

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: P919622

Luminaire Tested: DFN2DIP-PN4F0-070D040US935-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P919622  
REPORT IS A COMBINATION OF REPORTS P899616 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-070D040US935-RLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

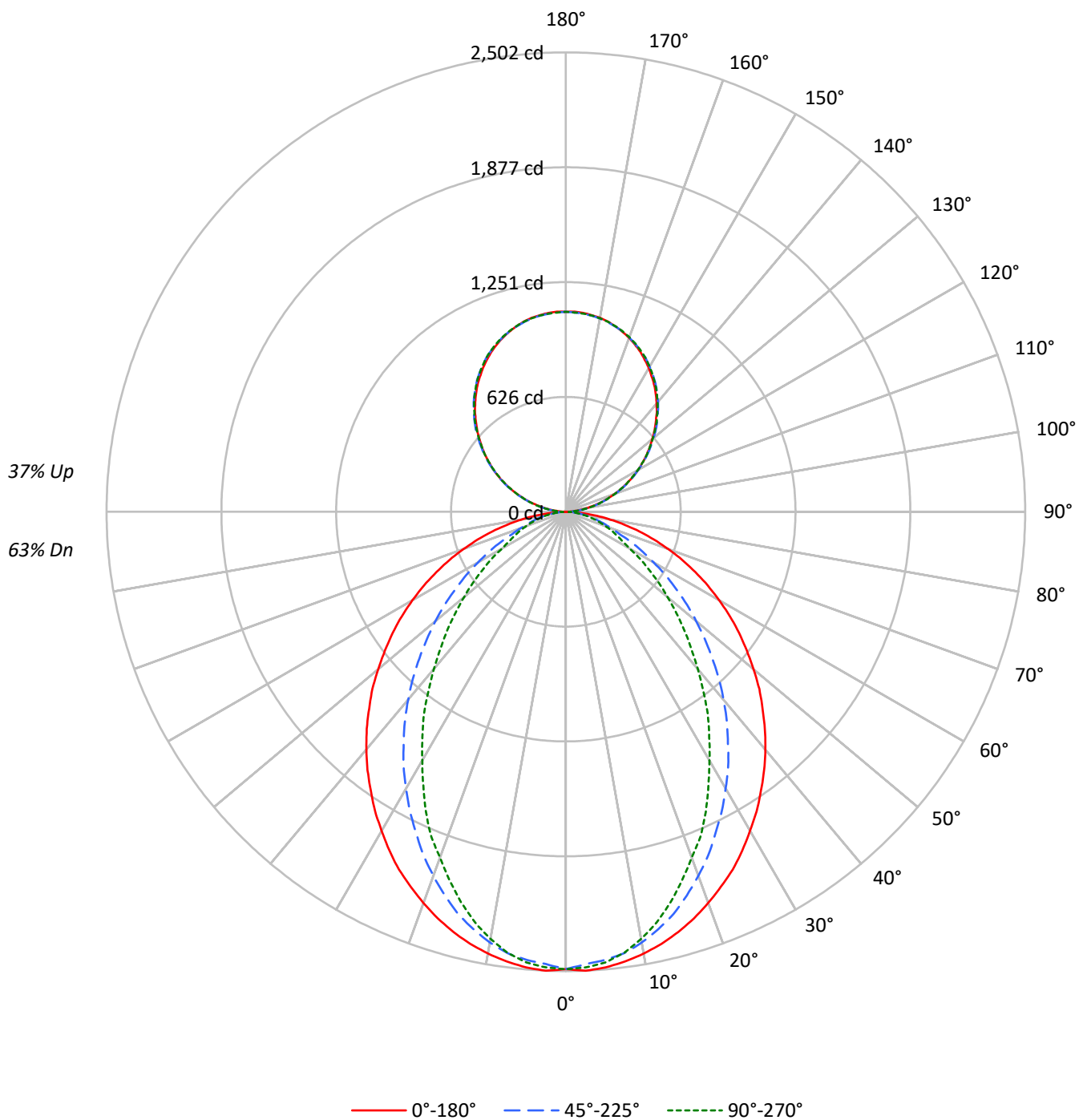
Lumens per Lamp: N/A  
Luminaire Lumens: 8170.8 lumens  
Efficiency: N/A  
Efficacy: 84.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 97  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9789  
Total Harmonic Distortion (THDi): 0.074  
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   | 110 | 110 | 110 | 110 | 103 | 103 | 103 | 103 | 90 | 90 | 90 | 79 | 79 | 79 | 68 | 68 | 68 |
| 1   | 101 | 97  | 93  | 90  | 95  | 91  | 88  | 85  | 80 | 78 | 76 | 70 | 68 | 67 | 61 | 60 | 58 |
| 2   | 93  | 85  | 80  | 75  | 87  | 80  | 75  | 71  | 71 | 67 | 64 | 62 | 59 | 57 | 54 | 52 | 50 |
| 3   | 85  | 76  | 69  | 63  | 79  | 71  | 65  | 60  | 63 | 58 | 54 | 56 | 52 | 49 | 49 | 46 | 43 |
| 4   | 78  | 67  | 60  | 54  | 73  | 64  | 57  | 51  | 57 | 51 | 47 | 50 | 46 | 42 | 44 | 41 | 38 |
| 5   | 72  | 61  | 53  | 47  | 67  | 57  | 50  | 45  | 51 | 45 | 41 | 45 | 41 | 37 | 40 | 36 | 33 |
| 6   | 67  | 55  | 47  | 41  | 62  | 52  | 44  | 39  | 46 | 40 | 36 | 41 | 36 | 33 | 36 | 33 | 30 |
| 7   | 62  | 50  | 42  | 36  | 58  | 47  | 40  | 35  | 42 | 36 | 32 | 38 | 33 | 29 | 33 | 30 | 27 |
| 8   | 57  | 45  | 38  | 32  | 54  | 43  | 36  | 31  | 39 | 33 | 29 | 35 | 30 | 26 | 31 | 27 | 24 |
| 9   | 54  | 42  | 34  | 29  | 50  | 40  | 33  | 28  | 36 | 30 | 26 | 32 | 27 | 24 | 29 | 25 | 22 |
| 10  | 50  | 38  | 31  | 26  | 47  | 36  | 30  | 25  | 33 | 27 | 24 | 30 | 25 | 22 | 27 | 23 | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1818 | 1818 | 1818 |
| 5°  | 1821 | 1790 | 1801 |
| 10° | 1803 | 1755 | 1743 |
| 15° | 1778 | 1697 | 1653 |
| 20° | 1746 | 1617 | 1542 |
| 25° | 1712 | 1528 | 1435 |
| 30° | 1667 | 1436 | 1299 |
| 35° | 1622 | 1338 | 1179 |
| 40° | 1577 | 1236 | 1042 |
| 45° | 1525 | 1122 | 918  |
| 50° | 1471 | 1008 | 797  |
| 55° | 1415 | 886  | 680  |
| 60° | 1349 | 758  | 560  |
| 65° | 1274 | 628  | 504  |
