

## Test Report

No. : KA/2019/B0852

Date : 2019/11/15

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SUMITOMO BAKELITE (TAIWAN) CO., LTD.

NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

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

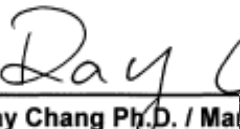
Sample Submitted By : SUMITOMO BAKELITE (TAIWAN) CO., LTD.  
Sample Description : EPOXY MOLDING COMPOUND  
Style/Item No. : EME-G700SLA SERIES  
Sample Receiving Date : 2019/11/11  
Testing Period : 2019/11/11 to 2019/11/15

=====  
**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 Result(s)** : Please refer to next page(s).

**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.

  
Ray Chang Ph.D. / Manager  
Signed for and on behalf of  
SGS Taiwan Limited  
Chemical Laboratory-Kaohsiung  


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SUMITOMO BAKELITE (TAIWAN) CO., LTD.

NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

## Test Result(s)

PART NAME NO.1 : BLACK EPOXY MOLDING COMPOUND

| Test Item (s)              | Unit  | Method  | MDL  | Result | Limit |      |
|----------------------------|-------|---|--|--------|-------|------|
|                            |       |   |  | No.1   |       |      |
| Cadmium (Cd)               | mg/kg | With reference to IEC 62321-5: 2013 and performed by ICP-OES.           | 2  | n.d.   | 100   |      |
| Lead (Pb)                  | mg/kg | With reference to IEC 62321-5: 2013 and performed by ICP-OES.           | 2  | n.d.   | 1000  |      |
| Mercury (Hg)               | mg/kg | With reference to IEC 62321-4:2013+ AMD1:2017 and performed by ICP-OES. | 2  | n.d.   | 1000  |      |
| Hexavalent Chromium Cr(VI) | mg/kg | With reference to IEC 62321-7-2:2017 and performed by UV-VIS.           | 8  | n.d.   | 1000  |      |
| <b>Sum of PBBs</b>         | mg/kg | With reference to IEC 62321-6:2015 and performed by GC/MS.              | -  | n.d.   | 1000  |      |
| Monobromobiphenyl          | 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 PBDEs</b>        | mg/kg |   | With reference to IEC 62321-6:2015 and performed by GC/MS. | -      | 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.   | -      |       |      |

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SUMITOMO BAKELITE (TAIWAN) CO., LTD.

NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

| Test Item (s)  | Unit  | Method   | MDL | Result | Limit |
|--|-------|--|-----|--------|-------|
|  |       |  |     | No.1   |       |
| Antimony (Sb)  | mg/kg | With reference to US EPA 3052: 1996.<br>Analysis was performed by ICP-OES. | 2   | n.d.   | -     |
| Beryllium (Be)   | mg/kg | With reference to US EPA 3052: 1996.<br>Analysis was performed by ICP-OES. | 2   | n.d.   | -     |
| Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified ( $\alpha$ -HBCDD, $\beta$ -HBCDD, $\gamma$ -HBCDD) (CAS No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8)) | mg/kg | With reference to IEC 62321: 2008.<br>Analysis was performed by GC/MS.     | 5   | n.d.   | -     |
| PFOA (CAS No.: 335-67-1)   | mg/kg | With reference to US EPA 3550C: 2007.<br>Analysis was performed by LC/MS.  | 10  | n.d.   | -     |
| Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)  | mg/kg | With reference to US EPA 3550C: 2007.<br>Analysis was performed by LC/MS.  | 10  | n.d.   | -     |
| <b>Halogen</b>   |       |  |     |        |       |
| Halogen-Fluorine (F) (CAS No.: 14762-94-8)   | mg/kg | With reference to BS EN 14582:2016.<br>Analysis was performed by IC.       | 50  | n.d.   | -     |
| Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)  | mg/kg | With reference to BS EN 14582:2016.<br>Analysis was performed by IC.       | 50  | n.d.   | -     |
| Halogen-Bromine (Br) (CAS No.: 10097-32-2)   | mg/kg | With reference to BS EN 14582:2016.<br>Analysis was performed by IC.       | 50  | n.d.   | -     |
| Halogen-Iodine (I) (CAS No.: 14362-44-8)   | mg/kg | With reference to BS EN 14582:2016.<br>Analysis was performed by IC.       | 50  | n.d.   | -     |
| <b>Phthalates</b>  |       |  |     |        |       |
| DBP (Dibutyl phthalate) (CAS No.: 84-74-2)   | mg/kg | With reference to IEC 62321-8:2017.<br>Analysis was performed by GC/MS.    | 50  | n.d.   | 1000  |
| DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)  | mg/kg | With reference to IEC 62321-8:2017.<br>Analysis was performed by GC/MS.    | 50  | n.d.   | 1000  |
| DIPP (Diisopentyl Phthalat) (CAS No.: 605-50-5)  | mg/kg | With reference to IEC 62321-8:2017.<br>Analysis was performed by GC/MS.    | 50  | n.d.   | -     |
| DINP (Di-isononyl phthalate) (CAS No.: 28553-12-0, 68515-48-0)   | mg/kg | With reference to IEC 62321-8:2017.<br>Analysis was performed by GC/MS.    | 50  | n.d.   | -     |
| DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)  | mg/kg | With reference to IEC 62321-8:2017.<br>Analysis was performed by GC/MS.    | 50  | n.d.   | -     |

