

Organic Gas Speciation Profiles for Consumer Products (2010 Update)

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1. Introduction

Consumer products, as defined by Health and Safety Code §41712 [1], are any chemically formulated product used by household and institutional consumers, including but not limited to, detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; automotive specialty products; and aerosol coatings. Consumer products come in a variety of forms including liquids, pastes, solids, aerosols, etc. While the definition of consumer products includes aerosol coatings, it does not include furniture or architectural coatings. This document summarizes one hundred and six new organic gas (OG) speciation profiles that were recently developed for the 2010 consumer products inventory update. CARB staff typically conducts consumer product surveys [2] as necessary to obtain California product sales and formulation data. These new speciation profiles were built using the 1997, 2001, 2003, 2006, and 2010 survey databases and category specific “special” surveys, which include statewide emission estimates for individual inventory years that are adjusted according to population growth. The newly updated profiles are listed in Appendix 1.

This work only focuses on the profiles for categories of EIC 510-506-XXXX-XXXX. The updates for the profiles for aerosol coating categories (i.e., EIC 510-500-XXXX-XXXX) will be discussed in a separate document.

2. Methodology:

Sales quantities along with formulation data reported in consumer products surveys [2] mentioned above are used to develop the speciation profiles. The steps taken to generate the profiles for each category are summarized as follows:

- (1) Emissions of each ingredient in a product are calculated from reported survey sales and formulation. The formulation ingredients and their net weight from all products reported as the same category are extracted.
- (2) Adjustments of survey market coverage are made for the category emissions, if applicable. The survey coverage of 90% is estimated for most categories by CARB staff. With this coverage, emissions are adjusted to 100% by being multiplied by the factor of 1.1.
- (3) Inorganic compounds are removed from the list since they are excluded in the OG speciation profiles (e.g., pumice and ammonia).

- (4) For certain categories, extra adjustments need to be done for estimating their emissions:
 - A down-the-drain factor, 90% reduction, is applied to alcohol portion ingredients for the categories that are introduced into water treatment/sewage systems: fabric softener, other laundry products, laundry detergents, and hand dish soaps.
 - A combustion factor, 90% reduction, is applied to the ingredients for the category of charcoal lighter material.
- (5) After all the above adjustments, emissions are sorted and aggregated for each ingredient of the category. Multiple entries of the same ingredient need to be replaced with a single entry.
 - Certain ingredients are grouped and assigned a common name;
 - Petroleum solvent ingredients are renamed as “hydrocarbon solvent” with a bin number as defined in Section 94701 in the California Consumer Products Regulation [3].
 - New ARB-SAROAD codes are generated for the species that are in the existing CARB core chemical database—CEDIARS POLLUTANT table (Appendix 2).
- (6) Total net weight of each category is calculated by summing the emissions of all the ingredients/groups. The speciation profile for the category is then calculated by dividing the net weight of each ingredient/group by the total net weight. The details of the newly developed OG species profiles and ROG/TOG ratios are summarized in Appendix 3.

3. Discussion

To facilitate disaggregating calendar-year and category specific emission inventory estimates of TOG into discrete chemical components, speciation profiles need to be assigned to the related emission inventory categories in a cross-reference table. Because many changes (addition, deletion, merge, and etc.) have been made to the consumer products categories and many new speciation profiles have been created, the category-profile mapping needs to be updated accordingly. This section will discuss these category changes and mapping updates.

The current CARB consumer products inventory (excluding aerosol coatings) is formed by combining two historical trends from two time periods: years 1990 to 2002, and year 2003 and later.

- (1) For years 1990 to 2002, the ‘old’ consumer product survey speciation profiles (i.e., currently in-use) are mapped to the corresponding categories. Because the backcasting were extended back to 1975 in CEFS, the same mapping should be set to the 1990 value for years 1975 to 1989. However, ten EICs (Appendix 4a) were removed during the 2001 update of the inventory, resulting in 10 less EICs for years 2001 and 2002 as compared with years 2000 and earlier. Therefore the assignment of profiles to these 10 deleted EICs only applies to years 1975 to 2000.
- (2) Additionally, there are 22 consumer product EICs that were deleted from the inventory for years 2003 and later. The assignment of the profiles to these 22 EICs (Appendix 4b) only

applies to years 1975 to 2002. Furthermore, 30 new consumer product EICs (Appendix 4c) were added to the inventory for 2003 and later years. Therefore, for these years, the fraction table will point to the new 2010 survey profiles (i.e., the ones created in this work). For the rest of the 116 EICs, the newly created profiles will be applied to 76 (Appendix 4d) of them to replace the currently in-use profiles for 2003 and later years. There are no changes for the rest of the 40 EICs and mapping. In other words, the mapping of these 40 EICs (Appendix 4e) is applied to all years.

The complete cross-reference table for consumer products (excluding aerosol coatings) from 1975 to 2035 is compiled in file of CP_FRACTION.xlsx in Appendix 5.

4. Impacts of Profile Changes on Emission Inventory

The statewide annual average TOG emissions for the consumer products (510-506-XXXX-XXXX) are 218.14 and 219.56 tons/day for years 2014 and 2015, respectively. They are about 3.5% of the statewide total TOG emissions, based on the SoCAL 2012 PM 2.5 SIP Baseline Emission Projections (2008 base year) Ver. 1.04 [4]. With the new EIC-profile mapping, the estimated ROG emissions are 183.95 and 185.06 tons/day for years 2014 and 2015, respectively, which are both 7.0% less than the current ROG estimation (Table 1). Similarly, the ozone forming potential (OFP) values estimated with the new profiles and mapping are about 8.6-8.7% less than the current estimations for years 2014 and 2015 (Table 1).

