

REPORT NUMBER: ITL83372

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ISSUE DATE: 11/03/14

PREPARED FOR: RAB LIGHTING, INC.

CATALOG NUMBER: BAYLED104N (FLAT GLASS LENS - CEILING AND/OR PENDENT MOUNT - STANDARD DISTRIBUTION)

LUMINAIRE: CAST 2-PIECE WHITE PAINTED FINNED METAL HOUSING, FLAT METAL HEAT SINK MOUNTING PLATE WITH 4 EXTRUDED METAL HEAT SINKS, 4 CIRCUIT BOARDS EACH WITH 1 LED AND MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH AND 1 APERTURE PER LED, CLEAR FLAT GLASS LENS IN CAST WHITE PAINTED METAL LENS FRAME.

LAMPS: FOUR WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDS), TILTED 30-DEGREES FROM VERTICAL BASE-UP POSITION.

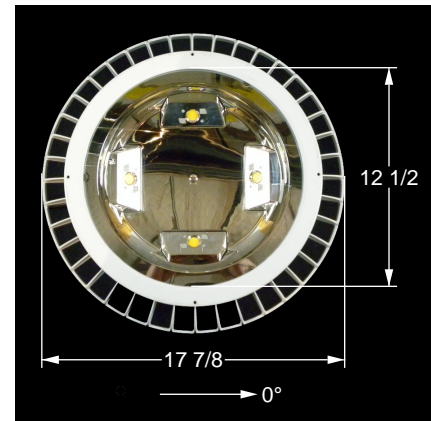
INPUT ELECTRICAL: 120.0 VOLTS, 123.5 WATTS, 1.03 AMPS

LED DRIVERS: FOUR RAB RD26

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120VAC, 60Hz) TO THE DRIVERS.

TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE = 35.0 FEET



CANDELA DISTRIBUTION						FLUX
	0.0	22.5	45.0	67.5	90.0	
0	3734	3734	3734	3734	3734	
5	3745	3721	3687	3732	3750	361
15	3855	3831	3859	3856	3919	1085
25	3576	3433	3606	3454	3584	1625
35	3332	3234	3094	3222	3372	1972
45	2649	2396	2427	2391	2594	1899
55	1757	1749	1686	1718	1720	1558
65	1236	1194	1096	1169	1182	1141
75	532	587	601	567	506	606
85	9	5	4	5	9	67
90	0	0	0	0	0	0
95	0	0	0	0	0	0
105	0	0	0	0	0	0
115	0	0	0	0	0	0
125	0	0	0	0	0	0
135	0	0	0	0	0	0
145	0	0	0	0	0	0
155	0	0	0	0	0	0
165	0	0	0	0	0	0
175	0	0	0	0	0	0
180	0	0	0	0	0	0

ZONAL LUMEN SUMMARY		
ZONE	LUMENS	%FIXT
0- 30	3072	29.8
0- 40	5044	48.9
0- 60	8501	82.4
0- 90	10315	100.0
90-120	0	0.0
90-130	0	0.0
90-150	0	0.0
90-180	0	0.0
0-180	10315	100.0

