



Test Report

No.: ETR22100537

Date: 11-Jan-2022

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RICHTEK TECHNOLOGY CORP.

14F, NO. 8, TAIYUEN 1ST., STREET, ZHUBEI CITY, HSINCHU COUNTY, TAIWAN 30288

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

Sample Submitted By : RICHTEK TECHNOLOGY CORP.
Sample Name : RAW MATERIAL ICP DATA --- COPPER WIRE
Style/Item No. : PC/EX1/SGL2/4N/H1/K1/K/ KC1/ RF2/ MAXSOFT ...etc Pd-Cu COPPER WIRE

Sample Receiving Date : 04-Jan-2022
Testing Period : 04-Jan-2022 to 11-Jan-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.


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



PIN CODE: FC7AF6CA

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Test Part Description

No.1 : SILVER COLORED METAL WIRE

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) | With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES. | 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 | | 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) | With reference to IEC 62321-8: 2017, analysis was performed by GC/MS. | mg/kg | 50 | 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. |
| 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. |
| Diisodecyl phthalate (DIDP) (CAS No.: 26761-40-0, 68515-49-1) | With reference to IEC 62321-8: 2017, analysis was performed by GC/MS. | mg/kg | 50 | n.d. |
| Diisononyl phthalate (DINP) (CAS No.: 28553-12-0, 68515-48-0) | With reference to IEC 62321-8: 2017, analysis was performed by GC/MS. | mg/kg | 50 | n.d. |
| Di-n-octyl phthalate (DNOP) (CAS No.: 117-84-0) | With reference to IEC 62321-8: 2017, analysis was performed by GC/MS. | mg/kg | 50 | n.d. |
| Di-ethyl phthalate (DEP) (CAS No.: 84-66-2) | With reference to IEC 62321-8: 2017, analysis was performed by GC/MS. | mg/kg | 50 | n.d. |
| Dimethyl phthalate (DMP) (CAS No.: 131-11-3) | With reference to IEC 62321-8: 2017, analysis was performed by GC/MS. | mg/kg | 50 | n.d. |
| Di-n-pentyl phthalate (DNPP) (CAS No.: 131-18-0) | With reference to IEC 62321-8: 2017, analysis was performed by GC/MS. | mg/kg | 50 | n.d. |
| 1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP) (CAS No.: 71888-89-6) | With reference to IEC 62321-8: 2017, analysis was performed by GC/MS. | mg/kg | 50 | n.d. |
| Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α - HBCDD, β - HBCDD, γ - HBCDD) (CAS No.: 25637-99-4, 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8)) | With reference to IEC 62321: 2008, analysis was performed by GC/MS. | mg/kg | 5 | n.d. |
| 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 3050B: 1996, analysis was performed by ICP-OES. | mg/kg | 2 | n.d. |

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| Test Item(s) | Method | Unit | MDL | Result |
|-------------------------------------|--|-------|-----|----------|
| | | | | No.1 |
| Beryllium (Be) (CAS No.: 7440-41-7) | With reference to US EPA 3050B: 1996, analysis was performed by ICP-OES. | mg/kg | 2 | n.d. |
| Red Phosphorus | Analysis was performed by Pyrolyzer-GC/MS. | ** | - | Negative |

Note :

