

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: P914078

Luminaire Tested: DFN2DIP-PN4F0-040D090US927-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P914078  
REPORT IS A COMBINATION OF REPORTS P899700 AND P896497  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-PN4F0-040D090US927-RLLFLL  
Description: 4 foot, Pentagon Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

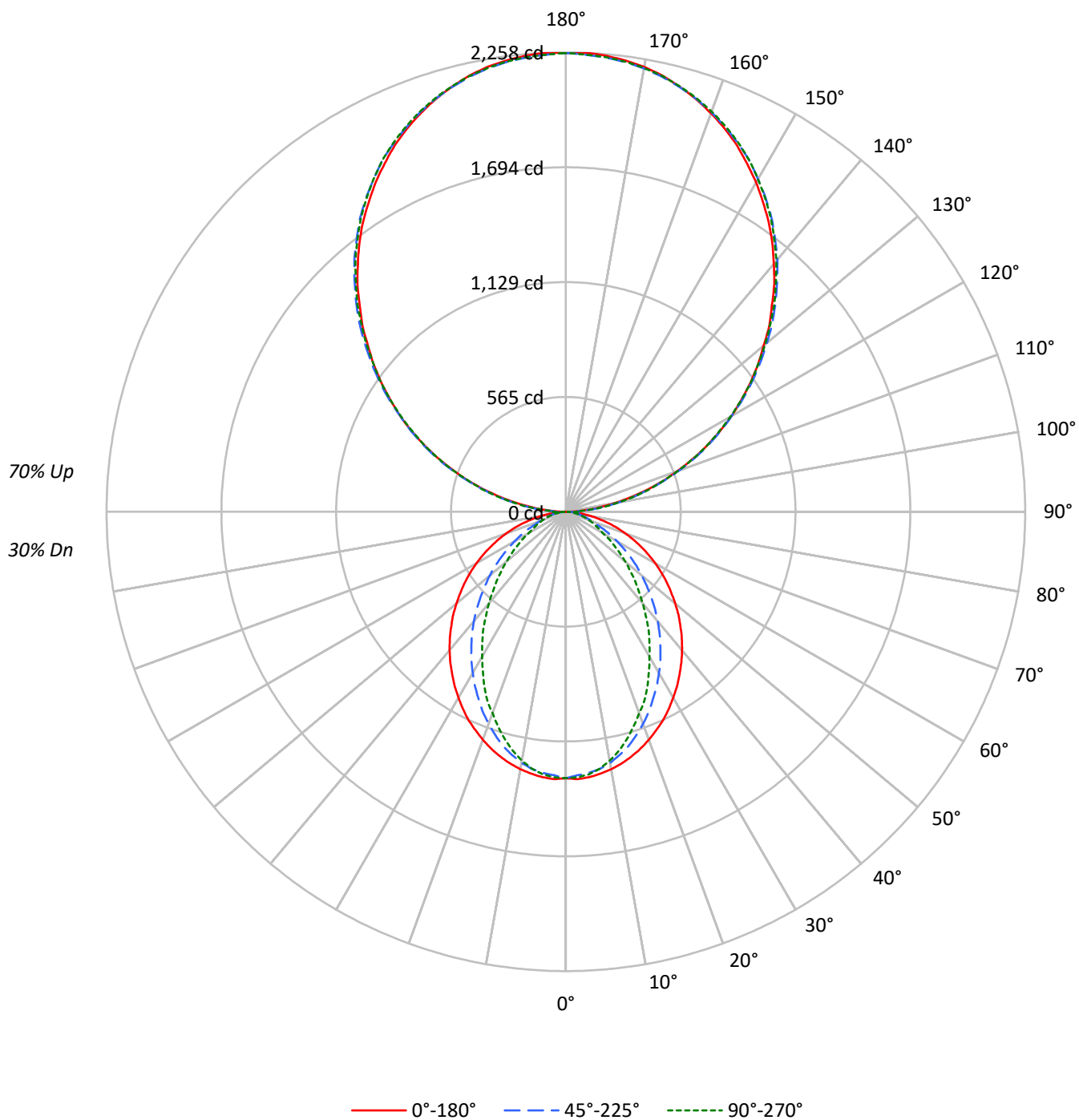
Lumens per Lamp: N/A  
Luminaire Lumens: 9003.1 lumens  
Efficiency: N/A  
Efficacy: 90.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.74' x L: 3.94' x H: 0.1')  
CIE Type: Semi-Indirect

