

Test Report

No.: ETR22B02494

Date: 21-Nov-2022

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SHOWA DENKO MATERIALS CO., LTD.
1772-1 KANAKUBO, YUUKI-SHI IBARAKI, 307-0015 JAPAN

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

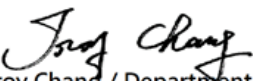
Sample Submitted By : SHOWA DENKO MATERIALS CO., LTD.
Sample Name : EPOXY MOLDING COMPOUND
Style/Item No. : CEL-9200HF SERIES (CEL-9200HF, CEL-9200ZHF, CEL-9200THF, CEL-9200HF9, CEL-9120HF, CEL-9210HF, CEL-9210ZHF, CEL-9220HF, CEL-9220ZHF, CEL-9221HF, E2063, CEL-310, CEL-312)


=====
Sample Receiving Date : 15-Nov-2022
Testing Period : 15-Nov-2022 to 21-Nov-2022

Test Requested : (1) 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).
(2) Please refer to next pages for the other item(s).

Test Results : Please refer to following pages.

Conclusion : (1) 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 / Department Manager
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei



PIN CODE: 6D4E9E92

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Test Part Description

No.1 : DARK GRAY LUMP

Test Result(s)

| Test Item(s) | Method | Unit | MDL | Result | Limit |
|--|---|-------|------|--------|-------|
| | | | | 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. | 100 |
| Lead (Pb) (CAS No.: 7439-92-1) | With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES. | mg/kg | 2 | n.d. | 1000 |
| 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. | 1000 |
| 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. | 1000 |
| 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. | 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. | - | |
| Sum of PBDEs | mg/kg | - | n.d. | 1000 | |

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| Test Item(s) | Method | Unit | MDL | Result | Limit |
|--|---|-------|-----|--------|-------|
| | | | | 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. | 1000 |
| Dibutyl phthalate (DBP) (CAS No.: 84-74-2) | | mg/kg | 50 | n.d. | 1000 |
| Di-(2-ethylhexyl) phthalate (DEHP) (CAS No.: 117-81-7) | | mg/kg | 50 | n.d. | 1000 |
| Diisobutyl phthalate (DIBP) (CAS No.: 84-69-5) | | mg/kg | 50 | n.d. | 1000 |
| Fluorine (F) (CAS No.: 14762-94-8) | With reference to BS EN 14582: 2016, analysis was performed by IC. | mg/kg | 50 | n.d. | - |
| Chlorine (Cl) (CAS No.: 22537-15-1) | | mg/kg | 50 | n.d. | - |
| Bromine (Br) (CAS No.: 10097-32-2) | | mg/kg | 50 | n.d. | - |
| Iodine (I) (CAS No.: 14362-44-8) | | mg/kg | 50 | n.d. | - |
| Antimony (Sb) (CAS No.: 7440-36-0) | With reference to US EPA 3052: 1996, analysis was performed by ICP-OES. | mg/kg | 2 | n.d. | - |

Note :

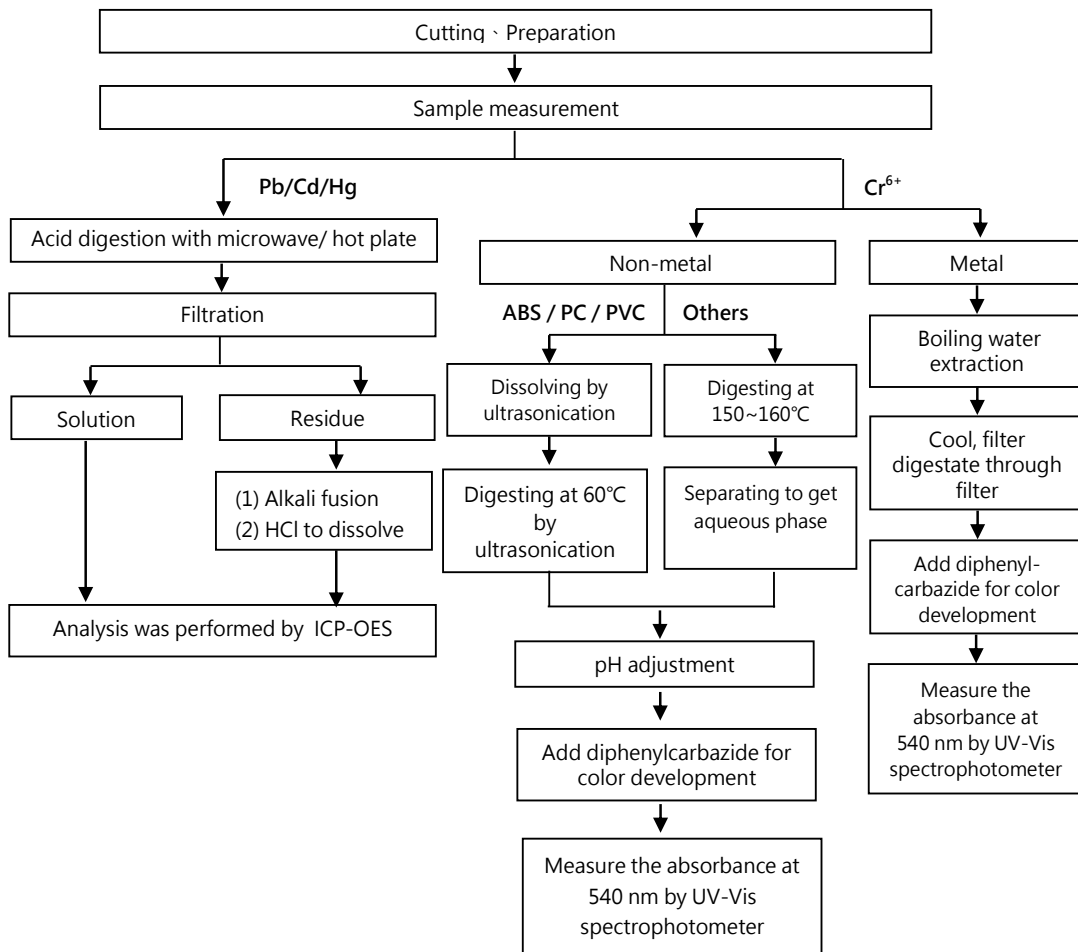
1. mg/kg = ppm ; 0.1wt% = 0.1% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected (Less than MDL)
4. "-" = Not Regulated
5. Unless otherwise stated , the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (w=0) stated in ILAC-G8:09/2019. According 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

