

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: P927134

Luminaire Tested: DFN2DIP-HX4F0-110D060US830-RLLONL

Issue Date: 12/12/2024

Test Information

Test Method: LM-79-2019
Report Number: P927134
REPORT IS A COMBINATION OF REPORTS P900870 AND P896187
Test Lab: INNOVATION CENTER
Issue Date: 12/12/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-HX4F0-110D060US830-RLONL
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens
Light Source: -
Ballast/Driver: -

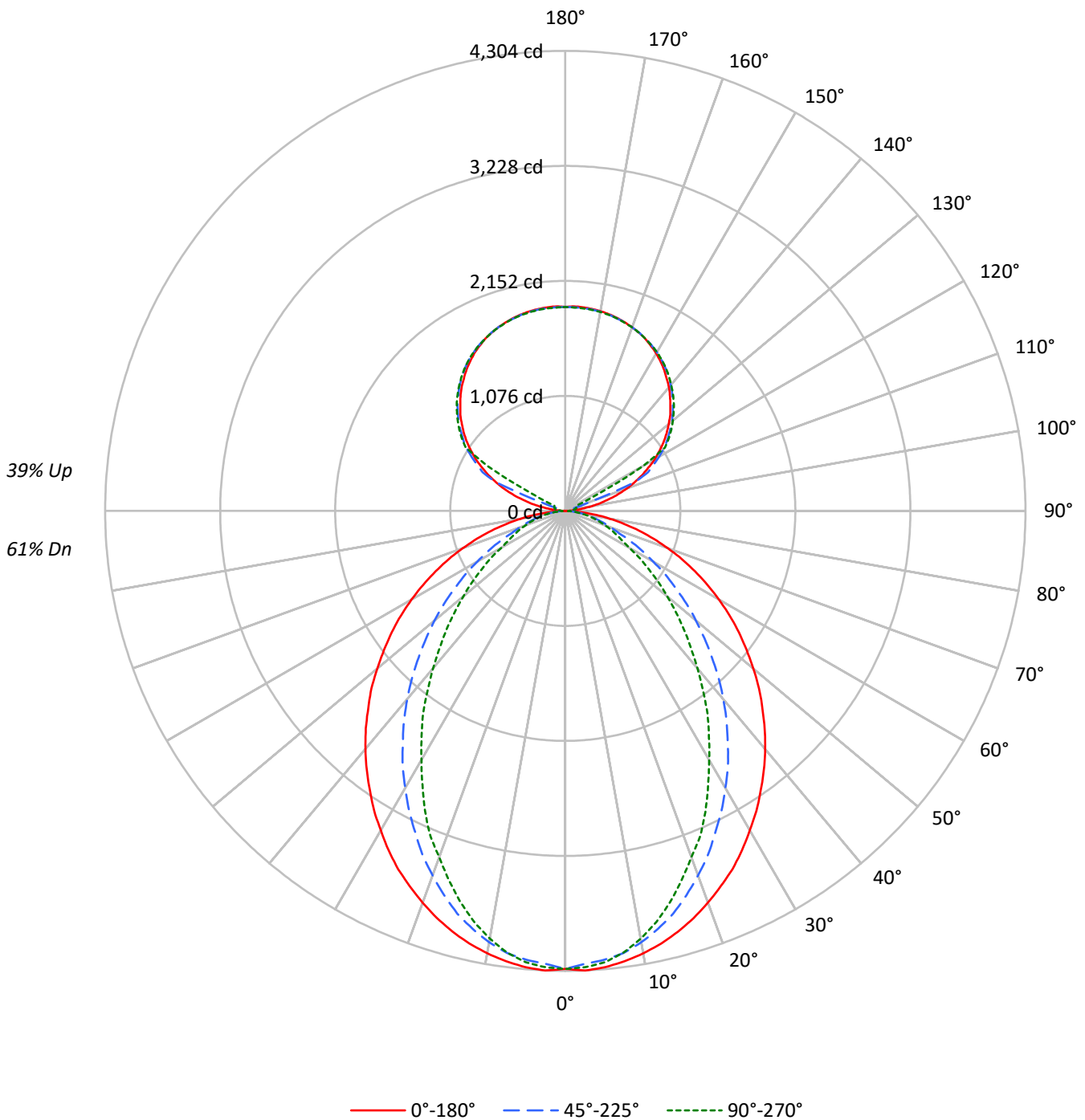
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 14410.8 lumens
Efficiency: N/A
Efficacy: 92.2 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16
Luminous Opening: Rectangular w/ Sides (W: 3.54' x L: 4.09' x H: 0.1')
CIE Type: Semi-Direct

