

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: P906685

Luminaire Tested: DFN2DIP-SQ4F0-060D110US835-FLLONL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P906685
REPORT IS A COMBINATION OF REPORTS P901669 AND P898471
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-SQ4F0-060D110US835-FLLONL
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens
Light Source: -
Ballast/Driver: -

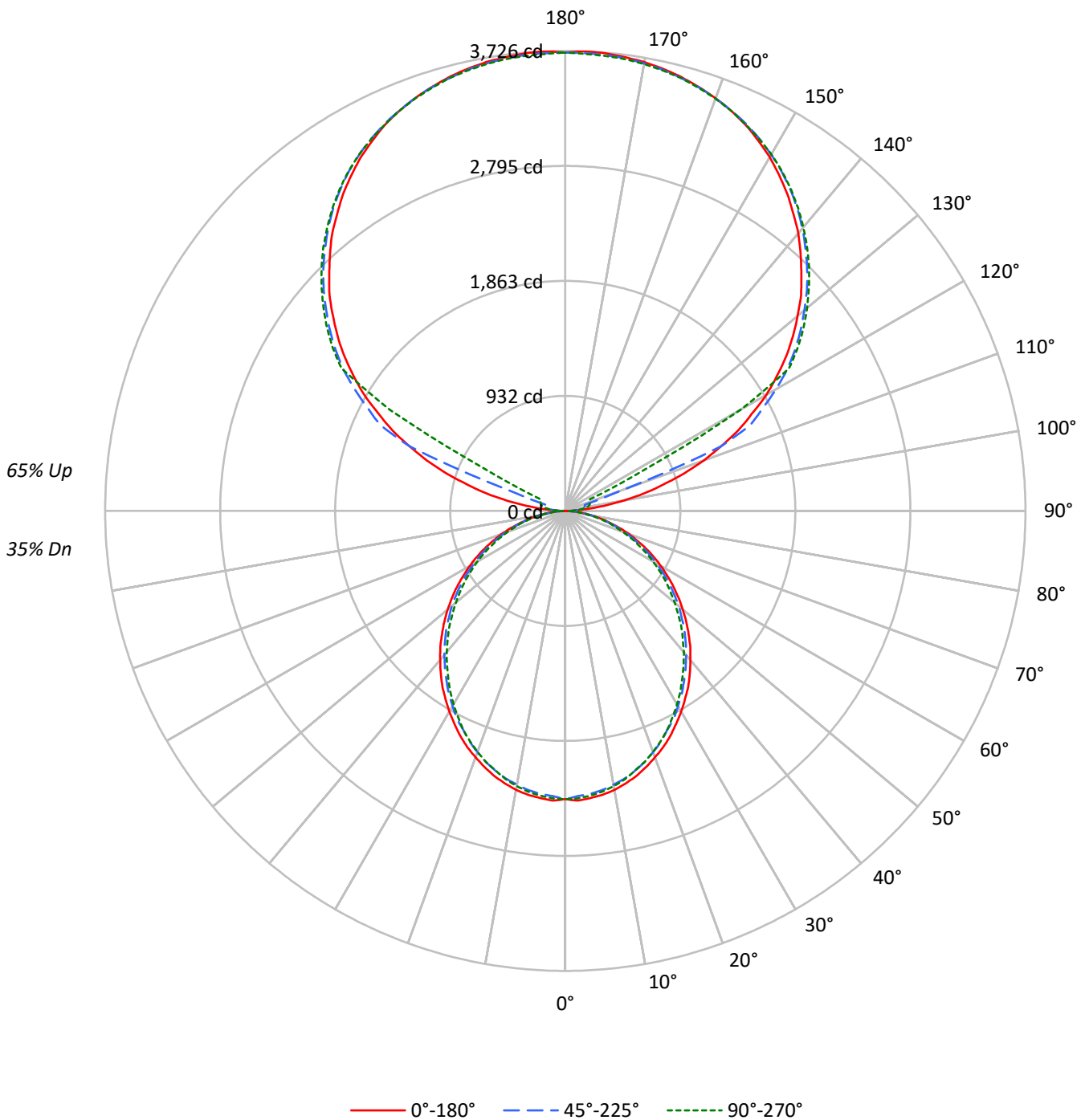
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 16830.0 lumens
Efficiency: N/A
Efficacy: 126.7 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-Indirect

