

## Test Report (SVHC)

No.: SHAEC24004942501

Date: Mar 22, 2024

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Client Name: SHANGHAI LEAEMC ELECTRONICS CO.,LTD.

Client Address: RM801, HONGYI BUILDING , NO.2158, WANYUAN ROAD, MINHANG DISTRICT, SHANGHAI.

Sample Name: Semiconductor Device

Model No.: SMC

Client Ref. Information: See attachment

The above sample(s) and information were provided by the client.

SGS Job No.: SHP24-007631

Sample Receiving Date: Mar 18, 2024

Testing Period: Mar 18, 2024 ~ Mar 22, 2024

Test Requested: As requested by client, SVHC screening is performed according to:  
(i) Two hundred and forty (240) substances in the Candidate List of Substances of Very High Concern (SVHC) for authorization published by European Chemicals Agency (ECHA) on and before Jan 23, 2024 regarding Regulation (EC) No 1907/2006 concerning the REACH.  
(ii) Two (2) substances in the Public Consultation List of potential Substances of Very High Concern (SVHC) published by European Chemicals Agency (ECHA) on and before Mar 1, 2024 regarding Regulation (EC) No 1907/2006 concerning the REACH.  
(iii) One (1) potential Substances of Very High Concern (SVHC) in the notification of WTO on Jun 1, 2021.

Test Method(s): Please refer to next page(s).

Test Result(s): Please refer to next page(s).

### Summary:

Signed for and on behalf of  
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.


Dora Hu  
Approved Signatory



**Test Report  
(SVHC)**

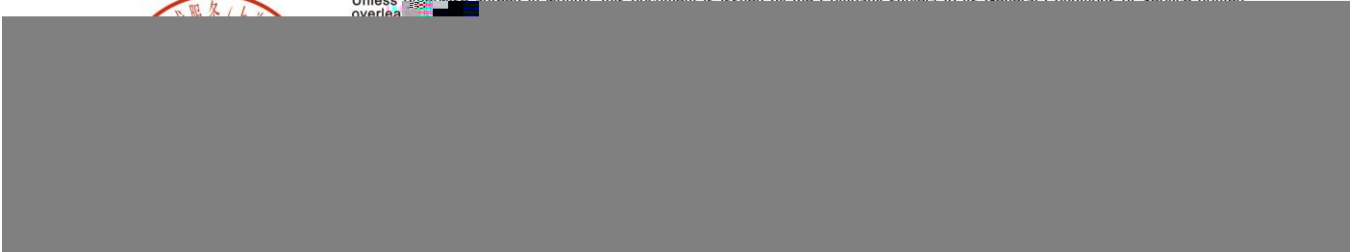
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The test results of SVHC over Limit in the articles of the submitted sample summary

Test Result ID	Description	Substance Name	CAS No.	Concentration (%)
001	Black body	Lead cyanamidate*	20837-86-9	2.297
001	Black body	Lead dinitrate*	10099-74-8	3.053
001	Black body	Lead monoxide*	1317-36-8	2.057
001	Black body	Lead oxide sulfate*	12036-76-9	2.427
001	Black body	Lead tetroxide (orange lead)*	1314-41-6	2.107
001	Black body	Sulfurous acid, lead salt, dibasic*	62229-08-7	2.436
001	Black body	Tetralead trioxide sulphate*	12202-17-4	2.242
001	Black body	Trilead bis(carbonate)dihydroxide (basic lead carbonate)*	1319-46-6	2.384
001	Black body	Lead di(acetate)*	301-04-2	2.999
001	Black body	Lead	7439-92-1	1.910



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### Remark :

1. The chemical analysis of specified SVHC is performed by means of currently available analytical techniques against the following SVHC related documents published by ECHA:  
<http://echa.europa.eu/web/guest/candidate-list-table>  
These lists are under evaluation by ECHA and may subject to change in the future.

2. REACH obligation:

- 2.1 Concerning article(s):

- Communication:

- Article 33 of Regulation (EC) No 1907/2006 requires supplier of an article containing a substance meeting the criteria in Article 57 and identified in accordance with Article 59(1) in a concentration above 0.1% weight by weight (w/w) shall provide the recipient of the article with sufficient information, available to the supplier, to allow safe use of the article including, as a minimum, the name of that substance in the Candidate List.

