

Test Report

No.: ETR22B02488

Date: 21-Nov-2022

Page: 1 of 9

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-9240HF SERIES (CEL-9240HF, CEL-9240ZHF, CEL-8240HF,
CEL-9240HF10SL, CEL-9040HF)

=====
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: AF4BF599

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

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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No.: ETR22B02488

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SHOWA DENKO MATERIALS CO., LTD.

1772-1 KANAKUBO, YUUKI-SHI IBARAKI, 307-0015 JAPAN

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 :

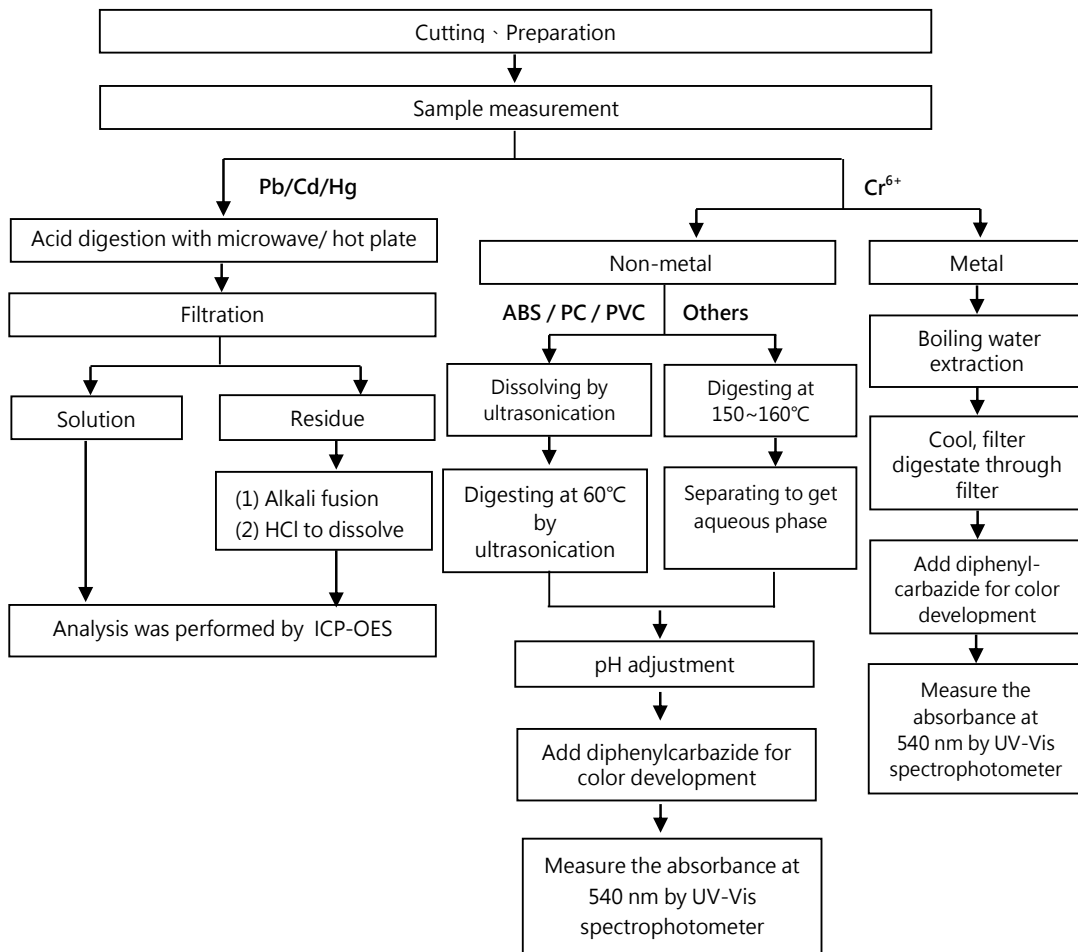
1. mg/kg = ppm ; 0.1wt% = 0.1% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected (Less than MDL)
4. "-" = Not Regulated
5. Unless otherwise stated , the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (w=0) stated in ILAC-G8:09/2019. According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

