

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: P925389

Luminaire Tested: DFN2DIP-SQ2F0-070D030US950-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P925389  
REPORT IS A COMBINATION OF REPORTS P901299 AND P898215  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ2F0-070D030US950-FLLONL  
Description: 2 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

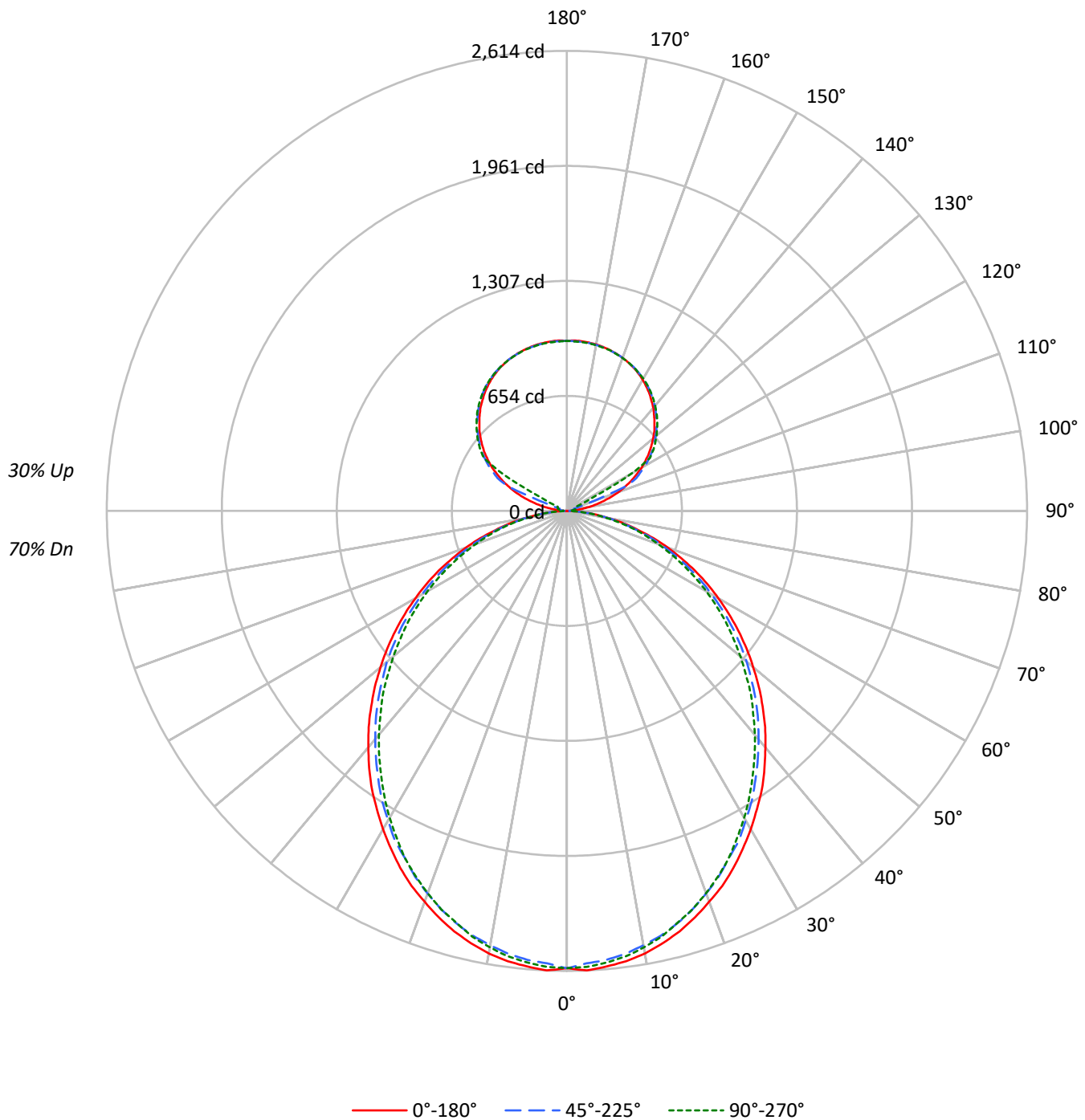
Lumens per Lamp: N/A  
Luminaire Lumens: 9444.7 lumens  
Efficiency: N/A  
Efficacy: 104.4 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.21' x L: 2.21' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 90.5  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9977  
Total Harmonic Distortion (THDi): 0.049  
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   | 112 | 112 | 112 | 112 | 106 | 106 | 106 | 106 | 94 | 94 | 94 | 84 | 84 | 84 | 75 | 75 | 75 |
| 1   | 102 | 98  | 94  | 90  | 97  | 93  | 89  | 86  | 83 | 80 | 78 | 74 | 72 | 70 | 66 | 64 | 63 |
| 2   | 93  | 85  | 79  | 74  | 88  | 81  | 75  | 71  | 73 | 68 | 64 | 65 | 62 | 59 | 58 | 55 | 53 |
| 3   | 85  | 75  | 68  | 62  | 80  | 71  | 65  | 59  | 64 | 59 | 54 | 58 | 53 | 50 | 51 | 48 | 45 |
| 4   | 78  | 67  | 58  | 52  | 73  | 63  | 56  | 50  | 57 | 51 | 46 | 51 | 47 | 43 | 46 | 42 | 39 |
| 5   | 72  | 60  | 51  | 45  | 67  | 57  | 49  | 43  | 51 | 45 | 40 | 46 | 41 | 37 | 41 | 37 | 34 |
| 6   | 66  | 54  | 45  | 39  | 62  | 51  | 43  | 38  | 46 | 40 | 35 | 42 | 37 | 33 | 38 | 33 | 30 |
| 7   | 61  | 48  | 40  | 34  | 58  | 46  | 39  | 33  | 42 | 36 | 31 | 38 | 33 | 29 | 34 | 30 | 27 |
| 8   | 57  | 44  | 36  | 31  | 54  | 42  | 35  | 30  | 38 | 32 | 28 | 35 | 30 | 26 | 32 | 27 | 24 |
| 9   | 53  | 40  | 33  | 27  | 50  | 39  | 32  | 27  | 35 | 29 | 25 | 32 | 27 | 23 | 29 | 25 | 22 |
| 10  | 50  | 37  | 30  | 25  | 47  | 36  | 29  | 24  | 33 | 27 | 23 | 30 | 25 | 21 | 27 | 23 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 5714 | 5714 | 5714 |
| 5°  | 5713 | 5622 | 5664 |
| 10° | 5657 | 5534 | 5579 |
| 15° | 5564 | 5430 | 5451 |
| 20° | 5441 | 5291 | 5321 |
| 25° | 5320 | 5128 | 5172 |
| 30° | 5169 | 4974 | 4983 |
| 35° | 5026 | 4796 | 4785 |
| 40° | 4851 | 4615 | 4595 |
| 45° | 4676 | 4433 | 4401 |
| 50° | 4485 | 4241 | 4177 |
| 55° | 4283 | 4020 | 3969 |
| 60° | 4056 | 3760 | 3730 |
