

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: P916429

Luminaire Tested: DFN2DIP-HX4F0-090D100US930-RLLFLL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P916429
REPORT IS A COMBINATION OF REPORTS P899418 AND P896188
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-HX4F0-090D100US930-RLLFLL
Description: 4 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens
Light Source: -
Ballast/Driver: -

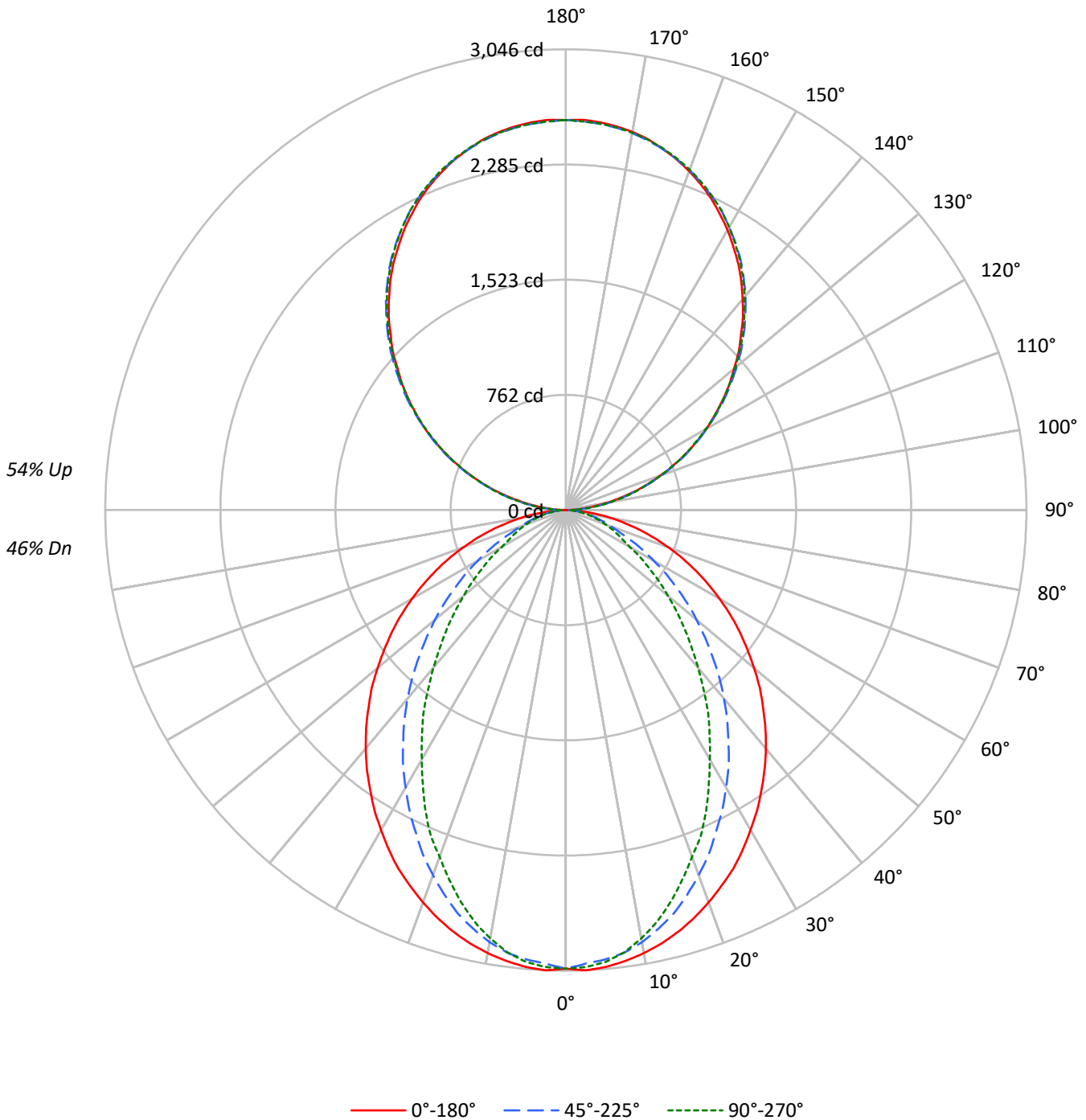
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 13452.5 lumens
Efficiency: N/A
Efficacy: 91.9 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: General Diffuse

