

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: P908389

Luminaire Tested: DFN2DIP-PN2F0-060D030US840-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P908389  
REPORT IS A COMBINATION OF REPORTS P900999 AND P897905  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN2F0-060D030US840-FLLONL  
Description: 2 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

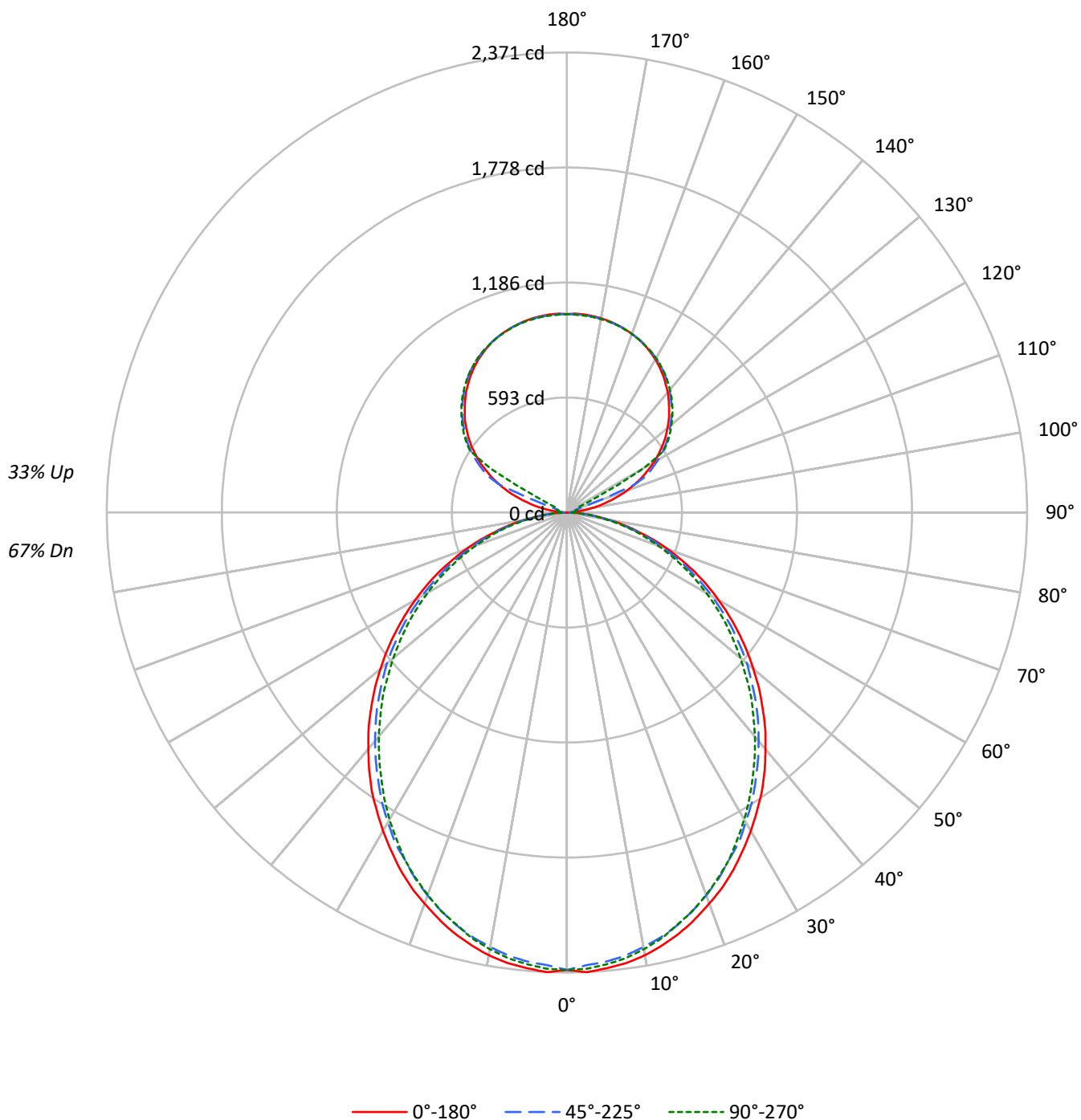
Lumens per Lamp: N/A  
Luminaire Lumens: 8997.9 lumens  
Efficiency: N/A  
Efficacy: 107.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.17' x L: 2.29' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 83.5  
Input Voltage (V): 120  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.946  
Total Harmonic Distortion (THDi): 0.132  
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°  | 5106 | 5106 | 5106 |
| 5°  | 5106 | 5024 | 5061 |
| 10° | 5057 | 4946 | 4985 |
| 15° | 4974 | 4853 | 4871 |
| 20° | 4866 | 4729 | 4754 |
| 25° | 4757 | 4583 | 4620 |
| 30° | 4623 | 4447 | 4452 |
| 35° | 4496 | 4287 | 4274 |
| 40° | 4340 | 4126 | 4104 |
| 45° | 4185 | 3963 | 3930 |
| 50° | 4015 | 3792 | 3729 |
| 55° | 3836 | 3595 | 3543 |
| 60° | 3633 | 3363 | 3329 |
| 65° | 3410 | 3120 | 3077 |
| 70° | 3127 | 2823 | 2805 |
| 75° | 2739 | 2469 | 2543 |
| 80° | 2266 | 2016 | 2063 |
| 85° | 1537 | 1275 | 1293 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 4185 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 221.9  | 2.5       |
| 10°-20°   | 624.4  | 6.9       |
| 20°-30°   | 917.5  | 10.2      |
| 30°-40°   | 1065.7 | 11.8      |
| 40°-50°   | 1064.4 | 11.8      |
| 50°-60°   | 928.1  | 10.3      |
| 60°-70°   | 686.1  | 7.6       |
| 70°-80°   | 388.2  | 4.3       |
| 80°-90°   | 104.2  | 1.2       |
| 90°-100°  | 33.7   | 0.4       |
| 100°-110° | 125.7  | 1.4       |
| 110°-120° | 333.3  | 3.7       |
| 120°-130° | 552.9  | 6.1       |
| 130°-140° | 587.3  | 6.5       |
| 140°-150° | 545.8  | 6.1       |
| 150°-160° | 438.8  | 4.9       |
| 160°-170° | 282.8  | 3.1       |
| 170°-180° | 97.3   | 1.1       |
| 0°-30°    | 1763.8 | 19.6      |
| 0°-40°    | 2829.5 | 31.4      |
| 0°-60°    | 4821.9 | 53.6      |
| 0°-90°    | 6000.4 | 66.7      |
| 90°-120°  | 492.7  | 5.5       |
| 90°-150°  | 2178.7 | 24.2      |
| 90°-180°  | 2998.0 | 33.3      |
| 0°-180°   | 8997.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2358 | 2358  | 2358 | 2358  | 2358 |      |
| 5°   | 2358 | 2349  | 2324 | 2342  | 2337 | 224  |
| 15°  | 2244 | 2231  | 2201 | 2210  | 2199 | 632  |
