

Scaled data based on original data using

LM-41-14 Approved Method for Photometric Testing Of Indoor Fluorescent Luminaires

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: METALUX

Report Number: 17279

Luminaire Tested: **HBE-432-N-A-UNV-EB81/PLUS-U**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-41-14  
Report Number: 17279  
Test Lab: LUMINAIRE TESTING LABORATORY, INC.  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: METALUX  
Catalog Number: HBE-432-N-A-UNV-EB81/PLUS-U  
Description: OPEN HIGH BAY LUMINAIRE WITH DOORFRAME AND PRISMATIC ACYRLIC LENS, SPECULAR REFLECTOR, NARROW DISTRIBUTION, NO UPLIGHT  
Light Source: FOUR 32 WATT T8 - 2850 LUMENS EA  
Ballast/Driver: -

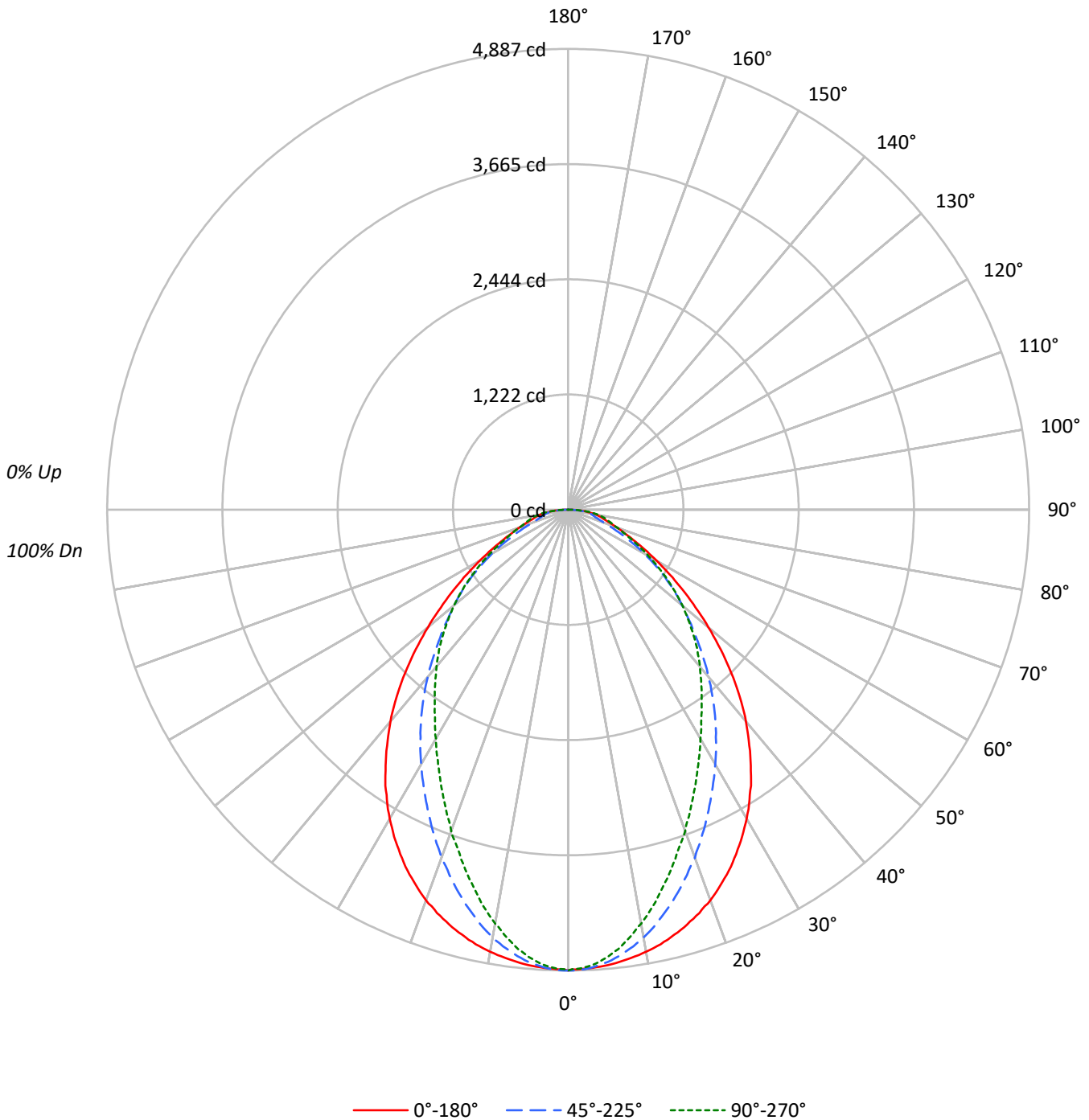
**Summary**

Lumens per Lamp: 2850 (4 lamps)  
Luminaire Lumens: 9064.5 lumens  
Efficiency: 79.5%  
Efficacy: 66.9 lumens/watt  
Spacing Criteria (0/90/45): 1.16 / 0.91 / 1.1  
Luminous Opening: Rectangular (W 1.59' x L: 3.96' x H: 0')  
CIE Type: Direct  
  
Input Watts (W): 135.5  
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									
RC	80									50									30									10									0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0													
RCR																																					
0	95	95	95	95	92	92	92	92	88	88	88	85	85	85	81	81	81	80																			
1	87	84	81	78	85	82	80	77	79	77	75	76	74	72	73	72	70	69																			
2	81	75	70	66	79	73	69	65	70	67	63	68	65	62	66	63	61	59																			
3	74	67	61	56	72	65	60	56	63	59	55	61	57	54	59	56	53	51																			
4	69	60	54	49	67	59	53	48	57	52	48	55	51	47	54	50	47	45																			
5	64	54	48	43	62	53	47	43	52	46	42	50	46	42	49	45	41	40																			
6	59	49	43	38	58	49	42	38	47	42	38	46	41	37	45	40	37	36																			