- Notification:

- In accordance with Regulation (EC) No 1907/2006, any EU producer or importer of articles shall notify ECHA, in accordance with paragraph 4 of Article 7, if a substance meets the criteria in Article 57 and is identified in accordance with Article 59(1) of the Regulation, if (a) the substance in the Candidate List is present in those articles in quantities totaling over one tonne per producer or importer per year; and (b) the substance in the Candidate List is present in those articles above a concentration of 0.1% weight by weight (w/w).

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- (a) a substance posing human health or environmental hazards in an individual concentration of 1 % by weight for mixtures that are solid or liquids (i.e., non-gaseous mixtures) or 0.2 % by volume for gaseous mixtures; or
- (b) a substance that is PBT, or vPvB in an individual concentration of 0.1 % by weight for mixtures that are solid or liquids (i.e., non-gaseous mixtures); or
- (c) a substance on the SVHC candidate list (for reasons other than those listed above), in an individual concentration of 0.1 % by weight for non-gaseous mixtures; or
- (d) a substance for which there are Europe-wide workplace exposure limits

3. If a SVHC is found over the reporting limit, client is suggested to identify the composite component which contains the SVHC and the exact concentration of the SVHC by requesting further quantitative analysis from the laboratory.

### Test Sample:

Photo of Submitted Sample



SGS authenticate the photo on original report only

### Sample Description:

Test Part ID	Material Description	Test Part ID	Material Description
A1	Black body	-	-

### Testing Group:

Test Result ID	Description	Test Part ID	SGS Sample ID
001	Black body	A1	SHA24-0049425-0001.C001



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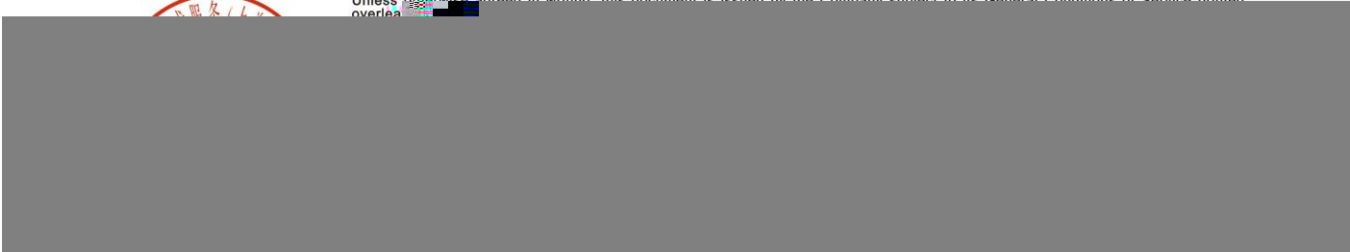
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**Test Method:**

With reference to SGS In-House method, analysis was performed by ICP-OES, UV-VIS, GC-MS, HPLC-DAD/MS and Colorimetric Method.



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## Test Results: (Substances in the Candidate List of SVHC)

Batch	Substance Name	CAS No.	001 Concentration (%)	RL (%)
VIII	Lead cyanamidate*	20837-86-9	2.297	0.010
VIII	Lead dinitrate*	10099-74-8	3.053	0.010
VIII	Lead monoxide*	1317-36-8	2.057	0.010
VIII	Lead oxide sulfate*	12036-76-9	2.427	0.010
VIII	Lead tetroxide (orange lead)*	1314-41-6	2.107	0.010
VIII	Sulfurous acid, lead salt, dibasic*	62229-08-7	2.436	0.010
VIII	Tetralead trioxide sulphate*	12202-17-4	2.242	0.010
VIII	Trilead bis(carbonate)dihydroxide (basic lead carbonate)*	1319-46-6	2.384	0.010
X	Lead di(acetate)*	301-04-2	2.999	0.010
XIX	Lead	7439-92-1	1.910	0.010
-	Other tested SVHC in Candidate list	-	ND	-

## Test Results: (Potential SVHC)

Batch	Substance Name	CAS No.	001 Concentration (%)	RL (%)
/	All tested Potential SVHC	-	ND	-

