

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: P920524

Luminaire Tested: DFN2DIP-SQ4F0-120D070US935-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P920524  
REPORT IS A COMBINATION OF REPORTS P900089 AND P896915  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-120D070US935-FLLFLL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

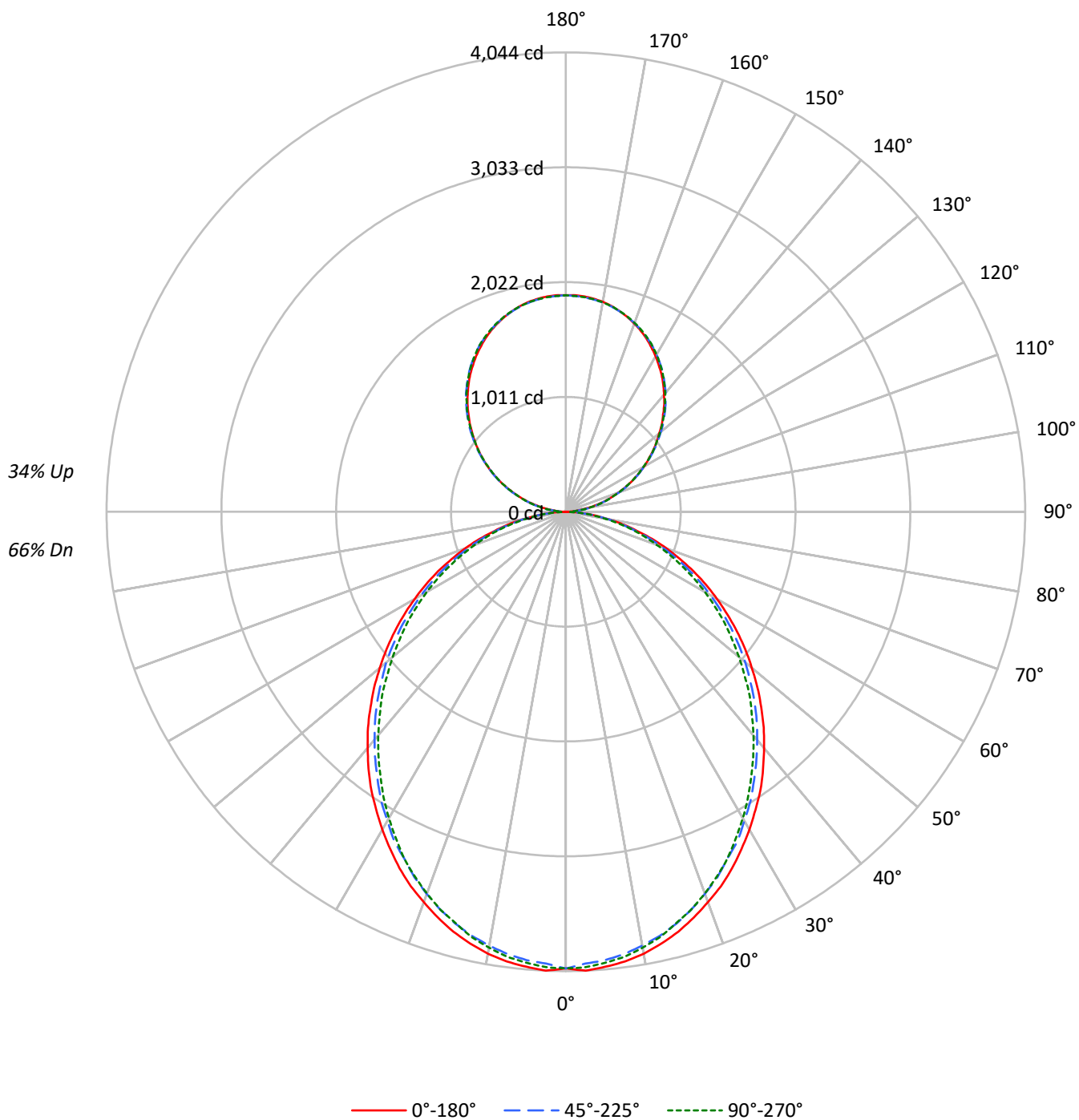
Lumens per Lamp: N/A  
Luminaire Lumens: 15562.6 lumens  
Efficiency: N/A  
Efficacy: 91.7 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 169.8  
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: P920524

