

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: P910472

Luminaire Tested: DFN2DIP-4P4F0-030D060US850-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P910472  
REPORT IS A COMBINATION OF REPORTS P899116 AND P895967  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P4F0-030D060US850-RLLFLL  
Description: 4 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

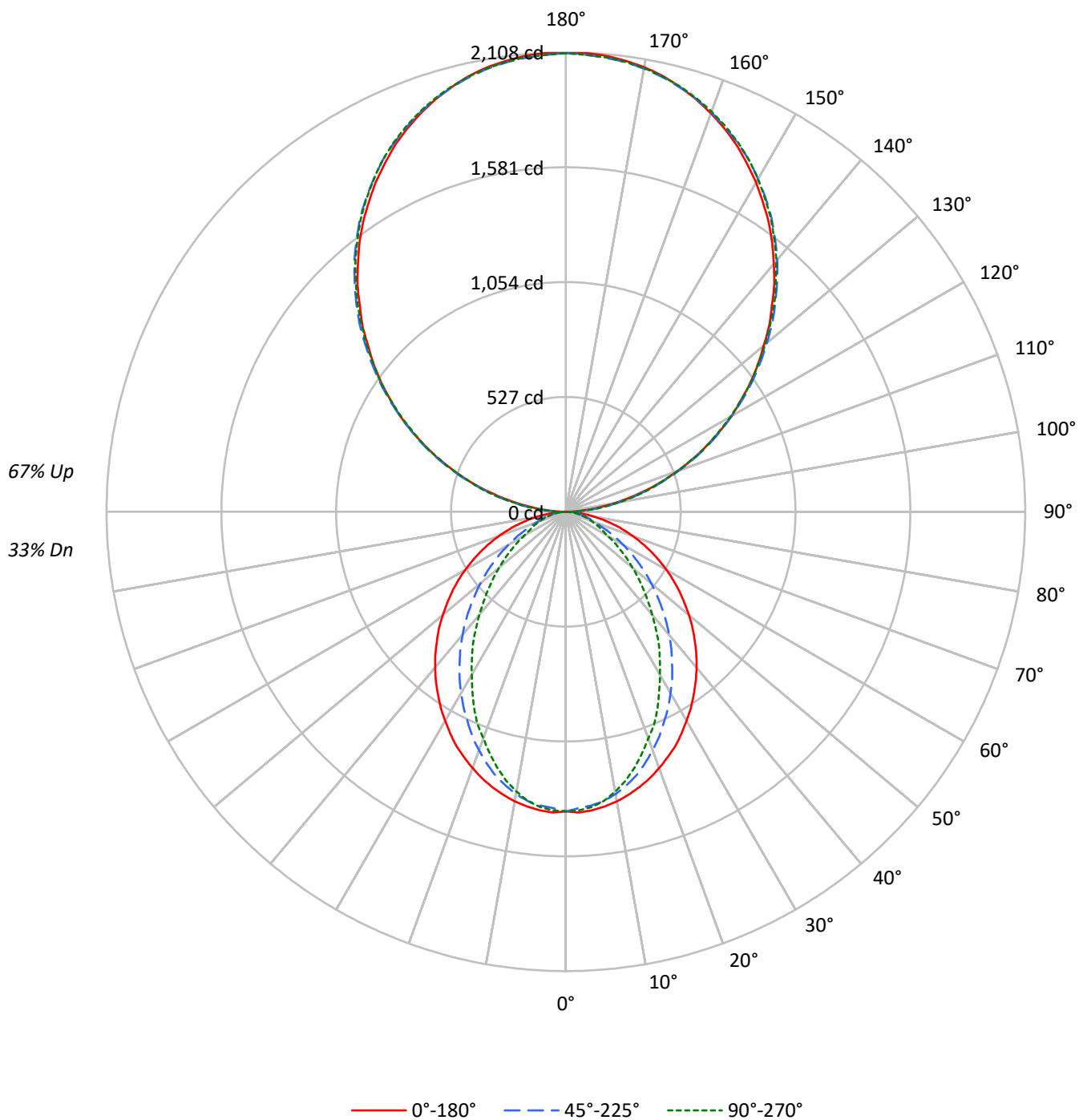
Lumens per Lamp: N/A  
Luminaire Lumens: 8716.7 lumens  
Efficiency: N/A  
Efficacy: 111.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 4.07' x L: 4.07' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 78  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.983  
Total Harmonic Distortion (THDi): 0.073  
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 | 93 | 93 | 93 | 93 | 74 | 74 | 74 | 56 | 56 | 56 | 40 | 40 | 40 |
| 1   | 94  | 90  | 86  | 83  | 85 | 81 | 78 | 75 | 65 | 63 | 61 | 50 | 48 | 47 | 36 | 35 | 34 |
| 2   | 86  | 79  | 73  | 68  | 77 | 71 | 67 | 62 | 57 | 54 | 51 | 44 | 42 | 40 | 32 | 31 | 29 |
| 3   | 79  | 70  | 63  | 57  | 71 | 63 | 57 | 52 | 51 | 46 | 43 | 39 | 36 | 34 | 29 | 27 | 25 |
| 4   | 72  | 62  | 54  | 49  | 65 | 56 | 50 | 45 | 45 | 41 | 37 | 35 | 32 | 29 | 26 | 24 | 22 |
| 5   | 66  | 55  | 47  | 42  | 59 | 50 | 43 | 38 | 40 | 36 | 32 | 32 | 28 | 26 | 23 | 21 | 19 |
| 6   | 61  | 49  | 42  | 36  | 55 | 45 | 38 | 33 | 36 | 32 | 28 | 29 | 25 | 23 | 21 | 19 | 17 |
| 7   | 56  | 45  | 37  | 32  | 51 | 41 | 34 | 29 | 33 | 28 | 25 | 26 | 23 | 20 | 19 | 17 | 15 |
| 8   | 52  | 40  | 33  | 28  | 47 | 37 | 30 | 26 | 30 | 25 | 22 | 24 | 20 | 18 | 18 | 16 | 14 |
| 9   | 49  | 37  | 30  | 25  | 44 | 34 | 27 | 23 | 28 | 23 | 20 | 22 | 19 | 16 | 17 | 14 | 13 |
| 10  | 45  | 34  | 27  | 22  | 41 | 31 | 25 | 21 | 25 | 21 | 18 | 20 | 17 | 15 | 15 | 13 | 11 |

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

|     | 0°  | 45° | 90° |
|-----|-----|-----|-----|
| 0°  | 892 | 892 | 892 |
| 5°  | 894 | 878 | 884 |
| 10° | 885 | 861 | 855 |
| 15° | 873 | 833 | 811 |
| 20° | 857 | 794 | 757 |
| 25° | 840 | 750 | 704 |
| 30° | 818 | 705 | 638 |
| 35° | 796 | 657 | 579 |
| 40° | 774 | 607 | 512 |
| 45° | 749 | 552 | 451 |
| 50° | 722 | 496 | 392 |
