

Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State  
Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: FAIL-SAFE

Report Number: P190101

Luminaire Tested: **TRF11-LD4-15W-50-CL-BK-UNV-EDC1**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: P190101  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P27863)  
Test Lab: INNOVATION CENTER(G2)  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: FAIL-SAFE  
Catalog Number: TRF11-LD4-15W-50-CL-BK-UNV-EDC1  
Description: TERRAPIN 11" LED WALL MOUNT WITH OPEN CLEAR LENS AND QUAD LENS COVER  
Light Source: (56) NICHIA 5000  
NF2L757DRT  
Ballast/Driver: OSRAM ELECTRONIC DRIVER PROGRAMMED AT 300mA  
OT25W/1

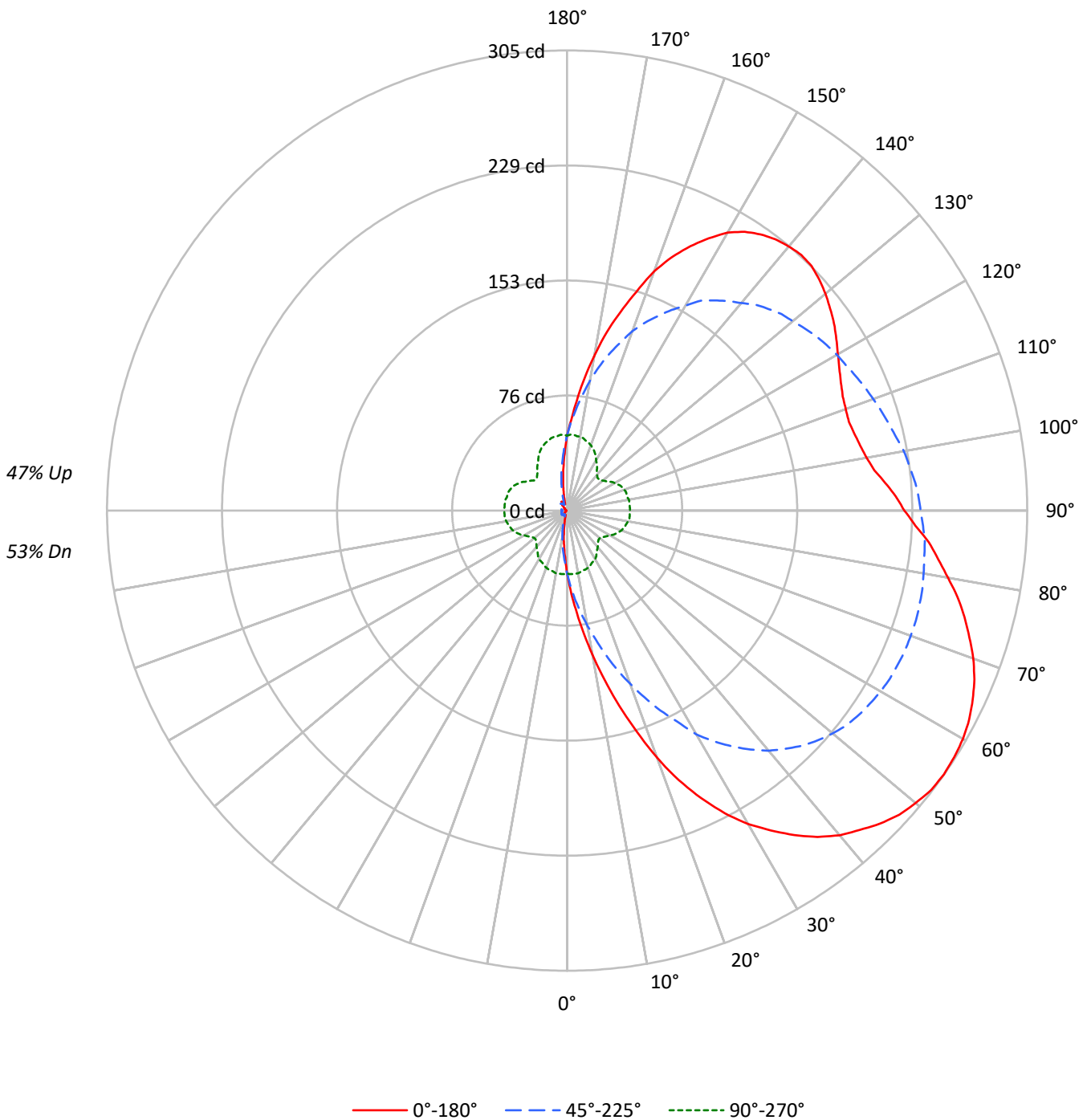
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1153.0 lumens  
Efficiency: N/A  
Efficacy: 80.1 lumens/watt  
Spacing Criteria (0/90/45): 3.33 / 1.31 / 2.89  
Luminous Opening: Rectangular w/ Sides (W: 0.92' x L: 0.29' x H: 0.92')  
CIE Type: General Diffuse  
  
Input Watts (W): 14.4  
Input Voltage (V): NR  
Input Current (A<sub>in</sub>): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT

TEST NUMBER: P190101

CATALOG NUMBER: TRF11-LD4-15W-50-CL-BK-UNV-EDC1

### Luminous Intensity Polar Plot





TEST NUMBER: P190101

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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |    |
| RC  | 80  |     |     |     | 70  |     |     |     | 50 |    |    |    | 30 |    |    |    | 10 | 0  |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0  |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |    |
| 0   | 108 | 108 | 108 | 108 | 100 | 100 | 100 | 100 | 85 | 85 | 85 | 71 | 71 | 71 | 59 | 59 | 59 | 53 |
| 1   | 94  | 87  | 81  | 76  | 86  | 80  | 75  | 70  | 67 | 63 | 60 | 55 | 52 | 49 | 44 | 42 | 40 | 35 |
| 2   | 83  | 73  | 65  | 58  | 76  | 67  | 60  | 54  | 56 | 50 | 45 | 46 | 41 | 38 | 36 | 33 | 30 | 25 |
| 3   | 75  | 63  | 53  | 46  | 68  | 58  | 49  | 43  | 48 | 41 | 36 | 39 | 34 | 30 | 30 | 27 | 23 | 19 |
| 4   | 68  | 54  | 45  | 38  | 61  | 50  | 41  | 35  | 41 | 35 | 29 | 34 | 28 | 24 | 26 | 22 | 19 | 15 |
| 5   | 62  | 48  | 38  | 31  | 56  | 44  | 35  | 29  | 36 | 30 | 24 | 29 | 24 | 20 | 23 | 19 | 15 | 12 |
| 6   | 56  | 42  | 33  | 26  | 51  | 39  | 30  | 24  | 32 | 26 | 20 | 26 | 21 | 17 | 20 | 16 | 13 | 10 |
| 7   | 52  | 38  | 29  | 23  | 47  | 35  | 27  | 21  | 29 | 22 | 17 | 24 | 18 | 14 | 18 | 14 | 11 | 8  |
| 8   | 48  | 34  | 25  | 19  | 44  | 31  | 23  | 18  | 26 | 20 | 15 | 21 | 16 | 12 | 17 | 13 | 10 | 7  |
| 9   | 44  | 31  | 23  | 17  | 41  | 28  | 21  | 16  | 24 | 18 | 13 | 19 | 14 | 11 | 15 | 11 | 8  | 6  |
| 10  | 41  | 28  | 20  | 15  | 38  | 26  | 19  | 14  | 22 | 16 | 12 | 18 | 13 | 9  | 14 | 10 | 7  | 5  |

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

|     | 0°   | 90°  | 180° |
|-----|------|------|------|
| 0°  | 1675 | 1675 | 1675 |
| 5°  | 2076 | 1568 | 739  |
| 10° | 2551 | 1467 | 297  |
| 15° | 3034 | 1344 | 113  |
| 20° | 3485 | 1266 | 62   |
| 25° | 3789 | 1163 | 56   |
| 30° | 3962 | 1096 | 63   |
| 35° | 4032 | 983  | 58   |
| 40° | 4059 | 900  | 45   |
| 45° | 4032 | 826  | 34   |
| 50° | 3981 | 809  | 25   |
| 55° | 3898 | 873  | 17   |
| 60° | 3785 | 964  | 7    |
| 65° | 3651 | 1088 | 7    |
| 70° | 3500 | 1206 | 16   |
| 75° | 3332 | 1305 | 16   |
| 80° | 3157 | 1421 | 16   |
| 85° | 3010 | 1546 | 8    |



