

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: P907712

Luminaire Tested: DFN2DIP-4P3F0-060D020US840-RLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P907712  
REPORT IS A COMBINATION OF REPORTS P899038 AND P895917  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-4P3F0-060D020US840-RLLFLL  
Description: 3 foot, 90deg - 4way Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

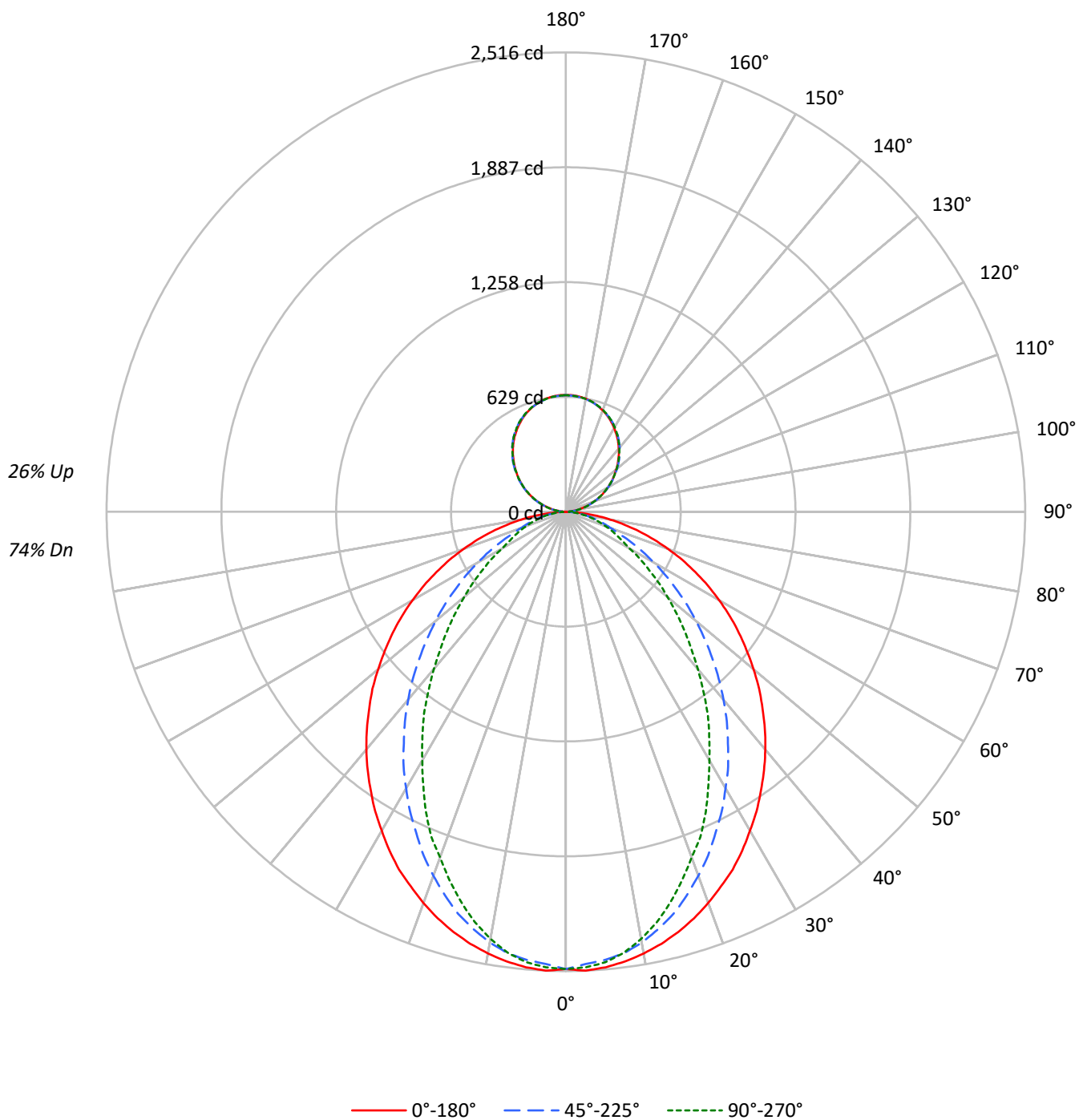
Lumens per Lamp: N/A  
Luminaire Lumens: 6937.8 lumens  
Efficiency: N/A  
Efficacy: 89.6 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.07' x L: 3.07' x H: 0.1')  
CIE Type: Semi-Direct

Input Watts (W): 77.4  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9963  
Total Harmonic Distortion (THDi): 0.065  
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   | 113 | 113 | 113 | 113 | 107 | 107 | 107 | 107 | 97 | 97 | 97 | 87 | 87 | 87 | 78 | 78 | 78 |
| 1   | 104 | 100 | 96  | 93  | 99  | 95  | 92  | 89  | 86 | 84 | 81 | 78 | 76 | 74 | 70 | 69 | 68 |
| 2   | 95  | 88  | 82  | 77  | 90  | 84  | 79  | 74  | 76 | 72 | 68 | 69 | 66 | 63 | 63 | 60 | 58 |
| 3   | 87  | 78  | 71  | 65  | 83  | 75  | 68  | 63  | 68 | 63 | 58 | 62 | 58 | 54 | 56 | 53 | 50 |
| 4   | 80  | 70  | 62  | 56  | 76  | 67  | 60  | 54  | 61 | 55 | 51 | 56 | 51 | 47 | 51 | 47 | 44 |
| 5   | 74  | 63  | 54  | 48  | 70  | 60  | 53  | 47  | 55 | 49 | 44 | 51 | 45 | 42 | 46 | 42 | 39 |
| 6   | 69  | 57  | 48  | 43  | 65  | 54  | 47  | 41  | 50 | 44 | 39 | 46 | 41 | 37 | 42 | 38 | 35 |
| 7   | 64  | 51  | 43  | 38  | 61  | 49  | 42  | 37  | 46 | 39 | 35 | 42 | 37 | 33 | 39 | 34 | 31 |
| 8   | 59  | 47  | 39  | 34  | 57  | 45  | 38  | 33  | 42 | 36 | 31 | 39 | 34 | 30 | 36 | 31 | 28 |
| 9   | 56  | 43  | 36  | 31  | 53  | 42  | 35  | 30  | 39 | 33 | 28 | 36 | 31 | 27 | 33 | 29 | 26 |
| 10  | 52  | 40  | 33  | 28  | 50  | 39  | 32  | 27  | 36 | 30 | 26 | 33 | 28 | 25 | 31 | 27 | 23 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2854 | 2854 | 2854 |
| 5°  | 2857 | 2807 | 2826 |
| 10° | 2827 | 2750 | 2733 |
| 15° | 2786 | 2657 | 2590 |
| 20° | 2733 | 2530 | 2415 |
| 25° | 2678 | 2388 | 2246 |
| 30° | 2605 | 2243 | 2031 |
| 35° | 2534 | 2086 | 1843 |
| 40° | 2461 | 1925 | 1628 |
