

## Chapter 7 - Speciation Profiles

The 1998 Architectural Coatings Survey, in contrast to past surveys, collected ingredient data in addition to sales and VOC content information for the 58 coating categories. We received data representing over 3,000 distinct ingredients. Listing all the ingredients was considered impractical and not consistent with our effort to maintain confidentiality. To maintain confidentiality three or more companies (“Three Company Rule”) must be using the ingredients shown in Tables 7-1, 7-2, and 7-3. Given the magnitude of ingredient data, like compounds were aggregated under common names and all the ingredients are ranked in descending order by mass. Table 7-1 summarizes ingredients in architectural coatings overall, while Tables 7-2 and 7-3 provide the ingredients in solvent-borne and water-borne coatings respectively. While it was our intent to provide species profiles by category, it was determined that this approach limited our ability to display as much of the data as possible while maintaining confidentiality.

The survey questionnaire (see Appendix A) provided two options for reporting ingredient information. Respondents could choose to use survey Form III, which required a listing of all coating ingredients that individually amount to 1.0% or greater by weight of the final product. Remaining ingredients that individually accounted for less than 1.0% of the final product would be aggregated under “Aggregated Ingredients <1.0%.” Survey Form IV provided an abbreviated approach to Form III in which the respondent would identify VOCs and Exempt Compounds only that individually amount to 1.0% or greater by weight of the final product. Any VOCs or Exempt Compounds that individually accounted for less than 1.0% of the final product could be aggregated. Remaining ingredients were entered under “All Other”. Approximately one-third of the survey respondents used survey Form III, while the rest used survey Form IV. Tables 7-1, 7-2, and 7-3 represent both survey Forms III and IV.

Since Tables 7-1 through 7-3 reflect both survey Forms III and IV, features of both Forms are present. For example, “All Other”, a feature of survey Form IV, and “Aggregated Ingredients <1.0%” a feature of Form III, both appear in all three tables. In all these tables, ingredient data not being used by three or more companies were aggregated under “Aggregated Protected Data”.

The Air Resources Board plans to use these species profiles in our ongoing effort to examine the future potential of reactivity based standards for architectural coatings. These profiles will also aid our emission modeling programs, which take into account photochemical reactivity. We consider the information contained in Tables 7-1, 7-2, and 7-3 to be simply a snapshot of what was reported in the 1998 survey questionnaire, and we will continue to refine and update these data. We have not categorized the compounds as VOCs, non-VOCs, or solids, in order to allow the public to see the most data possible.

