

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: P920233

Luminaire Tested: DFN2DIP-SQ3F0-110D040US935-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P920233  
REPORT IS A COMBINATION OF REPORTS P901395 AND P898289  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ3F0-110D040US935-FLLONL  
Description: 3 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

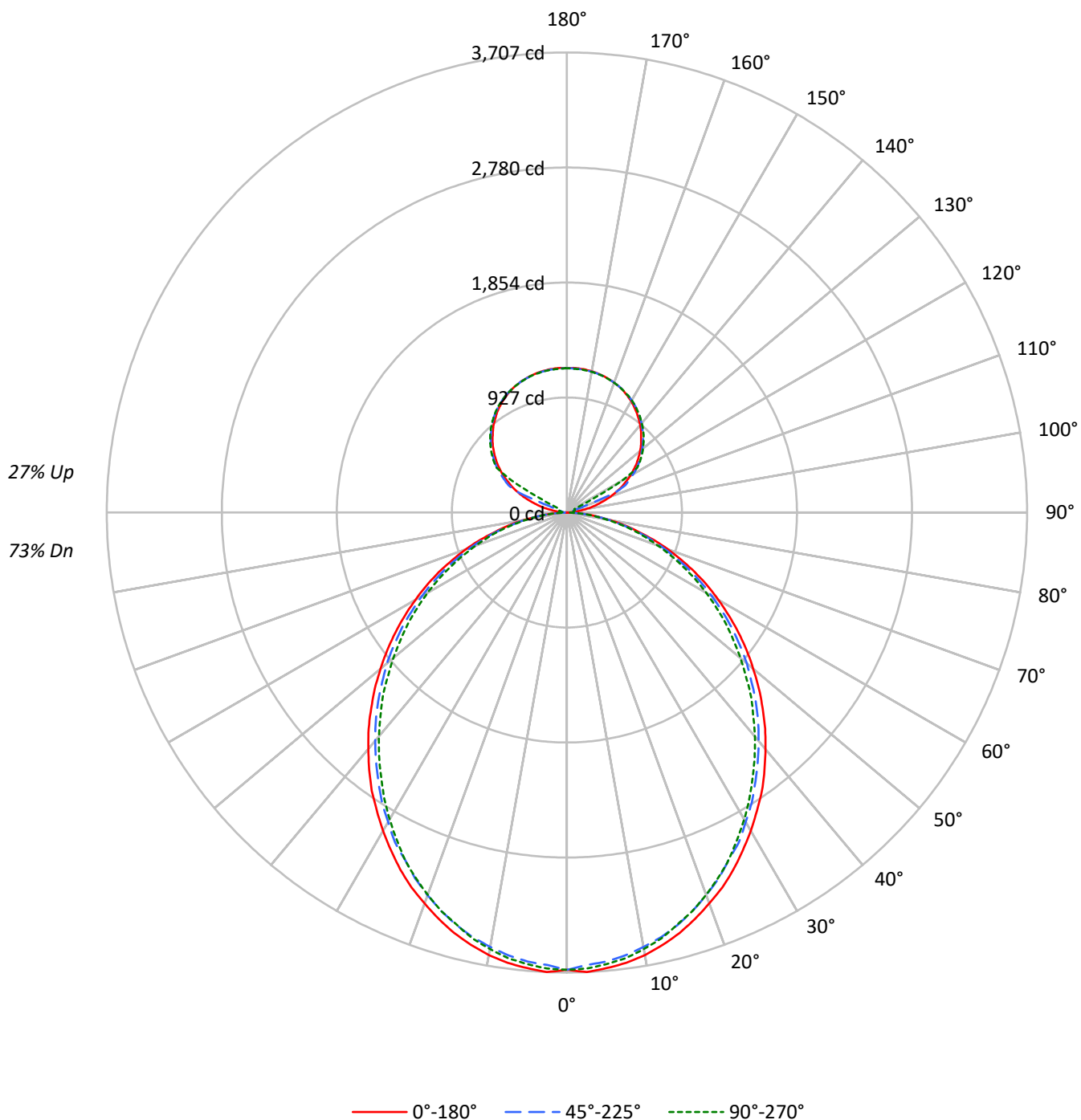
Lumens per Lamp: N/A  
Luminaire Lumens: 12785.8 lumens  
Efficiency: N/A  
Efficacy: 89.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.06' x L: 3.06' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 142.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
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 |    |    |    |    | 0  |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 113 | 113 | 113 | 113 | 107 | 107 | 107 | 107 | 96 | 96 | 96 | 87 | 87 | 87 | 78 | 78 | 78 | 78 | 78 | 73 |
| 1   | 103 | 99  | 95  | 91  | 98  | 94  | 90  | 87  | 85 | 82 | 79 | 76 | 74 | 72 | 69 | 67 | 66 | 66 | 66 | 62 |
| 2   | 94  | 86  | 80  | 74  | 89  | 82  | 76  | 71  | 74 | 70 | 66 | 67 | 64 | 60 | 60 | 58 | 55 | 55 | 55 | 52 |
| 3   | 86  | 76  | 68  | 62  | 81  | 72  | 65  | 60  | 66 | 60 | 55 | 59 | 55 | 51 | 54 | 50 | 47 | 47 | 47 | 44 |
| 4   | 78  | 67  | 59  | 53  | 74  | 64  | 57  | 51  | 58 | 52 | 47 | 53 | 48 | 44 | 48 | 44 | 41 | 41 | 41 | 38 |
| 5   | 72  | 60  | 52  | 45  | 68  | 57  | 50  | 44  | 52 | 46 | 41 | 48 | 42 | 38 | 43 | 39 | 35 | 35 | 35 | 33 |
| 6   | 67  | 54  | 46  | 39  | 63  | 52  | 44  | 38  | 47 | 41 | 36 | 43 | 38 | 34 | 39 | 35 | 31 | 31 | 31 | 29 |
| 7   | 62  | 49  | 41  | 35  | 58  | 47  | 39  | 34  | 43 | 36 | 32 | 39 | 34 | 30 | 36 | 31 | 28 | 28 | 28 | 26 |
| 8   | 57  | 45  | 37  | 31  | 54  | 43  | 35  | 30  | 39 | 33 | 28 | 36 | 31 | 27 | 33 | 28 | 25 | 25 | 25 | 23 |
| 9   | 54  | 41  | 33  | 28  | 51  | 39  | 32  | 27  | 36 | 30 | 26 | 33 | 28 | 24 | 30 | 26 | 23 | 23 | 23 | 21 |
| 10  | 50  | 38  | 30  | 25  | 48  | 36  | 29  | 24  | 33 | 27 | 23 | 31 | 26 | 22 | 28 | 24 | 21 | 21 | 21 | 19 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4223 | 4223 | 4223 |
| 5°  | 4227 | 4161 | 4190 |
| 10° | 4190 | 4102 | 4132 |
| 15° | 4125 | 4032 | 4042 |
| 20° | 4039 | 3935 | 3950 |
| 25° | 3954 | 3820 | 3844 |
