



Test Report

No.: ETR21A03051

Date: 21-Oct-2021

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MURATA MANUFACTURING CO., LTD.

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

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

Sample Submitted By : MURATA MANUFACTURING CO., LTD.

Sample Name : Electrode ZH_211021

CLIENT REF No : 1211006018

=====
Sample Receiving Date : 13-Oct-2021

Testing Period : 13-Oct-2021 to 21-Oct-2021

Test Requested : As specified by client, to test 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: 63F4087A

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Test Part Description

No.1 : COPPER COLORED FLAKE

Test Result(s)

| Test Item(s) | Method | Unit | MDL | Result |
|---|---|--------------------|-----|--------|
| | | | | No.1 |
| 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) | | mg/kg | 2 | n.d. |
| 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) (#2) | With reference to IEC 62321-7-1: 2015, analysis was performed by UV-VIS. | µg/cm ² | 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. |
| Sum of PBBs | | mg/kg | - | n.d. |
| Monobromodiphenyl ether | With reference to IEC 62321-6: 2015, analysis was performed by GC/MS. | 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. |
| Sum of PBDEs | | mg/kg | - | n.d. |

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| Test Item(s) | Method | Unit | MDL | Result |
|--|---|-------|-----|--------|
| | | | | No.1 |
| 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. |
| Dibutyl phthalate (DBP) (CAS No.: 84-74-2) | | mg/kg | 50 | n.d. |
| Diisobutyl phthalate (DIBP) (CAS No.: 84-69-5) | | mg/kg | 50 | n.d. |
| Di-(2-ethylhexyl) phthalate (DEHP) (CAS No.: 117-81-7) | | mg/kg | 50 | n.d. |

Note :

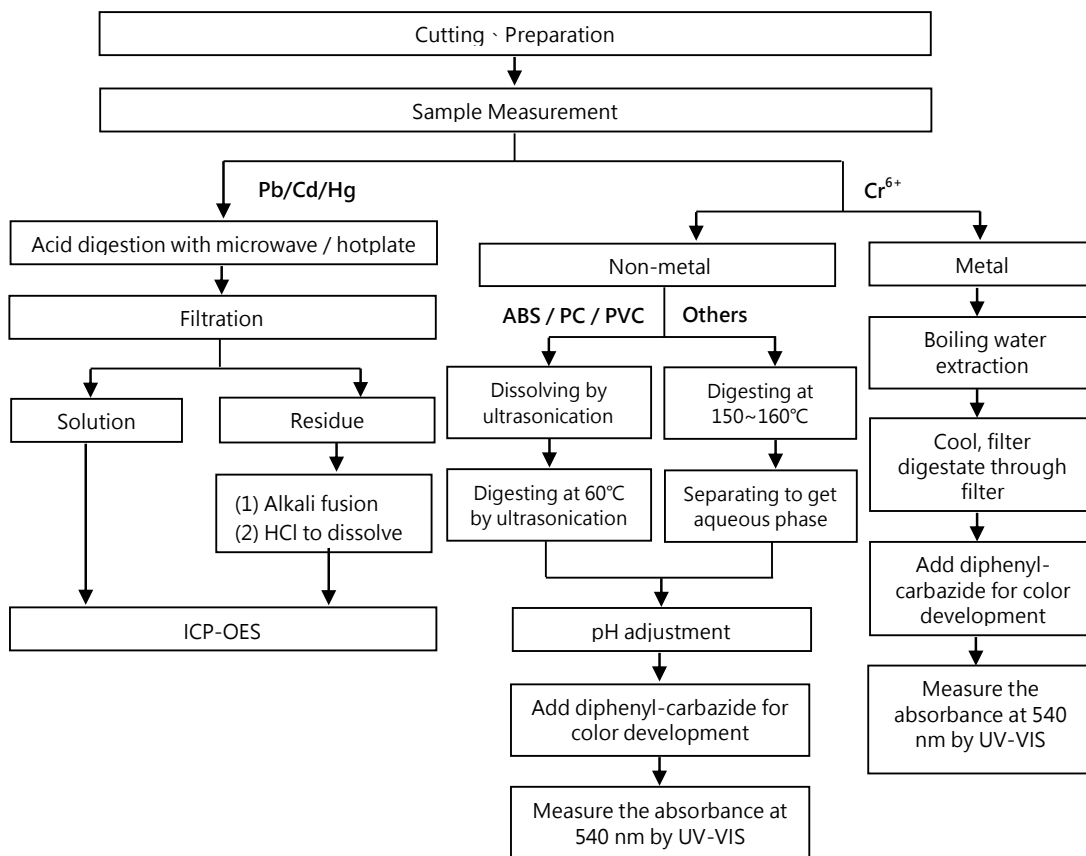
1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected (Less than MDL)
4. "-" = Not Regulated
5. (#2) =
 - a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 $\mu\text{g}/\text{cm}^2$. The sample coating is considered to contain Cr(VI).
 - 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)

