

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: P926422

Luminaire Tested: DFN2DIP-TR4F0-050D090US950-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P926422  
REPORT IS A COMBINATION OF REPORTS P900461 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-050D090US950-FLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

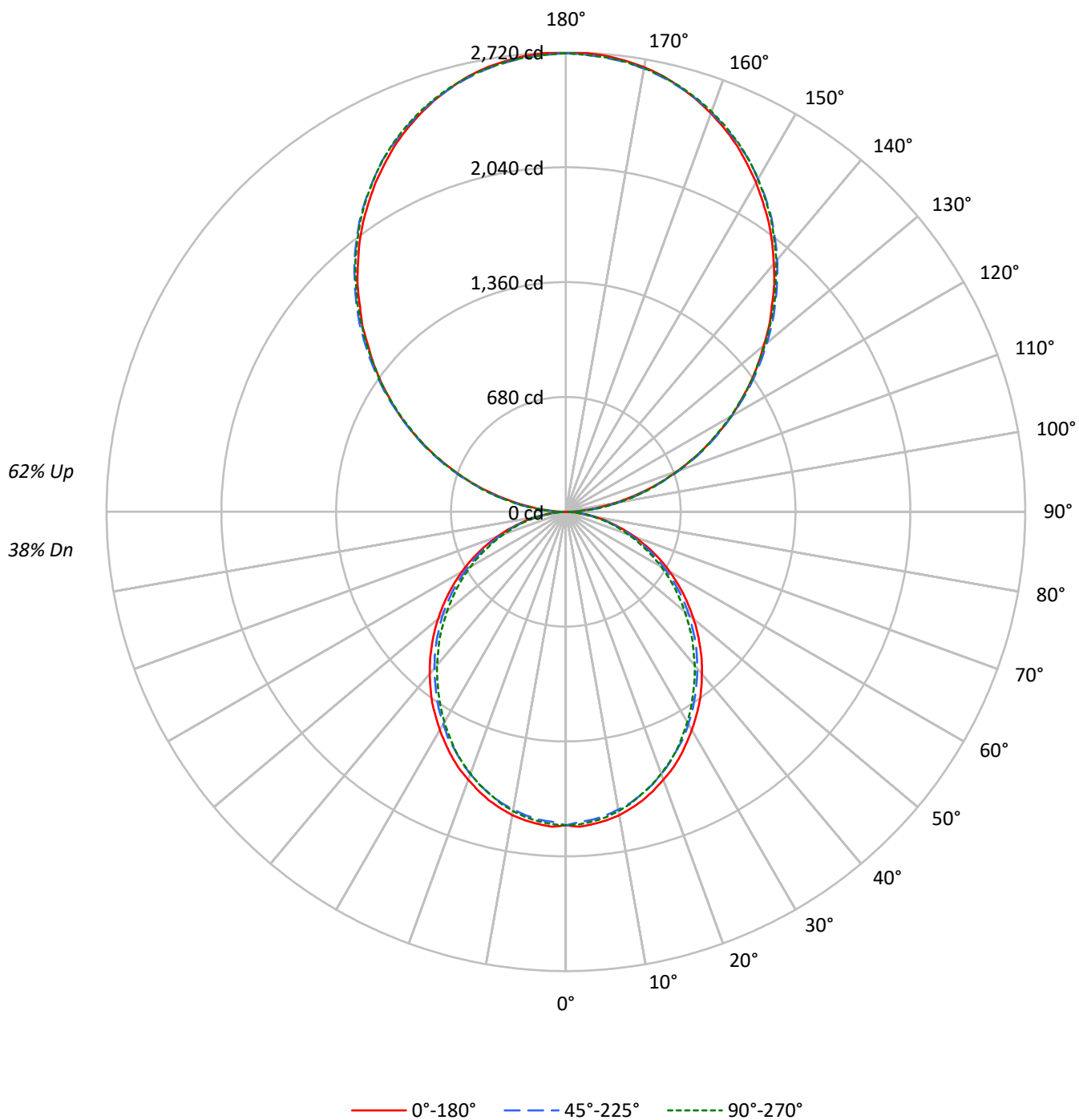
Lumens per Lamp: N/A  
Luminaire Lumens: 12320.9 lumens  
Efficiency: N/A  
Efficacy: 112.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 109.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.996  
Total Harmonic Distortion (THDi): 0.064  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P926422