| 65° | 3805 | 3488 | 3449 |
| 70° | 3487 | 3156 | 3144 |
| 75° | 3051 | 2758 | 2853 |
| 80° | 2519 | 2252 | 2316 |
| 85° | 1703 | 1423 | 1456 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 4676 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 244.6  | 2.6       |
| 10°-20°   | 688.1  | 7.3       |
| 20°-30°   | 1011.3 | 10.7      |
| 30°-40°   | 1174.5 | 12.4      |
| 40°-50°   | 1173.1 | 12.4      |
| 50°-60°   | 1022.9 | 10.8      |
| 60°-70°   | 756.1  | 8.0       |
| 70°-80°   | 427.8  | 4.5       |
| 80°-90°   | 114.6  | 1.2       |
| 90°-100°  | 31.9   | 0.3       |
| 100°-110° | 118.7  | 1.3       |
| 110°-120° | 314.9  | 3.3       |
| 120°-130° | 522.3  | 5.5       |
| 130°-140° | 554.8  | 5.9       |
| 140°-150° | 515.6  | 5.5       |
| 150°-160° | 414.5  | 4.4       |
| 160°-170° | 267.1  | 2.8       |
| 170°-180° | 91.9   | 1.0       |
| 0°-30°    | 1943.9 | 20.6      |
| 0°-40°    | 3118.5 | 33.0      |
| 0°-60°    | 5314.4 | 56.3      |
| 0°-90°    | 6613.0 | 70.0      |
| 90°-120°  | 465.5  | 4.9       |
| 90°-150°  | 2058.1 | 21.8      |
| 90°-180°  | 2832.0 | 30.0      |
| 0°-180°   | 9444.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2598 | 2598  | 2598 | 2598  | 2598 |      |
| 5°   | 2598 | 2589  | 2561 | 2581  | 2576 | 247  |
| 15°  | 2474 | 2459  | 2426 | 2436  | 2424 | 697  |
| 25°  | 2239 | 2219  | 2176 | 2181  | 2176 | 1030 |
| 35°  | 1932 | 1907  | 1866 | 1851  | 1839 | 1206 |
| 45°  | 1572 | 1554  | 1517 | 1489  | 1479 | 1213 |
| 55°  | 1189 | 1174  | 1144 | 1114  | 1102 | 1063 |
| 65°  | 802  | 787   | 762  | 740   | 727  | 793  |
| 75°  | 420  | 415   | 402  | 387   | 392  | 448  |
| 85°  | 102  | 100   | 98   | 90    | 88   | 114  |
| 90°  | 1    | 8     | 14   | 18    | 19   | 9    |
| 95°  | 45   | 22    | 27   | 31    | 30   | 54   |
| 105° | 212  | 233   | 43   | 50    | 53   | 227  |
| 115° | 402  | 414   | 431  | 108   | 57   | 396  |
| 125° | 568  | 577   | 591  | 596   | 598  | 507  |
| 135° | 703  | 714   | 721  | 728   | 726  | 543  |
| 145° | 816  | 815   | 827  | 832   | 828  | 510  |
| 155° | 898  | 892   | 900  | 904   | 899  | 414  |
| 165° | 946  | 942   | 944  | 949   | 944  | 267  |
| 175° | 968  | 963   | 964  | 969   | 962  | 92   |
| 180° | 966  | 966   | 966  | 966   | 966  |      |

