

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: 17280

Luminaire Tested: **HBE-654T5-N-UNV-EBT2-UPL-U**

Issue Date: 3/3/2020



Test Information

Test Method: LM-41-14
Report Number: 17280
Test Lab: LUMINAIRE TESTING LABORATORY, INC.
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: METALUX
Catalog Number: HBE-654T5-N-UNV-EBT2-UPL-U
Description: OPEN HIGH BAY LUMINAIRE WITH SIDE ENCLOSURES AND SPECULAR REFLECTOR, NARROW DISTRIBUTION WITH UPLIGHT
Light Source: -
SIX 54 WATT T5HO - 4400 LUMENS EA
Ballast/Driver: -

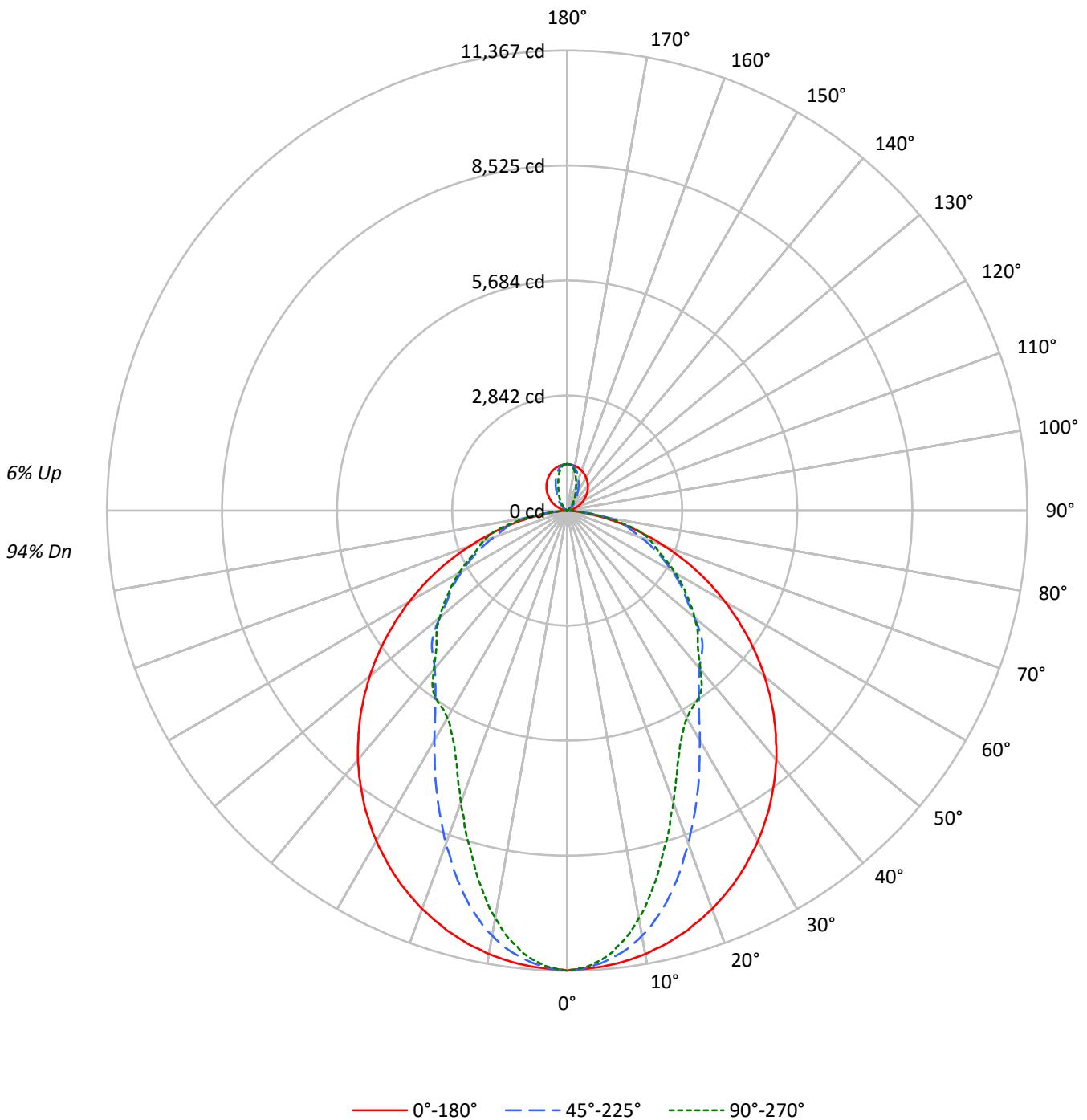
Summary

Lumens per Lamp: 4400 (6 lamps)
Luminaire Lumens: 24939.1 lumens
Efficiency: 94.5%
Efficacy: 69.7 lumens/watt
Spacing Criteria (0/90/45): 1.23 / 0.81 / 1.05
Luminous Opening: Rectangular w/ Sides (W: 1.59' x L: 3.96' x H: 0.08')
CIE Type: Direct

Input Watts (W): 357.9
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

TEST NUMBER: 17280
CATALOG NUMBER: HBE-654T5-N-UNV-EBT2-UPL-U

Luminous Intensity Polar Plot





TEST NUMBER: 17280

CATALOG NUMBER: HBE-654T5-N-UNV-EBT2-UPL-U

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	111	111	111	111	108	108	108	108	102	102	102	96	96	96	91	91	91	89
1	102	97	94	90	99	95	91	88	90	87	84	85	83	81	81	79	77	75
2	93	85	79	74	90	83	78	73	79	74	70	75	71	68	71	68	65	63
3	85	75	68	62	82	74	67	61	70	64	59	67	62	58	64	60	56	54
4	78	67	59	53	76	66	58	53	63	56	51	60	54	50	57	52	49	46
5	72	60	52	46	70	59	51	46	56	50	45	54	48	44	52	47	43	41
6	67	55	47	41	65	54	46	40	51	45	40	49	43	39	47	42	38	36
7	62	50	42	36	60	49	41	36	47	40	35	45	39	35	43	38	34	32
8	58	46	38	33	56	45	37	32	43	37	32	41	36	31	40	35	31	29
9	54	42	35	30	53	41	34	29	40	33	29	38	33	28	37	32	28	26
10	51	39	32	27	50	38	31	27	37	31	26	36	30	26	35	29	26	24

AVERAGE LUMINANCE (cd/sqm):

	0°	45°	90°
0°	19393	19393	19393