Input Watts (W): 132.8
Input Voltage (V):
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.946
Total Harmonic Distortion (THDi): 0.132
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: P906685

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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 | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 75 | 75 | 75 | 58 | 58 | 58 | 43 | 43 | 43 | 35 | | | | 35 |
| 1 | 95 | 90 | 86 | 83 | 85 | 82 | 79 | 76 | 66 | 64 | 62 | 51 | 50 | 48 | 38 | 37 | 36 | 30 | | | | 30 |
| 2 | 86 | 79 | 73 | 68 | 78 | 71 | 66 | 62 | 58 | 54 | 51 | 45 | 43 | 40 | 33 | 32 | 30 | 25 | | | | 25 |
| 3 | 78 | 69 | 62 | 56 | 71 | 63 | 57 | 52 | 51 | 46 | 43 | 40 | 37 | 34 | 29 | 27 | 26 | 21 | | | | 21 |
| 4 | 72 | 61 | 53 | 48 | 65 | 56 | 49 | 44 | 45 | 40 | 36 | 35 | 32 | 29 | 26 | 24 | 22 | 18 | | | | 18 |
| 5 | 66 | 54 | 46 | 41 | 59 | 50 | 43 | 38 | 40 | 35 | 31 | 32 | 28 | 25 | 24 | 21 | 19 | 16 | | | | 16 |
| 6 | 60 | 49 | 41 | 35 | 54 | 44 | 37 | 32 | 36 | 31 | 27 | 29 | 25 | 22 | 21 | 19 | 17 | 14 | | | | 14 |
| 7 | 56 | 44 | 36 | 31 | 50 | 40 | 33 | 28 | 33 | 28 | 24 | 26 | 22 | 19 | 20 | 17 | 15 | 12 | | | | 12 |
| 8 | 52 | 40 | 32 | 27 | 47 | 36 | 30 | 25 | 30 | 25 | 21 | 24 | 20 | 17 | 18 | 15 | 13 | 11 | | | | 11 |
| 9 | 48 | 36 | 29 | 24 | 43 | 33 | 27 | 22 | 27 | 22 | 19 | 22 | 18 | 15 | 17 | 14 | 12 | 10 | | | | 10 |
| 10 | 45 | 33 | 26 | 21 | 41 | 30 | 24 | 20 | 25 | 20 | 17 | 20 | 16 | 14 | 15 | 13 | 11 | 9 | | | | 9 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 1638 | 1638 | 1638 |
| 5° | 1641 | 1616 | 1627 |
| 10° | 1627 | 1594 | 1605 |
| 15° | 1603 | 1568 | 1571 |
| 20° | 1571 | 1532 | 1536 |
| 25° | 1539 | 1489 | 1496 |
| 30° | 1499 | 1449 | 1445 |
| 35° | 1460 | 1401 | 1390 |
| 40° | 1413 | 1353 | 1339 |
| 45° | 1366 | 1305 | 1286 |
| 50° | 1315 | 1255 | 1225 |
| 55° | 1261 | 1196 | 1169 |
| 60° | 1201 | 1127 | 1104 |
| 65° | 1134 | 1055 | 1028 |
| 70° | 1050 | 968 | 947 |
| 75° | 933 | 863 | 873 |
| 80° | 793 | 730 | 729 |
| 85° | 573 | 499 | 490 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 90°
 Vertical Angle: 90°
 Luminance: 1990 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 219.7 | 1.3 |
| 10°-20° | 618.3 | 3.7 |
| 20°-30° | 908.6 | 5.4 |
| 30°-40° | 1055.3 | 6.3 |
| 40°-50° | 1054.0 | 6.3 |
| 50°-60° | 919.0 | 5.5 |
| 60°-70° | 679.4 | 4.0 |
| 70°-80° | 384.4 | 2.3 |
| 80°-90° | 108.0 | 0.6 |
| 90°-100° | 122.4 | 0.7 |
| 100°-110° | 456.3 | 2.7 |
| 110°-120° | 1210.3 | 7.2 |
| 120°-130° | 2007.3 | 11.9 |
| 130°-140° | 2132.2 | 12.7 |
| 140°-150° | 1981.7 | 11.8 |
| 150°-160° | 1593.2 | 9.5 |
| 160°-170° | 1026.6 | 6.1 |
| 170°-180° | 353.3 | 2.1 |
| 0°-30° | 1746.6 | 10.4 |
| 0°-40° | 2801.8 | 16.6 |
| 0°-60° | 4774.8 | 28.4 |
| 0°-90° | 5946.5 | 35.3 |
| 90°-120° | 1789.0 | 10.6 |
| 90°-150° | 7910.3 | 47.0 |
| 90°-180° | 10883.0 | 64.7 |
| 0°-180° | 16830.0 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|------|------|-------|------|-------|------|------|
| 0° | 2335 | 2335 | 2335 | 2335 | 2335 | |
| 5° | 2335 | 2326 | 2301 | 2319 | 2315 | 222 |
| 15° | 2222 | 2209 | 2180 | 2189 | 2178 | 626 |
| 25° | 2011 | 1994 | 1955 | 1960 | 1955 | 926 |
| 35° | 1735 | 1713 | 1677 | 1663 | 1652 | 1084 |
| 45° | 1412 | 1396 | 1363 | 1338 | 1329 | 1090 |
| 55° | 1069 | 1055 | 1028 | 1001 | 990 | 955 |
| 65° | 721 | 707 | 685 | 664 | 653 | 713 |
| 75° | 377 | 373 | 361 | 348 | 352 | 402 |
| 85° | 92 | 90 | 88 | 81 | 79 | 103 |
| 90° | 3 | 32 | 54 | 67 | 72 | 15 |
| 95° | 174 | 86 | 105 | 118 | 116 | 207 |
| 105° | 817 | 897 | 164 | 193 | 204 | 873 |
| 115° | 1544 | 1590 | 1658 | 414 | 220 | 1521 |
| 125° | 2184 | 2219 | 2270 | 2289 | 2297 | 1948 |
| 135° | 2702 | 2746 | 2769 | 2797 | 2791 | 2088 |
| 145° | 3135 | 3132 | 3178 | 3197 | 3183 | 1961 |
| 155° | 3452 | 3428 | 3460 | 3476 | 3455 | 1591 |
| 165° | 3637 | 3621 | 3629 | 3648 | 3629 | 1028 |
| 175° | 3720 | 3702 | 3707 | 3726 | 3699 | 354 |
| 180° | 3712 | 3712 | 3712 | 3712 | 3712 | |



