

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: P907903

Luminaire Tested: DFN2DIP-HX2F0-030D040US840-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P907903  
REPORT IS A COMBINATION OF REPORTS P900693 AND P897595  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX2F0-030D040US840-FLLONL  
Description: 2 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

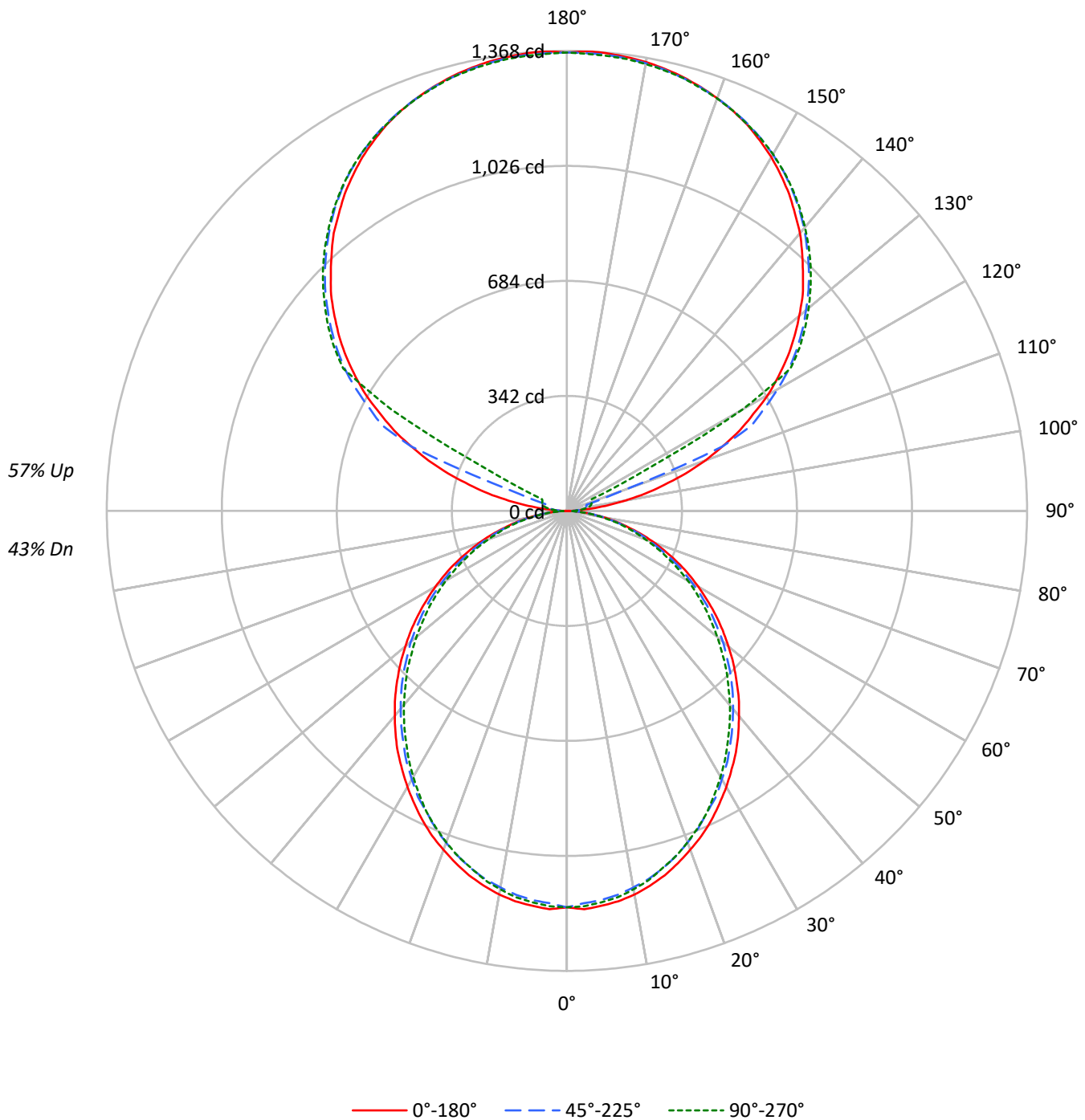
Lumens per Lamp: N/A  
Luminaire Lumens: 6998.4 lumens  
Efficiency: N/A  
Efficacy: 128.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 1.99' x L: 2.3' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 54.6  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9951  
Total Harmonic Distortion (THDi): 0.07  
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   | 105 | 105 | 105 | 105 | 96 | 96 | 96 | 96 | 79 | 79 | 79 | 64 | 64 | 64 | 50 | 50 | 50 |
| 1   | 96  | 92  | 88  | 85  | 88 | 84 | 81 | 78 | 70 | 67 | 65 | 56 | 55 | 53 | 44 | 43 | 42 |
| 2   | 88  | 80  | 74  | 69  | 80 | 74 | 68 | 64 | 61 | 57 | 54 | 49 | 47 | 44 | 39 | 37 | 35 |
| 3   | 80  | 71  | 63  | 58  | 73 | 65 | 58 | 53 | 54 | 49 | 45 | 44 | 40 | 38 | 34 | 32 | 30 |
| 4   | 73  | 62  | 55  | 49  | 66 | 57 | 50 | 45 | 48 | 43 | 39 | 39 | 35 | 32 | 31 | 28 | 26 |
| 5   | 67  | 56  | 48  | 42  | 61 | 51 | 44 | 39 | 43 | 37 | 33 | 35 | 31 | 28 | 28 | 25 | 23 |
| 6   | 62  | 50  | 42  | 36  | 56 | 46 | 39 | 34 | 38 | 33 | 29 | 31 | 27 | 24 | 25 | 22 | 20 |
| 7   | 57  | 45  | 37  | 32  | 52 | 41 | 34 | 29 | 35 | 29 | 25 | 29 | 25 | 22 | 23 | 20 | 18 |
| 8   | 53  | 41  | 33  | 28  | 48 | 38 | 31 | 26 | 32 | 26 | 23 | 26 | 22 | 19 | 21 | 18 | 16 |
| 9   | 49  | 37  | 30  | 25  | 45 | 34 | 28 | 23 | 29 | 24 | 20 | 24 | 20 | 17 | 19 | 16 | 14 |
| 10  | 46  | 34  | 27  | 22  | 42 | 31 | 25 | 21 | 27 | 22 | 18 | 22 | 18 | 16 | 18 | 15 | 13 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2777 | 2777 | 2777 |
| 5°  | 2777 | 2732 | 2752 |
| 10° | 2751 | 2689 | 2710 |
| 15° | 2706 | 2638 | 2646 |
| 20° | 2647 | 2570 | 2582 |
| 25° | 2588 | 2490 | 2508 |
| 30° | 2515 | 2415 | 2415 |
| 35° | 2446 | 2328 | 2318 |
| 40° | 2361 | 2239 | 2225 |
| 45° | 2277 | 2150 | 2129 |
| 50° | 2184 | 2056 | 2019 |
| 55° | 2087 | 1948 | 1916 |