7	55	45	39	34	54	45	38	34	43	38	34	42	37	34	41	37	33	32																			
8	52	42	35	31	50	41	35	31	40	35	31	39	34	31	38	34	30	29																			
9	48	38	32	28	47	38	32	28	37	32	28	36	31	28	36	31	28	26																			
10	46	36	30	26	45	35	30	26	35	29	26	34	29	26	33	29	25	24																			

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

	0°	45°	90°
0°	8338	8338	8338
5°	8305	8245	8157
10°	8248	7978	7721
15°	8148	7581	7153
20°	8001	7132	6583
25°	7767	6624	6018
30°	7453	6141	5522
35°	7034	5661	5136
40°	6526	5156	4835
45°	5885	4633	4534
50°	5152	4186	4199
55°	4405	3742	3787
60°	3702	3187	3364
65°	3092	2559	2959
70°	2714	2040	2739
75°	2617	1951	2848
80°	2928	2329	3232
85°	3230	2643	3563



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**ZONAL LUMENS:**

**CANDELA DISTRIBUTION:**

Zone	Lumens	% Fixture	% Lamp		0°	22.5°	45°	67.5°	90°	Flux
0°-10°	452.9	5.0	4.0	0°	4887	4887	4887	4887	4887	
10°-20°	1210.8	13.4	10.6	5°	4849	4854	4814	4786	4763	460
20°-30°	1649.8	18.2	14.5	15°	4613	4519	4292	4118	4050	1299
30°-40°	1758.6	19.4	15.4	25°	4126	3902	3519	3278	3197	1896
40°-50°	1567.8	17.3	13.8	35°	3377	3103	2718	2518	2466	2106
50°-60°	1166.5	12.9	10.2	45°	2439	2192	1920	1852	1879	1879
60°-70°	704.0	7.8	6.2	55°	1481	1326	1258	1247	1273	1331
70°-80°	391.1	4.3	3.4	65°	766	693	634	724	733	774
80°-90°	162.3	1.8	1.4	75°	397	352	296	395	432	430
90°-100°	0.6	0.0	0.0	85°	165	145	135	171	182	162
100°-110°	0.0	0.0	0.0	90°	6	6	11	19	19	11
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°	3313.6	36.6	29.1	165°	0	0	0	0	0	0
0°-40°	5072.2	56.0	44.5	175°	0	0	0	0	0	0
0°-60°	7806.5	86.1	68.5	180°	0	0	0	0	0	0
0°-90°	9063.9	100.0	79.5							
90°-120°	0.6	0.0	0.0							
90°-150°	0.6	0.0	0.0							
90°-180°	1.0	0.0	0.0							
0°-180°	9064.5	100.0	79.5							