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   | 102 | 102 | 102 | 102 | 92 | 92 | 92 | 92 | 72 | 72 | 72 | 54 | 54 | 54 | 38 | 38 | 38 |
| 1   | 94  | 89  | 86  | 83  | 84 | 80 | 77 | 75 | 64 | 62 | 60 | 48 | 47 | 46 | 34 | 33 | 32 |
| 2   | 85  | 78  | 73  | 68  | 76 | 71 | 66 | 62 | 56 | 53 | 50 | 43 | 40 | 38 | 30 | 29 | 28 |
| 3   | 78  | 69  | 62  | 57  | 70 | 62 | 57 | 52 | 50 | 46 | 42 | 38 | 35 | 33 | 27 | 25 | 24 |
| 4   | 71  | 61  | 54  | 48  | 64 | 55 | 49 | 44 | 44 | 40 | 36 | 34 | 31 | 28 | 24 | 22 | 21 |
| 5   | 66  | 55  | 47  | 41  | 59 | 49 | 43 | 38 | 40 | 35 | 31 | 30 | 27 | 25 | 22 | 20 | 18 |
| 6   | 60  | 49  | 41  | 36  | 54 | 44 | 38 | 33 | 36 | 31 | 27 | 28 | 24 | 22 | 20 | 18 | 16 |
| 7   | 56  | 44  | 37  | 31  | 50 | 40 | 33 | 29 | 32 | 27 | 24 | 25 | 22 | 19 | 18 | 16 | 14 |
| 8   | 52  | 40  | 33  | 28  | 46 | 36 | 30 | 25 | 29 | 25 | 21 | 23 | 20 | 17 | 17 | 15 | 13 |
| 9   | 48  | 36  | 29  | 25  | 43 | 33 | 27 | 23 | 27 | 22 | 19 | 21 | 18 | 15 | 16 | 13 | 12 |
| 10  | 45  | 33  | 27  | 22  | 40 | 30 | 24 | 20 | 25 | 20 | 17 | 19 | 16 | 14 | 14 | 12 | 11 |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 956 | 956 | 956 |
| 5°  | 957 | 941 | 947 |
| 10° | 948 | 923 | 916 |
| 15° | 935 | 892 | 869 |
| 20° | 918 | 850 | 811 |
| 25° | 900 | 803 | 754 |
| 30° | 876 | 755 | 683 |
| 35° | 853 | 703 | 620 |
| 40° | 829 | 650 | 548 |
| 45° | 802 | 590 | 483 |
| 50° | 773 | 530 | 419 |
| 55° | 744 | 466 | 357 |
| 60° | 709 | 398 | 294 |
| 65° | 670 | 330 | 265 |
| 70° | 622 | 266 | 240 |
| 75° | 562 | 235 | 219 |
| 80° | 474 | 198 | 191 |
| 85° | 330 | 133 | 144 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1766 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 122.7  | 1.4       |
| 10°-20°   | 336.9  | 3.7       |
| 20°-30°   | 473.1  | 5.3       |
| 30°-40°   | 515.7  | 5.7       |
| 40°-50°   | 473.9  | 5.3       |
| 50°-60°   | 372.2  | 4.1       |
| 60°-70°   | 242.3  | 2.7       |
| 70°-80°   | 124.7  | 1.4       |
| 80°-90°   | 38.2   | 0.4       |
| 90°-100°  | 139.5  | 1.5       |
| 100°-110° | 443.3  | 4.9       |
| 110°-120° | 758.7  | 8.4       |
| 120°-130° | 997.8  | 11.1      |
| 130°-140° | 1120.0 | 12.4      |
| 140°-150° | 1098.2 | 12.2      |
| 150°-160° | 921.3  | 10.2      |
| 160°-170° | 611.0  | 6.8       |
| 170°-180° | 213.5  | 2.4       |
| 0°-30°    | 932.7  | 10.4      |
| 0°-40°    | 1448.4 | 16.1      |
| 0°-60°    | 2294.6 | 25.5      |
| 0°-90°    | 2699.8 | 30.0      |
| 90°-120°  | 1341.5 | 14.9      |
| 90°-150°  | 4557.5 | 50.6      |
| 90°-180°  | 6303.0 | 70.0      |
| 0°-180°   | 9003.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1310 | 1310  | 1310 | 1310  | 1310 |      |
| 5°   | 1310 | 1304  | 1288 | 1299  | 1296 | 124  |
| 15°  | 1246 | 1233  | 1192 | 1170  | 1158 | 351  |
| 25°  | 1131 | 1093  | 1014 | 966   | 948  | 520  |
| 35°  | 974  | 914   | 810  | 735   | 709  | 610  |
| 45°  | 796  | 717   | 593  | 508   | 480  | 615  |
| 55°  | 606  | 513   | 385  | 314   | 292  | 541  |
| 65°  | 409  | 313   | 206  | 166   | 162  | 405  |
| 75°  | 218  | 135   | 95   | 86    | 85   | 231  |
| 85°  | 51   | 26    | 22   | 22    | 22   | 58   |
| 90°  | 2    | 24    | 67   | 62    | 65   | 9    |
| 95°  | 99   | 118   | 122  | 122   | 118  | 110  |
| 105° | 409  | 415   | 419  | 422   | 422  | 432  |
| 115° | 761  | 772   | 769  | 767   | 761  | 753  |
| 125° | 1107 | 1124  | 1119 | 1113  | 1111 | 990  |
| 135° | 1432 | 1453  | 1458 | 1455  | 1450 | 1107 |
| 145° | 1739 | 1752  | 1763 | 1765  | 1758 | 1086 |
| 155° | 1988 | 1994  | 2000 | 2009  | 2003 | 915  |
| 165° | 2163 | 2161  | 2161 | 2175  | 2165 | 610  |
| 175° | 2251 | 2245  | 2241 | 2255  | 2243 | 214  |
| 180° | 2255 | 2255  | 2255 | 2255  | 2255 |      |

