



Spectra Lux

2750 Sabourin, Saint-Laurent (Quebec) H4S 1M2 Canada
Tel.: (514) 332-0082 Fax: (514) 332-3590 www.spectralux.ca



Lab Code: 200899-0

Moving Mirror Goniophotometer Test Report

Standard(s): IES LM-63, IES LM-79, ANSI C82.77

Customer ANDlight, 1951 Franklin St., Vancouver, British Columbia , Canada, V5L 0C7

General Information		Lamp Details: CY4446		Driver Details: CY2019	
DUT Lab ID	SRIS 2832-1	Seasoning	0 Hour	Type	LED Power Supply
Lamp Type	LED/SSL	Test Product	BUT-60-P-27	Manufacturer	Meanwell
Current Mode	AC	Manufacturer	EPISTAR	Catalog No.	IDLV-45-12
Test Report	S20081311-R1	Lamp Catalog No.	OMNICHIP (320404-xx-300-12-4.4)	Maximum Power	45 W
Test Date	13 August 2020	Drive Current	30 mA	Input Voltage	120.00 V
Report Date	20 November 2020	Nominal Color	2700 K	Operating Frequency	60 Hz
Ambient	24.9 °C	Burning Position	Junction Axial	Input Power	21.74 W

Luminaire Data

General Information		Optics		Aperture (feet)	
Manufacturer	ANDlight	Reflector	None	X	-1.9583
Name	BUTTON	Housing	Aluminum Body c/w Nylon Rope	Y	-1.9583
Catalog No.	BUT-60-P-27	Lens	Opalin Acrylic Diffuser	Z	0.0000

Stabilization Time: 1 hour

Approved Signatory: Chrisnel Blot

Signature:



Luminaire Test Method

Precise installation and alignment of the luminaire to the rotation axis of the photometer is governed by a servomotor controlled via a microcontroller. A laser is used to validate the luminaire positioning. Before photometric measurements are taken, luminaire is operated long enough to reach stabilization and temperature equilibrium.

All movement commands issued to the photometer axes are mediated by the software to ensure the motion is within the limits of operation. The photometric detector used is a silicon detector corrected to closely match the spectral luminous efficiency photopic curve with a quality index less than 1.5%. Proper shielding is incorporated to the photometric test bench such that only the light from the unit under test is measured.

Luminous intensity measurements are performed at a distance great enough so that the inverse-square law applies. During each measurement the computer records the luminous intensity associated to the corresponding angles of radiation, as well as input electrical operational parameters and temperature measurements. Candela values are reported in IES format as per LM-63.

Equipment, reference standards are traceable to National Institute of Standards and Technology (NIST) and National Research Council of Canada (NRC).





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Electrical Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Power Supply	iRDC	CIF-3000A	974998	N.P.C.R.	N.P.C.R.
Input Power Meter	Yokogawa	WT210	27E116584	2020/07/22	2021/09/22
Output Power Meter	N/A	N/A	N/A	N.P.C.R.	N.P.C.R.

Photometric Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Photometer	N/A	N/A	N/A	N.P.C.R.	N.P.C.R.
Photodetector	INPHORA	IPR-PDET 19	110802	2019/09/05	2020/09/05

Environment Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Temperature Humidity Sensor	Omega	HH311	120504176	2020/07/16	2021/07/16

