

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: P903911

Luminaire Tested: DFN2DIP-SQ3F0-120D060US830-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P903911  
REPORT IS A COMBINATION OF REPORTS P901434 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-120D060US830-RLLONL  
Description: 3 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

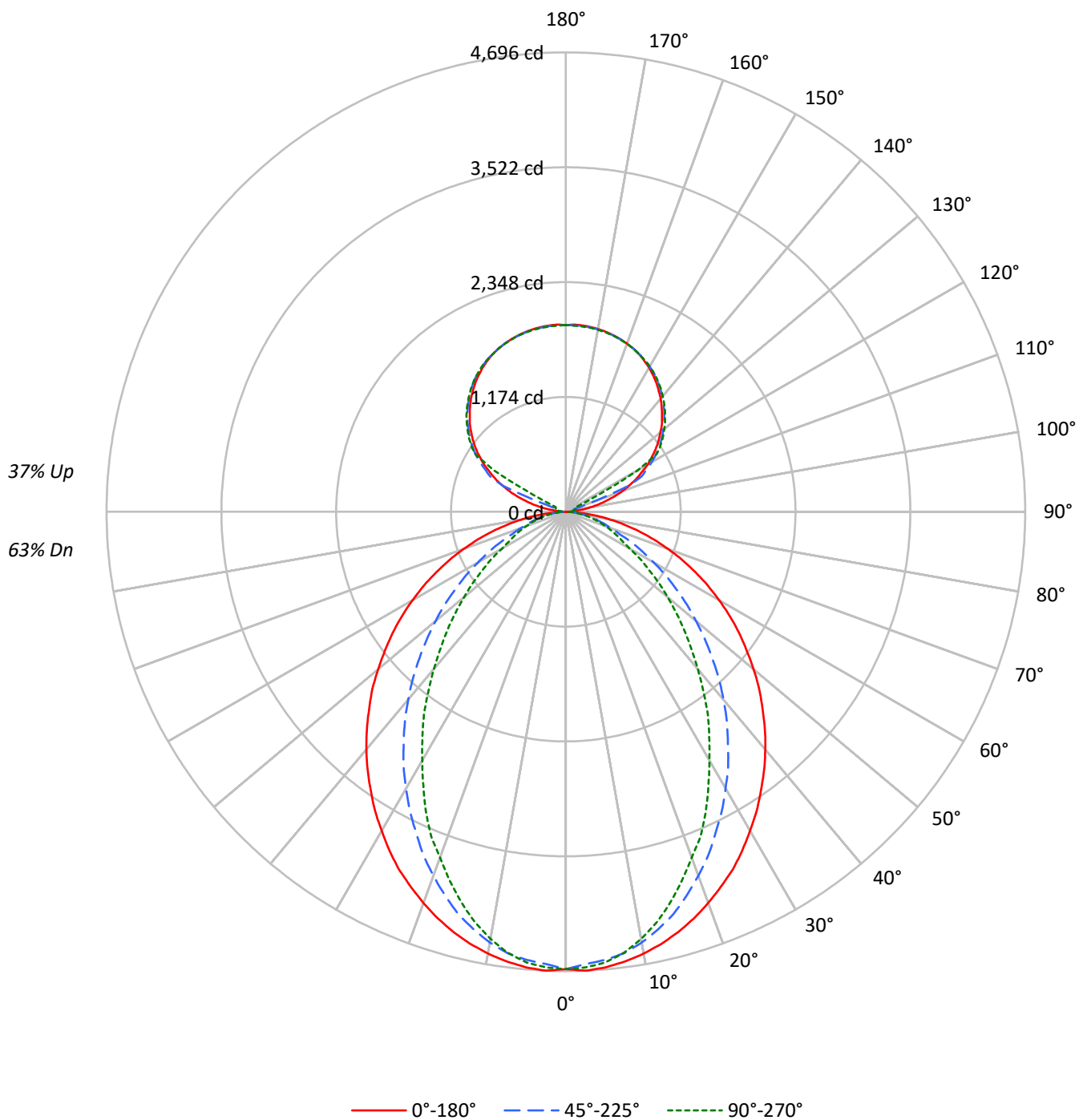
Lumens per Lamp: N/A  
Luminaire Lumens: 15212.6 lumens  
Efficiency: N/A  
Efficacy: 89.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 170.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9957  
Total Harmonic Distortion (THDi): 0.049  
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   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 91 | 91 | 91 | 79 | 79 | 79 | 68 | 68 | 68 |
| 1   | 101 | 97  | 93  | 90  | 95  | 91  | 88  | 85  | 80 | 78 | 76 | 71 | 69 | 67 | 61 | 60 | 59 |
| 2   | 93  | 86  | 80  | 75  | 87  | 81  | 75  | 71  | 71 | 67 | 64 | 63 | 60 | 57 | 55 | 52 | 51 |
| 3   | 85  | 76  | 69  | 63  | 80  | 72  | 65  | 60  | 63 | 58 | 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  | 67  | 57  | 50  | 45  | 51 | 45 | 41 | 46 | 41 | 37 | 40 | 37 | 34 |
| 6   | 67  | 55  | 47  | 41  | 62  | 52  | 45  | 39  | 46 | 41 | 36 | 41 | 37 | 33 | 37 | 33 | 30 |
| 7   | 62  | 50  | 42  | 36  | 58  | 47  | 40  | 35  | 42 | 36 | 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 | 27 | 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°  | 5356 | 5356 | 5356 |
| 5°  | 5361 | 5268 | 5303 |
| 10° | 5305 | 5161 | 5129 |
| 15° | 5228 | 4987 | 4861 |
| 20° | 5128 | 4748 | 4532 |
| 25° | 5026 | 4482 | 4214 |
| 30° | 4890 | 4209 | 3812 |
| 35° | 4756 | 3915 | 3459 |
| 40° | 4619 | 3612 | 3055 |
| 45° | 4461 | 3276 | 2688 |
| 50° | 4297 | 2938 | 2330 |
| 55° | 4126 | 2577 | 1987 |
| 60° | 3927 | 2199 | 1634 |
| 65° | 3698 | 1816 | 1468 |
| 70° | 3421 | 1459 | 1326 |
| 75° | 3072 | 1278 | 1202 |
| 80° | 2567 | 1061 | 1037 |
| 85° | 1741 | 691  | 769  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 4461 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 438.1   | 2.9       |
