

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: P925257

Luminaire Tested: DFN2DIP-PN4F0-120D040US950-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P925257  
REPORT IS A COMBINATION OF REPORTS P901145 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-120D040US950-FLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

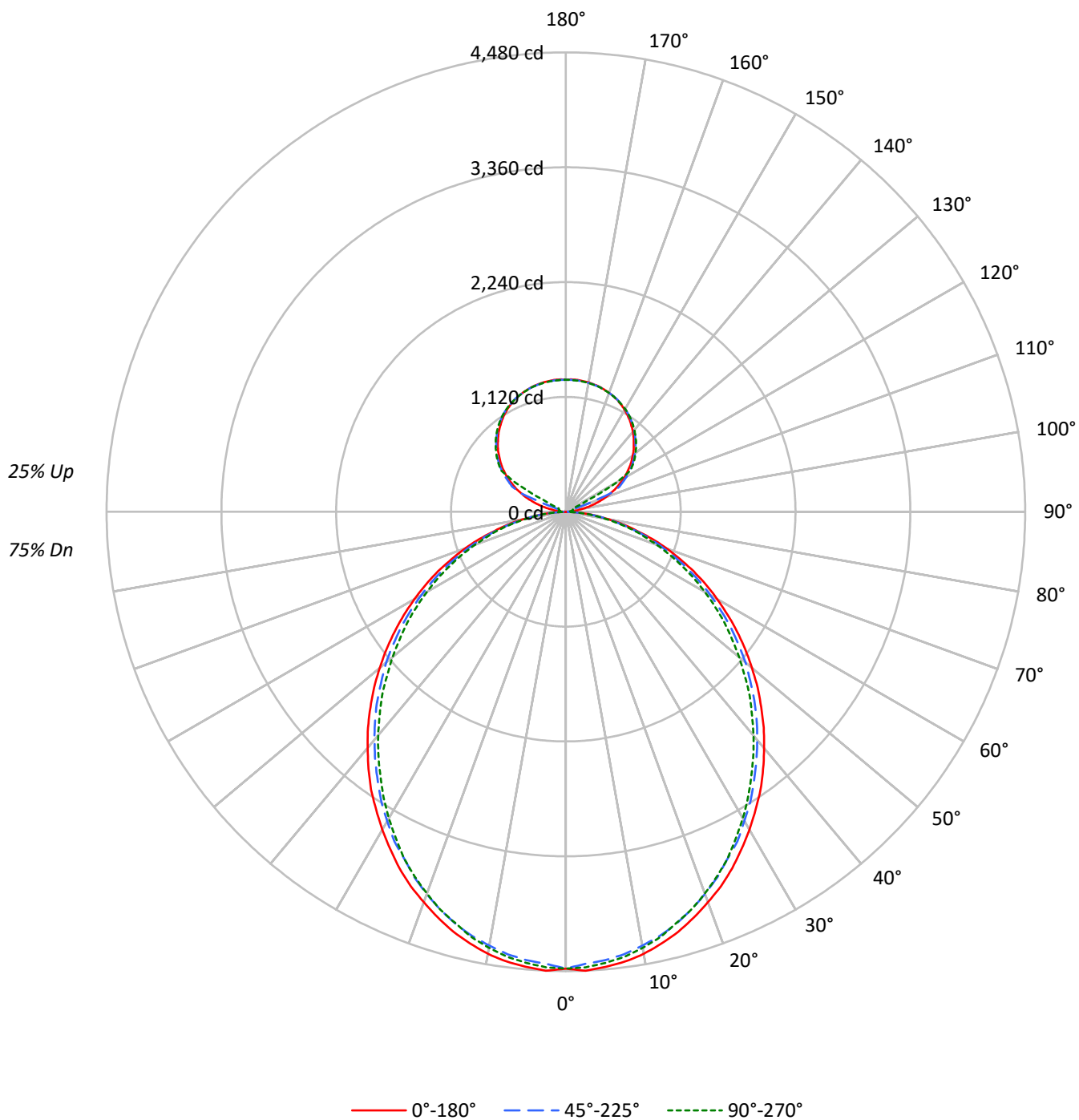
Lumens per Lamp: N/A  
Luminaire Lumens: 15111.4 lumens  
Efficiency: N/A  
Efficacy: 96.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 156.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9781  
Total Harmonic Distortion (THDi): 0.075  
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   | 113 | 113 | 113 | 113 | 108 | 108 | 108 | 108 | 97 | 97 | 97 | 88 | 88 | 88 | 79 | 79 | 79 |
| 1   | 103 | 99  | 95  | 91  | 98  | 94  | 91  | 87  | 85 | 83 | 80 | 77 | 75 | 73 | 70 | 68 | 67 |
| 2   | 94  | 86  | 80  | 75  | 89  | 82  | 77  | 72  | 75 | 70 | 66 | 68 | 64 | 61 | 62 | 59 | 56 |
| 3   | 86  | 76  | 68  | 62  | 81  | 73  | 66  | 60  | 66 | 61 | 56 | 60 | 56 | 52 | 55 | 51 | 48 |
| 4   | 79  | 67  | 59  | 53  | 75  | 64  | 57  | 51  | 59 | 53 | 48 | 54 | 49 | 45 | 49 | 45 | 41 |
| 5   | 72  | 60  | 52  | 46  | 69  | 58  | 50  | 44  | 53 | 46 | 41 | 48 | 43 | 39 | 44 | 40 | 36 |
| 6   | 67  | 54  | 46  | 40  | 63  | 52  | 44  | 39  | 48 | 41 | 36 | 44 | 38 | 34 | 40 | 35 | 32 |
| 7   | 62  | 49  | 41  | 35  | 59  | 47  | 39  | 34  | 43 | 37 | 32 | 40 | 34 | 30 | 37 | 32 | 28 |
| 8   | 58  | 45  | 37  | 31  | 55  | 43  | 36  | 30  | 40 | 33 | 29 | 37 | 31 | 27 | 34 | 29 | 25 |
| 9   | 54  | 41  | 33  | 28  | 51  | 39  | 32  | 27  | 37 | 30 | 26 | 34 | 28 | 24 | 31 | 26 | 23 |
| 10  | 50  | 38  | 30  | 25  | 48  | 36  | 29  | 25  | 34 | 28 | 23 | 31 | 26 | 22 | 29 | 24 | 21 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3252 | 3252 | 3252 |
| 5°  | 3257 | 3207 | 3228 |
| 10° | 3230 | 3164 | 3185 |
| 15° | 3183 | 3112 | 3118 |
| 20° | 3119 | 3040 | 3048 |
| 25° | 3055 | 2954 | 2968 |
| 30° | 2975 | 2874 | 2866 |
| 35° | 2899 | 2780 | 2758 |
| 40° | 2806 | 2684 | 2655 |
| 45° | 2713 | 2588 | 2550 |
| 50° | 2611 | 2488 | 2428 |
| 55° | 2504 | 2372 | 2316 |
| 60° | 2384 | 2234 | 2188 |
| 65° | 2253 | 2091 | 2037 |
