

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: P921268

Luminaire Tested: DFN2DIP-4P2F0-040D040US940-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P921268  
REPORT IS A COMBINATION OF REPORTS P899028 AND P895899  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P2F0-040D040US940-RLLFLL  
Description: 2 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

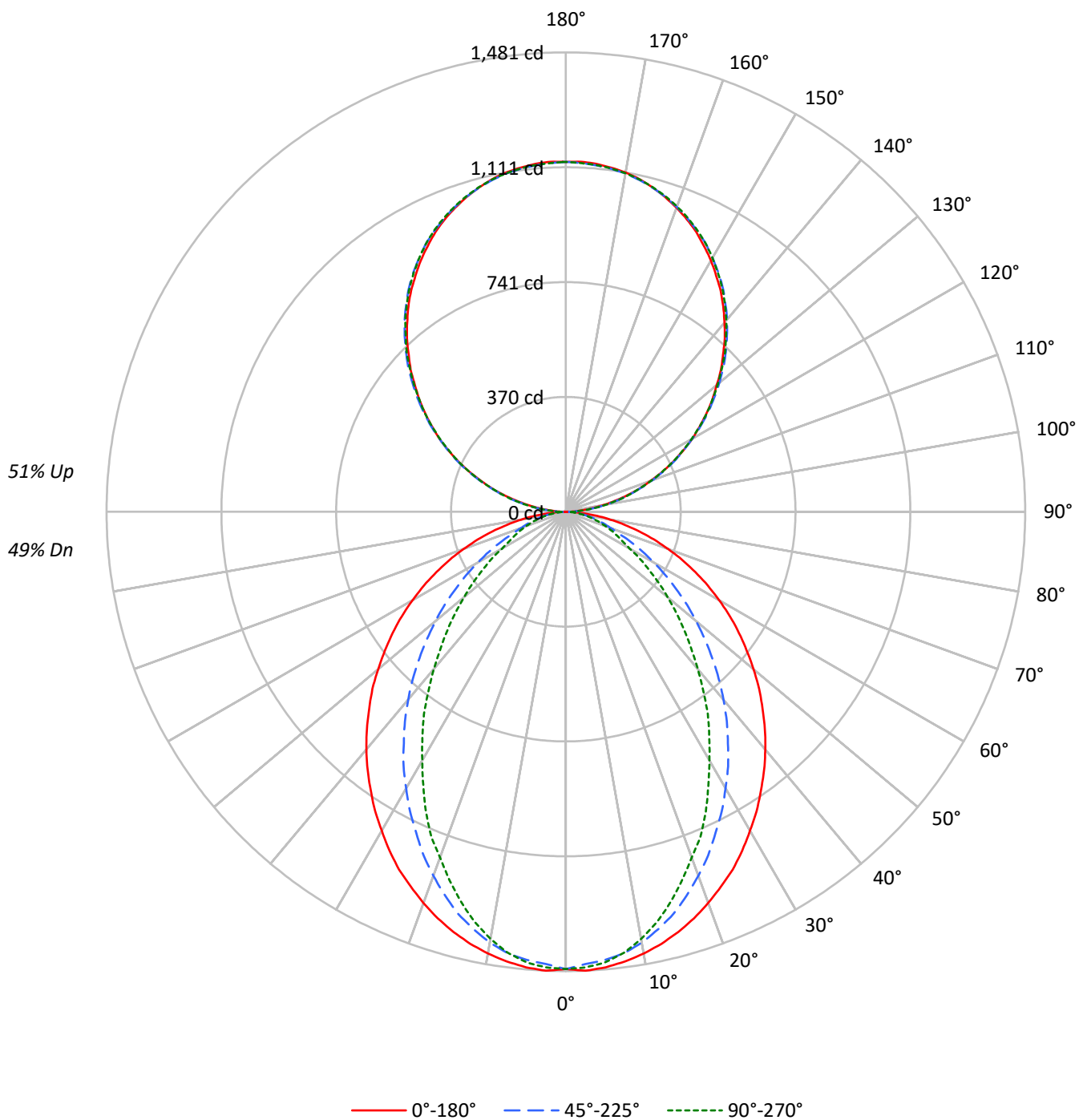
Lumens per Lamp: N/A  
Luminaire Lumens: 6188.5 lumens  
Efficiency: N/A  
Efficacy: 84.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 2.07' x L: 2.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 73.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.983  
Total Harmonic Distortion (THDi): 0.073  
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   | 107 | 107 | 107 | 107 | 99 | 99 | 99 | 99 | 83 | 83 | 83 | 68 | 68 | 68 | 55 | 55 | 55 |
| 1   | 98  | 94  | 90  | 87  | 90 | 87 | 84 | 81 | 73 | 71 | 69 | 61 | 59 | 58 | 50 | 49 | 48 |
| 2   | 90  | 83  | 77  | 72  | 82 | 76 | 71 | 67 | 65 | 61 | 58 | 54 | 51 | 49 | 44 | 42 | 41 |
| 3   | 82  | 73  | 66  | 60  | 75 | 68 | 61 | 57 | 58 | 53 | 49 | 48 | 45 | 42 | 40 | 37 | 35 |
| 4   | 75  | 65  | 57  | 51  | 69 | 60 | 54 | 48 | 51 | 46 | 42 | 43 | 40 | 36 | 36 | 33 | 31 |
| 5   | 69  | 58  | 50  | 44  | 64 | 54 | 47 | 42 | 46 | 41 | 37 | 39 | 35 | 32 | 32 | 29 | 27 |
| 6   | 64  | 52  | 44  | 39  | 59 | 49 | 42 | 37 | 42 | 36 | 32 | 35 | 31 | 28 | 30 | 26 | 24 |
| 7   | 59  | 47  | 40  | 34  | 55 | 44 | 37 | 32 | 38 | 33 | 29 | 32 | 28 | 25 | 27 | 24 | 22 |
| 8   | 55  | 43  | 36  | 30  | 51 | 40 | 33 | 29 | 35 | 29 | 26 | 30 | 26 | 23 | 25 | 22 | 20 |
| 9   | 51  | 39  | 32  | 27  | 47 | 37 | 30 | 26 | 32 | 27 | 23 | 27 | 23 | 20 | 23 | 20 | 18 |
| 10  | 48  | 36  | 29  | 24  | 44 | 34 | 28 | 23 | 30 | 24 | 21 | 25 | 21 | 19 | 22 | 18 | 16 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3691 | 3691 | 3691 |
| 5°  | 3690 | 3623 | 3650 |
| 10° | 3646 | 3543 | 3525 |
| 15° | 3588 | 3417 | 3336 |
| 20° | 3515 | 3247 | 3106 |
| 25° | 3439 | 3058 | 2884 |
| 30° | 3340 | 2865 | 2605 |
| 35° | 3243 | 2658 | 2359 |
| 40° | 3143 | 2446 | 2079 |
| 45° | 3029 | 2211 | 1825 |
| 50° | 2909 | 1975 | 1578 |
| 55° | 2784 | 1724 | 1340 |