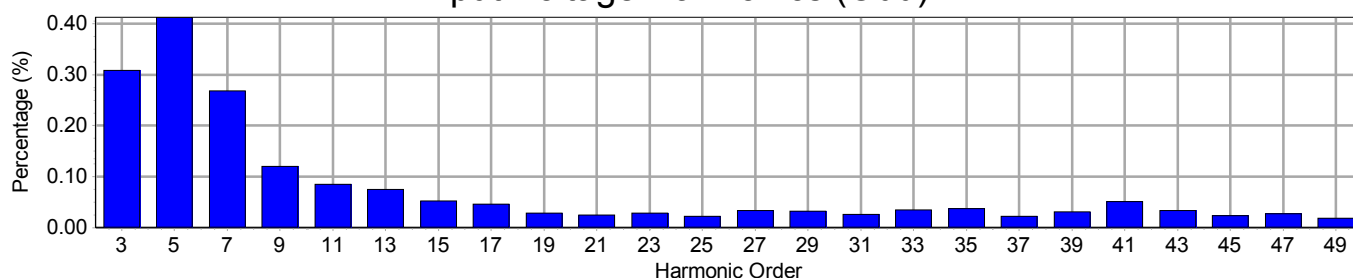


Electrical Measurements

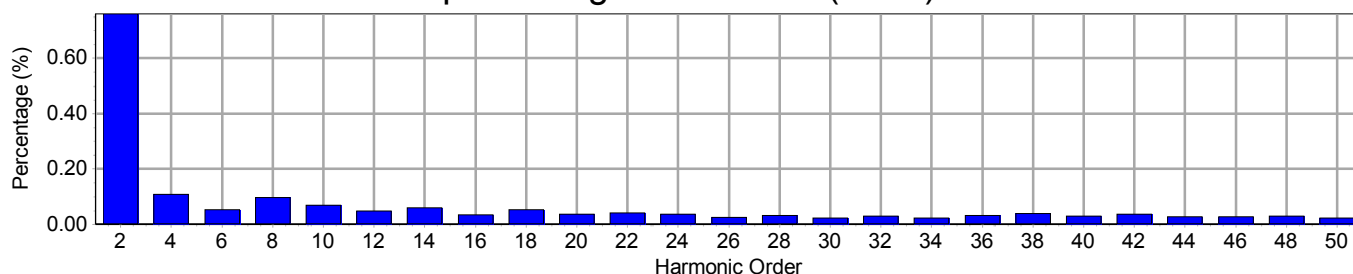
Input

Frequency	60 Hz	Active Power	21.74 W	THDV [ANSI]	1.00 %
Voltage	120.1 V(rms)	Apparent Power	22.46 VA	THDA [ANSI]	7.10 %
Current	0.1870 A(rms)	Power Factor	0.968	Max. Harmonic At	7th order

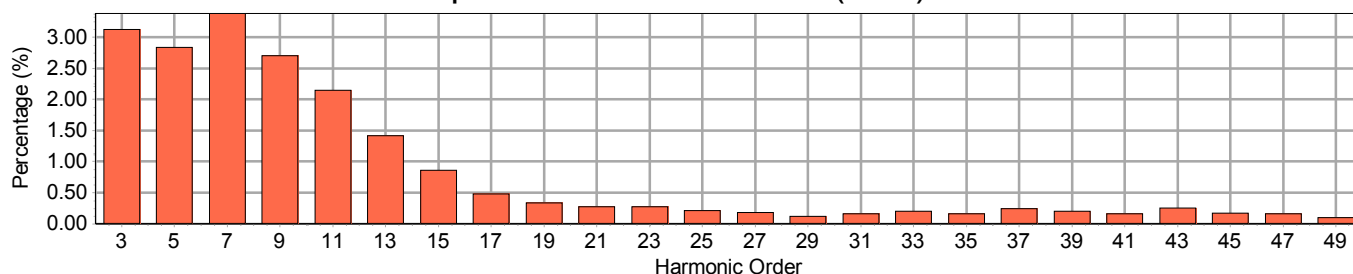
Input Voltage Harmonics (Odd)



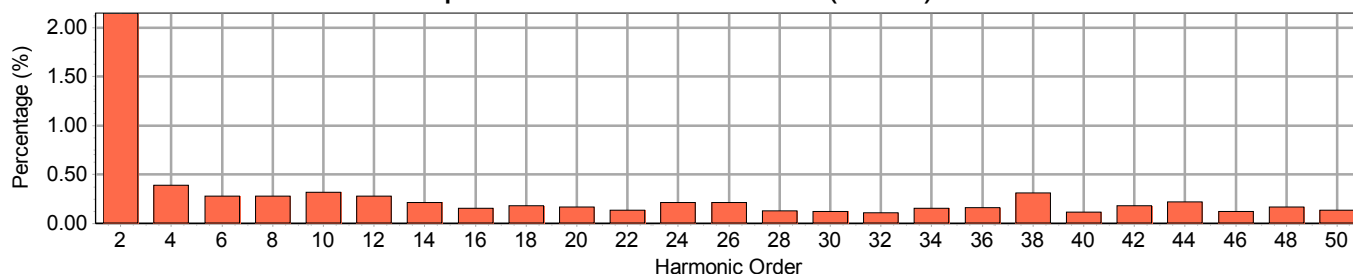
Input Voltage Harmonics (Even)



Input Current Harmonics (Odd)



Input Current Harmonics (Even)





