

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: P904852

Luminaire Tested: DFN2DIP-TR4F0-120D090US830-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P904852  
REPORT IS A COMBINATION OF REPORTS P900476 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-120D090US830-RLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

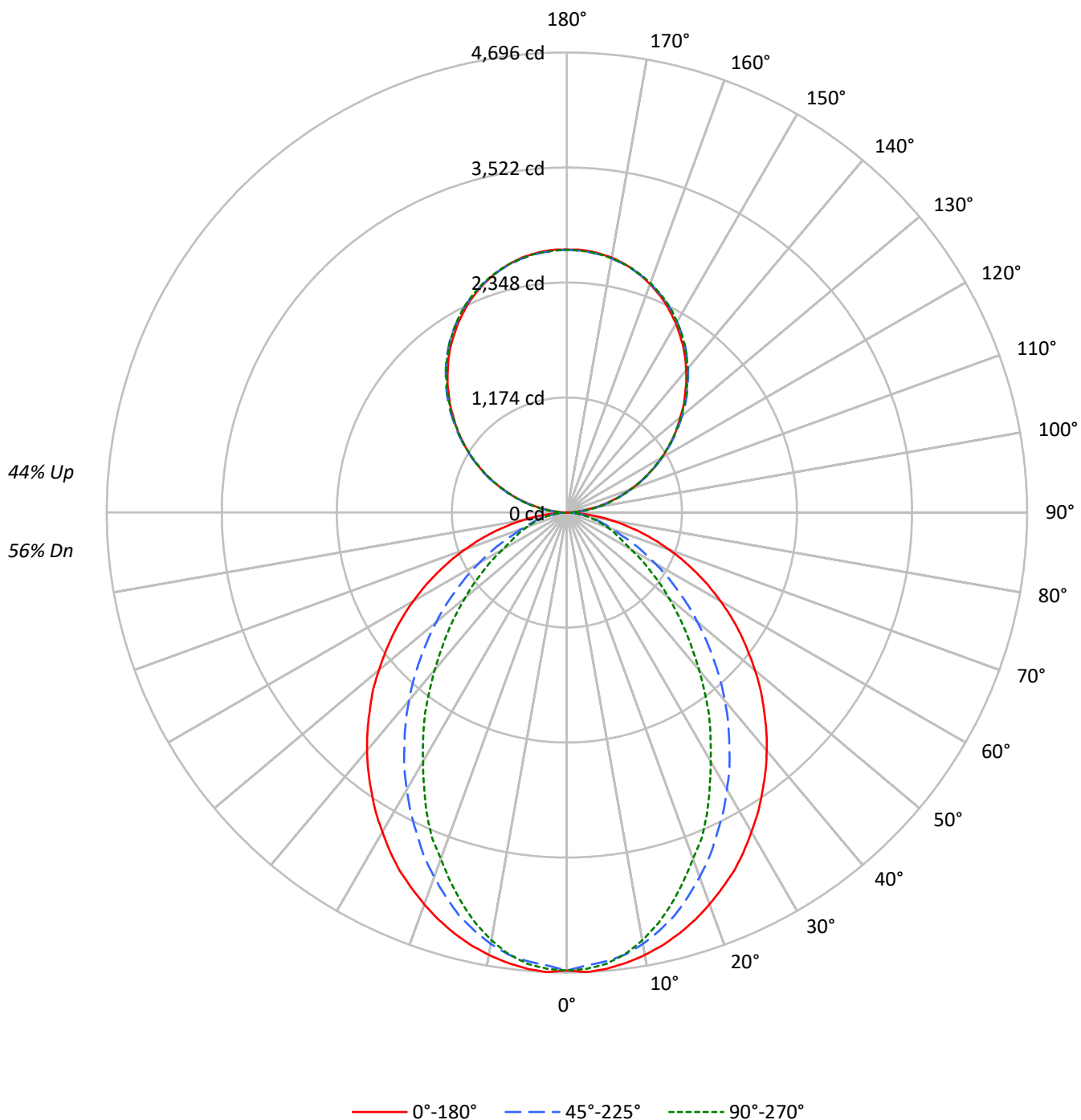
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 17121.2 lumens  
Efficiency: N/A  
Efficacy: 88.6 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): 193.3  
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

