

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: P926231

Luminaire Tested: DFN2DIP-TR3F0-040D080US950-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P926231  
REPORT IS A COMBINATION OF REPORTS P901863 AND P898751  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR3F0-040D080US950-FLLONL  
Description: 3 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

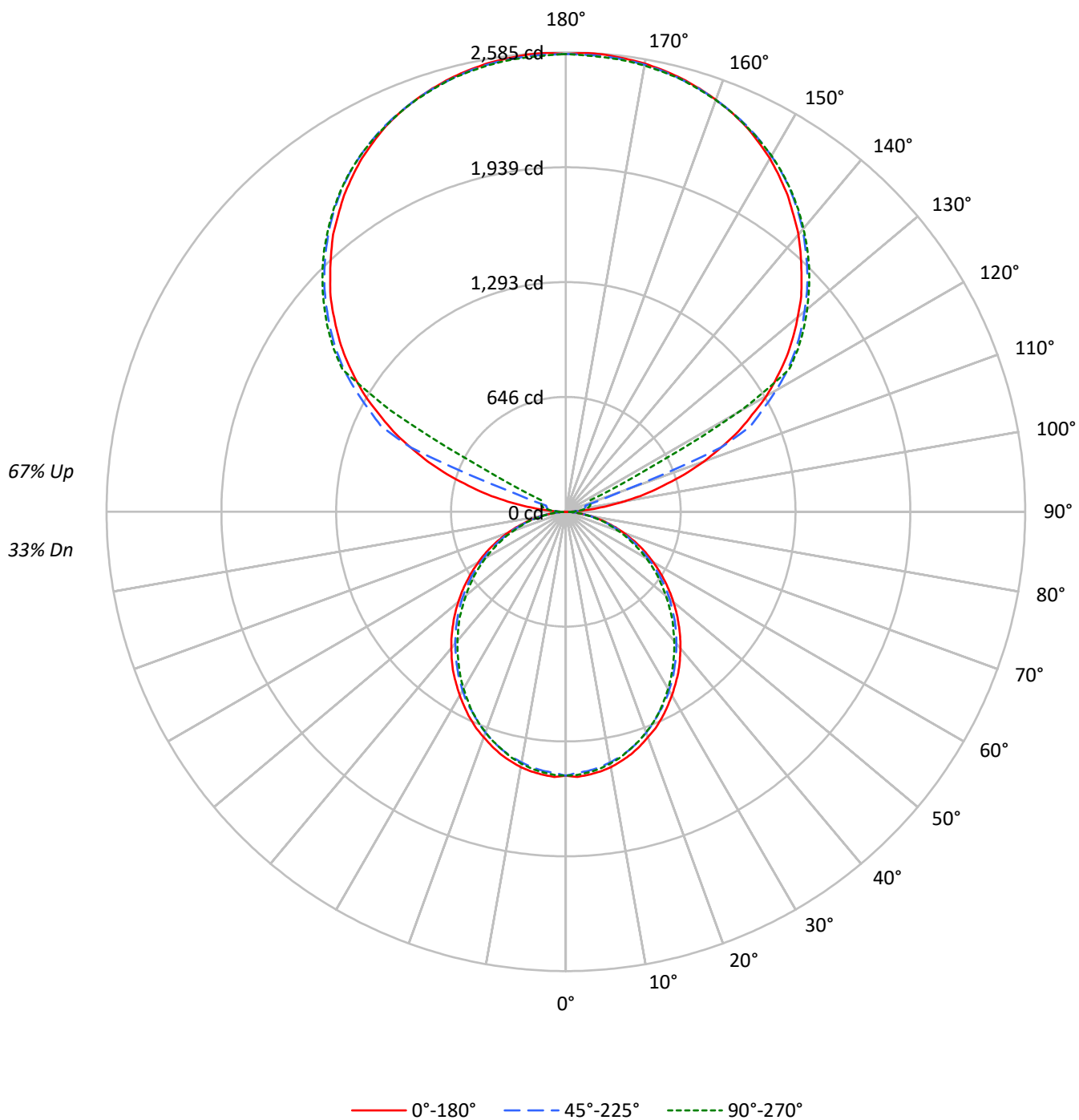
Lumens per Lamp: N/A  
Luminaire Lumens: 11333.5 lumens  
Efficiency: N/A  
Efficacy: 117.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.74' x L: 3.16' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 96.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
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   | 103 | 103 | 103 | 103 | 93 | 93 | 93 | 93 | 74 | 74 | 74 | 57 | 57 | 57 | 41 | 41 | 41 |
| 1   | 94  | 90  | 86  | 83  | 85 | 81 | 78 | 75 | 65 | 63 | 61 | 50 | 48 | 47 | 36 | 35 | 34 |
| 2   | 86  | 78  | 72  | 67  | 77 | 71 | 66 | 62 | 57 | 53 | 50 | 44 | 41 | 39 | 32 | 30 | 29 |
| 3   | 78  | 69  | 62  | 56  | 70 | 62 | 56 | 51 | 50 | 46 | 42 | 39 | 36 | 33 | 28 | 26 | 25 |
| 4   | 71  | 61  | 53  | 47  | 64 | 55 | 49 | 43 | 44 | 40 | 36 | 34 | 31 | 28 | 25 | 23 | 21 |
| 5   | 65  | 54  | 46  | 40  | 59 | 49 | 42 | 37 | 40 | 35 | 31 | 31 | 27 | 25 | 23 | 20 | 18 |
| 6   | 60  | 48  | 41  | 35  | 54 | 44 | 37 | 32 | 36 | 31 | 27 | 28 | 24 | 21 | 20 | 18 | 16 |
| 7   | 56  | 44  | 36  | 30  | 50 | 40 | 33 | 28 | 32 | 27 | 23 | 25 | 22 | 19 | 19 | 16 | 14 |
| 8   | 51  | 39  | 32  | 27  | 46 | 36 | 29 | 25 | 29 | 24 | 21 | 23 | 19 | 17 | 17 | 15 | 13 |
| 9   | 48  | 36  | 29  | 24  | 43 | 33 | 26 | 22 | 27 | 22 | 19 | 21 | 18 | 15 | 16 | 13 | 12 |
| 10  | 45  | 33  | 26  | 21  | 40 | 30 | 24 | 20 | 25 | 20 | 17 | 19 | 16 | 14 | 15 | 12 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1850 | 1850 | 1850 |
| 5°  | 1852 | 1823 | 1836 |
| 10° | 1836 | 1797 | 1809 |
| 15° | 1808 | 1766 | 1769 |
| 20° | 1771 | 1723 | 1728 |
| 25° | 1733 | 1672 | 1681 |
| 30° | 1687 | 1625 | 1622 |
| 35° | 1643 | 1570 | 1559 |
| 40° | 1588 | 1513 | 1499 |
| 45° | 1534 | 1457 | 1437 |
| 50° | 1475 | 1398 | 1366 |
| 55° | 1413 | 1329 | 1300 |
| 60° | 1342 | 1248 | 1225 |
| 65° | 1266 | 1164 | 1136 |
