

Test Report

No.: ETR21B05496

Date: 03-Dec-2021

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/on behalf of 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-9210HF, CEL-9210HF10AL, CEL-9210ZHF10AL, CEL-9220HF, CEL-9220ZHF, CEL-9220THF, CEL-9221HF, E2063, CEL-310, CEL-312, CEL-314, CEL-9250HF)

Sample Receiving Date : 29-Nov-2021
Testing Period : 29-Nov-2021 to 03-Dec-2021

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
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei



PIN CODE: 5848D0A4

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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
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)	With reference to IEC 62321-7-2: 2017, analysis was performed by UV-VIS.	mg/kg	8	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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SHOWA DENKO MATERIALS CO., LTD.

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

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.
Di-(2-ethylhexyl) phthalate (DEHP) (CAS No.: 117-81-7)		mg/kg	50	n.d.
Diisobutyl phthalate (DIBP) (CAS No.: 84-69-5)		mg/kg	50	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 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	14.5

Note :

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

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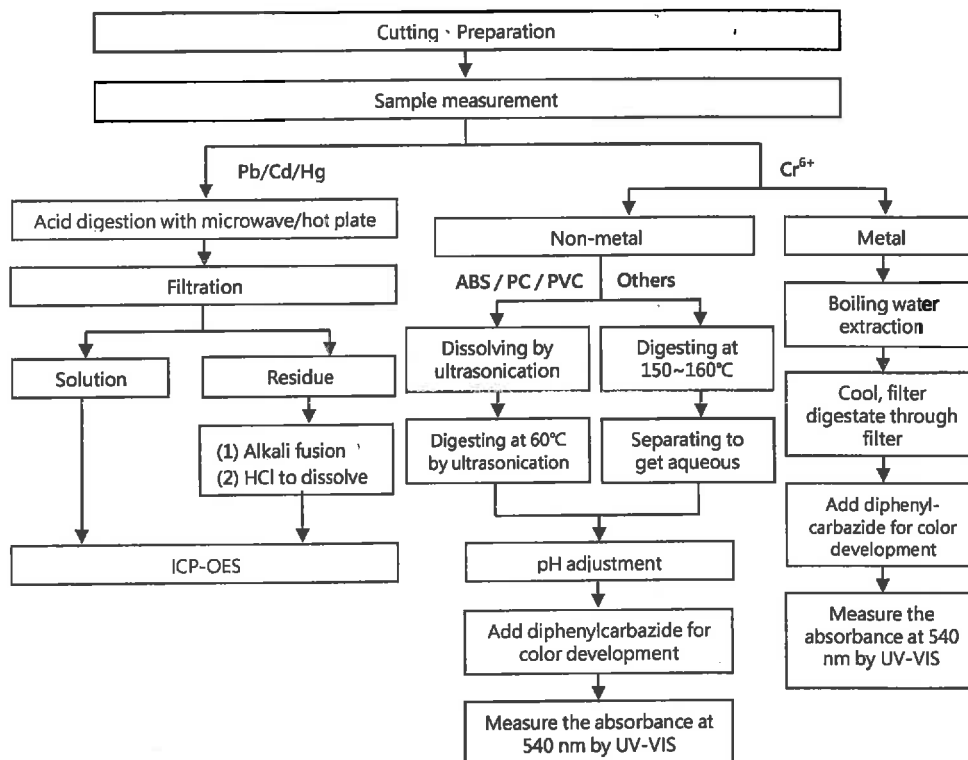
SHOWA DENKO MATERIALS CO., LTD.

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

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)



