IES LM-79-08

MEASUREMENT AND TEST REPORT

For

Xiamen Longstar Lighting Co., Ltd.

5 Houbin Road, XiangAn, Xiamen, China 361101

Test Model: L4-BR30D-11W-30S

Report Type:	Electrical and Photometric tests including: Luminous Flux, Color, Luminous Intensity Distribution
Test Engineer:	Hill Liu Hill Liu
Report Number:	RSZ161021511-10A1
Test Date:	2016-10-24
Report Date:	2016-10-27
Reviewed By:	Bill Xiong / EE Engineer Bill Xiong
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Accreditation:	The IAS Accreditation Number TL-460.

Note: The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).
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1. Product Description

General Information:

Two samples were received on 2016-10-21, one was tested in integrating sphere and the other was tested in goniophotometer.

Model Tested:	L4-BR30D-11W-30S
Manufacturer:	Xiamen Longstar Lighting Co., Ltd.
Product Designation:	Directional LED Lamp
Burning Time Before Test:	0hour(For New Products)

Rated Values:

Rated Voltage/Frequency:	AC 120V 60 Hz
Rated Power:	11W
Nominal CCT:	3000K

2. Standards Used

- IESNA LM-79-08: Approved Method: Electrical & Photometric Measurement of Solid-state Lighting Products
- ANSI C82.77-2002: Harmonic Emission Limits – Related Power Quality Requirements for Lighting

3. Description of Test Equipment

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
2.0m integrating sphere	EVERFINE	R98	11010018	R98	2015-11-09	2016-11-08
High accuracy array spectroradiometer	EVERFINE	HAAS-2000	1012016T	380-780nm	2016-03-10	2017-03-09
Digital Power Meter	EVERFINE	PF2010A	1011004	600V/20A	2016-07-11	2017-07-10
Digital CC&CV DC Power Supply	EVERFINE	WY305-V1	1101047	30V/5A	2016-07-07	2017-07-06
Temperature/humidity/clock	Victor	VC230	EE023	0~40°C0~90%	2016-03-21	2017-03-20
Standard Light Source	SENSING	N/A	LSD090808	N/A	2016-09-24	2017-09-23
Special zero-voltage synchronous switching AC	EVERFINE	DPS1010-YF	1011001T	0-150V， 0-300V	2016-03-04	2017-03-03
AC Power Supply	EVERFINE	VPS1030 PWM	1012017	0-150V， 0-300V	2016-03-04	2017-03-03
DC Power Supply	EVERFINE	WY12010	1009009	30V/5A	2016-03-04	2017-03-03
Power Meter	YOKOGAWA	WT-210	91KB35700	15/30/60/150/300/600 V	2016-03-04	2017-03-03
Goniophotometer	EVERFINE	GO-R5000	YG108492N10120001	1600mm,3000W/10A	2016-03-10	2017-03-09

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
Wireless Remote Sensor	N/A	433MHz	N/A	0°C~50°C;-20°C~60°C	2016-03-21	2017-03-20
Standard Light Source	EVERFINE	D908	1012003	N/A	2016-09-07	2017-09-06

Bay Area Compliance Laboratories Corp. (Dongguan) attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

4. Test Method

Product was tested with no seasoning. All stabilization and measurements were made in compliance with IES LM-79-08. The product was operated at rated voltage or at voltage required by manufacturer. The ambient temperature of the sample was maintained at 25°C±1°C during measurement. And relative humidity is less than 65%.

Integrating Sphere System

The system includes AC power source, digital power meter, DC power supply, spectrophotometer, and integrating sphere. The integrating sphere system is calibrated by standard light source before measurement.

4π geometry was used during measurement. The product was operated in its intended orientation in application and was recorded in this report.

The uncertainty of the light output (luminous flux) measurements is U=1.8% (K=2), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is U=20K (K=2), at the 95% confidence level. The uncertainty of the CRI is U=1.8(K=2), at the 95% confidence level.

The uncertainty of power meter AC current U=0.19 % of rdg, AC Voltage U=0.15% of rdg, Power U=0.20%) (K=2), at the 95% confidence level.

