Testing Lab.

Shenzhen LCS Compliance Testing Laboratory Ltd.

TESTING
NVLAP LAB CODE 600112-0

Report No.: LCS180801081BS

TEST REPORT of IES LM-79-08

Approved Method for Electrical and Photometric Measurements of Solid-State Lighting Products

Client.....	:	Shenzhen Sinoco Lighting Technologies Co.,Ltd.
Address.....	:	G building, Shasi, High-Tec, Industrial park, Shajing Town, Bao'an District, Shenzhen, Guangdong, China
Brand Name.....	:	Sinoco
Testing laboratory.....	:	Shenzhen LCS Compliance testing Laboratory Ltd.
Address.....	:	B Area, 2F, Building B, Zhongyu Green High-tech Industrial Park, Wenge Road, Heshuikou, Gongming Street, Guangming New District, Shenzhen, China
Product description ..	:	LED street light
Models.....	:	ST-52-150W
Rating.....	:	100-240Vac, 50/60Hz ,150W
Date of Test.....	:	August 07, 2018
Date of Issue.....	:	August 07, 2018

Test by:	**Check by:**	**Approved by:**
Yuki	Ian Luo	
Yuki/ Project Engineer	Ian Luo/ Director	Jesse Liu/ Manager

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Add: B Area, 2F, Building B, Zhongyu Green High-tech Industrial Park, Wenge Road, Heshuikou, Gongming Street, Guangming New District, Shenzhen, China
Tel: +(86) 0755-29871520 | Fax: +(86) 0755-2987 1521 | E-mail: webmaster@lcs-cert.com | http:// www.lcs-cert.com

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Add：B Area, 2F, Building B, Zhongyu Green High-tech Industrial Park, Wenge Road, Heshuikou, Gongming Street, Guangming New District, Shenzhen, China
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1. Test Method

Test Item.....:	Integrating Sphere Test
Ambient Condition .....:	25.1℃
Number of hours operated prior to Measurement .....(h):	0h
Stabilization time .....(h):	0.5h
Orientation(burning position) of SSL product during test .....:	down
Test Method .....:	The sample was tested according to the IES LM-79-2008. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.
Test Item.....:	Goniophotometer Test
Ambient Condition.....:	25.1℃
Total operated time of the product for measurements including stabilization..... (h):	2.5h
Correction factors applied.....:	Intensity distribution
Orientation(burning position) of SSL product during test .....:	down
Test Method.....:	The sample was tested according to the IES LM-79-2008. Photometric paramters were measured using a type C goniophotometer and software. The sample reference plane was located at the center of the sample goniometer at a test distance of 26m from the detectors. The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, Luminous efficacy, zonal flux were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals.

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2.Product Information

Product description.....:	LED street light
Model Number.....:	ST-52-150W
Rated Inputs.....:	100-240Vac, 50/60Hz
Rated Power.....:	150W
Declared CCT.....:	4000K
LED Manufacturer.....:	N/A
LED Model.....:	N/A
Forward current of the LED chip.....:	N/A
Date of Receipt Samples.....:	August 07，2018
Quantity of Receipt Samples.....:	1 unit

3.Test equipment list:

Manufacturer	Description	Equipment ID	Model	Calibration Date	Calibration Due Date
EVERFINE	Full-fieldSpeed Goniophotometer	SLCS-S-112	GO-R5000	2017/08/15	2018/08/14
EVERFINE	DigitalPower Meter	SLCS-S-103	PF2010	2017/08/15	2018/08/14
EVERFINE	ACTesting Power Source	SLCS-S-115	DPS1060	2017/08/15	2018/08/14
EVERFINE	TotalSpectral RadiantFlux Standard Lamp	SLCS-S-143	D908S	2017/08/14	2018/08/13
SENSING	2Meter Integrating Sphere	SLCS-S-038	SPR-3000	2017/08/15	2018/08/14
YOKOGAWA	DigitalPower Meter	SLCS-S-058	WT310	2017/08/15	2018/08/14
ALL POWER ELECTRONIC	ACTesting Power Source	SLCS-S-111	APW-105N	2017/08/15	2018/08/14
SENSING	Standard Lamp	SLCS-S-118	S11010017	2017/08/14	2018/08/13

