

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: 15830

Luminaire Tested: **CRF-24-632-UNV-IK12**

Issue Date: 3/3/2020



Test Information

Test Method: LM-79-08
Report Number: 15830
Test Lab: LUMINAIRE TESTING LABORATORY, INC.
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: FAIL-SAFE
Catalog Number: CRF-24-632-UNV-IK12
Description: FAILSAFE TRISEAL CRF SERIES 2x4 6L T8
Light Source: (6) DOUBLE ENDED T8 4 FOOT LINEAR FLUORESCENT LAMPS
F32W T8 32 WATTS
Ballast/Driver: (2) SYLVANIA ELECTRONIC BALLAST
QTP3X32T8/UNV-ISN-SC

Summary

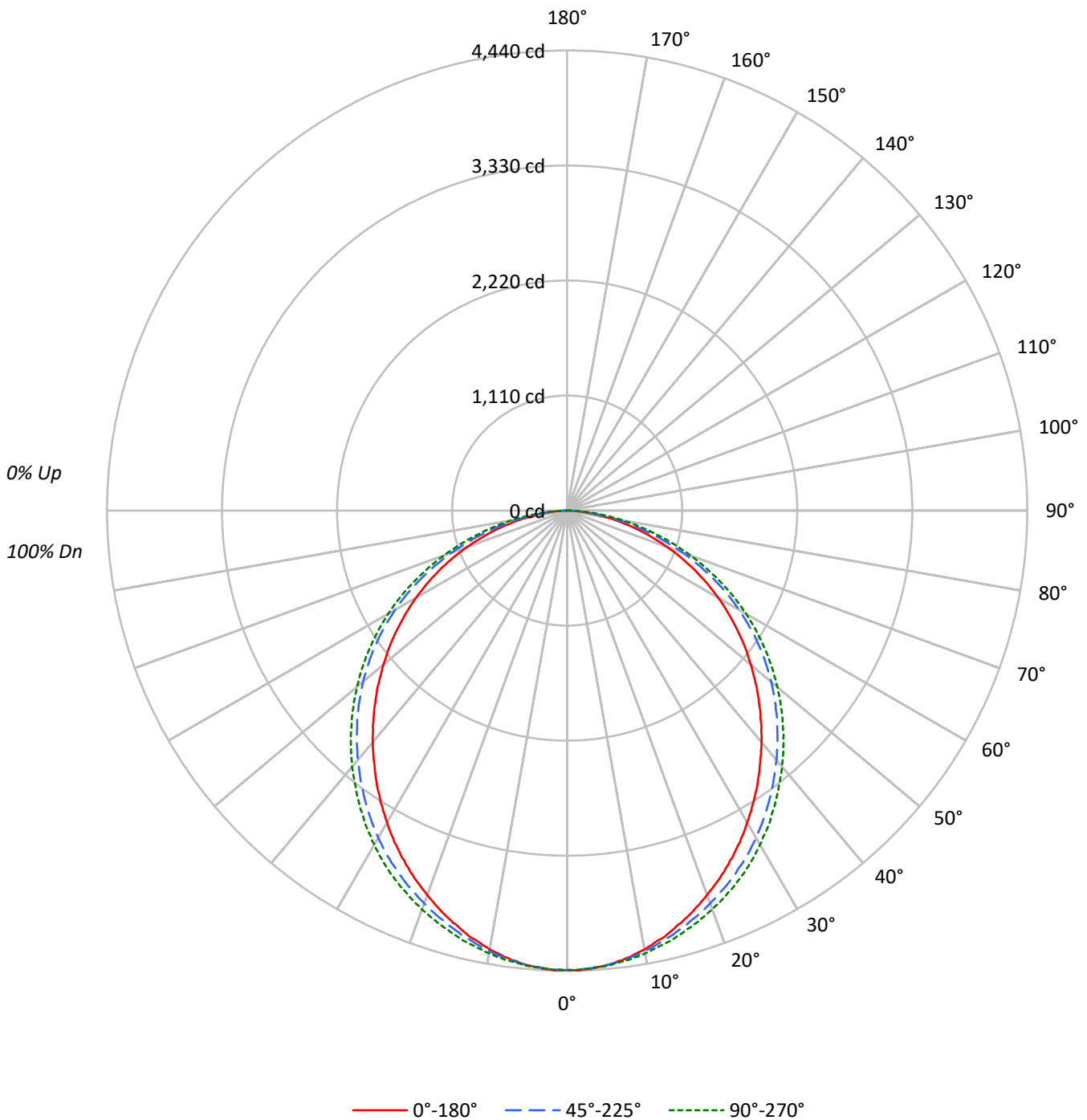
Lumens per Lamp: 2850 (6 lamps)
Luminaire Lumens: 12224.3 lumens
Efficiency: 71.5%
Efficacy: 77.5 lumens/watt
Spacing Criteria (0/90/45): 1.17 / 1.25 / 1.35
Luminous Opening: Rectangular (W 1.75' x L: 3.75' x H: 0')
CIE Type: Direct

