

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: P922691

Luminaire Tested: DFN2DIP-SQ2F0-080D040US940-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P922691  
REPORT IS A COMBINATION OF REPORTS P901314 AND P898215  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ2F0-080D040US940-RLLONL  
Description: 2 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

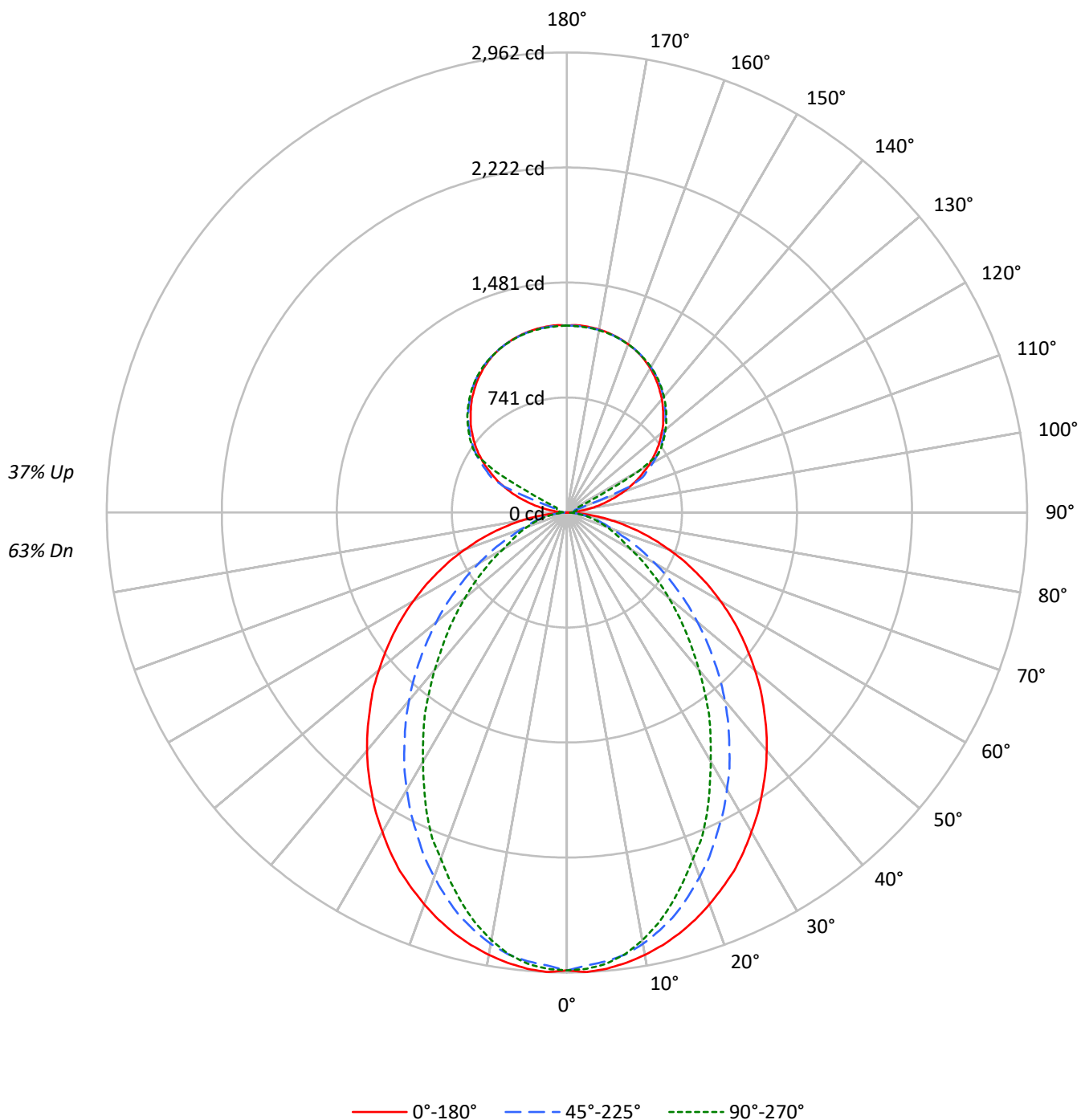
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 9594.8 lumens  
Efficiency: N/A  
Efficacy: 88.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.21' x L: 2.21' x H: 0.1')  
CIE Type: Semi-Direct  
  
Input Watts (W): 108.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9957  
Total Harmonic Distortion (THDi): 0.049  
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



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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |
| RC  | 80  |     |     |     | 70  |     |     |     | 50 |    |    |    | 30 |    |    |    | 10 |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
| 0   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 91 | 91 | 91 | 79 | 79 | 79 | 68 | 68 | 68 |
| 1   | 101 | 97  | 93  | 90  | 95  | 91  | 88  | 85  | 80 | 78 | 76 | 71 | 69 | 67 | 61 | 60 | 59 |
| 2   | 93  | 86  | 80  | 75  | 87  | 81  | 75  | 71  | 71 | 67 | 64 | 63 | 60 | 57 | 55 | 52 | 51 |
| 3   | 85  | 76  | 69  | 63  | 80  | 72  | 65  | 60  | 63 | 58 | 54 | 56 | 52 | 49 | 49 | 46 | 44 |
| 4   | 78  | 68  | 60  | 54  | 73  | 64  | 57  | 52  | 57 | 51 | 47 | 50 | 46 | 43 | 44 | 41 | 38 |
| 5   | 72  | 61  | 53  | 47  | 67  | 57  | 50  | 45  | 51 | 45 | 41 | 46 | 41 | 37 | 40 | 37 | 34 |
| 6   | 67  | 55  | 47  | 41  | 62  | 52  | 45  | 39  | 46 | 41 | 36 | 41 | 37 | 33 | 37 | 33 | 30 |
| 7   | 62  | 50  | 42  | 36  | 58  | 47  | 40  | 35  | 42 | 36 | 32 | 38 | 33 | 30 | 34 | 30 | 27 |
| 8   | 58  | 45  | 38  | 32  | 54  | 43  | 36  | 31  | 39 | 33 | 29 | 35 | 30 | 27 | 31 | 27 | 24 |
| 9   | 54  | 42  | 34  | 29  | 51  | 40  | 33  | 28  | 36 | 30 | 26 | 32 | 27 | 24 | 29 | 25 | 22 |
| 10  | 50  | 38  | 31  | 26  | 47  | 37  | 30  | 25  | 33 | 28 | 24 | 30 | 25 | 22 | 27 | 23 | 20 |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 6483 | 6483 | 6483 |
| 5°  | 6482 | 6366 | 6412 |
| 10° | 6407 | 6227 | 6194 |
