

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: P912376

Luminaire Tested: DFN2DIP-SQ4F0-140D070US850-FLLFLL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P912376
REPORT IS A COMBINATION OF REPORTS P900091 AND P896915
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-SQ4F0-140D070US850-FLLFLL
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens
Light Source: -
Ballast/Driver: -

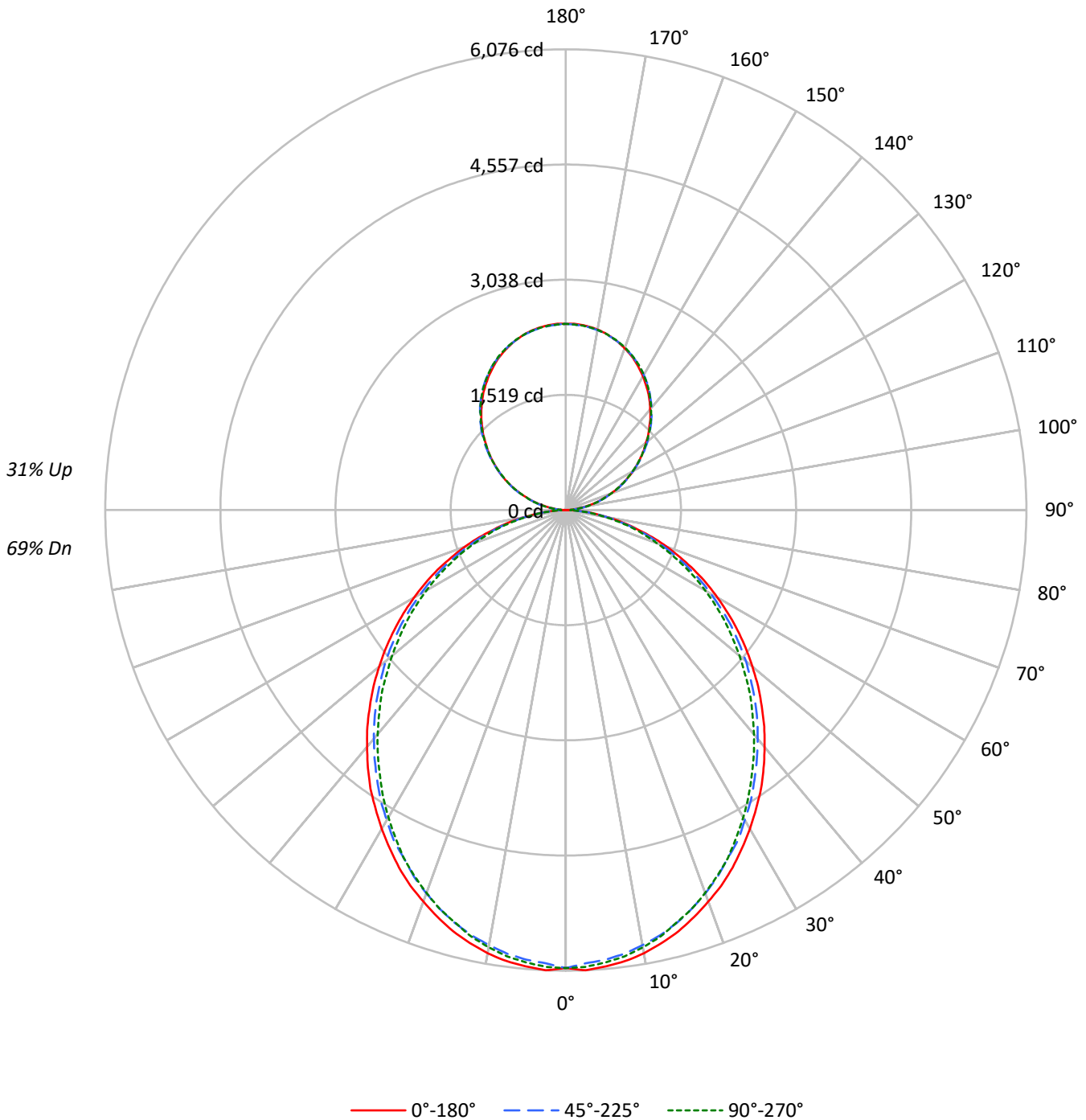
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 22241.0 lumens
Efficiency: N/A
Efficacy: 113.5 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')
CIE Type: Semi-Direct