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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 4.3    | 0.4       |
| 10°-20°   | 16.0   | 1.4       |
| 20°-30°   | 34.4   | 3.0       |
| 30°-40°   | 56.3   | 4.9       |
| 40°-50°   | 77.1   | 6.7       |
| 50°-60°   | 94.4   | 8.2       |
| 60°-70°   | 106.4  | 9.2       |
| 70°-80°   | 111.9  | 9.7       |
| 80°-90°   | 110.9  | 9.6       |
| 90°-100°  | 105.4  | 9.1       |
| 100°-110° | 97.3   | 8.4       |
| 110°-120° | 88.4   | 7.7       |
| 120°-130° | 78.1   | 6.8       |
| 130°-140° | 65.6   | 5.7       |
| 140°-150° | 50.7   | 4.4       |
| 150°-160° | 33.6   | 2.9       |
| 160°-170° | 17.2   | 1.5       |
| 170°-180° | 5.0    | 0.4       |
| 0°-30°    | 54.6   | 4.7       |
| 0°-40°    | 111.0  | 9.6       |
| 0°-60°    | 282.5  | 24.5      |
| 0°-90°    | 611.7  | 53.1      |
| 90°-120°  | 291.1  | 25.2      |
| 90°-150°  | 485.5  | 42.1      |
| 90°-180°  | 541.0  | 46.9      |
| 0°-180°   | 1153.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°  | 45° | 90° | 135° | 180° | Flux |
|------|-----|-----|-----|------|------|------|
| 0°   | 42  | 42  | 42  | 42   | 42   |      |
| 5°   | 66  | 59  | 42  | 28   | 23   | 7    |
| 15°  | 134 | 99  | 41  | 11   | 5    | 39   |
| 25°  | 210 | 146 | 38  | 4    | 3    | 98   |
| 35°  | 263 | 191 | 34  | 3    | 4    | 165  |
| 45°  | 293 | 220 | 29  | 4    | 2    | 227  |
| 55°  | 305 | 236 | 30  | 4    | 1    | 273  |
| 65°  | 297 | 242 | 36  | 4    | 1    | 294  |
| 75°  | 273 | 242 | 40  | 4    | 1    | 288  |
| 85°  | 241 | 238 | 42  | 3    | 1    | 199  |
| 90°  | 224 | 234 | 42  | 3    | 1    | 123  |
| 95°  | 212 | 231 | 42  | 3    | 1    | 171  |
| 105° | 197 | 221 | 41  | 4    | 1    | 209  |
| 115° | 200 | 211 | 39  | 4    | 1    | 199  |
| 125° | 216 | 202 | 33  | 6    | 2    | 193  |
| 135° | 229 | 189 | 30  | 6    | 3    | 176  |
| 145° | 224 | 170 | 35  | 6    | 6    | 140  |
| 155° | 193 | 142 | 43  | 4    | 6    | 90   |
| 165° | 136 | 107 | 48  | 13   | 6    | 40   |
| 175° | 73  | 67  | 50  | 34   | 28   | 8    |
| 180° | 50  | 50  | 50  | 50   | 50   |      |



TEST NUMBER: P190101

CATALOG NUMBER: TRF11-LD4-15W-50-CL-BK-UNV-EDC1

**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 5°    | 10°   | 15°   | 20°   | 22.5° | 25°   | 30°   | 35°   | 40°   | 45°   |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0°     | 41.6  | 41.6  | 41.6  | 41.6  | 41.6  | 41.6  | 41.6  | 41.6  | 41.6  | 41.6  | 41.6  |
| 2.5°   | 52.9  | 52.3  | 51.6  | 51.6  | 51.6  | 51.6  | 51.0  | 51.6  | 51.0  | 50.4  | 49.7  |
| 5°     | 65.5  | 65.5  | 64.9  | 64.9  | 64.2  | 63.6  | 63.0  | 62.3  | 61.1  | 59.8  | 58.6  |
| 7.5°   | 80.6  | 80.0  | 79.3  | 78.7  | 77.5  | 76.8  | 75.6  | 74.3  | 72.4  | 69.9  | 67.4  |
| 10°    | 97.0  | 95.7  | 95.1  | 93.8  | 91.9  | 90.7  | 89.4  | 86.9  | 83.8  | 80.6  | 77.5  |
| 12.5°  | 115.2 | 113.3 | 112.1 | 110.8 | 108.3 | 106.4 | 104.5 | 101.4 | 97.6  | 92.6  | 87.5  |
| 15°    | 134.1 | 132.9 | 131.0 | 129.1 | 126.6 | 124.1 | 122.2 | 117.8 | 112.1 | 105.8 | 98.9  |
| 17.5°  | 153.7 | 153.0 | 150.5 | 148.0 | 144.2 | 141.7 | 139.2 | 133.5 | 126.6 | 118.4 | 110.8 |
| 20°    | 174.4 | 173.8 | 171.3 | 168.1 | 163.1 | 159.9 | 155.5 | 149.2 | 141.1 | 131.6 | 122.2 |
| 22.5°  | 193.3 | 191.4 | 189.5 | 185.8 | 180.7 | 176.9 | 173.8 | 166.2 | 155.5 | 144.8 | 134.1 |
| 25°    | 210.3 | 209.1 | 206.5 | 202.8 | 197.7 | 193.3 | 190.2 | 182.0 | 171.9 | 159.3 | 146.1 |
| 27.5°  | 226.1 | 224.8 | 222.9 | 218.5 | 212.2 | 209.1 | 205.3 | 196.5 | 185.1 | 173.2 | 157.4 |
| 30°    | 239.9 | 239.3 | 236.8 | 232.4 | 226.7 | 222.3 | 219.1 | 210.3 | 199.0 | 185.8 | 171.3 |
| 32.5°  | 251.3 | 250.6 | 248.7 | 244.3 | 238.0 | 234.9 | 230.5 | 221.7 | 209.7 | 196.5 | 181.4 |
| 35°    | 262.6 | 262.0 | 259.4 | 254.4 | 248.7 | 245.0 | 241.2 | 231.7 | 220.4 | 206.5 | 190.8 |
| 37.5°  | 272.7 | 272.0 | 268.3 | 264.5 | 258.2 | 255.0 | 250.6 | 240.6 | 229.2 | 216.0 | 199.6 |
| 40°    | 280.9 | 279.6 | 277.1 | 272.7 | 266.4 | 263.2 | 258.8 | 249.4 | 238.0 | 223.5 | 207.8 |
| 42.5°  | 287.1 | 287.1 | 284.0 | 279.6 | 273.9 | 270.1 | 266.4 | 256.3 | 244.3 | 230.5 | 214.1 |
| 45°    | 293.4 | 292.8 | 289.7 | 285.9 | 279.6 | 276.4 | 272.0 | 262.6 | 251.3 | 236.8 | 220.4 |
| 47.5°  | 298.5 | 297.2 | 294.7 | 290.3 | 284.6 | 280.9 | 277.1 | 267.6 | 256.3 | 242.4 | 225.4 |
| 50°    | 301.6 | 301.0 | 297.9 | 293.4 | 288.4 | 284.6 | 280.2 | 271.4 | 260.1 | 246.2 | 229.8 |
| 52.5°  | 304.2 | 302.9 | 300.4 | 296.6 | 290.9 | 287.8 | 283.4 | 274.6 | 263.2 | 249.4 | 233.6 |
| 55°    | 304.8 | 303.5 | 301.6 | 297.9 | 292.2 | 289.0 | 285.3 | 275.8 | 265.1 | 251.9 | 236.1 |
| 57.5°  | 304.2 | 303.5 | 301.0 | 297.2 | 291.6 | 288.4 | 285.3 | 276.4 | 266.4 | 253.8 | 238.0 |
| 60°    | 302.9 | 302.3 | 299.1 | 295.3 | 290.9 | 287.8 | 284.6 | 276.4 | 266.4 | 254.4 | 239.9 |
| 62.5°  | 300.4 | 299.7 | 297.2 | 292.8 | 288.4 | 285.9 | 282.1 | 275.2 | 265.7 | 255.0 | 241.2 |
| 65°    | 296.6 | 296.0 | 293.4 | 289.7 | 285.9 | 282.7 | 280.2 | 273.3 | 265.1 | 254.4 | 241.8 |
| 67.5°  | 292.2 | 291.6 | 289.0 | 285.9 | 282.1 | 279.6 | 277.1 | 270.8 | 263.8 | 254.4 | 242.4 |
| 70°    | 286.5 | 285.9 | 283.4 | 280.2 | 277.1 | 275.2 | 272.7 | 267.0 | 261.3 | 253.1 | 242.4 |
| 72.5°  | 279.6 | 279.6 | 277.1 | 274.6 | 272.0 | 269.5 | 267.6 | 263.2 | 258.8 | 251.3 | 242.4 |
| 75°    | 272.7 | 272.0 | 270.8 | 268.3 | 265.7 | 263.8 | 262.6 | 259.4 | 255.0 | 250.0 | 241.8 |
| 77.5°  | 265.1 | 264.5 | 262.6 | 261.3 | 259.4 | 258.2 | 257.6 | 255.0 | 251.9 | 247.5 | 241.2 |
| 80°    | 256.3 | 256.3 | 255.0 | 253.8 | 252.5 | 251.9 | 251.3 | 250.0 | 248.7 | 245.6 | 239.9 |
| 82.5°  | 248.1 | 248.1 | 246.8 | 246.2 | 245.6 | 245.6 | 245.6 | 245.0 | 245.0 | 243.1 | 238.7 |
| 85°    | 240.6 | 239.9 | 239.3 | 238.7 | 238.7 | 239.3 | 239.3 | 240.6 | 241.2 | 241.2 | 238.0 |
| 87.5°  | 231.1 | 231.7 | 231.1 | 231.1 | 231.7 | 233.0 | 233.6 | 235.5 | 236.8 | 238.0 | 236.1 |
| 90°    | 223.5 | 223.5 | 223.5 | 224.2 | 225.4 | 226.7 | 228.0 | 230.5 | 233.0 | 234.9 | 234.3 |
| 92.5°  | 217.9 | 217.9 | 217.9 | 218.5 | 220.4 | 222.3 | 223.5 | 227.3 | 230.5 | 233.0 | 233.0 |
| 95°    | 211.6 | 211.6 | 212.2 | 212.8 | 215.4 | 217.3 | 219.1 | 223.5 | 226.7 | 230.5 | 231.1 |
| 97.5°  | 205.3 | 205.9 | 206.5 | 207.8 | 211.0 | 212.8 | 214.7 | 219.8 | 223.5 | 227.3 | 228.6 |
| 100°   | 201.5 | 201.5 | 202.1 | 204.7 | 207.2 | 209.1 | 211.6 | 216.6 | 221.0 | 224.8 | 226.7 |
| 102.5° | 199.0 | 199.0 | 199.6 | 201.5 | 204.7 | 206.5 | 208.4 | 214.1 | 218.5 | 222.3 | 223.5 |
| 105°   | 197.1 | 197.1 | 197.7 | 199.6 | 202.8 | 204.7 | 207.2 | 212.2 | 216.6 | 219.8 | 221.0 |
| 107.5° | 195.8 | 196.5 | 197.1 | 199.0 | 202.1 | 204.0 | 206.5 | 210.3 | 214.7 | 217.9 | 218.5 |
| 110°   | 196.5 | 197.1 | 197.7 | 199.6 | 202.8 | 204.7 | 206.5 | 210.3 | 214.1 | 216.6 | 216.0 |



