

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: P914077

Luminaire Tested: DFN2DIP-PN4F0-040D090US927-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P914077  
REPORT IS A COMBINATION OF REPORTS P901219 AND P898053  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-040D090US927-FLLONL  
Description: 4 foot, Pentagon Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

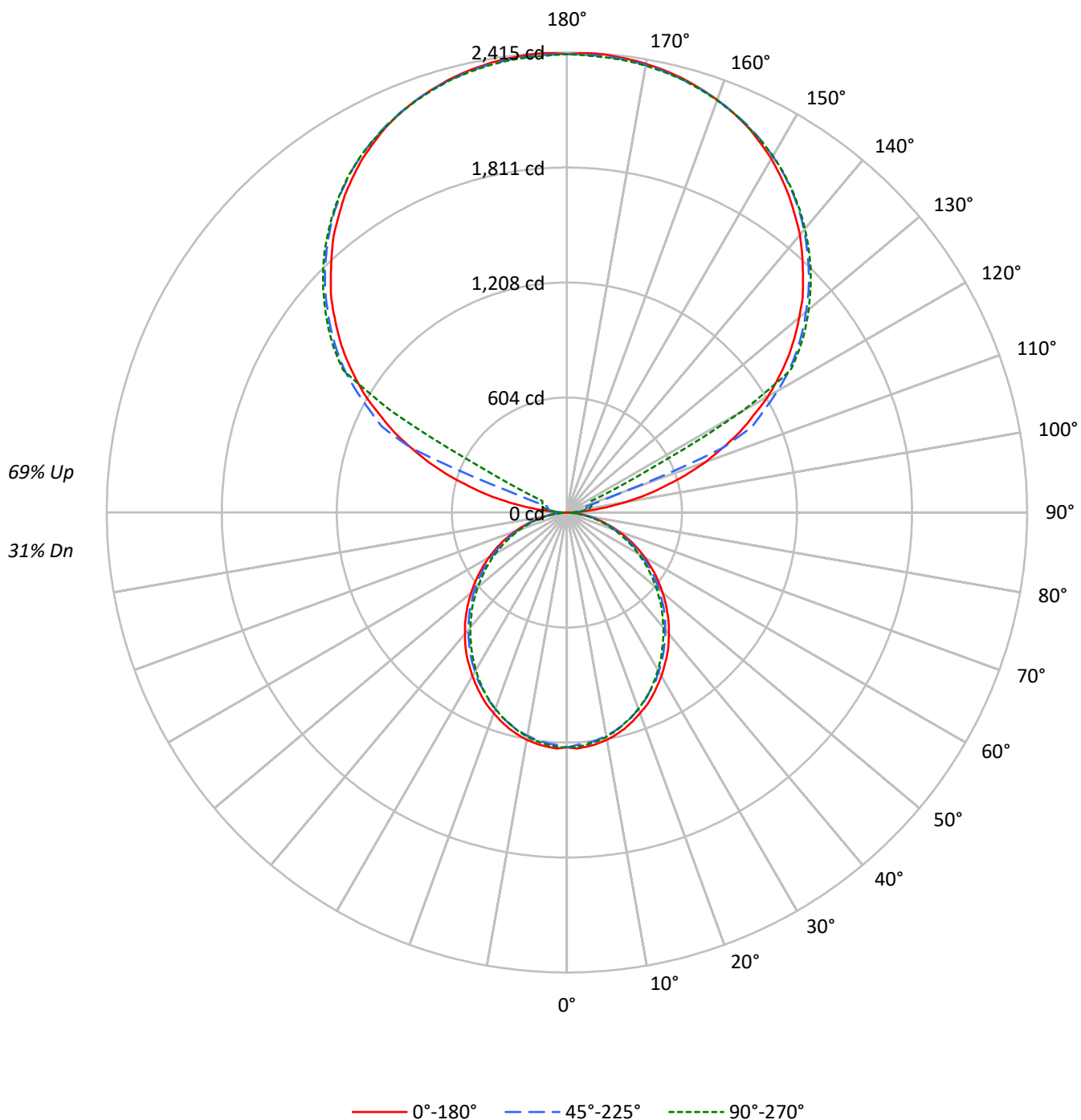
Lumens per Lamp: N/A  
Luminaire Lumens: 10195.3 lumens  
Efficiency: N/A  
Efficacy: 102.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 100  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9968  
Total Harmonic Distortion (THDi): 0.064  
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   | 103 | 103 | 103 | 103 | 92 | 92 | 92 | 92 | 73 | 73 | 73 | 55 | 55 | 55 | 38 | 38 | 38 |
| 1   | 93  | 89  | 86  | 82  | 84 | 80 | 77 | 74 | 64 | 61 | 59 | 48 | 47 | 46 | 34 | 33 | 32 |
| 2   | 85  | 78  | 72  | 67  | 76 | 70 | 65 | 61 | 56 | 52 | 49 | 42 | 40 | 38 | 30 | 29 | 27 |
| 3   | 78  | 68  | 61  | 56  | 69 | 62 | 56 | 51 | 49 | 45 | 41 | 37 | 35 | 32 | 26 | 25 | 23 |
| 4   | 71  | 60  | 53  | 47  | 63 | 55 | 48 | 43 | 44 | 39 | 35 | 33 | 30 | 27 | 24 | 22 | 20 |
| 5   | 65  | 54  | 46  | 40  | 58 | 49 | 42 | 37 | 39 | 34 | 30 | 30 | 26 | 24 | 21 | 19 | 17 |
| 6   | 60  | 48  | 40  | 35  | 53 | 44 | 37 | 32 | 35 | 30 | 26 | 27 | 23 | 21 | 19 | 17 | 15 |
| 7   | 55  | 43  | 36  | 30  | 49 | 39 | 33 | 28 | 32 | 27 | 23 | 24 | 21 | 18 | 18 | 15 | 14 |
| 8   | 51  | 39  | 32  | 27  | 46 | 36 | 29 | 24 | 29 | 24 | 20 | 22 | 19 | 16 | 16 | 14 | 12 |
| 9   | 47  | 36  | 28  | 24  | 43 | 32 | 26 | 22 | 26 | 21 | 18 | 20 | 17 | 14 | 15 | 13 | 11 |
| 10  | 44  | 33  | 26  | 21  | 40 | 30 | 23 | 19 | 24 | 19 | 16 | 19 | 15 | 13 | 14 | 12 | 10 |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 900 | 900 | 900 |
| 5°  | 901 | 888 | 894 |
| 10° | 894 | 876 | 882 |
| 15° | 881 | 861 | 863 |
| 20° | 863 | 842 | 844 |
| 25° | 846 | 818 | 822 |
| 30° | 823 | 796 | 793 |
| 35° | 802 | 769 | 763 |
| 40° | 777 | 743 | 735 |
| 45° | 751 | 716 | 706 |
| 50° | 723 | 689 | 672 |
| 55° | 693 | 657 | 641 |
| 60° | 660 | 618 | 606 |
| 65° | 623 | 579 | 564 |
| 70° | 577 | 531 | 519 |
