

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: P909748

Luminaire Tested: DFN2DIP-TR2F0-030D050US840-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P909748  
REPORT IS A COMBINATION OF REPORTS P900253 AND P897145  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR2F0-030D050US840-FLLFLL  
Description: 2 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

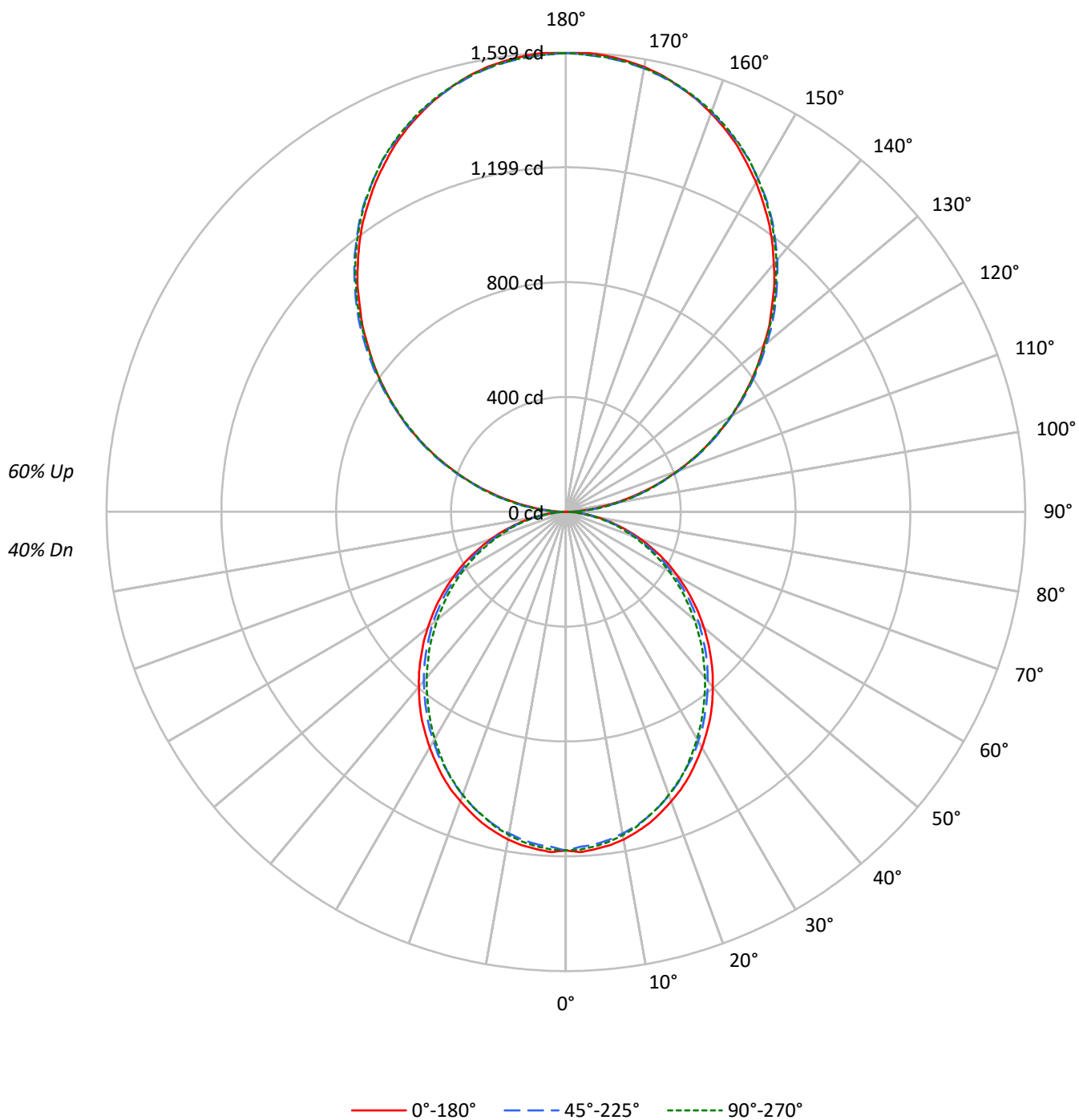
Lumens per Lamp: N/A  
Luminaire Lumens: 7468.0 lumens  
Efficiency: N/A  
Efficacy: 117.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.04' x L: 2.36' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 63.7  
Input Voltage (V): 120  
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   | 105 | 105 | 105 | 105 | 95 | 95 | 95 | 95 | 78 | 78 | 78 | 62 | 62 | 62 | 47 | 47 | 47 |
| 1   | 96  | 91  | 87  | 84  | 87 | 83 | 80 | 77 | 68 | 66 | 64 | 54 | 53 | 51 | 42 | 41 | 40 |
| 2   | 87  | 80  | 74  | 69  | 79 | 73 | 68 | 63 | 60 | 56 | 53 | 48 | 45 | 43 | 37 | 35 | 33 |
| 3   | 79  | 70  | 63  | 57  | 72 | 64 | 58 | 53 | 53 | 48 | 44 | 42 | 39 | 36 | 32 | 30 | 28 |
| 4   | 73  | 62  | 54  | 48  | 66 | 57 | 50 | 45 | 47 | 42 | 38 | 38 | 34 | 31 | 29 | 27 | 25 |
| 5   | 67  | 55  | 47  | 41  | 60 | 51 | 44 | 38 | 42 | 37 | 33 | 34 | 30 | 27 | 26 | 23 | 21 |
| 6   | 61  | 49  | 41  | 36  | 56 | 45 | 38 | 33 | 38 | 32 | 28 | 30 | 27 | 24 | 24 | 21 | 19 |
| 7   | 57  | 45  | 37  | 31  | 51 | 41 | 34 | 29 | 34 | 29 | 25 | 28 | 24 | 21 | 22 | 19 | 17 |
| 8   | 52  | 40  | 33  | 28  | 48 | 37 | 30 | 26 | 31 | 26 | 22 | 25 | 21 | 18 | 20 | 17 | 15 |
| 9   | 49  | 37  | 29  | 24  | 44 | 34 | 27 | 23 | 28 | 23 | 20 | 23 | 19 | 17 | 18 | 16 | 14 |
| 10  | 46  | 34  | 27  | 22  | 41 | 31 | 25 | 20 | 26 | 21 | 18 | 21 | 18 | 15 | 17 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2629 | 2629 | 2629 |
| 5°  | 2630 | 2587 | 2606 |
| 10° | 2604 | 2546 | 2566 |
| 15° | 2562 | 2498 | 2506 |
| 20° | 2507 | 2434 | 2445 |
| 25° | 2451 | 2359 | 2376 |
| 30° | 2383 | 2288 | 2288 |
| 35° | 2317 | 2206 | 2196 |
| 40° | 2238 | 2123 | 2109 |
| 45° | 2158 | 2039 | 2018 |
| 50° | 2070 | 1950 | 1914 |
| 55° | 1979 | 1849 | 1817 |
| 60° | 1875 | 1729 | 1707 |
| 65° | 1761 | 1603 | 1576 |
| 70° | 1616 | 1451 | 1434 |
| 75° | 1417 | 1267 | 1297 |
| 80° | 1174 | 1033 | 1049 |
| 85° | 802  | 651  | 652  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2158 cd/sqm

