

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: P904723

Luminaire Tested: DFN2DIP-TR4F0-090D040US830-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P904723  
REPORT IS A COMBINATION OF REPORTS P901899 AND P898849  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-090D040US830-FLLONL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

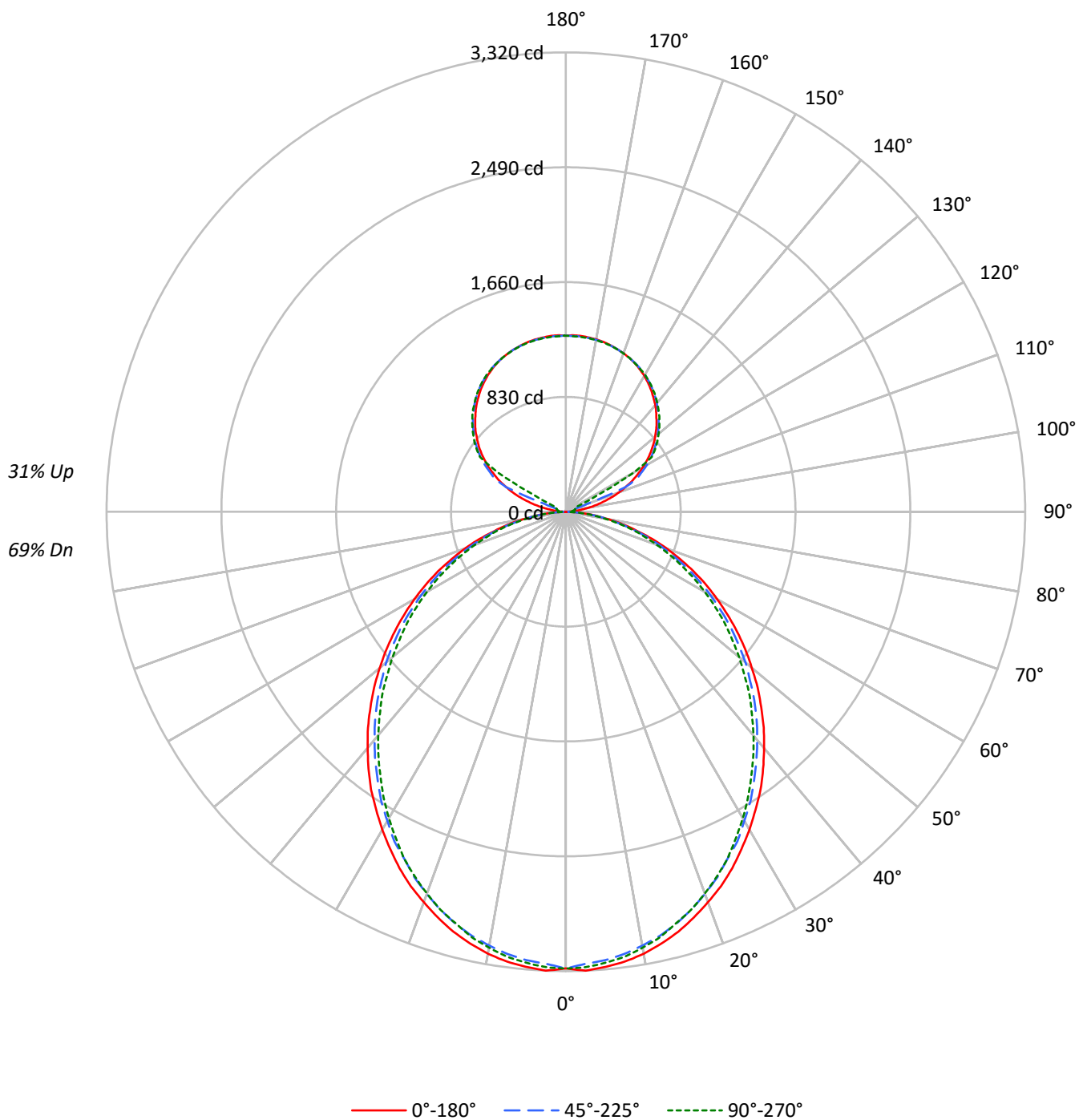
Lumens per Lamp: N/A  
Luminaire Lumens: 12130.5 lumens  
Efficiency: N/A  
Efficacy: 103.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: Semi-Direct

