

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: P909622

Luminaire Tested: DFN2DIP-SQ4F0-120D090US840-RLLFLL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P909622
REPORT IS A COMBINATION OF REPORTS P900126 AND P896915
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-SQ4F0-120D090US840-RLLFLL
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens
Light Source: -
Ballast/Driver: -

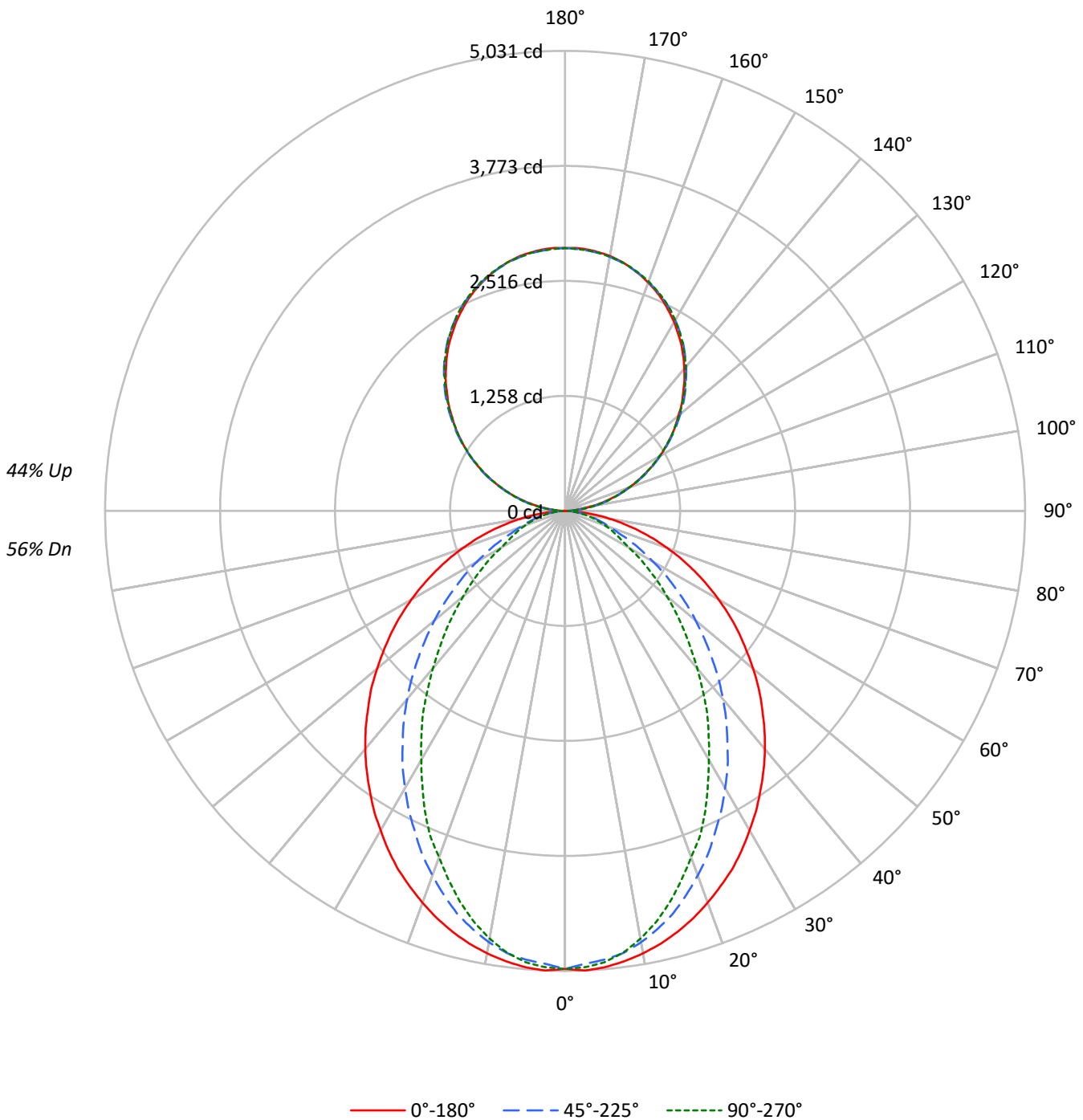
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 18344.2 lumens
Efficiency: N/A
Efficacy: 99.5 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')
CIE Type: General Diffuse