CATALOG NUMBER: DFN2DIP-SQ4F0-120D070US935-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   | 111 | 111 | 111 | 111 | 104 | 104 | 104 | 104 | 92 | 92 | 92 | 81 | 81 | 81 | 71 | 71 | 71 |
| 1   | 101 | 97  | 93  | 89  | 95  | 91  | 88  | 85  | 81 | 78 | 76 | 71 | 69 | 67 | 62 | 61 | 60 |
| 2   | 92  | 85  | 78  | 73  | 87  | 80  | 74  | 70  | 71 | 67 | 63 | 63 | 59 | 56 | 55 | 52 | 50 |
| 3   | 84  | 74  | 67  | 61  | 79  | 70  | 64  | 58  | 63 | 57 | 53 | 55 | 51 | 48 | 49 | 46 | 43 |
| 4   | 77  | 66  | 58  | 52  | 72  | 62  | 55  | 49  | 56 | 50 | 45 | 49 | 45 | 41 | 44 | 40 | 37 |
| 5   | 71  | 59  | 51  | 44  | 66  | 56  | 48  | 43  | 50 | 44 | 39 | 44 | 39 | 36 | 39 | 35 | 32 |
| 6   | 65  | 53  | 45  | 39  | 61  | 50  | 43  | 37  | 45 | 39 | 34 | 40 | 35 | 31 | 36 | 32 | 28 |
| 7   | 61  | 48  | 40  | 34  | 57  | 45  | 38  | 33  | 41 | 35 | 30 | 37 | 32 | 28 | 33 | 28 | 25 |
| 8   | 56  | 44  | 36  | 30  | 53  | 41  | 34  | 29  | 37 | 31 | 27 | 34 | 28 | 25 | 30 | 26 | 23 |
| 9   | 52  | 40  | 32  | 27  | 49  | 38  | 31  | 26  | 34 | 28 | 24 | 31 | 26 | 22 | 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°  | 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   | 2.4       |
| 10°-20°   | 1064.6  | 6.8       |
| 20°-30°   | 1564.6  | 10.1      |
| 30°-40°   | 1817.2  | 11.7      |
| 40°-50°   | 1814.9  | 11.7      |
| 50°-60°   | 1582.5  | 10.2      |
| 60°-70°   | 1169.9  | 7.5       |
| 70°-80°   | 661.9   | 4.3       |
| 80°-90°   | 180.1   | 1.2       |
| 90°-100°  | 117.9   | 0.8       |
| 100°-110° | 374.8   | 2.4       |
| 110°-120° | 641.3   | 4.1       |
| 120°-130° | 843.5   | 5.4       |
| 130°-140° | 946.7   | 6.1       |
| 140°-150° | 928.4   | 6.0       |
| 150°-160° | 778.8   | 5.0       |
| 160°-170° | 516.5   | 3.3       |
| 170°-180° | 180.5   | 1.2       |
| 0°-30°    | 3007.6  | 19.3      |
| 0°-40°    | 4824.8  | 31.0      |
| 0°-60°    | 8222.2  | 52.8      |
| 0°-90°    | 10234.1 | 65.8      |
| 90°-120°  | 1134.1  | 7.3       |
| 90°-150°  | 3852.7  | 24.8      |
| 90°-180°  | 5328.0  | 34.2      |
| 0°-180°   | 15562.6 | 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    | 21    | 56   | 53    | 55   | 15   |
| 95°  | 84   | 100   | 103  | 103   | 100  | 93   |
| 105° | 346  | 350   | 354  | 357   | 357  | 365  |
| 115° | 644  | 653   | 650  | 648   | 644  | 637  |
| 125° | 936  | 950   | 946  | 941   | 939  | 837  |
| 135° | 1211 | 1229  | 1232 | 1230  | 1226 | 936  |
| 145° | 1470 | 1481  | 1491 | 1492  | 1486 | 918  |
| 155° | 1681 | 1685  | 1691 | 1699  | 1694 | 774  |
| 165° | 1828 | 1827  | 1827 | 1838  | 1830 | 516  |
| 175° | 1903 | 1898  | 1895 | 1906  | 1896 | 181  |
| 180° | 1906 | 1906  | 1906 | 1906  | 1906 |      |