5°	19293	19030	18864
10°	19195	18304	17546
15°	19047	17127	15610
20°	18871	15599	13679
25°	18624	14031	12069
30°	18340	12553	11318
35°	17995	11413	11364
40°	17592	10870	10945
45°	17086	10847	10472
50°	16487	10264	10286
55°	15745	9745	9945
60°	14827	9399	9681
65°	13676	8981	9300
70°	11999	8435	9618
75°	9855	8494	9521
80°	6963	7759	7016
85°	3237	3607	2233



TEST NUMBER: 17280

CATALOG NUMBER: HBE-654T5-N-UNV-EBT2-UPL-U

ZONAL LUMENS:

CANDELA DISTRIBUTION:

Zone	Lumens	% Fixture	% Lamp		0°	22.5°	45°	67.5°	90°	Flux
0°-10°	1051.3	4.2	4.0	0°	11367	11367	11367	11367	11367	
10°-20°	2766.0	11.1	10.5	5°	11286	11288	11162	11107	11065	###
20°-30°	3668.4	14.7	13.9	15°	10844	10554	9831	9224	8961	3059
30°-40°	4026.8	16.1	15.3	25°	9990	9162	7633	6789	6567	4603
40°-50°	3936.5	15.8	14.9	35°	8767	7240	5678	5588	5655	5482
50°-60°	3396.6	13.6	12.9	45°	7230	5201	4728	4583	4566	5570
60°-70°	2589.2	10.4	9.8	55°	5452	3512	3518	3583	3592	4868
70°-80°	1604.5	6.4	6.1	65°	3540	2368	2471	2552	2561	3497
80°-90°	379.8	1.5	1.4	75°	1612	1275	1537	1704	1725	1722
90°-100°	16.5	0.1	0.1	85°	205	378	293	202	182	290
100°-110°	40.7	0.2	0.2	90°	3	14	17	19	19	5
110°-120°	80.5	0.3	0.3	95°	19	11	14	14	14	28
120°-130°	143.3	0.6	0.5	105°	157	16	21	23	23	169
130°-140°	233.7	0.9	0.9	115°	346	90	22	24	26	343
140°-150°	305.0	1.2	1.2	125°	537	230	88	31	27	479
150°-160°	325.3	1.3	1.2	135°	716	423	225	147	120	551
160°-170°	268.8	1.1	1.0	145°	869	663	407	309	275	544
170°-180°	106.3	0.4	0.4	155°	997	894	664	528	491	459
0°-30°	7485.8	30.0	28.4	165°	1089	1070	959	868	834	307
0°-40°	11512.6	46.2	43.6	175°	1137	1146	1136	1128	1125	108
0°-60°	18845.7	75.6	71.4	180°	1148	1148	1148	1148	1148	
0°-90°	23419.2	93.9	88.7							
90°-120°	137.7	0.6	0.5							
90°-150°	819.6	3.3	3.1							
90°-180°	1520.0	6.1	5.8							
0°-180°	24939.1	100.0	94.5							



