

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: P906997

Luminaire Tested: DFN2DIP-TR2F0-020D040US835-FLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P906997  
REPORT IS A COMBINATION OF REPORTS P901761 AND P897145  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-TR2F0-020D040US835-FLLONL  
Description: 2 foot, Triangle Define Geo, with Direct Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

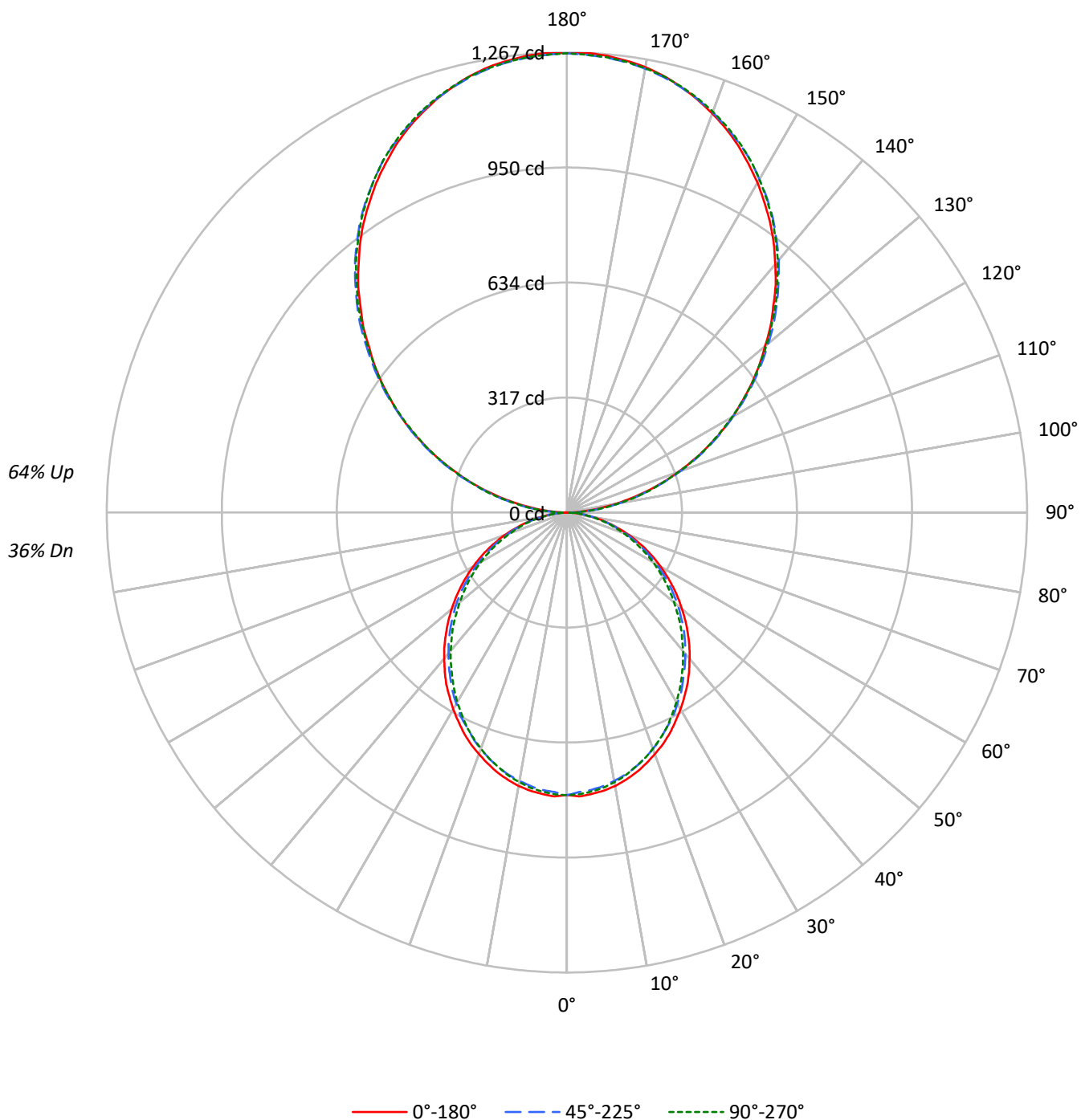
Lumens per Lamp: N/A  
Luminaire Lumens: 5520.0 lumens  
Efficiency: N/A  
Efficacy: 123.8 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.16 / 1.29  
Luminous Opening: Rectangular w/ Sides (W: 2.04' x L: 2.36' x H: 0.1')  
CIE Type: Semi-Indirect

Input Watts (W): 44.6  
Input Voltage (V): 120  
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   | 104 | 104 | 104 | 104 | 94 | 94 | 94 | 94 | 76 | 76 | 76 | 59 | 59 | 59 | 43 | 43 | 43 |
| 1   | 95  | 90  | 87  | 83  | 85 | 82 | 79 | 76 | 66 | 64 | 62 | 52 | 50 | 49 | 38 | 37 | 36 |
| 2   | 86  | 79  | 73  | 68  | 78 | 72 | 66 | 62 | 58 | 54 | 51 | 45 | 43 | 41 | 34 | 32 | 31 |
| 3   | 79  | 69  | 62  | 56  | 71 | 63 | 57 | 52 | 51 | 47 | 43 | 40 | 37 | 34 | 30 | 28 | 26 |
| 4   | 72  | 61  | 54  | 48  | 65 | 56 | 49 | 44 | 45 | 40 | 37 | 36 | 32 | 29 | 27 | 24 | 22 |
| 5   | 66  | 54  | 47  | 41  | 59 | 50 | 43 | 38 | 40 | 35 | 31 | 32 | 28 | 25 | 24 | 22 | 20 |
| 6   | 61  | 49  | 41  | 35  | 55 | 45 | 38 | 33 | 36 | 31 | 27 | 29 | 25 | 22 | 22 | 19 | 17 |
| 7   | 56  | 44  | 36  | 31  | 50 | 40 | 33 | 28 | 33 | 28 | 24 | 26 | 22 | 20 | 20 | 17 | 15 |
| 8   | 52  | 40  | 32  | 27  | 47 | 36 | 30 | 25 | 30 | 25 | 21 | 24 | 20 | 17 | 18 | 16 | 14 |
| 9   | 48  | 36  | 29  | 24  | 44 | 33 | 27 | 22 | 27 | 22 | 19 | 22 | 18 | 16 | 17 | 14 | 12 |
| 10  | 45  | 33  | 26  | 21  | 41 | 30 | 24 | 20 | 25 | 20 | 17 | 20 | 17 | 14 | 16 | 13 | 11 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1736 | 1736 | 1736 |
| 5°  | 1736 | 1708 | 1720 |
| 10° | 1719 | 1681 | 1694 |
| 15° | 1691 | 1649 | 1654 |
| 20° | 1655 | 1607 | 1614 |
| 25° | 1618 | 1557 | 1568 |
| 30° | 1573 | 1511 | 1511 |
| 35° | 1530 | 1456 | 1450 |
| 40° | 1477 | 1401 | 1392 |
| 45° | 1424 | 1346 | 1332 |