| 10°-20°   | 1202.7  | 7.9       |
| 20°-30°   | 1688.5  | 11.1      |
| 30°-40°   | 1840.6  | 12.1      |
| 40°-50°   | 1691.7  | 11.1      |
| 50°-60°   | 1328.6  | 8.7       |
| 60°-70°   | 864.8   | 5.7       |
| 70°-80°   | 445.2   | 2.9       |
| 80°-90°   | 117.0   | 0.8       |
| 90°-100°  | 62.9    | 0.4       |
| 100°-110° | 234.6   | 1.5       |
| 110°-120° | 622.2   | 4.1       |
| 120°-130° | 1032.0  | 6.8       |
| 130°-140° | 1096.2  | 7.2       |
| 140°-150° | 1018.8  | 6.7       |
| 150°-160° | 819.1   | 5.4       |
| 160°-170° | 527.8   | 3.5       |
| 170°-180° | 181.7   | 1.2       |
| 0°-30°    | 3329.4  | 21.9      |
| 0°-40°    | 5170.0  | 34.0      |
| 0°-60°    | 8190.3  | 53.8      |
| 0°-90°    | 9617.3  | 63.2      |
| 90°-120°  | 919.8   | 6.0       |
| 90°-150°  | 4066.8  | 26.7      |
| 90°-180°  | 5595.0  | 36.8      |
| 0°-180°   | 15212.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4675 | 4675  | 4675 | 4675  | 4675 |      |
| 5°   | 4675 | 4654  | 4598 | 4636  | 4624 | 443  |
| 15°  | 4446 | 4400  | 4256 | 4176  | 4133 | 1253 |
| 25°  | 4036 | 3900  | 3621 | 3448  | 3384 | 1856 |
| 35°  | 3478 | 3262  | 2890 | 2623  | 2530 | 2177 |
| 45°  | 2843 | 2559  | 2115 | 1815  | 1713 | 2195 |
| 55°  | 2162 | 1832  | 1375 | 1121  | 1041 | 1932 |
| 65°  | 1460 | 1117  | 736  | 592   | 580  | 1447 |
| 75°  | 778  | 482   | 338  | 309   | 305  | 823  |
| 85°  | 182  | 93    | 80   | 80    | 80   | 209  |
| 90°  | 1    | 17    | 28   | 35    | 37   | 14   |
| 95°  | 90   | 44    | 54   | 61    | 59   | 106  |
| 105° | 420  | 461   | 84   | 99    | 105  | 449  |
| 115° | 794  | 818   | 852  | 213   | 113  | 782  |
| 125° | 1123 | 1141  | 1167 | 1177  | 1181 | 1001 |
| 135° | 1389 | 1412  | 1424 | 1438  | 1435 | 1073 |
| 145° | 1612 | 1610  | 1634 | 1643  | 1636 | 1008 |
| 155° | 1775 | 1762  | 1779 | 1787  | 1776 | 818  |
| 165° | 1870 | 1862  | 1866 | 1876  | 1866 | 528  |
| 175° | 1913 | 1903  | 1906 | 1915  | 1902 | 182  |
| 180° | 1909 | 1909  | 1909 | 1909  | 1909 |      |