Input Watts (W): 156.3
Input Voltage (V):
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.9967
Total Harmonic Distortion (THDi): 0.063
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





TEST NUMBER: P927134

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COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

| | | | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RF | 20 | | | | 20 | | | | 20 | | | | 20 | | | | 20 | | | | |
| RC | 80 | | | | 70 | | | | 50 | | | | 30 | | | | 10 | | | 0 | |
| RW | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0 |
| RCR | | | | | | | | | | | | | | | | | | | | | |
| 0 | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 90 | 90 | 90 | 77 | 77 | 77 | 66 | 66 | 66 | 66 | 66 | 66 | 61 |
| 1 | 101 | 97 | 93 | 90 | 94 | 91 | 87 | 85 | 79 | 77 | 75 | 69 | 67 | 66 | 60 | 58 | 57 | 60 | 58 | 57 | 53 |
| 2 | 92 | 85 | 79 | 74 | 86 | 80 | 75 | 70 | 70 | 66 | 63 | 61 | 58 | 56 | 53 | 51 | 49 | 53 | 51 | 49 | 45 |
| 3 | 85 | 75 | 68 | 63 | 79 | 71 | 65 | 60 | 63 | 58 | 54 | 55 | 51 | 48 | 48 | 45 | 43 | 48 | 45 | 43 | 39 |
| 4 | 78 | 67 | 59 | 54 | 73 | 63 | 56 | 51 | 56 | 51 | 46 | 49 | 45 | 42 | 43 | 40 | 37 | 43 | 40 | 37 | 34 |
| 5 | 72 | 60 | 52 | 46 | 67 | 57 | 50 | 44 | 51 | 45 | 40 | 45 | 40 | 37 | 39 | 36 | 33 | 39 | 36 | 33 | 30 |
| 6 | 66 | 54 | 46 | 41 | 62 | 51 | 44 | 39 | 46 | 40 | 36 | 41 | 36 | 32 | 36 | 32 | 29 | 36 | 32 | 29 | 27 |
| 7 | 61 | 49 | 41 | 36 | 58 | 47 | 40 | 35 | 42 | 36 | 32 | 37 | 32 | 29 | 33 | 29 | 26 | 33 | 29 | 26 | 24 |
| 8 | 57 | 45 | 37 | 32 | 54 | 43 | 36 | 31 | 38 | 33 | 28 | 34 | 29 | 26 | 30 | 26 | 24 | 30 | 26 | 24 | 21 |
| 9 | 53 | 41 | 34 | 29 | 50 | 39 | 32 | 28 | 35 | 30 | 26 | 32 | 27 | 24 | 28 | 24 | 22 | 28 | 24 | 22 | 19 |
| 10 | 50 | 38 | 31 | 26 | 47 | 36 | 30 | 25 | 33 | 27 | 23 | 29 | 25 | 21 | 26 | 22 | 20 | 26 | 22 | 20 | 18 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 3186 | 3186 | 3186 |
| 5° | 3191 | 3136 | 3156 |
| 10° | 3160 | 3075 | 3053 |
| 15° | 3117 | 2973 | 2895 |
| 20° | 3060 | 2834 | 2700 |
| 25° | 3001 | 2677 | 2512 |
| 30° | 2922 | 2516 | 2273 |
| 35° | 2845 | 2343 | 2064 |
| 40° | 2766 | 2164 | 1824 |
| 45° | 2675 | 1966 | 1606 |
| 50° | 2580 | 1765 | 1393 |
| 55° | 2482 | 1551 | 1189 |
| 60° | 2368 | 1327 | 979 |
| 65° | 2237 | 1099 | 881 |
| 70° | 2078 | 887 | 798 |
| 75° | 1878 | 782 | 726 |
| 80° | 1589 | 657 | 630 |
| 85° | 1111 | 440 | 475 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
 Vertical Angle: 45°
 Luminance: 2675 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 401.6 | 2.8 |
| 10°-20° | 1102.4 | 7.7 |
| 20°-30° | 1547.8 | 10.7 |
| 30°-40° | 1687.2 | 11.7 |
| 40°-50° | 1550.7 | 10.8 |
| 50°-60° | 1217.8 | 8.5 |
| 60°-70° | 792.7 | 5.5 |
| 70°-80° | 408.0 | 2.8 |
| 80°-90° | 107.5 | 0.7 |
| 90°-100° | 62.9 | 0.4 |
| 100°-110° | 234.6 | 1.6 |
| 110°-120° | 622.2 | 4.3 |
| 120°-130° | 1031.9 | 7.2 |
| 130°-140° | 1096.2 | 7.6 |
| 140°-150° | 1018.8 | 7.1 |
| 150°-160° | 819.1 | 5.7 |
| 160°-170° | 527.8 | 3.7 |
| 170°-180° | 181.7 | 1.3 |
| 0°-30° | 3051.8 | 21.2 |
| 0°-40° | 4738.9 | 32.9 |
| 0°-60° | 7507.5 | 52.1 |
| 0°-90° | 8815.7 | 61.2 |
| 90°-120° | 919.7 | 6.4 |
| 90°-150° | 4066.6 | 28.2 |
| 90°-180° | 5595.0 | 38.8 |
| 0°-180° | 14410.8 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|------|------|-------|------|-------|------|------|
| 0° | 4285 | 4285 | 4285 | 4285 | 4285 | |
| 5° | 4285 | 4266 | 4215 | 4250 | 4238 | 406 |
| 15° | 4076 | 4033 | 3901 | 3827 | 3789 | 1148 |
| 25° | 3699 | 3575 | 3319 | 3160 | 3102 | 1701 |
| 35° | 3188 | 2990 | 2649 | 2404 | 2319 | 1995 |
| 45° | 2606 | 2346 | 1939 | 1663 | 1570 | 2012 |
| 55° | 1981 | 1679 | 1260 | 1028 | 954 | 1771 |
| 65° | 1338 | 1024 | 675 | 543 | 531 | 1326 |
| 75° | 713 | 442 | 310 | 283 | 279 | 755 |
| 85° | 167 | 85 | 74 | 74 | 74 | 191 |
| 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° | 1774 | 1762 | 1779 | 1787 | 1776 | 818 |
| 165° | 1870 | 1862 | 1866 | 1875 | 1866 | 528 |
| 175° | 1913 | 1903 | 1906 | 1915 | 1902 | 182 |
| 180° | 1908 | 1908 | 1908 | 1908 | 1908 | |