TEST NUMBER: 17280

CATALOG NUMBER: HBE-654T5-N-UNV-EBT2-UPL-U

CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°
0°	11367	11367	11367	11367	11367
0.5°	11340	11393	11359	11376	11354
1°	11339	11388	11351	11361	11343
1.5°	11333	11380	11339	11341	11315
2°	11333	11376	11325	11324	11297
2.5°	11327	11366	11306	11293	11273
3°	11319	11352	11279	11262	11240
3.5°	11311	11338	11251	11225	11200
4°	11306	11324	11228	11190	11161
4.5°	11299	11307	11196	11151	11115
5°	11286	11288	11162	11107	11065
5.5°	11274	11266	11126	11058	11003
6°	11262	11245	11088	11001	10944
6.5°	11247	11214	11043	10935	10847
7°	11234	11192	11003	10866	10782
7.5°	11216	11165	10958	10803	10703
8°	11202	11134	10906	10728	10625
8.5°	11180	11108	10850	10629	10536
9°	11161	11070	10791	10539	10431
9.5°	11143	11036	10730	10457	10321
10°	11121	11002	10662	10369	10221
10.5°	11100	10969	10601	10266	10118
11°	11072	10936	10527	10164	10013
11.5°	11044	10896	10451	10058	9882
12°	11022	10853	10364	9945	9757
12.5°	10997	10806	10282	9824	9636
13°	10974	10764	10202	9709	9506
13.5°	10942	10714	10108	9581	9387
14°	10910	10668	10023	9469	9250
14.5°	10874	10614	9927	9354	9114
15°	10844	10554	9831	9224	8961
15.5°	10812	10504	9732	9077	8824
16°	10786	10457	9623	8945	8687
16.5°	10741	10396	9527	8829	8572
17°	10701	10334	9412	8714	8460
17.5°	10669	10276	9313	8579	8322
18°	10633	10217	9200	8437	8203
18.5°	10593	10142	9071	8309	8028
19°	10547	10078	8956	8207	7909
19.5°	10510	10015	8861	8095	7808
20°	10473	9942	8753	7972	7677
20.5°	10425	9872	8644	7838	7546
21°	10378	9795	8518	7709	7412
21.5°	10335	9721	8413	7580	7310
22°	10289	9638	8299	7459	7184