| 60° | 1977 | 1821 | 1799 |
| 65° | 1856 | 1688 | 1660 |
| 70° | 1702 | 1526 | 1510 |
| 75° | 1491 | 1332 | 1364 |
| 80° | 1234 | 1084 | 1101 |
| 85° | 839  | 680  | 682  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2277 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 111.0  | 1.6       |
| 10°-20°   | 312.2  | 4.5       |
| 20°-30°   | 458.8  | 6.6       |
| 30°-40°   | 532.8  | 7.6       |
| 40°-50°   | 532.2  | 7.6       |
| 50°-60°   | 464.1  | 6.6       |
| 60°-70°   | 343.1  | 4.9       |
| 70°-80°   | 194.1  | 2.8       |
| 80°-90°   | 53.6   | 0.8       |
| 90°-100°  | 44.9   | 0.6       |
| 100°-110° | 167.6  | 2.4       |
| 110°-120° | 444.4  | 6.4       |
| 120°-130° | 737.1  | 10.5      |
| 130°-140° | 783.0  | 11.2      |
| 140°-150° | 727.7  | 10.4      |
| 150°-160° | 585.1  | 8.4       |
| 160°-170° | 377.0  | 5.4       |
| 170°-180° | 129.8  | 1.9       |
| 0°-30°    | 881.9  | 12.6      |
| 0°-40°    | 1414.7 | 20.2      |
| 0°-60°    | 2411.0 | 34.5      |
| 0°-90°    | 3001.7 | 42.9      |
| 90°-120°  | 656.9  | 9.4       |
| 90°-150°  | 2904.8 | 41.5      |
| 90°-180°  | 3997.0 | 57.1      |
| 0°-180°   | 6998.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1179 | 1179  | 1179 | 1179  | 1179 |      |
| 5°   | 1179 | 1174  | 1162 | 1171  | 1169 | 112  |
| 15°  | 1122 | 1116  | 1101 | 1105  | 1100 | 316  |
| 25°  | 1016 | 1007  | 987  | 990   | 987  | 467  |
| 35°  | 876  | 865   | 847  | 840   | 834  | 547  |
| 45°  | 713  | 705   | 688  | 676   | 671  | 550  |
| 55°  | 540  | 533   | 519  | 506   | 500  | 482  |
| 65°  | 364  | 357   | 346  | 336   | 330  | 360  |
| 75°  | 190  | 188   | 182  | 176   | 178  | 203  |
| 85°  | 46   | 45    | 44   | 41    | 40   | 52   |
| 90°  | 1    | 12    | 20   | 25    | 27   | 6    |
| 95°  | 64   | 32    | 38   | 43    | 42   | 76   |
| 105° | 300  | 330   | 60   | 71    | 75   | 320  |
| 115° | 567  | 584   | 609  | 152   | 81   | 558  |
| 125° | 802  | 815   | 834  | 840   | 843  | 715  |
| 135° | 992  | 1008  | 1017 | 1027  | 1025 | 767  |
| 145° | 1151 | 1150  | 1167 | 1174  | 1169 | 720  |
| 155° | 1268 | 1259  | 1271 | 1276  | 1269 | 584  |
| 165° | 1336 | 1330  | 1333 | 1340  | 1333 | 377  |
| 175° | 1366 | 1359  | 1361 | 1368  | 1358 | 130  |
