

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: P921494

Luminaire Tested: DFN2DIP-4P4F0-080D040US940-FLLFLL

Issue Date: 11/21/2024

Test Information

Test Method: LM-79-2019
Report Number: P921494
REPORT IS A COMBINATION OF REPORTS P899101 AND P895967
Test Lab: INNOVATION CENTER
Issue Date: 11/21/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: NEO-RAY
Catalog Number: DFN2DIP-4P4F0-080D040US940-FLLFLL
Description: 4 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Frosted Lens
Light Source: -
Ballast/Driver: -

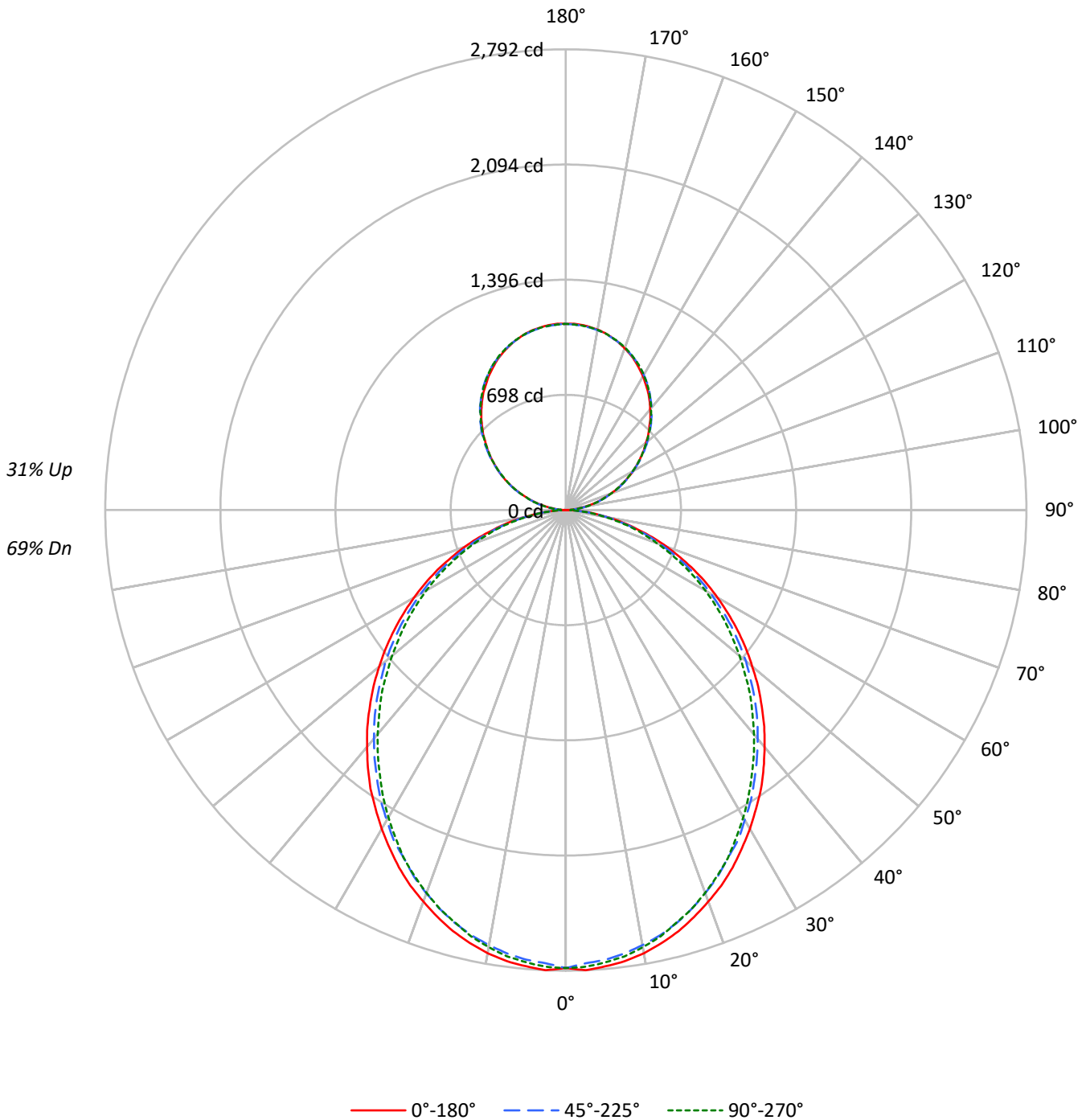
Summary

Lumens per Lamp: N/A
Luminaire Lumens: 10219.0 lumens
Efficiency: N/A
Efficacy: 87.6 lumens/watt
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')
CIE Type: Semi-Direct

Input Watts (W): 116.6
Input Voltage (V):
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: 0.9971
Total Harmonic Distortion (THDi): 0.049
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 24 FT

TEST NUMBER: P921494
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Luminous Intensity Polar Plot





TEST NUMBER: P921494

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

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 1801 | 1801 | 1801 |
| 5° | 1804 | 1776 | 1788 |
| 10° | 1789 | 1753 | 1765 |
| 15° | 1763 | 1725 | 1728 |
| 20° | 1728 | 1685 | 1690 |
| 25° | 1692 | 1638 | 1645 |
| 30° | 1648 | 1594 | 1589 |
| 35° | 1606 | 1542 | 1529 |
| 40° | 1555 | 1489 | 1473 |
| 45° | 1503 | 1436 | 1415 |
| 50° | 1447 | 1381 | 1348 |
| 55° | 1388 | 1317 | 1286 |
| 60° | 1322 | 1241 | 1216 |
| 65° | 1250 | 1163 | 1133 |
| 70° | 1157 | 1068 | 1044 |
| 75° | 1029 | 953 | 962 |
| 80° | 876 | 808 | 805 |
| 85° | 635 | 555 | 543 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 0°
 Vertical Angle: 45°