EFFICACY = 83.5 lm/W

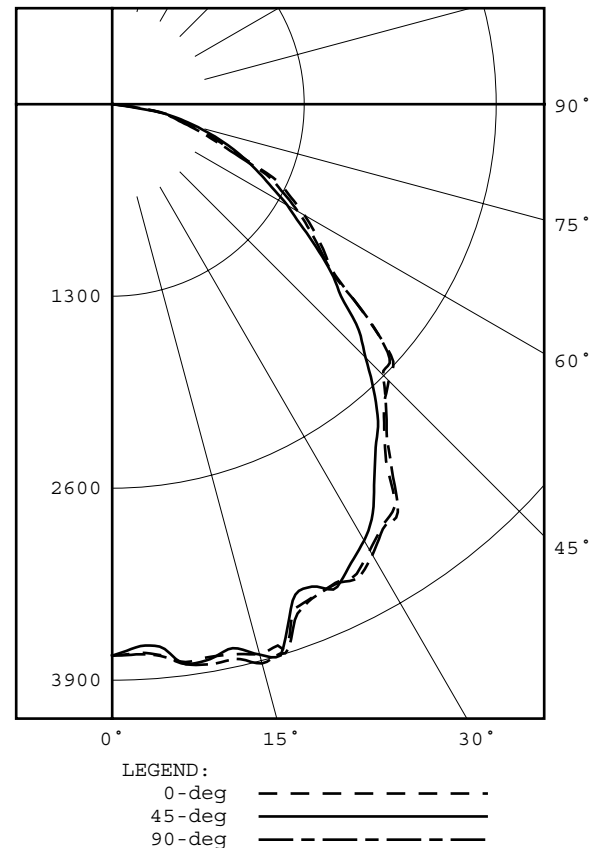
CIE TYPE - DIRECT

PLANE : 0-DEG 90-DEG

SPACING CRITERIA : 1.38 1.39

BEAM ANGLE (50%) : 104.2 X 104.0 DEGREES

FIELD ANGLE (10%) : 157.9 X 157.1 DEGREES



Checked B. HYRE  
Approved R. BEATTIE  
Lighting Engineer



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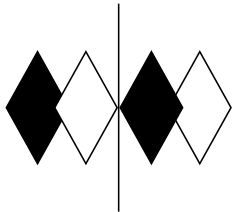
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LUMINOUS DIAMETER: 12.500

LUMINANCE DATA IN CANDELA/SQ M				
ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 45-DEG	AVERAGE 90-DEG	
45	47317.	43352.	46335.	
55	38690.	37127.	37876.	
65	36940.	32756.	35326.	
75	25962.	29329.	24693.	
85	1304.	580.	1304.	



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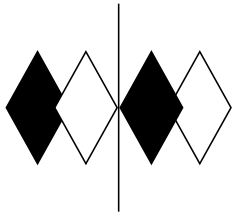
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CANDELA DISTRIBUTION  
LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0
0.0	3734	3734	3734	3734	3734
2.5	3720	3715	3681	3721	3729
5.0	3745	3721	3687	3732	3750
7.5	3810	3846	3825	3838	3825
10.0	3800	3842	3815	3862	3850
12.5	3815	3847	3773	3846	3847
15.0	3855	3831	3859	3856	3919
17.0	3833	3869	3902	3890	3890
17.5	3875	3881	3855	3914	3898
20.0	3630	3715	3576	3742	3670
22.5	3600	3548	3536	3574	3603
25.0	3576	3433	3606	3454	3584
27.5	3584	3352	3502	3395	3610
30.0	3487	3303	3411	3350	3523
32.5	3397	3201	3283	3252	3410
35.0	3332	3234	3094	3222	3372
37.5	3046	2993	2930	2995	3109
40.0	2865	2746	2801	2760	2890
42.5	2729	2578	2620	2581	2742
45.0	2649	2396	2427	2391	2594
47.5	2580	2211	2266	2208	2548
50.0	2256	2059	2023	2030	2267
52.5	1904	1903	1867	1874	1883
55.0	1757	1749	1686	1718	1720
57.5	1633	1619	1507	1559	1586
60.0	1503	1586	1369	1510	1452
62.5	1364	1355	1220	1332	1310
65.0	1236	1194	1096	1169	1182
67.5	980	1000	977	968	938
70.0	803	864	855	838	760
72.5	669	726	728	703	630
75.0	532	587	601	567	506
77.5	435	458	477	445	421
80.0	361	286	342	276	352
82.5	157	94	10	77	141
85.0	9	5	4	5	9
87.5	2	2	2	2	2
90.0	0	0	0	0	0
92.5	0	0	0	0	0
95.0	0	0	0	0	0
97.5	0	0	0	0	0
100.0	0	0	0	0	0
102.5	0	0	0	0	0
105.0	0	0	0	0	0
107.5	0	0	0	0	0
110.0	0	0	0	0	0
112.5	0	0	0	0	0
115.0	0	0	0	0	0
117.5	0	0	0	0	0
120.0	0	0	0	0	0
122.5	0	0	0	0	0
125.0	0	0	0	0	0
127.5	0	0	0	0	0
130.0	0	0	0	0	0
132.5	0	0	0	0	0
135.0	0	0	0	0	0
137.5	0	0	0	0	0
140.0	0	0	0	0	0
142.5	0	0	0	0	0
145.0	0	0	0	0	0
147.5	0	0	0	0	0
150.0	0	0	0	0	0
152.5	0	0	0	0	0
155.0	0	0	0	0	0