Input Watts (W): 157.7
Input Voltage (V): NR
Input Current (Ain): 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

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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	0		
RW	70	50	30	10	70	50	30	10	50	30	10		50	30	10		50	30	10	0
RCR																				
0	85	85	85	85	83	83	83	83	79	79	79		76	76	76		73	73	73	71
1	78	74	71	68	76	73	70	67	70	67	65		67	65	63		64	63	61	60
2	71	65	60	56	69	63	59	55	61	57	54		58	55	52		56	54	51	50
3	64	57	51	46	63	56	50	46	54	49	45		52	48	44		50	46	43	42
4	59	50	44	39	57	49	43	39	48	42	38		46	41	38		44	40	37	36
5	54	45	38	34	53	44	38	33	43	37	33		41	36	33		40	36	32	31
6	50	40	34	29	49	40	34	29	38	33	29		37	32	29		36	32	28	27
7	46	37	30	26	45	36	30	26	35	30	26		34	29	25		33	29	25	24
8	43	33	27	23	42	33	27	23	32	27	23		31	26	23		30	26	23	21
9	40	31	25	21	39	30	25	21	29	24	21		29	24	21		28	24	20	19
10	38	28	23	19	37	28	23	19	27	22	19		27	22	19		26	22	19	17

AVERAGE LUMINANCE (cd/sqm):

	0°	45°	90°
0°	7271	7271	7271
5°	7248	7246	7259
10°	7160	7192	7227
15°	7025	7110	7186
20°	6891	7041	7149
25°	6740	6979	7107
30°	6582	6902	7049
35°	6419	6814	6984
40°	6244	6723	6912
45°	6073	6646	6827
50°	5907	6558	6760
55°	5725	6446	6672
60°	5524	6285	6548
65°	5267	6047	6353
70°	4916	5673	6071
75°	4455	5121	5685
80°	3788	4373	5167
85°	2879	3425	4385



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ZONAL LUMENS:

CANDELA DISTRIBUTION:

Zone	Lumens	% Fixture	% Lamp		0°	22.5°	45°	67.5°	90°	Flux
0°-10°	417.6	3.4	2.4	0°	4433	4433	4433	4433	4433	
10°-20°	1181.0	9.7	6.9	5°	4402	4404	4401	4404	4409	417
20°-30°	1769.3	14.5	10.3	15°	4137	4153	4187	4218	4232	1167
30°-40°	2110.1	17.3	12.3	25°	3724	3766	3856	3915	3927	1716
40°-50°	2176.9	17.8	12.7	35°	3206	3267	3403	3477	3488	2004
50°-60°	1975.9	16.2	11.6	45°	2618	2703	2865	2939	2943	2021
60°-70°	1513.8	12.4	8.9	55°	2002	2097	2254	2330	2333	1790
70°-80°	857.1	7.0	5.0	65°	1357	1437	1558	1636	1637	1342
80°-90°	222.5	1.8	1.3	75°	703	745	808	882	897	744
90°-100°	0.1	0.0	0.0	85°	153	165	182	218	233	176
100°-110°	0.0	0.0	0.0	90°	0	0	1	7	10	6
110°-120°	0.0	0.0	0.0	95°	0	0	0	0	0	0
120°-130°	0.0	0.0	0.0	105°	0	0	0	0	0	0
130°-140°	0.0	0.0	0.0	115°	0	0	0	0	0	0
140°-150°	0.0	0.0	0.0	125°	0	0	0	0	0	0
150°-160°	0.0	0.0	0.0	135°	0	0	0	0	0	0
160°-170°	0.0	0.0	0.0	145°	0	0	0	0	0	0
170°-180°	0.0	0.0	0.0	155°	0	0	0	0	0	0
0°-30°	3367.9	27.6	19.7	165°	0	0	0	0	0	0
0°-40°	5478.0	44.8	32.0	175°	0	0	0	0	0	0
0°-60°	9630.8	78.8	56.3	180°	0	0	0	0	0	0
0°-90°	12224.2	100.0	71.5							
90°-120°	0.1	0.0	0.0							
90°-150°	0.1	0.0	0.0							
90°-180°	0.0	0.0	0.0							
0°-180°	12224.3	100.0	71.5							



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CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°
0°	4433	4433	4433	4433	4433
0.5°	4434	4437	4433	4435	4434
1°	4435	4434	4429	4432	4431
1.5°	4440	4433	4431	4433	4432
2°	4433	4427	4425	4427	4431
2.5°	4429	4426	4425	4427	4426
3°	4428	4421	4422	4423	4422
3.5°	4417	4419	4413	4420	4421
4°	4414	4414	4414	4416	4416
4.5°	4408	4406	4409	4414	4415
5°	4402	4404	4401	4404	4409
5.5°	4397	4394	4396	4401	4406
6°	4388	4386	4390	4395	4394
6.5°	4375	4378	4381	4388	4388
7°	4370	4368	4376	4383	4384
7.5°	4356	4357	4369	4378	4378
8°	4349	4348	4357	4367	4374
8.5°	4335	4336	4346	4361	4362
9°	4323	4323	4336	4350	4358
9.5°	4311	4315	4328	4345	4346
10°	4299	4299	4318	4329	4339
10.5°	4284	4288	4304	4325	4330
11°	4271	4274	4296	4311	4315
11.5°	4252	4264	4280	4302	4309
12°	4238	4246	4267	4288	4296
12.5°	4229	4231	4254	4280	4290
13°	4213	4218	4241	4267	4278
13.5°	4193	4201	4230	4258	4271
14°	4178	4183	4217	4245	4256
14.5°	4158	4168	4200	4230	4244
15°	4137	4153	4187	4218	4232
15.5°	4127	4136	4173	4206	4220
16°	4104	4120	4162	4197	4202
16.5°	4088	4099	4143	4183	4194
17°	4069	4087	4128	4166	4178
17.5°	4049	4070	4115	4154	4166
18°	4027	4049	4099	4140	4151
18.5°	4010	4031	4084	4128	4139
19°	3989	4012	4068	4111	4124
19.5°	3969	3993	4051	4098	4107
20°	3948	3975	4034	4079	4096
20.5°	3924	3955	4014	4068	4076
21°	3906	3934	4003	4052	4065
21.5°	3883	3916	3982	4035	4046
22°	3863	3893	3964	4016	4031



