

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: P926546

Luminaire Tested: DFN2DIP-TR4F0-090D040US950-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P926546  
REPORT IS A COMBINATION OF REPORTS P900379 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-090D040US950-FLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

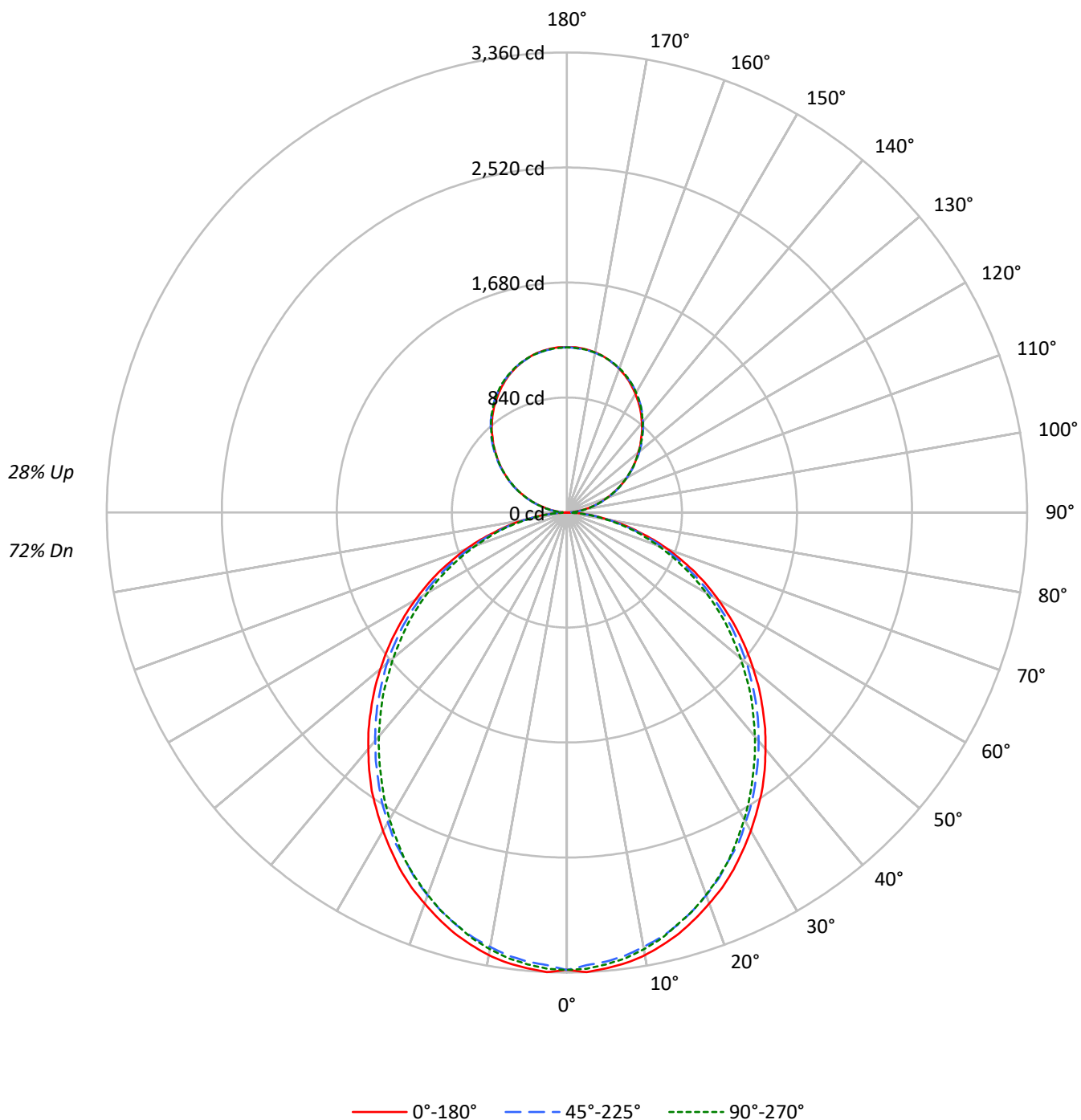
Lumens per Lamp: N/A  
Luminaire Lumens: 11877.3 lumens  
Efficiency: N/A  
Efficacy: 100.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 117.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.099  
Total Harmonic Distortion (THDi): 0.979  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P926546