| 60° | 2639 | 1464 | 1098 |
| 65° | 2472 | 1200 | 981  |
| 70° | 2268 | 954  | 879  |
| 75° | 2012 | 823  | 788  |
| 80° | 1645 | 664  | 666  |
| 85° | 1061 | 408  | 469  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 3029 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 138.2  | 2.2       |
| 10°-20°   | 379.3  | 6.1       |
| 20°-30°   | 532.5  | 8.6       |
| 30°-40°   | 580.5  | 9.4       |
| 40°-50°   | 533.5  | 8.6       |
| 50°-60°   | 419.0  | 6.8       |
| 60°-70°   | 272.7  | 4.4       |
| 70°-80°   | 140.4  | 2.3       |
| 80°-90°   | 39.0   | 0.6       |
| 90°-100°  | 69.8   | 1.1       |
| 100°-110° | 221.8  | 3.6       |
| 110°-120° | 379.5  | 6.1       |
| 120°-130° | 499.2  | 8.1       |
| 130°-140° | 560.3  | 9.1       |
| 140°-150° | 549.4  | 8.9       |
| 150°-160° | 460.9  | 7.4       |
| 160°-170° | 305.7  | 4.9       |
| 170°-180° | 106.8  | 1.7       |
| 0°-30°    | 1049.9 | 17.0      |
| 0°-40°    | 1630.4 | 26.3      |
| 0°-60°    | 2582.9 | 41.7      |
| 0°-90°    | 3035.0 | 49.0      |
| 90°-120°  | 671.2  | 10.8      |
| 90°-150°  | 2280.1 | 36.8      |
| 90°-180°  | 3153.0 | 50.9      |
| 0°-180°   | 6188.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1474 | 1474  | 1474 | 1474  | 1474 |      |
| 5°   | 1474 | 1468  | 1450 | 1462  | 1458 | 140  |
| 15°  | 1402 | 1387  | 1342 | 1317  | 1304 | 395  |
| 25°  | 1273 | 1230  | 1142 | 1087  | 1067 | 585  |
| 35°  | 1097 | 1029  | 911  | 827   | 798  | 686  |
| 45°  | 896  | 807   | 667  | 572   | 540  | 692  |
| 55°  | 682  | 578   | 434  | 354   | 328  | 609  |
| 65°  | 460  | 352   | 232  | 187   | 183  | 456  |
| 75°  | 245  | 152   | 107  | 97    | 96   | 260  |
| 85°  | 57   | 29    | 25   | 25    | 25   | 66   |
| 90°  | 1    | 12    | 33   | 31    | 32   | 6    |
| 95°  | 50   | 59    | 61   | 61    | 59   | 55   |
| 105° | 205  | 207   | 210  | 211   | 211  | 216  |
| 115° | 381  | 386   | 385  | 384   | 381  | 377  |
| 125° | 554  | 562   | 560  | 557   | 556  | 495  |
| 135° | 717  | 727   | 729  | 728   | 725  | 554  |
| 145° | 870  | 877   | 882  | 883   | 880  | 544  |
| 155° | 995  | 998   | 1000 | 1005  | 1002 | 458  |
| 165° | 1082 | 1081  | 1081 | 1088  | 1083 | 305  |
| 175° | 1126 | 1123  | 1121 | 1128  | 1122 | 107  |
