

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: P924310

Luminaire Tested: DFN2DIP-HX2F0-050D040US950-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P924310  
REPORT IS A COMBINATION OF REPORTS P899177 AND P896039  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-HX2F0-050D040US950-FLLFLL  
Description: 2 foot, Hexagon Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

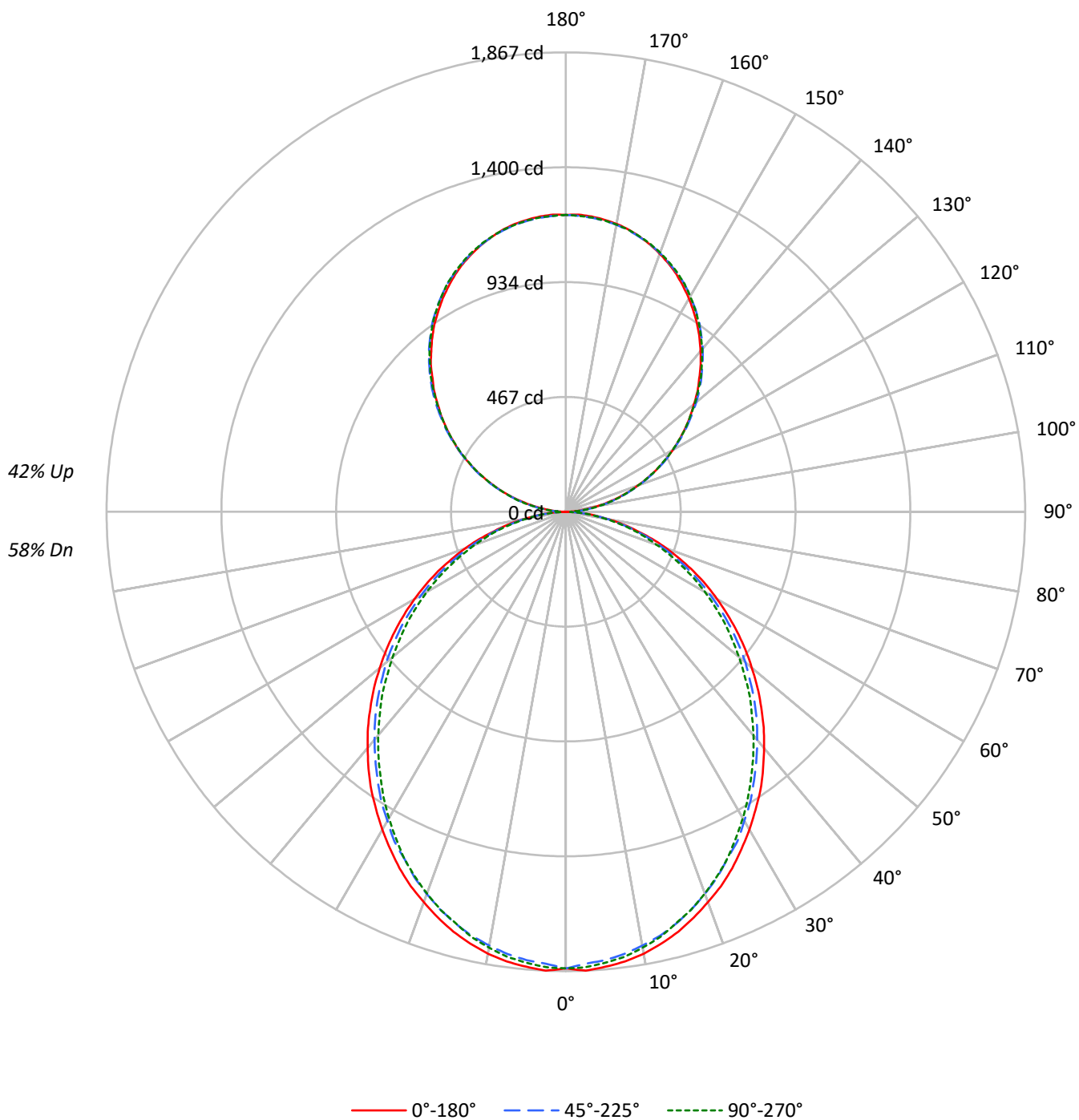
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 8099.4 lumens  
Efficiency: N/A  
Efficacy: 105.3 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): 76.9  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
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: P924310

CATALOG NUMBER: DFN2DIP-HX2F0-050D040US950-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   | 109 | 109 | 109 | 109 | 102 | 102 | 102 | 102 | 88 | 88 | 88 | 75 | 75 | 75 | 64 | 64 | 64 |
| 1   | 100 | 95  | 91  | 88  | 93  | 89  | 86  | 82  | 77 | 75 | 72 | 66 | 65 | 63 | 56 | 55 | 54 |
| 2   | 91  | 83  | 77  | 72  | 84  | 78  | 72  | 68  | 68 | 64 | 60 | 58 | 55 | 52 | 50 | 47 | 45 |
| 3   | 83  | 73  | 66  | 60  | 77  | 69  | 62  | 57  | 60 | 55 | 50 | 52 | 48 | 44 | 44 | 41 | 39 |
| 4   | 76  | 65  | 57  | 51  | 70  | 61  | 54  | 48  | 53 | 47 | 43 | 46 | 42 | 38 | 39 | 36 | 33 |
| 5   | 70  | 58  | 50  | 43  | 65  | 54  | 47  | 41  | 48 | 42 | 37 | 41 | 37 | 33 | 35 | 32 | 29 |
| 6   | 64  | 52  | 44  | 38  | 60  | 49  | 41  | 36  | 43 | 37 | 32 | 37 | 33 | 29 | 32 | 29 | 26 |
| 7   | 59  | 47  | 39  | 33  | 55  | 44  | 37  | 32  | 39 | 33 | 29 | 34 | 29 | 26 | 29 | 26 | 23 |
| 8   | 55  | 43  | 35  | 29  | 51  | 40  | 33  | 28  | 36 | 30 | 26 | 31 | 26 | 23 | 27 | 23 | 20 |
| 9   | 51  | 39  | 31  | 26  | 48  | 37  | 30  | 25  | 33 | 27 | 23 | 29 | 24 | 21 | 25 | 21 | 18 |
| 10  | 48  | 36  | 28  | 24  | 45  | 34  | 27  | 23  | 30 | 25 | 21 | 27 | 22 | 19 | 23 | 19 | 17 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4373 | 4373 | 4373 |
| 5°  | 4373 | 4302 | 4333 |
| 10° | 4331 | 4234 | 4267 |
| 15° | 4260 | 4153 | 4167 |
| 20° | 4167 | 4046 | 4065 |
| 25° | 4074 | 3920 | 3949 |
| 30° | 3960 | 3802 | 3803 |
| 35° | 3851 | 3664 | 3650 |
| 40° | 3718 | 3525 | 3503 |
| 45° | 3585 | 3385 | 3352 |
