



Test Report

Report No.: PTC19092003201C-EN01

Issue Date: Nov.15, 2019

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Applicant: ZHONGSHAN PROTOSTAR optoeletronic Co.,Ltd
Address: No.6, Fuheng Dong Road Yongxing Ind.Zone, Henglan Town, Zhongshan, Guangdong, China

The following merchandise was (were) submitted and identified by client as:

Sample Name: fluorescent lamp
Model No.: F4T5 ; 4W ; F6T5 ; 6W ; F8T5 ; 8W; 10W; 15W ; 18W ; 2U 9W ;13W ; 2U 18W ; 7W ; PL 9W; 11W; PL 18W; T5 F4W LED ; T5 F4.5W LED ; T8 F6.5W LED ;T8 F7W LED ; T8 F10W LED
Manufacturer: ZHONGSHAN PROTOSTAR optoeletronic Co.,Ltd
Address: No.6, Fuheng Dong Road Yongxing Ind.Zone, Henglan Town, Zhongshan, Guangdong, China
Sample Received Date: Oct. 10, 2019
Completed Date: Oct. 16, 2019

Test Requested and Conclusion(s):

No	Test Sample	Standard and Requirement	Conclusion(s)
1	Submitted sample	RoHS Directive 2011/65/EU and its subsequent amendments regulation EU No.2015/863. - Lead (Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr ⁶⁺), PBBs and PBDEs, Phthalates (DBP, BBP,DEHP,DIBP)	PASS

Test Result(s): Please refer to next page(s).

Signed for and on Behalf of PTC

Frank Lin/ Laboratory manager
DongGuan Precise Testing and Certification Corp. Ltd.

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Test Result(s):

RoHS - Lead (Pb)/Cadmium(Cd)/Mercury(Hg)/Hexavalent Chromium(Cr⁶⁺)/PBBs/PBDEs

Method: IEC62321-3-1: 2013, IEC62321-5: 2013, IEC62321-6:2015,IEC62321-4: 2013+AMD1:

2017, IEC 62321-7-1:2015, IEC 62321-7-2: 2017, analyzed by EDXRF & AAS & ICP-AES & GC-MS & UV-Vis.

No.	Material Description	EDXRF Result					Chemical Result (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
1	Transparent glass with white coating (modulator tube, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
2	Transparent glass (inner of modulator tube, T4 2U 9W)	BL	BL	BL	BL	BL	--	PASS
3	Silvery metal (screw thread, T4 U2 9W)	BL	BL	BL	BL	--	--	PASS
4	Black ceramic (top of lamp, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
5	Silvery metal (solder, on top of lamp, T4 U2 9W)	BL	BL	BL	BL	--	--	PASS
6	White plastic with black printing (lamp base, T4 U2 9W)	BL	BL	BL	BL	IN	PBBs:N.D. PBDEs:N.D.	PASS
7	White material (inside lamp base, T4 U2 9W)	BL	BL	BL	BL	IN	PBBs:N.D. PBDEs:N.D.	PASS
8	Copper-colored metal wire (filament, T4 U2 9W)	BL	BL	BL	BL	--	--	PASS
9	Transparent plastic with deep green paper (pad, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS

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No.	Material Description	EDXRF Result					Chemical Result (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
10	Black plastic with white printing (wrapping of resistor, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
11	Grey body with multicolor printing (resistor, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
12	Silvery metal wire (resistor, T4 U2 9W)	BL	BL	BL	BL	--	--	PASS
13	Green PVC with black printing (wire jacket, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
14	White soft plastic (bushing, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
15	White fabric (bushing, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
16	Silvery metal (wire, T4 U2 9W)	BL	BL	BL	BL	--	--	PASS
17	Green / brown PCB (T4 U2 9W)	BL	BL	BL	BL	IN	PBBs:N.D. PBDEs:N.D.	PASS
18	Silvery metal (solder, PCB, T4 U2 9W)	BL	BL	BL	BL	--	--	PASS
19	Chip resistor (T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
20	Green plastic with white printing (wrapping of capacitor, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
21	Black rubber (cover of capacitor, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
22	Silvery metal (shell of capacitor, T4 U2 9W)	BL	BL	BL	BL	--	--	PASS
23	Silvery metal pin	BL	BL	BL	BL	--	--	PASS