| 180° | 1363 | 1363  | 1363 | 1363  | 1363 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1178.8 | 1178.8 | 1178.8 | 1178.8 | 1178.8 |
| 2.5°   | 1185.7 | 1180.0 | 1167.5 | 1178.8 | 1176.7 |
| 5°     | 1178.8 | 1174.4 | 1161.9 | 1170.9 | 1168.7 |
| 7.5°   | 1170.9 | 1164.2 | 1151.7 | 1160.8 | 1158.5 |
| 10°    | 1158.5 | 1150.5 | 1137.0 | 1146.0 | 1142.7 |
| 12.5°  | 1141.5 | 1134.7 | 1121.2 | 1126.7 | 1124.5 |
| 15°    | 1122.2 | 1115.5 | 1100.7 | 1105.2 | 1099.5 |
| 17.5°  | 1098.3 | 1091.7 | 1076.8 | 1082.5 | 1076.8 |
| 20°    | 1072.3 | 1065.5 | 1049.7 | 1053.0 | 1048.5 |
| 22.5°  | 1046.3 | 1036.1 | 1021.3 | 1021.3 | 1019.0 |
| 25°    | 1015.6 | 1006.6 | 987.3  | 989.6  | 987.3  |
| 27.5°  | 981.6  | 973.6  | 959.0  | 955.6  | 950.0  |
| 30°    | 947.7  | 938.6  | 921.6  | 918.2  | 913.6  |
| 32.5°  | 911.4  | 904.6  | 886.5  | 879.6  | 875.0  |
| 35°    | 876.3  | 864.9  | 846.8  | 839.9  | 834.2  |
| 37.5°  | 836.6  | 826.4  | 808.2  | 800.2  | 794.6  |
| 40°    | 795.8  | 786.7  | 768.5  | 758.4  | 753.9  |
| 42.5°  | 756.1  | 747.0  | 728.9  | 717.5  | 710.7  |
| 45°    | 713.1  | 705.1  | 688.0  | 675.6  | 671.1  |
| 47.5°  | 671.1  | 663.2  | 645.0  | 632.5  | 625.7  |
| 50°    | 626.8  | 621.2  | 605.3  | 589.5  | 583.8  |
| 52.5°  | 583.8  | 575.8  | 561.2  | 548.7  | 540.7  |
| 55°    | 539.7  | 532.8  | 519.2  | 505.6  | 500.0  |
| 57.5°  | 495.3  | 489.7  | 474.9  | 461.3  | 456.8  |
| 60°    | 451.1  | 446.7  | 430.8  | 418.3  | 415.0  |
| 62.5°  | 408.1  | 400.1  | 388.8  | 377.5  | 372.9  |
| 65°    | 364.0  | 357.1  | 345.8  | 335.6  | 329.9  |
| 67.5°  | 318.6  | 312.9  | 302.7  | 294.8  | 290.2  |
| 70°    | 276.6  | 272.1  | 261.9  | 253.9  | 249.4  |
| 72.5°  | 233.6  | 228.9  | 223.3  | 215.4  | 212.1  |
| 75°    | 190.4  | 188.2  | 182.5  | 175.7  | 178.0  |
| 77.5°  | 151.9  | 147.3  | 145.0  | 141.7  | 138.4  |
| 80°    | 113.4  | 112.2  | 109.9  | 106.5  | 104.3  |
| 82.5°  | 77.1   | 77.1   | 76.0   | 71.4   | 71.4   |
| 85°    | 46.5   | 45.3   | 44.2   | 40.8   | 39.7   |
| 87.5°  | 20.4   | 18.2   | 15.9   | 12.5   | 11.3   |
| 90°    | 0.9    | 11.8   | 19.7   | 24.7   | 26.6   |
| 92.5°  | 24.7   | 20.7   | 23.6   | 25.7   | 26.6   |