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
22.5°	3843	3875	3948	4005	4014
23°	3819	3854	3932	3984	3995
23.5°	3799	3831	3912	3966	3981
24°	3772	3810	3893	3951	3964
24.5°	3753	3789	3873	3932	3944
25°	3724	3766	3856	3915	3927
25.5°	3707	3741	3832	3895	3909
26°	3679	3721	3814	3877	3891
26.5°	3653	3698	3797	3855	3871
27°	3627	3672	3773	3839	3852
27.5°	3608	3652	3755	3815	3833
28°	3579	3626	3734	3797	3810
28.5°	3556	3601	3711	3779	3790
29°	3529	3576	3689	3756	3765
29.5°	3504	3555	3669	3736	3747
30°	3475	3530	3644	3714	3722
30.5°	3451	3504	3623	3691	3704
31°	3422	3476	3597	3669	3672
31.5°	3400	3451	3575	3646	3655
32°	3368	3429	3551	3621	3634
32.5°	3345	3397	3527	3599	3611
33°	3314	3372	3504	3574	3589
33.5°	3287	3348	3480	3551	3558
34°	3262	3319	3453	3527	3533
34.5°	3235	3294	3428	3504	3510
35°	3206	3267	3403	3477	3488
35.5°	3176	3241	3379	3452	3459
36°	3150	3213	3349	3427	3435
36.5°	3121	3185	3326	3401	3409
37°	3089	3156	3301	3375	3385
37.5°	3062	3131	3274	3350	3355
38°	3032	3102	3246	3321	3333
38.5°	3004	3075	3221	3300	3305
39°	2974	3044	3194	3269	3280
39.5°	2947	3016	3167	3244	3254
40°	2916	2989	3140	3216	3228
40.5°	2890	2959	3115	3188	3197
41°	2860	2931	3086	3164	3172
41.5°	2827	2903	3058	3133	3143
42°	2801	2875	3033	3107	3117
42.5°	2769	2847	3005	3081	3089
43°	2737	2817	2976	3053	3062
43.5°	2709	2789	2947	3023	3030
44°	2682	2758	2919	2996	3006
44.5°	2649	2730	2891	2968	2974



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
45°	2618	2703	2865	2939	2943
45.5°	2590	2672	2837	2910	2914
46°	2560	2642	2807	2881	2890
46.5°	2529	2614	2775	2853	2859
47°	2503	2586	2750	2822	2829
47.5°	2467	2554	2719	2795	2797
48°	2437	2525	2687	2765	2769
48.5°	2406	2495	2661	2735	2740
49°	2374	2465	2629	2705	2709
49.5°	2346	2436	2600	2675	2676
50°	2315	2407	2570	2645	2649
50.5°	2283	2372	2538	2615	2613
51°	2251	2343	2507	2583	2586
51.5°	2222	2314	2476	2552	2553
52°	2193	2284	2445	2520	2525
52.5°	2160	2252	2414	2489	2491
53°	2131	2221	2385	2459	2460
53.5°	2098	2189	2351	2427	2425
54°	2068	2158	2320	2395	2397
54.5°	2034	2128	2288	2364	2364
55°	2002	2097	2254	2330	2333
55.5°	1972	2065	2219	2298	2298
56°	1940	2032	2189	2266	2266
56.5°	1907	2001	2156	2232	2232
57°	1876	1969	2122	2199	2197
57.5°	1843	1936	2087	2166	2166
58°	1811	1905	2055	2132	2133
58.5°	1780	1871	2019	2097	2098
59°	1749	1840	1986	2065	2063
59.5°	1716	1807	1950	2030	2030
60°	1684	1774	1916	1997	1996
60.5°	1652	1742	1881	1960	1959
61°	1617	1708	1847	1926	1926
61.5°	1588	1673	1810	1892	1890
62°	1553	1641	1776	1854	1854
62.5°	1521	1607	1740	1819	1817
63°	1488	1573	1704	1784	1782
63.5°	1457	1539	1668	1746	1748
64°	1423	1505	1632	1709	1710
64.5°	1391	1470	1595	1672	1674
65°	1357	1437	1558	1636	1637
65.5°	1324	1403	1519	1600	1600
66°	1291	1368	1483	1562	1564
66.5°	1257	1335	1446	1525	1527
67°	1225	1299	1409	1487	1489