TEST NUMBER: P903911

CATALOG NUMBER: DFN2DIP-SQ3F0-120D060US830-RLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4674.6 | 4674.6 | 4674.6 | 4674.6 | 4674.6 |
| 2.5°   | 4695.7 | 4674.6 | 4628.0 | 4670.6 | 4662.0 |
| 5°     | 4674.6 | 4653.5 | 4598.3 | 4636.5 | 4623.9 |
| 7.5°   | 4636.5 | 4611.3 | 4552.1 | 4568.7 | 4547.6 |
| 10°    | 4585.8 | 4556.2 | 4471.7 | 4458.7 | 4433.6 |
| 12.5°  | 4522.4 | 4484.3 | 4369.8 | 4344.7 | 4298.1 |
| 15°    | 4446.2 | 4399.5 | 4255.9 | 4175.5 | 4133.3 |
| 17.5°  | 4357.3 | 4289.5 | 4111.7 | 4018.9 | 3951.1 |
| 20°    | 4255.9 | 4171.0 | 3959.6 | 3854.1 | 3760.7 |
| 22.5°  | 4145.9 | 4048.5 | 3803.0 | 3659.3 | 3596.1 |
| 25°    | 4036.0 | 3900.3 | 3621.2 | 3447.9 | 3384.2 |
| 27.5°  | 3904.9 | 3760.7 | 3452.0 | 3253.2 | 3155.7 |
| 30°    | 3765.3 | 3604.2 | 3265.7 | 3050.3 | 2935.8 |
| 32.5°  | 3629.7 | 3434.9 | 3088.4 | 2834.4 | 2728.5 |
| 35°    | 3477.6 | 3261.7 | 2889.6 | 2623.0 | 2529.6 |
| 37.5°  | 3329.4 | 3096.5 | 2703.3 | 2411.1 | 2305.6 |
| 40°    | 3172.8 | 2919.2 | 2508.6 | 2208.3 | 2098.3 |
| 42.5°  | 3012.1 | 2741.5 | 2314.2 | 2000.9 | 1895.5 |
| 45°    | 2842.9 | 2559.3 | 2115.3 | 1814.7 | 1713.2 |
| 47.5°  | 2682.2 | 2382.0 | 1925.0 | 1624.4 | 1531.4 |
| 50°    | 2504.5 | 2204.2 | 1738.8 | 1446.6 | 1358.2 |
| 52.5°  | 2330.8 | 2013.5 | 1561.0 | 1281.9 | 1201.6 |
| 55°    | 2161.6 | 1831.7 | 1374.8 | 1121.2 | 1040.8 |
| 57.5°  | 1988.3 | 1649.9 | 1210.0 | 973.1  | 905.3  |
| 60°    | 1810.6 | 1472.2 | 1036.3 | 821.0  | 753.2  |
| 62.5°  | 1637.4 | 1298.9 | 888.3  | 685.4  | 651.7  |
| 65°    | 1459.6 | 1116.7 | 736.1  | 592.5  | 579.5  |
| 67.5°  | 1290.4 | 947.4  | 592.5  | 520.2  | 507.7  |
| 70°    | 1112.7 | 782.8  | 490.6  | 448.4  | 431.3  |
| 72.5°  | 943.5  | 630.2  | 410.2  | 376.5  | 368.1  |
| 75°    | 778.3  | 482.0  | 338.5  | 308.8  | 304.7  |
| 77.5°  | 613.6  | 342.4  | 266.6  | 249.6  | 241.0  |
| 80°    | 461.0  | 245.5  | 202.8  | 186.2  | 186.2  |
| 82.5°  | 321.4  | 165.1  | 139.6  | 131.0  | 131.0  |
| 85°    | 181.8  | 92.9   | 80.3   | 80.3   | 80.3   |
| 87.5°  | 67.8   | 33.6   | 33.6   | 29.6   | 29.6   |
| 90°    | 1.3    | 16.6   | 27.5   | 34.6   | 37.2   |
| 92.5°  | 34.6   | 29.0   | 33.1   | 35.9   | 37.2   |
| 95°    | 89.7   | 44.1   | 53.8   | 60.9   | 59.4   |
| 97.5°  | 161.6  | 48.4   | 70.3   | 74.6   | 76.0   |
| 100°   | 244.5  | 55.2   | 78.7   | 89.7   | 92.5   |
| 102.5° | 335.5  | 332.9  | 81.5   | 96.6   | 100.9  |
| 105°   | 419.8  | 461.3  | 84.3   | 99.3   | 105.0  |
| 107.5° | 517.9  | 552.3  | 87.1   | 102.2  | 107.7  |
| 110°   | 611.9  | 640.7  | 241.8  | 103.7  | 109.1  |