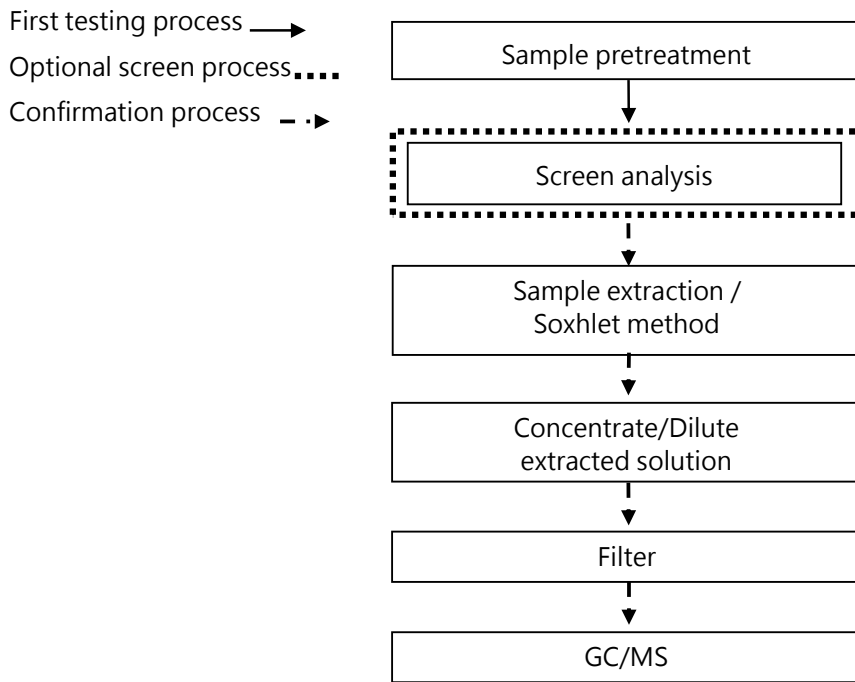
These samples were dissolved totally by pre-conditioning method according to below flow chart.

(Cr⁶⁺ test method excluded)



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Analytical flow chart – PBBs / PBDEs



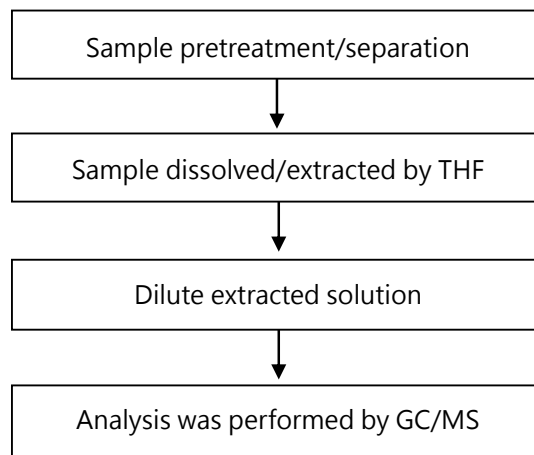
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SHOWA DENKO MATERIALS CO., LTD.

1772-1 KANAKUBO, YUUKI-SHI IBARAKI, 307-0015 JAPAN

Analytical flow chart - Phthalate

【Test method: IEC 62321-8】

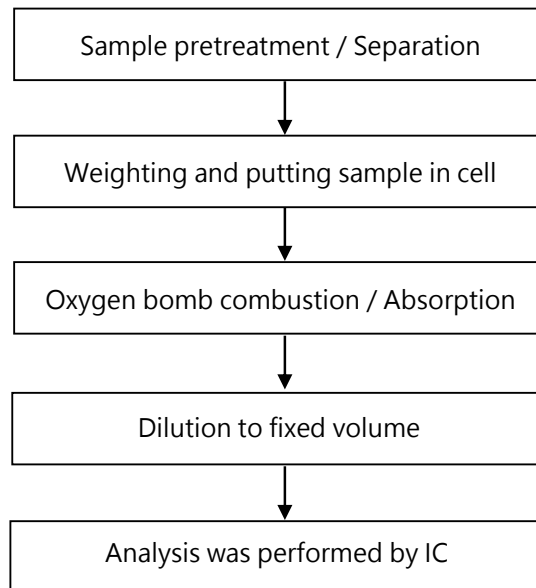


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Analytical flow chart - Halogen