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### Luminous Intensity Polar Plot



TEST NUMBER: P926546

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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   | 112 | 112 | 112 | 112 | 106 | 106 | 106 | 106 | 95 | 95 | 95 | 85 | 85 | 85 | 76 | 76 | 76 |
| 1   | 103 | 98  | 94  | 91  | 97  | 93  | 90  | 86  | 84 | 81 | 79 | 75 | 73 | 71 | 67 | 66 | 64 |
| 2   | 93  | 86  | 79  | 74  | 88  | 81  | 76  | 71  | 73 | 69 | 65 | 66 | 63 | 59 | 59 | 56 | 54 |
| 3   | 85  | 75  | 68  | 62  | 81  | 72  | 65  | 59  | 65 | 59 | 55 | 58 | 54 | 50 | 52 | 49 | 46 |
| 4   | 78  | 67  | 59  | 52  | 74  | 64  | 56  | 51  | 58 | 52 | 47 | 52 | 47 | 43 | 47 | 43 | 40 |
| 5   | 72  | 60  | 51  | 45  | 68  | 57  | 49  | 44  | 52 | 45 | 41 | 47 | 42 | 38 | 42 | 38 | 35 |
| 6   | 66  | 54  | 45  | 39  | 63  | 51  | 44  | 38  | 47 | 40 | 35 | 42 | 37 | 33 | 38 | 34 | 31 |
| 7   | 61  | 49  | 40  | 35  | 58  | 47  | 39  | 34  | 42 | 36 | 31 | 39 | 33 | 29 | 35 | 31 | 27 |
| 8   | 57  | 44  | 36  | 31  | 54  | 42  | 35  | 30  | 39 | 33 | 28 | 35 | 30 | 26 | 32 | 28 | 24 |
| 9   | 53  | 41  | 33  | 28  | 50  | 39  | 32  | 27  | 36 | 30 | 25 | 33 | 27 | 24 | 30 | 25 | 22 |
| 10  | 50  | 37  | 30  | 25  | 47  | 36  | 29  | 24  | 33 | 27 | 23 | 30 | 25 | 21 | 28 | 23 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2654 | 2654 | 2654 |
| 5°  | 2658 | 2617 | 2635 |
| 10° | 2637 | 2582 | 2599 |
| 15° | 2598 | 2539 | 2543 |
| 20° | 2546 | 2480 | 2486 |
| 25° | 2494 | 2410 | 2420 |
| 30° | 2428 | 2344 | 2336 |
| 35° | 2367 | 2266 | 2247 |
| 40° | 2290 | 2188 | 2163 |
| 45° | 2214 | 2109 | 2076 |
| 50° | 2131 | 2027 | 1976 |
| 55° | 2044 | 1932 | 1884 |
| 60° | 1946 | 1818 | 1778 |
| 65° | 1839 | 1701 | 1654 |
| 70° | 1703 | 1559 | 1520 |
| 75° | 1513 | 1388 | 1396 |
| 80° | 1286 | 1170 | 1160 |
| 85° | 931  | 794  | 769  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2214 cd/sqm

