

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: P904898

Luminaire Tested: DFN2DIP-4P2F0-040D040US835-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P904898  
REPORT IS A COMBINATION OF REPORTS P899027 AND P895899  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P2F0-040D040US835-FLLFLL  
Description: 2 foot, 90deg - 4way Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

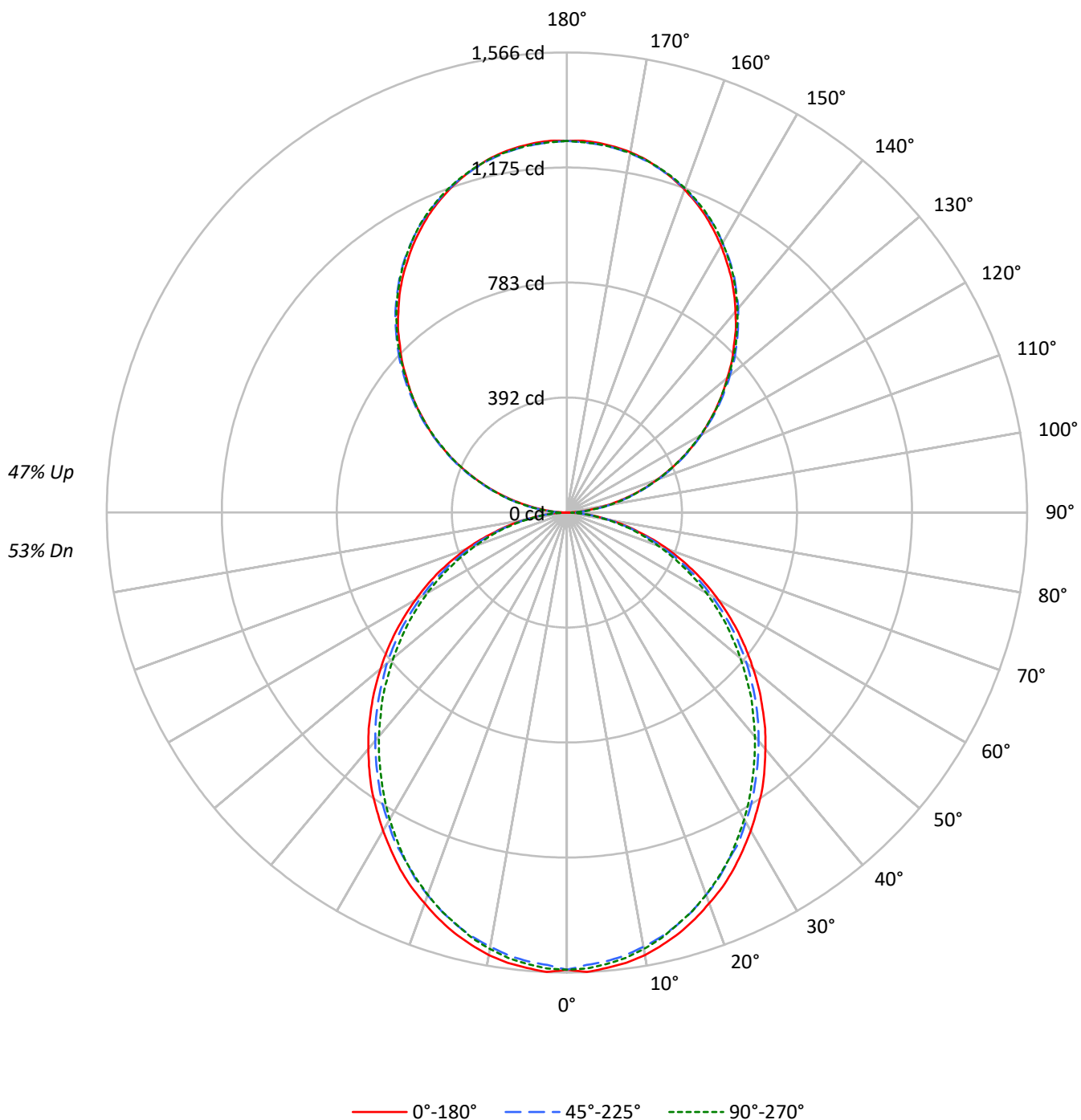
Lumens per Lamp: N/A  
Luminaire Lumens: 7500.0 lumens  
Efficiency: N/A  
Efficacy: 102.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.07' x L: 2.07' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 73.1  
Input Voltage (V): 120  
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   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 71 | 71 | 71 | 59 | 59 | 59 |
| 1   | 98  | 94  | 90  | 87  | 91  | 87  | 84  | 81  | 74 | 72 | 70 | 63 | 61 | 59 | 52 | 51 | 50 |
| 2   | 90  | 82  | 76  | 71  | 83  | 76  | 71  | 66  | 65 | 61 | 58 | 55 | 52 | 50 | 46 | 44 | 42 |
| 3   | 82  | 72  | 65  | 59  | 75  | 67  | 61  | 55  | 58 | 53 | 49 | 49 | 45 | 42 | 41 | 38 | 36 |
| 4   | 75  | 64  | 56  | 50  | 69  | 60  | 52  | 47  | 51 | 46 | 41 | 43 | 39 | 36 | 36 | 33 | 31 |
| 5   | 69  | 57  | 49  | 43  | 63  | 53  | 46  | 40  | 46 | 40 | 36 | 39 | 35 | 31 | 33 | 29 | 27 |
| 6   | 63  | 51  | 43  | 37  | 58  | 48  | 40  | 35  | 41 | 36 | 31 | 35 | 31 | 27 | 30 | 26 | 24 |
| 7   | 59  | 46  | 38  | 33  | 54  | 43  | 36  | 31  | 37 | 32 | 28 | 32 | 28 | 24 | 27 | 24 | 21 |
| 8   | 54  | 42  | 34  | 29  | 50  | 39  | 32  | 27  | 34 | 29 | 24 | 29 | 25 | 22 | 25 | 21 | 19 |
| 9   | 51  | 38  | 31  | 26  | 47  | 36  | 29  | 24  | 31 | 26 | 22 | 27 | 23 | 19 | 23 | 20 | 17 |
| 10  | 47  | 35  | 28  | 23  | 44  | 33  | 26  | 22  | 29 | 23 | 20 | 25 | 21 | 18 | 21 | 18 | 15 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3897 | 3897 | 3897 |
| 5°  | 3896 | 3833 | 3862 |
| 10° | 3856 | 3772 | 3803 |
| 15° | 3792 | 3700 | 3716 |
| 20° | 3707 | 3604 | 3626 |
| 25° | 3623 | 3491 | 3522 |
| 30° | 3520 | 3385 | 3393 |
| 35° | 3421 | 3262 | 3257 |
| 40° | 3301 | 3137 | 3127 |
| 45° | 3180 | 3011 | 2993 |
| 50° | 3049 | 2879 | 2839 |
| 55° | 2910 | 2727 | 2696 |
| 60° | 2753 | 2548 | 2532 |