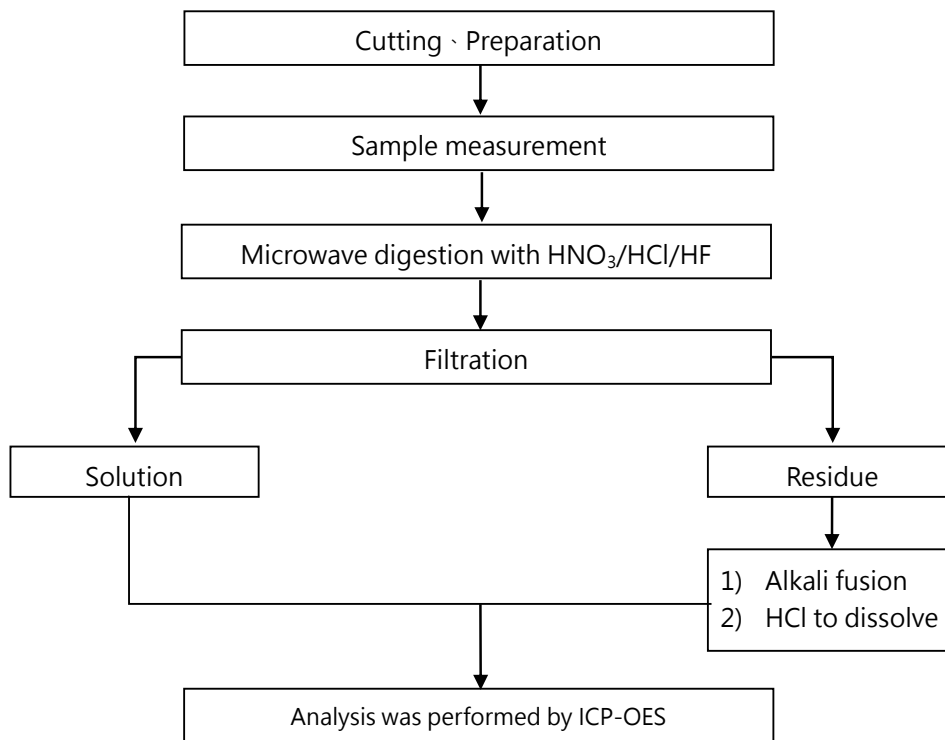


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Analytical flow chart of elements (Heavy metal included)

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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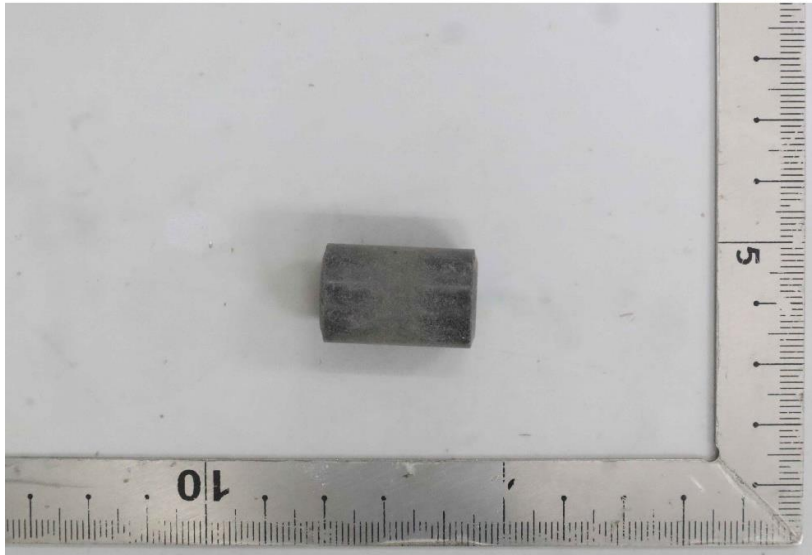
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SHOWA DENKO MATERIALS CO., LTD.

1772-1 KANAKUBO, YUUKI-SHI IBARAKI, 307-0015 JAPAN

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

ETR22B02488



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1772-1 KANAKUBO, YUUKI-SHI IBARAKI, 307-0015 JAPAN

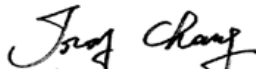
The following sample(s) was/were submitted and identified by the applicant as:


Sample Submitted By : SHOWA DENKO MATERIALS CO., LTD.
Sample Name : EPOXY MOLDING COMPOUND
Style/Item No. : CEL-9240HF SERIES (CEL-9240HF, CEL-9240ZHF, CEL-8240HF,
CEL-9240HF10SL, CEL-9040HF)

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

Test Requested : Testing item(s) is/are specified by client. Please refer to result table for testing item(s).

