

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: P917168

Luminaire Tested: DFN2DIP-SQ2F0-050D060US930-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P917168  
REPORT IS A COMBINATION OF REPORTS P899811 AND P896659  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ2F0-050D060US930-FLLFLL  
Description: 2 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

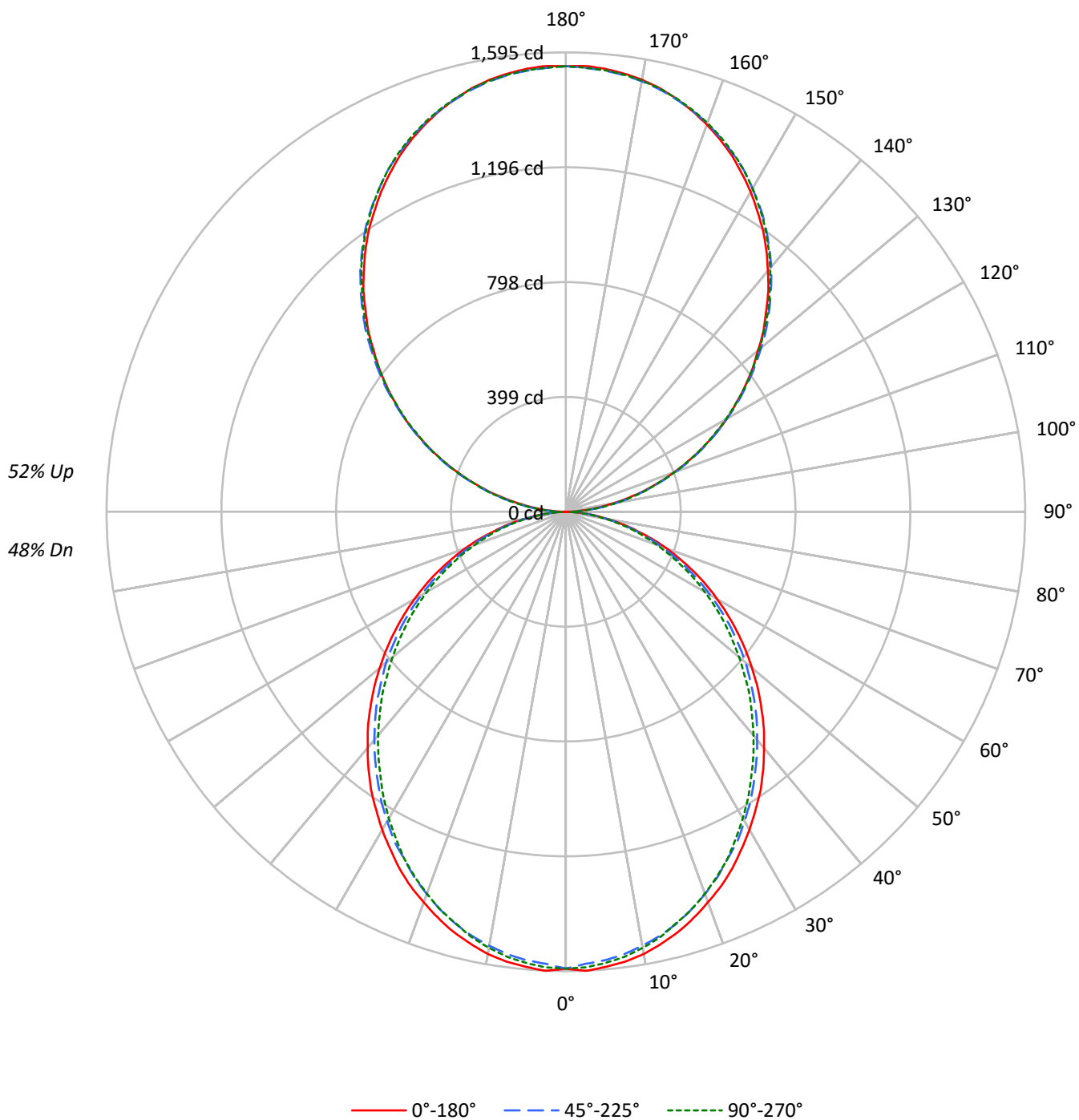
Lumens per Lamp: N/A  
Luminaire Lumens: 8365.0 lumens  
Efficiency: N/A  
Efficacy: 92.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.21' x L: 2.21' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 90.1  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.996  
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   | 107 | 107 | 107 | 107 | 98 | 98 | 98 | 98 | 82 | 82 | 82 | 68 | 68 | 68 | 55 | 55 | 55 |
| 1   | 97  | 93  | 89  | 86  | 89 | 86 | 82 | 79 | 72 | 70 | 68 | 60 | 58 | 57 | 48 | 47 | 46 |
| 2   | 89  | 81  | 75  | 70  | 81 | 75 | 70 | 65 | 63 | 59 | 56 | 52 | 50 | 47 | 42 | 41 | 39 |
| 3   | 81  | 71  | 64  | 58  | 74 | 66 | 60 | 54 | 56 | 51 | 47 | 46 | 43 | 40 | 38 | 35 | 33 |
| 4   | 74  | 63  | 55  | 49  | 68 | 59 | 52 | 46 | 50 | 44 | 40 | 41 | 37 | 34 | 34 | 31 | 28 |
| 5   | 68  | 56  | 48  | 42  | 62 | 52 | 45 | 40 | 44 | 39 | 35 | 37 | 33 | 30 | 30 | 27 | 25 |
| 6   | 63  | 51  | 42  | 37  | 57 | 47 | 40 | 34 | 40 | 34 | 30 | 34 | 29 | 26 | 27 | 24 | 22 |
| 7   | 58  | 46  | 38  | 32  | 53 | 42 | 35 | 30 | 36 | 31 | 27 | 30 | 26 | 23 | 25 | 22 | 19 |
| 8   | 54  | 41  | 34  | 28  | 49 | 39 | 32 | 27 | 33 | 28 | 24 | 28 | 24 | 20 | 23 | 20 | 17 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 28 | 24 | 30 | 25 | 21 | 26 | 21 | 18 | 21 | 18 | 16 |
| 10  | 47  | 35  | 27  | 23  | 43 | 32 | 26 | 21 | 28 | 23 | 19 | 24 | 20 | 17 | 20 | 17 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3488 | 3488 | 3488 |
| 5°  | 3487 | 3431 | 3458 |
| 10° | 3453 | 3378 | 3406 |
| 15° | 3396 | 3315 | 3328 |
| 20° | 3322 | 3230 | 3248 |
| 25° | 3247 | 3130 | 3157 |
| 30° | 3155 | 3037 | 3042 |
| 35° | 3068 | 2928 | 2921 |
| 40° | 2961 | 2817 | 2805 |
| 45° | 2854 | 2706 | 2686 |
| 50° | 2738 | 2589 | 2550 |
| 55° | 2615 | 2454 | 2423 |
| 60° | 2476 | 2295 | 2277 |