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CANDELA DISTRIBUTION  
LATERAL ANGLE

	0.0	22.5	45.0	67.5	90.0
157.5	0	0	0	0	0
160.0	0	0	0	0	0
162.5	0	0	0	0	0
165.0	0	0	0	0	0
167.5	0	0	0	0	0
170.0	0	0	0	0	0
172.5	0	0	0	0	0
175.0	0	0	0	0	0
177.5	0	0	0	0	0
180.0	0	0	0	0	0



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5-DEGREE  
ZONAL LUMEN SUMMARY

0- 5	89
5- 10	273
10- 15	455
15- 20	630
20- 25	750
25- 30	875
30- 35	971
35- 40	1002
40- 45	972
45- 50	926
50- 55	824
55- 60	734
60- 65	641
65- 70	500
70- 75	367
75- 80	239
80- 85	66
85- 90	1
90- 95	0
95-100	0
100-105	0
105-110	0
110-115	0
115-120	0
120-125	0
125-130	0
130-135	0
135-140	0
140-145	0
145-150	0
150-155	0
155-160	0
160-165	0
165-170	0
170-175	0
175-180	0

10-DEGREE  
ZONAL LUMEN SUMMARY

0- 10	361
0- 20	1446
0- 30	3072
0- 40	5044
0- 50	6943
0- 60	8501
0- 70	9642
0- 80	10248
0- 90	10315
0-100	10315
0-110	10315
0-120	10315
0-130	10315
0-140	10315
0-150	10315
0-160	10315
0-170	10315
0-180	10315



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# COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20

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
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	110	105	101	98	107	103	99	96	99	96	93	95	92	90	91	89	87	85
2	100	92	86	80	97	90	84	79	87	82	77	84	79	76	81	77	74	72
3	91	81	74	67	89	80	73	67	77	71	66	74	69	64	72	67	63	61
4	84	72	64	57	82	71	63	57	69	62	56	66	60	55	64	59	55	53
5	77	65	56	50	75	64	56	49	62	54	49	60	53	48	58	52	48	46
6	72	59	50	44	70	58	49	43	56	48	43	54	48	43	53	47	42	40
7	66	53	45	39	65	52	44	38	51	43	38	49	43	38	48	42	38	36
8	62	49	40	34	60	48	40	34	47	39	34	45	39	34	44	38	34	32
9	58	45	37	31	56	44	36	31	43	36	31	42	35	31	41	35	31	29
10	54	41	33	28	53	41	33	28	40	33	28	39	32	28	38	32	28	26

ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS TEST SAMPLE.



