

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: P925265

Luminaire Tested: DFN2DIP-PN4F0-120D060US950-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P925265  
REPORT IS A COMBINATION OF REPORTS P901181 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-120D060US950-FLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

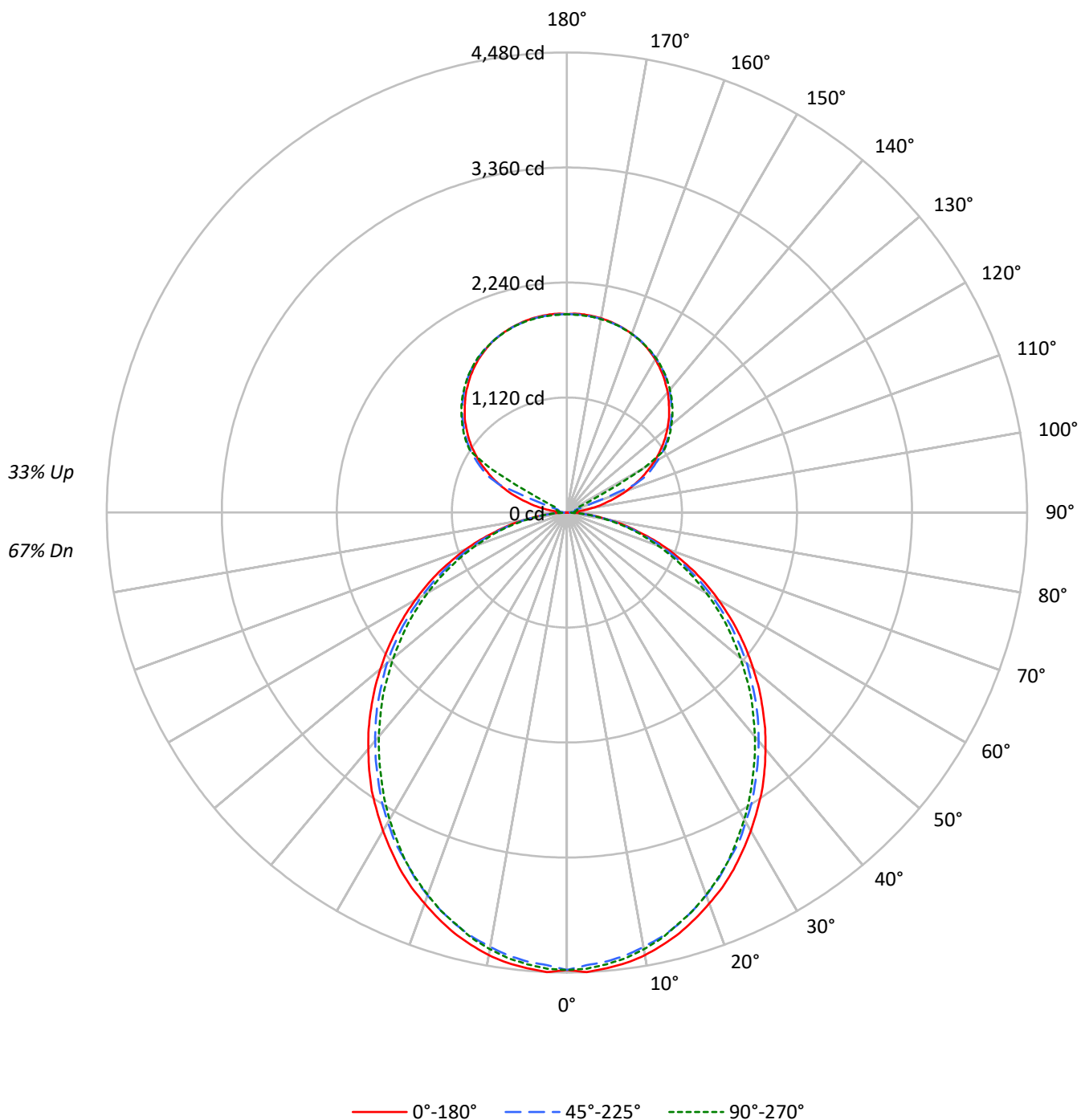
Lumens per Lamp: N/A  
Luminaire Lumens: 17000.3 lumens  
Efficiency: N/A  
Efficacy: 99.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 171.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9781  
Total Harmonic Distortion (THDi): 0.075  
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   | 111 | 111 | 111 | 111 | 105 | 105 | 105 | 105 | 93 | 93 | 93 | 82 | 82 | 82 | 71 | 71 | 71 |
| 1   | 102 | 97  | 93  | 90  | 95  | 92  | 88  | 85  | 81 | 79 | 76 | 72 | 70 | 68 | 63 | 62 | 60 |
| 2   | 92  | 85  | 79  | 73  | 87  | 80  | 75  | 70  | 71 | 67 | 63 | 63 | 60 | 57 | 56 | 53 | 51 |
| 3   | 84  | 75  | 67  | 61  | 79  | 71  | 64  | 58  | 63 | 58 | 53 | 56 | 52 | 48 | 49 | 46 | 43 |
| 4   | 77  | 66  | 58  | 52  | 72  | 63  | 55  | 50  | 56 | 50 | 45 | 50 | 45 | 41 | 44 | 40 | 37 |
| 5   | 71  | 59  | 51  | 44  | 67  | 56  | 48  | 43  | 50 | 44 | 39 | 45 | 40 | 36 | 40 | 36 | 33 |
| 6   | 66  | 53  | 45  | 39  | 62  | 50  | 43  | 37  | 45 | 39 | 34 | 41 | 35 | 32 | 36 | 32 | 29 |
| 7   | 61  | 48  | 40  | 34  | 57  | 46  | 38  | 33  | 41 | 35 | 30 | 37 | 32 | 28 | 33 | 29 | 26 |
| 8   | 56  | 44  | 36  | 30  | 53  | 42  | 34  | 29  | 38 | 31 | 27 | 34 | 29 | 25 | 30 | 26 | 23 |
| 9   | 53  | 40  | 32  | 27  | 50  | 38  | 31  | 26  | 35 | 29 | 24 | 31 | 26 | 23 | 28 | 24 | 21 |
| 10  | 49  | 37  | 29  | 24  | 46  | 35  | 28  | 24  | 32 | 26 | 22 | 29 | 24 | 20 | 26 | 22 | 19 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3252 | 3252 | 3252 |
| 5°  | 3257 | 3207 | 3228 |
| 10° | 3230 | 3164 | 3185 |
| 15° | 3183 | 3112 | 3118 |
| 20° | 3119 | 3040 | 3048 |
| 25° | 3055 | 2954 | 2968 |
| 30° | 2975 | 2874 | 2866 |
| 35° | 2899 | 2780 | 2758 |
| 40° | 2806 | 2684 | 2655 |
| 45° | 2713 | 2588 | 2550 |
| 50° | 2611 | 2488 | 2428 |
| 55° | 2504 | 2372 | 2316 |
| 60° | 2384 | 2234 | 2188 |
| 65° | 2253 | 2091 | 2037 |