| 95°    | 64.0   | 31.5   | 38.4   | 43.4   | 42.4   |
| 97.5°  | 115.4  | 34.5   | 50.3   | 53.3   | 54.2   |
| 100°   | 174.6  | 39.5   | 56.2   | 64.0   | 66.0   |
| 102.5° | 239.6  | 237.8  | 58.2   | 69.0   | 72.0   |
| 105°   | 299.8  | 329.5  | 60.2   | 71.0   | 74.9   |
| 107.5° | 369.9  | 394.6  | 62.2   | 73.0   | 77.0   |
| 110°   | 437.1  | 457.7  | 172.7  | 74.0   | 77.9   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 500.2  | 517.9  | 501.1  | 75.9   | 79.0   |
| 115°   | 567.1  | 583.9  | 608.6  | 151.9  | 81.0   |
| 117.5° | 625.4  | 645.1  | 662.0  | 520.8  | 262.4  |
| 120°   | 690.5  | 705.3  | 723.1  | 735.0  | 601.8  |
| 122.5° | 745.7  | 761.5  | 781.3  | 787.2  | 788.2  |
| 125°   | 801.9  | 814.9  | 833.5  | 840.5  | 843.4  |
| 127.5° | 853.2  | 867.1  | 881.9  | 891.8  | 892.7  |
| 130°   | 901.6  | 917.5  | 928.2  | 939.1  | 938.2  |
| 132.5° | 950.9  | 963.8  | 974.6  | 983.5  | 982.6  |
| 135°   | 992.4  | 1008.2 | 1017.0 | 1026.9 | 1025.0 |
| 137.5° | 1035.7 | 1047.5 | 1057.5 | 1067.3 | 1064.4 |
| 140°   | 1078.1 | 1086.1 | 1096.9 | 1105.8 | 1100.9 |
| 142.5° | 1113.8 | 1120.6 | 1133.5 | 1141.2 | 1136.4 |
| 145°   | 1151.2 | 1150.2 | 1166.9 | 1173.9 | 1168.9 |
| 147.5° | 1183.7 | 1180.7 | 1197.5 | 1202.4 | 1198.6 |
| 150°   | 1215.3 | 1208.4 | 1224.3 | 1230.1 | 1225.2 |
| 152.5° | 1241.9 | 1234.1 | 1248.8 | 1254.8 | 1247.9 |
| 155°   | 1267.6 | 1258.8 | 1270.6 | 1276.5 | 1268.6 |
| 157.5° | 1288.3 | 1280.4 | 1289.4 | 1296.3 | 1288.3 |
| 160°   | 1306.1 | 1300.1 | 1306.1 | 1311.9 | 1305.0 |
| 162.5° | 1321.8 | 1316.0 | 1320.9 | 1327.8 | 1318.9 |
| 165°   | 1335.6 | 1329.8 | 1332.7 | 1339.6 | 1332.7 |
| 167.5° | 1346.6 | 1340.5 | 1343.6 | 1350.5 | 1341.6 |
| 170°   | 1355.4 | 1349.5 | 1351.4 | 1358.4 | 1349.5 |
| 172.5° | 1361.3 | 1355.4 | 1357.5 | 1364.3 | 1355.4 |
| 175°   | 1366.1 | 1359.3 | 1361.3 | 1368.2 | 1358.4 |
| 177.5° | 1368.2 | 1361.3 | 1362.3 | 1369.3 | 1360.4 |
| 180°   | 1363.3 | 1363.3 | 1363.3 | 1363.3 | 1363.3 |

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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 | 9.99             | 10.79 | 11.01 | 11.82 | 13.18 | 9.57           | 10.37 | 10.58 | 11.39 | 12.76 |