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**CANDELA DISTRIBUTION (FULL):**

	0°	22.5°	45°	67.5°	90°
0°	4887	4887	4887	4887	4887
0.5°	4876	4897	4887	4886	4873
1°	4876	4895	4885	4883	4872
1.5°	4874	4892	4881	4879	4867
2°	4872	4890	4875	4871	4857
2.5°	4871	4887	4869	4861	4849
3°	4866	4881	4861	4850	4836
3.5°	4860	4875	4851	4838	4821
4°	4858	4868	4840	4823	4803
4.5°	4852	4861	4825	4804	4781
5°	4849	4854	4814	4786	4763
5.5°	4841	4844	4800	4765	4738
6°	4834	4832	4779	4739	4711
6.5°	4826	4826	4766	4714	4691
7°	4817	4811	4743	4687	4658
7.5°	4809	4797	4723	4660	4624
8°	4801	4787	4702	4633	4593
8.5°	4789	4771	4681	4601	4561
9°	4781	4758	4656	4567	4522
9.5°	4769	4742	4633	4534	4486
10°	4761	4726	4605	4501	4457
10.5°	4749	4709	4578	4468	4418
11°	4737	4693	4550	4433	4383
11.5°	4723	4674	4523	4397	4341
12°	4713	4654	4492	4359	4305
12.5°	4692	4631	4456	4314	4265
13°	4682	4613	4426	4279	4219
13.5°	4663	4586	4392	4238	4174
14°	4645	4564	4359	4201	4131
14.5°	4632	4542	4327	4163	4088
15°	4613	4519	4292	4118	4050
15.5°	4596	4489	4256	4079	4006
16°	4576	4465	4222	4038	3966
16.5°	4554	4439	4185	3998	3919
17°	4536	4414	4147	3954	3880
17.5°	4514	4382	4108	3909	3827
18°	4499	4356	4073	3872	3785
18.5°	4471	4324	4031	3833	3744
19°	4448	4298	3994	3789	3706
19.5°	4433	4271	3963	3744	3670
20°	4407	4240	3928	3702	3626
20.5°	4380	4207	3880	3660	3572
21°	4356	4173	3841	3614	3532
21.5°	4328	4142	3805	3571	3492
22°	4301	4108	3762	3528	3448



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
22.5°	4272	4074	3722	3487	3403
23°	4245	4044	3684	3448	3363
23.5°	4219	4009	3641	3402	3320
24°	4187	3971	3600	3361	3277
24.5°	4160	3935	3558	3319	3240
25°	4126	3902	3519	3278	3197
25.5°	4094	3862	3477	3237	3155
26°	4064	3827	3439	3200	3117
26.5°	4026	3788	3397	3155	3072
27°	3996	3747	3357	3115	3036
27.5°	3962	3713	3316	3078	2995
28°	3929	3675	3277	3038	2959
28.5°	3892	3633	3238	2998	2922
29°	3855	3594	3198	2959	2882
29.5°	3820	3556	3157	2921	2845
30°	3783	3515	3117	2881	2803
30.5°	3744	3476	3079	2846	2774
31°	3710	3438	3040	2811	2737
31.5°	3667	3397	3001	2773	2704
32°	3627	3355	2960	2734	2662
32.5°	3585	3312	2917	2697	2626
33°	3547	3271	2875	2661	2594
33.5°	3511	3232	2841	2627	2567
34°	3466	3188	2798	2590	2532
34.5°	3422	3147	2759	2554	2499
35°	3377	3103	2718	2518	2466
35.5°	3334	3058	2680	2485	2436
36°	3291	3014	2640	2451	2409
36.5°	3246	2974	2597	2416	2378
37°	3202	2928	2558	2382	2345
37.5°	3153	2883	2518	2348	2314
38°	3107	2840	2477	2315	2288
38.5°	3067	2794	2437	2281	2256
39°	3020	2748	2398	2248	2228
39.5°	2976	2703	2355	2213	2198
40°	2930	2660	2315	2181	2171
40.5°	2888	2616	2276	2148	2144
41°	2837	2572	2238	2118	2116
41.5°	2791	2527	2198	2086	2086
42°	2743	2478	2155	2048	2055
42.5°	2692	2430	2114	2017	2030
43°	2642	2384	2076	1984	2002
43.5°	2594	2338	2038	1948	1969
44°	2543	2290	1998	1918	1939
44.5°	2497	2242	1960	1883	1908