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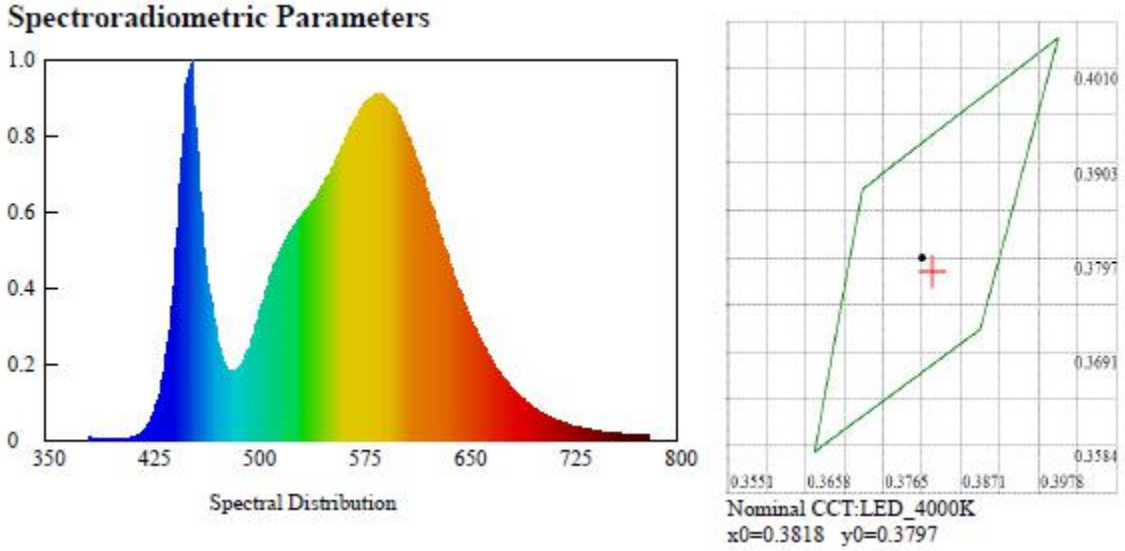
4. Integrating Sphere Test Results：

4.1 Test Data

Test type	Voltage (V AC)	Frequency (Hz)	Current (A)	Power Factor	Power (W)
Input	220.0	50.0	0.7015	0.974	150.39

Test type	CCT (K)	CRI	Duv	Luminous flux (lm)	Luminous efficacy(lm/w)
Output	3935	75.3	-0.00017	23394.6	155.56

4.2 Spectrum



Chromaticity Coordinates: x=0.3832 y=0.3781 u'=0.2264 v'=0.5026

Correlated Color Temperature: 3935 K

Dominant Wavelength: 578.0 nm(E)