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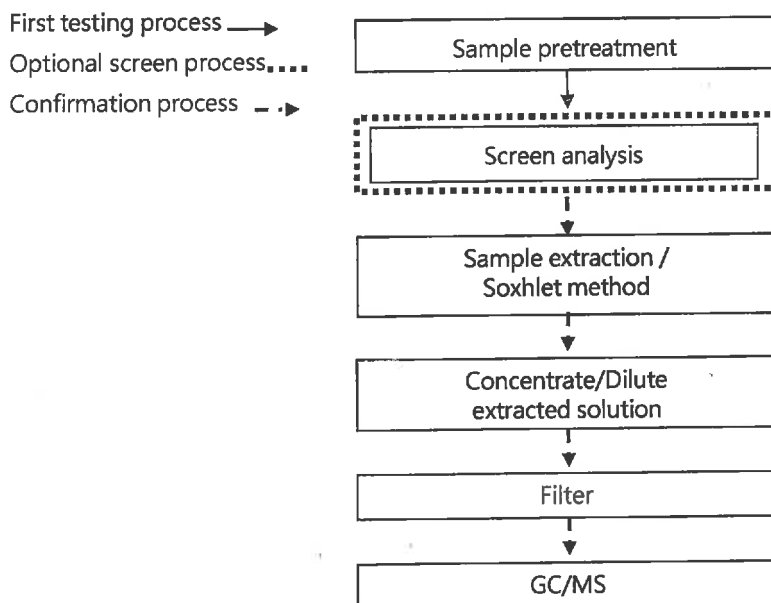
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SHOWA DENKO MATERIALS CO., LTD.

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Analytical flow chart – PBBs / PBDEs



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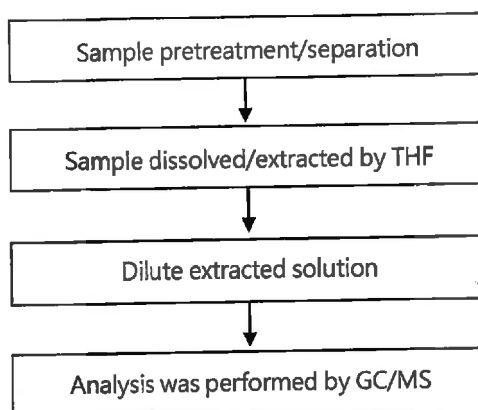
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SHOWA DENKO MATERIALS CO., LTD.

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Analytical flow chart - Phthalate

【Test method: IEC 62321-8】



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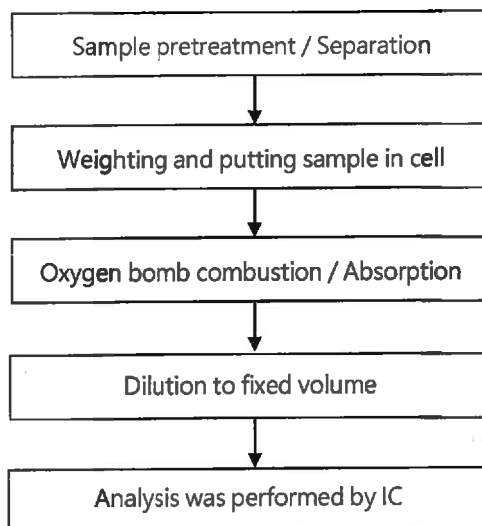
Date: 03-Dec-2021

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

Analytical flow chart - Halogen



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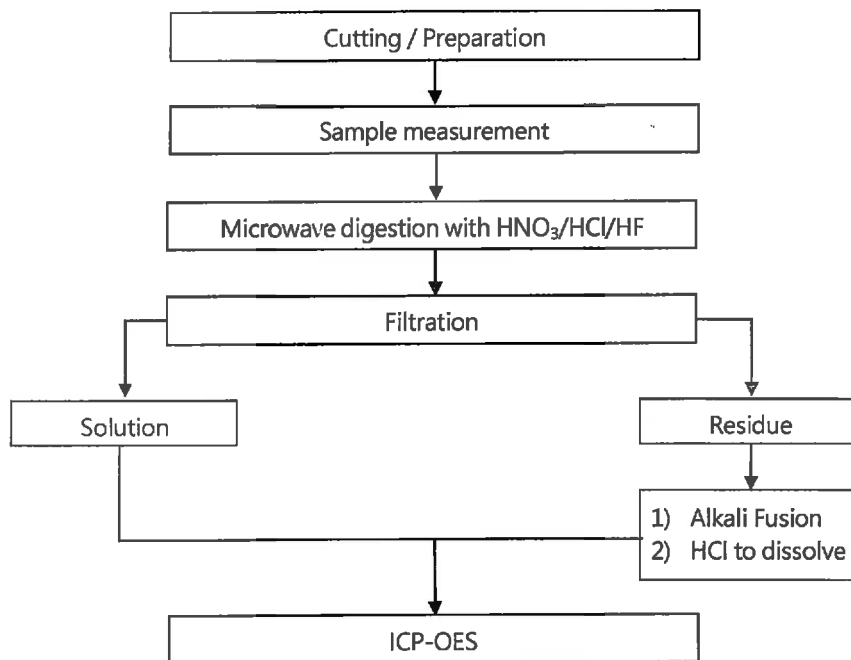
SHOWA DENKO MATERIALS CO., LTD.