The impacts of the profile update for selected toxic compounds and high global-warming potential (GWP) compounds in consumer products (excluding aerosol coatings) are estimated for years 2014 and 2015 (Table 1). Seven toxics of interest include dichloromethane, perchloroethylene, trichloroethylene, n-hexane, n-propyl bromine, t-butyl acetate and formaldehyde. However, formaldehyde is not found in any of the profiles. The updated profile mapping (including the 106 new profiles) will result in 11% more emissions of dichloromethane from consumer products (excluding aerosol coatings) for both years, but the emissions of perchloroethylene (-82%), trichloroethylene (-53%), n-hexane (-90%), and t-butyl acetate (-100%) will greatly decrease comparing to the ones calculated with the current profiles and mapping. The two high GWP compounds of interest are HFC-152a and HFC-134a. The updates of new profiles cause a 206% increase of HFC-152a for both 2014 and 2015. Because HFC-134a was only required to be reported by the 2003 and later surveys, the profiles developed based on the old surveys don't contain this compound.

Table 1. Impacts of Changes on Consumer Products Emission Inventory Using Updated Mapping and Profiles**(a) Year 2014**

Statewide Annual Ave. Emissions		with current profile mapping (tons/day)	with updated mapping –106 new profiles included (tons/day)	Change	
				Emission (tons/day)	Percentage
ROG		197.86	183.95	-13.91	-7.0%
OFP (tons O ₃)		314.25	286.89	-27.36	-8.7%
Toxics	dichloromethane	4.43	4.92	0.49	+11.1%
	perchloroethylene	3.81	0.68	-3.13	-82.2%
	trichloroethylene	0.89	0.41	-0.48	-53.9%
	n-hexane	2.67	0.27	-2.40	-89.9%
	n-propyl bromide	0.02	0.02	0.00	0.0%
	t-butyl acetate	0.07	2.84E-05	-0.07	-100.0%
High GWP species	HFC-152a	2.13	6.52	4.39	+206.1%
	HFC-134a	N/A	1.64	1.64	N/A

(b) Year 2015

Statewide Annual Ave. Emissions		with current profile mapping (tons/day)	with updated mapping –106 new profiles included (tons/day)	Change	
				Emission (tons/day)	Percentage
ROG		199.12	185.06	-14.06	-7.1%
OFP (tons O ₃)		316.09	289.00	-27.09	-8.6%
Toxics	dichloromethane	4.47	4.97	0.50	+11.2%
	perchloroethylene	3.84	0.69	-3.15	-82.0%
	trichloroethylene	0.90	0.42	-0.48	-53.3%
	n-hexane	2.69	0.27	-2.42	-90.0%
	n-propyl bromide	0.02	0.02	0.00	0.0%
	t-butyl acetate	0.07	2.87E-05	-0.07	-100.0%
High GWP species	HFC-152a	2.15	6.58	4.43	+206.0%
	HFC-134a	N/A	1.65	1.65	N/A

5. Version Control

This section will be completed after management approval and after the CEIDARS FRACTION table and ORGPROFILE table are updated. Version information from CEIDARS FRACTION table will be copied here.

Acknowledgment

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References:

1. *California Health and Safety Code.*
2. CARB. *Consumer Products Program Surveys and Notices.* [cited 2014 April 2]; Available from: <http://www.arb.ca.gov/consprod/survey/survey.htm>.
3. *Regulation for Reducing Emissions from Consumer Products, California Code of Regulations*, in Title 17.
4. CEPAM, 2014, California Air Resources Board.

Appendix 1. Names and assignments for the new OG speciation profiles for consumer products (2010 update)

<i>OG Profile Number</i>	<i>Profile Name</i>	<i>EIC</i>
3001	CONS PRD- CONSTRUCTION, PANEL, OR FLOOR COVERING ADHESIVE (2010 UPDATE)	510-506-6505-0000
3002	CONS PRD- GENERAL PURPOSE ADHESIVE (2010 UPDATE)	510-506-6507-0000
3003	CONS PRD- AEROSOL ADHESIVE (INCLUDING INDUSTRIAL) (2010 UPDATE)	510-506-6508-0000
3004	CONS PRD- PIPE CEMENT AND PRIMER (2010 UPDATE)	510-506-6509-0000
3005	CONS PRD- SEALANT AND CAULKING COMPOUND (2010 UPDATE)	510-506-6520-0000
3006	CONS PRD- BUG AND TAR REMOVER (2010 UPDATE)	510-506-6530-0000
3007	CONS PRD- AUTO HARD PASTE WAX (2010 UPDATE)	510-506-6533-0000
3008	CONS PRD- AUTOMOTIVE INSTANT DETAILER (2010 UPDATE)	510-506-6534-0000
3009	CONS PRD- AUTOMOTIVE POLISH, SEALANT, WAX, GLAZE (2010 UPDATE)	510-506-6535-0000
3010	CONS PRD- AUTOMOTIVE RUBBING OR POLISHING COMPOUND (2010 UPDATE)	510-506-6538-0000
3011	CONS PRD- TIRE CLEANER AND WHEEL CLEANER (2010 UPDATE)	510-506-6539-0000
3012	CONS PRD- AUTOMOTIVE BRAKE CLEANER (2010 UPDATE)	510-506-6551-0000
3013	CONS PRD- CARBURETOR OR FUEL-INJECTION AIR INTAKE CLEANER (2010 UPDATE)	510-506-6552-0000
3014	CONS PRD- ENGINE DEGREASER (2010 UPDATE)	510-506-6553-0000
3015	CONS PRD- TIRE SEALANTS AND INFLATOR (2010 UPDATE)	510-506-6557-0000
3016	CONS PRD- AUTOMOTIVE UNDERCOATINGS - AEROSOL (2010 UPDATE)	510-506-6558-0000
3017	CONS PRD- AUTOMOTIVE WINDSHIELD WASHER FLUID - NON TYPE A AREAS (2010 UPDATE)	510-506-6560-0000
3018	CONS PRD- PAINT REMOVER OR STRIPPER (2010 UPDATE)	510-506-6571-0000
3019	CONS PRD- MULTI-PURPOSE SOLVENT AND PAINT THINNER (2010 UPDATE)	510-506-6580-0000
3020	CONS PRD- DISINFECTANTS (ALL FORMS) (2010 UPDATE)	510-506-6590-0000
3021	CONS PRD- SANITIZER (2010 UPDATE)	510-506-6591-0000
3022	CONS PRD- NON-SELECTIVE TERRESTRIAL HERBICIDE (2010 UPDATE)	510-506-6600-0000
3023	CONS PRD- FLEA AND TICK INSECTICIDE (2010 UPDATE)	510-506-6610-0000
3024	CONS PRD- FLYING BUG INSECTICIDE - AEROSOL (2010 UPDATE)	510-506-6611-0000
3025	CONS PRD- FLYING BUG INSECTICIDE - NON-AEROSOL (2010 UPDATE)	510-506-6612-0000
3026	CONS PRD- WASP OR HORNET INSECTICIDE (2010 UPDATE)	510-506-6613-0000