| 55° | 695 | 436 | 335 |
| 60° | 663 | 373 | 276 |
| 65° | 626 | 309 | 249 |
| 70° | 582 | 250 | 225 |
| 75° | 526 | 221 | 206 |
| 80° | 445 | 186 | 180 |
| 85° | 311 | 126 | 137 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1591 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 128.9  | 1.5       |
| 10°-20°   | 353.8  | 4.1       |
| 20°-30°   | 496.7  | 5.7       |
| 30°-40°   | 541.4  | 6.2       |
| 40°-50°   | 497.6  | 5.7       |
| 50°-60°   | 390.8  | 4.5       |
| 60°-70°   | 254.4  | 2.9       |
| 70°-80°   | 130.9  | 1.5       |
| 80°-90°   | 39.4   | 0.5       |
| 90°-100°  | 130.2  | 1.5       |
| 100°-110° | 413.7  | 4.7       |
| 110°-120° | 708.0  | 8.1       |
| 120°-130° | 931.2  | 10.7      |
| 130°-140° | 1045.3 | 12.0      |
| 140°-150° | 1025.0 | 11.8      |
| 150°-160° | 859.8  | 9.9       |
| 160°-170° | 570.2  | 6.5       |
| 170°-180° | 199.3  | 2.3       |
| 0°-30°    | 979.3  | 11.2      |
| 0°-40°    | 1520.7 | 17.4      |
| 0°-60°    | 2409.2 | 27.6      |
| 0°-90°    | 2833.9 | 32.5      |
| 90°-120°  | 1252.0 | 14.4      |
| 90°-150°  | 4253.5 | 48.8      |
| 90°-180°  | 5883.0 | 67.5      |
| 0°-180°   | 8716.7 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1375 | 1375  | 1375 | 1375  | 1375 |      |
| 5°   | 1375 | 1369  | 1353 | 1364  | 1360 | 130  |
| 15°  | 1308 | 1294  | 1252 | 1228  | 1216 | 369  |
| 25°  | 1187 | 1147  | 1065 | 1014  | 995  | 546  |
| 35°  | 1023 | 959   | 850  | 772   | 744  | 640  |
| 45°  | 836  | 753   | 622  | 534   | 504  | 646  |
| 55°  | 636  | 539   | 404  | 330   | 306  | 568  |
| 65°  | 429  | 328   | 216  | 174   | 170  | 426  |
| 75°  | 229  | 142   | 100  | 91    | 90   | 242  |
| 85°  | 54   | 27    | 24   | 24    | 24   | 61   |
| 90°  | 2    | 23    | 62   | 58    | 60   | 9    |
| 95°  | 93   | 110   | 114  | 114   | 110  | 103  |
| 105° | 382  | 387   | 391  | 394   | 394  | 403  |
| 115° | 710  | 721   | 718  | 716   | 710  | 703  |
| 125° | 1034 | 1049  | 1044 | 1039  | 1037 | 924  |
| 135° | 1337 | 1356  | 1360 | 1358  | 1353 | 1033 |
| 145° | 1623 | 1636  | 1646 | 1648  | 1641 | 1014 |
| 155° | 1856 | 1861  | 1866 | 1875  | 1870 | 854  |
| 165° | 2019 | 2017  | 2017 | 2030  | 2021 | 569  |
