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TOXIC SUBSTANCES CONTROL ACT (TSCA)

PL 94-469

CANDIDATE LIST OF CHEMICAL SUBSTANCES

ADDENDUM III

CHEMICAL SUBSTANCES OF UNKNOWN OR VARIABLE COMPOSITION, COMPLEX REACTION PRODUCTS AND BIOLOGICAL MATERIALS

MARCH 1978

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF TOXIC SUBSTANCES
WASHINGTON, D.C. 20460

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U.S. Environmental Protection Agency
Office of Toxic Substances
Washington, DC 20460

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INTRODUCTION

The Toxic Substances Control Act (TSCA), Public Law 94-469, requires the U.S. Environmental Protection Agency to compile, keep current, and publish a list of each chemical substance which is manufactured, imported, or processed in the United States for commercial purposes. Under the authority of Section 8 of TSCA, EPA will compile this inventory from reports prepared and submitted by manufacturers, importers, and processors of chemical substances in accordance with Inventory Reporting Regulations (40 CFR 710). These regulations were published in the FEDERAL REGISTER on December 23, 1977 (pages 64572 to 64596), and became effective on January 1, 1978.

In April 1977, EPA published the TSCA Candidate List of Chemical Substances, which identifies over 30,000 chemical substances. The Candidate List was prepared to assist persons in reporting chemical substances for the Inventory. In January 1978, EPA published two addenda to the Candidate List, the first identifying petroleum refinery intermediate and final process stream chemical substances, and the second identifying an additional 3,000 Class 1 chemical substances. A Class 1 chemical substance is one whose composition can be represented by a definite chemical structure diagram.

This document, addendum III to the Candidate List, identifies primarily Class 2 chemical substances, and provides a mechanism for identifying and reporting others. A Class 2 chemical substance is one whose composition cannot be represented by a definite chemical structure diagram. Some chemical substances identified in this addendum are defined, in part, in terms of the processes by which they are manufactured. Other chemical substances are simply identified by names which are widely recognized and need no further definition.

Certain common materials of commerce, such as inorganic glasses, are defined by the Inventory Reporting Regulations as mixtures. To facilitate reporting, this addendum defines certain categories which encompass the individual chemical substances manufactured in the production of these mixtures.

This addendum is organized into ten sections, listing terms developed by EPA in cooperation with various trade associations and other agents. They represent industries involved in the manufacture of Class 2 chemical substances which are difficult to define, either due to slight variations of process or because the composition of these substances is not completely known or is variable. Although this addendum identifies chemical substances which are common to specific industries, it does not include all reportable chemical substances manufactured within these industries. Furthermore, <u>any</u> persons who manufacture such substances may use the nomenclature presented in this addendum to report for the Inventory if this nomenclature accurately describes the chemical substances they manufacture.

All chemical substances identified in this addendum, with the exception of those in Section I (multi-component Class 2 substances derived from natural fats and oils or synthetic substitutes), are listed with CAS Registry Numbers and EPA Code Designations, and may be reported on Form A. The substances identified in Section I must be reported on Form C according to the procedures outlined in that section.

Section I

CLASS 2 CHEMICAL SUBSTANCES DERIVED FROM NATURAL FATS AND OILS AND SYNTHETIC SUBSTITUTES

An Alternate Procedure for Substance Identification and Reporting for the Chemical Substance Inventory

General

This section presents an alternate and relatively simple procedure for identifying and reporting certain multicomponent Class 2 chemical substances derived from natural fats and oils and synthetic long-chain alkyl substitutes. The procedure was developed by The Soap and Detergent Association in conjunction with the EPA and is intended to standardize the identification of substances manufactured and used extensively in the soap and detergent industry. This standardization should provide for easier and more certain reporting and recording of information for these substances. Accordingly, the procedure may be used to report multicomponent soaps and surface active agents (and also their precursors and derivatives) manufactured, imported, or processed for such uses as wetting agents, emulsifiers, dispersants, and penetrants. Its applicability, however, should extend beyond the soap and detergent industry.

This procedure may not be used to report any single component Class 1 chemical substance (i.e., a substance whose composition may be represented by a definite chemical structure diagram) or any combination of such substances prepared by mixing without chemical reaction. Furthermore, it should not be used in those cases where the person reporting considers its applicability to be marginal or in question. Instead, the conventional procedures should be followed for chemical substance identification and reporting, as specified in the EPA publication "Reporting for the Chemical Substance Inventory" (December 1977).

The Class 2 chemical substances which may be reported following procedures specified here are complex, multicomponent materials whose individual components have a common structural feature: one or more long-chain alkyl groups to which is attached a chemically functional group or groups. These components differ from one another with respect to one or more of the following long-chain alkyl group characteristics: length (carbon number), saturation, structure (linear or branched), and/or the position of functional group attachment(s).

Before 1950, most of these substances were derived commercially from natural sources. However, synthetically-derived sources of similar composition have since been developed and are presently used interchangeably with natural sources.

Substance Identification

According to procedures specified in this section, certain of these Class 2 chemical substances may be identified by systematically-derived, chemically-descriptive SDA Substance Names. The proper SDA Substance Name for each is that which most precisely describes the chemical composition of the substance. Each substance is reported on Inventory Report Form C and identified only by the SDA Substance Name and special SDA Reporting Number, and not in terms of source, blend, process, or reaction information. During form processing, each substance reported following this procedure will be assigned a CAS Registry Number which will appear on the Inventory with the SDA Substance Name and Reporting Number and with substance synonyms, if reported.

SDA Substance Names consist of two or, in some cases, three parts. The two parts common to all SDA Substance Names are: (1) the Alkyl Descriptor, A, which describes the long-chain alkyl groups of the substance, and (2) the Functionality Descriptor, F, which identifies the functional group(s) of the substance. A third part, the Salt Descriptor, S, identifies the cation(s) of any salt.

SDA Substance Names are systematically constructed according to the following formats:

(A) alkyl (F),

or in the case of salts,

(A) alkyl (F)(S),

where A denotes the Alkyl Descriptor; F, the Functionality Descriptor; and S, the Salt Descriptor.

For example, the SDA Substance Name for a fatty amine which contains predominantly C_{10}-C_{16} saturated alkyl chain-lengths is:

C_{10}-C_{16} alkyl amine

where the phrase "C_{10}-C_{16}" corresponds to the Alkyl Descriptor (A), and "amine", to the Functionality Descriptor (F).

Similarly, the SDA Substance Name for the sodium salt of a fatty carboxylic acid comprised predominantly of C_{18} saturated and C_{18} unsaturated alkyl chains is:

C_{18} and C_{18} unsaturated alkyl carboxylic acid sodium salt

where the phrase "C_{18} and C_{18} unsaturated" corresponds to the Alkyl Descriptor (A); "carboxylic acid", to the Functionality Descriptor (F); and "sodium salt", to the Salt Descriptor (S).

The Class 2 chemical substances covered by this section are limited to those whose composition may be described using the Alkyl, Functionality, and Salt Descriptors listed in Tables 1, 2, and 3, respectively. These descriptors, discussed in detail below, may be combined in the SDA Substance Name format to describe more than 5,000 multicomponent Class 2 chemical substances.

Alkyl Description

Table 1 lists the Alkyl Descriptors covered by this system of substance identification; assigned to each is a two-digit Alkyl Descriptor Code used in generating the SDA Reporting Numbers, described later. Each Descriptor identifies a distribution of alkyl groups in terms of carbon chainlength, saturation and/or unsaturation, and linear or branched structure. Alkyl group distributions are inclusive of both even and odd alkyl chainlengths.

The Descriptors of Table 1 were chosen to cover the predominant long-chain alkyl group distributions actually present in most commercial multicomponent Class 2 substances of this type, and to provide for each as precise a description as practical. Use of this procedure is predicated on selecting the narrowest alkyl distribution (Alkyl Descriptor) which describes the predominant long-chain alkyl groups of the substance reported. In this context, the term "predominant" means that about 80 to 100 percent of all long-chain alkyl groups are included within the description.

In the Alkyl Descriptor, a saturated, linear long-chain alkyl group is denoted by "C_x" where the subscript x indicates the number of carbon atoms in the alkyl chain. Unsaturated and multiple branched alkyl groups are denoted by "C_x unsaturated" and "C_x branched", respectively.

By convention, the number of carbon atoms in a long-chain alkyl group includes all long-chain alkyl and functional group carbon atoms, other than those contained in an aromatic ring, which are connected to each other in a unbroken chain of carbon-carbon bonds. For example, the alkyl chainlength, designated by "R" in the representative structural diagrams found in Table 2, includes the acyl carbon of carboxylic acids and their derivatives, and the total number of carbon atoms in such structures as $R\text{-}CH_2\text{-}OH$ or $R\text{-}CH{=}CH_2$. The alkyl group does not include, however, functional group carbon atoms which are part of a phenyl ring, or are separated from the alkyl chain by a phenyl group or an atom other than carbon, e.g., R-  , $R\text{-}N(CH_3)_2$, or $R\text{-}O(CH_2)_3NH_2$.

Unless specified otherwise, the alkyl groups identified by each Alkyl Descriptor are linear, or essentially linear, hydrocarbon chains. The natural fats and oils listed below provide such alkyl groups:

Vegetable		Animal	Marine
Avocado	Peanut	Grease	Herring
Babassu	Rapeseed	Lard	Menhaden
Castor	Rice Bran	Neatsfoot	Salmon
Coconut	Safflower	Poultry	Sardine
Corn	Safflower (high oleic)	Tallow	Sperm Body (whale)
Cottonseed	Sesame		Sperm Head (whale)
Crambe	Sorghum		Whale
Linseed	Soybean		
Olive	Sunflower		
Oiticica	Tung		
Palm	Wheat Germ		
Palm-kernel			

These sources provide both saturated and unsaturated alkyl groups; castor oil provides a C_{18} hydroxy substituted alkyl group. Alkyl groups derived from other natural sources are not covered by this procedure.

Synthetic sources can provide linear or essentially linear alkyl groups, i.e., chain branching, if any, is limited to no more than one secondary methyl (CH_3-) or ethyl (C_2H_5-) group per alkyl chain. For purposes of this section, the latter type of alkyl chain is included within the designation "linear". Multiple branched alkyl groups, derived exclusively from synthetic sources, have separate Alkyl Descriptors.

Some Class 2 chemical substances covered by this procedure are comprised of components which have two or more long-chain alkyl groups, e.g., (dialkyl) amine, or (dialkyl) dimethyl ammonium chloride. This procedure may be used to identity such substances provided that each long-chain alkyl group is describable, in its predominant composition, by an Alkyl Descriptor found in Table 1 and that none of these long-chain alkyl groups is a single component structure describable by a definite chemical structural diagram.