### Notes:

- (1) The table above only shows detected SVHC, and SVHC that below RL are not reported. Please refer to Appendix for the full list of tested SVHC.
- (2) RL = Reporting Limit (Test data will be shown if it RL. RL is not regulatory limit.)  
ND = Not detected (lower than RL), ND is denoted on the SVHC substance.
- (3) \* The test result is based on the calculation of selected element(s) and to the worst-case scenario.  
\*\* The test result is based on the calculation of selected marker(s) and to the worst-case scenario.  
Calculated concentration of boric compounds are based on water extractive boron detected by ICP-OES.  
Calculated concentration of Barium diboron tetraoxide is based on water extractive boron and barium detected by ICP-OES.  
RL = 0.01% is evaluated for element (i.e. cobalt, arsenic, lead, chromium (VI), aluminum, zirconium, boron, strontium, zinc, antimony, titanium, barium and cadmium respectively), except molybdenum  
RL=0.001%, boron RL=0.005% (only for Lead bis(tetrafluoroborate), Orthoboric acid, sodium salt, Barium diboron tetraoxide), chromium (VI) RL=0.005% (only for Pentazinc chromate octahydroxide), fluorine RL=0.060%.
- (4) § The substance is proposed for the identification as SVHC only where it contains Michler's ketone (CAS Number: 90-94-8) or Michler's base (CAS Number: 101-61-1) 0.1% (w/w).
- (5) Composite test has been performed in equal proportion for the components/material per client requested. And the result is calculated using the minimum sample weight.
- (6) In consideration of the analysis requirement and the limit of sample volume, the screening test for the article is based on components / material enough to test.
- (7) / = Potential SVHC

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.

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## Appendix

### Full list of tested SVHC:

Batch	No.	Substance Name	CAS No.	RL (%)
I	1	4,4'-Diaminodiphenylmethane(MDA)	101-77-9	0.100
I	2	5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)	81-15-2	0.100
I	3	Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)	85535-84-8	0.100
I	4	Anthracene	120-12-7	0.100
I	5	Benzyl butyl phthalate (BBP)	85-68-7	0.100
I	6	Bis(2-ethylhexyl)phthalate (DEHP)	117-81-7	0.100
I	7	Bis(tributyltin)oxide (TBTO)	56-35-9	0.100
I	8	Cobalt dichloride*	7646-79-9	0.010
I	9	Diarsenic pentaoxide*	1303-28-2	0.010
I	10	Diarsenic trioxide*	1327-53-3	0.010
I	11	Dibutyl phthalate (DBP)	84-74-2	0.100
I	12	Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified ( -HBCDD, -HBCDD, -HBCDD)	-	0.100
I	13	Lead hydrogen arsenate*	7784-40-9	0.010
I	14	Sodium dichromate*	10588-01-9 /7789-12-0	0.010
I	15	Triethyl arsenate*	15606-95-8	0.010
II	16	2,4-Dinitrotoluene	121-14-2	0.100
II	17	Acrylamide	79-06-1	

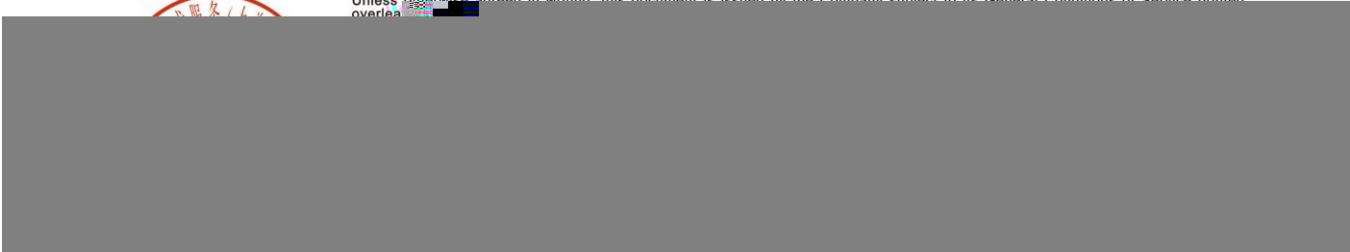
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Batch	No.	Substance Name	CAS No.	RL (%)
III	36	Trichloroethylene	79-01-6	0.100
IV	37	2-Ethoxyethanol	110-80-5	0.100
IV	38	2-Methoxyethanol	109-86-4	0.100
IV	39	Chromic acid, Oligomers of chromic acid and dichromic acid, Dichromic acid*	13530-68-2 /7738-94-5	0.010
IV	40	Chromium trioxide*	1333-82-0	0.010
IV	41	Cobalt(II) carbonate*		