| 180° | 1128 | 1128  | 1128 | 1128  | 1128 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1474.2 | 1474.2 | 1474.2 | 1474.2 | 1474.2 |
| 2.5°   | 1480.9 | 1474.2 | 1459.5 | 1472.9 | 1470.2 |
| 5°     | 1474.2 | 1467.5 | 1450.1 | 1462.1 | 1458.2 |
| 7.5°   | 1462.1 | 1454.2 | 1435.6 | 1440.7 | 1434.1 |
| 10°    | 1446.2 | 1436.8 | 1410.2 | 1406.0 | 1398.2 |
| 12.5°  | 1426.2 | 1414.2 | 1378.0 | 1370.1 | 1355.4 |
| 15°    | 1402.1 | 1387.4 | 1342.1 | 1316.8 | 1303.5 |
| 17.5°  | 1374.1 | 1352.7 | 1296.6 | 1267.4 | 1246.0 |
| 20°    | 1342.1 | 1315.4 | 1248.7 | 1215.4 | 1186.0 |
| 22.5°  | 1307.4 | 1276.8 | 1199.3 | 1154.0 | 1134.1 |
| 25°    | 1272.7 | 1230.0 | 1141.9 | 1087.4 | 1067.2 |
| 27.5°  | 1231.5 | 1186.0 | 1088.6 | 1025.9 | 995.1  |
| 30°    | 1187.4 | 1136.6 | 1029.8 | 961.9  | 925.9  |
| 32.5°  | 1144.7 | 1083.2 | 973.9  | 893.9  | 860.4  |
| 35°    | 1096.7 | 1028.6 | 911.2  | 827.2  | 797.7  |
| 37.5°  | 1050.0 | 976.5  | 852.5  | 760.4  | 727.1  |
| 40°    | 1000.6 | 920.6  | 791.1  | 696.4  | 661.7  |
| 42.5°  | 949.8  | 864.5  | 729.8  | 631.0  | 597.7  |
| 45°    | 896.5  | 807.1  | 667.1  | 572.3  | 540.3  |
| 47.5°  | 845.9  | 751.2  | 607.1  | 512.3  | 483.0  |
| 50°    | 789.8  | 695.1  | 548.3  | 456.2  | 428.3  |
| 52.5°  | 735.0  | 635.0  | 492.3  | 404.2  | 378.9  |
| 55°    | 681.7  | 577.6  | 433.5  | 353.6  | 328.2  |
| 57.5°  | 627.1  | 520.3  | 381.6  | 306.8  | 285.5  |
| 60°    | 571.0  | 464.2  | 326.8  | 258.9  | 237.6  |
| 62.5°  | 516.4  | 409.7  | 280.1  | 216.2  | 205.5  |
| 65°    | 460.3  | 352.1  | 232.1  | 186.8  | 182.7  |
| 67.5°  | 407.0  | 298.8  | 186.8  | 164.1  | 160.1  |
| 70°    | 350.9  | 246.8  | 154.7  | 141.4  | 136.0  |
| 72.5°  | 297.6  | 198.8  | 129.4  | 118.8  | 116.1  |
| 75°    | 245.4  | 152.0  | 106.7  | 97.4   | 96.1   |
| 77.5°  | 193.5  | 108.0  | 84.1   | 78.7   | 76.0   |
| 80°    | 145.3  | 77.4   | 63.9   | 58.8   | 58.8   |
| 82.5°  | 101.4  | 52.1   | 44.1   | 41.3   | 41.3   |
| 85°    | 57.3   | 29.3   | 25.3   | 25.3   | 25.3   |
| 87.5°  | 21.4   | 10.6   | 10.6   | 9.4    | 9.4    |
| 90°    | 1.0    | 12.2   | 33.3   | 31.3   | 32.3   |
| 92.5°  | 21.0   | 28.5   | 29.6   | 30.6   | 30.6   |
