

TEST REPORT

Report No.: HTR2001060014

Date: January 06, 2020

Applicant : EN POWER ELECTRONICS LLC
Applicant Address : Office#M01, Mezzanine Floor, Al Marri 7 building Besides Dewa Power Station, Manama Street 51 Ras Al Khor Industrial 1, P.o box: 126081, Dubai - UAE
Manufacturer : EN POWER ELECTRONICS LLC
Manufacturer Address : Office#M01, Mezzanine Floor, Al Marri 7 building Besides Dewa Power Station, Manama Street 51 Ras Al Khor Industrial 1, P.o box: 126081, Dubai - UAE
The following samples were submitted by the client said to be:

Sample Name : Flexible led strip
Model No. : See in Annex page at the end of this report
Trademark :



Sample Receiving Date : January 02, 2020
Test Period : January 02- January 06, 2020
Test Requested : Pb, Cd, Cr(VI), Hg, PBBs, PBDEs content
Test Results : Details, please refer to the following pages.
Test Requested : As requested by client, to evaluate the compliance of the submitted sample with the Directive 2011/65/EU and its amendment Directive EU 2015/863 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
Test method : 1. Review was performed for the sample and the related Bill of Material submitted by the Applicant.
2. To refer to the standard IEC 62321:2017 Ed.1 a) Screening by XRF Spectroscopy. b) Wet chemical test i) Determination of Lead, Cadmium and Mercury by ICP-OES / AAS. ii) Determination of Hexavalent Chromium by UV-VIS. iii) Determination of PBBs and PBDEs by GC/MS.

Prepared by: Vivian Cao
(Engineer)

Approved & Authorized Signer : Rose
(Manager)

Official Seal



Declaration:

- (1) The test results exclusively refer to the samples examined.
- (2) This report shall not be reproduced except in full without written approval and does not authorize the use of Shenzhen Hong Testing technology Co., Ltd
- (3) The report is invalid without signature and seal of Shenzhen Hong Testing technology Co., Ltd

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Test Method

(1) Screening limits for regulated elements according to IEC 62321-3-1:2013 (Unit: mg/kg)

Element	Polymers	Metals	Composite material
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	$BL \leq (300-3\sigma) < X$	N/A	$BL \leq (250-3\sigma) < X$

(2) Screening limits for Phthalates

Test Item(s)	Screening limits(Unit: mg/kg)
Dibutyl phthalate(DBP)	$BL \leq 600 < X$
Benzylbutyl phthalate(BBP)	$BL \leq 600 < X$
Di-2-ethylhexyl phthalate(DEHP)	$BL \leq 600 < X$
Diisobutyl phthalate(DIBP)	$BL \leq 600 < X$

(3) Chemical Test

Test Item	Test Method	Test Instrument	MDL (mg/kg)	EU RoHS Limit (mg/kg)
Lead (Pb)	IEC 62321-5:2013	ICP-OES	2	1000
Cadmium (Cd)	IEC 62321-5:2013	ICP-OES	2	100
Mercury (Hg)	IEC 62321-4:2013+AMD1:2017	ICP-OES	2	1000
Hexavalent Chromium (Cr(VI))	IEC 62321-7-2:2017 (non-metal)	UV-Vis	8	1000
	IEC 62321-7-1:2015 (metal)	UV-Vis	0.1($\mu\text{g}/\text{cm}^2$)	/
Polybrominated Biphenyls (PBBs)	IEC 62321-6:2015	GC-MS	5	1000
Polybrominated Diphenyl Ethers (PBDEs)	IEC 62321-6:2015	GC-MS	5	1000
Phthalates(DBP, BBP, DEHP, DIBP)	IEC 62321-8:2017	GC-MS	50	1000

Remark:

- BL = Under the screening limit
- OL = Above the screening limit
- X = The range of needing to do further testing
- 3 σ = The reproducibility of analytical instruments
- N/A = Not applicable
- LOD = Detection limit

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(2) Test result for Chemical Confirmation

(a) The test result of PBBs, PBDEs

Testing item	No.& Result (mg/kg)	
	8.	
Polybrominated biphenyls (PBBs)	N.D.	
Polybrominated diphenyl ethers(PBDEs)	N.D.	

Remark: N.D. = Not Detected, MDL = Method Detection Limit
mg/kg = ppm = parts per million, 1000 mg/kg = 0.1%
IN= Uncertain, Further chemical test, X = The range of needing to do further testing
N/A= Not applicable, BL = Under the screening limit
OL = Further chemical test will be conducted while the result is above the screening limit.
* = The screened result was found by XRF and further chemical test was suggested
When conducting the test for PBBs&PBDEs, XRF was introduced to screen Br
Exclusively; When conducting the test for Hexavalent Chromium, XRF was introduced to
screen Chromium exclusively.

