

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: P905397

Luminaire Tested: DFN2DIP-HX3F0-090D040US835-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P905397  
REPORT IS A COMBINATION OF REPORTS P900748 AND P897645  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX3F0-090D040US835-RLLONL  
Description: 3 foot, Hexagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

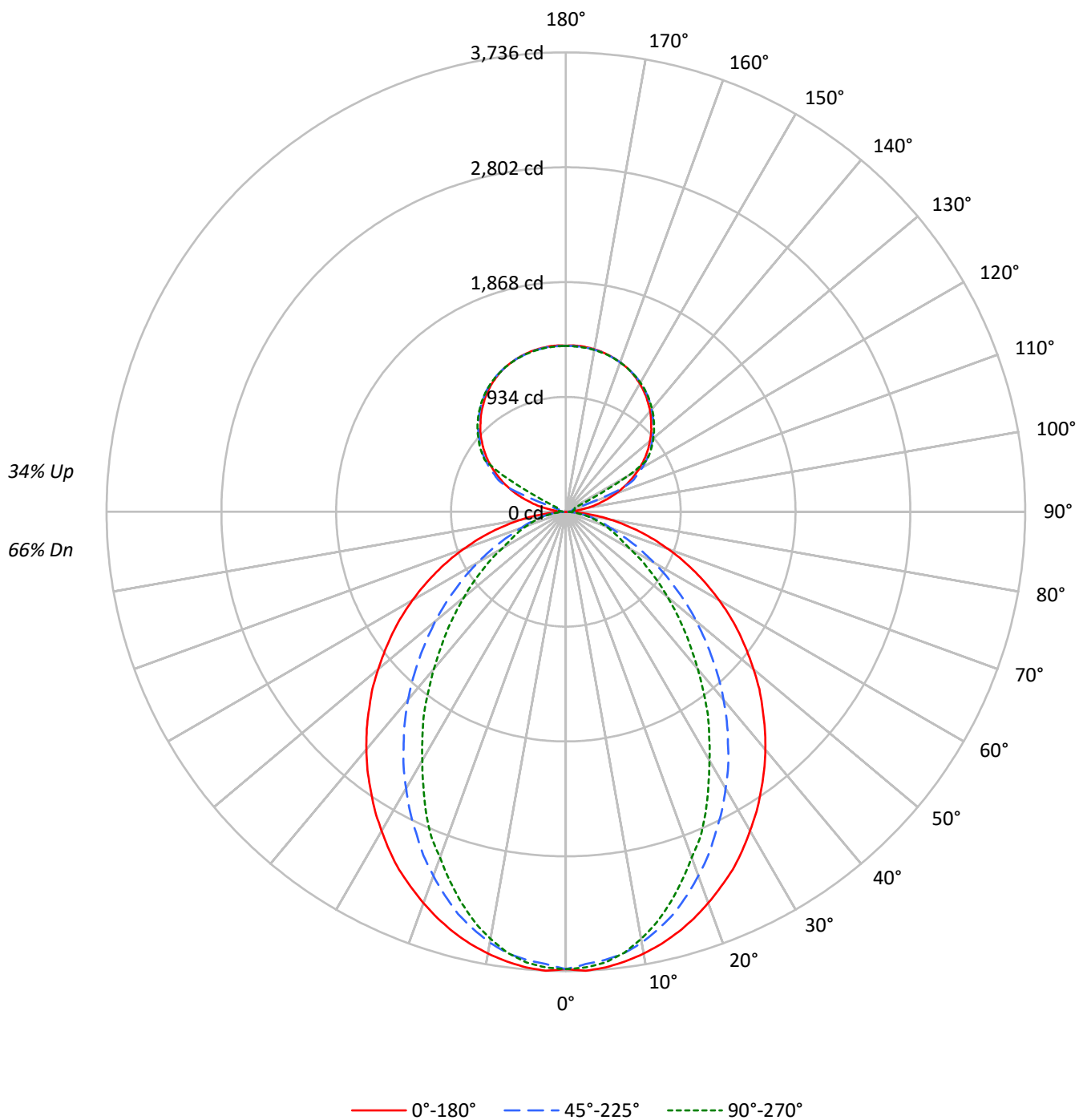
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 11610.0 lumens  
Efficiency: N/A  
Efficacy: 94.9 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.84' x L: 3.28' x H: 0.1')  
CIE Type: Semi-Direct  
  
Input Watts (W): 122.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9968  
Total Harmonic Distortion (THDi): 0.064  
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   | 111 | 111 | 111 | 111 | 104 | 104 | 104 | 104 | 92 | 92 | 92 | 81 | 81 | 81 | 71 | 71 | 71 |
| 1   | 102 | 98  | 94  | 91  | 96  | 92  | 89  | 86  | 82 | 79 | 77 | 72 | 71 | 69 | 64 | 62 | 61 |
| 2   | 93  | 86  | 80  | 75  | 88  | 81  | 76  | 72  | 73 | 68 | 65 | 64 | 61 | 59 | 57 | 54 | 52 |
| 3   | 86  | 76  | 69  | 63  | 80  | 72  | 66  | 61  | 65 | 60 | 55 | 57 | 54 | 50 | 51 | 48 | 45 |
| 4   | 79  | 68  | 60  | 54  | 74  | 65  | 58  | 52  | 58 | 52 | 48 | 52 | 47 | 44 | 46 | 42 | 40 |
| 5   | 73  | 61  | 53  | 47  | 68  | 58  | 51  | 45  | 52 | 46 | 42 | 47 | 42 | 38 | 42 | 38 | 35 |
| 6   | 67  | 55  | 47  | 41  | 63  | 52  | 45  | 40  | 47 | 41 | 37 | 43 | 38 | 34 | 38 | 34 | 31 |
| 7   | 62  | 50  | 42  | 37  | 59  | 48  | 40  | 35  | 43 | 37 | 33 | 39 | 34 | 30 | 35 | 31 | 28 |
| 8   | 58  | 46  | 38  | 33  | 55  | 44  | 37  | 32  | 40 | 34 | 29 | 36 | 31 | 27 | 32 | 28 | 25 |
| 9   | 54  | 42  | 35  | 29  | 51  | 40  | 33  | 29  | 37 | 31 | 27 | 33 | 28 | 25 | 30 | 26 | 23 |
| 10  | 51  | 39  | 32  | 27  | 48  | 37  | 30  | 26  | 34 | 28 | 24 | 31 | 26 | 23 | 28 | 24 | 21 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4309 | 4309 | 4309 |
| 5°  | 4314 | 4237 | 4265 |
| 10° | 4269 | 4151 | 4124 |
| 15° | 4208 | 4011 | 3907 |
| 20° | 4129 | 3819 | 3642 |
| 25° | 4047 | 3605 | 3386 |
| 30° | 3938 | 3385 | 3062 |
| 35° | 3831 | 3149 | 2778 |
| 40° | 3722 | 2905 | 2452 |
| 45° | 3596 | 2635 | 2157 |