			name	CAS No.	RL (%)
			(methylamino)hexa-2,5-dien-1-ylmethyl ammonium chloride (C.I. 26153) §	548-62-9	0.100
			Triethylene glycol dimethyl ether (TEGDME)	112-49-2	0.100
			Triethylene glycol dimethyl ether (TEGDME)	110-71-4	0.100
			Triphenylmethane (methylamino)trityl	90-94-8	0.100
			Triphenylmethane (methylamino)trityl	561-41-1	0.100
			Triphenylmethane (methylamino)trityl	1303-86-2	0.010
			Triphenylmethane (methylamino)trityl	75-12-7	0.100
			Triphenylmethane (methylamino)trityl	17570-76-2	0.010
			Triphenylmethane (methylamino)trityl	101-61-1	0.100
			Triphenylmethane (methylamino)trityl	2451-62-9	0.100
			Triphenylmethane (methylamino)trityl	6786-83-0	0.100
VII	83		(phenylamino)naphthalene-1-methanol (C.I. Solvent Blue 4) §		
VII	84		-TGIC (1,3,5-tris[(2S and 2R)-2,3-epoxypropyl]-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione)	59653-74-6	0.100
VIII	85		[Phthalato(2-)]dioxotrilead*	69011-06-9	0.010
VIII	86		1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	84777-06-0	0.100
VIII	87		1,2-Diethoxyethane	629-14-1	0.100
VIII	88		1-Bromopropane	106-94-5	0.100
VIII	89		3-Ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine	143860-04-2	0.100
VIII	90		4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated	-	0.100
VIII	91		4,4'-Methylenedi-o-toluidine	838-88-0	0.100
VIII	92		4,4'-Oxydianiline and its salts	101-80-4	0.100
VIII	93		4-Aminoazobenzene	60-09-3	0.100
VIII	94		4-Methyl-m-phenylenediamine	95-80-7	0.100
VIII	95		4-Nonylphenol, branched and linear	-	0.100
VIII	96		Acetic acid, lead salt, basic*	120-71-8	0.100
VIII	97		Acetic acid, lead salt, basic*	51404-69-4	0.010
			Biphenyl-4-ylamine	92-67-1	0.100
			Decabromodiphenyl ether (DecaBDE)	1163-19-5	0.100

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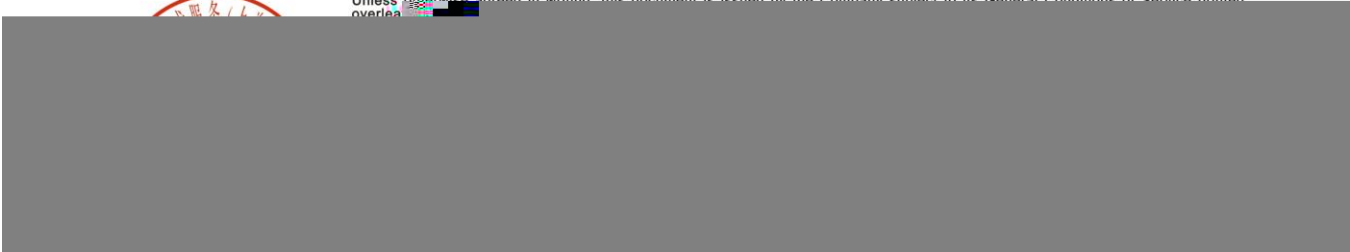
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Batch	No.	Substance Name	CAS No.	RL (%)
IX	144	Pentadecafluorooctanoic acid (PFOA)	335-67-1	0.100
X	145	Cadmium sulphide*	1306-23-6	