TEST NUMBER: 17280

CATALOG NUMBER: HBE-654T5-N-UNV-EBT2-UPL-U

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
22.5°	10243	9564	8184	7344	7080
23°	10191	9492	8077	7233	6958
23.5°	10143	9403	7967	7108	6843
24°	10099	9321	7860	7002	6754
24.5°	10042	9239	7741	6888	6653
25°	9990	9162	7633	6789	6567
25.5°	9942	9071	7527	6688	6471
26°	9886	8980	7414	6589	6387
26.5°	9836	8892	7305	6499	6321
27°	9773	8798	7188	6409	6245
27.5°	9716	8701	7079	6328	6187
28°	9664	8618	6967	6253	6124
28.5°	9595	8523	6863	6173	6055
29°	9546	8424	6752	6111	6002
29.5°	9488	8336	6659	6046	5960
30°	9422	8239	6562	5989	5918
30.5°	9364	8143	6462	5932	5878
31°	9304	8040	6361	5878	5845
31.5°	9239	7948	6268	5829	5812
32°	9170	7844	6164	5777	5782
32.5°	9106	7743	6071	5743	5765
33°	9035	7639	5981	5702	5740
33.5°	8972	7546	5904	5669	5722
34°	8911	7447	5827	5640	5703
34.5°	8841	7340	5749	5611	5680
35°	8767	7240	5678	5588	5655
35.5°	8698	7144	5604	5563	5627
36°	8626	7048	5538	5541	5596
36.5°	8552	6942	5472	5520	5559
37°	8481	6833	5409	5489	5514
37.5°	8411	6731	5354	5472	5465
38°	8340	6627	5292	5439	5402
38.5°	8259	6527	5235	5401	5331
39°	8186	6430	5186	5356	5263
39.5°	8112	6327	5144	5309	5194
40°	8038	6219	5092	5247	5129
40.5°	7964	6125	5050	5176	5059
41°	7880	6021	5010	5108	4991
41.5°	7799	5914	4975	5037	4926
42°	7711	5809	4937	4961	4862
42.5°	7636	5704	4903	4901	4807
43°	7557	5601	4874	4831	4751
43.5°	7476	5503	4840	4765	4698
44°	7393	5399	4802	4705	4647
44.5°	7307	5301	4767	4647	4602



TEST NUMBER: 17280

CATALOG NUMBER: HBE-654T5-N-UNV-EBT2-UPL-U

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
45°	7230	5201	4728	4583	4566
45.5°	7148	5098	4686	4537	4528
46°	7059	4996	4636	4471	4491
46.5°	6971	4897	4580	4422	4453
47°	6886	4803	4522	4377	4411
47.5°	6801	4709	4458	4331	4367
48°	6714	4611	4388	4282	4323
48.5°	6616	4524	4322	4240	4271
49°	6535	4427	4248	4203	4212
49.5°	6450	4345	4171	4163	4166
50°	6367	4270	4105	4119	4116
50.5°	6278	4178	4032	4069	4058
51°	6188	4097	3970	4016	4011
51.5°	6104	4017	3903	3963	3960
52°	6008	3939	3837	3909	3908
52.5°	5915	3861	3770	3847	3855
53°	5820	3788	3716	3792	3801
53.5°	5732	3715	3668	3744	3756
54°	5635	3649	3611	3694	3702
54.5°	5545	3581	3564	3637	3646
55°	5452	3512	3518	3583	3592
55.5°	5356	3455	3472	3532	3542
56°	5263	3397	3426	3477	3499
56.5°	5158	3340	3381	3427	3451
57°	5074	3282	3334	3376	3394
57.5°	4982	3227	3280	3320	3343
58°	4874	3175	3224	3270	3296
58.5°	4785	3120	3165	3220	3246
59°	4694	3072	3109	3168	3189
59.5°	4608	3027	3058	3123	3145
60°	4503	2979	3001	3072	3093
60.5°	4405	2931	2945	3019	3030
61°	4317	2876	2895	2967	2981
61.5°	4221	2822	2838	2909	2929
62°	4118	2766	2785	2861	2871
62.5°	4030	2706	2731	2810	2816
63°	3929	2636	2673	2752	2758
63.5°	3833	2570	2621	2701	2709
64°	3733	2503	2568	2647	2656
64.5°	3640	2437	2521	2592	2610
65°	3540	2368	2471	2552	2561
65.5°	3440	2297	2419	2491	2511
66°	3343	2227	2367	2452	2471
66.5°	3247	2163	2311	2399	2432
67°	3149	2102	2260	2355	2394



