

# CERTIFICATE



128, Yeoui-daero, Yeongdeungpo-gu, Seoul, Korea

## Issued by

\* 55, Yeosusandan 2-ro, Yeosu-si,  
Jeollanam-do, Korea.

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Product	ABS
Grade	AF312C
Issue date	January 22, 2018

## 1. Information of Chemical

- Usage : The application of Electronic & Automobile part and so on.
- Chemical Type : Thermoplastics
- MSDS Information : [www.chemwide.com](http://www.chemwide.com)

## 2. Certificate

- This certifies that below mentioned substances are never used as additives in the manufacturing process by intention.
- We hereby certify that above grade does not contain below mentioned substances

### Not Used and not contain these substances

The substances which ECHA added on the Candidate List of Substances of very high concern (SVHC) for authorization.

(Based on ECHA/PR/08/38, ECHA/PR/10/01 and ECHA/PR/10/05, ECHA/PR/10/12, ECHA/PR/10/16 and ECHA/PR/10/26, ECHA/PR/11/26, ECHA/PR/12/16 and ECHA/PR/12/39, ECHA/PR/13/26, ECHA/PR/13/40, ECHA/PR/14/18, ED/39/2015, ED/79/2015, ED/21/2016, ED/01/2017, ED/30/2017, ED/01/2018)

*Yong Jun Kim*

ABS QA Manager Y.J. Kim  
LG Chem, Ltd.

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## Appendix :

### Candidate List of Substances of Very High Concern for Authorization (1/9)

No	SVHC Candidate list	EC Number	CAS Number
1	anthracene	204-371-1	120-12-7
2	4,4'-diaminodiphenylmethane	202-974-4	101-77-9
3	dibutyl phthalate(DBP)	201-557-4	84-74-2
4	cobalt dichloride	231-589-4	7646-79-9
5	diarsenic pentaoxide	215-116-9	1303-28-2
6	diarsenic trioxide	215-481-4	1327-53-3
7	sodium dichromate	234-190-3	7789-12-0 10588-01-9
8	5-tert-butyl-2,4,6-trinitro-m-xylene(musk xylene)	201-329-4	81-15-2
9	Bis(2-ethyl(hexyl)phthalate)(DEHP)	204-211-0	117-81-7
10	hexabromocyclododecane(HBCDD)	247-148-4 221-695-9	25637-99-4
11	short chain chlorinated paraffins(SCCPs)	287-476-5	85535-84-8
12	bis(tributyltin)oxide(TBTO)	200-268-0	56-35-9
13	lead hydrogen arsenate	232-064-2	7784-40-9
14	triethyl arsenate	427-700-2	15606-95-8
15	benzyl butyl phthalate(BBP)	201-622-7	85-68-7
16	Anthracene oil	292-602-7	90640-80-5
17	Anthracene oil, anthracene paste, distn, light	295-278-5	91995-17-4
18	Anthracene oil, anthracene paste, anthracene fraction	295-275-9	91995-15-2
19	Anthracene oil, anthracene-low	292-604-8	90640-82-7
20	Anthracene oil, anthracene-paste	292-603-2	90640-81-6
21	Coal tar pitch, hightemperature	266-028-2	65996-93-2
22	Acrylamide	201-173-7	79-06-1
23	2,4-Dinitrotoluene	204-450-0	121-14-2
24	Diisobutyl phthalate	201-553-2	84-69-5
25	Lead chromate	231-846-0	7758-97-6
26	Lead chromate molybdate sulphate red	235-759-9	12656-85-8
27	Lead sulfochromate yellow	215-693-7	1344-37-2
28	Tris(2-chloroethyl)phosphate	204-118-5	115-96-8
29	Trichloroethylene	201-167-4	79-01-6