Input Watts (W): 184.3
Input Voltage (V):
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.9933
Total Harmonic Distortion (THDi): 0.066
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: P909622

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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 | 109 | 109 | 109 | 109 | 101 | 101 | 101 | 101 | 87 | 87 | 87 | 74 | 74 | 74 | 62 | 62 | 62 | 56 | 56 | 56 | 56 |
| 1 | 100 | 96 | 92 | 88 | 93 | 89 | 86 | 83 | 77 | 75 | 72 | 66 | 64 | 63 | 55 | 54 | 53 | 48 | 48 | 48 | 48 |
| 2 | 91 | 84 | 78 | 73 | 85 | 79 | 73 | 69 | 68 | 64 | 61 | 58 | 56 | 53 | 49 | 47 | 46 | 41 | 41 | 41 | 41 |
| 3 | 84 | 74 | 67 | 62 | 78 | 70 | 63 | 58 | 61 | 56 | 52 | 52 | 49 | 46 | 44 | 42 | 40 | 36 | 36 | 36 | 36 |
| 4 | 77 | 66 | 59 | 53 | 71 | 62 | 55 | 50 | 54 | 49 | 45 | 47 | 43 | 40 | 40 | 37 | 35 | 31 | 31 | 31 | 31 |
| 5 | 71 | 59 | 51 | 46 | 66 | 56 | 49 | 43 | 49 | 43 | 39 | 42 | 38 | 35 | 36 | 33 | 30 | 27 | 27 | 27 | 27 |
| 6 | 65 | 53 | 46 | 40 | 61 | 50 | 43 | 38 | 44 | 38 | 34 | 38 | 34 | 31 | 33 | 30 | 27 | 24 | 24 | 24 | 24 |
| 7 | 61 | 48 | 41 | 35 | 56 | 46 | 39 | 34 | 40 | 35 | 30 | 35 | 31 | 27 | 30 | 27 | 24 | 22 | 22 | 22 | 22 |
| 8 | 56 | 44 | 37 | 31 | 52 | 42 | 35 | 30 | 37 | 31 | 27 | 32 | 28 | 25 | 28 | 25 | 22 | 20 | 20 | 20 | 20 |
| 9 | 53 | 41 | 33 | 28 | 49 | 38 | 32 | 27 | 34 | 28 | 25 | 30 | 25 | 22 | 26 | 23 | 20 | 18 | 18 | 18 | 18 |
| 10 | 49 | 37 | 30 | 25 | 46 | 35 | 29 | 24 | 31 | 26 | 22 | 28 | 23 | 20 | 24 | 21 | 18 | 16 | 16 | 16 | 16 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 3514 | 3514 | 3514 |
| 5° | 3520 | 3459 | 3482 |
| 10° | 3485 | 3392 | 3369 |
| 15° | 3437 | 3281 | 3195 |
| 20° | 3373 | 3127 | 2981 |
| 25° | 3308 | 2954 | 2774 |
| 30° | 3221 | 2777 | 2512 |
| 35° | 3136 | 2587 | 2281 |
| 40° | 3048 | 2390 | 2016 |
| 45° | 2947 | 2171 | 1776 |
| 50° | 2843 | 1950 | 1542 |
| 55° | 2734 | 1714 | 1316 |
| 60° | 2607 | 1466 | 1085 |
| 65° | 2462 | 1215 | 977 |
| 70° | 2285 | 981 | 886 |
| 75° | 2064 | 866 | 808 |
| 80° | 1743 | 729 | 704 |
| 85° | 1214 | 490 | 536 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
 Vertical Angle: 45°
 Luminance: 2947 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 469.4 | 2.6 |
| 10°-20° | 1288.6 | 7.0 |
| 20°-30° | 1809.2 | 9.9 |
| 30°-40° | 1972.1 | 10.8 |
| 40°-50° | 1812.6 | 9.9 |
| 50°-60° | 1423.5 | 7.8 |
| 60°-70° | 926.6 | 5.1 |
| 70°-80° | 476.9 | 2.6 |
| 80°-90° | 129.9 | 0.7 |
| 90°-100° | 177.9 | 1.0 |
| 100°-110° | 565.2 | 3.1 |
| 110°-120° | 967.2 | 5.3 |
| 120°-130° | 1272.0 | 6.9 |
| 130°-140° | 1427.7 | 7.8 |
| 140°-150° | 1400.0 | 7.6 |
| 150°-160° | 1174.4 | 6.4 |
| 160°-170° | 778.9 | 4.2 |
| 170°-180° | 272.2 | 1.5 |
| 0°-30° | 3567.2 | 19.4 |
| 0°-40° | 5539.3 | 30.2 |
| 0°-60° | 8775.3 | 47.8 |
| 0°-90° | 10308.8 | 56.2 |
| 90°-120° | 1710.2 | 9.3 |
| 90°-150° | 5809.9 | 31.7 |
| 90°-180° | 8035.0 | 43.8 |
| 0°-180° | 18344.2 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|------|------|-------|------|-------|------|------|
| 0° | 5008 | 5008 | 5008 | 5008 | 5008 | |
| 5° | 5008 | 4986 | 4927 | 4968 | 4954 | 475 |
| 15° | 4764 | 4714 | 4560 | 4474 | 4429 | 1342 |
| 25° | 4324 | 4179 | 3880 | 3694 | 3626 | 1989 |
| 35° | 3726 | 3495 | 3096 | 2810 | 2710 | 2332 |
| 45° | 3046 | 2742 | 2266 | 1944 | 1836 | 2352 |
| 55° | 2316 | 1963 | 1473 | 1201 | 1115 | 2070 |
| 65° | 1564 | 1196 | 789 | 635 | 621 | 1550 |
| 75° | 834 | 516 | 363 | 331 | 326 | 882 |
| 85° | 195 | 100 | 86 | 86 | 86 | 224 |
| 90° | 3 | 31 | 85 | 80 | 82 | 18 |
| 95° | 126 | 151 | 155 | 155 | 151 | 141 |
| 105° | 522 | 529 | 534 | 538 | 538 | 551 |
| 115° | 971 | 984 | 980 | 978 | 971 | 960 |
| 125° | 1412 | 1433 | 1426 | 1419 | 1416 | 1261 |
| 135° | 1826 | 1853 | 1858 | 1855 | 1848 | 1411 |
| 145° | 2217 | 2234 | 2248 | 2250 | 2241 | 1385 |
| 155° | 2535 | 2542 | 2550 | 2562 | 2554 | 1167 |
| 165° | 2757 | 2755 | 2755 | 2772 | 2760 | 778 |
| 175° | 2869 | 2862 | 2857 | 2874 | 2860 | 273 |
| 180° | 2874 | 2874 | 2874 | 2874 | 2874 | |