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CATALOG NUMBER: DFN2DIP-TR2F0-030D050US840-FLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 111.0  | 1.5       |
| 10°-20°   | 312.2  | 4.2       |
| 20°-30°   | 458.8  | 6.1       |
| 30°-40°   | 532.8  | 7.1       |
| 40°-50°   | 532.2  | 7.1       |
| 50°-60°   | 464.1  | 6.2       |
| 60°-70°   | 343.1  | 4.6       |
| 70°-80°   | 194.1  | 2.6       |
| 80°-90°   | 55.8   | 0.7       |
| 90°-100°  | 98.8   | 1.3       |
| 100°-110° | 314.0  | 4.2       |
| 110°-120° | 537.3  | 7.2       |
| 120°-130° | 706.6  | 9.5       |
| 130°-140° | 793.2  | 10.6      |
| 140°-150° | 777.8  | 10.4      |
| 150°-160° | 652.5  | 8.7       |
| 160°-170° | 432.7  | 5.8       |
| 170°-180° | 151.2  | 2.0       |
| 0°-30°    | 881.9  | 11.8      |
| 0°-40°    | 1414.7 | 18.9      |
| 0°-60°    | 2411.0 | 32.3      |
| 0°-90°    | 3003.9 | 40.2      |
| 90°-120°  | 950.1  | 12.7      |
| 90°-150°  | 3227.7 | 43.2      |
| 90°-180°  | 4464.0 | 59.8      |
| 0°-180°   | 7468.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1179 | 1179  | 1179 | 1179  | 1179 |      |
| 5°   | 1179 | 1174  | 1162 | 1171  | 1169 | 112  |
| 15°  | 1122 | 1116  | 1101 | 1105  | 1100 | 316  |
| 25°  | 1016 | 1007  | 987  | 990   | 987  | 467  |
| 35°  | 876  | 865   | 847  | 840   | 834  | 547  |
| 45°  | 713  | 705   | 688  | 676   | 671  | 550  |
| 55°  | 540  | 533   | 519  | 506   | 500  | 482  |
| 65°  | 364  | 357   | 346  | 336   | 330  | 360  |
| 75°  | 190  | 188   | 182  | 176   | 178  | 203  |
| 85°  | 46   | 45    | 44   | 41    | 40   | 52   |
| 90°  | 1    | 17    | 47   | 44    | 46   | 7    |
| 95°  | 70   | 84    | 86   | 86    | 84   | 78   |
| 105° | 290  | 294   | 297  | 299   | 299  | 306  |
| 115° | 539  | 547   | 544  | 543   | 539  | 533  |
| 125° | 784  | 796   | 792  | 788   | 787  | 701  |
| 135° | 1014 | 1029  | 1032 | 1031  | 1027 | 784  |
| 145° | 1232 | 1241  | 1249 | 1250  | 1245 | 769  |
| 155° | 1408 | 1412  | 1416 | 1423  | 1419 | 648  |
| 165° | 1532 | 1530  | 1530 | 1540  | 1533 | 432  |
| 175° | 1594 | 1590  | 1587 | 1597  | 1589 | 151  |
| 180° | 1597 | 1597  | 1597 | 1597  | 1597 |      |

