



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: CY4453		Driver Details: CY2019	
DUT Lab ID	SRIS 2832-8	Seasoning	0 Hour	Type	LED Power Supply
Lamp Type	LED/SSL	Test Product	BUT-60-CW-41	Manufacturer	Meanwell
Current Mode	AC	Manufacturer	EPISTAR	Catalog No.	IDLV-45-12
Test Report	S2008173-R1	Lamp Catalog No.	OMNICHIP (320404-xx-300-12-4.4)	Maximum Power	45 W
Test Date	17 August 2020	Drive Current	30 mA	Input Voltage	120.00 V
Report Date	20 November 2020	Nominal Color	4100 K	Operating Frequency	60 Hz
Ambient	25.1 °C	Burning Position	Junction Axial	Input Power	23.20 W

Luminaire Data

General Information		Optics		Aperture (feet)	
Manufacturer	ANDlight	Reflector	None	X	0.0000
Name	BUTTON	Housing	Aluminum Body c/w Nylon Rope	Y	-1.9583
Catalog No.	BUT-60-CW-41	Lens	Opalin Acrylic Diffuser	Z	-1.9583

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

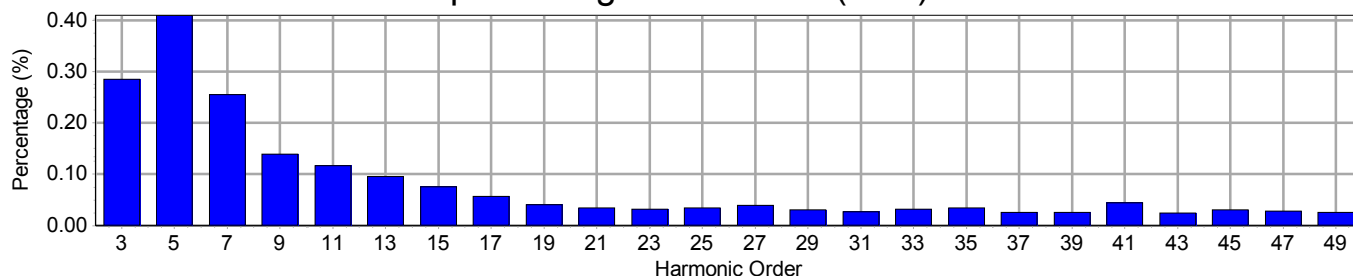


Electrical Measurements

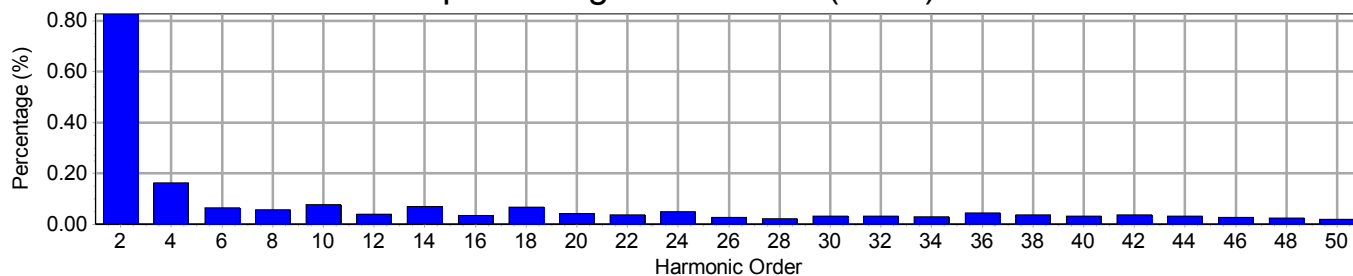
Input

Frequency	60 Hz	Active Power	23.20 W	THDV [ANSI]	1.06 %
Voltage	120.0 V(rms)	Apparent Power	24.04 VA	THDA [ANSI]	7.17 %
Current	0.2003 A(rms)	Power Factor	0.965	Max. Harmonic At	3rd order

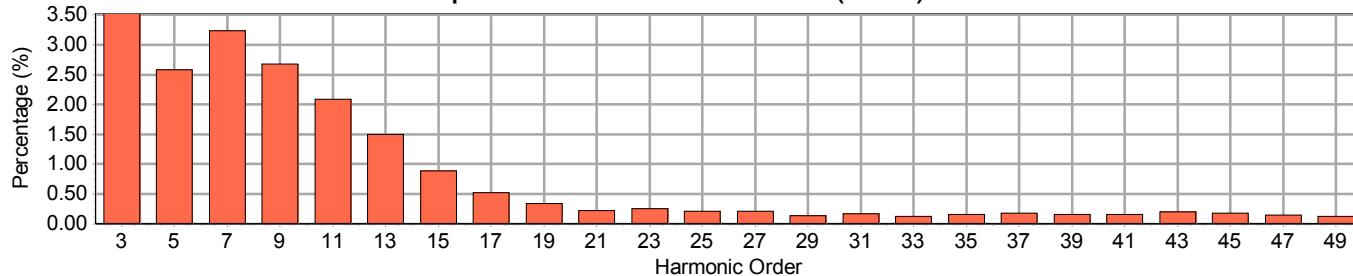
Input Voltage Harmonics (Odd)