Goniophotometer System

The goniophotometer system is calibrated by standard light source before measurement.

Type C goniophotometer was used for measuring total luminous flux, luminous intensity distribution, and color spatial uniformity. The product was operated in its intended orientation in application and was recorded in this report.

The uncertainty of the luminous intensity is U=1.6% (K=2) , at the 95% confidence level.

5. Test Result

[Integrating Sphere System]

Total operating time for integrating sphere test: **1.0 hour**

Test orientation: **Base up**

Electrical Measurement

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
119.9	60	0.09080	10.70	0.9824

Photometric Measurement

Luminous Flux (lm)	Radiant Flux (W)	Efficacy (lm/W)	CCT (K)	Duv
1035.2	3.2072	96.75	3063	-0.00115

Chromaticity Coordinate

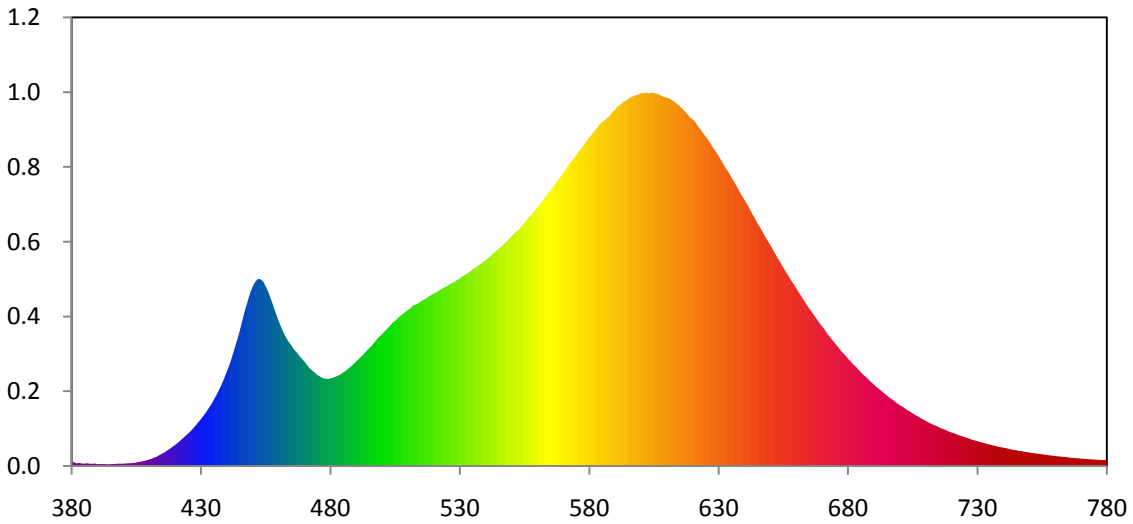
x	y	u	v	u'	v'
0.4309	0.3992	0.2488	0.3457	0.2488	0.5185