| 65° | 2580 | 2360 | 2339 |
| 70° | 2361 | 2131 | 2129 |
| 75° | 2061 | 1858 | 1927 |
| 80° | 1695 | 1509 | 1559 |
| 85° | 1135 | 943  | 970  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3180 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 146.5  | 2.0       |
| 10°-20°   | 412.2  | 5.5       |
| 20°-30°   | 605.7  | 8.1       |
| 30°-40°   | 703.5  | 9.4       |
| 40°-50°   | 702.6  | 9.4       |
| 50°-60°   | 612.7  | 8.2       |
| 60°-70°   | 452.9  | 6.0       |
| 70°-80°   | 256.2  | 3.4       |
| 80°-90°   | 71.2   | 0.9       |
| 90°-100°  | 78.3   | 1.0       |
| 100°-110° | 248.7  | 3.3       |
| 110°-120° | 425.6  | 5.7       |
| 120°-130° | 559.8  | 7.5       |
| 130°-140° | 628.3  | 8.4       |
| 140°-150° | 616.2  | 8.2       |
| 150°-160° | 516.9  | 6.9       |
| 160°-170° | 342.8  | 4.6       |
| 170°-180° | 119.8  | 1.6       |
| 0°-30°    | 1164.4 | 15.5      |
| 0°-40°    | 1867.9 | 24.9      |
| 0°-60°    | 3183.2 | 42.4      |
| 0°-90°    | 3963.6 | 52.8      |
| 90°-120°  | 752.7  | 10.0      |
| 90°-150°  | 2556.9 | 34.1      |
| 90°-180°  | 3536.0 | 47.1      |
| 0°-180°   | 7500.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1556 | 1556  | 1556 | 1556  | 1556 |      |
| 5°   | 1556 | 1550  | 1534 | 1546  | 1543 | 148  |
| 15°  | 1482 | 1473  | 1453 | 1459  | 1452 | 417  |
| 25°  | 1341 | 1329  | 1304 | 1306  | 1304 | 617  |
| 35°  | 1157 | 1142  | 1118 | 1109  | 1102 | 722  |
| 45°  | 941  | 931   | 908  | 892   | 886  | 727  |
| 55°  | 712  | 703   | 686  | 668   | 660  | 637  |
| 65°  | 480  | 471   | 456  | 443   | 436  | 475  |
| 75°  | 251  | 248   | 241  | 232   | 235  | 268  |
| 85°  | 61   | 60    | 58   | 54    | 52   | 68   |
| 90°  | 1    | 14    | 37   | 35    | 36   | 7    |
| 95°  | 56   | 66    | 68   | 68    | 66   | 62   |
| 105° | 230  | 233   | 235  | 237   | 237  | 242  |
| 115° | 427  | 433   | 431  | 430   | 427  | 422  |
| 125° | 621  | 631   | 628  | 624   | 623  | 555  |
| 135° | 804  | 815   | 818  | 816   | 814  | 621  |
| 145° | 976  | 983   | 989  | 990   | 986  | 610  |
| 155° | 1116 | 1119  | 1122 | 1127  | 1124 | 513  |
| 165° | 1214 | 1212  | 1212 | 1220  | 1215 | 342  |
| 175° | 1263 | 1260  | 1257 | 1265  | 1259 | 120  |