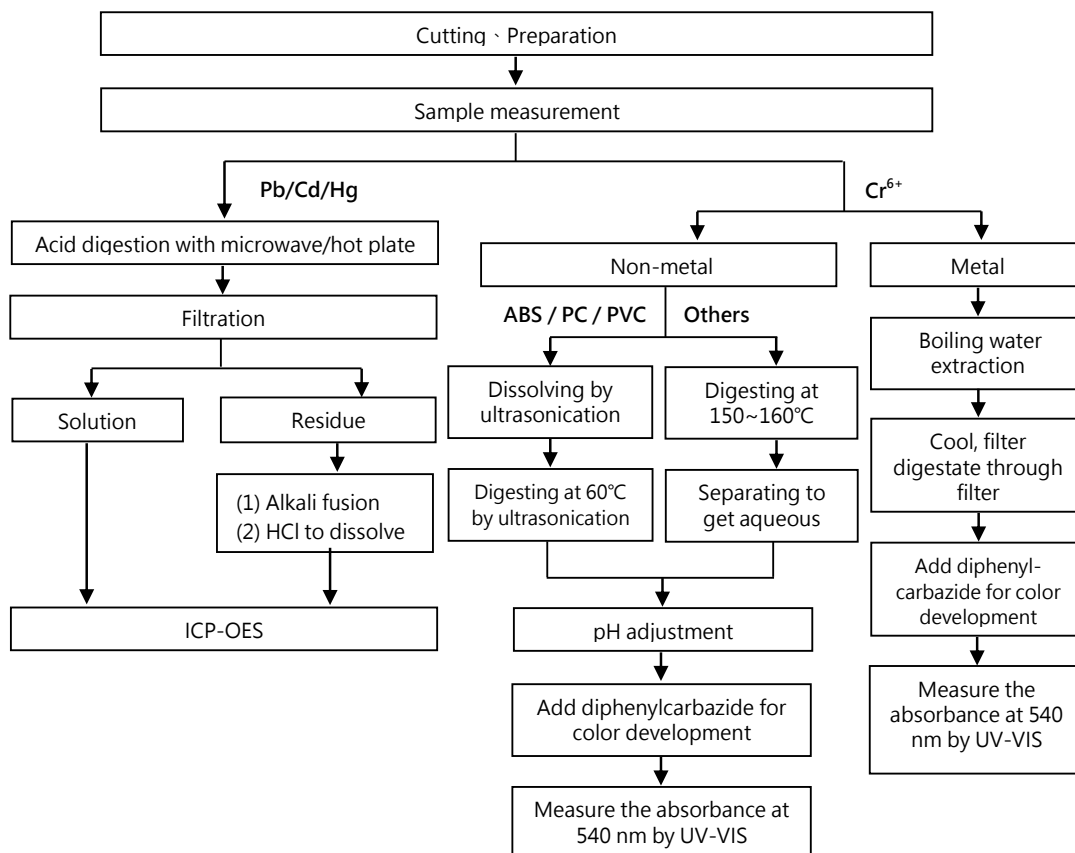
1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected (Less than MDL)
4. "-" = Not Regulated
5. ** = Qualitative analysis (No Unit)
6. Negative = Undetectable ; Positive = Detectable
7. (#2) =
 - a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater 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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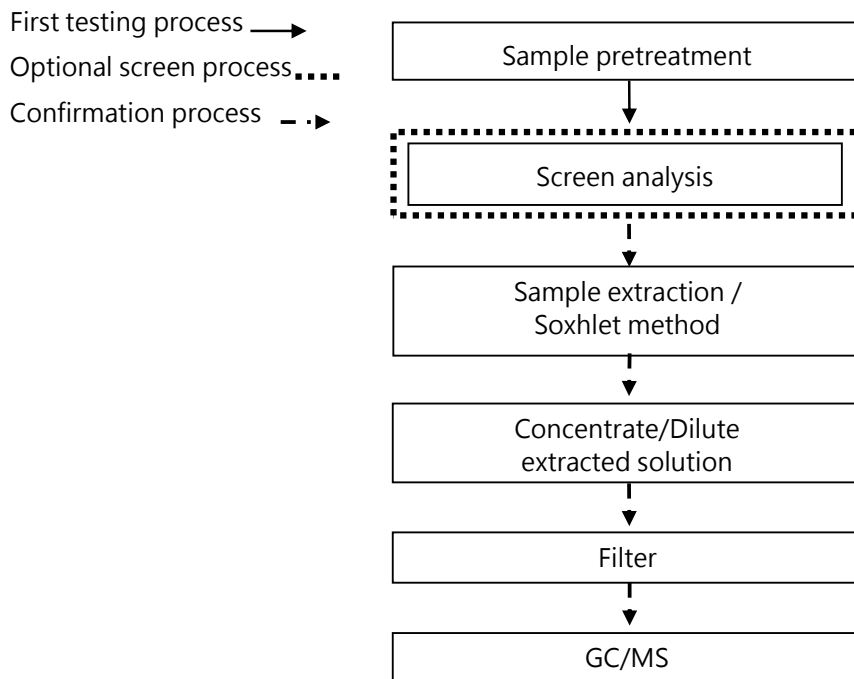
Analytical flow chart of Heavy Metal