TEST NUMBER: P906685

CATALOG NUMBER: DFN2DIP-SQ4F0-060D110US835-FLLONL

CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 0° | 2334.6 | 2334.6 | 2334.6 | 2334.6 | 2334.6 |
| 2.5° | 2348.2 | 2337.0 | 2312.2 | 2334.6 | 2330.3 |
| 5° | 2334.6 | 2325.8 | 2301.0 | 2318.9 | 2314.6 |
| 7.5° | 2318.9 | 2305.6 | 2280.8 | 2298.9 | 2294.4 |
| 10° | 2294.4 | 2278.7 | 2251.7 | 2269.6 | 2262.9 |
| 12.5° | 2260.6 | 2247.2 | 2220.3 | 2231.5 | 2227.0 |
| 15° | 2222.4 | 2209.1 | 2179.8 | 2188.9 | 2177.7 |
| 17.5° | 2175.3 | 2162.0 | 2132.7 | 2143.8 | 2132.7 |
| 20° | 2123.6 | 2110.3 | 2078.8 | 2085.5 | 2076.7 |
| 22.5° | 2072.2 | 2051.9 | 2022.6 | 2022.6 | 2018.1 |
| 25° | 2011.4 | 1993.6 | 1955.4 | 1959.7 | 1955.4 |
| 27.5° | 1944.0 | 1928.3 | 1899.2 | 1892.6 | 1881.4 |
| 30° | 1876.9 | 1858.7 | 1825.2 | 1818.5 | 1809.4 |
| 32.5° | 1804.9 | 1791.6 | 1755.6 | 1742.0 | 1733.0 |
| 35° | 1735.4 | 1713.0 | 1677.0 | 1663.4 | 1652.2 |
| 37.5° | 1656.8 | 1636.5 | 1600.6 | 1584.8 | 1573.6 |
| 40° | 1576.0 | 1557.9 | 1522.0 | 1502.0 | 1492.9 |
| 42.5° | 1497.4 | 1479.3 | 1443.6 | 1421.0 | 1407.6 |
| 45° | 1412.2 | 1396.4 | 1362.6 | 1338.1 | 1329.0 |
| 47.5° | 1329.0 | 1313.3 | 1277.4 | 1252.6 | 1239.2 |
| 50° | 1241.4 | 1230.2 | 1198.8 | 1167.3 | 1156.1 |
| 52.5° | 1156.1 | 1140.4 | 1111.3 | 1086.6 | 1070.9 |
| 55° | 1068.7 | 1055.1 | 1028.2 | 1001.3 | 990.1 |
| 57.5° | 981.1 | 969.9 | 940.6 | 913.7 | 904.6 |
| 60° | 893.4 | 884.6 | 853.2 | 828.4 | 821.7 |
| 62.5° | 808.1 | 792.4 | 770.0 | 747.6 | 738.6 |
| 65° | 720.7 | 707.2 | 684.8 | 664.5 | 653.3 |
| 67.5° | 630.9 | 619.5 | 599.5 | 583.8 | 574.7 |
| 70° | 547.8 | 538.8 | 518.5 | 502.8 | 494.0 |
| 72.5° | 462.5 | 453.5 | 442.3 | 426.6 | 419.9 |
| 75° | 377.0 | 372.8 | 361.3 | 348.0 | 352.5 |
| 77.5° | 300.8 | 291.8 | 287.2 | 280.6 | 273.9 |
| 80° | 224.6 | 222.2 | 217.7 | 211.0 | 206.5 |
| 82.5° | 152.7 | 152.7 | 150.5 | 141.5 | 141.5 |
| 85° | 91.9 | 89.8 | 87.6 | 80.7 | 78.6 |
| 87.5° | 40.5 | 36.0 | 31.4 | 24.8 | 22.4 |
| 90° | 2.6 | 32.2 | 53.6 | 67.3 | 72.4 |