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

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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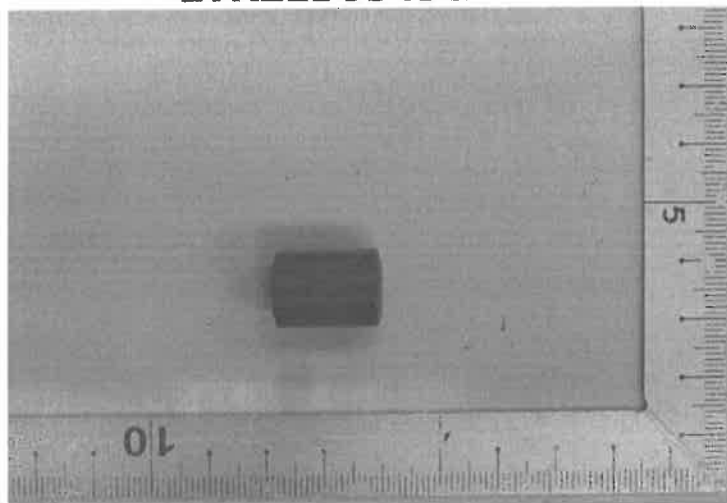
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SHOWA DENKO MATERIALS CO., LTD.

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. *

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** End of Report **

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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/on behalf of 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-9210HF, CEL-9210HF10AL,
CEL-9210ZHF10AL, CEL-9220HF, CEL-9220ZHF, CEL-9220THF, CEL-9221HF,
E2063, CEL-310, CEL-312, CEL-314, CEL-9250HF)

Sample Receiving Date : 29-Nov-2021
Testing Period : 29-Nov-2021 to 03-Dec-2021

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



PIN CODE: B04B3EBE

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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
Beryllium (Be) (CAS No.: 7440-41-7)	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% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected (Less than MDL)

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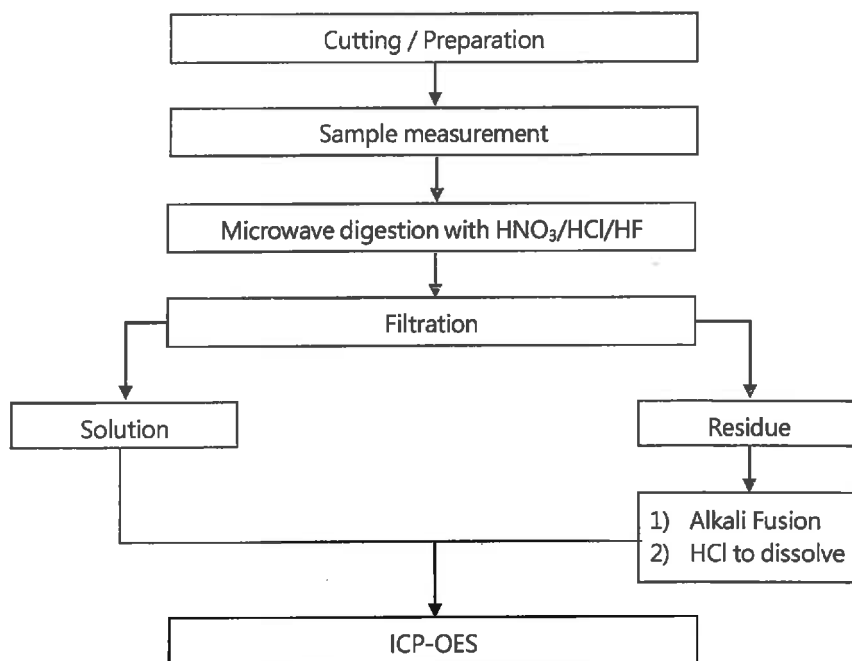
SHOWA DENKO MATERIALS CO., LTD.

