

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: P903652

Luminaire Tested: DFN2DIP-SQ3F0-050D050US830-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P903652  
REPORT IS A COMBINATION OF REPORTS P899881 AND P896733  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-050D050US830-FLLFLL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

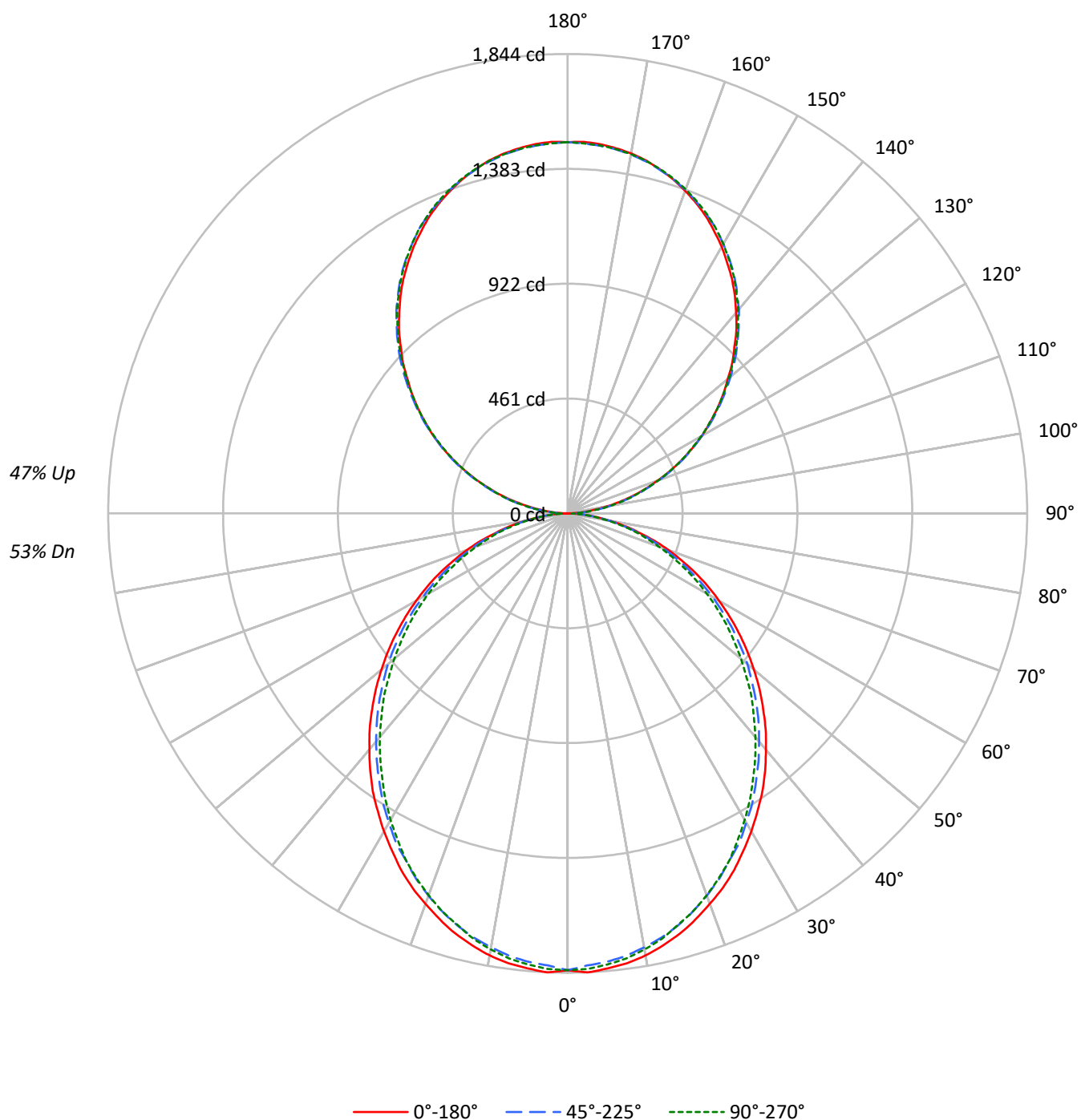
Lumens per Lamp: N/A  
Luminaire Lumens: 8836.3 lumens  
Efficiency: N/A  
Efficacy: 111.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 79.1  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P903652