TEST NUMBER: 17280

CATALOG NUMBER: HBE-654T5-N-UNV-EBT2-UPL-U

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
67.5°	3049	2045	2206	2308	2359
68°	2947	1986	2152	2262	2326
68.5°	2854	1933	2097	2218	2295
69°	2751	1887	2041	2184	2267
69.5°	2646	1830	1986	2141	2234
70°	2544	1780	1931	2110	2204
70.5°	2463	1732	1885	2084	2162
71°	2368	1686	1835	2051	2134
71.5°	2269	1635	1790	2018	2096
72°	2178	1580	1745	1985	2055
72.5°	2071	1522	1698	1944	2010
73°	1988	1470	1660	1904	1966
73.5°	1895	1421	1630	1865	1918
74°	1799	1367	1596	1825	1856
74.5°	1696	1321	1565	1773	1791
75°	1612	1275	1537	1704	1725
75.5°	1528	1223	1502	1648	1648
76°	1445	1169	1467	1589	1566
76.5°	1361	1121	1425	1518	1496
77°	1263	1074	1386	1442	1407
77.5°	1178	1022	1339	1359	1323
78°	1086	976	1293	1273	1252
78.5°	1014	928	1234	1198	1163
79°	945	885	1164	1114	1080
79.5°	862	843	1094	1038	1004
80°	793	802	1021	959	925
80.5°	721	767	954	894	868
81°	653	733	882	832	806
81.5°	587	700	809	758	729
82°	524	667	737	679	635
82.5°	468	628	665	594	532
83°	406	580	605	506	432
83.5°	351	538	538	409	355
84°	300	493	460	323	281
84.5°	250	435	381	259	219
85°	205	378	293	202	182
85.5°	160	313	216	165	159
86°	124	255	166	146	147
86.5°	93	200	126	132	136
87°	69	151	109	118	121
87.5°	46	104	94	101	103
88°	26	73	79	80	79
88.5°	13	50	58	58	58
89°	8	31	37	36	38
89.5°	4	17	18	17	17



TEST NUMBER: 17280

CATALOG NUMBER: HBE-654T5-N-UNV-EBT2-UPL-U

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
90°	3	14	17	19	19
90.5°	3	9	17	19	23
91°	3	5	8	9	11
91.5°	4	6	7	7	7
92°	5	7	7	7	7
92.5°	6	8	8	8	9
93°	7	9	10	9	10
93.5°	9	9	10	11	10
94°	12	11	12	12	13
94.5°	15	11	12	13	13
95°	19	11	14	14	14
95.5°	23	12	14	15	15
96°	27	12	15	16	17
96.5°	32	13	16	17	18
97°	38	13	18	18	19
97.5°	44	13	18	19	19
98°	51	13	17	19	20
98.5°	59	14	18	21	21
99°	66	14	18	21	22
99.5°	72	13	18	21	22
100°	79	14	19	21	22
100.5°	88	14	19	21	22
101°	95	14	19	21	22
101.5°	102	14	19	22	22
102°	110	14	19	22	22
102.5°	116	14	19	22	23
103°	124	15	20	22	23
103.5°	132	14	20	22	23
104°	141	15	20	22	23
104.5°	149	15	20	23	23
105°	157	16	21	23	23
105.5°	166	17	21	23	24
106°	175	18	21	24	25
106.5°	184	19	21	23	25
107°	193	20	21	24	25
107.5°	203	22	21	24	25
108°	214	24	21	24	25
108.5°	223	26	21	24	25
109°	232	30	21	25	26
109.5°	241	33	21	25	26
110°	251	37	21	24	26
110.5°	260	41	21	24	26
111°	271	47	21	24	26
111.5°	280	52	21	24	26
112°	289	57	22	25	26



TEST NUMBER: 17280

CATALOG NUMBER: HBE-654T5-N-UNV-EBT2-UPL-U

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
112.5°	298	63	22	25	26
113°	308	68	21	25	26
113.5°	319	74	21	25	26
114°	328	79	22	25	26
114.5°	337	86	22	25	26
115°	346	90	22	24	26
115.5°	356	96	22	24	26
116°	365	102	23	24	26
116.5°	376	108	23	24	26
117°	385	114	24	24	26
117.5°	394	119	25	25	26
118°	403	126	26	24	26
118.5°	413	132	28	25	26
119°	422	138	29	25	26
119.5°	432	145	31	25	26
120°	441	152	35	25	26
120.5°	451	160	38	25	26
121°	460	166	42	25	26
121.5°	470	174	47	26	26
122°	479	182	52	26	26
122.5°	489	190	57	26	27
123°	499	198	63	26	27
123.5°	509	206	69	27	27
124°	519	215	75	29	27
124.5°	527	222	81	30	27
125°	537	230	88	31	27
125.5°	546	239	95	34	29
126°	556	247	101	36	30
126.5°	565	255	108	39	31
127°	573	264	115	43	33
127.5°	582	272	121	47	34
128°	592	281	128	51	37
128.5°	600	291	135	57	40
129°	610	300	141	62	43
129.5°	620	310	147	68	47
130°	629	319	154	74	52
130.5°	637	327	160	81	57
131°	646	336	167	88	62
131.5°	653	346	173	95	67
132°	663	356	180	102	75
132.5°	672	368	187	110	82
133°	680	377	194	118	89
133.5°	689	388	201	125	96
134°	699	399	209	132	103
134.5°	707	411	217	140	112