TEST NUMBER: P904852

CATALOG NUMBER: DFN2DIP-TR4F0-120D090US830-RLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P904852

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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 | 55 | 54 | 53 |
| 2   | 91  | 84  | 78  | 73  | 85  | 79  | 73  | 69  | 68 | 64 | 61 | 58 | 56 | 53 | 49 | 47 | 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 | 30 |
| 6   | 65  | 53  | 46  | 40  | 61  | 50  | 43  | 38  | 44 | 38 | 34 | 38 | 34 | 31 | 33 | 30 | 27 |
| 7   | 61  | 48  | 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°  | 3714 | 3714 | 3714 |
| 5°  | 3720 | 3655 | 3678 |
| 10° | 3683 | 3583 | 3558 |
| 15° | 3632 | 3465 | 3373 |
| 20° | 3565 | 3301 | 3146 |
| 25° | 3497 | 3118 | 2927 |
| 30° | 3404 | 2931 | 2648 |
| 35° | 3314 | 2729 | 2404 |
| 40° | 3222 | 2520 | 2124 |
| 45° | 3115 | 2288 | 1870 |
| 50° | 3005 | 2055 | 1622 |
| 55° | 2890 | 1805 | 1384 |
| 60° | 2756 | 1544 | 1139 |
| 65° | 2603 | 1278 | 1025 |
| 70° | 2417 | 1030 | 927  |
| 75° | 2183 | 908  | 843  |
| 80° | 1845 | 761  | 731  |
| 85° | 1286 | 508  | 549  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3115 cd/sqm

TEST NUMBER: P904852

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 438.1   | 2.6       |
| 10°-20°   | 1202.7  | 7.0       |
| 20°-30°   | 1688.5  | 9.9       |
| 30°-40°   | 1840.6  | 10.8      |
| 40°-50°   | 1691.7  | 9.9       |
| 50°-60°   | 1328.6  | 7.8       |
| 60°-70°   | 864.8   | 5.1       |
| 70°-80°   | 445.2   | 2.6       |
| 80°-90°   | 121.2   | 0.7       |
| 90°-100°  | 166.0   | 1.0       |
| 100°-110° | 527.5   | 3.1       |
| 110°-120° | 902.7   | 5.3       |
| 120°-130° | 1187.2  | 6.9       |
| 130°-140° | 1332.5  | 7.8       |
| 140°-150° | 1306.7  | 7.6       |
| 150°-160° | 1096.1  | 6.4       |
| 160°-170° | 726.9   | 4.2       |
| 170°-180° | 254.1   | 1.5       |
| 0°-30°    | 3329.4  | 19.4      |
| 0°-40°    | 5170.0  | 30.2      |
| 0°-60°    | 8190.3  | 47.8      |
| 0°-90°    | 9621.5  | 56.2      |
| 90°-120°  | 1596.2  | 9.3       |
| 90°-150°  | 5422.6  | 31.7      |
| 90°-180°  | 7500.0  | 43.8      |
| 0°-180°   | 17121.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4675 | 4675  | 4675 | 4675  | 4675 |      |
| 5°   | 4675 | 4654  | 4598 | 4636  | 4624 | 443  |
| 15°  | 4446 | 4400  | 4256 | 4176  | 4133 | 1253 |
| 25°  | 4036 | 3900  | 3621 | 3448  | 3384 | 1856 |
| 35°  | 3478 | 3262  | 2890 | 2623  | 2530 | 2177 |
| 45°  | 2843 | 2559  | 2115 | 1815  | 1713 | 2195 |
| 55°  | 2162 | 1832  | 1375 | 1121  | 1041 | 1932 |
| 65°  | 1460 | 1117  | 736  | 592   | 580  | 1447 |
| 75°  | 778  | 482   | 338  | 309   | 305  | 823  |
| 85°  | 182  | 93    | 80   | 80    | 80   | 209  |
| 90°  | 2    | 29    | 79   | 74    | 77   | 17   |
| 95°  | 118  | 141   | 145  | 145   | 141  | 131  |
| 105° | 487  | 493   | 498  | 502   | 502  | 514  |
| 115° | 906  | 919   | 915  | 912   | 906  | 896  |
| 125° | 1318 | 1338  | 1331 | 1324  | 1322 | 1177 |
| 135° | 1704 | 1729  | 1734 | 1732  | 1725 | 1317 |
| 145° | 2069 | 2085  | 2098 | 2100  | 2092 | 1293 |
| 155° | 2366 | 2372  | 2380 | 2391  | 2384 | 1089 |
| 165° | 2574 | 2571  | 2571 | 2587  | 2576 | 726  |
| 175° | 2678 | 2671  | 2667 | 2683  | 2669 | 254  |
| 180° | 2683 | 2683  | 2683 | 2683  | 2683 |      |