TEST NUMBER: P190101

CATALOG NUMBER: TRF11-LD4-15W-50-CL-BK-UNV-EDC1

**CANDELA DISTRIBUTION (continued):**

|        | 0°    | 5°    | 10°   | 15°   | 20°   | 22.5° | 25°   | 30°   | 35°   | 40°   | 45°   |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 112.5° | 197.7 | 198.4 | 199.0 | 200.9 | 203.4 | 205.3 | 207.2 | 210.3 | 213.5 | 214.7 | 213.5 |
| 115°   | 200.2 | 200.9 | 201.5 | 203.4 | 205.9 | 207.2 | 208.4 | 211.0 | 212.8 | 213.5 | 211.0 |
| 117.5° | 203.4 | 204.0 | 204.7 | 206.5 | 208.4 | 209.1 | 210.3 | 212.2 | 213.5 | 212.2 | 208.4 |
| 120°   | 207.2 | 207.2 | 207.8 | 209.7 | 211.0 | 212.2 | 212.8 | 213.5 | 213.5 | 211.0 | 206.5 |
| 122.5° | 211.6 | 211.6 | 212.2 | 212.8 | 214.1 | 214.1 | 214.7 | 214.1 | 212.8 | 209.7 | 204.0 |
| 125°   | 216.0 | 216.0 | 216.0 | 216.6 | 216.6 | 216.6 | 216.6 | 215.4 | 213.5 | 208.4 | 201.5 |
| 127.5° | 219.8 | 219.8 | 219.8 | 219.8 | 219.1 | 219.1 | 218.5 | 216.0 | 212.8 | 206.5 | 198.4 |
| 130°   | 223.5 | 223.5 | 222.9 | 222.3 | 221.0 | 220.4 | 219.1 | 216.6 | 211.6 | 205.3 | 195.2 |
| 132.5° | 226.7 | 226.7 | 225.4 | 224.2 | 222.9 | 221.7 | 220.4 | 216.6 | 210.3 | 202.8 | 192.7 |
| 135°   | 229.2 | 228.6 | 227.3 | 226.1 | 223.5 | 222.3 | 220.4 | 215.4 | 209.1 | 200.2 | 188.9 |
| 137.5° | 229.8 | 229.8 | 228.0 | 226.7 | 223.5 | 221.7 | 219.8 | 214.1 | 206.5 | 197.1 | 185.1 |
| 140°   | 228.6 | 228.0 | 226.7 | 224.8 | 221.0 | 219.1 | 216.6 | 210.3 | 202.1 | 192.1 | 179.5 |
| 142.5° | 226.7 | 226.1 | 224.8 | 222.3 | 218.5 | 216.0 | 212.8 | 206.5 | 197.7 | 187.7 | 175.1 |
| 145°   | 223.5 | 222.9 | 221.0 | 218.5 | 214.7 | 212.2 | 209.1 | 202.1 | 193.3 | 182.0 | 170.0 |
| 147.5° | 219.1 | 218.5 | 216.6 | 214.1 | 209.7 | 206.5 | 203.4 | 196.5 | 187.7 | 176.9 | 165.0 |
| 150°   | 212.8 | 211.6 | 209.7 | 206.5 | 202.8 | 199.6 | 196.5 | 189.5 | 180.1 | 170.0 | 156.8 |
| 152.5° | 203.4 | 202.8 | 200.9 | 197.7 | 194.0 | 190.8 | 187.7 | 180.7 | 171.9 | 161.2 | 149.9 |
| 155°   | 193.3 | 192.1 | 190.8 | 187.7 | 183.9 | 180.7 | 177.6 | 171.3 | 163.1 | 152.4 | 142.3 |
| 157.5° | 182.0 | 180.7 | 179.5 | 176.3 | 173.2 | 170.0 | 167.5 | 160.6 | 152.4 | 144.2 | 134.8 |
| 160°   | 168.8 | 167.5 | 166.2 | 163.1 | 158.7 | 156.8 | 153.7 | 148.6 | 141.7 | 134.1 | 126.6 |
| 162.5° | 151.8 | 151.1 | 149.9 | 147.4 | 144.8 | 142.9 | 140.4 | 135.4 | 129.7 | 124.1 | 116.5 |
| 165°   | 136.0 | 135.4 | 134.8 | 132.2 | 130.4 | 129.1 | 126.6 | 122.8 | 117.8 | 112.7 | 107.1 |
| 167.5° | 120.9 | 120.3 | 119.6 | 117.8 | 116.5 | 114.6 | 112.7 | 110.2 | 105.8 | 102.0 | 97.6  |
| 170°   | 104.5 | 104.5 | 103.9 | 102.6 | 101.4 | 100.8 | 98.9  | 97.0  | 93.8  | 90.7  | 87.5  |
| 172.5° | 88.8  | 88.2  | 88.2  | 86.9  | 86.9  | 86.3  | 85.0  | 83.8  | 81.2  | 79.3  | 76.8  |
| 175°   | 73.0  | 73.0  | 73.0  | 72.4  | 72.4  | 72.4  | 71.2  | 70.5  | 69.3  | 68.6  | 67.4  |
| 177.5° | 59.8  | 59.2  | 59.8  | 59.8  | 59.8  | 59.8  | 59.2  | 59.2  | 59.2  | 58.6  | 58.6  |
| 180°   | 49.7  | 49.7  | 49.7  | 49.7  | 49.7  | 49.7  | 49.7  | 49.7  | 49.7  | 49.7  | 49.7  |