Input Watts (W): 196
Input Voltage (V):
Input Current (A_{in}): 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

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Luminous Intensity Polar Plot





TEST NUMBER: P912376

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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 | 112 | 112 | 112 | 112 | 106 | 106 | 106 | 106 | 94 | 94 | 94 | 83 | 83 | 83 | 74 | 74 | 74 | 69 | | | |
| 1 | 102 | 98 | 94 | 90 | 96 | 92 | 89 | 86 | 83 | 80 | 77 | 74 | 71 | 70 | 65 | 64 | 62 | 58 | | | |
| 2 | 93 | 85 | 79 | 74 | 88 | 81 | 75 | 70 | 72 | 68 | 64 | 65 | 61 | 58 | 57 | 55 | 52 | 49 | | | |
| 3 | 85 | 75 | 67 | 61 | 80 | 71 | 64 | 59 | 64 | 58 | 54 | 57 | 53 | 49 | 51 | 48 | 45 | 41 | | | |
| 4 | 78 | 67 | 58 | 52 | 73 | 63 | 56 | 50 | 57 | 51 | 46 | 51 | 46 | 42 | 46 | 42 | 39 | 35 | | | |
| 5 | 71 | 59 | 51 | 45 | 67 | 56 | 49 | 43 | 51 | 45 | 40 | 46 | 41 | 37 | 41 | 37 | 34 | 31 | | | |
| 6 | 66 | 53 | 45 | 39 | 62 | 51 | 43 | 38 | 46 | 40 | 35 | 41 | 36 | 32 | 37 | 33 | 30 | 27 | | | |
| 7 | 61 | 48 | 40 | 34 | 58 | 46 | 39 | 33 | 42 | 35 | 31 | 38 | 33 | 29 | 34 | 30 | 26 | 24 | | | |
| 8 | 57 | 44 | 36 | 31 | 54 | 42 | 35 | 30 | 38 | 32 | 28 | 35 | 29 | 26 | 31 | 27 | 24 | 22 | | | |
| 9 | 53 | 40 | 33 | 27 | 50 | 39 | 31 | 26 | 35 | 29 | 25 | 32 | 27 | 23 | 29 | 25 | 21 | 19 | | | |
| 10 | 50 | 37 | 30 | 25 | 47 | 36 | 29 | 24 | 32 | 27 | 22 | 30 | 25 | 21 | 27 | 23 | 20 | 18 | | | |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 4239 | 4239 | 4239 |
| 5° | 4246 | 4181 | 4209 |
| 10° | 4211 | 4125 | 4153 |
| 15° | 4149 | 4058 | 4066 |
| 20° | 4066 | 3965 | 3976 |
| 25° | 3982 | 3853 | 3871 |
| 30° | 3878 | 3748 | 3739 |
| 35° | 3779 | 3626 | 3598 |
| 40° | 3657 | 3501 | 3464 |
| 45° | 3536 | 3377 | 3328 |
| 50° | 3403 | 3246 | 3169 |
| 55° | 3264 | 3095 | 3024 |
| 60° | 3107 | 2916 | 2858 |
| 65° | 2936 | 2731 | 2661 |
| 70° | 2717 | 2504 | 2450 |
| 75° | 2415 | 2234 | 2258 |
| 80° | 2051 | 1890 | 1886 |
| 85° | 1483 | 1293 | 1268 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
 Vertical Angle: 45°
 Luminance: 3536 cd/sqm



