



Test Report

No.: ETR21602390

Date: 28-Jun-2021

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NANTONG HORNBY ELECTRONIC CO.,LTD

NO.8, XING YUAN ROAD,RUCHENG INDUSTRIAL ZONE, RUGAO CITY, JIANGSU PROVINCE, P. R. C.

The following sample(s) was/were submitted and identified by/on behalf of the applicant as:

Sample Submitted By : NANTONG HORNBY ELECTRONIC CO.,LTD

Sample Name : DIODES(R-6)

Used For. : DIODES(R-6)

Sample Receiving Date : 15-Jun-2021

Testing Period : 15-Jun-2021 to 24-Jun-2021

Test Requested : As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).

Test Results : Please refer to following pages.

Troy Chang
Troy Chang, Manager
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei



PIN CODE: 622B5C04

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Test Part Description

- No.1 : BLACK BODY
- No.2 : PLATING LAYER OF SILVER COLORED METAL
- No.3 : SILVER COLORED METAL (INCLUDING THE PLATING LAYER)

Test Result(s)

Test Item(s)	Method	Unit	MDL	Result		
				No.1	No.2	No.3
Cadmium (Cd) (CAS No.: 7440-43-9)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.	---	---
Lead (Pb) (CAS No.: 7439-92-1)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	6170	---	---
Mercury (Hg) (CAS No.: 7439-97-6)	With reference to IEC 62321-4: 2013+AMD1: 2017, analysis was performed by ICP-OES.	mg/kg	2	n.d.	---	---
Hexavalent Chromium Cr(VI) (CAS No.: 18540-29-9)	With reference to IEC 62321-7-2: 2017, analysis was performed by UV-VIS.	mg/kg	8	n.d.	---	---
Cadmium (Cd) (CAS No.: 7440-43-9)	IEC 62321-5: 2013 application of modified digestion by surface etching, analysis was performed by ICP-OES.	mg/kg	2	---	n.d.	---
Lead (Pb) (CAS No.: 7439-92-1)	IEC 62321-5: 2013 application of modified digestion by surface etching, analysis was performed by ICP-OES.	mg/kg	2	---	51.1	---
Mercury (Hg) (CAS No.: 7439-97-6)	IEC 62321-4: 2013+AMD1: 2017 application of modified digestion by surface etching, analysis was performed by ICP-OES.	mg/kg	2	---	n.d.	---
Hexavalent Chromium Cr(VI) (CAS No.: 18540-29-9) (#2)	With reference to IEC 62321-7-1: 2015, analysis was performed by UV-VIS.	µg/cm ²	0.1	---	n.d.	---

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Test Item(s)	Method	Unit	MDL	Result		
				No.1	No.2	No.3
Monobromobiphenyl	With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.	mg/kg	5	n.d.	---	n.d.
Dibromobiphenyl		mg/kg	5	n.d.	---	n.d.
Tribromobiphenyl		mg/kg	5	n.d.	---	n.d.
Tetrabromobiphenyl		mg/kg	5	n.d.	---	n.d.
Pentabromobiphenyl		mg/kg	5	n.d.	---	n.d.
Hexabromobiphenyl		mg/kg	5	n.d.	---	n.d.
Heptabromobiphenyl		mg/kg	5	n.d.	---	n.d.
Octabromobiphenyl		mg/kg	5	n.d.	---	n.d.
Nonabromobiphenyl		mg/kg	5	n.d.	---	n.d.
Decabromobiphenyl		mg/kg	5	n.d.	---	n.d.
Sum of PBBs		mg/kg	-	n.d.	---	n.d.
Monobromodiphenyl ether		mg/kg	5	n.d.	---	n.d.
Dibromodiphenyl ether		mg/kg	5	n.d.	---	n.d.
Tribromodiphenyl ether		mg/kg	5	n.d.	---	n.d.
Tetrabromodiphenyl ether		mg/kg	5	n.d.	---	n.d.
Pentabromodiphenyl ether		mg/kg	5	n.d.	---	n.d.
Hexabromodiphenyl ether		mg/kg	5	n.d.	---	n.d.
Heptabromodiphenyl ether		mg/kg	5	n.d.	---	n.d.
Octabromodiphenyl ether		mg/kg	5	n.d.	---	n.d.
Nonabromodiphenyl ether		mg/kg	5	n.d.	---	n.d.
Decabromodiphenyl ether	mg/kg	5	n.d.	---	n.d.	
Sum of PBDEs	mg/kg	-	n.d.	---	n.d.	
Butyl benzyl phthalate (BBP) (CAS No.: 85-68-7)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	---	n.d.
Dibutyl phthalate (DBP) (CAS No.: 84-74-2)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	---	n.d.
Di-(2-ethylhexyl) phthalate (DEHP) (CAS No.: 117-81-7)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	---	n.d.
Diisobutyl phthalate (DIBP) (CAS No.: 84-69-5)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	---	n.d.