| 15° | 6307 | 6008 | 5863 |
| 20° | 6179 | 5711 | 5460 |
| 25° | 6048 | 5381 | 5072 |
| 30° | 5876 | 5044 | 4582 |
| 35° | 5707 | 4683 | 4151 |
| 40° | 5534 | 4310 | 3660 |
| 45° | 5335 | 3900 | 3215 |
| 50° | 5127 | 3486 | 2781 |
| 55° | 4910 | 3046 | 2364 |
| 60° | 4657 | 2588 | 1937 |
| 65° | 4367 | 2124 | 1733 |
| 70° | 4014 | 1692 | 1556 |
| 75° | 3569 | 1465 | 1398 |
| 80° | 2930 | 1190 | 1183 |
| 85° | 1908 | 738  | 842  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 5335 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 276.3  | 2.9       |
| 10°-20°   | 758.6  | 7.9       |
| 20°-30°   | 1065.0 | 11.1      |
| 30°-40°   | 1160.9 | 12.1      |
| 40°-50°   | 1067.0 | 11.1      |
| 50°-60°   | 838.0  | 8.7       |
| 60°-70°   | 545.4  | 5.7       |
| 70°-80°   | 280.8  | 2.9       |
| 80°-90°   | 73.8   | 0.8       |
| 90°-100°  | 39.7   | 0.4       |
| 100°-110° | 148.0  | 1.5       |
| 110°-120° | 392.4  | 4.1       |
| 120°-130° | 650.9  | 6.8       |
| 130°-140° | 691.4  | 7.2       |
| 140°-150° | 642.6  | 6.7       |
| 150°-160° | 516.6  | 5.4       |
| 160°-170° | 332.9  | 3.5       |
| 170°-180° | 114.6  | 1.2       |
| 0°-30°    | 2099.9 | 21.9      |
| 0°-40°    | 3260.8 | 34.0      |
| 0°-60°    | 5165.8 | 53.8      |
| 0°-90°    | 6065.8 | 63.2      |
| 90°-120°  | 580.1  | 6.0       |
| 90°-150°  | 2565.0 | 26.7      |
| 90°-180°  | 3529.0 | 36.8      |
| 0°-180°   | 9594.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2948 | 2948  | 2948 | 2948  | 2948 |      |
| 5°   | 2948 | 2935  | 2900 | 2924  | 2916 | 280  |
| 15°  | 2804 | 2775  | 2684 | 2634  | 2607 | 790  |
| 25°  | 2546 | 2460  | 2284 | 2175  | 2134 | 1171 |
| 35°  | 2193 | 2057  | 1822 | 1654  | 1595 | 1373 |
| 45°  | 1793 | 1614  | 1334 | 1144  | 1081 | 1385 |
| 55°  | 1363 | 1155  | 867  | 707   | 656  | 1218 |
| 65°  | 921  | 704   | 464  | 374   | 365  | 913  |
| 75°  | 491  | 304   | 214  | 195   | 192  | 519  |
| 85°  | 115  | 59    | 51   | 51    | 51   | 132  |
| 90°  | 1    | 10    | 17   | 22    | 24   | 9    |
| 95°  | 56   | 28    | 34   | 38    | 38   | 67   |
| 105° | 265  | 291   | 53   | 63    | 66   | 283  |
| 115° | 501  | 516   | 537  | 134   | 72   | 493  |
| 125° | 708  | 720   | 736  | 742   | 745  | 632  |
| 135° | 876  | 890   | 898  | 907   | 905  | 677  |