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### Luminous Intensity Polar Plot



TEST NUMBER: P926422

CATALOG NUMBER: DFN2DIP-TR4F0-050D090US950-FLLFLL

**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   | 104 | 104 | 104 | 104 | 95 | 95 | 95 | 95 | 77 | 77 | 77 | 61 | 61 | 61 | 45 | 45 | 45 |
| 1   | 95  | 91  | 87  | 84  | 86 | 83 | 79 | 77 | 67 | 65 | 63 | 53 | 52 | 50 | 40 | 39 | 38 |
| 2   | 87  | 79  | 73  | 68  | 78 | 72 | 67 | 63 | 59 | 55 | 52 | 47 | 44 | 42 | 35 | 34 | 32 |
| 3   | 79  | 70  | 63  | 57  | 71 | 64 | 57 | 52 | 52 | 47 | 44 | 41 | 38 | 35 | 31 | 29 | 27 |
| 4   | 72  | 62  | 54  | 48  | 65 | 56 | 50 | 44 | 46 | 41 | 37 | 37 | 33 | 30 | 28 | 26 | 24 |
| 5   | 66  | 55  | 47  | 41  | 60 | 50 | 43 | 38 | 41 | 36 | 32 | 33 | 29 | 26 | 25 | 23 | 21 |
| 6   | 61  | 49  | 41  | 35  | 55 | 45 | 38 | 33 | 37 | 32 | 28 | 30 | 26 | 23 | 23 | 20 | 18 |
| 7   | 56  | 44  | 36  | 31  | 51 | 41 | 34 | 29 | 34 | 28 | 25 | 27 | 23 | 20 | 21 | 18 | 16 |
| 8   | 52  | 40  | 33  | 27  | 47 | 37 | 30 | 25 | 31 | 25 | 22 | 25 | 21 | 18 | 19 | 16 | 14 |
| 9   | 49  | 37  | 29  | 24  | 44 | 34 | 27 | 23 | 28 | 23 | 19 | 23 | 19 | 16 | 18 | 15 | 13 |
| 10  | 45  | 33  | 26  | 22  | 41 | 31 | 24 | 20 | 26 | 21 | 17 | 21 | 17 | 15 | 16 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1474 | 1474 | 1474 |
| 5°  | 1477 | 1454 | 1464 |
| 10° | 1465 | 1434 | 1444 |
| 15° | 1443 | 1411 | 1413 |
| 20° | 1414 | 1378 | 1381 |
| 25° | 1385 | 1339 | 1344 |
| 30° | 1349 | 1302 | 1298 |
| 35° | 1315 | 1259 | 1248 |
| 40° | 1272 | 1216 | 1201 |
| 45° | 1230 | 1172 | 1153 |
| 50° | 1184 | 1126 | 1098 |
| 55° | 1136 | 1073 | 1047 |
| 60° | 1081 | 1010 | 988  |
| 65° | 1022 | 945  | 919  |
| 70° | 946  | 866  | 845  |
| 75° | 841  | 771  | 776  |
| 80° | 715  | 650  | 645  |
| 85° | 517  | 440  | 427  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2117 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 174.7   | 1.4       |
| 10°-20°   | 491.5   | 4.0       |
| 20°-30°   | 722.3   | 5.9       |
| 30°-40°   | 838.9   | 6.8       |
| 40°-50°   | 837.9   | 6.8       |
| 50°-60°   | 730.6   | 5.9       |
| 60°-70°   | 540.1   | 4.4       |
| 70°-80°   | 305.6   | 2.5       |
| 80°-90°   | 88.4    | 0.7       |
| 90°-100°  | 168.0   | 1.4       |
| 100°-110° | 533.9   | 4.3       |
| 110°-120° | 913.7   | 7.4       |
| 120°-130° | 1201.6  | 9.8       |
| 130°-140° | 1348.7  | 10.9      |
| 140°-150° | 1322.6  | 10.7      |
| 150°-160° | 1109.5  | 9.0       |
| 160°-170° | 735.8   | 6.0       |
| 170°-180° | 257.2   | 2.1       |
| 0°-30°    | 1388.5  | 11.3      |
| 0°-40°    | 2227.5  | 18.1      |
| 0°-60°    | 3796.0  | 30.8      |
| 0°-90°    | 4730.0  | 38.4      |
| 90°-120°  | 1615.6  | 13.1      |
| 90°-150°  | 5488.5  | 44.5      |
| 90°-180°  | 7591.0  | 61.6      |
| 0°-180°   | 12320.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1856 | 1856  | 1856 | 1856  | 1856 |      |
| 5°   | 1856 | 1849  | 1829 | 1844  | 1840 | 176  |
| 15°  | 1767 | 1756  | 1733 | 1740  | 1731 | 498  |
| 25°  | 1599 | 1585  | 1554 | 1558  | 1554 | 736  |
| 35°  | 1380 | 1362  | 1333 | 1322  | 1314 | 862  |
| 45°  | 1123 | 1110  | 1083 | 1064  | 1057 | 866  |
| 55°  | 850  | 839   | 817  | 796   | 787  | 760  |
| 65°  | 573  | 562   | 544  | 528   | 519  | 567  |
| 75°  | 300  | 296   | 287  | 277   | 280  | 320  |
| 85°  | 73   | 71    | 70   | 64    | 62   | 82   |
| 90°  | 2    | 30    | 80   | 75    | 78   | 12   |
| 95°  | 120  | 142   | 146  | 146   | 142  | 133  |
| 105° | 493  | 499   | 504  | 508   | 508  | 520  |
| 115° | 917  | 930   | 926  | 924   | 917  | 907  |
| 125° | 1334 | 1354  | 1348 | 1340  | 1338 | 1192 |
| 135° | 1725 | 1750  | 1755 | 1753  | 1746 | 1333 |
| 145° | 2094 | 2110  | 2124 | 2126  | 2117 | 1308 |
| 155° | 2394 | 2401  | 2408 | 2420  | 2413 | 1102 |
| 165° | 2605 | 2602  | 2602 | 2619  | 2607 | 735  |
| 175° | 2710 | 2704  | 2699 | 2716  | 2702 | 258  |
| 180° | 2716 | 2716  | 2716 | 2716  | 2716 |      |

