

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: P920528

Luminaire Tested: DFN2DIP-SQ4F0-120D080US935-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P920528  
REPORT IS A COMBINATION OF REPORTS P900107 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-120D080US935-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

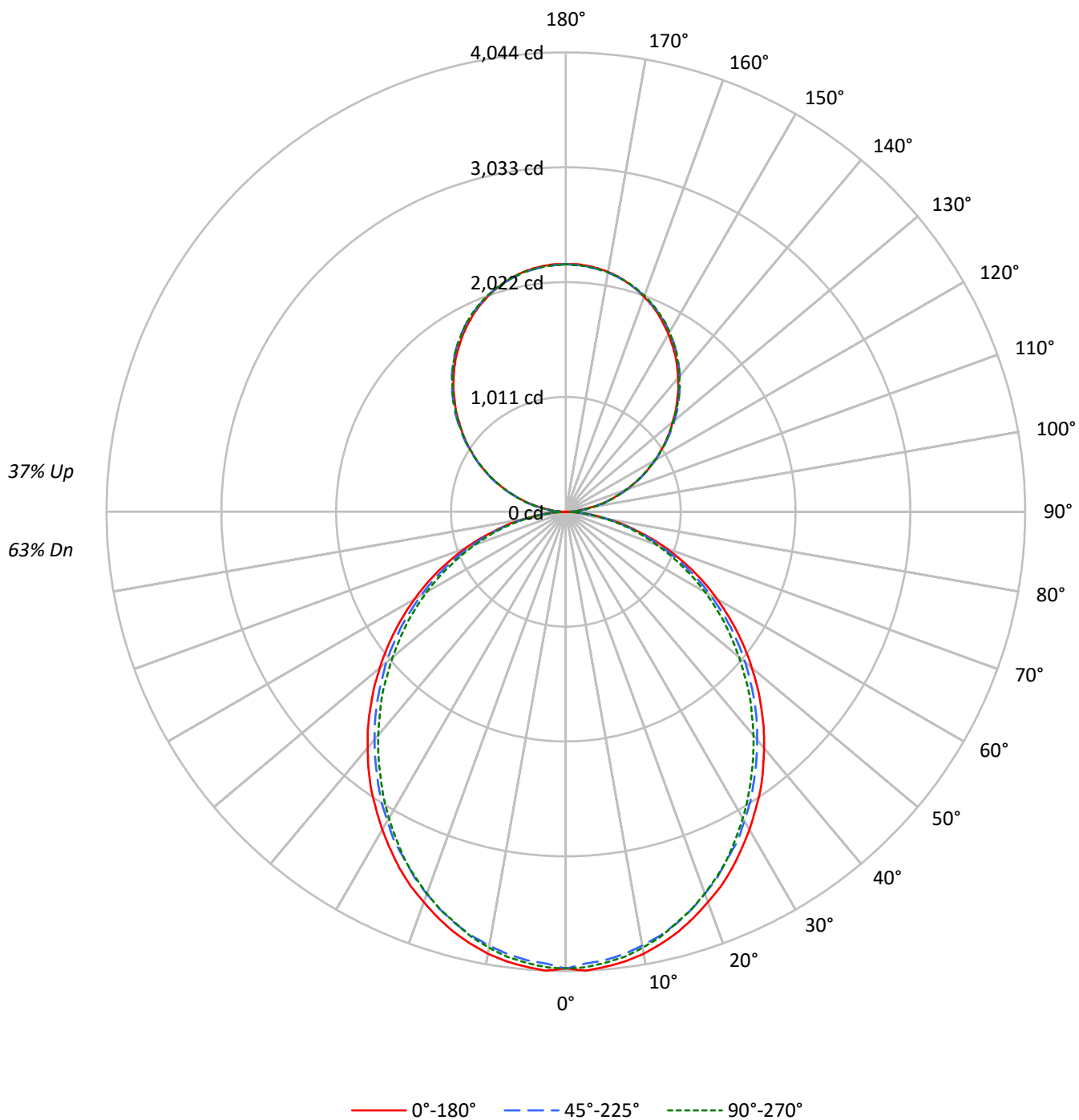
Lumens per Lamp: N/A  
Luminaire Lumens: 16324.6 lumens  
Efficiency: N/A  
Efficacy: 92.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 177.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9933  
Total Harmonic Distortion (THDi): 0.066  
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: P920528

CATALOG NUMBER: DFN2DIP-SQ4F0-120D080US935-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   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 90 | 90 | 90 | 79 | 79 | 79 | 68 | 68 | 68 |
| 1   | 101 | 96  | 92  | 89  | 94  | 90  | 87  | 84  | 79 | 77 | 74 | 69 | 67 | 66 | 60 | 59 | 57 |
| 2   | 92  | 84  | 78  | 72  | 86  | 79  | 73  | 69  | 70 | 65 | 62 | 61 | 58 | 55 | 53 | 50 | 48 |
| 3   | 84  | 74  | 66  | 60  | 78  | 70  | 63  | 58  | 61 | 56 | 52 | 54 | 50 | 46 | 47 | 44 | 41 |
| 4   | 77  | 66  | 57  | 51  | 71  | 62  | 54  | 49  | 55 | 49 | 44 | 48 | 43 | 40 | 42 | 38 | 35 |
| 5   | 70  | 58  | 50  | 44  | 66  | 55  | 48  | 42  | 49 | 43 | 38 | 43 | 38 | 35 | 38 | 34 | 31 |
| 6   | 65  | 53  | 44  | 38  | 61  | 50  | 42  | 37  | 44 | 38 | 33 | 39 | 34 | 30 | 34 | 30 | 27 |
| 7   | 60  | 48  | 39  | 34  | 56  | 45  | 38  | 32  | 40 | 34 | 30 | 36 | 31 | 27 | 31 | 27 | 24 |
| 8   | 56  | 43  | 35  | 30  | 52  | 41  | 34  | 29  | 37 | 31 | 26 | 33 | 28 | 24 | 29 | 25 | 22 |
| 9   | 52  | 40  | 32  | 27  | 49  | 38  | 30  | 26  | 34 | 28 | 24 | 30 | 25 | 22 | 27 | 23 | 20 |
| 10  | 49  | 36  | 29  | 24  | 46  | 35  | 28  | 23  | 31 | 25 | 21 | 28 | 23 | 20 | 25 | 21 | 18 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2821 | 2821 | 2821 |
| 5°  | 2825 | 2782 | 2801 |
| 10° | 2802 | 2745 | 2764 |
| 15° | 2761 | 2701 | 2706 |
| 20° | 2705 | 2638 | 2646 |
| 25° | 2650 | 2564 | 2576 |
| 30° | 2581 | 2494 | 2488 |
| 35° | 2515 | 2413 | 2394 |
| 40° | 2434 | 2330 | 2305 |
| 45° | 2353 | 2247 | 2214 |
| 50° | 2265 | 2160 | 2109 |