| 145° | 1016 | 1016  | 1030 | 1036  | 1032 | 636  |
| 155° | 1119 | 1112  | 1122 | 1127  | 1120 | 516  |
| 165° | 1179 | 1174  | 1177 | 1183  | 1177 | 333  |
| 175° | 1206 | 1200  | 1202 | 1208  | 1199 | 115  |
| 180° | 1204 | 1204  | 1204 | 1204  | 1204 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2948.4 | 2948.4 | 2948.4 | 2948.4 | 2948.4 |
| 2.5°   | 2961.6 | 2948.4 | 2918.9 | 2945.8 | 2940.4 |
| 5°     | 2948.4 | 2935.1 | 2900.2 | 2924.3 | 2916.3 |
| 7.5°   | 2924.3 | 2908.4 | 2871.0 | 2881.6 | 2868.2 |
| 10°    | 2892.3 | 2873.6 | 2820.4 | 2812.2 | 2796.3 |
| 12.5°  | 2852.4 | 2828.3 | 2756.1 | 2740.2 | 2710.8 |
| 15°    | 2804.3 | 2774.8 | 2684.2 | 2633.6 | 2606.9 |
| 17.5°  | 2748.2 | 2705.4 | 2593.4 | 2534.8 | 2492.0 |
| 20°    | 2684.2 | 2630.7 | 2497.4 | 2430.9 | 2371.9 |
| 22.5°  | 2614.9 | 2553.4 | 2398.6 | 2308.0 | 2268.1 |
| 25°    | 2545.5 | 2460.1 | 2283.9 | 2174.7 | 2134.5 |
| 27.5°  | 2462.8 | 2371.9 | 2177.2 | 2051.8 | 1990.4 |
| 30°    | 2374.8 | 2273.1 | 2059.8 | 1923.9 | 1851.6 |
| 32.5°  | 2289.3 | 2166.5 | 1947.9 | 1787.7 | 1720.9 |
| 35°    | 2193.3 | 2057.2 | 1822.5 | 1654.4 | 1595.4 |
| 37.5°  | 2099.9 | 1953.0 | 1705.0 | 1520.7 | 1454.2 |
| 40°    | 2001.2 | 1841.2 | 1582.2 | 1392.8 | 1323.4 |
| 42.5°  | 1899.8 | 1729.1 | 1459.6 | 1262.0 | 1195.4 |
| 45°    | 1793.1 | 1614.2 | 1334.2 | 1144.5 | 1080.6 |
| 47.5°  | 1691.8 | 1502.4 | 1214.2 | 1024.5 | 965.9  |
| 50°    | 1579.6 | 1390.3 | 1096.7 | 912.4  | 856.6  |
| 52.5°  | 1470.1 | 1269.9 | 984.5  | 808.5  | 757.9  |
| 55°    | 1363.3 | 1155.3 | 867.1  | 707.1  | 656.5  |
| 57.5°  | 1254.1 | 1040.6 | 763.2  | 613.8  | 571.0  |
| 60°    | 1141.9 | 928.5  | 653.6  | 517.7  | 475.0  |
| 62.5°  | 1032.7 | 819.2  | 560.3  | 432.3  | 411.1  |
| 65°    | 920.6  | 704.3  | 464.2  | 373.7  | 365.4  |
| 67.5°  | 813.9  | 597.6  | 373.7  | 328.1  | 320.2  |
| 70°    | 701.8  | 493.7  | 309.4  | 282.8  | 272.1  |
| 72.5°  | 595.0  | 397.4  | 258.8  | 237.6  | 232.1  |
| 75°    | 490.9  | 304.1  | 213.5  | 194.7  | 192.3  |
| 77.5°  | 387.0  | 216.0  | 168.2  | 157.4  | 152.0  |
| 80°    | 290.7  | 154.9  | 128.0  | 117.4  | 117.4  |
| 82.5°  | 202.7  | 104.2  | 88.0   | 82.7   | 82.7   |
| 85°    | 114.7  | 58.6   | 50.6   | 50.6   | 50.6   |
| 87.5°  | 42.7   | 21.2   | 21.2   | 18.7   | 18.7   |