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

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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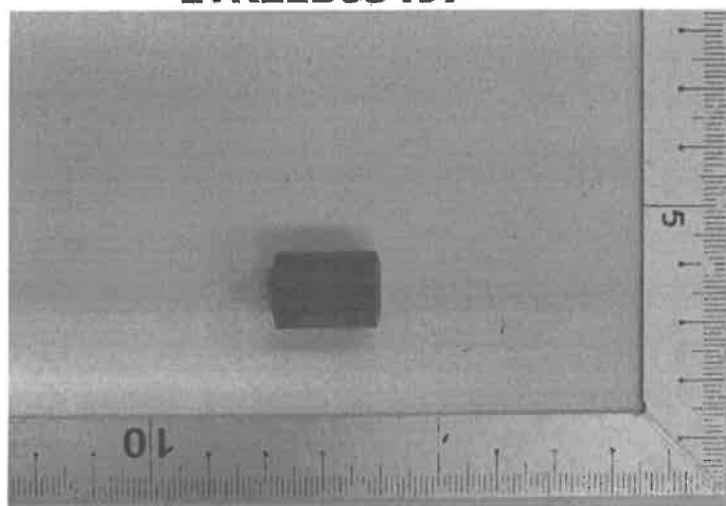
Page: 4 of 4

SHOWA DENKO MATERIALS CO., LTD.

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

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Sample Receiving Date : 29-Nov-2021
Testing Period : 29-Nov-2021 to 03-Dec-2021

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



PIN CODE: 2C45E8B0

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SGS Taiwan Ltd. 台灣檢驗科技股份有限公司

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Member of the SGS Group



Test Report

No.: ETR21B05498

Date: 03-Dec-2021

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

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Test Report

No.: ETR21805498

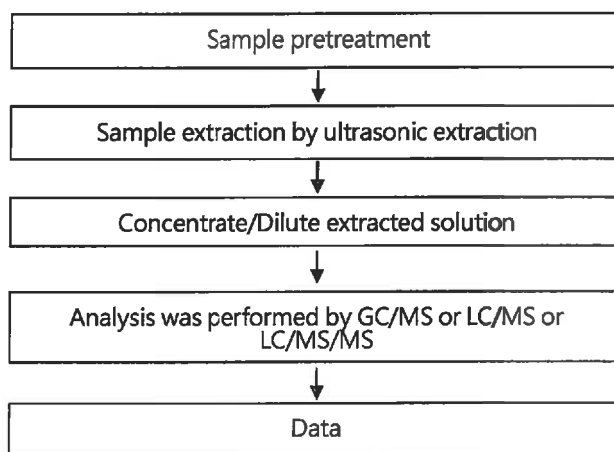
Date: 03-Dec-2021

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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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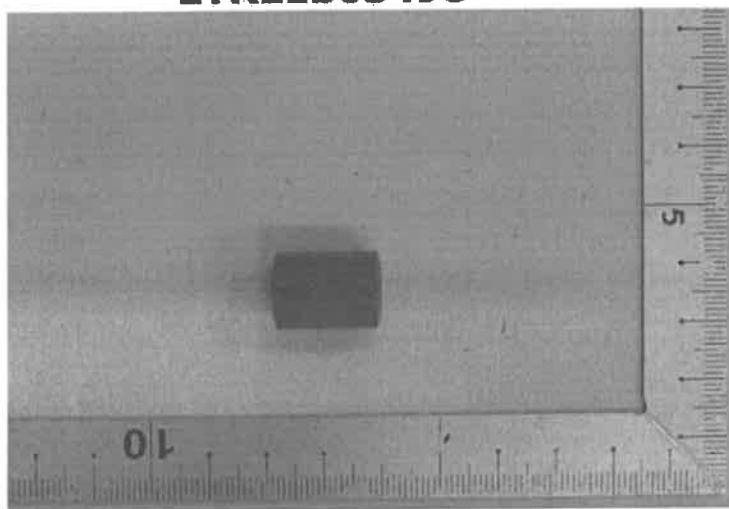
Page: 4 of 4

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. *

ETR21B05498



** End of Report **

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