| 50° | 3465 | 2362 | 1869 |
| 55° | 3328 | 2072 | 1592 |
| 60° | 3170 | 1768 | 1309 |
| 65° | 2988 | 1460 | 1175 |
| 70° | 2767 | 1172 | 1060 |
| 75° | 2488 | 1027 | 959  |
| 80° | 2086 | 852  | 824  |
| 85° | 1425 | 554  | 605  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 3596 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 348.6   | 3.0       |
| 10°-20°   | 957.0   | 8.2       |
| 20°-30°   | 1343.6  | 11.6      |
| 30°-40°   | 1464.6  | 12.6      |
| 40°-50°   | 1346.2  | 11.6      |
| 50°-60°   | 1057.2  | 9.1       |
| 60°-70°   | 688.1   | 5.9       |
| 70°-80°   | 354.2   | 3.1       |
| 80°-90°   | 92.8    | 0.8       |
| 90°-100°  | 44.5    | 0.4       |
| 100°-110° | 165.9   | 1.4       |
| 110°-120° | 440.1   | 3.8       |
| 120°-130° | 729.9   | 6.3       |
| 130°-140° | 775.4   | 6.7       |
| 140°-150° | 720.6   | 6.2       |
| 150°-160° | 579.4   | 5.0       |
| 160°-170° | 373.3   | 3.2       |
| 170°-180° | 128.5   | 1.1       |
| 0°-30°    | 2649.2  | 22.8      |
| 0°-40°    | 4113.9  | 35.4      |
| 0°-60°    | 6517.2  | 56.1      |
| 0°-90°    | 7652.4  | 65.9      |
| 90°-120°  | 650.5   | 5.6       |
| 90°-150°  | 2876.4  | 24.8      |
| 90°-180°  | 3958.0  | 34.1      |
| 0°-180°   | 11610.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3720 | 3720  | 3720 | 3720  | 3720 |      |
| 5°   | 3720 | 3703  | 3659 | 3689  | 3679 | 353  |
| 15°  | 3538 | 3501  | 3386 | 3322  | 3289 | 997  |
| 25°  | 3212 | 3104  | 2882 | 2744  | 2693 | 1477 |
| 35°  | 2767 | 2595  | 2299 | 2087  | 2013 | 1732 |
| 45°  | 2262 | 2036  | 1683 | 1444  | 1363 | 1747 |
| 55°  | 1720 | 1458  | 1094 | 892   | 828  | 1537 |
| 65°  | 1161 | 889   | 586  | 471   | 461  | 1151 |
| 75°  | 619  | 384   | 269  | 246   | 242  | 655  |
| 85°  | 145  | 74    | 64   | 64    | 64   | 166  |
| 90°  | 1    | 12    | 20   | 24    | 26   | 11   |
| 95°  | 63   | 31    | 38   | 43    | 42   | 75   |
| 105° | 297  | 326   | 60   | 70    | 74   | 317  |
| 115° | 562  | 578   | 603  | 150   | 80   | 553  |
| 125° | 794  | 807   | 825  | 832   | 835  | 708  |
| 135° | 983  | 998   | 1007 | 1017  | 1015 | 759  |
| 145° | 1140 | 1139  | 1156 | 1162  | 1158 | 713  |
| 155° | 1255 | 1246  | 1258 | 1264  | 1256 | 578  |