Functionality Description and Substance Definition

Table 2 lists the Functionality Descriptors which may be used in this procedure of substance identification; assigned to each is a three-digit Functionality Descriptor Code used in generating SDA Reporting Numbers. The partial chemical substance nomenclature (Functionality Descriptors) for each identifies a specific functional group or groups. Different Descriptors are provided for salts, and for their corresponding acids.

Associated with each Functionality Descriptor in Table 2 is a representative structural diagram or diagrams. In many cases, these diagrams depict only one of several possible isomers of a substance identified by a given Functionality Descriptor. For example, a C_{14}-C_{18} alkyl amine reported by this procedure may contain components which have the amine functional group ($-NH_2$) attached to a terminal alkyl carbon, as shown in Table 2 for Functionality Descriptor Code 029, or to any other carbon atom in the alkyl chain. The applicability and limitations of each representative structural diagram are defined by a Substance Definition. Each Functionality Descriptor listed in Table 2 is assigned a Substance Definition Format number ranging from 1 to 6. Through this number, the SDA Substance Name is linked to one of six generalized Substance Definitions appearing in Table 4. For each substance reported by this procedure, a unique definition can be generated by inserting the Alkyl, Functionality, and Salt Descriptor parts of its SDA Substance Name, and the corresponding representative structural diagram found in Table 2 into the appropriate generalized Substance Definition. Examples contained in Table 4 illustrate how such definitions may be generated. The Substance Definitions provide a chemical description of each substance identified by an SDA Substance Name and specifies the applicability and limitation of the corresponding representative structural diagram.

> Note: In Table 4, the term "positional isomers", appearing in some Substance Definitions refers to substances which are otherwise similar except for the position of functional group attachment(s) on the long-chain alkyl group(s).

Salt Description

Table 3 lists the Salt Descriptors covered by this system of substance identification; assigned to each is a two-digit Salt Descriptor Code used in generating the SDA Reporting Number. SDA Substance Names for Class 2 chemical substance which are not salts contain no Salt Descriptor part; the Salt Descriptor Code for such substances is 00.

Mixed salts of monovalent anions are considered mixtures of the individual salts, each of which should be reported separately. Mixed salts of divalent anions, however, may be reported as a single substance.

Reporting Instructions

Class 2 chemical substances identified following this procedure may only be reported on Chemical Substance Inventory Report Form C. Although substance synonyms may also be provided, the chemical substance need only be identified by its SDA Substance Name and a systematically-derived SDA Reporting Number. The SDA Reporting Number indicates that the substance is being reported according to the procedure described here and also serves as a redundancy check on the correctness of the reported SDA Substance Name.

The SDA Reporting Number is derived using the two- or three-digit codes associated with each Alkyl, Functionality, or Salt Descriptor contained in Tables 1 to 3. The SDA Reporting Number is generated by systematically combining these codes for a given substance in a manner similar to that used to derive the SDA Substance Name. SDA Reporting Numbers have the following formats:

SDA aa-fff-ss

or for mixed salts of divalent anions,

SDA aa-fff-ss,s's'

where "aa" denotes the appropriate Alkyl Descriptor Code; "fff", the appropriate Functionality Descriptor Code; and "ss" (and "s's'") the appropriate Salt Descriptor Code(s).

For example, the SDA Reporting Number for C_{10}-C_{16} alkyl amine is:

SDA 15-029-00

This number was generated using the Descriptor Codes found in Tables 1 to 3. Table 1 identifies the Alkyl Descriptor Code for "C_{10}-C_{16}": 15. Table 2 identifies the Functionality Descriptor Code for "(alkyl) amine": 029. Table 3 identifies the Salt Descriptor Code to be used when the substance is not a salt: 00. Inserting these numbers in the standard format yields the correct SDA Reporting Number.

A seven step method, described below for a specific example, is useful in applying the nomenclature of this section to the identification and reporting of particular chemical substances. Additional examples which further illustrate the applicability and limitations of the procedure immediately follow Table 4.

INTRODUCTORY EXAMPLE

A fatty carboxylic acid is prepared by blending acids from various sources which contain linear alkyl groups having even and odd carbon numbers. The fatty acid is then reacted with sodium hydroxide to form the sodium salt. The composition of the starting fatty acid is listed below in terms of the percent by weight of each of its components.

Component Alkyl Group	% Composition
C_8 saturated	0.5
C_{10} saturated	1.5
C_{12} saturated	7
C_{14} saturated	5
C_{15} saturated	5
C_{16} saturated	10
C_{17} saturated	10
C_{18} saturated	30
C_{20} saturated	1.0
C_{16} unsaturated	5
C_{18} unsaturated	25

Step 1: Identify the Major Component Alkyl Groups

On a worksheet, list in the following format the alkyl groups which correspond to the alkyl components in the starting ingredients. Include the actual percentage by weight of each such component. As a practical consideration, components present at less than two (2) percent by weight need not be included.

Carbon Chainlength Distribution			
Saturated	Unsaturated	Branched	% Composition*
C_{12}	--	No	7
C_{14}	--	No	5
C_{15}	--	No	5
C_{16}	--	No	10
C_{17}	--	No	10
C_{18}	--	No	30
--	C_{16}	No	5
--	C_{18}	No	25

*by weight of starting fatty acid.

NOTE: The C_8, C_{10}, and C_{20} alkyl components of this example were omitted because each is present at less than two percent by weight.

Step 2: Identify the Most Appropriate Alkyl Descriptor

Select from Table 1 those Alkyl Descriptors which could conceivably describe the predominant alkyl groups of the substance. Eliminate by inspection those Alkyl Descriptors which are obviously inadequate for reasons of alkyl chainlength, saturation and/or unsaturation, or structure. In this example, the Alkyl Descriptors for solely saturated, solely unsaturated, or branched alkyl groups are clearly inappropriate and are not considered. Other Alkyl Descriptors are not considered because their chainlength distributions are not appropriate.

By such an analysis, the Alkyl Descriptors which correspond to Alkyl Descriptor Codes 01, 04, and 11 are selected as candidates.

To determine the most appropriate Alkyl Descriptor from among these candidates, construct the following table:

Alkyl Desc. Code	Predominant Carbon Chainlength			Components Within Category	Number of Extra Components	Number of Missing Components
	Saturated	Unsaturated	Branched			
01	8-18	18	No	93%	5	1
04	14-18	16-18	No	90	1	1
11	16-18	18	No	75	0	4

The information entered under the Alkyl Descriptor Code and Predominant Carbon Chainlength headings are taken from Table 1. The entries under the other headings were calculated by the following methods:

Components Within Category: For each Alkyl Descriptor, add the percentages of each alkyl component, listed in Table 1, whose long-chain alkyl group is included within the specified distribution, e.g., 90 percent of the components shown in Step 1 fall within Alkyl Descriptor Code 04.

Number of Extra Components: For each Alkyl Descriptor, subtract from the total number of long-chain alkyl groups of the specified distribution those which appear in the actual alkyl composition, e.g., for Alkyl Descriptor Code 04, only the C_{17} unsaturated group is absent from the actual alkyl composition.

Number of Missing Components: For each Alkyl Descriptor, subtract from the total number of alkyl components in the actual composition those which are included within the alkyl distribution specified for the Alkyl Descriptor, e.g., only the C_{12} saturated alkyl component of the actual composition is not included within Alkyl Descriptor Code 04.

Analysis: By inspection of the table shown above, it is clear that the Alkyl Descriptors which correspond to Codes 01 and 04 both adequately encompass the predominant alkyl composition of the substance, i.e., greater than 80 percent of the actual alkyl composition is included within the range of each of these alkyl distributions. The Alkyl

Descriptor corresponding to Code 04 is selected, however, because this Alkyl Descriptor includes the fewest extra and missing component alkyl groups.

NOTE: This procedure for determining the most appropriate Alkyl Descriptor should be followed only once for each unique alkyl composition reported. It need not be repeated for functionality variations involving the same alkyl composition.

Step 3: Select the Appropriate Functionality Descriptor

Refer to Table 2 and select the Functionality Descriptor which identifies the functionality of the substance. In this example, the appropriate Functionality Descriptor for a salt of a fatty carboxylic acid corresponds to Code 006.

Step 4: Select the Appropriate Salt Descriptor

Refer to Table 3 and select the Salt Descriptor(s) which identifies, if appropriate, the cation(s) of the salt being reported. In this example, the Salt Descriptor, for the sodium cation, corresponds to Code 04.

Step 5: Construct the SDA Reporting Number

Using the prefix SDA, and the Alkyl, Functionality, and Salt Descriptor Codes derived from steps 2 through 4, contruct the SDA Reporting Number using the proper format:

SDA 04-006-04

Step 6: Construct the SDA Substance Name

In the appropriate format, construct the SDA Substance Name for the chemical substance, using the nomenclature which corresponds to the appropriate Descriptor Codes found in Tables 1 through 3, respectively. In this example, the SDA Substance Name is:

C_{14}-C_{18} and C_{16}-C_{18} unsaturated alkyl carboxylic acid sodium salt.

Step 7: Complete Form C

Complete Blocks I through IV of Form C following the instructions provided in the EPA publication "Reporting for the Chemical Substance Inventory" (December 1977). In Block V, as shown below, enter the SDA Substance Name in the space provided for the Specific Chemical Name. Indicate that the substance is a Class 2 substance by checking the appropriate box. Below the line labeled "Molecular Formula", enter the SDA Reporting Number. Determine whether any other chemical substances manufactured at the plant site are encompassed by this particular SDA Substance Name and Reporting Number. If so, consider them all as a single substance and enter the appropriate code digit in the box labeled

"Production Range" which corresponds to their combined 1977 production volume. If any of the substances are not site limited, make no check in the box labeled "site limited". Finally, make all necessary confidentiality claims by checking the appropriate boxes.