TEST NUMBER: P909622

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CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 0° | 5008.5 | 5008.5 | 5008.5 | 5008.5 | 5008.5 |
| 2.5° | 5031.2 | 5008.5 | 4958.5 | 5004.2 | 4995.0 |
| 5° | 5008.5 | 4985.9 | 4926.7 | 4967.6 | 4954.2 |
| 7.5° | 4967.6 | 4940.7 | 4877.2 | 4895.0 | 4872.4 |
| 10° | 4913.3 | 4881.6 | 4791.1 | 4777.2 | 4750.3 |
| 12.5° | 4845.4 | 4804.6 | 4681.9 | 4655.1 | 4605.1 |
| 15° | 4763.7 | 4713.7 | 4559.8 | 4473.7 | 4428.6 |
| 17.5° | 4668.5 | 4595.9 | 4405.4 | 4306.0 | 4233.4 |
| 20° | 4559.8 | 4469.0 | 4242.4 | 4129.4 | 4029.4 |
| 22.5° | 4442.0 | 4337.7 | 4074.6 | 3920.7 | 3852.9 |
| 25° | 4324.2 | 4178.9 | 3879.8 | 3694.2 | 3625.9 |
| 27.5° | 4183.8 | 4029.4 | 3698.5 | 3485.6 | 3381.1 |
| 30° | 4034.2 | 3861.6 | 3499.0 | 3268.1 | 3145.5 |
| 32.5° | 3889.0 | 3680.3 | 3309.0 | 3036.9 | 2923.4 |
| 35° | 3726.0 | 3494.6 | 3095.9 | 2810.4 | 2710.3 |
| 37.5° | 3567.2 | 3317.7 | 2896.4 | 2583.3 | 2470.3 |
| 40° | 3399.4 | 3127.8 | 2687.8 | 2366.0 | 2248.2 |
| 42.5° | 3227.2 | 2937.3 | 2479.5 | 2143.8 | 2030.8 |
| 45° | 3046.0 | 2742.1 | 2266.4 | 1944.3 | 1835.5 |
| 47.5° | 2873.8 | 2552.1 | 2062.5 | 1740.4 | 1640.8 |
| 50° | 2683.4 | 2361.7 | 1863.0 | 1549.9 | 1455.2 |
| 52.5° | 2497.3 | 2157.3 | 1672.5 | 1373.4 | 1287.4 |
| 55° | 2316.0 | 1962.6 | 1473.0 | 1201.2 | 1115.2 |
| 57.5° | 2130.3 | 1767.8 | 1296.5 | 1042.6 | 970.0 |
| 60° | 1940.0 | 1577.3 | 1110.3 | 879.6 | 807.0 |
| 62.5° | 1754.3 | 1391.7 | 951.7 | 734.4 | 698.2 |
| 65° | 1563.9 | 1196.5 | 788.7 | 634.8 | 620.9 |
| 67.5° | 1382.6 | 1015.1 | 634.8 | 557.3 | 543.9 |
| 70° | 1192.1 | 838.7 | 525.6 | 480.4 | 462.1 |
| 72.5° | 1010.9 | 675.2 | 439.5 | 403.4 | 394.4 |
| 75° | 833.8 | 516.4 | 362.6 | 330.8 | 326.5 |
| 77.5° | 657.4 | 366.9 | 285.7 | 267.4 | 258.2 |
| 80° | 493.9 | 263.1 | 217.3 | 199.5 | 199.5 |
| 82.5° | 344.4 | 176.9 | 149.6 | 140.4 | 140.4 |
| 85° | 194.8 | 99.6 | 86.0 | 86.0 | 86.0 |
| 87.5° | 72.6 | 36.1 | 36.1 | 31.7 | 31.7 |
| 90° | 2.6 | 31.2 | 84.9 | 79.7 | 82.3 |