Input Watts (W): 146.4
Input Voltage (V):
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.9821
Total Harmonic Distortion (THDi): 0.08
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: P916429

CATALOG NUMBER: DFN2DIP-HX4F0-090D100US930-RLFL

COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

| | | | | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RF | 20 | | | | 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 | 106 | 106 | 106 | 106 | 98 | 98 | 98 | 98 | 81 | 81 | 81 | 66 | 66 | 66 | 53 | 53 | 53 | 46 | | | | 46 |
| 1 | 97 | 93 | 90 | 86 | 89 | 86 | 83 | 80 | 72 | 70 | 68 | 59 | 58 | 56 | 47 | 46 | 45 | 40 | | | | 40 |
| 2 | 89 | 82 | 76 | 71 | 82 | 76 | 71 | 66 | 64 | 60 | 57 | 52 | 50 | 48 | 42 | 41 | 39 | 34 | | | | 34 |
| 3 | 82 | 72 | 65 | 60 | 75 | 67 | 61 | 56 | 56 | 52 | 48 | 47 | 44 | 41 | 38 | 36 | 34 | 30 | | | | 30 |
| 4 | 75 | 64 | 57 | 51 | 69 | 60 | 53 | 48 | 50 | 45 | 41 | 42 | 38 | 35 | 34 | 32 | 29 | 26 | | | | 26 |
| 5 | 69 | 58 | 50 | 44 | 63 | 53 | 46 | 41 | 45 | 40 | 36 | 38 | 34 | 31 | 31 | 28 | 26 | 23 | | | | 23 |
| 6 | 63 | 52 | 44 | 38 | 58 | 48 | 41 | 36 | 41 | 36 | 32 | 34 | 30 | 27 | 28 | 25 | 23 | 20 | | | | 20 |
| 7 | 59 | 47 | 39 | 34 | 54 | 44 | 37 | 32 | 37 | 32 | 28 | 31 | 27 | 24 | 26 | 23 | 21 | 18 | | | | 18 |
| 8 | 55 | 43 | 35 | 30 | 50 | 40 | 33 | 28 | 34 | 29 | 25 | 29 | 25 | 22 | 24 | 21 | 19 | 16 | | | | 16 |
| 9 | 51 | 39 | 32 | 27 | 47 | 36 | 30 | 25 | 31 | 26 | 23 | 27 | 23 | 20 | 22 | 19 | 17 | 15 | | | | 15 |
| 10 | 48 | 36 | 29 | 24 | 44 | 33 | 27 | 23 | 29 | 24 | 20 | 25 | 21 | 18 | 21 | 18 | 15 | 13 | | | | 13 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 2255 | 2255 | 2255 |
| 5° | 2259 | 2219 | 2233 |
| 10° | 2237 | 2176 | 2161 |
| 15° | 2206 | 2104 | 2049 |
| 20° | 2165 | 2005 | 1911 |
| 25° | 2124 | 1895 | 1778 |
| 30° | 2068 | 1781 | 1609 |
| 35° | 2013 | 1658 | 1461 |
| 40° | 1958 | 1532 | 1291 |
| 45° | 1893 | 1391 | 1137 |
| 50° | 1826 | 1249 | 986 |
| 55° | 1757 | 1098 | 841 |
| 60° | 1676 | 939 | 693 |
| 65° | 1583 | 778 | 624 |
| 70° | 1471 | 628 | 564 |
| 75° | 1329 | 554 | 514 |
| 80° | 1125 | 465 | 446 |
| 85° | 786 | 312 | 336 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 90°
 Vertical Angle: 90°
 Luminance: 1946 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 284.2 | 2.1 |
| 10°-20° | 780.3 | 5.8 |
| 20°-30° | 1095.5 | 8.1 |
| 30°-40° | 1194.1 | 8.9 |
| 40°-50° | 1097.5 | 8.2 |
| 50°-60° | 861.9 | 6.4 |
| 60°-70° | 561.0 | 4.2 |
| 70°-80° | 288.8 | 2.1 |
| 80°-90° | 81.0 | 0.6 |
| 90°-100° | 159.6 | 1.2 |
| 100°-110° | 507.0 | 3.8 |
| 110°-120° | 867.6 | 6.4 |
| 120°-130° | 1141.0 | 8.5 |
| 130°-140° | 1280.7 | 9.5 |
| 140°-150° | 1255.9 | 9.3 |
| 150°-160° | 1053.5 | 7.8 |
| 160°-170° | 698.7 | 5.2 |
| 170°-180° | 244.2 | 1.8 |
| 0°-30° | 2159.9 | 16.1 |
| 0°-40° | 3354.0 | 24.9 |
| 0°-60° | 5313.5 | 39.5 |
| 0°-90° | 6244.4 | 46.4 |
| 90°-120° | 1534.1 | 11.4 |
| 90°-150° | 5211.7 | 38.7 |
| 90°-180° | 7208.0 | 53.6 |
| 0°-180° | 13452.5 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|------|------|-------|------|-------|------|------|
| 0° | 3033 | 3033 | 3033 | 3033 | 3033 | |
| 5° | 3033 | 3019 | 2983 | 3008 | 3000 | 288 |
| 15° | 2884 | 2854 | 2761 | 2709 | 2682 | 813 |
| 25° | 2618 | 2530 | 2349 | 2237 | 2196 | 1204 |
| 35° | 2256 | 2116 | 1875 | 1702 | 1641 | 1412 |
| 45° | 1844 | 1660 | 1372 | 1177 | 1111 | 1424 |
| 55° | 1402 | 1188 | 892 | 727 | 675 | 1253 |
| 65° | 947 | 724 | 478 | 384 | 376 | 939 |
| 75° | 505 | 313 | 220 | 200 | 198 | 534 |
| 85° | 118 | 60 | 52 | 52 | 52 | 135 |
| 90° | 2 | 28 | 76 | 72 | 74 | 13 |
| 95° | 114 | 135 | 139 | 139 | 135 | 126 |
| 105° | 468 | 474 | 479 | 483 | 483 | 494 |
| 115° | 871 | 883 | 879 | 877 | 871 | 861 |
| 125° | 1266 | 1286 | 1280 | 1272 | 1270 | 1132 |
| 135° | 1638 | 1662 | 1667 | 1664 | 1658 | 1266 |
| 145° | 1988 | 2004 | 2016 | 2019 | 2010 | 1242 |
| 155° | 2274 | 2280 | 2287 | 2298 | 2291 | 1047 |
| 165° | 2474 | 2471 | 2471 | 2487 | 2476 | 698 |
| 175° | 2574 | 2568 | 2563 | 2578 | 2565 | 245 |
| 180° | 2578 | 2578 | 2578 | 2578 | 2578 | |