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No.	Material Description	EDXRF Result					Chemical Result (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
	(capacitor, T4 U2 9W)							
24	Grey foil (filling of capacitor, T4 U2 9W)	BL	BL	BL	BL	--	--	PASS
25	Silvery-grey foil (filling of capacitor, T4 U2 9W)	BL	BL	BL	BL	--	--	PASS
26	Brown paper with liquid (filling of capacitor, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
27	Silvery metal plate (capacitor, T4 U2 9W)	BL	BL	BL	BL	--	--	PASS
28	Dark grey body with blue coating (core of toroidal inductor, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
29	Copper-colored metal with transparent surface (coil of toroidal inductor, T4 U2 9W)	BL	BL	BL	BL	--	--	PASS
30	Red surfaced metal wire (coil of toroidal inductor, T4 U2 9W)	BL	BL	BL	BL	--	--	PASS
31	Black body with silvery printing (diode, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
32	Silvery metal pin (diode, T4 U2 9W)	BL	BL	BL	BL	--	--	PASS
33	Black body with brown printing (triode, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
34	Silvery metal (triode, T4 U2 9W)	BL	BL	BL	BL	--	--	PASS

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No.	Material Description	EDXRF Result					Chemical Result (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
35	Green solid material with black printing (shell of C2/C3, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
36	Silvery block (filling of C2/C3, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
37	Silvery metal pin (C2/C3, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
38	Deep green solid material (shell of C4/C5, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
39	Black plastic with white printing (bushing of inductor, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
40	Copper-colored metal with transparent surface (coil of inductor, T4 U2 9W)	BL	BL	BL	BL	--	--	PASS
41	Silvery metal pin (inductor, T4 U2 9W)	BL	BL	BL	BL	--	--	PASS
42	Dark grey core (inductor, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
43	Red plastic with adhesive backing (adhesive tape, transformer, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
44	Copper-colored metal (coil of transformer, T4 U2 9W)	BL	BL	BL	BL	--	--	PASS

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No.	Material Description	EDXRF Result					Chemical Result (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
45	Black plastic (bobbin of transformer, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
46	Dark grey core (transformer, T4 U2 9W)	BL	BL	BL	BL	BL	--	PASS
47	Dark grey body with green coating (core of toroidal inductor, T4 U2 13W)	BL	BL	BL	BL	BL	--	PASS
48	reddish-brown solid material with black printing (shell of C1, T4 2U 18W)	BL	BL	BL	BL	BL	--	PASS
49	Orange plastic with black printing and adhesive backing (adhesive tape, T4 2U 18W)	BL	BL	BL	BL	BL	--	PASS
50	Yellow plastic with black printing and adhesive backing (adhesive tape, T4 2U 18W)	BL	BL	BL	BL	BL	--	PASS
51	Silvery metal (cap on both sides of modulator tube, T5 4W)	BL	BL	BL	BL	--	--	PASS
52	Golden metal (top of lamp, T5 4W)	BL	BL	BL	BL	--	--	PASS

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No.	Material Description	EDXRF Result					Chemical Result (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
53	Brown solide material (both sides of modulator tube, T5 4W)	BL	BL	BL	BL	BL	--	PASS
54	Black PCB (both sides of modulator tube, T5 4W)	BL	BL	BL	BL	BL	--	PASS
55	Dark yellow solid material (both sides of modulator tube, T5 6W)	BL	BL	BL	BL	BL	--	PASS
56	Silvery metal (cap on both sides of modulator tube, T8 18W)	BL	BL	BL	BL	--	--	PASS
57	Yellow PCB (T8 18W)	BL	BL	BL	BL	BL	--	PASS
58	Silvery metal with black printing (top of modulator tube, 11W)	BL	BL	BL	BL	--	--	PASS
59	White plastic (lamp base, 11W)	BL	BL	BL	BL	BL	--	PASS
60	White plastic with light blue coating (lamp base, H24W)	BL	BL	BL	BL	BL	--	PASS
61	White plastic with blue coating (lamp base, 9W)	BL	BL	BL	BL	BL	--	PASS
62	Silvery metal (top of lamp, 9W)	BL	BL	BL	BL	--	--	PASS
63	Golden metal (washer, T5 F8W LED)	BL	BL	BL	BL	BL	--	PASS
64	Translucent plastic film (inside tube, T5 F8W LED)	BL	BL	BL	BL	BL	--	PASS

