



Test Report

No.: ETR21105791M18

Date: 29-Jan-2021

Page: 1 of 8

SHOWA DENKO MATERIALS CO., LTD.

14, GOIMINAMIKAIGAN, ICHIHARA-SHI, CHIBA, 290-8567, 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 : DIE ATTACH FILM
Style/Item No. : HR-5104 SERIES

Sample Receiving Date : 25-Jan-2021
Testing Period : 25-Jan-2021 to 29-Jan-2021

Test Requested : (1) As specified by client, with reference to RoHS Directive 2011/65/EU Annex II to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs 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 selected part of submitted sample(s), the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs comply with the limits as set by RoHS Directive 2011/65/EU Annex II.


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



PIN CODE: D3CBD848

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SHOWA DENKO MATERIALS CO., LTD.

14, GOIMINAMIKAIGAN, ICHIHARA-SHI, CHIBA, 290-8567, JAPAN

Test Part Description

No.1 : WHITE FILM (EXCLUDING THE DOUBLE RELEASE FILM)

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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SHOWA DENKO MATERIALS CO., LTD.

14, GOIMINAMIKAIGAN, ICHIHARA-SHI, CHIBA, 290-8567, JAPAN

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
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	148	-
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.	-
Antimony trioxide (Sb ₂ O ₃) (CAS No.: 1309-64-4)	Calculated from the result of Antimony.	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)
4. "-" = Not Regulated
5. ▲ : The MDL was evaluated for element / tested substance.

Conversion Formula : $AX = A \times F$

AX	A	F
Antimony trioxide (Sb ₂ O ₃)	Antimony	1.1971

Parameter Conversion Table : https://eecloud.sgs.com/Region_TW/DocDownload.aspx#otherDoc

6. The statement of compliance conformity is based on comparison of testing results and limits.
7. This is the additional test report of ETR21105791.

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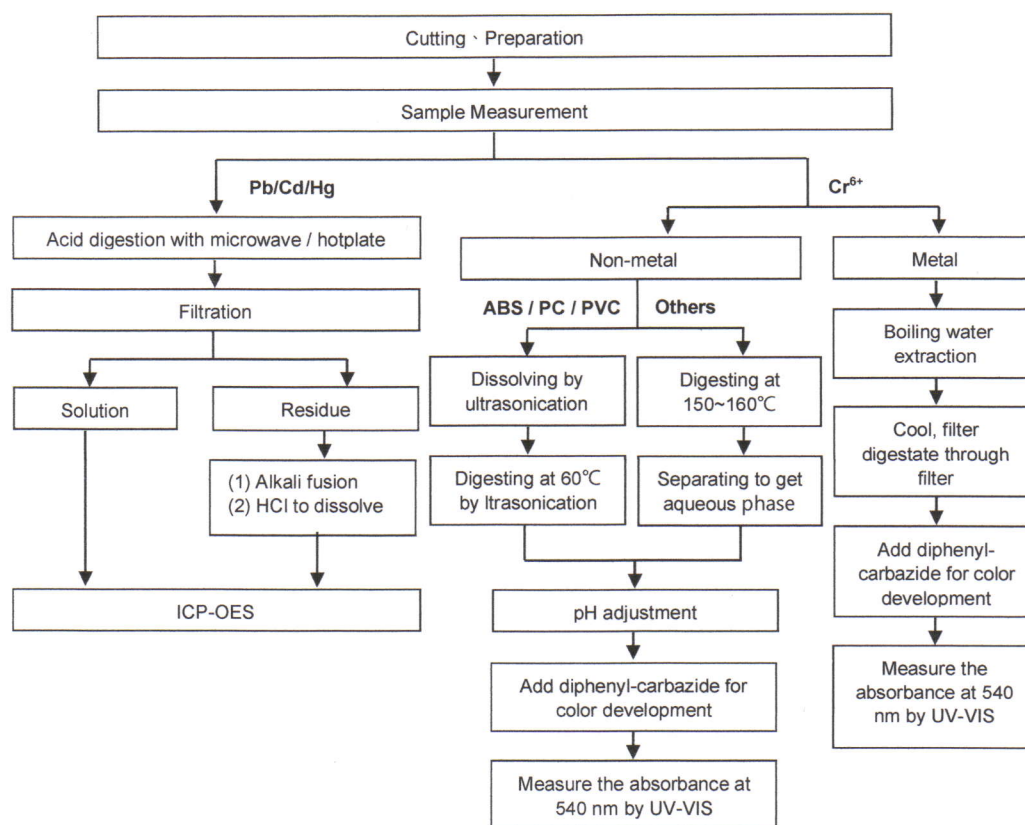
SHOWA DENKO MATERIALS CO., LTD.