| 70° | 1183 | 507  | 457  |
| 75° | 1068 | 447  | 417  |
| 80° | 902  | 376  | 363  |
| 85° | 629  | 252  | 275  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 1525 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 233.5  | 2.9       |
| 10°-20°   | 640.9  | 7.8       |
| 20°-30°   | 899.8  | 11.0      |
| 30°-40°   | 980.8  | 12.0      |
| 40°-50°   | 901.5  | 11.0      |
| 50°-60°   | 708.0  | 8.7       |
| 60°-70°   | 460.8  | 5.6       |
| 70°-80°   | 237.2  | 2.9       |
| 80°-90°   | 63.6   | 0.8       |
| 90°-100°  | 67.4   | 0.8       |
| 100°-110° | 214.2  | 2.6       |
| 110°-120° | 366.5  | 4.5       |
| 120°-130° | 482.0  | 5.9       |
| 130°-140° | 541.0  | 6.6       |
| 140°-150° | 530.5  | 6.5       |
| 150°-160° | 445.0  | 5.4       |
| 160°-170° | 295.1  | 3.6       |
| 170°-180° | 103.2  | 1.3       |
| 0°-30°    | 1774.1 | 21.7      |
| 0°-40°    | 2754.9 | 33.7      |
| 0°-60°    | 4364.3 | 53.4      |
| 0°-90°    | 5126.0 | 62.7      |
| 90°-120°  | 648.0  | 7.9       |
| 90°-150°  | 2201.5 | 26.9      |
| 90°-180°  | 3045.0 | 37.3      |
| 0°-180°   | 8170.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2491 | 2491  | 2491 | 2491  | 2491 |      |
| 5°   | 2491 | 2480  | 2450 | 2471  | 2464 | 236  |
| 15°  | 2369 | 2344  | 2268 | 2225  | 2202 | 668  |
| 25°  | 2151 | 2078  | 1930 | 1837  | 1803 | 989  |
| 35°  | 1853 | 1738  | 1540 | 1398  | 1348 | 1160 |
| 45°  | 1515 | 1364  | 1127 | 967   | 913  | 1170 |
| 55°  | 1152 | 976   | 732  | 597   | 555  | 1029 |
| 65°  | 778  | 595   | 392  | 316   | 309  | 771  |
| 75°  | 415  | 257   | 180  | 164   | 162  | 439  |
| 85°  | 97   | 50    | 43   | 43    | 43   | 111  |
| 90°  | 1    | 12    | 32   | 30    | 31   | 8    |
| 95°  | 48   | 57    | 59   | 59    | 57   | 53   |
| 105° | 198  | 200   | 202  | 204   | 204  | 209  |
| 115° | 368  | 373   | 371  | 370   | 368  | 364  |
| 125° | 535  | 543   | 540  | 538   | 537  | 478  |
| 135° | 692  | 702   | 704  | 703   | 700  | 535  |
| 145° | 840  | 846   | 852  | 853   | 849  | 525  |
| 155° | 960  | 963   | 966  | 971   | 968  | 442  |
| 165° | 1045 | 1044  | 1044 | 1050  | 1046 | 295  |
| 175° | 1087 | 1085  | 1083 | 1089  | 1084 | 103  |