Colour Fidelity Index: Rf=74

Gamut Index: Rg=92

Luminous Flux: 23394.6 lm

Purity: 0.2851

Chromaticity Difference: -0.00017Duv

Peak Wavelength: 455.0 nm

Color Ratio: Kr=38.7% Kg=53.2% Kb=8.1%

Bandwidth: 18nm

Radiant Flux: 72.227 W

Photosynthetically Active Radiation(PAR): 70.98W

Photosynthetic Photon Flux(PPF):333.42μmol/s

Rendering Index: Ra=75.3

R1=72	R2=84	R3=93	R4=72	R5=72	R6=77	R7=81	R8=51
R9=-27	R10=63	R11=68	R12=48	R13=76	R14=96	R15=65	Re=66

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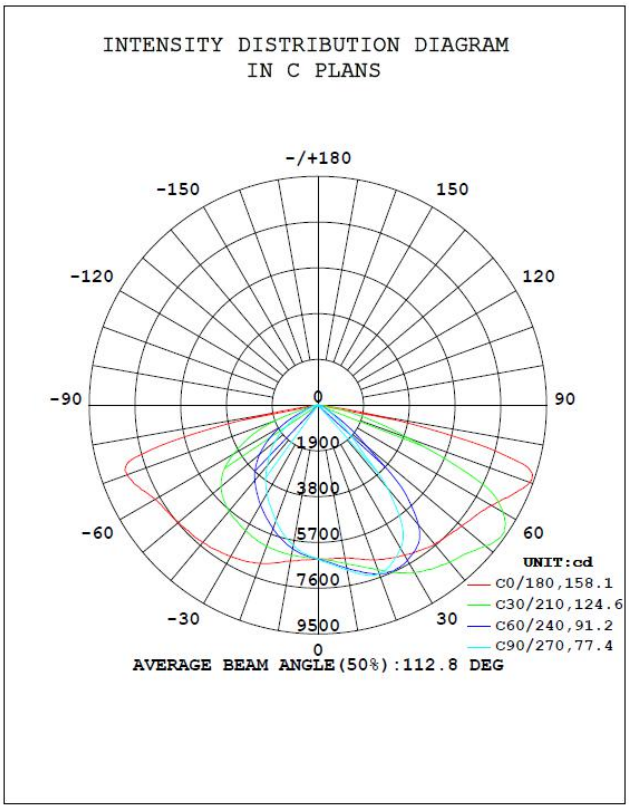
5. Goniophotometer Test results

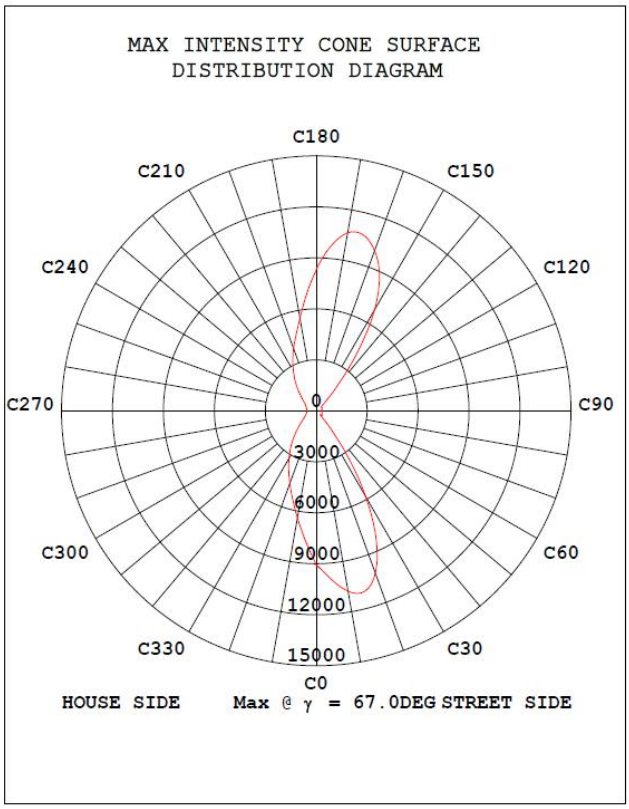
5.1 Test Data

Test type	Voltage (V AC)	Frequency (Hz)	Current (A)	Power Factor	Power (W)
Input	220.0	50.01	0.7014	0.9741	150.35

Test type	Total Flux (lm)	Luminous efficacy(lm/w)	ZL (0~90°)	ZL (80~90°)
Output	23382	155.52	99.8%	0.6%