| 30° | 3847 | 3713 | 3709 |
| 35° | 3746 | 3587 | 3567 |
| 40° | 3622 | 3459 | 3431 |
| 45° | 3498 | 3332 | 3292 |
| 50° | 3362 | 3197 | 3131 |
| 55° | 3220 | 3042 | 2983 |
| 60° | 3059 | 2858 | 2813 |
| 65° | 2883 | 2667 | 2613 |
| 70° | 2659 | 2434 | 2397 |
| 75° | 2349 | 2154 | 2196 |
| 80° | 1974 | 1797 | 1815 |
| 85° | 1390 | 1191 | 1188 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3498 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 346.9   | 2.7       |
| 10°-20°   | 975.9   | 7.6       |
| 20°-30°   | 1434.2  | 11.2      |
| 30°-40°   | 1665.7  | 13.0      |
| 40°-50°   | 1663.7  | 13.0      |
| 50°-60°   | 1450.7  | 11.3      |
| 60°-70°   | 1072.4  | 8.4       |
| 70°-80°   | 606.7   | 4.7       |
| 80°-90°   | 162.2   | 1.3       |
| 90°-100°  | 38.3    | 0.3       |
| 100°-110° | 142.9   | 1.1       |
| 110°-120° | 378.9   | 3.0       |
| 120°-130° | 628.5   | 4.9       |
| 130°-140° | 667.6   | 5.2       |
| 140°-150° | 620.4   | 4.9       |
| 150°-160° | 498.8   | 3.9       |
| 160°-170° | 321.4   | 2.5       |
| 170°-180° | 110.6   | 0.9       |
| 0°-30°    | 2757.0  | 21.6      |
| 0°-40°    | 4422.7  | 34.6      |
| 0°-60°    | 7537.0  | 58.9      |
| 0°-90°    | 9378.3  | 73.3      |
| 90°-120°  | 560.1   | 4.4       |
| 90°-150°  | 2476.6  | 19.4      |
| 90°-180°  | 3407.0  | 26.6      |
| 0°-180°   | 12785.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3685 | 3685  | 3685 | 3685  | 3685 |      |
| 5°   | 3685 | 3671  | 3632 | 3660  | 3654 | 350  |
| 15°  | 3508 | 3487  | 3441 | 3455  | 3437 | 988  |
| 25°  | 3175 | 3147  | 3087 | 3094  | 3087 | 1461 |
| 35°  | 2739 | 2704  | 2647 | 2626  | 2608 | 1711 |
| 45°  | 2229 | 2204  | 2151 | 2112  | 2098 | 1720 |
| 55°  | 1687 | 1666  | 1623 | 1580  | 1563 | 1508 |
| 65°  | 1138 | 1116  | 1081 | 1049  | 1031 | 1125 |
| 75°  | 595  | 588   | 570  | 549   | 556  | 635  |
| 85°  | 145  | 142   | 138  | 127   | 124  | 162  |
| 90°  | 1    | 10    | 17   | 21    | 23   | 12   |
| 95°  | 55   | 27    | 33   | 37    | 36   | 65   |
| 105° | 256  | 281   | 51   | 60    | 64   | 273  |
| 115° | 484  | 498   | 519  | 130   | 69   | 476  |
| 125° | 684  | 695   | 711  | 717   | 719  | 610  |
| 135° | 846  | 860   | 867  | 876   | 874  | 654  |
| 145° | 982  | 981   | 995  | 1001  | 997  | 614  |