3027	CONS PRD- LAWN AND GARDEN INSECTICIDE (2010 UPDATE)	510-506-6614-0000
3028	CONS PRD- CRAWLING BUG INSECTICIDE - AEROSOL (2010 UPDATE)	510-506-6615-0000
3029	CONS PRD- CRAWLING BUG INSECTICIDE - NON-AEROSOL (2010 UPDATE)	510-506-6616-0000
3030	CONS PRD- INSECTICIDE FOGGER - AEROSOL (2010 UPDATE)	510-506-6617-0000
3031	CONS PRD- INSECT REPELLENT - AEROSOL (2010 UPDATE)	510-506-6625-0000
3032	CONS PRD- INSECT REPELLENT - NON-AEROSOL (2010 UPDATE)	510-506-6626-0000
3033	CONS PRD- CARPET AND UPHOLSTERY CLEANER - AEROSOL (2010 UPDATE)	510-506-6635-0000
3034	CONS PRD- CARPET AND UPHOLSTERY CLEANER - NON-AEROSOL (2010 UPDATE)	510-506-6636-0000
3035	CONS PRD- SPOT REMOVER - AEROSOL (2010 UPDATE)	510-506-6638-0000
3036	CONS PRD- SPOT REMOVER - NON-AEROSOL (2010 UPDATE)	510-506-6639-0000
3037	CONS PRD- FABRIC PROTECTANT - AEROSOL (2010 UPDATE)	510-506-6640-0000
3038	CONS PRD- FLOOR WAX STRIPPER (2010 UPDATE)	510-506-6650-0000
3039	CONS PRD- GENERAL PURPOSE CLEANER - AEROSOL (2010 UPDATE)	510-506-6651-0000
3040	CONS PRD- GENERAL PURPOSE CLEANER - NON-AEROSOL (2010 UPDATE)	510-506-6652-0000
3041	CONS PRD- GENERAL PURPOSE DEGREASER - AEROSOL (2010 UPDATE)	510-506-6653-0000
3042	CONS PRD- GENERAL PURPOSE DEGREASER - NON-AEROSOL (2010 UPDATE)	510-506-6654-0000
3043	CONS PRD- GLASS CLEANER - AEROSOL (2010 UPDATE)	510-506-6655-0000
3044	CONS PRD- GLASS CLEANER - NON-AEROSOL (2010 UPDATE)	510-506-6656-0000
3045	CONS PRD- METAL POLISH OR CLEANSER (2010 UPDATE)	510-506-6657-0000
3046	CONS PRD- OVEN CLEANER - AEROSOL (2010 UPDATE)	510-506-6658-0000
3047	CONS PRD- OVEN CLEANER - NON-AEROSOL (2010 UPDATE)	510-506-6659-0000
3048	CONS PRD- BATHROOM AND TILE CLEANER - AEROSOL (2010 UPDATE)	510-506-6661-0000
3049	CONS PRD- BATHROOM AND TILE CLEANER - NON-AEROSOL (2010 UPDATE)	510-506-6662-0000
3050	CONS PRD- LAUNDRY PREWASH (2010 UPDATE)	510-506-6670-0000
3051	CONS PRD- LAUNDRY STARCH OR SIZING (2010 UPDATE)	510-506-6672-0000
3052	CONS PRD- DUSTING AID - AEROSOL (2010 UPDATE)	510-506-6680-0000
3053	CONS PRD- DUSTING AID - NON-AEROSOL (2010 UPDATE)	510-506-6681-0000
3054	CONS PRD- FLOOR POLISH OR WAX - RESILIENT AND NONRESILIENT (2010 UPDATE)	510-506-6682-0000
3055	CONS PRD- FLOOR POLISH OR WAX - WOOD (2010 UPDATE)	510-506-6684-0000
3056	CONS PRD- FURNITURE MAINTENANCE PRODUCT - AEROSOL (2010 UPDATE)	510-506-6685-0000
3057	CONS PRD- FURNITURE MAINTENANCE PRODUCT - NON-AEROSOL (2010 UPDATE)	510-506-6686-0000