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NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

| Test Item (s)   | Unit  | Method   | MDL | Result | Limit |
|---|-------|--|-----|--------|-------|
|   |       |  |     | No.1   |       |
| DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)   | mg/kg | With reference to IEC 62321-8:2017. Analysis was performed by GC/MS. | 50  | n.d.   | 1000  |
| DNHP (Di-n-hexyl phthalate) (CAS No.: 84-75-3)  | mg/kg | With reference to IEC 62321-8:2017. Analysis was performed by GC/MS. | 50  | n.d.   | -     |
| DMEP (Bis (2-methoxyethyl) phthalate) (CAS No.: 117-82-8)   | mg/kg | With reference to IEC 62321-8:2017. Analysis was performed by GC/MS. | 50  | n.d.   | -     |
| DPP (Di-pentyl phthalate) (CAS No.: 131-18-0)   | mg/kg | With reference to IEC 62321-8:2017. Analysis was performed by GC/MS. | 50  | n.d.   | -     |
| DIHP (1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich) (CAS No.: 71888-89-6)     | mg/kg | With reference to IEC 62321-8:2017. Analysis was performed by GC/MS. | 50  | n.d.   | -     |
| DHNUP (1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters) (CAS No.: 68515-42-4) | mg/kg | With reference to IEC 62321-8:2017. Analysis was performed by GC/MS. | 50  | n.d.   | -     |
| DIDP (Di-isodecyl phthalate) (CAS No.: 26761-40-0; 68515-49-1)  | mg/kg | With reference to IEC 62321-8:2017. Analysis was performed by GC/MS. | 50  | n.d.   | -     |
| BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)   | mg/kg | With reference to IEC 62321-8:2017. Analysis was performed by GC/MS. | 50  | n.d.   | 1000  |

**Note :**

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. " - " = Not Regulated

**PFOS Reference Information : POPs - (EU) 2019/1021**

Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above 1µg/m<sup>2</sup>. PFOS refer to Perfluorooctanesulfonic acid and its derivatives including Perfluorooctanesulfonic acid, Perfluorooctane sulfonamide, N-Methylperfluorooctane sulfonamide, N-Ethylperfluorooctane sulfonamide, N-Methylperfluorooctane sulfonamidoethanol and N-Ethylperfluorooctane sulfonamidoethanol.