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Harmonic Measurements

Odd Harmonics				Even Harmonics			
Harmonic Order	Frequency (HZ)	Voltage Harmonics (%)	Current Harmonics (%)	Harmonic Order	Frequency (HZ)	Voltage Harmonics (%)	Current Harmonics (%)
1	60	100.000	100.000	2	120	0.762	2.154
3	180	0.309	3.126	4	240	0.109	0.391
5	300	0.414	2.841	6	360	0.053	0.281
7	420	0.268	3.391	8	480	0.095	0.279
9	540	0.121	2.707	10	600	0.068	0.318
11	660	0.085	2.153	12	720	0.047	0.278
13	780	0.075	1.419	14	840	0.060	0.215
15	900	0.053	0.866	16	960	0.034	0.155
17	1020	0.045	0.476	18	1080	0.052	0.179
19	1140	0.029	0.331	20	1200	0.037	0.168
21	1260	0.025	0.278	22	1320	0.042	0.132
23	1380	0.028	0.275	24	1440	0.036	0.212
25	1500	0.022	0.212	26	1560	0.024	0.214
27	1620	0.033	0.180	28	1680	0.031	0.128
29	1740	0.032	0.114	30	1800	0.022	0.120
31	1860	0.026	0.158	32	1920	0.028	0.106
33	1980	0.035	0.201	34	2040	0.021	0.153
35	2100	0.038	0.161	36	2160	0.031	0.162
37	2220	0.022	0.243	38	2280	0.038	0.314
39	2340	0.031	0.200	40	2400	0.029	0.115
41	2460	0.052	0.164	42	2520	0.036	0.179
43	2580	0.034	0.249	44	2640	0.028	0.220
45	2700	0.024	0.175	46	2760	0.026	0.121
47	2820	0.027	0.164	48	2880	0.029	0.170
49	2940	0.018	0.094	50	3000	0.023	0.135



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Photometric Report: S20081311-R1

Prepared for: ANDlight · Test Date: 13 August 2020

Luminaire: BUTTON · Lumcat: BUT-60-P-27

Coefficients of Utilization - Zonal Cavity Method

RCR	RC				0.9				0.8				0.7				0.5			0.1			0
	RW	0.7	0.5	0.3	0.1	0.7	0.5	0.3	0.1	0.7	0.5	0.3	0.1	0.5	0.3	0.1	0.5	0.3	0.1	0.5	0.3	0.1	0
0		121	121	121	121	118	118	118	118	114	114	114	114	108	108	108	97	97	97	97	97	97	95
1		111	106	101	97	108	103	99	95	104	100	96	93	95	92	89	86	84	82	86	84	82	79
2		101	92	85	79	98	90	83	77	95	87	81	76	83	78	73	75	72	69	75	72	69	66
3		92	81	72	65	89	79	71	64	86	77	69	63	73	67	62	66	62	58	66	62	58	56
4		84	71	62	55	82	70	61	54	79	68	60	54	65	58	52	59	54	50	59	54	50	47
5		78	64	54	47	75	62	53	47	72	61	52	46	58	51	45	53	48	43	53	48	43	41
6		72	57	48	41	69	56	47	41	67	55	46	40	52	45	39	48	42	38	48	42	38	36
7		66	52	43	36	64	51	42	36	62	50	41	35	48	40	35	44	38	34	44	38	34	32
8		62	47	38	32	60	46	38	32	58	45	37	32	43	36	31	40	34	30	40	34	30	28
9		57	43	35	29	56	42	34	29	54	41	34	28	40	33	28	37	31	27	37	31	27	25
10		54	40	31	26	52	39	31	26	51	38	31	26	37	30	25	34	29	25	34	29	25	23

Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0 - 10	36	3.12	3.12
10 - 20	104	8.96	8.96
20 - 30	158	13.68	13.68
30 - 40	191	16.52	16.52
40 - 50	200	17.25	17.25
50 - 60	181	15.68	15.68
60 - 70	136	11.72	11.72
70 - 80	72	6.25	6.25
80 - 90	15	1.31	1.31
90 - 120	20	1.72	1.72
90 - 130	31	2.64	2.64
90 - 150	52	4.46	4.46
90 - 180	64	5.50	5.50
0 - 180	1157	100.00	100.00

Average Luminance (Cd/m²)

Angle	0 Degree	45 Degree	90 Degree
45.0	1405	1305	1215
55.0	1163	1244	1411
65.0	1209	1208	1136
75.0	1010	930	870
85.0	407	428	533

