

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: P903330

Luminaire Tested: DFN2DIP-PN4F0-090D050US830-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P903330  
REPORT IS A COMBINATION OF REPORTS P899638 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-090D050US830-RLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

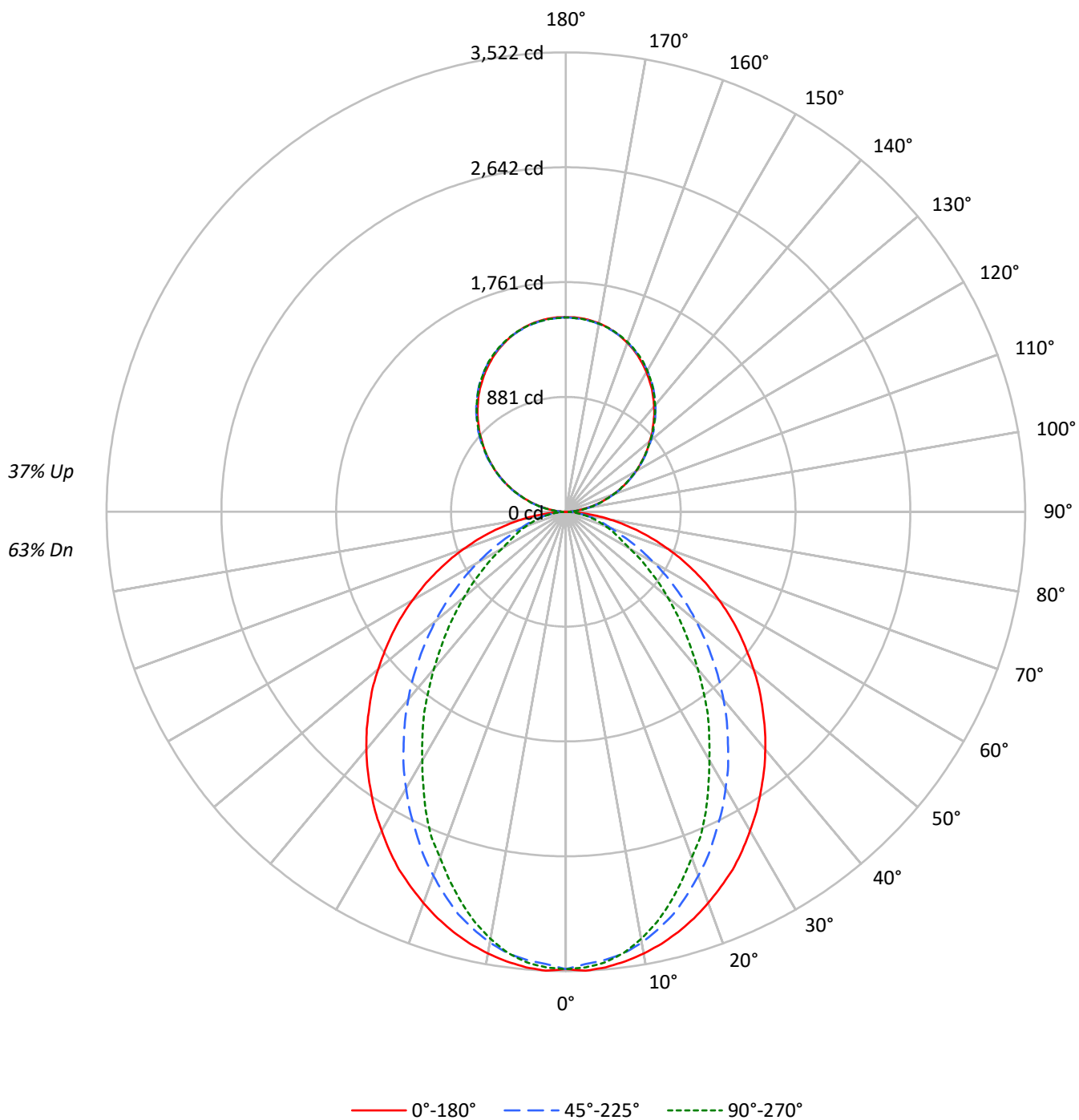
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 11381.2 lumens  
Efficiency: N/A  
Efficacy: 90.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Direct  
  
Input Watts (W): 126  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9963  
Total Harmonic Distortion (THDi): 0.065  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-PN4F0-090D050US830-RLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P903330

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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 | 104 | 104 | 104 | 104 | 91 | 91 | 91 | 79 | 79 | 79 | 68 | 68 | 68 |
| 1   | 101 | 97  | 93  | 90  | 95  | 91  | 88  | 85  | 81 | 78 | 76 | 71 | 69 | 67 | 61 | 60 | 59 |
| 2   | 93  | 86  | 80  | 75  | 87  | 81  | 75  | 71  | 71 | 67 | 64 | 63 | 60 | 57 | 55 | 53 | 51 |
| 3   | 85  | 76  | 69  | 63  | 80  | 72  | 65  | 60  | 64 | 59 | 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  | 68  | 57  | 50  | 45  | 51 | 45 | 41 | 46 | 41 | 37 | 40 | 37 | 34 |
| 6   | 67  | 55  | 47  | 41  | 62  | 52  | 45  | 39  | 47 | 41 | 36 | 41 | 37 | 33 | 37 | 33 | 30 |
| 7   | 62  | 50  | 42  | 36  | 58  | 47  | 40  | 35  | 42 | 37 | 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 | 28 | 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°  | 2559 | 2559 | 2559 |
| 5°  | 2563 | 2519 | 2535 |
| 10° | 2538 | 2470 | 2453 |
| 15° | 2503 | 2389 | 2326 |
| 20° | 2457 | 2276 | 2170 |
| 25° | 2409 | 2150 | 2019 |
| 30° | 2346 | 2021 | 1828 |
| 35° | 2284 | 1883 | 1660 |
| 40° | 2220 | 1739 | 1467 |
| 45° | 2147 | 1580 | 1292 |
| 50° | 2070 | 1419 | 1121 |
| 55° | 1991 | 1247 | 957  |
| 60° | 1899 | 1067 | 788  |
| 65° | 1793 | 884  | 710  |
| 70° | 1665 | 713  | 643  |
| 75° | 1504 | 629  | 586  |
| 80° | 1270 | 529  | 510  |