| 50° | 1367 | 1288 | 1264 |
| 55° | 1306 | 1220 | 1199 |
| 60° | 1238 | 1141 | 1126 |
| 65° | 1162 | 1058 | 1040 |
| 70° | 1067 | 957  | 947  |
| 75° | 935  | 836  | 856  |
| 80° | 776  | 683  | 692  |
| 85° | 528  | 430  | 430  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 90°

Luminance: 1650 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 73.2   | 1.3       |
| 10°-20°   | 206.1  | 3.7       |
| 20°-30°   | 302.9  | 5.5       |
| 30°-40°   | 351.8  | 6.4       |
| 40°-50°   | 351.3  | 6.4       |
| 50°-60°   | 306.3  | 5.5       |
| 60°-70°   | 226.5  | 4.1       |
| 70°-80°   | 128.1  | 2.3       |
| 80°-90°   | 37.4   | 0.7       |
| 90°-100°  | 78.3   | 1.4       |
| 100°-110° | 248.7  | 4.5       |
| 110°-120° | 425.6  | 7.7       |
| 120°-130° | 559.8  | 10.1      |
| 130°-140° | 628.3  | 11.4      |
| 140°-150° | 616.2  | 11.2      |
| 150°-160° | 516.9  | 9.4       |
| 160°-170° | 342.8  | 6.2       |
| 170°-180° | 119.8  | 2.2       |
| 0°-30°    | 582.2  | 10.5      |
| 0°-40°    | 934.0  | 16.9      |
| 0°-60°    | 1591.6 | 28.8      |
| 0°-90°    | 1983.6 | 35.9      |
| 90°-120°  | 752.7  | 13.6      |
| 90°-150°  | 2556.9 | 46.3      |
| 90°-180°  | 3536.0 | 64.1      |
| 0°-180°   | 5520.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 778  | 778   | 778  | 778   | 778  |      |
| 5°   | 778  | 775   | 767  | 773   | 772  | 74   |
| 15°  | 741  | 736   | 727  | 730   | 726  | 209  |
| 25°  | 670  | 664   | 652  | 653   | 652  | 309  |
| 35°  | 578  | 571   | 559  | 554   | 551  | 361  |
| 45°  | 471  | 466   | 454  | 446   | 443  | 363  |
| 55°  | 356  | 352   | 343  | 334   | 330  | 318  |
| 65°  | 240  | 236   | 228  | 222   | 218  | 238  |
| 75°  | 126  | 124   | 120  | 116   | 118  | 134  |
| 85°  | 31   | 30    | 29   | 27    | 26   | 34   |
| 90°  | 1    | 14    | 37   | 35    | 36   | 5    |
| 95°  | 56   | 66    | 68   | 68    | 66   | 62   |
| 105° | 230  | 233   | 235  | 237   | 237  | 242  |
| 115° | 427  | 433   | 431  | 430   | 427  | 422  |
| 125° | 621  | 631   | 628  | 624   | 623  | 555  |
| 135° | 804  | 815   | 818  | 816   | 814  | 621  |
| 145° | 976  | 983   | 989  | 990   | 986  | 610  |