| 175° | 2101 | 2096  | 2092 | 2104  | 2094 | 200  |
| 180° | 2104 | 2104  | 2104 | 2104  | 2104 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1375.0 | 1375.0 | 1375.0 | 1375.0 | 1375.0 |
| 2.5°   | 1381.3 | 1375.0 | 1361.3 | 1373.8 | 1371.4 |
| 5°     | 1375.0 | 1368.8 | 1352.6 | 1363.8 | 1360.1 |
| 7.5°   | 1363.8 | 1356.4 | 1339.0 | 1343.9 | 1337.7 |
| 10°    | 1348.9 | 1340.2 | 1315.4 | 1311.5 | 1304.2 |
| 12.5°  | 1330.2 | 1319.0 | 1285.4 | 1278.0 | 1264.3 |
| 15°    | 1307.8 | 1294.1 | 1251.8 | 1228.2 | 1215.8 |
| 17.5°  | 1281.7 | 1261.8 | 1209.5 | 1182.2 | 1162.2 |
| 20°    | 1251.8 | 1226.9 | 1164.7 | 1133.7 | 1106.2 |
| 22.5°  | 1219.6 | 1190.8 | 1118.6 | 1076.4 | 1057.8 |
| 25°    | 1187.2 | 1147.3 | 1065.2 | 1014.2 | 995.4  |
| 27.5°  | 1148.6 | 1106.2 | 1015.4 | 957.0  | 928.2  |
| 30°    | 1107.6 | 1060.2 | 960.6  | 897.3  | 863.6  |
| 32.5°  | 1067.6 | 1010.4 | 908.5  | 833.7  | 802.6  |
| 35°    | 1022.9 | 959.4  | 849.9  | 771.5  | 744.1  |
| 37.5°  | 979.4  | 910.8  | 795.2  | 709.2  | 678.3  |
| 40°    | 933.3  | 858.7  | 737.9  | 649.5  | 617.3  |
| 42.5°  | 886.0  | 806.5  | 680.7  | 588.5  | 557.5  |
| 45°    | 836.3  | 752.8  | 622.3  | 533.8  | 503.9  |
| 47.5°  | 788.9  | 700.7  | 566.3  | 477.8  | 450.5  |
| 50°    | 736.7  | 648.3  | 511.5  | 425.5  | 399.5  |
| 52.5°  | 685.6  | 592.3  | 459.2  | 377.1  | 353.4  |
| 55°    | 635.8  | 538.8  | 404.3  | 329.8  | 306.2  |
| 57.5°  | 584.9  | 485.3  | 356.0  | 286.2  | 266.3  |
| 60°    | 532.5  | 433.1  | 304.9  | 241.4  | 221.6  |
| 62.5°  | 481.6  | 382.1  | 261.3  | 201.6  | 191.7  |
| 65°    | 429.3  | 328.5  | 216.5  | 174.2  | 170.5  |
| 67.5°  | 379.6  | 278.7  | 174.2  | 153.0  | 149.3  |
| 70°    | 327.3  | 230.2  | 144.3  | 131.9  | 126.9  |
| 72.5°  | 277.5  | 185.3  | 120.7  | 110.8  | 108.2  |
| 75°    | 228.9  | 141.8  | 99.6   | 90.8   | 89.6   |
| 77.5°  | 180.4  | 100.7  | 78.4   | 73.4   | 70.9   |
| 80°    | 135.6  | 72.2   | 59.7   | 54.8   | 54.8   |
| 82.5°  | 94.5   | 48.6   | 41.0   | 38.6   | 38.6   |
| 85°    | 53.5   | 27.3   | 23.6   | 23.6   | 23.6   |
| 87.5°  | 20.0   | 9.9    | 9.9    | 8.8    | 8.8    |
| 90°    | 1.9    | 22.8   | 62.2   | 58.3   | 60.2   |
