

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: P910206

Luminaire Tested: DFN2DIP-TR4F0-090D110US840-FLLFLL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P910206  
REPORT IS A COMBINATION OF REPORTS P900505 AND P897293  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR4F0-090D110US840-FLLFLL  
Description: 4 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Frosted Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

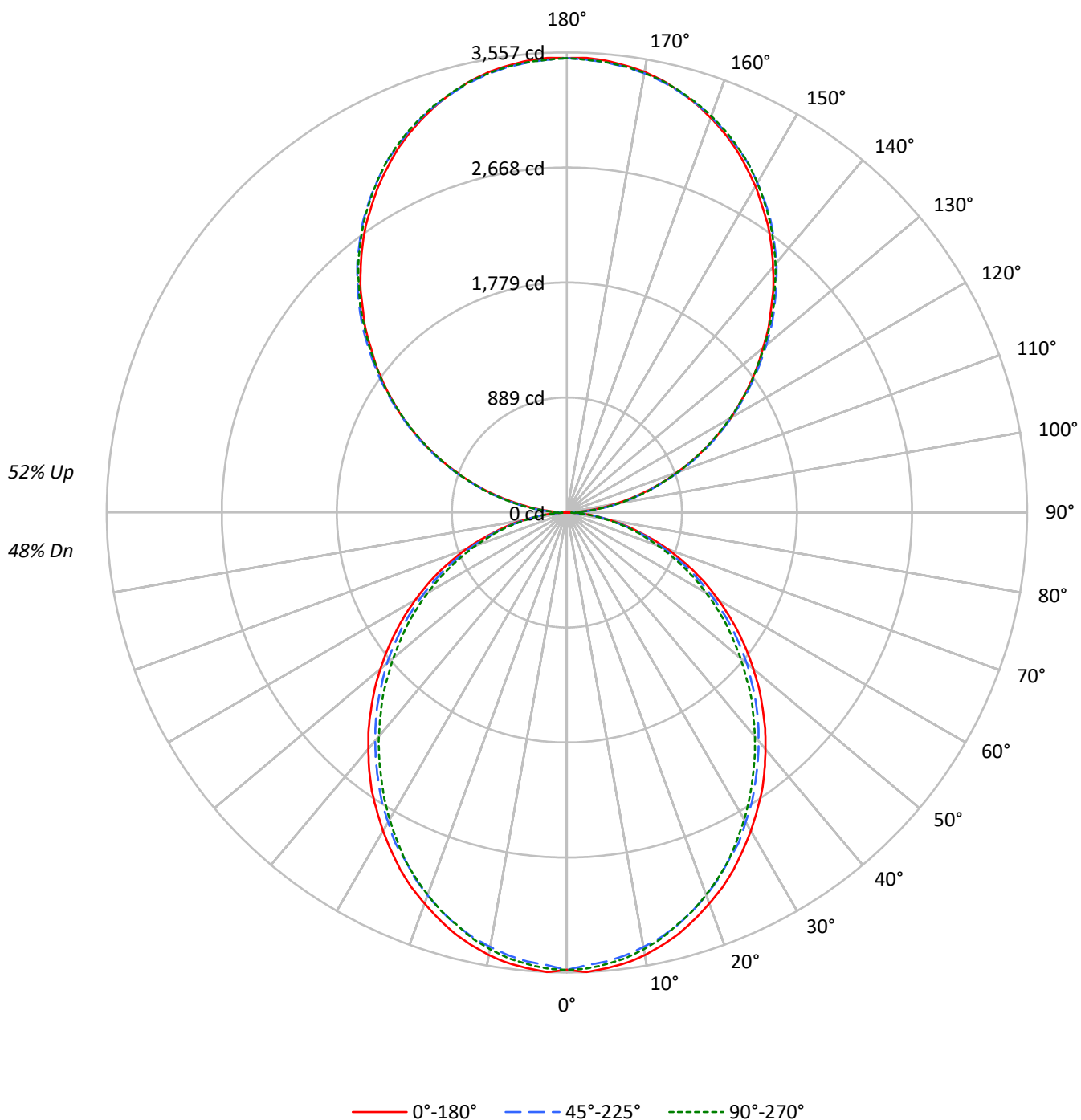
Lumens per Lamp: N/A  
Luminaire Lumens: 18828.9 lumens  
Efficiency: N/A  
Efficacy: 109.3 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 3.43' x L: 3.96' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 172.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.099  
Total Harmonic Distortion (THDi): 0.979  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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CATALOG NUMBER: DFN2DIP-TR4F0-090D110US840-FLLFLL

### 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   | 107 | 107 | 107 | 107 | 98 | 98 | 98 | 98 | 82 | 82 | 82 | 68 | 68 | 68 | 54 | 54 | 54 |
| 1   | 97  | 93  | 89  | 86  | 89 | 86 | 82 | 79 | 72 | 70 | 67 | 59 | 58 | 56 | 48 | 47 | 46 |
| 2   | 89  | 81  | 75  | 70  | 81 | 75 | 70 | 65 | 63 | 59 | 56 | 52 | 49 | 47 | 42 | 40 | 38 |
| 3   | 81  | 71  | 64  | 58  | 74 | 66 | 60 | 54 | 56 | 51 | 47 | 46 | 43 | 40 | 37 | 35 | 33 |
| 4   | 74  | 63  | 55  | 49  | 68 | 58 | 51 | 46 | 49 | 44 | 40 | 41 | 37 | 34 | 33 | 31 | 28 |
| 5   | 68  | 56  | 48  | 42  | 62 | 52 | 45 | 40 | 44 | 39 | 34 | 37 | 33 | 29 | 30 | 27 | 25 |
| 6   | 62  | 50  | 42  | 37  | 57 | 47 | 40 | 34 | 40 | 34 | 30 | 33 | 29 | 26 | 27 | 24 | 22 |
| 7   | 58  | 46  | 38  | 32  | 53 | 42 | 35 | 30 | 36 | 31 | 26 | 30 | 26 | 23 | 25 | 22 | 19 |
| 8   | 54  | 41  | 34  | 28  | 49 | 38 | 32 | 27 | 33 | 27 | 24 | 28 | 23 | 20 | 23 | 20 | 17 |
| 9   | 50  | 38  | 30  | 25  | 46 | 35 | 28 | 24 | 30 | 25 | 21 | 26 | 21 | 18 | 21 | 18 | 16 |
| 10  | 47  | 35  | 27  | 23  | 43 | 32 | 26 | 21 | 28 | 23 | 19 | 24 | 19 | 17 | 20 | 16 | 14 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2809 | 2809 | 2809 |
| 5°  | 2814 | 2770 | 2789 |
| 10° | 2791 | 2733 | 2751 |
| 15° | 2750 | 2688 | 2692 |
| 20° | 2695 | 2625 | 2631 |
| 25° | 2640 | 2551 | 2562 |
