

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: P904037

Luminaire Tested: DFN2DIP-SQ4F0-080D140US830-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P904037  
REPORT IS A COMBINATION OF REPORTS P901709 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-080D140US830-FLLONL  
Description: 4 foot, Square Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

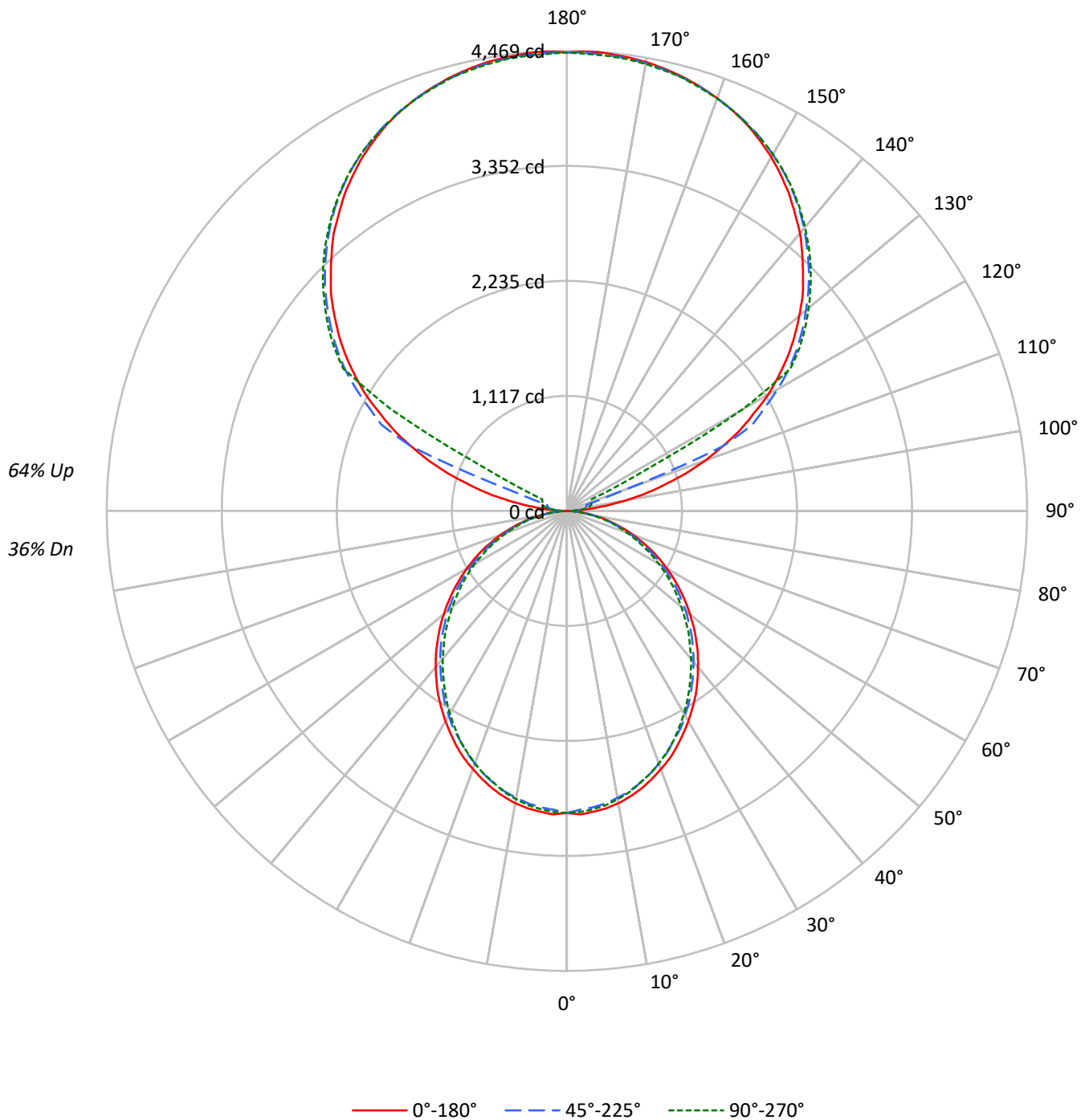
Lumens per Lamp: N/A  
Luminaire Lumens: 20528.5 lumens  
Efficiency: N/A  
Efficacy: 115.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 177.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9954  
Total Harmonic Distortion (THDi): 0.076  
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   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 76 | 76 | 76 | 59 | 59 | 59 | 44 | 44 | 44 |
| 1   | 95  | 90  | 87  | 83  | 86 | 82 | 79 | 76 | 66 | 64 | 62 | 52 | 50 | 49 | 39 | 38 | 37 |
| 2   | 86  | 79  | 73  | 68  | 78 | 72 | 67 | 62 | 58 | 54 | 51 | 46 | 43 | 41 | 34 | 32 | 31 |
| 3   | 79  | 69  | 62  | 57  | 71 | 63 | 57 | 52 | 51 | 47 | 43 | 40 | 37 | 35 | 30 | 28 | 26 |
| 4   | 72  | 61  | 54  | 48  | 65 | 56 | 49 | 44 | 45 | 41 | 37 | 36 | 32 | 30 | 27 | 25 | 23 |
| 5   | 66  | 55  | 47  | 41  | 59 | 50 | 43 | 38 | 41 | 35 | 32 | 32 | 28 | 26 | 24 | 22 | 20 |
| 6   | 61  | 49  | 41  | 35  | 55 | 45 | 38 | 33 | 37 | 31 | 27 | 29 | 25 | 22 | 22 | 19 | 17 |
| 7   | 56  | 44  | 36  | 31  | 51 | 40 | 33 | 29 | 33 | 28 | 24 | 26 | 23 | 20 | 20 | 17 | 15 |
| 8   | 52  | 40  | 32  | 27  | 47 | 37 | 30 | 25 | 30 | 25 | 21 | 24 | 20 | 18 | 18 | 16 | 14 |
| 9   | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 22 | 28 | 23 | 19 | 22 | 18 | 16 | 17 | 14 | 12 |
| 10  | 45  | 33  | 26  | 21  | 41 | 31 | 24 | 20 | 25 | 20 | 17 | 20 | 17 | 14 | 16 | 13 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2059 | 2059 | 2059 |
| 5°  | 2062 | 2030 | 2044 |
| 10° | 2045 | 2003 | 2017 |
| 15° | 2015 | 1971 | 1975 |
| 20° | 1974 | 1925 | 1931 |
| 25° | 1934 | 1871 | 1880 |
| 30° | 1883 | 1821 | 1816 |
| 35° | 1835 | 1761 | 1747 |
| 40° | 1776 | 1700 | 1682 |
| 45° | 1717 | 1640 | 1616 |
| 50° | 1653 | 1577 | 1539 |
| 55° | 1585 | 1503 | 1469 |
| 60° | 1509 | 1416 | 1388 |
| 65° | 1426 | 1326 | 1292 |