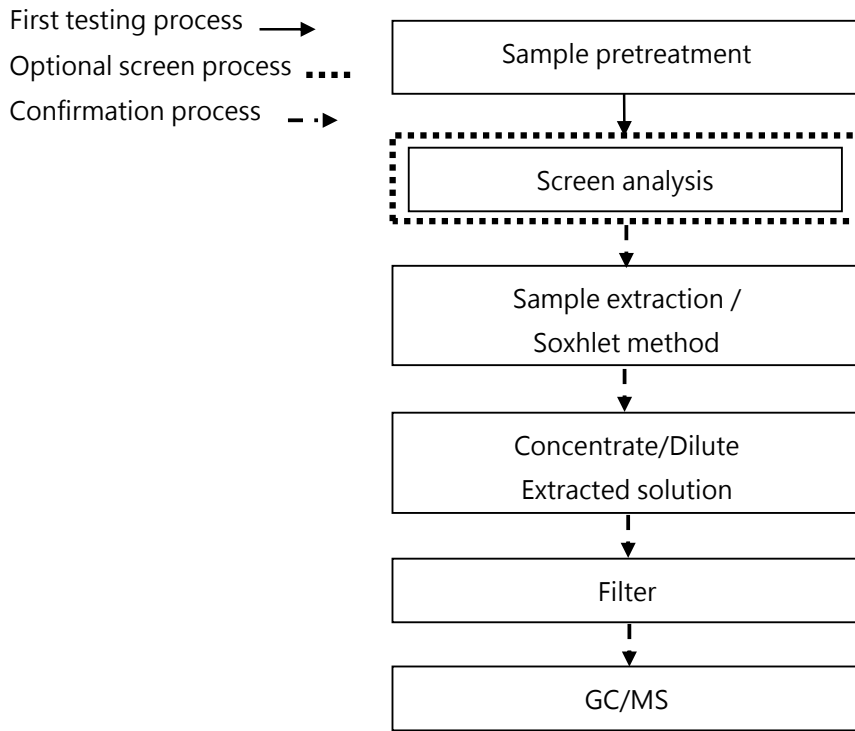


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Analytical flow chart – PBBs / PBDEs



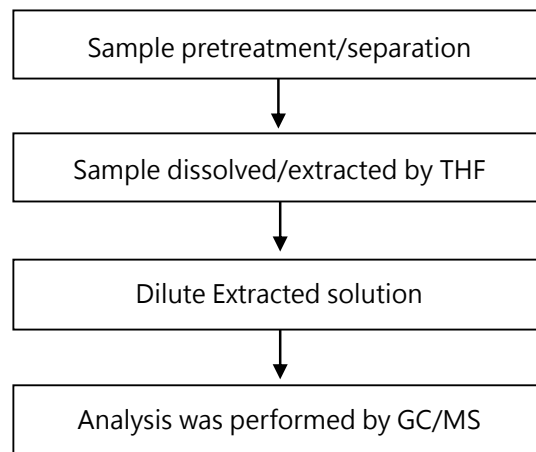
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Analytical flow chart - Phthalate

【Test method: IEC 62321-8】



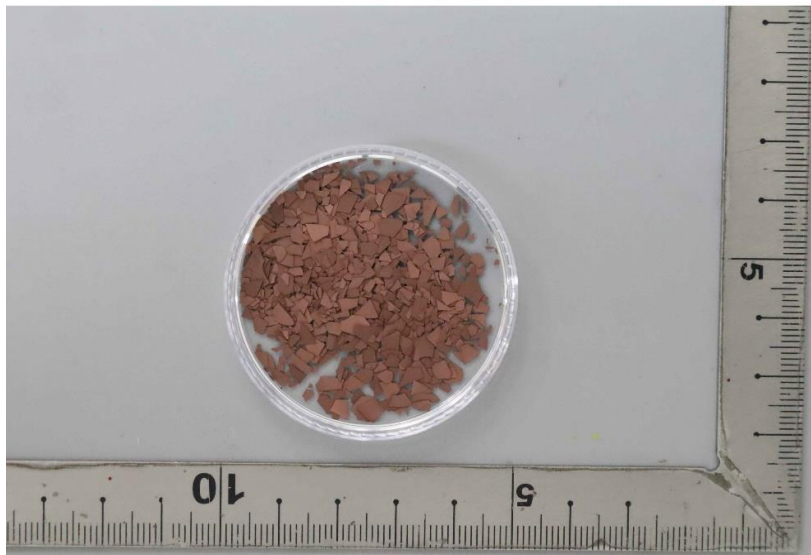
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* The tested sample / part is marked by an arrow if it's shown on the photo. *

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** End of Report **

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