## Appendix :

### Candidate List of Substances of Very High Concern for Authorization (2/9)

No	SVHC Candidate list	EC Number	CAS Number
30	Boric acid	233-139-2 234-343-4	10043-35-3 11113-50-1
31	Disodium tetraborate, anhydrous	215-540-4	1330-43-4 12179-04-3 1303-96-4
32	Tetraboron disodium heptaoxide, hydrate	235-541-3	12267-73-1
33	Sodium chromate	231-889-5	2146108
34	Potassium chromate	232-140-5	7789-00-6
35	Ammonium dichromate	232-143-1	2151163
36	Potassium dichromate	231-906-6	7778-50-9
37	Cobalt(II) sulphate	233-334-2	10124-43-3
38	Cobalt(II) dinitrate	233-402-1	10141-05-6
39	Cobalt(II) carbonate	208-169-4	513-79-1
40	Cobalt(II) diacetate	200-755-8	71-48-7
41	2-Methoxyethanol	203-713-7	109-86-4
42	2-Ethoxyethanol	203-804-1	110-80-5
43	Chromium trioxide	215-607-8	1333-82-0
44	Acids generated from chromium trioxide and their oligomers: - . Chromic acid - . Dichromic acid Oligomers of chromic acid and dichromic acid	231-801-5 236-881-5	7738-94-5 13530-68-2
45	2-ethoxyethyl acetate	203-839-2	111-15-9
46	Strontium chromate	232-142-6	7789-06-02
47	1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters(DHNUP)	271-084-6	68515-42-4
48	Hydrazine Hydrazing hydrate	206-114-9	302-01-2 7803-57-8
49	1-methyl-2-pyrrolidone	212-828-1	872-50-4
50	1,2,3-trichloropropane	202-486-1	96-18-4
51	1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters(DIHP)	276-158-1	71888-89-6

## Appendix :

### Candidate List of Substances of Very High Concern for Authorization (3/9)

No	SVHC Candidate list	EC Number	CAS Number
52	Zirconia Aluminosilicate Refractory Ceramic Fibres are fibres covered by index number 650-017-00-8 in Annex VI, part 3, table 3.1 of Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, and fulfil the three following conditions: a) oxides of aluminium, silicon and zirconium are the main components present (in the fibres) within variable concentration ranges b) fibres have a length weighted geometric mean diameter less two standard geometric errors of 6 or less micrometres ( $\mu\text{m}$ ). c) alkaline oxide and alkali earth oxide ( $\text{Na}_2\text{O}+\text{K}_2\text{O}+\text{CaO}+\text{MgO}+\text{BaO}$ ) content less or equal to 18% by weight		
53	Calcium arsenate	231-904-5	7778-44-1
54	Bis(2-methoxyethyl) ether	203-924-4	111-96-6
55	Aluminosilicate Refractory Ceramic Fibres are fibres covered by index number 650-017-00-8 in Annex VI, part 3, table 3.1 of Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, and fulfil the three following conditions: a) oxides of aluminium and silicon are the main components present (in the fibres) within variable concentration ranges b) fibres have a length weighted geometric mean diameter less two standard geometric errors of 6 or less micrometres ( $\mu\text{m}$ ) c) alkaline oxide and alkali earth oxide ( $\text{Na}_2\text{O}+\text{K}_2\text{O}+\text{CaO}+\text{MgO}+\text{BaO}$ ) content less or equal to 18% by weight		
56	Potassium hydroxyoctaoxodizincatedichromate	234-329-8	11103-86-9
57	Lead dipicrate	229-335-2	6477-64-1
58	N,N-dimethylacetamide	204-826-4	127-19-5
59	Arsenic acid	231-901-9	7778-39-4
60	2-Methoxyaniline; o-Anisidine	201-963-1	90-04-0
61	Trilead diarsenate	222-979-5	3687-31-8
62	1,2-dichloroethane	203-458-1	107-06-2
63	Pentazinc chromate octahydroxide	256-418-0	49663-84-5
64	Formaldehyde, oligomeric reaction products with aniline	500-036-1	25214-70-4
65	Bis(2-methoxyethyl) phthalate	204-212-6	117-82-8
66	4-(1,1,3,3-tetramethylbutyl)phenol	205-426-2	140-66-9