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

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### Luminous Intensity Polar Plot



TEST NUMBER: P904723

CATALOG NUMBER: DFN2DIP-TR4F0-090D040US830-FLONL

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

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2622 | 2622 | 2622 |
| 5°  | 2626 | 2586 | 2603 |
| 10° | 2605 | 2551 | 2568 |
| 15° | 2567 | 2509 | 2513 |
| 20° | 2515 | 2450 | 2456 |
| 25° | 2464 | 2381 | 2391 |
| 30° | 2399 | 2316 | 2308 |
| 35° | 2338 | 2239 | 2220 |
| 40° | 2263 | 2162 | 2137 |
| 45° | 2188 | 2084 | 2051 |
| 50° | 2106 | 2003 | 1952 |
| 55° | 2020 | 1908 | 1861 |
| 60° | 1923 | 1797 | 1757 |
| 65° | 1817 | 1681 | 1634 |
| 70° | 1682 | 1540 | 1502 |
| 75° | 1495 | 1371 | 1380 |
| 80° | 1270 | 1155 | 1146 |
| 85° | 919  | 784  | 759  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2188 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 310.7   | 2.6       |
| 10°-20°   | 874.1   | 7.2       |
| 20°-30°   | 1284.6  | 10.6      |
| 30°-40°   | 1492.0  | 12.3      |
| 40°-50°   | 1490.1  | 12.3      |
| 50°-60°   | 1299.3  | 10.7      |
| 60°-70°   | 960.5   | 7.9       |
| 70°-80°   | 543.4   | 4.5       |
| 80°-90°   | 145.7   | 1.2       |
| 90°-100°  | 41.9    | 0.3       |
| 100°-110° | 156.4   | 1.3       |
| 110°-120° | 414.8   | 3.4       |
| 120°-130° | 688.0   | 5.7       |
| 130°-140° | 730.8   | 6.0       |
| 140°-150° | 679.2   | 5.6       |
| 150°-160° | 546.1   | 4.5       |
| 160°-170° | 351.9   | 2.9       |
| 170°-180° | 121.1   | 1.0       |
| 0°-30°    | 2469.3  | 20.4      |
| 0°-40°    | 3961.3  | 32.7      |
| 0°-60°    | 6750.7  | 55.7      |
| 0°-90°    | 8400.3  | 69.2      |
| 90°-120°  | 613.2   | 5.1       |
| 90°-150°  | 2711.2  | 22.4      |
| 90°-180°  | 3730.0  | 30.7      |
| 0°-180°   | 12130.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3301 | 3301  | 3301 | 3301  | 3301 |      |
| 5°   | 3301 | 3288  | 3253 | 3278  | 3272 | 313  |
| 15°  | 3142 | 3123  | 3082 | 3095  | 3079 | 885  |
| 25°  | 2844 | 2818  | 2765 | 2771  | 2765 | 1309 |
| 35°  | 2454 | 2422  | 2371 | 2352  | 2336 | 1532 |
| 45°  | 1996 | 1974  | 1926 | 1892  | 1879 | 1541 |
| 55°  | 1511 | 1492  | 1454 | 1416  | 1400 | 1351 |
| 65°  | 1019 | 1000  | 968  | 940   | 924  | 1007 |
| 75°  | 533  | 527   | 511  | 492   | 498  | 569  |
