°    | 1713.0 | 1392.8 | 980.4  | 776.7  | 712.6  |
| 62.5°  | 1549.1 | 1228.9 | 840.3  | 648.5  | 616.5  |
| 65°    | 1380.9 | 1056.5 | 696.4  | 560.5  | 548.2  |
| 67.5°  | 1220.8 | 896.3  | 560.5  | 492.1  | 480.3  |
| 70°    | 1052.7 | 740.6  | 464.1  | 424.2  | 408.0  |
| 72.5°  | 892.6  | 596.2  | 388.1  | 356.2  | 348.2  |
| 75°    | 736.3  | 456.0  | 320.2  | 292.1  | 288.3  |
| 77.5°  | 580.5  | 324.0  | 252.3  | 236.1  | 228.0  |
| 80°    | 436.1  | 232.3  | 191.9  | 176.2  | 176.2  |
| 82.5°  | 304.1  | 156.2  | 132.1  | 123.9  | 123.9  |
| 85°    | 172.0  | 87.9   | 76.0   | 76.0   | 76.0   |
| 87.5°  | 64.1   | 31.8   | 31.8   | 28.0   | 28.0   |
| 90°    | 1.7    | 20.9   | 34.8   | 43.6   | 47.0   |
| 92.5°  | 43.6   | 36.6   | 41.8   | 45.3   | 47.0   |
| 95°    | 113.2  | 55.6   | 67.9   | 76.8   | 74.9   |
| 97.5°  | 203.8  | 61.0   | 88.7   | 94.2   | 95.8   |
| 100°   | 308.4  | 69.7   | 99.3   | 113.2  | 116.6  |
| 102.5° | 423.3  | 419.9  | 102.8  | 121.8  | 127.2  |
| 105°   | 529.6  | 581.9  | 106.3  | 125.4  | 132.4  |
| 107.5° | 653.3  | 696.7  | 109.9  | 128.9  | 135.9  |
| 110°   | 771.9  | 808.2  | 305.0  | 130.7  | 137.6  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 883.3  | 914.5  | 885.0  | 134.0  | 139.5  |
| 115°   | 1001.7 | 1031.3 | 1074.9 | 268.3  | 142.9  |
| 117.5° | 1104.5 | 1139.2 | 1169.0 | 919.7  | 463.4  |
| 120°   | 1219.5 | 1245.5 | 1277.0 | 1297.9 | 1062.7 |
| 122.5° | 1316.9 | 1344.9 | 1379.8 | 1390.2 | 1392.0 |
| 125°   | 1416.2 | 1439.0 | 1472.0 | 1484.3 | 1489.4 |
| 127.5° | 1506.8 | 1531.2 | 1557.6 | 1574.8 | 1576.5 |
| 130°   | 1592.2 | 1620.1 | 1639.2 | 1658.5 | 1656.8 |
| 132.5° | 1679.4 | 1702.1 | 1721.2 | 1736.9 | 1735.2 |
| 135°   | 1752.6 | 1780.5 | 1796.0 | 1813.6 | 1810.1 |
| 137.5° | 1829.2 | 1850.0 | 1867.6 | 1885.0 | 1879.8 |
| 140°   | 1904.0 | 1918.1 | 1937.2 | 1952.8 | 1944.1 |
| 142.5° | 1966.9 | 1979.1 | 2001.6 | 2015.5 | 2006.8 |
| 145°   | 2033.1 | 2031.2 | 2060.8 | 2073.0 | 2064.3 |
| 147.5° | 2090.4 | 2085.3 | 2114.8 | 2123.5 | 2116.7 |
| 150°   | 2146.3 | 2134.0 | 2162.0 | 2172.3 | 2163.6 |
| 152.5° | 2193.3 | 2179.3 | 2205.4 | 2216.0 | 2203.8 |
| 155°   | 2238.5 | 2223.0 | 2243.9 | 2254.2 | 2240.4 |
| 157.5° | 2275.1 | 2261.3 | 2277.0 | 2289.2 | 2275.1 |
| 160°   | 2306.6 | 2296.1 | 2306.6 | 2316.9 | 2304.7 |
| 162.5° | 2334.3 | 2324.0 | 2332.6 | 2344.8 | 2329.1 |
| 165°   | 2358.8 | 2348.4 | 2353.6 | 2365.7 | 2353.6 |
| 167.5° | 2377.9 | 2367.4 | 2372.8 | 2385.0 | 2369.3 |
| 170°   | 2393.7 | 2383.1 | 2386.7 | 2398.9 | 2383.1 |
| 172.5° | 2404.1 | 2393.7 | 2397.2 | 2409.4 | 2393.7 |