 Luminance: 1503 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|---------|-----------|
| 0°-10° | 261.3 | 2.6 |
| 10°-20° | 735.1 | 7.2 |
| 20°-30° | 1080.3 | 10.6 |
| 30°-40° | 1254.7 | 12.3 |
| 40°-50° | 1253.1 | 12.3 |
| 50°-60° | 1092.7 | 10.7 |
| 60°-70° | 807.7 | 7.9 |
| 70°-80° | 457.0 | 4.5 |
| 80°-90° | 123.8 | 1.2 |
| 90°-100° | 69.8 | 0.7 |
| 100°-110° | 221.8 | 2.2 |
| 110°-120° | 379.5 | 3.7 |
| 120°-130° | 499.2 | 4.9 |
| 130°-140° | 560.3 | 5.5 |
| 140°-150° | 549.4 | 5.4 |
| 150°-160° | 460.9 | 4.5 |
| 160°-170° | 305.7 | 3.0 |
| 170°-180° | 106.8 | 1.0 |
| 0°-30° | 2076.6 | 20.3 |
| 0°-40° | 3331.3 | 32.6 |
| 0°-60° | 5677.0 | 55.6 |
| 0°-90° | 7065.6 | 69.1 |
| 90°-120° | 671.2 | 6.6 |
| 90°-150° | 2280.1 | 22.3 |
| 90°-180° | 3153.0 | 30.9 |
| 0°-180° | 10219.0 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|------|------|-------|------|-------|------|------|
| 0° | 2776 | 2776 | 2776 | 2776 | 2776 | |
| 5° | 2776 | 2765 | 2736 | 2757 | 2752 | 263 |
| 15° | 2642 | 2626 | 2592 | 2602 | 2589 | 744 |
| 25° | 2392 | 2370 | 2325 | 2330 | 2325 | 1100 |
| 35° | 2063 | 2037 | 1994 | 1978 | 1964 | 1288 |
| 45° | 1679 | 1660 | 1620 | 1591 | 1580 | 1296 |
| 55° | 1271 | 1254 | 1222 | 1190 | 1177 | 1136 |
| 65° | 857 | 841 | 814 | 790 | 777 | 847 |
| 75° | 448 | 443 | 430 | 414 | 419 | 479 |
| 85° | 109 | 107 | 104 | 96 | 94 | 122 |
| 90° | 1 | 12 | 33 | 31 | 32 | 10 |
| 95° | 50 | 59 | 61 | 61 | 59 | 55 |
| 105° | 205 | 207 | 210 | 211 | 211 | 216 |
| 115° | 381 | 386 | 385 | 384 | 381 | 377 |
| 125° | 554 | 562 | 560 | 557 | 556 | 495 |
| 135° | 717 | 727 | 729 | 728 | 725 | 554 |
| 145° | 870 | 877 | 882 | 883 | 880 | 544 |
| 155° | 995 | 998 | 1000 | 1005 | 1002 | 458 |
| 165° | 1082 | 1081 | 1081 | 1088 | 1083 | 305 |
| 175° | 1126 | 1123 | 1121 | 1128 | 1122 | 107 |
| 180° | 1128 | 1128 | 1128 | 1128 | 1128 | |