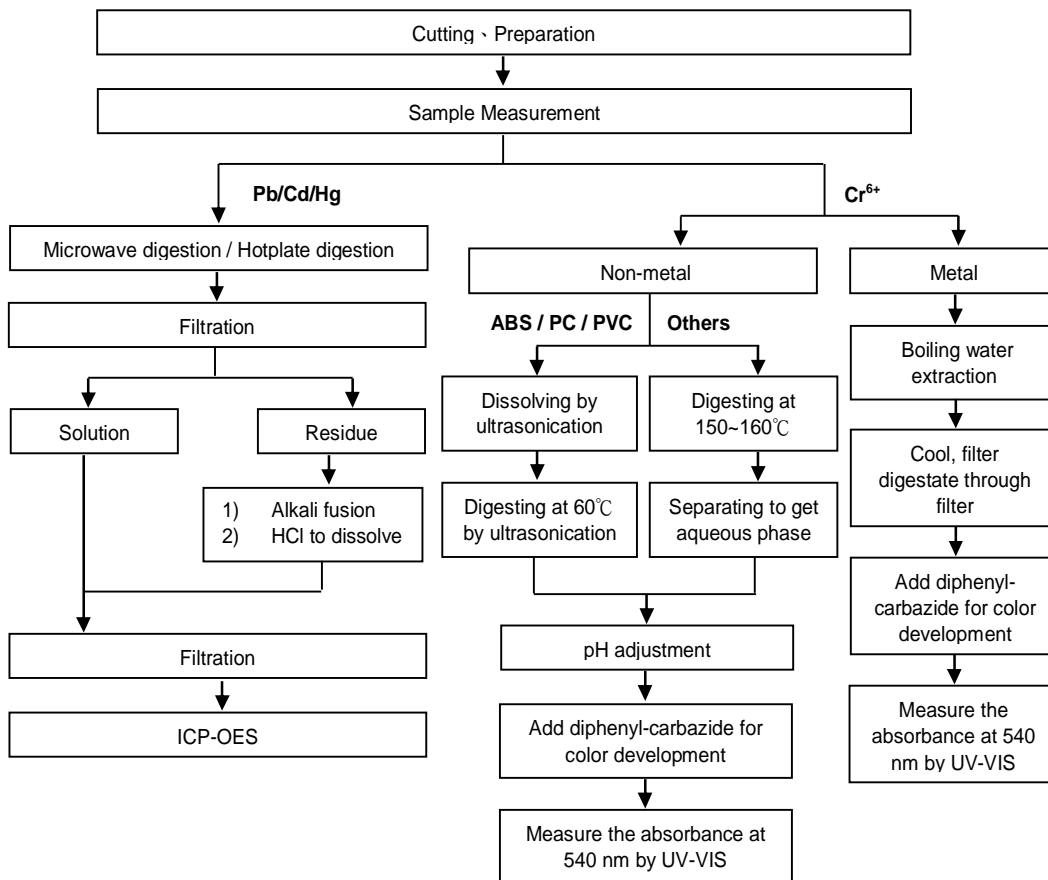
SUMITOMO BAKELITE (TAIWAN) CO., LTD.

NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

### 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)

- Technician: Jony Liu
- Supervisor: Ray Chang

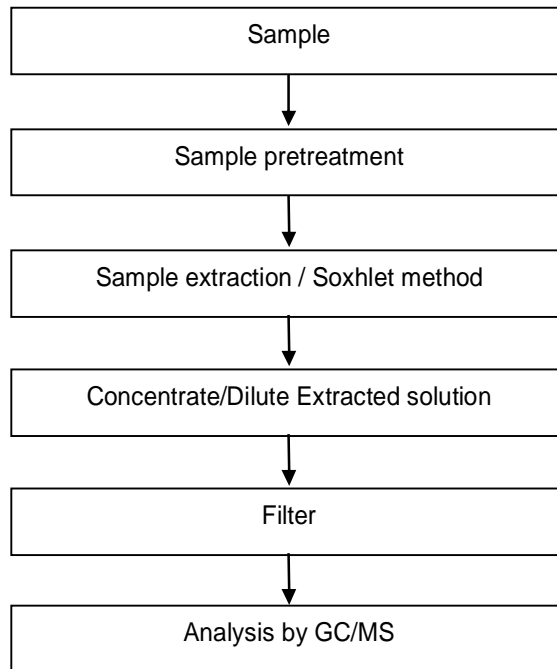


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### PBB/PBDE analytical FLOW CHART