| 50° | 3439 | 3237 | 3179 |
| 55° | 3286 | 3067 | 3017 |
| 60° | 3112 | 2867 | 2832 |
| 65° | 2922 | 2657 | 2614 |
| 70° | 2680 | 2402 | 2378 |
| 75° | 2347 | 2096 | 2149 |
| 80° | 1943 | 1707 | 1734 |
| 85° | 1319 | 1070 | 1073 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3585 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 174.7  | 2.2       |
| 10°-20°   | 491.5  | 6.1       |
| 20°-30°   | 722.3  | 8.9       |
| 30°-40°   | 838.9  | 10.4      |
| 40°-50°   | 837.9  | 10.3      |
| 50°-60°   | 730.6  | 9.0       |
| 60°-70°   | 540.1  | 6.7       |
| 70°-80°   | 305.6  | 3.8       |
| 80°-90°   | 84.1   | 1.0       |
| 90°-100°  | 74.7   | 0.9       |
| 100°-110° | 237.3  | 2.9       |
| 110°-120° | 406.1  | 5.0       |
| 120°-130° | 534.0  | 6.6       |
| 130°-140° | 599.4  | 7.4       |
| 140°-150° | 587.8  | 7.3       |
| 150°-160° | 493.1  | 6.1       |
| 160°-170° | 327.0  | 4.0       |
| 170°-180° | 114.3  | 1.4       |
| 0°-30°    | 1388.5 | 17.1      |
| 0°-40°    | 2227.5 | 27.5      |
| 0°-60°    | 3796.0 | 46.9      |
| 0°-90°    | 4725.7 | 58.3      |
| 90°-120°  | 718.0  | 8.9       |
| 90°-150°  | 2439.3 | 30.1      |
| 90°-180°  | 3374.0 | 41.7      |
| 0°-180°   | 8099.4 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1856 | 1856  | 1856 | 1856  | 1856 |      |
| 5°   | 1856 | 1849  | 1829 | 1844  | 1840 | 176  |
| 15°  | 1767 | 1756  | 1733 | 1740  | 1731 | 498  |
| 25°  | 1599 | 1585  | 1554 | 1558  | 1554 | 736  |
| 35°  | 1380 | 1362  | 1333 | 1322  | 1314 | 862  |
| 45°  | 1123 | 1110  | 1083 | 1064  | 1057 | 866  |
| 55°  | 850  | 839   | 817  | 796   | 787  | 760  |
| 65°  | 573  | 562   | 544  | 528   | 519  | 567  |
| 75°  | 300  | 296   | 287  | 277   | 280  | 320  |
| 85°  | 73   | 71    | 70   | 64    | 62   | 82   |
| 90°  | 1    | 13    | 36   | 34    | 34   | 8    |
| 95°  | 53   | 63    | 65   | 65    | 63   | 59   |
| 105° | 219  | 222   | 224  | 226   | 226  | 231  |
| 115° | 408  | 413   | 412  | 410   | 408  | 403  |
| 125° | 593  | 602   | 599  | 596   | 594  | 530  |
| 135° | 767  | 778   | 780  | 779   | 776  | 593  |
| 145° | 931  | 938   | 944  | 945   | 941  | 582  |
| 155° | 1064 | 1067  | 1070 | 1076  | 1072 | 490  |
| 165° | 1158 | 1157  | 1157 | 1164  | 1159 | 327  |