CATALOG NUMBER: DFN2DIP-SQ3F0-050D050US830-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P903652

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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   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 71 | 71 | 71 | 59 | 59 | 59 |
| 1   | 98  | 94  | 90  | 87  | 91  | 87  | 84  | 81  | 74 | 72 | 70 | 63 | 61 | 59 | 52 | 51 | 50 |
| 2   | 90  | 82  | 76  | 71  | 83  | 76  | 71  | 66  | 65 | 61 | 58 | 55 | 52 | 50 | 46 | 44 | 42 |
| 3   | 82  | 72  | 65  | 59  | 75  | 67  | 61  | 55  | 58 | 53 | 49 | 49 | 45 | 42 | 41 | 38 | 36 |
| 4   | 75  | 64  | 56  | 50  | 69  | 60  | 52  | 47  | 51 | 46 | 41 | 43 | 39 | 36 | 36 | 33 | 31 |
| 5   | 69  | 57  | 49  | 43  | 63  | 53  | 46  | 40  | 46 | 40 | 36 | 39 | 35 | 31 | 33 | 29 | 27 |
| 6   | 63  | 51  | 43  | 37  | 58  | 48  | 40  | 35  | 41 | 36 | 31 | 35 | 31 | 27 | 30 | 26 | 24 |
| 7   | 59  | 46  | 38  | 33  | 54  | 43  | 36  | 31  | 37 | 32 | 28 | 32 | 28 | 24 | 27 | 24 | 21 |
| 8   | 54  | 42  | 34  | 29  | 50  | 39  | 32  | 27  | 34 | 29 | 24 | 29 | 25 | 22 | 25 | 21 | 19 |
| 9   | 51  | 38  | 31  | 26  | 47  | 36  | 29  | 24  | 31 | 26 | 22 | 27 | 23 | 19 | 23 | 20 | 17 |
| 10  | 47  | 35  | 28  | 23  | 44  | 33  | 26  | 22  | 29 | 23 | 20 | 25 | 21 | 18 | 21 | 18 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2101 | 2101 | 2101 |
| 5°  | 2103 | 2070 | 2085 |
| 10° | 2085 | 2041 | 2056 |
| 15° | 2053 | 2006 | 2011 |
| 20° | 2010 | 1958 | 1966 |
| 25° | 1967 | 1901 | 1913 |
| 30° | 1914 | 1848 | 1846 |
| 35° | 1864 | 1785 | 1775 |
| 40° | 1802 | 1721 | 1707 |
| 45° | 1741 | 1658 | 1638 |
| 50° | 1673 | 1591 | 1558 |
| 55° | 1602 | 1514 | 1484 |
| 60° | 1522 | 1422 | 1400 |
| 65° | 1434 | 1327 | 1300 |
| 70° | 1323 | 1211 | 1193 |
| 75° | 1169 | 1072 | 1093 |
| 80° | 982  | 894  | 903  |
| 85° | 691  | 592  | 591  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 1741 cd/sqm

