

## Test Report

No. : KA/2020/41909

Date : 2020/05/04

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SUMITOMO BAKELITE SINGAPORE PTE CO., LTD.  
NO. 1 SENOKO SOUTH ROAD, SINGAPORE 758069

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

Sample Submitted By : SUMITOMO BAKELITE SINGAPORE PTE CO., LTD.  
Sample Description : DIE ATTACH PASTE  
Style/Item No. : CRM-1076NS  
Sample Receiving Date : 2020/04/27  
Testing Period : 2020/04/27 to 2020/05/04

=====  
**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  




PIN CODE: 75AEBD56

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NO. 1 SENOKO SOUTH ROAD, SINGAPORE 758069

## Test Result(s)

PART NAME NO.1 : SILVER DIE ATTACH PASTE

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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Test Item (s)	Unit	Method	MDL	Result	Limit
				No.1	
Beryllium (Be)	mg/kg	With reference to US EPA 3052: 1996. Analysis was performed by ICP-OES.	2	n.d.	-
Arsenic (As)	mg/kg	With reference to US EPA 3052: 1996. Analysis was performed by ICP-OES.	2	n.d.	-
Antimony (Sb)	mg/kg	With reference to US EPA 3052: 1996. 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. Analysis was performed by GC/MS.	5	n.d.	-
Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	mg/kg	With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.	-
PFOA (CAS No.: 335-67-1)	mg/kg	With reference to US EPA 3550C: 2007. 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. 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. 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. 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. 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. 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. Analysis was performed by GC/MS.	50	n.d.	1000
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
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
DIPP (Diisopentyl Phthalat) (CAS No.: 605-50-5)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	n.d.	-

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Test Item (s)	Unit	Method	MDL	Result	Limit
				No.1	
DINP (Di-isononyl phthalate) (CAS No.: 28553-12-0, 68515-48-0)	mg/kg	With reference to IEC 62321-8:2017. 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. Analysis was performed by GC/MS.	50	n.d.	-
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.	-
Red phosphorus	**	Analysis was performed by Pyrolyzer-GC/MS.	-	Negative	-

## Note :

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. " - " = Not Regulated
5. \*\* = Qualitative analysis (No Unit)
6. Negative = Undetectable / Positive = Detectable
7. The statement of compliance conformity is based on comparison of testing results and limits.

## 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>.

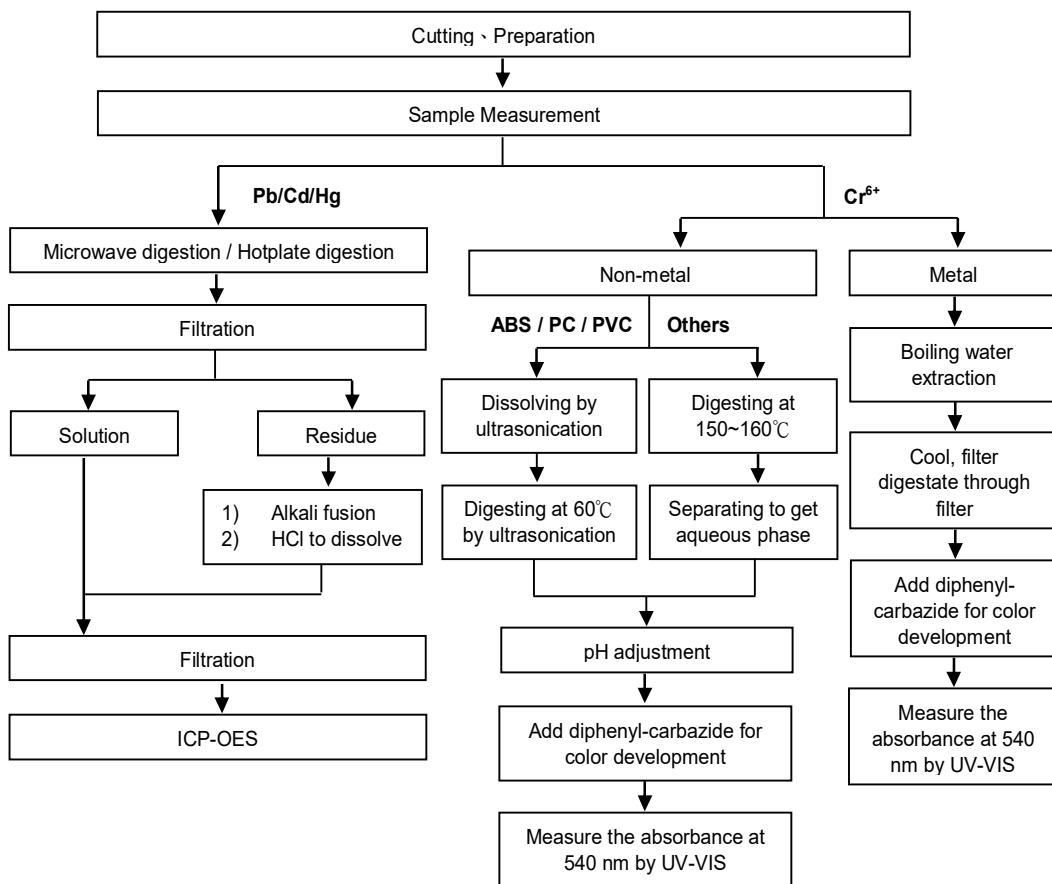
PFOS refer to Perfluorooctanesulfonic acid and its derivatives including Perfluorooctanesulfonic acid, Perfluorooctane sulfonamide, N-Methylperfluorooctane sulfonamide, N-Ethylperfluorooctane sulfonamide, N-Methylperfluorooctane sulfonamidoethanol and N-Ethylperfluorooctane sulfonamidoethanol.