SAMPLE FORM C: BLOCK V

V. CHEMICAL SUBSTANCE WHERE THE IDENTITY IS CONFIDENTIAL (AND/OR) THE CAS REGISTRY NUMBER IS UNKNOWN

NUMBER	CAS REGISTRY NUMBER (IF KNOWN)	SPECIFIC CHEMICAL NAME (SEPARATE MULTIPLE NAMES WITH A SEMI-COLON) ☐ CLASS 1 ☒ CLASS 2	PRODUCTION RANGE	ACTIVITY: MANUFACTURE	ACTIVITY: IMPORT	SITE LIMITED	CONFIDENTIALITY CLAIMS: (a) MANUFACTURE	(b) IMPORT	(c) SITE LIMITED	(d) PRODUCTION	(e) CORPORATION	(f) PLANT SITE	EPA USE ONLY	NUMBER
1		C_{14}-C_{18} and C_{16}-C_{18} unsaturated alkyl carboxylic acid sodium salt	4	X										1

IN THE SPACE PROVIDED BELOW, PROVIDE STRUCTURAL INFORMATION, MOLECULAR FORMULA, AND OTHER SUPPLEMENTAL INFORMATION TO AID IN THE SPECIFIC IDENTIFICATION OF THE CHEMICAL SUBSTANCE:

☐ NO OF SHEETS — SEE ATTACHED SHEETS (WRITE FORM NO ON ALL ATTACHMENTS)

MOLECULAR FORMULA

SDA 04-006-04

(g) ☐ CHEMICAL SUBSTANCE IDENTITY IS CONFIDENTIAL

(1) SUBSTANTIATION

☐ No of sheets attached (write form number on all substantiation sheets)

(2) Proposed Generic Name

☐ (3) I agree to the terms of CONFIDENTIAL CHEMICAL SUBSTANCE IDENTITY STATEMENT on the back of this form

TABLE 1

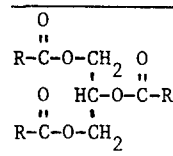
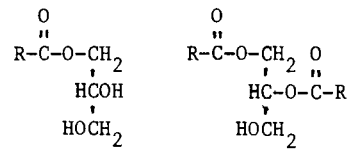
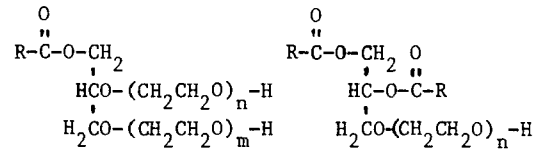
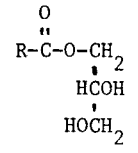
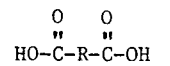
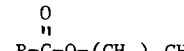
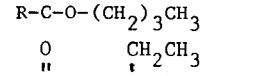
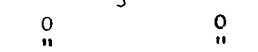
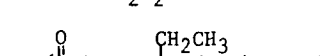
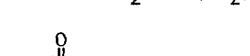
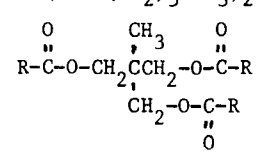
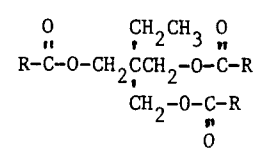
Alkyl Descriptors

Alkyl Descriptor Code	Predominant Carbon Chainlength Distribution Saturated	Unsaturated	Branched	Alkyl Descriptor (A) Nomenclature
01	8-18	18	No	C_8-C_{18} and C_{18} unsaturated
02	10-16	12-20	No	C_{10}-C_{16} and C_{12}-C_{20} unsaturated
03	14-18	12-20	No	C_{14}-C_{18} and C_{12}-C_{20} unsaturated
04	14-18	16-18	No	C_{14}-C_{18} and C_{16}-C_{18} unsaturated
05	14-18	16-22	No	C_{14}-C_{18} and C_{16}-C_{22} unsaturated
06	14-18	16-26	No	C_{14}-C_{18} and C_{16}-C_{26} unsaturated
07	14-22	16-22	No	C_{14}-C_{22} and C_{16}-C_{22} unsaturated
08	16-22	18	No	C_{16}-C_{22} and C_{18} unsaturated
09	16	18	No	C_{16} and C_{18} unsaturated
10	16	18,18*	No	C_{16} plus C_{18} unsaturated and C_{18} hydroxy unsaturated
11	16-18	18	No	C_{16}-C_{18} and C_{18} unsaturated
12	18	18	No	C_{18} and C_{18} unsaturated
13	6-12		No	C_6-C_{12}
14	8-26		No	C_8-C_{26}
15	10-16		No	C_{10}-C_{16}
16	12-18		No	C_{12}-C_{18}
17	14-18		No	C_{14}-C_{18}
18	14-26		No	C_{14}-C_{26}
19	16-18		No	C_{16}-C_{18}
20	16-18,18*		No	C_{16}-C_{18} and C_{18} hydroxy
21	16-22		No	C_{16}-C_{22}
22	8		Yes	C_8 branched
23	9		Yes	C_9 branched
24	12		Yes	C_{12} branched
25	11-13		Yes	C_{11}-C_{13} branched
26		10-16	No	C_{10}-C_{16} unsaturated
27		14-18	No	C_{14}-C_{18} unsaturated

*Hydroxy substituted alkyl group derived from Castor Oil

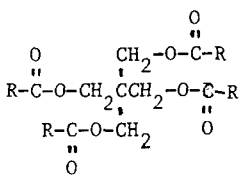
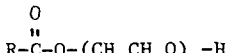
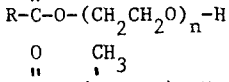
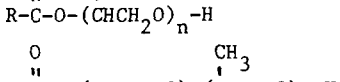
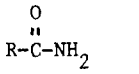
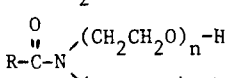
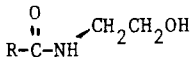
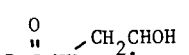
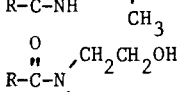
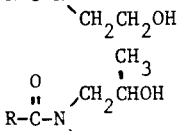
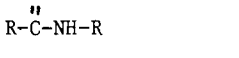
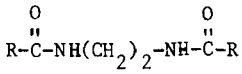
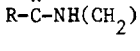
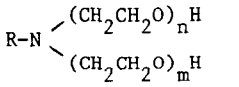
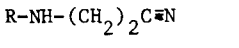
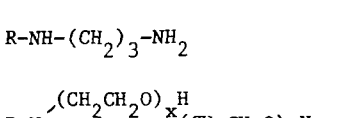
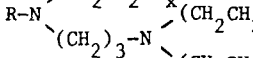
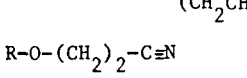
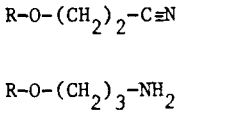
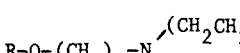
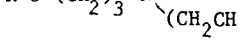
TABLE 2

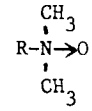
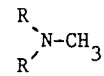
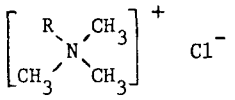
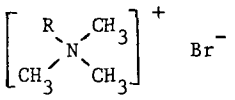
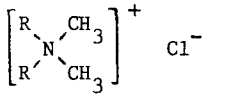
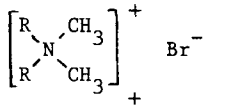
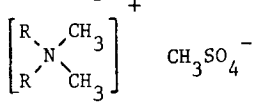
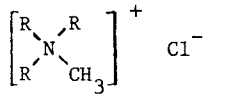
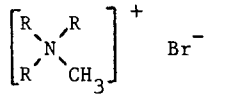
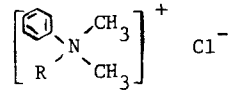
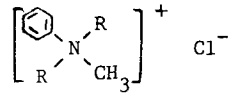
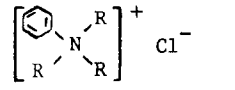
Functionality Descriptors

Func. Desc. Code	Functionality Descriptor (F) Nomenclature	Common Name	Representative Structural Diagram[a]	Substance Definition Format[b]
001	(trialkyl) glyceride	refined fat or oil		1
002	(alkyl) and (dialkyl) glyceride			1
003	(alkyl) and (dialkyl) glyceride ethoxylate			2
004	(alkyl) glyceride			1
005	(alkyl) carboxylic acid	fatty acid		1
006	(alkyl) carboxylic acid (salt)	soap		1
007	(alkyl) dicarboxylic acid	fatty dibasic acid		1
008	(alkyl) carboxylic acid n-butyl ester	fatty butyl ester		1
009	(alkyl) carboxylic acid 2-ethylhexyl ester	fatty 2- ethylhexyl ester		1
010	(alkyl) carboxylic acid methyl ester	fatty methyl ester		1
011	(dialkyl) carboxylic acid ethylene glycol diester	fatty ethylene glycol diester		1
012	(alkyl) dicarboxylic acid 2-ethylhexyl diester	fatty 2-ethylhexyl diester		1
013	(alkyl) dicarboxylic acid hexyl diester	fatty hexyl diester		1
014	(trialkyl) carboxylic acid trimethylolethane triester			1
015	(trialkyl) carboxylic acid trimethylolpropane triester			1

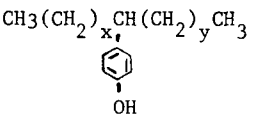
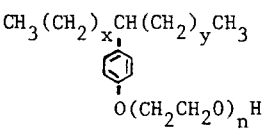
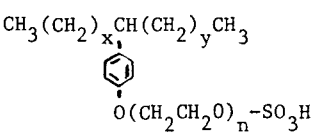
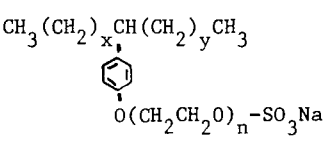
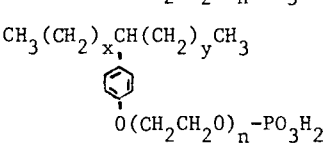
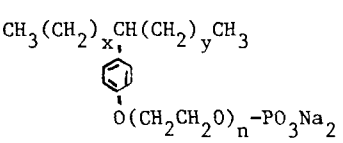
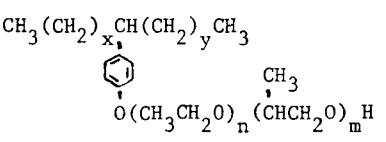
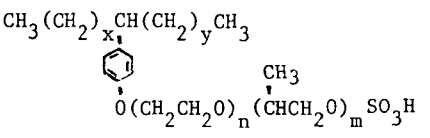
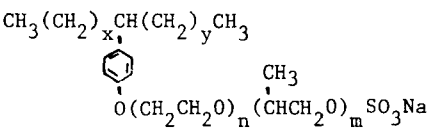
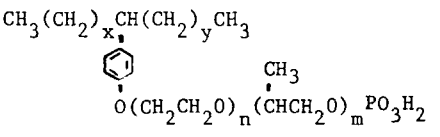
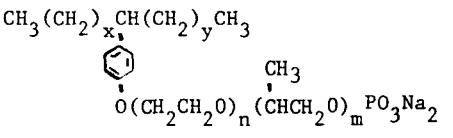
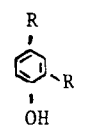
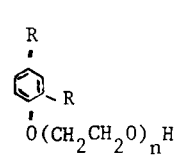
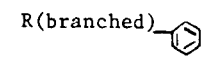
[a]Salts are depicted in terms of sodium cation(s).