TEST NUMBER: P909748

CATALOG NUMBER: DFN2DIP-TR2F0-030D050US840-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1178.8 | 1178.8 | 1178.8 | 1178.8 | 1178.8 |
| 2.5°   | 1185.7 | 1180.0 | 1167.5 | 1178.8 | 1176.7 |
| 5°     | 1178.8 | 1174.4 | 1161.9 | 1170.9 | 1168.7 |
| 7.5°   | 1170.9 | 1164.2 | 1151.7 | 1160.8 | 1158.5 |
| 10°    | 1158.5 | 1150.5 | 1137.0 | 1146.0 | 1142.7 |
| 12.5°  | 1141.5 | 1134.7 | 1121.2 | 1126.7 | 1124.5 |
| 15°    | 1122.2 | 1115.5 | 1100.7 | 1105.2 | 1099.5 |
| 17.5°  | 1098.3 | 1091.7 | 1076.8 | 1082.5 | 1076.8 |
| 20°    | 1072.3 | 1065.5 | 1049.7 | 1053.0 | 1048.5 |
| 22.5°  | 1046.3 | 1036.1 | 1021.3 | 1021.3 | 1019.0 |
| 25°    | 1015.6 | 1006.6 | 987.3  | 989.6  | 987.3  |
| 27.5°  | 981.6  | 973.6  | 959.0  | 955.6  | 950.0  |
| 30°    | 947.7  | 938.6  | 921.6  | 918.2  | 913.6  |
| 32.5°  | 911.4  | 904.6  | 886.5  | 879.6  | 875.0  |
| 35°    | 876.3  | 864.9  | 846.8  | 839.9  | 834.2  |
| 37.5°  | 836.6  | 826.4  | 808.2  | 800.2  | 794.6  |
| 40°    | 795.8  | 786.7  | 768.5  | 758.4  | 753.9  |
| 42.5°  | 756.1  | 747.0  | 728.9  | 717.5  | 710.7  |
| 45°    | 713.1  | 705.1  | 688.0  | 675.6  | 671.1  |
| 47.5°  | 671.1  | 663.2  | 645.0  | 632.5  | 625.7  |
| 50°    | 626.8  | 621.2  | 605.3  | 589.5  | 583.8  |
| 52.5°  | 583.8  | 575.8  | 561.2  | 548.7  | 540.7  |
| 55°    | 539.7  | 532.8  | 519.2  | 505.6  | 500.0  |
| 57.5°  | 495.3  | 489.7  | 474.9  | 461.3  | 456.8  |
| 60°    | 451.1  | 446.7  | 430.8  | 418.3  | 415.0  |
| 62.5°  | 408.1  | 400.1  | 388.8  | 377.5  | 372.9  |
| 65°    | 364.0  | 357.1  | 345.8  | 335.6  | 329.9  |
| 67.5°  | 318.6  | 312.9  | 302.7  | 294.8  | 290.2  |
| 70°    | 276.6  | 272.1  | 261.9  | 253.9  | 249.4  |
| 72.5°  | 233.6  | 228.9  | 223.3  | 215.4  | 212.1  |
| 75°    | 190.4  | 188.2  | 182.5  | 175.7  | 178.0  |
| 77.5°  | 151.9  | 147.3  | 145.0  | 141.7  | 138.4  |
| 80°    | 113.4  | 112.2  | 109.9  | 106.5  | 104.3  |
| 82.5°  | 77.1   | 77.1   | 76.0   | 71.4   | 71.4   |
| 85°    | 46.5   | 45.3   | 44.2   | 40.8   | 39.7   |
| 87.5°  | 20.4   | 18.2   | 15.9   | 12.5   | 11.3   |
| 90°    | 1.4    | 17.4   | 47.2   | 44.3   | 45.7   |
| 92.5°  | 29.9   | 40.4   | 41.9   | 43.3   | 43.3   |
| 95°    | 70.3   | 83.8   | 86.1   | 86.1   | 83.8   |
| 97.5°  | 116.9  | 129.5  | 134.8  | 134.8  | 134.8  |
| 100°   | 170.9  | 182.0  | 185.8  | 185.8  | 184.4  |
| 102.5° | 227.7  | 235.9  | 241.2  | 242.7  | 241.2  |
| 105°   | 289.8  | 293.7  | 296.6  | 298.9  | 298.9  |
| 107.5° | 351.4  | 357.2  | 357.2  | 358.2  | 351.4  |
| 110°   | 411.1  | 418.9  | 418.9  | 418.9  | 415.0  |