Color Rendering Index

Ra
83.5

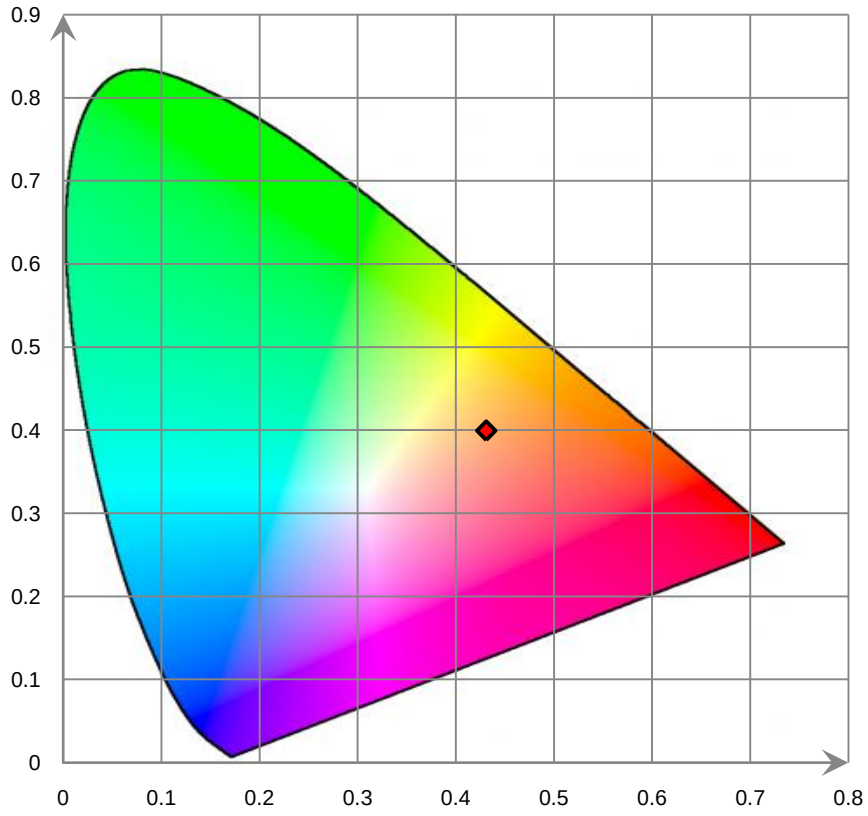
R1	R2	R3	R4
82	92	95	81
R5	R6	R7	R8
83	91	83	60
R9	R10	R11	R12
11	83	80	77
R13	R14	R15	
85	98	75	

Relative Spectral Power Distribution

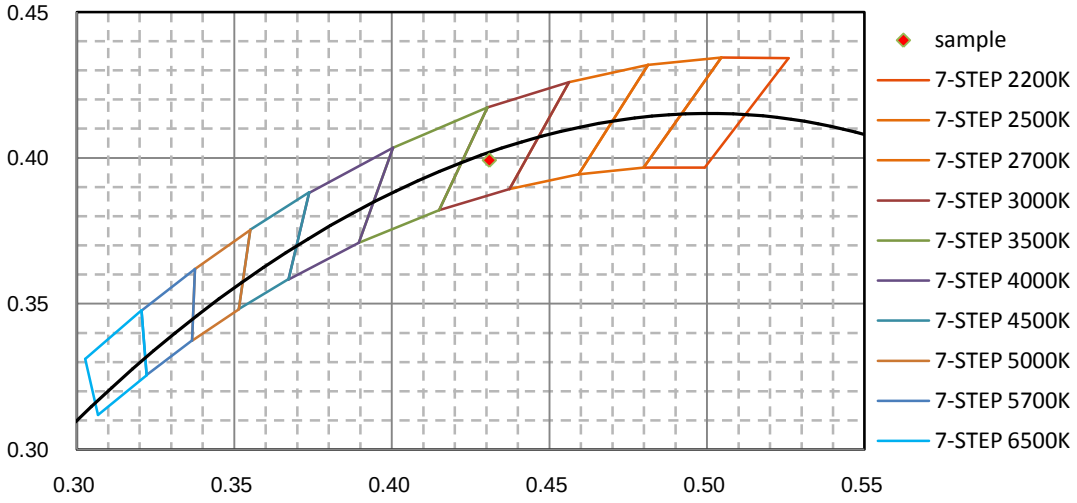


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	2.38E-01	465	6.75E+00	550	1.29E+01	635	1.62E+01	720	1.89E+00
385	1.48E-01	470	5.85E+00	555	1.36E+01	640	1.49E+01	725	1.63E+00
390	1.14E-01	475	5.10E+00	560	1.45E+01	645	1.36E+01	730	1.40E+00
395	1.14E-01	480	4.91E+00	565	1.54E+01	650	1.24E+01	735	1.21E+00
400	1.44E-01	485	5.25E+00	570	1.64E+01	655	1.11E+01	740	1.04E+00
405	2.09E-01	490	5.86E+00	575	1.74E+01	660	9.97E+00	745	8.95E-01
410	3.80E-01	495	6.60E+00	580	1.84E+01	665	8.83E+00	750	7.77E-01
415	7.04E-01	500	7.38E+00	585	1.93E+01	670	7.84E+00	755	6.71E-01
420	1.19E+00	505	8.13E+00	590	2.00E+01	675	6.88E+00	760	5.80E-01
425	1.82E+00	510	8.74E+00	595	2.05E+01	680	6.02E+00	765	4.97E-01
430	2.64E+00	515	9.22E+00	600	2.09E+01	685	5.26E+00	770	4.28E-01
435	3.73E+00	520	9.66E+00	605	2.09E+01	690	4.57E+00	775	3.79E-01
440	5.30E+00	525	1.01E+01	610	2.06E+01	695	3.97E+00	780	3.50E-01
445	7.58E+00	530	1.05E+01	615	2.02E+01	700	3.42E+00		
450	1.01E+01	535	1.10E+01	620	1.94E+01	705	2.96E+00		
455	1.01E+01	540	1.15E+01	625	1.85E+01	710	2.55E+00		
460	8.13E+00	545	1.22E+01	630	1.74E+01	715	2.20E+00		