| 180° | 1089 | 1089  | 1089 | 1089  | 1089 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2491.0 | 2491.0 | 2491.0 | 2491.0 | 2491.0 |
| 2.5°   | 2502.1 | 2491.0 | 2466.1 | 2488.8 | 2484.2 |
| 5°     | 2491.0 | 2479.7 | 2450.3 | 2470.6 | 2463.9 |
| 7.5°   | 2470.6 | 2457.2 | 2425.7 | 2434.5 | 2423.3 |
| 10°    | 2443.6 | 2427.8 | 2382.8 | 2375.9 | 2362.5 |
| 12.5°  | 2409.8 | 2389.5 | 2328.6 | 2315.1 | 2290.3 |
| 15°    | 2369.2 | 2344.3 | 2267.8 | 2225.0 | 2202.5 |
| 17.5°  | 2321.9 | 2285.8 | 2191.1 | 2141.5 | 2105.4 |
| 20°    | 2267.8 | 2222.6 | 2110.0 | 2053.7 | 2004.0 |
| 22.5°  | 2209.2 | 2157.3 | 2026.4 | 1949.9 | 1916.2 |
| 25°    | 2150.6 | 2078.4 | 1929.6 | 1837.3 | 1803.4 |
| 27.5°  | 2080.8 | 2004.0 | 1839.4 | 1733.5 | 1681.6 |
| 30°    | 2006.4 | 1920.5 | 1740.2 | 1625.4 | 1564.4 |
| 32.5°  | 1934.1 | 1830.4 | 1645.7 | 1510.4 | 1453.9 |
| 35°    | 1853.0 | 1738.0 | 1539.8 | 1397.7 | 1348.0 |
| 37.5°  | 1774.2 | 1650.0 | 1440.5 | 1284.8 | 1228.6 |
| 40°    | 1690.7 | 1555.6 | 1336.7 | 1176.7 | 1118.1 |
| 42.5°  | 1605.1 | 1460.9 | 1233.1 | 1066.2 | 1010.0 |
| 45°    | 1514.9 | 1363.7 | 1127.2 | 967.0  | 912.9  |
| 47.5°  | 1429.3 | 1269.3 | 1025.8 | 865.6  | 816.1  |
| 50°    | 1334.5 | 1174.6 | 926.5  | 770.9  | 723.8  |
| 52.5°  | 1242.0 | 1072.9 | 831.8  | 683.0  | 640.2  |
| 55°    | 1151.8 | 976.0  | 732.5  | 597.4  | 554.7  |
| 57.5°  | 1059.5 | 879.2  | 644.8  | 518.5  | 482.4  |
| 60°    | 964.8  | 784.5  | 552.2  | 437.5  | 401.3  |
| 62.5°  | 872.4  | 692.2  | 473.3  | 365.2  | 347.2  |
| 65°    | 777.7  | 595.0  | 392.3  | 315.7  | 308.8  |
| 67.5°  | 687.6  | 504.9  | 315.7  | 277.2  | 270.5  |
| 70°    | 592.9  | 417.1  | 261.4  | 238.9  | 229.8  |
| 72.5°  | 502.7  | 335.8  | 218.6  | 200.7  | 196.1  |
| 75°    | 414.7  | 256.8  | 180.3  | 164.5  | 162.4  |
| 77.5°  | 326.9  | 182.4  | 142.1  | 132.9  | 128.5  |
| 80°    | 245.6  | 130.8  | 108.1  | 99.3   | 99.3   |
| 82.5°  | 171.3  | 88.0   | 74.4   | 69.8   | 69.8   |
| 85°    | 96.9   | 49.5   | 42.8   | 42.8   | 42.8   |
| 87.5°  | 36.1   | 17.9   | 17.9   | 15.8   | 15.8   |
| 90°    | 0.9    | 11.8   | 32.2   | 30.2   | 31.2   |
| 92.5°  | 20.3   | 27.6   | 28.6   | 29.5   | 29.5   |
| 95°    | 48.0   | 57.2   | 58.8   | 58.8   | 57.2   |