| 85° | 885  | 355  | 386  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2147 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 328.6   | 2.9       |
| 10°-20°   | 902.0   | 7.9       |
| 20°-30°   | 1266.4  | 11.1      |
| 30°-40°   | 1380.5  | 12.1      |
| 40°-50°   | 1268.8  | 11.1      |
| 50°-60°   | 996.5   | 8.8       |
| 60°-70°   | 648.6   | 5.7       |
| 70°-80°   | 333.9   | 2.9       |
| 80°-90°   | 89.5    | 0.8       |
| 90°-100°  | 92.2    | 0.8       |
| 100°-110° | 293.0   | 2.6       |
| 110°-120° | 501.5   | 4.4       |
| 120°-130° | 659.5   | 5.8       |
| 130°-140° | 740.3   | 6.5       |
| 140°-150° | 725.9   | 6.4       |
| 150°-160° | 609.0   | 5.4       |
| 160°-170° | 403.9   | 3.5       |
| 170°-180° | 141.2   | 1.2       |
| 0°-30°    | 2497.0  | 21.9      |
| 0°-40°    | 3877.5  | 34.1      |
| 0°-60°    | 6142.8  | 54.0      |
| 0°-90°    | 7214.7  | 63.4      |
| 90°-120°  | 886.7   | 7.8       |
| 90°-150°  | 3012.5  | 26.5      |
| 90°-180°  | 4167.0  | 36.6      |
| 0°-180°   | 11381.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3506 | 3506  | 3506 | 3506  | 3506 |      |
| 5°   | 3506 | 3490  | 3449 | 3477  | 3468 | 332  |
| 15°  | 3335 | 3300  | 3192 | 3132  | 3100 | 940  |
| 25°  | 3027 | 2925  | 2716 | 2586  | 2538 | 1392 |
| 35°  | 2608 | 2446  | 2167 | 1967  | 1897 | 1632 |
| 45°  | 2132 | 1920  | 1586 | 1361  | 1285 | 1647 |
| 55°  | 1621 | 1374  | 1031 | 841   | 781  | 1449 |
| 65°  | 1095 | 838   | 552  | 444   | 435  | 1085 |
| 75°  | 584  | 362   | 254  | 232   | 229  | 617  |
| 85°  | 136  | 70    | 60   | 60    | 60   | 156  |
| 90°  | 1    | 16    | 44   | 41    | 43   | 11   |
| 95°  | 66   | 78    | 80   | 80    | 78   | 73   |
| 105° | 270  | 274   | 277  | 279   | 279  | 285  |
| 115° | 503  | 510   | 508  | 507   | 503  | 498  |
| 125° | 732  | 743   | 740  | 736   | 734  | 654  |
| 135° | 947  | 961   | 963  | 962   | 958  | 732  |
| 145° | 1149 | 1158  | 1166 | 1167  | 1162 | 718  |
| 155° | 1314 | 1318  | 1322 | 1328  | 1324 | 605  |
| 165° | 1430 | 1428  | 1428 | 1438  | 1431 | 403  |
| 175° | 1488 | 1484  | 1482 | 1490  | 1483 | 141  |
| 180° | 1490 | 1490  | 1490 | 1490  | 1490 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3506.0 | 3506.0 | 3506.0 | 3506.0 | 3506.0 |