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## Analytical flow chart of Heavy Metal

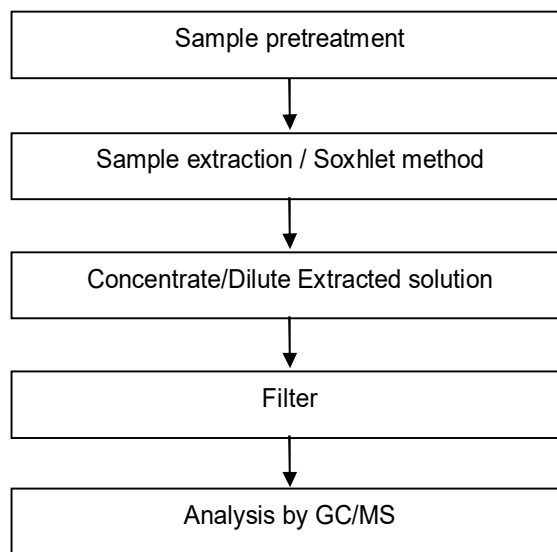
These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr<sup>6+</sup> test method excluded)



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## PBB/PBDE analytical FLOW CHART

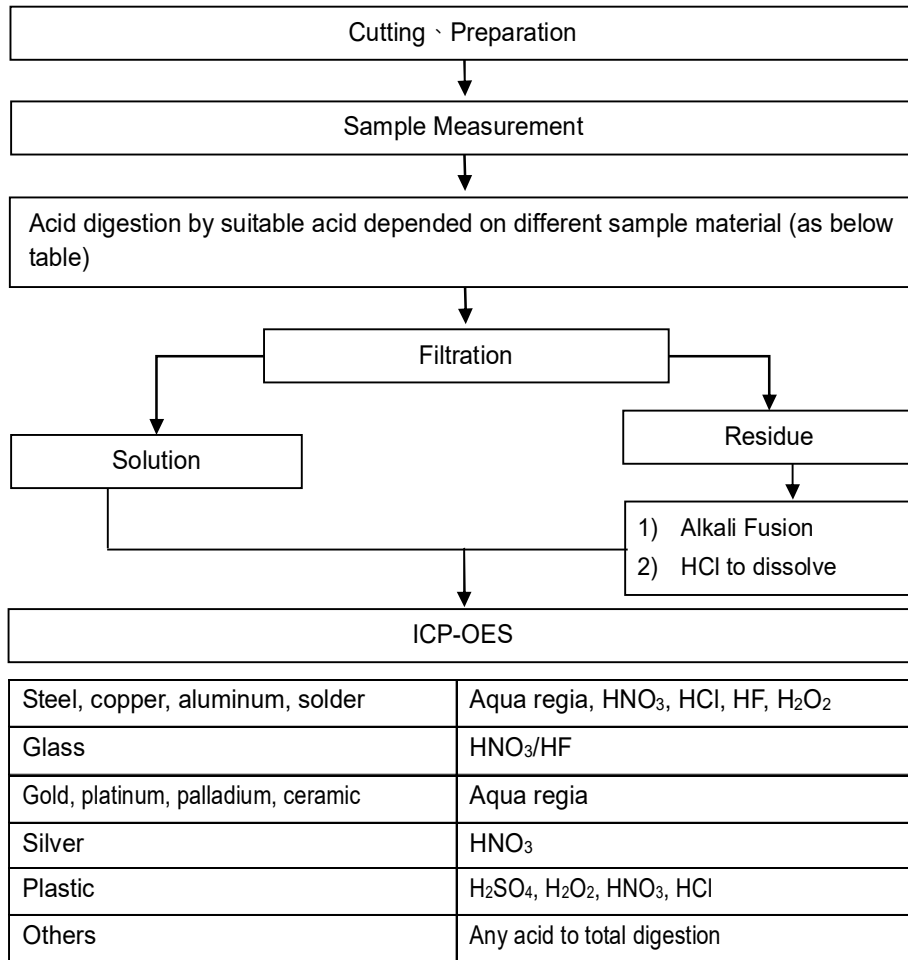


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### Flow Chart of digestion for the elements analysis performed by ICP-OES