| 65° | 2323 | 2129 | 2105 |
| 70° | 2129 | 1927 | 1920 |
| 75° | 1862 | 1684 | 1741 |
| 80° | 1538 | 1375 | 1414 |
| 85° | 1040 | 867  | 888  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2854 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 149.3  | 1.8       |
| 10°-20°   | 420.0  | 5.0       |
| 20°-30°   | 617.3  | 7.4       |
| 30°-40°   | 717.0  | 8.6       |
| 40°-50°   | 716.1  | 8.6       |
| 50°-60°   | 624.4  | 7.5       |
| 60°-70°   | 461.6  | 5.5       |
| 70°-80°   | 261.1  | 3.1       |
| 80°-90°   | 73.3   | 0.9       |
| 90°-100°  | 95.7   | 1.1       |
| 100°-110° | 304.2  | 3.6       |
| 110°-120° | 520.6  | 6.2       |
| 120°-130° | 684.6  | 8.2       |
| 130°-140° | 768.4  | 9.2       |
| 140°-150° | 753.5  | 9.0       |
| 150°-160° | 632.1  | 7.6       |
| 160°-170° | 419.2  | 5.0       |
| 170°-180° | 146.5  | 1.8       |
| 0°-30°    | 1186.6 | 14.2      |
| 0°-40°    | 1903.6 | 22.8      |
| 0°-60°    | 3244.1 | 38.8      |
| 0°-90°    | 4040.1 | 48.3      |
| 90°-120°  | 920.5  | 11.0      |
| 90°-150°  | 3127.0 | 37.4      |
| 90°-180°  | 4325.0 | 51.7      |
| 0°-180°   | 8365.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1586 | 1586  | 1586 | 1586  | 1586 |      |
| 5°   | 1586 | 1580  | 1563 | 1576  | 1573 | 151  |
| 15°  | 1510 | 1501  | 1481 | 1487  | 1480 | 425  |
| 25°  | 1367 | 1354  | 1328 | 1332  | 1328 | 629  |
| 35°  | 1179 | 1164  | 1139 | 1130  | 1123 | 736  |
| 45°  | 959  | 949   | 926  | 909   | 903  | 740  |
| 55°  | 726  | 717   | 698  | 680   | 673  | 649  |
| 65°  | 490  | 480   | 465  | 452   | 444  | 484  |
| 75°  | 256  | 253   | 246  | 236   | 240  | 273  |
| 85°  | 62   | 61    | 60   | 55    | 53   | 70   |
| 90°  | 1    | 17    | 46   | 43    | 44   | 8    |
| 95°  | 68   | 81    | 84   | 84    | 81   | 76   |
| 105° | 281  | 284   | 287  | 290   | 290  | 296  |
| 115° | 522  | 530   | 528  | 526   | 522  | 517  |
| 125° | 760  | 771   | 768  | 764   | 762  | 679  |
| 135° | 983  | 997   | 1000 | 999   | 995  | 760  |
| 145° | 1193 | 1202  | 1210 | 1211  | 1206 | 745  |
| 155° | 1364 | 1368  | 1372 | 1379  | 1374 | 628  |
| 165° | 1484 | 1483  | 1483 | 1492  | 1486 | 419  |
| 175° | 1544 | 1541  | 1538 | 1547  | 1539 | 147  |