| 70° | 2085 | 1917 | 1874 |
| 75° | 1853 | 1709 | 1725 |
| 80° | 1574 | 1444 | 1438 |
| 85° | 1139 | 985  | 963  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2713 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 419.3   | 2.5       |
| 10°-20°   | 1179.6  | 6.9       |
| 20°-30°   | 1733.6  | 10.2      |
| 30°-40°   | 2013.5  | 11.8      |
| 40°-50°   | 2011.0  | 11.8      |
| 50°-60°   | 1753.5  | 10.3      |
| 60°-70°   | 1296.2  | 7.6       |
| 70°-80°   | 733.4   | 4.3       |
| 80°-90°   | 197.0   | 1.2       |
| 90°-100°  | 63.7    | 0.4       |
| 100°-110° | 237.5   | 1.4       |
| 110°-120° | 629.8   | 3.7       |
| 120°-130° | 1044.5  | 6.1       |
| 130°-140° | 1109.5  | 6.5       |
| 140°-150° | 1031.2  | 6.1       |
| 150°-160° | 829.1   | 4.9       |
| 160°-170° | 534.2   | 3.1       |
| 170°-180° | 183.9   | 1.1       |
| 0°-30°    | 3332.5  | 19.6      |
| 0°-40°    | 5345.9  | 31.4      |
| 0°-60°    | 9110.4  | 53.6      |
| 0°-90°    | 11336.9 | 66.7      |
| 90°-120°  | 930.9   | 5.5       |
| 90°-150°  | 4116.2  | 24.2      |
| 90°-180°  | 5663.0  | 33.3      |
| 0°-180°   | 17000.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4454 | 4454  | 4454 | 4454  | 4454 |      |
| 5°   | 4454 | 4438  | 4390 | 4424  | 4416 | 423  |
| 15°  | 4240 | 4215  | 4159 | 4176  | 4155 | 1194 |
| 25°  | 3838 | 3804  | 3731 | 3739  | 3731 | 1766 |
| 35°  | 3311 | 3268  | 3200 | 3174  | 3152 | 2068 |
| 45°  | 2694 | 2664  | 2600 | 2553  | 2536 | 2079 |
| 55°  | 2039 | 2013  | 1962 | 1910  | 1889 | 1823 |
| 65°  | 1375 | 1349  | 1306 | 1268  | 1247 | 1360 |
| 75°  | 719  | 711   | 689  | 664   | 673  | 768  |
| 85°  | 175  | 171   | 167  | 154   | 150  | 196  |
| 90°  | 1    | 17    | 28   | 35    | 38   | 16   |
| 95°  | 91   | 45    | 54   | 62    | 60   | 108  |
| 105° | 425  | 467   | 85   | 101   | 106  | 454  |
| 115° | 804  | 828   | 862  | 215   | 115  | 791  |
| 125° | 1136 | 1155  | 1181 | 1191  | 1195 | 1014 |
| 135° | 1406 | 1429  | 1441 | 1455  | 1452 | 1086 |
| 145° | 1631 | 1630  | 1654 | 1663  | 1656 | 1020 |
| 155° | 1796 | 1784  | 1800 | 1809  | 1798 | 828  |
| 165° | 1893 | 1884  | 1888 | 1898  | 1888 | 535  |
| 175° | 1936 | 1926  | 1929 | 1939  | 1925 | 184  |