## Appendix :

### Candidate List of Substances of Very High Concern for Authorization (4/9)

No	SVHC Candidate list	EC Number	CAS Number
67	Lead diazide, Lead azide	236-542-1	13424-46-9
68	Phenolphthalein	201-004-7	1977-09-08
69	Dichromium tris(chromate)	246-356-2	24613-89-6
70	Lead styphnate	239-290-0	15245-44-0
71	2,2'-dichloro-4,4'-methylenedianiline	202-918-9	101-14-4
72	$\alpha,\alpha$ -Bis[4-(dimethylamino)phenyl]-4 (phenylamino)naphthalene-1-methanol (C.I. Solvent Blue 4) [with $\geq 0.1\%$ of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)]	229-851-8	6786-83-0
73	N,N,N',N'-tetramethyl-4,4'-methylenedianiline (Michler's base)	202-959-2	101-61-1
74	1,3,5-tris[(2S and 2R)-2,3-epoxypropyl]-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione ( $\beta$ -TGIC)	423-400-0	59653-74-6
75	Diboron trioxide	215-125-8	1303-86-2
76	1,2-bis(2-methoxyethoxy)ethane (TEGDME; triglyme)	203-977-3	112-49-2
77	4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol [with $\geq 0.1\%$ of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)]	209-218-2	561-41-1
78	Lead(II) bis(methanesulfonate)	401-750-5	17570-76-2
79	Formamide	200-842-0	75-12-07
80	[4-[4,4'-bis(dimethylamino) benzhydrylidene]cyclohexa-2,5-dien-1-ylidene]dimethylammonium chloride (C.I. Basic Violet 3) [with $\geq 0.1\%$ of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)]	208-953-6	548-62-9
81	1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME)	203-794-9	110-71-4
82	[4-[[4-anilino-1-naphthyl][4-(dimethylamino)phenyl]methylene]cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Blue 26) [with $\geq 0.1\%$ of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)]	219-943-6	2580-56-5
83	1,3,5-Tris(oxiran-2-ylmethyl)-1,3,5-triazinane-2,4,6-trione (TGIC)	219-514-3	2451-62-9
84	4,4'-bis(dimethylamino)benzophenone (Michler's ketone)	202-027-5	90-94-8
85	Pyrochlore, antimony lead yellow	232-382-1	8012-00-8
86	6-methoxy-m-toluidine (p-cresidine)	204-419-1	120-71-8
87	Henicosaflluoroundecanoic acid	218-165-4	2058-94-8