5.2 Luminous Intensity Distribution Diagram and C0 Plane Isolux Diagram (Unit : lx)





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5.3 Zonal Flux Diagram

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	644.1	680.3	694.5	688.4	657.8	619.5	590.6	610.4	0- 10	615.2	615.2	2.63,2.63
20	683.5	742.2	743.9	757.6	699.3	583.8	510.6	573.3	10- 20	1860	2475	10.6,10.6
30	718.7	790.8	686.9	815.0	725.1	539.5	424.5	532.3	20- 30	3051	5526	23.6,23.6
40	753.5	795.3	449.8	823.1	744.2	488.5	327.7	486.8	30- 40	3985	9511	40.7,40.7
50	780.4	692.2	146.7	749.1	756.4	411.4	231.3	421.8	40- 50	4316	13826	59.1,59.1
60	833.3	311.8	55.05	384.6	781.5	273.2	116.7	305.2	50- 60	4121	17948	76.8,76.8
70	936.4	47.34	24.54	73.18	843.6	78.74	39.73	98.41	60- 70	3414	21362	91.4,91.4
80	230.9	13.33	4.444	13.70	196.3	20.22	15.42	21.95	70- 80	1838	23200	99.2,99.2
90	0.7872	0.1957	0.0437	0.1019	0.8526	0.0931	0.0292	0.1608	80- 90	133.7	23334	99.8,99.8