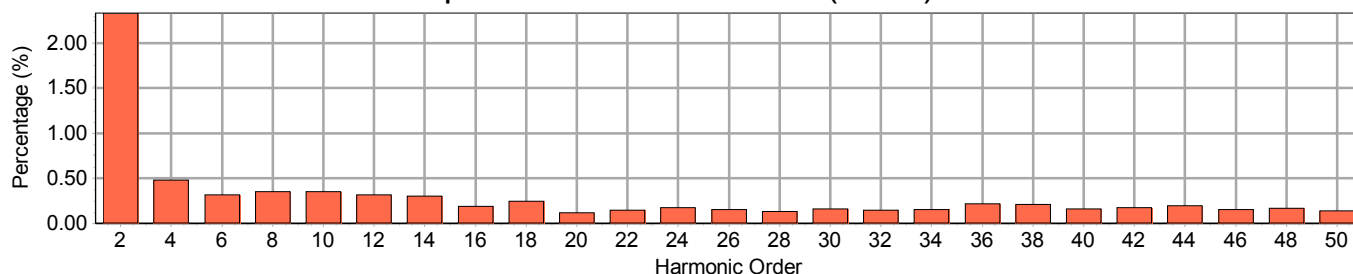
Input Voltage Harmonics (Even)



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	0.828	2.337
3	180	0.285	3.530	4	240	0.164	0.481
5	300	0.410	2.585	6	360	0.063	0.313
7	420	0.255	3.237	8	480	0.057	0.353
9	540	0.140	2.673	10	600	0.078	0.351
11	660	0.117	2.084	12	720	0.039	0.318
13	780	0.095	1.492	14	840	0.070	0.299
15	900	0.076	0.881	16	960	0.034	0.188
17	1020	0.057	0.525	18	1080	0.068	0.242
19	1140	0.041	0.342	20	1200	0.043	0.116
21	1260	0.035	0.216	22	1320	0.037	0.143
23	1380	0.032	0.257	24	1440	0.049	0.173
25	1500	0.034	0.207	26	1560	0.026	0.156
27	1620	0.040	0.208	28	1680	0.022	0.132
29	1740	0.031	0.138	30	1800	0.030	0.159
31	1860	0.027	0.168	32	1920	0.031	0.149
33	1980	0.032	0.127	34	2040	0.028	0.155
35	2100	0.034	0.160	36	2160	0.043	0.214
37	2220	0.026	0.175	38	2280	0.037	0.209
39	2340	0.025	0.157	40	2400	0.031	0.162
41	2460	0.044	0.155	42	2520	0.036	0.175
43	2580	0.024	0.198	44	2640	0.031	0.193
45	2700	0.030	0.178	46	2760	0.027	0.152
47	2820	0.029	0.145	48	2880	0.025	0.166
49	2940	0.026	0.128	50	3000	0.019	0.136



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Photometric Report: S2008173-R1

Prepared for: ANDlight · Test Date: 17 August 2020

Luminaire: BUTTON · Lumcat: BUT-60-CW-41

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		116	116	116	116	107	107	107	107	99	99	99	99	83	83	83	56	56	56	56	56	56	50
1		100	93	86	80	92	85	79	74	84	78	73	68	64	60	56	40	38	36	40	38	36	30
2		89	78	68	60	81	71	63	55	74	65	57	51	53	47	42	32	29	26	32	29	26	21
3		80	66	56	47	73	61	51	44	66	55	47	40	45	38	33	27	23	20	27	23	20	15
4		73	57	46	38	66	52	43	35	60	48	39	32	39	32	26	23	19	15	23	19	15	11
5		66	50	39	32	60	46	36	29	54	42	33	27	34	27	22	20	16	12	20	16	12	9
6		60	44	34	26	55	41	31	24	49	37	28	22	30	23	18	18	13	10	18	13	10	7
7		55	40	29	22	50	36	27	21	46	33	25	19	27	20	15	16	12	9	16	12	9	6
8		51	35	26	19	46	33	24	18	42	30	22	16	24	18	13	14	10	7	14	10	7	5
9		47	32	23	17	43	29	21	15	39	27	19	14	22	16	11	13	9	6	13	9	6	4
10		44	29	20	15	40	27	19	13	36	24	17	12	20	14	10	12	8	5	12	8	5	3

Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0 - 10	1	0.07	0.07
10 - 20	9	0.60	0.60
20 - 30	28	1.80	1.80
30 - 40	54	3.50	3.50
40 - 50	84	5.49	5.49
50 - 60	115	7.52	7.52
60 - 70	142	9.25	9.25
70 - 80	162	10.54	10.54
80 - 90	172	11.23	11.23
90 - 120	476	31.02	31.02
90 - 130	591	38.54	38.54
90 - 150	729	47.53	47.53
90 - 180	767	50.00	50.00
0 - 180	1534	100.00	100.00

Average Luminance (Cd/m²)

Angle	0 Degree	45 Degree	90 Degree
45.0	884	644	24
55.0	1154	800	39
65.0	2137	1496	46
75.0	3325	2473	88
85.0	9278	6483	288

Luminaire Luminous Flux: 1534

Measured Input Power: 23.20 W

Total Luminaire Efficiency: N/A

Luminaire Luminous Efficacy: 66.1 lm/W

Luminaire Spacing Criterion (0 Degree): 10.7335

Luminaire Spacing Criterion (90 Degree): 1.8152

Category: Up and Down

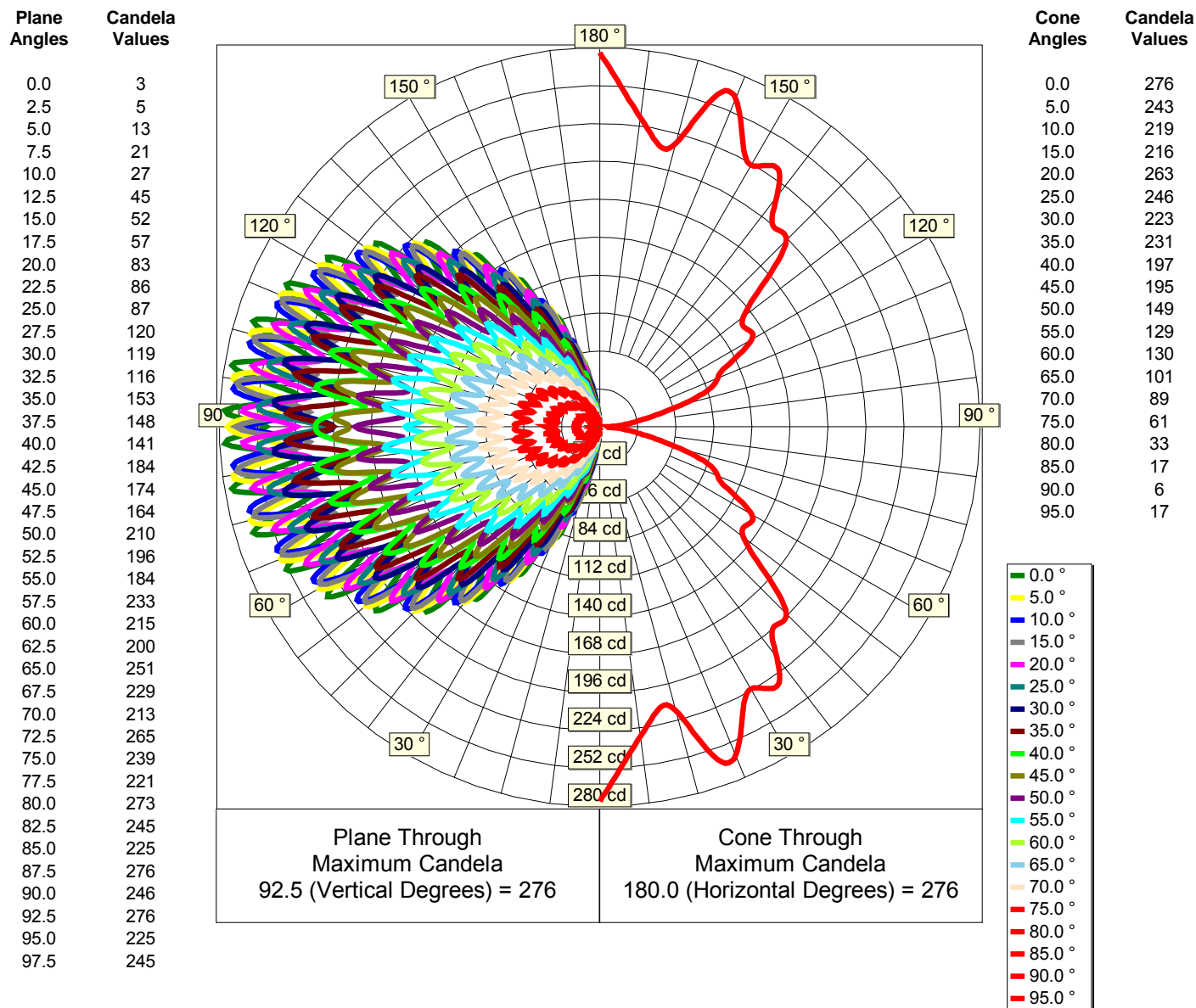


Photometric Report: S2008173-R1

Prepared for: ANDlight · Test Date: 17 August 2020

Luminaire: BUTTON · Lumcat: BUT-60-CW-41

Luminous Intensity - Polar Curve for each Plane(1)





Photometric Report: S2008173-R1

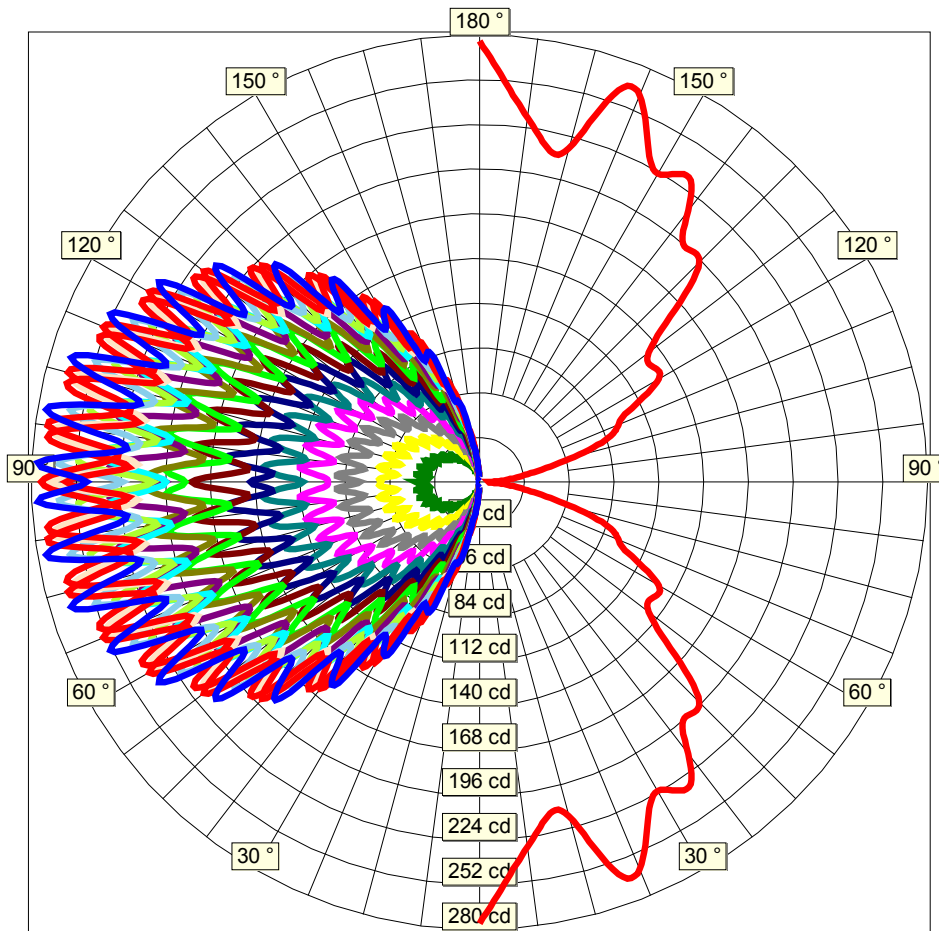
Prepared for: ANDlight · Test Date: 17 August 2020

Luminaire: BUTTON · Lumcat: BUT-60-CW-41

Luminous Intensity - Polar Curve for each Plane(2)

Plane
Angles

Plane Angles	Candela Values
100.0	273
102.5	221
105.0	239
107.5	265
110.0	213
112.5	229
115.0	251
117.5	200
120.0	215
122.5	233
125.0	184
127.5	196
130.0	210
132.5	164
135.0	174
137.5	184
140.0	141
142.5	148
145.0	153
147.5	116
150.0	119
152.5	120
155.0	87
157.5	86
160.0	83
162.5	57
165.0	52
167.5	45
170.0	27
172.5	21
175.0	13
177.5	5
180.0	3