| 25°  | 2031 | 2013  | 1975 | 1979  | 1975 | 935  |
| 35°  | 1752 | 1730  | 1694 | 1680  | 1668 | 1094 |
| 45°  | 1426 | 1410  | 1376 | 1351  | 1342 | 1101 |
| 55°  | 1079 | 1066  | 1038 | 1011  | 1000 | 965  |
| 65°  | 728  | 714   | 692  | 671   | 660  | 720  |
| 75°  | 381  | 376   | 365  | 351   | 356  | 406  |
| 85°  | 93   | 91    | 88   | 82    | 79   | 104  |
| 90°  | 1    | 9     | 15   | 19    | 20   | 8    |
| 95°  | 48   | 24    | 29   | 33    | 32   | 57   |
| 105° | 225  | 247   | 45   | 53    | 56   | 240  |
| 115° | 425  | 438   | 456  | 114   | 61   | 419  |
| 125° | 602  | 611   | 625  | 630   | 633  | 536  |
| 135° | 744  | 756   | 763  | 770   | 769  | 575  |
| 145° | 863  | 863   | 875  | 880   | 877  | 540  |
| 155° | 951  | 944   | 953  | 957   | 952  | 438  |
| 165° | 1002 | 997   | 1000 | 1005  | 1000 | 283  |
| 175° | 1025 | 1020  | 1021 | 1026  | 1019 | 98   |
| 180° | 1022 | 1022  | 1022 | 1022  | 1022 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2357.6 | 2357.6 | 2357.6 | 2357.6 | 2357.6 |
| 2.5°   | 2371.4 | 2360.1 | 2335.0 | 2357.6 | 2353.3 |
| 5°     | 2357.6 | 2348.7 | 2323.7 | 2341.8 | 2337.4 |
| 7.5°   | 2341.8 | 2328.3 | 2303.3 | 2321.6 | 2317.0 |
| 10°    | 2317.0 | 2301.2 | 2273.9 | 2292.0 | 2285.2 |
| 12.5°  | 2282.9 | 2269.4 | 2242.2 | 2253.5 | 2249.0 |
| 15°    | 2244.3 | 2230.9 | 2201.3 | 2210.5 | 2199.2 |
| 17.5°  | 2196.8 | 2183.3 | 2153.7 | 2164.9 | 2153.7 |
| 20°    | 2144.6 | 2131.1 | 2099.3 | 2106.1 | 2097.2 |
| 22.5°  | 2092.6 | 2072.1 | 2042.6 | 2042.6 | 2038.0 |
| 25°    | 2031.2 | 2013.3 | 1974.7 | 1979.0 | 1974.7 |
| 27.5°  | 1963.2 | 1947.3 | 1917.9 | 1911.3 | 1900.0 |
| 30°    | 1895.4 | 1877.0 | 1843.2 | 1836.4 | 1827.3 |
| 32.5°  | 1822.7 | 1809.3 | 1772.9 | 1759.2 | 1750.1 |
| 35°    | 1752.5 | 1729.9 | 1693.5 | 1679.8 | 1668.5 |
| 37.5°  | 1673.1 | 1652.6 | 1616.4 | 1600.4 | 1589.1 |
| 40°    | 1591.5 | 1573.3 | 1537.0 | 1516.8 | 1507.6 |
| 42.5°  | 1512.2 | 1493.9 | 1457.8 | 1435.0 | 1421.5 |
| 45°    | 1426.1 | 1410.2 | 1376.0 | 1351.3 | 1342.1 |
| 47.5°  | 1342.1 | 1326.3 | 1290.0 | 1265.0 | 1251.4 |
| 50°    | 1253.6 | 1242.3 | 1210.6 | 1178.8 | 1167.5 |
| 52.5°  | 1167.5 | 1151.7 | 1122.3 | 1097.3 | 1081.5 |
| 55°    | 1079.2 | 1065.5 | 1038.3 | 1011.2 | 999.9  |
| 57.5°  | 990.8  | 979.5  | 949.9  | 922.7  | 913.5  |
| 60°    | 902.2  | 893.3  | 861.6  | 836.6  | 829.8  |
| 62.5°  | 816.1  | 800.2  | 777.6  | 755.0  | 745.9  |
| 65°    | 727.8  | 714.2  | 691.6  | 671.1  | 659.7  |
| 67.5°  | 637.1  | 625.6  | 605.4  | 589.6  | 580.4  |