| 95°    | 49.7   | 59.2   | 60.9   | 60.9   | 59.2   |
| 97.5°  | 82.7   | 91.5   | 95.2   | 95.2   | 95.2   |
| 100°   | 120.7  | 128.6  | 131.3  | 131.3  | 130.3  |
| 102.5° | 160.9  | 166.7  | 170.4  | 171.4  | 170.4  |
| 105°   | 204.7  | 207.4  | 209.5  | 211.2  | 211.2  |
| 107.5° | 248.3  | 252.4  | 252.4  | 253.0  | 248.3  |
| 110°   | 290.4  | 295.9  | 295.9  | 295.9  | 293.2  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 336.0  | 341.8  | 340.7  | 338.0  | 336.0  |
| 115°   | 380.8  | 386.4  | 384.6  | 383.6  | 380.8  |
| 117.5° | 425.4  | 432.9  | 428.2  | 425.4  | 422.8  |
| 120°   | 470.4  | 477.8  | 470.4  | 470.4  | 467.3  |
| 122.5° | 511.1  | 520.7  | 515.9  | 513.2  | 511.1  |
| 125°   | 554.0  | 562.5  | 559.8  | 556.7  | 555.7  |
| 127.5° | 595.8  | 606.4  | 602.6  | 598.5  | 595.8  |
| 130°   | 634.9  | 647.2  | 645.5  | 643.5  | 639.7  |
| 132.5° | 678.8  | 688.3  | 689.0  | 684.2  | 681.5  |
| 135°   | 716.6  | 727.1  | 729.2  | 728.1  | 725.4  |
| 137.5° | 758.8  | 767.2  | 768.9  | 768.2  | 764.2  |
| 140°   | 795.8  | 804.3  | 809.0  | 809.0  | 805.3  |
| 142.5° | 833.9  | 842.4  | 845.1  | 846.1  | 842.4  |
| 145°   | 870.0  | 876.7  | 882.2  | 883.2  | 879.5  |
| 147.5° | 902.2  | 910.7  | 914.8  | 916.5  | 912.8  |
| 150°   | 935.6  | 941.4  | 945.1  | 948.2  | 945.1  |
| 152.5° | 965.2  | 970.9  | 975.7  | 979.5  | 975.7  |
| 155°   | 994.7  | 997.5  | 1000.5 | 1005.3 | 1002.2 |
| 157.5° | 1020.3 | 1022.3 | 1024.0 | 1030.8 | 1026.0 |
| 160°   | 1043.0 | 1045.1 | 1046.1 | 1051.9 | 1047.8 |
| 162.5° | 1064.1 | 1064.1 | 1065.1 | 1071.6 | 1066.8 |
| 165°   | 1082.2 | 1081.1 | 1081.1 | 1087.9 | 1083.2 |
| 167.5° | 1098.5 | 1095.4 | 1095.4 | 1102.2 | 1097.4 |
| 170°   | 1110.7 | 1108.0 | 1107.0 | 1113.7 | 1108.0 |
| 172.5° | 1119.2 | 1116.5 | 1115.4 | 1122.3 | 1116.5 |
| 175°   | 1126.1 | 1123.3 | 1121.2 | 1128.0 | 1122.3 |
| 177.5° | 1129.8 | 1127.0 | 1125.0 | 1130.8 | 1125.0 |
| 180°   | 1128.0 | 1128.0 | 1128.0 | 1128.0 | 1128.0 |

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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 | 11.46            | 12.28 | 12.43 | 13.26 | 14.55 | 7.42           | 8.24  | 8.39  | 9.22  | 10.51 |