| 92.5°  | 39.4   | 53.3   | 55.2   | 57.1   | 57.1   |
| 95°    | 92.6   | 110.3  | 113.6  | 113.6  | 110.3  |
| 97.5°  | 154.2  | 170.7  | 177.7  | 177.7  | 177.7  |
| 100°   | 225.2  | 239.8  | 244.9  | 244.9  | 243.0  |
| 102.5° | 300.1  | 310.9  | 317.8  | 319.7  | 317.8  |
| 105°   | 381.9  | 387.0  | 390.8  | 394.0  | 394.0  |
| 107.5° | 463.1  | 470.8  | 470.8  | 472.0  | 463.1  |
| 110°   | 541.9  | 551.9  | 551.9  | 551.9  | 546.8  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 626.8  | 637.6  | 635.7  | 630.6  | 626.8  |
| 115°   | 710.5  | 720.7  | 717.5  | 715.6  | 710.5  |
| 117.5° | 793.7  | 807.7  | 798.7  | 793.7  | 788.6  |
| 120°   | 877.4  | 891.4  | 877.4  | 877.4  | 871.7  |
| 122.5° | 953.5  | 971.3  | 962.4  | 957.4  | 953.5  |
| 125°   | 1033.5 | 1049.3 | 1044.2 | 1038.6 | 1036.7 |
| 127.5° | 1111.6 | 1131.2 | 1124.2 | 1116.7 | 1111.6 |
| 130°   | 1184.5 | 1207.4 | 1204.2 | 1200.4 | 1193.4 |
| 132.5° | 1266.4 | 1284.1 | 1285.3 | 1276.5 | 1271.4 |
| 135°   | 1336.8 | 1356.4 | 1360.2 | 1358.3 | 1353.2 |
| 137.5° | 1415.4 | 1431.3 | 1434.5 | 1433.2 | 1425.6 |
| 140°   | 1484.6 | 1500.5 | 1509.3 | 1509.3 | 1502.4 |
| 142.5° | 1555.6 | 1571.5 | 1576.6 | 1578.4 | 1571.5 |
| 145°   | 1622.9 | 1635.6 | 1645.8 | 1647.6 | 1640.7 |
| 147.5° | 1683.1 | 1699.0 | 1706.6 | 1709.7 | 1702.8 |
| 150°   | 1745.3 | 1756.1 | 1763.1 | 1768.7 | 1763.1 |
| 152.5° | 1800.5 | 1811.3 | 1820.2 | 1827.2 | 1820.2 |
| 155°   | 1855.7 | 1860.8 | 1866.4 | 1875.4 | 1869.7 |
| 157.5° | 1903.3 | 1907.1 | 1910.3 | 1923.0 | 1914.1 |
| 160°   | 1945.9 | 1949.6 | 1951.5 | 1962.3 | 1954.7 |
| 162.5° | 1985.1 | 1985.1 | 1987.0 | 1999.1 | 1990.2 |
| 165°   | 2018.7 | 2016.8 | 2016.8 | 2029.6 | 2020.7 |
| 167.5° | 2049.2 | 2043.6 | 2043.6 | 2056.2 | 2047.3 |
| 170°   | 2072.1 | 2067.0 | 2065.1 | 2077.7 | 2067.0 |
| 172.5° | 2087.9 | 2082.8 | 2080.9 | 2093.6 | 2082.8 |
| 175°   | 2100.6 | 2095.6 | 2091.7 | 2104.4 | 2093.6 |
| 177.5° | 2107.5 | 2102.6 | 2098.7 | 2109.4 | 2098.7 |
| 180°   | 2104.4 | 2104.4 | 2104.4 | 2104.4 | 2104.4 |

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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 | 4.87             | 5.57 | 5.97 | 6.67 | 8.17  | 0.83           | 1.53 | 1.93 | 2.63 | 4.13 |
