



# Test Report

No.: ETR24805306

Date: 05-Sep-2024

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MURATA MANUFACTURING CO., LTD.

1-10-1, HIGASHI KOTARI, NAGAOAKAKYO-SHI, KYOTO, 617-8555, JAPAN.

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

Sample Submitted By : MURATA MANUFACTURING CO., LTD.  
 Sample Name : Electrode ZD\_240905  
 CLIENT REF No : 1240821029


=====  
 Sample Receiving Date : 28-Aug-2024  
 Testing Period : 28-Aug-2024 to 05-Sep-2024

**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.

**Conclusion** : Based on the performed tests on submitted sample(s), the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

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




PIN CODE: 52929422

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## Test Part Description

No.1 : GRAY FLAKE

## Test Result(s)

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Cadmium (Cd)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.	100
Lead (Pb)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.	1000
Mercury (Hg)	With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.	mg/kg	2	n.d.	1000
Hexavalent Chromium Cr(VI) (#2)	With reference to IEC 62321-7-1: 2015, analysis was performed by UV-VIS.	µg/cm <sup>2</sup>	0.1	n.d.	-
Monobromobiphenyl	With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.	mg/kg	5	n.d.	-
Dibromobiphenyl		mg/kg	5	n.d.	-
Tribromobiphenyl		mg/kg	5	n.d.	-
Tetrabromobiphenyl		mg/kg	5	n.d.	-
Pentabromobiphenyl		mg/kg	5	n.d.	-
Hexabromobiphenyl		mg/kg	5	n.d.	-
Heptabromobiphenyl		mg/kg	5	n.d.	-
Octabromobiphenyl		mg/kg	5	n.d.	-
Nonabromobiphenyl		mg/kg	5	n.d.	-
Decabromobiphenyl		mg/kg	5	n.d.	-
<b>Sum of PBBs</b>		mg/kg	-	n.d.	1000
Monobromodiphenyl ether		mg/kg	5	n.d.	-
Dibromodiphenyl ether		mg/kg	5	n.d.	-
Tribromodiphenyl ether		mg/kg	5	n.d.	-
Tetrabromodiphenyl ether		mg/kg	5	n.d.	-
Pentabromodiphenyl ether		mg/kg	5	n.d.	-
Hexabromodiphenyl ether		mg/kg	5	n.d.	-
Heptabromodiphenyl ether		mg/kg	5	n.d.	-
Octabromodiphenyl ether		mg/kg	5	n.d.	-
Nonabromodiphenyl ether		mg/kg	5	n.d.	-
Decabromodiphenyl ether	mg/kg	5	n.d.	-	
<b>Sum of PBDEs</b>	mg/kg	-	n.d.	1000	

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Butyl benzyl phthalate (BBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Dibutyl phthalate (DBP)		mg/kg	50	n.d.	1000
Di-(2-ethylhexyl) phthalate (DEHP)		mg/kg	50	n.d.	1000
Diisobutyl phthalate (DIBP)		mg/kg	50	n.d.	1000

**Note :**

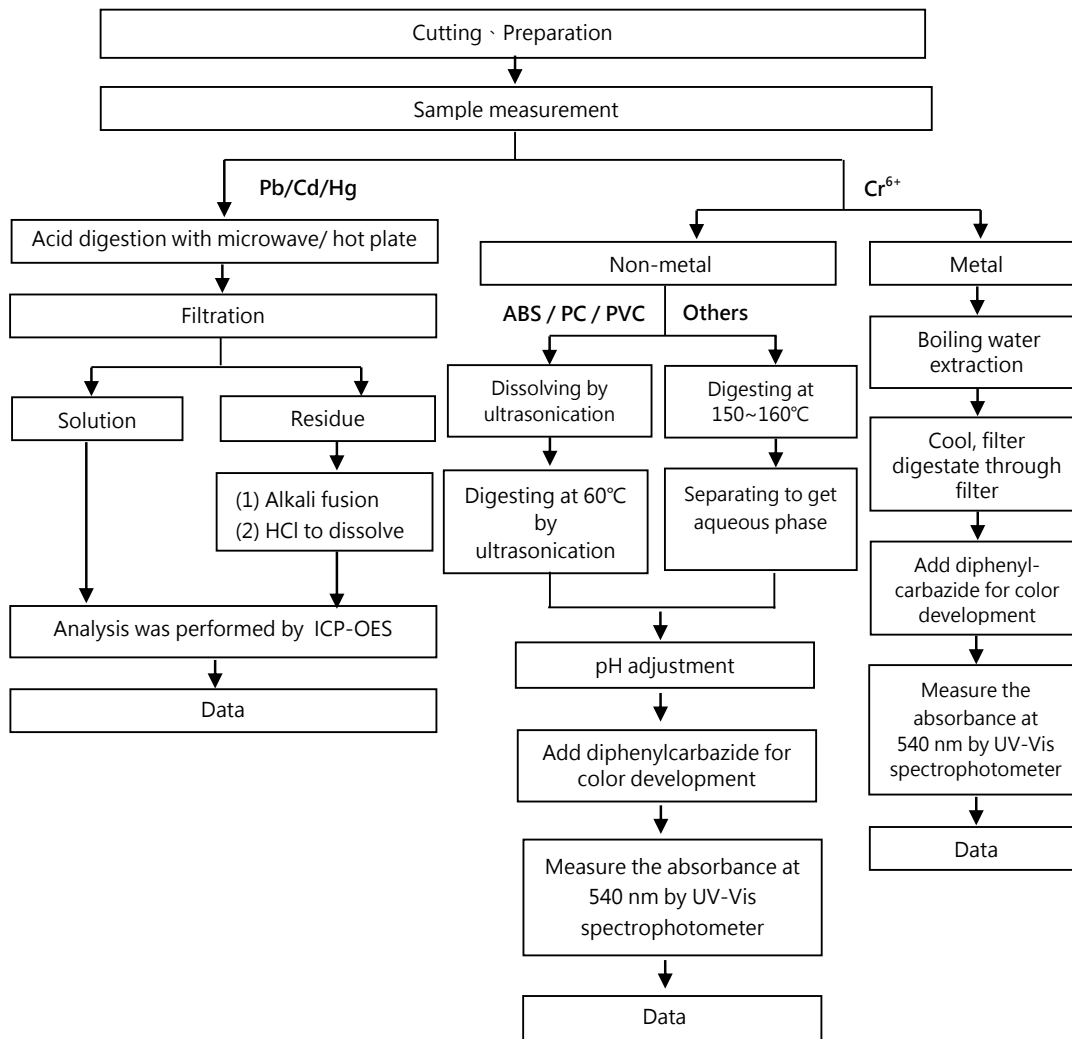
1. mg/kg = ppm ; 0.1wt% = 0.1% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected ( Less than MDL)
4. "-" = Not Regulated
5. (#2) =
  - a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 µg/cm<sup>2</sup>. The sample coating is considered to contain Cr(VI).
  - b. The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 µg/cm<sup>2</sup>). The coating is considered a non-Cr(VI) based coating
  - c. The result between 0.10 µg/cm<sup>2</sup> and 0.13 µg/cm<sup>2</sup> is considered to be inconclusive - unavoidable coating variations may influence the determination.
6. Unless otherwise stated , the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (w=0) stated in ILAC-G8:09/2019. According to this rule, the judgement of conformity is based on the comparing test results with limits.