Cone
Angles

Cone Angles	Candela Values
100.0	33
105.0	61
110.0	89
115.0	101
120.0	130
125.0	129
130.0	149
135.0	195
140.0	197
145.0	231
150.0	223
155.0	246
160.0	263
165.0	216
170.0	219
175.0	243
180.0	276

Plane Through
Maximum Candela
92.5 (Vertical Degrees) = 276

Cone Through
Maximum Candela
180.0 (Horizontal Degrees) = 276

100.0 °
105.0 °
110.0 °
115.0 °
120.0 °
125.0 °
130.0 °
135.0 °
140.0 °
145.0 °
150.0 °
155.0 °
160.0 °
165.0 °
170.0 °
175.0 °
180.0 °



IES File Headers

IESNA:LM-63
 [ISSUEDATE] 17 August 2020
 [TESTLAB] Spectra Lux
 [TEST] S2008173-R1
 [MANUFAC] ANDlight
 [LUMCAT] BUT-60-CW-41
 [LUMINAIRE] BUTTON
 [LAMP] EPISTAR OMNICHIP (320404-xx-300-12-4.4)LEDs c/w Meanwell Driver IDLV-45-12 @ 120.00V
 [_BURNING] Axial (1,534 Luminaire Lumens)
 [_REFLECTOR] None
 [_LENS] Opalin Acrylic Diffuser
 [_HOUSING] Aluminum Body c/w Nylon Rope
 [_NOMINAL COLOR] 4100 K
 [_DRIVE CURRENT] 30 mA

Candela Table

Lateral Angles

	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0
V e r t i c a l	0.0	3	3	3	3	3	3	3	3	3
	2.5	5	5	5	6	5	5	6	5	4
	5.0	13	11	10	10	12	11	11	9	9
	7.5	21	22	20	22	18	17	16	16	14
	10.0	27	29	32	30	26	27	28	22	18
	12.5	45	40	36	36	42	39	36	36	29
	15.0	52	58	53	55	46	42	40	40	35
	17.5	57	60	67	63	56	58	58	46	42
	20.0	83	72	66	65	77	73	66	66	55
	22.5	86	95	87	92	76	69	66	66	69
	25.0	87	91	103	97	86	90	90	72	65
	27.5	120	104	95	93	112	106	96	97	81
	30.0	119	130	121	126	106	96	92	92	96
	32.5	116	120	136	128	114	119	120	97	87
	35.0	153	134	122	120	145	137	124	126	106
	37.5	148	163	151	158	132	121	115	116	122
	40.0	141	147	166	156	140	147	148	120	108
	42.5	184	161	146	143	174	164	149	152	128
	45.0	174	192	179	187	157	143	136	137	145
A n g l e s	47.5	164	170	193	181	164	171	173	140	126
	50.0	210	184	167	165	200	188	171	175	148
	52.5	196	217	203	211	177	162	155	156	165
	55.0	184	190	216	202	183	192	194	157	141
	57.5	233	204	185	182	221	208	189	194	165
	60.0	215	238	223	232	194	178	170	171	181
	62.5	200	206	235	220	200	209	211	171	154
	65.0	251	220	199	197	239	225	204	210	179
	67.5	229	254	238	248	207	190	182	183	194
	70.0	213	218	249	232	212	222	224	182	164
	72.5	265	232	210	207	251	236	214	221	189
	75.0	239	266	250	259	216	198	190	191	203
	77.5	221	226	259	240	221	231	233	190	170
	80.0	273	240	216	214	259	244	221	227	195
	82.5	245	272	257	266	221	203	195	195	208
	85.0	225	230	263	245	226	235	237	193	173
	87.5	276	243	219	216	263	246	223	231	197
	90.0	246	274	258	268	223	204	196	196	209