TEST NUMBER: P903911

CATALOG NUMBER: DFN2DIP-SQ3F0-120D060US830-RLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 700.2  | 725.0  | 701.5  | 106.2  | 110.6  |
| 115°   | 794.1  | 817.6  | 852.2  | 212.7  | 113.3  |
| 117.5° | 875.5  | 903.1  | 926.7  | 729.2  | 367.3  |
| 120°   | 966.8  | 987.4  | 1012.4 | 1028.9 | 842.4  |
| 122.5° | 1044.0 | 1066.1 | 1093.8 | 1102.0 | 1103.5 |
| 125°   | 1122.8 | 1140.8 | 1167.0 | 1176.7 | 1180.7 |
| 127.5° | 1194.6 | 1213.9 | 1234.7 | 1248.5 | 1249.8 |
| 130°   | 1262.3 | 1284.4 | 1299.5 | 1314.8 | 1313.4 |
| 132.5° | 1331.3 | 1349.3 | 1364.4 | 1376.9 | 1375.5 |
| 135°   | 1389.4 | 1411.6 | 1423.8 | 1437.8 | 1434.9 |
| 137.5° | 1450.0 | 1466.6 | 1480.5 | 1494.3 | 1490.3 |
| 140°   | 1509.4 | 1520.6 | 1535.7 | 1548.1 | 1541.2 |
| 142.5° | 1559.2 | 1569.0 | 1586.9 | 1597.8 | 1590.9 |
| 145°   | 1611.7 | 1610.2 | 1633.7 | 1643.4 | 1636.5 |
| 147.5° | 1657.2 | 1653.0 | 1676.5 | 1683.4 | 1678.0 |
| 150°   | 1701.5 | 1691.8 | 1713.9 | 1722.1 | 1715.2 |
| 152.5° | 1738.7 | 1727.7 | 1748.3 | 1756.7 | 1747.0 |
| 155°   | 1774.6 | 1762.3 | 1778.9 | 1787.1 | 1776.0 |
| 157.5° | 1803.6 | 1792.6 | 1805.1 | 1814.8 | 1803.6 |
| 160°   | 1828.5 | 1820.1 | 1828.5 | 1836.7 | 1827.1 |
| 162.5° | 1850.5 | 1842.3 | 1849.2 | 1858.9 | 1846.4 |
| 165°   | 1869.9 | 1861.7 | 1865.8 | 1875.5 | 1865.8 |
| 167.5° | 1885.1 | 1876.8 | 1881.0 | 1890.7 | 1878.2 |
| 170°   | 1897.6 | 1889.2 | 1892.1 | 1901.7 | 1889.2 |
| 172.5° | 1905.8 | 1897.6 | 1900.4 | 1910.1 | 1897.6 |
| 175°   | 1912.7 | 1903.0 | 1905.8 | 1915.4 | 1901.7 |
| 177.5° | 1915.4 | 1905.8 | 1907.2 | 1916.9 | 1904.5 |
| 180°   | 1908.6 | 1908.6 | 1908.6 | 1908.6 | 1908.6 |