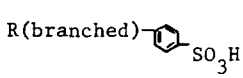
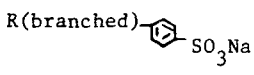
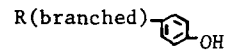
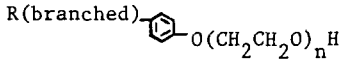
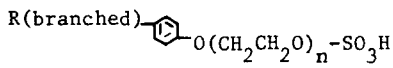
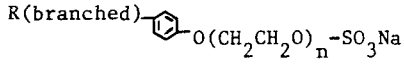
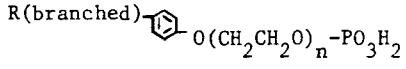
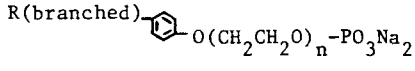
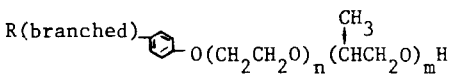
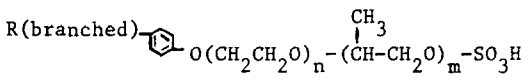
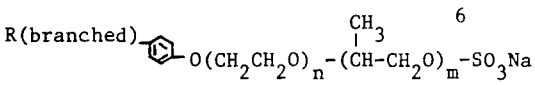
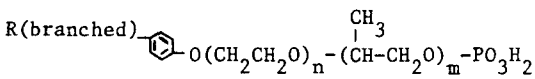
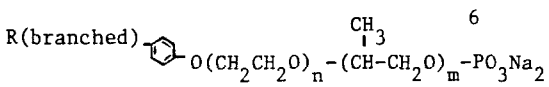
[b]Refer to corresponding Substance Definition Format number (1-6) in Table 4.

016	(tetraalkyl) carboxylic acid pentaerythritol tetraester			2
017	(alkyl) carboxylic acid ethoxylate	ethoxylated fatty acid		2
018	(alkyl) carboxylic acid propoxylate	propoxylated fatty acid		2
019	(alkyl) carboxylic acid ethoxylate propoxylate	ethoxylated propoxylated fatty acid		2
020	(alkyl) carboxylic acid amide	fatty amide		1
021	(alkyl) carboxylic acid amide ethoxylate	ethoxylated fatty amide		2
022	(alkyl) carboxylic acid amide monoethanol	monoethanol fatty amide		1
023	(alkyl) carboxylic acid amide monoisopropanol	monoisopropanol fatty amide		1
024	(alkyl) carboxylic acid amide diethanol	diethanol fatty amide		1
025	(alkyl) carboxylic acid amide diisopropanol	diisopropanol fatty amide		1
026	(alkyl) carboxylic acid amide (alkyl)			1
027	N,N'-(dialkyl) ethylene bis amide			1
028	N,N'-(dialkyl) propylene bis amide			1
029	(alkyl) amine	fatty amine		3
030	(alkyl) amine ethoxylate	ethoxylated fatty amine		4
031	(alkyl) amino ethylene nitrile	fatty amine nitrile		3
032	N-(alkyl) propylene diamine			3
033	N-(alkyl) propylene diamine ethoxylate			4
034	(alkyl) alkoxy ethylene nitrile	fatty ether nitrile		3
035	(alkyl) alkoxy propylene amine			3
036	(alkyl) alkoxy propylene amine ethoxylate			4
037	(alkyl) alkoxy ethylene amino nitrile	fatty ether amino nitrile		3
038	(alkyl) alkoxy propylene amine propylene amine	fatty ether diamine		3

039	(alkyl) nitrile	fatty nitrile	$R-C\equiv N$	3
040	(alkyl) dimethyl amine	fatty dimethyl amine	$R-N-(CH_3)_2$	3
041	(alkyl) dimethyl amine oxide	fatty dimethyl amine oxide		3
042	(dialkyl) amine	dialkyl amine		3
043	(dialkyl) methyl amine	dialkyl methyl amine		3
044	(trialkyl) amine	trialkyl amine		3
045	(alkyl) trimethyl ammonium chloride	alkyl trimethyl ammonium chloride		3
046	(alkyl) trimethyl ammonium bromide	alkyl trimethyl ammonium bromide		3
047	(dialkyl) dimethyl ammonium chloride	dialkyl dimethyl ammonium chloride		3
048	(dialkyl) dimethyl ammonium bromide	dialkyl dimethyl ammonium bromide		3
049	(dialkyl) dimethyl ammonium methyl sulfate	dialkyl dimethyl ammonium methyl sulfate		
050	(trialkyl) methyl ammonium chloride			3
051	(trialkyl) methyl ammonium bromide			3
052	(alkyl) benzyl dimethyl ammonium chloride			3
053	(dialkyl) benzyl methyl ammonium chloride			3
054	(trialkyl) benzyl ammonium chloride			3
055	(alkyl) chloride	alkyl chloride	RCH_2-Cl	3
056	(alkyl) bromide	alkyl bromide	RCH_2-Br	3
057	(alkyl) alpha olefin	alpha olefin	$R-CH=CH_2$	3
058	(alkyl) alkene and (alkyl) hydroxy sulfonic acid		$R(CH_2)_xCH=CH(CH_2)_y-SO_3H$, $R(CH_2)_xCH(CH_2)_y-SO_3H$ (OH)	3
059	(alkyl) alkene and (alkyl) hydroxy sulfonic acid (salts)	olefin sulfonate	$R(CH_2)_xCH=CH(CH_2)_y-SO_3Na$ $R(CH_2)_xCH(CH_2)_y-SO_3Na$ (OH)	3

060	(alkyl) alcohol	fatty alcohol	$R-CH_2-OH$	3
061	(alkyl) alcohol sulfuric acid		$R-CH_2-OSO_3H$	3
062	(alkyl) alcohol sulfuric acid (salt)	alkyl sulfate	$R-CH_2-OSO_3Na$	3
063	(alkyl) alcohol phosphoric acid		$R-CH_2-OPO_3H_2$	3
064	(alkyl) alcohol phosphoric acid (salt)	alkyl phosphate ester	$R-CH_2-OPO_3Na_2$	3
065	(alkyl) alcohol ethoxylate	ethoxylated fatty alcohol	$R-CH_2-O-(CH_2CH_2O)_n-H$	4
066	(alkyl) alcohol ethoxylate sulfuric acid		$R-CH_2-O-(CH_2CH_2O)_n-SO_3H$	4
067	(alkyl) ethoxylate sulfuric acid (salt)	ethoxylated alkyl sulfate	$R-CH_2-O-(CH_2CH_2O)_n-SO_3Na$	4
068	(alkyl) alcohol ethoxylate phosphoric acid		$R-CH_2-O-(CH_2CH_2O)_n-PO_3H_2$	4
069	(alkyl) alcohol ethoxylate phosphoric acid (salt)	ethoxylated alkyl phosphate ester	$R-CH_2-O-(CH_2CH_2O)_n-PO_3Na_2$	4
070	(alkyl) alcohol ethoxylate propoxylate	ethoxylated propoxylated fatty alcohol	$R-CH_2-O-(CH_2CH_2O)_n(\overset{CH_3}{\overset{\vert}{C}}HCH_2O)_m-H$	4
071	(alkyl) alcohol ethoxylate propoxylate sulfuric acid		$R-CH_2-O-(CH_2CH_2O)_n(\overset{CH_3}{\overset{\vert}{C}}HCH_2O)_m-SO_3H$	4
072	(alkyl) alcohol ethoxylate propoxylate sulfuric acid (salt)	ethoxylated propoxylated alkyl sulfate	$R-CH_2-O-(CH_2CH_2O)_n(\overset{CH_3}{\overset{\vert}{C}}HCH_2O)_m-SO_3Na$	4
073	(alkyl) alcohol ethoxylate propoxylate phosphoric acid		$R-CH_2-O-(CH_2CH_2O)_n(\overset{CH_3}{\overset{\vert}{C}}HCH_2O)_m-PO_3H_2$	4
074	(alkyl) alcohol ethoxylate propoxylate phosphoric acid (salt)	ethoxylated propoxylated alkyl phosphate ester	$R-CH_2-O-(CH_2CH_2O)_n(\overset{CH_3}{\overset{\vert}{C}}HCH_2O)_m-PO_3Na_2$	4
075	(alkyl) glyceryl ether chloride		$R-O-CH_2\overset{OH}{\overset{\vert}{C}}HCH_2-Cl$	3
076	(alkyl) glycidyl ether		$R-O-CH_2\overset{O}{\overset{/\backslash}{C}}HCH_2$	3
077	(alkyl) glyceryl ether sulfonic acid (salt)	fatty glycerol sulfonate	$R-O-CH_2\overset{OH}{\overset{\vert}{C}}HCH_2-SO_3Na$	3
078	(alkyl) epoxide		$R-\overset{O}{\overset{/\backslash}{C}}HCH_2$	1
079	(alkyl) benzene	LAB	$CH_3(CH_2)_x\overset{\vert}{C}H(CH_2)_yCH_3$ 	3
080	(alkyl) benzene sulfonic acid		$CH_3(CH_2)_x\overset{\vert}{C}H(CH_2)_yCH_3$  SO_3H	3
081	(alkyl) benzene sulfonic acid (salt)	LAS	$CH_3(CH_2)_x\overset{\vert}{C}H(CH_2)_yCH_3$  SO_3Na	3

082	(alkyl) phenol	linear alkyl phenol		3
083	(alkyl) phenol ethoxylate	ethoxylated linear alkyl phenol		4
084	(alkyl) phenol ethoxylate sulfuric acid			4
085	(alkyl) phenol ethoxylate sulfuric acid (salt)	ethoxylated linear alkyl phosphate ester		4
086	(alkyl) phenol ethoxylate phosphoric acid			4
087	(alkyl) phenol ethoxylate phosphoric acid (salt)	ethoxylated linear alkyl phosphate ester		4
088	(alkyl) phenol ethoxylate propoxylate	ethoxylated propoxylated linear alkyl phenol		4
089	(alkyl) phenol ethoxylate propoxylate sulfuric acid			4
090	(alkyl) phenol ethoxylate propoxylate sulfuric acid (salt)	ethoxylated propoxylated alkyl phenol sulfate		4
091	(alkyl) phenol ethoxylate propoxylate phosphoric acid			4
092	(alkyl) phenol ethoxylate propoxylate phosphoric acid (salt)	ethoxylated propoxylated linear alkyl phenol phosphate ester		4
093	(dialkyl) phenol	linear dialkyl phenol		3
094	(dialkyl) phenol ethoxylate	ethoxylated linear dialkyl phenol		4
095	(branched alkyl) benzene	AB		5