- Technician : Dorothy Chen
- Supervisor: Ray Chang



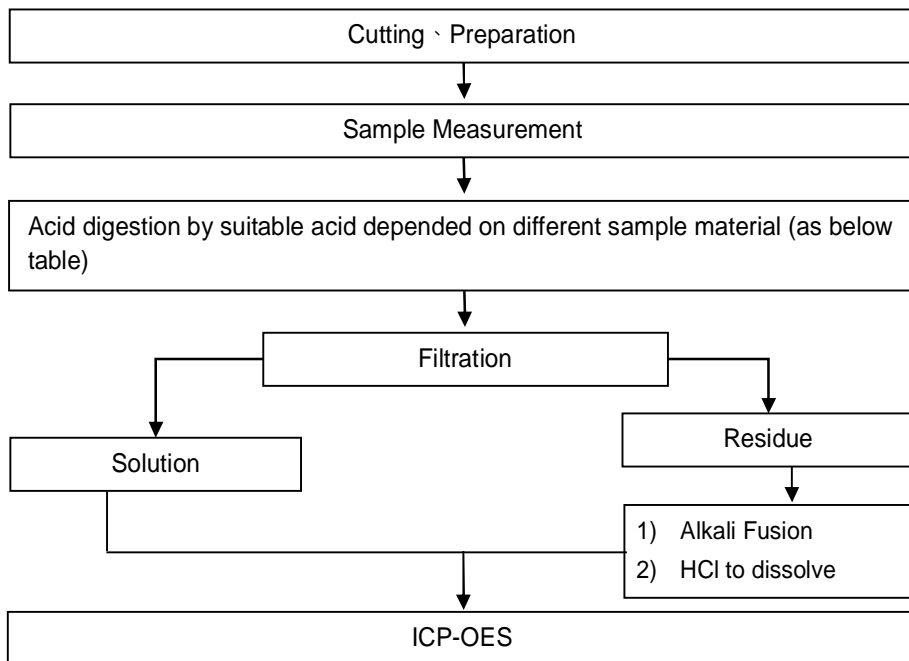
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### Flow Chart of digestion for the elements analysis performed by ICP-OES

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

- Technician: Jony Liu
- Supervisor: Ray Chang



| ICP-OES                            |   |
|------------------------------------|---|
| Steel, copper, aluminum, solder    | Aqua regia, HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub>                   |
| Glass                              | HNO <sub>3</sub> /HF  |
| Gold, platinum, palladium, ceramic | Aqua regia  |
| Silver                             | HNO <sub>3</sub>  |
| Plastic                            | H <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> O <sub>2</sub> , HNO <sub>3</sub> , HCl |
| Others                             | Any acid to total digestion   |

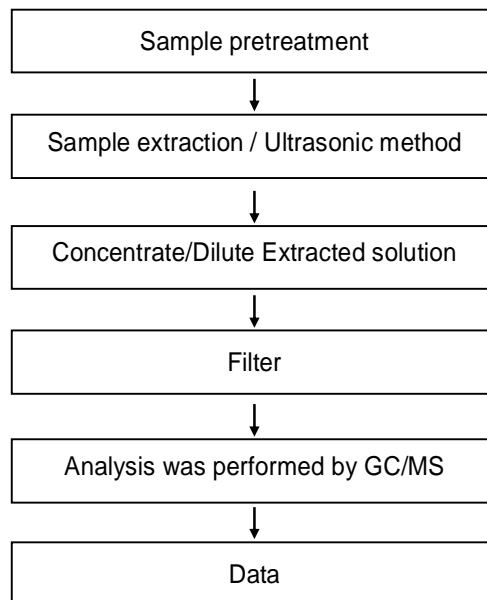
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### HBCDD analytical flow chart

- Technician : Dorothy Chen
- Supervisor: Ray Chang



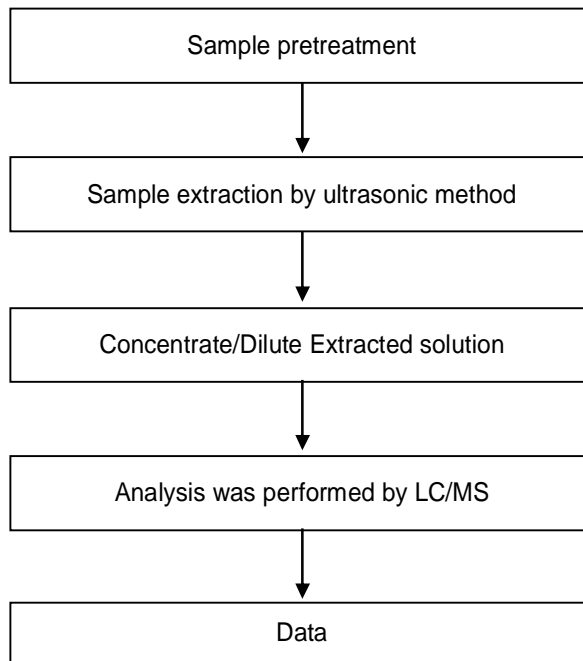


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NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