| 75° | 513 | 473 | 478 |
| 80° | 436 | 400 | 398 |
| 85° | 315 | 273 | 266 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1282 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 116.0   | 1.1       |
| 10°-20°   | 326.5   | 3.2       |
| 20°-30°   | 479.8   | 4.7       |
| 30°-40°   | 557.3   | 5.5       |
| 40°-50°   | 556.6   | 5.5       |
| 50°-60°   | 485.3   | 4.8       |
| 60°-70°   | 358.8   | 3.5       |
| 70°-80°   | 203.0   | 2.0       |
| 80°-90°   | 57.8    | 0.6       |
| 90°-100°  | 79.3    | 0.8       |
| 100°-110° | 295.8   | 2.9       |
| 110°-120° | 784.4   | 7.7       |
| 120°-130° | 1301.0  | 12.8      |
| 130°-140° | 1382.0  | 13.6      |
| 140°-150° | 1284.4  | 12.6      |
| 150°-160° | 1032.6  | 10.1      |
| 160°-170° | 665.4   | 6.5       |
| 170°-180° | 229.0   | 2.2       |
| 0°-30°    | 922.4   | 9.0       |
| 0°-40°    | 1479.7  | 14.5      |
| 0°-60°    | 2521.7  | 24.7      |
| 0°-90°    | 3141.3  | 30.8      |
| 90°-120°  | 1159.5  | 11.4      |
| 90°-150°  | 5127.0  | 50.3      |
| 90°-180°  | 7054.0  | 69.2      |
| 0°-180°   | 10195.3 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1233 | 1233  | 1233 | 1233  | 1233 |      |
| 5°   | 1233 | 1228  | 1215 | 1225  | 1222 | 117  |
| 15°  | 1174 | 1167  | 1151 | 1156  | 1150 | 331  |
| 25°  | 1062 | 1053  | 1033 | 1035  | 1033 | 489  |
| 35°  | 916  | 905   | 886  | 878   | 873  | 572  |
| 45°  | 746  | 738   | 720  | 707   | 702  | 576  |
| 55°  | 564  | 557   | 543  | 529   | 523  | 505  |
| 65°  | 381  | 373   | 362  | 351   | 345  | 376  |
| 75°  | 199  | 197   | 191  | 184   | 186  | 213  |
| 85°  | 49   | 48    | 46   | 43    | 42   | 54   |
| 90°  | 2    | 21    | 35   | 44    | 47   | 9    |
| 95°  | 113  | 56    | 68   | 77    | 75   | 134  |
| 105° | 529  | 582   | 106  | 125   | 132  | 566  |
| 115° | 1001 | 1031  | 1074 | 268   | 143  | 986  |
| 125° | 1415 | 1438  | 1471 | 1483  | 1489 | 1262 |
| 135° | 1752 | 1780  | 1795 | 1813  | 1809 | 1353 |
| 145° | 2032 | 2030  | 2060 | 2072  | 2063 | 1271 |
| 155° | 2237 | 2222  | 2243 | 2253  | 2239 | 1031 |
| 165° | 2357 | 2347  | 2352 | 2364  | 2352 | 666  |
| 175° | 2411 | 2399  | 2403 | 2415  | 2398 | 229  |
| 180° | 2406 | 2406  | 2406 | 2406  | 2406 |      |