14, GOIMINAMIKAIGAN, ICHIHARA-SHI, CHIBA, 290-8567, JAPAN

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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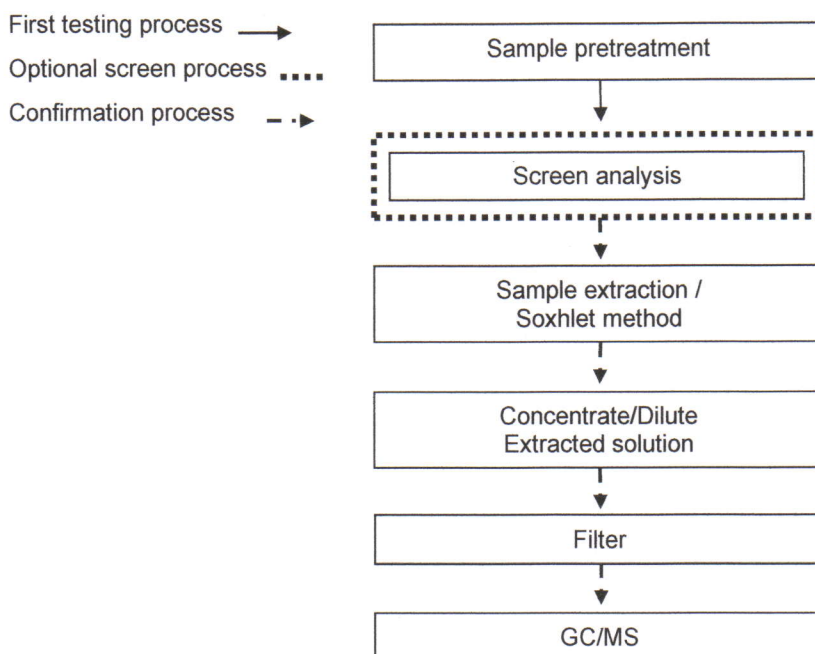
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SHOWA DENKO MATERIALS CO., LTD.

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Analytical flow chart – PBBs / PBDEs



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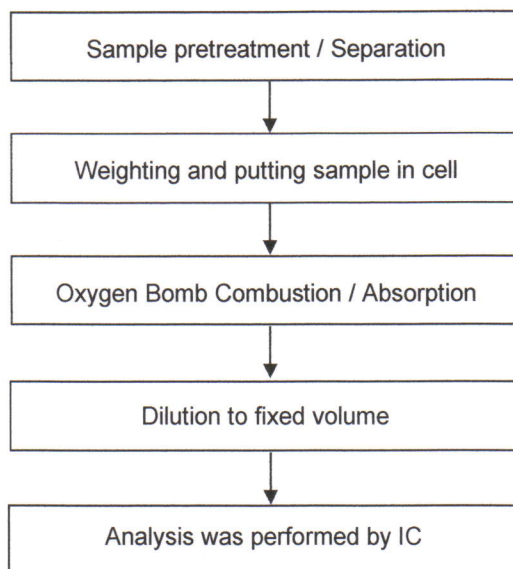
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SHOWA DENKO MATERIALS CO., LTD.