TEST NUMBER: P190101

CATALOG NUMBER: TRF11-LD4-15W-50-CL-BK-UNV-EDC1

**CANDELA DISTRIBUTION (continued):**

|        | 50°   | 55°   | 60°   | 65°   | 67.5° | 70°   | 75°   | 80°  | 85°  | 90°  | 95°  |
|--------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|
| 0°     | 41.6  | 41.6  | 41.6  | 41.6  | 41.6  | 41.6  | 41.6  | 41.6 | 41.6 | 41.6 | 41.6 |
| 2.5°   | 49.1  | 48.5  | 47.9  | 47.2  | 46.6  | 46.0  | 45.3  | 44.1 | 43.5 | 42.2 | 41.6 |
| 5°     | 57.3  | 55.4  | 53.5  | 51.6  | 51.0  | 49.7  | 48.5  | 46.0 | 44.1 | 42.2 | 40.3 |
| 7.5°   | 64.9  | 62.3  | 59.8  | 56.7  | 55.4  | 53.5  | 51.0  | 47.9 | 45.3 | 42.2 | 39.7 |
| 10°    | 73.7  | 69.3  | 65.5  | 61.7  | 59.2  | 57.3  | 53.5  | 49.7 | 45.3 | 42.2 | 38.4 |
| 12.5°  | 82.5  | 77.5  | 71.8  | 66.7  | 64.2  | 61.1  | 56.0  | 51.0 | 46.0 | 41.6 | 37.2 |
| 15°    | 92.6  | 85.6  | 78.7  | 71.8  | 68.6  | 64.9  | 58.6  | 52.3 | 46.6 | 40.9 | 35.9 |
| 17.5°  | 102.6 | 93.8  | 85.6  | 77.5  | 73.0  | 68.6  | 61.1  | 54.2 | 47.2 | 40.9 | 35.3 |
| 20°    | 112.7 | 102.6 | 91.9  | 81.9  | 77.5  | 72.4  | 63.6  | 54.8 | 47.2 | 40.3 | 34.0 |
| 22.5°  | 122.8 | 110.8 | 98.9  | 86.9  | 81.2  | 75.6  | 65.5  | 56.0 | 47.2 | 39.7 | 32.7 |
| 25°    | 132.9 | 119.0 | 105.2 | 91.9  | 85.6  | 79.3  | 67.4  | 56.7 | 47.2 | 38.4 | 31.5 |
| 27.5°  | 142.9 | 127.8 | 112.1 | 96.3  | 89.4  | 82.5  | 69.3  | 57.3 | 47.2 | 37.8 | 30.2 |
| 30°    | 153.0 | 136.0 | 118.4 | 101.4 | 93.2  | 85.0  | 70.5  | 57.9 | 46.6 | 37.2 | 29.0 |
| 32.5°  | 163.1 | 143.6 | 124.1 | 105.8 | 96.3  | 87.5  | 71.8  | 57.9 | 46.0 | 35.9 | 27.1 |
| 35°    | 172.5 | 151.1 | 130.4 | 109.6 | 99.5  | 90.0  | 72.4  | 57.3 | 44.7 | 34.0 | 25.8 |
| 37.5°  | 180.7 | 159.3 | 136.0 | 113.3 | 102.6 | 91.9  | 73.0  | 56.7 | 43.5 | 32.7 | 24.6 |
| 40°    | 188.3 | 166.9 | 141.1 | 117.1 | 105.2 | 93.8  | 73.7  | 56.0 | 42.2 | 31.5 | 22.7 |
| 42.5°  | 194.6 | 172.5 | 146.1 | 120.9 | 108.3 | 95.7  | 73.7  | 55.4 | 40.9 | 30.2 | 21.4 |
| 45°    | 200.2 | 178.2 | 151.1 | 124.1 | 110.8 | 98.2  | 74.3  | 55.4 | 40.3 | 29.0 | 20.8 |
| 47.5°  | 205.9 | 183.2 | 155.5 | 127.8 | 114.0 | 100.8 | 75.6  | 55.4 | 40.3 | 28.3 | 20.2 |
| 50°    | 210.3 | 187.7 | 160.6 | 131.6 | 117.1 | 103.3 | 77.5  | 56.0 | 40.3 | 28.3 | 20.2 |
| 52.5°  | 214.1 | 191.4 | 165.6 | 135.4 | 120.9 | 105.8 | 79.3  | 57.9 | 40.9 | 29.0 | 20.8 |
| 55°    | 217.3 | 195.2 | 169.4 | 139.2 | 124.7 | 109.6 | 81.9  | 59.8 | 42.8 | 30.2 | 20.8 |
| 57.5°  | 219.8 | 198.4 | 173.2 | 142.9 | 127.8 | 113.3 | 85.0  | 62.3 | 44.7 | 31.5 | 21.4 |
| 60°    | 222.3 | 201.5 | 176.9 | 146.7 | 131.6 | 117.1 | 88.8  | 65.5 | 47.2 | 32.7 | 22.0 |
| 62.5°  | 224.2 | 204.0 | 180.1 | 150.5 | 136.0 | 120.9 | 91.9  | 68.0 | 49.1 | 34.6 | 22.7 |
| 65°    | 226.1 | 206.5 | 183.9 | 154.9 | 139.8 | 125.3 | 96.3  | 71.8 | 51.6 | 35.9 | 23.3 |
| 67.5°  | 227.3 | 209.1 | 187.0 | 159.9 | 144.2 | 129.1 | 100.1 | 74.9 | 54.2 | 37.2 | 23.9 |
| 70°    | 228.6 | 211.6 | 190.2 | 164.4 | 148.6 | 133.5 | 103.9 | 78.1 | 56.0 | 38.4 | 23.9 |
| 72.5°  | 229.8 | 214.1 | 193.3 | 168.1 | 152.4 | 137.3 | 107.7 | 80.6 | 57.9 | 39.0 | 24.6 |
| 75°    | 230.5 | 215.4 | 195.8 | 171.9 | 156.2 | 141.1 | 110.8 | 83.1 | 59.2 | 39.7 | 24.6 |
| 77.5°  | 231.1 | 217.3 | 198.4 | 175.1 | 159.3 | 144.8 | 114.0 | 85.6 | 61.1 | 40.3 | 24.6 |
| 80°    | 231.7 | 218.5 | 200.9 | 177.6 | 163.7 | 147.4 | 116.5 | 87.5 | 61.7 | 40.9 | 24.6 |
| 82.5°  | 231.7 | 219.8 | 202.8 | 180.1 | 166.2 | 149.9 | 119.0 | 88.8 | 63.0 | 41.6 | 24.6 |
| 85°    | 231.7 | 221.0 | 204.7 | 182.0 | 168.8 | 152.4 | 120.3 | 90.0 | 63.6 | 41.6 | 24.6 |
| 87.5°  | 231.1 | 221.0 | 205.9 | 183.9 | 170.0 | 153.7 | 122.2 | 91.3 | 64.2 | 41.6 | 23.9 |
| 90°    | 229.8 | 221.0 | 206.5 | 184.5 | 171.3 | 154.9 | 122.8 | 91.9 | 64.2 | 41.6 | 23.9 |
| 92.5°  | 229.8 | 220.4 | 205.9 | 184.5 | 170.7 | 154.3 | 122.8 | 91.3 | 64.2 | 41.6 | 23.9 |
| 95°    | 228.0 | 219.1 | 204.7 | 183.9 | 170.0 | 154.3 | 122.8 | 91.3 | 64.2 | 41.6 | 23.9 |
| 97.5°  | 225.4 | 217.3 | 202.8 | 182.0 | 168.8 | 153.0 | 122.2 | 91.3 | 64.2 | 41.6 | 23.9 |
| 100°   | 223.5 | 215.4 | 201.5 | 180.7 | 167.5 | 151.8 | 121.5 | 90.7 | 63.6 | 41.6 | 23.9 |
| 102.5° | 221.0 | 212.8 | 198.4 | 178.2 | 165.0 | 149.9 | 119.6 | 90.0 | 63.6 | 40.9 | 23.9 |
| 105°   | 218.5 | 209.1 | 195.2 | 175.1 | 161.2 | 147.4 | 117.8 | 88.8 | 62.3 | 40.9 | 24.6 |
| 107.5° | 215.4 | 205.9 | 191.4 | 171.3 | 157.4 | 144.2 | 115.2 | 86.9 | 61.7 | 40.9 | 24.6 |
| 110°   | 211.6 | 202.1 | 187.7 | 167.5 | 153.7 | 140.4 | 112.7 | 85.0 | 60.5 | 40.3 | 24.6 |