TEST NUMBER: P914078

CATALOG NUMBER: DFN2DIP-PN4F0-040D090US927-RLFL

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1309.6 | 1309.6 | 1309.6 | 1309.6 | 1309.6 |
| 2.5°   | 1315.6 | 1309.6 | 1296.6 | 1308.5 | 1306.1 |
| 5°     | 1309.6 | 1303.7 | 1288.2 | 1298.9 | 1295.5 |
| 7.5°   | 1298.9 | 1291.9 | 1275.3 | 1279.9 | 1274.1 |
| 10°    | 1284.8 | 1276.4 | 1252.8 | 1249.1 | 1242.1 |
| 12.5°  | 1267.0 | 1256.3 | 1224.2 | 1217.2 | 1204.1 |
| 15°    | 1245.6 | 1232.6 | 1192.3 | 1169.8 | 1158.0 |
| 17.5°  | 1220.8 | 1201.7 | 1151.9 | 1125.9 | 1106.9 |
| 20°    | 1192.3 | 1168.5 | 1109.3 | 1079.7 | 1053.6 |
| 22.5°  | 1161.5 | 1134.2 | 1065.4 | 1025.2 | 1007.5 |
| 25°    | 1130.7 | 1092.7 | 1014.5 | 966.0  | 948.1  |
| 27.5°  | 1094.0 | 1053.6 | 967.1  | 911.4  | 884.1  |
| 30°    | 1054.9 | 1009.7 | 914.9  | 854.5  | 822.5  |
| 32.5°  | 1016.9 | 962.3  | 865.2  | 794.1  | 764.4  |
| 35°    | 974.3  | 913.8  | 809.5  | 734.8  | 708.7  |
| 37.5°  | 932.8  | 867.5  | 757.3  | 675.5  | 645.9  |
| 40°    | 888.9  | 817.8  | 702.8  | 618.7  | 587.9  |
| 42.5°  | 843.8  | 768.0  | 648.3  | 560.5  | 531.0  |
| 45°    | 796.5  | 717.0  | 592.6  | 508.4  | 480.0  |
| 47.5°  | 751.5  | 667.3  | 539.3  | 455.1  | 429.0  |
| 50°    | 701.6  | 617.5  | 487.1  | 405.3  | 380.5  |
| 52.5°  | 653.0  | 564.1  | 437.4  | 359.1  | 336.6  |
| 55°    | 605.6  | 513.2  | 385.2  | 314.1  | 291.6  |
| 57.5°  | 557.1  | 462.2  | 339.0  | 272.6  | 253.7  |
| 60°    | 507.2  | 412.4  | 290.3  | 230.0  | 211.0  |
| 62.5°  | 458.8  | 363.9  | 248.8  | 192.0  | 182.6  |
| 65°    | 408.9  | 312.8  | 206.2  | 166.0  | 162.3  |
| 67.5°  | 361.6  | 265.5  | 166.0  | 145.8  | 142.2  |
| 70°    | 311.7  | 219.3  | 137.4  | 125.6  | 120.8  |
| 72.5°  | 264.4  | 176.6  | 114.9  | 105.5  | 103.1  |
| 75°    | 218.0  | 135.1  | 94.8   | 86.5   | 85.4   |
| 77.5°  | 171.9  | 95.9   | 74.7   | 69.9   | 67.5   |
| 80°    | 129.1  | 68.8   | 56.8   | 52.2   | 52.2   |
| 82.5°  | 90.1   | 46.3   | 39.1   | 36.7   | 36.7   |
| 85°    | 50.9   | 26.1   | 22.5   | 22.5   | 22.5   |
| 87.5°  | 19.0   | 9.4    | 9.4    | 8.3    | 8.3    |