| 45° | 2377 | 1746 | 1433 |
| 50° | 2290 | 1566 | 1242 |
| 55° | 2199 | 1373 | 1058 |
| 60° | 2093 | 1172 | 870  |
| 65° | 1971 | 968  | 782  |
| 70° | 1823 | 777  | 707  |
| 75° | 1637 | 681  | 641  |
| 80° | 1368 | 566  | 553  |
| 85° | 928  | 368  | 410  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2377 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 234.7  | 3.4       |
| 10°-20°   | 644.3  | 9.3       |
| 20°-30°   | 904.6  | 13.0      |
| 30°-40°   | 986.1  | 14.2      |
| 40°-50°   | 906.3  | 13.1      |
| 50°-60°   | 711.7  | 10.3      |
| 60°-70°   | 463.3  | 6.7       |
| 70°-80°   | 238.5  | 3.4       |
| 80°-90°   | 62.7   | 0.9       |
| 90°-100°  | 39.5   | 0.6       |
| 100°-110° | 125.6  | 1.8       |
| 110°-120° | 214.9  | 3.1       |
| 120°-130° | 282.7  | 4.1       |
| 130°-140° | 317.3  | 4.6       |
| 140°-150° | 311.1  | 4.5       |
| 150°-160° | 261.0  | 3.8       |
| 160°-170° | 173.1  | 2.5       |
| 170°-180° | 60.5   | 0.9       |
| 0°-30°    | 1783.6 | 25.7      |
| 0°-40°    | 2769.6 | 39.9      |
| 0°-60°    | 4387.7 | 63.2      |
| 0°-90°    | 5152.1 | 74.3      |
| 90°-120°  | 380.0  | 5.5       |
| 90°-150°  | 1291.1 | 18.6      |
| 90°-180°  | 1786.0 | 25.7      |
| 0°-180°   | 6937.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2504 | 2504  | 2504 | 2504  | 2504 |      |
| 5°   | 2504 | 2493  | 2463 | 2484  | 2477 | 237  |
| 15°  | 2382 | 2357  | 2280 | 2237  | 2214 | 671  |
| 25°  | 2162 | 2090  | 1940 | 1847  | 1813 | 994  |
| 35°  | 1863 | 1747  | 1548 | 1405  | 1355 | 1166 |
| 45°  | 1523 | 1371  | 1133 | 972   | 918  | 1176 |
| 55°  | 1158 | 981   | 736  | 601   | 558  | 1035 |
| 65°  | 782  | 598   | 394  | 317   | 310  | 775  |
| 75°  | 417  | 258   | 181  | 165   | 163  | 441  |
| 85°  | 97   | 50    | 43   | 43    | 43   | 112  |
| 90°  | 1    | 7     | 19   | 18    | 18   | 7    |
| 95°  | 28   | 34    | 34   | 34    | 34   | 31   |
| 105° | 116  | 117   | 119  | 120   | 120  | 122  |
| 115° | 216  | 219   | 218  | 217   | 216  | 213  |
| 125° | 314  | 318   | 317  | 315   | 315  | 280  |
| 135° | 406  | 412   | 413  | 412   | 411  | 314  |
| 145° | 493  | 496   | 500  | 500   | 498  | 308  |
| 155° | 563  | 565   | 566  | 569   | 568  | 259  |