| 30° | 2571 | 2481 | 2473 |
| 35° | 2505 | 2399 | 2379 |
| 40° | 2424 | 2316 | 2289 |
| 45° | 2344 | 2233 | 2198 |
| 50° | 2256 | 2146 | 2092 |
| 55° | 2164 | 2045 | 1994 |
| 60° | 2060 | 1925 | 1883 |
| 65° | 1947 | 1801 | 1751 |
| 70° | 1802 | 1650 | 1609 |
| 75° | 1602 | 1469 | 1478 |
| 80° | 1361 | 1238 | 1228 |
| 85° | 985  | 840  | 814  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 2738 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 332.9   | 1.8       |
| 10°-20°   | 936.5   | 5.0       |
| 20°-30°   | 1376.3  | 7.3       |
| 30°-40°   | 1598.5  | 8.5       |
| 40°-50°   | 1596.5  | 8.5       |
| 50°-60°   | 1392.1  | 7.4       |
| 60°-70°   | 1029.1  | 5.5       |
| 70°-80°   | 582.2   | 3.1       |
| 80°-90°   | 163.7   | 0.9       |
| 90°-100°  | 217.4   | 1.2       |
| 100°-110° | 690.8   | 3.7       |
| 110°-120° | 1182.1  | 6.3       |
| 120°-130° | 1554.6  | 8.3       |
| 130°-140° | 1745.0  | 9.3       |
| 140°-150° | 1711.2  | 9.1       |
| 150°-160° | 1435.4  | 7.6       |
| 160°-170° | 951.9   | 5.1       |
| 170°-180° | 332.7   | 1.8       |
| 0°-30°    | 2645.7  | 14.1      |
| 0°-40°    | 4244.2  | 22.5      |
| 0°-60°    | 7232.9  | 38.4      |
| 0°-90°    | 9007.9  | 47.8      |
| 90°-120°  | 2090.2  | 11.1      |
| 90°-150°  | 7101.0  | 37.7      |
| 90°-180°  | 9821.0  | 52.2      |
| 0°-180°   | 18828.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3536 | 3536  | 3536 | 3536  | 3536 |      |
| 5°   | 3536 | 3523  | 3486 | 3513  | 3506 | 336  |
| 15°  | 3367 | 3346  | 3302 | 3316  | 3299 | 948  |
| 25°  | 3047 | 3020  | 2962 | 2969  | 2962 | 1402 |
| 35°  | 2629 | 2595  | 2540 | 2520  | 2503 | 1642 |
| 45°  | 2139 | 2115  | 2064 | 2027  | 2013 | 1651 |
| 55°  | 1619 | 1598  | 1558 | 1517  | 1500 | 1447 |
| 65°  | 1092 | 1071  | 1037 | 1007  | 990  | 1079 |
| 75°  | 571  | 565   | 547  | 527   | 534  | 610  |
| 85°  | 139  | 136   | 133  | 122   | 119  | 155  |
| 90°  | 3    | 38    | 104  | 98    | 101  | 18   |
| 95°  | 155  | 184   | 190  | 190   | 184  | 172  |
| 105° | 638  | 646   | 652  | 658   | 658  | 673  |
| 115° | 1186 | 1203  | 1198 | 1195  | 1186 | 1173 |
| 125° | 1725 | 1752  | 1743 | 1734  | 1731 | 1542 |
| 135° | 2232 | 2264  | 2271 | 2268  | 2259 | 1725 |
| 145° | 2709 | 2730  | 2747 | 2751  | 2739 | 1693 |