| 180° | 1932 | 1932  | 1932 | 1932  | 1932 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4454.5 | 4454.5 | 4454.5 | 4454.5 | 4454.5 |
| 2.5°   | 4480.4 | 4459.0 | 4411.8 | 4454.5 | 4446.3 |
| 5°     | 4454.5 | 4437.6 | 4390.4 | 4424.5 | 4416.3 |
| 7.5°   | 4424.5 | 4399.0 | 4351.8 | 4386.3 | 4377.7 |
| 10°    | 4377.7 | 4347.7 | 4296.3 | 4330.4 | 4317.7 |
| 12.5°  | 4313.1 | 4287.7 | 4236.3 | 4257.7 | 4249.0 |
| 15°    | 4240.4 | 4215.0 | 4159.1 | 4176.3 | 4155.0 |
| 17.5°  | 4150.5 | 4125.0 | 4069.1 | 4090.5 | 4069.1 |
| 20°    | 4051.8 | 4026.4 | 3966.4 | 3979.1 | 3962.3 |
| 22.5°  | 3953.7 | 3915.0 | 3859.1 | 3859.1 | 3850.5 |
| 25°    | 3837.8 | 3803.7 | 3731.0 | 3739.2 | 3731.0 |
| 27.5°  | 3709.2 | 3679.2 | 3623.8 | 3611.0 | 3589.7 |
| 30°    | 3581.0 | 3546.5 | 3482.4 | 3469.7 | 3452.4 |
| 32.5°  | 3443.7 | 3418.4 | 3349.7 | 3323.8 | 3306.6 |
| 35°    | 3311.0 | 3268.4 | 3199.7 | 3173.9 | 3152.5 |
| 37.5°  | 3161.1 | 3122.5 | 3053.8 | 3023.9 | 3002.5 |
| 40°    | 3007.1 | 2972.6 | 2903.9 | 2865.7 | 2848.5 |
| 42.5°  | 2857.1 | 2822.6 | 2754.4 | 2711.3 | 2685.8 |
| 45°    | 2694.4 | 2664.4 | 2599.8 | 2553.1 | 2535.8 |
| 47.5°  | 2535.8 | 2505.8 | 2437.2 | 2390.0 | 2364.5 |
| 50°    | 2368.6 | 2347.2 | 2287.2 | 2227.2 | 2205.8 |
| 52.5°  | 2205.8 | 2175.9 | 2120.5 | 2073.1 | 2043.2 |
| 55°    | 2039.1 | 2013.2 | 1961.8 | 1910.5 | 1889.1 |
| 57.5°  | 1871.8 | 1850.5 | 1794.6 | 1743.2 | 1726.0 |
| 60°    | 1704.6 | 1687.8 | 1627.8 | 1580.6 | 1567.8 |
| 62.5°  | 1542.0 | 1511.9 | 1469.3 | 1426.5 | 1409.2 |
| 65°    | 1375.2 | 1349.2 | 1306.5 | 1267.9 | 1246.6 |
| 67.5°  | 1203.9 | 1182.0 | 1143.8 | 1113.9 | 1096.6 |
| 70°    | 1045.2 | 1027.9 | 989.3  | 959.3  | 942.6  |
| 72.5°  | 882.5  | 865.3  | 843.9  | 814.0  | 801.2  |
| 75°    | 719.4  | 711.2  | 689.4  | 664.0  | 672.6  |
| 77.5°  | 573.9  | 556.7  | 548.1  | 535.3  | 522.6  |
| 80°    | 428.5  | 424.0  | 415.4  | 402.7  | 394.0  |
| 82.5°  | 291.3  | 291.3  | 287.2  | 270.0  | 270.0  |
| 85°    | 175.4  | 171.3  | 167.2  | 154.1  | 150.0  |
| 87.5°  | 77.3   | 68.6   | 60.0   | 47.2   | 42.7   |
| 90°    | 1.3    | 16.8   | 27.9   | 35.0   | 37.7   |
| 92.5°  | 35.0   | 29.4   | 33.5   | 36.3   | 37.7   |