TEST NUMBER: P190101

CATALOG NUMBER: TRF11-LD4-15W-50-CL-BK-UNV-EDC1

**CANDELA DISTRIBUTION (continued):**

|        | 50°   | 55°   | 60°   | 65°   | 67.5° | 70°   | 75°   | 80°  | 85°  | 90°  | 95°  |
|--------|-------|-------|-------|-------|-------|-------|-------|------|------|------|------|
| 112.5° | 207.8 | 197.7 | 183.2 | 161.8 | 149.2 | 136.0 | 108.9 | 82.5 | 59.2 | 39.7 | 24.6 |
| 115°   | 204.7 | 193.3 | 178.2 | 156.2 | 144.2 | 131.6 | 105.2 | 80.0 | 57.3 | 39.0 | 24.6 |
| 117.5° | 201.5 | 189.5 | 173.2 | 151.1 | 139.2 | 126.6 | 100.8 | 76.8 | 55.4 | 37.8 | 23.9 |
| 120°   | 198.4 | 185.1 | 168.8 | 146.1 | 133.5 | 121.5 | 96.3  | 73.0 | 52.9 | 36.5 | 23.9 |
| 122.5° | 194.0 | 180.7 | 162.5 | 141.1 | 128.5 | 116.5 | 91.9  | 69.3 | 50.4 | 35.3 | 23.3 |
| 125°   | 190.8 | 175.7 | 156.8 | 135.4 | 123.4 | 111.5 | 87.5  | 66.1 | 47.9 | 33.4 | 22.7 |
| 127.5° | 186.4 | 171.3 | 151.8 | 129.7 | 117.8 | 106.4 | 83.1  | 62.3 | 45.3 | 32.1 | 22.0 |
| 130°   | 183.2 | 166.9 | 146.7 | 124.7 | 113.3 | 101.4 | 79.3  | 59.2 | 43.5 | 30.9 | 21.4 |
| 132.5° | 178.8 | 161.2 | 141.7 | 120.3 | 108.9 | 97.6  | 76.2  | 56.7 | 41.6 | 29.6 | 20.8 |
| 135°   | 175.1 | 156.2 | 137.3 | 115.9 | 104.5 | 94.5  | 73.7  | 55.4 | 40.3 | 29.6 | 20.8 |
| 137.5° | 170.7 | 151.8 | 132.9 | 112.7 | 101.4 | 91.3  | 71.8  | 54.2 | 40.3 | 29.6 | 21.4 |
| 140°   | 165.6 | 146.7 | 128.5 | 108.9 | 98.9  | 88.8  | 70.5  | 54.2 | 40.9 | 30.9 | 22.7 |
| 142.5° | 159.3 | 142.3 | 124.7 | 106.4 | 96.3  | 87.5  | 69.9  | 54.8 | 42.2 | 32.1 | 23.9 |
| 145°   | 154.3 | 138.5 | 121.5 | 103.9 | 95.1  | 86.9  | 70.5  | 56.0 | 44.1 | 34.6 | 26.4 |
| 147.5° | 149.9 | 134.8 | 118.4 | 102.0 | 93.8  | 86.3  | 71.2  | 57.3 | 46.0 | 36.5 | 28.3 |
| 150°   | 144.2 | 129.7 | 115.2 | 100.1 | 92.6  | 85.6  | 71.8  | 59.2 | 47.9 | 38.4 | 30.2 |
| 152.5° | 137.9 | 124.7 | 111.5 | 98.2  | 91.3  | 84.4  | 71.8  | 60.5 | 49.7 | 40.9 | 32.7 |
| 155°   | 131.6 | 119.6 | 107.7 | 95.1  | 89.4  | 83.1  | 71.8  | 61.1 | 51.6 | 42.8 | 34.6 |
| 157.5° | 124.7 | 114.6 | 103.3 | 92.6  | 86.9  | 81.9  | 71.8  | 61.7 | 52.9 | 44.7 | 36.5 |
| 160°   | 117.1 | 108.3 | 98.9  | 89.4  | 84.4  | 80.0  | 70.5  | 61.7 | 53.5 | 46.0 | 38.4 |
| 162.5° | 109.6 | 101.4 | 93.2  | 85.0  | 80.6  | 76.8  | 69.3  | 61.1 | 54.2 | 47.2 | 40.3 |
| 165°   | 100.8 | 93.8  | 87.5  | 80.6  | 76.8  | 73.7  | 67.4  | 60.5 | 54.2 | 47.9 | 42.2 |
| 167.5° | 92.6  | 87.5  | 81.9  | 76.2  | 73.0  | 70.5  | 64.9  | 59.2 | 54.2 | 49.1 | 44.1 |
| 170°   | 83.8  | 79.3  | 75.6  | 71.2  | 68.6  | 66.7  | 62.3  | 57.9 | 53.5 | 49.7 | 45.3 |
| 172.5° | 74.3  | 71.2  | 68.6  | 65.5  | 64.2  | 62.3  | 59.2  | 56.0 | 52.9 | 49.7 | 46.6 |
| 175°   | 65.5  | 63.6  | 62.3  | 60.5  | 59.2  | 58.6  | 56.7  | 54.2 | 52.3 | 50.4 | 48.5 |
| 177.5° | 57.3  | 56.7  | 56.0  | 55.4  | 54.8  | 54.2  | 53.5  | 52.3 | 51.6 | 50.4 | 49.7 |
| 180°   | 49.7  | 49.7  | 49.7  | 49.7  | 49.7  | 49.7  | 49.7  | 49.7 | 49.7 | 49.7 | 49.7 |