TEST NUMBER: P927134

CATALOG NUMBER: DFN2DIP-HX4F0-110D060US830-RLLONL

CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 0° | 4284.9 | 4284.9 | 4284.9 | 4284.9 | 4284.9 |
| 2.5° | 4304.2 | 4284.9 | 4242.1 | 4281.2 | 4273.4 |
| 5° | 4284.9 | 4265.6 | 4215.0 | 4249.9 | 4238.4 |
| 7.5° | 4249.9 | 4226.8 | 4172.5 | 4187.8 | 4168.4 |
| 10° | 4203.5 | 4176.2 | 4098.9 | 4087.0 | 4064.0 |
| 12.5° | 4145.4 | 4110.4 | 4005.5 | 3982.4 | 3939.6 |
| 15° | 4075.5 | 4032.7 | 3901.0 | 3827.4 | 3788.7 |
| 17.5° | 3994.0 | 3931.9 | 3769.0 | 3683.8 | 3621.7 |
| 20° | 3901.0 | 3823.3 | 3629.5 | 3532.8 | 3447.2 |
| 22.5° | 3800.3 | 3710.9 | 3485.9 | 3354.3 | 3296.2 |
| 25° | 3699.4 | 3575.2 | 3319.3 | 3160.5 | 3102.1 |
| 27.5° | 3579.3 | 3447.2 | 3164.2 | 2981.9 | 2892.6 |
| 30° | 3451.3 | 3303.7 | 2993.5 | 2795.9 | 2691.0 |
| 32.5° | 3327.1 | 3148.5 | 2830.9 | 2598.1 | 2501.0 |
| 35° | 3187.6 | 2989.7 | 2648.7 | 2404.3 | 2318.7 |
| 37.5° | 3051.9 | 2838.3 | 2477.9 | 2210.1 | 2113.5 |
| 40° | 2908.3 | 2675.9 | 2299.4 | 2024.1 | 1923.4 |
| 42.5° | 2761.0 | 2512.9 | 2121.3 | 1834.1 | 1737.4 |
| 45° | 2605.9 | 2345.9 | 1939.0 | 1663.3 | 1570.4 |
| 47.5° | 2458.6 | 2183.4 | 1764.5 | 1488.9 | 1403.8 |
| 50° | 2295.6 | 2020.4 | 1593.9 | 1326.0 | 1244.9 |
| 52.5° | 2136.5 | 1845.6 | 1430.9 | 1175.0 | 1101.3 |
| 55° | 1981.3 | 1679.0 | 1260.1 | 1027.7 | 954.1 |
| 57.5° | 1822.6 | 1512.3 | 1109.1 | 892.0 | 829.8 |
| 60° | 1659.6 | 1349.5 | 949.9 | 752.5 | 690.4 |
| 62.5° | 1500.8 | 1190.7 | 814.2 | 628.3 | 597.4 |
| 65° | 1337.9 | 1023.6 | 674.7 | 543.1 | 531.1 |
| 67.5° | 1182.8 | 868.5 | 543.1 | 476.8 | 465.3 |
| 70° | 1019.9 | 717.5 | 449.7 | 411.0 | 395.4 |
| 72.5° | 864.7 | 577.7 | 376.1 | 345.1 | 337.3 |
| 75° | 713.4 | 441.8 | 310.2 | 283.0 | 279.4 |
| 77.5° | 562.4 | 313.9 | 244.4 | 228.7 | 220.9 |
| 80° | 422.5 | 225.1 | 186.0 | 170.8 | 170.8 |