## Appendix :

### Candidate List of Substances of Very High Concern for Authorization (5/9)

No	SVHC Candidate list	EC Number	CAS Number
88	Hexahydromethylphthalic anhydride [1], Hexahydro-4-methylphthalic anhydride [2], Hexahydro-1-methylphthalic anhydride [3], Hexahydro-3-methylphthalic anhydride [4] [The individual isomers [2], [3] and [4] (including their cis- and trans- stereo isomeric forms) and all possible combinations of the isomers [1] are covered by this entry]	247-094-1, 243-072-0, 256-356-4, 260-566-1	25550-51-0, 19438-60-9, 48122-14-1, 57110-29-9
89	Cyclohexane-1,2-dicarboxylic anhydride [1], cis-cyclohexane-1,2-dicarboxylic anhydride [2], trans-cyclohexane-1,2-dicarboxylic anhydride [3] [The individual cis- [2] and trans- [3] isomer substances and all possible combinations of the cis- and trans-isomers [1] are covered by this entry]	201-604-9, 236-086-3, 238-009-9	85-42-7, 13149-00-3, 14166-21-3
90	Dibutyltin dichloride (DBTC)	211-670-0	683-18-1
91	Lead bis(tetrafluoroborate)	237-486-0	13814-96-5
92	Lead dinitrate	233-245-9	10099-74-8
93	Silicic acid, lead salt	234-363-3	11120-22-2
94	4-Aminoazobenzene	200-453-6	60-09-3
95	Lead titanium zirconium oxide	235-727-4	12626-81-2
96	Lead monoxide (lead oxide)	215-267-0	1317-36-8
97	o-Toluidine	202-429-0	95-53-4
98	3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine	421-150-7	143860-04-2
99	Silicic acid (H <sub>2</sub> Si <sub>2</sub> O <sub>5</sub> ), barium salt (1:1), lead-doped	272-271-5	68784-75-8
100	Trilead bis(carbonate)dihydroxide	215-290-6	1319-46-6
101	Furan	203-727-3	110-00-9
102	N,N-dimethylformamide	200-679-5	68-12-02
103	4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated [covering well-defined substances and UVCB substances, polymers and homologues]	-	-
104	4-Nonylphenol, branched and linear [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof]	-	-
105	4,4'-methylenedi-o-toluidine	212-658-8	838-88-0
106	Diethyl sulphate	200-589-6	64-67-5
107	Dimethyl sulphate	201-058-1	77-78-1
108	Lead oxide sulfate	234-853-7	12036-76-9
109	Lead titanium trioxide	235-038-9	12060-00-3

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### Candidate List of Substances of Very High Concern for Authorization (6/9)

No	SVHC Candidate list	EC Number	CAS Number
110	Acetic acid, lead salt, basic	257-175-3	51404-69-4
111	[Phthalato(2-)]dioxotrilead	273-688-5	69011-06-9
112	Bis(pentabromophenyl) ether (decabromodiphenyl ether; DecaBDE)	214-604-9	1163-19-5
113	N-methylacetamide	201-182-6	79-16-3
114	Dinoseb (6-sec-butyl-2,4-dinitrophenol)	201-861-7	88-85-7
115	1,2-Diethoxyethane	211-076-1	629-14-1
116	Tetralead trioxide sulphate	235-380-9	12202-17-4
117	N-pentyl-isopentylphthalate	-	776297-69-9
118	Dioxobis(stearato)trilead	235-702-8	12578-12-0
119	Tetraethyllead	201-075-4	78-00-2
120	Pentalead tetraoxide sulphate	235-067-7	12065-90-6
121	Pentacosafuorotridecanoic acid	276-745-2	72629-94-8
122	Tricosafuorododecanoic acid	206-203-2	307-55-1
123	Heptacosafuorotetradecanoic acid	206-803-4	376-06-7
124	1-bromopropane (n-propyl bromide)	203-445-0	106-94-5
125	Methoxyacetic acid	210-894-6	625-45-6
126	4-methyl-m-phenylenediamine (toluene-2,4-diamine)	202-453-1	95-80-7
127	Methyloxirane (Propylene oxide)	200-879-2	75-56-9
128	Trilead dioxide phosphonate	235-252-2	12141-20-7
129	o-aminoazotoluene	202-591-2	97-56-3
130	1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	284-032-2	84777-06-0
131	4,4'-oxydianiline and its salts	202-977-0	101-80-4
132	Orange lead (lead tetroxide)	215-235-6	1314-41-6
133	Biphenyl-4-ylamine	202-177-1	92-67-1
134	Diisopentylphthalate	210-088-4	605-50-5
135	Fatty acids, C16-18, lead salts	292-966-7	91031-62-8
136	Diazene-1,2-dicarboxamide (C,C'-azodi(formamide))	204-650-8	123-77-3
137	Sulfurous acid, lead salt, dibasic	263-467-1	62229-08-7
138	Lead cyanamidate	244-073-9	20837-86-9