### Analytical flow chart of PFOA/PFOS content

- Technician : Ginny Huang
- Supervisor: Ray Chang



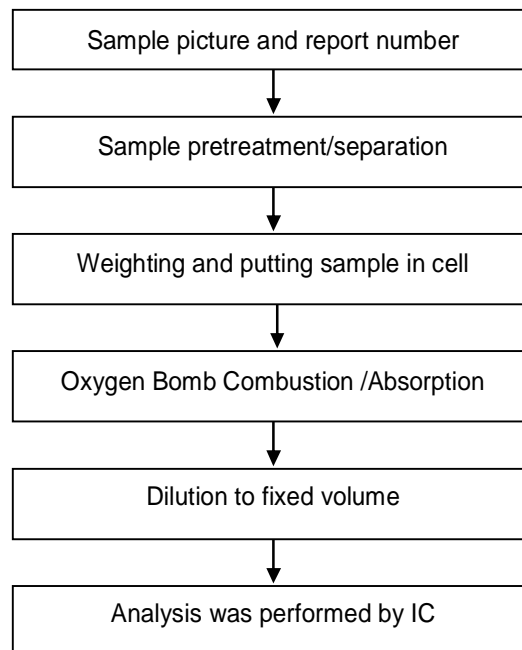
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### Analytical flow chart of halogen content

- Technician : Jean Hung
- Supervisor: Ray Chang



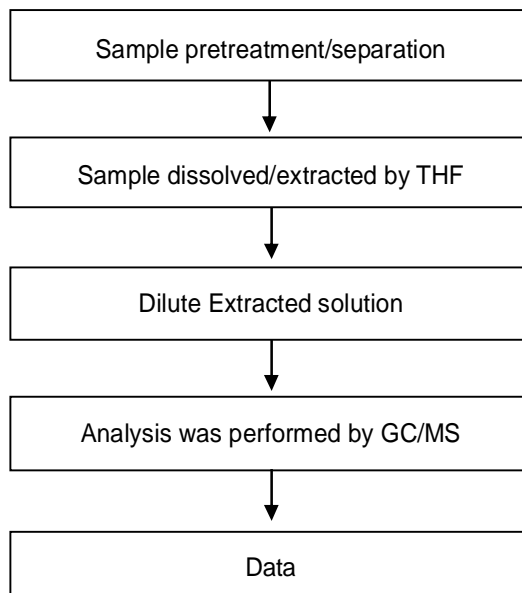
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NO. 1, HWA SYI RD., TA FA INDUSTRIAL DISTRICT, TA LIAO, KAOHSIUNG, TAIWAN

### Analytical flow chart of phthalate content

- Technician: Dorothy Chen
- Supervisor: Ray Chang

#### 【Test method: IEC 62321-8】



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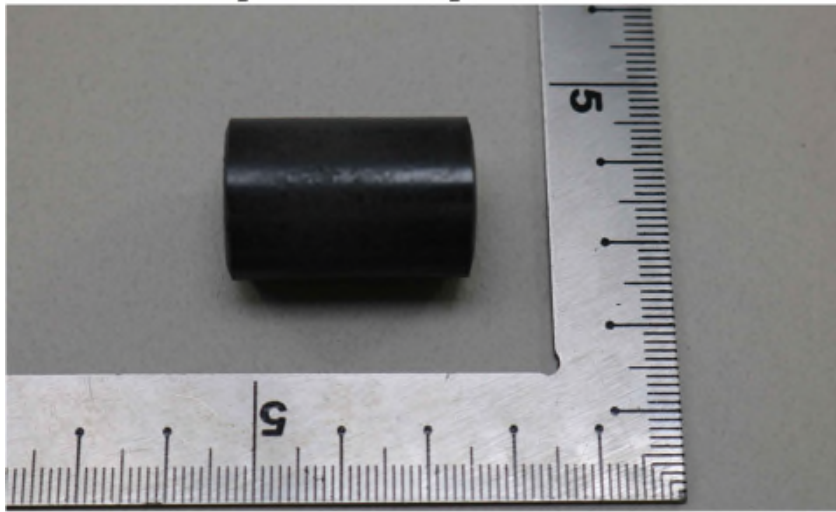
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\* The tested sample / part is marked by an arrow if it's shown on the photo. \*

### KA/2019/B0852



\*\* End of Report \*\*