| 97.5°  | 79.8   | 88.3   | 92.0   | 92.0   | 92.0   |
| 100°   | 116.6  | 124.2  | 126.7  | 126.7  | 125.8  |
| 102.5° | 155.3  | 160.9  | 164.5  | 165.5  | 164.5  |
| 105°   | 197.7  | 200.3  | 202.2  | 203.9  | 203.9  |
| 107.5° | 239.7  | 243.7  | 243.7  | 244.3  | 239.7  |
| 110°   | 280.4  | 285.7  | 285.7  | 285.7  | 283.1  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 324.4  | 330.0  | 329.0  | 326.4  | 324.4  |
| 115°   | 367.7  | 373.1  | 371.3  | 370.4  | 367.7  |
| 117.5° | 410.8  | 418.0  | 413.5  | 410.8  | 408.2  |
| 120°   | 454.2  | 461.3  | 454.2  | 454.2  | 451.2  |
| 122.5° | 493.5  | 502.7  | 498.2  | 495.5  | 493.5  |
| 125°   | 534.9  | 543.1  | 540.5  | 537.5  | 536.6  |
| 127.5° | 575.3  | 585.5  | 581.9  | 577.9  | 575.3  |
| 130°   | 613.0  | 624.9  | 623.3  | 621.3  | 617.7  |
| 132.5° | 655.4  | 664.6  | 665.3  | 660.6  | 658.1  |
| 135°   | 691.9  | 702.1  | 704.0  | 703.0  | 700.4  |
| 137.5° | 732.6  | 740.8  | 742.4  | 741.7  | 737.9  |
| 140°   | 768.4  | 776.6  | 781.2  | 781.2  | 777.6  |
| 142.5° | 805.2  | 813.4  | 816.0  | 817.0  | 813.4  |
| 145°   | 840.0  | 846.5  | 851.8  | 852.8  | 849.2  |
| 147.5° | 871.2  | 879.3  | 883.3  | 884.9  | 881.3  |
| 150°   | 903.4  | 909.0  | 912.6  | 915.5  | 912.6  |
| 152.5° | 931.9  | 937.5  | 942.1  | 945.7  | 942.1  |
| 155°   | 960.4  | 963.1  | 966.0  | 970.7  | 967.7  |
| 157.5° | 985.2  | 987.0  | 988.7  | 995.3  | 990.7  |
| 160°   | 1007.1 | 1009.1 | 1010.0 | 1015.6 | 1011.7 |
| 162.5° | 1027.4 | 1027.4 | 1028.5 | 1034.7 | 1030.1 |
| 165°   | 1044.9 | 1043.9 | 1043.9 | 1050.4 | 1045.9 |
| 167.5° | 1060.7 | 1057.6 | 1057.6 | 1064.3 | 1059.6 |
| 170°   | 1072.5 | 1069.8 | 1068.8 | 1075.4 | 1069.8 |
| 172.5° | 1080.6 | 1078.1 | 1077.0 | 1083.7 | 1078.1 |
| 175°   | 1087.3 | 1084.6 | 1082.6 | 1089.2 | 1083.7 |
| 177.5° | 1090.9 | 1088.2 | 1086.2 | 1091.8 | 1086.2 |
| 180°   | 1089.2 | 1089.2 | 1089.2 | 1089.2 | 1089.2 |

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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 | 10.34            | 11.29 | 11.19 | 12.15 | 13.23 | 6.31           | 7.25  | 7.15  | 8.12  | 9.20  |
|                 | 3H   | 12.03            | 12.88 | 12.89 | 13.75 | 14.86 | 7.51           | 8.35  | 8.37  | 9.23  | 10.33 |