TEST NUMBER: P912376

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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 568.6 | 2.6 |
| 10°-20° | 1599.8 | 7.2 |
| 20°-30° | 2351.1 | 10.6 |
| 30°-40° | 2730.7 | 12.3 |
| 40°-50° | 2727.3 | 12.3 |
| 50°-60° | 2378.1 | 10.7 |
| 60°-70° | 1757.9 | 7.9 |
| 70°-80° | 994.6 | 4.5 |
| 80°-90° | 269.5 | 1.2 |
| 90°-100° | 151.9 | 0.7 |
| 100°-110° | 482.7 | 2.2 |
| 110°-120° | 826.1 | 3.7 |
| 120°-130° | 1086.4 | 4.9 |
| 130°-140° | 1219.5 | 5.5 |
| 140°-150° | 1195.8 | 5.4 |
| 150°-160° | 1003.1 | 4.5 |
| 160°-170° | 665.3 | 3.0 |
| 170°-180° | 232.5 | 1.0 |
| 0°-30° | 4519.6 | 20.3 |
| 0°-40° | 7250.2 | 32.6 |
| 0°-60° | 12355.7 | 55.6 |
| 0°-90° | 15377.7 | 69.1 |
| 90°-120° | 1460.7 | 6.6 |
| 90°-150° | 4962.4 | 22.3 |
| 90°-180° | 6863.0 | 30.9 |
| 0°-180° | 22241.0 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|------|------|-------|------|-------|------|------|
| 0° | 6041 | 6041 | 6041 | 6041 | 6041 | |
| 5° | 6041 | 6018 | 5954 | 6001 | 5990 | 573 |
| 15° | 5751 | 5716 | 5641 | 5664 | 5635 | 1620 |
| 25° | 5205 | 5159 | 5060 | 5071 | 5060 | 2395 |
| 35° | 4491 | 4433 | 4340 | 4304 | 4275 | 2804 |
| 45° | 3654 | 3614 | 3526 | 3462 | 3439 | 2820 |
| 55° | 2766 | 2730 | 2661 | 2591 | 2562 | 2472 |
| 65° | 1865 | 1830 | 1772 | 1720 | 1691 | 1844 |
| 75° | 976 | 965 | 935 | 900 | 912 | 1042 |
| 85° | 238 | 232 | 227 | 209 | 203 | 265 |
| 90° | 2 | 27 | 72 | 68 | 70 | 21 |
| 95° | 108 | 129 | 132 | 132 | 129 | 120 |
| 105° | 446 | 452 | 456 | 460 | 460 | 470 |
| 115° | 829 | 841 | 837 | 835 | 829 | 820 |
| 125° | 1206 | 1224 | 1218 | 1212 | 1210 | 1077 |
| 135° | 1560 | 1582 | 1587 | 1585 | 1579 | 1205 |
| 145° | 1893 | 1908 | 1920 | 1922 | 1914 | 1183 |
| 155° | 2165 | 2171 | 2178 | 2188 | 2181 | 997 |
| 165° | 2355 | 2353 | 2353 | 2368 | 2357 | 664 |
| 175° | 2451 | 2445 | 2440 | 2455 | 2443 | 233 |
| 180° | 2455 | 2455 | 2455 | 2455 | 2455 | |