100	0.9091	0.1267	0.0364	0.0870	1.328	0.1820	0.0583	0.2149	90-100	3.488	23338	99.8,99.8
110	1.039	0.2064	0.0655	0.2328	1.667	0.5514	0.1029	0.6452	100-110	5.080	23343	99.8,99.8
120	1.025	0.3692	0.1966	0.4037	1.623	0.8764	0.2118	1.037	110-120	6.701	23349	99.9,99.9
130	1.089	0.6370	0.4735	0.6399	1.175	0.9457	0.3725	1.125	120-130	7.027	23356	99.9,99.9
140	1.320	0.9330	0.8150	0.8549	1.046	0.9742	0.7807	1.183	130-140	6.911	23363	99.9,99.9
150	1.435	1.267	1.151	1.131	1.118	1.253	1.137	1.402	140-150	7.017	23370	100,100
160	1.443	1.369	1.341	1.266	1.291	1.402	1.443	1.449	150-160	6.126	23376	100,100
170	1.601	1.557	1.501	1.430	1.393	1.500	1.575	1.590	160-170	4.045	23381	100,100
180	1.724	1.655	1.567	1.558	1.638	1.644	1.640	1.565	170-180	1.500	23382	100,100
DEG	LUMINOUS INTENSITY:×10cd									UNIT:lm		

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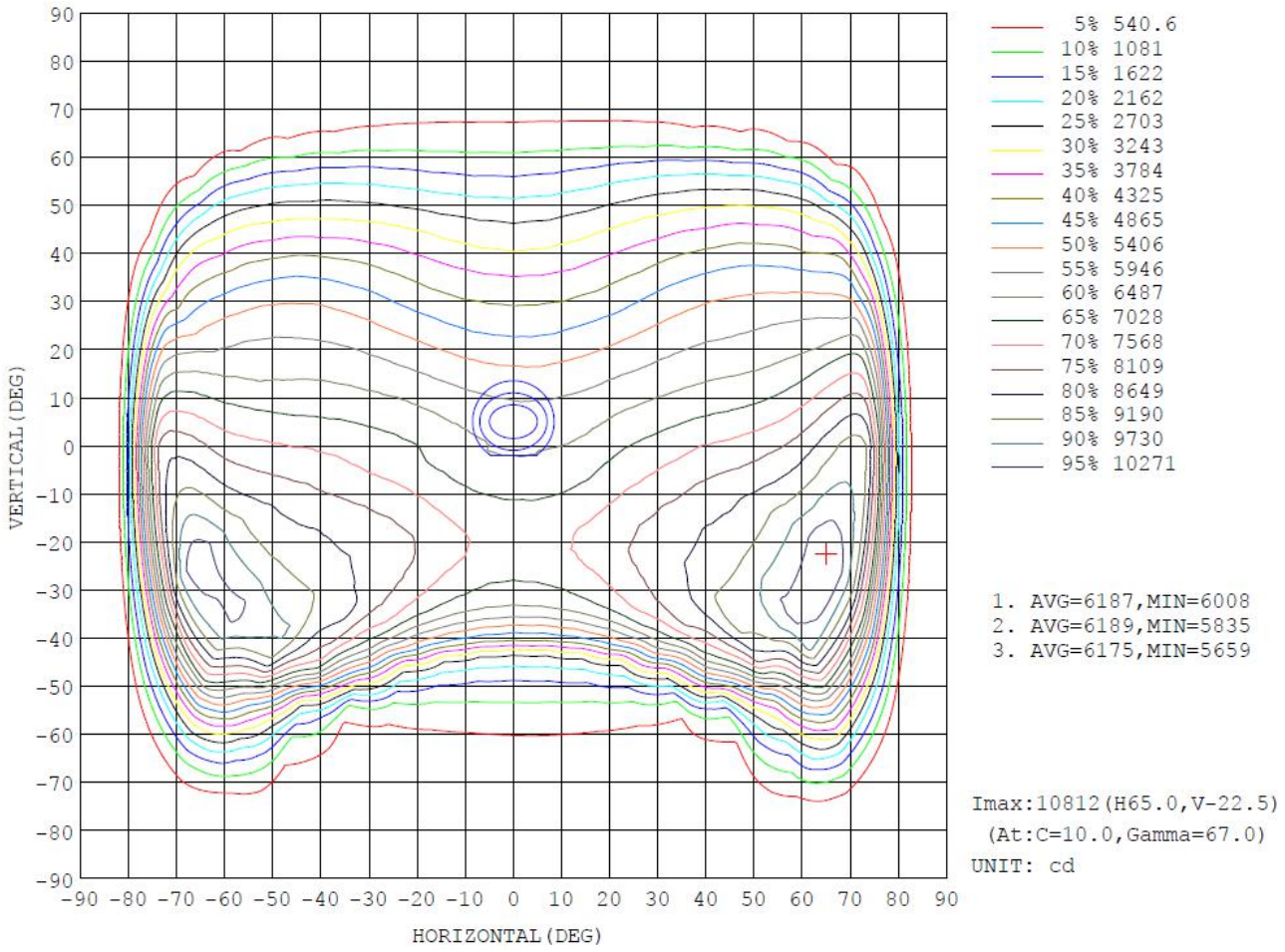
5.4 Isocandela Diagram