| 90°    | 2.1    | 24.5   | 66.6   | 62.5   | 64.6   |
| 92.5°  | 42.1   | 57.1   | 59.2   | 61.2   | 61.2   |
| 95°    | 99.3   | 118.3  | 121.7  | 121.7  | 118.3  |
| 97.5°  | 165.2  | 182.8  | 190.4  | 190.4  | 190.4  |
| 100°   | 241.3  | 257.0  | 262.4  | 262.4  | 260.4  |
| 102.5° | 321.5  | 333.1  | 340.6  | 342.6  | 340.6  |
| 105°   | 409.2  | 414.6  | 418.7  | 422.2  | 422.2  |
| 107.5° | 496.2  | 504.4  | 504.4  | 505.7  | 496.2  |
| 110°   | 580.5  | 591.4  | 591.4  | 591.4  | 586.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 671.6  | 683.2  | 681.1  | 675.7  | 671.6  |
| 115°   | 761.4  | 772.2  | 768.8  | 766.8  | 761.4  |
| 117.5° | 850.4  | 865.4  | 855.9  | 850.4  | 844.9  |
| 120°   | 940.2  | 955.1  | 940.2  | 940.2  | 934.0  |
| 122.5° | 1021.7 | 1040.8 | 1031.3 | 1025.8 | 1021.7 |
| 125°   | 1107.4 | 1124.3 | 1119.0 | 1112.8 | 1110.8 |
| 127.5° | 1191.0 | 1212.0 | 1204.6 | 1196.4 | 1191.0 |
| 130°   | 1269.2 | 1293.6 | 1290.2 | 1286.1 | 1278.7 |
| 132.5° | 1356.8 | 1375.9 | 1377.2 | 1367.7 | 1362.3 |
| 135°   | 1432.3 | 1453.3 | 1457.5 | 1455.4 | 1450.0 |
| 137.5° | 1516.6 | 1533.6 | 1537.0 | 1535.6 | 1527.5 |
| 140°   | 1590.7 | 1607.7 | 1617.2 | 1617.2 | 1609.7 |
| 142.5° | 1666.8 | 1683.8 | 1689.2 | 1691.3 | 1683.8 |
| 145°   | 1738.9 | 1752.5 | 1763.3 | 1765.4 | 1757.9 |
| 147.5° | 1803.5 | 1820.4 | 1828.6 | 1832.0 | 1824.6 |
| 150°   | 1870.1 | 1881.7 | 1889.1 | 1895.2 | 1889.1 |
| 152.5° | 1929.2 | 1940.8 | 1950.3 | 1957.8 | 1950.3 |
| 155°   | 1988.4 | 1993.8 | 1999.9 | 2009.4 | 2003.3 |
| 157.5° | 2039.3 | 2043.4 | 2046.8 | 2060.4 | 2050.9 |
| 160°   | 2084.9 | 2089.0 | 2091.0 | 2102.5 | 2094.4 |
| 162.5° | 2127.0 | 2127.0 | 2129.1 | 2142.0 | 2132.5 |
| 165°   | 2163.1 | 2161.0 | 2161.0 | 2174.6 | 2165.1 |
| 167.5° | 2195.7 | 2189.6 | 2189.6 | 2203.1 | 2193.6 |
| 170°   | 2220.2 | 2214.7 | 2212.7 | 2226.3 | 2214.7 |
| 172.5° | 2237.1 | 2231.7 | 2229.7 | 2243.3 | 2231.7 |
| 175°   | 2250.7 | 2245.3 | 2241.2 | 2254.9 | 2243.3 |
| 177.5° | 2258.2 | 2252.8 | 2248.7 | 2260.3 | 2248.7 |
| 180°   | 2254.9 | 2254.9 | 2254.9 | 2254.9 | 2254.9 |