TEST NUMBER: P904852

CATALOG NUMBER: DFN2DIP-TR4F0-120D090US830-RLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4674.6 | 4674.6 | 4674.6 | 4674.6 | 4674.6 |
| 2.5°   | 4695.7 | 4674.6 | 4628.0 | 4670.6 | 4662.0 |
| 5°     | 4674.6 | 4653.5 | 4598.3 | 4636.5 | 4623.9 |
| 7.5°   | 4636.5 | 4611.3 | 4552.1 | 4568.7 | 4547.6 |
| 10°    | 4585.8 | 4556.2 | 4471.7 | 4458.7 | 4433.6 |
| 12.5°  | 4522.4 | 4484.3 | 4369.8 | 4344.7 | 4298.1 |
| 15°    | 4446.2 | 4399.5 | 4255.9 | 4175.5 | 4133.3 |
| 17.5°  | 4357.3 | 4289.5 | 4111.7 | 4018.9 | 3951.1 |
| 20°    | 4255.9 | 4171.0 | 3959.6 | 3854.1 | 3760.7 |
| 22.5°  | 4145.9 | 4048.5 | 3803.0 | 3659.3 | 3596.1 |
| 25°    | 4036.0 | 3900.3 | 3621.2 | 3447.9 | 3384.2 |
| 27.5°  | 3904.9 | 3760.7 | 3452.0 | 3253.2 | 3155.7 |
| 30°    | 3765.3 | 3604.2 | 3265.7 | 3050.3 | 2935.8 |
| 32.5°  | 3629.7 | 3434.9 | 3088.4 | 2834.4 | 2728.5 |
| 35°    | 3477.6 | 3261.7 | 2889.6 | 2623.0 | 2529.6 |
| 37.5°  | 3329.4 | 3096.5 | 2703.3 | 2411.1 | 2305.6 |
| 40°    | 3172.8 | 2919.2 | 2508.6 | 2208.3 | 2098.3 |
| 42.5°  | 3012.1 | 2741.5 | 2314.2 | 2000.9 | 1895.5 |
| 45°    | 2842.9 | 2559.3 | 2115.3 | 1814.7 | 1713.2 |
| 47.5°  | 2682.2 | 2382.0 | 1925.0 | 1624.4 | 1531.4 |
| 50°    | 2504.5 | 2204.2 | 1738.8 | 1446.6 | 1358.2 |
| 52.5°  | 2330.8 | 2013.5 | 1561.0 | 1281.9 | 1201.6 |
| 55°    | 2161.6 | 1831.7 | 1374.8 | 1121.2 | 1040.8 |
| 57.5°  | 1988.3 | 1649.9 | 1210.0 | 973.1  | 905.3  |
| 60°    | 1810.6 | 1472.2 | 1036.3 | 821.0  | 753.2  |
| 62.5°  | 1637.4 | 1298.9 | 888.3  | 685.4  | 651.7  |
| 65°    | 1459.6 | 1116.7 | 736.1  | 592.5  | 579.5  |
| 67.5°  | 1290.4 | 947.4  | 592.5  | 520.2  | 507.7  |
| 70°    | 1112.7 | 782.8  | 490.6  | 448.4  | 431.3  |
| 72.5°  | 943.5  | 630.2  | 410.2  | 376.5  | 368.1  |
| 75°    | 778.3  | 482.0  | 338.5  | 308.8  | 304.7  |
| 77.5°  | 613.6  | 342.4  | 266.6  | 249.6  | 241.0  |
| 80°    | 461.0  | 245.5  | 202.8  | 186.2  | 186.2  |
| 82.5°  | 321.4  | 165.1  | 139.6  | 131.0  | 131.0  |
| 85°    | 181.8  | 92.9   | 80.3   | 80.3   | 80.3   |
| 87.5°  | 67.8   | 33.6   | 33.6   | 29.6   | 29.6   |
| 90°    | 2.5    | 29.1   | 79.3   | 74.4   | 76.8   |
| 92.5°  | 50.1   | 68.0   | 70.4   | 72.8   | 72.8   |
| 95°    | 118.1  | 140.7  | 144.8  | 144.8  | 140.7  |
| 97.5°  | 196.5  | 217.5  | 226.5  | 226.5  | 226.5  |
| 100°   | 287.1  | 305.8  | 312.2  | 312.2  | 309.8  |
| 102.5° | 382.6  | 396.3  | 405.2  | 407.6  | 405.2  |
| 105°   | 486.9  | 493.3  | 498.2  | 502.3  | 502.3  |
| 107.5° | 590.4  | 600.1  | 600.1  | 601.7  | 590.4  |
| 110°   | 690.7  | 703.7  | 703.7  | 703.7  | 697.2  |