| 70° | 1168 | 1061 | 1040 |
| 75° | 1033 | 938  | 950  |
| 80° | 869  | 780  | 781  |
| 85° | 614  | 513  | 504  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1714 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 139.8   | 1.2       |
| 10°-20°   | 393.2   | 3.5       |
| 20°-30°   | 577.9   | 5.1       |
| 30°-40°   | 671.2   | 5.9       |
| 40°-50°   | 670.3   | 5.9       |
| 50°-60°   | 584.5   | 5.2       |
| 60°-70°   | 432.1   | 3.8       |
| 70°-80°   | 244.5   | 2.2       |
| 80°-90°   | 69.0    | 0.6       |
| 90°-100°  | 84.9    | 0.7       |
| 100°-110° | 316.6   | 2.8       |
| 110°-120° | 839.7   | 7.4       |
| 120°-130° | 1392.7  | 12.3      |
| 130°-140° | 1479.4  | 13.1      |
| 140°-150° | 1374.9  | 12.1      |
| 150°-160° | 1105.4  | 9.8       |
| 160°-170° | 712.3   | 6.3       |
| 170°-180° | 245.2   | 2.2       |
| 0°-30°    | 1110.8  | 9.8       |
| 0°-40°    | 1782.0  | 15.7      |
| 0°-60°    | 3036.8  | 26.8      |
| 0°-90°    | 3782.4  | 33.4      |
| 90°-120°  | 1241.3  | 11.0      |
| 90°-150°  | 5488.3  | 48.4      |
| 90°-180°  | 7551.0  | 66.6      |
| 0°-180°   | 11333.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1485 | 1485  | 1485 | 1485  | 1485 |      |
| 5°   | 1485 | 1479  | 1463 | 1475  | 1472 | 141  |
| 15°  | 1413 | 1405  | 1386 | 1392  | 1385 | 398  |
| 25°  | 1279 | 1268  | 1244 | 1246  | 1244 | 589  |
| 35°  | 1104 | 1090  | 1067 | 1058  | 1051 | 689  |
| 45°  | 898  | 888   | 867  | 851   | 845  | 693  |
| 55°  | 680  | 671   | 654  | 637   | 630  | 608  |
| 65°  | 458  | 450   | 436  | 423   | 416  | 453  |
| 75°  | 240  | 237   | 230  | 221   | 224  | 256  |
| 85°  | 58   | 57    | 56   | 51    | 50   | 65   |
| 90°  | 2    | 22    | 37   | 47    | 50   | 10   |
| 95°  | 121  | 60    | 73   | 82    | 80   | 143  |
| 105° | 567  | 623   | 114  | 134   | 142  | 605  |
| 115° | 1072 | 1103  | 1150 | 287   | 153  | 1055 |
| 125° | 1515 | 1540  | 1575 | 1588  | 1594 | 1351 |
| 135° | 1875 | 1905  | 1922 | 1940  | 1936 | 1448 |
| 145° | 2175 | 2173  | 2205 | 2218  | 2208 | 1360 |
| 155° | 2395 | 2378  | 2401 | 2412  | 2397 | 1104 |
| 165° | 2524 | 2512  | 2518 | 2531  | 2518 | 713  |
| 175° | 2581 | 2568  | 2572 | 2585  | 2566 | 246  |