**Table 7-1**  
Architectural Coatings Speciation Profile – Overall  
(Ranked by Mass)

Item #	Name	Item #	Name
1	All Other	47	attapulgite
2	water	48	2-(2-methoxyethoxy)ethanol
3	Aggregated Protected Data	49	n-butanol
4	calcium carbonate	50	diatomaceous earth
5	titanium dioxide	51	methyl isobutyl ketone
6	medium aliphatic solvent naphtha	52	propylene glycol monomethyl
7	asphalt fumes (petroleum)	53	solvent-refined heavy paraffinic distillate
8	2,2,4-trimethyl-1,3-pentanediol isobutyrate	54	chlorinated paraffin
9	propylene glycol	55	silica (crystalline-cristobalite)
10	stoddard solvent	56	iodopropynyl butylcarbamate
11	ethylene glycol	57	dipropylene glycol methyl ether
12	talc	58	zinc oxide
13	Aggregated VOCs < 1.0%	59	ethyl benzene
14	vm & painters naphtha	60	mica
15	epon 1001 resin	61	naphtha
16	petroleum naphtha, heavy alkylate	62	diatomaceous silica, flux-calcined
17	xylenes	63	heavy aromatic naphtha solvent
18	aromatic 100	64	chloraflin
19	kaolin	65	ammonium hydroxide
20	distillate(petroleum), hydrotreated light	66	amorphous silica
21	Aggregate Ingredients < 1.0%	67	2,2'-oxybisethanol
22	toluene	68	Volatile Methyl Siloxanes
23	2-propenoic acid, butyl ester, polymer with ethenyl acetate	69	aqualyte (TM), LSC cocktail
24	methyl ethyl ketone	70	ethyl 3-ethoxypropionate
25	2-(2-butoxyethoxy)ethanol	71	2-propoxyethanol
26	sand	72	styrene
27	limestone	73	ammonia
28	ethyl alcohol	74	isobutyl isobutyrate
29	butyl acetate	75	dipropylene glycol
30	methanol	76	sodium silicoaluminate
31	1,1,1-trichloroethane	77	aluminum
32	hydrotreated heavy naphtha	78	wollastonite
33	vinyl acetate	79	propylene glycol monomethyl ether acetate
34	kerosene	80	meta-xylene
35	petroleum ether	81	polypropylene glycol
36	oil of linseed	82	barium boron oxide
37	aluminum silicate	83	mesitylene
38	fibrous glass filter media	84	2-amino-2-methyl-1-propanol
39	2-propanol	85	butene, homopolymer
40	2-butoxy ethanol	86	hydroxyethyl cellulose
41	naphtha, petroleum, light steam-cracked arom., piperylene conc., polyimd.	87	2-methyl-1-propanol
42	isobutyl acetate	88	2-(2-butoxyethoxy)ethyl acetate
43	2,2'-[(1-methylethylidene)bis(4,1- phenyleneoxymethylene)]bisoxirane homopolymer	89	aluminum oxide
44	1,3,4-trimethylbenzene	90	1,6-hexamethylene diisocyanate homopolymer
45	acetone	91	barium sulfate
46	methyl n-amyl ketone	92	2-methyl-2,4-pentanediol
		93	triethylenetetramine

Table 7-1 Continued

Item #	Name	Item #	Name
94	solvent naphtha, petroleum, heavy aliph.	140	tergitol np-33
95	2-propanol, 1-(2-butoxy-1-methylethoxy)-	141	chlorothalonil
96	benzyl alcohol	142	silicon dioxide, amorphous
97	2-pentanone	143	1-butanol, 2-methyl-, acetate
98	ferric oxide	144	triethanolamine
99	pine oil	145	limonene
100	carbon black	146	vinyl toluene
101	ethyl methyl ketone oxime	147	tri(butyl cellosolve) phosphate
102	collodion	148	2-ethoxyethyl acetate
103	phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]	149	troysan 174
104	1-methyl-2-pyrrolidinone	150	cumene
105	isophorone diamine	151	2,4-pentanedione
106	Triton(R) X-100	152	paraffin
107	tung oil	153	cobalt 2-ethylhexanoate
108	zinc phosphate	154	zinc
109	heavy straight-run naphtha	155	Aggregated Exempt Compounds <1.0%
110	portland cement	156	tetraethyl orthosilicate
111	Magnesium Aluminum Silicate	157	methyl isobutyl carbinol
112	2-methoxy-1-propanol acetate	158	castor oil
113	4-chlorobenzotrifluoride	159	n-propyl acetate
114	butyl benzyl phthalate	160	sodium polyacrylate
115	ethylmethylbenzene	161	dibutyl phthalate
116	stearic acid	162	formaldehyde
117	2-butoxyethyl acetate	163	n-propanol
118	sec-butyl alcohol	164	siloxanes and silicones, di-me, reaction products with silica
119	propylene glycol monopropyl ether	165	n,n-dimethylethanolamine
120	zirconium 2-ethylhexanoate	166	poloxanlene
121	4-nonylphenol (branched)	167	quaternary ammonium compounds, bis(hydrogenated tallow alkyl)dimethyl, salts with bentonite
122	propylene carbonate	168	triethyl amine
123	1-butoxy-2-propanol	169	soybean lecithin
124	epikote 862	170	cellulose
125	scintillation surfactant	171	tris(dimethylaminomethyl)phenol
126	hexane	172	calcium 2-ethylhexanoate
127	n-heptane	173	di-sec-octyl phthalate
128	methylene diphenyl diisocyanate	174	di-n-butyltin dilaurate
129	aluminum hydroxide	175	acetic acid
130	iron oxide	176	polyethylene
131	2-(2-ethoxyethoxy)ethanol	177	aluminum phosphate
132	triphosphoric acid, pentapotassium salt	178	2,6-dimethyl-4-heptanone
133	ethyl acetate	179	Zinc Chromate
134	methyl methacrylate	180	silica, amorphous
135	naphthalene	181	phosphoric acid
136	amyl acetate	182	furfuryl alcohol
137	styrene-butadiene copolymers	183	C.I. pigment yellow 42
138	cyclohexanone	184	2-ethyl-1-hexanol
139	4-hydroxy-4-methyl-2-pentanone	185	2-phenoxyethanol
		186	tetraethylenepentamine