| 92.5° | 53.7 | 72.8 | 75.4 | 78.0 | 78.0 |
| 95° | 126.5 | 150.8 | 155.1 | 155.1 | 150.8 |
| 97.5° | 210.6 | 233.1 | 242.7 | 242.7 | 242.7 |
| 100° | 307.6 | 327.6 | 334.5 | 334.5 | 331.9 |
| 102.5° | 409.9 | 424.6 | 434.1 | 436.8 | 434.1 |
| 105° | 521.7 | 528.6 | 533.8 | 538.2 | 538.2 |
| 107.5° | 632.6 | 643.0 | 643.0 | 644.7 | 632.6 |
| 110° | 740.0 | 754.0 | 754.0 | 754.0 | 747.0 |



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CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 856.2 | 870.9 | 868.3 | 861.4 | 856.2 |
| 115° | 970.6 | 984.4 | 980.1 | 977.5 | 970.6 |
| 117.5° | 1084.1 | 1103.2 | 1091.1 | 1084.1 | 1077.1 |
| 120° | 1198.5 | 1217.5 | 1198.5 | 1198.5 | 1190.6 |
| 122.5° | 1302.4 | 1326.8 | 1314.6 | 1307.7 | 1302.4 |
| 125° | 1411.7 | 1433.3 | 1426.4 | 1418.6 | 1416.0 |
| 127.5° | 1518.2 | 1545.1 | 1535.6 | 1525.2 | 1518.2 |
| 130° | 1617.9 | 1649.1 | 1644.8 | 1639.5 | 1630.0 |
| 132.5° | 1729.7 | 1753.9 | 1755.7 | 1743.5 | 1736.7 |
| 135° | 1825.8 | 1852.7 | 1858.0 | 1855.3 | 1848.5 |
| 137.5° | 1933.3 | 1955.0 | 1959.3 | 1957.6 | 1947.2 |
| 140° | 2027.8 | 2049.4 | 2061.5 | 2061.5 | 2052.0 |
| 142.5° | 2124.9 | 2146.5 | 2153.4 | 2156.1 | 2146.5 |
| 145° | 2216.8 | 2234.0 | 2247.9 | 2250.5 | 2241.0 |
| 147.5° | 2299.1 | 2320.7 | 2331.1 | 2335.4 | 2325.9 |
| 150° | 2384.0 | 2398.7 | 2408.2 | 2416.0 | 2408.2 |
| 152.5° | 2459.3 | 2474.1 | 2486.2 | 2495.8 | 2486.2 |
| 155° | 2534.8 | 2541.6 | 2549.5 | 2561.6 | 2553.8 |
| 157.5° | 2599.7 | 2604.9 | 2609.3 | 2626.6 | 2614.4 |
| 160° | 2657.8 | 2663.0 | 2665.6 | 2680.3 | 2669.9 |
| 162.5° | 2711.5 | 2711.5 | 2714.1 | 2730.6 | 2718.5 |
| 165° | 2757.4 | 2754.8 | 2754.8 | 2772.2 | 2760.1 |
| 167.5° | 2799.0 | 2791.3 | 2791.3 | 2808.5 | 2796.4 |
| 170° | 2830.2 | 2823.3 | 2820.8 | 2838.0 | 2823.3 |
| 172.5° | 2851.9 | 2845.0 | 2842.4 | 2859.7 | 2845.0 |
| 175° | 2869.2 | 2862.3 | 2857.1 | 2874.5 | 2859.7 |
| 177.5° | 2878.7 | 2871.9 | 2866.6 | 2881.3 | 2866.6 |
| 180° | 2874.5 | 2874.5 | 2874.5 | 2874.5 | 2874.5 |