TEST NUMBER: P921494

CATALOG NUMBER: DFN2DIP-4P4F0-080D040US940-FLLFL

CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 0° | 2775.7 | 2775.7 | 2775.7 | 2775.7 | 2775.7 |
| 2.5° | 2791.9 | 2778.6 | 2749.1 | 2775.7 | 2770.6 |
| 5° | 2775.7 | 2765.3 | 2735.9 | 2757.1 | 2752.0 |
| 7.5° | 2757.1 | 2741.2 | 2711.8 | 2733.3 | 2727.9 |
| 10° | 2727.9 | 2709.2 | 2677.2 | 2698.4 | 2690.6 |
| 12.5° | 2687.7 | 2671.8 | 2639.8 | 2653.1 | 2647.8 |
| 15° | 2642.4 | 2626.5 | 2591.7 | 2602.5 | 2589.2 |
| 17.5° | 2586.3 | 2570.4 | 2535.6 | 2549.0 | 2535.6 |
| 20° | 2524.9 | 2509.0 | 2471.6 | 2479.6 | 2469.1 |
| 22.5° | 2463.7 | 2439.6 | 2404.8 | 2404.8 | 2399.4 |
| 25° | 2391.5 | 2370.3 | 2325.0 | 2330.0 | 2325.0 |
| 27.5° | 2311.3 | 2292.7 | 2258.1 | 2250.1 | 2236.9 |
| 30° | 2231.5 | 2209.9 | 2170.1 | 2162.1 | 2151.3 |
| 32.5° | 2146.0 | 2130.1 | 2087.3 | 2071.2 | 2060.5 |
| 35° | 2063.2 | 2036.7 | 1993.9 | 1977.7 | 1964.4 |
| 37.5° | 1969.8 | 1945.7 | 1903.0 | 1884.3 | 1871.0 |
| 40° | 1873.8 | 1852.3 | 1809.5 | 1785.7 | 1774.9 |
| 42.5° | 1780.4 | 1758.8 | 1716.4 | 1689.4 | 1673.7 |
| 45° | 1679.0 | 1660.3 | 1620.1 | 1590.9 | 1580.2 |
| 47.5° | 1580.2 | 1561.5 | 1518.7 | 1489.2 | 1473.4 |
| 50° | 1476.0 | 1462.7 | 1425.2 | 1387.9 | 1374.6 |
| 52.5° | 1374.6 | 1355.8 | 1321.3 | 1291.9 | 1273.2 |
| 55° | 1270.6 | 1254.5 | 1222.5 | 1190.5 | 1177.1 |
| 57.5° | 1166.4 | 1153.2 | 1118.3 | 1086.3 | 1075.5 |
| 60° | 1062.2 | 1051.8 | 1014.3 | 984.9 | 977.0 |
| 62.5° | 960.8 | 942.2 | 915.5 | 888.9 | 878.2 |
| 65° | 856.9 | 840.8 | 814.1 | 790.1 | 776.8 |
| 67.5° | 750.1 | 736.6 | 712.7 | 694.1 | 683.3 |
| 70° | 651.3 | 640.5 | 616.5 | 597.8 | 587.3 |
| 72.5° | 549.9 | 539.2 | 525.8 | 507.2 | 499.3 |
| 75° | 448.3 | 443.2 | 429.6 | 413.8 | 419.1 |
| 77.5° | 357.7 | 346.9 | 341.5 | 333.6 | 325.7 |
| 80° | 267.1 | 264.2 | 258.9 | 250.9 | 245.5 |
| 82.5° | 181.6 | 181.6 | 179.0 | 168.2 | 168.2 |
| 85° | 109.3 | 106.7 | 104.2 | 96.0 | 93.5 |
| 87.5° | 48.2 | 42.8 | 37.4 | 29.4 | 26.7 |
| 90° | 1.0 | 12.2 | 33.3 | 31.3 | 32.3 |
| 92.5° | 21.0 | 28.5 | 29.6 | 30.6 | 30.6 |
| 95° | 49.7 | 59.2 | 60.9 | 60.9 | 59.2 |
| 97.5° | 82.7 | 91.5 | 95.2 | 95.2 | 95.2 |
| 100° | 120.7 | 128.6 | 131.3 | 131.3 | 130.3 |
| 102.5° | 160.9 | 166.7 | 170.4 | 171.4 | 170.4 |
| 105° | 204.7 | 207.4 | 209.5 | 211.2 | 211.2 |
| 107.5° | 248.3 | 252.4 | 252.4 | 253.0 | 248.3 |
| 110° | 290.4 | 295.9 | 295.9 | 295.9 | 293.2 |