| 85°  | 130  | 127   | 124  | 114   | 111  | 145  |
| 90°  | 1    | 11    | 18   | 23    | 25   | 11   |
| 95°  | 60   | 29    | 36   | 40    | 40   | 71   |
| 105° | 280  | 308   | 56   | 66    | 70   | 299  |
| 115° | 529  | 545   | 568  | 142   | 76   | 521  |
| 125° | 748  | 760   | 778  | 784   | 787  | 668  |
| 135° | 926  | 941   | 949  | 958   | 957  | 715  |
| 145° | 1074 | 1074  | 1089 | 1096  | 1091 | 672  |
| 155° | 1183 | 1175  | 1186 | 1191  | 1184 | 545  |
| 165° | 1247 | 1241  | 1244 | 1250  | 1244 | 352  |
| 175° | 1275 | 1269  | 1270 | 1277  | 1268 | 121  |
| 180° | 1272 | 1272  | 1272 | 1272  | 1272 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3300.7 | 3300.7 | 3300.7 | 3300.7 | 3300.7 |
| 2.5°   | 3319.9 | 3304.1 | 3269.1 | 3300.7 | 3294.7 |
| 5°     | 3300.7 | 3288.2 | 3253.3 | 3278.5 | 3272.4 |
| 7.5°   | 3278.5 | 3259.7 | 3224.6 | 3250.3 | 3243.9 |
| 10°    | 3243.9 | 3221.6 | 3183.5 | 3208.8 | 3199.4 |
| 12.5°  | 3196.0 | 3177.1 | 3139.1 | 3154.9 | 3148.6 |
| 15°    | 3142.2 | 3123.3 | 3081.8 | 3094.6 | 3078.8 |
| 17.5°  | 3075.4 | 3056.6 | 3015.2 | 3031.0 | 3015.2 |
| 20°    | 3002.4 | 2983.5 | 2939.0 | 2948.5 | 2936.0 |
| 22.5°  | 2929.6 | 2901.1 | 2859.6 | 2859.6 | 2853.2 |
| 25°    | 2843.7 | 2818.5 | 2764.7 | 2770.7 | 2764.7 |
| 27.5°  | 2748.5 | 2726.2 | 2685.2 | 2675.8 | 2659.9 |
| 30°    | 2653.5 | 2627.9 | 2580.4 | 2571.0 | 2558.2 |
| 32.5°  | 2551.8 | 2533.0 | 2482.1 | 2463.0 | 2450.1 |
| 35°    | 2453.5 | 2421.9 | 2371.0 | 2351.8 | 2336.0 |
| 37.5°  | 2342.4 | 2313.8 | 2262.9 | 2240.7 | 2224.9 |
| 40°    | 2228.2 | 2202.6 | 2151.7 | 2123.5 | 2110.7 |
| 42.5°  | 2117.0 | 2091.5 | 2041.0 | 2009.0 | 1990.2 |
| 45°    | 1996.5 | 1974.3 | 1926.5 | 1891.8 | 1879.1 |
| 47.5°  | 1879.1 | 1856.8 | 1805.9 | 1770.9 | 1752.1 |
| 50°    | 1755.1 | 1739.3 | 1694.8 | 1650.4 | 1634.6 |
| 52.5°  | 1634.6 | 1612.3 | 1571.2 | 1536.2 | 1514.0 |
| 55°    | 1511.0 | 1491.8 | 1453.7 | 1415.7 | 1399.9 |
| 57.5°  | 1387.0 | 1371.2 | 1329.8 | 1291.8 | 1278.9 |
| 60°    | 1263.1 | 1250.7 | 1206.2 | 1171.2 | 1161.8 |
| 62.5°  | 1142.5 | 1120.3 | 1088.6 | 1057.1 | 1044.2 |
| 65°    | 1019.0 | 999.8  | 968.1  | 939.5  | 923.7  |
| 67.5°  | 892.0  | 875.9  | 847.5  | 825.4  | 812.6  |
| 70°    | 774.5  | 761.7  | 733.1  | 710.9  | 698.4  |
| 72.5°  | 653.9  | 641.1  | 625.3  | 603.1  | 593.7  |
| 75°    | 533.1  | 527.0  | 510.9  | 492.0  | 498.4  |