|                 | 4H   | 12.65            | 13.45 | 13.52 | 14.33 | 15.44 | 7.96           | 8.76  | 8.84  | 9.64  | 10.76 |
|                 | 6H   | 13.08            | 13.81 | 13.97 | 14.70 | 15.83 | 8.29           | 9.03  | 9.18  | 9.91  | 11.04 |
|                 | 8H   | 13.21            | 13.91 | 14.11 | 14.81 | 15.94 | 8.38           | 9.08  | 9.28  | 9.99  | 11.12 |
|                 | 12H  | 13.28            | 13.94 | 14.18 | 14.84 | 15.99 | 8.43           | 9.10  | 9.33  | 10.00 | 11.15 |
| 4H              | 2H   | 10.38            | 11.17 | 11.26 | 12.05 | 13.17 | 6.92           | 7.72  | 7.80  | 8.60  | 9.72  |
|                 | 3H   | 12.22            | 12.88 | 13.11 | 13.79 | 14.93 | 8.28           | 8.94  | 9.17  | 9.86  | 10.99 |
|                 | 4H   | 12.92            | 13.52 | 13.82 | 14.43 | 15.59 | 8.83           | 9.44  | 9.74  | 10.35 | 11.50 |
|                 | 6H   | 13.44            | 13.96 | 14.36 | 14.89 | 16.05 | 9.26           | 9.78  | 10.18 | 10.71 | 11.87 |
|                 | 8H   | 13.62            | 14.11 | 14.54 | 15.03 | 16.21 | 9.39           | 9.88  | 10.31 | 10.80 | 11.98 |
|                 | 12H  | 13.72            | 14.16 | 14.66 | 15.10 | 16.28 | 9.46           | 9.90  | 10.40 | 10.84 | 12.02 |
| 8H              | 4H   | 12.89            | 13.38 | 13.81 | 14.31 | 15.48 | 9.12           | 9.61  | 10.04 | 10.54 | 11.71 |
|                 | 6H   | 13.47            | 13.87 | 14.41 | 14.84 | 16.01 | 9.65           | 10.05 | 10.59 | 11.02 | 12.19 |
|                 | 8H   | 13.69            | 14.04 | 14.64 | 15.00 | 16.19 | 9.84           | 10.20 | 10.80 | 11.15 | 12.35 |
|                 | 12H  | 13.83            | 14.14 | 14.79 | 15.10 | 16.34 | 9.97           | 10.28 | 10.92 | 11.23 | 12.47 |
| 12H             | 4H   | 12.85            | 13.29 | 13.79 | 14.23 | 15.41 | 9.13           | 9.57  | 10.07 | 10.52 | 11.69 |
|                 | 6H   | 13.44            | 13.80 | 14.40 | 14.76 | 15.95 | 9.70           | 10.05 | 10.65 | 11.01 | 12.20 |
|                 | 8H   | 13.67            | 13.98 | 14.63 | 14.93 | 16.17 | 9.92           | 10.23 | 10.87 | 11.18 | 12.42 |

END OF REPORT