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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°    | 1.7    | 20.7   | 56.3   | 52.9   | 54.6   |
| 92.5°  | 35.6   | 48.3   | 50.0   | 51.7   | 51.7   |
| 95°    | 83.9   | 100.0  | 102.9  | 102.9  | 100.0  |
| 97.5°  | 139.7  | 154.5  | 160.9  | 160.9  | 160.9  |
| 100°   | 204.0  | 217.2  | 221.8  | 221.8  | 220.1  |
| 102.5° | 271.8  | 281.5  | 287.9  | 289.6  | 287.9  |
| 105°   | 345.9  | 350.5  | 354.0  | 356.9  | 356.9  |
| 107.5° | 419.5  | 426.4  | 426.4  | 427.6  | 419.5  |
| 110°   | 490.8  | 500.0  | 500.0  | 500.0  | 495.3  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 567.7  | 577.6  | 575.8  | 571.2  | 567.7  |
| 115°   | 643.6  | 652.8  | 650.0  | 648.2  | 643.6  |
| 117.5° | 718.8  | 731.5  | 723.5  | 718.8  | 714.3  |
| 120°   | 794.7  | 807.4  | 794.7  | 794.7  | 789.5  |
| 122.5° | 863.7  | 879.8  | 871.8  | 867.1  | 863.7  |
| 125°   | 936.1  | 950.5  | 945.9  | 940.7  | 939.0  |
| 127.5° | 1006.8 | 1024.6 | 1018.3 | 1011.4 | 1006.8 |
| 130°   | 1072.9 | 1093.6 | 1090.7 | 1087.3 | 1080.9 |
| 132.5° | 1147.0 | 1163.1 | 1164.2 | 1156.2 | 1151.6 |
| 135°   | 1210.8 | 1228.6 | 1232.1 | 1230.3 | 1225.7 |
| 137.5° | 1282.0 | 1296.4 | 1299.2 | 1298.1 | 1291.2 |
| 140°   | 1344.7 | 1359.1 | 1367.1 | 1367.1 | 1360.8 |
| 142.5° | 1409.0 | 1423.4 | 1428.0 | 1429.7 | 1423.4 |
| 145°   | 1470.0 | 1481.4 | 1490.6 | 1492.4 | 1486.1 |
| 147.5° | 1524.6 | 1538.9 | 1545.8 | 1548.7 | 1542.4 |
| 150°   | 1580.9 | 1590.6 | 1597.0 | 1602.1 | 1597.0 |
| 152.5° | 1630.8 | 1640.6 | 1648.6 | 1655.0 | 1648.6 |
| 155°   | 1680.8 | 1685.4 | 1690.7 | 1698.7 | 1693.5 |
| 157.5° | 1724.0 | 1727.4 | 1730.3 | 1741.8 | 1733.7 |
| 160°   | 1762.5 | 1765.9 | 1767.6 | 1777.4 | 1770.5 |
| 162.5° | 1798.1 | 1798.1 | 1799.8 | 1810.7 | 1802.7 |
| 165°   | 1828.5 | 1826.8 | 1826.8 | 1838.3 | 1830.2 |
| 167.5° | 1856.1 | 1851.0 | 1851.0 | 1862.4 | 1854.4 |
| 170°   | 1876.8 | 1872.2 | 1870.5 | 1882.0 | 1872.2 |
| 172.5° | 1891.2 | 1886.5 | 1884.8 | 1896.3 | 1886.5 |
| 175°   | 1902.6 | 1898.1 | 1894.6 | 1906.1 | 1896.3 |
| 177.5° | 1909.0 | 1904.4 | 1900.9 | 1910.7 | 1900.9 |
| 180°   | 1906.1 | 1906.1 | 1906.1 | 1906.1 | 1906.1 |