| 70° | 2085 | 1917 | 1874 |
| 75° | 1853 | 1709 | 1725 |
| 80° | 1574 | 1444 | 1438 |
| 85° | 1139 | 985  | 963  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2713 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 419.3   | 2.8       |
| 10°-20°   | 1179.6  | 7.8       |
| 20°-30°   | 1733.6  | 11.5      |
| 30°-40°   | 2013.5  | 13.3      |
| 40°-50°   | 2011.0  | 13.3      |
| 50°-60°   | 1753.5  | 11.6      |
| 60°-70°   | 1296.2  | 8.6       |
| 70°-80°   | 733.4   | 4.9       |
| 80°-90°   | 195.8   | 1.3       |
| 90°-100°  | 42.5    | 0.3       |
| 100°-110° | 158.3   | 1.0       |
| 110°-120° | 419.9   | 2.8       |
| 120°-130° | 696.4   | 4.6       |
| 130°-140° | 739.7   | 4.9       |
| 140°-150° | 687.5   | 4.5       |
| 150°-160° | 552.7   | 3.7       |
| 160°-170° | 356.1   | 2.4       |
| 170°-180° | 122.6   | 0.8       |
| 0°-30°    | 3332.5  | 22.1      |
| 0°-40°    | 5345.9  | 35.4      |
| 0°-60°    | 9110.4  | 60.3      |
| 0°-90°    | 11335.8 | 75.0      |
| 90°-120°  | 620.6   | 4.1       |
| 90°-150°  | 2744.1  | 18.2      |
| 90°-180°  | 3776.0  | 25.0      |
| 0°-180°   | 15111.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4454 | 4454  | 4454 | 4454  | 4454 |      |
| 5°   | 4454 | 4438  | 4390 | 4424  | 4416 | 423  |
| 15°  | 4240 | 4215  | 4159 | 4176  | 4155 | 1194 |
| 25°  | 3838 | 3804  | 3731 | 3739  | 3731 | 1766 |
| 35°  | 3311 | 3268  | 3200 | 3174  | 3152 | 2068 |
| 45°  | 2694 | 2664  | 2600 | 2553  | 2536 | 2079 |
| 55°  | 2039 | 2013  | 1962 | 1910  | 1889 | 1823 |
| 65°  | 1375 | 1349  | 1306 | 1268  | 1247 | 1360 |
| 75°  | 719  | 711   | 689  | 664   | 673  | 768  |
| 85°  | 175  | 171   | 167  | 154   | 150  | 196  |
| 90°  | 1    | 11    | 19   | 23    | 25   | 14   |
| 95°  | 60   | 30    | 36   | 41    | 40   | 72   |
| 105° | 283  | 311   | 57   | 67    | 71   | 303  |
| 115° | 536  | 552   | 575  | 144   | 76   | 527  |
| 125° | 758  | 770   | 787  | 794   | 797  | 676  |
| 135° | 938  | 952   | 961  | 970   | 968  | 724  |
| 145° | 1088 | 1087  | 1102 | 1109  | 1104 | 680  |
| 155° | 1198 | 1189  | 1200 | 1206  | 1198 | 552  |
| 165° | 1262 | 1256  | 1259 | 1266  | 1259 | 356  |
| 175° | 1291 | 1284  | 1286 | 1292  | 1283 | 123  |