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



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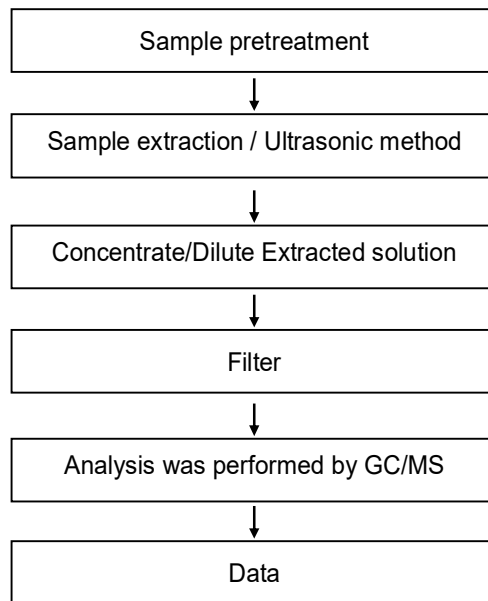
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## HBCDD analytical flow chart

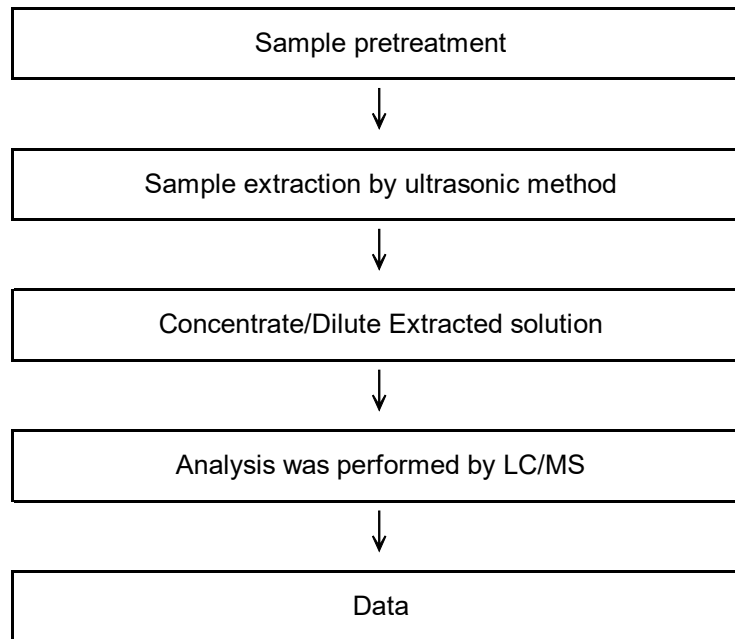


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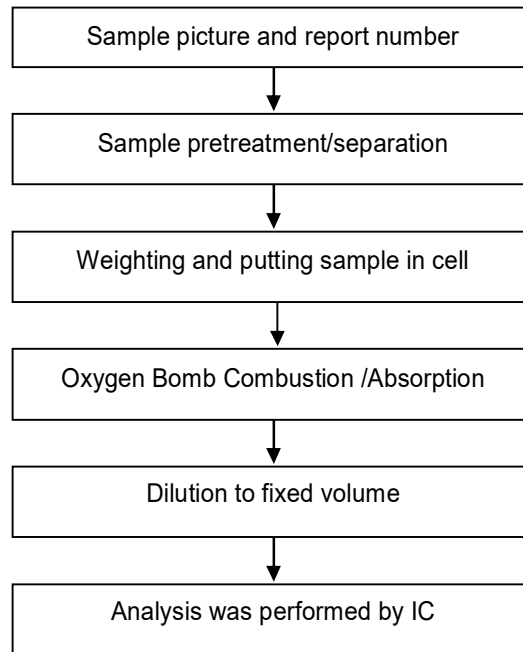
### Analytical flow chart of PFOA/PFOS