TEST NUMBER: P925389

CATALOG NUMBER: DFN2DIP-SQ2F0-070D030US950-FLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2598.4 | 2598.4 | 2598.4 | 2598.4 | 2598.4 |
| 2.5°   | 2613.6 | 2601.1 | 2573.5 | 2598.4 | 2593.6 |
| 5°     | 2598.4 | 2588.7 | 2561.1 | 2581.0 | 2576.2 |
| 7.5°   | 2581.0 | 2566.1 | 2538.5 | 2558.7 | 2553.7 |
| 10°    | 2553.7 | 2536.1 | 2506.2 | 2526.1 | 2518.7 |
| 12.5°  | 2516.0 | 2501.2 | 2471.2 | 2483.6 | 2478.6 |
| 15°    | 2473.6 | 2458.7 | 2426.1 | 2436.2 | 2423.7 |
| 17.5°  | 2421.1 | 2406.3 | 2373.6 | 2386.1 | 2373.6 |
| 20°    | 2363.5 | 2348.7 | 2313.7 | 2321.2 | 2311.4 |
| 22.5°  | 2306.3 | 2283.8 | 2251.2 | 2251.2 | 2246.1 |
| 25°    | 2238.8 | 2218.8 | 2176.5 | 2181.2 | 2176.5 |
| 27.5°  | 2163.7 | 2146.2 | 2113.9 | 2106.4 | 2093.9 |
| 30°    | 2089.0 | 2068.7 | 2031.4 | 2024.0 | 2013.9 |
| 32.5°  | 2008.8 | 1994.1 | 1954.0 | 1938.9 | 1928.8 |
| 35°    | 1931.5 | 1906.6 | 1866.5 | 1851.4 | 1838.9 |
| 37.5°  | 1844.0 | 1821.5 | 1781.4 | 1763.9 | 1751.4 |
| 40°    | 1754.1 | 1734.0 | 1693.9 | 1671.7 | 1661.6 |
| 42.5°  | 1666.6 | 1646.5 | 1606.7 | 1581.5 | 1566.7 |
| 45°    | 1571.7 | 1554.3 | 1516.6 | 1489.3 | 1479.2 |
| 47.5°  | 1479.2 | 1461.7 | 1421.7 | 1394.1 | 1379.3 |
| 50°    | 1381.7 | 1369.2 | 1334.2 | 1299.3 | 1286.8 |
| 52.5°  | 1286.8 | 1269.3 | 1237.0 | 1209.4 | 1191.8 |
| 55°    | 1189.4 | 1174.4 | 1144.4 | 1114.5 | 1102.0 |
| 57.5°  | 1091.9 | 1079.5 | 1046.8 | 1016.9 | 1006.9 |
| 60°    | 994.4  | 984.5  | 949.6  | 922.0  | 914.6  |
| 62.5°  | 899.4  | 882.0  | 857.1  | 832.2  | 822.1  |
| 65°    | 802.2  | 787.0  | 762.2  | 739.6  | 727.1  |
| 67.5°  | 702.2  | 689.6  | 667.2  | 649.8  | 639.7  |
| 70°    | 609.7  | 599.7  | 577.1  | 559.6  | 549.8  |
| 72.5°  | 514.8  | 504.8  | 492.3  | 474.8  | 467.4  |
| 75°    | 419.7  | 414.9  | 402.1  | 387.3  | 392.4  |
| 77.5°  | 334.9  | 324.7  | 319.7  | 312.2  | 304.9  |
| 80°    | 249.9  | 247.4  | 242.3  | 234.9  | 229.8  |
| 82.5°  | 169.9  | 169.9  | 167.5  | 157.5  | 157.5  |
| 85°    | 102.4  | 100.0  | 97.6   | 89.9   | 87.5   |