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Batch	No.	Substance Name	CAS No.	RL (%)
XIV	167	Nitrobenzene	98-95-3	0.100
XIV	168	Perfluorononan-1-oic-acid and its sodium and ammonium salts	-	0.100
XV	169	Benzo[def]chrysene (Benzo[a]pyrene)	50-32-8	0.100
XVI	170	4,4'-isopropylidenediphenol (bisphenol A)	80-05-7	0.100
XVI	171	4-Heptylphenol, branched and linear	-	0.100
XVI	172	Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts	-	0.100
XVI	173	p-(1,1-dimethylpropyl)phenol	80-46-6	0.100
XVII	174	Perfluorohexane-1-sulphonic acid and its salts	-	0.100
XVIII	175	1,6,7,8,9,14,15,16,17,17,18,18-Dodecachloropentacyclo[12.2.1.16,9.02,13.05,10]octadeca-7,15-diene ("Dechlorane Plus" <sup>TM</sup> ) [covering any of its individual anti- and syn-isomers or any combination thereof]	-	0.100
XVIII	176	Benz[a]anthracene	56-55-3	0.100
XVIII	177	Cadmium nitrate*	10325-94-7	0.010
XVIII	178	Cadmium carbonate*	513-78-0	0.010
XVIII	179	Cadmium hydroxide*	21041-95-2	0.010
XVIII	180	Chrysene	218-01-9	0.100
XVIII	181	Reaction products of 1,3,4-thiadiazolidine-2,5-dithione, formaldehyde and 4-heptylphenol, branched and linear (RP-HP) [with 0.1% w/w 4-heptylphenol, branched and linear]	-	0.100
XIX	182	Benzene-1,2,4-tricarboxylic acid 1,2 anhydride (trimellitic anhydride) (TMA)	552-30-7	0.100
XIX	183	Benzo[ghi]perylene	191-24-2	0.100
XIX	184	Decamethylcyclotetrasiloxane (D5)	541-02-6	0.100
XIX	185	Dicyclohexyl phthalate (DCHP)	84-61-7	0.100
XIX	186	Disodium octaborate*	12008-41-2	0.010
XIX	187	Dodecamethylcyclohexasiloxane (D6)	540-97-6	0.100
XIX	188	Ethylenediamine (EDA)	107-15-3	0.100
XIX	189	Lead	7439-92-1	0.010
XIX	190	Octamethylcyclotetrasiloxane (D4)	556-67-2	0.100
XIX	191	Terphenyl, hydrogenated	61788-32-7	0.100
XX	192	1,7,7-trimethyl-3-(phenylmethylene)bicyclo[2.2.1]heptan-2-one		

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Batch	No.	Substance Name	CAS No.	RL (%)
XXI	200	4-tert-butylphenol (PTBP)	98-54-4	0.100
XXI	201	Tris(4-nonylphenyl, branched and linear) phosphite (TNPP) with 0.1% w/w of 4-nonylphenol, branched and linear (4-NP)	-	0.100
XXII	202	2-benzyl-2-dimethylamino-4'-morpholinobutyrophenone	119313-12-1	0.100
XXII	203	2-methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one	71868-10-5	0.100
XXII	204	Diisohexyl phthalate	71850-09-4	0.100
XXII	205	Perfluorobutane sulfonic acid (PFBS) and its salts	-	0.100
XXIII	206	1-vinylimidazole	1072-63-5	0.100
XXIII	207	2-methylimidazole	693-98-1	0.100
XXIII	208	Butyl 4-hydroxybenzoate	94-26-8	0.100
XXIII	209	Dibutylbis(pentane-2,4-dionato-O,O')tin**	22673-19-4	0.100
XXIV	210	bis(2-(2-methoxyethoxy)ethyl) ether	143-24-8	0.100
XXIV	211	Diocetyl tin dilaurate, stannane, dioctyl-, bis(coco acyloxy) derivs., and any other stannane, dioctyl-, bis(fatty acyloxy) derivs. wherein C12 is the predominant carbon number of the fatty acyloxy moiety**	-	0.100
XXV	212	1,4-Dioxane	123-91-1	0.100
XXV	213	2,2-bis(bromomethyl)propane 1,3-diol (BMP); 2,2-dimethylpropan-1-ol, tribromo derivative/3-bromo-2,2-bis(bromomethyl)-1-propanol (TBNPA); 2,3-dibromo-1-propanol (2,3-DBPA)	-	0.100
XXV	214	2-(4-tert-butylbenzyl)propionaldehyde and its individual stereoisomers	-	0.100
XXV	215	4,4'-(1-methylpropylidene)bisphenol; (bisphenol B)	77-40-7	0.100
XXV	216	Glutaral	111-30-8	0.100
XXV	217	Medium-chain chlorinated paraffins (MCCP) [UVCB substances consisting of more than or equal to 80% linear chloroalkanes with carbon chain lengths within the range from C14 to C17]	-	0.100