|                 | 3H   | 13.11            | 13.85 | 14.10 | 14.84 | 16.15 | 8.59           | 9.32  | 9.57  | 10.31 | 11.62 |
|                 | 4H   | 13.70            | 14.40 | 14.70 | 15.39 | 16.71 | 9.02           | 9.72  | 10.02 | 10.71 | 12.03 |
|                 | 6H   | 14.11            | 14.75 | 15.11 | 15.75 | 17.08 | 9.32           | 9.96  | 10.33 | 10.96 | 12.29 |
|                 | 8H   | 14.22            | 14.83 | 15.24 | 15.85 | 17.17 | 9.40           | 10.01 | 10.42 | 11.03 | 12.35 |
|                 | 12H  | 14.28            | 14.85 | 15.29 | 15.86 | 17.21 | 9.44           | 10.02 | 10.45 | 11.03 | 12.38 |
| 4H              | 2H   | 11.47            | 12.17 | 12.47 | 13.16 | 14.48 | 8.00           | 8.70  | 9.00  | 9.69  | 11.01 |
|                 | 3H   | 13.27            | 13.85 | 14.28 | 14.87 | 16.20 | 9.33           | 9.90  | 10.34 | 10.93 | 12.26 |
|                 | 4H   | 13.95            | 14.47 | 14.96 | 15.49 | 16.84 | 9.86           | 10.38 | 10.87 | 11.40 | 12.75 |
|                 | 6H   | 14.44            | 14.89 | 15.47 | 15.93 | 17.28 | 10.25          | 10.71 | 11.28 | 11.75 | 13.10 |
|                 | 8H   | 14.60            | 15.02 | 15.63 | 16.06 | 17.42 | 10.37          | 10.79 | 11.40 | 11.82 | 13.19 |
|                 | 12H  | 14.68            | 15.07 | 15.73 | 16.11 | 17.48 | 10.42          | 10.80 | 11.47 | 11.85 | 13.22 |
| 8H              | 4H   | 13.91            | 14.33 | 14.94 | 15.36 | 16.73 | 10.12          | 10.55 | 11.15 | 11.58 | 12.94 |
|                 | 6H   | 14.45            | 14.80 | 15.50 | 15.87 | 17.24 | 10.61          | 10.96 | 11.67 | 12.04 | 13.40 |
|                 | 8H   | 14.65            | 14.96 | 15.71 | 16.02 | 17.40 | 10.79          | 11.09 | 11.85 | 12.15 | 13.54 |
|                 | 12H  | 14.77            | 15.04 | 15.84 | 16.10 | 17.52 | 10.89          | 11.16 | 11.95 | 12.21 | 13.64 |
| 12H             | 4H   | 13.86            | 14.24 | 14.91 | 15.29 | 16.66 | 10.12          | 10.50 | 11.17 | 11.55 | 12.92 |
|                 | 6H   | 14.42            | 14.73 | 15.48 | 15.79 | 17.17 | 10.65          | 10.96 | 11.72 | 12.02 | 13.40 |
|                 | 8H   | 14.63            | 14.90 | 15.69 | 15.95 | 17.37 | 10.85          | 11.12 | 11.91 | 12.17 | 13.60 |