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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 | 12.23            | 13.25 | 13.04 | 14.08 | 15.11 | 11.78          | 12.81 | 12.59 | 13.64 | 14.66 |
|                 | 3H   | 13.90            | 14.82 | 14.73 | 15.66 | 16.72 | 13.41          | 14.33 | 14.23 | 15.17 | 16.23 |
|                 | 4H   | 14.50            | 15.37 | 15.34 | 16.22 | 17.28 | 14.01          | 14.88 | 14.85 | 15.72 | 16.79 |
|                 | 6H   | 14.91            | 15.71 | 15.76 | 16.57 | 17.65 | 14.41          | 15.21 | 15.26 | 16.07 | 17.15 |
|                 | 8H   | 15.02            | 15.79 | 15.88 | 16.66 | 17.74 | 14.52          | 15.29 | 15.38 | 16.16 | 17.24 |
|                 | 12H  | 15.08            | 15.81 | 15.95 | 16.68 | 17.78 | 14.57          | 15.30 | 15.44 | 16.17 | 17.27 |
| 4H              | 2H   | 12.71            | 13.58 | 13.55 | 14.42 | 15.49 | 12.35          | 13.22 | 13.20 | 14.07 | 15.14 |
|                 | 3H   | 14.59            | 15.32 | 15.45 | 16.20 | 17.28 | 14.19          | 14.91 | 15.04 | 15.79 | 16.87 |
|                 | 4H   | 15.32            | 15.98 | 16.18 | 16.86 | 17.96 | 14.89          | 15.55 | 15.76 | 16.43 | 17.54 |
|                 | 6H   | 15.85            | 16.42 | 16.73 | 17.32 | 18.43 | 15.41          | 15.98 | 16.30 | 16.89 | 18.00 |
|                 | 8H   | 16.00            | 16.54 | 16.89 | 17.43 | 18.56 | 15.56          | 16.10 | 16.45 | 17.00 | 18.12 |
|                 | 12H  | 16.08            | 16.57 | 16.99 | 17.48 | 18.61 | 15.64          | 16.12 | 16.54 | 17.03 | 18.16 |
| 8H              | 4H   | 15.53            | 16.06 | 16.41 | 16.96 | 18.08 | 15.15          | 15.68 | 16.04 | 16.58 | 17.71 |
|                 | 6H   | 16.17            | 16.61 | 17.08 | 17.55 | 18.68 | 15.79          | 16.23 | 16.70 | 17.17 | 18.29 |
|                 | 8H   | 16.40            | 16.79 | 17.32 | 17.72 | 18.86 | 16.00          | 16.39 | 16.93 | 17.33 | 18.47 |
|                 | 12H  | 16.54            | 16.88 | 17.46 | 17.81 | 19.00 | 16.13          | 16.47 | 17.05 | 17.40 | 18.59 |
| 12H             | 4H   | 15.52            | 16.00 | 16.43 | 16.92 | 18.05 | 15.15          | 15.63 | 16.06 | 16.55 | 17.68 |
|                 | 6H   | 16.20            | 16.59 | 17.12 | 17.53 | 18.67 | 15.83          | 16.22 | 16.75 | 17.15 | 18.30 |
|                 | 8H   | 16.45            | 16.80 | 17.38 | 17.72 | 18.92 | 16.07          | 16.42 | 17.00 | 17.34 | 18.54 |

END OF REPORT