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Analytical flow chart - Halogen



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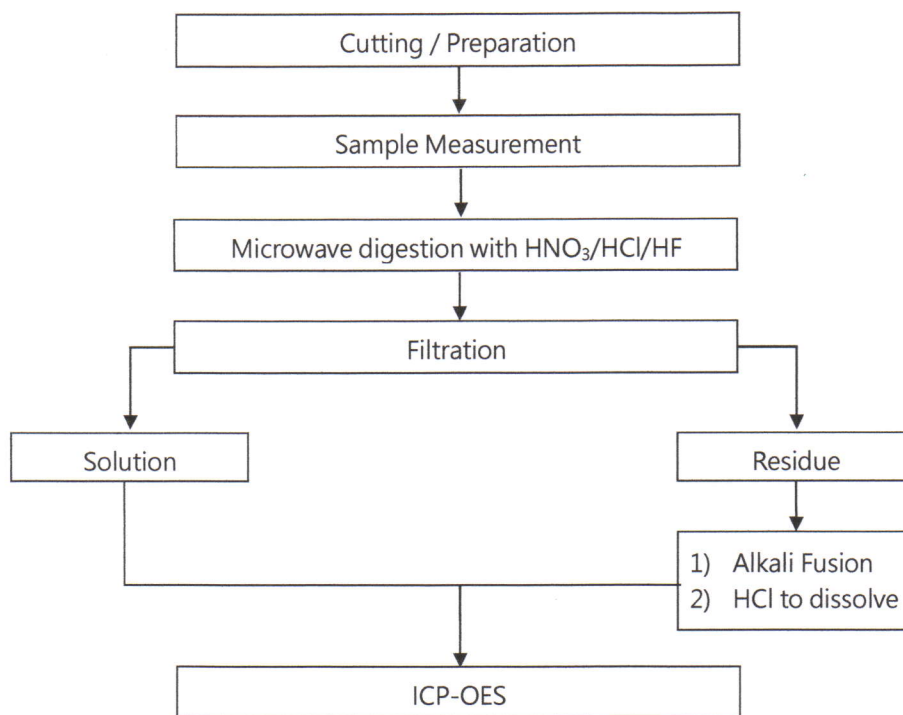
SHOWA DENKO MATERIALS CO., LTD.

14, GOIMINAMIKAIGAN, ICHIHARA-SHI, CHIBA, 290-8567, JAPAN

Analytical flow chart of Heavy Metal

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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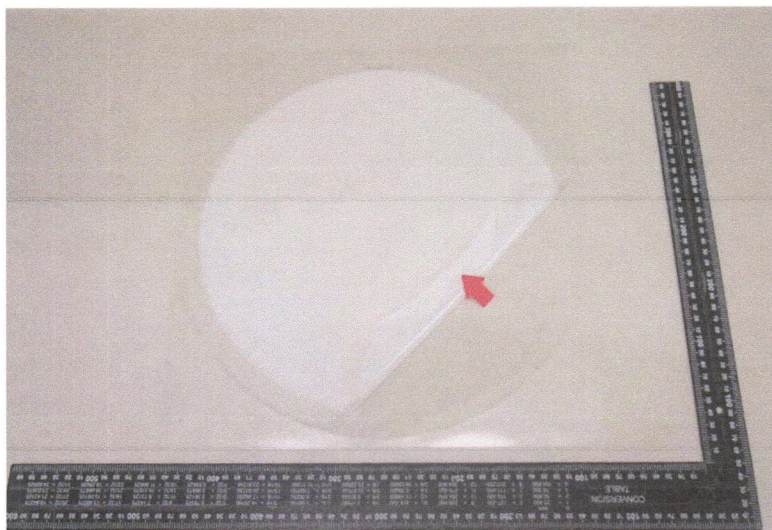
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SHOWA DENKO MATERIALS CO., LTD.

14, GOIMINAMIKAIGAN, ICHIHARA-SHI, CHIBA, 290-8567, JAPAN

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

ETR21105791



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Test Report

No.: ETR21105791M36

Date: 29-Jan-2021

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SHOWA DENKO MATERIALS CO., LTD.

