

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: P920368

Luminaire Tested: DFN2DIP-SQ4F0-070D140US935-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P920368  
REPORT IS A COMBINATION OF REPORTS P900187 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-070D140US935-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

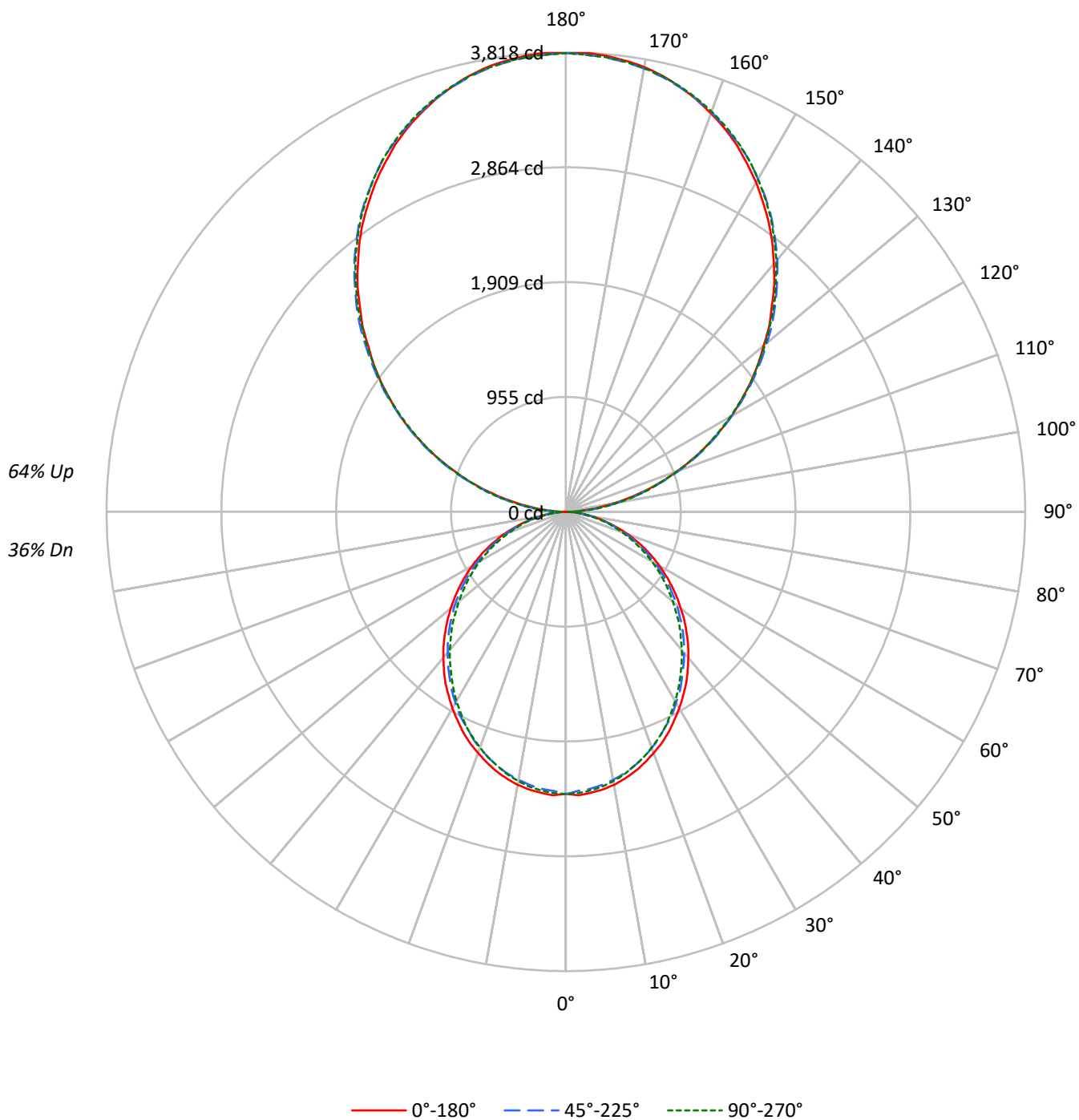
Lumens per Lamp: N/A  
Luminaire Lumens: 16634.5 lumens  
Efficiency: N/A  
Efficacy: 99.5 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 167.1  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9967  
Total Harmonic Distortion (THDi): 0.063  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