CIE 1931 x y Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

Total operating time for luminous intensity distribution: **1.0 hour**

Test orientation: **Base up**

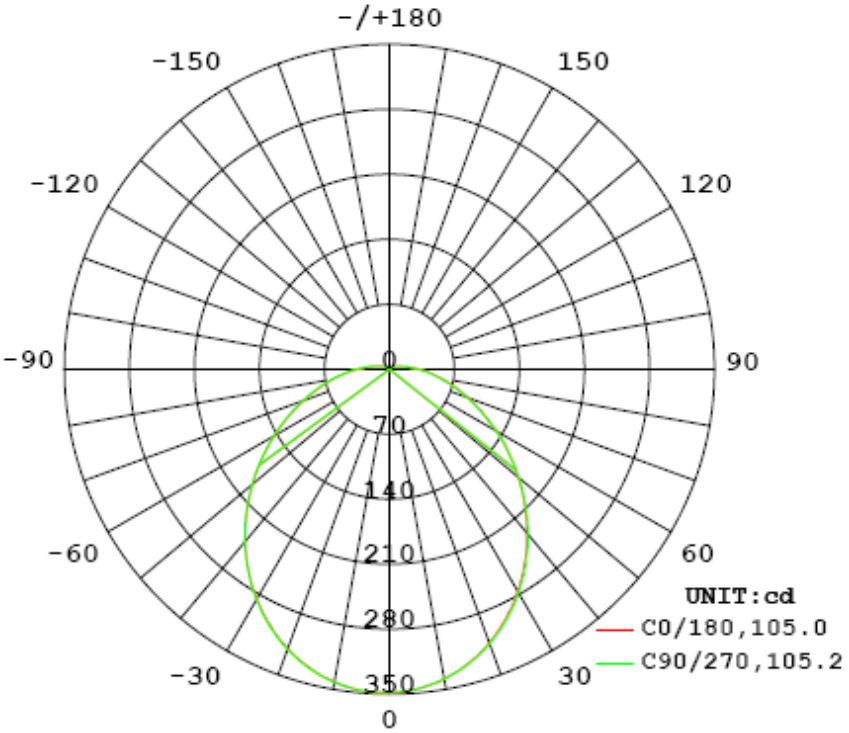
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.0	60	0.0910	10.73	0.9823

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I_{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
1036.24	96.60	349.2	1.19	1.19

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% Imax):	105.0	105.2	105.2	105.1	105.1
Field Angle (10% Imax):	178.6	178.7	178.6	178.6	178.6