| 70° | 1320 | 1216 | 1190 |
| 75° | 1173 | 1085 | 1097 |
| 80° | 996  | 918  | 916  |
| 85° | 720  | 628  | 616  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2388 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 276.1   | 1.3       |
| 10°-20°   | 777.0   | 3.8       |
| 20°-30°   | 1141.8  | 5.6       |
| 30°-40°   | 1326.2  | 6.5       |
| 40°-50°   | 1324.5  | 6.5       |
| 50°-60°   | 1155.0  | 5.6       |
| 60°-70°   | 853.8   | 4.2       |
| 70°-80°   | 483.0   | 2.4       |
| 80°-90°   | 135.3   | 0.7       |
| 90°-100°  | 146.9   | 0.7       |
| 100°-110° | 547.4   | 2.7       |
| 110°-120° | 1451.8  | 7.1       |
| 120°-130° | 2408.0  | 11.7      |
| 130°-140° | 2557.8  | 12.5      |
| 140°-150° | 2377.2  | 11.6      |
| 150°-160° | 1911.2  | 9.3       |
| 160°-170° | 1231.5  | 6.0       |
| 170°-180° | 423.9   | 2.1       |
| 0°-30°    | 2195.0  | 10.7      |
| 0°-40°    | 3521.1  | 17.2      |
| 0°-60°    | 6000.6  | 29.2      |
| 0°-90°    | 7472.8  | 36.4      |
| 90°-120°  | 2146.1  | 10.5      |
| 90°-150°  | 9489.1  | 46.2      |
| 90°-180°  | 13056.0 | 63.6      |
| 0°-180°   | 20528.5 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2934 | 2934  | 2934 | 2934  | 2934 |      |
| 5°   | 2934 | 2923  | 2892 | 2914  | 2909 | 279  |
| 15°  | 2793 | 2776  | 2739 | 2751  | 2737 | 787  |
| 25°  | 2528 | 2505  | 2458 | 2463  | 2458 | 1163 |
| 35°  | 2181 | 2153  | 2108 | 2090  | 2076 | 1362 |
| 45°  | 1775 | 1755  | 1712 | 1682  | 1670 | 1370 |
| 55°  | 1343 | 1326  | 1292 | 1258  | 1244 | 1201 |
| 65°  | 906  | 889   | 860  | 835   | 821  | 896  |
| 75°  | 474  | 468   | 454  | 437   | 443  | 506  |
| 85°  | 116  | 113   | 110  | 102   | 99   | 129  |
| 90°  | 3    | 39    | 64   | 81    | 87   | 19   |
| 95°  | 209  | 103   | 126  | 142   | 139  | 248  |
| 105° | 980  | 1076  | 197  | 232   | 245  | 1047 |
| 115° | 1853 | 1908  | 1988 | 496   | 264  | 1824 |
| 125° | 2620 | 2662  | 2723 | 2746  | 2755 | 2336 |
| 135° | 3242 | 3294  | 3322 | 3355  | 3348 | 2504 |
| 145° | 3761 | 3757  | 3812 | 3835  | 3818 | 2352 |
| 155° | 4141 | 4112  | 4151 | 4170  | 4144 | 1908 |
| 165° | 4363 | 4344  | 4354 | 4376  | 4354 | 1233 |
| 175° | 4463 | 4440  | 4447 | 4469  | 4437 | 425  |
