

## REACH CERTIFICATE OF COMPLIANCE:

In compliance with REACH Directives which is the European Community Regulation on chemicals and their safe use (EC Regulation No. 1907/2006), Abracon LLC. assures its customers that all Abracon products meet the following requirements pertaining to the 197 SVHCs (Substances of Very High Concern) - Candidate list specified as the below table.

The Candidate list is also published at:

<http://echa.europa.eu/web/guest/candidate-list-table>

Abracon LLC. certifies that some products do contain the Substances of Very High Concern (SVHC's). It should be noted that SVHC items are not banned from inclusion, but are Reportable per current REACH regulations

There are some Ceramic package Crystals that are using over 0.1% w/w of the Reportable Substances Diboron Trioxide, and Lead Oxide in Sealing Glass material: **ABM8G, ABM3, ABM7, ABMM3, ABM2, ABC2.**

**AB, ABL, ABL2, ABL3, ABL5, ABL52, ABL53, ABL5G, ABU and ABMC2** are using over 0.1% w/w of the Reportable Substances Diboron Trioxide in Sealing Glass material.

**ARJ11** is using over 0.1% of the Reportable Substance Hexahydromethylphthalic anhydride in the Epoxy Resin of the LED

**ABS25** is using over 0.1%w/w of the Reportable Substance Lead in Solder and Plating.

Dip type ceramic components includes MHz ceramic resonators, filters: **HWZT-Series, AWCR-Series, AFC-Series** are using > 0.1% w/w of the Reportable Substance Lead Oxide/Tetroxide in Piezoelectric Ceramic.

SMD type ceramic components includes MHz ceramic resonators, filters: **ASFC-Series, AWSCR-Series and AWSZT** are using > 0.1% w/w Reportable Substance Boric acid in glass of silver paste, and using >0.1% w/w Reportable Substance Lead Oxide/Tetroxide in Piezoelectric Ceramic.

Table 1: 197 SVHC Item List

#	Substance Name	CAS #	Substance Threshold Limit in ppm	Date of inclusion
1	Anthracene	120-12-7	1000	2008.10.28
2	4,4'- Diaminodiphenylmethane	101-77-9	1000	2008.10.28
3	Dibutyl phthalate	84-74-2	1000	2008.10.28
4	Cobalt dichloride	7646-79-9	1000	2008.10.28
5	Diarsenic pentaoxide	1303-28-2	1000	2008.10.28
6	Diarsenic trioxide	1327-53-3	1000	2008.10.28
7	Sodium dichromate, dihydrate	10588-01-9	1000	2008.10.28
8	5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)	81-15-2	1000	2008.10.28
9	Bis (2-ethyl(hexyl)phthalate) (DEHP)	117-81-7	1000	2008.10.28
10	Hexabromocyclododecane (HBCDD)	3194-55-6	1000	2008.10.28
11	Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)	85535-84-8	1000	2008.10.28
12	Bis(tributyltin) oxide,hexabutyldistannoxane	56-35-9	1000	2008.10.28
13	Lead hydrogen arsenate	7784-40-9	1000	2008.10.28
14	Triethyl arsenate	15606-95-8	1000	2008.10.28
15	Benzyl butyl phthalate	85-68-7	1000	2008.10.28
16	2,4-Dinitrotoluene	121-14-2	1000	2010.1.13
	Aluminosilicate Refractory Ceramic Fibres			
	<u>Note:</u> this substance is listed again on 2012.12.19			
17	Anthracene oil	90640-80-5	1000	2010.1.13