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### Analytical flow chart of Halogen

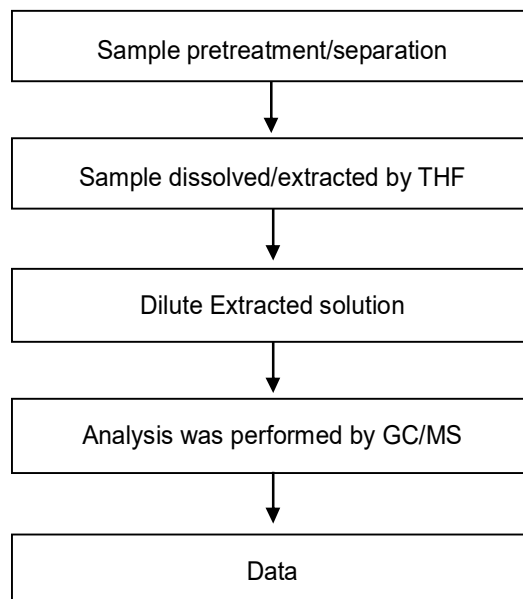


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### Analytical flow chart of phthalate content

**【Test method: IEC 62321-8】**



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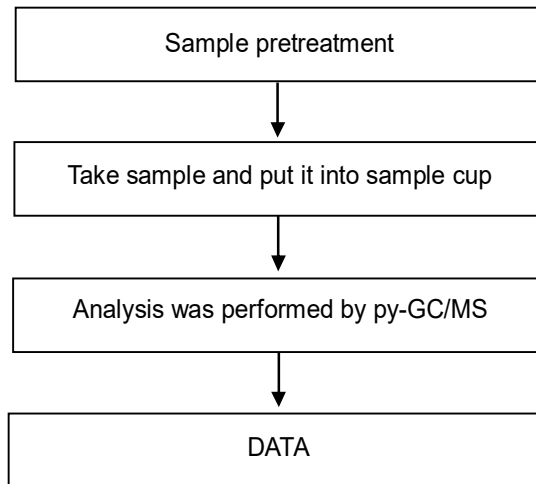
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### Analytical flow chart - Red phosphorus



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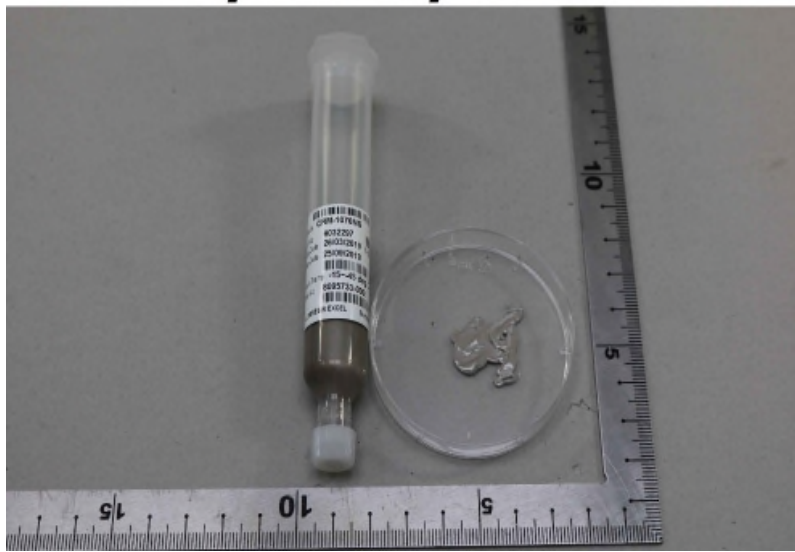
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\* The tested sample / part is marked by an arrow if it's shown on the photo. \*

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\*\* End of Report \*\*

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