Test Results : Please refer to following pages.


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



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

Test Part Description

No.1 : DARK GRAY LUMP

Test Result(s)

Test Item(s)	Method	Unit	MDL	Result
				No.1
PFOS and its salts (CAS No.: 1763-23-1 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.
PFOA and its salts (CAS No.: 335-67-1 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.

Note :

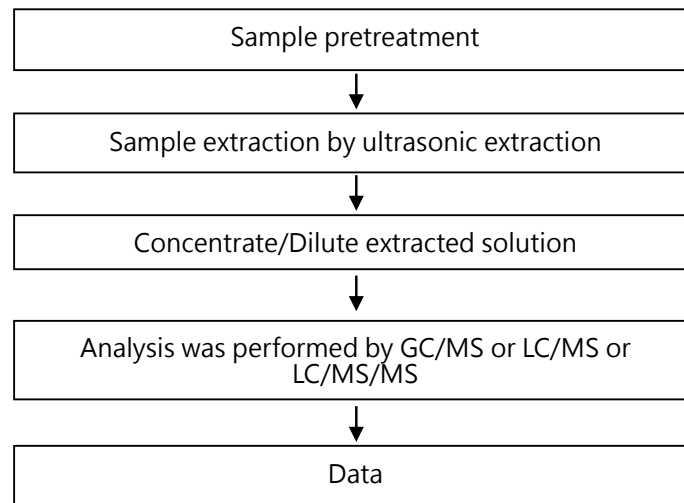
1. mg/kg = ppm ; 0.1wt% = 0.1% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected (Less than MDL)
4. PFOS and its salts including :
CAS No.: 1763-23-1, 2795-39-3, 29457-72-5, 29081-56-9, 70225-14-8, 56773-42-3, 251099-16-8, 307-35-7, 91036-71-4, 4021-47-0 and others.
5. PFOA and its salts including :
CAS No.: 335-67-1, 335-95-5, 2395-00-8, 335-93-3, 335-66-0, 3825-26-1 and others.

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SHOWA DENKO MATERIALS CO., LTD.

1772-1 KANAKUBO, YUUKI-SHI IBARAKI, 307-0015 JAPAN

Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)



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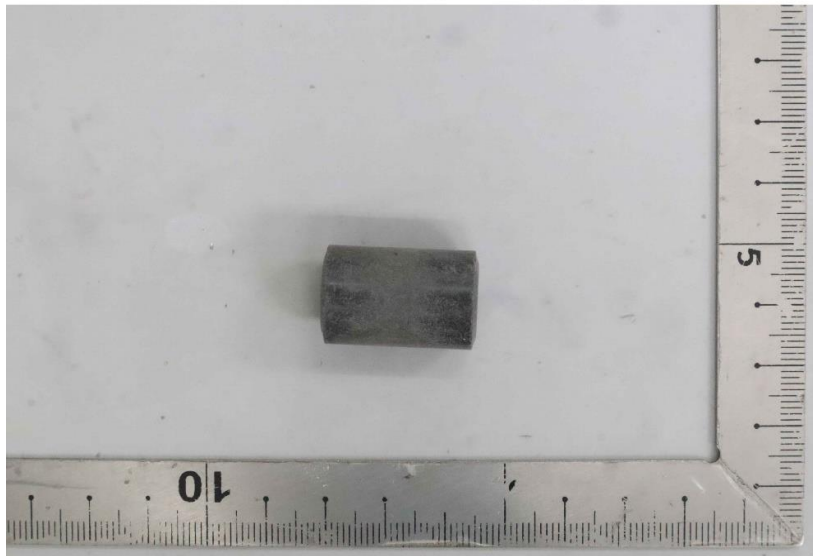
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SHOWA DENKO MATERIALS CO., LTD.

1772-1 KANAKUBO, YUUKI-SHI IBARAKI, 307-0015 JAPAN

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

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SHOWA DENKO MATERIALS CO., LTD.
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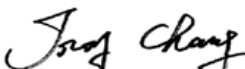
The following sample(s) was/were submitted and identified by the applicant as:


Sample Submitted By : SHOWA DENKO MATERIALS CO., LTD.
Sample Name : EPOXY MOLDING COMPOUND
Style/Item No. : CEL-9240HF SERIES (CEL-9240HF, CEL-9240ZHF, CEL-8240HF,
CEL-9240HF10SL, CEL-9040HF)

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

Test Requested : Testing item(s) is/are specified by client. Please refer to result table for testing item(s).