| 155° | 1116 | 1119  | 1122 | 1127  | 1124 | 513  |
| 165° | 1214 | 1212  | 1212 | 1220  | 1215 | 342  |
| 175° | 1263 | 1260  | 1257 | 1265  | 1259 | 120  |
| 180° | 1265 | 1265  | 1265 | 1265  | 1265 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 778.2 | 778.2 | 778.2 | 778.2 | 778.2 |
| 2.5°   | 782.7 | 779.0 | 770.7 | 778.2 | 776.8 |
| 5°     | 778.2 | 775.3 | 767.0 | 773.0 | 771.5 |
| 7.5°   | 773.0 | 768.5 | 760.3 | 766.3 | 764.8 |
| 10°    | 764.8 | 759.6 | 750.6 | 756.5 | 754.3 |
| 12.5°  | 753.5 | 749.1 | 740.1 | 743.8 | 742.3 |
| 15°    | 740.8 | 736.4 | 726.6 | 729.6 | 725.9 |
| 17.5°  | 725.1 | 720.7 | 710.9 | 714.6 | 710.9 |
| 20°    | 707.9 | 703.4 | 692.9 | 695.2 | 692.2 |
| 22.5°  | 690.7 | 684.0 | 674.2 | 674.2 | 672.7 |
| 25°    | 670.5 | 664.5 | 651.8 | 653.2 | 651.8 |
| 27.5°  | 648.0 | 642.8 | 633.1 | 630.9 | 627.1 |
| 30°    | 625.6 | 619.6 | 608.4 | 606.2 | 603.1 |
| 32.5°  | 601.6 | 597.2 | 585.2 | 580.7 | 577.7 |
| 35°    | 578.5 | 571.0 | 559.0 | 554.5 | 550.7 |
| 37.5°  | 552.3 | 545.5 | 533.5 | 528.3 | 524.5 |
| 40°    | 525.3 | 519.3 | 507.3 | 500.7 | 497.6 |
| 42.5°  | 499.1 | 493.1 | 481.2 | 473.7 | 469.2 |
| 45°    | 470.7 | 465.5 | 454.2 | 446.0 | 443.0 |
| 47.5°  | 443.0 | 437.8 | 425.8 | 417.5 | 413.1 |
| 50°    | 413.8 | 410.1 | 399.6 | 389.1 | 385.4 |
| 52.5°  | 385.4 | 380.1 | 370.4 | 362.2 | 357.0 |
| 55°    | 356.2 | 351.7 | 342.7 | 333.8 | 330.0 |
| 57.5°  | 327.0 | 323.3 | 313.5 | 304.6 | 301.5 |
| 60°    | 297.8 | 294.9 | 284.4 | 276.1 | 273.9 |
| 62.5°  | 269.4 | 264.1 | 256.7 | 249.2 | 246.2 |
| 65°    | 240.2 | 235.7 | 228.3 | 221.5 | 217.8 |
| 67.5°  | 210.3 | 206.5 | 199.8 | 194.6 | 191.6 |
| 70°    | 182.6 | 179.6 | 172.8 | 167.6 | 164.7 |
| 72.5°  | 154.2 | 151.2 | 147.4 | 142.2 | 140.0 |
| 75°    | 125.7 | 124.3 | 120.4 | 116.0 | 117.5 |
| 77.5°  | 100.3 | 97.3  | 95.7  | 93.5  | 91.3  |
| 80°    | 74.9  | 74.1  | 72.6  | 70.3  | 68.8  |
| 82.5°  | 50.9  | 50.9  | 50.2  | 47.2  | 47.2  |
| 85°    | 30.6  | 29.9  | 29.2  | 26.9  | 26.2  |
| 87.5°  | 13.5  | 12.0  | 10.5  | 8.3   | 7.5   |
| 90°    | 1.1   | 13.7  | 37.4  | 35.1  | 36.2  |
| 92.5°  | 23.6  | 32.0  | 33.2  | 34.3  | 34.3  |
| 95°    | 55.7  | 66.4  | 68.3  | 68.3  | 66.4  |