TEST NUMBER: P916429

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CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 0° | 3032.7 | 3032.7 | 3032.7 | 3032.7 | 3032.7 |
| 2.5° | 3046.4 | 3032.7 | 3002.3 | 3030.1 | 3024.5 |
| 5° | 3032.7 | 3019.0 | 2983.2 | 3007.9 | 2999.7 |
| 7.5° | 3007.9 | 2991.6 | 2953.2 | 2963.9 | 2950.2 |
| 10° | 2975.0 | 2955.8 | 2901.1 | 2892.6 | 2876.3 |
| 12.5° | 2933.9 | 2909.2 | 2835.0 | 2818.6 | 2788.3 |
| 15° | 2884.4 | 2854.2 | 2761.0 | 2708.8 | 2681.5 |
| 17.5° | 2826.8 | 2782.9 | 2667.5 | 2607.2 | 2563.3 |
| 20° | 2761.0 | 2706.0 | 2568.8 | 2500.4 | 2439.8 |
| 22.5° | 2689.7 | 2626.5 | 2467.2 | 2374.0 | 2333.0 |
| 25° | 2618.3 | 2530.4 | 2349.3 | 2236.9 | 2195.5 |
| 27.5° | 2533.3 | 2439.8 | 2239.5 | 2110.5 | 2047.3 |
| 30° | 2442.7 | 2338.2 | 2118.6 | 1978.9 | 1904.6 |
| 32.5° | 2354.7 | 2228.4 | 2003.6 | 1838.8 | 1770.1 |
| 35° | 2256.1 | 2116.0 | 1874.6 | 1701.7 | 1641.1 |
| 37.5° | 2160.0 | 2008.9 | 1753.8 | 1564.2 | 1495.8 |
| 40° | 2058.4 | 1893.9 | 1627.4 | 1432.6 | 1361.3 |
| 42.5° | 1954.1 | 1778.6 | 1501.3 | 1298.1 | 1229.6 |
| 45° | 1844.4 | 1660.4 | 1372.3 | 1177.2 | 1111.4 |
| 47.5° | 1740.1 | 1545.3 | 1248.9 | 1053.8 | 993.5 |
| 50° | 1624.8 | 1430.0 | 1128.0 | 938.5 | 881.1 |
| 52.5° | 1512.1 | 1306.3 | 1012.8 | 831.6 | 779.5 |
| 55° | 1402.3 | 1188.3 | 891.9 | 727.4 | 675.2 |
| 57.5° | 1290.0 | 1070.4 | 785.1 | 631.3 | 587.3 |
| 60° | 1174.6 | 955.0 | 672.4 | 532.6 | 488.6 |
| 62.5° | 1062.3 | 842.7 | 576.3 | 444.7 | 422.8 |
| 65° | 946.9 | 724.5 | 477.5 | 384.3 | 375.9 |
| 67.5° | 837.1 | 614.7 | 384.3 | 337.5 | 329.3 |
| 70° | 721.9 | 507.8 | 318.3 | 290.9 | 279.8 |
| 72.5° | 612.0 | 408.8 | 266.1 | 244.3 | 238.8 |
| 75° | 504.9 | 312.7 | 219.6 | 200.3 | 197.7 |
| 77.5° | 398.0 | 222.2 | 172.9 | 161.9 | 156.4 |
| 80° | 299.1 | 159.3 | 131.6 | 120.8 | 120.8 |
| 82.5° | 208.5 | 107.1 | 90.6 | 85.0 | 85.0 |
| 85° | 117.9 | 60.3 | 52.1 | 52.1 | 52.1 |
| 87.5° | 43.9 | 21.8 | 21.8 | 19.2 | 19.2 |
| 90° | 2.4 | 28.0 | 76.1 | 71.5 | 73.9 |