18	Anthracene oil, anthracene paste	90640-81-6	1000	2010.1.13
19	Anthracene oil, anthracene paste, anthracene fraction	91995-15-2	1000	2010.1.13
20	Anthracene oil, anthracene paste, distn. lights	91995-17-4	1000	2010.1.13
21	Anthracene oil, anthracene-low	90640-82-7	1000	2010.1.13
22	Diisobutyl phthalate	84-69-5	1000	2010.1.13
23	Lead chromate	7758-97-6	1000	2010.1.13
24	Lead chromate molybdate sulphate red (C.I. Pigment Red 104)	12656-85-8	1000	2010.1.13
25	Lead sulfochromate yellow (C.I. Pigment Yellow 34)	1344-37-2	1000	2010.1.13
26	Pitch, coal tar, high temp.	65996-93-2	1000	2010.1.13
27	Tris(2-chloroethyl)phosphate Zirconia Aluminosilicate Refractory Ceramic Fibres <b>Note:</b> this substance is listed again below on 2012.12.19	115-96-8	1000	2010.1.13
28	Acrylamide	79-06-1	1000	2010.3.30
29	Trichloroethylene	79-01-6	1000	2010.6.18
30	Boric acid	10043-35-3	1000	2010.6.18
31	Disodium tetraborate, anhydrous	1330-43-4	1000	2010.6.18
32	Tetraboron disodium heptaoxide, hydrate	12267-73-1	1000	2010.6.18
33	Sodium chromate	7775-11-3	1000	2010.6.18
34	Potassium chromate	7789-00-6	1000	2010.6.18
35	Ammonium dichromate	7789-09-5	1000	2010.6.18
36	Potassium dichromate	7778-50-9	1000	2010.6.18
37	2-Ethoxyethanol	110-80-5	1000	2010.12.15
38	2-Methoxyethanol	109-86-4	1000	2010.12.15
39	Chromic acid	7738-94-5	1000	2010.12.15
40	Chromium trioxide	1333-82-0	1000	2010.12.15
41	Cobalt(II) carbonate	513-79-1	1000	2010.12.15
42	Cobalt(II) diacetate	71-48-7	1000	2010.12.15
43	Cobalt(II) dinitrate	10141-05-6	1000	2010.12.15
44	Cobalt(II) sulphate	10124-43-3	1000	2010.12.15
45	1,2,3-Trichloropropane	96-18-4	1000	2011.6.20
46	1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich	71888-89-6	1000	2011.6.20
47	1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters	68515-42-4	1000	2011.6.20
48	1-Methyl-2-pyrrolidone	872-50-4	1000	2011.6.20
49	2-Ethoxyethyl acetate	111-15-9	1000	2011.6.20
50	Hydrazine	302-01-2 / 7803-57-8	1000	2011.6.20
51	Strontium chromate	7789-06-2	1000	2011.6.20
52	Dichromium tris(chromate)	24613-89-6	1000	2011.12.19
53	Potassium hydroxyoctaoxidizincatedi-chromate	11103-86-9	1000	2011.12.19
54	Pentazinc chromate octahydroxide	49663-84-5	1000	2011.12.19
55	Aluminosilicate Refractory Ceramic Fibres (RCF)	-	1000	2011.12.19
56	Zirconia Aluminosilicate Refractory Ceramic Fibres (Zr-RCF)	-	1000	2011.12.19
57	Formaldehyde, oligomeric reaction products with aniline (technical MDA)	25214-70-4	1000	2011.12.19
58	Bis(2-methoxyethyl) phthalate	117-82-8	1000	2011.12.19
59	2-Methoxyaniline; o-Anisidine	90-04-0	1000	2011.12.19
60	4-(1,1,3,3-tetramethylbutyl)phenol, (4-tert-Octylphenol)	140-66-9	1000	2011.12.19
61	1,2-Dichloroethane	107-06-2	1000	2011.12.19