| 87.5°  | 45.0   | 40.1   | 35.0   | 27.6   | 24.9   |
| 90°    | 0.7    | 8.4    | 13.9   | 17.6   | 18.8   |
| 92.5°  | 17.6   | 14.7   | 16.8   | 18.2   | 18.8   |
| 95°    | 45.4   | 22.3   | 27.2   | 30.8   | 30.1   |
| 97.5°  | 81.8   | 24.5   | 35.6   | 37.8   | 38.4   |
| 100°   | 123.7  | 28.0   | 39.9   | 45.4   | 46.8   |
| 102.5° | 169.8  | 168.5  | 41.2   | 48.8   | 51.0   |
| 105°   | 212.5  | 233.4  | 42.6   | 50.3   | 53.1   |
| 107.5° | 262.1  | 279.5  | 44.1   | 51.7   | 54.6   |
| 110°   | 309.7  | 324.3  | 122.3  | 52.5   | 55.2   |

TEST NUMBER: P925389

CATALOG NUMBER: DFN2DIP-SQ2F0-070D030US950-FLLONL

**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 354.4 | 366.9 | 355.1 | 53.8  | 55.9  |
| 115°   | 401.8 | 413.7 | 431.2 | 107.6 | 57.3  |
| 117.5° | 443.1 | 457.1 | 469.0 | 369.0 | 185.9 |
| 120°   | 489.2 | 499.7 | 512.3 | 520.7 | 426.3 |
| 122.5° | 528.3 | 539.6 | 553.6 | 557.7 | 558.5 |
| 125°   | 568.2 | 577.3 | 590.6 | 595.5 | 597.6 |
| 127.5° | 604.5 | 614.3 | 624.9 | 631.8 | 632.5 |
| 130°   | 638.8 | 650.1 | 657.7 | 665.3 | 664.7 |
| 132.5° | 673.7 | 682.9 | 690.5 | 696.8 | 696.1 |
| 135°   | 703.1 | 714.4 | 720.6 | 727.6 | 726.2 |
| 137.5° | 733.8 | 742.2 | 749.3 | 756.2 | 754.1 |
| 140°   | 763.9 | 769.5 | 777.1 | 783.4 | 780.0 |
| 142.5° | 789.1 | 794.0 | 803.1 | 808.6 | 805.2 |
| 145°   | 815.7 | 814.9 | 826.8 | 831.7 | 828.2 |
| 147.5° | 838.7 | 836.6 | 848.5 | 851.9 | 849.2 |
| 150°   | 861.1 | 856.2 | 867.4 | 871.5 | 868.0 |
| 152.5° | 879.9 | 874.3 | 884.8 | 889.0 | 884.2 |
| 155°   | 898.1 | 891.9 | 900.2 | 904.4 | 898.9 |
| 157.5° | 912.8 | 907.3 | 913.6 | 918.4 | 912.8 |
| 160°   | 925.4 | 921.2 | 925.4 | 929.6 | 924.6 |
| 162.5° | 936.5 | 932.3 | 935.9 | 940.7 | 934.4 |
| 165°   | 946.3 | 942.2 | 944.3 | 949.1 | 944.3 |
| 167.5° | 954.0 | 949.8 | 951.9 | 956.9 | 950.6 |
| 170°   | 960.3 | 956.1 | 957.5 | 962.4 | 956.1 |
| 172.5° | 964.5 | 960.3 | 961.7 | 966.6 | 960.3 |
| 175°   | 967.9 | 963.1 | 964.5 | 969.4 | 962.4 |
| 177.5° | 969.4 | 964.5 | 965.3 | 970.1 | 963.8 |
| 180°   | 965.9 | 965.9 | 965.9 | 965.9 | 965.9 |