| 155° | 1081 | 1073  | 1083 | 1088  | 1082 | 498  |
| 165° | 1139 | 1134  | 1136 | 1142  | 1136 | 322  |
| 175° | 1165 | 1159  | 1161 | 1166  | 1158 | 111  |
| 180° | 1162 | 1162  | 1162 | 1162  | 1162 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3685.2 | 3685.2 | 3685.2 | 3685.2 | 3685.2 |
| 2.5°   | 3706.6 | 3688.9 | 3649.9 | 3685.2 | 3678.4 |
| 5°     | 3685.2 | 3671.3 | 3632.2 | 3660.4 | 3653.6 |
| 7.5°   | 3660.4 | 3639.4 | 3600.3 | 3628.8 | 3621.7 |
| 10°    | 3621.7 | 3596.8 | 3554.4 | 3582.5 | 3572.0 |
| 12.5°  | 3568.3 | 3547.2 | 3504.8 | 3522.4 | 3515.3 |
| 15°    | 3508.1 | 3487.0 | 3440.8 | 3455.1 | 3437.4 |
| 17.5°  | 3433.7 | 3412.7 | 3366.4 | 3384.1 | 3366.4 |
| 20°    | 3352.1 | 3331.0 | 3281.4 | 3291.9 | 3278.1 |
| 22.5°  | 3270.9 | 3238.9 | 3192.7 | 3192.7 | 3185.5 |
| 25°    | 3175.0 | 3146.9 | 3086.7 | 3093.5 | 3086.7 |
| 27.5°  | 3068.6 | 3043.8 | 2997.9 | 2987.4 | 2969.8 |
| 30°    | 2962.6 | 2934.0 | 2881.0 | 2870.5 | 2856.2 |
| 32.5°  | 2849.0 | 2828.0 | 2771.2 | 2749.8 | 2735.5 |
| 35°    | 2739.3 | 2704.0 | 2647.1 | 2625.7 | 2608.0 |
| 37.5°  | 2615.2 | 2583.3 | 2526.5 | 2501.6 | 2484.0 |
| 40°    | 2487.8 | 2459.2 | 2402.4 | 2370.8 | 2356.6 |
| 42.5°  | 2363.7 | 2335.1 | 2278.7 | 2243.0 | 2222.0 |
| 45°    | 2229.1 | 2204.2 | 2150.9 | 2112.2 | 2097.9 |
| 47.5°  | 2097.9 | 2073.1 | 2016.3 | 1977.2 | 1956.1 |
| 50°    | 1959.5 | 1941.9 | 1892.2 | 1842.6 | 1825.0 |
| 52.5°  | 1825.0 | 1800.1 | 1754.3 | 1715.1 | 1690.3 |
| 55°    | 1687.0 | 1665.5 | 1623.1 | 1580.5 | 1562.9 |
| 57.5°  | 1548.6 | 1530.9 | 1484.7 | 1442.2 | 1427.9 |
| 60°    | 1410.2 | 1396.4 | 1346.7 | 1307.6 | 1297.1 |
| 62.5°  | 1275.7 | 1250.9 | 1215.5 | 1180.2 | 1165.9 |
| 65°    | 1137.6 | 1116.2 | 1080.9 | 1049.0 | 1031.3 |
| 67.5°  | 995.9  | 977.9  | 946.3  | 921.5  | 907.2  |
| 70°    | 864.7  | 850.4  | 818.5  | 793.7  | 779.7  |
| 72.5°  | 730.1  | 715.8  | 698.2  | 673.4  | 662.8  |
| 75°    | 595.1  | 588.4  | 570.3  | 549.3  | 556.5  |
| 77.5°  | 474.8  | 460.5  | 453.4  | 442.9  | 432.4  |
| 80°    | 354.6  | 350.8  | 343.6  | 333.1  | 326.0  |
| 82.5°  | 241.0  | 241.0  | 237.6  | 223.3  | 223.3  |
| 85°    | 145.2  | 141.7  | 138.4  | 127.4  | 124.1  |
| 87.5°  | 63.9   | 56.7   | 49.6   | 39.1   | 35.3   |