| 90°    | 0.8    | 10.4   | 17.4   | 21.8   | 23.5   |
| 92.5°  | 21.8   | 18.3   | 20.9   | 22.6   | 23.5   |
| 95°    | 56.5   | 27.8   | 33.9   | 38.3   | 37.5   |
| 97.5°  | 101.9  | 30.5   | 44.4   | 47.1   | 47.9   |
| 100°   | 154.2  | 34.9   | 49.7   | 56.5   | 58.3   |
| 102.5° | 211.6  | 210.0  | 51.4   | 60.9   | 63.6   |
| 105°   | 264.7  | 291.0  | 53.1   | 62.7   | 66.2   |
| 107.5° | 326.6  | 348.4  | 54.9   | 64.5   | 67.9   |
| 110°   | 385.9  | 404.1  | 152.5  | 65.4   | 68.8   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 441.7  | 457.3  | 442.5  | 67.1   | 69.7   |
| 115°   | 500.8  | 515.6  | 537.4  | 134.1  | 71.5   |
| 117.5° | 552.2  | 569.6  | 584.5  | 459.9  | 231.7  |
| 120°   | 609.8  | 622.8  | 638.5  | 649.0  | 531.4  |
| 122.5° | 658.4  | 672.4  | 689.9  | 695.1  | 696.0  |
| 125°   | 708.1  | 719.5  | 736.0  | 742.2  | 744.8  |
| 127.5° | 753.4  | 765.6  | 778.7  | 787.5  | 788.3  |
| 130°   | 796.1  | 810.1  | 819.6  | 829.2  | 828.4  |
| 132.5° | 839.6  | 851.0  | 860.6  | 868.4  | 867.6  |
| 135°   | 876.3  | 890.3  | 898.0  | 906.8  | 905.1  |
| 137.5° | 914.5  | 925.0  | 933.8  | 942.4  | 939.9  |
| 140°   | 952.0  | 959.0  | 968.6  | 976.4  | 972.1  |
| 142.5° | 983.5  | 989.5  | 1000.9 | 1007.7 | 1003.4 |
| 145°   | 1016.5 | 1015.7 | 1030.4 | 1036.5 | 1032.2 |
| 147.5° | 1045.2 | 1042.6 | 1057.4 | 1061.8 | 1058.4 |
| 150°   | 1073.1 | 1067.0 | 1081.0 | 1086.2 | 1081.8 |
| 152.5° | 1096.6 | 1089.7 | 1102.7 | 1108.0 | 1101.9 |
| 155°   | 1119.3 | 1111.5 | 1121.9 | 1127.1 | 1120.2 |
| 157.5° | 1137.6 | 1130.6 | 1138.5 | 1144.6 | 1137.6 |
| 160°   | 1153.2 | 1148.0 | 1153.2 | 1158.4 | 1152.4 |
| 162.5° | 1167.2 | 1162.0 | 1166.4 | 1172.4 | 1164.6 |
| 165°   | 1179.4 | 1174.2 | 1176.8 | 1182.9 | 1176.8 |
| 167.5° | 1189.0 | 1183.7 | 1186.4 | 1192.5 | 1184.6 |
| 170°   | 1196.9 | 1191.6 | 1193.3 | 1199.4 | 1191.6 |
| 172.5° | 1202.0 | 1196.9 | 1198.6 | 1204.7 | 1196.9 |
| 175°   | 1206.3 | 1200.2 | 1202.0 | 1208.1 | 1199.4 |
| 177.5° | 1208.1 | 1202.0 | 1202.9 | 1209.1 | 1201.2 |
| 180°   | 1203.8 | 1203.8 | 1203.8 | 1203.8 | 1203.8 |

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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 | 14.68            | 15.63 | 15.52 | 16.49 | 17.56 | 10.64          | 11.59 | 11.48 | 12.45 | 13.52 |