3058	CONS PRD- MULTIPURPOSE LUBRICANT (2010 UPDATE)	510-506-6700-0000
3059	CONS PRD- SILICONE BASED MULTI-PURPOSE LUBRICANT (2010 UPDATE)	510-506-6701-0000
3060	CONS PRD- PENETRANT (2010 UPDATE)	510-506-6702-0000
3061	CONS PRD- SPECIAL PURPOSE LUBRICANT (2010 UPDATE)	510-506-6703-0000
3062	CONS PRD- SINGLE PHASE AEROSOL AIR FRESHENER (2010 UPDATE)	510-506-6710-0000
3063	CONS PRD- DOUBLE PHASE AEROSOL AIR FRESHENER (2010 UPDATE)	510-506-6711-0000
3065	CONS PRD- LIQUID OR PUMP AIR FRESHENER (2010 UPDATE)	510-506-6713-0000
3066	CONS PRD- CHARCOAL LIGHTER MATERIAL (2010 UPDATE)	510-506-6720-0000
3067	CONS PRD- AEROSOL COOKING SPRAY (2010 UPDATE)	510-506-6721-0000
3068	CONS PRD- ANTIPERSPIRANT (2010 UPDATE)	510-506-6730-0000
3069	CONS PRD- UNDERARM DEODORANT (2010 UPDATE)	510-506-6732-0000
3070	CONS PRD- ASTRINGENTS AND TONER (2010 UPDATE)	510-506-6740-0000
3071	CONS PRD- PERSONAL FRAGRANCE PRODUCT (FRAGRANCE <= 20%) (2010 UPDATE)	510-506-6750-0000
3072	CONS PRD- PERSONAL FRAGRANCE PRODUCT (FRAGRANCE > 20%) (2010 UPDATE)	510-506-6751-0000
3073	CONS PRD- HAIR SPRAY (2010 UPDATE)	510-506-6760-0000
3074	CONS PRD- HAIR SHINE (2010 UPDATE)	510-506-6766-0000
3075	CONS PRD- NAIL COATING (2010 UPDATE)	510-506-6770-0000
3076	CONS PRD- RUBBING ALCOHOL (2010 UPDATE)	510-506-6780-0000
3077	CONS PRD- HEAVY-DUTY HAND CLEANSER OR SOAP (2010 UPDATE)	510-506-6792-0000
3078	CONS PRD- DEODORANT BODY SPRAY (2010 UPDATE)	510-506-6735-0000
3079	CONS PRD- DRYER SHEET (2010 UPDATE)	510-506-6630-0000
3080	CONS PRD- ODOR REMOVER OR ELIMINATOR (2010 UPDATE)	510-506-6588-0000
3081	CONS PRD- WINDSHIELD WATER REPELLENT (2010 UPDATE)	510-506-6565-0000
3082	CONS PRD- FLOOR MAINTENANCE PRODUCT (2010 UPDATE)	510-506-6645-0000
3083	CONS PRD- TEMPORARY HAIR COLOR - AEROSOL (2010 UPDATE)	510-506-6756-0000
3084	CONS PRD- INSULATING AND SEALING FOAM (2010 UPDATE)	510-506-6522-0000
3085	CONS PRD- HAND SANITIZER (2010 UPDATE)	510-506-6793-0000
3086	CONS PRD- PERSONAL CARE WIPES (2010 UPDATE)	510-506-6787-0000
3087	CONS PRD- FABRIC PROTECTANT - NON-AEROSOL (2010 UPDATE)	510-506-6642-0000
3088	CONS PRD- SUN SCREEN AND TANNING PRODUCT (2010 UPDATE)	510-506-6742-0000
3089	CONS PRD- FABRIC SOFTENER (2010 UPDATE)	510-506-6631-0000
3090	CONS PRD- MOTHBALLS (2010 UPDATE)	510-506-6644-0000

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3091	CONS PRD- BRUSH CLEANER (2010 UPDATE)	510-506-6795-0000
3092	CONS PRD- AUTOMOTIVE WINDSHIELD WASHER FLUID - TYPE A AREAS (2010 UPDATE)	510-506-6562-0000
3093	CONS PRD- PRESSURIZED GAS DUSTER (2010 UPDATE)	510-506-6796-0000
3094	CONS PRD- WITCH HAZEL (2010 UPDATE)	510-506-6797-0000
3095	CONS PRD- MOTOR VEHICLE WASH AND CLEANER (2010 UPDATE)	510-506-6564-0000
3096	CONS PRD- ALL OTHER ADHESIVES (2010 UPDATE)	510-506-6514-0000
3097	CONS PRD- OTHER SEALANTS (2010 UPDATE)	510-506-6519-0000
3098	CONS PRD- OTHER CLEANERS AND DEGREASERS (2010 UPDATE)	510-506-6902-0000
3099	CONS PRD- OTHER FUELS (2010 UPDATE)	510-506-6904-0000
3100	CONS PRD- OTHER LAUNDRY (2010 UPDATE)	510-506-6668-0000
3101	CONS PRD- OTHER MISC HOUSEHOLD PRODUCTS (2010 UPDATE)	510-506-6905-0000
3102	CONS PRD- OTHER PERSONAL CARE PRODUCTS (2010 UPDATE)	510-506-6906-0000
3103	CONS PRD- OTHER PESTICIDES AND INSECTICIDES (2010 UPDATE)	510-506-6628-0000
3104	CONS PRD- OTHER VEHICLE MAINTENANCE PRODUCTS (2010 UPDATE)	510-506-6903-0000
3105	CONS PRD- MISC ART AND OFFICE PRODUCTS (2010 UPDATE)	510-506-6907-0000
3106	CONS PRD- OTHER LAWN AND GARDEN PRODUCTS (2010 UPDATE)	510-506-6908-0000
3107	CONS PRD- OTHER AIR FRESHENERS (2010 UPDATE)	510-506-6909-0000