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
45°	2439	2192	1920	1852	1879
45.5°	2393	2145	1886	1823	1849
46°	2338	2100	1846	1789	1817
46.5°	2294	2051	1811	1758	1786
47°	2243	2009	1780	1729	1761
47.5°	2192	1961	1741	1694	1727
48°	2140	1916	1706	1662	1698
48.5°	2088	1871	1674	1629	1668
49°	2037	1821	1641	1600	1636
49.5°	1993	1781	1611	1576	1609
50°	1941	1742	1577	1547	1582
50.5°	1897	1694	1548	1517	1552
51°	1848	1650	1514	1485	1519
51.5°	1798	1612	1482	1457	1487
52°	1751	1568	1450	1427	1460
52.5°	1702	1525	1418	1398	1430
53°	1662	1484	1385	1367	1396
53.5°	1612	1448	1357	1341	1368
54°	1569	1400	1322	1309	1338
54.5°	1526	1363	1287	1278	1306
55°	1481	1326	1258	1247	1273
55.5°	1439	1287	1226	1223	1249
56°	1395	1249	1191	1191	1214
56.5°	1353	1212	1158	1162	1187
57°	1320	1178	1129	1136	1160
57.5°	1270	1136	1093	1104	1127
58°	1235	1103	1059	1077	1103
58.5°	1195	1071	1025	1048	1072
59°	1158	1038	993	1022	1043
59.5°	1118	1005	961	996	1016
60°	1085	973	934	973	986
60.5°	1049	946	903	943	961
61°	1011	911	868	914	931
61.5°	977	880	837	890	904
62°	949	853	808	866	879
62.5°	915	825	775	841	855
63°	883	798	747	817	831
63.5°	852	770	719	793	803
64°	821	744	689	768	780
64.5°	793	717	663	746	754
65°	766	693	634	724	733
65.5°	738	668	608	702	710
66°	714	646	583	681	690
66.5°	689	624	558	661	670
67°	668	602	531	642	650





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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
67.5°	646	578	509	624	632
68°	623	559	486	606	615
68.5°	606	539	465	590	596
69°	585	520	446	572	580
69.5°	564	500	425	558	567
70°	544	483	409	533	549
70.5°	529	467	393	516	530
71°	516	453	379	502	518
71.5°	493	440	366	488	506
72°	478	426	351	474	494
72.5°	465	411	340	459	483
73°	448	399	330	446	471
73.5°	435	387	320	433	462
74°	423	375	311	420	452
74.5°	410	363	303	408	440
75°	397	352	296	395	432
75.5°	388	341	290	383	425
76°	379	330	283	372	415
76.5°	368	320	277	361	404
77°	359	309	272	350	393
77.5°	347	298	266	338	384
78°	339	287	260	328	375
78.5°	328	277	255	317	363
79°	317	267	249	307	351
79.5°	307	256	243	297	340
80°	298	245	237	288	329
80.5°	289	236	230	278	317
81°	275	226	222	269	305
81.5°	262	217	213	258	292
82°	248	206	204	246	280
82.5°	234	196	194	235	264
83°	220	185	183	224	248
83.5°	207	175	172	212	233
84°	194	166	160	199	217
84.5°	181	155	147	185	199
85°	165	145	135	171	182
85.5°	150	132	123	156	163
86°	134	119	111	141	145
86.5°	120	105	96	123	128
87°	103	92	83	105	110
87.5°	86	78	69	89	90
88°	65	60	54	72	73
88.5°	47	42	41	57	56
89°	31	28	30	43	43
89.5°	16	16	19	31	32



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**CANDELA DISTRIBUTION (continued):**

	0°	22.5°	45°	67.5°	90°
90°	6	6	11	19	19
90.5°	1	1	4	8	7
91°	0	0	0	1	1
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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CATALOG NUMBER: HBE-432-N-A-UNV-EB81/PLUS-U

**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: 17279

CATALOG NUMBER: HBE-432-N-A-UNV-EB81/PLUS-U

**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: 17279

CATALOG NUMBER: HBE-432-N-A-UNV-EB81/PLUS-U

**CANDELA DISTRIBUTION (continued):**

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

(END OF REPORT)