TEST NUMBER: P926422

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1856.0 | 1856.0 | 1856.0 | 1856.0 | 1856.0 |
| 2.5°   | 1866.8 | 1857.9 | 1838.3 | 1856.0 | 1852.7 |
| 5°     | 1856.0 | 1849.0 | 1829.3 | 1843.5 | 1840.2 |
| 7.5°   | 1843.5 | 1832.9 | 1813.3 | 1827.7 | 1824.0 |
| 10°    | 1824.0 | 1811.6 | 1790.2 | 1804.3 | 1799.1 |
| 12.5°  | 1797.1 | 1786.6 | 1765.2 | 1774.1 | 1770.4 |
| 15°    | 1766.8 | 1756.2 | 1732.9 | 1740.2 | 1731.2 |
| 17.5°  | 1729.3 | 1718.7 | 1695.4 | 1704.3 | 1695.4 |
| 20°    | 1688.3 | 1677.7 | 1652.7 | 1658.0 | 1651.0 |
| 22.5°  | 1647.4 | 1631.2 | 1608.0 | 1608.0 | 1604.3 |
| 25°    | 1599.1 | 1584.9 | 1554.5 | 1558.0 | 1554.5 |
| 27.5°  | 1545.5 | 1533.0 | 1509.9 | 1504.6 | 1495.7 |
| 30°    | 1492.1 | 1477.7 | 1451.0 | 1445.7 | 1438.5 |
| 32.5°  | 1434.9 | 1424.3 | 1395.7 | 1384.9 | 1377.8 |
| 35°    | 1379.6 | 1361.8 | 1333.2 | 1322.4 | 1313.6 |
| 37.5°  | 1317.1 | 1301.1 | 1272.4 | 1259.9 | 1251.1 |
| 40°    | 1253.0 | 1238.6 | 1210.0 | 1194.0 | 1186.9 |
| 42.5°  | 1190.5 | 1176.1 | 1147.7 | 1129.6 | 1119.0 |
| 45°    | 1122.7 | 1110.2 | 1083.3 | 1063.8 | 1056.6 |
| 47.5°  | 1056.6 | 1044.1 | 1015.5 | 995.8  | 985.2  |
| 50°    | 986.9  | 978.0  | 953.0  | 928.1  | 919.1  |
| 52.5°  | 919.1  | 906.6  | 883.5  | 863.8  | 851.3  |
| 55°    | 849.6  | 838.9  | 817.4  | 796.0  | 787.1  |
| 57.5°  | 779.9  | 771.0  | 747.7  | 726.4  | 719.1  |
| 60°    | 710.3  | 703.3  | 678.3  | 658.5  | 653.3  |
| 62.5°  | 642.5  | 630.0  | 612.2  | 594.3  | 587.2  |
| 65°    | 573.0  | 562.2  | 544.4  | 528.3  | 519.4  |
| 67.5°  | 501.6  | 492.6  | 476.6  | 464.1  | 456.9  |
| 70°    | 435.5  | 428.3  | 412.2  | 399.7  | 392.8  |
| 72.5°  | 367.8  | 360.5  | 351.6  | 339.1  | 333.8  |
| 75°    | 299.7  | 296.3  | 287.2  | 276.7  | 280.3  |
| 77.5°  | 239.2  | 231.9  | 228.4  | 223.0  | 217.8  |
| 80°    | 178.6  | 176.7  | 173.1  | 167.8  | 164.2  |
| 82.5°  | 121.3  | 121.3  | 119.6  | 112.5  | 112.5  |
| 85°    | 73.1   | 71.4   | 69.6   | 64.2   | 62.5   |
| 87.5°  | 32.1   | 28.6   | 25.0   | 19.7   | 17.8   |