| 92.5° | 67.3 | 56.5 | 64.4 | 69.9 | 72.4 |
| 95° | 174.5 | 85.8 | 104.6 | 118.3 | 115.5 |
| 97.5° | 314.2 | 94.1 | 136.8 | 145.1 | 147.7 |
| 100° | 475.6 | 107.5 | 153.1 | 174.5 | 179.9 |
| 102.5° | 652.6 | 647.5 | 158.5 | 187.9 | 196.2 |
| 105° | 816.6 | 897.3 | 164.0 | 193.3 | 204.2 |
| 107.5° | 1007.4 | 1074.3 | 169.4 | 198.7 | 209.6 |
| 110° | 1190.1 | 1246.3 | 470.2 | 201.6 | 212.1 |



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CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1362.1 | 1410.2 | 1364.6 | 206.7 | 215.0 |
| 115° | 1544.5 | 1590.1 | 1657.5 | 413.7 | 220.4 |
| 117.5° | 1703.1 | 1756.7 | 1802.6 | 1418.2 | 714.5 |
| 120° | 1880.4 | 1920.6 | 1969.1 | 2001.3 | 1638.6 |
| 122.5° | 2030.7 | 2073.7 | 2127.6 | 2143.6 | 2146.5 |
| 125° | 2183.8 | 2218.9 | 2269.9 | 2288.7 | 2296.7 |
| 127.5° | 2323.5 | 2361.1 | 2401.6 | 2428.4 | 2431.0 |
| 130° | 2455.2 | 2498.3 | 2527.6 | 2557.3 | 2554.8 |
| 132.5° | 2589.5 | 2624.6 | 2654.0 | 2678.2 | 2675.7 |
| 135° | 2702.5 | 2745.5 | 2769.4 | 2796.6 | 2791.1 |
| 137.5° | 2820.5 | 2852.7 | 2879.8 | 2906.6 | 2898.6 |
| 140° | 2936.0 | 2957.6 | 2987.0 | 3011.2 | 2997.8 |
| 142.5° | 3032.9 | 3051.7 | 3086.5 | 3107.9 | 3094.5 |
| 145° | 3135.0 | 3132.1 | 3177.7 | 3196.6 | 3183.2 |
| 147.5° | 3223.4 | 3215.4 | 3261.0 | 3274.4 | 3263.9 |
| 150° | 3309.5 | 3290.7 | 3333.7 | 3349.7 | 3336.3 |
| 152.5° | 3381.9 | 3360.5 | 3400.7 | 3417.0 | 3398.2 |
| 155° | 3451.8 | 3427.8 | 3460.0 | 3476.0 | 3454.6 |
| 157.5° | 3508.2 | 3486.8 | 3511.1 | 3529.9 | 3508.2 |
| 160° | 3556.7 | 3540.4 | 3556.7 | 3572.6 | 3553.8 |
| 162.5° | 3599.4 | 3583.5 | 3596.9 | 3615.7 | 3591.5 |
| 165° | 3637.1 | 3621.1 | 3629.1 | 3647.9 | 3629.1 |
| 167.5° | 3666.7 | 3650.5 | 3658.8 | 3677.6 | 3653.4 |
| 170° | 3691.0 | 3674.7 | 3680.1 | 3699.0 | 3674.7 |
| 172.5° | 3706.9 | 3691.0 | 3696.4 | 3715.2 | 3691.0 |
| 175° | 3720.3 | 3701.5 | 3706.9 | 3725.8 | 3699.0 |
| 177.5° | 3725.8 | 3706.9 | 3709.8 | 3728.6 | 3704.4 |
| 180° | 3712.4 | 3712.4 | 3712.4 | 3712.4 | 3712.4 |