| 95°    | 90.8   | 44.6   | 54.5   | 61.6   | 60.1   |
| 97.5°  | 163.5  | 48.9   | 71.2   | 75.6   | 76.9   |
| 100°   | 247.5  | 55.9   | 79.7   | 90.8   | 93.6   |
| 102.5° | 339.6  | 337.0  | 82.5   | 97.8   | 102.1  |
| 105°   | 424.9  | 466.9  | 85.3   | 100.6  | 106.3  |
| 107.5° | 524.2  | 559.0  | 88.1   | 103.4  | 109.0  |
| 110°   | 619.3  | 648.5  | 244.7  | 104.9  | 110.4  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 708.7  | 733.8  | 710.1  | 107.5  | 111.9  |
| 115°   | 803.7  | 827.5  | 862.5  | 215.3  | 114.7  |
| 117.5° | 886.2  | 914.1  | 938.0  | 738.0  | 371.8  |
| 120°   | 978.5  | 999.4  | 1024.7 | 1041.4 | 852.7  |
| 122.5° | 1056.7 | 1079.1 | 1107.1 | 1115.4 | 1116.9 |
| 125°   | 1136.4 | 1154.6 | 1181.1 | 1191.0 | 1195.1 |
| 127.5° | 1209.1 | 1228.7 | 1249.7 | 1263.7 | 1265.0 |
| 130°   | 1277.6 | 1300.0 | 1315.3 | 1330.7 | 1329.4 |
| 132.5° | 1347.5 | 1365.7 | 1381.0 | 1393.6 | 1392.3 |
| 135°   | 1406.3 | 1428.7 | 1441.1 | 1455.2 | 1452.4 |
| 137.5° | 1467.6 | 1484.4 | 1498.5 | 1512.5 | 1508.4 |
| 140°   | 1527.7 | 1539.1 | 1554.4 | 1566.9 | 1560.0 |
| 142.5° | 1578.2 | 1588.0 | 1606.2 | 1617.2 | 1610.3 |
| 145°   | 1631.3 | 1629.8 | 1653.6 | 1663.4 | 1656.4 |
| 147.5° | 1677.3 | 1673.1 | 1696.9 | 1703.8 | 1698.4 |
| 150°   | 1722.2 | 1712.3 | 1734.8 | 1743.1 | 1736.1 |
| 152.5° | 1759.8 | 1748.7 | 1769.6 | 1778.1 | 1768.2 |
| 155°   | 1796.2 | 1783.7 | 1800.5 | 1808.8 | 1797.6 |
| 157.5° | 1825.6 | 1814.4 | 1827.0 | 1836.8 | 1825.6 |
| 160°   | 1850.8 | 1842.3 | 1850.8 | 1859.1 | 1849.3 |
| 162.5° | 1873.0 | 1864.7 | 1871.7 | 1881.5 | 1868.9 |
| 165°   | 1892.6 | 1884.3 | 1888.4 | 1898.3 | 1888.4 |
| 167.5° | 1908.0 | 1899.6 | 1903.9 | 1913.7 | 1901.0 |
| 170°   | 1920.7 | 1912.2 | 1915.1 | 1924.8 | 1912.2 |
| 172.5° | 1929.0 | 1920.7 | 1923.5 | 1933.3 | 1920.7 |
| 175°   | 1936.0 | 1926.1 | 1929.0 | 1938.7 | 1924.8 |
| 177.5° | 1938.7 | 1929.0 | 1930.4 | 1940.2 | 1927.7 |
| 180°   | 1931.8 | 1931.8 | 1931.8 | 1931.8 | 1931.8 |

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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 | 12.79            | 13.82 | 13.59 | 14.64 | 15.66 | 12.35          | 13.38 | 13.15 | 14.20 | 15.22 |