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No.	Material Description	EDXRF Result					Chemical Result (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
65	Transparent glue (both sides of tube, T5 F8W LED)	BL	BL	BL	BL	BL	--	PASS
66	White PVC (wire jacket, T5 F8W LED)	BL	BL	BL	BL	BL	--	PASS
67	Silvery metal (wire, T5 F8W LED)	BL	BL	BL	BL	--	--	PASS
68	Silvery metal with white printing (LED base)	BL	BL	BL	BL	--	--	PASS
69	Silvery metal (solder, LED base)	BL	BL	BL	BL	--	--	PASS
70	White / transparent plastic (LED)	BL	BL	BL	BL	BL	--	PASS

- Note:**
1. mg/kg = milligram per kilogram (ppm).
 2. N.D. = Not Detected (<RL).
 3. Negative = Absence of Cr⁶⁺.
 4. Positive = Presence of Cr⁶⁺: the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.
 5. The result are obtained by EDXRF for primary screening, if the result exceeds the below limit (BL), and further chemical testing.

Screening limits in mg/kg for regulated elements in various matrices

Elements	Polymer	Metal	Composite Materials
Pb	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$LOD < X < (150+3\sigma) \leq OL$
Hg	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$
Br	$BL \leq (300-3\sigma) < X$	--	$BL \leq (250-3\sigma) < X$

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BL = Below Limit, OL = Over Limit, IN = Inconclusive, LOD = Limit of Detection

Chemical Testing - Detection Limit & 2011/65/EU Limit:

No	Name of Chemicals	Detection Limit (mg/kg)	2011/65/EU Limit (mg/kg)
1	Lead (Pb)	5	1000
2	Cadmium (Cd)	5	100
3	Mercury (Hg)	5	1000
4	Chromium VI (Cr VI)	Non-metal: 10 Metal: Negative	Non-metal: 1000 Metal: Negative
5	Polybromobiphenyls (PBBs) -Bromobiphenyl (MonoBB) -Dibromobiphenyl (DiBB) -Tribromobiphenyl (TriBB) -Tetrabromobiphenyl (TetraBB) -Pentabromobiphenyl (PentaBB) -Hexabromobiphenyl (HexaBB) -Heptabromobiphenyl (HeptaBB) -Octabromobiphenyl (OctaBB) -Nonabromobiphenyl (NonaBB) -Decabromobiphenyl (DecaBB)	Each 5	Sum: 1 000
6	Polybromodiphenyl ethers (PBDEs) -Bromodiphenyl ether (MonoBDE) -Dibromodiphenyl ether (DiBDE) -Tribromodiphenyl ether (TriBDE) -Tetrabromodiphenyl ether (TetraBDE) -Pentabromodiphenyl ether (PentaBDE) -Hexabromodiphenyl ether (HexaBDE) -Heptabromodiphenyl ether (HeptaBDE) -Octabromodiphenyl ether (OctaBDE) -Nonabromodiphenyl ether (NonaBDE) -Decabromodiphenyl ether (DecaBDE)	Each 5	Sum: 1 000

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Test Result(s):

ROHS - Phthalates DIBP, DBP, BBP, DEHP

Method: IEC 62321-8: 2017, analyzed by Gas Chromatograph-Mass Spectrometry (GC-MS).

Substances	DBP	BBP	DEHP	DIBP	Conclusion
CAS No.	84-74-2	85-68-7	117-81-7	84-69-5	
Limit (mg/kg)	1000	1000	1000	1000	
RL (mg/kg)	50	50	50	50	
Material No.	Result (mg/kg)				
6+7+9	N.D.	N.D.	N.D.	N.D.	PASS
10	N.D.	N.D.	N.D.	N.D.	PASS
13	N.D.	N.D.	N.D.	N.D.	PASS
14+15+17	N.D.	N.D.	N.D.	N.D.	PASS
20+21+39	N.D.	N.D.	N.D.	N.D.	PASS
43+49+50	N.D.	N.D.	N.D.	N.D.	PASS
54+57+59	N.D.	N.D.	N.D.	N.D.	PASS
60+61	N.D.	N.D.	N.D.	N.D.	PASS
64+65+70	N.D.	N.D.	N.D.	N.D.	PASS
66	N.D.	N.D.	N.D.	N.D.	PASS

- Note:**
1. mg/kg = milligram per kilogram (ppm).
 2. N.D. = Not Detected (<RL).
 3. RL=Reporting Limit.