Table 7-2

Architectural Coatings Speciation Profile - Solvent-borne  
(Ranked by Mass)

Item #	Name	Item #	Name
1	All Other	52	propylene glycol monomethyl ether acetate
2	Aggregated Protected Data	53	aluminum silicate
3	medium aliphatic solvent naphtha	54	mesitylene
4	stoddard solvent	55	2-methyl-1-propanol
5	calcium carbonate	56	butene, homopolymer
6	talc	57	mica
7	vm & painters naphtha	58	aluminum oxide
8	epon 1001 resin	60	1,6-hexamethylene diisocyanate homopolymer
9	titanium dioxide	61	methanol
10	petroleum naphtha, heavy alkylate	62	diatomaceous silica, flux-calcined
11	xylenes	63	triethylenetetramine
12	aromatic 100	64	meta-xylene
13	toluene	65	solvent naphtha, petroleum, heavy aliph.
14	distillate(petroleum), hydrotreated light	66	benzyl alcohol
15	water	67	amorphous silica
16	methyl ethyl ketone	68	2-pentanone
17	sand	69	barium sulfate
18	ethyl alcohol	70	2-propoxyethanol
19	butyl acetate	71	ferric oxide
20	Aggregated VOCs < 1.0%	72	pine oil
21	1,1,1-trichloroethane	73	carbon black
22	hydrotreated heavy naphtha	74	collodion
23	kerosene	75	phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]
24	petroleum ether	76	ethyl methyl ketone oxime
25	oil of linseed	77	isophorone diamine
26	fibrous glass filter media	78	tung oil
27	2-propanol	79	zinc phosphate
28	naphtha, petroleum, light steam-cracked arom., piperylene conc., polymd.	80	portland cement
29	isobutyl acetate	81	heavy straight-run naphtha
30	acetone	82	styrene
31	1,3,4-trimethylbenzene	83	2-methoxy-1-propanol acetate
32	methyl n-amyl ketone	84	ethylmethylbenzene
33	attapulgate	85	2-butoxyethyl acetate
34	Aggregate Ingredients < 1.0%	86	zinc oxide
35	limestone	87	2,2,4-trimethyl-1,3-pentanediol isobutyrate
36	methyl isobutyl ketone	88	2,2'-oxybisethanol
37	n-butanol	89	zirconium 2-ethylhexanoate
38	2-butoxy ethanol	90	dipropylene glycol methyl ether
40	propylene glycol monomethyl	91	4-nonylphenol (branched)
41	kaolin	92	propylene carbonate
42	chlorinated paraffin	93	epikote 862
43	asphalt fumes (petroleum)	94	aluminum
44	ethyl benzene	95	n-heptane
45	naphtha		
46	heavy aromatic naphtha solvent		
47	chloraflin		
49	ethyl 3-ethoxypropionate		
50	aqualyte (TM), LSC cocktail		
51	isobutyl isobutyrate		