TEST NUMBER: P190101

CATALOG NUMBER: TRF11-LD4-15W-50-CL-BK-UNV-EDC1

**CANDELA DISTRIBUTION (continued):**

|        | 100° | 105° | 110° | 112.5° | 115° | 120° | 125° | 130° | 135° | 140° | 145° |
|--------|------|------|------|--------|------|------|------|------|------|------|------|
| 0°     | 41.6 | 41.6 | 41.6 | 41.6   | 41.6 | 41.6 | 41.6 | 41.6 | 41.6 | 41.6 | 41.6 |
| 2.5°   | 40.3 | 39.7 | 38.4 | 37.8   | 37.8 | 36.5 | 35.9 | 35.3 | 34.0 | 33.4 | 32.7 |
| 5°     | 39.0 | 37.2 | 35.3 | 34.6   | 33.4 | 32.1 | 30.9 | 29.6 | 28.3 | 27.1 | 25.8 |
| 7.5°   | 37.2 | 34.6 | 32.1 | 30.9   | 30.2 | 27.7 | 26.4 | 24.6 | 22.7 | 21.4 | 20.8 |
| 10°    | 35.3 | 32.1 | 29.0 | 27.7   | 26.4 | 23.9 | 22.0 | 20.2 | 18.3 | 17.0 | 15.1 |
| 12.5°  | 33.4 | 29.6 | 26.4 | 24.6   | 23.3 | 20.8 | 18.3 | 16.4 | 14.5 | 12.6 | 11.3 |
| 15°    | 31.5 | 27.7 | 23.9 | 22.0   | 20.2 | 17.6 | 15.1 | 12.6 | 10.7 | 9.4  | 8.2  |
| 17.5°  | 29.6 | 25.2 | 21.4 | 19.5   | 17.6 | 15.1 | 12.0 | 10.1 | 8.2  | 6.9  | 5.7  |
| 20°    | 28.3 | 23.3 | 18.9 | 17.0   | 15.7 | 12.6 | 9.4  | 7.6  | 6.3  | 5.0  | 4.4  |
| 22.5°  | 26.4 | 21.4 | 17.0 | 15.1   | 13.2 | 10.1 | 7.6  | 5.7  | 4.4  | 3.8  | 3.1  |
| 25°    | 25.2 | 19.5 | 15.1 | 13.2   | 11.3 | 8.2  | 6.3  | 4.4  | 3.8  | 3.1  | 3.1  |
| 27.5°  | 23.3 | 18.3 | 13.2 | 11.3   | 9.4  | 6.9  | 5.0  | 3.8  | 3.1  | 3.1  | 3.1  |
| 30°    | 22.0 | 16.4 | 12.0 | 10.1   | 8.2  | 5.7  | 3.8  | 3.1  | 3.1  | 3.1  | 3.1  |
| 32.5°  | 20.8 | 15.1 | 10.7 | 8.8    | 7.6  | 5.0  | 3.1  | 3.1  | 3.1  | 3.1  | 3.8  |
| 35°    | 18.9 | 13.9 | 9.4  | 7.6    | 6.3  | 4.4  | 3.1  | 3.1  | 3.1  | 3.8  | 3.8  |
| 37.5°  | 17.6 | 12.6 | 8.8  | 6.9    | 5.7  | 3.1  | 3.1  | 3.1  | 3.1  | 3.8  | 3.8  |
| 40°    | 16.4 | 12.0 | 8.2  | 6.3    | 5.0  | 3.1  | 3.1  | 3.1  | 3.8  | 3.8  | 3.8  |
| 42.5°  | 15.7 | 11.3 | 7.6  | 5.7    | 4.4  | 3.1  | 3.1  | 3.8  | 3.8  | 3.8  | 3.8  |
| 45°    | 15.1 | 10.7 | 6.9  | 5.0    | 3.8  | 3.1  | 3.1  | 3.8  | 3.8  | 4.4  | 3.8  |
| 47.5°  | 14.5 | 10.1 | 6.3  | 4.4    | 3.1  | 3.1  | 3.8  | 3.8  | 4.4  | 4.4  | 3.8  |
| 50°    | 14.5 | 9.4  | 5.7  | 4.4    | 3.1  | 3.1  | 3.8  | 4.4  | 4.4  | 4.4  | 3.8  |
| 52.5°  | 14.5 | 9.4  | 5.0  | 3.8    | 3.1  | 3.8  | 3.8  | 4.4  | 4.4  | 4.4  | 3.8  |
| 55°    | 14.5 | 8.8  | 5.0  | 3.8    | 3.1  | 3.8  | 4.4  | 4.4  | 4.4  | 3.8  | 3.1  |
| 57.5°  | 14.5 | 8.2  | 4.4  | 3.8    | 3.1  | 3.8  | 4.4  | 4.4  | 4.4  | 3.8  | 3.1  |
| 60°    | 13.9 | 7.6  | 4.4  | 3.1    | 3.8  | 4.4  | 4.4  | 4.4  | 4.4  | 3.8  | 3.1  |
| 62.5°  | 13.9 | 7.6  | 3.8  | 3.8    | 3.8  | 4.4  | 4.4  | 4.4  | 3.8  | 3.8  | 2.5  |
| 65°    | 13.9 | 6.9  | 3.8  | 3.8    | 3.8  | 4.4  | 5.0  | 4.4  | 3.8  | 3.1  | 2.5  |
| 67.5°  | 13.9 | 6.9  | 3.8  | 3.8    | 3.8  | 4.4  | 5.0  | 4.4  | 3.8  | 3.1  | 2.5  |
| 70°    | 13.9 | 6.3  | 3.8  | 3.8    | 4.4  | 4.4  | 5.0  | 4.4  | 3.8  | 3.1  | 2.5  |
| 72.5°  | 13.2 | 6.3  | 3.8  | 3.8    | 4.4  | 5.0  | 5.0  | 4.4  | 3.8  | 3.1  | 2.5  |
| 75°    | 13.2 | 6.3  | 3.8  | 3.8    | 4.4  | 5.0  | 5.0  | 4.4  | 3.8  | 3.1  | 1.9  |
| 77.5°  | 12.6 | 5.7  | 3.8  | 3.8    | 4.4  | 5.0  | 5.0  | 4.4  | 3.8  | 2.5  | 1.9  |
| 80°    | 12.6 | 5.7  | 3.8  | 3.8    | 4.4  | 5.0  | 5.0  | 4.4  | 3.8  | 2.5  | 1.9  |
| 82.5°  | 12.6 | 5.7  | 3.8  | 4.4    | 4.4  | 5.0  | 5.0  | 4.4  | 3.1  | 2.5  | 1.9  |
| 85°    | 12.6 | 5.7  | 3.8  | 3.8    | 4.4  | 5.0  | 5.0  | 4.4  | 3.1  | 2.5  | 1.9  |
| 87.5°  | 12.0 | 5.7  | 3.8  | 3.8    | 4.4  | 5.0  | 5.0  | 3.8  | 3.1  | 2.5  | 1.9  |
| 90°    | 12.0 | 5.0  | 3.8  | 3.8    | 4.4  | 5.0  | 5.0  | 3.8  | 3.1  | 1.9  | 1.3  |
| 92.5°  | 12.0 | 5.7  | 3.8  | 4.4    | 4.4  | 5.0  | 5.0  | 4.4  | 3.1  | 2.5  | 1.9  |
| 95°    | 12.6 | 5.7  | 3.8  | 4.4    | 4.4  | 5.0  | 5.0  | 4.4  | 3.1  | 2.5  | 1.9  |
| 97.5°  | 12.6 | 5.7  | 3.8  | 4.4    | 4.4  | 5.0  | 5.0  | 4.4  | 3.1  | 2.5  | 1.9  |
| 100°   | 12.6 | 5.7  | 3.8  | 4.4    | 5.0  | 5.0  | 5.0  | 4.4  | 3.8  | 2.5  | 1.9  |
| 102.5° | 12.6 | 5.7  | 3.8  | 4.4    | 4.4  | 5.0  | 5.0  | 4.4  | 3.8  | 2.5  | 1.9  |
| 105°   | 12.6 | 6.3  | 3.8  | 4.4    | 4.4  | 5.0  | 5.0  | 4.4  | 3.8  | 2.5  | 1.9  |
| 107.5° | 13.2 | 6.3  | 3.8  | 3.8    | 4.4  | 5.0  | 5.7  | 5.0  | 3.8  | 2.5  | 1.9  |
| 110°   | 13.2 | 6.3  | 3.8  | 3.8    | 4.4  | 5.0  | 5.7  | 5.0  | 3.8  | 3.1  | 2.5  |