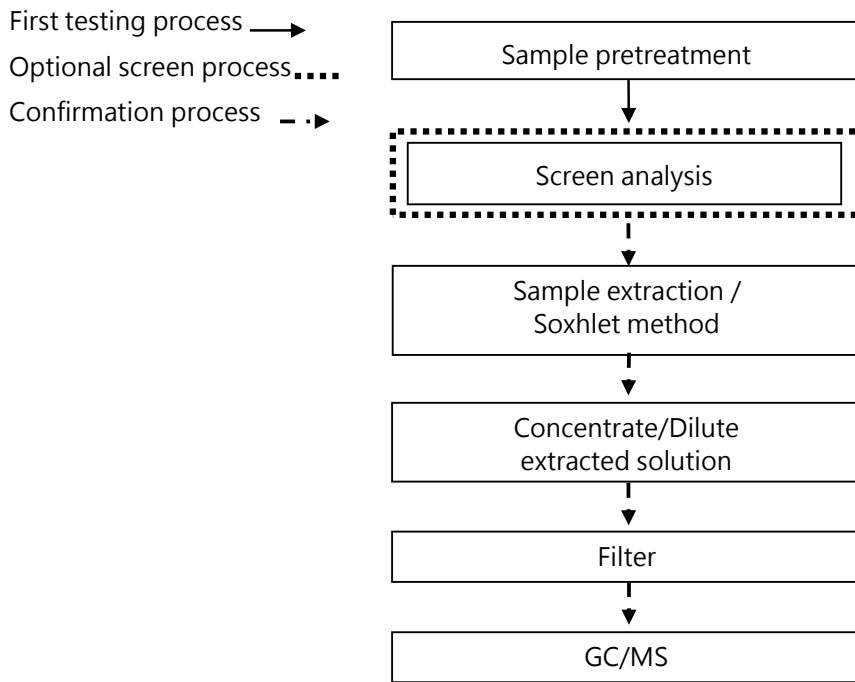
These samples were dissolved totally by pre-conditioning method according to below flow chart.

(Cr⁶⁺ test method excluded)



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Analytical flow chart – PBBs / PBDEs

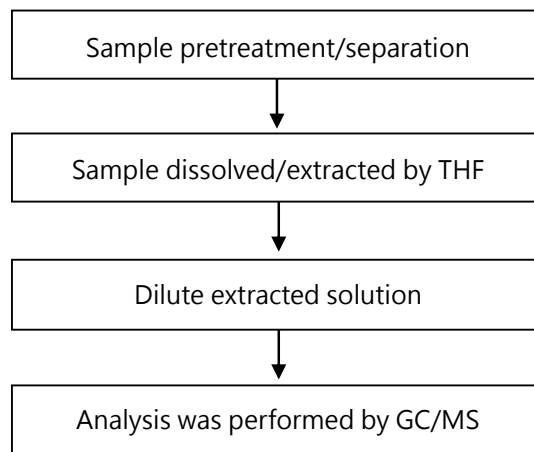


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Analytical flow chart - Phthalate