| 180° | 4453 | 4453  | 4453 | 4453  | 4453 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2933.9 | 2933.9 | 2933.9 | 2933.9 | 2933.9 |
| 2.5°   | 2951.0 | 2937.0 | 2905.9 | 2933.9 | 2928.6 |
| 5°     | 2933.9 | 2922.9 | 2891.8 | 2914.2 | 2908.9 |
| 7.5°   | 2914.2 | 2897.5 | 2866.4 | 2889.1 | 2883.4 |
| 10°    | 2883.4 | 2863.6 | 2829.8 | 2852.2 | 2843.9 |
| 12.5°  | 2840.9 | 2824.1 | 2790.3 | 2804.3 | 2798.7 |
| 15°    | 2793.0 | 2776.3 | 2739.4 | 2750.8 | 2736.8 |
| 17.5°  | 2733.7 | 2717.0 | 2680.1 | 2694.3 | 2680.1 |
| 20°    | 2668.8 | 2652.0 | 2612.5 | 2620.9 | 2609.8 |
| 22.5°  | 2604.2 | 2578.7 | 2541.8 | 2541.8 | 2536.2 |
| 25°    | 2527.8 | 2505.4 | 2457.5 | 2462.9 | 2457.5 |
| 27.5°  | 2443.1 | 2423.4 | 2386.8 | 2378.4 | 2364.4 |
| 30°    | 2358.7 | 2335.9 | 2293.8 | 2285.4 | 2274.0 |
| 32.5°  | 2268.3 | 2251.5 | 2206.3 | 2189.2 | 2177.9 |
| 35°    | 2180.9 | 2152.8 | 2107.5 | 2090.5 | 2076.4 |
| 37.5°  | 2082.1 | 2056.6 | 2011.5 | 1991.7 | 1977.6 |
| 40°    | 1980.7 | 1957.8 | 1912.7 | 1887.5 | 1876.1 |
| 42.5°  | 1881.9 | 1859.1 | 1814.2 | 1785.7 | 1769.1 |
| 45°    | 1774.7 | 1754.9 | 1712.4 | 1681.6 | 1670.3 |
| 47.5°  | 1670.3 | 1650.5 | 1605.2 | 1574.1 | 1557.4 |
| 50°    | 1560.1 | 1546.1 | 1506.5 | 1467.0 | 1452.9 |
| 52.5°  | 1452.9 | 1433.1 | 1396.7 | 1365.6 | 1345.8 |
| 55°    | 1343.0 | 1326.0 | 1292.2 | 1258.4 | 1244.3 |
| 57.5°  | 1232.9 | 1218.9 | 1182.0 | 1148.2 | 1136.8 |
| 60°    | 1122.8 | 1111.7 | 1072.1 | 1041.0 | 1032.6 |
| 62.5°  | 1015.6 | 995.9  | 967.7  | 939.6  | 928.2  |
| 65°    | 905.8  | 888.7  | 860.5  | 835.1  | 821.0  |
| 67.5°  | 792.9  | 778.5  | 753.4  | 733.7  | 722.3  |
| 70°    | 688.4  | 677.0  | 651.7  | 631.9  | 620.8  |
| 72.5°  | 581.3  | 570.0  | 555.8  | 536.1  | 527.7  |
| 75°    | 473.8  | 468.4  | 454.1  | 437.3  | 443.0  |
| 77.5°  | 378.1  | 366.6  | 361.0  | 352.6  | 344.2  |
| 80°    | 282.3  | 279.3  | 273.6  | 265.2  | 259.5  |
| 82.5°  | 191.9  | 191.9  | 189.2  | 177.8  | 177.8  |
| 85°    | 115.6  | 112.8  | 110.2  | 101.5  | 98.8   |
| 87.5°  | 50.9   | 45.2   | 39.5   | 31.1   | 28.2   |
| 90°    | 3.0    | 38.6   | 64.3   | 80.8   | 86.9   |
| 92.5°  | 80.8   | 67.8   | 77.3   | 83.8   | 86.9   |