Appendix 2. New ARB-SAROAD codes to be added to CEIDARS POLLUTANT table

<i>ARB-SAROAD</i>	<i>CAS</i>	<i>Chemical Name</i>	<i>Formula</i>	<i>Molecular Weight</i>
43861	53-60-5	Dibasic Ester		
43862	8008-31-9	Tangerine Oil		
43863	93-92-5	Styrallyl Acetate	C10H12O2	164.20
43864	68308-67-8	Soy Dimethyl Ethyl Ammonium Ethosulfate		
43865	2492-26-4	Sodium Mercaptobenzothiazole	C7H5NNa2	189.23
43866	98-59-9	P-Toluenesulfonyl Chloride	C7H7ClO2S	190.65
43868	624-54-4	Pentyl Propanoate	C8H16O2	144.21
43869	927-49-1	6-Undecanone	C11H22O	170.3
43871	1301152	3-(4-Methoxyphenyl)-2-Methylpropanal	C11H14O2	178.23
43872	88-04-0	4-Chloro-3,5-Dimethylphenol	C8H9ClO	156.61
43873	129828-24-6	Oil Of Lemon Eucalyptus		
43874	30136-13-1	N-Propoxypropanol	C6H14O2	118.17
43875	112-14-1	N-Octyl Acetate	C10H20O2	172.27
43876	98-92-0	Pyridine-3-Carboxamide	C6H6N2O	122.12
43877	26896-20-8	Neodecanoic Acid	C10H20O2	172.26
43879	2426-08-6	N-Butyl Glycidyl Ether	C7H14O2	130.18
43880	99-97-8	N,N-Dimethyl-P-Toluidine	C9H13N	135.21
43881	55934-93-5	Tripropylene Glycol N-Butyl Ether	C13H28O4	248.40
43882	609-72-3	N,N-Dimethyl-O-Toluidine	C9H13N	135.21
43883	613-48-9	N,N-Diethyl-P-Toluidine	C11H17N	163.26
43884	134-62-3	N,N-Diethyl-M-Toluamide	C12H17NO	191.27
43887	137-05-3	Methyl Cyanoacrylate	C5H5NO2	111.11
43888	8006-90-4	Mentha Piperita		
43891	78-70-6	3,7-Dimethylocta-1,6-Dien-3-Ol	C10H18O	154.25
43892	112-53-8	1-Dodecanol	C12H26O	186.34
43894	24800-44-0	Tripropylene Glycol	C9H20O4	192.30
43895	112-25-4	Ethylene Glycol Monoethyl Ether	C8H18O2	146.23
43896	8016-20-4	Grapefruit Oil		
43897	18395-30-7	Isobutyltrimethoxysilane	C7H18O3Si	178.30
43898	106-27-4	Isoamyl N-Butyrate	C9H18O2	158.24
43899	868-77-9	Hydroxyethyl Methacrylate	C6H10O3	130.14
43900	27813-02-1	Hydroxypropyl Methacrylate	C7H12O3	144.17
43901	118-56-9	Homosalate	C16H22O3	262.36
43902	526-95-4	Gluconic Acid	C6H12O7	196.16
43904	2530-83-8	G-Glycidoxypopyltrimethoxysilane	C9H20O5Si	236.38
43905	75-12-7	Formamide	CH3NO	45.04
43906	112-35-6	Triethylene Glycol Monomethyl Ether	C7H16O4	164.20
43907	17689-77-9	Ethyltriacetoxysilane	C8H14O6Si	234.28
43908	107-15-3	Ethylenediamine	C2H8N2	60.10
43909	94944-95-3	Ethylene Glycol Ester		
43910	90-00-6	1-Ethyl-2-Hydroxybenzene	C8H10O	122.16
43911	97-63-2	Ethyl Methacrylate	C6H10O2	114.14
43912	108-64-5	Ethyl Isovalerate	C7H14O2	130.18

43913	68603-25-8	Ethoxylated Propoxylated Alcohols, C8-10	C12H30O2	206.37
43915	21982-43-4	Ethoxyethyl Cyanoacrylate	C8H11NO3	169.18
43916	533-50-6	Erythrulose	C4H8O4	120.10
43917	107-47-1	Di-T-Butyl Sulfide	C8H18S	146.29
43918	112-50-5	Triethylene Glycol Monoethyl Ether	C8H18O4	178.23
43919	51730-94-0	Dipropylene Glycol Phenyl Ether	C12H18O3	210.27
43920	15764-24-6	Dipropylene Glycol Ethyl Ether	C8H18O3	162.23
43921	629-82-3	Dioctyl Ether	C16H34O	242.44
43922	96-26-4	Dihydroxyacetone	C3H6O3	90.08
43923	18479-58-8	Dihydromyrcenol	C10H20O	156.20
43924	26266-77-3	Dihydroabietyl Alcohol	C20H34O	290.48
43926	110-85-0	Diethylenediamine	C4H10N2	86.14
43927	6881-94-3	Diethylene Glycol Propyl Ether	C7H16O3	148.20
43928	2351-43-1	Diethylene Glycol Monomethacrylate	C8H14O4	174.19
43929	1559-36-0	Diethylene Glycol 2-Ethylhexyl Ether	C12H26O3	218.33
43930	1559-37-1	Triethylene Glycol Mono-2-Ethylhexyl Ether	C14H30O4	262.40
43931	112-15-2	Diethylene Glycol Ethyl Ether Acetate	C8H16O4	176.21
43932	112-36-7	Diethylene Glycol Diethyl Ether	C8H18O3	162.23
43933	101-43-9	Cyclohexyl Methacrylate	C10H16O2	168.23
43934	106-23-0	Citronellal	C10H18O	154.25
43935	142-62-1	N-Hexanoic Acid	C6H12O2	116.16
43937	68991-52-6	C10-16 Alkenes	C13H26	182.34
43938	68551-17-7	C10-13 Isoalkanes	C12H24	168.32
43939	111-75-1	Butylethanolamine	C6H15NO	117.19
43940	108-18-9	Bis(isopropyl)amine	C6H15N	101.19
43941	140-11-4	Benzyl Acetate	C9H10O2	150.17
43942	280-57-9	Triethylene Diamine	C6H12N2	112.17
43943	68649-00-3	Benzenesulfonic Acid, Mono C9-17 Branch Alkyl Derivatives, Isopropylamine Salts		
43945	6419-19-8	Amino, Tris(Methylene Phosphonic Acid)	C3H12NO9P3	299.05
43946	115-69-5	Amino Methyl Propanediol	C4H11NO2	105.14
43948	67784-80-9	Alkyl (C16-C18) Methyl Esters	C18H36O3	300.48
43949	67762-30-5	Alcohols C14-C18	C16H34O	242.44
43950	284-97-9	Acrylates/Octylacrylamide Copolymer		
43951	90438-79-2	Acetic Acid Ester W/C7 Rich Oxo Alcohol		
43952	108419-34-7	Acetic Acid, Alkyl (C9 To C11) Esters Mixture		
43953	142-26-7	N-(2-Hydroxyethyl)Acetamide	C4H9NO2	103.12
43954	9999-18-2	Toximul 3406f		
43955	2517-43-3	3-Methoxy-1-Butanol	C5H12O2	104.15
43956	13822-56-5	3-Aminopropyltrimethoxysilane	C6H17NO3Si	179.29
43957	919-30-2	3-Aminopropyl-Triethoxysilane	C9H23NO3Si	221.37
43959	54571-67-4	2-Pyrrolidone-5-Carboxylic Acid, Sodium Salt	C5H6NNaO3	151.10
43960	10215-30-2	2-Propoxy-1-Propanol	C6H14O2	118.17
43961	57-06-7	2-Propenyl Isothiocyanate	C4H5NS	99.15
43962	122-70-3	2-Phenylethyl Propanoate	C11H14O2	178.23
43963	617-94-7	2-Phenyl-2-Propanol	C9H12O	136.19
43964	611-15-4	2-Methylstyrene	C9H10	118.19