TEST NUMBER: P926546

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 314.4   | 2.6       |
| 10°-20°   | 884.7   | 7.4       |
| 20°-30°   | 1300.2  | 10.9      |
| 30°-40°   | 1510.1  | 12.7      |
| 40°-50°   | 1508.2  | 12.7      |
| 50°-60°   | 1315.1  | 11.1      |
| 60°-70°   | 972.2   | 8.2       |
| 70°-80°   | 550.0   | 4.6       |
| 80°-90°   | 148.6   | 1.3       |
| 90°-100°  | 74.7    | 0.6       |
| 100°-110° | 237.3   | 2.0       |
| 110°-120° | 406.1   | 3.4       |
| 120°-130° | 534.0   | 4.5       |
| 130°-140° | 599.4   | 5.0       |
| 140°-150° | 587.8   | 4.9       |
| 150°-160° | 493.1   | 4.2       |
| 160°-170° | 327.0   | 2.8       |
| 170°-180° | 114.3   | 1.0       |
| 0°-30°    | 2499.3  | 21.0      |
| 0°-40°    | 4009.4  | 33.8      |
| 0°-60°    | 6832.8  | 57.5      |
| 0°-90°    | 8503.6  | 71.6      |
| 90°-120°  | 718.0   | 6.0       |
| 90°-150°  | 2439.3  | 20.5      |
| 90°-180°  | 3374.0  | 28.4      |
| 0°-180°   | 11877.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3341 | 3341  | 3341 | 3341  | 3341 |      |
| 5°   | 3341 | 3328  | 3293 | 3318  | 3312 | 317  |
| 15°  | 3180 | 3161  | 3119 | 3132  | 3116 | 896  |
| 25°  | 2878 | 2853  | 2798 | 2804  | 2798 | 1324 |
| 35°  | 2483 | 2451  | 2400 | 2380  | 2364 | 1551 |
| 45°  | 2021 | 1998  | 1950 | 1915  | 1902 | 1560 |
| 55°  | 1529 | 1510  | 1471 | 1433  | 1417 | 1367 |
| 65°  | 1031 | 1012  | 980  | 951   | 935  | 1020 |
| 75°  | 540  | 533   | 517  | 498   | 504  | 576  |
| 85°  | 132  | 128   | 126  | 116   | 112  | 147  |
| 90°  | 1    | 13    | 36   | 34    | 34   | 11   |
| 95°  | 53   | 63    | 65   | 65    | 63   | 59   |
| 105° | 219  | 222   | 224  | 226   | 226  | 231  |
| 115° | 408  | 413   | 412  | 410   | 408  | 403  |
| 125° | 593  | 602   | 599  | 596   | 594  | 530  |
| 135° | 767  | 778   | 780  | 779   | 776  | 593  |
| 145° | 931  | 938   | 944  | 945   | 941  | 582  |
| 155° | 1064 | 1067  | 1070 | 1076  | 1072 | 490  |
| 165° | 1158 | 1157  | 1157 | 1164  | 1159 | 327  |
| 175° | 1205 | 1202  | 1200 | 1207  | 1201 | 114  |
| 180° | 1207 | 1207  | 1207 | 1207  | 1207 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3340.8 | 3340.8 | 3340.8 | 3340.8 | 3340.8 |
| 2.5°   | 3360.3 | 3344.2 | 3308.9 | 3340.8 | 3334.7 |
| 5°     | 3340.8 | 3328.2 | 3292.8 | 3318.4 | 3312.2 |
| 7.5°   | 3318.4 | 3299.3 | 3263.8 | 3289.8 | 3283.3 |
| 10°    | 3283.3 | 3260.8 | 3222.2 | 3247.8 | 3238.3 |
| 12.5°  | 3234.8 | 3215.7 | 3177.3 | 3193.2 | 3186.8 |
| 15°    | 3180.3 | 3161.3 | 3119.3 | 3132.3 | 3116.2 |
| 17.5°  | 3112.8 | 3093.7 | 3051.8 | 3067.9 | 3051.8 |
| 20°    | 3038.9 | 3019.8 | 2974.8 | 2984.3 | 2971.7 |
| 22.5°  | 2965.2 | 2936.3 | 2894.3 | 2894.3 | 2887.9 |
| 25°    | 2878.3 | 2852.7 | 2798.3 | 2804.4 | 2798.3 |
| 27.5°  | 2781.9 | 2759.3 | 2717.9 | 2708.3 | 2692.3 |
| 30°    | 2685.8 | 2659.8 | 2611.8 | 2602.2 | 2589.3 |
| 32.5°  | 2582.9 | 2563.8 | 2512.3 | 2492.9 | 2479.9 |
| 35°    | 2483.4 | 2451.3 | 2399.8 | 2380.4 | 2364.4 |
| 37.5°  | 2370.9 | 2341.9 | 2290.4 | 2267.9 | 2251.9 |
| 40°    | 2255.3 | 2229.4 | 2177.9 | 2149.3 | 2136.4 |