| 155° | 3098 | 3106  | 3116 | 3131  | 3121 | 1426 |
| 165° | 3370 | 3367  | 3367 | 3388  | 3373 | 951  |
| 175° | 3507 | 3498  | 3492 | 3513  | 3495 | 333  |
| 180° | 3513 | 3513  | 3513 | 3513  | 3513 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3536.4 | 3536.4 | 3536.4 | 3536.4 | 3536.4 |
| 2.5°   | 3557.0 | 3540.1 | 3502.6 | 3536.4 | 3530.0 |
| 5°     | 3536.4 | 3523.1 | 3485.7 | 3512.7 | 3506.2 |
| 7.5°   | 3512.7 | 3492.5 | 3455.0 | 3482.4 | 3475.6 |
| 10°    | 3475.6 | 3451.7 | 3410.9 | 3438.0 | 3427.9 |
| 12.5°  | 3424.3 | 3404.1 | 3363.4 | 3380.2 | 3373.5 |
| 15°    | 3366.6 | 3346.4 | 3302.0 | 3315.7 | 3298.7 |
| 17.5°  | 3295.1 | 3274.9 | 3230.6 | 3247.5 | 3230.6 |
| 20°    | 3216.8 | 3196.6 | 3149.0 | 3159.1 | 3145.7 |
| 22.5°  | 3138.9 | 3108.3 | 3063.8 | 3063.8 | 3057.0 |
| 25°    | 3046.9 | 3019.8 | 2962.1 | 2968.6 | 2962.1 |
| 27.5°  | 2944.8 | 2920.9 | 2877.0 | 2866.9 | 2849.9 |
| 30°    | 2843.1 | 2815.6 | 2764.7 | 2754.6 | 2741.0 |
| 32.5°  | 2734.1 | 2713.9 | 2659.4 | 2638.9 | 2625.1 |
| 35°    | 2628.8 | 2594.8 | 2540.3 | 2519.8 | 2502.9 |
| 37.5°  | 2509.7 | 2479.0 | 2424.5 | 2400.8 | 2383.8 |
| 40°    | 2387.3 | 2360.0 | 2305.4 | 2275.1 | 2261.5 |
| 42.5°  | 2268.3 | 2240.9 | 2186.8 | 2152.5 | 2132.3 |
| 45°    | 2139.1 | 2115.4 | 2064.1 | 2026.9 | 2013.3 |
| 47.5°  | 2013.3 | 1989.4 | 1934.9 | 1897.4 | 1877.2 |
| 50°    | 1880.5 | 1863.5 | 1815.8 | 1768.3 | 1751.3 |
| 52.5°  | 1751.3 | 1727.5 | 1683.4 | 1646.0 | 1622.1 |
| 55°    | 1618.9 | 1598.3 | 1557.5 | 1516.8 | 1499.9 |
| 57.5°  | 1486.1 | 1469.2 | 1424.8 | 1384.0 | 1370.3 |
| 60°    | 1353.3 | 1340.0 | 1292.3 | 1254.9 | 1244.8 |
| 62.5°  | 1224.2 | 1200.3 | 1166.4 | 1132.6 | 1118.8 |
| 65°    | 1091.8 | 1071.2 | 1037.2 | 1006.6 | 989.7  |
| 67.5°  | 955.7  | 938.5  | 908.1  | 884.3  | 870.6  |
| 70°    | 829.8  | 816.1  | 785.5  | 761.6  | 748.3  |
| 72.5°  | 700.6  | 686.9  | 669.9  | 646.2  | 636.1  |
| 75°    | 571.2  | 564.6  | 547.3  | 527.1  | 534.0  |
| 77.5°  | 455.7  | 442.0  | 435.2  | 425.1  | 415.0  |
| 80°    | 340.2  | 336.6  | 329.7  | 319.6  | 312.9  |
| 82.5°  | 231.3  | 231.3  | 228.0  | 214.3  | 214.3  |
| 85°    | 139.3  | 136.0  | 132.8  | 122.3  | 119.1  |
| 87.5°  | 61.3   | 54.4   | 47.7   | 37.6   | 33.9   |
