

CERTIFICATE



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

Issued by

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

LG Chem, Ltd. Yeosu Plant QA Team

* Tel : 82-61-680-1210

* Fax : 82-61-680-6023

Product	ABS
Grade	ER232
Issue date	May 23, 2021

1. Information of Chemical

- Usage : The application of Electronic & Automobile part and so on.
- Chemical Type : Thermoplastics
- MSDS Information : 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, ED/61/2018, ED/88/2018, ED/71/2019)

Hyeong Seok Kim

ABS QA Manager
LG Chem, Ltd.

※ THIS DOCUMENT IS FOR INFORMATION PURPOSE ONLY. THIS DOCUMENT DOES NOT CONSTITUTE A CONTRACT OR A PRE-CONTRACT AND IT IS NON-BINDING ON LG CHEM IN ANY MANNER WHATSOEVER.

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 (μm). 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 (μm) 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	α,α -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 (β -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 ₂ Si ₂ O ₅), 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

Appendix :

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
139	Ammoniumpentadecafluorootanoate (APFO)	223-320-4	3825-26-1

Appendix :

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

No	SVHC Candidate list	EC Number	CAS Number
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
160	2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)	239-622-4	15571-58-1

Appendix :

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

No	SVHC Candidate list	EC Number	CAS Number
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 ≥ 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	-	-
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

Appendix :

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

No	SVHC Candidate list	EC Number	CAS Number
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)	-	-
182	Benzo[ghi]perylene (BgP)	205-883-8	191-24-2
183	Decamethylcyclopentasiloxane (D5)	208-764-9	541-02-6
184	Disodium octaborate	234-541-0	12008-41-2
185	Dodecamethylcyclohexasiloxane (D6)	208-762-8	540-97-6
186	Ethylenediamine	203-468-6	107-15-3
187	Lead	231-100-4	7439-92-1
188	Octamethylcyclotetrasiloxane (D4)	209-136-7	556-67-2
189	Terphenyl hydrogenated	262-967-7	61788-32-7
190	dicyclohexyl phthalate (DCHP)	201-545-9	84-61-7
191	Benzene-1,2,4-tricarboxylic acid 1,2-anhydride (trimellitic anhydride) (TMA)	209-008-0	552-30-7
192	2,2-bis(4'-hydroxyphenyl)-4-methylpentane	401-720-1	6807-17-6
193	Benzo[k]fluoranthene	205-916-6	207-08-9
194	Fluoranthene	205-912-4	206-44-0, 93951-69-0
195	Phenanthrene	201-581-5	85-01-8
196	Pyrene	204-927-3	129-00-0, 1718-52-1
197	1,7,7-trimethyl-3-(phenylmethylene)bicyclo[2.2.1]heptan-2-one	239-139-9	15087-24-8
198	Tris(4-nonylphenyl, branched and linear) phosphite (TNPP) with ≥ 0.1% w/w of 4-nonylphenol, branched and linear (4-NP)	-	-
199	4-tert-butylphenol	202-679-0	98-54-4
200	2-methoxyethyl acetate	203-772-9	110-49-6
201	2,3,3,3-tetrafluoro-2-(heptafluoropropoxy) propionic acid, its salts and its acyl halides	-	-

Entry updated in the Candidate List for authorization on 16 July 2019 and the SVHC property.