| 42.5°  | 2142.8 | 2116.9 | 2065.8 | 2033.5 | 2014.4 |
| 45°    | 2020.8 | 1998.3 | 1949.9 | 1914.8 | 1901.9 |
| 47.5°  | 1901.9 | 1879.4 | 1827.9 | 1792.5 | 1773.4 |
| 50°    | 1776.4 | 1760.4 | 1715.4 | 1670.5 | 1654.4 |
| 52.5°  | 1654.4 | 1631.9 | 1590.3 | 1554.9 | 1532.4 |
| 55°    | 1529.4 | 1509.9 | 1471.4 | 1432.9 | 1416.9 |
| 57.5°  | 1403.9 | 1387.9 | 1346.0 | 1307.5 | 1294.5 |
| 60°    | 1278.5 | 1265.9 | 1220.8 | 1185.4 | 1175.9 |
| 62.5°  | 1156.4 | 1133.9 | 1101.9 | 1069.9 | 1056.9 |
| 65°    | 1031.4 | 1011.9 | 979.9  | 950.9  | 934.9  |
| 67.5°  | 902.9  | 886.6  | 857.8  | 835.4  | 822.4  |
| 70°    | 783.9  | 770.9  | 742.0  | 719.5  | 706.9  |
| 72.5°  | 661.9  | 648.9  | 632.9  | 610.5  | 600.9  |
| 75°    | 539.6  | 533.4  | 517.1  | 498.0  | 504.5  |
| 77.5°  | 430.4  | 417.6  | 411.1  | 401.5  | 392.0  |
| 80°    | 321.4  | 318.0  | 311.5  | 301.9  | 295.5  |
| 82.5°  | 218.5  | 218.5  | 215.4  | 202.4  | 202.4  |
| 85°    | 131.6  | 128.5  | 125.5  | 115.5  | 112.5  |
| 87.5°  | 57.9   | 51.4   | 45.0   | 35.5   | 32.1   |
| 90°    | 1.0    | 13.1   | 35.7   | 33.5   | 34.5   |
| 92.5°  | 22.5   | 30.5   | 31.7   | 32.7   | 32.7   |
| 95°    | 53.1   | 63.3   | 65.2   | 65.2   | 63.3   |
| 97.5°  | 88.4   | 97.9   | 101.9  | 101.9  | 101.9  |
| 100°   | 129.2  | 137.6  | 140.4  | 140.4  | 139.4  |
| 102.5° | 172.1  | 178.3  | 182.3  | 183.4  | 182.3  |
| 105°   | 219.0  | 221.9  | 224.1  | 225.9  | 225.9  |
| 107.5° | 265.6  | 270.0  | 270.0  | 270.6  | 265.6  |
| 110°   | 310.7  | 316.5  | 316.5  | 316.5  | 313.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 359.5  | 365.7  | 364.5  | 361.7  | 359.5  |
| 115°   | 407.5  | 413.4  | 411.5  | 410.4  | 407.5  |
| 117.5° | 455.2  | 463.2  | 458.1  | 455.2  | 452.3  |
| 120°   | 503.2  | 511.2  | 503.2  | 503.2  | 499.9  |
| 122.5° | 546.8  | 557.0  | 552.0  | 549.0  | 546.8  |
| 125°   | 592.7  | 601.8  | 598.9  | 595.6  | 594.5  |
| 127.5° | 637.5  | 648.7  | 644.7  | 640.3  | 637.5  |
| 130°   | 679.2  | 692.4  | 690.6  | 688.4  | 684.4  |
| 132.5° | 726.2  | 736.4  | 737.2  | 732.0  | 729.1  |
| 135°   | 766.6  | 777.9  | 780.1  | 778.9  | 776.1  |
| 137.5° | 811.8  | 820.8  | 822.6  | 821.9  | 817.6  |
| 140°   | 851.3  | 860.5  | 865.6  | 865.6  | 861.6  |
| 142.5° | 892.2  | 901.2  | 904.1  | 905.3  | 901.2  |
| 145°   | 930.7  | 938.0  | 943.8  | 944.9  | 940.9  |
| 147.5° | 965.3  | 974.3  | 978.7  | 980.5  | 976.5  |
| 150°   | 1000.9 | 1007.1 | 1011.1 | 1014.4 | 1011.1 |
| 152.5° | 1032.6 | 1038.7 | 1043.9 | 1047.9 | 1043.9 |
| 155°   | 1064.2 | 1067.1 | 1070.4 | 1075.5 | 1072.2 |
| 157.5° | 1091.6 | 1093.7 | 1095.5 | 1102.8 | 1097.7 |
| 160°   | 1115.9 | 1118.1 | 1119.1 | 1125.3 | 1121.0 |
| 162.5° | 1138.4 | 1138.4 | 1139.6 | 1146.4 | 1141.4 |
| 165°   | 1157.8 | 1156.6 | 1156.6 | 1163.9 | 1158.8 |
| 167.5° | 1175.2 | 1171.9 | 1171.9 | 1179.2 | 1174.1 |
| 170°   | 1188.3 | 1185.3 | 1184.3 | 1191.5 | 1185.3 |
| 172.5° | 1197.4 | 1194.5 | 1193.4 | 1200.7 | 1194.5 |
| 175°   | 1204.7 | 1201.8 | 1199.6 | 1206.8 | 1200.7 |
| 177.5° | 1208.7 | 1205.8 | 1203.6 | 1209.8 | 1203.6 |
| 180°   | 1206.8 | 1206.8 | 1206.8 | 1206.8 | 1206.8 |