43965	2682-20-4	2-Methyl-4-Isothiazolin-3-One	C4H5NOS	115.15
43966	137-26-8	Tetramethylthiuram Disulfide	C6H12N2S4	240.43
43967	2163-42-0	2-Methyl-1,3-Propanediol	C4H10O2	90.12
43968	79-41-4	2-Methacrylic Acid	C4H6O2	86.09
43971	1070-03-7	2-Ethylhexyl Dihydrogen Phosphate	C8H19O4P	210.21
43972	96-20-8	2-Amino-1-Butanol	C4H11NO	89.14
43973	576-26-1	2,6-Dimethylphenol	C8H10O	122.17
43974	527-60-6	2,4,6-Trimethylphenol	C9H12O	136.19
43975	29662-90-6	2,2-Dimethyl Octanoic Acid	C10H20O2	172.26
43976	616-45-5	2- Pyrrolidone	C4H7NO	85.11
43977	1120-36-1	1-Tetradecene	C14H28	196.37
43978	68511-50-2	1-Propene-2-Methyl, Sulfurized		
43980	3391-86-4	1-Octen-3-ol	C8H16O	128.21
43982	90-15-3	1-Naphthol	C10H8O	144.17
43983	140-67-0	1-Methoxy-4-(2-Propenyl)benzene	C10H12O	148.20
43984	2687-91-4	1-Ethyl-2-Pyrrolidinone	C6H11NO	113.16
43985	106-43-4	1-Chloro-4-Methyl-Benzene	C7H7Cl	126.58
43986	114-83-0	1-Acetyl-2-Phenylhydrazine	C8H10N2O	150.18
43987	504-63-2	1,3-Propandiol	C3H8O2	76.09
43988	5343-92-0	1,2-Pentanediol	C5H12O2	104.15
43989	2634-33-5	1,2-Benzisothiazolin-3-one	C7H5NOS	151.19
43990	85595-45-5	Corrosion Inhibitor		
43991	2455-24-5	Tetrahydrofurfuryl Methacrylate	C9H14O3	170.21
43994	614-45-9	Tert-Butyl Peroxybenzoate	C11H14O3	194.23
50268	121-69-7	N,N-Dimethylaniline	C8H11N	121.18
43802	75-09-2	Dichloromethane	CH2CL2	84.93
50178	84-66-2	Diethyl Phthalate	C12H14O4	222.24

Appendix 3. New OG speciation profiles for consumer products (2010 update)

See details in CP_OG2010.xlsx (available upon request)

Appendix 4. Changes of consumer products categories (EIC 510-506-XXXX-XXXX)**a. EICs deleted by 2001 inventory update (applied to 2001 and later years)**

<i>EIC</i>	<i>Category Name</i>
51050665060000	CONTACT ADHESIVE
51050665400000	VINYL AND LEATHER CLEANERS
51050665700000	GRAFFITI REMOVERS
51050665810000	ELECTRONIC CLEANER
51050665820000	ADHESIVE REMOVER
51050666370000	CARPET DEODORIZERS
51050666600000	TOILET BOWL CLEANERS
51050666870000	SHOE CARE PRODUCTS
51050667670000	HAIR STYLING GELS
51050667840000	PERSONAL HYGIENE SPRAYS

b. EICs deleted by 2010 inventory update (applied to 2003 and later years)