| 165° | 1323 | 1317  | 1320 | 1326  | 1320 | 374  |
| 175° | 1353 | 1346  | 1348 | 1355  | 1345 | 129  |
| 180° | 1350 | 1350  | 1350 | 1350  | 1350 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3719.7 | 3719.7 | 3719.7 | 3719.7 | 3719.7 |
| 2.5°   | 3736.5 | 3719.7 | 3682.5 | 3716.5 | 3709.7 |
| 5°     | 3719.7 | 3702.9 | 3659.0 | 3689.3 | 3679.3 |
| 7.5°   | 3689.3 | 3669.3 | 3622.2 | 3635.4 | 3618.6 |
| 10°    | 3649.0 | 3625.4 | 3558.3 | 3547.9 | 3527.9 |
| 12.5°  | 3598.6 | 3568.3 | 3477.2 | 3457.2 | 3420.0 |
| 15°    | 3537.9 | 3500.8 | 3386.5 | 3322.5 | 3289.0 |
| 17.5°  | 3467.2 | 3413.3 | 3271.8 | 3197.9 | 3144.0 |
| 20°    | 3386.5 | 3319.0 | 3150.7 | 3066.8 | 2992.5 |
| 22.5°  | 3299.0 | 3221.5 | 3026.1 | 2911.8 | 2861.5 |
| 25°    | 3211.5 | 3103.6 | 2881.5 | 2743.6 | 2692.9 |
| 27.5°  | 3107.2 | 2992.5 | 2746.8 | 2588.6 | 2511.1 |
| 30°    | 2996.1 | 2867.9 | 2598.6 | 2427.2 | 2336.1 |
| 32.5°  | 2888.2 | 2733.2 | 2457.5 | 2255.4 | 2171.1 |
| 35°    | 2767.2 | 2595.4 | 2299.3 | 2087.2 | 2012.9 |
| 37.5°  | 2649.3 | 2464.0 | 2151.1 | 1918.6 | 1834.7 |
| 40°    | 2524.7 | 2322.9 | 1996.1 | 1757.2 | 1669.7 |
| 42.5°  | 2396.8 | 2181.5 | 1841.4 | 1592.2 | 1508.2 |
| 45°    | 2262.2 | 2036.5 | 1683.2 | 1443.9 | 1363.2 |
| 47.5°  | 2134.3 | 1895.4 | 1531.8 | 1292.5 | 1218.6 |
| 50°    | 1992.9 | 1753.9 | 1383.6 | 1151.1 | 1080.7 |
| 52.5°  | 1854.7 | 1602.2 | 1242.2 | 1020.0 | 956.1  |
| 55°    | 1720.0 | 1457.5 | 1093.9 | 892.2  | 828.2  |
| 57.5°  | 1582.2 | 1312.9 | 962.9  | 774.3  | 720.4  |
| 60°    | 1440.7 | 1171.4 | 824.7  | 653.2  | 599.3  |
| 62.5°  | 1302.9 | 1033.6 | 706.8  | 545.4  | 518.6  |
| 65°    | 1161.4 | 888.6  | 585.7  | 471.4  | 461.1  |
| 67.5°  | 1026.8 | 753.9  | 471.4  | 413.9  | 403.9  |
| 70°    | 885.4  | 622.9  | 390.4  | 356.8  | 343.2  |
| 72.5°  | 750.7  | 501.4  | 326.4  | 299.6  | 292.9  |
| 75°    | 619.3  | 383.6  | 269.3  | 245.7  | 242.5  |
| 77.5°  | 488.2  | 272.5  | 212.1  | 198.6  | 191.8  |
| 80°    | 366.8  | 195.4  | 161.4  | 148.2  | 148.2  |
| 82.5°  | 255.7  | 131.4  | 111.1  | 104.3  | 104.3  |
| 85°    | 144.6  | 73.9   | 63.9   | 63.9   | 63.9   |
| 87.5°  | 53.9   | 26.8   | 26.8   | 23.6   | 23.6   |
| 90°    | 0.9    | 11.7   | 19.5   | 24.5   | 26.3   |