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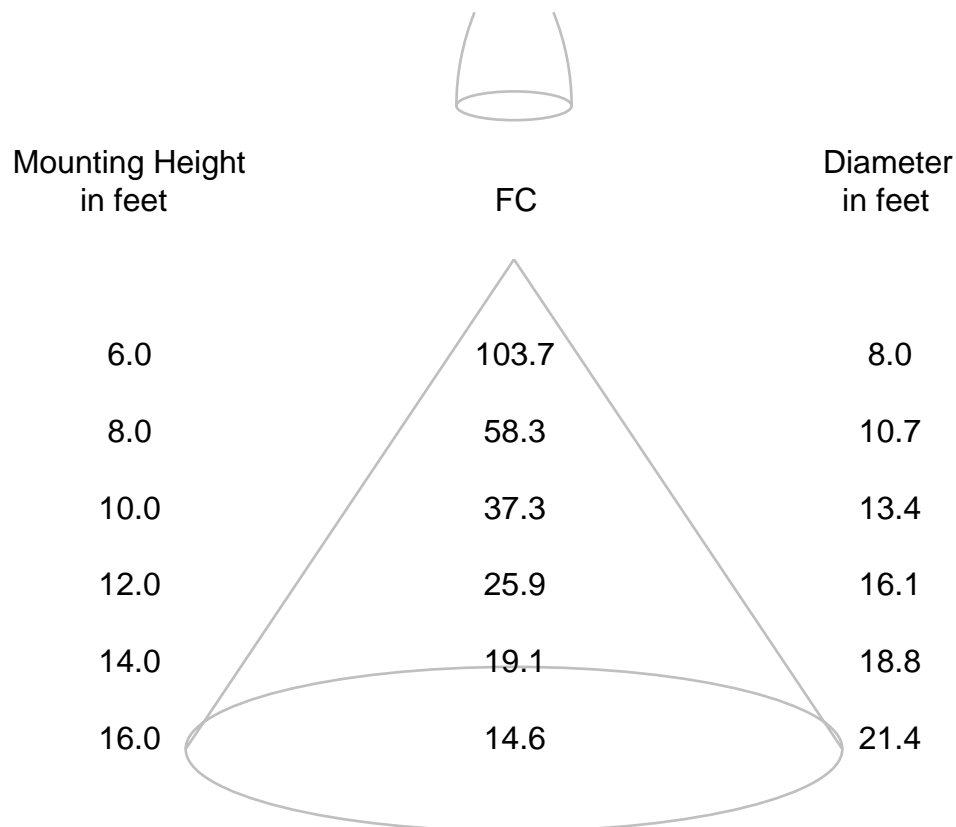
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## CONE OF LIGHT DIAGRAM

(diameter shown is where fc value is half the fc at nadir)



Note: The candela values used to generate this diagram were obtained by averaging the photometric data into a single plane.



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CATALOG NUMBER: BAYLED104N (FLAT GLASS LENS - CEILING AND/OR PENDENT MOUNT - STANDARD DISTRIBUTION)

ADDRESS: 170 LUDLOW AVE  
NORTHVALE, NJ 07647

LUMINAIRE: CAST 2-PIECE WHITE PAINTED FINNED METAL HOUSING, FLAT METAL HEAT SINK MOUNTING PLATE WITH 4 EXTRUDED METAL HEAT SINKS, 4 CIRCUIT BOARDS EACH WITH 1 LED AND MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH, MOLDED PLASTIC REFLECTOR WITH SPECULAR FINISH AND 1 APERTURE PER LED, CLEAR FLAT GLASS LENS IN CAST WHITE PAINTED METAL LENS FRAME.

LAMP: FOUR WHITE MULTI-CHIP LIGHT EMITTING DIODES (LEDs), TILTED 30-DEGREES FROM VERTICAL BASE-UP POSITION.

DRIVERS: FOUR RAB RD26

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120.0 AND 277.0 VAC, 60Hz) TO THE DRIVERS.

INSTRUMENTS:	Associated Power Technologies APT5040 AC Power Source	Calibration Due: N/A
	Yokogawa WT210 Digital Power Meter #8	12/31/14
	Ocean Optics QE65000 Spectroradiometer	07/14/15
	ITL 2.0m Diameter Integrating Sphere S20-2, 4PI Geometry	07/14/15

OBJECT OF TEST: Measure the Total Radiant Flux\*, Spectral Power Distribution (SPD), Correlated Color Temperature (CCT), Color Rendering Indices (CRI<sub>a</sub>,1-14), Chromaticity Coordinates (x,y; u'v'), ANSI C78.377 Duv, Scotopic / Photopic Ratio, and electrical data including ANSI C82.77-2002 Power Factor (PF) and Total Harmonic Distortion (THD) to the test sample. Report Off-State Power. Measure electrical data including Total Harmonic Distortion (THD) at maximum nominal rated voltage.