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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 | 7.47 | 8.21 | 8.54 | 9.28 | 10.75 | 7.02 | 7.77 | 8.10 | 8.84 | 10.31 |
| | 3H | 9.12 | 9.79 | 10.20 | 10.87 | 12.36 | 8.63 | 9.30 | 9.71 | 10.38 | 11.87 |
| | 4H | 9.71 | 10.34 | 10.80 | 11.42 | 12.91 | 9.21 | 9.84 | 10.31 | 10.93 | 12.42 |
| | 6H | 10.10 | 10.69 | 11.21 | 11.77 | 13.28 | 9.60 | 10.19 | 10.71 | 11.27 | 12.78 |
| | 8H | 10.21 | 10.76 | 11.31 | 11.86 | 13.36 | 9.71 | 10.26 | 10.81 | 11.36 | 12.86 |
| | 12H | 10.25 | 10.78 | 11.36 | 11.88 | 13.40 | 9.74 | 10.27 | 10.85 | 11.37 | 12.89 |
| 4H | 2H | 7.91 | 8.55 | 9.01 | 9.63 | 11.12 | 7.56 | 8.19 | 8.66 | 9.28 | 10.77 |
| | 3H | 9.77 | 10.30 | 10.88 | 11.41 | 12.92 | 9.37 | 9.89 | 10.47 | 11.00 | 12.51 |
| | 4H | 10.49 | 10.97 | 11.60 | 12.07 | 13.60 | 10.06 | 10.55 | 11.17 | 11.65 | 13.17 |
| | 6H | 11.00 | 11.41 | 12.12 | 12.54 | 14.05 | 10.57 | 10.98 | 11.69 | 12.11 | 13.62 |
| | 8H | 11.15 | 11.54 | 12.27 | 12.65 | 14.18 | 10.71 | 11.10 | 11.83 | 12.21 | 13.75 |
| | 12H | 11.22 | 11.57 | 12.35 | 12.70 | 14.23 | 10.77 | 11.12 | 11.90 | 12.25 | 13.79 |
| 8H | 4H | 10.67 | 11.06 | 11.79 | 12.18 | 13.71 | 10.30 | 10.68 | 11.42 | 11.80 | 13.33 |
| | 6H | 11.30 | 11.62 | 12.45 | 12.78 | 14.31 | 10.92 | 11.24 | 12.06 | 12.40 | 13.93 |
| | 8H | 11.53 | 11.81 | 12.67 | 12.95 | 14.50 | 11.13 | 11.41 | 12.28 | 12.55 | 14.10 |
| | 12H | 11.66 | 11.90 | 12.81 | 13.04 | 14.62 | 11.25 | 11.49 | 12.40 | 12.63 | 14.21 |
| 12H | 4H | 10.65 | 11.00 | 11.79 | 12.13 | 13.67 | 10.29 | 10.64 | 11.42 | 11.77 | 13.30 |
| | 6H | 11.33 | 11.61 | 12.48 | 12.75 | 14.30 | 10.96 | 11.24 | 12.11 | 12.38 | 13.93 |
| | 8H | 11.57 | 11.82 | 12.72 | 12.95 | 14.54 | 11.19 | 11.44 | 12.34 | 12.57 | 14.16 |