62	Bis(2-methoxyethyl) ether	111-96-6	1000	2011.12.19
63	Arsenic acid	7778-39-4	1000	2011.12.19
64	Calcium arsenate	7778-44-1	1000	2011.12.19
65	Trilead diarsenate	3687-31-8	1000	2011.12.19
66	N,N-dimethylacetamide (DMAC)	127-19-5	1000	2011.12.19
67	2,2'-dichloro-4,4'-methylenedianiline (MOCA)	101-14-4	1000	2011.12.19
68	Phenolphthalein	77-09-8	1000	2011.12.19
69	Lead azide Lead diazide	13424-46-9	1000	2011.12.19
70	Lead styphnate	15245-44-0	1000	2011.12.19
71	Lead dipicrate	6477-64-1	1000	2011.12.19
72	1,2-bis(2-methoxyethoxy)ethane (TEGDME; triglyme)	112-49-2	1000	2012.06.18
73	<b>1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME)</b>	110-71-4	1000	2012.06.18
74	Diboron trioxide	1303-86-2	1000	2012.06.18
75	Formamide	75-12-7	1000	2012.06.18
76	Lead(II) bis(methanesulfonate)	17570-76-2	1000	2012.06.18
77	TGIC (1,3,5-tris(oxiranylmethyl)-1,3,5-triazine-2,4,6(1H,3H,5H)-trione)	2451-62-9	1000	2012.06.18
78	$\beta$ -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	1000	2012.06.18
79	4,4'-bis(dimethylamino)benzophenone (Michler's ketone)	90-94-8	1000	2012.06.18
80	N,N,N',N'-tetramethyl-4,4'-methylenedianiline (Michler's base)	101-61-1	1000	2012.06.18
81	[4-[4,4'-bis(dimethylamino) benzhydrylidene]cyclohexa-2,5-dien-1-ylidene]dimethylammonium chloride (C.I. Basic Violet 3)	548-62-9	1000	2012.06.18
82	[4-[[4-anilino-1-naphthyl][4-(dimethylamino)phenyl]methylene]cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Blue 26)	2580-56-5	1000	2012.06.18
83	$\alpha,\alpha$ -Bis[4-(dimethylamino)phenyl]-4 (phenylamino)naphthalene-1-methanol (C.I. Solvent Blue 4)	6786-83-0	1000	2012.06.18
84	4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol	561-41-1	1000	2012.06.18
85	Bis(pentabromophenyl) ether (decabromodiphenyl ether; DecaBDE)	1163-19-5	1000	2012.12.19
86	Pentacosafuorotridecanoic acid	72629-94-8	1000	2012.12.19
87	Tricosafuorododecanoic acid	307-55-1	1000	2012.12.19
88	Henicosafuoroundecanoic acid	2058-94-8	1000	2012.12.19
89	Heptacosafuorotetradecanoic acid	376-06-7	1000	2012.12.19
90	Diazene-1,2-dicarboxamide (C,C'-azodi(formamide))	123-77-3	1000	2012.12.19
91	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].	85-42-7, 13149-00-3, 14166-21-3	1000	2012.12.19
92	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]	25550-51-0, 19438-60-9, 48122-14-1, 57110-29-9	1000	2012.12.19
93	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]	-	1000	2012.12.19