| 2.5°   | 3521.8 | 3506.0 | 3470.9 | 3503.0 | 3496.5 |
| 5°     | 3506.0 | 3490.1 | 3448.8 | 3477.3 | 3467.9 |
| 7.5°   | 3477.3 | 3458.5 | 3414.1 | 3426.5 | 3410.7 |
| 10°    | 3439.3 | 3417.1 | 3353.8 | 3344.0 | 3325.2 |
| 12.5°  | 3391.8 | 3363.3 | 3277.4 | 3258.6 | 3223.5 |
| 15°    | 3334.6 | 3299.7 | 3191.9 | 3131.6 | 3100.0 |
| 17.5°  | 3268.0 | 3217.2 | 3083.8 | 3014.2 | 2963.4 |
| 20°    | 3191.9 | 3128.3 | 2969.7 | 2890.6 | 2820.6 |
| 22.5°  | 3109.4 | 3036.4 | 2852.2 | 2744.5 | 2697.1 |
| 25°    | 3027.0 | 2925.3 | 2715.9 | 2586.0 | 2538.2 |
| 27.5°  | 2928.7 | 2820.6 | 2589.0 | 2439.9 | 2366.8 |
| 30°    | 2824.0 | 2703.1 | 2449.3 | 2287.7 | 2201.9 |
| 32.5°  | 2722.3 | 2576.2 | 2316.3 | 2125.8 | 2046.4 |
| 35°    | 2608.2 | 2446.3 | 2167.2 | 1967.3 | 1897.2 |
| 37.5°  | 2497.1 | 2322.4 | 2027.5 | 1808.4 | 1729.3 |
| 40°    | 2379.6 | 2189.4 | 1881.4 | 1656.2 | 1573.8 |
| 42.5°  | 2259.1 | 2056.2 | 1735.6 | 1500.7 | 1421.5 |
| 45°    | 2132.2 | 1919.5 | 1586.5 | 1360.9 | 1284.9 |
| 47.5°  | 2011.7 | 1786.5 | 1443.8 | 1218.2 | 1148.6 |
| 50°    | 1878.4 | 1653.1 | 1304.1 | 1085.0 | 1018.6 |
| 52.5°  | 1748.1 | 1510.1 | 1170.8 | 961.4  | 901.2  |
| 55°    | 1621.2 | 1373.8 | 1031.0 | 840.9  | 780.6  |
| 57.5°  | 1491.3 | 1237.5 | 907.6  | 729.8  | 679.0  |
| 60°    | 1357.9 | 1104.1 | 777.3  | 615.7  | 564.9  |
| 62.5°  | 1228.0 | 974.2  | 666.2  | 514.1  | 488.8  |
| 65°    | 1094.7 | 837.5  | 552.0  | 444.3  | 434.6  |
| 67.5°  | 967.8  | 710.6  | 444.3  | 390.1  | 380.7  |
| 70°    | 834.5  | 587.1  | 368.0  | 336.3  | 323.5  |
| 72.5°  | 707.6  | 472.6  | 307.6  | 282.4  | 276.1  |
| 75°    | 583.7  | 361.6  | 253.8  | 231.6  | 228.6  |
| 77.5°  | 460.1  | 256.8  | 199.9  | 187.2  | 180.8  |
| 80°    | 345.7  | 184.2  | 152.1  | 139.7  | 139.7  |
| 82.5°  | 241.0  | 123.9  | 104.7  | 98.3   | 98.3   |
| 85°    | 136.3  | 69.7   | 60.2   | 60.2   | 60.2   |
| 87.5°  | 50.8   | 25.3   | 25.3   | 22.2   | 22.2   |
| 90°    | 1.3    | 16.2   | 44.0   | 41.4   | 42.7   |
| 92.5°  | 27.9   | 37.7   | 39.1   | 40.4   | 40.4   |
| 95°    | 65.6   | 78.2   | 80.4   | 80.4   | 78.2   |
| 97.5°  | 109.1  | 120.8  | 125.8  | 125.8  | 125.8  |