| 90°    | 2.5    | 29.5   | 80.2   | 75.3   | 77.8   |
| 92.5°  | 50.8   | 68.8   | 71.3   | 73.6   | 73.6   |
| 95°    | 119.5  | 142.4  | 146.5  | 146.5  | 142.4  |
| 97.5°  | 198.9  | 220.2  | 229.2  | 229.2  | 229.2  |
| 100°   | 290.6  | 309.5  | 316.0  | 316.0  | 313.6  |
| 102.5° | 387.2  | 401.2  | 410.1  | 412.6  | 410.1  |
| 105°   | 492.8  | 499.3  | 504.3  | 508.4  | 508.4  |
| 107.5° | 597.6  | 607.4  | 607.4  | 609.0  | 597.6  |
| 110°   | 699.1  | 712.3  | 712.3  | 712.3  | 705.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 808.8  | 822.7  | 820.2  | 813.8  | 808.8  |
| 115°   | 916.9  | 930.0  | 925.9  | 923.5  | 916.9  |
| 117.5° | 1024.1 | 1042.1 | 1030.7 | 1024.1 | 1017.5 |
| 120°   | 1132.2 | 1150.1 | 1132.2 | 1132.2 | 1124.8 |
| 122.5° | 1230.4 | 1253.4 | 1241.9 | 1235.3 | 1230.4 |
| 125°   | 1333.6 | 1354.0 | 1347.5 | 1340.1 | 1337.7 |
| 127.5° | 1434.2 | 1459.6 | 1450.7 | 1440.8 | 1434.2 |
| 130°   | 1528.4 | 1557.9 | 1553.8 | 1548.8 | 1539.9 |
| 132.5° | 1634.0 | 1656.9 | 1658.5 | 1647.1 | 1640.6 |
| 135°   | 1724.8 | 1750.2 | 1755.2 | 1752.7 | 1746.2 |
| 137.5° | 1826.3 | 1846.8 | 1851.0 | 1849.3 | 1839.5 |
| 140°   | 1915.6 | 1936.0 | 1947.5 | 1947.5 | 1938.5 |
| 142.5° | 2007.3 | 2027.7 | 2034.3 | 2036.8 | 2027.7 |
| 145°   | 2094.1 | 2110.4 | 2123.5 | 2126.0 | 2117.0 |
| 147.5° | 2171.9 | 2192.3 | 2202.1 | 2206.2 | 2197.3 |
| 150°   | 2252.1 | 2266.0 | 2275.0 | 2282.3 | 2275.0 |
| 152.5° | 2323.3 | 2337.2 | 2348.7 | 2357.7 | 2348.7 |
| 155°   | 2394.5 | 2401.0 | 2408.5 | 2419.9 | 2412.6 |
| 157.5° | 2455.9 | 2460.8 | 2464.9 | 2481.3 | 2469.8 |
| 160°   | 2510.7 | 2515.7 | 2518.2 | 2532.0 | 2522.2 |
| 162.5° | 2561.5 | 2561.5 | 2564.0 | 2579.5 | 2568.1 |
| 165°   | 2604.9 | 2602.4 | 2602.4 | 2618.8 | 2607.4 |
| 167.5° | 2644.2 | 2636.9 | 2636.9 | 2653.2 | 2641.7 |
| 170°   | 2673.7 | 2667.1 | 2664.7 | 2681.0 | 2667.1 |
| 172.5° | 2694.1 | 2687.6 | 2685.1 | 2701.5 | 2687.6 |
| 175°   | 2710.5 | 2703.9 | 2699.1 | 2715.5 | 2701.5 |
| 177.5° | 2719.5 | 2713.0 | 2708.0 | 2722.0 | 2708.0 |
| 180°   | 2715.5 | 2715.5 | 2715.5 | 2715.5 | 2715.5 |