TEST NUMBER: 17280

CATALOG NUMBER: HBE-654T5-N-UNV-EBT2-UPL-U

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
135°	716	423	225	147	120
135.5°	723	434	234	154	127
136°	732	447	243	161	134
136.5°	740	458	251	168	143
137°	749	470	261	175	151
137.5°	756	482	269	183	158
138°	764	494	277	190	165
138.5°	772	507	286	196	172
139°	780	520	296	204	179
139.5°	788	530	305	211	185
140°	796	541	314	219	192
140.5°	802	553	324	226	200
141°	810	566	333	234	207
141.5°	817	578	342	243	214
142°	826	590	351	252	223
142.5°	833	603	361	262	232
143°	840	615	370	270	240
143.5°	848	627	380	280	248
144°	855	639	389	289	256
144.5°	862	651	398	300	266
145°	869	663	407	309	275
145.5°	876	676	417	319	284
146°	884	687	427	330	294
146.5°	890	699	437	340	305
147°	897	712	447	350	317
147.5°	905	724	458	361	326
148°	911	736	469	372	337
148.5°	918	748	481	382	347
149°	925	760	493	392	358
149.5°	931	773	505	403	370
150°	937	784	518	413	381
150.5°	943	794	531	423	392
151°	951	805	546	434	403
151.5°	957	817	560	444	414
152°	962	830	575	455	425
152.5°	968	840	590	465	435
153°	974	851	604	476	446
153.5°	980	861	620	489	454
154°	986	873	635	501	465
154.5°	992	884	650	514	479
155°	997	894	664	528	491
155.5°	1002	905	679	542	504
156°	1009	915	695	555	515
156.5°	1014	924	710	572	529
157°	1019	934	725	588	542



TEST NUMBER: 17280

CATALOG NUMBER: HBE-654T5-N-UNV-EBT2-UPL-U

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
157.5°	1023	945	740	604	560
158°	1030	955	756	622	578
158.5°	1034	964	772	638	593
159°	1038	973	787	655	611
159.5°	1043	982	802	674	631
160°	1048	991	818	693	648
160.5°	1052	1001	832	709	665
161°	1056	1008	846	725	684
161.5°	1062	1016	862	743	702
162°	1066	1025	876	763	719
162.5°	1070	1033	891	781	737
163°	1074	1041	903	799	758
163.5°	1077	1049	919	816	777
164°	1081	1056	932	833	793
164.5°	1085	1062	945	851	817
165°	1089	1070	959	868	834
165.5°	1092	1076	974	884	851
166°	1096	1082	986	902	869
166.5°	1099	1088	998	919	889
167°	1103	1093	1010	934	909
167.5°	1105	1099	1021	951	927
168°	1108	1104	1032	968	943
168.5°	1111	1109	1043	982	959
169°	1114	1114	1054	1000	975
169.5°	1116	1118	1064	1015	994
170°	1119	1122	1072	1027	1008
170.5°	1121	1125	1081	1040	1022
171°	1123	1127	1089	1053	1035
171.5°	1125	1131	1098	1064	1050
172°	1127	1134	1106	1076	1065
172.5°	1129	1136	1113	1086	1075
173°	1131	1138	1119	1095	1088
173.5°	1132	1140	1124	1106	1101
174°	1135	1142	1128	1113	1109
174.5°	1135	1144	1133	1121	1117
175°	1137	1146	1136	1128	1125
175.5°	1138	1147	1138	1133	1132
176°	1139	1147	1141	1137	1136
176.5°	1139	1148	1142	1140	1139
177°	1140	1149	1143	1143	1142
177.5°	1141	1150	1145	1144	1144
178°	1141	1150	1144	1145	1145
178.5°	1142	1151	1145	1146	1146
179°	1142	1151	1146	1146	1147
179.5°	1143	1151	1147	1147	1147



TEST NUMBER: 17280

CATALOG NUMBER: HBE-654T5-N-UNV-EBT2-UPL-U

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
180°	1148	1148	1148	1148	1148

(END OF REPORT)