TEST NUMBER: P904852

CATALOG NUMBER: DFN2DIP-TR4F0-120D090US830-RLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 799.1  | 812.8  | 810.4  | 804.0  | 799.1  |
| 115°   | 905.9  | 918.8  | 914.7  | 912.4  | 905.9  |
| 117.5° | 1011.8 | 1029.6 | 1018.3 | 1011.8 | 1005.3 |
| 120°   | 1118.6 | 1136.3 | 1118.6 | 1118.6 | 1111.3 |
| 122.5° | 1215.6 | 1238.3 | 1227.0 | 1220.5 | 1215.6 |
| 125°   | 1317.6 | 1337.8 | 1331.3 | 1324.0 | 1321.6 |
| 127.5° | 1417.0 | 1442.1 | 1433.2 | 1423.5 | 1417.0 |
| 130°   | 1510.0 | 1539.2 | 1535.1 | 1530.2 | 1521.4 |
| 132.5° | 1614.4 | 1637.0 | 1638.6 | 1627.3 | 1620.9 |
| 135°   | 1704.1 | 1729.2 | 1734.1 | 1731.6 | 1725.2 |
| 137.5° | 1804.4 | 1824.7 | 1828.7 | 1827.1 | 1817.4 |
| 140°   | 1892.6 | 1912.8 | 1924.1 | 1924.1 | 1915.2 |
| 142.5° | 1983.2 | 2003.4 | 2009.9 | 2012.3 | 2003.4 |
| 145°   | 2069.0 | 2085.1 | 2098.0 | 2100.5 | 2091.6 |
| 147.5° | 2145.8 | 2166.0 | 2175.7 | 2179.7 | 2170.9 |
| 150°   | 2225.1 | 2238.8 | 2247.7 | 2254.9 | 2247.7 |
| 152.5° | 2295.4 | 2309.1 | 2320.4 | 2329.4 | 2320.4 |
| 155°   | 2365.8 | 2372.2 | 2379.5 | 2390.9 | 2383.6 |
| 157.5° | 2426.4 | 2431.3 | 2435.3 | 2451.5 | 2440.1 |
| 160°   | 2480.6 | 2485.5 | 2487.9 | 2501.6 | 2491.9 |
| 162.5° | 2530.7 | 2530.7 | 2533.2 | 2548.5 | 2537.2 |
| 165°   | 2573.6 | 2571.2 | 2571.2 | 2587.4 | 2576.1 |
| 167.5° | 2612.4 | 2605.2 | 2605.2 | 2621.3 | 2610.0 |
| 170°   | 2641.6 | 2635.1 | 2632.7 | 2648.8 | 2635.1 |
| 172.5° | 2661.7 | 2655.3 | 2652.9 | 2669.1 | 2655.3 |
| 175°   | 2678.0 | 2671.4 | 2666.6 | 2682.9 | 2669.1 |
| 177.5° | 2686.8 | 2680.4 | 2675.5 | 2689.3 | 2675.5 |
| 180°   | 2682.9 | 2682.9 | 2682.9 | 2682.9 | 2682.9 |