TEST NUMBER: P914077

CATALOG NUMBER: DFN2DIP-PN4F0-040D090US927-FLLONL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1233.0 | 1233.0 | 1233.0 | 1233.0 | 1233.0 |
| 2.5°   | 1240.2 | 1234.2 | 1221.1 | 1233.0 | 1230.7 |
| 5°     | 1233.0 | 1228.3 | 1215.2 | 1224.6 | 1222.4 |
| 7.5°   | 1224.6 | 1217.6 | 1204.5 | 1214.1 | 1211.7 |
| 10°    | 1211.7 | 1203.4 | 1189.2 | 1198.6 | 1195.1 |
| 12.5°  | 1193.8 | 1186.8 | 1172.6 | 1178.5 | 1176.1 |
| 15°    | 1173.7 | 1166.6 | 1151.2 | 1156.0 | 1150.1 |
| 17.5°  | 1148.8 | 1141.8 | 1126.3 | 1132.2 | 1126.3 |
| 20°    | 1121.5 | 1114.4 | 1097.9 | 1101.4 | 1096.8 |
| 22.5°  | 1094.3 | 1083.6 | 1068.2 | 1068.2 | 1065.8 |
| 25°    | 1062.2 | 1052.8 | 1032.7 | 1035.0 | 1032.7 |
| 27.5°  | 1026.7 | 1018.3 | 1003.1 | 999.5  | 993.6  |
| 30°    | 991.2  | 981.7  | 963.9  | 960.4  | 955.6  |
| 32.5°  | 953.2  | 946.2  | 927.2  | 920.0  | 915.2  |
| 35°    | 916.5  | 904.7  | 885.7  | 878.5  | 872.6  |
| 37.5°  | 875.0  | 864.3  | 845.3  | 837.0  | 831.1  |
| 40°    | 832.3  | 822.8  | 803.7  | 793.2  | 788.5  |
| 42.5°  | 790.8  | 781.2  | 762.4  | 750.4  | 743.4  |
| 45°    | 745.8  | 737.5  | 719.6  | 706.7  | 701.9  |
| 47.5°  | 701.9  | 693.6  | 674.6  | 661.6  | 654.5  |
| 50°    | 655.6  | 649.7  | 633.1  | 616.5  | 610.5  |
| 52.5°  | 610.5  | 602.3  | 586.9  | 573.9  | 565.5  |
| 55°    | 564.4  | 557.2  | 543.0  | 528.8  | 522.9  |
| 57.5°  | 518.1  | 512.2  | 496.7  | 482.5  | 477.8  |
| 60°    | 471.8  | 467.1  | 450.6  | 437.5  | 434.0  |
| 62.5°  | 426.8  | 418.5  | 406.7  | 394.8  | 390.1  |
| 65°    | 380.6  | 373.4  | 361.6  | 350.9  | 345.1  |
| 67.5°  | 333.2  | 327.2  | 316.6  | 308.3  | 303.6  |
| 70°    | 289.3  | 284.6  | 273.9  | 265.5  | 260.9  |
| 72.5°  | 244.3  | 239.5  | 233.6  | 225.3  | 221.7  |
| 75°    | 199.2  | 196.9  | 190.8  | 183.8  | 186.2  |
| 77.5°  | 158.8  | 154.1  | 151.7  | 148.1  | 144.7  |
| 80°    | 118.6  | 117.3  | 114.9  | 111.5  | 109.1  |
| 82.5°  | 80.6   | 80.6   | 79.5   | 74.7   | 74.7   |
| 85°    | 48.6   | 47.5   | 46.3   | 42.6   | 41.5   |
| 87.5°  | 21.4   | 19.0   | 16.6   | 13.1   | 11.8   |
| 90°    | 1.7    | 20.9   | 34.7   | 43.6   | 46.9   |