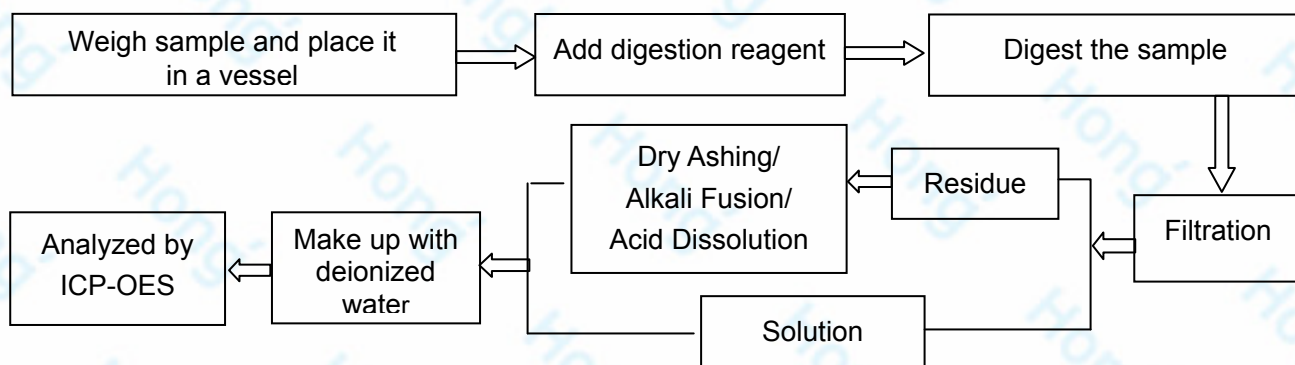
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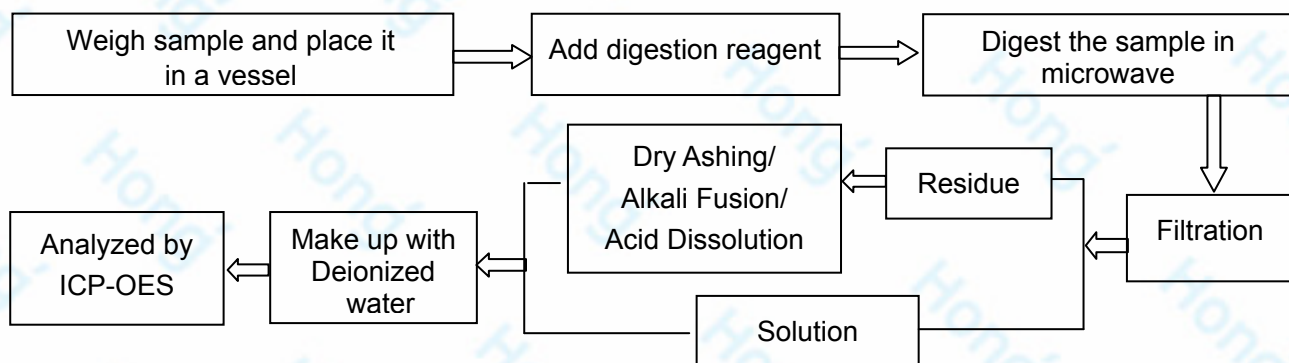
Date: January 06, 2020

Test Process

1. Lead(Pb), Cadmium(Cd), Chromium(Cr)



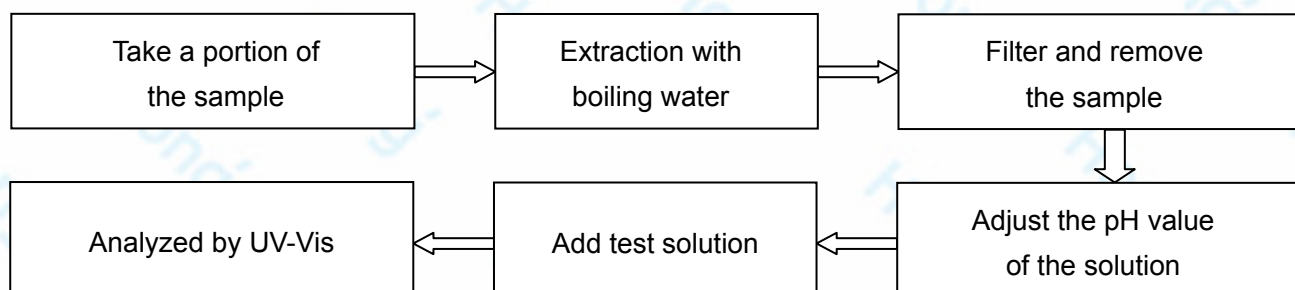
2. Mercury(Hg)