| 180° | 1265 | 1265  | 1265 | 1265  | 1265 |      |



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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1556.4 | 1556.4 | 1556.4 | 1556.4 | 1556.4 |
| 2.5°   | 1565.5 | 1558.0 | 1541.5 | 1556.4 | 1553.6 |
| 5°     | 1556.4 | 1550.5 | 1534.0 | 1545.9 | 1543.1 |
| 7.5°   | 1545.9 | 1537.0 | 1520.5 | 1532.6 | 1529.6 |
| 10°    | 1529.6 | 1519.1 | 1501.2 | 1513.1 | 1508.6 |
| 12.5°  | 1507.0 | 1498.1 | 1480.2 | 1487.7 | 1484.6 |
| 15°    | 1481.6 | 1472.7 | 1453.2 | 1459.2 | 1451.8 |
| 17.5°  | 1450.2 | 1441.3 | 1421.8 | 1429.2 | 1421.8 |
| 20°    | 1415.7 | 1406.8 | 1385.9 | 1390.3 | 1384.5 |
| 22.5°  | 1381.4 | 1367.9 | 1348.4 | 1348.4 | 1345.4 |
| 25°    | 1340.9 | 1329.0 | 1303.6 | 1306.5 | 1303.6 |
| 27.5°  | 1296.0 | 1285.5 | 1266.2 | 1261.7 | 1254.3 |
| 30°    | 1251.2 | 1239.2 | 1216.8 | 1212.3 | 1206.3 |
| 32.5°  | 1203.3 | 1194.4 | 1170.4 | 1161.4 | 1155.3 |
| 35°    | 1156.9 | 1142.0 | 1118.0 | 1109.0 | 1101.5 |
| 37.5°  | 1104.5 | 1091.0 | 1067.0 | 1056.6 | 1049.1 |
| 40°    | 1050.7 | 1038.6 | 1014.6 | 1001.3 | 995.3  |
| 42.5°  | 998.3  | 986.2  | 962.4  | 947.3  | 938.4  |
| 45°    | 941.4  | 931.0  | 908.4  | 892.1  | 886.0  |
| 47.5°  | 886.0  | 875.5  | 851.6  | 835.1  | 826.2  |
| 50°    | 827.6  | 820.1  | 799.2  | 778.2  | 770.7  |
| 52.5°  | 770.7  | 760.3  | 740.9  | 724.4  | 713.9  |
| 55°    | 712.5  | 703.4  | 685.5  | 667.5  | 660.1  |
| 57.5°  | 654.0  | 646.6  | 627.0  | 609.1  | 603.1  |
| 60°    | 595.6  | 589.7  | 568.8  | 552.3  | 547.8  |
| 62.5°  | 538.8  | 528.3  | 513.4  | 498.4  | 492.4  |
| 65°    | 480.5  | 471.4  | 456.5  | 443.0  | 435.6  |
| 67.5°  | 420.6  | 413.0  | 399.7  | 389.2  | 383.2  |
| 70°    | 365.2  | 359.2  | 345.7  | 335.2  | 329.3  |
| 72.5°  | 308.4  | 302.3  | 294.9  | 284.4  | 279.9  |
| 75°    | 251.4  | 248.5  | 240.9  | 232.0  | 235.0  |
| 77.5°  | 200.5  | 194.5  | 191.5  | 187.0  | 182.6  |
| 80°    | 149.7  | 148.1  | 145.1  | 140.7  | 137.7  |
| 82.5°  | 101.8  | 101.8  | 100.4  | 94.3   | 94.3   |
| 85°    | 61.3   | 59.9   | 58.4   | 53.8   | 52.4   |
| 87.5°  | 27.0   | 24.0   | 21.0   | 16.5   | 14.9   |
| 90°    | 1.1    | 13.7   | 37.4   | 35.1   | 36.2   |
| 92.5°  | 23.6   | 32.0   | 33.2   | 34.3   | 34.3   |