TEST NUMBER: P925389

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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 | 14.88            | 15.96 | 15.65 | 16.74 | 17.70 | 14.44          | 15.51 | 15.20 | 16.30 | 17.25 |
|                 | 3H   | 16.54            | 17.51 | 17.32 | 18.30 | 19.29 | 16.05          | 17.02 | 16.83 | 17.81 | 18.80 |
|                 | 4H   | 17.12            | 18.04 | 17.92 | 18.84 | 19.84 | 16.63          | 17.54 | 17.43 | 18.35 | 19.34 |
|                 | 6H   | 17.52            | 18.36 | 18.33 | 19.17 | 20.18 | 17.02          | 17.86 | 17.83 | 18.67 | 19.68 |
|                 | 8H   | 17.62            | 18.43 | 18.44 | 19.26 | 20.27 | 17.12          | 17.92 | 17.94 | 18.76 | 19.77 |
|                 | 12H  | 17.67            | 18.44 | 18.49 | 19.26 | 20.30 | 17.16          | 17.93 | 17.99 | 18.75 | 19.79 |
| 4H              | 2H   | 15.36            | 16.27 | 16.16 | 17.08 | 18.07 | 15.00          | 15.92 | 15.80 | 16.72 | 17.71 |
|                 | 3H   | 17.22            | 17.98 | 18.03 | 18.82 | 19.83 | 16.81          | 17.57 | 17.62 | 18.41 | 19.42 |
|                 | 4H   | 17.93            | 18.62 | 18.75 | 19.46 | 20.50 | 17.50          | 18.20 | 18.33 | 19.03 | 20.07 |
|                 | 6H   | 18.44            | 19.04 | 19.28 | 19.90 | 20.94 | 18.00          | 18.60 | 18.85 | 19.47 | 20.51 |
|                 | 8H   | 18.58            | 19.14 | 19.43 | 20.00 | 21.06 | 18.14          | 18.71 | 18.99 | 19.56 | 20.62 |
|                 | 12H  | 18.66            | 19.16 | 19.52 | 20.04 | 21.10 | 18.21          | 18.71 | 19.07 | 19.59 | 20.65 |
| 8H              | 4H   | 18.13            | 18.69 | 18.98 | 19.55 | 20.61 | 17.75          | 18.31 | 18.60 | 19.17 | 20.23 |
|                 | 6H   | 18.75            | 19.21 | 19.62 | 20.11 | 21.17 | 18.36          | 18.83 | 19.23 | 19.73 | 20.78 |
|                 | 8H   | 18.96            | 19.37 | 19.84 | 20.26 | 21.34 | 18.56          | 18.98 | 19.45 | 19.87 | 20.94 |
|                 | 12H  | 19.08            | 19.45 | 19.97 | 20.33 | 21.46 | 18.67          | 19.04 | 19.56 | 19.92 | 21.05 |
| 12H             | 4H   | 18.12            | 18.63 | 18.99 | 19.51 | 20.57 | 17.75          | 18.26 | 18.62 | 19.14 | 20.20 |
|                 | 6H   | 18.77            | 19.19 | 19.66 | 20.08 | 21.15 | 18.40          | 18.81 | 19.28 | 19.71 | 20.78 |
|                 | 8H   | 19.01            | 19.37 | 19.90 | 20.26 | 21.39 | 18.63          | 18.99 | 19.52 | 19.88 | 21.01 |

END OF REPORT