| 180° | 1288 | 1288  | 1288 | 1288  | 1288 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4454.5 | 4454.5 | 4454.5 | 4454.5 | 4454.5 |
| 2.5°   | 4480.4 | 4459.0 | 4411.8 | 4454.5 | 4446.3 |
| 5°     | 4454.5 | 4437.6 | 4390.4 | 4424.5 | 4416.3 |
| 7.5°   | 4424.5 | 4399.0 | 4351.8 | 4386.3 | 4377.7 |
| 10°    | 4377.7 | 4347.7 | 4296.3 | 4330.4 | 4317.7 |
| 12.5°  | 4313.1 | 4287.7 | 4236.3 | 4257.7 | 4249.0 |
| 15°    | 4240.4 | 4215.0 | 4159.1 | 4176.3 | 4155.0 |
| 17.5°  | 4150.5 | 4125.0 | 4069.1 | 4090.5 | 4069.1 |
| 20°    | 4051.8 | 4026.4 | 3966.4 | 3979.1 | 3962.3 |
| 22.5°  | 3953.7 | 3915.0 | 3859.1 | 3859.1 | 3850.5 |
| 25°    | 3837.8 | 3803.7 | 3731.0 | 3739.2 | 3731.0 |
| 27.5°  | 3709.2 | 3679.2 | 3623.8 | 3611.0 | 3589.7 |
| 30°    | 3581.0 | 3546.5 | 3482.4 | 3469.7 | 3452.4 |
| 32.5°  | 3443.7 | 3418.4 | 3349.7 | 3323.8 | 3306.6 |
| 35°    | 3311.0 | 3268.4 | 3199.7 | 3173.9 | 3152.5 |
| 37.5°  | 3161.1 | 3122.5 | 3053.8 | 3023.9 | 3002.5 |
| 40°    | 3007.1 | 2972.6 | 2903.9 | 2865.7 | 2848.5 |
| 42.5°  | 2857.1 | 2822.6 | 2754.4 | 2711.3 | 2685.8 |
| 45°    | 2694.4 | 2664.4 | 2599.8 | 2553.1 | 2535.8 |
| 47.5°  | 2535.8 | 2505.8 | 2437.2 | 2390.0 | 2364.5 |
| 50°    | 2368.6 | 2347.2 | 2287.2 | 2227.2 | 2205.8 |
| 52.5°  | 2205.8 | 2175.9 | 2120.5 | 2073.1 | 2043.2 |
| 55°    | 2039.1 | 2013.2 | 1961.8 | 1910.5 | 1889.1 |
| 57.5°  | 1871.8 | 1850.5 | 1794.6 | 1743.2 | 1726.0 |
| 60°    | 1704.6 | 1687.8 | 1627.8 | 1580.6 | 1567.8 |
| 62.5°  | 1542.0 | 1511.9 | 1469.3 | 1426.5 | 1409.2 |
| 65°    | 1375.2 | 1349.2 | 1306.5 | 1267.9 | 1246.6 |
| 67.5°  | 1203.9 | 1182.0 | 1143.8 | 1113.9 | 1096.6 |
| 70°    | 1045.2 | 1027.9 | 989.3  | 959.3  | 942.6  |
| 72.5°  | 882.5  | 865.3  | 843.9  | 814.0  | 801.2  |
| 75°    | 719.4  | 711.2  | 689.4  | 664.0  | 672.6  |
| 77.5°  | 573.9  | 556.7  | 548.1  | 535.3  | 522.6  |
| 80°    | 428.5  | 424.0  | 415.4  | 402.7  | 394.0  |
| 82.5°  | 291.3  | 291.3  | 287.2  | 270.0  | 270.0  |
| 85°    | 175.4  | 171.3  | 167.2  | 154.1  | 150.0  |
| 87.5°  | 77.3   | 68.6   | 60.0   | 47.2   | 42.7   |
| 90°    | 0.9    | 11.2   | 18.6   | 23.4   | 25.1   |
| 92.5°  | 23.4   | 19.6   | 22.3   | 24.2   | 25.1   |