| 92.5° | 48.2 | 65.3 | 67.7 | 70.0 | 70.0 |
| 95° | 113.5 | 135.3 | 139.2 | 139.2 | 135.3 |
| 97.5° | 188.9 | 209.1 | 217.7 | 217.7 | 217.7 |
| 100° | 276.0 | 293.8 | 300.0 | 300.0 | 297.7 |
| 102.5° | 367.7 | 380.9 | 389.5 | 391.8 | 389.5 |
| 105° | 468.0 | 474.2 | 478.8 | 482.7 | 482.7 |
| 107.5° | 567.4 | 576.8 | 576.8 | 578.4 | 567.4 |
| 110° | 663.9 | 676.3 | 676.3 | 676.3 | 670.1 |



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CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 768.0 | 781.2 | 778.9 | 772.7 | 768.0 |
| 115° | 870.7 | 883.0 | 879.2 | 876.9 | 870.7 |
| 117.5° | 972.5 | 989.6 | 978.7 | 972.5 | 966.2 |
| 120° | 1075.1 | 1092.2 | 1075.1 | 1075.1 | 1068.1 |
| 122.5° | 1168.3 | 1190.1 | 1179.2 | 1173.1 | 1168.3 |
| 125° | 1266.3 | 1285.7 | 1279.5 | 1272.5 | 1270.2 |
| 127.5° | 1362.0 | 1386.0 | 1377.4 | 1368.2 | 1362.0 |
| 130° | 1451.3 | 1479.3 | 1475.4 | 1470.7 | 1462.2 |
| 132.5° | 1551.6 | 1573.4 | 1574.9 | 1564.1 | 1557.8 |
| 135° | 1637.9 | 1662.0 | 1666.6 | 1664.3 | 1658.1 |
| 137.5° | 1734.3 | 1753.7 | 1757.6 | 1756.1 | 1746.7 |
| 140° | 1819.0 | 1838.4 | 1849.3 | 1849.3 | 1840.8 |
| 142.5° | 1906.1 | 1925.5 | 1931.7 | 1934.1 | 1925.5 |
| 145° | 1988.4 | 2004.0 | 2016.5 | 2018.8 | 2010.2 |
| 147.5° | 2062.3 | 2081.8 | 2091.1 | 2095.0 | 2086.4 |
| 150° | 2138.5 | 2151.7 | 2160.3 | 2167.2 | 2160.3 |
| 152.5° | 2206.1 | 2219.3 | 2230.2 | 2238.8 | 2230.2 |
| 155° | 2273.8 | 2280.0 | 2287.0 | 2297.8 | 2290.8 |
| 157.5° | 2332.1 | 2336.7 | 2340.6 | 2356.1 | 2345.3 |
| 160° | 2384.2 | 2388.8 | 2391.1 | 2404.3 | 2395.0 |
| 162.5° | 2432.4 | 2432.4 | 2434.6 | 2449.4 | 2438.6 |
| 165° | 2473.5 | 2471.2 | 2471.2 | 2486.7 | 2475.9 |
| 167.5° | 2510.9 | 2503.9 | 2503.9 | 2519.4 | 2508.5 |
| 170° | 2538.8 | 2532.6 | 2530.3 | 2545.9 | 2532.6 |
| 172.5° | 2558.2 | 2552.0 | 2549.7 | 2565.3 | 2552.0 |
| 175° | 2573.8 | 2567.6 | 2563.0 | 2578.5 | 2565.3 |
| 177.5° | 2582.4 | 2576.2 | 2571.5 | 2584.7 | 2571.5 |
| 180° | 2578.5 | 2578.5 | 2578.5 | 2578.5 | 2578.5 |