Luminaire Luminous Flux: 1157

Measured Input Power: 21.74 W

Total Luminaire Efficiency: N/A

Luminaire Luminous Efficacy: 53.2 lm/W

Luminaire Spacing Criterion (0 Degree): 1.2287

Luminaire Spacing Criterion (90 Degree): 1.3432

Category: Up and Down



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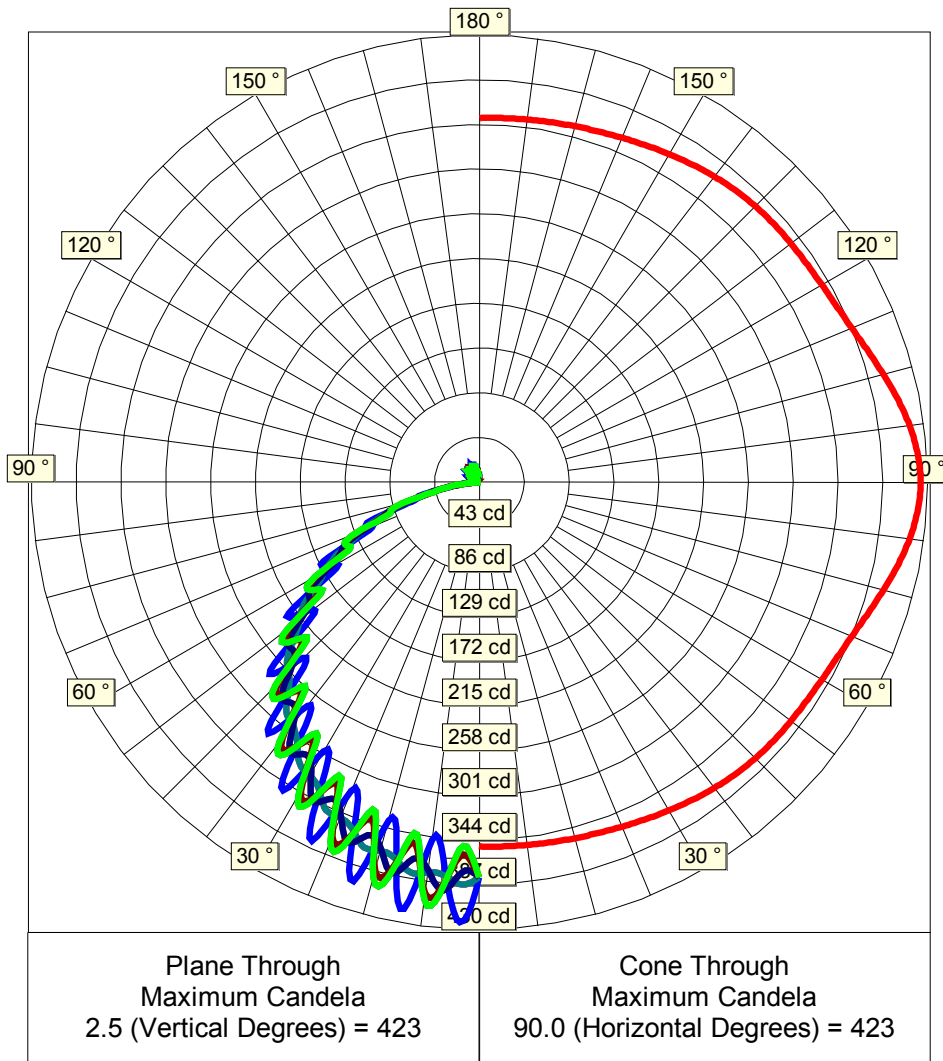
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Luminaire: BUTTON · Lumcat: BUT-60-P-27

Luminous Intensity - Polar Curve for each Plane(1)

Plane
Angles

Plane Angles	Candela Values
0.0	380
2.5	423
5.0	375
7.5	347
10.0	416
12.5	368
15.0	337
17.5	402
20.0	350
22.5	321
25.0	380
27.5	328
30.0	299
32.5	351
35.0	300
37.5	271
40.0	315
42.5	266
45.0	239
47.5	273
50.0	227
52.5	201
55.0	225
57.5	182
60.0	158
62.5	172
65.0	134
67.5	111
70.0	115
72.5	83
75.0	63
77.5	58
80.0	35
82.5	21
85.0	13
87.5	5
90.0	3
92.5	5
95.0	4
97.5	5



Cone
Angles

Cone Angles	Candela Values
0.0	350
22.5	358
45.0	375
67.5	387
90.0	423
112.5	387
135.0	375
157.5	358
180.0	350