| 100°   | 159.5  | 169.8  | 173.4  | 173.4  | 172.1  |
| 102.5° | 212.5  | 220.2  | 225.1  | 226.5  | 225.1  |
| 105°   | 270.5  | 274.1  | 276.8  | 279.0  | 279.0  |
| 107.5° | 328.0  | 333.4  | 333.4  | 334.3  | 328.0  |
| 110°   | 383.7  | 391.0  | 391.0  | 391.0  | 387.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 443.9  | 451.6  | 450.3  | 446.7  | 443.9  |
| 115°   | 503.2  | 510.5  | 508.2  | 506.9  | 503.2  |
| 117.5° | 562.1  | 572.0  | 565.7  | 562.1  | 558.6  |
| 120°   | 621.4  | 631.3  | 621.4  | 621.4  | 617.4  |
| 122.5° | 675.3  | 688.0  | 681.6  | 678.1  | 675.3  |
| 125°   | 732.0  | 743.2  | 739.6  | 735.6  | 734.2  |
| 127.5° | 787.2  | 801.2  | 796.3  | 790.8  | 787.2  |
| 130°   | 839.0  | 855.1  | 852.8  | 850.2  | 845.2  |
| 132.5° | 896.9  | 909.5  | 910.4  | 904.1  | 900.5  |
| 135°   | 946.8  | 960.6  | 963.4  | 962.1  | 958.5  |
| 137.5° | 1002.5 | 1013.7 | 1016.0 | 1015.0 | 1009.7 |
| 140°   | 1051.4 | 1062.7 | 1068.9 | 1068.9 | 1064.0 |
| 142.5° | 1101.7 | 1113.0 | 1116.6 | 1117.9 | 1113.0 |
| 145°   | 1149.4 | 1158.4 | 1165.5 | 1167.0 | 1162.0 |
| 147.5° | 1192.1 | 1203.3 | 1208.7 | 1211.0 | 1206.0 |
| 150°   | 1236.1 | 1243.8 | 1248.7 | 1252.7 | 1248.7 |
| 152.5° | 1275.3 | 1282.9 | 1289.1 | 1294.1 | 1289.1 |
| 155°   | 1314.3 | 1317.9 | 1321.9 | 1328.2 | 1324.2 |
| 157.5° | 1348.0 | 1350.7 | 1352.9 | 1362.0 | 1355.7 |
| 160°   | 1378.1 | 1380.8 | 1382.1 | 1389.8 | 1384.4 |
| 162.5° | 1406.0 | 1406.0 | 1407.3 | 1415.9 | 1409.6 |
| 165°   | 1429.8 | 1428.4 | 1428.4 | 1437.5 | 1431.2 |
| 167.5° | 1451.3 | 1447.3 | 1447.3 | 1456.3 | 1450.0 |
| 170°   | 1467.5 | 1464.0 | 1462.6 | 1471.6 | 1464.0 |
| 172.5° | 1478.8 | 1475.2 | 1473.9 | 1482.8 | 1475.2 |
| 175°   | 1487.8 | 1484.1 | 1481.5 | 1490.4 | 1482.8 |
| 177.5° | 1492.7 | 1489.1 | 1486.4 | 1494.0 | 1486.4 |
| 180°   | 1490.4 | 1490.4 | 1490.4 | 1490.4 | 1490.4 |

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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 | 11.58            | 12.54 | 12.43 | 13.39 | 14.46 | 7.55           | 8.50  | 8.39  | 9.36  | 10.43 |
|                 | 3H   | 13.27            | 14.13 | 14.13 | 14.99 | 16.09 | 8.75           | 9.60  | 9.60  | 10.47 | 11.56 |
