

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: P921546

Luminaire Tested: DFN2DIP-HX2F0-030D050US940-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P921546  
REPORT IS A COMBINATION OF REPORTS P899183 AND P896039  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX2F0-030D050US940-FLLFLL  
Description: 2 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

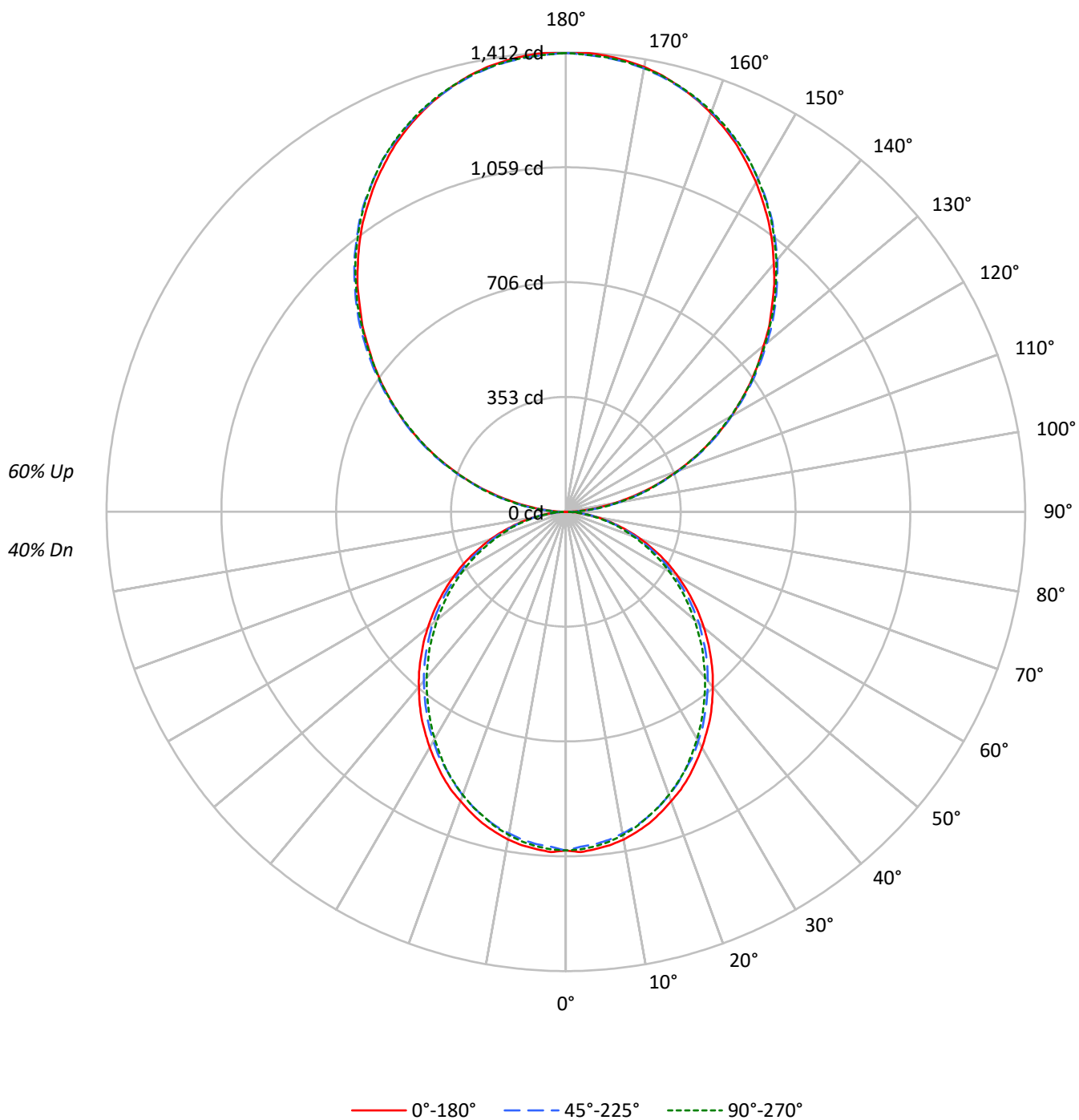
Lumens per Lamp: N/A  
Luminaire Lumens: 6594.2 lumens  
Efficiency: N/A  
Efficacy: 103.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 1.99' x L: 2.3' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 63.7  
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



TEST NUMBER: P921546

CATALOG NUMBER: DFN2DIP-HX2F0-030D050US940-FLLFL

**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 | 95 | 95 | 95 | 95 | 78 | 78 | 78 | 62 | 62 | 62 | 47 | 47 | 47 |
| 1   | 96  | 91  | 87  | 84  | 87 | 83 | 80 | 77 | 68 | 66 | 64 | 54 | 53 | 51 | 42 | 41 | 40 |
| 2   | 87  | 80  | 74  | 69  | 79 | 73 | 68 | 63 | 60 | 56 | 53 | 48 | 45 | 43 | 37 | 35 | 33 |
| 3   | 79  | 70  | 63  | 57  | 72 | 64 | 58 | 53 | 53 | 48 | 44 | 42 | 39 | 36 | 32 | 30 | 28 |
| 4   | 73  | 62  | 54  | 48  | 66 | 57 | 50 | 45 | 47 | 42 | 38 | 38 | 34 | 31 | 29 | 27 | 25 |
| 5   | 67  | 55  | 47  | 41  | 60 | 51 | 44 | 38 | 42 | 37 | 33 | 34 | 30 | 27 | 26 | 23 | 21 |
| 6   | 61  | 49  | 41  | 36  | 56 | 45 | 38 | 33 | 38 | 32 | 28 | 30 | 27 | 24 | 24 | 21 | 19 |
| 7   | 57  | 45  | 37  | 31  | 51 | 41 | 34 | 29 | 34 | 29 | 25 | 28 | 24 | 21 | 22 | 19 | 17 |
| 8   | 52  | 40  | 33  | 28  | 48 | 37 | 30 | 26 | 31 | 26 | 22 | 25 | 21 | 18 | 20 | 17 | 15 |
| 9   | 49  | 37  | 29  | 24  | 44 | 34 | 27 | 23 | 28 | 23 | 20 | 23 | 19 | 17 | 18 | 16 | 14 |
| 10  | 46  | 34  | 27  | 22  | 41 | 31 | 25 | 20 | 26 | 21 | 18 | 21 | 18 | 15 | 17 | 14 | 12 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2453 | 2453 | 2453 |
| 5°  | 2453 | 2412 | 2430 |
| 10° | 2429 | 2374 | 2393 |
| 15° | 2389 | 2329 | 2337 |
| 20° | 2337 | 2269 | 2280 |
| 25° | 2285 | 2198 | 2215 |
| 30° | 2221 | 2132 | 2133 |
| 35° | 2160 | 2055 | 2047 |
| 40° | 2085 | 1977 | 1965 |
| 45° | 2010 | 1898 | 1880 |
| 50° | 1929 | 1816 | 1783 |
| 55° | 1843 | 1720 | 1692 |