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Note :

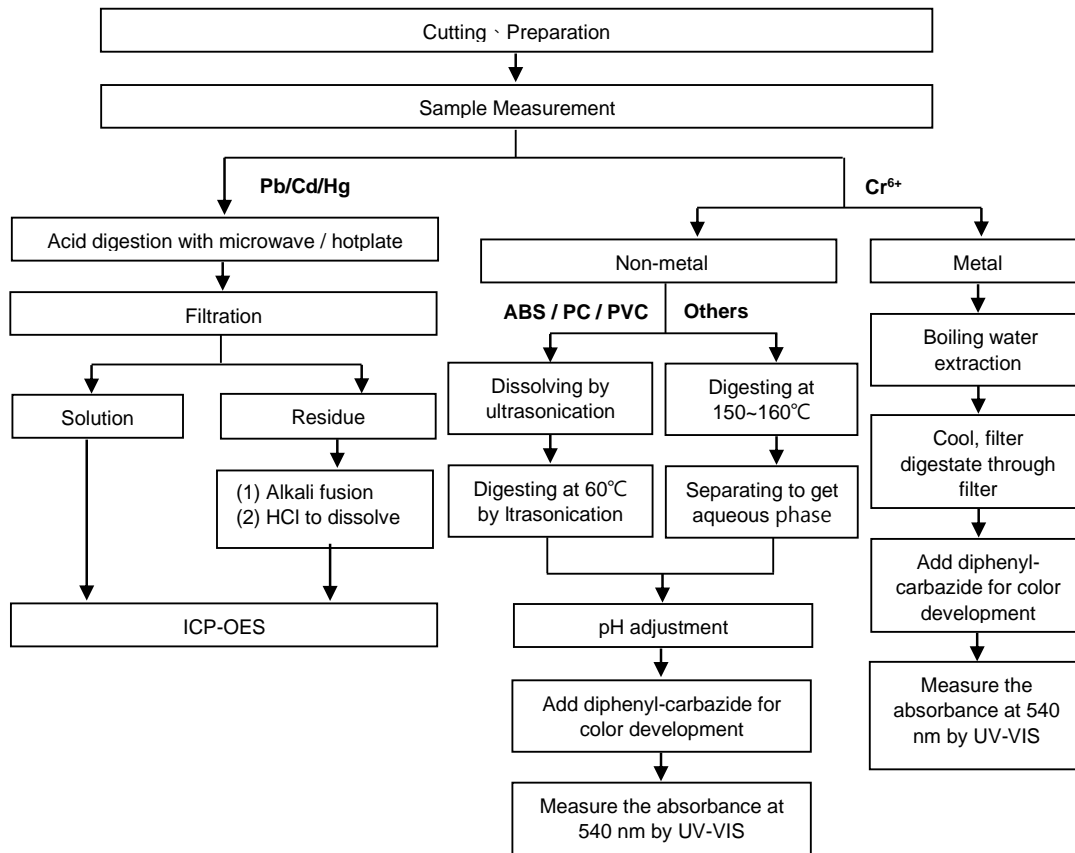
1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected (Less than MDL)
4. "-" = Not Regulated
5. "---" = Not Conducted
6. (#2) =
 - a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 $\mu\text{g}/\text{cm}^2$. The sample coating is considered to contain Cr(VI).
 - b. The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 $\mu\text{g}/\text{cm}^2$). The coating is considered a non-Cr(VI) based coating
 - c. The result between 0.10 $\mu\text{g}/\text{cm}^2$ and 0.13 $\mu\text{g}/\text{cm}^2$ is considered to be inconclusive - unavoidable coating variations may influence the determination.

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Analytical flow chart of Heavy Metal

These samples were dissolved totally by pre-conditioning method according to below flow chart.