| 92.5°  | 24.5   | 20.5   | 23.4   | 25.4   | 26.3   |
| 95°    | 63.4   | 31.2   | 38.0   | 43.0   | 42.0   |
| 97.5°  | 114.3  | 34.2   | 49.8   | 52.8   | 53.7   |
| 100°   | 172.9  | 39.1   | 55.7   | 63.4   | 65.4   |
| 102.5° | 237.3  | 235.5  | 57.6   | 68.3   | 71.3   |
| 105°   | 296.9  | 326.3  | 59.6   | 70.3   | 74.2   |
| 107.5° | 366.3  | 390.7  | 61.6   | 72.3   | 76.2   |
| 110°   | 432.8  | 453.2  | 171.0  | 73.3   | 77.1   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 495.3  | 512.8  | 496.2  | 75.2   | 78.2   |
| 115°   | 561.6  | 578.2  | 602.7  | 150.4  | 80.2   |
| 117.5° | 619.3  | 638.8  | 655.5  | 515.7  | 259.8  |
| 120°   | 683.8  | 698.4  | 716.0  | 727.8  | 595.9  |
| 122.5° | 738.4  | 754.1  | 773.7  | 779.5  | 780.5  |
| 125°   | 794.1  | 806.9  | 825.4  | 832.3  | 835.2  |
| 127.5° | 844.9  | 858.6  | 873.3  | 883.1  | 884.0  |
| 130°   | 892.8  | 908.5  | 919.1  | 929.9  | 929.0  |
| 132.5° | 941.6  | 954.4  | 965.1  | 973.9  | 973.0  |
| 135°   | 982.7  | 998.4  | 1007.1 | 1016.9 | 1015.0 |
| 137.5° | 1025.6 | 1037.3 | 1047.2 | 1056.9 | 1054.0 |
| 140°   | 1067.6 | 1075.5 | 1086.2 | 1095.0 | 1090.1 |
| 142.5° | 1102.9 | 1109.7 | 1122.4 | 1130.1 | 1125.3 |
| 145°   | 1140.0 | 1139.0 | 1155.5 | 1162.4 | 1157.5 |
| 147.5° | 1172.1 | 1169.2 | 1185.8 | 1190.7 | 1186.9 |
| 150°   | 1203.4 | 1196.6 | 1212.3 | 1218.1 | 1213.2 |
| 152.5° | 1229.8 | 1222.0 | 1236.6 | 1242.5 | 1235.7 |
| 155°   | 1255.2 | 1246.5 | 1258.2 | 1264.0 | 1256.2 |
| 157.5° | 1275.7 | 1267.9 | 1276.8 | 1283.6 | 1275.7 |
| 160°   | 1293.3 | 1287.4 | 1293.3 | 1299.1 | 1292.3 |
| 162.5° | 1308.9 | 1303.1 | 1308.0 | 1314.8 | 1306.0 |
| 165°   | 1322.6 | 1316.8 | 1319.7 | 1326.5 | 1319.7 |
| 167.5° | 1333.4 | 1327.4 | 1330.5 | 1337.3 | 1328.5 |
| 170°   | 1342.2 | 1336.3 | 1338.2 | 1345.1 | 1336.3 |
| 172.5° | 1348.0 | 1342.2 | 1344.2 | 1351.0 | 1342.2 |
| 175°   | 1352.8 | 1346.0 | 1348.0 | 1354.8 | 1345.1 |
| 177.5° | 1354.8 | 1348.0 | 1349.0 | 1355.9 | 1347.1 |
| 180°   | 1350.0 | 1350.0 | 1350.0 | 1350.0 | 1350.0 |

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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 | 13.55            | 14.53 | 14.36 | 15.36 | 16.39 | 9.52           | 10.50 | 10.34 | 11.34 | 12.36 |