| 180° | 1547 | 1547  | 1547 | 1547  | 1547 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1586.2 | 1586.2 | 1586.2 | 1586.2 | 1586.2 |
| 2.5°   | 1595.4 | 1587.8 | 1571.0 | 1586.2 | 1583.3 |
| 5°     | 1586.2 | 1580.2 | 1563.3 | 1575.5 | 1572.6 |
| 7.5°   | 1575.5 | 1566.4 | 1549.6 | 1561.9 | 1558.9 |
| 10°    | 1558.9 | 1548.2 | 1529.9 | 1542.0 | 1537.5 |
| 12.5°  | 1535.9 | 1526.8 | 1508.5 | 1516.1 | 1513.0 |
| 15°    | 1509.9 | 1500.9 | 1481.0 | 1487.2 | 1479.5 |
| 17.5°  | 1477.9 | 1468.8 | 1448.9 | 1456.5 | 1448.9 |
| 20°    | 1442.8 | 1433.8 | 1412.4 | 1416.9 | 1411.0 |
| 22.5°  | 1407.9 | 1394.1 | 1374.2 | 1374.2 | 1371.1 |
| 25°    | 1366.6 | 1354.5 | 1328.5 | 1331.5 | 1328.5 |
| 27.5°  | 1320.8 | 1310.1 | 1290.4 | 1285.8 | 1278.2 |
| 30°    | 1275.1 | 1262.9 | 1240.1 | 1235.5 | 1229.4 |
| 32.5°  | 1226.3 | 1217.2 | 1192.8 | 1183.6 | 1177.5 |
| 35°    | 1179.0 | 1163.8 | 1139.4 | 1130.2 | 1122.6 |
| 37.5°  | 1125.6 | 1111.9 | 1087.4 | 1076.8 | 1069.2 |
| 40°    | 1070.8 | 1058.5 | 1034.0 | 1020.4 | 1014.3 |
| 42.5°  | 1017.4 | 1005.1 | 980.8  | 965.4  | 956.3  |
| 45°    | 959.4  | 948.8  | 925.8  | 909.1  | 902.9  |
| 47.5°  | 902.9  | 892.3  | 867.9  | 851.0  | 842.0  |
| 50°    | 843.4  | 835.8  | 814.5  | 793.1  | 785.5  |
| 52.5°  | 785.5  | 774.8  | 755.0  | 738.3  | 727.6  |
| 55°    | 726.1  | 716.9  | 698.5  | 680.3  | 672.7  |
| 57.5°  | 666.5  | 658.9  | 639.0  | 620.8  | 614.6  |
| 60°    | 607.0  | 601.0  | 579.7  | 562.8  | 558.3  |
| 62.5°  | 549.1  | 538.4  | 523.2  | 507.9  | 501.8  |
| 65°    | 489.7  | 480.5  | 465.2  | 451.5  | 443.8  |
| 67.5°  | 428.7  | 420.9  | 407.3  | 396.6  | 390.4  |
| 70°    | 372.2  | 366.1  | 352.3  | 341.6  | 335.7  |
| 72.5°  | 314.3  | 308.1  | 300.5  | 289.8  | 285.3  |
| 75°    | 256.2  | 253.2  | 245.5  | 236.4  | 239.5  |
| 77.5°  | 204.4  | 198.2  | 195.2  | 190.6  | 186.1  |
| 80°    | 152.6  | 151.0  | 147.9  | 143.4  | 140.3  |
| 82.5°  | 103.7  | 103.7  | 102.2  | 96.1   | 96.1   |
| 85°    | 62.5   | 61.0   | 59.5   | 54.9   | 53.4   |
| 87.5°  | 27.5   | 24.5   | 21.4   | 16.8   | 15.2   |
| 90°    | 1.4    | 16.8   | 45.7   | 42.9   | 44.3   |
| 92.5°  | 28.9   | 39.2   | 40.6   | 42.0   | 42.0   |