XXV

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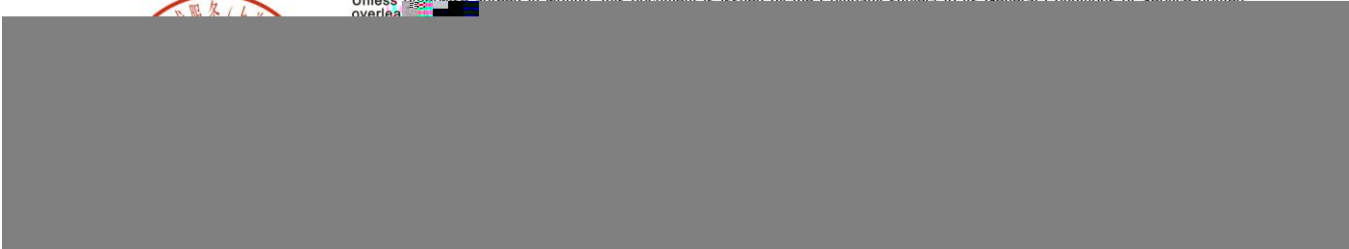
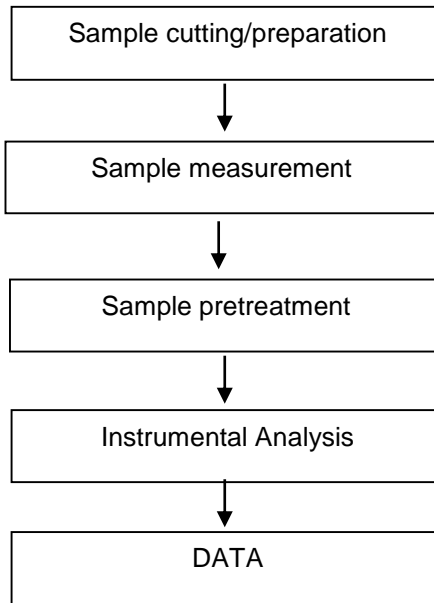
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Batch	No.	Substance Name	CAS No.	RL (%)
XXVI	222	S-(tricyclo[5.2.1.0'2,6]deca-3-en-8(or 9)-yl) O-(isopropyl or isobutyl or 2-ethylhexyl) O-(isopropyl or isobutyl or 2-ethylhexyl) phosphorodithioate	255881-94-8	0.100
XXVI	223	Tris(2-methoxyethoxy)vinylsilane	1067-53-4	0.100
XXVII	224	N-(hydroxymethyl)acrylamide	924-42-5	0.100
XXVIII	225	1,1'-[ethane-1,2-diylbis(oxy)]bis[2,4,6-tribromobenzene]	37853-59-1	0.100
XXVIII	226	2,2',6,6'-tetrabromo-4,4'-isopropylidenediphenol	79-94-7	0.100
XXVIII	227	4,4'-sulphonyldiphenol	80-09-1	0.100
XXVIII	228	Barium diboron tetraoxide*	13701-59-2	0.005
XXVIII	229	Bis(2-ethylhexyl) tetrabromophthalate covering any of the individual isomers and/or combinations thereof	-	0.100
XXVIII	230	Isobutyl 4-hydroxybenzoate	4247-02-3	0.100
XXVIII	231	Melamine	108-78-1	0.100
XXVIII	232	Perfluoroheptanoic acid and its salts	-	0.100
XXVIII	233	reaction mass of 2,2,3,3,5,5,6,6-octafluoro-4-(1,1,1,2,3,3,3-heptafluoropropan-2-yl)morpholine and 2,2,3,3,5,5,6,6-octafluoro-4-(heptafluoropropyl)morpholine*	-	0.060
XXIX	234	Bis(4-chlorophenyl) sulphone	80-07-9	0.100
XXIX	235	Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	75980-60-8	0.100
XXX	236	2,4,6-tri-tert-butylphenol	732-26-3	0.100
XXX	237	2-(2H-benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl)phenol (UV-329)	3147-75-9	0.100
XXX	238	2-(dimethylamino)-2-[(4-methylphenyl)methyl]-1-[4-(morpholin-4-yl)phenyl]butan-1-one	119344-86-4	0.100
XXX	239	Bumetrizole (UV-326)	3896-11-5	0.100
XXX	240	Oligomerisation and alkylation reaction products of 2-phenylpropene and phenol	-	0.100
/	241	Bis( , -dimethylbenzyl) peroxide	80-43-3	0.100
/	242	Triphenyl phosphate	115-86-6	0.100
/	243	Resorcinol	108-46-3	0.100