TEST NUMBER: P909748

CATALOG NUMBER: DFN2DIP-TR2F0-030D050US840-FLLFLL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 475.6  | 483.8  | 482.4  | 478.6  | 475.6  |
| 115°   | 539.2  | 546.9  | 544.5  | 543.1  | 539.2  |
| 117.5° | 602.3  | 612.9  | 606.1  | 602.3  | 598.4  |
| 120°   | 665.8  | 676.4  | 665.8  | 665.8  | 661.5  |
| 122.5° | 723.6  | 737.1  | 730.3  | 726.5  | 723.6  |
| 125°   | 784.3  | 796.3  | 792.4  | 788.1  | 786.7  |
| 127.5° | 843.4  | 858.4  | 853.1  | 847.3  | 843.4  |
| 130°   | 898.9  | 916.2  | 913.7  | 910.9  | 905.5  |
| 132.5° | 961.0  | 974.4  | 975.4  | 968.7  | 964.8  |
| 135°   | 1014.4 | 1029.3 | 1032.2 | 1030.8 | 1026.9 |
| 137.5° | 1074.1 | 1086.1 | 1088.5 | 1087.5 | 1081.8 |
| 140°   | 1126.5 | 1138.6 | 1145.3 | 1145.3 | 1140.0 |
| 142.5° | 1180.4 | 1192.6 | 1196.4 | 1197.8 | 1192.6 |
| 145°   | 1231.5 | 1241.1 | 1248.8 | 1250.3 | 1245.0 |
| 147.5° | 1277.3 | 1289.3 | 1295.1 | 1297.5 | 1292.1 |
| 150°   | 1324.4 | 1332.6 | 1337.9 | 1342.2 | 1337.9 |
| 152.5° | 1366.3 | 1374.5 | 1381.2 | 1386.5 | 1381.2 |
| 155°   | 1408.2 | 1412.0 | 1416.3 | 1423.1 | 1418.8 |
| 157.5° | 1444.3 | 1447.1 | 1449.6 | 1459.3 | 1452.5 |
| 160°   | 1476.5 | 1479.5 | 1480.9 | 1489.0 | 1483.3 |
| 162.5° | 1506.4 | 1506.4 | 1507.8 | 1517.0 | 1510.3 |
| 165°   | 1532.0 | 1530.5 | 1530.5 | 1540.1 | 1533.4 |
| 167.5° | 1555.0 | 1550.6 | 1550.6 | 1560.3 | 1553.6 |
| 170°   | 1572.4 | 1568.5 | 1567.1 | 1576.7 | 1568.5 |
| 172.5° | 1584.4 | 1580.5 | 1579.1 | 1588.7 | 1580.5 |
| 175°   | 1594.1 | 1590.1 | 1587.3 | 1596.9 | 1588.7 |
| 177.5° | 1599.3 | 1595.5 | 1592.6 | 1600.7 | 1592.6 |
| 180°   | 1596.9 | 1596.9 | 1596.9 | 1596.9 | 1596.9 |