096	(branched alkyl) benzene sulfonic acid			5
097	(branched alkyl) benzene sulfonic acid (salt)	ABS		5
098	(branched alkyl) phenol	branched alkyl phenol		5
099	(branched alkyl) phenol ethoxylate	ethoxylated branched alkyl phenol		6
100	(branched alkyl) phenol ethoxylate sulfuric acid			6
101	(branched alkyl) phenol ethoxylate sulfuric acid (salt)	ethoxylated branched alkyl phenol sulfate		6
102	(branched alkyl) phenol ethoxylate phosphoric acid			6
103	(branched alkyl) phenol ethoxylated phosphoric acid (salt)	ethoxylated branched alkyl phenol phosphate ester		6
104	(branched alkyl) phenol ethoxylate propoxylate	ethoxylated propoxylated branched alkyl phenol		6
105	(branched alkyl) phenol ethoxylate propoxylate sulfuric acid			6
106	(branched alkyl) phenol ethoxylate propoxylate sulfuric acid (salt)	ethoxylated propoxylated branched alkyl phenol sulfate		6
107	(branched alkyl) phenol ethoxylate propoxylate phosphoric acid			6
108	(branched alkyl) phenol ethoxylate propoxylate phosphoric acid (salt)	ethoxylated propoxylated branched alkyl phenol phosphate ester		6

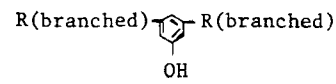
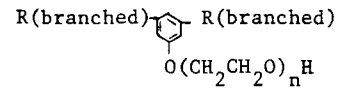
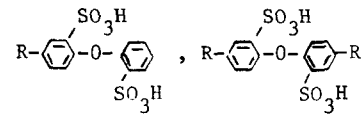
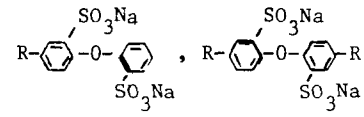
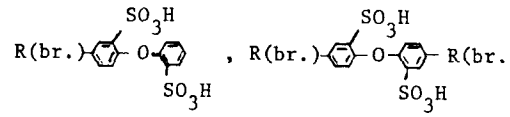
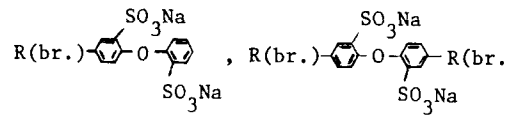
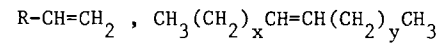
109	(branched dialkyl) phenol	branched dialkyl phenol		5
110	(branched dialkyl) phenol ethoxylate	ethoxylated branched dialkyl phenol		6
111	(alkyl) and (dialkyl) phenoxy benzene sulfonic acid			5
112	(alkyl) and (dialkyl) phenoxy benzene sulfonic acid (salt)			5
113	(branched alkyl) and (branched dialkyl) phenoxy benzene sulfonic acid			5
114	(branched alkyl) and (branched dialkyl) phenoxy benzene sulfonic acid (salt)			5
115	(alkyl) alpha and (alkyl) internal olefin			3

TABLE 3
Salt Descriptors

Salt Descriptor Code	Salt Descriptor (S) Nomenclature
00	(none)
01	ammonium salt
02	lithium salt
03	potassium salt
04	sodium salt
05	barium salt
06	calcium salt
07	magnesium salt
08	nickel salt
09	zinc salt
10	aluminum salt
11	titanium salt
12	monoethanol amine salt
13	diethanol amine salt
14	triethanol amine salt

TABLE 4
Chemical Substance Identification
with Examples

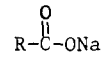
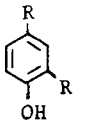
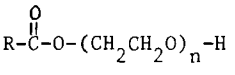
Substance Definition Format	SDA Reporting Number	SDA Substance Name	Substance Definition
1	SDA 00-000-00	(A) alkyl (F) (S) or (A) alkyl (F)	The combination of alkyl (F)(S) having predominantly (A) alkyl chainlengths that generally conform to the following structural diagram: [Insert the Representative Structural Diagram from Table 2 which corresponds to F; indicate proper salt form(s), if applicable.]
	EXAMPLES:		
	SDA 13-006-04	C_6-C_{12} alkyl carboxylic acid sodium salt	The combination of alkyl carboxylic acid sodium salts having predominantly C_6-C_{12} alkyl chainlengths that generally conform to the following structural diagram: 
	SDA 13-093-00	C_6-C_{12} dialkyl phenol	The combination of dialkyl phenols having predominantly C_6-C_{12} alkyl chainlengths that generally conform to the following structural diagram: 
2	SDA 00-000-00	(A) alkyl (F) (S) or (A) alkyl (F)	The combination of alkyl (F)(S) having predominantly (A) alkyl chainlengths and ethoxylate and/or propoxylate homologues (as appropriate) that generally conform to the following structural diagram: [Insert the Representative Structural Diagram from Table 2 which corresponds to F; indicate proper salt form(s), if applicable.]
	EXAMPLE:		
	SDA 13-017-00	C_6-C_{12} alkyl carboxylic acid ethoxylate	The combination of alkyl carboxylic acid ethoxylates having predominantly C_6-C_{12} alkyl chainlengths and ethoxylate homologues that generally conform to the following structural diagram: 

TABLE 4 (continued)

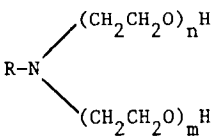
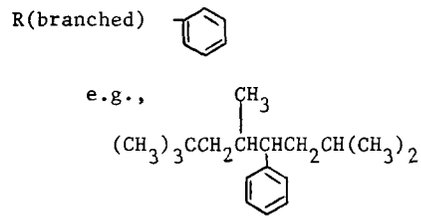
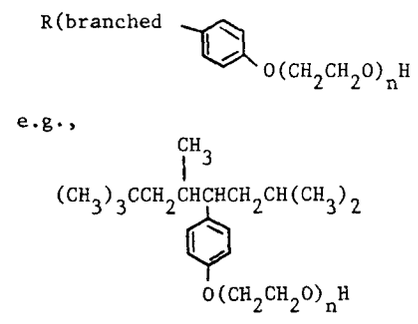
Substance Definition Format	SDA Reporting Number	SDA Substance Name	Substance Definition
3	SDA 00-000-00	(A) alkyl (F) (S) or (A) alkyl (F)	The combination of alkyl (F)(S) having predominantly (A) alkyl chainlengths that generally conform to, or are positional isomers of, the following structural diagram: [Insert the Representative Structural Diagram from Table 2 which corresponds to F; indicate proper salt form(s), if applicable.]
EXAMPLE:			
	SDA 13-060-00	C_6-C_{12} alkyl alcohol	The combination of alkyl alcohols having predominantly C_6-C_{12} alkyl chainlengths that generally conform to, or are positional isomers of, the following structural diagram: $R\text{-}CH_2\text{-}OH$
4	SDA 00-000-00	(A) alkyl (F) (S) or (A) alkyl (F)	The combination of alkyl (F)(S) having predominantly (A) alkyl chainlengths and ethoxylate and/or propoxylate homologues (as appropriate) that generally conform to, or are positional isomers of, the following structural diagram: [Insert the Representative Structural Diagram from Table 2 which corresponds to F; indicate proper salt form(s), if applicable.]
EXAMPLE:			
	SDA 13-030-00	C_6-C_{12} alkyl amine ethoxylate	The combination of alkyl amine ethoxylates having predominantly C_6-C_{12} alkyl chainlengths and ethoxylate homologues that generally conform to, or are positional isomers of, the following structural diagram: 

TABLE 4 (continued)

Substance Definition Format	SDA Reporting Number	SDA Substance Name	Substance Definition
5	SDA 00-000-00	(A) alkyl (F) (S) or (A) alkyl (F)	The combination of alkyl (F)(S) positional isomers having predominantly (A) alkyl chainlengths that generally conform to the following structural diagram: [Insert the Representative Structural Diagram from Table 2 which corresponds to F; indicate proper salt form(s), if applicable.]
EXAMPLE:			
	SDA 24-095-00	C_{12} branched alkyl benzene	The combination of alkyl benzene positional isomers having predominantly C_{12} branched alkyl chainlengths that generally conform to the following structural diagram: 
6	SDA 00-000-00	(A) alkyl (F) (S) or (A) alkyl (F)	The combination of alkyl (F)(S) having predominantly (A) alkyl chainlengths and ethoxylate and/or propoxylate homologues (as appropriate) that generally conform to, or are positional isomers of, the following structural diagram: [Insert the Representative Structural Diagram from Table 2 which corresponds to F; indicate proper salt form(s), if applicable.]
EXAMPLE:			
	SDA 24-099-00	C_{12} branched alkyl phenol ethoxylate	The combination of alkyl phenol ethoxylates having predominantly C_{12} branched alkyl chainlengths and ethoxylate homologues that generally conform to, or are positional isomers of, the following structural diagram: 

ILLUSTRATIVE EXAMPLES

The examples listed below illustrate the applicability and limitations of this method. Where appropriate, the examples are treated by the seven step procedure outlined in the Reporting Instructions.

EXAMPLE 1

A mixture of synthetically derived saturated C_{12} through C_{18} linear alcohols is reacted with ethylene oxide to manufacture the ethoxylated alcohol.

Step 1: The distribution of alkyl chainlengths in the starting fatty alcohol is determined to be:

Carbon Chainlength Distribution			
Saturated	Unsat.	Branched	% Composition*
C_{12}	--	No	20
C_{14}	--	No	30
C_{16}	--	No	30
C_{18}	--	No	20

* by weight of starting fatty alcohol

Step 2: The following table lists those Alkyl Descriptors which should be considered:

Alkyl Desc. Code	Predominant Carbon Chainlength			Components Within Category	Number[a] of Extra Components	Number[a] of Missing Components
	Saturated	Unsaturated	Branched			
14	8-26	--	No	100%	6	0
15	10-16	--	No	80	1	1
16	12-18	--	No	100	0	0
17	14-18	--	No	80	0	1
18	14-26	--	No	80	4	1

[a]Since the alcohol contains only even chainlengths, only the possible even chainlenths are considered.

Analysis: Alkyl Descriptors 14 and 16 include the same percentage of components of the fatty alcohol (100 percent) within the range of the descriptors. However, Descriptor 16 includes the highest percentage of components with the fewest additional or missing components. Therefore, Alkyl Descriptor 16 is most representative of the alkyl composition.