TEST NUMBER: P903911

CATALOG NUMBER: DFN2DIP-SQ3F0-120D060US830-RLONL

**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 | 14.10            | 15.05 | 14.94 | 15.91 | 16.98 | 10.06          | 11.01 | 10.90 | 11.87 | 12.94 |
|                 | 3H   | 15.78            | 16.63 | 16.63 | 17.50 | 18.60 | 11.25          | 12.10 | 12.10 | 12.97 | 14.07 |
|                 | 4H   | 16.39            | 17.19 | 17.26 | 18.07 | 19.18 | 11.70          | 12.50 | 12.57 | 13.38 | 14.49 |
|                 | 6H   | 16.81            | 17.55 | 17.70 | 18.43 | 19.56 | 12.02          | 12.76 | 12.90 | 13.64 | 14.77 |
|                 | 8H   | 16.94            | 17.64 | 17.83 | 18.54 | 19.67 | 12.11          | 12.81 | 13.00 | 13.71 | 14.84 |
|                 | 12H  | 17.01            | 17.67 | 17.90 | 18.57 | 19.72 | 12.16          | 12.83 | 13.05 | 13.72 | 14.87 |
| 4H              | 2H   | 14.13            | 14.93 | 15.00 | 15.80 | 16.92 | 10.66          | 11.47 | 11.54 | 12.34 | 13.45 |
|                 | 3H   | 15.96            | 16.63 | 16.85 | 17.54 | 18.66 | 12.02          | 12.69 | 12.91 | 13.59 | 14.72 |
|                 | 4H   | 16.66            | 17.26 | 17.55 | 18.17 | 19.32 | 12.57          | 13.17 | 13.46 | 14.08 | 15.23 |
|                 | 6H   | 17.17            | 17.69 | 18.09 | 18.62 | 19.78 | 12.98          | 13.51 | 13.90 | 14.43 | 15.59 |
|                 | 8H   | 17.35            | 17.84 | 18.26 | 18.76 | 19.92 | 13.11          | 13.60 | 14.03 | 14.52 | 15.69 |
|                 | 12H  | 17.45            | 17.88 | 18.38 | 18.82 | 20.00 | 13.18          | 13.62 | 14.11 | 14.56 | 15.73 |
| 8H              | 4H   | 16.63            | 17.12 | 17.55 | 18.04 | 19.21 | 12.85          | 13.34 | 13.77 | 14.26 | 15.43 |
|                 | 6H   | 17.20            | 17.60 | 18.14 | 18.56 | 19.73 | 13.37          | 13.77 | 14.31 | 14.73 | 15.90 |
|                 | 8H   | 17.41            | 17.77 | 18.36 | 18.72 | 19.90 | 13.55          | 13.91 | 14.50 | 14.86 | 16.05 |
|                 | 12H  | 17.55            | 17.86 | 18.50 | 18.81 | 20.04 | 13.67          | 13.99 | 14.63 | 14.93 | 16.17 |
| 12H             | 4H   | 16.59            | 17.03 | 17.52 | 17.97 | 19.14 | 12.86          | 13.30 | 13.80 | 14.24 | 15.41 |
|                 | 6H   | 17.17            | 17.53 | 18.12 | 18.48 | 19.67 | 13.41          | 13.77 | 14.37 | 14.73 | 15.91 |
|                 | 8H   | 17.39            | 17.71 | 18.35 | 18.65 | 19.89 | 13.62          | 13.94 | 14.58 | 14.89 | 16.12 |