TEST NUMBER: P912376

CATALOG NUMBER: DFN2DIP-SQ4F0-140D070US850-FLLFLL

CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 0° | 6041.3 | 6041.3 | 6041.3 | 6041.3 | 6041.3 |
| 2.5° | 6076.3 | 6047.4 | 5983.3 | 6041.3 | 6030.2 |
| 5° | 6041.3 | 6018.4 | 5954.3 | 6000.6 | 5989.5 |
| 7.5° | 6000.6 | 5966.1 | 5902.0 | 5948.8 | 5937.0 |
| 10° | 5937.0 | 5896.4 | 5826.8 | 5873.0 | 5855.7 |
| 12.5° | 5849.5 | 5815.0 | 5745.4 | 5774.3 | 5762.7 |
| 15° | 5750.9 | 5716.5 | 5640.6 | 5664.1 | 5635.1 |
| 17.5° | 5629.0 | 5594.5 | 5518.6 | 5547.6 | 5518.6 |
| 20° | 5495.2 | 5460.7 | 5379.3 | 5396.6 | 5373.8 |
| 22.5° | 5362.0 | 5309.7 | 5233.8 | 5233.8 | 5222.2 |
| 25° | 5204.9 | 5158.6 | 5060.0 | 5071.1 | 5060.0 |
| 27.5° | 5030.4 | 4989.8 | 4914.6 | 4897.3 | 4868.4 |
| 30° | 4856.6 | 4809.8 | 4722.9 | 4705.7 | 4682.2 |
| 32.5° | 4670.6 | 4636.1 | 4542.9 | 4507.9 | 4484.4 |
| 35° | 4490.6 | 4432.7 | 4339.5 | 4304.5 | 4275.4 |
| 37.5° | 4287.2 | 4234.8 | 4141.7 | 4101.1 | 4072.0 |
| 40° | 4078.2 | 4031.4 | 3938.3 | 3886.6 | 3863.1 |
| 42.5° | 3874.8 | 3828.0 | 3735.6 | 3677.0 | 3642.5 |
| 45° | 3654.2 | 3613.6 | 3526.1 | 3462.5 | 3439.1 |
| 47.5° | 3439.1 | 3398.4 | 3305.4 | 3241.3 | 3206.8 |
| 50° | 3212.3 | 3183.4 | 3102.0 | 3020.6 | 2991.6 |
| 52.5° | 2991.6 | 2950.9 | 2875.7 | 2811.6 | 2771.1 |
| 55° | 2765.5 | 2730.4 | 2660.7 | 2591.1 | 2562.1 |
| 57.5° | 2538.6 | 2509.7 | 2433.9 | 2364.3 | 2340.8 |
| 60° | 2311.8 | 2289.1 | 2207.7 | 2143.6 | 2126.3 |
| 62.5° | 2091.2 | 2050.5 | 1992.5 | 1934.7 | 1911.3 |
| 65° | 1865.0 | 1829.8 | 1772.0 | 1719.5 | 1690.6 |
| 67.5° | 1632.7 | 1603.1 | 1551.3 | 1510.6 | 1487.2 |
| 70° | 1417.5 | 1394.1 | 1341.8 | 1301.1 | 1278.2 |
| 72.5° | 1196.9 | 1173.4 | 1144.5 | 1103.9 | 1086.6 |
| 75° | 975.7 | 964.6 | 935.0 | 900.5 | 912.2 |
| 77.5° | 778.4 | 755.0 | 743.3 | 726.1 | 708.8 |
| 80° | 581.2 | 575.0 | 563.4 | 546.1 | 534.3 |
| 82.5° | 395.0 | 395.0 | 389.5 | 366.1 | 366.1 |
| 85° | 237.9 | 232.3 | 226.8 | 208.9 | 203.4 |
| 87.5° | 104.8 | 93.0 | 81.4 | 64.1 | 57.9 |
| 90° | 2.2 | 26.6 | 72.5 | 68.1 | 70.3 |
| 92.5° | 45.9 | 62.2 | 64.4 | 66.7 | 66.7 |
| 95° | 108.0 | 128.8 | 132.5 | 132.5 | 128.8 |
| 97.5° | 179.9 | 199.1 | 207.3 | 207.3 | 207.3 |
| 100° | 262.7 | 279.8 | 285.7 | 285.7 | 283.5 |
| 102.5° | 350.1 | 362.6 | 370.8 | 373.1 | 370.8 |
| 105° | 445.6 | 451.5 | 455.9 | 459.7 | 459.7 |
| 107.5° | 540.3 | 549.2 | 549.2 | 550.7 | 540.3 |
| 110° | 632.1 | 644.0 | 644.0 | 644.0 | 638.0 |



TEST NUMBER: P912376

CATALOG NUMBER: DFN2DIP-SQ4F0-140D070US850-FLLFLL

CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 731.3 | 743.9 | 741.7 | 735.7 | 731.3 |
| 115° | 829.0 | 840.8 | 837.2 | 835.0 | 829.0 |
| 117.5° | 925.9 | 942.2 | 931.9 | 925.9 | 920.0 |
| 120° | 1023.6 | 1039.9 | 1023.6 | 1023.6 | 1017.0 |
| 122.5° | 1112.4 | 1133.2 | 1122.9 | 1116.9 | 1112.4 |
| 125° | 1205.7 | 1224.2 | 1218.3 | 1211.7 | 1209.5 |
| 127.5° | 1296.8 | 1319.7 | 1311.6 | 1302.7 | 1296.8 |
| 130° | 1381.9 | 1408.5 | 1404.9 | 1400.4 | 1392.2 |
| 132.5° | 1477.4 | 1498.1 | 1499.6 | 1489.3 | 1483.3 |
| 135° | 1559.6 | 1582.4 | 1587.0 | 1584.7 | 1578.8 |
| 137.5° | 1651.3 | 1669.8 | 1673.5 | 1672.0 | 1663.2 |
| 140° | 1732.0 | 1750.6 | 1760.9 | 1760.9 | 1752.8 |
| 142.5° | 1814.9 | 1833.4 | 1839.3 | 1841.5 | 1833.4 |
| 145° | 1893.4 | 1908.1 | 1920.0 | 1922.2 | 1914.1 |
| 147.5° | 1963.7 | 1982.2 | 1991.1 | 1994.8 | 1986.7 |
| 150° | 2036.2 | 2048.8 | 2057.0 | 2063.6 | 2057.0 |
| 152.5° | 2100.6 | 2113.2 | 2123.5 | 2131.7 | 2123.5 |
| 155° | 2165.0 | 2170.9 | 2177.6 | 2187.9 | 2181.3 |
| 157.5° | 2220.6 | 2225.0 | 2228.6 | 2243.5 | 2233.1 |
| 160° | 2270.1 | 2274.6 | 2276.8 | 2289.3 | 2280.4 |
| 162.5° | 2316.0 | 2316.0 | 2318.3 | 2332.2 | 2321.9 |
| 165° | 2355.2 | 2353.0 | 2353.0 | 2367.8 | 2357.4 |
| 167.5° | 2390.8 | 2384.1 | 2384.1 | 2398.9 | 2388.6 |
| 170° | 2417.4 | 2411.5 | 2409.3 | 2424.1 | 2411.5 |
| 172.5° | 2435.9 | 2429.9 | 2427.7 | 2442.6 | 2429.9 |
| 175° | 2450.7 | 2444.8 | 2440.4 | 2455.1 | 2442.6 |
| 177.5° | 2458.9 | 2452.9 | 2448.5 | 2461.1 | 2448.5 |
| 180° | 2455.1 | 2455.1 | 2455.1 | 2455.1 | 2455.1 |