| 95°    | 68.1   | 81.1   | 83.5   | 83.5   | 81.1   |
| 97.5°  | 113.3  | 125.5  | 130.6  | 130.6  | 130.6  |
| 100°   | 165.6  | 176.3  | 180.0  | 180.0  | 178.6  |
| 102.5° | 220.6  | 228.5  | 233.7  | 235.1  | 233.7  |
| 105°   | 280.8  | 284.5  | 287.3  | 289.7  | 289.7  |
| 107.5° | 340.5  | 346.1  | 346.1  | 347.0  | 340.5  |
| 110°   | 398.4  | 405.8  | 405.8  | 405.8  | 402.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 460.8  | 468.7  | 467.3  | 463.6  | 460.8  |
| 115°   | 522.4  | 529.9  | 527.5  | 526.1  | 522.4  |
| 117.5° | 583.5  | 593.8  | 587.2  | 583.5  | 579.8  |
| 120°   | 645.1  | 655.3  | 645.1  | 645.1  | 640.8  |
| 122.5° | 701.0  | 714.0  | 707.5  | 703.8  | 701.0  |
| 125°   | 759.8  | 771.4  | 767.7  | 763.5  | 762.1  |
| 127.5° | 817.2  | 831.6  | 826.5  | 820.9  | 817.2  |
| 130°   | 870.8  | 887.6  | 885.3  | 882.5  | 877.3  |
| 132.5° | 931.0  | 944.0  | 944.9  | 938.4  | 934.7  |
| 135°   | 982.8  | 997.2  | 1000.0 | 998.6  | 994.8  |
| 137.5° | 1040.6 | 1052.2 | 1054.6 | 1053.6 | 1048.1 |
| 140°   | 1091.4 | 1103.1 | 1109.6 | 1109.6 | 1104.5 |
| 142.5° | 1143.6 | 1155.3 | 1159.0 | 1160.4 | 1155.3 |
| 145°   | 1193.1 | 1202.4 | 1209.9 | 1211.3 | 1206.2 |
| 147.5° | 1237.4 | 1249.0 | 1254.7 | 1256.9 | 1251.8 |
| 150°   | 1283.1 | 1291.0 | 1296.2 | 1300.3 | 1296.2 |
| 152.5° | 1323.6 | 1331.6 | 1338.1 | 1343.3 | 1338.1 |
| 155°   | 1364.2 | 1368.0 | 1372.1 | 1378.8 | 1374.5 |
| 157.5° | 1399.2 | 1402.1 | 1404.4 | 1413.7 | 1407.2 |
| 160°   | 1430.5 | 1433.3 | 1434.7 | 1442.6 | 1437.0 |
| 162.5° | 1459.4 | 1459.4 | 1460.8 | 1469.7 | 1463.1 |
| 165°   | 1484.1 | 1482.7 | 1482.7 | 1492.1 | 1485.6 |
| 167.5° | 1506.5 | 1502.4 | 1502.4 | 1511.6 | 1505.1 |
| 170°   | 1523.3 | 1519.6 | 1518.2 | 1527.5 | 1519.6 |
| 172.5° | 1535.0 | 1531.2 | 1529.8 | 1539.1 | 1531.2 |
| 175°   | 1544.3 | 1540.6 | 1537.7 | 1547.1 | 1539.1 |
| 177.5° | 1549.4 | 1545.7 | 1542.9 | 1550.8 | 1542.9 |
| 180°   | 1547.1 | 1547.1 | 1547.1 | 1547.1 | 1547.1 |

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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 | 11.34            | 12.18 | 12.31 | 13.17 | 14.46 | 10.89          | 11.74 | 11.86 | 12.72 | 14.02 |