Test Material List

The following materials apply only to the samples submitted for phthalates testing.

Material No.	Description/Location
6	White plastic with black printing (lamp base, T4 U2 9W)
7	White material (inside lamp base, T4 U2 9W)
9	Transparent plastic with deep green paper (pad, T4 U2 9W)
10	Black plastic with white printing (wrapping of resistor, T4 U2 9W)
13	Green PVC with black printing (wire jacket, T4 U2 9W)
14	White soft plastic (bushing, T4 U2 9W)

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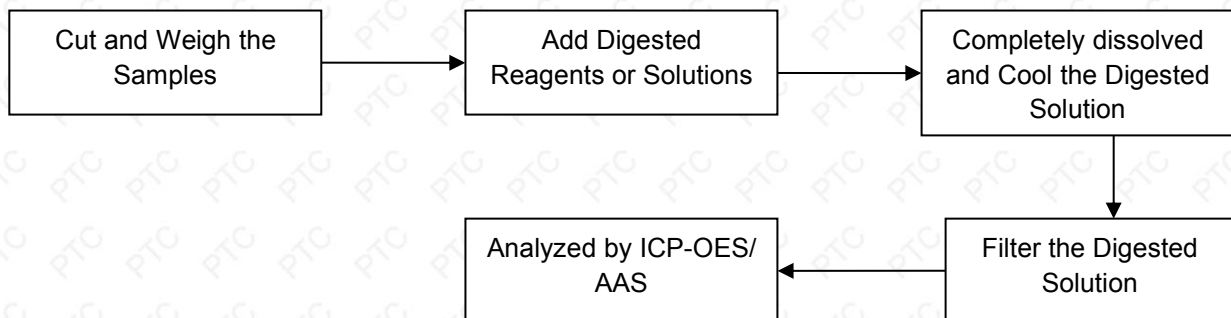
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Material No.	Description/Location
15	White fabric (bushing, T4 U2 9W)
17	Green / brown PCB (T4 U2 9W)
20	Green plastic with white printing (wrapping of capacitor, T4 U2 9W)
21	Black rubber (cover of capacitor, T4 U2 9W)
39	Black plastic with white printing (bushing of inductor, T4 U2 9W)
43	Red plastic with adhesive backing (adhesive tape, transformer, T4 U2 9W)
49	Orange plastic with black printing and adhesive backing (adhesive tape, T4 2U 18W)
54	Black PCB (both sides of modulator tube, T5 4W)
57	Yellow PCB (T8 18W)
59	White plastic (lamp base, 11W)
60	White plastic with light blue coating (lamp base, H24W)
61	White plastic with blue coating (lamp base, 9W)
64	Translucent plastic film (inside tube, T5 F8W LED)
65	Transparent glue (both sides of tube, T5 F8W LED)
66	White PVC (wire jacket, T5 F8W LED)
70	White / transparent plastic (LED)

Test Process Flow:

1. Lead, Cadmium, Mercury



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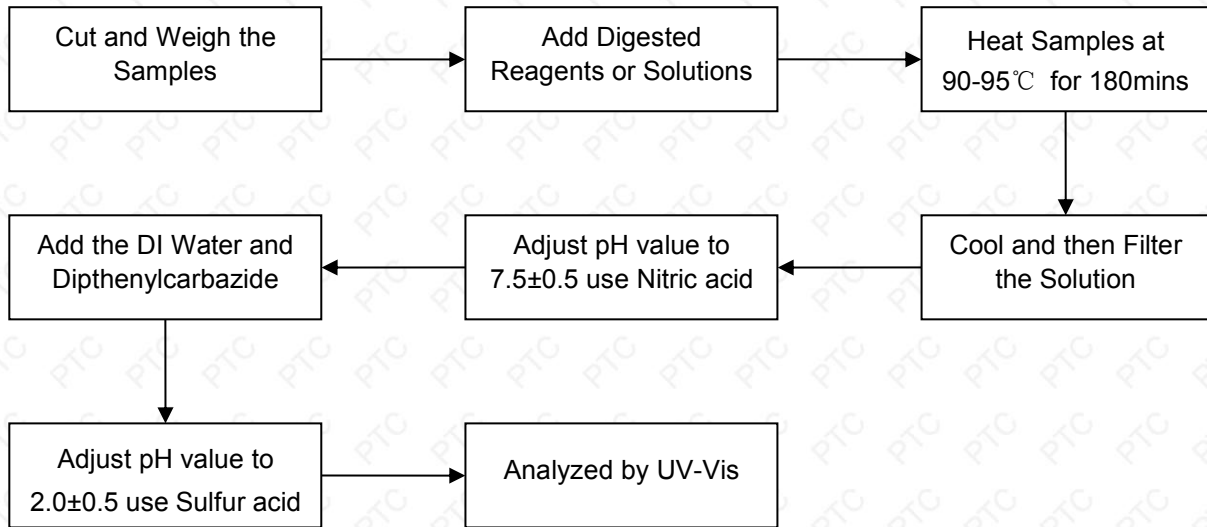
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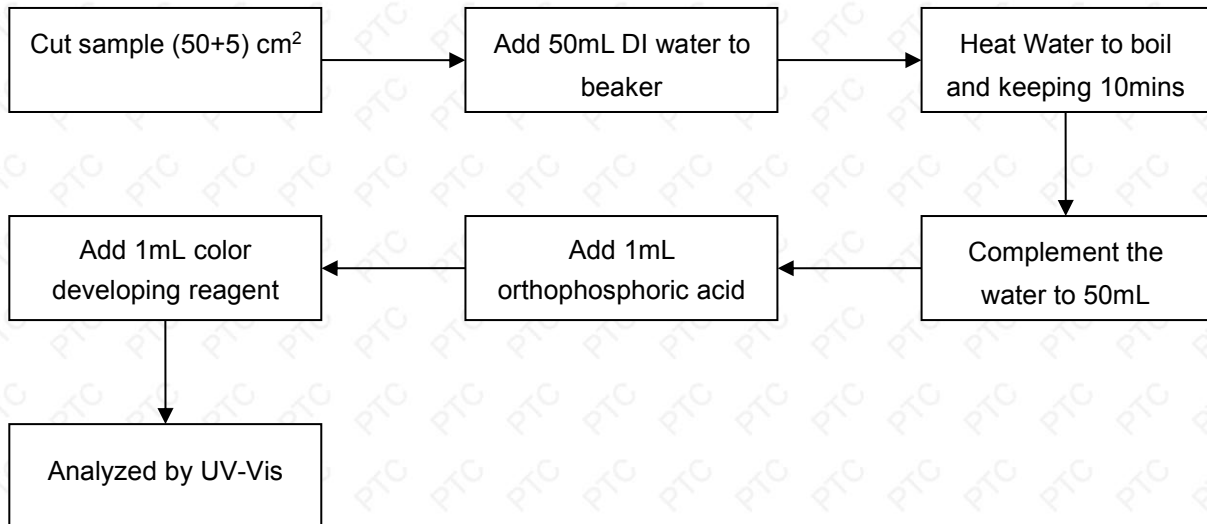
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2. Hexavalent Chromium (Non-metal)



Hexavalent Chromium (Metal)



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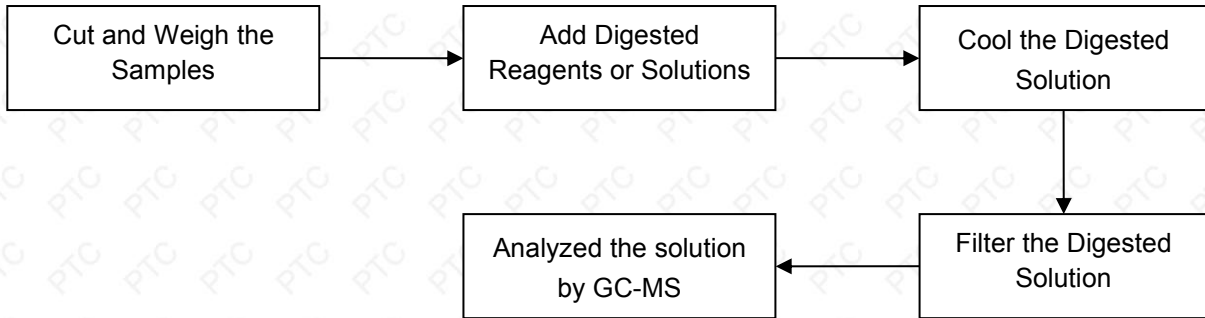
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3. PBBs & PBDEs, Phthalates