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
67.5°	1192	1265	1373	1450	1453
68°	1159	1230	1334	1412	1416
68.5°	1125	1195	1296	1375	1379
69°	1092	1160	1259	1335	1342
69.5°	1058	1126	1221	1298	1304
70°	1025	1090	1183	1262	1266
70.5°	993	1055	1146	1221	1229
71°	960	1021	1108	1184	1192
71.5°	928	985	1071	1146	1155
72°	895	951	1033	1107	1118
72.5°	862	916	995	1070	1082
73°	830	882	957	1032	1043
73.5°	798	848	921	994	1006
74°	766	814	884	957	971
74.5°	734	778	846	919	934
75°	703	745	808	882	897
75.5°	671	712	773	846	860
76°	640	679	736	807	824
76.5°	609	645	700	771	789
77°	579	613	666	735	753
77.5°	547	580	630	699	718
78°	517	549	596	663	683
78.5°	488	517	561	628	649
79°	458	485	528	593	614
79.5°	429	455	495	559	580
80°	401	425	463	525	547
80.5°	374	396	431	492	513
81°	346	367	400	459	479
81.5°	319	339	370	427	447
82°	293	311	341	394	415
82.5°	268	284	312	363	383
83°	243	259	284	333	352
83.5°	219	234	257	302	322
84°	196	210	231	274	291
84.5°	175	187	206	246	262
85°	153	165	182	218	233
85.5°	132	144	158	190	205
86°	112	124	136	166	178
86.5°	93	104	114	140	152
87°	76	86	94	117	127
87.5°	59	68	74	94	104
88°	43	51	56	74	81
88.5°	28	34	39	54	60
89°	14	19	24	37	42
89.5°	2	6	10	21	25



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
90°	0	0	1	7	10
90.5°	0	0	0	0	0
91°	0	0	0	0	0
91.5°	0	0	0	0	0
92°	0	0	0	0	0
92.5°	0	0	0	0	0
93°	0	0	0	0	0
93.5°	0	0	0	0	0
94°	0	0	0	0	0
94.5°	0	0	0	0	0
95°	0	0	0	0	0
95.5°	0	0	0	0	0
96°	0	0	0	0	0
96.5°	0	0	0	0	0
97°	0	0	0	0	0
97.5°	0	0	0	0	0
98°	0	0	0	0	0
98.5°	0	0	0	0	0
99°	0	0	0	0	0
99.5°	0	0	0	0	0
100°	0	0	0	0	0
100.5°	0	0	0	0	0
101°	0	0	0	0	0
101.5°	0	0	0	0	0
102°	0	0	0	0	0
102.5°	0	0	0	0	0
103°	0	0	0	0	0
103.5°	0	0	0	0	0
104°	0	0	0	0	0
104.5°	0	0	0	0	0
105°	0	0	0	0	0
105.5°	0	0	0	0	0
106°	0	0	0	0	0
106.5°	0	0	0	0	0
107°	0	0	0	0	0
107.5°	0	0	0	0	0
108°	0	0	0	0	0
108.5°	0	0	0	0	0
109°	0	0	0	0	0
109.5°	0	0	0	0	0
110°	0	0	0	0	0
110.5°	0	0	0	0	0
111°	0	0	0	0	0
111.5°	0	0	0	0	0
112°	0	0	0	0	0



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
112.5°	0	0	0	0	0
113°	0	0	0	0	0
113.5°	0	0	0	0	0
114°	0	0	0	0	0
114.5°	0	0	0	0	0
115°	0	0	0	0	0
115.5°	0	0	0	0	0
116°	0	0	0	0	0
116.5°	0	0	0	0	0
117°	0	0	0	0	0
117.5°	0	0	0	0	0
118°	0	0	0	0	0
118.5°	0	0	0	0	0
119°	0	0	0	0	0
119.5°	0	0	0	0	0
120°	0	0	0	0	0
120.5°	0	0	0	0	0
121°	0	0	0	0	0
121.5°	0	0	0	0	0
122°	0	0	0	0	0
122.5°	0	0	0	0	0
123°	0	0	0	0	0
123.5°	0	0	0	0	0
124°	0	0	0	0	0
124.5°	0	0	0	0	0
125°	0	0	0	0	0
125.5°	0	0	0	0	0
126°	0	0	0	0	0
126.5°	0	0	0	0	0
127°	0	0	0	0	0
127.5°	0	0	0	0	0
128°	0	0	0	0	0
128.5°	0	0	0	0	0
129°	0	0	0	0	0
129.5°	0	0	0	0	0
130°	0	0	0	0	0
130.5°	0	0	0	0	0
131°	0	0	0	0	0
131.5°	0	0	0	0	0
132°	0	0	0	0	0
132.5°	0	0	0	0	0
133°	0	0	0	0	0
133.5°	0	0	0	0	0
134°	0	0	0	0	0
134.5°	0	0	0	0	0