| 90°    | 0.8    | 10.1   | 16.8   | 21.1   | 22.6   |
| 92.5°  | 21.1   | 17.7   | 20.1   | 21.9   | 22.6   |
| 95°    | 54.6   | 26.9   | 32.7   | 37.0   | 36.2   |
| 97.5°  | 98.4   | 29.4   | 42.9   | 45.5   | 46.2   |
| 100°   | 148.9  | 33.7   | 48.0   | 54.6   | 56.3   |
| 102.5° | 204.3  | 202.8  | 49.6   | 58.8   | 61.4   |
| 105°   | 255.6  | 280.9  | 51.3   | 60.5   | 63.9   |
| 107.5° | 315.4  | 336.4  | 53.0   | 62.3   | 65.6   |
| 110°   | 372.6  | 390.2  | 147.2  | 63.1   | 66.4   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 426.5  | 441.5  | 427.2  | 64.7   | 67.3   |
| 115°   | 483.5  | 497.8  | 518.9  | 129.5  | 69.1   |
| 117.5° | 533.2  | 550.0  | 564.4  | 444.0  | 223.7  |
| 120°   | 588.8  | 601.3  | 616.5  | 626.6  | 513.1  |
| 122.5° | 635.8  | 649.3  | 666.2  | 671.1  | 672.0  |
| 125°   | 683.7  | 694.7  | 710.7  | 716.6  | 719.1  |
| 127.5° | 727.5  | 739.3  | 751.9  | 760.3  | 761.1  |
| 130°   | 768.7  | 782.2  | 791.3  | 800.6  | 799.9  |
| 132.5° | 810.7  | 821.7  | 830.9  | 838.5  | 837.8  |
| 135°   | 846.1  | 859.6  | 867.1  | 875.5  | 873.9  |
| 137.5° | 883.0  | 893.1  | 901.6  | 910.0  | 907.5  |
| 140°   | 919.2  | 926.0  | 935.2  | 942.8  | 938.6  |
| 142.5° | 949.6  | 955.4  | 966.4  | 973.0  | 968.9  |
| 145°   | 981.5  | 980.7  | 994.9  | 1000.8 | 996.6  |
| 147.5° | 1009.2 | 1006.7 | 1021.0 | 1025.2 | 1021.9 |
| 150°   | 1036.1 | 1030.3 | 1043.8 | 1048.8 | 1044.6 |
| 152.5° | 1058.9 | 1052.1 | 1064.7 | 1069.8 | 1063.9 |
| 155°   | 1080.7 | 1073.2 | 1083.3 | 1088.3 | 1081.6 |
| 157.5° | 1098.4 | 1091.7 | 1099.3 | 1105.2 | 1098.4 |
| 160°   | 1113.5 | 1108.4 | 1113.5 | 1118.5 | 1112.7 |
| 162.5° | 1127.0 | 1122.0 | 1126.2 | 1132.0 | 1124.5 |
| 165°   | 1138.8 | 1133.8 | 1136.3 | 1142.1 | 1136.3 |
| 167.5° | 1148.1 | 1142.9 | 1145.6 | 1151.4 | 1143.8 |
| 170°   | 1155.6 | 1150.6 | 1152.2 | 1158.1 | 1150.6 |
| 172.5° | 1160.6 | 1155.6 | 1157.4 | 1163.2 | 1155.6 |
| 175°   | 1164.8 | 1158.9 | 1160.6 | 1166.5 | 1158.1 |
| 177.5° | 1166.5 | 1160.6 | 1161.5 | 1167.4 | 1159.9 |
| 180°   | 1162.3 | 1162.3 | 1162.3 | 1162.3 | 1162.3 |



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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 | 14.17            | 15.28 | 14.89 | 16.03 | 16.93 | 13.72          | 14.84 | 14.45 | 15.59 | 16.48 |