| 60° | 1745 | 1608 | 1588 |
| 65° | 1639 | 1490 | 1466 |
| 70° | 1503 | 1347 | 1333 |
| 75° | 1316 | 1176 | 1205 |
| 80° | 1089 | 956  | 972  |
| 85° | 740  | 601  | 601  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2010 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 98.0   | 1.5       |
| 10°-20°   | 275.6  | 4.2       |
| 20°-30°   | 405.1  | 6.1       |
| 30°-40°   | 470.5  | 7.1       |
| 40°-50°   | 469.9  | 7.1       |
| 50°-60°   | 409.8  | 6.2       |
| 60°-70°   | 302.9  | 4.6       |
| 70°-80°   | 171.4  | 2.6       |
| 80°-90°   | 49.2   | 0.7       |
| 90°-100°  | 87.3   | 1.3       |
| 100°-110° | 277.2  | 4.2       |
| 110°-120° | 474.5  | 7.2       |
| 120°-130° | 624.0  | 9.5       |
| 130°-140° | 700.4  | 10.6      |
| 140°-150° | 686.8  | 10.4      |
| 150°-160° | 576.1  | 8.7       |
| 160°-170° | 382.1  | 5.8       |
| 170°-180° | 133.5  | 2.0       |
| 0°-30°    | 778.7  | 11.8      |
| 0°-40°    | 1249.2 | 18.9      |
| 0°-60°    | 2128.9 | 32.3      |
| 0°-90°    | 2652.4 | 40.2      |
| 90°-120°  | 838.9  | 12.7      |
| 90°-150°  | 2850.1 | 43.2      |
| 90°-180°  | 3942.0 | 59.8      |
| 0°-180°   | 6594.2 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1041 | 1041  | 1041 | 1041  | 1041 |      |
| 5°   | 1041 | 1037  | 1026 | 1034  | 1032 | 99   |
| 15°  | 991  | 985   | 972  | 976   | 971  | 279  |
| 25°  | 897  | 889   | 872  | 874   | 872  | 413  |
| 35°  | 774  | 764   | 748  | 742   | 737  | 483  |
| 45°  | 630  | 623   | 608  | 597   | 592  | 486  |
| 55°  | 476  | 470   | 458  | 446   | 442  | 426  |
| 65°  | 321  | 315   | 305  | 296   | 291  | 318  |
| 75°  | 168  | 166   | 161  | 155   | 157  | 179  |
| 85°  | 41   | 40    | 39   | 36    | 35   | 46   |
| 90°  | 1    | 15    | 42   | 39    | 40   | 6    |
| 95°  | 62   | 74    | 76   | 76    | 74   | 69   |
| 105° | 256  | 259   | 262  | 264   | 264  | 270  |
| 115° | 476  | 483   | 481  | 480   | 476  | 471  |
| 125° | 692  | 703   | 700  | 696   | 695  | 619  |
| 135° | 896  | 909   | 911  | 910   | 907  | 692  |
| 145° | 1087 | 1096  | 1103 | 1104  | 1099 | 679  |
| 155° | 1243 | 1247  | 1251 | 1257  | 1253 | 572  |
| 165° | 1353 | 1351  | 1351 | 1360  | 1354 | 382  |