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

(Cr^{6+} test method excluded)



Analytical flow chart – PBBs / PBDEs



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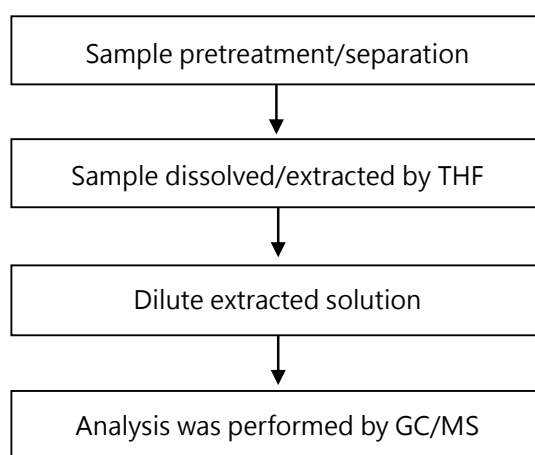
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Analytical flow chart - Phthalate

【Test method: IEC 62321-8】



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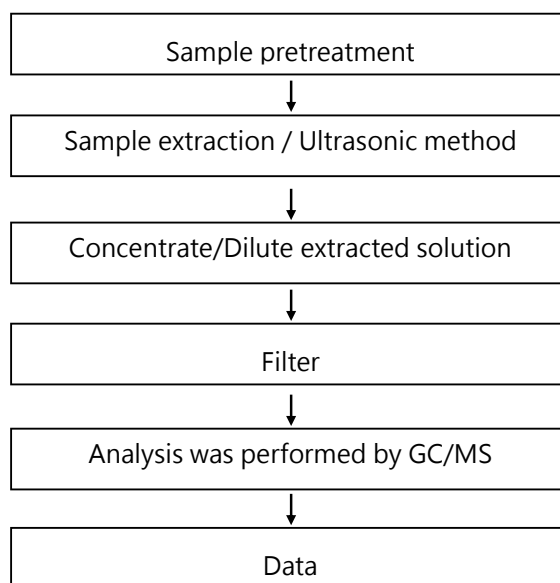
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Analytical flow chart - HBCDD



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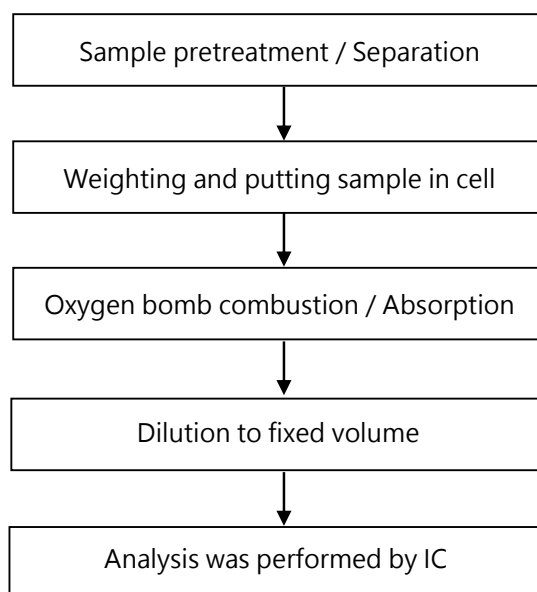
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Analytical flow chart - Halogen