| 95°    | 55.7   | 66.4   | 68.3   | 68.3   | 66.4   |
| 97.5°  | 92.7   | 102.6  | 106.8  | 106.8  | 106.8  |
| 100°   | 135.4  | 144.2  | 147.2  | 147.2  | 146.1  |
| 102.5° | 180.4  | 186.9  | 191.1  | 192.2  | 191.1  |
| 105°   | 229.6  | 232.6  | 234.9  | 236.8  | 236.8  |
| 107.5° | 278.4  | 283.0  | 283.0  | 283.7  | 278.4  |
| 110°   | 325.7  | 331.8  | 331.8  | 331.8  | 328.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 376.8  | 383.3  | 382.1  | 379.1  | 376.8  |
| 115°   | 427.1  | 433.3  | 431.3  | 430.2  | 427.1  |
| 117.5° | 477.1  | 485.5  | 480.2  | 477.1  | 474.1  |
| 120°   | 527.5  | 535.8  | 527.5  | 527.5  | 524.0  |
| 122.5° | 573.2  | 583.9  | 578.6  | 575.5  | 573.2  |
| 125°   | 621.3  | 630.8  | 627.8  | 624.3  | 623.2  |
| 127.5° | 668.2  | 680.0  | 675.8  | 671.2  | 668.2  |
| 130°   | 712.0  | 725.8  | 723.9  | 721.6  | 717.4  |
| 132.5° | 761.2  | 771.9  | 772.7  | 767.3  | 764.3  |
| 135°   | 803.6  | 815.4  | 817.7  | 816.5  | 813.5  |
| 137.5° | 850.9  | 860.4  | 862.3  | 861.5  | 857.0  |
| 140°   | 892.4  | 902.0  | 907.3  | 907.3  | 903.1  |
| 142.5° | 935.2  | 944.7  | 947.7  | 948.9  | 944.7  |
| 145°   | 975.6  | 983.2  | 989.3  | 990.5  | 986.3  |
| 147.5° | 1011.8 | 1021.3 | 1025.9 | 1027.8 | 1023.6 |
| 150°   | 1049.2 | 1055.7 | 1059.9 | 1063.3 | 1059.9 |
| 152.5° | 1082.4 | 1088.8 | 1094.2 | 1098.4 | 1094.2 |
| 155°   | 1115.5 | 1118.6 | 1122.0 | 1127.4 | 1123.9 |
| 157.5° | 1144.2 | 1146.4 | 1148.3 | 1156.0 | 1150.6 |
| 160°   | 1169.7 | 1172.0 | 1173.1 | 1179.6 | 1175.0 |
| 162.5° | 1193.3 | 1193.3 | 1194.5 | 1201.7 | 1196.4 |
| 165°   | 1213.6 | 1212.4 | 1212.4 | 1220.0 | 1214.7 |
| 167.5° | 1231.9 | 1228.4 | 1228.4 | 1236.1 | 1230.7 |
| 170°   | 1245.6 | 1242.5 | 1241.4 | 1249.0 | 1242.5 |
| 172.5° | 1255.1 | 1252.1 | 1250.9 | 1258.6 | 1252.1 |
| 175°   | 1262.8 | 1259.7 | 1257.4 | 1265.0 | 1258.6 |
| 177.5° | 1267.0 | 1263.9 | 1261.6 | 1268.1 | 1261.6 |
| 180°   | 1265.0 | 1265.0 | 1265.0 | 1265.0 | 1265.0 |

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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 | 12.12            | 13.01 | 13.05 | 13.96 | 15.19 | 11.68          | 12.56 | 12.61 | 13.51 | 14.74 |