Step 3: Referring to Table 2, the Functionality Descriptor for an ethoxylated fatty alcohol is 065.

Step 4: Referring to Table 3, the appropriate Salt Descriptor is 00, since the substance is not a salt.

Step 5: Construct the SDA Reporting Number by sequentially combining the codes derived in steps 2, 3 and 4:

SDA 16-065-00

Step 6: Following the standard format, construct the SDA Substance Name using the descriptor nomenclature, found in Tables 1 through 3, which corresponds to each descriptor code:

C_{12}-C_{18} alkyl alcohol ethoxylate

Step 7: Complete Form C, taking into account all the individual chemical substances which are encompassed by this SDA Substance Name and Reporting Number.

EXAMPLE 2

A manufacturer reacts a mixture of linear synthetic C_{12}-C_{15} alcohols with ethylene oxide and propylene oxide to form the ethoxylated, propoxylated alcohol.

Step 1: The distribution of alkyl chainlengths in the starting fatty alcohol is determined to be:

Carbon Chainlength Distribution			
Saturated	Unsat.	Branched	% Composition*
C_{12}	--	No	20
C_{13}	--	No	30
C_{14}	--	No	30
C_{15}	--	No	20

* by weight of starting fatty alcohol

Step 2: The following table lists those Alkyl Descriptors which should be considered:

Alkyl Desc. Code	Predominant Carbon Chainlength Saturated	Unsaturated	Branched	Components Within Category	Number[b] of Extra Components	Number[b] of Missing Components
14	8-26	--	No	100	15	0
15	10-16	--	No	100	3	0
16	12-18	--	No	100	3	0

[b]Since the alcohol contains both even and odd chainlengths, all chainlengths are considered.

Analysis: All three Alkyl Descriptors (14, 15, 16) include the same percentage of components of the starting fatty alcohol. Alkyl Descriptors 15 and 16, however, both provide the fewest additional or missing components. Although either descriptor is applicable based on the previous analysis, Alkyl Descriptor 15 is preferred, since it provides a better technical description of the alkyl composition, i.e., the fatty alcohol composition is nearer the center of the range provided by Alkyl Descriptor 15.

Step 3: Referring to Table 2, the Functionality Descriptor for an ethoxylated propoxylated fatty alcohol is 070.

Step 4: Referring to Table 3, the appropriate Salt Descriptor is 00, since the substance is not a salt.

Step 5: Construct the SDA Reporting Number by sequentially combining the codes derived in Steps 2, 3, and 4:

SDA 15-070-00

Step 6: Following the standard format, construct the SDA Substance Name using the descriptor nomenclature, found in Tables 1 through 3, which corresponds to each descriptor code:

C_{10}-C_{16} alkyl alcohol ethoxylate propoxylate

Step 7: Complete Form C, taking into account all the individual chemical substances which are encompassed by this SDA Substance Name and Reporting Number.

EXAMPLE 3

A manufacturer blends two linear synthetic alcohol mixtures, and then reacts them with ethylene oxide and propylene oxide, forms the phosphate acid ester by reaction with polyphosphoric acid and finally neutralizes with a combination of potassium hydroxide and sodium hydroxide.

Step 1: The distribution of alkyl chainlengths in the starting saturated, linear fatty alcohol is determined to be:

Alkyl Chainlength	C_{10}-C_{14} Alcohol	C_{12}-C_{18} Alcohol	4:1 Blend* % Composition
C_{10}	85	0	68.0
C_{12}	8	20	10.4
C_{14}	6	30	10.8
C_{16}	0	30	6.0
C_{18}	0	20	4.0

* by weight of starting fatty alcohols

Step 2: The following table lists those Alkyl Descriptors which should be considered:

Alkyl Desc. Code	Predominant Carbon Chainlength			Components Within Category	Number of Extra Components	Number of Missing Components
	Saturated	Unsaturated	Branched			
13	6-12	--	No	78.4	2	3
14	8-26	--	No	99.2	5	0
15	10-16	--	No	95.2	0	1

Analysis: Alkyl Descriptors 14 and 15 include essentially the same percentage of alkyl components within the descriptor ranges. Alkyl Descriptor 15 is selected because it includes the fewest additional or missing components.

Step 3: Referring to Table 2, the Functionality Descriptor for ethoxylated propoxylated alkyl phosphate ester is 074.

Step 4: Referring to Table 3, the appropriate Salt Descriptor is 03, 04, since it is a mixed potassium salt and sodium salt of the divalent alkyl phosphoric acid anion.

NOTE: Mixed salts should be reported in terms of the individual components for salts of monovalent anions. For example, for the mixed sodium and potassium salts of a C_{10}-C_{16} alkyl carboxylic acid, report separately the sodium salt (SDA 15-006-04) on Form C and the potassium salt (SDA 15-006-03) on a separate Form C.

Step 5: Construct the SDA Reporting Number by sequentially combining the codes derived in steps 2, 3, and 4:

SDA 15-074-03,04

Step 6: Following the standard format, construct the SDA Substance Name using the descriptor nomenclature, found in Tables 1 through 3, which corresponds to each descriptor code:

C_{10}-C_{16} alkyl alcohol ethoxylate propoxylate phosphoric acid potassium and sodium salt

Step 7: Complete Form C, taking into account all the individual chemical substances which are encompassed by this SDA Substance Name and Reporting Number.

EXAMPLE 4

As an aid in reporting natural fats and oils, the sources covered in the addencum are listed below, together with the Alkyl Descriptor Codes, which, in most instances, should be appropriate.

Source	Alkyl Descriptor Code	Source	Alkyl Descriptor Code
Avocado	9	Poultry	4
Babassu	1	Rapeseed	11
Castor	10	Rice Bran	11
Coconut	1	Safflower	11
Corn	11	Safflower (high oleic)	9
Cottonseed	11	Salmon	5
Crambe	7	Sardine	5
Grease (animal)	4	Sesame	11
Herring	4	Sorghum	11
Lard	4	Soybean	11
Linseed	11	Sperm Body	3
Menhaden	5	Sperm Head	2
Neatsfoot	4	Sunflower	11
Olive	11	Tallow	4
Oiticica	11	Tung	9
Palm	11	Whale	5
Palm-kernal	1		
Peanut	8		

The indicated Alkyl Descriptors may be used to describe the alkyl chainlengths of the natural sources unless they have been fractionated or combined with other materials.

EXAMPLE 5

Stearyl amine is reacted with fatty acids to form an amide.

Step 1: The distribution of alkyl chainlengths in the fatty acids is determined to be:

Carbon Chainlength Distribution			
Saturated	Unsat.	Branched	% Composition*
C_{14}	--	No	2.5
C_{16}	--	No	25.0
C_{18}	--	No	18.0
--	C_{16}	No	3.0
--	C_{18}	No	50.5

* by weight of starting fatty acids

Step 2: It is obvious by inspection, without generating a table, that Alkyl Descriptor Code 04 provides a perfect descriptor.

Step 3: Because stearyl amine (C_{18} saturated alkyl amine), a Class 1 chemical substance, is used as one of the reactants, the manufactured substance in this example must be reported according to the normal method for reporting Class 2 chemical substances with no known CAS Registry Number. The SDA method may be used, however, to define the fatty acid reactant. Referring to Table 2, the Functionality Descriptor for the fatty acid is 005.

Step 4: Referring to Table 3, the appropriate Salt Descriptor for the fatty acid is 00, because the substance is not a salt.

Step 5: Construct the SDA Reporting Number by sequentially combining the codes derived in steps 2, 3 and 4.

SDA 04-005-00

Step 6: Following the standard format, construct the SDA Substance Name using the descriptor nomenclature, found in Tables 1 through 3, which corresponds to each descriptor code.

C_{14}-C_{18} and C_{16}-C_{18} unsaturated alkyl carboxylic acid

Step 7: On Form C, in the space provided for structural and other supplemental information, enter the following reaction description:

Stearyl amine + C_{14}-C_{18} and C_{16}-C_{18} unsaturated alkyl carboxylic acid ⟶
124-30-1
(CAS Reg. No.) SDA 04-005-00

C_{14}-C_{18} and C_{16}-C_{18} unsaturated alkyl stearyl amide

Note: If the alkyl amine reactant had been a Class 2 chemical substance reportable using this method, the reaction product could could be reported using Functionality Descriptor 026: (alkyl) carboxylic acid amide (alkyl).

EXAMPLE 6

A manufacturer hydrogenates an alkyl nitrile and then alkylates it to form a dialkyl amine which is then reacted with methyl chloride to form a quaternary ammonium chemical substance.

Step 1: The alkyl nitrile and the alkylating agents are separately described by Alkyl Descriptors found in Table 1. Hence, their alkyl compositions may be combined and the SDA method may be used. The distribution of alkyl chainlengths in the linear fatty reactants is determined to be:

Alkyl Chainlength	Nitrile	Alkylating Agent	% Composition*
C_{12}	25	--	12.5
C_{14}	40	--	20
C_{16}	35	40	37.5
C_{18}	--	30	15
C_{18} unsaturated	--	30	15

*by weight of the combination of alkyl nitrile and alkylating agent

Step 2: The following table lists those Alkyl Descriptors which should be considered:

Alkyl Desc. Code	Predominant Carbon Chainlength Saturated	Unsaturated	Branched	Components Within Category	Number of Extra Components	Number of Missing Components
01	8-18	18	No	100	2	0
02	10-16	12-20	No	85	5	1
03	14-18	12-20	No	87.5	4	1
04	14-18	16-18	No	87.5	1	1
05	14-18	16-22	No	87.5	3	1
06	14-18	16-26	No	87.5	5	1
07	14-22	16-22	No	87.5	5	1
08	14-22	18	No	87.5	2	2

Analysis: Alkyl Descriptor 01 includes the highest percentage of components (100 percent). Alkyl Descriptor 04 includes a somewhat lower percentage of components, but has the same total number of additional and missing components as Descriptor 01. Because of the higher precentage of components, Descriptor 01 is selected.

Step 3: Referring to Table 2, the Functionality Descriptor for dialkyl dimethyl ammonium chloride is 047.

Step 4: Referring to Table 3, the appropriate Salt Descriptor is 00, since the substance is not a salt.

Step 5: Construct the SDA Reporting Number and subsequently combining the codes derived in steps 2, 3, and 4:

SDA 01-047-00

Step 6: Following the standard format, construct the SDA Substance Name using the descriptor nomenclature found in Table 1 through 3, which corresponds to each descriptor code:

C_8-C_{18} and C_{18} unsaturated dialkyl dimethyl ammonium chloride

Step 7: Complete Form C, taking into account all the individual chemical substances which are encompassed by this SDA Substance Name and Reporting Number.