| 90°    | 3.1    | 38.2   | 103.8  | 97.5   | 100.6  |
| 92.5°  | 65.6   | 89.0   | 92.1   | 95.3   | 95.3   |
| 95°    | 154.6  | 184.3  | 189.6  | 189.6  | 184.3  |
| 97.5°  | 257.4  | 284.9  | 296.6  | 296.6  | 296.6  |
| 100°   | 376.0  | 400.3  | 408.8  | 408.8  | 405.7  |
| 102.5° | 501.0  | 519.0  | 530.7  | 533.8  | 530.7  |
| 105°   | 637.6  | 646.1  | 652.5  | 657.7  | 657.7  |
| 107.5° | 773.2  | 785.9  | 785.9  | 788.0  | 773.2  |
| 110°   | 904.5  | 921.5  | 921.5  | 921.5  | 913.0  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 1046.4 | 1064.4 | 1061.3 | 1052.8 | 1046.4 |
| 115°   | 1186.3 | 1203.2 | 1197.9 | 1194.8 | 1186.3 |
| 117.5° | 1325.0 | 1348.3 | 1333.4 | 1325.0 | 1316.6 |
| 120°   | 1464.8 | 1488.1 | 1464.8 | 1464.8 | 1455.3 |
| 122.5° | 1592.0 | 1621.5 | 1606.7 | 1598.2 | 1592.0 |
| 125°   | 1725.4 | 1751.8 | 1743.3 | 1733.8 | 1730.6 |
| 127.5° | 1855.6 | 1888.4 | 1876.8 | 1864.1 | 1855.6 |
| 130°   | 1977.4 | 2015.6 | 2010.2 | 2003.9 | 1992.3 |
| 132.5° | 2114.1 | 2143.7 | 2145.9 | 2131.0 | 2122.5 |
| 135°   | 2231.6 | 2264.4 | 2270.8 | 2267.7 | 2259.2 |
| 137.5° | 2363.0 | 2389.4 | 2394.7 | 2392.6 | 2380.0 |
| 140°   | 2478.4 | 2504.9 | 2519.7 | 2519.7 | 2508.1 |
| 142.5° | 2597.1 | 2623.5 | 2632.0 | 2635.1 | 2623.5 |
| 145°   | 2709.3 | 2730.5 | 2747.4 | 2750.6 | 2739.0 |
| 147.5° | 2810.0 | 2836.4 | 2849.1 | 2854.4 | 2842.8 |
| 150°   | 2913.8 | 2931.7 | 2943.4 | 2952.9 | 2943.4 |
| 152.5° | 3005.9 | 3023.8 | 3038.7 | 3050.4 | 3038.7 |
| 155°   | 3098.1 | 3106.4 | 3116.0 | 3130.9 | 3121.3 |
| 157.5° | 3177.4 | 3183.8 | 3189.1 | 3210.3 | 3195.4 |
| 160°   | 3248.4 | 3254.8 | 3257.9 | 3276.0 | 3263.3 |
| 162.5° | 3314.1 | 3314.1 | 3317.3 | 3337.4 | 3322.6 |
| 165°   | 3370.2 | 3367.0 | 3367.0 | 3388.2 | 3373.4 |
| 167.5° | 3421.0 | 3411.5 | 3411.5 | 3432.7 | 3417.9 |
| 170°   | 3459.2 | 3450.7 | 3447.6 | 3468.7 | 3450.7 |
| 172.5° | 3485.7 | 3477.2 | 3474.0 | 3495.2 | 3477.2 |
| 175°   | 3506.9 | 3498.4 | 3492.0 | 3513.2 | 3495.2 |
| 177.5° | 3518.5 | 3510.0 | 3503.6 | 3521.7 | 3503.6 |
| 180°   | 3513.2 | 3513.2 | 3513.2 | 3513.2 | 3513.2 |

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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 | 10.65            | 11.49 | 11.63 | 12.48 | 13.78 | 10.22          | 11.06 | 11.19 | 12.05 | 13.35 |