Luminous Intensity (cd) Distribution Data

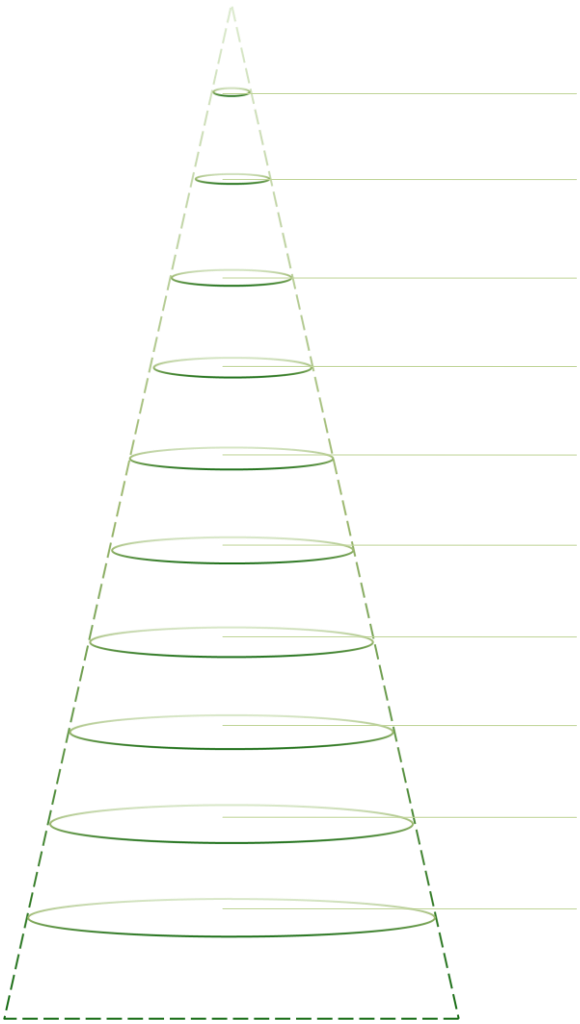
γ \ C	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	348	348	348	348	348	348	348	348
5.0°	347	347	347	348	347	347	346	346
10.0°	342	342	343	343	342	341	340	339
15.0°	333	334	334	334	334	332	330	328
20.0°	320	321	322	322	321	319	317	314
25.0°	304	306	307	307	306	303	300	297
30.0°	286	287	288	288	287	284	281	277
35.0°	265	266	267	267	266	263	259	255
40.0°	242	243	245	244	243	239	235	232
45.0°	218	220	220	220	218	215	211	207
50.0°	193	195	196	195	193	190	186	182
55.0°	168	170	171	170	168	165	161	158
60.0°	143	145	146	146	144	141	137	134
65.0°	120	122	123	123	121	118	115	112
70.0°	98	100	101	101	99	97	94	92
75.0°	79	81	82	81	80	78	76	74
80.0°	62	63	64	64	63	61	60	58
85.0°	47	48	49	49	48	47	45	44
90.0°	35	36	37	37	36	35	34	33
95.0°	25	26	27	27	26	26	25	24
100.0°	18	19	19	19	19	18	18	17
105.0°	13	13	14	14	14	13	13	12
110.0°	9	10	10	10	10	10	10	9
115.0°	7	8	8	8	8	8	7	7
120.0°	6	6	6	6	6	6	6	6
125.0°	4	5	5	5	5	5	5	4
130.0°	4	4	4	4	4	4	4	4
135.0°	3	3	3	3	3	3	3	3
140.0°	2	2	2	2	2	2	2	2
145.0°	2	2	2	2	2	2	2	2
150.0°	1	1	1	1	1	1	1	1
155.0°	1	1	1	1	1	1	1	1
160.0°	1	1	1	1	1	1	1	1
165.0°	1	1	1	1	1	1	1	1
170.0°	1	1	1	1	1	1	1	1
175.0°	1	1	1	1	1	1	1	1
180.0°	0	0	0	0	0	0	0	0

Luminous Intensity (cd) Distribution Data (cont.)