| 175° | 1408 | 1404  | 1402 | 1410  | 1403 | 134  |
| 180° | 1410 | 1410  | 1410 | 1410  | 1410 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1040.9 | 1040.9 | 1040.9 | 1040.9 | 1040.9 |
| 2.5°   | 1047.0 | 1042.0 | 1030.9 | 1040.9 | 1039.0 |
| 5°     | 1040.9 | 1037.0 | 1025.9 | 1033.9 | 1032.0 |
| 7.5°   | 1033.9 | 1028.0 | 1016.9 | 1025.0 | 1023.0 |
| 10°    | 1023.0 | 1015.9 | 1004.0 | 1011.9 | 1009.0 |
| 12.5°  | 1007.9 | 1001.9 | 990.0  | 994.9  | 992.9  |
| 15°    | 990.9  | 985.0  | 971.9  | 975.9  | 970.9  |
| 17.5°  | 969.8  | 963.9  | 950.8  | 955.8  | 950.8  |
| 20°    | 946.8  | 940.8  | 926.8  | 929.8  | 925.9  |
| 22.5°  | 923.9  | 914.9  | 901.8  | 901.8  | 899.7  |
| 25°    | 896.8  | 888.9  | 871.8  | 873.8  | 871.8  |
| 27.5°  | 866.7  | 859.7  | 846.8  | 843.8  | 838.8  |
| 30°    | 836.8  | 828.8  | 813.8  | 810.7  | 806.7  |
| 32.5°  | 804.8  | 798.8  | 782.7  | 776.7  | 772.7  |
| 35°    | 773.7  | 763.7  | 747.7  | 741.6  | 736.6  |
| 37.5°  | 738.7  | 729.7  | 713.6  | 706.6  | 701.6  |
| 40°    | 702.7  | 694.6  | 678.6  | 669.7  | 665.7  |
| 42.5°  | 667.6  | 659.6  | 643.6  | 633.6  | 627.6  |
| 45°    | 629.6  | 622.6  | 607.5  | 596.6  | 592.5  |
| 47.5°  | 592.5  | 585.6  | 569.5  | 558.5  | 552.5  |
| 50°    | 553.5  | 548.5  | 534.5  | 520.5  | 515.5  |
| 52.5°  | 515.5  | 508.5  | 495.5  | 484.5  | 477.4  |
| 55°    | 476.5  | 470.5  | 458.4  | 446.5  | 441.5  |
| 57.5°  | 437.4  | 432.4  | 419.4  | 407.3  | 403.3  |
| 60°    | 398.3  | 394.4  | 380.4  | 369.3  | 366.4  |
| 62.5°  | 360.3  | 353.3  | 343.3  | 333.3  | 329.3  |
| 65°    | 321.4  | 315.3  | 305.3  | 296.3  | 291.3  |
| 67.5°  | 281.3  | 276.3  | 267.2  | 260.3  | 256.3  |
| 70°    | 244.2  | 240.2  | 231.2  | 224.2  | 220.3  |
| 72.5°  | 206.3  | 202.2  | 197.2  | 190.2  | 187.3  |
| 75°    | 168.1  | 166.2  | 161.1  | 155.2  | 157.2  |
| 77.5°  | 134.1  | 130.1  | 128.0  | 125.1  | 122.2  |
| 80°    | 100.1  | 99.1   | 97.0   | 94.1   | 92.1   |
| 82.5°  | 68.0   | 68.0   | 67.1   | 63.0   | 63.0   |
| 85°    | 41.0   | 40.0   | 39.1   | 36.0   | 35.0   |
| 87.5°  | 18.0   | 16.1   | 14.0   | 11.1   | 10.0   |
| 90°    | 1.2    | 15.3   | 41.6   | 39.1   | 40.4   |
| 92.5°  | 26.4   | 35.7   | 37.0   | 38.3   | 38.3   |