PROCEDURE: The test sample was provided by the customer and had an unknown number of operating hours. The test sample was mounted inside the integrating sphere and allowed to stabilize. After stabilization occurred, measurements were taken. In order to measure mean performance, multiple data sets were recorded and averaged. Readings were taken with the test sample operating at 120.0 VAC input. Electrical data was also recorded at maximum nominal rated input voltage (277.0 VAC). All testing performed in a 25 +/-1 degree Celsius free air ambient and in accordance with IESNA LM-79-08. All data are traceable to the National Institute of Standards and Technology. Off-State Power was reported with no voltage applied to the sample.

\*NOTE: Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even when these effects are compensated for, are likely to have a greater variation in results compared to the flux output calculated from a goniophotometric exploration since these artifacts do not affect the goniophotometric results.

RESULTS: (continued subsequent pages)

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Checked	<i>N THOMAS</i>
Approved	<i>P O'CONNOR</i> Sphere Lab Supervisor



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NVLAP LAB CODE: 200925-0

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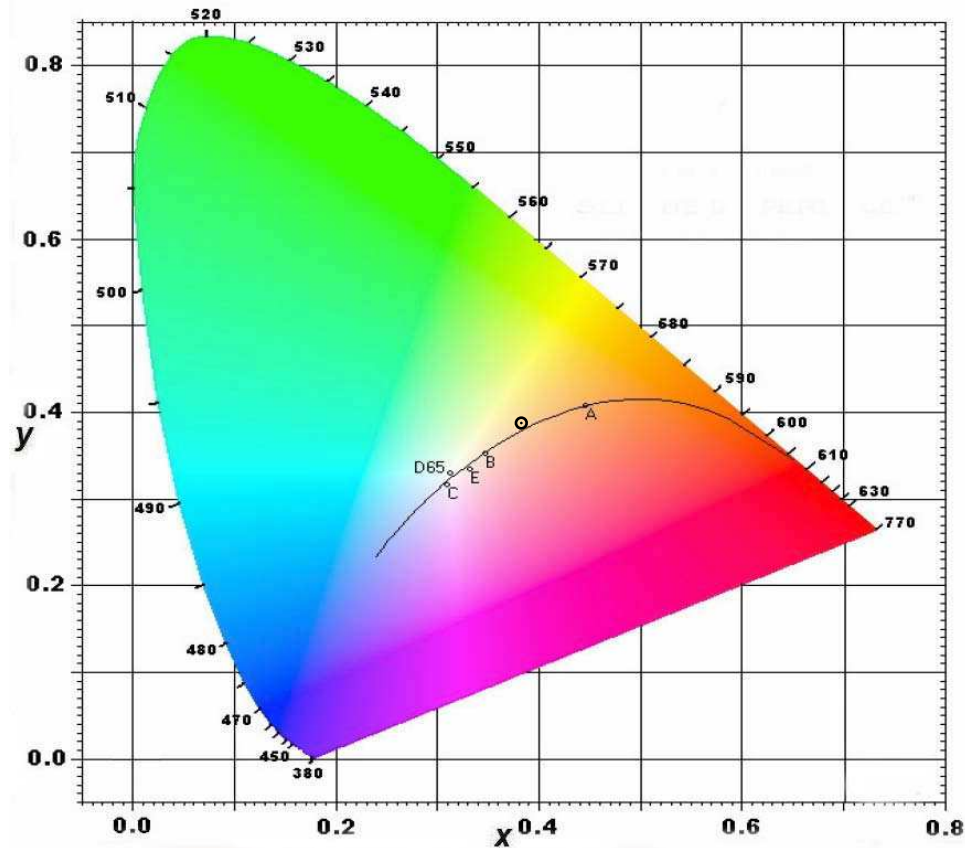
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## CIE Chromaticity Diagram