| 82.5° | 294.5 | 151.4 | 128.0 | 120.2 | 120.2 |
| 85° | 166.6 | 85.2 | 73.6 | 73.6 | 73.6 |
| 87.5° | 62.1 | 30.8 | 30.8 | 27.1 | 27.1 |
| 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° | 161.5 | 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 | 100.8 |
| 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 | 109.0 |



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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 | 817.5 | 852.1 | 212.7 | 113.3 |
| 117.5° | 875.5 | 903.1 | 926.7 | 729.1 | 367.3 |
| 120° | 966.7 | 987.4 | 1012.3 | 1028.8 | 842.4 |
| 122.5° | 1043.9 | 1066.1 | 1093.8 | 1102.0 | 1103.5 |
| 125° | 1122.7 | 1140.7 | 1166.9 | 1176.6 | 1180.7 |
| 127.5° | 1194.5 | 1213.8 | 1234.7 | 1248.4 | 1249.8 |
| 130° | 1262.2 | 1284.3 | 1299.4 | 1314.7 | 1313.4 |
| 132.5° | 1331.3 | 1349.3 | 1364.4 | 1376.8 | 1375.5 |
| 135° | 1389.3 | 1411.5 | 1423.7 | 1437.7 | 1434.9 |
| 137.5° | 1449.9 | 1466.5 | 1480.5 | 1494.2 | 1490.2 |
| 140° | 1509.3 | 1520.5 | 1535.6 | 1548.1 | 1541.2 |
| 142.5° | 1559.2 | 1568.9 | 1586.8 | 1597.7 | 1590.8 |
| 145° | 1611.7 | 1610.2 | 1633.6 | 1643.3 | 1636.5 |
| 147.5° | 1657.1 | 1653.0 | 1676.4 | 1683.3 | 1677.9 |
| 150° | 1701.4 | 1691.7 | 1713.8 | 1722.0 | 1715.2 |
| 152.5° | 1738.6 | 1727.6 | 1748.2 | 1756.6 | 1746.9 |
| 155° | 1774.5 | 1762.2 | 1778.8 | 1787.0 | 1776.0 |
| 157.5° | 1803.6 | 1792.5 | 1805.0 | 1814.7 | 1803.6 |
| 160° | 1828.4 | 1820.1 | 1828.4 | 1836.6 | 1827.0 |
| 162.5° | 1850.4 | 1842.2 | 1849.1 | 1858.8 | 1846.4 |
| 165° | 1869.8 | 1861.6 | 1865.7 | 1875.4 | 1865.7 |
| 167.5° | 1885.0 | 1876.7 | 1880.9 | 1890.7 | 1878.1 |
| 170° | 1897.5 | 1889.1 | 1892.0 | 1901.6 | 1889.1 |
| 172.5° | 1905.7 | 1897.5 | 1900.3 | 1910.0 | 1897.5 |
| 175° | 1912.6 | 1902.9 | 1905.7 | 1915.3 | 1901.6 |
| 177.5° | 1915.3 | 1905.7 | 1907.1 | 1916.9 | 1904.4 |
| 180° | 1908.5 | 1908.5 | 1908.5 | 1908.5 | 1908.5 |