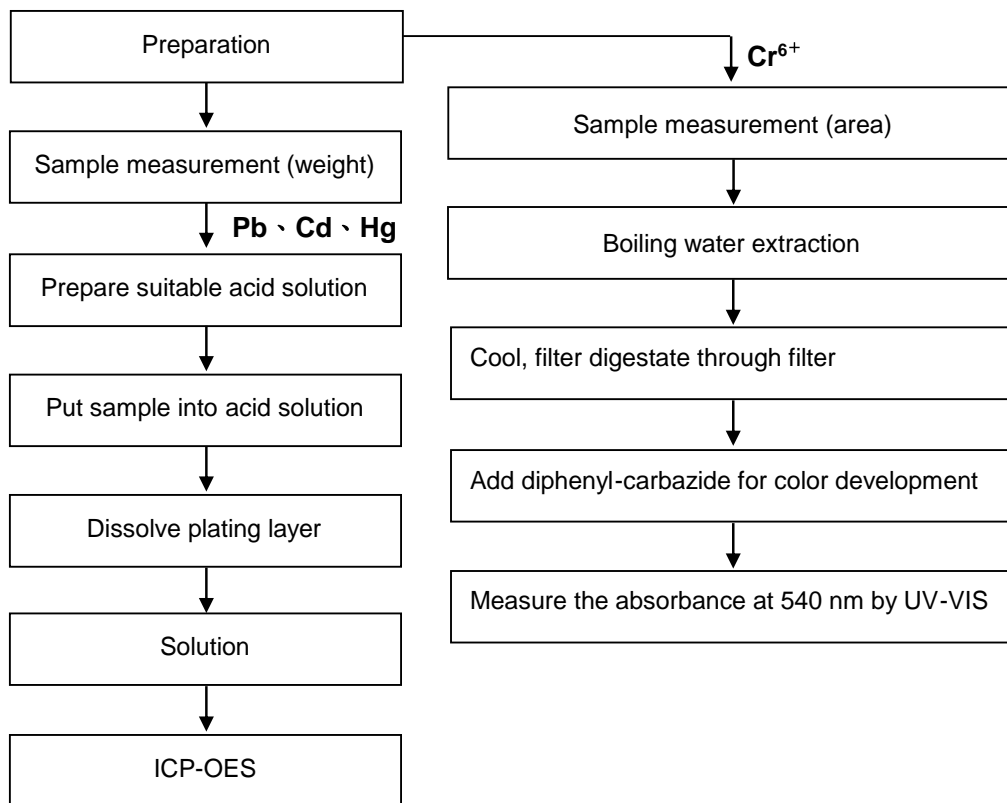
(Cr⁶⁺ test method excluded)



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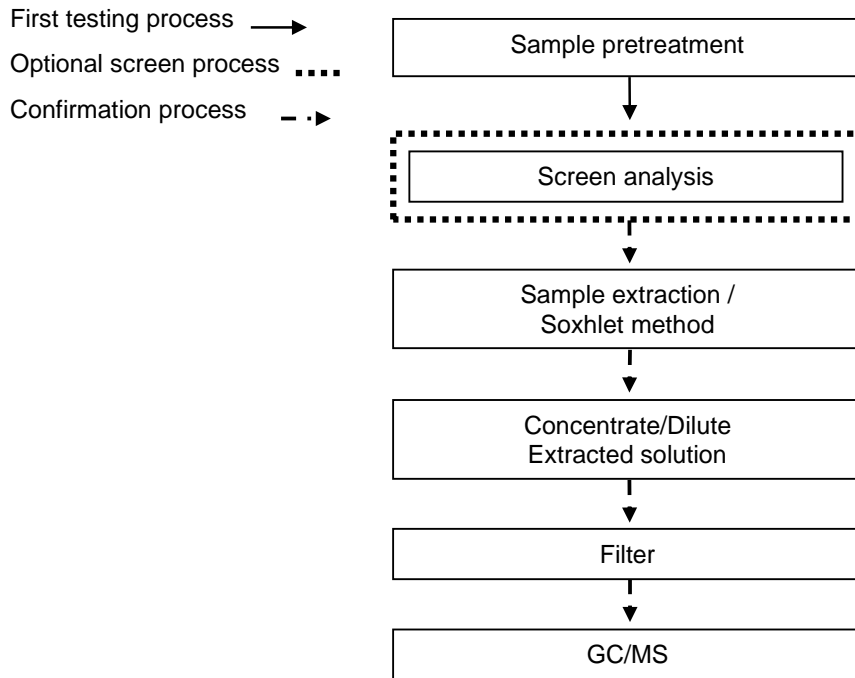
Flow Chart of Stripping method for metal analysis

The plating layer of samples were dissolved totally by pre -conditioning method according to below flow chart. (Cr⁶⁺ test method excluded)



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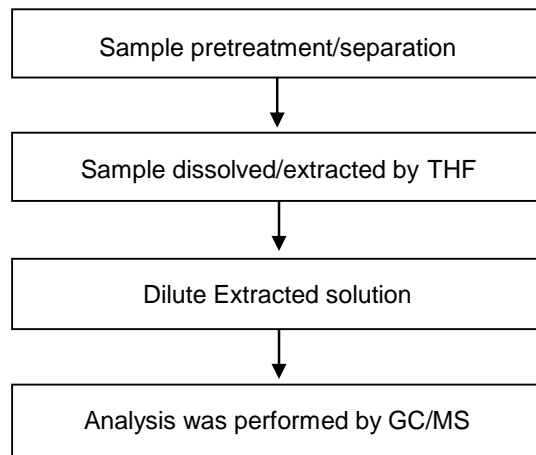
Analytical flow chart – PBBs / PBDEs