TEST NUMBER: P909748

CATALOG NUMBER: DFN2DIP-TR2F0-030D050US840-FLLFLL

**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 | 9.52             | 10.30 | 10.56 | 11.35 | 12.75 | 9.10           | 9.88  | 10.14 | 10.92 | 12.33 |
|                 | 3H   | 11.15            | 11.85 | 12.20 | 12.90 | 14.33 | 10.69          | 11.39 | 11.74 | 12.44 | 13.87 |
|                 | 4H   | 11.72            | 12.38 | 12.78 | 13.44 | 14.87 | 11.26          | 11.92 | 12.32 | 12.98 | 14.41 |
|                 | 6H   | 12.10            | 12.71 | 13.17 | 13.77 | 15.21 | 11.64          | 12.25 | 12.71 | 13.31 | 14.75 |
|                 | 8H   | 12.19            | 12.77 | 13.26 | 13.85 | 15.28 | 11.73          | 12.31 | 12.81 | 13.39 | 14.83 |
|                 | 12H  | 12.23            | 12.78 | 13.31 | 13.85 | 15.31 | 11.77          | 12.32 | 12.84 | 13.39 | 14.85 |
| 4H              | 2H   | 9.97             | 10.63 | 11.03 | 11.68 | 13.11 | 9.63           | 10.29 | 10.69 | 11.34 | 12.77 |
|                 | 3H   | 11.80            | 12.35 | 12.87 | 13.43 | 14.87 | 11.41          | 11.97 | 12.49 | 13.05 | 14.49 |
|                 | 4H   | 12.49            | 13.00 | 13.57 | 14.07 | 15.53 | 12.09          | 12.60 | 13.17 | 13.67 | 15.14 |
|                 | 6H   | 12.98            | 13.41 | 14.06 | 14.51 | 15.97 | 12.58          | 13.02 | 13.67 | 14.11 | 15.57 |
|                 | 8H   | 13.11            | 13.52 | 14.20 | 14.61 | 16.08 | 12.72          | 13.12 | 13.80 | 14.21 | 15.69 |
|                 | 12H  | 13.17            | 13.54 | 14.28 | 14.64 | 16.12 | 12.77          | 13.13 | 13.87 | 14.24 | 15.72 |
| 8H              | 4H   | 12.67            | 13.08 | 13.76 | 14.16 | 15.64 | 12.32          | 12.72 | 13.40 | 13.81 | 15.29 |
|                 | 6H   | 13.27            | 13.60 | 14.38 | 14.73 | 16.21 | 12.92          | 13.25 | 14.03 | 14.38 | 15.85 |
|                 | 8H   | 13.47            | 13.77 | 14.59 | 14.88 | 16.37 | 13.12          | 13.41 | 14.23 | 14.52 | 16.01 |
|                 | 12H  | 13.59            | 13.84 | 14.71 | 14.95 | 16.48 | 13.22          | 13.47 | 14.34 | 14.58 | 16.11 |
| 12H             | 4H   | 12.65            | 13.02 | 13.75 | 14.12 | 15.60 | 12.30          | 12.67 | 13.41 | 13.77 | 15.25 |
|                 | 6H   | 13.29            | 13.59 | 14.41 | 14.70 | 16.19 | 12.95          | 13.25 | 14.07 | 14.36 | 15.85 |
|                 | 8H   | 13.51            | 13.77 | 14.63 | 14.88 | 16.41 | 13.17          | 13.43 | 14.29 | 14.53 | 16.06 |