| 95°    | 209.3  | 102.9  | 125.5  | 141.9  | 138.6  |
| 97.5°  | 376.9  | 112.9  | 164.2  | 174.1  | 177.2  |
| 100°   | 570.5  | 128.9  | 183.7  | 209.3  | 215.8  |
| 102.5° | 782.9  | 776.7  | 190.2  | 225.4  | 235.4  |
| 105°   | 979.6  | 1076.4 | 196.7  | 231.9  | 244.9  |
| 107.5° | 1208.4 | 1288.7 | 203.2  | 238.4  | 251.4  |
| 110°   | 1427.7 | 1495.1 | 564.0  | 241.9  | 254.5  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1633.9 | 1691.7 | 1637.0 | 248.0  | 257.9  |
| 115°   | 1852.8 | 1907.5 | 1988.3 | 496.3  | 264.4  |
| 117.5° | 2043.0 | 2107.2 | 2162.4 | 1701.3 | 857.1  |
| 120°   | 2255.8 | 2304.0 | 2362.1 | 2400.7 | 1965.7 |
| 122.5° | 2436.0 | 2487.7 | 2552.3 | 2571.4 | 2574.9 |
| 125°   | 2619.7 | 2661.7 | 2723.0 | 2745.5 | 2755.1 |
| 127.5° | 2787.3 | 2832.4 | 2881.0 | 2913.1 | 2916.2 |
| 130°   | 2945.3 | 2997.0 | 3032.2 | 3067.8 | 3064.7 |
| 132.5° | 3106.4 | 3148.5 | 3183.7 | 3212.7 | 3209.7 |
| 135°   | 3241.9 | 3293.5 | 3322.2 | 3354.7 | 3348.2 |
| 137.5° | 3383.4 | 3422.1 | 3454.6 | 3486.7 | 3477.2 |
| 140°   | 3522.0 | 3548.0 | 3583.2 | 3612.3 | 3596.2 |
| 142.5° | 3638.3 | 3660.8 | 3702.6 | 3728.2 | 3712.1 |
| 145°   | 3760.7 | 3757.3 | 3812.0 | 3834.6 | 3818.5 |
| 147.5° | 3866.8 | 3857.2 | 3911.9 | 3928.0 | 3915.3 |
| 150°   | 3970.1 | 3947.5 | 3999.1 | 4018.2 | 4002.2 |
| 152.5° | 4056.9 | 4031.3 | 4079.5 | 4099.0 | 4076.4 |
| 155°   | 4140.7 | 4112.0 | 4150.7 | 4169.8 | 4144.2 |
| 157.5° | 4208.5 | 4182.8 | 4211.9 | 4234.5 | 4208.5 |
| 160°   | 4266.6 | 4247.1 | 4266.6 | 4285.7 | 4263.2 |
| 162.5° | 4317.9 | 4298.7 | 4314.9 | 4337.4 | 4308.4 |
| 165°   | 4363.0 | 4343.9 | 4353.5 | 4376.0 | 4353.5 |
| 167.5° | 4398.7 | 4379.1 | 4389.0 | 4411.7 | 4382.5 |
| 170°   | 4427.7 | 4408.2 | 4414.7 | 4437.3 | 4408.2 |
| 172.5° | 4446.8 | 4427.7 | 4434.2 | 4456.8 | 4427.7 |
| 175°   | 4462.9 | 4440.3 | 4446.8 | 4469.4 | 4437.3 |
| 177.5° | 4469.4 | 4446.8 | 4450.3 | 4472.8 | 4443.8 |
| 180°   | 4453.3 | 4453.3 | 4453.3 | 4453.3 | 4453.3 |

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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 | 8.39             | 9.14  | 9.45  | 10.21 | 11.66 | 7.94           | 8.69  | 9.01  | 9.76  | 11.21 |