| 165° | 613  | 612   | 612  | 616   | 613  | 173  |
| 175° | 638  | 636   | 635  | 639   | 636  | 61   |
| 180° | 639  | 639   | 639  | 639   | 639  |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2504.3 | 2504.3 | 2504.3 | 2504.3 | 2504.3 |
| 2.5°   | 2515.6 | 2504.3 | 2479.2 | 2502.0 | 2497.5 |
| 5°     | 2504.3 | 2493.0 | 2463.4 | 2483.9 | 2477.1 |
| 7.5°   | 2483.9 | 2470.3 | 2438.6 | 2447.5 | 2436.2 |
| 10°    | 2456.6 | 2440.7 | 2395.6 | 2388.6 | 2375.1 |
| 12.5°  | 2422.8 | 2402.3 | 2341.0 | 2327.5 | 2302.5 |
| 15°    | 2381.9 | 2356.8 | 2279.9 | 2236.9 | 2214.2 |
| 17.5°  | 2334.3 | 2297.9 | 2202.7 | 2152.9 | 2116.7 |
| 20°    | 2279.9 | 2234.4 | 2121.2 | 2064.7 | 2014.7 |
| 22.5°  | 2221.0 | 2168.8 | 2037.3 | 1960.4 | 1926.4 |
| 25°    | 2162.1 | 2089.5 | 1940.0 | 1847.1 | 1813.0 |
| 27.5°  | 2091.9 | 2014.7 | 1849.3 | 1742.7 | 1690.6 |
| 30°    | 2017.1 | 1930.8 | 1749.5 | 1634.1 | 1572.8 |
| 32.5°  | 1944.5 | 1840.2 | 1654.6 | 1518.4 | 1461.7 |
| 35°    | 1863.0 | 1747.4 | 1548.0 | 1405.1 | 1355.1 |
| 37.5°  | 1783.6 | 1658.8 | 1448.2 | 1291.7 | 1235.2 |
| 40°    | 1699.7 | 1563.9 | 1343.8 | 1183.0 | 1124.1 |
| 42.5°  | 1613.7 | 1468.6 | 1239.7 | 1071.9 | 1015.4 |
| 45°    | 1523.0 | 1371.0 | 1133.3 | 972.1  | 917.8  |
| 47.5°  | 1436.9 | 1276.1 | 1031.3 | 870.2  | 820.4  |
| 50°    | 1341.7 | 1180.8 | 931.5  | 775.0  | 727.6  |
| 52.5°  | 1248.6 | 1078.6 | 836.3  | 686.7  | 643.7  |
| 55°    | 1158.0 | 981.3  | 736.5  | 600.7  | 557.5  |
| 57.5°  | 1065.2 | 883.8  | 648.2  | 521.3  | 484.9  |
| 60°    | 970.0  | 788.7  | 555.2  | 439.8  | 403.4  |
| 62.5°  | 877.2  | 695.9  | 475.8  | 367.2  | 349.1  |
| 65°    | 781.9  | 598.2  | 394.4  | 317.4  | 310.4  |
| 67.5°  | 691.3  | 507.6  | 317.4  | 278.7  | 272.0  |
| 70°    | 596.0  | 419.3  | 262.8  | 240.2  | 231.1  |
| 72.5°  | 505.4  | 337.6  | 219.7  | 201.8  | 197.1  |
| 75°    | 417.0  | 258.2  | 181.3  | 165.4  | 163.3  |
| 77.5°  | 328.7  | 183.5  | 142.8  | 133.7  | 129.2  |
| 80°    | 246.9  | 131.5  | 108.7  | 99.8   | 99.8   |
| 82.5°  | 172.2  | 88.5   | 74.7   | 70.2   | 70.2   |
| 85°    | 97.4   | 49.8   | 43.0   | 43.0   | 43.0   |
| 87.5°  | 36.4   | 18.1   | 18.1   | 15.9   | 15.9   |