94	4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated [covering well-defined substances and UVCB substances, polymers and homologues]	-	1000	2012.12.19
95	Methoxyacetic acid	625-45-6	1000	2012.12.19
96	N,N-dimethylformamide	68-12-2	1000	2012.12.19
97	Dibutyltin dichloride (DBTC)	683-18-1	1000	2012.12.19
98	Lead monoxide (Lead oxide)	1317-36-8	1000	2012.12.19
99	Orange lead (Lead tetroxide)	1314-41-6	1000	2012.12.19
100	Lead bis(tetrafluoroborate)	13814-96-5	1000	2012.12.19
101	Trilead bis(carbonate)dihydroxide	1319-46-6	1000	2012.12.19
102	Lead titanium trioxide	12060-00-3	1000	2012.12.19
103	Lead titanium zirconium oxide	12626-81-2	1000	2012.12.19
104	Silicic acid, lead salt	11120-22-2	1000	2012.12.19
105	Silicic acid (H <sub>2</sub> Si <sub>2</sub> O <sub>5</sub> ), barium salt (1:1), lead-doped [with lead (Pb) content above the applicable generic concentration limit for 'toxicity for reproduction' Repr. 1A (CLP) or category 1 (DSD); the substance is a member of the group entry of lead compounds, with index number 082-001-00-6 in Regulation (EC) No 1272/2008]	68784-75-8	1000	2012.12.19
106	1-bromopropane (n-propyl bromide)	106-94-5	1000	2012.12.19
107	Methyloxirane (Propylene oxide)	75-56-9	1000	2012.12.19
108	1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	84777-06-0	1000	2012.12.19
109	Diisopentylphthalate (DIPP)	605-50-5	1000	2012.12.19
110	N-pentyl-isopentylphthalate	- 776297-69-9	1000	2012.12.19
111	1,2-diethoxyethane	629-14-1	1000	2012.12.19
112	Acetic acid, lead salt, basic	51404-69-4	1000	2012.12.19
113	Lead oxide sulfate	12036-76-9	1000	2012.12.19
114	[Phthalato(2-)]dioxotrilead	69011-06-9	1000	2012.12.19
115	Dioxobis(stearato)trilead	12578-12-0	1000	2012.12.19
116	Fatty acids, C16-18, lead salts	91031-62-8	1000	2012.12.19
117	Lead cyanamidate	20837-86-9	1000	2012.12.19
118	Lead dinitrate	10099-74-8	1000	2012.12.19
119	Pentalead tetraoxide sulphate	12065-90-6	1000	2012.12.19
120	Pyrochlore, antimony lead yellow	8012-00-8	1000	2012.12.19
121	Sulfurous acid, lead salt, dibasic	62229-08-7	1000	2012.12.19
122	Tetraethyllead	78-00-2	1000	2012.12.19
123	Tetralead trioxide sulphate	12202-17-4	1000	2012.12.19
124	Trilead dioxide phosphonate	12141-20-7	1000	2012.12.19
125	Furan	110-00-9	1000	2012.12.19
126	Diethyl sulphate	64-67-5	1000	2012.12.19
127	Dimethyl sulphate	77-78-1	1000	2012.12.19
128	3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine	143860-04-2	1000	2012.12.19
129	Dinoseb (6-sec-butyl-2,4-dinitrophenol)	88-85-7	1000	2012.12.19
130	4,4'-methylenedi-o-toluidine	838-88-0	1000	2012.12.19
131	4,4'-oxydianiline and its salts	101-80-4	1000	2012.12.19
132	4-aminoazobenzene	60-09-3	1000	2012.12.19
133	4-methyl-m-phenylenediamine (toluene-2,4-diamine)	95-80-7	1000	2012.12.19
134	6-methoxy-m-toluidine (p-cresidine)	120-71-8	1000	2012.12.19
135	Biphenyl-4-ylamine	92-67-1	1000	2012.12.19
136	o-aminoazotoluene [(4-o-tolylazo-o-toluidine)]	97-56-3	1000	2012.12.19

137	o-toluidine	95-53-4	1000	2012.12.19
138	N-methylacetamide	79-16-3	1000	2012.12.19
139	Cadmium	7440-43-9	1000	2013.06.20
140	Ammonium pentadecafluorooctanoate (APFO)	3825-26-1	1000	2013.06.20
141	Pentadecafluorooctanoic acid (PFOA)	335-67-1	1000	2013.06.20
142	Dipentyl phthalate (DPP)	131-18-0	1000	2013.06.20
143	4-Nonylphenol, branched and linear, ethoxylated		1000	2013.06.20
144	Cadmium oxide	1306-19-0	1000	2013.06.20
145	Cadmium sulphide	1306-23-6	1000	2013.12.16
146	Disodium 4-amino-3-[[4'-[[2,4-diaminophenyl]azo][1,1'-biphenyl]-4-yl]azo]-5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate (C.I. Direct Black 38)	1937-37-7	1000	2013.12.16
147	Dihexyl phthalate	84-75-3	1000	2013.12.16
148	Imidazolidine-2-thione; (2-imidazoline-2-thiol)	96-45-7	1000	2013.12.16
149	Trixylyl phosphate	25155-23-1	1000	2013.12.16
150	Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate) (C.I. Direct Red 28)	573-58-0	1000	2013.12.16
151	Lead di(acetate)	301-04-2	1000	2013.12.16
152	1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	68515-50-4	1000	2014.06.11
153	Sodium perborate; perboric acid, sodium salt	N/A	1000	2014.06.11
154	Sodium peroxometaborate	7632-04-4	1000	2014.06.11
155	Cadmium chloride	10108-64-2	1000	2014.06.11
156	2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	25973-55-1	1000	2014-12-17
157	2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)	3846-71-7	1000	2014-12-17
158	2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)	15571-58-1	1000	2014-12-17
159	Cadmium fluoride	7790-79-6	1000	2014-12-17
160	Cadmium sulphate	10124-3-4 31119-53-6	1000	2014-12-17
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)	---	1000	2014-12-17
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)	68515-51-5 68648-93-1	1000	2015-06-15
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 stereoisomers of [1] and [2] or any combination thereof]	---	1000	2015-06-15
164	Nitrobenzene –	98-95-3	1000	2015-12-17
165	2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327)	3864-99-1	1000	2015-12-17
166	2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-350)	36437-37-3	1000	2015-12-17
167	1,3-propanesultone	1120-71-4	1000	2015-12-17
168	Perfluorononan-1-oic-acid and its sodium and ammonium salts	375-95-1 21049-39-8 4149-60-4	1000	2015-12-17
169	Benzo (def)chrysene	50-32-8	1000	2016-06-20
170	4,4'-Isopropylidenediphenol - Bisphenol A; BPA -	80-05-7	1000	2017-01-12
171	4-heptylphenol, branched and linear	---	1000	2017-01-12
172	Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts	335-76-2 3830-45-3 3108-42-7	1000	2017-01-12