| 55° | 2172 | 2060 | 2012 |
| 60° | 2067 | 1940 | 1902 |
| 65° | 1954 | 1817 | 1771 |
| 70° | 1808 | 1667 | 1631 |
| 75° | 1607 | 1487 | 1502 |
| 80° | 1365 | 1257 | 1255 |
| 85° | 987  | 860  | 843  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 2353 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 378.4   | 2.3       |
| 10°-20°   | 1064.6  | 6.5       |
| 20°-30°   | 1564.6  | 9.6       |
| 30°-40°   | 1817.2  | 11.1      |
| 40°-50°   | 1814.9  | 11.1      |
| 50°-60°   | 1582.5  | 9.7       |
| 60°-70°   | 1169.9  | 7.2       |
| 70°-80°   | 661.9   | 4.1       |
| 80°-90°   | 180.9   | 1.1       |
| 90°-100°  | 134.8   | 0.8       |
| 100°-110° | 428.3   | 2.6       |
| 110°-120° | 733.0   | 4.5       |
| 120°-130° | 964.0   | 5.9       |
| 130°-140° | 1082.0  | 6.6       |
| 140°-150° | 1061.0  | 6.5       |
| 150°-160° | 890.1   | 5.5       |
| 160°-170° | 590.3   | 3.6       |
| 170°-180° | 206.3   | 1.3       |
| 0°-30°    | 3007.6  | 18.4      |
| 0°-40°    | 4824.8  | 29.6      |
| 0°-60°    | 8222.2  | 50.4      |
| 0°-90°    | 10234.8 | 62.7      |
| 90°-120°  | 1296.1  | 7.9       |
| 90°-150°  | 4403.1  | 27.0      |
| 90°-180°  | 6090.0  | 37.3      |
| 0°-180°   | 16324.6 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4020 | 4020  | 4020 | 4020  | 4020 |      |
| 5°   | 4020 | 4005  | 3962 | 3993  | 3986 | 382  |
| 15°  | 3827 | 3804  | 3754 | 3769  | 3750 | 1078 |
| 25°  | 3464 | 3433  | 3367 | 3375  | 3367 | 1594 |
| 35°  | 2988 | 2950  | 2888 | 2864  | 2845 | 1866 |
| 45°  | 2432 | 2405  | 2346 | 2304  | 2289 | 1877 |
| 55°  | 1840 | 1817  | 1771 | 1724  | 1705 | 1645 |
| 65°  | 1241 | 1218  | 1179 | 1144  | 1125 | 1227 |
| 75°  | 649  | 642   | 622  | 599   | 607  | 693  |
| 85°  | 158  | 155   | 151  | 139   | 135  | 177  |
| 90°  | 2    | 24    | 64   | 60    | 62   | 16   |
| 95°  | 96   | 114   | 118  | 118   | 114  | 107  |
| 105° | 395  | 401   | 405  | 408   | 408  | 417  |
| 115° | 736  | 746   | 743  | 741   | 736  | 728  |
| 125° | 1070 | 1086  | 1081 | 1075  | 1073 | 956  |
| 135° | 1384 | 1404  | 1408 | 1406  | 1401 | 1070 |
| 145° | 1680 | 1693  | 1704 | 1706  | 1698 | 1050 |
| 155° | 1921 | 1926  | 1932 | 1941  | 1935 | 884  |
| 165° | 2090 | 2088  | 2088 | 2101  | 2092 | 590  |