|                 | 3H   | 12.31            | 13.06 | 13.30 | 14.06 | 15.39 | 11.84          | 12.59 | 12.82 | 13.59 | 14.91 |
|                 | 4H   | 12.90            | 13.61 | 13.90 | 14.61 | 15.94 | 12.42          | 13.14 | 13.42 | 14.14 | 15.47 |
|                 | 6H   | 13.29            | 13.95 | 14.30 | 14.96 | 16.30 | 12.82          | 13.48 | 13.83 | 14.49 | 15.83 |
|                 | 8H   | 13.40            | 14.03 | 14.41 | 15.05 | 16.39 | 12.92          | 13.55 | 13.94 | 14.57 | 15.92 |
|                 | 12H  | 13.45            | 14.04 | 14.47 | 15.06 | 16.42 | 12.97          | 13.56 | 13.99 | 14.58 | 15.94 |
| 4H              | 2H   | 11.11            | 11.83 | 12.12 | 12.83 | 14.16 | 10.77          | 11.48 | 11.77 | 12.48 | 13.81 |
|                 | 3H   | 12.97            | 13.57 | 13.99 | 14.60 | 15.95 | 12.58          | 13.18 | 13.60 | 14.21 | 15.55 |
|                 | 4H   | 13.69            | 14.23 | 14.71 | 15.26 | 16.62 | 13.28          | 13.83 | 14.30 | 14.85 | 16.22 |
|                 | 6H   | 14.20            | 14.67 | 15.23 | 15.72 | 17.08 | 13.79          | 14.26 | 14.83 | 15.31 | 16.67 |
|                 | 8H   | 14.35            | 14.79 | 15.38 | 15.83 | 17.21 | 13.94          | 14.38 | 14.97 | 15.42 | 16.80 |
|                 | 12H  | 14.42            | 14.82 | 15.48 | 15.87 | 17.26 | 14.00          | 14.40 | 15.05 | 15.45 | 16.84 |
| 8H              | 4H   | 13.88            | 14.32 | 14.92 | 15.36 | 16.74 | 13.52          | 13.96 | 14.56 | 15.00 | 16.38 |
|                 | 6H   | 14.51            | 14.88 | 15.57 | 15.96 | 17.33 | 14.15          | 14.51 | 15.21 | 15.59 | 16.97 |
|                 | 8H   | 14.73            | 15.05 | 15.80 | 16.12 | 17.51 | 14.36          | 14.68 | 15.43 | 15.75 | 17.15 |
|                 | 12H  | 14.86            | 15.15 | 15.93 | 16.21 | 17.64 | 14.48          | 14.76 | 15.55 | 15.82 | 17.26 |
| 12H             | 4H   | 13.87            | 14.26 | 14.92 | 15.32 | 16.70 | 13.52          | 13.91 | 14.57 | 14.97 | 16.35 |
|                 | 6H   | 14.54            | 14.86 | 15.61 | 15.93 | 17.32 | 14.19          | 14.51 | 15.26 | 15.58 | 16.97 |
|                 | 8H   | 14.78            | 15.07 | 15.85 | 16.13 | 17.56 | 14.43          | 14.71 | 15.50 | 15.77 | 17.21 |

END OF REPORT