TEST NUMBER: P920368

CATALOG NUMBER: DFN2DIP-SQ4F0-070D140US935-FLLFLL

### Luminous Intensity Polar Plot



TEST NUMBER: P920368

CATALOG NUMBER: DFN2DIP-SQ4F0-070D140US935-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   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 76 | 76 | 76 | 59 | 59 | 59 | 43 | 43 | 43 |
| 1   | 95  | 90  | 87  | 83  | 85 | 82 | 79 | 76 | 66 | 64 | 62 | 52 | 50 | 49 | 38 | 37 | 36 |
| 2   | 86  | 79  | 73  | 68  | 78 | 72 | 66 | 62 | 58 | 54 | 51 | 45 | 43 | 41 | 34 | 32 | 31 |
| 3   | 79  | 69  | 62  | 56  | 71 | 63 | 57 | 52 | 51 | 47 | 43 | 40 | 37 | 34 | 30 | 28 | 26 |
| 4   | 72  | 61  | 54  | 48  | 65 | 56 | 49 | 44 | 45 | 40 | 37 | 36 | 32 | 29 | 27 | 24 | 22 |
| 5   | 66  | 54  | 47  | 41  | 59 | 50 | 43 | 38 | 40 | 35 | 31 | 32 | 28 | 25 | 24 | 22 | 20 |
| 6   | 61  | 49  | 41  | 35  | 55 | 45 | 38 | 33 | 36 | 31 | 27 | 29 | 25 | 22 | 22 | 19 | 17 |
| 7   | 56  | 44  | 36  | 31  | 50 | 40 | 33 | 28 | 33 | 28 | 24 | 26 | 22 | 20 | 20 | 17 | 15 |
| 8   | 52  | 40  | 32  | 27  | 47 | 36 | 30 | 25 | 30 | 25 | 21 | 24 | 20 | 17 | 18 | 16 | 14 |
| 9   | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 22 | 27 | 22 | 19 | 22 | 18 | 16 | 17 | 14 | 12 |
| 10  | 45  | 33  | 26  | 21  | 41 | 30 | 24 | 20 | 25 | 20 | 17 | 20 | 17 | 14 | 16 | 13 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1646 | 1646 | 1646 |
| 5°  | 1648 | 1623 | 1634 |
| 10° | 1635 | 1601 | 1612 |
| 15° | 1611 | 1575 | 1578 |
| 20° | 1578 | 1539 | 1543 |
| 25° | 1546 | 1496 | 1503 |
| 30° | 1505 | 1455 | 1451 |
| 35° | 1467 | 1407 | 1397 |
| 40° | 1420 | 1359 | 1345 |
| 45° | 1373 | 1311 | 1292 |
| 50° | 1321 | 1260 | 1230 |
| 55° | 1267 | 1202 | 1174 |
| 60° | 1206 | 1132 | 1109 |
| 65° | 1140 | 1060 | 1033 |
| 70° | 1055 | 972  | 951  |
| 75° | 938  | 867  | 876  |
| 80° | 796  | 734  | 732  |
| 85° | 576  | 502  | 492  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 3001 cd/sqm