|                 | 3H   | 16.35            | 17.20 | 17.20 | 18.07 | 19.16 | 11.82          | 12.67 | 12.67 | 13.54 | 14.64 |
|                 | 4H   | 16.95            | 17.75 | 17.82 | 18.62 | 19.73 | 12.26          | 13.06 | 13.13 | 13.94 | 15.05 |
|                 | 6H   | 17.36            | 18.10 | 18.24 | 18.98 | 20.10 | 12.57          | 13.31 | 13.46 | 14.19 | 15.32 |
|                 | 8H   | 17.48            | 18.18 | 18.37 | 19.08 | 20.21 | 12.66          | 13.36 | 13.55 | 14.26 | 15.38 |
|                 | 12H  | 17.54            | 18.21 | 18.43 | 19.10 | 20.25 | 12.70          | 13.37 | 13.59 | 14.26 | 15.41 |
| 4H              | 2H   | 14.71            | 15.51 | 15.58 | 16.38 | 17.49 | 11.24          | 12.04 | 12.12 | 12.92 | 14.03 |
|                 | 3H   | 16.52            | 17.19 | 17.41 | 18.10 | 19.22 | 12.58          | 13.25 | 13.47 | 14.15 | 15.28 |
|                 | 4H   | 17.21            | 17.81 | 18.10 | 18.72 | 19.87 | 13.12          | 13.72 | 14.01 | 14.63 | 15.78 |
|                 | 6H   | 17.71            | 18.23 | 18.62 | 19.16 | 20.31 | 13.52          | 14.04 | 14.44 | 14.97 | 16.13 |
|                 | 8H   | 17.88            | 18.36 | 18.79 | 19.29 | 20.45 | 13.64          | 14.13 | 14.56 | 15.05 | 16.22 |
|                 | 12H  | 17.97            | 18.40 | 18.90 | 19.34 | 20.52 | 13.70          | 14.14 | 14.64 | 15.08 | 16.25 |
| 8H              | 4H   | 17.18            | 17.67 | 18.09 | 18.59 | 19.75 | 13.39          | 13.88 | 14.31 | 14.80 | 15.97 |
|                 | 6H   | 17.73            | 18.13 | 18.67 | 19.09 | 20.26 | 13.89          | 14.29 | 14.83 | 15.26 | 16.42 |
|                 | 8H   | 17.93            | 18.29 | 18.88 | 19.24 | 20.43 | 14.07          | 14.43 | 15.02 | 15.38 | 16.56 |
|                 | 12H  | 18.06            | 18.38 | 19.02 | 19.32 | 20.56 | 14.18          | 14.49 | 15.13 | 15.44 | 16.67 |
| 12H             | 4H   | 17.13            | 17.57 | 18.07 | 18.51 | 19.69 | 13.40          | 13.84 | 14.34 | 14.78 | 15.95 |
|                 | 6H   | 17.70            | 18.06 | 18.65 | 19.01 | 20.20 | 13.94          | 14.29 | 14.89 | 15.25 | 16.43 |
|                 | 8H   | 17.91            | 18.23 | 18.87 | 19.17 | 20.41 | 14.14          | 14.45 | 15.09 | 15.40 | 16.63 |