14, GOIMINAMIKAIGAN, ICHIHARA-SHI, CHIBA, 290-8567, 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 : DIE ATTACH FILM

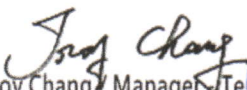
Style/Item No. : HR-5104 SERIES

Sample Receiving Date : 25-Jan-2021

Testing Period : 25-Jan-2021 to 29-Jan-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, Manager
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei



PIN CODE: EFB4E1AD

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No.: ETR21105791M36

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SHOWA DENKO MATERIALS CO., LTD.

14, GOIMINAMIKAIGAN, ICHIHARA-SHI, CHIBA, 290-8567, JAPAN

Test Part Description

No.1 : WHITE FILM (EXCLUDING THE DOUBLE RELEASE FILM)

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.
6. This is the additional test report of ETR21105791.

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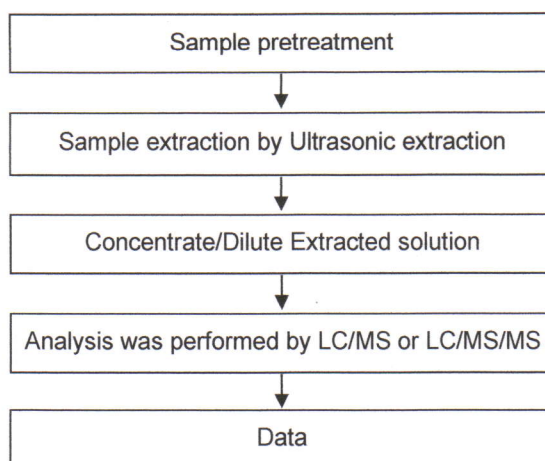
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SHOWA DENKO MATERIALS CO., LTD.

14, GOIMINAMIKAIGAN, ICHIHARA-SHI, CHIBA, 290-8567, JAPAN

Analytical flow chart - PFOA/PFOS



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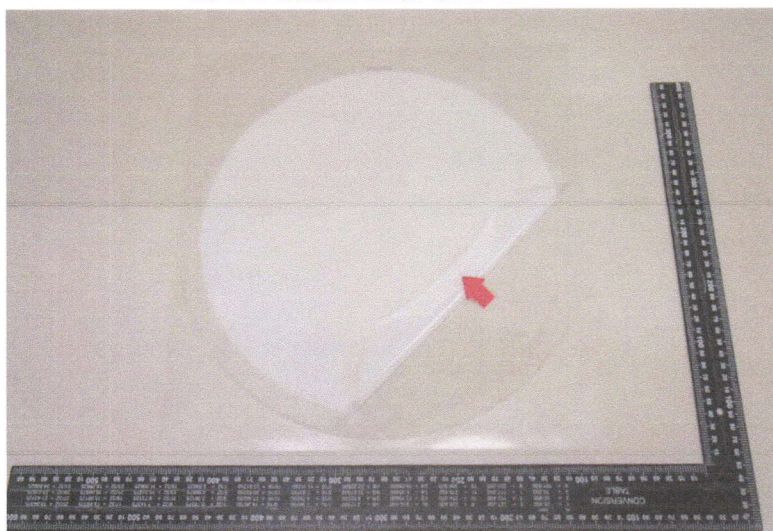
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SHOWA DENKO MATERIALS CO., LTD.

14, GOIMINAMIKAIGAN, ICHIHARA-SHI, CHIBA, 290-8567, 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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Test Report

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SHOWA DENKO MATERIALS CO., LTD.