**Table 7-2** Continued

Item #	Name
96	barium boron oxide
97	methylene diphenyl diisocyanate
98	aluminum hydroxide
99	ethyl acetate
100	naphthalene
101	amyl acetate
102	cyclohexanone
103	magnesium aluminum silicate
104	silicon dioxide, amorphous
105	1-butanol, 2-methyl-, acetate
106	4-hydroxy-4-methyl-2-pentanone
107	iron oxide
108	2-(2-butoxyethoxy)ethanol
109	ethylene glycol
110	limonene
111	vinyl toluene
112	2-ethoxyethyl acetate
113	cumene
114	2,4-pentanedione
115	wollastonite
116	propylene glycol monopropyl ether
117	propylene glycol
118	paraffin
119	2-(2-methoxyethoxy)ethanol
120	zinc
121	cobalt 2-ethylhexanoate
122	methyl isobutyl carbinol
123	castor oil
124	n-propyl acetate
125	tetraethyl orthosilicate
126	n-propanol
127	Volatile Methyl Siloxanes
129	sodium silicoaluminate
130	Aggregated Exempt Compounds <1.0%
131	soybean lecithin
132	tris(dimethylaminomethyl)phenol
133	calcium 2-ethylhexanoate
134	di-sec-octyl phthalate
135	di-n-butyltin dilaurate
136	2,6-dimethyl-4-heptanone
137	Zinc Chromate
138	hexane
139	phosphoric acid
140	furfuryl alcohol
141	2-methyl-2,4-pentanediol
142	silica, amorphous
143	solvent-refined heavy paraffinic distillate
144	C.I. pigment yellow 42
145	aluminum phosphate
146	2-ethyl-1-hexanol

**Table 7-3**  
Architectural Coatings Speciation Profile - Water-borne  
(Ranked by Mass)

Item #	Name	Item #	Name
1	water	48	2-methyl-2,4-pentanediol
2	All Other	49	vm & painters naphtha
3	Aggregated Protected Data	50	2-propanol, 1-(2-butoxy-1-methylethoxy)-
4	calcium carbonate	51	toluene
5	titanium dioxide	52	1-methyl-2-pyrrolidinone
6	2,2,4-trimethyl-1,3-pentanediol isobutyrate	53	propylene glycol monomethyl
7	asphalt fumes (petroleum)	54	n-butanol
8	propylene glycol	55	Triton(R) X-100
9	ethylene glycol	56	butyl benzyl phthalate
10	Aggregated VOCs < 1.0%	57	sec-butyl alcohol
11	kaolin	58	2-propanol
12	Aggregate Ingredients <1.0%	59	magnesium aluminum silicate
13	2-propenoic acid, butyl ester, polymer with ethenyl acetate	60	1-butoxy-2-propanol
14	2-(2-butoxyethoxy)ethanol	61	petroleum naphtha, heavy alkylate
15	talc	62	barium sulfate
16	methanol	63	scintillation surfactant
17	limestone	64	propylene glycol monopropyl ether
18	vinyl acetate	65	triphosphoric acid, pentapotassium salt
19	medium aliphatic solvent naphtha	66	2-(2-ethoxyethoxy)ethanol
20	aluminum silicate	67	xylenes
21	distillate(petroleum), hydrotreated light	68	1,3,4-trimethylbenzene
22	2-(2-methoxyethoxy)ethanol	69	tergitol np-33
23	diatomaceous earth	70	triethanolamine
24	2-butoxy ethanol	71	chlorothalonil
25	solvent-refined heavy paraffinic distillate	72	tri(butyl cellosolve) phosphate
26	silica (crystalline-cristobalite)	73	troysan 174
27	iodopropynyl butylcarbamate	74	sodium polyacrylate
28	dipropylene glycol methyl ether	75	dibutyl phthalate
29	zinc oxide	76	Aggregated Exempt Compounds <1.0%
30	sand	77	n,n-dimethylethanolamine
31	ammonium hydroxide	78	triethyl amine
32	mica	79	ethyl alcohol
33	2,2'-oxybisethanol	80	zinc phosphate
34	Volatile Methyl Siloxanes	81	heavy aromatic naphtha solvent
35	diatomaceous silica, flux-calcined	82	acetic acid
36	ammonia	83	aluminum phosphate
37	amorphous silica	84	carbon black
38	dipropylene glycol	85	2-ethyl-1-hexanol
39	stoddard solvent	86	benzyl alcohol
40	sodium silicoaluminate	87	propylene glycol monomethyl ether acetate
41	wollastonite	88	2-methyl-1-propanol
42	2-propoxyethanol		
43	2-amino-2-methyl-1-propanol		
44	hydroxyethyl cellulose		
45	aromatic 100		
46	barium boron oxide		
47	epon 1001 resin		