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
135°	0	0	0	0	0
135.5°	0	0	0	0	0
136°	0	0	0	0	0
136.5°	0	0	0	0	0
137°	0	0	0	0	0
137.5°	0	0	0	0	0
138°	0	0	0	0	0
138.5°	0	0	0	0	0
139°	0	0	0	0	0
139.5°	0	0	0	0	0
140°	0	0	0	0	0
140.5°	0	0	0	0	0
141°	0	0	0	0	0
141.5°	0	0	0	0	0
142°	0	0	0	0	0
142.5°	0	0	0	0	0
143°	0	0	0	0	0
143.5°	0	0	0	0	0
144°	0	0	0	0	0
144.5°	0	0	0	0	0
145°	0	0	0	0	0
145.5°	0	0	0	0	0
146°	0	0	0	0	0
146.5°	0	0	0	0	0
147°	0	0	0	0	0
147.5°	0	0	0	0	0
148°	0	0	0	0	0
148.5°	0	0	0	0	0
149°	0	0	0	0	0
149.5°	0	0	0	0	0
150°	0	0	0	0	0
150.5°	0	0	0	0	0
151°	0	0	0	0	0
151.5°	0	0	0	0	0
152°	0	0	0	0	0
152.5°	0	0	0	0	0
153°	0	0	0	0	0
153.5°	0	0	0	0	0
154°	0	0	0	0	0
154.5°	0	0	0	0	0
155°	0	0	0	0	0
155.5°	0	0	0	0	0
156°	0	0	0	0	0
156.5°	0	0	0	0	0
157°	0	0	0	0	0



TEST NUMBER: 15830

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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
157.5°	0	0	0	0	0
158°	0	0	0	0	0
158.5°	0	0	0	0	0
159°	0	0	0	0	0
159.5°	0	0	0	0	0
160°	0	0	0	0	0
160.5°	0	0	0	0	0
161°	0	0	0	0	0
161.5°	0	0	0	0	0
162°	0	0	0	0	0
162.5°	0	0	0	0	0
163°	0	0	0	0	0
163.5°	0	0	0	0	0
164°	0	0	0	0	0
164.5°	0	0	0	0	0
165°	0	0	0	0	0
165.5°	0	0	0	0	0
166°	0	0	0	0	0
166.5°	0	0	0	0	0
167°	0	0	0	0	0
167.5°	0	0	0	0	0
168°	0	0	0	0	0
168.5°	0	0	0	0	0
169°	0	0	0	0	0
169.5°	0	0	0	0	0
170°	0	0	0	0	0
170.5°	0	0	0	0	0
171°	0	0	0	0	0
171.5°	0	0	0	0	0
172°	0	0	0	0	0
172.5°	0	0	0	0	0
173°	0	0	0	0	0
173.5°	0	0	0	0	0
174°	0	0	0	0	0
174.5°	0	0	0	0	0
175°	0	0	0	0	0
175.5°	0	0	0	0	0
176°	0	0	0	0	0
176.5°	0	0	0	0	0
177°	0	0	0	0	0
177.5°	0	0	0	0	0
178°	0	0	0	0	0
178.5°	0	0	0	0	0
179°	0	0	0	0	0
179.5°	0	0	0	0	0



TEST NUMBER: 15830

CATALOG NUMBER: CRF-24-632-UNV-IK12

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
180°	0	0	0	0	0

(END OF REPORT)