14, GOIMINAMIKAIGAN, ICHIHARA-SHI, CHIBA, 290-8567, 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 : DIE ATTACH FILM
Style/Item No. : HR-5104 SERIES

Sample Receiving Date : 25-Jan-2021
Testing Period : 25-Jan-2021 to 29-Jan-2021

Test Requested : As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine DBP, BBP, DEHP, DIBP contents in the submitted sample(s).
Test Results : Please refer to following pages.
Conclusion : Based on the performed tests on selected part of submitted sample(s), the test results of 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
Troy Chang, Manager, Tech
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei



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SHOWA DENKO MATERIALS CO., LTD.

14, GOIMINAMIKAIGAN, ICHIHARA-SHI, CHIBA, 290-8567, JAPAN

Test Part Description

No.1 : WHITE FILM (EXCLUDING THE DOUBLE RELEASE FILM)

Test Result(s)

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)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
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.	1000
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.	1000

Note :

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected (Less than MDL)
4. The statement of compliance conformity is based on comparison of testing results and limits.
5. This is the additional test report of ETR21105791.

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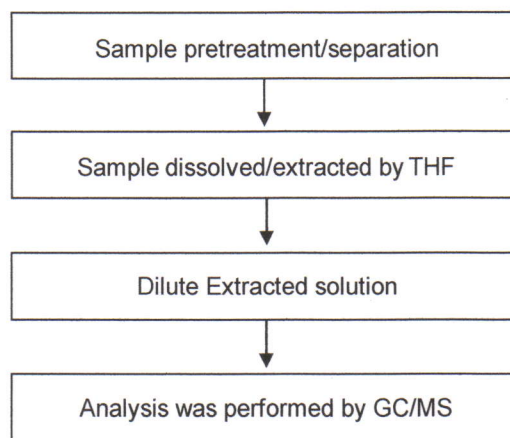
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SHOWA DENKO MATERIALS CO., LTD.

14, GOIMINAMIKAIGAN, ICHIHARA-SHI, CHIBA, 290-8567, JAPAN

Analytical flow chart - Phthalate

【Test method: IEC 62321-8】



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Test Report

No.: ETR21105791M09

Date: 29-Jan-2021

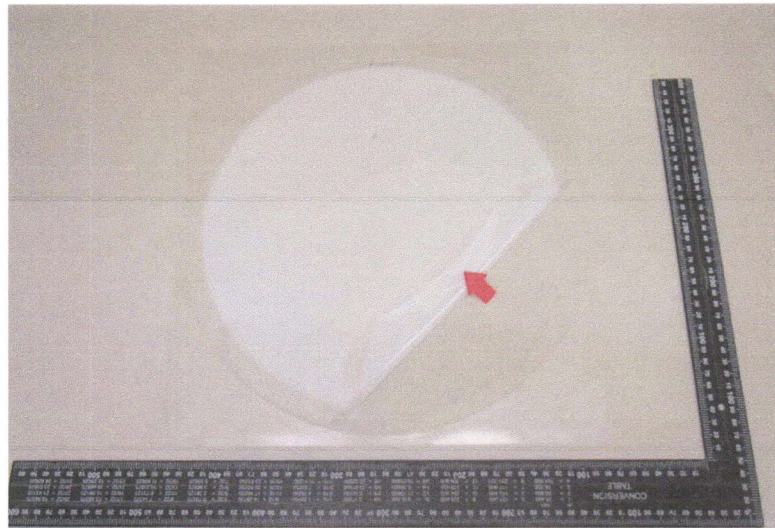
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SHOWA DENKO MATERIALS CO., LTD.

14, GOIMINAMIKAIGAN, ICHIHARA-SHI, CHIBA, 290-8567, JAPAN

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

ETR21105791



** End of Report **

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Test Report

No.: ETR21105791M45

Date: 29-Jan-2021

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SHOWA DENKO MATERIALS CO., LTD.
14, GOIMINAMIKAIGAN, ICHIHARA-SHI, CHIBA, 290-8567, 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 : DIE ATTACH FILM
Style/Item No. : HR-5104 SERIES

Sample Receiving Date : 25-Jan-2021
Testing Period : 25-Jan-2021 to 29-Jan-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, Manager
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei



PIN CODE: 998978ED

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Test Report

No.: ETR21105791M45

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SHOWA DENKO MATERIALS CO., LTD.