EXAMPLE 7

The still bottoms from the distillation of the alcohol described in Example 2 are sold for use in a lubricant.

Step 1: The composition varies and is not well defined. Therefore, it cannot be represented in terms of alkyl composition, etc.

Step 2: Referring back to Example 2, Alkyl Descriptor 15 was selected to describe the alkyl composition.

Step 3: Although this variable composition is not included in Table 2, the Functionality Descriptor for the fatty alcohol is 060.

Step 4: Although this variable composition is not included in Table 3, the Salt Descriptor is 00.

Step 5: The Reporting Number for the fatty alcohol is SDA 15-060-00.

Step 6: The Substance Name for the fatty alcohol is C_{10}-C_{16} alkyl alcohol.

Step 7: On Form C, in the space provided for structural and other supplemental information, enter the following description:

> Still bottoms from distillation of SDA 15-060-00, (C_{10}-C_{16} alkyl alcohol).
>
> NOTE: Since the chemical substance is distributed in commerce, it must be reported. The variable composition of this material can be reported using the appropriate precursors as defined by this addendum.

EXAMPLE 8

A manufacturer distills a blend of linear saturated fatty acids to obtain a relatively pure dodecyl (C_{12}) fatty acid. The fatty acid is reacted to form a methyl ester.

Step 1: Since the fatty acid is a single chainlength without any isomeric variations, the Alkyl Descriptors are not appropriate. Instead, Form A, Form B, or Form C should be considered for reporting this Class 1 chemical substance, depending on whether the substance appears on the Candidate List or has a CAS Registry Number.

NOTE: If the fatty acid reactant had been a complex combination of chainlengths, this system would have been applicable.

Steps 2 - 7: These steps are not appropriate in view of the conventional reporting which is required.

SECTION II

COKE AND SELECTED COAL CHEMICALS

Developed in Conjunction
with the
American Coke and Coal Chemicals Institute

Coke (Coal) [*65996-77-2] H000-0189

The cellular carbonaceous mass resulting from the high temperature (greater than 700°C) destructive distillation of coal. Composed primarily of carbon. May contain varying amounts of sulfur and ash.

Coke Oven Light Oil (Coal) [*65996-78-3] H000-0205

Synonyms: Light Oil (Coal), Intermediate Light Oil (Coal), Crude Light Oil (Coal)

The volatile organic liquid extracted from the gas evolved in the high temperature (greater than 700°C) destructive distillation of coal. Composed primarily of benzene, toluene, and xylenes. May contain other minor hydrocarbon constituents.

Solvent Naphtha (Coal) [*65996-79-4] H000-0314

The distillate from either High Temperature Coal Tar, Coke Oven Light Oil, or Coal Tar Oil Alkaline Extract Residue having an approximate distillation range of 130°C to 210°C. Composed primarily of indene and other polycyclic ring systems containing a single aromatic ring. May contain phenolic compounds and aromatic nitrogen bases.

Ammonia Liquor (Coal) [*65996-80-7] H000-0422

The dilute aqueous solution extracted from the gas evolved in the high temperature (greater than 700°C) destructive distillation of coal. Composed primarily of ammonium carbonate and other ammonium salts. May contain other water-soluble substances including phenol.

Coke Oven Gas (Coal) [*65996-81-8] H000-0531

The gas evolved from the high temperature (greater than 700°C) destructive distillation of coal after the removal of High Temperature Coal Tar, Coke Oven Light Oil, and Ammonia Liquor. Composed primarily of hydrogen and methane. May contain ammonia, hydrogen sulfide, and low molecular weight hydrocarbons.

Coal Tar Oil [*65996-82-9] H000-0655

Synonyms: Chemical Oil (Coal), Tar Acid Oil (Coal)
The distillate from High Temperature Coal Tar having an approximate distillation range of 130° to 250°C. Composed primarily of naphthalene, alkylnaphthalenes, phenolic compounds, and aromatic nitrogen bases.

Coal Tar Oil Alkaline Extract [*65996-83-0] H000-0761

Synonym: Chemical Oil Alkaline Extract (Coal)
The extract from Coal Tar Oil produced by an alkaline wash such as aqueous sodium hydroxide. Composed primarily of the alkali salts of various phenolic compounds.

Crude Coal Tar Bases [*65996-84-1] H000-0879

The reaction product obtained by neutralizing Coal Tar Base Extract Oil with an alkaline solution, such as aqueous sodium hydroxide, to obtain the free bases. Composed primarily of a complex combination of pyridine, quinoline, and their alkyl derivatives.

Crude Coal Tar Acids [*65996-85-2] H000-0989

The reaction product obtained by neutralizing Coal Tar Oil Alkaline Extract with an acidic solution, such as aqueous sulfuric acid, to obtain the free acids. Composed primarily of phenol, cresols, and xylenols.

Coal Tar Base Extract Oil [*65996-86-3] H000-1073

The extract from Coal Tar Oil Alkaline Extract Residue produced by an acidic wash such as aqueous sulfuric acid after distillation to remove naphthalene. Composed primarily of the acid salts of various aromatic nitrogen bases including pyridine, quinoline, and their alkyl derivatives.

Coal Tar Oil Alkaline Extract Residue [*65996-87-4] H000-1197

Synonym: Chemical Oil Alkaline Extract Residue

The residue obtained from Coal Tar Oil by an alkaline wash such as aqueous sodium hydroxide after the removal of Crude Coal Tar Acids. Composed primarily of naphthalenes and aromatic nitrogen bases.

Benzol Forerunnings (Coal) [*65996-88-5] H000-1213

The distillate from Coke Oven Light Oil having an approximate distillation range below 100°C. Composed primarily of C_4-C_6 aliphatic hydrocarbons.

Coal Tar, High Temperature [*65996-89-6] H000-1322

The condensation product obtained by cooling, to approximately ambient temperature, the gas evolved in the high temperature (greater than 700°C) destructive distillation of coal. A black viscous liquid denser than water. Composed primarily of a complex mixture of condensed ring aromatic hydrocarbons. May contain minor amounts of phenolic compounds and aromatic nitrogen bases.

Coal Tar, Low Temperature [*65996-90-9] H000-1430

The condensation product obtained by cooling, to approximately ambient temperature, the gas evolved in low temperature (less than 700°C) destructive distillation of coal. A black viscous liquid denser than water. Composed primarily of condensed ring aromatic hydrocarbons, phenolic compounds, aromatic nitrogen bases, and their alkyl derivatives.

Coal Tar Upper Distillate [*65996-91-0] H000-1545

The distillate from High Temperature Coal Tar having an approximate distillation range of 220°C to 450°C. Composed primarily of three to four membered condensed ring aromatic hydrocarbons.

Coal Tar Distillate [*65996-92-1] H000-1669

The distillate from High Temperature Coal Tar having an approximate distillation range of 130°C to 450°C. Composed primarily of two to four membered condensed ring aromatic hydrocarbons, phenolic compounds, and aromatic nitrogen bases.

Coal Tar Pitch [*65996-93-2] H000-1778

The residue from the distillation of High Temperature Coal Tar. A black solid with a softening point from 40°C to 180°C. Composed primarily of a complex combination of three or more membered condensed ring aromatic hydrocarbons.

SECTION III

CHEMICAL SUBSTANCES COMMON TO THE IRON AND STEEL INDUSTRY

Developed in Conjunction
with the
American Iron and Steel Institute

Iron Ore Agglomerates [*65996-65-8] H000-1886

The product of agglomerating iron ore fines, concentrates, Iron Sinter, and other iron-bearing materials. Includes pellets, nodules and briquettes.

Iron Sinter [*65996-66-9] H000-1995

The thermally agglomerated substance formed by heating a variable mixture of finely divided coke, iron ore, Blast Furnace Dust, Steelmaking Dust, Mill Scale, other miscellaneous iron-bearing materials, limestone, and dolomite at 2400°F to 2700°F.

Furnace Iron [*65996-67-0] H000-2085

The metallic substance produced in a blast furnace or direct reduction furnace which contains over 90% iron.

Blast Furnace Gas (Ferrous Metals) [*65996-68-1] H000-2116

The off gas from blast furnaces. Composed primarily of carbon monoxide, carbon dioxide, nitrogen, and hydrogen.

Blast Furnace Slag (Ferrous Metals) [*65996-69-2] H000-2225

The fused substance formed by the action of a flux upon the gangue of the iron-bearing materials charged to a blast furnace and upon the oxidized impurities in the iron produced. Depending upon the particular blast furnace operation, the slag is composed primarily of oxides of aluminum, calcium, magnesium, and silicon, with varying amounts of sulfur.

Blast Furnace Dust (Ferrous Metals) [*65996-70-5] H000-2333

The dust generated from the initial cleaning of off gases from a blast furnace. Composed primarily of iron and carbon. May contain varying amounts of other elements, oxides, and trace compounds.

Steelmaking Slag [*65996-71-6] H000-2442

The fused substance formed by the action of a flux upon the gangue of iron-bearing materials charged to a steelmaking furnace and upon the oxidized impurities in the steel produced. Depending upon the particular steelmaking operation, the slag is composed primarily of oxides of aluminum, calcium, iron, magnesium, manganese, phosphorus, and silicon, with varying amounts of sulfur.

Steelmaking Dust [*65996-72-7] H000-2551

The dust generated during the charging, operation, and tapping of a steelmaking furnace and from steel conditioning, including that which is recovered through the use of pollution abatement equipment. Composed primarily of iron oxides. May contain varying amounts of other metallic oxides and trace compounds.

Blast Furnace and Steelmaking Sludge [*65996-73-8] H000-2675

The wetted particulate matter recovered by wet collection techniques, including pollution abatement equipment, for the recovery of materials such as iron sinter dust, Blast Furnace Dust, Steelmaking Dust, and Mill Scale.

Mill Scale (Ferrous Metals) [*65996-74-9] H000-2784

The oxidized surface of steel produced during reheating, conditioning, hot rolling, and hot forming operations. This substance is usually removed by process waters used for descaling, roll and material cooling, and other purposes. It is subsequently recovered by gravity separation techniques. Composed primarily of high-purity iron oxides. May contain varying amounts of other oxides, elements, and trace compounds.

Spent Pickle Liquor (Ferrous Metals) [*65996-75-0] H000-2899

The solution of an appropriate pickling acid or combination of acids containing any of the elements, oxides, or salts present in steel. Pickling acids include hydrochloric, hydrofluoric, nitric, phosphoric, and sulfuric acids.