|                 | 3H   | 6.54             | 7.17 | 7.65 | 8.27 | 9.79  | 2.01           | 2.64 | 3.12 | 3.74 | 5.26 |
|                 | 4H   | 7.15             | 7.75 | 8.27 | 8.85 | 10.37 | 2.45           | 3.05 | 3.57 | 4.15 | 5.68 |
|                 | 6H   | 7.57             | 8.12 | 8.69 | 9.22 | 10.76 | 2.77           | 3.32 | 3.90 | 4.43 | 5.96 |
|                 | 8H   | 7.69             | 8.22 | 8.82 | 9.34 | 10.87 | 2.86           | 3.38 | 3.99 | 4.50 | 6.03 |
|                 | 12H  | 7.75             | 8.25 | 8.89 | 9.36 | 10.92 | 2.90           | 3.40 | 4.03 | 4.51 | 6.06 |
| 4H              | 2H   | 4.87             | 5.47 | 6.00 | 6.57 | 8.10  | 1.41           | 2.01 | 2.54 | 3.11 | 4.64 |
|                 | 3H   | 6.69             | 7.19 | 7.83 | 8.32 | 9.86  | 2.75           | 3.25 | 3.88 | 4.38 | 5.92 |
|                 | 4H   | 7.39             | 7.84 | 8.52 | 8.96 | 10.52 | 3.30           | 3.75 | 4.43 | 4.87 | 6.43 |
|                 | 6H   | 7.90             | 8.29 | 9.04 | 9.43 | 10.98 | 3.71           | 4.10 | 4.85 | 5.24 | 6.79 |
|                 | 8H   | 8.08             | 8.44 | 9.22 | 9.57 | 11.14 | 3.84           | 4.20 | 4.98 | 5.34 | 6.90 |
|                 | 12H  | 8.17             | 8.50 | 9.32 | 9.64 | 11.21 | 3.90           | 4.23 | 5.06 | 5.37 | 6.95 |
| 8H              | 4H   | 7.35             | 7.71 | 8.49 | 8.84 | 10.41 | 3.57           | 3.94 | 4.71 | 5.07 | 6.63 |
|                 | 6H   | 7.91             | 8.21 | 9.07 | 9.39 | 10.95 | 4.09           | 4.39 | 5.25 | 5.56 | 7.13 |
|                 | 8H   | 8.13             | 8.40 | 9.30 | 9.55 | 11.13 | 4.28           | 4.54 | 5.45 | 5.70 | 7.28 |
|                 | 12H  | 8.27             | 8.50 | 9.44 | 9.65 | 11.27 | 4.40           | 4.63 | 5.56 | 5.78 | 7.40 |
| 12H             | 4H   | 7.29             | 7.62 | 8.45 | 8.77 | 10.34 | 3.57           | 3.90 | 4.73 | 5.05 | 6.62 |
|                 | 6H   | 7.89             | 8.15 | 9.05 | 9.31 | 10.89 | 4.14           | 4.40 | 5.30 | 5.56 | 7.14 |
|                 | 8H   | 8.11             | 8.34 | 9.28 | 9.49 | 11.11 | 4.35           | 4.58 | 5.51 | 5.73 | 7.34 |

END OF REPORT