|                 | 3H   | 14.46            | 15.39 | 15.28 | 16.23 | 17.27 | 13.98          | 14.91 | 14.79 | 15.74 | 16.78 |
|                 | 4H   | 15.06            | 15.94 | 15.89 | 16.78 | 17.83 | 14.57          | 15.45 | 15.40 | 16.29 | 17.34 |
|                 | 6H   | 15.47            | 16.28 | 16.31 | 17.13 | 18.19 | 14.98          | 15.79 | 15.82 | 16.64 | 17.70 |
|                 | 8H   | 15.58            | 16.36 | 16.43 | 17.22 | 18.29 | 15.09          | 15.86 | 15.94 | 16.73 | 17.79 |
|                 | 12H  | 15.64            | 16.37 | 16.50 | 17.23 | 18.32 | 15.14          | 15.87 | 16.00 | 16.73 | 17.82 |
| 4H              | 2H   | 13.27            | 14.15 | 14.10 | 14.99 | 16.04 | 12.92          | 13.80 | 13.75 | 14.64 | 15.69 |
|                 | 3H   | 15.16            | 15.89 | 16.00 | 16.76 | 17.83 | 14.75          | 15.49 | 15.60 | 16.36 | 17.42 |
|                 | 4H   | 15.88            | 16.55 | 16.74 | 17.42 | 18.51 | 15.46          | 16.13 | 16.32 | 17.00 | 18.09 |
|                 | 6H   | 16.41            | 16.98 | 17.28 | 17.88 | 18.97 | 15.98          | 16.56 | 16.86 | 17.45 | 18.55 |
|                 | 8H   | 16.56            | 17.10 | 17.44 | 17.99 | 19.10 | 16.13          | 16.67 | 17.01 | 17.56 | 18.67 |
|                 | 12H  | 16.64            | 17.13 | 17.54 | 18.04 | 19.15 | 16.20          | 16.69 | 17.10 | 17.60 | 18.72 |
| 8H              | 4H   | 16.09            | 16.63 | 16.97 | 17.52 | 18.63 | 15.72          | 16.26 | 16.60 | 17.15 | 18.26 |
|                 | 6H   | 16.73            | 17.18 | 17.64 | 18.11 | 19.22 | 16.36          | 16.80 | 17.26 | 17.73 | 18.84 |
|                 | 8H   | 16.96            | 17.35 | 17.87 | 18.28 | 19.40 | 16.57          | 16.97 | 17.49 | 17.89 | 19.02 |
|                 | 12H  | 17.10            | 17.45 | 18.02 | 18.36 | 19.54 | 16.70          | 17.04 | 17.61 | 17.96 | 19.14 |
| 12H             | 4H   | 16.08            | 16.57 | 16.98 | 17.48 | 18.59 | 15.72          | 16.21 | 16.62 | 17.12 | 18.23 |
|                 | 6H   | 16.76            | 17.16 | 17.68 | 18.08 | 19.21 | 16.40          | 16.80 | 17.31 | 17.72 | 18.85 |
|                 | 8H   | 17.02            | 17.36 | 17.93 | 18.28 | 19.46 | 16.64          | 16.99 | 17.56 | 17.91 | 19.09 |