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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 | 12.45            | 13.54 | 13.19 | 14.31 | 15.24 | 12.02          | 13.11 | 12.76 | 13.88 | 14.81 |
|                 | 3H   | 14.13            | 15.11 | 14.89 | 15.89 | 16.84 | 13.65          | 14.64 | 14.41 | 15.42 | 16.37 |
|                 | 4H   | 14.72            | 15.65 | 15.50 | 16.44 | 17.41 | 14.25          | 15.18 | 15.03 | 15.97 | 16.94 |
|                 | 6H   | 15.13            | 15.99 | 15.93 | 16.79 | 17.77 | 14.66          | 15.52 | 15.45 | 16.31 | 17.30 |
|                 | 8H   | 15.25            | 16.06 | 16.05 | 16.88 | 17.86 | 14.77          | 15.59 | 15.57 | 16.40 | 17.39 |
|                 | 12H  | 15.30            | 16.08 | 16.11 | 16.89 | 17.90 | 14.82          | 15.60 | 15.63 | 16.41 | 17.42 |
| 4H              | 2H   | 12.94            | 13.87 | 13.72 | 14.65 | 15.62 | 12.59          | 13.52 | 13.37 | 14.31 | 15.28 |
|                 | 3H   | 14.82            | 15.60 | 15.62 | 16.42 | 17.41 | 14.43          | 15.21 | 15.23 | 16.03 | 17.01 |
|                 | 4H   | 15.55            | 16.25 | 16.36 | 17.08 | 18.09 | 15.14          | 15.85 | 15.95 | 16.67 | 17.68 |
|                 | 6H   | 16.08            | 16.69 | 16.90 | 17.53 | 18.55 | 15.67          | 16.28 | 16.49 | 17.12 | 18.14 |
|                 | 8H   | 16.23            | 16.80 | 17.06 | 17.64 | 18.67 | 15.82          | 16.39 | 16.65 | 17.23 | 18.26 |
|                 | 12H  | 16.32            | 16.83 | 17.16 | 17.69 | 18.73 | 15.89          | 16.41 | 16.74 | 17.27 | 18.31 |
| 8H              | 4H   | 15.76            | 16.34 | 16.59 | 17.18 | 18.21 | 15.40          | 15.98 | 16.23 | 16.82 | 17.85 |
|                 | 6H   | 16.40            | 16.88 | 17.26 | 17.76 | 18.79 | 16.04          | 16.52 | 16.90 | 17.40 | 18.43 |
|                 | 8H   | 16.63            | 17.05 | 17.50 | 17.93 | 18.97 | 16.26          | 16.68 | 17.13 | 17.56 | 18.61 |
|                 | 12H  | 16.77            | 17.14 | 17.64 | 18.01 | 19.11 | 16.39          | 16.76 | 17.26 | 17.63 | 18.73 |
| 12H             | 4H   | 15.76            | 16.28 | 16.61 | 17.14 | 18.17 | 15.41          | 15.92 | 16.26 | 16.79 | 17.82 |
|                 | 6H   | 16.44            | 16.86 | 17.30 | 17.74 | 18.78 | 16.08          | 16.51 | 16.95 | 17.39 | 18.43 |
|                 | 8H   | 16.69            | 17.06 | 17.56 | 17.93 | 19.03 | 16.33          | 16.70 | 17.20 | 17.57 | 18.68 |