3. Hexavalent Chromium (Cr (VI))

(1) IEC 62321-7-1:2015

Plating/Metal sample(s)

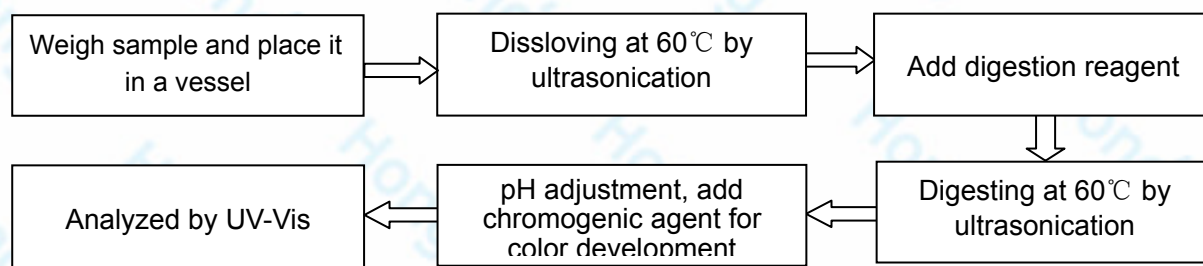


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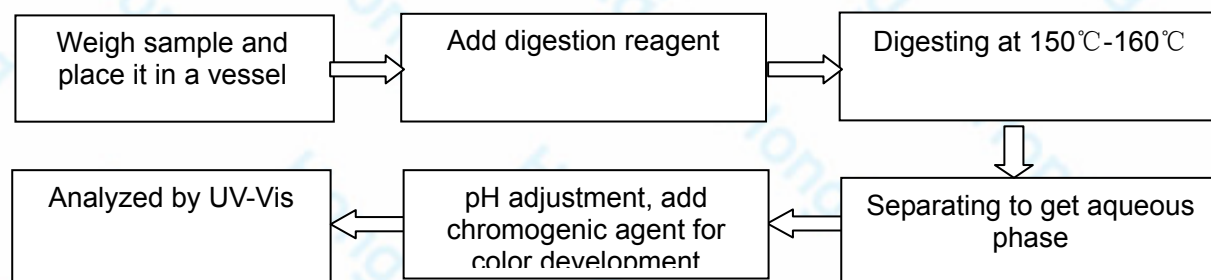
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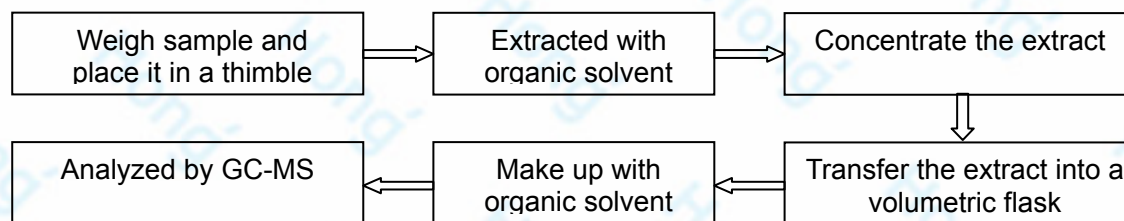
(2) IEC 62321-7-2:2017

Non-metal sample(s) (Material ABS/PC/PVC)

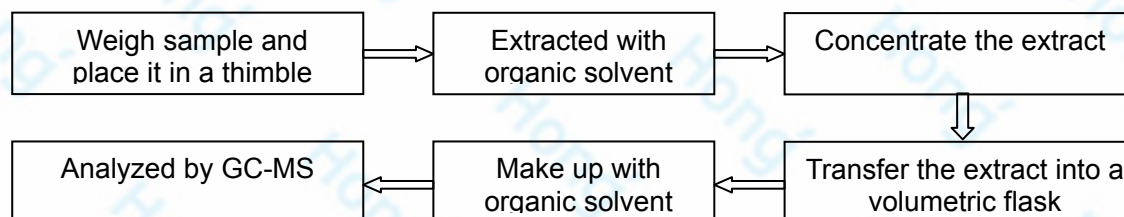
(3) IEC 62321-7-2:2017

Non-metal sample(s) (Others)