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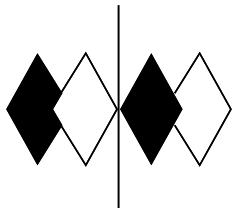
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# RESULTS:

SPECTRORADIOMETRIC	
Observer	CIE 1931 2 degree
Chromaticity Ordinate x	0.3825
Chromaticity Ordinate y	0.3872
Observer	CIE 1976 2 degree
Chromaticity Ordinate u'	0.2224
Chromaticity Ordinate v'	0.5064
Correlated Color Temp CCT (K)	4018
ANSI C78.377-2008 Duv	0.004
Scotopic / Photopic Lumen Ratio	1.682
Total Radiant Flux (milliWatts)	30656 *
ELECTRICAL	
Input Voltage (Volts AC)	120.0
Input Current (Amps AC)	1.04
Input Power (Watts)	123.6
Input Power Factor (%)	99.0
Input Current THD (%)	8.2
Input Voltage THD (%)	0.1
Off-State Power (Watts)	
0.0	
ELECTRICAL AT MAX NOMINAL INPUT	
Input Voltage (Volts AC)	277.0
Input Current (Amps AC)	0.485
Input Power (Watts)	122.7
Input Power Factor (%)	91.3
Input Current THD (%)	11.2
Input Voltage THD (%)	0.1

COLOR RENDERING INDICES	CRI
Ra (Average 1-8)	82
R1 Light greyish red	80
R2 Dark greyish yellow	86
R3 Strong yellowish green	91
R4 Moderate yellowish green	84
R5 Light bluish green	80
R6 Light blue	82
R7 Light violet	87
R8 Light reddish purple	65
R9 Strong red	4
R10 Strong yellow	67
R11 Strong green	84
R12 Strong blue	60
R13 Light yellowish pink (skin)	81
R14 Moderate olive green (leaf)	95

\*NOTE: Proper calibration of integrating spheres for measuring total flux output of non-directional samples will produce reliable, repeatable results within the calibration tolerances of the equipment used. However, measurement of test samples with significant self absorption and/or directional output, even when these effects are compensated for, are likely to have a greater variation in results compared to the flux output calculated from a goniophotometric exploration since these artifacts do not affect the goniophotometric results.



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# RESULTS:

Wavelength	mW per nm	Wavelength	mW per nm	Wavelength	mW per nm
380	0.716	515	123.271	650	88.491
385	0.748	520	131.361	655	78.485
390	0.817	525	136.375	660	69.322
395	0.971	530	139.615	665	60.876
400	1.293	535	141.376	670	53.138
405	1.932	540	142.169	675	46.165
410	3.231	545	142.829	680	39.967
415	5.961	550	144.098	685	34.495
420	11.590	555	146.071	690	29.661
425	22.604	560	149.040	695	25.503
430	41.751	565	152.912	700	21.876
435	70.973	570	157.636	705	18.730
440	116.291	575	162.616	710	16.002
445	170.005	580	167.575	715	13.668
450	174.700	585	171.830	720	11.686
455	125.627	590	174.724	725	9.938
460	85.410	595	175.816	730	8.491
465	62.940	600	175.246	735	7.239
470	46.198	605	172.333	740	6.177
475	37.604	610	167.378	745	5.279
480	37.236	615	160.591	750	4.526
485	42.226	620	152.211	755	3.871
490	52.147	625	142.382	760	3.324
495	66.195	630	131.805	765	2.863
500	82.342	635	120.855	770	2.470
505	98.081	640	109.905	775	2.124
510	111.978	645	98.986	780	1.832