| 77.5°  | 425.3  | 412.6  | 406.1  | 396.7  | 387.3  |
| 80°    | 317.5  | 314.1  | 307.7  | 298.3  | 292.0  |
| 82.5°  | 215.8  | 215.8  | 212.8  | 200.0  | 200.0  |
| 85°    | 130.0  | 127.0  | 123.9  | 114.1  | 111.1  |
| 87.5°  | 57.2   | 50.8   | 44.5   | 35.1   | 31.7   |
| 90°    | 0.8    | 11.0   | 18.4   | 23.1   | 24.8   |
| 92.5°  | 23.1   | 19.3   | 22.1   | 23.9   | 24.8   |
| 95°    | 59.8   | 29.4   | 35.8   | 40.5   | 39.6   |
| 97.5°  | 107.7  | 32.2   | 46.9   | 49.8   | 50.6   |
| 100°   | 163.0  | 36.9   | 52.5   | 59.8   | 61.6   |
| 102.5° | 223.7  | 222.0  | 54.3   | 64.4   | 67.2   |
| 105°   | 279.8  | 307.6  | 56.2   | 66.3   | 69.9   |
| 107.5° | 345.3  | 368.3  | 58.1   | 68.1   | 71.8   |
| 110°   | 407.9  | 427.2  | 161.2  | 69.1   | 72.7   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 466.8  | 483.3  | 467.7  | 70.9   | 73.7   |
| 115°   | 529.3  | 545.0  | 568.1  | 141.8  | 75.6   |
| 117.5° | 583.7  | 602.1  | 617.8  | 486.1  | 244.9  |
| 120°   | 644.5  | 658.3  | 674.9  | 686.0  | 561.7  |
| 122.5° | 696.0  | 710.8  | 729.2  | 734.7  | 735.7  |
| 125°   | 748.5  | 760.5  | 778.0  | 784.5  | 787.2  |
| 127.5° | 796.4  | 809.3  | 823.1  | 832.4  | 833.2  |
| 130°   | 841.5  | 856.3  | 866.3  | 876.5  | 875.6  |
| 132.5° | 887.5  | 899.6  | 909.6  | 917.9  | 917.1  |
| 135°   | 926.2  | 941.0  | 949.2  | 958.5  | 956.7  |
| 137.5° | 966.7  | 977.7  | 987.0  | 996.2  | 993.4  |
| 140°   | 1006.3 | 1013.7 | 1023.8 | 1032.1 | 1027.5 |
| 142.5° | 1039.5 | 1045.9 | 1057.9 | 1065.2 | 1060.6 |
| 145°   | 1074.5 | 1073.6 | 1089.1 | 1095.6 | 1091.0 |
| 147.5° | 1104.8 | 1102.0 | 1117.7 | 1122.3 | 1118.7 |
| 150°   | 1134.3 | 1127.8 | 1142.6 | 1148.1 | 1143.5 |
| 152.5° | 1159.1 | 1151.8 | 1165.5 | 1171.1 | 1164.7 |
| 155°   | 1183.1 | 1174.9 | 1185.9 | 1191.4 | 1184.0 |
| 157.5° | 1202.4 | 1195.0 | 1203.4 | 1209.8 | 1202.4 |
| 160°   | 1219.0 | 1213.4 | 1219.0 | 1224.5 | 1218.0 |
| 162.5° | 1233.7 | 1228.2 | 1232.8 | 1239.3 | 1231.0 |
| 165°   | 1246.6 | 1241.1 | 1243.9 | 1250.3 | 1243.9 |
| 167.5° | 1256.8 | 1251.1 | 1254.1 | 1260.5 | 1252.2 |
| 170°   | 1265.1 | 1259.5 | 1261.3 | 1267.8 | 1259.5 |
| 172.5° | 1270.5 | 1265.1 | 1267.0 | 1273.4 | 1265.1 |
| 175°   | 1275.1 | 1268.7 | 1270.5 | 1277.0 | 1267.8 |
| 177.5° | 1277.0 | 1270.5 | 1271.5 | 1278.0 | 1269.7 |
| 180°   | 1272.4 | 1272.4 | 1272.4 | 1272.4 | 1272.4 |