<i>EIC</i>	<i>Category Name</i>
51050667120000	DUAL PURPOSE AIR FRESHENER/DISINFECTANT
51050669000000	COMBINED SMALL CATEGORIES
51050667830000	FOOT POWDERS
51050667710000	NAIL BASE COATS, UNDERCOATS
51050667330000	UNDERARM DEODORANTS - NON-AEROSOLS
51050667310000	UNDERARM ANTIPERSPIRANTS - NON-AEROSOLS
51050666830000	NON-RESILIENT FLOOR WAX/POLISH
51050666710000	LAUNDRY PREWASH - OTHER FORMS
51050666270000	FUNGICIDES AND NEMATICIDES
51050666010000	SELECTIVE HERBICIDES/DEFOLIANTS
51050665920000	STERILANTS (NOT INCLUDING ETHYLENE OXIDE)
51050665560000	SOLVENT PARTS CLEANER - NON-AEROSOLS
51050665550000	SOLVENT PARTS CLEANER - AEROSOLS
51050665500000	BATTERY CLEANERS
51050665410000	WHEEL CLEANERS
51050665320000	AUTO CARPET AND UPHOLSTERY CLEANERS - NON-AEROSOLS
51050665310000	AUTO CARPET AND UPHOLSTERY CLEANERS - AEROSOLS
51050665210000	WOOD FILLERS
51050665100000	WOODWORKING GLUES
51050665040000	CARPET AND TILE ADHESIVES
51050665030000	AUTOMOTIVE ADHESIVES
51050665020000	ARTS AND CRAFTS ADHESIVES

c. EICs added by 2010 inventory update (applied to 2003 and later years)

<i>EIC</i>	<i>Category Name</i>
51050667350000	DEODORANT BODY SPRAY
51050666300000	FABRIC SOFTENER DRYER SHEET
51050665880000	ODOR REMOVER/ELIMINATOR
51050665650000	WINDSHIELD WASHER REPELLENT
51050666450000	FLOOR MAINTENANCE PRODUCT
51050667560000	TEMP HAIR COLOR
51050665220000	INSULATING AND SEALING FOAM
51050667930000	HAND SANITIZER
51050667870000	PERSONAL CARE WIPES

51050666420000	FABRIC PROTECTANT - NON-AEROSOL
51050667420000	SUN SCREEN/TANNING PRODUCTS
51050666310000	FABRIC SOFTENER
51050666440000	MOTHBALLS
51050667950000	BRUSH CLEANER
51050665620000	AUTOMOTIVE WINDSHIELD WASHER FLUID -TYPE A AREAS
51050667960000	PRESSURIZED GAS DUSTER
51050667970000	WITCH HAZEL
51050665640000	MOTOR VEHICLE WASH
51050665140000	OTHER ADHESIVES
51050665190000	OTHER SEALANTS AND CHULKS
51050669020000	OTHER CLEANERS/DEGREASERS/SOLVENTS
51050669040000	OTHER FUELS
51050666800000	OTHER LAUNDRY PRODUCTS
51050669050000	OTHER MISC. HOUSEHOLD PRODUCTS
51050669060000	OTHER PERSONAL CARE PRODUCTS
51050666280000	OTHER INSECTICIDES AND REPELLENTS
51050669030000	OTHER AUTO/VEH/MARINE CARE PRODUCTS
51050669070000	MISCL. OFFICE AND ART SUPPLIES
51050669080000	LAWN AND GARDEN PRODUCTS
51050669090000	OTHER AIR FRESHENERS

d. EICs without update but profiles are updated (applied to 2003 and later years)

<i>EIC</i>	<i>Category Name</i>
51050665050000	CONSTRUCTION AND PANEL ADHESIVES
51050665070000	GENERAL PURPOSE ADHESIVE
51050665080000	AEROSOL ADHESIVE (INCLUDING INDUSTRIAL)
51050665090000	PIPE CEMENTS AND PRIMERS
51050665200000	SEALANTS & CAULKING COMPOUNDS
51050665300000	BUG AND TAR REMOVERS
51050665330000	AUTOMOTIVE HARD PASTE WAXES
51050665340000	AUTOMOTIVE INSTANT DETAILERS
51050665350000	AUTOMOTIVE WAXES/POLISHES/SEALANTS/GLAZES
51050665380000	AUTOMOTIVE RUBBING OR POLISHING COMPOUNDS
51050665390000	TIRE AND WHEEL CLEANERS
51050665510000	AUTOMOTIVE BRAKE CLEANERS
51050665520000	CARBURETOR OR FUEL-INJECTION AIR INTAKE CLEANERS
51050665530000	ENGINE DEGREASERS - AEROSOLS
51050665570000	TIRE SEALANTS AND INFLATORS
51050665580000	AUTOMOTIVE UNDERCOATINGS - AEROSOLS
51050665600000	AUTOMOTIVE WINDSHIELD WASHER FLUIDS - NON TYPE A
51050665710000	PAINT REMOVERS OR STRIPPERS
51050665800000	MULTI-PURPOSE SOLVENTS AND PAINT THINNERS
51050665900000	DISINFECTANTS
51050665910000	SANITIZERS
51050666000000	NON-SELECTIVE HERBICIDES/DEFOLIANTS
51050666100000	FLEA AND TICK INSECTICIDE
51050666110000	FLYING INSECT INSECTICIDE - AEROSOLS
51050666120000	FLYING INSECT INSECTICIDE - NON-AEROSOLS
51050666130000	WASP AND HORNET INSECTICIDE
51050666140000	LAWN AND GARDEN INSECTICIDES
51050666150000	CRAWLING BUG INSECTICIDES - AEROSOLS
51050666160000	CRAWLING BUG INSECTICIDES - NON-AEROSOLS