4. Polybrominated Biphenyls (PBBs), Polybrominated Diphenyl Ethers (PBDEs)



5. Phthalates(DBP/BBP/DEHP/DIBP)

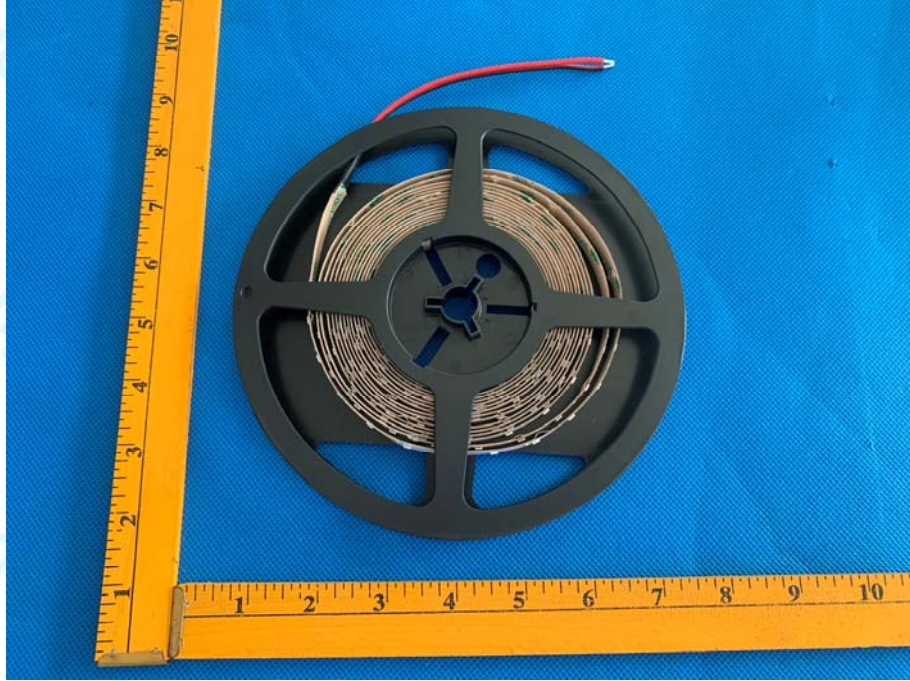


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Tested sample photo(s):



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Annex

	Product part numbers
	BR-F3528xx60-xx-x-Fx-Vx
	BR-F3528xx120-xx-x-Fx-Vx
	BR-F3528xx180-xx-x-Fx-Vx
	BR-F3528xx240-xx-x-Fx-Vx
	BR-F3528xx240D-xx-x-Fx-Vx
	BR-F2835xx30-xx-x-Fx-Vx
	BR-F2835xx60-xx-x-Fx-Vx
	BR-2835xx120-xx-x-Fx-Vx
1	BR-F2835xx180-xx-x-Fx-Vx
	BR-F2835xx240-xx-x-Fx-Vx
	BR-F2835xx112-xx-x-Fx-Vx
	BR-F2835xx96-xx-x-Fx-Vx
	BR-F5050xx30-xx-x-Fx-Vx
	BR-F5050xx60-xx-x-Fx-Vx
	BR-F5050xx120D-xx-x-Fx-Vx
	BR-F5630xx126-xx-x-Fx-Vx
	BR-F5050xx96-xx-x-Fx-Vx
	BR-F3014xx70-xx-x-Fx-Vx
	BR-F2216xx120-xx-x-Fx-Vx
2	"BR" in the part number represents the brand " Brio Series", a product serie from the brand"LED RAY".
3	"F" in the part number represents "Flexible LED STRIP".
4	Numbers like "3528", "2835", "5050", "5630", "3014", "2216" represents the size of the LEDs;
5	The first "xx" represents the CCT/Color, such a"WW=Warm White", "NW=Natural White", "CW=Cool White", "B=Blue Color", " G=Green Color", " R=Red Color".
6	Numbers like "60", "120", "180", "240", "112", "126", "96", "30", "70" represents the quantity of LEDs per meter;
7	"D" means "double row";
8	The second "xx" represents the Color Kelvin, such as "22=2200K", "24=2400K", "27=2700K", "30=3000K", "40=4000K", "65=6500K", "Blank = Solid Color like Red, Green, Blue...etc"
9	"x" represents the MacAdam Binning, such as " C= MacAdam 3 Step", "C1=MacAdam 4 Step".
10	"Fx" Represents the waterproof types, such as"F0=IP20", "F1=IP54", "F2=IP65", "F3=IP66", "F4=IP67", "F5=IP68" etc.
11	"Vx" Represents the Voltage, Such as " V1=DC12V", "V2=DC24V" etc.

---THE END OF REPORT---