TEST NUMBER: P912376
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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 | 13.91 | 14.97 | 14.68 | 15.77 | 16.73 | 13.46 | 14.53 | 14.23 | 15.32 | 16.29 |
| | 3H | 15.58 | 16.54 | 16.37 | 17.35 | 18.35 | 15.09 | 16.05 | 15.88 | 16.86 | 17.85 |
| | 4H | 16.18 | 17.09 | 16.99 | 17.90 | 18.91 | 15.69 | 16.59 | 16.49 | 17.41 | 18.42 |
| | 6H | 16.60 | 17.43 | 17.42 | 18.25 | 19.28 | 16.10 | 16.93 | 16.91 | 17.75 | 18.78 |
| | 8H | 16.71 | 17.50 | 17.54 | 18.35 | 19.37 | 16.21 | 17.00 | 17.03 | 17.84 | 18.87 |
| | 12H | 16.77 | 17.52 | 17.60 | 18.36 | 19.41 | 16.26 | 17.01 | 17.09 | 17.85 | 18.90 |
| 4H | 2H | 14.39 | 15.29 | 15.20 | 16.11 | 17.12 | 14.04 | 14.94 | 14.84 | 15.75 | 16.76 |
| | 3H | 16.28 | 17.03 | 17.10 | 17.88 | 18.91 | 15.87 | 16.63 | 16.69 | 17.47 | 18.50 |
| | 4H | 17.01 | 17.69 | 17.84 | 18.54 | 19.59 | 16.58 | 17.27 | 17.42 | 18.11 | 19.17 |
| | 6H | 17.54 | 18.13 | 18.39 | 19.00 | 20.06 | 17.10 | 17.70 | 17.95 | 18.57 | 19.63 |
| | 8H | 17.69 | 18.25 | 18.55 | 19.11 | 20.18 | 17.26 | 17.81 | 18.11 | 18.68 | 19.75 |
| | 12H | 17.78 | 18.28 | 18.65 | 19.16 | 20.24 | 17.33 | 17.83 | 18.20 | 18.71 | 19.79 |
| 8H | 4H | 17.22 | 17.77 | 18.07 | 18.64 | 19.71 | 16.84 | 17.40 | 17.70 | 18.26 | 19.33 |
| | 6H | 17.86 | 18.32 | 18.75 | 19.23 | 20.30 | 17.48 | 17.94 | 18.36 | 18.85 | 19.92 |
| | 8H | 18.09 | 18.50 | 18.98 | 19.40 | 20.49 | 17.70 | 18.10 | 18.59 | 19.01 | 20.09 |
| | 12H | 18.23 | 18.59 | 19.13 | 19.49 | 20.63 | 17.82 | 18.18 | 18.72 | 19.08 | 20.22 |
| 12H | 4H | 17.21 | 17.71 | 18.09 | 18.60 | 19.68 | 16.85 | 17.35 | 17.72 | 18.23 | 19.31 |
| | 6H | 17.90 | 18.30 | 18.79 | 19.21 | 20.29 | 17.52 | 17.93 | 18.42 | 18.83 | 19.92 |
| | 8H | 18.15 | 18.51 | 19.05 | 19.40 | 20.54 | 17.77 | 18.13 | 18.67 | 19.02 | 20.16 |