| 95°    | 60.5   | 29.8   | 36.3   | 41.0   | 40.1   |
| 97.5°  | 109.0  | 32.6   | 47.5   | 50.4   | 51.2   |
| 100°   | 164.9  | 37.3   | 53.1   | 60.5   | 62.4   |
| 102.5° | 226.4  | 224.7  | 55.0   | 65.2   | 68.0   |
| 105°   | 283.2  | 311.3  | 56.9   | 67.1   | 70.8   |
| 107.5° | 349.5  | 372.7  | 58.8   | 69.0   | 72.7   |
| 110°   | 412.9  | 432.4  | 163.1  | 69.9   | 73.6   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 472.5  | 489.2  | 473.4  | 71.7   | 74.6   |
| 115°   | 535.8  | 551.6  | 575.0  | 143.5  | 76.5   |
| 117.5° | 590.8  | 609.4  | 625.3  | 492.0  | 247.8  |
| 120°   | 652.3  | 666.3  | 683.1  | 694.3  | 568.5  |
| 122.5° | 704.4  | 719.4  | 738.1  | 743.6  | 744.6  |
| 125°   | 757.6  | 769.8  | 787.4  | 794.0  | 796.8  |
| 127.5° | 806.0  | 819.1  | 833.1  | 842.5  | 843.3  |
| 130°   | 851.7  | 866.7  | 876.8  | 887.1  | 886.3  |
| 132.5° | 898.3  | 910.5  | 920.7  | 929.1  | 928.2  |
| 135°   | 937.5  | 952.5  | 960.8  | 970.1  | 968.3  |
| 137.5° | 978.4  | 989.6  | 999.0  | 1008.3 | 1005.5 |
| 140°   | 1018.5 | 1026.0 | 1036.2 | 1044.6 | 1040.0 |
| 142.5° | 1052.2 | 1058.7 | 1070.8 | 1078.1 | 1073.5 |
| 145°   | 1087.6 | 1086.6 | 1102.3 | 1108.9 | 1104.3 |
| 147.5° | 1118.2 | 1115.4 | 1131.3 | 1135.9 | 1132.3 |
| 150°   | 1148.0 | 1141.6 | 1156.5 | 1162.1 | 1157.4 |
| 152.5° | 1173.2 | 1165.8 | 1179.7 | 1185.3 | 1178.9 |
| 155°   | 1197.5 | 1189.2 | 1200.3 | 1205.9 | 1198.4 |
| 157.5° | 1217.0 | 1209.6 | 1218.1 | 1224.6 | 1217.0 |
| 160°   | 1233.8 | 1228.2 | 1233.8 | 1239.3 | 1232.9 |
| 162.5° | 1248.7 | 1243.2 | 1247.8 | 1254.3 | 1245.9 |
| 165°   | 1261.8 | 1256.2 | 1259.0 | 1265.5 | 1259.0 |
| 167.5° | 1272.1 | 1266.3 | 1269.3 | 1275.8 | 1267.4 |
| 170°   | 1280.5 | 1274.8 | 1276.6 | 1283.2 | 1274.8 |
| 172.5° | 1286.0 | 1280.5 | 1282.4 | 1288.9 | 1280.5 |
| 175°   | 1290.6 | 1284.1 | 1286.0 | 1292.5 | 1283.2 |
| 177.5° | 1292.5 | 1286.0 | 1286.9 | 1293.5 | 1285.1 |
| 180°   | 1287.9 | 1287.9 | 1287.9 | 1287.9 | 1287.9 |

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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 | 13.42            | 14.56 | 14.13 | 15.29 | 16.16 | 12.98          | 14.12 | 13.69 | 14.85 | 15.72 |