TEST NUMBER: P903652

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 172.6  | 2.0       |
| 10°-20°   | 485.6  | 5.5       |
| 20°-30°   | 713.7  | 8.1       |
| 30°-40°   | 828.9  | 9.4       |
| 40°-50°   | 827.8  | 9.4       |
| 50°-60°   | 721.8  | 8.2       |
| 60°-70°   | 533.6  | 6.0       |
| 70°-80°   | 301.9  | 3.4       |
| 80°-90°   | 83.9   | 0.9       |
| 90°-100°  | 92.2   | 1.0       |
| 100°-110° | 293.0  | 3.3       |
| 110°-120° | 501.5  | 5.7       |
| 120°-130° | 659.5  | 7.5       |
| 130°-140° | 740.3  | 8.4       |
| 140°-150° | 725.9  | 8.2       |
| 150°-160° | 609.0  | 6.9       |
| 160°-170° | 403.9  | 4.6       |
| 170°-180° | 141.2  | 1.6       |
| 0°-30°    | 1371.9 | 15.5      |
| 0°-40°    | 2200.7 | 24.9      |
| 0°-60°    | 3750.4 | 42.4      |
| 0°-90°    | 4669.8 | 52.8      |
| 90°-120°  | 886.7  | 10.0      |
| 90°-150°  | 3012.5 | 34.1      |
| 90°-180°  | 4167.0 | 47.2      |
| 0°-180°   | 8836.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1834 | 1834  | 1834 | 1834  | 1834 |      |
| 5°   | 1834 | 1827  | 1807 | 1821  | 1818 | 174  |
| 15°  | 1746 | 1735  | 1712 | 1719  | 1710 | 492  |
| 25°  | 1580 | 1566  | 1536 | 1539  | 1536 | 727  |
| 35°  | 1363 | 1346  | 1317 | 1307  | 1298 | 851  |
| 45°  | 1109 | 1097  | 1070 | 1051  | 1044 | 856  |
| 55°  | 839  | 829   | 808  | 786   | 778  | 750  |
| 65°  | 566  | 555   | 538  | 522   | 513  | 560  |
| 75°  | 296  | 293   | 284  | 273   | 277  | 316  |
| 85°  | 72   | 70    | 69   | 63    | 62   | 81   |
| 90°  | 1    | 16    | 44   | 41    | 43   | 9    |
| 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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CATALOG NUMBER: DFN2DIP-SQ3F0-050D050US830-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1833.7 | 1833.7 | 1833.7 | 1833.7 | 1833.7 |
| 2.5°   | 1844.4 | 1835.6 | 1816.2 | 1833.7 | 1830.4 |
| 5°     | 1833.7 | 1826.8 | 1807.3 | 1821.4 | 1818.1 |
| 7.5°   | 1821.4 | 1810.9 | 1791.5 | 1805.7 | 1802.1 |
| 10°    | 1802.1 | 1789.8 | 1768.7 | 1782.6 | 1777.4 |
| 12.5°  | 1775.6 | 1765.1 | 1744.0 | 1752.8 | 1749.2 |
| 15°    | 1745.6 | 1735.1 | 1712.1 | 1719.3 | 1710.4 |
| 17.5°  | 1708.5 | 1698.1 | 1675.1 | 1683.9 | 1675.1 |
| 20°    | 1668.0 | 1657.6 | 1632.9 | 1638.0 | 1631.2 |
| 22.5°  | 1627.6 | 1611.7 | 1588.7 | 1588.7 | 1585.1 |
| 25°    | 1579.9 | 1565.8 | 1535.9 | 1539.3 | 1535.9 |
| 27.5°  | 1526.9 | 1514.6 | 1491.8 | 1486.5 | 1477.7 |
| 30°    | 1474.1 | 1460.0 | 1433.6 | 1428.3 | 1421.3 |
| 32.5°  | 1417.7 | 1407.2 | 1378.9 | 1368.3 | 1361.2 |
| 35°    | 1363.0 | 1345.5 | 1317.2 | 1306.6 | 1297.8 |
| 37.5°  | 1301.3 | 1285.4 | 1257.2 | 1244.8 | 1236.0 |
| 40°    | 1237.9 | 1223.7 | 1195.4 | 1179.7 | 1172.6 |
| 42.5°  | 1176.2 | 1162.0 | 1133.9 | 1116.1 | 1105.6 |
| 45°    | 1109.2 | 1096.8 | 1070.3 | 1051.0 | 1043.9 |
| 47.5°  | 1043.9 | 1031.5 | 1003.3 | 983.8  | 973.4  |
| 50°    | 975.1  | 966.3  | 941.6  | 916.9  | 908.0  |
| 52.5°  | 908.0  | 895.7  | 872.9  | 853.5  | 841.1  |
| 55°    | 839.4  | 828.8  | 807.6  | 786.5  | 777.7  |
| 57.5°  | 770.5  | 761.8  | 738.8  | 717.7  | 710.5  |