TEST NUMBER: P920368

CATALOG NUMBER: DFN2DIP-SQ4F0-070D140US935-FLLFLL

**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 220.7   | 1.3       |
| 10°-20°   | 621.0   | 3.7       |
| 20°-30°   | 912.7   | 5.5       |
| 30°-40°   | 1060.0  | 6.4       |
| 40°-50°   | 1058.7  | 6.4       |
| 50°-60°   | 923.2   | 5.5       |
| 60°-70°   | 682.4   | 4.1       |
| 70°-80°   | 386.1   | 2.3       |
| 80°-90°   | 112.7   | 0.7       |
| 90°-100°  | 235.9   | 1.4       |
| 100°-110° | 749.5   | 4.5       |
| 110°-120° | 1282.7  | 7.7       |
| 120°-130° | 1686.9  | 10.1      |
| 130°-140° | 1893.5  | 11.4      |
| 140°-150° | 1856.8  | 11.2      |
| 150°-160° | 1557.6  | 9.4       |
| 160°-170° | 1033.0  | 6.2       |
| 170°-180° | 361.0   | 2.2       |
| 0°-30°    | 1754.4  | 10.5      |
| 0°-40°    | 2814.4  | 16.9      |
| 0°-60°    | 4796.3  | 28.8      |
| 0°-90°    | 5977.6  | 35.9      |
| 90°-120°  | 2268.1  | 13.6      |
| 90°-150°  | 7705.3  | 46.3      |
| 90°-180°  | 10657.0 | 64.1      |
| 0°-180°   | 16634.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2345 | 2345  | 2345 | 2345  | 2345 |      |
| 5°   | 2345 | 2336  | 2311 | 2329  | 2325 | 223  |
| 15°  | 2232 | 2219  | 2190 | 2199  | 2188 | 629  |
| 25°  | 2020 | 2002  | 1964 | 1969  | 1964 | 930  |
| 35°  | 1743 | 1721  | 1684 | 1671  | 1660 | 1089 |
| 45°  | 1418 | 1403  | 1369 | 1344  | 1335 | 1095 |
| 55°  | 1074 | 1060  | 1033 | 1006  | 994  | 960  |
| 65°  | 724  | 710   | 688  | 668   | 656  | 716  |
| 75°  | 379  | 374   | 363  | 350   | 354  | 404  |
| 85°  | 92   | 90    | 88   | 81    | 79   | 103  |
| 90°  | 3    | 41    | 113  | 106   | 109  | 16   |
| 95°  | 168  | 200   | 206  | 206   | 200  | 187  |
| 105° | 692  | 701   | 708  | 714   | 714  | 730  |
| 115° | 1287 | 1306  | 1300 | 1296  | 1287 | 1273 |
| 125° | 1872 | 1901  | 1892 | 1881  | 1878 | 1673 |
| 135° | 2422 | 2457  | 2464 | 2461  | 2451 | 1872 |
| 145° | 2940 | 2963  | 2981 | 2985  | 2972 | 1837 |
| 155° | 3362 | 3371  | 3381 | 3397  | 3387 | 1547 |
| 165° | 3657 | 3654  | 3654 | 3677  | 3660 | 1032 |
| 175° | 3805 | 3796  | 3789 | 3812  | 3793 | 362  |
| 180° | 3812 | 3812  | 3812 | 3812  | 3812 |      |

TEST NUMBER: P920368

CATALOG NUMBER: DFN2DIP-SQ4F0-070D140US935-FLLFLL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2345.1 | 2345.1 | 2345.1 | 2345.1 | 2345.1 |
| 2.5°   | 2358.8 | 2347.5 | 2322.6 | 2345.1 | 2340.8 |
| 5°     | 2345.1 | 2336.3 | 2311.4 | 2329.3 | 2325.0 |
| 7.5°   | 2329.3 | 2315.9 | 2291.0 | 2309.3 | 2304.7 |
| 10°    | 2304.7 | 2288.9 | 2261.8 | 2279.8 | 2273.1 |
| 12.5°  | 2270.7 | 2257.4 | 2230.3 | 2241.5 | 2237.0 |
| 15°    | 2232.5 | 2219.0 | 2189.6 | 2198.7 | 2187.5 |
| 17.5°  | 2185.0 | 2171.7 | 2142.2 | 2153.5 | 2142.2 |
| 20°    | 2133.1 | 2119.8 | 2088.2 | 2094.9 | 2086.0 |
| 22.5°  | 2081.5 | 2061.1 | 2031.7 | 2031.7 | 2027.1 |
| 25°    | 2020.5 | 2002.5 | 1964.3 | 1968.6 | 1964.3 |
| 27.5°  | 1952.7 | 1937.0 | 1907.8 | 1901.1 | 1889.8 |
| 30°    | 1885.3 | 1867.1 | 1833.4 | 1826.7 | 1817.6 |
| 32.5°  | 1813.0 | 1799.7 | 1763.5 | 1749.9 | 1740.8 |
| 35°    | 1743.2 | 1720.7 | 1684.5 | 1670.9 | 1659.7 |
| 37.5°  | 1664.2 | 1643.9 | 1607.7 | 1592.0 | 1580.7 |
| 40°    | 1583.1 | 1564.9 | 1528.8 | 1508.7 | 1499.6 |
| 42.5°  | 1504.2 | 1486.0 | 1450.1 | 1427.4 | 1413.9 |
| 45°    | 1418.5 | 1402.7 | 1368.7 | 1344.1 | 1335.0 |
| 47.5°  | 1335.0 | 1319.2 | 1283.1 | 1258.2 | 1244.8 |
| 50°    | 1247.0 | 1235.7 | 1204.1 | 1172.6 | 1161.3 |
| 52.5°  | 1161.3 | 1145.6 | 1116.4 | 1091.5 | 1075.6 |
| 55°    | 1073.5 | 1059.9 | 1032.9 | 1005.8 | 994.5  |
| 57.5°  | 985.5  | 974.2  | 944.8  | 917.7  | 908.7  |
| 60°    | 897.4  | 888.5  | 857.0  | 832.2  | 825.4  |
| 62.5°  | 811.7  | 796.0  | 773.5  | 751.0  | 741.9  |
| 65°    | 724.0  | 710.3  | 687.9  | 667.5  | 656.3  |
| 67.5°  | 633.8  | 622.3  | 602.2  | 586.4  | 577.3  |
| 70°    | 550.3  | 541.2  | 520.8  | 505.1  | 496.2  |
| 72.5°  | 464.6  | 455.6  | 444.3  | 428.5  | 421.8  |
| 75°    | 378.8  | 374.4  | 362.9  | 349.6  | 354.1  |
| 77.5°  | 302.2  | 293.1  | 288.5  | 281.8  | 275.2  |
| 80°    | 225.6  | 223.3  | 218.7  | 212.0  | 207.4  |
| 82.5°  | 153.3  | 153.3  | 151.2  | 142.2  | 142.2  |
| 85°    | 92.4   | 90.2   | 88.1   | 81.1   | 79.0   |
| 87.5°  | 40.6   | 36.2   | 31.6   | 24.9   | 22.5   |
| 90°    | 3.4    | 41.4   | 112.6  | 105.7  | 109.2  |
| 92.5°  | 71.3   | 96.5   | 100.0  | 103.4  | 103.4  |
| 95°    | 167.8  | 200.0  | 205.7  | 205.7  | 200.0  |
| 97.5°  | 279.3  | 309.2  | 321.8  | 321.8  | 321.8  |
| 100°   | 408.0  | 434.5  | 443.6  | 443.6  | 440.1  |
| 102.5° | 543.6  | 563.2  | 575.8  | 579.3  | 575.8  |
| 105°   | 691.9  | 701.1  | 708.0  | 713.7  | 713.7  |
| 107.5° | 839.0  | 852.8  | 852.8  | 855.1  | 839.0  |
| 110°   | 981.5  | 999.9  | 999.9  | 999.9  | 990.7  |