Test Results : Please refer to following pages.


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



PIN CODE: DB4140A0

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SHOWA DENKO MATERIALS CO., LTD.

1772-1 KANAKUBO, YUUKI-SHI IBARAKI, 307-0015 JAPAN

Test Part Description

No.1 : DARK GRAY LUMP

Test Result(s)

Test Item(s)	Method	Unit	MDL	Result
				No.1
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.
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.

Note :

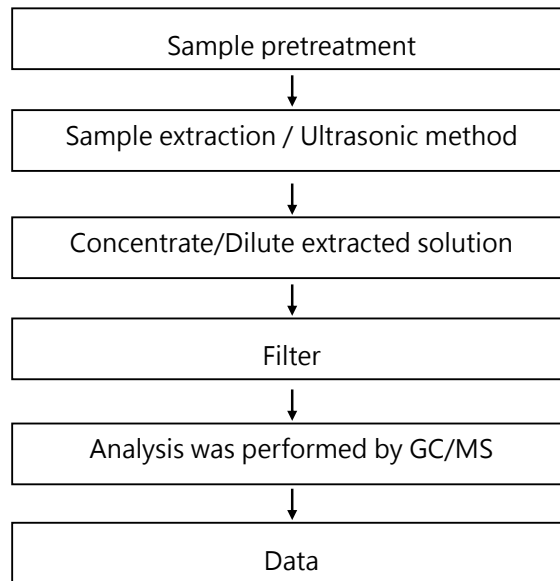
1. mg/kg = ppm ; 0.1wt% = 0.1% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected (Less than MDL)

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SHOWA DENKO MATERIALS CO., LTD.

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Analytical flow chart - HBCDD



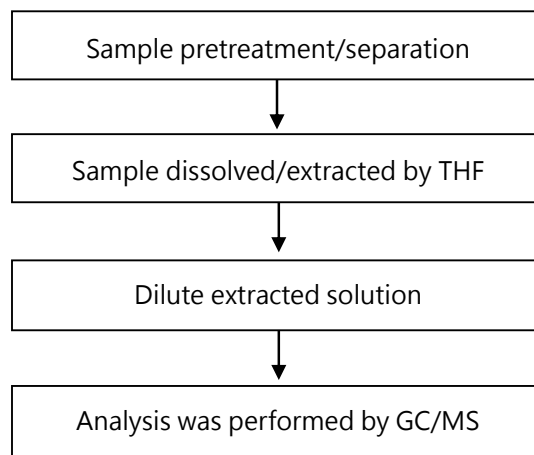
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Analytical flow chart - Phthalate

【Test method: IEC 62321-8】



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Test Report

No.: ETR22B02492

Date: 21-Nov-2022

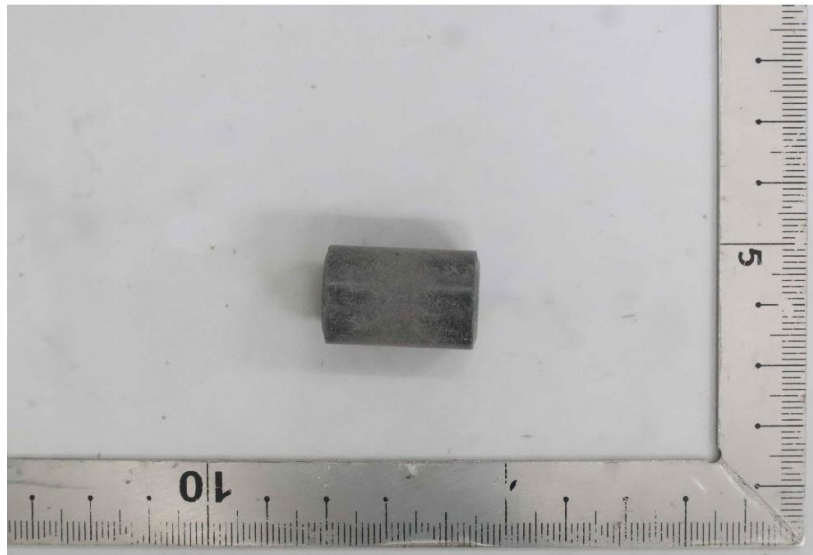
Page: 5 of 5

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

ETR22B02492



** End of Report **

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