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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 | 9.63 | 10.43 | 10.62 | 11.43 | 12.75 | 5.60 | 6.40 | 6.59 | 7.40 | 8.73 |
| | 3H | 11.30 | 12.02 | 12.31 | 13.03 | 14.38 | 6.79 | 7.51 | 7.79 | 8.52 | 9.86 |
| | 4H | 11.91 | 12.59 | 12.93 | 13.60 | 14.96 | 7.24 | 7.92 | 8.26 | 8.93 | 10.28 |
| | 6H | 12.33 | 12.96 | 13.36 | 13.97 | 15.34 | 7.56 | 8.18 | 8.59 | 9.20 | 10.57 |
| | 8H | 12.46 | 13.05 | 13.49 | 14.09 | 15.45 | 7.65 | 8.24 | 8.68 | 9.28 | 10.64 |
| | 12H | 12.52 | 13.08 | 13.56 | 14.11 | 15.50 | 7.69 | 8.26 | 8.73 | 9.29 | 10.67 |
| 4H | 2H | 9.64 | 10.32 | 10.67 | 11.33 | 12.69 | 6.19 | 6.87 | 7.22 | 7.88 | 9.24 |
| | 3H | 11.47 | 12.03 | 12.50 | 13.08 | 14.44 | 7.54 | 8.11 | 8.57 | 9.15 | 10.51 |
| | 4H | 12.16 | 12.68 | 13.20 | 13.71 | 15.10 | 8.09 | 8.61 | 9.13 | 9.64 | 11.03 |
| | 6H | 12.68 | 13.12 | 13.73 | 14.18 | 15.56 | 8.51 | 8.95 | 9.56 | 10.01 | 11.39 |
| | 8H | 12.85 | 13.26 | 13.90 | 14.31 | 15.71 | 8.64 | 9.05 | 9.69 | 10.10 | 11.50 |
| | 12H | 12.95 | 13.32 | 14.01 | 14.38 | 15.79 | 8.70 | 9.08 | 9.77 | 10.14 | 11.55 |
| 8H | 4H | 12.13 | 12.54 | 13.18 | 13.59 | 14.99 | 8.37 | 8.78 | 9.42 | 9.83 | 11.23 |
| | 6H | 12.69 | 13.04 | 13.77 | 14.13 | 15.52 | 8.89 | 9.23 | 9.96 | 10.32 | 11.72 |
| | 8H | 12.91 | 13.21 | 13.99 | 14.29 | 15.70 | 9.08 | 9.38 | 10.16 | 10.46 | 11.87 |
| | 12H | 13.05 | 13.31 | 14.13 | 14.38 | 15.84 | 9.20 | 9.46 | 10.28 | 10.53 | 11.99 |
| 12H | 4H | 12.08 | 12.45 | 13.15 | 13.52 | 14.92 | 8.37 | 8.75 | 9.44 | 9.81 | 11.21 |
| | 6H | 12.67 | 12.97 | 13.75 | 14.05 | 15.46 | 8.94 | 9.24 | 10.02 | 10.31 | 11.73 |
| | 8H | 12.89 | 13.15 | 13.97 | 14.22 | 15.68 | 9.15 | 9.41 | 10.23 | 10.48 | 11.94 |