|                 | 3H   | 15.23            | 16.11 | 16.06 | 16.95 | 18.00 | 10.72          | 11.60 | 11.55 | 12.44 | 13.49 |
|                 | 4H   | 15.84            | 16.67 | 16.68 | 17.51 | 18.58 | 11.17          | 12.00 | 12.02 | 12.85 | 13.92 |
|                 | 6H   | 16.26            | 17.02 | 17.12 | 17.88 | 18.96 | 11.50          | 12.26 | 12.36 | 13.12 | 14.20 |
|                 | 8H   | 16.39            | 17.11 | 17.26 | 17.99 | 19.07 | 11.59          | 12.32 | 12.46 | 13.19 | 14.27 |
|                 | 12H  | 16.45            | 17.14 | 17.32 | 18.01 | 19.12 | 11.64          | 12.33 | 12.51 | 13.20 | 14.30 |
| 4H              | 2H   | 13.58            | 14.41 | 14.43 | 15.26 | 16.33 | 10.13          | 10.96 | 10.98 | 11.81 | 12.88 |
|                 | 3H   | 15.42            | 16.10 | 16.28 | 16.99 | 18.07 | 11.49          | 12.18 | 12.35 | 13.06 | 14.14 |
|                 | 4H   | 16.11            | 16.73 | 16.98 | 17.61 | 18.72 | 12.04          | 12.67 | 12.91 | 13.55 | 14.65 |
|                 | 6H   | 16.63            | 17.16 | 17.51 | 18.07 | 19.18 | 12.46          | 13.00 | 13.35 | 13.91 | 15.02 |
|                 | 8H   | 16.80            | 17.30 | 17.69 | 18.20 | 19.32 | 12.59          | 13.10 | 13.48 | 13.99 | 15.12 |
|                 | 12H  | 16.90            | 17.35 | 17.81 | 18.27 | 19.39 | 12.66          | 13.11 | 13.57 | 14.03 | 15.16 |
| 8H              | 4H   | 16.09            | 16.59 | 16.98 | 17.49 | 18.61 | 12.33          | 12.83 | 13.22 | 13.73 | 14.85 |
|                 | 6H   | 16.65            | 17.07 | 17.57 | 18.00 | 19.13 | 12.85          | 13.26 | 13.76 | 14.20 | 15.32 |
|                 | 8H   | 16.86            | 17.23 | 17.79 | 18.16 | 19.30 | 13.03          | 13.40 | 13.96 | 14.33 | 15.48 |
|                 | 12H  | 17.00            | 17.33 | 17.93 | 18.25 | 19.44 | 13.16          | 13.48 | 14.09 | 14.40 | 15.60 |
| 12H             | 4H   | 16.05            | 16.50 | 16.96 | 17.41 | 18.54 | 12.34          | 12.79 | 13.25 | 13.71 | 14.84 |
|                 | 6H   | 16.63            | 16.99 | 17.55 | 17.93 | 19.07 | 12.89          | 13.26 | 13.82 | 14.19 | 15.34 |
|                 | 8H   | 16.85            | 17.17 | 17.78 | 18.10 | 19.29 | 13.11          | 13.43 | 14.04 | 14.35 | 15.55 |