| 90°    | 0.6    | 7.0    | 18.9   | 17.7   | 18.3   |
| 92.5°  | 11.9   | 16.2   | 16.8   | 17.4   | 17.4   |
| 95°    | 28.1   | 33.5   | 34.4   | 34.4   | 33.5   |
| 97.5°  | 46.8   | 51.8   | 53.9   | 53.9   | 53.9   |
| 100°   | 68.4   | 72.8   | 74.3   | 74.3   | 73.7   |
| 102.5° | 91.1   | 94.3   | 96.4   | 97.0   | 96.4   |
| 105°   | 115.9  | 117.4  | 118.7  | 119.6  | 119.6  |
| 107.5° | 140.6  | 142.9  | 142.9  | 143.3  | 140.6  |
| 110°   | 164.5  | 167.5  | 167.5  | 167.5  | 166.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 112.5° | 190.3 | 193.5 | 193.0 | 191.4 | 190.3 |
| 115°   | 215.7 | 218.7 | 217.8 | 217.2 | 215.7 |
| 117.5° | 241.0 | 245.2 | 242.5 | 241.0 | 239.3 |
| 120°   | 266.3 | 270.5 | 266.3 | 266.3 | 264.6 |
| 122.5° | 289.4 | 294.8 | 292.2 | 290.6 | 289.4 |
| 125°   | 313.7 | 318.5 | 317.0 | 315.3 | 314.7 |
| 127.5° | 337.4 | 343.4 | 341.2 | 338.9 | 337.4 |
| 130°   | 359.5 | 366.5 | 365.5 | 364.4 | 362.2 |
| 132.5° | 384.4 | 389.8 | 390.1 | 387.5 | 385.9 |
| 135°   | 405.8 | 411.7 | 412.8 | 412.3 | 410.7 |
| 137.5° | 429.6 | 434.4 | 435.5 | 435.1 | 432.7 |
| 140°   | 450.6 | 455.4 | 458.2 | 458.2 | 456.1 |
| 142.5° | 472.2 | 477.0 | 478.6 | 479.1 | 477.0 |
| 145°   | 492.6 | 496.4 | 499.6 | 500.1 | 498.0 |
| 147.5° | 510.9 | 515.7 | 518.1 | 519.0 | 516.8 |
| 150°   | 529.8 | 533.0 | 535.1 | 536.8 | 535.1 |
| 152.5° | 546.5 | 549.8 | 552.5 | 554.6 | 552.5 |
| 155°   | 563.3 | 564.8 | 566.5 | 569.3 | 567.5 |
| 157.5° | 577.7 | 578.9 | 579.9 | 583.7 | 581.0 |
| 160°   | 590.7 | 591.8 | 592.4 | 595.6 | 593.3 |
| 162.5° | 602.6 | 602.6 | 603.1 | 606.8 | 604.1 |
| 165°   | 612.8 | 612.2 | 612.2 | 616.0 | 613.4 |
| 167.5° | 622.0 | 620.3 | 620.3 | 624.1 | 621.5 |
| 170°   | 628.9 | 627.4 | 626.8 | 630.7 | 627.4 |
| 172.5° | 633.8 | 632.2 | 631.7 | 635.5 | 632.2 |
| 175°   | 637.6 | 636.1 | 634.9 | 638.7 | 635.5 |
| 177.5° | 639.7 | 638.2 | 637.0 | 640.3 | 637.0 |
| 180°   | 638.7 | 638.7 | 638.7 | 638.7 | 638.7 |

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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 | 12.78            | 13.85 | 13.50 | 14.59 | 15.47 | 8.74           | 9.81  | 9.46  | 10.55 | 11.43 |
|                 | 3H   | 14.47            | 15.43 | 15.21 | 16.18 | 17.09 | 9.94           | 10.90 | 10.68 | 11.65 | 12.56 |