| 175° | 2174 | 2169  | 2165 | 2178  | 2167 | 207  |
| 180° | 2178 | 2178  | 2178 | 2178  | 2178 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4020.3 | 4020.3 | 4020.3 | 4020.3 | 4020.3 |
| 2.5°   | 4043.6 | 4024.3 | 3981.7 | 4020.3 | 4012.9 |
| 5°     | 4020.3 | 4005.0 | 3962.4 | 3993.1 | 3985.7 |
| 7.5°   | 3993.1 | 3970.1 | 3927.5 | 3958.7 | 3950.9 |
| 10°    | 3950.9 | 3923.8 | 3877.5 | 3908.2 | 3896.8 |
| 12.5°  | 3892.7 | 3869.7 | 3823.3 | 3842.6 | 3834.8 |
| 15°    | 3827.0 | 3804.1 | 3753.6 | 3769.2 | 3749.9 |
| 17.5°  | 3745.9 | 3722.9 | 3672.4 | 3691.7 | 3672.4 |
| 20°    | 3656.8 | 3633.8 | 3579.8 | 3591.2 | 3576.1 |
| 22.5°  | 3568.2 | 3533.4 | 3482.9 | 3482.9 | 3475.2 |
| 25°    | 3463.6 | 3432.9 | 3367.3 | 3374.7 | 3367.3 |
| 27.5°  | 3347.6 | 3320.5 | 3270.5 | 3259.0 | 3239.8 |
| 30°    | 3231.9 | 3200.8 | 3142.9 | 3131.4 | 3115.9 |
| 32.5°  | 3108.0 | 3085.1 | 3023.1 | 2999.8 | 2984.2 |
| 35°    | 2988.3 | 2949.8 | 2887.8 | 2864.5 | 2845.2 |
| 37.5°  | 2852.9 | 2818.1 | 2756.1 | 2729.1 | 2709.8 |
| 40°    | 2714.0 | 2682.8 | 2620.8 | 2586.4 | 2570.8 |
| 42.5°  | 2578.6 | 2547.4 | 2485.9 | 2447.0 | 2424.0 |
| 45°    | 2431.7 | 2404.7 | 2346.4 | 2304.2 | 2288.6 |
| 47.5°  | 2288.6 | 2261.5 | 2199.6 | 2157.0 | 2134.0 |
| 50°    | 2137.7 | 2118.4 | 2064.2 | 2010.1 | 1990.8 |
| 52.5°  | 1990.8 | 1963.8 | 1913.7 | 1871.0 | 1844.0 |
| 55°    | 1840.3 | 1817.0 | 1770.6 | 1724.2 | 1704.9 |
| 57.5°  | 1689.4 | 1670.1 | 1619.6 | 1573.3 | 1557.7 |
| 60°    | 1538.4 | 1523.3 | 1469.1 | 1426.5 | 1415.0 |
| 62.5°  | 1391.6 | 1364.5 | 1326.0 | 1287.5 | 1271.9 |
| 65°    | 1241.1 | 1217.7 | 1179.1 | 1144.3 | 1125.1 |
| 67.5°  | 1086.5 | 1066.8 | 1032.3 | 1005.3 | 989.7  |
| 70°    | 943.3  | 927.7  | 892.9  | 865.8  | 850.7  |
| 72.5°  | 796.5  | 780.9  | 761.6  | 734.6  | 723.1  |
| 75°    | 649.3  | 641.9  | 622.2  | 599.3  | 607.0  |
| 77.5°  | 518.0  | 502.4  | 494.6  | 483.1  | 471.7  |
| 80°    | 386.8  | 382.6  | 374.9  | 363.4  | 355.6  |
| 82.5°  | 262.9  | 262.9  | 259.2  | 243.7  | 243.7  |
| 85°    | 158.3  | 154.6  | 150.9  | 139.1  | 135.3  |
| 87.5°  | 69.7   | 61.9   | 54.2   | 42.6   | 38.6   |
| 90°    | 2.0    | 23.7   | 64.4   | 60.4   | 62.4   |
| 92.5°  | 40.7   | 55.2   | 57.2   | 59.1   | 59.1   |