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5.5 Luminous Distribution Intensity Data

Table--1 UNIT: ×10cd

γ (DEG) \ C (DEG)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
0	639	639	639	639	639	639	639	639	639	639	639	639	639	639	639	639	639	639	639
5	640	644	647	648	653	656	659	661	662	663	664	665	664	662	660	656	654	651	645
10	644	656	664	666	677	683	687	690	694	695	695	695	693	691	686	680	674	667	658
15	661	674	686	693	706	712	718	721	726	728	726	727	726	723	717	710	702	689	678
20	684	700	718	728	738	747	745	743	741	744	746	749	755	758	757	746	733	716	699
25	702	727	755	766	775	769	756	741	728	725	729	748	769	787	793	785	766	739	715
30	719	755	789	803	804	778	744	712	691	687	696	722	758	803	827	821	797	760	725
35	737	785	819	830	817	773	717	665	622	610	630	675	737	803	843	846	824	785	734
40	753	814	851	852	828	762	651	534	466	450	478	562	676	794	853	866	853	806	744
45	764	844	877	872	840	701	506	314	246	233	251	348	552	748	870	888	877	833	750
50	780	874	903	909	809	575	264	180	153	147	154	192	314	638	860	923	902	862	756
55	800	916	951	935	704	309	146	106	93.3	90.1	92.2	108	163	437	791	966	943	899	767
60	833	978	1011	887	513	110	66.5	58.2	56.3	55.0	54.3	56.5	65.2	148	621	970	1010	953	782
65	886	1055	1028	720	176	46.4	43.6	42.1	38.7	37.4	38.8	41.8	43.4	49.0	269	821	1037	1037	816
70	936	1040	955	397	59.5	35.1	31.9	29.2	25.7	24.5	26.1	29.3	32.1	36.7	110	485	903	1042	844
75	802	780	619	209	34.4	24.0	21.0	18.4	15.9	14.9	16.0	18.5	21.1	24.4	48.5	242	560	710	719
80	231	284	244	77.9	15.2	11.4	9.52	6.70	4.99	4.44	4.88	6.55	9.23	11.0	16.4	76.5	176	203	196
85	8.12	15.0	19.8	5.50	1.35	0.61	0.44	0.35	0.31	0.31	0.31	0.33	0.38	0.48	0.78	2.03	7.11	5.12	5.20
90	0.79	0.77	0.63	0.43	0.25	0.14	0.09	0.07	0.06	0.04	0.04	0.05	0.06	0.07	0.14	0.30	0.50	0.72	0.85
95	0.78	0.69	0.48	0.30	0.17	0.09	0.07	0.06	0.04	0.04	0.04	0.04	0.05	0.06	0.10	0.22	0.41	0.69	1.09
100	0.91	0.72	0.48	0.30	0.16	0.09	0.07	0.06	0.04	0.04	0.04	0.04	0.05	0.06	0.12	0.22	0.44	0.71	1.33
105	0.95	0.75	0.48	0.30	0.18	0.12	0.09	0.06	0.04	0.04	0.04	0.04	0.06	0.12	0.21	0.34	0.59	0.86	1.46
110	1.04	0.82	0.51	0.37	0.25	0.17	0.14	0.11	0.11	0.07	0.06	0.07	0.11	0.18	0.28	0.47	0.70	0.95	1.67
115	1.04	0.84	0.59	0.45	0.34	0.25	0.23	0.17	0.15	0.12	0.12	0.12	0.21	0.26	0.38	0.52	0.74	1.06	1.77
120	1.02	0.84	0.59	0.46	0.39	0.35	0.30	0.24	0.23	0.20	0.17	0.23	0.28	0.35	0.46	0.58	0.76	1.05	1.62
125	1.02	0.84	0.71	0.61	0.51	0.47	0.45	0.42	0.36	0.36	0.34	0.36	0.41	0.48	0.57	0.71	0.90	1.09	1.30
130	1.09	0.93	0.82	0.73	0.68	0.59	0.58	0.57	0.49	0.47	0.45	0.47	0.53	0.58	0.70	0.78	0.96	1.18	1.18
135	1.17	1.05	0.92	0.85	0.81	0.71	0.71	0.69	0.63	0.62	0.60	0.62	0.68	0.63	0.81	0.90	0.99	1.18	1.05
140	1.32	1.26	1.15	1.05	0.96	0.90	0.93	0.90	0.83	0.82	0.74	0.80	0.84	0.83	0.88	1.03	1.19	1.33	1.05
145	1.42	1.39	1.25	1.16	1.09	1.12	1.15	1.08	1.00	0.95	0.89	0.97	0.97	1.00	1.00	1.06	1.22	1.40	1.05
150	1.44	1.41	1.34	1.28	1.26	1.28	1.27	1.25	1.18	1.15	1.07	1.09	1.08	1.15	1.11	1.17	1.22	1.39	1.12
155	1.44	1.45	1.40	1.38	1.33	1.33	1.32	1.33	1.27	1.25	1.18	1.18	1.16	1.21	1.27	1.17	1.22	1.39	1.21
160	1.44	1.45	1.40	1.38	1.35	1.38	1.38	1.39	1.39	1.34	1.27	1.27	1.27	1.24	1.29	1.24	1.25	1.39	1.29
165	1.51	1.51	1.45	1.40	1.43	1.46	1.49	1.45	1.40	1.39	1.39	1.33	1.36	1.31	1.33	1.32	1.33	1.44	1.31
170	1.60	1.61	1.58	1.55	1.54	1.57	1.59	1.56	1.51	1.50	1.47	1.46	1.49	1.43	1.43	1.43	1.45	1.53	1.39
175	1.72	1.73	1.70	1.64	1.64	1.67	1.62	1.61	1.61	1.56	1.53	1.54	1.54	1.51	1.54	1.54	1.56	1.62	1.59
180	1.72	1.69	1.71	1.64	1.64	1.67	1.63	1.60	1.64	1.57	1.56	1.59	1.58	1.54	1.58	1.56	1.57	1.64	1.64

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6. Photo of sample:

----- End of test report-----

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