|                 | 4H   | 15.09            | 15.99 | 15.84 | 16.75 | 17.68 | 10.40          | 11.30 | 11.15 | 12.06 | 12.99 |
|                 | 6H   | 15.52            | 16.35 | 16.28 | 17.12 | 18.06 | 10.72          | 11.56 | 11.49 | 12.33 | 13.27 |
|                 | 8H   | 15.65            | 16.44 | 16.43 | 17.23 | 18.17 | 10.82          | 11.61 | 11.60 | 12.40 | 13.34 |
|                 | 12H  | 15.71            | 16.47 | 16.50 | 17.25 | 18.22 | 10.87          | 11.63 | 11.65 | 12.41 | 13.37 |
| 4H              | 2H   | 12.82            | 13.73 | 13.58 | 14.49 | 15.41 | 9.36           | 10.27 | 10.12 | 11.03 | 11.95 |
|                 | 3H   | 14.67            | 15.42 | 15.44 | 16.22 | 17.16 | 10.73          | 11.48 | 11.50 | 12.27 | 13.21 |
|                 | 4H   | 15.37            | 16.05 | 16.15 | 16.85 | 17.82 | 11.28          | 11.96 | 12.06 | 12.76 | 13.73 |
|                 | 6H   | 15.89            | 16.48 | 16.70 | 17.30 | 18.28 | 11.70          | 12.29 | 12.51 | 13.11 | 14.09 |
|                 | 8H   | 16.07            | 16.62 | 16.88 | 17.43 | 18.42 | 11.83          | 12.38 | 12.64 | 13.20 | 14.19 |
|                 | 12H  | 16.17            | 16.67 | 17.00 | 17.50 | 18.50 | 11.91          | 12.40 | 12.73 | 13.24 | 14.23 |
| 8H              | 4H   | 15.35            | 15.90 | 16.16 | 16.72 | 17.71 | 11.57          | 12.12 | 12.38 | 12.94 | 13.93 |
|                 | 6H   | 15.92            | 16.38 | 16.76 | 17.23 | 18.22 | 12.09          | 12.55 | 12.93 | 13.40 | 14.39 |
|                 | 8H   | 16.14            | 16.54 | 16.98 | 17.39 | 18.40 | 12.28          | 12.68 | 13.13 | 13.54 | 14.54 |
|                 | 12H  | 16.28            | 16.64 | 17.13 | 17.48 | 18.55 | 12.40          | 12.76 | 13.25 | 13.60 | 14.67 |
| 12H             | 4H   | 15.31            | 15.81 | 16.14 | 16.65 | 17.64 | 11.59          | 12.08 | 12.42 | 12.92 | 13.91 |
|                 | 6H   | 15.90            | 16.30 | 16.74 | 17.16 | 18.16 | 12.14          | 12.55 | 12.99 | 13.40 | 14.41 |
|                 | 8H   | 16.12            | 16.48 | 16.97 | 17.33 | 18.39 | 12.36          | 12.71 | 13.21 | 13.56 | 14.62 |

END OF REPORT