|                 | 3H   | 12.98            | 13.73 | 13.96 | 14.73 | 16.05 | 12.49          | 13.24 | 13.47 | 14.24 | 15.56 |
|                 | 4H   | 13.55            | 14.27 | 14.55 | 15.27 | 16.59 | 13.06          | 13.77 | 14.05 | 14.77 | 16.10 |
|                 | 6H   | 13.93            | 14.60 | 14.94 | 15.60 | 16.94 | 13.43          | 14.10 | 14.44 | 15.10 | 16.44 |
|                 | 8H   | 14.03            | 14.66 | 15.04 | 15.68 | 17.02 | 13.53          | 14.16 | 14.54 | 15.18 | 16.51 |
|                 | 12H  | 14.07            | 14.67 | 15.09 | 15.68 | 17.04 | 13.56          | 14.16 | 14.58 | 15.18 | 16.54 |
| 4H              | 2H   | 11.78            | 12.50 | 12.79 | 13.50 | 14.83 | 11.43          | 12.15 | 12.43 | 13.15 | 14.47 |
|                 | 3H   | 13.63            | 14.23 | 14.64 | 15.25 | 16.59 | 13.22          | 13.82 | 14.23 | 14.84 | 16.18 |
|                 | 4H   | 14.32            | 14.87 | 15.34 | 15.89 | 17.25 | 13.90          | 14.45 | 14.92 | 15.47 | 16.83 |
|                 | 6H   | 14.82            | 15.29 | 15.85 | 16.34 | 17.69 | 14.39          | 14.86 | 15.42 | 15.90 | 17.26 |
|                 | 8H   | 14.96            | 15.40 | 15.99 | 16.44 | 17.81 | 14.52          | 14.96 | 15.55 | 16.00 | 17.37 |
|                 | 12H  | 15.02            | 15.42 | 16.07 | 16.47 | 17.85 | 14.57          | 14.97 | 15.62 | 16.02 | 17.40 |
| 8H              | 4H   | 14.51            | 14.95 | 15.54 | 15.99 | 17.36 | 14.13          | 14.57 | 15.16 | 15.61 | 16.98 |
|                 | 6H   | 15.11            | 15.48 | 16.17 | 16.56 | 17.93 | 14.73          | 15.09 | 15.78 | 16.17 | 17.54 |
|                 | 8H   | 15.32            | 15.64 | 16.38 | 16.71 | 18.10 | 14.93          | 15.25 | 15.99 | 16.31 | 17.70 |
|                 | 12H  | 15.44            | 15.72 | 16.51 | 16.78 | 18.21 | 15.03          | 15.31 | 16.10 | 16.37 | 17.80 |
| 12H             | 4H   | 14.49            | 14.89 | 15.54 | 15.94 | 17.32 | 14.12          | 14.52 | 15.17 | 15.57 | 16.95 |
|                 | 6H   | 15.14            | 15.46 | 16.20 | 16.52 | 17.91 | 14.77          | 15.09 | 15.83 | 16.15 | 17.54 |
|                 | 8H   | 15.37            | 15.65 | 16.43 | 16.71 | 18.14 | 14.98          | 15.27 | 16.05 | 16.32 | 17.76 |