| 70°    | 553.2  | 544.1  | 523.6  | 507.8  | 498.9  |
| 72.5°  | 467.1  | 458.0  | 446.7  | 430.8  | 424.0  |
| 75°    | 380.7  | 376.5  | 364.9  | 351.4  | 356.0  |
| 77.5°  | 303.8  | 294.7  | 290.0  | 283.4  | 276.6  |
| 80°    | 226.8  | 224.4  | 219.8  | 213.1  | 208.5  |
| 82.5°  | 154.2  | 154.2  | 152.0  | 142.9  | 142.9  |
| 85°    | 92.8   | 90.7   | 88.5   | 81.5   | 79.4   |
| 87.5°  | 40.9   | 36.4   | 31.7   | 25.0   | 22.6   |
| 90°    | 0.7    | 8.9    | 14.7   | 18.6   | 19.9   |
| 92.5°  | 18.6   | 15.6   | 17.8   | 19.3   | 19.9   |
| 95°    | 48.1   | 23.6   | 28.8   | 32.6   | 31.8   |
| 97.5°  | 86.5   | 26.0   | 37.7   | 40.0   | 40.7   |
| 100°   | 131.0  | 29.6   | 42.2   | 48.1   | 49.6   |
| 102.5° | 179.8  | 178.3  | 43.6   | 51.7   | 54.0   |
| 105°   | 224.9  | 247.1  | 45.1   | 53.2   | 56.2   |
| 107.5° | 277.4  | 295.9  | 46.7   | 54.7   | 57.8   |
| 110°   | 327.8  | 343.3  | 129.5  | 55.5   | 58.5   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 375.2  | 388.4  | 375.9  | 57.0   | 59.2   |
| 115°   | 425.4  | 438.0  | 456.5  | 113.9  | 60.7   |
| 117.5° | 469.1  | 483.8  | 496.4  | 390.6  | 196.8  |
| 120°   | 517.9  | 529.0  | 542.3  | 551.2  | 451.3  |
| 122.5° | 559.3  | 571.2  | 586.0  | 590.4  | 591.2  |
| 125°   | 601.5  | 611.1  | 625.2  | 630.4  | 632.6  |
| 127.5° | 640.0  | 650.3  | 661.5  | 668.8  | 669.5  |
| 130°   | 676.2  | 688.1  | 696.2  | 704.3  | 703.7  |
| 132.5° | 713.2  | 722.9  | 730.9  | 737.6  | 736.9  |
| 135°   | 744.3  | 756.2  | 762.8  | 770.2  | 768.7  |
| 137.5° | 776.8  | 785.7  | 793.1  | 800.5  | 798.3  |
| 140°   | 808.6  | 814.6  | 822.6  | 829.3  | 825.7  |
| 142.5° | 835.4  | 840.5  | 850.1  | 856.0  | 852.3  |
| 145°   | 863.4  | 862.6  | 875.3  | 880.4  | 876.7  |
| 147.5° | 887.8  | 885.6  | 898.2  | 901.8  | 898.9  |
| 150°   | 911.5  | 906.4  | 918.2  | 922.5  | 918.9  |
| 152.5° | 931.4  | 925.5  | 936.7  | 941.1  | 935.9  |
| 155°   | 950.7  | 944.1  | 952.9  | 957.4  | 951.5  |
| 157.5° | 966.2  | 960.4  | 967.0  | 972.2  | 966.2  |
| 160°   | 979.6  | 975.1  | 979.6  | 984.0  | 978.8  |
| 162.5° | 991.4  | 986.9  | 990.7  | 995.8  | 989.2  |
| 165°   | 1001.7 | 997.3  | 999.6  | 1004.7 | 999.6  |
| 167.5° | 1009.9 | 1005.4 | 1007.6 | 1012.9 | 1006.2 |
| 170°   | 1016.5 | 1012.1 | 1013.6 | 1018.8 | 1012.1 |
| 172.5° | 1021.0 | 1016.5 | 1018.0 | 1023.2 | 1016.5 |
| 175°   | 1024.6 | 1019.5 | 1021.0 | 1026.1 | 1018.8 |
| 177.5° | 1026.1 | 1021.0 | 1021.8 | 1026.9 | 1020.3 |