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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 | 4.76             | 5.45 | 5.88 | 6.56 | 8.09  | 0.73           | 1.42 | 1.84 | 2.52 | 4.06 |
|                 | 3H   | 6.43             | 7.05 | 7.56 | 8.16 | 9.71  | 1.90           | 2.52 | 3.03 | 3.64 | 5.19 |
|                 | 4H   | 7.03             | 7.62 | 8.17 | 8.74 | 10.29 | 2.35           | 2.93 | 3.48 | 4.05 | 5.61 |
|                 | 6H   | 7.45             | 7.99 | 8.59 | 9.11 | 10.67 | 2.66           | 3.20 | 3.81 | 4.32 | 5.89 |
|                 | 8H   | 7.57             | 8.09 | 8.72 | 9.22 | 10.78 | 2.75           | 3.26 | 3.90 | 4.40 | 5.95 |
|                 | 12H  | 7.63             | 8.12 | 8.78 | 9.25 | 10.83 | 2.79           | 3.27 | 3.94 | 4.40 | 5.98 |
| 4H              | 2H   | 4.76             | 5.35 | 5.90 | 6.46 | 8.02  | 1.30           | 1.89 | 2.45 | 3.01 | 4.56 |
|                 | 3H   | 6.58             | 7.07 | 7.73 | 8.21 | 9.78  | 2.64           | 3.13 | 3.79 | 4.27 | 5.84 |
|                 | 4H   | 7.27             | 7.72 | 8.42 | 8.85 | 10.44 | 3.19           | 3.63 | 4.34 | 4.77 | 6.35 |
|                 | 6H   | 7.78             | 8.16 | 8.94 | 9.32 | 10.90 | 3.60           | 3.98 | 4.75 | 5.14 | 6.71 |
|                 | 8H   | 7.95             | 8.31 | 9.11 | 9.46 | 11.05 | 3.73           | 4.08 | 4.88 | 5.23 | 6.82 |
|                 | 12H  | 8.04             | 8.37 | 9.22 | 9.53 | 11.12 | 3.78           | 4.11 | 4.96 | 5.27 | 6.86 |
| 8H              | 4H   | 7.23             | 7.58 | 8.38 | 8.73 | 10.32 | 3.46           | 3.82 | 4.61 | 4.96 | 6.56 |
|                 | 6H   | 7.79             | 8.09 | 8.97 | 9.27 | 10.86 | 3.97           | 4.27 | 5.15 | 5.46 | 7.05 |
|                 | 8H   | 8.01             | 8.27 | 9.19 | 9.43 | 11.04 | 4.16           | 4.42 | 5.34 | 5.59 | 7.20 |
|                 | 12H  | 8.14             | 8.37 | 9.33 | 9.53 | 11.18 | 4.28           | 4.50 | 5.46 | 5.67 | 7.31 |
| 12H             | 4H   | 7.17             | 7.50 | 8.34 | 8.65 | 10.25 | 3.46           | 3.78 | 4.63 | 4.94 | 6.54 |
|                 | 6H   | 7.77             | 8.02 | 8.95 | 9.19 | 10.80 | 4.02           | 4.28 | 5.20 | 5.45 | 7.06 |
|                 | 8H   | 7.98             | 8.21 | 9.17 | 9.37 | 11.02 | 4.23           | 4.45 | 5.41 | 5.62 | 7.26 |

END OF REPORT