TEST NUMBER: P920368

CATALOG NUMBER: DFN2DIP-SQ4F0-070D140US935-FLLFL

**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1135.5 | 1155.0 | 1151.6 | 1142.4 | 1135.5 |
| 115°   | 1287.2 | 1305.6 | 1299.8 | 1296.4 | 1287.2 |
| 117.5° | 1437.8 | 1463.1 | 1447.0 | 1437.8 | 1428.6 |
| 120°   | 1589.5 | 1614.8 | 1589.5 | 1589.5 | 1579.2 |
| 122.5° | 1727.4 | 1759.5 | 1743.5 | 1734.3 | 1727.4 |
| 125°   | 1872.2 | 1900.9 | 1891.7 | 1881.4 | 1877.9 |
| 127.5° | 2013.5 | 2049.2 | 2036.5 | 2022.7 | 2013.5 |
| 130°   | 2145.7 | 2187.1 | 2181.3 | 2174.5 | 2161.8 |
| 132.5° | 2294.0 | 2326.2 | 2328.5 | 2312.4 | 2303.2 |
| 135°   | 2421.6 | 2457.2 | 2464.1 | 2460.6 | 2451.4 |
| 137.5° | 2564.1 | 2592.8 | 2598.6 | 2596.3 | 2582.5 |
| 140°   | 2689.3 | 2718.1 | 2734.2 | 2734.2 | 2721.5 |
| 142.5° | 2818.0 | 2846.8 | 2856.0 | 2859.5 | 2846.8 |
| 145°   | 2939.9 | 2962.9 | 2981.3 | 2984.7 | 2972.1 |
| 147.5° | 3049.1 | 3077.8 | 3091.6 | 3097.4 | 3084.7 |
| 150°   | 3161.7 | 3181.2 | 3193.9 | 3204.2 | 3193.9 |
| 152.5° | 3261.7 | 3281.3 | 3297.4 | 3309.9 | 3297.4 |
| 155°   | 3361.7 | 3370.9 | 3381.2 | 3397.3 | 3387.0 |
| 157.5° | 3447.9 | 3454.8 | 3460.5 | 3483.5 | 3467.4 |
| 160°   | 3524.9 | 3531.8 | 3535.3 | 3554.8 | 3540.9 |
| 162.5° | 3596.1 | 3596.1 | 3599.6 | 3621.4 | 3605.3 |
| 165°   | 3657.1 | 3653.6 | 3653.6 | 3676.6 | 3660.5 |
| 167.5° | 3712.2 | 3701.9 | 3701.9 | 3724.8 | 3708.7 |
| 170°   | 3753.6 | 3744.4 | 3740.9 | 3763.9 | 3744.4 |
| 172.5° | 3782.4 | 3773.2 | 3769.7 | 3792.7 | 3773.2 |
| 175°   | 3805.4 | 3796.1 | 3789.3 | 3812.2 | 3792.7 |
| 177.5° | 3817.9 | 3808.8 | 3801.9 | 3821.4 | 3801.9 |
| 180°   | 3812.2 | 3812.2 | 3812.2 | 3812.2 | 3812.2 |