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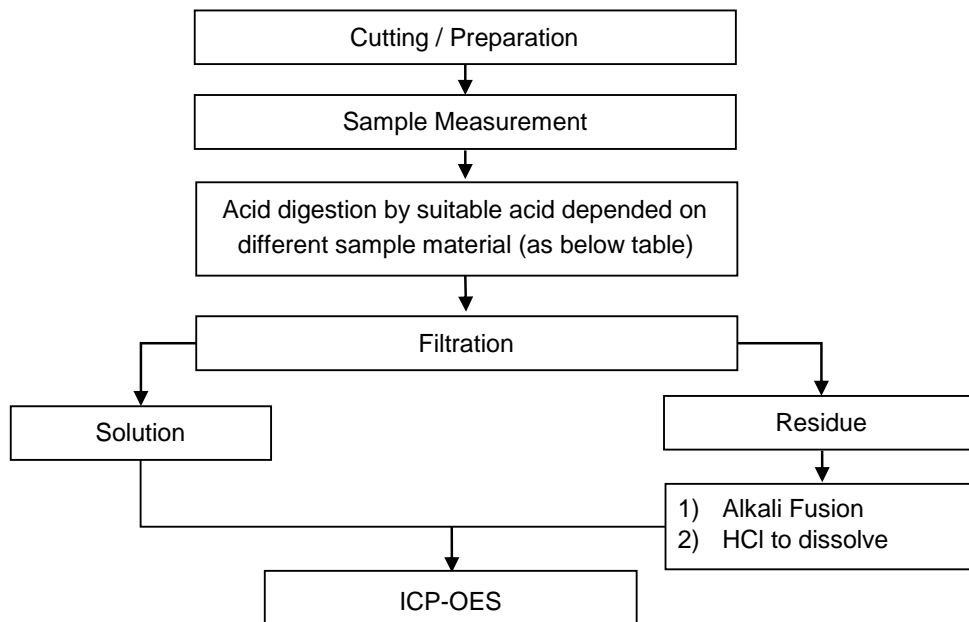
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Flow Chart of digestion for the elements analysis performed by ICP-OES

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



| | |
|------------------------------------|---|
| Steel, copper, aluminum, solder | Aqua regia, HNO ₃ , HCl, HF, H ₂ O ₂ |
| Glass | HNO ₃ /HF |
| Gold, platinum, palladium, ceramic | Aqua regia |
| Silver | HNO ₃ |
| Plastic | H ₂ SO ₄ , H ₂ O ₂ , HNO ₃ , HCl |
| Others | Added appropriate reagent to total digestion |

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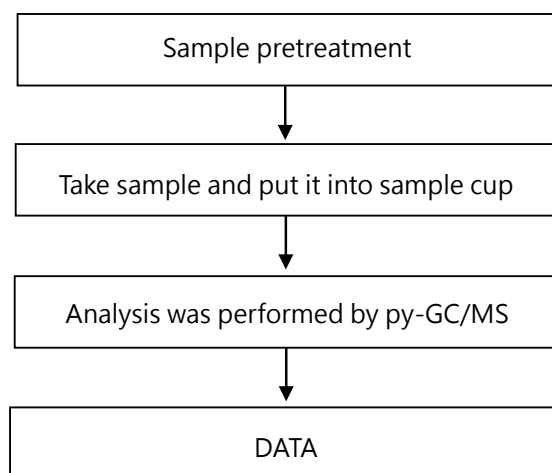
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Analytical flow chart - Red phosphorus



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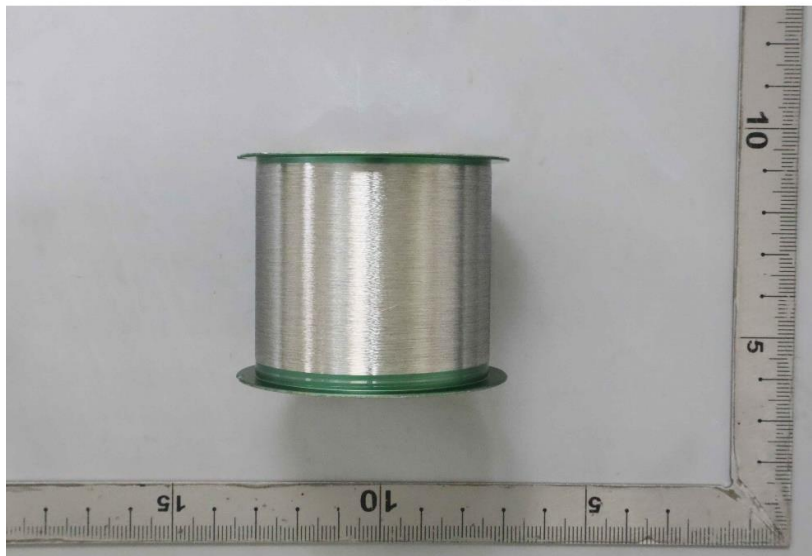
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* The tested sample / part is marked by an arrow if it's shown on the photo. *

ETR22100537



** End of Report **

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