| 95°    | 62.1   | 74.0   | 76.1   | 76.1   | 74.0   |
| 97.5°  | 103.3  | 114.3  | 119.0  | 119.0  | 119.0  |
| 100°   | 150.9  | 160.7  | 164.1  | 164.1  | 162.8  |
| 102.5° | 201.1  | 208.3  | 212.9  | 214.3  | 212.9  |
| 105°   | 255.9  | 259.3  | 261.9  | 263.9  | 263.9  |
| 107.5° | 310.3  | 315.4  | 315.4  | 316.3  | 310.3  |
| 110°   | 363.0  | 369.9  | 369.9  | 369.9  | 366.4  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 420.0  | 427.2  | 426.0  | 422.6  | 420.0  |
| 115°   | 476.1  | 483.0  | 480.8  | 479.6  | 476.1  |
| 117.5° | 531.8  | 541.2  | 535.2  | 531.8  | 528.4  |
| 120°   | 587.9  | 597.3  | 587.9  | 587.9  | 584.1  |
| 122.5° | 638.9  | 650.9  | 644.9  | 641.5  | 638.9  |
| 125°   | 692.5  | 703.1  | 699.7  | 695.9  | 694.6  |
| 127.5° | 744.8  | 758.0  | 753.3  | 748.1  | 744.8  |
| 130°   | 793.7  | 809.0  | 806.8  | 804.3  | 799.6  |
| 132.5° | 848.6  | 860.4  | 861.3  | 855.3  | 851.9  |
| 135°   | 895.7  | 908.8  | 911.4  | 910.2  | 906.8  |
| 137.5° | 948.4  | 959.0  | 961.2  | 960.3  | 955.2  |
| 140°   | 994.7  | 1005.4 | 1011.3 | 1011.3 | 1006.7 |
| 142.5° | 1042.3 | 1053.0 | 1056.4 | 1057.7 | 1053.0 |
| 145°   | 1087.4 | 1095.9 | 1102.7 | 1104.0 | 1099.3 |
| 147.5° | 1127.8 | 1138.4 | 1143.5 | 1145.7 | 1140.9 |
| 150°   | 1169.5 | 1176.7 | 1181.3 | 1185.2 | 1181.3 |
| 152.5° | 1206.5 | 1213.7 | 1219.6 | 1224.3 | 1219.6 |
| 155°   | 1243.4 | 1246.8 | 1250.6 | 1256.6 | 1252.8 |
| 157.5° | 1275.3 | 1277.8 | 1280.0 | 1288.5 | 1282.5 |
| 160°   | 1303.8 | 1306.4 | 1307.6 | 1314.8 | 1309.7 |
| 162.5° | 1330.2 | 1330.2 | 1331.4 | 1339.5 | 1333.6 |
| 165°   | 1352.7 | 1351.4 | 1351.4 | 1359.9 | 1354.0 |
| 167.5° | 1373.1 | 1369.2 | 1369.2 | 1377.8 | 1371.8 |
| 170°   | 1388.4 | 1385.0 | 1383.8 | 1392.2 | 1385.0 |
| 172.5° | 1399.0 | 1395.6 | 1394.4 | 1402.8 | 1395.6 |
| 175°   | 1407.6 | 1404.1 | 1401.6 | 1410.1 | 1402.8 |
| 177.5° | 1412.2 | 1408.8 | 1406.2 | 1413.5 | 1406.2 |
| 180°   | 1410.1 | 1410.1 | 1410.1 | 1410.1 | 1410.1 |

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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 | 9.27             | 10.05 | 10.31 | 11.10 | 12.50 | 8.85           | 9.63  | 9.89  | 10.67 | 12.08 |