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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 | 7.43             | 8.20  | 8.48  | 9.26  | 10.68 | 7.00           | 7.77  | 8.05  | 8.82  | 10.25 |
|                 | 3H   | 9.09             | 9.77  | 10.15 | 10.84 | 12.28 | 8.62           | 9.30  | 9.68  | 10.37 | 11.81 |
|                 | 4H   | 9.67             | 10.32 | 10.74 | 11.39 | 12.84 | 9.20           | 9.85  | 10.27 | 10.91 | 12.37 |
|                 | 6H   | 10.06            | 10.66 | 11.15 | 11.73 | 13.20 | 9.59           | 10.19 | 10.67 | 11.26 | 12.72 |
|                 | 8H   | 10.17            | 10.74 | 11.25 | 11.82 | 13.28 | 9.69           | 10.26 | 10.78 | 11.35 | 12.81 |
|                 | 12H  | 10.21            | 10.75 | 11.30 | 11.83 | 13.32 | 9.73           | 10.27 | 10.82 | 11.35 | 12.84 |
| 4H              | 2H   | 7.88             | 8.54  | 8.96  | 9.60  | 11.05 | 7.54           | 8.19  | 8.62  | 9.26  | 10.71 |
|                 | 3H   | 9.74             | 10.28 | 10.83 | 11.38 | 12.84 | 9.35           | 9.89  | 10.43 | 10.99 | 12.45 |
|                 | 4H   | 10.45            | 10.95 | 11.54 | 12.03 | 13.52 | 10.05          | 10.55 | 11.14 | 11.63 | 13.12 |
|                 | 6H   | 10.96            | 11.39 | 12.06 | 12.50 | 13.98 | 10.55          | 10.98 | 11.65 | 12.09 | 13.57 |
|                 | 8H   | 11.11            | 11.51 | 12.21 | 12.61 | 14.10 | 10.70          | 11.10 | 11.80 | 12.20 | 13.69 |
|                 | 12H  | 11.18            | 11.54 | 12.29 | 12.65 | 14.15 | 10.76          | 11.12 | 11.87 | 12.23 | 13.73 |
| 8H              | 4H   | 10.64            | 11.04 | 11.74 | 12.14 | 13.64 | 10.28          | 10.68 | 11.38 | 11.78 | 13.28 |
|                 | 6H   | 11.27            | 11.60 | 12.39 | 12.74 | 14.23 | 10.91          | 11.24 | 12.03 | 12.38 | 13.87 |
|                 | 8H   | 11.49            | 11.78 | 12.62 | 12.90 | 14.41 | 11.12          | 11.41 | 12.25 | 12.53 | 14.04 |
|                 | 12H  | 11.61            | 11.87 | 12.75 | 12.99 | 14.54 | 11.23          | 11.49 | 12.36 | 12.60 | 14.15 |
| 12H             | 4H   | 10.62            | 10.98 | 11.74 | 12.10 | 13.60 | 10.27          | 10.63 | 11.39 | 11.74 | 13.25 |
|                 | 6H   | 11.30            | 11.59 | 12.42 | 12.71 | 14.22 | 10.95          | 11.24 | 12.07 | 12.36 | 13.87 |
|                 | 8H   | 11.53            | 11.79 | 12.67 | 12.91 | 14.46 | 11.18          | 11.43 | 12.31 | 12.55 | 14.10 |