0.0 °
22.5 °
45.0 °
67.5 °
90.0 °
112.5 °
135.0 °
157.5 °
180.0 °

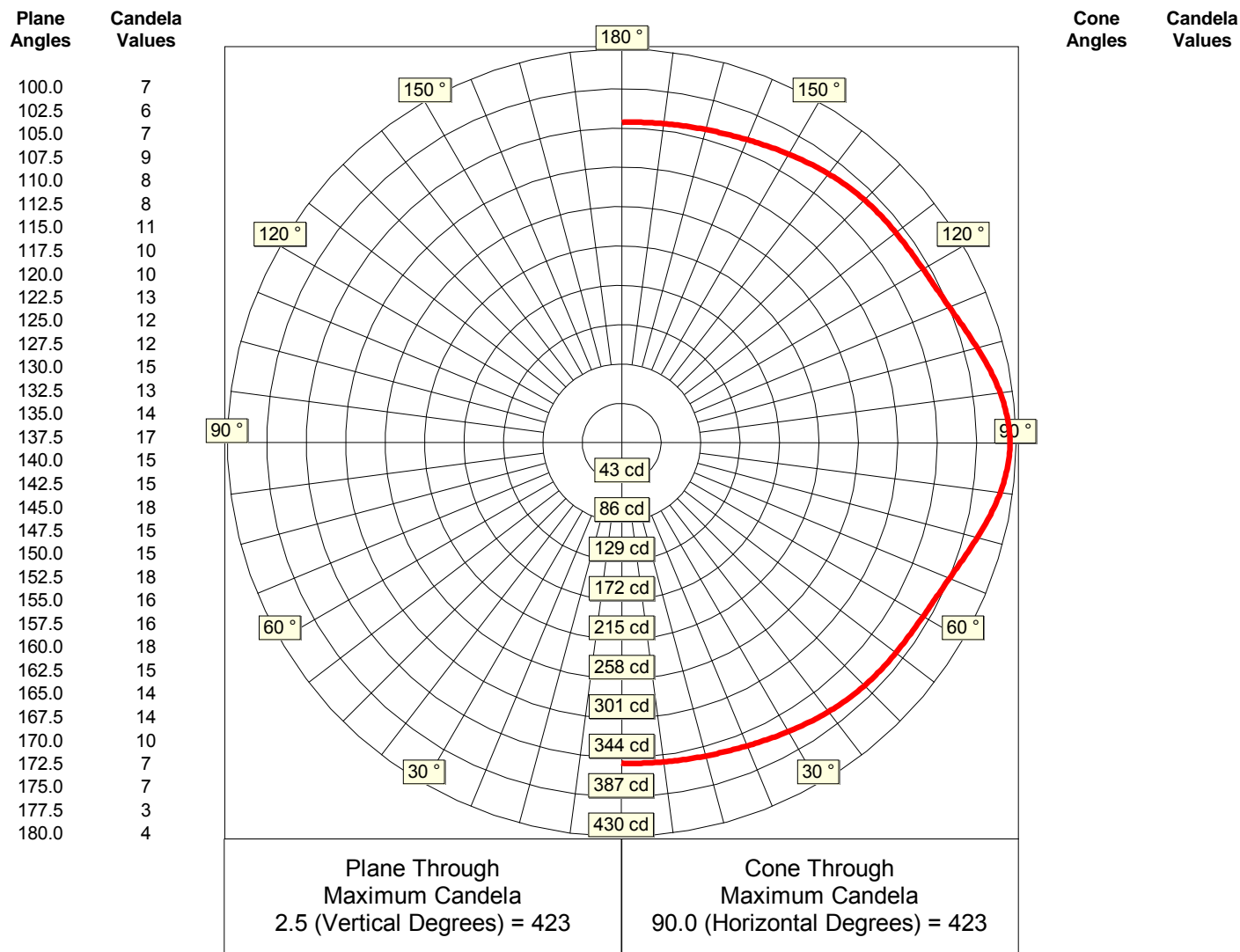


Photometric Report: S20081311-R1

Prepared for: ANDlight · Test Date: 13 August 2020

Luminaire: BUTTON · Lumcat: BUT-60-P-27

Luminous Intensity - Polar Curve for each Plane(2)