| 60°    | 701.7  | 694.8  | 670.1  | 650.6  | 645.5  |
| 62.5°  | 634.8  | 622.5  | 604.8  | 587.2  | 580.1  |
| 65°    | 566.1  | 555.4  | 537.8  | 522.0  | 513.1  |
| 67.5°  | 495.6  | 486.6  | 470.9  | 458.5  | 451.4  |
| 70°    | 430.3  | 423.2  | 407.3  | 394.9  | 388.0  |
| 72.5°  | 363.4  | 356.2  | 347.4  | 335.1  | 329.8  |
| 75°    | 296.1  | 292.8  | 283.8  | 273.3  | 276.9  |
| 77.5°  | 236.3  | 229.1  | 225.6  | 220.4  | 215.2  |
| 80°    | 176.4  | 174.6  | 171.0  | 165.8  | 162.2  |
| 82.5°  | 119.9  | 119.9  | 118.2  | 111.1  | 111.1  |
| 85°    | 72.2   | 70.5   | 68.8   | 63.4   | 61.7   |
| 87.5°  | 31.8   | 28.3   | 24.7   | 19.4   | 17.6   |
| 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 | 10.08            | 10.96 | 11.01 | 11.91 | 13.14 | 9.63           | 10.52 | 10.56 | 11.47 | 12.70 |
|                 | 3H   | 11.73            | 12.53 | 12.68 | 13.49 | 14.74 | 11.24          | 12.04 | 12.19 | 13.00 | 14.25 |
|                 | 4H   | 12.32            | 13.07 | 13.28 | 14.04 | 15.30 | 11.83          | 12.58 | 12.78 | 13.54 | 14.80 |
|                 | 6H   | 12.72            | 13.41 | 13.69 | 14.38 | 15.66 | 12.22          | 12.91 | 13.19 | 13.88 | 15.16 |
|                 | 8H   | 12.82            | 13.48 | 13.80 | 14.47 | 15.74 | 12.32          | 12.98 | 13.30 | 13.97 | 15.24 |
|                 | 12H  | 12.87            | 13.50 | 13.85 | 14.48 | 15.77 | 12.36          | 12.99 | 13.34 | 13.97 | 15.27 |
| 4H              | 2H   | 10.54            | 11.29 | 11.50 | 12.25 | 13.52 | 10.18          | 10.93 | 11.15 | 11.90 | 13.16 |
|                 | 3H   | 12.40            | 13.03 | 13.37 | 14.02 | 15.30 | 11.99          | 12.62 | 12.96 | 13.61 | 14.89 |
|                 | 4H   | 13.11            | 13.69 | 14.09 | 14.67 | 15.97 | 12.69          | 13.26 | 13.67 | 14.25 | 15.55 |
|                 | 6H   | 13.62            | 14.12 | 14.62 | 15.13 | 16.43 | 13.19          | 13.69 | 14.19 | 14.70 | 15.99 |
|                 | 8H   | 13.77            | 14.23 | 14.77 | 15.24 | 16.55 | 13.33          | 13.80 | 14.33 | 14.80 | 16.11 |
|                 | 12H  | 13.84            | 14.26 | 14.86 | 15.28 | 16.60 | 13.39          | 13.81 | 14.41 | 14.83 | 16.15 |
| 8H              | 4H   | 13.31            | 13.77 | 14.30 | 14.77 | 16.08 | 12.93          | 13.39 | 13.92 | 14.39 | 15.71 |
|                 | 6H   | 13.93            | 14.31 | 14.95 | 15.36 | 16.67 | 13.55          | 13.93 | 14.57 | 14.98 | 16.29 |
|                 | 8H   | 14.15            | 14.49 | 15.18 | 15.52 | 16.85 | 13.76          | 14.09 | 14.79 | 15.13 | 16.46 |
|                 | 12H  | 14.28            | 14.58 | 15.31 | 15.60 | 16.98 | 13.87          | 14.16 | 14.90 | 15.19 | 16.56 |
| 12H             | 4H   | 13.29            | 13.71 | 14.31 | 14.73 | 16.05 | 12.92          | 13.34 | 13.94 | 14.36 | 15.68 |
|                 | 6H   | 13.96            | 14.30 | 14.99 | 15.33 | 16.66 | 13.59          | 13.93 | 14.62 | 14.96 | 16.29 |
|                 | 8H   | 14.20            | 14.50 | 15.23 | 15.52 | 16.90 | 13.82          | 14.12 | 14.85 | 15.14 | 16.52 |