TEST NUMBER: P921494

CATALOG NUMBER: DFN2DIP-4P4F0-080D040US940-FLLFLL

CANDELA DISTRIBUTION (continued):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 336.0 | 341.8 | 340.7 | 338.0 | 336.0 |
| 115° | 380.8 | 386.4 | 384.6 | 383.6 | 380.8 |
| 117.5° | 425.4 | 432.9 | 428.2 | 425.4 | 422.8 |
| 120° | 470.4 | 477.8 | 470.4 | 470.4 | 467.3 |
| 122.5° | 511.1 | 520.7 | 515.9 | 513.2 | 511.1 |
| 125° | 554.0 | 562.5 | 559.8 | 556.7 | 555.7 |
| 127.5° | 595.8 | 606.4 | 602.6 | 598.5 | 595.8 |
| 130° | 634.9 | 647.2 | 645.5 | 643.5 | 639.7 |
| 132.5° | 678.8 | 688.3 | 689.0 | 684.2 | 681.5 |
| 135° | 716.6 | 727.1 | 729.2 | 728.1 | 725.4 |
| 137.5° | 758.8 | 767.2 | 768.9 | 768.2 | 764.2 |
| 140° | 795.8 | 804.3 | 809.0 | 809.0 | 805.3 |
| 142.5° | 833.9 | 842.4 | 845.1 | 846.1 | 842.4 |
| 145° | 870.0 | 876.7 | 882.2 | 883.2 | 879.5 |
| 147.5° | 902.2 | 910.7 | 914.8 | 916.5 | 912.8 |
| 150° | 935.6 | 941.4 | 945.1 | 948.2 | 945.1 |
| 152.5° | 965.2 | 970.9 | 975.7 | 979.5 | 975.7 |
| 155° | 994.7 | 997.5 | 1000.5 | 1005.3 | 1002.2 |
| 157.5° | 1020.3 | 1022.3 | 1024.0 | 1030.8 | 1026.0 |
| 160° | 1043.0 | 1045.1 | 1046.1 | 1051.9 | 1047.8 |
| 162.5° | 1064.1 | 1064.1 | 1065.1 | 1071.6 | 1066.8 |
| 165° | 1082.2 | 1081.1 | 1081.1 | 1087.9 | 1083.2 |
| 167.5° | 1098.5 | 1095.4 | 1095.4 | 1102.2 | 1097.4 |
| 170° | 1110.7 | 1108.0 | 1107.0 | 1113.7 | 1108.0 |
| 172.5° | 1119.2 | 1116.5 | 1115.4 | 1122.3 | 1116.5 |
| 175° | 1126.1 | 1123.3 | 1121.2 | 1128.0 | 1122.3 |
| 177.5° | 1129.8 | 1127.0 | 1125.0 | 1130.8 | 1125.0 |
| 180° | 1128.0 | 1128.0 | 1128.0 | 1128.0 | 1128.0 |