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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 | 12.23            | 13.29 | 13.00 | 14.09 | 15.06 | 11.80          | 12.86 | 12.57 | 13.66 | 14.62 |
|                 | 3H   | 13.90            | 14.86 | 14.69 | 15.66 | 16.66 | 13.43          | 14.39 | 14.22 | 15.19 | 16.19 |
|                 | 4H   | 14.50            | 15.40 | 15.30 | 16.22 | 17.22 | 14.03          | 14.93 | 14.83 | 15.74 | 16.75 |
|                 | 6H   | 14.91            | 15.74 | 15.73 | 16.56 | 17.59 | 14.43          | 15.27 | 15.25 | 16.09 | 17.11 |
|                 | 8H   | 15.02            | 15.81 | 15.84 | 16.65 | 17.68 | 14.55          | 15.34 | 15.37 | 16.18 | 17.20 |
|                 | 12H  | 15.08            | 15.83 | 15.91 | 16.67 | 17.72 | 14.59          | 15.35 | 15.43 | 16.19 | 17.24 |
| 4H              | 2H   | 12.71            | 13.62 | 13.52 | 14.43 | 15.44 | 12.37          | 13.27 | 13.18 | 14.09 | 15.09 |
|                 | 3H   | 14.60            | 15.35 | 15.42 | 16.20 | 17.22 | 14.21          | 14.96 | 15.02 | 15.81 | 16.83 |
|                 | 4H   | 15.32            | 16.01 | 16.15 | 16.85 | 17.90 | 14.92          | 15.60 | 15.75 | 16.45 | 17.50 |
|                 | 6H   | 15.85            | 16.44 | 16.70 | 17.31 | 18.37 | 15.44          | 16.03 | 16.29 | 16.90 | 17.96 |
|                 | 8H   | 16.00            | 16.56 | 16.85 | 17.42 | 18.49 | 15.59          | 16.15 | 16.44 | 17.01 | 18.08 |
|                 | 12H  | 16.08            | 16.58 | 16.96 | 17.47 | 18.54 | 15.66          | 16.16 | 16.54 | 17.05 | 18.12 |
| 8H              | 4H   | 15.53            | 16.09 | 16.39 | 16.95 | 18.02 | 15.17          | 15.73 | 16.03 | 16.59 | 17.66 |
|                 | 6H   | 16.17            | 16.63 | 17.05 | 17.54 | 18.61 | 15.81          | 16.27 | 16.69 | 17.18 | 18.25 |
|                 | 8H   | 16.40            | 16.80 | 17.29 | 17.71 | 18.79 | 16.03          | 16.44 | 16.92 | 17.34 | 18.42 |
|                 | 12H  | 16.54            | 16.90 | 17.43 | 17.79 | 18.93 | 16.15          | 16.51 | 17.05 | 17.41 | 18.54 |
| 12H             | 4H   | 15.53            | 16.03 | 16.40 | 16.91 | 17.99 | 15.18          | 15.68 | 16.05 | 16.56 | 17.64 |
|                 | 6H   | 16.20            | 16.61 | 17.10 | 17.51 | 18.60 | 15.85          | 16.26 | 16.74 | 17.16 | 18.25 |
|                 | 8H   | 16.46            | 16.82 | 17.35 | 17.71 | 18.85 | 16.10          | 16.46 | 16.99 | 17.35 | 18.49 |