| 175° | 1205 | 1202  | 1200 | 1207  | 1201 | 114  |
| 180° | 1207 | 1207  | 1207 | 1207  | 1207 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1856.0 | 1856.0 | 1856.0 | 1856.0 | 1856.0 |
| 2.5°   | 1866.8 | 1857.9 | 1838.3 | 1856.0 | 1852.7 |
| 5°     | 1856.0 | 1849.0 | 1829.3 | 1843.5 | 1840.2 |
| 7.5°   | 1843.5 | 1832.9 | 1813.3 | 1827.7 | 1824.0 |
| 10°    | 1824.0 | 1811.6 | 1790.2 | 1804.3 | 1799.1 |
| 12.5°  | 1797.1 | 1786.6 | 1765.2 | 1774.1 | 1770.4 |
| 15°    | 1766.8 | 1756.2 | 1732.9 | 1740.2 | 1731.2 |
| 17.5°  | 1729.3 | 1718.7 | 1695.4 | 1704.3 | 1695.4 |
| 20°    | 1688.3 | 1677.7 | 1652.7 | 1658.0 | 1651.0 |
| 22.5°  | 1647.4 | 1631.2 | 1608.0 | 1608.0 | 1604.3 |
| 25°    | 1599.1 | 1584.9 | 1554.5 | 1558.0 | 1554.5 |
| 27.5°  | 1545.5 | 1533.0 | 1509.9 | 1504.6 | 1495.7 |
| 30°    | 1492.1 | 1477.7 | 1451.0 | 1445.7 | 1438.5 |
| 32.5°  | 1434.9 | 1424.3 | 1395.7 | 1384.9 | 1377.8 |
| 35°    | 1379.6 | 1361.8 | 1333.2 | 1322.4 | 1313.6 |
| 37.5°  | 1317.1 | 1301.1 | 1272.4 | 1259.9 | 1251.1 |
| 40°    | 1253.0 | 1238.6 | 1210.0 | 1194.0 | 1186.9 |
| 42.5°  | 1190.5 | 1176.1 | 1147.7 | 1129.6 | 1119.0 |
| 45°    | 1122.7 | 1110.2 | 1083.3 | 1063.8 | 1056.6 |
| 47.5°  | 1056.6 | 1044.1 | 1015.5 | 995.8  | 985.2  |
| 50°    | 986.9  | 978.0  | 953.0  | 928.1  | 919.1  |
| 52.5°  | 919.1  | 906.6  | 883.5  | 863.8  | 851.3  |
| 55°    | 849.6  | 838.9  | 817.4  | 796.0  | 787.1  |
| 57.5°  | 779.9  | 771.0  | 747.7  | 726.4  | 719.1  |
| 60°    | 710.3  | 703.3  | 678.3  | 658.5  | 653.3  |
| 62.5°  | 642.5  | 630.0  | 612.2  | 594.3  | 587.2  |
| 65°    | 573.0  | 562.2  | 544.4  | 528.3  | 519.4  |
| 67.5°  | 501.6  | 492.6  | 476.6  | 464.1  | 456.9  |
| 70°    | 435.5  | 428.3  | 412.2  | 399.7  | 392.8  |
| 72.5°  | 367.8  | 360.5  | 351.6  | 339.1  | 333.8  |
| 75°    | 299.7  | 296.3  | 287.2  | 276.7  | 280.3  |
| 77.5°  | 239.2  | 231.9  | 228.4  | 223.0  | 217.8  |
| 80°    | 178.6  | 176.7  | 173.1  | 167.8  | 164.2  |
| 82.5°  | 121.3  | 121.3  | 119.6  | 112.5  | 112.5  |
| 85°    | 73.1   | 71.4   | 69.6   | 64.2   | 62.5   |
| 87.5°  | 32.1   | 28.6   | 25.0   | 19.7   | 17.8   |
| 90°    | 1.0    | 13.1   | 35.7   | 33.5   | 34.5   |
| 92.5°  | 22.5   | 30.5   | 31.7   | 32.7   | 32.7   |