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## Analytical flow chart of heavy metal

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

( Cr<sup>6+</sup> test method excluded )

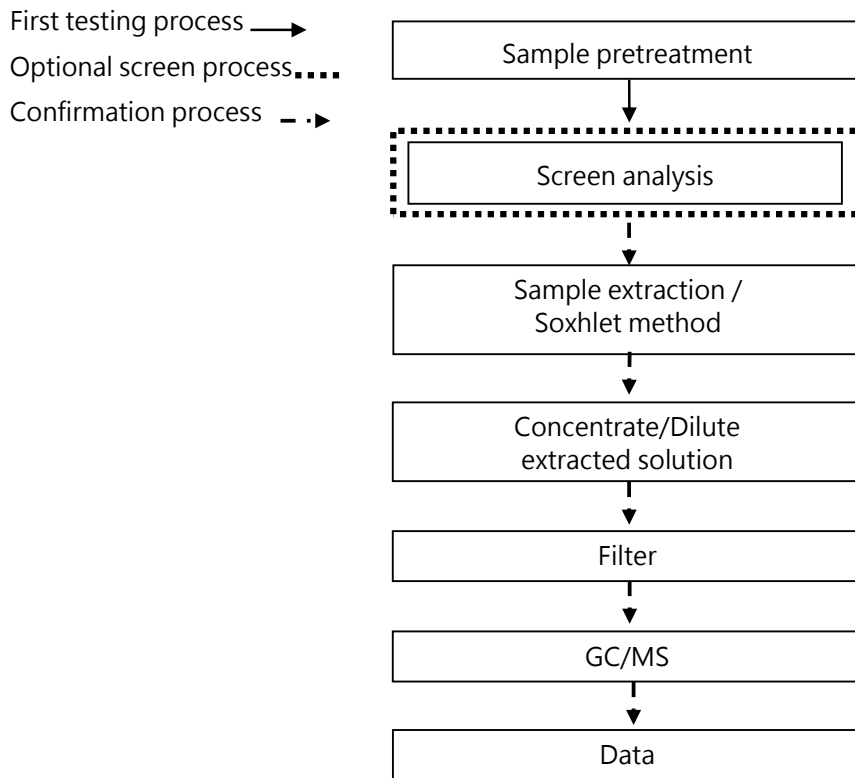


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### Analytical flow chart – PBBs / PBDEs



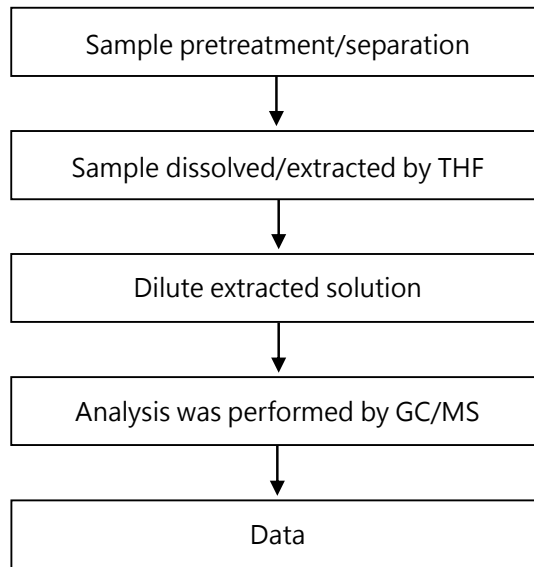
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### Analytical flow chart - Phthalate

【 Test method: IEC 62321-8 】



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

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\*\* End of Report \*\*

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