| 97.5°  | 92.7  | 102.6 | 106.8 | 106.8 | 106.8 |
| 100°   | 135.4 | 144.2 | 147.2 | 147.2 | 146.1 |
| 102.5° | 180.4 | 186.9 | 191.1 | 192.2 | 191.1 |
| 105°   | 229.6 | 232.6 | 234.9 | 236.8 | 236.8 |
| 107.5° | 278.4 | 283.0 | 283.0 | 283.7 | 278.4 |
| 110°   | 325.7 | 331.8 | 331.8 | 331.8 | 328.8 |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 376.8  | 383.3  | 382.1  | 379.1  | 376.8  |
| 115°   | 427.1  | 433.3  | 431.3  | 430.2  | 427.1  |
| 117.5° | 477.1  | 485.5  | 480.2  | 477.1  | 474.1  |
| 120°   | 527.5  | 535.8  | 527.5  | 527.5  | 524.0  |
| 122.5° | 573.2  | 583.9  | 578.6  | 575.5  | 573.2  |
| 125°   | 621.3  | 630.8  | 627.8  | 624.3  | 623.2  |
| 127.5° | 668.2  | 680.0  | 675.8  | 671.2  | 668.2  |
| 130°   | 712.0  | 725.8  | 723.9  | 721.6  | 717.4  |
| 132.5° | 761.2  | 771.9  | 772.7  | 767.3  | 764.3  |
| 135°   | 803.6  | 815.4  | 817.7  | 816.5  | 813.5  |
| 137.5° | 850.9  | 860.4  | 862.3  | 861.5  | 857.0  |
| 140°   | 892.4  | 902.0  | 907.3  | 907.3  | 903.1  |
| 142.5° | 935.2  | 944.7  | 947.7  | 948.9  | 944.7  |
| 145°   | 975.6  | 983.2  | 989.3  | 990.5  | 986.3  |
| 147.5° | 1011.8 | 1021.3 | 1025.9 | 1027.8 | 1023.6 |
| 150°   | 1049.2 | 1055.7 | 1059.9 | 1063.3 | 1059.9 |
| 152.5° | 1082.4 | 1088.8 | 1094.2 | 1098.4 | 1094.2 |
| 155°   | 1115.5 | 1118.6 | 1122.0 | 1127.4 | 1123.9 |
| 157.5° | 1144.2 | 1146.4 | 1148.3 | 1156.0 | 1150.6 |
| 160°   | 1169.7 | 1172.0 | 1173.1 | 1179.6 | 1175.0 |
| 162.5° | 1193.3 | 1193.3 | 1194.5 | 1201.7 | 1196.4 |
| 165°   | 1213.6 | 1212.4 | 1212.4 | 1220.0 | 1214.7 |
| 167.5° | 1231.9 | 1228.4 | 1228.4 | 1236.1 | 1230.7 |
| 170°   | 1245.6 | 1242.5 | 1241.4 | 1249.0 | 1242.5 |
| 172.5° | 1255.1 | 1252.1 | 1250.9 | 1258.6 | 1252.1 |
| 175°   | 1262.8 | 1259.7 | 1257.4 | 1265.0 | 1258.6 |
| 177.5° | 1267.0 | 1263.9 | 1261.6 | 1268.1 | 1261.6 |
| 180°   | 1265.0 | 1265.0 | 1265.0 | 1265.0 | 1265.0 |

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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 | 7.60             | 8.34  | 8.66  | 9.41  | 10.87 | 7.17           | 7.92  | 8.24  | 8.99  | 10.45 |
|                 | 3H   | 9.22             | 9.89  | 10.30 | 10.97 | 12.45 | 8.76           | 9.43  | 9.84  | 10.51 | 11.99 |