TEST NUMBER: P190101

CATALOG NUMBER: TRF11-LD4-15W-50-CL-BK-UNV-EDC1

**CANDELA DISTRIBUTION (continued):**

|        | 100° | 105° | 110° | 112.5° | 115° | 120° | 125° | 130° | 135° | 140° | 145° |
|--------|------|------|------|--------|------|------|------|------|------|------|------|
| 112.5° | 13.9 | 6.9  | 3.8  | 3.8    | 4.4  | 5.0  | 5.7  | 5.0  | 4.4  | 3.1  | 2.5  |
| 115°   | 13.9 | 6.9  | 4.4  | 4.4    | 4.4  | 5.0  | 5.7  | 5.7  | 4.4  | 3.8  | 2.5  |
| 117.5° | 14.5 | 7.6  | 4.4  | 4.4    | 4.4  | 5.7  | 5.7  | 5.7  | 5.0  | 3.8  | 3.1  |
| 120°   | 14.5 | 8.2  | 4.4  | 4.4    | 4.4  | 5.7  | 5.7  | 5.7  | 5.0  | 4.4  | 3.1  |
| 122.5° | 14.5 | 8.2  | 5.0  | 4.4    | 4.4  | 5.0  | 5.7  | 6.3  | 5.7  | 4.4  | 3.8  |
| 125°   | 14.5 | 8.8  | 5.0  | 4.4    | 4.4  | 5.0  | 5.7  | 6.3  | 5.7  | 5.0  | 4.4  |
| 127.5° | 14.5 | 9.4  | 5.7  | 4.4    | 4.4  | 5.0  | 5.7  | 6.3  | 6.3  | 5.7  | 4.4  |
| 130°   | 14.5 | 10.1 | 6.3  | 5.0    | 4.4  | 5.0  | 5.7  | 6.3  | 6.3  | 5.7  | 5.0  |
| 132.5° | 14.5 | 10.1 | 6.9  | 5.0    | 4.4  | 4.4  | 5.0  | 6.3  | 6.3  | 6.3  | 5.7  |
| 135°   | 15.1 | 10.7 | 7.6  | 5.7    | 4.4  | 4.4  | 5.0  | 5.7  | 6.3  | 6.3  | 6.3  |
| 137.5° | 15.7 | 11.3 | 7.6  | 6.3    | 5.0  | 4.4  | 5.0  | 5.7  | 6.3  | 6.3  | 6.3  |
| 140°   | 17.0 | 12.0 | 8.2  | 6.9    | 5.7  | 4.4  | 4.4  | 5.0  | 5.7  | 6.3  | 6.3  |
| 142.5° | 18.3 | 13.2 | 9.4  | 7.6    | 6.3  | 4.4  | 4.4  | 5.0  | 5.7  | 6.3  | 6.9  |
| 145°   | 19.5 | 14.5 | 10.1 | 8.8    | 6.9  | 5.0  | 4.4  | 5.0  | 5.7  | 6.3  | 6.3  |
| 147.5° | 21.4 | 16.4 | 11.3 | 9.4    | 8.2  | 5.7  | 4.4  | 4.4  | 5.0  | 5.7  | 6.3  |
| 150°   | 23.3 | 18.3 | 13.2 | 10.7   | 9.4  | 6.3  | 5.0  | 4.4  | 4.4  | 5.0  | 5.7  |
| 152.5° | 25.8 | 20.2 | 15.1 | 12.6   | 10.7 | 7.6  | 5.7  | 4.4  | 4.4  | 4.4  | 5.0  |
| 155°   | 27.7 | 22.0 | 17.0 | 14.5   | 12.6 | 9.4  | 6.9  | 5.7  | 4.4  | 4.4  | 4.4  |
| 157.5° | 30.2 | 24.6 | 19.5 | 17.0   | 15.1 | 11.3 | 8.8  | 6.9  | 5.7  | 5.0  | 4.4  |
| 160°   | 32.1 | 26.4 | 22.0 | 19.5   | 17.6 | 13.9 | 10.7 | 8.8  | 6.9  | 5.7  | 5.0  |
| 162.5° | 34.6 | 29.0 | 24.6 | 22.7   | 20.8 | 17.0 | 13.9 | 11.3 | 9.4  | 7.6  | 6.9  |
| 165°   | 37.2 | 32.1 | 27.7 | 25.8   | 23.9 | 20.8 | 17.6 | 14.5 | 12.6 | 10.7 | 9.4  |
| 167.5° | 39.0 | 35.3 | 30.9 | 29.0   | 27.7 | 24.6 | 21.4 | 18.9 | 17.0 | 15.1 | 13.2 |
| 170°   | 41.6 | 37.8 | 34.6 | 32.7   | 31.5 | 29.0 | 25.8 | 23.9 | 22.0 | 20.2 | 18.3 |
| 172.5° | 44.1 | 40.9 | 38.4 | 37.2   | 35.9 | 33.4 | 30.9 | 29.0 | 27.7 | 25.8 | 24.6 |
| 175°   | 46.0 | 44.1 | 42.2 | 41.6   | 40.3 | 39.0 | 37.2 | 35.9 | 34.0 | 33.4 | 32.1 |
| 177.5° | 48.5 | 47.2 | 46.6 | 46.0   | 45.3 | 44.7 | 43.5 | 42.8 | 42.2 | 41.6 | 40.9 |
| 180°   | 49.7 | 49.7 | 49.7 | 49.7   | 49.7 | 49.7 | 49.7 | 49.7 | 49.7 | 49.7 | 49.7 |