| 180° | 2576 | 2576  | 2576 | 2576  | 2576 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1484.8 | 1484.8 | 1484.8 | 1484.8 | 1484.8 |
| 2.5°   | 1493.5 | 1486.3 | 1470.6 | 1484.8 | 1482.1 |
| 5°     | 1484.8 | 1479.2 | 1463.4 | 1474.8 | 1472.1 |
| 7.5°   | 1474.8 | 1466.3 | 1450.6 | 1462.1 | 1459.2 |
| 10°    | 1459.2 | 1449.2 | 1432.1 | 1443.5 | 1439.2 |
| 12.5°  | 1437.7 | 1429.2 | 1412.1 | 1419.3 | 1416.3 |
| 15°    | 1413.4 | 1405.0 | 1386.4 | 1392.1 | 1385.0 |
| 17.5°  | 1383.5 | 1375.0 | 1356.4 | 1363.5 | 1356.4 |
| 20°    | 1350.6 | 1342.1 | 1322.1 | 1326.3 | 1320.8 |
| 22.5°  | 1317.9 | 1305.0 | 1286.4 | 1286.4 | 1283.5 |
| 25°    | 1279.2 | 1267.9 | 1243.6 | 1246.4 | 1243.6 |
| 27.5°  | 1236.4 | 1226.4 | 1208.0 | 1203.7 | 1196.6 |
| 30°    | 1193.6 | 1182.2 | 1160.8 | 1156.5 | 1150.8 |
| 32.5°  | 1147.9 | 1139.5 | 1116.6 | 1108.0 | 1102.2 |
| 35°    | 1103.7 | 1089.5 | 1066.6 | 1058.0 | 1050.8 |
| 37.5°  | 1053.7 | 1040.8 | 1017.9 | 1008.0 | 1000.8 |
| 40°    | 1002.4 | 990.8  | 967.9  | 955.2  | 949.5  |
| 42.5°  | 952.4  | 940.8  | 918.1  | 903.7  | 895.2  |
| 45°    | 898.1  | 888.2  | 866.6  | 851.1  | 845.2  |
| 47.5°  | 845.2  | 835.2  | 812.4  | 796.7  | 788.2  |
| 50°    | 789.5  | 782.4  | 762.4  | 742.4  | 735.2  |
| 52.5°  | 735.2  | 725.3  | 706.8  | 691.1  | 681.1  |
| 55°    | 679.7  | 671.0  | 654.0  | 636.8  | 629.7  |
| 57.5°  | 623.9  | 616.9  | 598.2  | 581.1  | 575.4  |
| 60°    | 568.2  | 562.6  | 542.6  | 526.9  | 522.6  |
| 62.5°  | 514.0  | 504.0  | 489.8  | 475.5  | 469.7  |
| 65°    | 458.4  | 449.7  | 435.5  | 422.6  | 415.6  |
| 67.5°  | 401.3  | 394.0  | 381.3  | 371.3  | 365.6  |
| 70°    | 348.4  | 342.7  | 329.8  | 319.8  | 314.2  |
| 72.5°  | 294.2  | 288.4  | 281.3  | 271.3  | 267.0  |
| 75°    | 239.8  | 237.1  | 229.8  | 221.3  | 224.2  |
| 77.5°  | 191.3  | 185.6  | 182.7  | 178.4  | 174.2  |
| 80°    | 142.8  | 141.3  | 138.4  | 134.2  | 131.4  |
| 82.5°  | 97.1   | 97.1   | 95.8   | 90.0   | 90.0   |
| 85°    | 58.5   | 57.1   | 55.7   | 51.3   | 50.0   |
| 87.5°  | 25.8   | 22.9   | 20.0   | 15.7   | 14.2   |
| 90°    | 1.8    | 22.3   | 37.2   | 46.7   | 50.3   |
| 92.5°  | 46.7   | 39.2   | 44.7   | 48.5   | 50.3   |