IES File Headers

IESNA:LM-63
 [ISSUEDATE] 13 August 2020
 [TESTLAB] Spectra Lux
 [TEST] S20081311-R1
 [MANUFAC] ANDlight
 [LUMCAT] BUT-60-P-27
 [LUMINAIRE] BUTTON
 [LAMP] EPISTAR OMNICHIP (320404-xx-300-12-4.4) c/w Meanwell Driver IDLV-45-12 @ 120.00V
 [_BURNING] Vertical Base Up (1,157 Luminaire Lumens)
 [_REFLECTOR] None
 [_LENS] Opalin Acrylic Diffuser
 [_HOUSING] Aluminum Body c/w Nylon Rope
 [_NOMINAL COLOR] 2700 K
 [_DRIVE CURRENT] 30 mA

Candela Table

Lateral Angles

	0.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0
V e r t i c a l	0.0	380	380	380	380	380	380	380	380
	2.5	350	358	375	387	423	387	375	350
	5.0	389	386	394	379	375	379	394	389
	7.5	405	399	376	378	347	378	376	405
	10.0	344	353	368	381	416	381	368	344
	12.5	381	378	385	371	368	371	385	381
	15.0	393	387	365	367	337	367	365	393
	17.5	332	340	356	368	402	368	356	332
	20.0	365	363	368	355	350	355	368	365
	22.5	374	368	347	349	321	349	368	374
	25.0	314	321	336	348	380	348	336	314
	27.5	343	341	346	333	328	333	346	343
	30.0	348	343	323	325	299	325	343	348
	32.5	289	297	310	321	351	321	310	289
	35.0	314	312	316	305	300	305	316	314
	37.5	315	311	293	294	271	294	311	315
	40.0	260	266	278	288	315	288	278	260
	42.5	280	277	281	271	266	271	277	280
A n g l e s	45.0	276	272	257	259	239	259	272	276
	47.5	225	231	241	250	273	250	241	225
	50.0	239	237	239	231	227	231	237	239
	52.5	232	229	215	217	201	217	229	232
	55.0	186	190	199	206	225	206	199	186
	57.5	193	192	193	186	182	186	192	193
	60.0	182	180	169	171	158	171	180	182
	62.5	142	145	151	157	172	157	145	142
	65.0	142	141	142	137	134	137	141	142
	67.5	128	127	119	120	111	120	127	128
	70.0	95	97	101	104	115	104	97	95
	72.5	89	88	88	85	83	85	88	89
	75.0	73	72	67	68	63	68	72	73
	77.5	48	49	50	52	58	52	49	48
	80.0	37	37	37	36	35	36	37	37
	82.5	23	23	21	22	21	22	23	23
	85.0	10	10	10	11	13	11	10	10
	87.5	3	4	5	5	5	5	4	3
	90.0	2	2	3	4	3	4	2	2



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Lateral Angles

	0.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0
V e r t i c a l	92.5	2	2	3	4	5	4	3	2
	95.0	3	4	4	5	4	5	4	4
	97.5	4	4	5	5	5	5	4	4
	100.0	4	4	5	5	7	5	5	4
	102.5	5	5	6	6	6	6	5	5
	105.0	6	6	6	7	7	6	6	6
	107.5	6	6	7	8	9	8	7	6
	110.0	7	7	8	8	8	8	7	7
	112.5	9	8	8	9	8	9	8	9
	115.0	8	8	9	10	11	10	9	8
	117.5	10	10	10	10	10	10	10	10
	120.0	11	11	10	11	10	11	10	11
	122.5	10	10	11	12	13	12	11	10
	125.0	12	12	12	12	12	12	12	12
	127.5	13	13	13	13	12	13	13	13
	130.0	12	12	13	14	15	14	13	12
	132.5	14	14	14	14	13	14	14	14
	135.0	15	15	14	14	14	14	15	15
	137.5	13	14	15	15	17	15	15	14
	140.0	15	16	16	15	15	16	16	15
A n g l e s	142.5	16	16	15	16	15	16	15	16
	145.0	14	15	15	17	18	17	15	15
	147.5	17	16	17	16	15	16	17	16
	150.0	17	16	16	16	15	16	16	17
	152.5	15	15	16	17	18	17	16	15
	155.0	16	16	16	16	16	16	16	16
	157.5	16	16	16	16	16	16	16	16
	160.0	14	14	15	16	18	16	15	14
	162.5	15	15	15	15	15	15	15	15
	165.0	15	14	13	14	14	14	13	14
	167.5	12	11	12	12	14	12	12	11
	170.0	11	11	10	10	10	10	10	11
	172.5	9	9	8	8	7	8	8	9
	175.0	6	6	6	7	7	7	6	6
	177.5	4	4	3	4	3	4	3	4
	180.0	4	4	4	4	4	4	4	4