|                 | 3H   | 10.90            | 11.60 | 11.95 | 12.65 | 14.08 | 10.44          | 11.14 | 11.49 | 12.19 | 13.62 |
|                 | 4H   | 11.47            | 12.13 | 12.53 | 13.19 | 14.62 | 11.01          | 11.67 | 12.07 | 12.73 | 14.16 |
|                 | 6H   | 11.85            | 12.46 | 12.91 | 13.51 | 14.96 | 11.39          | 12.00 | 12.45 | 13.05 | 14.50 |
|                 | 8H   | 11.94            | 12.52 | 13.01 | 13.59 | 15.03 | 11.48          | 12.06 | 12.55 | 13.14 | 14.57 |
|                 | 12H  | 11.97            | 12.53 | 13.05 | 13.59 | 15.06 | 11.51          | 12.06 | 12.59 | 13.13 | 14.59 |
| 4H              | 2H   | 9.71             | 10.38 | 10.78 | 11.43 | 12.86 | 9.38           | 10.04 | 10.44 | 11.09 | 12.52 |
|                 | 3H   | 11.54            | 12.10 | 12.62 | 13.18 | 14.62 | 11.16          | 11.71 | 12.23 | 12.80 | 14.24 |
|                 | 4H   | 12.23            | 12.74 | 13.31 | 13.81 | 15.28 | 11.84          | 12.35 | 12.92 | 13.42 | 14.89 |
|                 | 6H   | 12.72            | 13.16 | 13.81 | 14.25 | 15.71 | 12.33          | 12.76 | 13.41 | 13.86 | 15.32 |
|                 | 8H   | 12.86            | 13.26 | 13.94 | 14.35 | 15.83 | 12.46          | 12.87 | 13.55 | 13.96 | 15.43 |
|                 | 12H  | 12.91            | 13.28 | 14.02 | 14.38 | 15.86 | 12.51          | 12.88 | 13.62 | 13.98 | 15.46 |
| 8H              | 4H   | 12.41            | 12.82 | 13.50 | 13.91 | 15.38 | 12.06          | 12.47 | 13.15 | 13.56 | 15.03 |
|                 | 6H   | 13.01            | 13.35 | 14.12 | 14.48 | 15.95 | 12.66          | 13.00 | 13.77 | 14.13 | 15.60 |
|                 | 8H   | 13.22            | 13.51 | 14.33 | 14.62 | 16.11 | 12.86          | 13.15 | 13.98 | 14.27 | 15.76 |
|                 | 12H  | 13.33            | 13.59 | 14.45 | 14.69 | 16.22 | 12.96          | 13.22 | 14.08 | 14.33 | 15.85 |
| 12H             | 4H   | 12.39            | 12.76 | 13.50 | 13.86 | 15.34 | 12.05          | 12.42 | 13.15 | 13.52 | 15.00 |
|                 | 6H   | 13.04            | 13.33 | 14.15 | 14.44 | 15.93 | 12.70          | 12.99 | 13.81 | 14.10 | 15.59 |
|                 | 8H   | 13.26            | 13.51 | 14.38 | 14.62 | 16.15 | 12.91          | 13.17 | 14.03 | 14.28 | 15.81 |