| 180°   | 1022.5 | 1022.5 | 1022.5 | 1022.5 | 1022.5 |

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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 | 14.23            | 15.27 | 15.03 | 16.09 | 17.10 | 13.80          | 14.83 | 14.60 | 15.65 | 16.66 |
|                 | 3H   | 15.89            | 16.82 | 16.70 | 17.65 | 18.69 | 15.41          | 16.34 | 16.22 | 17.17 | 18.21 |
|                 | 4H   | 16.47            | 17.35 | 17.30 | 18.18 | 19.24 | 15.99          | 16.86 | 16.82 | 17.70 | 18.75 |
|                 | 6H   | 16.86            | 17.67 | 17.70 | 18.52 | 19.58 | 16.37          | 17.18 | 17.22 | 18.03 | 19.10 |
|                 | 8H   | 16.96            | 17.73 | 17.81 | 18.60 | 19.66 | 16.48          | 17.25 | 17.33 | 18.11 | 19.18 |
|                 | 12H  | 17.01            | 17.74 | 17.87 | 18.60 | 19.70 | 16.52          | 17.25 | 17.37 | 18.11 | 19.20 |
| 4H              | 2H   | 14.71            | 15.58 | 15.54 | 16.42 | 17.47 | 14.36          | 15.23 | 15.19 | 16.07 | 17.12 |
|                 | 3H   | 16.56            | 17.30 | 17.41 | 18.17 | 19.23 | 16.16          | 16.90 | 17.01 | 17.77 | 18.83 |
|                 | 4H   | 17.27            | 17.94 | 18.13 | 18.81 | 19.90 | 16.85          | 17.52 | 17.71 | 18.39 | 19.48 |
|                 | 6H   | 17.77            | 18.35 | 18.65 | 19.24 | 20.34 | 17.35          | 17.93 | 18.23 | 18.83 | 19.92 |
|                 | 8H   | 17.92            | 18.46 | 18.79 | 19.35 | 20.46 | 17.49          | 18.03 | 18.37 | 18.92 | 20.03 |
|                 | 12H  | 17.99            | 18.48 | 18.89 | 19.38 | 20.50 | 17.56          | 18.04 | 18.45 | 18.95 | 20.07 |
| 8H              | 4H   | 17.47            | 18.01 | 18.34 | 18.90 | 20.01 | 17.10          | 17.64 | 17.98 | 18.53 | 19.64 |
|                 | 6H   | 18.08            | 18.53 | 18.99 | 19.46 | 20.57 | 17.71          | 18.15 | 18.61 | 19.09 | 20.20 |
|                 | 8H   | 18.29            | 18.69 | 19.21 | 19.61 | 20.74 | 17.91          | 18.31 | 18.82 | 19.23 | 20.36 |
|                 | 12H  | 18.42            | 18.77 | 19.33 | 19.68 | 20.86 | 18.02          | 18.37 | 18.94 | 19.28 | 20.46 |
| 12H             | 4H   | 17.46            | 17.94 | 18.36 | 18.85 | 19.97 | 17.10          | 17.58 | 18.00 | 18.49 | 19.61 |
|                 | 6H   | 18.11            | 18.50 | 19.02 | 19.43 | 20.56 | 17.75          | 18.14 | 18.66 | 19.07 | 20.19 |
|                 | 8H   | 18.34            | 18.69 | 19.26 | 19.61 | 20.79 | 17.97          | 18.32 | 18.89 | 19.24 | 20.42 |

END OF REPORT