51050666170000	INSECTICIDE FOGGERS
51050666250000	INSECT REPELLANTS - AEROSOLS
51050666260000	INSECT REPELLANTS - NON-AEROSOLS
51050666350000	CARPET AND UPHOLSTERY CLEANERS - AEROSOLS
51050666360000	CARPET AND UPHOLSTERY CLEANERS - NON-AEROSOLS
51050666380000	SPOT REMOVERS - AEROSOLS
51050666390000	SPOT REMOVERS - NON-AEROSOLS
51050666400000	FABRIC PROTECTANTS - AEROSOL
51050666500000	FLOOR WAX STRIPPERS
51050666510000	GENERAL PURPOSE CLEANERS - AEROSOLS
51050666520000	GENERAL PURPOSE CLEANERS - NON-AEROSOLS
51050666530000	GENERAL PURPOSE DEGREASERS - AEROSOLS
51050666540000	GENERAL PURPOSE DEGREASERS - NON-AEROSOLS
51050666550000	GLASS CLEANERS - AEROSOLS
51050666560000	GLASS CLEANERS - NON-AEROSOLS
51050666570000	METAL POLISHES/CLEANSERS
51050666580000	OVEN CLEANERS - AEROSOLS
51050666590000	OVEN CLEANERS - NON-AEROSOLS
51050666610000	BATHROOM AND TILE CLEANERS - AEROSOLS
51050666620000	BATHROOM AND TILE CLEANERS - NON-AEROSOLS
51050666700000	LAUNDRY PREWASH
51050666720000	LAUNDRY STARCHES, SIZINGS, ETC.
51050666800000	DUSTING AIDS - AEROSOLS
51050666810000	DUSTING AIDS - NON-AEROSOLS
51050666820000	FLOOR POLISH OR WAX
51050666840000	WOOD FLOOR WAX/POLISH
51050666850000	FURNITURE MAINTENANCE PRODUCTS - AEROSOLS
51050666860000	FURNITURE MAINTENANCE PRODUCTS - OTHER FORMS
51050667000000	MULTI-PURPOSE LUBRICANT
51050667010000	SILICONE BASED MULTI-PURPOSE LUBRICANT
51050667020000	PENETRANT
51050667030000	SPECIALTY LUBRICANT
51050667100000	SINGLE PHASE AEROSOL AIR FRESHENERS
51050667110000	DOUBLE PHASE AEROSOL AIR FRESHENERS
51050667130000	LIQUID/PUMP SPRAY AIR FRESHENERS
51050667200000	CHARCOAL LIGHTER MATERIALS
51050667210000	AEROSOL COOKING SPRAYS
51050667300000	UNDERARM ANTIPERSPIRANTS
51050667320000	UNDERARM DEODORANTS
51050667400000	ASTRINGENTS/TONERS
51050667500000	PERSONAL FRAGRANCE PRODUCT (FRAGRANCE <= 20%)
51050667510000	PERSONAL FRAGRANCE PRODUCT (FRAGRANCE > 20%)
51050667600000	HAIR SPRAY
51050667660000	HAIR SHINES
51050667700000	NAIL COATINGS
51050667800000	RUBBING ALCOHOL
51050667920000	HEAVY DUTY HAND CLEANER OR SOAP

e. EICs and profiles both no update (applied to all years)

<i>EIC</i>	<i>Category Name</i>
51050665120000	CONTACT ADHESIVE - GENERAL PURPOSE
51050665130000	CONTACT ADHESIVE - SPECIAL PURPOSE
51050665150000	ADHESIVE REMOVERS - FLOOR AND WALL COVERING
51050665160000	ADHESIVE REMOVERS - GASKET OR THREAD LOCKING
51050665170000	ADHESIVE REMOVERS - GENERAL PURPOSE
51050665180000	ADHESIVE REMOVERS - SPECIALTY
51050665360000	RUBBER AND VINYL PROTECTANTS - AEROSOLS
51050665370000	RUBBER AND VINYL PROTECTANTS - NON-AEROSOLS
51050665540000	ENGINE DEGREASERS - NON-AEROSOLS
51050665590000	AUTOMOTIVE UNDERCOATINGS - NON-AEROSOLS
51050665720000	GRAFFITI REMOVER - AEROSOL
51050665730000	GRAFFITI REMOVER - NON-AEROSOL
51050665830000	ELECTRICAL CLEANER
51050665840000	ELECTRONIC CLEANER
51050665850000	ENERGIZED ELECTRICAL CLEANER
51050666330000	FABRIC REFRESHER - AEROSOL
51050666340000	FABRIC REFRESHER - NON-AEROSOL
51050666630000	TOILET/URINAL CARE PRODUCT (PARA-ONLY)
51050666640000	TOILET/URINAL CARE PRODUCT (NON-PARA)
51050666730000	ANTI-STATIC PRODUCT - AEROSOL
51050666740000	ANTI-STATIC PRODUCT - NON-AEROSOL
51050666880000	FOOTWEAR OR LEATHER CARE PRODUCT - AEROSOL
51050666890000	FOOTWEAR OR LEATHER CARE PRODUCT - SOLID
51050666900000	FOOTWEAR OR LEATHER CARE PRODUCT - ALL OTHER FORMS
51050666910000	WOOD CLEANER - AEROSOL
51050666920000	WOOD CLEANER - NON-AEROSOL
51050667140000	SOLID/GEL AIR FRESHENERS
51050667410000	HAND AND BODY LOTIONS
51050667570000	HAIR CARE PRODUCT - CONDITIONER
51050667580000	HAIR CARE PRODUCT - SHAMPOO
51050667590000	OTHER HAIR CARE PRODUCTS
51050667650000	HAIR MOUSSES
51050667680000	HAIR STYLING PRODUCT - AEROSOL/PUMP SPRAY
51050667690000	HAIR STYLING PRODUCT - ALL OTHER FORMS
51050667720000	NAIL POLISH REMOVERS
51050667810000	SHAVING CREAMS
51050667820000	SHAVING GELS
51050667850000	PERSONAL HYGIENE PRODUCTS
51050667900000	LAUNDRY DETERGENT
51050667910000	HAND DISHWASHING SOAP

Appendix 5. Updated assignments for consumer products categories (EIC 510-506-XXXX-XXXX)

See details in CP_FRACTION.xlsx (available upon request)