| 95°    | 53.1   | 63.3   | 65.2   | 65.2   | 63.3   |
| 97.5°  | 88.4   | 97.9   | 101.9  | 101.9  | 101.9  |
| 100°   | 129.2  | 137.6  | 140.4  | 140.4  | 139.4  |
| 102.5° | 172.1  | 178.3  | 182.3  | 183.4  | 182.3  |
| 105°   | 219.0  | 221.9  | 224.1  | 225.9  | 225.9  |
| 107.5° | 265.6  | 270.0  | 270.0  | 270.6  | 265.6  |
| 110°   | 310.7  | 316.5  | 316.5  | 316.5  | 313.7  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 359.5  | 365.7  | 364.5  | 361.7  | 359.5  |
| 115°   | 407.5  | 413.4  | 411.5  | 410.4  | 407.5  |
| 117.5° | 455.2  | 463.2  | 458.1  | 455.2  | 452.3  |
| 120°   | 503.2  | 511.2  | 503.2  | 503.2  | 499.9  |
| 122.5° | 546.8  | 557.0  | 552.0  | 549.0  | 546.8  |
| 125°   | 592.7  | 601.8  | 598.9  | 595.6  | 594.5  |
| 127.5° | 637.5  | 648.7  | 644.7  | 640.3  | 637.5  |
| 130°   | 679.2  | 692.4  | 690.6  | 688.4  | 684.4  |
| 132.5° | 726.2  | 736.4  | 737.2  | 732.0  | 729.1  |
| 135°   | 766.6  | 777.9  | 780.1  | 778.9  | 776.1  |
| 137.5° | 811.8  | 820.8  | 822.6  | 821.9  | 817.6  |
| 140°   | 851.3  | 860.5  | 865.6  | 865.6  | 861.6  |
| 142.5° | 892.2  | 901.2  | 904.1  | 905.3  | 901.2  |
| 145°   | 930.7  | 938.0  | 943.8  | 944.9  | 940.9  |
| 147.5° | 965.3  | 974.3  | 978.7  | 980.5  | 976.5  |
| 150°   | 1000.9 | 1007.1 | 1011.1 | 1014.4 | 1011.1 |
| 152.5° | 1032.6 | 1038.7 | 1043.9 | 1047.9 | 1043.9 |
| 155°   | 1064.2 | 1067.1 | 1070.4 | 1075.5 | 1072.2 |
| 157.5° | 1091.6 | 1093.7 | 1095.5 | 1102.8 | 1097.7 |
| 160°   | 1115.9 | 1118.1 | 1119.1 | 1125.3 | 1121.0 |
| 162.5° | 1138.4 | 1138.4 | 1139.6 | 1146.4 | 1141.4 |
| 165°   | 1157.8 | 1156.6 | 1156.6 | 1163.9 | 1158.8 |
| 167.5° | 1175.2 | 1171.9 | 1171.9 | 1179.2 | 1174.1 |
| 170°   | 1188.3 | 1185.3 | 1184.3 | 1191.5 | 1185.3 |
| 172.5° | 1197.4 | 1194.5 | 1193.4 | 1200.7 | 1194.5 |
| 175°   | 1204.7 | 1201.8 | 1199.6 | 1206.8 | 1200.7 |
| 177.5° | 1208.7 | 1205.8 | 1203.6 | 1209.8 | 1203.6 |
| 180°   | 1206.8 | 1206.8 | 1206.8 | 1206.8 | 1206.8 |

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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 | 13.00            | 13.94 | 13.88 | 14.84 | 15.99 | 12.57          | 13.52 | 13.46 | 14.42 | 15.57 |