| 92.5°  | 43.6   | 36.6   | 41.7   | 45.3   | 46.9   |
| 95°    | 113.1  | 55.6   | 67.8   | 76.7   | 74.9   |
| 97.5°  | 203.7  | 61.0   | 88.7   | 94.0   | 95.7   |
| 100°   | 308.2  | 69.7   | 99.3   | 113.1  | 116.6  |
| 102.5° | 423.0  | 419.7  | 102.7  | 121.8  | 127.1  |
| 105°   | 529.3  | 581.6  | 106.2  | 125.3  | 132.3  |
| 107.5° | 652.9  | 696.3  | 109.8  | 128.8  | 135.9  |
| 110°   | 771.3  | 807.8  | 304.8  | 130.6  | 137.5  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 882.8  | 914.0  | 884.5  | 134.0  | 139.3  |
| 115°   | 1001.1 | 1030.6 | 1074.3 | 268.2  | 142.8  |
| 117.5° | 1103.8 | 1138.6 | 1168.3 | 919.2  | 463.1  |
| 120°   | 1218.8 | 1244.8 | 1276.3 | 1297.1 | 1062.1 |
| 122.5° | 1316.2 | 1344.1 | 1379.0 | 1389.3 | 1391.2 |
| 125°   | 1415.4 | 1438.1 | 1471.2 | 1483.4 | 1488.6 |
| 127.5° | 1505.9 | 1530.3 | 1556.6 | 1574.0 | 1575.6 |
| 130°   | 1591.3 | 1619.3 | 1638.3 | 1657.5 | 1655.9 |
| 132.5° | 1678.4 | 1701.1 | 1720.1 | 1735.9 | 1734.2 |
| 135°   | 1751.6 | 1779.5 | 1795.0 | 1812.6 | 1809.1 |
| 137.5° | 1828.1 | 1849.0 | 1866.5 | 1883.9 | 1878.7 |
| 140°   | 1902.9 | 1917.0 | 1936.0 | 1951.7 | 1943.1 |
| 142.5° | 1965.8 | 1978.0 | 2000.5 | 2014.4 | 2005.7 |
| 145°   | 2031.9 | 2030.0 | 2059.7 | 2071.9 | 2063.2 |
| 147.5° | 2089.2 | 2084.1 | 2113.6 | 2122.3 | 2115.4 |
| 150°   | 2145.1 | 2132.9 | 2160.8 | 2171.1 | 2162.4 |
| 152.5° | 2192.0 | 2178.1 | 2204.2 | 2214.7 | 2202.5 |
| 155°   | 2237.3 | 2221.8 | 2242.6 | 2253.0 | 2239.1 |
| 157.5° | 2273.9 | 2260.0 | 2275.7 | 2287.9 | 2273.9 |
| 160°   | 2305.2 | 2294.7 | 2305.2 | 2315.6 | 2303.4 |
| 162.5° | 2333.0 | 2322.6 | 2331.3 | 2343.5 | 2327.8 |
| 165°   | 2357.4 | 2347.0 | 2352.2 | 2364.4 | 2352.2 |
| 167.5° | 2376.6 | 2366.1 | 2371.4 | 2383.6 | 2367.9 |
| 170°   | 2392.3 | 2381.8 | 2385.3 | 2397.5 | 2381.8 |
| 172.5° | 2402.7 | 2392.3 | 2395.8 | 2408.0 | 2392.3 |
| 175°   | 2411.3 | 2399.1 | 2402.7 | 2414.8 | 2397.5 |
| 177.5° | 2414.8 | 2402.7 | 2404.5 | 2416.7 | 2401.0 |
| 180°   | 2406.2 | 2406.2 | 2406.2 | 2406.2 | 2406.2 |

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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 | 4.81             | 5.52 | 5.91  | 6.62  | 8.14  | 4.37           | 5.08 | 5.47 | 6.18 | 7.70  |