| 95°    | 95.9   | 114.3  | 117.5  | 117.5  | 114.3  |
| 97.5°  | 159.6  | 176.7  | 183.9  | 183.9  | 183.9  |
| 100°   | 233.2  | 248.2  | 253.5  | 253.5  | 251.5  |
| 102.5° | 310.6  | 321.8  | 329.0  | 331.0  | 329.0  |
| 105°   | 395.4  | 400.6  | 404.6  | 407.9  | 407.9  |
| 107.5° | 479.4  | 487.3  | 487.3  | 488.6  | 479.4  |
| 110°   | 560.9  | 571.4  | 571.4  | 571.4  | 566.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 648.8  | 660.0  | 658.1  | 652.8  | 648.8  |
| 115°   | 735.6  | 746.1  | 742.8  | 740.8  | 735.6  |
| 117.5° | 821.6  | 836.0  | 826.8  | 821.6  | 816.3  |
| 120°   | 908.3  | 922.7  | 908.3  | 908.3  | 902.3  |
| 122.5° | 987.0  | 1005.5 | 996.3  | 991.0  | 987.0  |
| 125°   | 1069.8 | 1086.2 | 1081.0 | 1075.0 | 1073.1 |
| 127.5° | 1150.6 | 1171.0 | 1163.7 | 1155.9 | 1150.6 |
| 130°   | 1226.1 | 1249.7 | 1246.5 | 1242.6 | 1235.4 |
| 132.5° | 1310.9 | 1329.2 | 1330.6 | 1321.4 | 1316.1 |
| 135°   | 1383.7 | 1404.1 | 1408.1 | 1406.1 | 1400.8 |
| 137.5° | 1465.2 | 1481.6 | 1484.9 | 1483.6 | 1475.7 |
| 140°   | 1536.8 | 1553.2 | 1562.4 | 1562.4 | 1555.1 |
| 142.5° | 1610.3 | 1626.8 | 1632.0 | 1634.0 | 1626.8 |
| 145°   | 1680.0 | 1693.1 | 1703.6 | 1705.6 | 1698.3 |
| 147.5° | 1742.3 | 1758.8 | 1766.6 | 1770.0 | 1762.7 |
| 150°   | 1806.7 | 1817.8 | 1825.1 | 1831.0 | 1825.1 |
| 152.5° | 1863.8 | 1875.0 | 1884.2 | 1891.4 | 1884.2 |
| 155°   | 1921.0 | 1926.2 | 1932.2 | 1941.3 | 1935.4 |
| 157.5° | 1970.2 | 1974.2 | 1977.5 | 1990.5 | 1981.4 |
| 160°   | 2014.2 | 2018.2 | 2020.2 | 2031.3 | 2023.4 |
| 162.5° | 2054.9 | 2054.9 | 2056.9 | 2069.4 | 2060.2 |
| 165°   | 2089.7 | 2087.7 | 2087.7 | 2100.9 | 2091.7 |
| 167.5° | 2121.2 | 2115.4 | 2115.4 | 2128.5 | 2119.3 |
| 170°   | 2144.9 | 2139.7 | 2137.7 | 2150.9 | 2139.7 |
| 172.5° | 2161.4 | 2156.1 | 2154.1 | 2167.2 | 2156.1 |
| 175°   | 2174.5 | 2169.2 | 2165.2 | 2178.4 | 2167.2 |
| 177.5° | 2181.7 | 2176.4 | 2172.5 | 2183.7 | 2172.5 |
| 180°   | 2178.4 | 2178.4 | 2178.4 | 2178.4 | 2178.4 |

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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 | 11.98            | 12.97 | 12.82 | 13.83 | 14.91 | 11.54          | 12.53 | 12.38 | 13.39 | 14.47 |