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Lateral Angles

	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	
V e r t i c a l	92.5	276	243	219	216	263	246	223	231	197	195
	95.0	225	230	263	245	226	235	237	193	173	157
	97.5	245	272	257	266	221	203	195	195	208	183
	100.0	273	240	216	214	259	244	221	227	195	192
	102.5	221	226	259	240	221	231	233	190	170	154
	105.0	239	266	250	259	216	198	190	191	203	178
	107.5	265	232	210	207	251	236	214	221	189	185
	110.0	213	218	249	232	212	222	224	182	164	148
	112.5	229	254	238	248	207	190	182	183	194	170
	115.0	251	220	199	197	239	225	204	210	179	176
	117.5	200	206	235	220	200	209	211	171	154	139
	120.0	215	238	223	232	194	178	170	171	181	159
	122.5	233	204	185	182	221	208	189	194	165	162
	125.0	184	190	216	202	183	192	194	157	141	128
	127.5	196	217	203	211	177	162	155	156	165	144
	130.0	210	184	167	165	200	188	171	175	148	146
	132.5	164	170	193	181	164	171	173	140	126	113
	135.0	174	192	179	187	157	143	136	137	145	127
137.5	184	161	146	143	174	164	149	152	128	126	
A n g l e s	140.0	141	147	166	156	140	147	148	120	108	97
	142.5	148	163	151	158	132	121	115	116	122	107
	145.0	153	134	122	120	145	137	124	126	106	104
	147.5	116	120	136	128	114	119	120	97	87	78
	150.0	119	130	121	126	106	96	92	92	96	84
	152.5	120	104	95	93	112	106	96	97	81	79
	155.0	87	91	103	97	86	90	90	72	65	58
	157.5	86	95	87	92	76	69	66	66	69	60
	160.0	83	72	66	65	77	73	66	66	55	54
	162.5	57	60	67	63	56	58	58	46	42	37
	165.0	52	58	53	55	46	42	40	40	41	35
	167.5	45	40	36	36	42	39	36	36	30	29
	170.0	27	29	32	30	26	27	28	22	20	18
	172.5	21	22	20	22	18	17	16	16	16	14
	175.0	13	11	10	10	12	11	11	11	9	9
	177.5	5	5	5	6	5	5	6	5	5	4
	180.0	3	3	3	3	3	3	3	3	3	3



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Lateral Angles

	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0	90.0	95.0
V e r t i c a l	0.0	3	3	3	3	3	3	3	3	3
	2.5	5	5	4	4	4	4	4	4	4
	5.0	7	6	6	5	5	5	4	3	4
	7.5	13	10	8	7	6	5	4	3	4
	10.0	17	17	13	11	8	6	5	4	4
	12.5	21	18	17	13	12	8	5	4	3
	15.0	33	25	19	16	12	9	7	4	3
	17.5	36	35	27	23	15	10	8	5	4
	20.0	40	34	33	25	21	14	8	5	3
	22.5	56	43	33	27	21	16	10	6	4
	25.0	57	55	43	37	24	16	11	6	4
	27.5	59	51	50	38	32	21	11	6	3
	30.0	79	62	47	39	30	23	15	7	4
	32.5	78	76	61	51	34	22	15	7	5
	35.0	78	68	67	50	43	28	15	8	4
	37.5	102	79	61	51	39	31	19	9	4
	40.0	96	95	77	65	44	28	20	9	5
	42.5	95	83	82	63	54	36	18	10	4
	45.0	122	96	73	62	48	38	24	11	5
	47.5	113	113	91	78	53	34	24	11	5
A n g l e s	50.0	111	96	96	74	64	43	22	12	4
	52.5	140	110	85	72	56	45	28	13	5
	55.0	128	128	104	89	61	40	28	12	6
	57.5	124	108	108	83	73	49	25	13	5
	60.0	155	122	94	80	63	51	32	15	5
	62.5	139	140	114	99	68	44	31	14	7
	65.0	134	117	118	91	80	54	28	15	5
	67.5	166	131	102	86	68	56	36	17	6
	70.0	148	149	122	105	73	48	34	15	7
	72.5	142	124	124	96	85	58	30	16	6
	75.0	174	138	107	91	72	59	38	18	6
	77.5	154	155	128	110	76	50	36	16	7
	80.0	147	128	128	100	88	60	32	16	6
	82.5	179	142	110	93	74	61	39	18	7
	85.0	157	158	131	112	78	51	36	16	7
	87.5	149	129	130	101	89	61	33	17	6
	90.0	180	143	110	94	74	61	40	19	7
	92.5	149	129	130	101	89	61	33	17	6
	95.0	157	158	131	112	78	51	36	16	7
	97.5	179	142	110	93	74	61	39	18	7
	100.0	147	128	128	100	88	60	32	16	6
	102.5	154	155	128	110	76	50	36	16	7
	105.0	174	138	107	91	72	59	38	18	6
	107.5	142	124	124	96	85	58	30	16	6
	110.0	148	149	122	105	73	48	34	15	7
	112.5	166	131	102	86	68	56	36	17	6
	115.0	134	117	118	91	80	54	28	15	5
	117.5	139	140	114	99	68	44	31	14	7
	120.0	155	122	94	80	63	51	32	15	5
	122.5	124	108	108	83	73	49	25	13	5
	125.0	128	128	104	89	61	40	28	12	6
	127.5	140	110	85	72	56	45	28	13	5
	130.0	111	96	96	74	64	43	22	12	4
	132.5	113	113	91	78	53	34	24	11	5