|                 | 3H   | 15.84            | 16.85 | 16.58 | 17.60 | 18.53 | 15.35          | 16.36 | 16.09 | 17.11 | 18.04 |
|                 | 4H   | 16.44            | 17.39 | 17.19 | 18.15 | 19.09 | 15.94          | 16.89 | 16.70 | 17.66 | 18.60 |
|                 | 6H   | 16.85            | 17.72 | 17.62 | 18.50 | 19.45 | 16.35          | 17.22 | 17.12 | 18.00 | 18.95 |
|                 | 8H   | 16.96            | 17.79 | 17.74 | 18.59 | 19.54 | 16.45          | 17.29 | 17.24 | 18.09 | 19.04 |
|                 | 12H  | 17.01            | 17.81 | 17.80 | 18.60 | 19.58 | 16.50          | 17.30 | 17.29 | 18.09 | 19.07 |
| 4H              | 2H   | 14.65            | 15.60 | 15.42 | 16.37 | 17.31 | 14.30          | 15.25 | 15.06 | 16.01 | 16.95 |
|                 | 3H   | 16.54            | 17.33 | 17.31 | 18.13 | 19.09 | 16.13          | 16.92 | 16.90 | 17.72 | 18.68 |
|                 | 4H   | 17.26            | 17.98 | 18.05 | 18.78 | 19.76 | 16.83          | 17.55 | 17.62 | 18.36 | 19.34 |
|                 | 6H   | 17.78            | 18.41 | 18.59 | 19.23 | 20.22 | 17.35          | 17.98 | 18.16 | 18.80 | 19.79 |
|                 | 8H   | 17.94            | 18.52 | 18.75 | 19.34 | 20.34 | 17.50          | 18.08 | 18.31 | 18.91 | 19.91 |
|                 | 12H  | 18.02            | 18.54 | 18.85 | 19.39 | 20.40 | 17.57          | 18.10 | 18.40 | 18.94 | 19.95 |
| 8H              | 4H   | 17.47            | 18.05 | 18.28 | 18.88 | 19.88 | 17.09          | 17.68 | 17.90 | 18.50 | 19.50 |
|                 | 6H   | 18.11            | 18.59 | 18.95 | 19.45 | 20.46 | 17.72          | 18.21 | 18.56 | 19.07 | 20.07 |
|                 | 8H   | 18.33            | 18.76 | 19.18 | 19.62 | 20.64 | 17.93          | 18.36 | 18.78 | 19.22 | 20.24 |
|                 | 12H  | 18.47            | 18.85 | 19.32 | 19.70 | 20.77 | 18.06          | 18.43 | 18.91 | 19.29 | 20.36 |
| 12H             | 4H   | 17.47            | 17.99 | 18.30 | 18.84 | 19.84 | 17.10          | 17.62 | 17.93 | 18.47 | 19.48 |
|                 | 6H   | 18.14            | 18.57 | 18.99 | 19.43 | 20.45 | 17.76          | 18.20 | 18.61 | 19.06 | 20.07 |
|                 | 8H   | 18.39            | 18.77 | 19.24 | 19.62 | 20.69 | 18.01          | 18.39 | 18.86 | 19.24 | 20.31 |