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Test Part Description

No.1 : WHITE FILM (EXCLUDING THE DOUBLE RELEASE FILM)

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)
4. This is the additional test report of ETR21105791.

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Date: 29-Jan-2021

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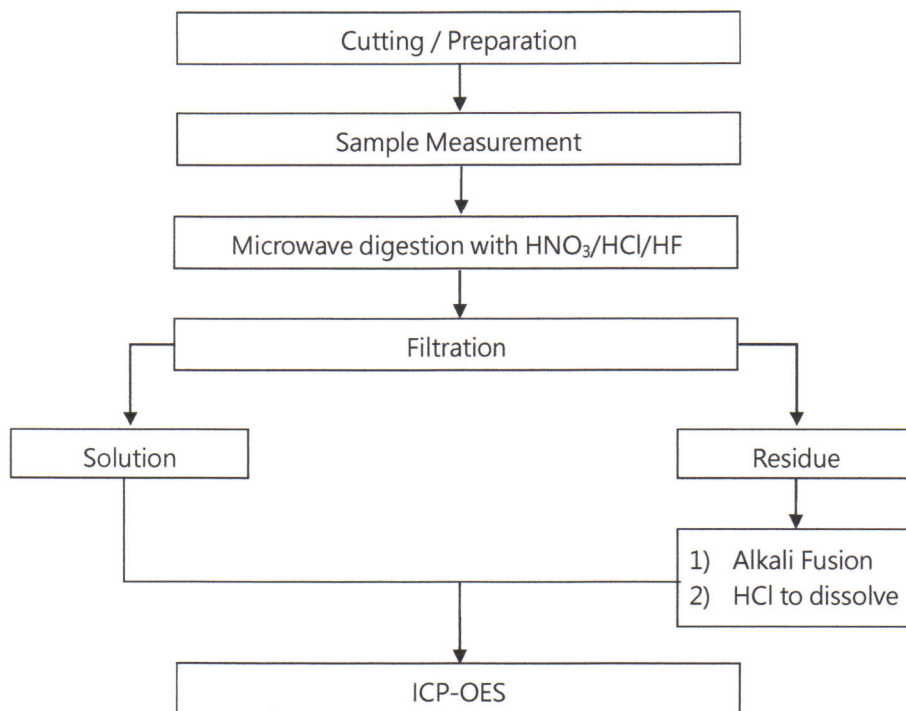
SHOWA DENKO MATERIALS CO., LTD.

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Analytical flow chart of Heavy Metal

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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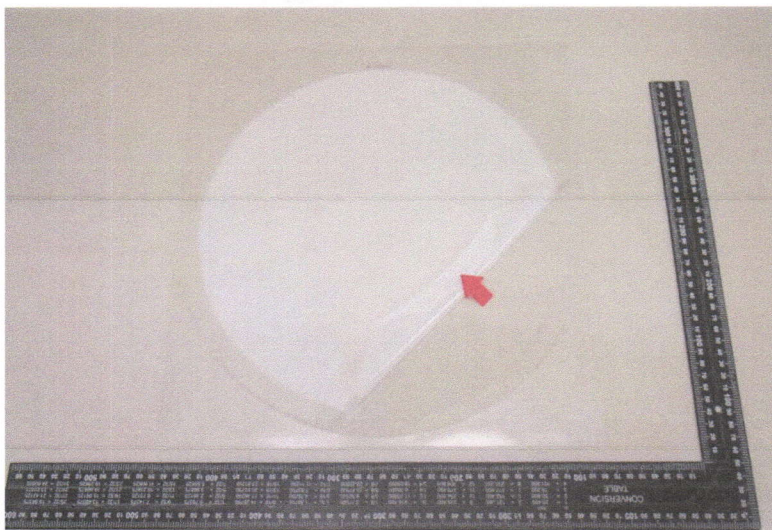
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