**ATTACHMENTS**

**Testing Flow Chart**



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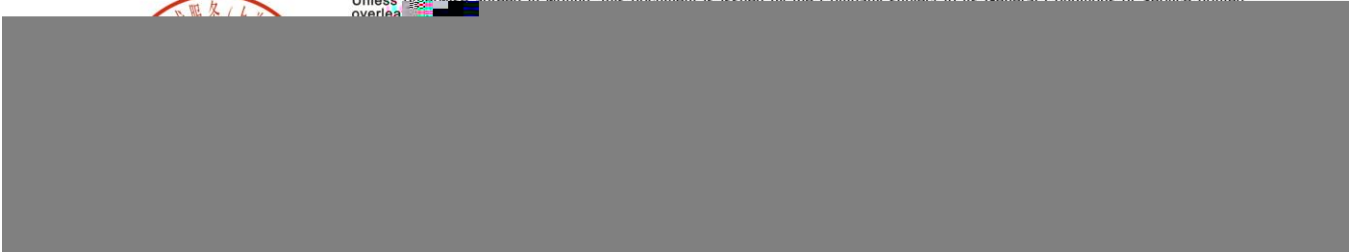
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SMA, SMAF, SMB, SMBF, SMC, DO-15, DO-41, DO-201, P600 ,  
DO-214AA/AB/AC, DO-218AB/AC,  
SOD123, SOD123FL, SOD323, SOD523, SOT23,  
T0263, T0252, T0277.





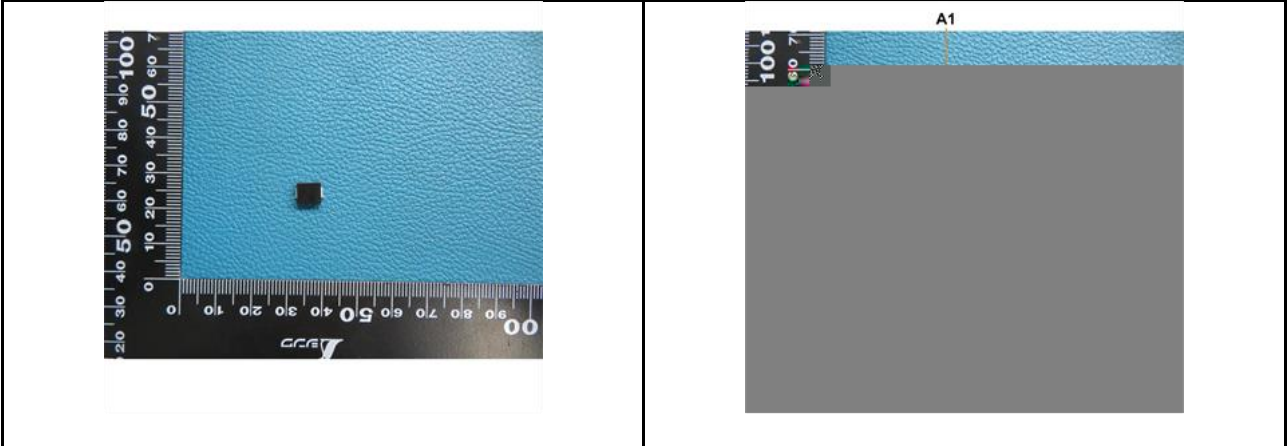
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### Sample photos:



SGS authenticate the photo on original report only  
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