173	p-(1,1-dimethylpropyl)phenol	80-46-6	1000	2017-01-12
174	Perfluorohexane-1-sulphonic acid and its salts - PFHxS	-	1000	2017-07-07
175	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 (4-HPbl)	-	1000	2018-01-15
176	Dodecachloropentacyclo [12.2.1.16,9.02,13.05,10]octadeca-7,15diene ("Dechlorane Plus"™) Covering any of its individual anti- and syn-isomers or any combination thereof	-	1000	2018-01-15
177	Chrysene	218-01-9, 1719-03-5	1000	2018-01-15
178	Cadmium nitrate	10022-68-1, 10325-94-7	1000	2018-01-15
179	Cadmium hydroxide	21041-95-2	1000	2018-01-15
180	Cadmium carbonate	513-78-0	1000	2018-01-15
181	Benz[a]anthracene	56-55-3,171 8-53-2	1000	2018-01-15
182	Benzene-1,2,4-tricarboxylic 1,2 anhydride (trimellitic anhydride) (TMA)	552-30-7	1000	2018-06-27
183	Dicyclohexyl phthalate (DCHP)	84-61-7	1000	2018-06-27
184	Terphenyl, hydrogenated	61788-32-7	1000	2018-06-27
185	Octamethylcyclotetrasiloxane(D4)	556-67-2	1000	2018-06-27
186	Lead	7439-92-1	1000	2018-06-27
187	Ethylenediamine	107-15-3	1000	2018-06-27
188	Dodecamethylcyclohexasiloxane(D6)	540-97-6	1000	2018-06-27
189	Disodium octaborate	540-97-6	1000	2018-06-27
190	Decamethylcyclopentasiloxane (D5)	541-02-6	1000	2018-06-27
191	Benzo[ghi]perylene	191-24-2	1000	2018-06-27
192	Pyrene	129-00-0	1000	2019-01-15
193	Phenanthrene	85-01-8	1000	2019-01-15
194	Fluoranthene	206-44-0	1000	2019-01-15
195	Benzo(K) Fluoranthene	207-08-9	1000	2019-01-15
196	2,2-bis(4'-hydroxyphenyl)-4-methylpentane	6807-17-6	1000	2019-01-15
197	1,7,7-trimethyl-3-(phenylmethylene)bicyclo[2.2.1]heptan-2-one (3-benzylidene camphor; 3-BC)	15087-24-8	1000	2019-01-15

Signature:  Date: 01-15-2019

Name: Leo Santillan

Title: Quality Engineering Technician &  
Environmental Compliance Coordinator



Signature:  Date: 01-15-2019

Name: Reuben Quintanilla

Title: Quality & Process Improvement Manager