Photo(s) of Sample:



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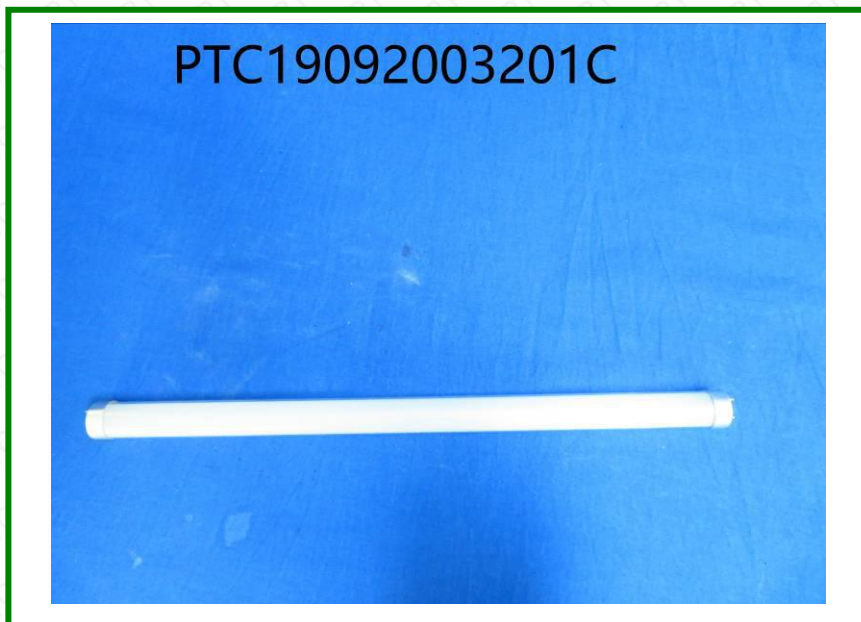


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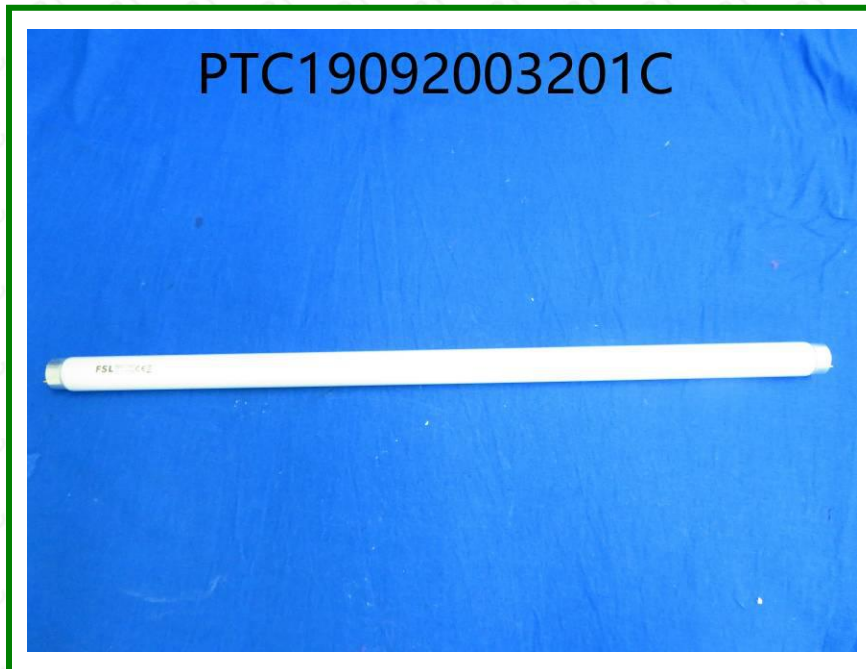


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