TEST NUMBER: P190101

CATALOG NUMBER: TRF11-LD4-15W-50-CL-BK-UNV-EDC1

**CANDELA DISTRIBUTION (continued):**

|        | 150° | 155° | 157.5° | 160° | 165° | 170° | 175° | 180° |
|--------|------|------|--------|------|------|------|------|------|
| 0°     | 41.6 | 41.6 | 41.6   | 41.6 | 41.6 | 41.6 | 41.6 | 41.6 |
| 2.5°   | 32.1 | 31.5 | 31.5   | 30.9 | 30.9 | 30.9 | 30.2 | 30.9 |
| 5°     | 25.2 | 24.6 | 24.6   | 23.9 | 23.9 | 22.7 | 22.7 | 23.3 |
| 7.5°   | 19.5 | 18.3 | 18.3   | 17.6 | 17.6 | 17.0 | 16.4 | 17.0 |
| 10°    | 14.5 | 13.2 | 13.2   | 12.6 | 12.0 | 11.3 | 11.3 | 11.3 |
| 12.5°  | 10.1 | 9.4  | 8.8    | 8.8  | 8.2  | 7.6  | 7.6  | 7.6  |
| 15°    | 6.9  | 6.3  | 6.3    | 5.7  | 5.7  | 5.0  | 5.0  | 5.0  |
| 17.5°  | 5.0  | 4.4  | 3.8    | 3.8  | 3.8  | 3.1  | 3.1  | 3.1  |
| 20°    | 3.8  | 3.1  | 3.1    | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  |
| 22.5°  | 3.1  | 3.1  | 3.1    | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  |
| 25°    | 3.1  | 3.1  | 3.1    | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  |
| 27.5°  | 3.1  | 3.1  | 3.8    | 3.8  | 3.8  | 3.8  | 3.8  | 3.8  |
| 30°    | 3.8  | 3.8  | 3.8    | 3.8  | 3.8  | 3.8  | 3.8  | 3.8  |
| 32.5°  | 3.8  | 3.8  | 3.8    | 3.8  | 3.8  | 3.8  | 3.8  | 3.8  |
| 35°    | 3.8  | 3.8  | 3.8    | 3.8  | 3.8  | 3.8  | 3.8  | 3.8  |
| 37.5°  | 3.8  | 3.8  | 3.8    | 3.8  | 3.8  | 3.8  | 3.8  | 3.8  |
| 40°    | 3.8  | 3.8  | 3.8    | 3.8  | 3.8  | 3.1  | 3.1  | 3.1  |
| 42.5°  | 3.8  | 3.8  | 3.8    | 3.1  | 3.1  | 3.1  | 3.1  | 3.1  |
| 45°    | 3.8  | 3.8  | 3.1    | 3.1  | 3.1  | 2.5  | 2.5  | 2.5  |
| 47.5°  | 3.8  | 3.1  | 3.1    | 3.1  | 2.5  | 2.5  | 1.9  | 1.9  |
| 50°    | 3.1  | 2.5  | 2.5    | 2.5  | 1.9  | 1.9  | 1.9  | 1.9  |
| 52.5°  | 3.1  | 2.5  | 2.5    | 2.5  | 1.9  | 1.9  | 1.3  | 1.3  |
| 55°    | 3.1  | 2.5  | 1.9    | 1.9  | 1.9  | 1.3  | 1.3  | 1.3  |
| 57.5°  | 2.5  | 1.9  | 1.9    | 1.9  | 1.3  | 1.3  | 1.3  | 1.3  |
| 60°    | 2.5  | 1.9  | 1.9    | 1.3  | 1.3  | 1.3  | 0.6  | 0.6  |
| 62.5°  | 2.5  | 1.9  | 1.3    | 1.3  | 1.3  | 1.3  | 0.6  | 0.6  |
| 65°    | 1.9  | 1.9  | 1.3    | 1.3  | 1.3  | 1.3  | 0.6  | 0.6  |
| 67.5°  | 1.9  | 1.3  | 1.3    | 1.3  | 1.3  | 1.3  | 0.6  | 0.6  |
| 70°    | 1.9  | 1.3  | 1.3    | 1.3  | 1.3  | 1.3  | 1.3  | 1.3  |
| 72.5°  | 1.9  | 1.3  | 1.3    | 1.3  | 1.3  | 1.3  | 1.3  | 1.3  |
| 75°    | 1.9  | 1.3  | 1.3    | 1.3  | 1.3  | 1.3  | 1.3  | 1.3  |
| 77.5°  | 1.9  | 1.3  | 1.3    | 1.3  | 1.3  | 1.3  | 1.3  | 1.3  |
| 80°    | 1.3  | 1.3  | 1.3    | 1.3  | 1.3  | 1.3  | 1.3  | 1.3  |
| 82.5°  | 1.3  | 1.3  | 1.3    | 1.3  | 1.3  | 1.3  | 1.3  | 1.3  |
| 85°    | 1.3  | 1.3  | 1.3    | 1.3  | 1.3  | 0.6  | 0.6  | 0.6  |
| 87.5°  | 1.3  | 0.6  | 0.6    | 0.6  | 0.6  | 0.6  | 0.6  | 0.6  |
| 90°    | 1.3  | 1.3  | 1.3    | 0.6  | 0.6  | 0.6  | 0.6  | 0.6  |
| 92.5°  | 1.3  | 1.3  | 1.3    | 1.3  | 1.3  | 0.6  | 0.6  | 0.6  |
| 95°    | 1.3  | 1.3  | 1.3    | 1.3  | 0.6  | 0.6  | 0.6  | 0.6  |
| 97.5°  | 1.3  | 1.3  | 1.3    | 1.3  | 0.6  | 0.6  | 0.6  | 0.6  |
| 100°   | 1.3  | 1.3  | 1.3    | 1.3  | 0.6  | 0.6  | 0.6  | 0.6  |
| 102.5° | 1.3  | 1.3  | 0.6    | 0.6  | 0.6  | 0.6  | 0.6  | 0.6  |
| 105°   | 1.3  | 1.3  | 0.6    | 0.6  | 0.6  | 0.6  | 0.6  | 0.6  |
| 107.5° | 1.3  | 1.3  | 1.3    | 0.6  | 0.6  | 0.6  | 0.6  | 0.6  |
| 110°   | 1.9  | 1.3  | 1.3    | 0.6  | 0.6  | 0.6  | 0.6  | 0.6  |



TEST NUMBER: P190101

CATALOG NUMBER: TRF11-LD4-15W-50-CL-BK-UNV-EDC1

**CANDELA DISTRIBUTION (continued):**

|        | 150° | 155° | 157.5° | 160° | 165° | 170° | 175° | 180° |
|--------|------|------|--------|------|------|------|------|------|
| 112.5° | 1.9  | 1.3  | 1.3    | 1.3  | 0.6  | 0.6  | 0.6  | 0.6  |
| 115°   | 1.9  | 1.9  | 1.3    | 1.3  | 1.3  | 1.3  | 0.6  | 0.6  |
| 117.5° | 2.5  | 1.9  | 1.9    | 1.9  | 1.3  | 1.3  | 1.3  | 1.3  |
| 120°   | 2.5  | 2.5  | 1.9    | 1.9  | 1.3  | 1.3  | 1.3  | 1.3  |
| 122.5° | 3.1  | 2.5  | 2.5    | 1.9  | 1.9  | 1.9  | 1.3  | 1.3  |
| 125°   | 3.1  | 2.5  | 2.5    | 2.5  | 1.9  | 1.9  | 1.9  | 1.9  |
| 127.5° | 3.8  | 3.1  | 3.1    | 2.5  | 2.5  | 1.9  | 1.9  | 1.9  |
| 130°   | 4.4  | 3.8  | 3.8    | 3.1  | 2.5  | 2.5  | 2.5  | 2.5  |
| 132.5° | 5.0  | 4.4  | 3.8    | 3.8  | 3.1  | 3.1  | 3.1  | 2.5  |
| 135°   | 5.7  | 5.0  | 4.4    | 4.4  | 3.8  | 3.8  | 3.1  | 3.1  |
| 137.5° | 6.3  | 5.7  | 5.7    | 5.0  | 4.4  | 4.4  | 4.4  | 4.4  |
| 140°   | 6.3  | 6.3  | 5.7    | 5.7  | 5.7  | 5.0  | 5.0  | 5.0  |
| 142.5° | 6.9  | 6.3  | 6.3    | 6.3  | 6.3  | 5.7  | 5.7  | 5.7  |
| 145°   | 6.9  | 6.9  | 6.9    | 6.9  | 6.9  | 6.3  | 6.3  | 6.3  |
| 147.5° | 6.3  | 6.9  | 6.9    | 6.9  | 6.9  | 6.9  | 6.9  | 6.9  |
| 150°   | 6.3  | 6.3  | 6.3    | 6.9  | 6.9  | 6.9  | 6.9  | 6.9  |
| 152.5° | 5.7  | 5.7  | 6.3    | 6.3  | 6.3  | 6.3  | 6.3  | 6.3  |
| 155°   | 5.0  | 5.0  | 5.0    | 5.7  | 5.7  | 5.7  | 5.7  | 5.7  |
| 157.5° | 4.4  | 4.4  | 4.4    | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  |
| 160°   | 5.0  | 4.4  | 4.4    | 4.4  | 4.4  | 4.4  | 4.4  | 4.4  |
| 162.5° | 5.7  | 5.7  | 5.0    | 5.0  | 4.4  | 4.4  | 4.4  | 4.4  |
| 165°   | 8.2  | 7.6  | 6.9    | 6.9  | 6.3  | 6.3  | 5.7  | 5.7  |
| 167.5° | 12.0 | 10.7 | 10.7   | 10.1 | 9.4  | 8.8  | 8.8  | 8.8  |
| 170°   | 17.0 | 16.4 | 15.7   | 15.1 | 14.5 | 13.9 | 13.9 | 13.9 |
| 172.5° | 23.3 | 22.7 | 22.0   | 21.4 | 20.8 | 20.2 | 20.2 | 20.2 |
| 175°   | 30.9 | 30.2 | 30.2   | 29.6 | 28.3 | 28.3 | 28.3 | 28.3 |
| 177.5° | 40.3 | 39.7 | 39.7   | 39.0 | 38.4 | 38.4 | 38.4 | 37.8 |
| 180°   | 49.7 | 49.7 | 49.7   | 49.7 | 49.7 | 49.7 | 49.7 | 49.7 |

(END OF REPORT)