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Lateral Angles

	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0	90.0	95.0	
V e r t i c a l	135.0	122	96	73	62	48	38	24	11	5	11
	137.5	95	83	82	63	54	36	18	10	4	10
	140.0	96	95	77	65	44	28	20	9	5	9
	142.5	102	79	61	51	39	31	19	9	4	9
	145.0	78	68	67	50	43	28	15	8	4	8
	147.5	78	76	61	51	34	22	15	7	5	7
	150.0	79	62	47	39	30	23	15	7	4	7
	152.5	59	51	50	38	32	21	11	6	3	6
	155.0	57	55	43	37	24	16	11	6	4	6
	157.5	56	43	33	27	21	16	10	6	4	6
	160.0	40	34	33	25	21	14	8	5	3	5
	162.5	36	35	27	23	15	10	8	5	4	5
	165.0	33	25	19	16	12	9	7	4	3	4
	167.5	21	18	17	13	12	8	5	4	3	4
	170.0	17	17	13	11	8	6	5	4	4	4
	172.5	13	10	8	7	6	5	4	4	3	4
	175.0	7	6	6	5	5	5	4	4	3	4
	177.5	5	5	4	4	4	4	4	4	4	4
	180.0	3	3	3	3	3	3	3	3	3	3
A n g l e s											



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Lab Code: 200899-0

Lateral Angles

	100.0	105.0	110.0	115.0	120.0	125.0	130.0	135.0	140.0	145.0
V e r t i c a l	0.0	3	3	3	3	3	3	3	3	3
	2.5	4	4	4	4	5	5	4	5	5
	5.0	4	5	5	6	6	7	9	9	11
	7.5	4	5	6	7	8	10	13	14	16
	10.0	5	6	8	11	13	17	18	20	22
	12.5	5	8	12	13	17	18	21	29	30
	15.0	7	9	12	16	19	25	33	35	41
	17.5	8	10	15	23	27	35	36	37	42
	20.0	8	14	21	25	33	40	54	55	66
	22.5	10	16	21	27	33	43	56	60	69
	25.0	11	16	24	37	43	55	57	58	65
	27.5	11	21	32	38	50	51	59	79	81
	30.0	15	23	30	39	47	62	79	84	96
	32.5	15	22	34	51	61	76	78	78	87
	35.0	15	28	43	50	67	68	78	104	106
	37.5	19	31	39	51	61	79	102	107	122
	40.0	20	28	44	65	77	95	96	97	108
	42.5	18	36	54	63	82	83	95	126	128
	45.0	24	38	48	62	73	96	122	127	145
	47.5	24	34	53	78	91	113	113	113	126
A n g l e s	50.0	22	43	64	74	96	96	111	146	148
	52.5	28	45	56	72	85	110	140	144	165
	55.0	28	40	61	89	104	128	128	128	141
	57.5	25	49	73	83	108	108	124	162	165
	60.0	32	51	63	80	94	122	155	159	181
	62.5	31	44	68	99	114	140	139	139	154
	65.0	28	54	80	91	118	117	134	176	179
	67.5	36	56	68	86	102	131	166	170	194
	70.0	34	48	73	105	122	149	148	148	164
	72.5	30	58	85	96	124	124	142	185	189
	75.0	38	59	72	91	107	138	174	178	203
	77.5	36	50	76	110	128	155	154	154	170
	80.0	32	60	88	100	128	128	147	192	195
	82.5	39	61	74	93	110	142	179	183	208
	85.0	36	51	78	112	131	158	157	157	173
	87.5	33	61	89	101	130	129	149	195	197
	90.0	40	61	74	94	110	143	180	184	209
	92.5	33	61	89	101	130	129	149	195	197
	95.0	36	51	78	112	131	158	157	157	173
	97.5	39	61	74	93	110	142	179	183	208
	100.0	32	60	88	100	128	128	147	192	195
	102.5	36	50	76	110	128	155	154	154	170
	105.0	38	59	72	91	107	138	174	178	203
	107.5	30	58	85	96	124	124	142	185	189
	110.0	34	48	73	105	122	149	148	148	164
	112.5	36	56	68	86	102	131	166	170	194
	115.0	28	54	80	91	118	117	134	176	179
	117.5	31	44	68	99	114	140	139	139	154
	120.0	32	51	63	80	94	122	155	159	181
	122.5	25	49	73	83	108	108	124	162	165
	125.0	28	40	61	89	104	128	128	128	141
	127.5	28	45	56	72	85	110	140	144	165
	130.0	22	43	64	74	96	96	111	146	148
	132.5	24	34	53	78	91	113	113	113	126