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Analytical flow chart - Phthalate

【Test method: IEC 62321-8】



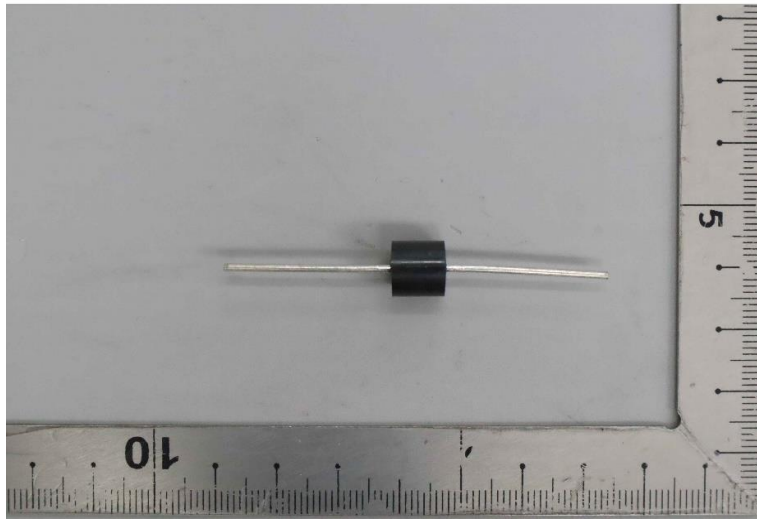
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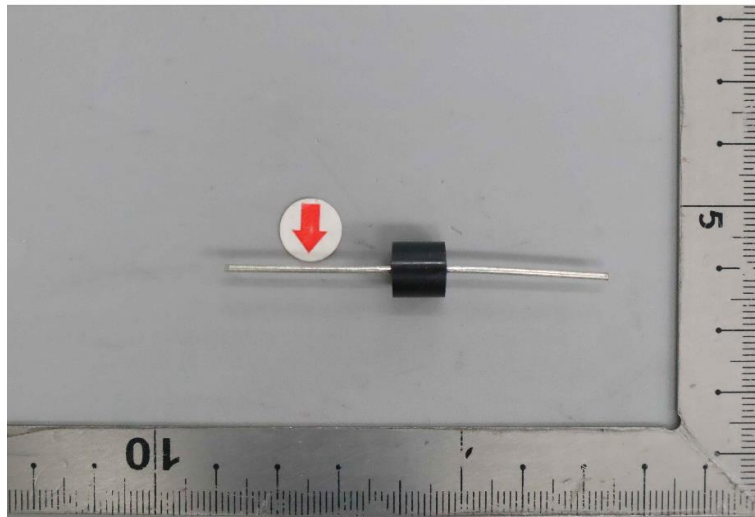
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* The tested sample / part is marked by an arrow if it's shown on the photo. *

ETR21602390 NO.1



ETR21602390 NO.2

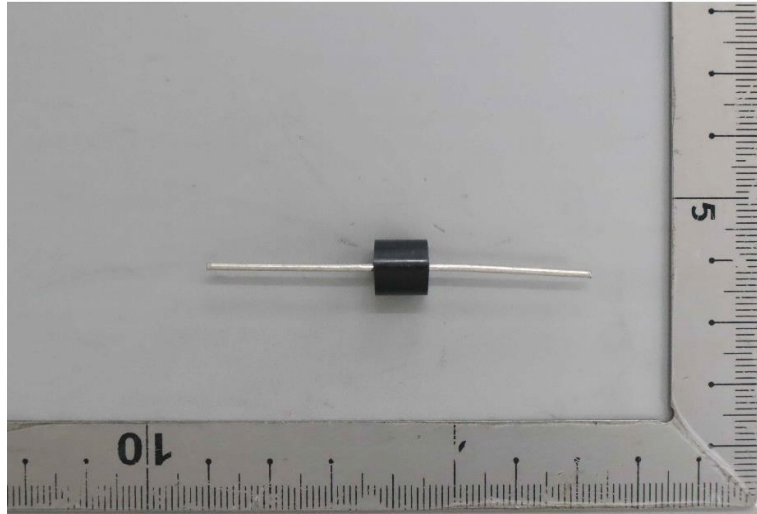


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ETR21602390 NO.3



** End of Report **

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