|                 | 3H   | 15.11            | 16.13 | 15.83 | 16.87 | 17.77 | 14.62          | 15.65 | 15.34 | 16.39 | 17.28 |
|                 | 4H   | 15.71            | 16.68 | 16.45 | 17.43 | 18.33 | 15.22          | 16.19 | 15.96 | 16.94 | 17.85 |
|                 | 6H   | 16.12            | 17.02 | 16.88 | 17.78 | 18.70 | 15.63          | 16.53 | 16.39 | 17.28 | 18.21 |
|                 | 8H   | 16.24            | 17.09 | 17.00 | 17.87 | 18.79 | 15.75          | 16.60 | 16.51 | 17.38 | 18.30 |
|                 | 12H  | 16.30            | 17.11 | 17.07 | 17.88 | 18.83 | 15.80          | 16.61 | 16.57 | 17.38 | 18.33 |
| 4H              | 2H   | 13.92            | 14.89 | 14.66 | 15.63 | 16.54 | 13.57          | 14.53 | 14.31 | 15.28 | 16.19 |
|                 | 3H   | 15.81            | 16.62 | 16.57 | 17.40 | 18.33 | 15.41          | 16.22 | 16.16 | 17.00 | 17.93 |
|                 | 4H   | 16.54            | 17.28 | 17.31 | 18.06 | 19.01 | 16.12          | 16.86 | 16.89 | 17.64 | 18.60 |
|                 | 6H   | 17.07            | 17.71 | 17.86 | 18.52 | 19.48 | 16.65          | 17.29 | 17.44 | 18.10 | 19.06 |
|                 | 8H   | 17.23            | 17.83 | 18.02 | 18.63 | 19.60 | 16.80          | 17.40 | 17.60 | 18.20 | 19.18 |
|                 | 12H  | 17.32            | 17.86 | 18.13 | 18.68 | 19.66 | 16.88          | 17.42 | 17.69 | 18.24 | 19.22 |
| 8H              | 4H   | 16.76            | 17.35 | 17.55 | 18.16 | 19.13 | 16.39          | 16.98 | 17.18 | 17.79 | 18.76 |
|                 | 6H   | 17.40            | 17.90 | 18.23 | 18.75 | 19.72 | 17.03          | 17.52 | 17.85 | 18.37 | 19.34 |
|                 | 8H   | 17.63            | 18.07 | 18.46 | 18.91 | 19.90 | 17.25          | 17.69 | 18.08 | 18.53 | 19.52 |
|                 | 12H  | 17.78            | 18.16 | 18.61 | 19.00 | 20.05 | 17.38          | 17.76 | 18.21 | 18.60 | 19.64 |
| 12H             | 4H   | 16.76            | 17.29 | 17.57 | 18.12 | 19.10 | 16.40          | 16.93 | 17.21 | 17.76 | 18.74 |
|                 | 6H   | 17.44            | 17.88 | 18.27 | 18.72 | 19.71 | 17.07          | 17.51 | 17.91 | 18.36 | 19.35 |
|                 | 8H   | 17.69            | 18.08 | 18.53 | 18.92 | 19.96 | 17.32          | 17.71 | 18.16 | 18.55 | 19.59 |