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Lateral Angles

	100.0	105.0	110.0	115.0	120.0	125.0	130.0	135.0	140.0	145.0
135.0	24	38	48	62	73	96	122	127	145	137
137.5	18	36	54	63	82	83	95	126	128	152
140.0	20	28	44	65	77	95	96	97	108	120
142.5	19	31	39	51	61	79	102	107	122	116
145.0	15	28	43	50	67	68	78	104	106	126
147.5	15	22	34	51	61	76	78	78	87	97
150.0	15	23	30	39	47	62	79	84	96	92
152.5	11	21	32	38	50	51	59	79	81	97
155.0	11	16	24	37	43	55	57	58	65	72
157.5	10	16	21	27	33	43	56	60	69	66
160.0	8	14	21	25	33	34	40	54	55	66
162.5	8	10	15	23	27	35	36	37	42	46
165.0	7	9	12	16	19	25	33	35	41	40
167.5	5	8	12	13	17	18	21	29	30	36
170.0	5	6	8	11	13	17	17	18	20	22
172.5	4	5	6	7	8	10	13	14	16	16
175.0	4	5	5	5	6	6	7	9	9	11
177.5	4	4	4	4	4	5	5	4	5	5
180.0	3	3	3	3	3	3	3	3	3	3

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Lateral Angles

	150.0	155.0	160.0	165.0	170.0	175.0	180.0
V e r t i c a l	0.0	3	3	3	3	3	3
	2.5	6	5	5	6	5	5
	5.0	11	11	12	10	10	13
	7.5	16	17	18	22	20	21
	10.0	28	27	26	30	32	29
	12.5	36	39	42	36	36	40
	15.0	40	42	46	55	53	58
	17.5	58	58	56	63	67	60
	20.0	66	73	77	65	66	72
	22.5	66	69	76	92	87	95
	25.0	90	90	86	97	103	91
	27.5	96	106	112	93	95	104
	30.0	92	96	106	126	121	130
	32.5	120	119	114	128	136	120
	35.0	124	137	145	120	122	134
	37.5	115	121	132	158	151	163
	40.0	148	147	140	156	166	147
	42.5	149	164	174	143	146	161
	45.0	136	143	157	187	179	192
	47.5	173	171	164	181	193	170
A n g l e s	50.0	171	188	200	165	167	184
	52.5	155	162	177	211	203	217
	55.0	194	192	183	202	216	190
	57.5	189	208	221	182	185	204
	60.0	170	178	194	232	223	238
	62.5	211	209	200	220	235	206
	65.0	204	225	239	197	199	220
	67.5	182	190	207	248	238	254
	70.0	224	222	212	232	249	218
	72.5	214	236	251	207	210	232
	75.0	190	198	216	259	250	266
	77.5	233	231	221	240	259	226
	80.0	221	244	259	214	216	240
	82.5	195	203	221	266	257	272
	85.0	237	235	226	245	263	230
	87.5	223	246	263	216	219	243
	90.0	196	204	223	268	258	274
	92.5	223	246	263	216	219	243
	95.0	237	235	226	245	263	230
	97.5	195	203	221	266	257	272
	100.0	221	244	259	214	216	240
	102.5	233	231	221	240	259	226
	105.0	190	198	216	259	250	266
	107.5	214	236	251	207	210	232
	110.0	224	222	212	232	249	218
	112.5	182	190	207	248	238	254
	115.0	204	225	239	197	199	220
	117.5	211	209	200	220	235	206
	120.0	170	178	194	232	223	238
	122.5	189	208	221	182	185	204
	125.0	194	192	183	202	216	190
	127.5	155	162	177	211	203	217
	130.0	171	188	200	165	167	184
	132.5	173	171	164	181	193	170



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Lateral Angles

	150.0	155.0	160.0	165.0	170.0	175.0	180.0	
V e r t i c a l	135.0	136	143	157	187	179	192	174
	137.5	149	164	174	143	146	161	184
	140.0	148	147	140	156	166	147	141
	142.5	115	121	132	158	151	163	148
	145.0	124	137	145	120	122	134	153
	147.5	120	119	114	128	136	120	116
	150.0	92	96	106	126	121	130	119
	152.5	96	106	112	93	95	104	120
	155.0	90	90	86	97	103	91	87
	157.5	66	69	76	92	87	95	86
	160.0	66	73	77	65	66	72	83
	162.5	58	58	56	63	67	60	57
	165.0	40	42	46	55	53	58	52
	167.5	36	39	42	36	36	40	45
	170.0	28	27	26	30	32	29	27
	172.5	16	17	18	22	20	22	21
	175.0	11	11	12	10	10	11	13
	177.5	6	5	5	6	5	5	5
	180.0	3	3	3	3	3	3	3
A n g l e s								