|                 | 3H   | 14.64            | 15.48 | 15.53 | 16.40 | 17.57 | 14.18          | 15.02 | 15.07 | 15.93 | 17.11 |
|                 | 4H   | 15.21            | 16.01 | 16.12 | 16.93 | 18.11 | 14.75          | 15.55 | 15.66 | 16.47 | 17.65 |
|                 | 6H   | 15.60            | 16.33 | 16.52 | 17.26 | 18.45 | 15.14          | 15.88 | 16.06 | 16.80 | 17.99 |
|                 | 8H   | 15.69            | 16.40 | 16.62 | 17.34 | 18.53 | 15.24          | 15.94 | 16.17 | 16.88 | 18.07 |
|                 | 12H  | 15.74            | 16.40 | 16.67 | 17.34 | 18.56 | 15.27          | 15.94 | 16.21 | 16.88 | 18.10 |
| 4H              | 2H   | 13.46            | 14.26 | 14.37 | 15.18 | 16.36 | 13.12          | 13.92 | 14.03 | 14.84 | 16.02 |
|                 | 3H   | 15.30            | 15.97 | 16.23 | 16.92 | 18.11 | 14.92          | 15.59 | 15.84 | 16.53 | 17.73 |
|                 | 4H   | 16.00            | 16.61 | 16.94 | 17.55 | 18.77 | 15.61          | 16.22 | 16.54 | 17.16 | 18.38 |
|                 | 6H   | 16.50            | 17.02 | 17.45 | 17.99 | 19.21 | 16.10          | 16.63 | 17.05 | 17.59 | 18.82 |
|                 | 8H   | 16.64            | 17.13 | 17.59 | 18.09 | 19.32 | 16.24          | 16.73 | 17.19 | 17.69 | 18.93 |
|                 | 12H  | 16.70            | 17.14 | 17.67 | 18.12 | 19.36 | 16.30          | 16.74 | 17.27 | 17.72 | 18.96 |
| 8H              | 4H   | 16.19            | 16.68 | 17.14 | 17.64 | 18.88 | 15.84          | 16.33 | 16.79 | 17.29 | 18.53 |
|                 | 6H   | 16.80            | 17.20 | 17.77 | 18.21 | 19.44 | 16.45          | 16.85 | 17.42 | 17.86 | 19.09 |
|                 | 8H   | 17.00            | 17.36 | 17.99 | 18.35 | 19.61 | 16.65          | 17.01 | 17.63 | 18.00 | 19.25 |
|                 | 12H  | 17.12            | 17.44 | 18.11 | 18.42 | 19.72 | 16.75          | 17.07 | 17.74 | 18.05 | 19.35 |
| 12H             | 4H   | 16.18            | 16.62 | 17.15 | 17.60 | 18.84 | 15.84          | 16.28 | 16.81 | 17.26 | 18.50 |
|                 | 6H   | 16.82            | 17.18 | 17.81 | 18.17 | 19.43 | 16.48          | 16.84 | 17.47 | 17.83 | 19.09 |
|                 | 8H   | 17.05            | 17.37 | 18.04 | 18.35 | 19.65 | 16.71          | 17.02 | 17.70 | 18.01 | 19.31 |