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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 | 12.26            | 13.14 | 13.17 | 14.07 | 15.25 | 8.23           | 9.12  | 9.14  | 10.04 | 11.22 |
|                 | 3H   | 13.94            | 14.73 | 14.86 | 15.66 | 16.87 | 9.43           | 10.22 | 10.35 | 11.15 | 12.36 |
|                 | 4H   | 14.55            | 15.30 | 15.49 | 16.24 | 17.45 | 9.88           | 10.63 | 10.82 | 11.56 | 12.78 |
|                 | 6H   | 14.98            | 15.66 | 15.92 | 16.61 | 17.84 | 10.20          | 10.89 | 11.15 | 11.84 | 13.06 |
|                 | 8H   | 15.10            | 15.76 | 16.06 | 16.72 | 17.94 | 10.30          | 10.95 | 11.25 | 11.91 | 13.14 |
|                 | 12H  | 15.17            | 15.79 | 16.13 | 16.74 | 17.99 | 10.34          | 10.96 | 11.30 | 11.92 | 13.17 |
| 4H              | 2H   | 12.28            | 13.03 | 13.23 | 13.97 | 15.18 | 8.83           | 9.58  | 9.78  | 10.52 | 11.74 |
|                 | 3H   | 14.12            | 14.74 | 15.07 | 15.71 | 16.94 | 10.19          | 10.81 | 11.14 | 11.78 | 13.01 |
|                 | 4H   | 14.81            | 15.38 | 15.77 | 16.34 | 17.60 | 10.74          | 11.31 | 11.70 | 12.27 | 13.53 |
|                 | 6H   | 15.33            | 15.82 | 16.30 | 16.80 | 18.06 | 11.16          | 11.65 | 12.14 | 12.64 | 13.89 |
|                 | 8H   | 15.51            | 15.96 | 16.48 | 16.94 | 18.21 | 11.29          | 11.75 | 12.27 | 12.73 | 14.00 |
|                 | 12H  | 15.60            | 16.01 | 16.60 | 17.01 | 18.28 | 11.36          | 11.77 | 12.36 | 12.77 | 14.04 |
| 8H              | 4H   | 14.78            | 15.24 | 15.76 | 16.22 | 17.49 | 11.03          | 11.48 | 12.00 | 12.46 | 13.73 |
|                 | 6H   | 15.35            | 15.73 | 16.35 | 16.75 | 18.02 | 11.55          | 11.92 | 12.55 | 12.94 | 14.21 |
|                 | 8H   | 15.57            | 15.90 | 16.58 | 16.91 | 18.19 | 11.74          | 12.07 | 12.75 | 13.08 | 14.36 |
|                 | 12H  | 15.71            | 16.00 | 16.72 | 17.00 | 18.34 | 11.86          | 12.15 | 12.87 | 13.15 | 14.49 |
| 12H             | 4H   | 14.74            | 15.15 | 15.73 | 16.14 | 17.42 | 11.03          | 11.44 | 12.03 | 12.44 | 13.71 |
|                 | 6H   | 15.33            | 15.66 | 16.34 | 16.67 | 17.95 | 11.60          | 11.93 | 12.60 | 12.94 | 14.22 |
|                 | 8H   | 15.55            | 15.84 | 16.56 | 16.84 | 18.18 | 11.81          | 12.10 | 12.82 | 13.10 | 14.44 |