| 95°    | 121.1  | 59.5   | 72.6   | 82.1   | 80.1   |
| 97.5°  | 218.0  | 65.3   | 94.9   | 100.7  | 102.5  |
| 100°   | 330.0  | 74.6   | 106.3  | 121.1  | 124.8  |
| 102.5° | 452.9  | 449.2  | 110.0  | 130.3  | 136.1  |
| 105°   | 566.6  | 622.6  | 113.7  | 134.1  | 141.7  |
| 107.5° | 698.9  | 745.4  | 117.5  | 137.9  | 145.4  |
| 110°   | 825.8  | 864.7  | 326.3  | 139.9  | 147.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 945.0  | 978.4  | 946.8  | 143.4  | 149.2  |
| 115°   | 1071.6 | 1103.3 | 1150.0 | 287.1  | 152.9  |
| 117.5° | 1181.6 | 1218.8 | 1250.7 | 984.0  | 495.8  |
| 120°   | 1304.7 | 1332.5 | 1366.2 | 1388.5 | 1136.9 |
| 122.5° | 1408.9 | 1438.8 | 1476.2 | 1487.3 | 1489.3 |
| 125°   | 1515.1 | 1539.5 | 1574.9 | 1587.9 | 1593.5 |
| 127.5° | 1612.1 | 1638.2 | 1666.4 | 1684.9 | 1686.7 |
| 130°   | 1703.5 | 1733.3 | 1753.7 | 1774.3 | 1772.5 |
| 132.5° | 1796.7 | 1821.0 | 1841.4 | 1858.2 | 1856.4 |
| 135°   | 1875.0 | 1904.9 | 1921.5 | 1940.3 | 1936.5 |
| 137.5° | 1956.9 | 1979.3 | 1998.1 | 2016.7 | 2011.1 |
| 140°   | 2037.0 | 2052.1 | 2072.5 | 2089.3 | 2079.9 |
| 142.5° | 2104.3 | 2117.3 | 2141.4 | 2156.3 | 2147.0 |
| 145°   | 2175.1 | 2173.1 | 2204.8 | 2217.9 | 2208.5 |
| 147.5° | 2236.5 | 2230.9 | 2262.5 | 2271.9 | 2264.5 |
| 150°   | 2296.2 | 2283.1 | 2313.0 | 2324.0 | 2314.8 |
| 152.5° | 2346.5 | 2331.6 | 2359.4 | 2370.8 | 2357.7 |
| 155°   | 2394.9 | 2378.3 | 2400.6 | 2411.7 | 2396.9 |
| 157.5° | 2434.0 | 2419.2 | 2436.0 | 2449.1 | 2434.0 |
| 160°   | 2467.7 | 2456.5 | 2467.7 | 2478.8 | 2465.7 |
| 162.5° | 2497.4 | 2486.3 | 2495.6 | 2508.6 | 2491.8 |
| 165°   | 2523.5 | 2512.5 | 2518.0 | 2531.0 | 2518.0 |
| 167.5° | 2544.0 | 2532.8 | 2538.5 | 2551.6 | 2534.8 |
| 170°   | 2560.9 | 2549.6 | 2553.4 | 2566.5 | 2549.6 |
| 172.5° | 2572.0 | 2560.9 | 2564.6 | 2577.7 | 2560.9 |
| 175°   | 2581.2 | 2568.2 | 2572.0 | 2585.0 | 2566.5 |
| 177.5° | 2585.0 | 2572.0 | 2573.9 | 2587.0 | 2570.2 |
| 180°   | 2575.7 | 2575.7 | 2575.7 | 2575.7 | 2575.7 |

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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 | 7.59             | 8.32  | 8.67  | 9.40  | 10.89 | 7.16           | 7.89  | 8.25  | 8.97  | 10.46 |