## Appendix :

### Candidate List of Substances of Very High Concern for Authorization (7/9)

No	SVHC Candidate list	EC Number	CAS Number
139	Ammoniumpentadecafluorootanoate (APFO)	223-320-4	3825-26-1
140	Di-n-pentyl phthalate (DPP)	205-017-9	131-18-0
141	Cadmium	231-152-8	7440-43-9
142	Pentadecafluorooctanoic acid (PFOA)	206-397-9	335-67-1
143	Cadmium oxide	215-146-2	1306-19-0
144	4-Nonylphenol, branched and linear, ethoxylated [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol , ethoxylated covering UVCB- and well-defined substances, polymers and homologues]	284-325-5, 247-770-6, 203-199-4, 241-427-4, 250-339-5, 257-907-1, -, -, etc.	84852-15-3, 26543-97-5, 104-40-5, 17404-66-9, 30784-30-6, 52427-13-1, 186825-36-5, 142731-63-3, etc.
145	Dihexyl phthalate	201-559-5	84-75-3
146	Trixylyl phosphate	246-677-8	25155-23-1
147	Imidazolidine-2-thione; 2-imidazoline-2-thiol	202-506-9	94-45-7
148	Disodium 4-amino-3-[[4'-[(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo] -5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate	217-710-3	1937-37-7
149	Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate)	209-358-4	573-58-0
150	Cadmium sulphide	215-147-8	1306-23-6
151	Lead di(acetate)	206-104-4	301-04-2
152	1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	271-093-5	68515-50-4
153	Cadmium chloride	233-296-7	10108-64-2
154	Sodium perborate; perboric acid, sodium salt	239-172-9; 234-390-0	
155	Sodium peroxometaborate	231-556-4	7632-04-4
156	Cadmium fluoride	232-222-0	7790-79-6
157	Cadmium sulphate	233-331-6	10124-36-4; 31119-53-6
158	2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)	223-346-6	3846-71-7
159	2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	247-384-8	25973-55-1



## Appendix :

### Candidate List of Substances of Very High Concern for Authorization (8/9)

No	SVHC Candidate list	EC Number	CAS Number
160	2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)	239-622-4	15571-58-1
161	reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE)		
162	1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with $\geq 0.3\%$ of dihexyl phthalate (EC No. 201-559-5)	271-094-0 272-013-1	68515-51-5 68648-93-1
163	5-sec-butyl-2-(2,4-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [1], 5-sec-butyl-2-(4,6-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [2] [covering any of the individual isomers of [1] and [2] or any combination thereof]		
164	1,3-propanesultone	214-317-9	1120-71-4
165	2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327)	223-383-8	3864-99-1
166	2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-350)	253-037-1	36437-37-3
167	Nitrobenzene	202-716-0	98-95-3
168	Perfluorononan-1-oic-acid and its sodium and ammonium salts	206-801-3	375-95-1 21049-39-8 4149-60-4
169	Benzo[def]chrysene	200-028-5	50-32-8
170	4,4'-isopropylidenediphenol	201-245-8	80-05-7
171	4-Heptylphenol, branched and linear	-	-
172	Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts	-	-
173	p-(1,1-dimethylpropyl)phenol	201-280-9	80-46-6
174	Perfluorohexane-1-sulphonic acid and its salts	-	-

## Appendix :

### Candidate List of Substances of Very High Concern for Authorization (9/9)

No	SVHC Candidate list	EC Number	CAS Number
175	Benz[a]anthracene	200-280-6	56-55-3 1718-53-2
176	Cadmium carbonate	208-168-9	513-78-0
177	Cadmium hydroxide	244-168-5	21041-95-2
178	Cadmium nitrate	233-710-6	10022-68-1 10325-94-7
179	Chrysene	205-923-4	218-01-9 1719-03-5
180	Dodecachloropentacyclo[12.2.1.16,9.02,13.05,10]octadeca-7,15-diene ("Dechlorane Plus"™)	-	-
181	Reaction products of 1,3,4-thiadiazolidine-2,5-dithione, formaldehyde and 4-heptylphenol, branched and linear (RP-HP)	-	-

Entry updated in the Candidate List for authorization on 15 January 2018 and the SVHC property.