γ \ C	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	348	348	348	348	348	348	348	348
5.0°	346	346	345	345	345	346	346	347
10.0°	339	338	338	338	339	340	340	342
15.0°	328	327	327	328	329	330	331	332
20.0°	314	313	313	314	315	316	318	319
25.0°	296	295	295	296	298	300	301	303
30.0°	276	275	275	276	278	280	283	285
35.0°	254	253	253	254	256	258	261	263
40.0°	230	229	229	230	232	235	237	241
45.0°	206	204	204	205	207	210	213	216
50.0°	181	179	179	180	181	184	188	191
55.0°	156	155	155	155	157	159	163	166
60.0°	133	131	131	131	132	135	139	142
65.0°	110	109	108	108	109	112	115	118
70.0°	90	89	88	88	89	91	94	97
75.0°	72	71	70	70	71	73	75	77
80.0°	57	55	55	55	55	56	58	60
85.0°	43	42	42	41	42	43	44	46
90.0°	32	31	31	31	31	32	33	34
95.0°	23	23	22	22	22	23	24	25
100.0°	17	16	16	16	16	16	17	18
105.0°	12	12	12	12	12	12	12	13
110.0°	9	9	9	9	9	9	9	9
115.0°	7	7	7	7	7	7	7	7
120.0°	6	5	5	5	5	5	6	6
125.0°	4	4	4	4	4	4	4	4
130.0°	4	3	3	3	3	3	3	3
135.0°	3	3	3	3	3	3	3	3
140.0°	2	2	2	2	2	2	2	2
145.0°	2	2	2	2	1	1	1	2
150.0°	1	1	1	1	1	1	1	1
155.0°	1	1	1	1	1	1	1	1
160.0°	1	1	1	1	1	1	1	1
165.0°	1	1	1	1	1	1	1	1
170.0°	1	1	1	1	1	1	1	0
175.0°	1	1	1	1	1	1	1	0
180.0°	0	0	0	0	0	0	0	0

Average Area Illumination Figure

Angle:105.1°. Flux out:637.1lm



Height (m)	Diameter (cm)	E_{avg}(lx)	E_{max}(lx)
0.5	130.56	460.6	1396.0
1.0	261.12	115.2	349.0
1.5	391.67	51.2	155.1
2.0	522.23	28.8	87.3
2.5	652.79	18.4	55.8
3.0	783.35	12.8	38.8
3.5	913.91	9.4	28.5
4.0	1044.47	7.2	21.8
4.5	1175.02	5.7	17.2
5.0	1305.58	4.6	14.0

Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	8.3	0.80
5-10	24.6	2.37
10-15	39.8	3.84
15-20	53.4	5.16
20-25	64.8	6.25
25-30	73.7	7.12
30-35	79.7	7.69
35-40	82.8	7.99
40-45	83.0	8.02
45-50	80.6	7.78
50-55	75.9	7.32
55-60	69.4	6.70
60-65	61.5	5.93
65-70	52.9	5.11
70-75	44.3	4.27
75-80	35.9	3.47
80-85	28.2	2.72
85-90	21.4	2.07
90-95	15.7	1.51
95-100	11.2	1.09
100-105	7.9	0.76
105-110	5.7	0.55
110-115	4.2	0.40
115-120	3.1	0.30
120-125	2.3	0.23
125-130	1.7	0.17
130-135	1.3	0.12
135-140	0.9	0.08
140-145	0.6	0.07
145-150	0.4	0.04
150-155	0.3	0.03
155-160	0.2	0.01
160-165	0.1	0.02
165-170	0.1	0.00
170-175	0.0	0.01
175-180	0.0	0.00

Deg	Flux (lm)	%
0-5	8.3	0.80
0-10	32.9	3.17
0-15	72.7	7.01
0-20	126.1	12.17
0-25	190.9	18.42
0-30	264.6	25.54
0-35	344.4	33.23
0-40	427.2	41.22
0-45	510.2	49.24
0-50	590.8	57.02
0-55	666.7	64.34
0-60	736.1	71.04
0-65	797.6	76.97
0-70	850.5	82.08
0-75	894.8	86.35
0-80	930.8	89.82
0-85	959.0	92.54
0-90	980.4	94.61
0-95	996.1	96.12
0-100	1007.3	97.21
0-105	1015.3	97.97
0-110	1020.9	98.52
0-115	1025.1	98.92
0-120	1028.2	99.22
0-125	1030.5	99.45
0-130	1032.3	99.62
0-135	1033.5	99.74
0-140	1034.4	99.82
0-145	1035.1	99.89
0-150	1035.5	99.93
0-155	1035.8	99.96
0-160	1036.0	99.97
0-165	1036.1	99.99
0-170	1036.2	99.99
0-175	1036.2	100.00
0-180	1036.2	100.00

6. Product Photo

**********END OF REPORT**********