TEST NUMBER: P921494
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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 | 10.94 | 12.00 | 11.71 | 12.80 | 13.77 | 10.49 | 11.56 | 11.27 | 12.35 | 13.32 |
| | 3H | 12.62 | 13.57 | 13.40 | 14.38 | 15.38 | 12.13 | 13.08 | 12.91 | 13.89 | 14.89 |
| | 4H | 13.22 | 14.12 | 14.02 | 14.94 | 15.95 | 12.72 | 13.63 | 13.53 | 14.44 | 15.45 |
| | 6H | 13.63 | 14.47 | 14.45 | 15.29 | 16.31 | 13.13 | 13.97 | 13.95 | 14.79 | 15.81 |
| | 8H | 13.75 | 14.54 | 14.57 | 15.38 | 16.41 | 13.24 | 14.04 | 14.07 | 14.88 | 15.90 |
| | 12H | 13.80 | 14.56 | 14.64 | 15.40 | 16.45 | 13.29 | 14.05 | 14.13 | 14.89 | 15.94 |
| 4H | 2H | 11.42 | 12.33 | 12.23 | 13.14 | 14.15 | 11.07 | 11.97 | 11.88 | 12.79 | 13.80 |
| | 3H | 13.31 | 14.07 | 14.13 | 14.92 | 15.94 | 12.91 | 13.66 | 13.73 | 14.51 | 15.53 |
| | 4H | 14.04 | 14.73 | 14.87 | 15.57 | 16.63 | 13.62 | 14.30 | 14.45 | 15.15 | 16.20 |
| | 6H | 14.57 | 15.17 | 15.42 | 16.04 | 17.10 | 14.14 | 14.73 | 14.99 | 15.61 | 16.66 |
| | 8H | 14.73 | 15.29 | 15.58 | 16.15 | 17.22 | 14.29 | 14.85 | 15.15 | 15.71 | 16.78 |
| | 12H | 14.82 | 15.32 | 15.69 | 16.20 | 17.28 | 14.37 | 14.87 | 15.24 | 15.75 | 16.83 |
| 8H | 4H | 14.25 | 14.81 | 15.11 | 15.68 | 16.75 | 13.88 | 14.43 | 14.73 | 15.30 | 16.37 |
| | 6H | 14.90 | 15.36 | 15.78 | 16.27 | 17.34 | 14.52 | 14.98 | 15.40 | 15.88 | 16.96 |
| | 8H | 15.13 | 15.54 | 16.02 | 16.44 | 17.53 | 14.73 | 15.14 | 15.63 | 16.04 | 17.13 |
| | 12H | 15.27 | 15.63 | 16.17 | 16.53 | 17.67 | 14.86 | 15.22 | 15.76 | 16.11 | 17.26 |
| 12H | 4H | 14.25 | 14.75 | 15.12 | 15.64 | 16.71 | 13.88 | 14.38 | 14.76 | 15.27 | 16.34 |
| | 6H | 14.93 | 15.34 | 15.83 | 16.24 | 17.33 | 14.56 | 14.97 | 15.45 | 15.87 | 16.96 |
| | 8H | 15.19 | 15.55 | 16.08 | 16.44 | 17.58 | 14.81 | 15.17 | 15.70 | 16.06 | 17.20 |