|                 | 3H   | 13.76            | 14.56 | 14.71 | 15.52 | 16.77 | 13.27          | 14.07 | 14.22 | 15.03 | 16.28 |
|                 | 4H   | 14.34            | 15.09 | 15.29 | 16.05 | 17.31 | 13.84          | 14.59 | 14.80 | 15.56 | 16.82 |
|                 | 6H   | 14.72            | 15.41 | 15.69 | 16.38 | 17.66 | 14.22          | 14.91 | 15.19 | 15.88 | 17.16 |
|                 | 8H   | 14.82            | 15.48 | 15.79 | 16.46 | 17.73 | 14.31          | 14.98 | 15.29 | 15.96 | 17.23 |
|                 | 12H  | 14.86            | 15.49 | 15.84 | 16.47 | 17.76 | 14.35          | 14.98 | 15.33 | 15.96 | 17.25 |
| 4H              | 2H   | 12.57            | 13.33 | 13.54 | 14.29 | 15.55 | 12.22          | 12.97 | 13.18 | 13.93 | 15.20 |
|                 | 3H   | 14.42            | 15.04 | 15.39 | 16.04 | 17.31 | 14.01          | 14.64 | 14.98 | 15.63 | 16.91 |
|                 | 4H   | 15.11            | 15.69 | 16.09 | 16.67 | 17.97 | 14.69          | 15.26 | 15.67 | 16.25 | 17.55 |
|                 | 6H   | 15.61            | 16.10 | 16.60 | 17.11 | 18.41 | 15.17          | 15.67 | 16.17 | 16.68 | 17.98 |
|                 | 8H   | 15.75            | 16.21 | 16.74 | 17.21 | 18.53 | 15.31          | 15.77 | 16.31 | 16.78 | 18.09 |
|                 | 12H  | 15.81            | 16.23 | 16.83 | 17.25 | 18.57 | 15.36          | 15.78 | 16.38 | 16.80 | 18.12 |
| 8H              | 4H   | 15.30            | 15.76 | 16.29 | 16.76 | 18.08 | 14.92          | 15.38 | 15.92 | 16.39 | 17.70 |
|                 | 6H   | 15.90            | 16.28 | 16.92 | 17.33 | 18.64 | 15.52          | 15.90 | 16.54 | 16.95 | 18.26 |
|                 | 8H   | 16.11            | 16.45 | 17.14 | 17.48 | 18.81 | 15.71          | 16.05 | 16.74 | 17.08 | 18.41 |
|                 | 12H  | 16.23            | 16.52 | 17.26 | 17.55 | 18.92 | 15.82          | 16.11 | 16.85 | 17.14 | 18.51 |
| 12H             | 4H   | 15.28            | 15.70 | 16.30 | 16.72 | 18.04 | 14.91          | 15.33 | 15.93 | 16.35 | 17.67 |
|                 | 6H   | 15.93            | 16.26 | 16.96 | 17.30 | 18.63 | 15.55          | 15.89 | 16.58 | 16.92 | 18.25 |
|                 | 8H   | 16.15            | 16.45 | 17.18 | 17.48 | 18.85 | 15.77          | 16.07 | 16.80 | 17.09 | 18.47 |