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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 | 12.09 | 12.97 | 12.99 | 13.89 | 15.07 | 8.05 | 8.93 | 8.96 | 9.85 | 11.04 |
| | 3H | 13.77 | 14.56 | 14.69 | 15.49 | 16.70 | 9.24 | 10.03 | 10.16 | 10.96 | 12.17 |
| | 4H | 14.39 | 15.13 | 15.32 | 16.07 | 17.29 | 9.69 | 10.44 | 10.63 | 11.38 | 12.59 |
| | 6H | 14.81 | 15.50 | 15.76 | 16.44 | 17.67 | 10.02 | 10.70 | 10.96 | 11.65 | 12.88 |
| | 8H | 14.94 | 15.60 | 15.90 | 16.56 | 17.78 | 10.11 | 10.76 | 11.06 | 11.72 | 12.95 |
| | 12H | 15.01 | 15.63 | 15.97 | 16.58 | 17.84 | 10.15 | 10.78 | 11.11 | 11.73 | 12.98 |
| 4H | 2H | 12.11 | 12.86 | 13.05 | 13.79 | 15.01 | 8.65 | 9.40 | 9.59 | 10.33 | 11.55 |
| | 3H | 13.95 | 14.57 | 14.90 | 15.54 | 16.77 | 10.01 | 10.63 | 10.96 | 11.59 | 12.83 |
| | 4H | 14.65 | 15.21 | 15.61 | 16.17 | 17.43 | 10.56 | 11.12 | 11.52 | 12.08 | 13.34 |
| | 6H | 15.17 | 15.65 | 16.14 | 16.64 | 17.90 | 10.98 | 11.47 | 11.95 | 12.45 | 13.71 |
| | 8H | 15.35 | 15.80 | 16.32 | 16.78 | 18.05 | 11.11 | 11.56 | 12.09 | 12.54 | 13.81 |
| | 12H | 15.45 | 15.86 | 16.44 | 16.85 | 18.13 | 11.18 | 11.59 | 12.17 | 12.58 | 13.86 |
| 8H | 4H | 14.62 | 15.07 | 15.59 | 16.05 | 17.32 | 10.84 | 11.30 | 11.82 | 12.28 | 13.55 |
| | 6H | 15.19 | 15.57 | 16.19 | 16.59 | 17.85 | 11.37 | 11.74 | 12.37 | 12.76 | 14.03 |
| | 8H | 15.41 | 15.74 | 16.42 | 16.75 | 18.04 | 11.56 | 11.89 | 12.57 | 12.90 | 14.18 |
| | 12H | 15.55 | 15.85 | 16.57 | 16.85 | 18.18 | 11.68 | 11.97 | 12.69 | 12.97 | 14.31 |
| 12H | 4H | 14.57 | 14.98 | 15.57 | 15.98 | 17.25 | 10.85 | 11.26 | 11.85 | 12.26 | 13.53 |
| | 6H | 15.17 | 15.50 | 16.18 | 16.51 | 17.79 | 11.42 | 11.75 | 12.42 | 12.76 | 14.04 |
| | 8H | 15.39 | 15.68 | 16.40 | 16.69 | 18.02 | 11.63 | 11.92 | 12.64 | 12.92 | 14.26 |