|                 | 3H   | 13.66            | 14.54 | 14.51 | 15.42 | 16.52 | 13.17          | 14.05 | 14.02 | 14.92 | 16.03 |
|                 | 4H   | 14.25            | 15.09 | 15.12 | 15.97 | 17.08 | 13.76          | 14.60 | 14.63 | 15.48 | 16.59 |
|                 | 6H   | 14.66            | 15.44 | 15.54 | 16.32 | 17.45 | 14.16          | 14.94 | 15.04 | 15.82 | 16.95 |
|                 | 8H   | 14.77            | 15.51 | 15.66 | 16.41 | 17.54 | 14.27          | 15.01 | 15.16 | 15.91 | 17.04 |
|                 | 12H  | 14.83            | 15.53 | 15.72 | 16.43 | 17.58 | 14.32          | 15.02 | 15.21 | 15.92 | 17.07 |
| 4H              | 2H   | 12.46            | 13.30 | 13.33 | 14.18 | 15.29 | 12.10          | 12.94 | 12.98 | 13.82 | 14.94 |
|                 | 3H   | 14.34            | 15.04 | 15.23 | 15.95 | 17.08 | 13.93          | 14.63 | 14.82 | 15.54 | 16.67 |
|                 | 4H   | 15.06            | 15.70 | 15.96 | 16.61 | 17.77 | 14.64          | 15.28 | 15.54 | 16.18 | 17.34 |
|                 | 6H   | 15.59            | 16.14 | 16.50 | 17.07 | 18.23 | 15.16          | 15.71 | 16.07 | 16.64 | 17.80 |
|                 | 8H   | 15.75            | 16.26 | 16.66 | 17.19 | 18.36 | 15.31          | 15.82 | 16.22 | 16.75 | 17.92 |
|                 | 12H  | 15.83            | 16.29 | 16.76 | 17.23 | 18.41 | 15.38          | 15.84 | 16.31 | 16.79 | 17.96 |
| 8H              | 4H   | 15.27            | 15.79 | 16.18 | 16.71 | 17.88 | 14.89          | 15.41 | 15.81 | 16.33 | 17.51 |
|                 | 6H   | 15.91            | 16.34 | 16.85 | 17.31 | 18.48 | 15.53          | 15.96 | 16.47 | 16.92 | 18.09 |
|                 | 8H   | 16.14            | 16.51 | 17.09 | 17.47 | 18.66 | 15.74          | 16.12 | 16.70 | 17.08 | 18.27 |
|                 | 12H  | 16.28            | 16.61 | 17.23 | 17.56 | 18.80 | 15.87          | 16.20 | 16.82 | 17.15 | 18.39 |
| 12H             | 4H   | 15.26            | 15.73 | 16.20 | 16.67 | 17.85 | 14.89          | 15.36 | 15.83 | 16.30 | 17.48 |
|                 | 6H   | 15.94            | 16.32 | 16.89 | 17.28 | 18.47 | 15.57          | 15.95 | 16.52 | 16.91 | 18.10 |
|                 | 8H   | 16.19            | 16.53 | 17.15 | 17.48 | 18.72 | 15.81          | 16.15 | 16.77 | 17.10 | 18.34 |