| 175°   | 2412.7 | 2400.5 | 2404.1 | 2416.2 | 2398.9 |
| 177.5° | 2416.2 | 2404.1 | 2405.8 | 2418.1 | 2402.4 |
| 180°   | 2407.5 | 2407.5 | 2407.5 | 2407.5 | 2407.5 |

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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 | 12.08            | 12.96 | 12.99 | 13.89 | 15.07 | 8.05           | 8.94  | 8.96  | 9.86  | 11.04 |
|                 | 3H   | 13.76            | 14.55 | 14.68 | 15.48 | 16.69 | 9.25           | 10.04 | 10.17 | 10.97 | 12.17 |
|                 | 4H   | 14.37            | 15.12 | 15.31 | 16.05 | 17.27 | 9.70           | 10.45 | 10.63 | 11.38 | 12.60 |
|                 | 6H   | 14.79            | 15.48 | 15.74 | 16.43 | 17.65 | 10.02          | 10.71 | 10.97 | 11.65 | 12.88 |
|                 | 8H   | 14.92            | 15.58 | 15.88 | 16.54 | 17.76 | 10.12          | 10.77 | 11.07 | 11.73 | 12.96 |
|                 | 12H  | 14.99            | 15.61 | 15.94 | 16.56 | 17.81 | 10.16          | 10.78 | 11.12 | 11.74 | 12.99 |
| 4H              | 2H   | 12.10            | 12.85 | 13.04 | 13.79 | 15.00 | 8.65           | 9.40  | 9.59  | 10.34 | 11.55 |
|                 | 3H   | 13.94            | 14.56 | 14.89 | 15.53 | 16.75 | 10.01          | 10.63 | 10.96 | 11.60 | 12.83 |
|                 | 4H   | 14.63            | 15.20 | 15.59 | 16.16 | 17.41 | 10.56          | 11.13 | 11.52 | 12.09 | 13.34 |
|                 | 6H   | 15.15            | 15.64 | 16.12 | 16.62 | 17.88 | 10.98          | 11.47 | 11.96 | 12.46 | 13.71 |
|                 | 8H   | 15.33            | 15.78 | 16.30 | 16.76 | 18.03 | 11.11          | 11.57 | 12.09 | 12.55 | 13.81 |
|                 | 12H  | 15.42            | 15.83 | 16.42 | 16.83 | 18.10 | 11.18          | 11.59 | 12.18 | 12.59 | 13.86 |
| 8H              | 4H   | 14.60            | 15.06 | 15.58 | 16.04 | 17.30 | 10.84          | 11.30 | 11.82 | 12.28 | 13.55 |
|                 | 6H   | 15.17            | 15.55 | 16.17 | 16.57 | 17.83 | 11.37          | 11.74 | 12.37 | 12.76 | 14.03 |
|                 | 8H   | 15.39            | 15.72 | 16.40 | 16.73 | 18.01 | 11.56          | 11.89 | 12.57 | 12.90 | 14.18 |
|                 | 12H  | 15.53            | 15.82 | 16.54 | 16.82 | 18.15 | 11.68          | 11.97 | 12.69 | 12.97 | 14.30 |
| 12H             | 4H   | 14.56            | 14.97 | 15.55 | 15.96 | 17.24 | 10.85          | 11.26 | 11.84 | 12.26 | 13.53 |
|                 | 6H   | 15.15            | 15.48 | 16.16 | 16.49 | 17.77 | 11.42          | 11.75 | 12.42 | 12.76 | 14.04 |
|                 | 8H   | 15.37            | 15.66 | 16.38 | 16.66 | 17.99 | 11.63          | 11.92 | 12.64 | 12.92 | 14.25 |