|                 | 4H   | 13.89            | 14.69 | 14.76 | 15.57 | 16.68 | 9.20           | 10.01 | 10.07 | 10.88 | 11.99 |
|                 | 6H   | 14.32            | 15.06 | 15.20 | 15.94 | 17.06 | 9.53           | 10.27 | 10.41 | 11.15 | 12.27 |
|                 | 8H   | 14.45            | 15.16 | 15.34 | 16.05 | 17.17 | 9.63           | 10.33 | 10.52 | 11.23 | 12.35 |
|                 | 12H  | 14.52            | 15.19 | 15.41 | 16.08 | 17.23 | 9.67           | 10.35 | 10.57 | 11.24 | 12.38 |
| 4H              | 2H   | 11.62            | 12.42 | 12.49 | 13.30 | 14.40 | 8.16           | 8.97  | 9.04  | 9.84  | 10.95 |
|                 | 3H   | 13.46            | 14.13 | 14.35 | 15.03 | 16.16 | 9.52           | 10.19 | 10.41 | 11.10 | 12.22 |
|                 | 4H   | 14.16            | 14.77 | 15.06 | 15.67 | 16.82 | 10.08          | 10.68 | 10.97 | 11.59 | 12.74 |
|                 | 6H   | 14.68            | 15.21 | 15.60 | 16.13 | 17.29 | 10.50          | 11.03 | 11.42 | 11.95 | 13.10 |
|                 | 8H   | 14.86            | 15.35 | 15.78 | 16.27 | 17.44 | 10.64          | 11.12 | 11.55 | 12.04 | 13.21 |
|                 | 12H  | 14.97            | 15.41 | 15.90 | 16.35 | 17.51 | 10.71          | 11.15 | 11.64 | 12.09 | 13.25 |
| 8H              | 4H   | 14.14            | 14.63 | 15.05 | 15.55 | 16.71 | 10.37          | 10.86 | 11.28 | 11.78 | 12.94 |
|                 | 6H   | 14.71            | 15.11 | 15.65 | 16.08 | 17.24 | 10.89          | 11.30 | 11.83 | 12.26 | 13.42 |
|                 | 8H   | 14.93            | 15.29 | 15.88 | 16.24 | 17.42 | 11.08          | 11.44 | 12.03 | 12.40 | 13.58 |
|                 | 12H  | 15.08            | 15.39 | 16.03 | 16.34 | 17.57 | 11.21          | 11.52 | 12.16 | 12.47 | 13.70 |
| 12H             | 4H   | 14.09            | 14.53 | 15.03 | 15.47 | 16.64 | 10.38          | 10.82 | 11.31 | 11.76 | 12.93 |
|                 | 6H   | 14.69            | 15.04 | 15.64 | 16.00 | 17.18 | 10.94          | 11.30 | 11.89 | 12.25 | 13.43 |
|                 | 8H   | 14.91            | 15.23 | 15.87 | 16.18 | 17.41 | 11.16          | 11.47 | 12.11 | 12.42 | 13.65 |