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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 | 12.16 | 13.09 | 13.02 | 13.97 | 15.07 | 8.13 | 9.06 | 8.99 | 9.94 | 11.05 |
| | 3H | 13.84 | 14.68 | 14.72 | 15.56 | 16.70 | 9.33 | 10.16 | 10.20 | 11.05 | 12.18 |
| | 4H | 14.46 | 15.24 | 15.35 | 16.14 | 17.28 | 9.79 | 10.57 | 10.68 | 11.46 | 12.61 |
| | 6H | 14.89 | 15.61 | 15.79 | 16.51 | 17.66 | 10.11 | 10.84 | 11.02 | 11.74 | 12.89 |
| | 8H | 15.01 | 15.70 | 15.93 | 16.62 | 17.77 | 10.21 | 10.90 | 11.12 | 11.81 | 12.97 |
| | 12H | 15.08 | 15.73 | 16.00 | 16.65 | 17.83 | 10.26 | 10.91 | 11.17 | 11.82 | 13.00 |
| 4H | 2H | 12.19 | 12.97 | 13.08 | 13.87 | 15.01 | 8.74 | 9.52 | 9.64 | 10.42 | 11.56 |
| | 3H | 14.03 | 14.68 | 14.93 | 15.61 | 16.76 | 10.10 | 10.75 | 11.01 | 11.68 | 12.84 |
| | 4H | 14.73 | 15.32 | 15.64 | 16.24 | 17.42 | 10.65 | 11.25 | 11.57 | 12.17 | 13.35 |
| | 6H | 15.25 | 15.76 | 16.18 | 16.70 | 17.89 | 11.08 | 11.59 | 12.01 | 12.54 | 13.72 |
| | 8H | 15.42 | 15.90 | 16.36 | 16.84 | 18.04 | 11.21 | 11.69 | 12.15 | 12.63 | 13.83 |
| | 12H | 15.52 | 15.95 | 16.48 | 16.91 | 18.11 | 11.28 | 11.71 | 12.24 | 12.67 | 13.87 |
| 8H | 4H | 14.70 | 15.18 | 15.63 | 16.12 | 17.31 | 10.94 | 11.42 | 11.88 | 12.36 | 13.56 |
| | 6H | 15.27 | 15.67 | 16.23 | 16.65 | 17.84 | 11.47 | 11.86 | 12.43 | 12.84 | 14.04 |
| | 8H | 15.49 | 15.84 | 16.46 | 16.81 | 18.02 | 11.66 | 12.01 | 12.63 | 12.98 | 14.19 |
| | 12H | 15.63 | 15.94 | 16.60 | 16.90 | 18.17 | 11.78 | 12.09 | 12.76 | 13.06 | 14.32 |
| 12H | 4H | 14.66 | 15.09 | 15.61 | 16.04 | 17.25 | 10.95 | 11.38 | 11.90 | 12.34 | 13.54 |
| | 6H | 15.25 | 15.60 | 16.22 | 16.57 | 17.78 | 11.52 | 11.87 | 12.49 | 12.84 | 14.05 |
| | 8H | 15.47 | 15.78 | 16.44 | 16.74 | 18.01 | 11.73 | 12.04 | 12.70 | 13.00 | 14.27 |