|                 | 3H   | 9.23             | 9.88  | 10.32 | 10.98 | 12.48 | 8.76           | 9.41  | 9.86  | 10.51 | 12.01 |
|                 | 4H   | 9.80             | 10.42 | 10.91 | 11.52 | 13.03 | 9.33           | 9.95  | 10.44 | 11.05 | 12.56 |
|                 | 6H   | 10.19            | 10.76 | 11.30 | 11.86 | 13.38 | 9.72           | 10.29 | 10.83 | 11.39 | 12.91 |
|                 | 8H   | 10.28            | 10.83 | 11.40 | 11.94 | 13.46 | 9.82           | 10.36 | 10.94 | 11.47 | 12.99 |
|                 | 12H  | 10.32            | 10.84 | 11.45 | 11.95 | 13.49 | 9.85           | 10.37 | 10.98 | 11.48 | 13.02 |
| 4H              | 2H   | 8.03             | 8.65  | 9.14  | 9.74  | 11.26 | 7.68           | 8.31  | 8.80  | 9.40  | 10.92 |
|                 | 3H   | 9.87             | 10.39 | 10.99 | 11.51 | 13.04 | 9.48           | 10.00 | 10.60 | 11.12 | 12.65 |
|                 | 4H   | 10.57            | 11.05 | 11.70 | 12.16 | 13.71 | 10.17          | 10.65 | 11.30 | 11.76 | 13.31 |
|                 | 6H   | 11.07            | 11.48 | 12.20 | 12.61 | 14.15 | 10.67          | 11.07 | 11.80 | 12.21 | 13.75 |
|                 | 8H   | 11.21            | 11.59 | 12.34 | 12.72 | 14.28 | 10.81          | 11.19 | 11.94 | 12.31 | 13.87 |
|                 | 12H  | 11.27            | 11.62 | 12.42 | 12.76 | 14.32 | 10.86          | 11.20 | 12.01 | 12.34 | 13.90 |
| 8H              | 4H   | 10.75            | 11.13 | 11.89 | 12.26 | 13.82 | 10.40          | 10.78 | 11.53 | 11.90 | 13.46 |
|                 | 6H   | 11.37            | 11.68 | 12.52 | 12.85 | 14.40 | 11.01          | 11.32 | 12.16 | 12.49 | 14.05 |
|                 | 8H   | 11.58            | 11.86 | 12.74 | 13.01 | 14.58 | 11.22          | 11.49 | 12.38 | 12.64 | 14.21 |
|                 | 12H  | 11.70            | 11.94 | 12.86 | 13.09 | 14.69 | 11.32          | 11.56 | 12.48 | 12.71 | 14.32 |
| 12H             | 4H   | 10.73            | 11.08 | 11.88 | 12.22 | 13.78 | 10.38          | 10.73 | 11.53 | 11.87 | 13.43 |
|                 | 6H   | 11.40            | 11.67 | 12.55 | 12.82 | 14.39 | 11.05          | 11.32 | 12.21 | 12.47 | 14.04 |
|                 | 8H   | 11.62            | 11.87 | 12.79 | 13.01 | 14.62 | 11.27          | 11.51 | 12.43 | 12.66 | 14.27 |