|                 | 3H   | 10.04            | 10.72 | 11.12 | 11.79 | 13.26 | 9.55           | 10.23 | 10.63 | 11.30 | 12.77 |
|                 | 4H   | 10.63            | 11.27 | 11.71 | 12.34 | 13.82 | 10.13          | 10.77 | 11.22 | 11.85 | 13.33 |
|                 | 6H   | 11.03            | 11.61 | 12.12 | 12.70 | 14.18 | 10.53          | 11.11 | 11.62 | 12.19 | 13.68 |
|                 | 8H   | 11.13            | 11.69 | 12.23 | 12.79 | 14.27 | 10.63          | 11.19 | 11.73 | 12.28 | 13.77 |
|                 | 12H  | 11.18            | 11.71 | 12.28 | 12.80 | 14.31 | 10.67          | 11.20 | 11.77 | 12.29 | 13.80 |
| 4H              | 2H   | 8.83             | 9.47  | 9.93  | 10.55 | 12.03 | 8.48           | 9.12  | 9.57  | 10.20 | 11.67 |
|                 | 3H   | 10.70            | 11.23 | 11.80 | 12.33 | 13.82 | 10.29          | 10.82 | 11.39 | 11.93 | 13.42 |
|                 | 4H   | 11.41            | 11.90 | 12.51 | 12.99 | 14.50 | 10.98          | 11.47 | 12.09 | 12.57 | 14.08 |
|                 | 6H   | 11.92            | 12.34 | 13.03 | 13.46 | 14.96 | 11.49          | 11.91 | 12.60 | 13.03 | 14.53 |
|                 | 8H   | 12.07            | 12.46 | 13.18 | 13.57 | 15.09 | 11.63          | 12.03 | 12.75 | 13.14 | 14.66 |
|                 | 12H  | 12.14            | 12.50 | 13.27 | 13.62 | 15.14 | 11.69          | 12.05 | 12.82 | 13.17 | 14.69 |
| 8H              | 4H   | 11.60            | 11.99 | 12.71 | 13.10 | 14.62 | 11.22          | 11.61 | 12.33 | 12.72 | 14.24 |
|                 | 6H   | 12.23            | 12.55 | 13.36 | 13.70 | 15.22 | 11.84          | 12.17 | 12.98 | 13.32 | 14.84 |
|                 | 8H   | 12.45            | 12.73 | 13.59 | 13.87 | 15.40 | 12.06          | 12.34 | 13.20 | 13.47 | 15.01 |
|                 | 12H  | 12.58            | 12.83 | 13.72 | 13.96 | 15.53 | 12.17          | 12.42 | 13.31 | 13.55 | 15.12 |
| 12H             | 4H   | 11.58            | 11.93 | 12.71 | 13.05 | 14.58 | 11.21          | 11.56 | 12.34 | 12.69 | 14.21 |
|                 | 6H   | 12.26            | 12.54 | 13.40 | 13.67 | 15.21 | 11.89          | 12.17 | 13.03 | 13.30 | 14.84 |
|                 | 8H   | 12.50            | 12.75 | 13.64 | 13.88 | 15.45 | 12.12          | 12.37 | 13.26 | 13.50 | 15.07 |

END OF REPORT