|                 | 4H   | 9.79             | 10.43 | 10.88 | 11.51 | 12.99 | 9.33           | 9.97  | 10.42 | 11.05 | 12.53 |
|                 | 6H   | 10.17            | 10.75 | 11.26 | 11.84 | 13.33 | 9.71           | 10.29 | 10.80 | 11.38 | 12.87 |
|                 | 8H   | 10.26            | 10.82 | 11.36 | 11.92 | 13.40 | 9.80           | 10.36 | 10.90 | 11.46 | 12.95 |
|                 | 12H  | 10.29            | 10.82 | 11.40 | 11.92 | 13.43 | 9.83           | 10.36 | 10.94 | 11.45 | 12.97 |
| 4H              | 2H   | 8.03             | 8.67  | 9.13  | 9.75  | 11.23 | 7.70           | 8.33  | 8.79  | 9.41  | 10.90 |
|                 | 3H   | 9.86             | 10.39 | 10.96 | 11.50 | 13.00 | 9.48           | 10.01 | 10.58 | 11.12 | 12.61 |
|                 | 4H   | 10.55            | 11.04 | 11.66 | 12.14 | 13.65 | 10.16          | 10.65 | 11.27 | 11.74 | 13.26 |
|                 | 6H   | 11.04            | 11.46 | 12.15 | 12.58 | 14.09 | 10.64          | 11.06 | 11.76 | 12.18 | 13.69 |
|                 | 8H   | 11.18            | 11.57 | 12.29 | 12.68 | 14.20 | 10.78          | 11.17 | 11.89 | 12.28 | 13.81 |
|                 | 12H  | 11.23            | 11.59 | 12.36 | 12.71 | 14.24 | 10.83          | 11.18 | 11.96 | 12.30 | 13.84 |
| 8H              | 4H   | 10.73            | 11.12 | 11.84 | 12.23 | 13.76 | 10.38          | 10.77 | 11.49 | 11.88 | 13.41 |
|                 | 6H   | 11.33            | 11.65 | 12.47 | 12.81 | 14.33 | 10.98          | 11.30 | 12.11 | 12.45 | 13.98 |
|                 | 8H   | 11.53            | 11.82 | 12.68 | 12.95 | 14.49 | 11.18          | 11.46 | 12.32 | 12.59 | 14.14 |
|                 | 12H  | 11.64            | 11.89 | 12.79 | 13.02 | 14.60 | 11.27          | 11.52 | 12.42 | 12.65 | 14.23 |
| 12H             | 4H   | 10.71            | 11.06 | 11.84 | 12.19 | 13.72 | 10.36          | 10.72 | 11.50 | 11.84 | 13.37 |
|                 | 6H   | 11.35            | 11.64 | 12.50 | 12.77 | 14.31 | 11.01          | 11.29 | 12.15 | 12.43 | 13.97 |
|                 | 8H   | 11.57            | 11.82 | 12.72 | 12.95 | 14.53 | 11.23          | 11.47 | 12.37 | 12.61 | 14.18 |

END OF REPORT