|                 | 3H   | 6.46             | 7.10 | 7.58  | 8.21  | 9.75  | 5.98           | 6.61 | 7.09 | 7.72 | 9.26  |
|                 | 4H   | 7.04             | 7.65 | 8.17  | 8.76  | 10.30 | 6.56           | 7.16 | 7.68 | 8.27 | 9.82  |
|                 | 6H   | 7.44             | 7.99 | 8.57  | 9.11  | 10.66 | 6.95           | 7.50 | 8.08 | 8.62 | 10.17 |
|                 | 8H   | 7.54             | 8.07 | 8.68  | 9.20  | 10.75 | 7.05           | 7.58 | 8.18 | 8.71 | 10.25 |
|                 | 12H  | 7.58             | 8.09 | 8.72  | 9.21  | 10.78 | 7.08           | 7.59 | 8.22 | 8.71 | 10.28 |
| 4H              | 2H   | 5.25             | 5.86 | 6.38  | 6.97  | 8.51  | 4.90           | 5.51 | 6.03 | 6.62 | 8.16  |
|                 | 3H   | 7.11             | 7.61 | 8.25  | 8.75  | 10.31 | 6.70           | 7.21 | 7.84 | 8.35 | 9.90  |
|                 | 4H   | 7.82             | 8.28 | 8.96  | 9.41  | 10.98 | 7.40           | 7.86 | 8.54 | 8.99 | 10.57 |
|                 | 6H   | 8.33             | 8.72 | 9.47  | 9.87  | 11.44 | 7.90           | 8.30 | 9.05 | 9.45 | 11.02 |
|                 | 8H   | 8.47             | 8.85 | 9.62  | 9.99  | 11.57 | 8.05           | 8.42 | 9.19 | 9.56 | 11.14 |
|                 | 12H  | 8.54             | 8.88 | 9.71  | 10.03 | 11.62 | 8.10           | 8.44 | 9.27 | 9.59 | 11.18 |
| 8H              | 4H   | 8.00             | 8.37 | 9.15  | 9.52  | 11.10 | 7.63           | 8.00 | 8.78 | 9.14 | 10.73 |
|                 | 6H   | 8.63             | 8.94 | 9.80  | 10.12 | 11.70 | 8.25           | 8.56 | 9.42 | 9.74 | 11.32 |
|                 | 8H   | 8.85             | 9.12 | 10.02 | 10.28 | 11.88 | 8.47           | 8.73 | 9.64 | 9.90 | 11.50 |
|                 | 12H  | 8.98             | 9.21 | 10.16 | 10.37 | 12.01 | 8.58           | 8.81 | 9.75 | 9.97 | 11.61 |
| 12H             | 4H   | 7.98             | 8.32 | 9.14  | 9.47  | 11.06 | 7.62           | 7.96 | 8.78 | 9.11 | 10.70 |
|                 | 6H   | 8.66             | 8.93 | 9.83  | 10.09 | 11.69 | 8.29           | 8.56 | 9.47 | 9.72 | 11.33 |
|                 | 8H   | 8.90             | 9.13 | 10.07 | 10.29 | 11.92 | 8.52           | 8.76 | 9.70 | 9.92 | 11.55 |

END OF REPORT