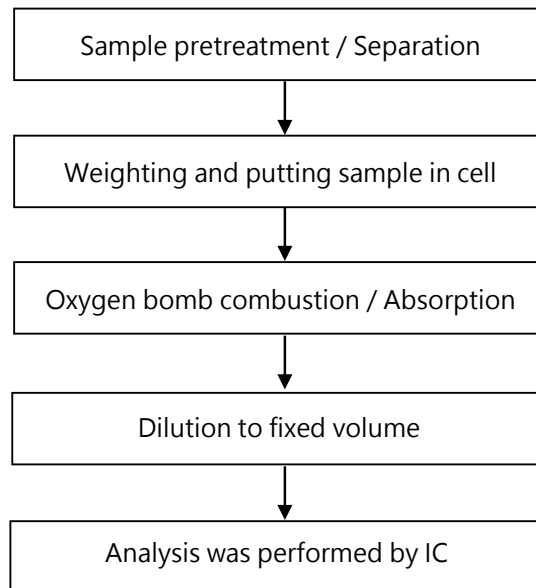
【Test method: IEC 62321-8】

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Analytical flow chart - Halogen

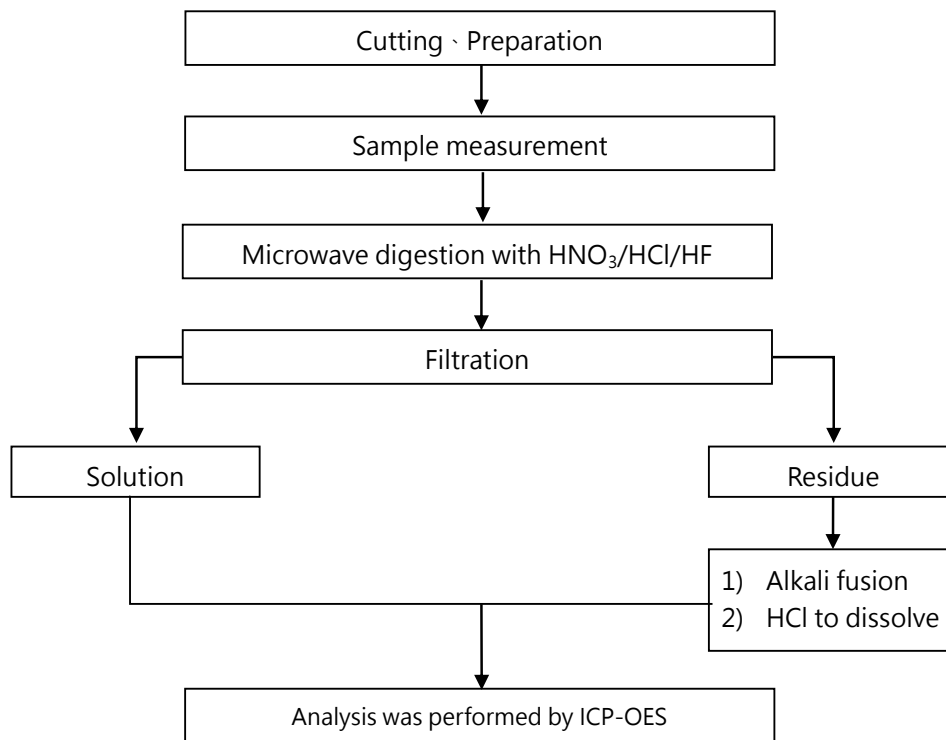


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Analytical flow chart of elements (Heavy metal included)

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

【Reference method : US EPA 3051A 、 US EPA 3052】



* US EPA 3051A method does not add HF.

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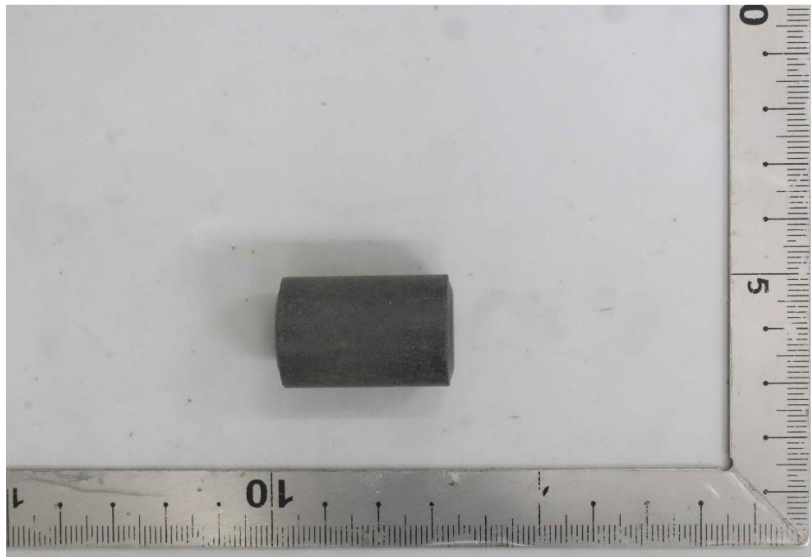
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* The tested sample / part is marked by an arrow if it's shown on the photo. *

ETR22B02494



** End of Report **

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