TEST NUMBER: P920368

CATALOG NUMBER: DFN2DIP-SQ4F0-070D140US935-FLLFLL

**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 | 7.55             | 8.30  | 8.62  | 9.37  | 10.83 | 7.11           | 7.85  | 8.18  | 8.92  | 10.38 |
|                 | 3H   | 9.21             | 9.88  | 10.29 | 10.96 | 12.43 | 8.72           | 9.39  | 9.79  | 10.47 | 11.94 |
|                 | 4H   | 9.79             | 10.43 | 10.88 | 11.51 | 12.99 | 9.30           | 9.93  | 10.39 | 11.01 | 12.50 |
|                 | 6H   | 10.19            | 10.77 | 11.29 | 11.86 | 13.35 | 9.69           | 10.27 | 10.79 | 11.36 | 12.85 |
|                 | 8H   | 10.29            | 10.85 | 11.40 | 11.95 | 13.44 | 9.79           | 10.35 | 10.89 | 11.45 | 12.94 |
|                 | 12H  | 10.34            | 10.87 | 11.45 | 11.96 | 13.47 | 9.83           | 10.36 | 10.94 | 11.45 | 12.96 |
| 4H              | 2H   | 8.00             | 8.63  | 9.09  | 9.72  | 11.20 | 7.64           | 8.28  | 8.74  | 9.36  | 10.84 |
|                 | 3H   | 9.86             | 10.39 | 10.96 | 11.50 | 12.99 | 9.45           | 9.98  | 10.55 | 11.09 | 12.59 |
|                 | 4H   | 10.57            | 11.06 | 11.68 | 12.16 | 13.67 | 10.15          | 10.63 | 11.26 | 11.73 | 13.25 |
|                 | 6H   | 11.08            | 11.50 | 12.20 | 12.62 | 14.13 | 10.65          | 11.07 | 11.77 | 12.19 | 13.70 |
|                 | 8H   | 11.23            | 11.62 | 12.35 | 12.74 | 14.26 | 10.80          | 11.19 | 11.91 | 12.30 | 13.83 |
|                 | 12H  | 11.30            | 11.66 | 12.44 | 12.78 | 14.31 | 10.85          | 11.21 | 11.99 | 12.33 | 13.86 |
| 8H              | 4H   | 10.76            | 11.15 | 11.87 | 12.26 | 13.79 | 10.38          | 10.77 | 11.50 | 11.89 | 13.41 |
|                 | 6H   | 11.39            | 11.71 | 12.53 | 12.87 | 14.39 | 11.01          | 11.33 | 12.14 | 12.48 | 14.01 |
|                 | 8H   | 11.61            | 11.90 | 12.76 | 13.03 | 14.57 | 11.22          | 11.50 | 12.36 | 12.64 | 14.18 |
|                 | 12H  | 11.74            | 11.99 | 12.89 | 13.12 | 14.70 | 11.33          | 11.58 | 12.48 | 12.71 | 14.29 |
| 12H             | 4H   | 10.74            | 11.09 | 11.87 | 12.22 | 13.75 | 10.37          | 10.73 | 11.50 | 11.85 | 13.38 |
|                 | 6H   | 11.42            | 11.70 | 12.56 | 12.84 | 14.38 | 11.05          | 11.33 | 12.19 | 12.47 | 14.01 |
|                 | 8H   | 11.66            | 11.91 | 12.81 | 13.04 | 14.62 | 11.28          | 11.53 | 12.43 | 12.66 | 14.24 |

END OF REPORT