|                 | 3H   | 11.62            | 12.34 | 12.65 | 13.37 | 14.76 | 11.16          | 11.88 | 12.19 | 12.91 | 14.30 |
|                 | 4H   | 12.19            | 12.87 | 13.23 | 13.91 | 15.30 | 11.73          | 12.41 | 12.77 | 13.45 | 14.84 |
|                 | 6H   | 12.57            | 13.19 | 13.61 | 14.23 | 15.64 | 12.11          | 12.73 | 13.16 | 13.77 | 15.18 |
|                 | 8H   | 12.66            | 13.26 | 13.71 | 14.31 | 15.72 | 12.20          | 12.80 | 13.26 | 13.85 | 15.26 |
|                 | 12H  | 12.70            | 13.26 | 13.76 | 14.31 | 15.74 | 12.23          | 12.80 | 13.29 | 13.85 | 15.28 |
| 4H              | 2H   | 10.43            | 11.11 | 11.48 | 12.15 | 13.55 | 10.10          | 10.78 | 11.14 | 11.81 | 13.21 |
|                 | 3H   | 12.27            | 12.83 | 13.32 | 13.90 | 15.31 | 11.88          | 12.45 | 12.93 | 13.51 | 14.92 |
|                 | 4H   | 12.96            | 13.48 | 14.02 | 14.53 | 15.97 | 12.56          | 13.08 | 13.62 | 14.14 | 15.57 |
|                 | 6H   | 13.45            | 13.89 | 14.51 | 14.97 | 16.40 | 13.05          | 13.50 | 14.12 | 14.58 | 16.00 |
|                 | 8H   | 13.58            | 14.00 | 14.65 | 15.07 | 16.51 | 13.18          | 13.60 | 14.25 | 14.67 | 16.12 |
|                 | 12H  | 13.64            | 14.02 | 14.73 | 15.10 | 16.55 | 13.24          | 13.61 | 14.32 | 14.70 | 16.15 |
| 8H              | 4H   | 13.14            | 13.56 | 14.21 | 14.63 | 16.07 | 12.79          | 13.20 | 13.86 | 14.28 | 15.72 |
|                 | 6H   | 13.74            | 14.08 | 14.83 | 15.20 | 16.63 | 13.39          | 13.73 | 14.48 | 14.84 | 16.28 |
|                 | 8H   | 13.94            | 14.24 | 15.04 | 15.34 | 16.80 | 13.59          | 13.89 | 14.68 | 14.98 | 16.44 |
|                 | 12H  | 14.05            | 14.32 | 15.16 | 15.41 | 16.91 | 13.68          | 13.95 | 14.79 | 15.04 | 16.54 |
| 12H             | 4H   | 13.12            | 13.50 | 14.21 | 14.58 | 16.03 | 12.77          | 13.15 | 13.86 | 14.24 | 15.68 |
|                 | 6H   | 13.76            | 14.07 | 14.86 | 15.16 | 16.62 | 13.42          | 13.72 | 14.52 | 14.82 | 16.28 |
|                 | 8H   | 13.98            | 14.25 | 15.09 | 15.34 | 16.84 | 13.64          | 13.90 | 14.74 | 15.00 | 16.49 |