Metallic Dross or Spelter (Ferrous Metals) [*65996-76-1] H000-2915

The metallic salts and oxides removed from the molten metals used to coat steel by dip processes. Composed primarily of salts and oxides of aluminum, lead, tin, and zinc.

Chemical Substances Manufactured as Part of Steel [*65997-19-5] H000-3094

This category includes the chemical substances which are manufactured as part of steel and alloy steels. The following list identifies those elements which may exist in steel or which may comprise compounds present in steel or alloy steels. Aluminum, Beryllium, Boron, Calcium, Carbon, Cerium, Chromium, Cobalt, Copper, Hafnium, Iron, Lanthanum, Lead, Magnesium, Manganese, Molybdenum, Nickel, Niobium, Nitrogen, Oxygen, Phosphorus, Selenium, Silicon Sulfur, Tantalum, Tin, Titanium, Tungsten, Vanadium, Yttrium, Zinc, Zirconium.

SECTION IV

WOOD AND PULP CHEMICALS

Developed in Conjunction
with the
Pulp Chemicals Association

Oil of Turpentine [*8006-64-2] H000-3119

Any of the volatile predominately terpenic fractions or distillates resulting from the solvent extraction of, gum collection from, or pulping of softwoods. Composed primarily of the $C_{10}H_{16}$ terpene hydrocarbons: α-pinene, β-pinene, limonene, 3-carene, camphene. May contain other acyclic, monocyclic, or bicyclic terpenes, oxygenated terpenes, and anethole. Exact composition varies with refining methods and the age, location, and species of the softwood source.

Oil of Turpentine, α-Pinene Fraction [*65996-96-5] H000-3234

The hydrocarbon fraction distilled from Oil of Turpentine. Contains greater than 80% α-pinene, the remainder being other terpene hydrocarbons.

Oil of Turpentine, β-Pinene Fraction [*65996-97-6] H000-3343

The hydrocarbon fraction distilled from Oil of Turpentine or produced by the isomerization of α-pinene. Contains greater than 70% β-pinene. Other major components being limonene, α-pinene, camphene, myrcene. May contain other acyclic, monocyclic, and bicyclic terpenes.

Pine Oil [*8002-09-3] H000-3459

A complex combination of terpenes produced by the high temperature distillation of oil of turpentine residues or by the catalytic hydration of pinenes. Composed primarily of isomeric tertiary and secondary cyclic terpene alcohols. May contain terpene hydrocarbons and ethers. Exact composition varies with production methods and turpentine source.

Terpenes, 80% or greater Limonene Fraction [*65996-98-7] H000-3568

A complex combination of terpenes derived from Oil of Turpentine or citrus oils by fractionation or isomerization of other terpene fractions. Contains at least 80% limonene, the remainder being other terpene hydrocarbons. May contain trace amounts of alcohols, ethers, aldehydes, or ketones.

Oil of Turpentine, 50% or greater Limonene Fraction [*65996-99-8] H000-3683

A complex combination of terpenes derived from Oil of Turpentine. Contains at least 50% limonene, the remainder being phellandrenes, terpinenes, terpinolene, cineoles.

Oil of Turpentine, 80% or greater Terpinolene Fraction [*65997-00-4] H000-3705

A complex combination of terpenes derived from Oil of Turpentine. Contains at least 80% terpinolene, the remainder being mixed terpene hydrocarbons.

Tall Oil [*8002-26-4] H000-3818

A complex combination of tall oil rosin and fatty acids derived from the acidulation of crude tall oil soap and including that which is further refined. Contains at least 10% rosin.

Tall Oil, sodium salt [*65997-01-5] H000-3922

Synonyms: Black Liquor Soap, Tall Oil Soap Skimmings, Crude Tall Oil Soap (Kraft Process)

The sodium salt of Tall Oil formed during the kraft process where it becomes a component of the spent pulping liquor. The soap separates when the pulping liquor is concentrated and can be recovered by skimming the concentrated liquor.

Spent Acid from Crude Tall Oil Soap Acidulation [*65997-02-6] H000-4015

The aqueous layer formed by acidulation of tall oil soap with sulfuric acid during the production of Tall Oil. Composed primarily of a solution of sodium sulfate, the remainder being lignin and Tall Oil.

Tall Oil Pitch [*8016-81-7] H000-4122

The residue from the distillation of Tall Oil. Composed primarily of high-boiling esters of fatty acids and rosin. May contain neutral materials, free fatty acids and rosin acids.

Tall Oil Heads [*65997-03-7] H000-4246

The low boiling fraction obtained by the distillation of Tall Oil. Contains fatty acids such as palmitic, stearic, oleic and linoleic as well as neutral materials.

Tall Oil Fatty Acids [*61790-12-3] H000-4352

A complex combination obtained by distillation of Tall Oil. Contains at least 90% fatty acids, primarily oleic and linoleic acids, the remainder being rosin and neutral materials.

Rosin [*8050-09-7] H000-4463

A complex combination derived from wood, especially pine wood. Composed primarily of resin acids and modified resin acids such as dimers and decarboxylated resin acids. Includes rosin stabilized by catalytic disproportionation.

Tall Oil Fatty Acids, Sodium Salt [*61790-45-2] H000-4577

Tall Oil Fatty Acids, Potassium Salt [*61790-44-1] H000-4696

Rosin, Glycerol Ester [*8050-31-5] H000-4713

Rosin, Pentaerythritol Ester [*8050-26-8] H000-4823

Rosin, Maleic Acid Adduct [*8050-28-0] H000-4931

Rosin, Fumaric Acid Adduct [*65997-04-8] H000-5028

Rosin, Polymerized [*65997-05-9] H000-5138

Rosin, Hydrogenated [*65997-06-0] H000-5258

Rosin, Reaction Product with Formaldehyde [*65997-07-1] H000-5367

Rosin, Maleic Acid Adduct - Glycerol Ester [*65997-08-2] H000-5477

Rosin, Maleic Acid Adduct - Pentaerythritol Ester [*65997-09-3] H000-5586

Rosin, Fumaric Acid Adduct - Glycerol Ester [*65997-10-6] H000-5615

Rosin, Fumaric Acid Adduct - Pentaerythritol Ester [*65997-11-7] H000-5724

Rosin, Polymerized - Glycerol Ester [*9006-47-7] H000-5831

Rosin, Polymerized - Pentaerythritol Ester [*65997-12-8] H000-5949

Rosin, Hydrogenated - Glycerol Ester [*65997-13-9] H000-6034

Rosin, Hydrogenated - Pentaerythritol Ester [*65997-14-0] H000-6149

SECTION V

CHEMICAL SUBSTANCES MANUFACTURED IN THE PAPER INDUSTRY

Developed in Conjunction with the American Paper Institute

Cellulose, Chemical Pulp [*65996-61-4] H000-6263

The fibrous substance obtained from the treatment of lignocellulosic substances (wood or other agricultural fiber sources) with one or more aqueous solutions of pulping and/or bleaching chemicals. Composed of cellulose, hemi-cellulose, lignin, and other minor components. The relative amounts of these components depend on the extent of the pulping and bleaching processes.

Examples: bleached and unbleached kraft, sulfite and semichemical pulp and bleached mechanical pulp. Includes virgin and recycled pulps.

Starch, Oxidized [*65996-62-5] H000-6372

The substance resulting from treatment of starch in aqueous slurry with an aqueous oxidizing agent such as hydrogen peroxide, sodium hypochlorite, hypochlorous acid, or ammonium persulfate. Under controlled conditions of temperature, pressure, and time, the oxidizing agent reacts with the starch to cleave the polymeric chains and to oxidize the end groups from aldehyde to carboxylic acid groups.

Starch, Acid Hydrolyzed [*65996-63-6] H000-6481

The substance resulting from treatment of starch in aqueous slurry with small amounts of an acidifying substance, such as aluminum sulfate, generally at elevated temperature and pressure. The process is usually continuous with the time of treatment very short. Degree of hydrolysis is usually determined by measurement of viscosity and controlled by rate of the slurry through the reactor, temperature, and acidity.

Starch, Enzyme Hydrolyzed [*65996-64-7] H000-6591

The substance resulting from treatment of starch in aqueous slurry with amylase or carbohydrase under controlled conditions of temperature, pressure, and time. The degree of hydrolysis is usually determined by measurement of viscosity. Enzymatic hydrolysis is terminated by destroying the enzyme by raising the temperature or adjusting the pH.

Magnesium Bisulfite [13774-25-9] H000-6613

Spent pulping liquor [*66071-92-0] H000-7855

The aqueous solution resulting from the reaction of lignocellulosic substances (wood or other agricultural fiber sources) with one or more pulping chemicals including those used in the kraft, sulfite, semichemical or other pulping processes. Composition is highly variable and includes excess pulping chemicals, dissolved and degraded cellulose, hemicellulose and lignin.

SECTION VI

CHEMICAL SUBSTANCES MANUFACTURED IN THE FERTILIZER INDUSTRY

Developed in Conjunction
with
The Fertilizer Institute

Phosphate Rock, Calcined [*65996-94-3] H000-6738

Substance obtained by heating naturally occurring phosphate rock to 732°C to 816°C (1350°F to 1500°F) in a fluidized bed or other suitable device for oxidizing carbonaceous matter. Characterized by upgraded phosphorus content and reduced hydrocarbon levels.

Superphosphate [*8011-76-5] H000-6842

Synonyms: Normal Superphosphate, Enriched Superphosphate
Substance obtained by treating phosphate rock with sulfuric acid or a mixture of sulfuric and phosphoric acids. Composed primarily of calcium phosphates and calcium sulfate.

Superphosphate, Concentrated [*65996-95-4] H000-6955

Synonyms: Double Superphosphate, Treble Superphosphate, Triple Superphosphate
Substance obtained by acidulating phosphate rock with phosphoric acid. Normally characterized as containing 40% or more available phosphoric oxide (P_2O_5). Composed primarily of calcium phosphate.

Superphosphoric Acid [*8017-16-1] H000-7045

Synonym: Polyphosphoric Acid
Combination of phosphoric acids obtained by dehydration of orthophosphoric acid or by oxidation of phosphorus in the presence of water. Composed primarily of polyphosphoric acids whose molecular structure contains more than one atom of phosphorus.

SECTION VII

NATURAL OILS AND EXTRACTIVES

Developed in Conjunction
with the
Essential Oils Association

This section identifies certain chemical substances which are primarily oils derived from botanical sources. In some instances, a substance is defined to include the oil, extractives, and physically modified derivatives obtained from the source. In this context, "physically modified" means the application of certain processes not involving chemical reactions, namely: distillation, expression, filtration, drying, heating, cooling, extraction, and decolorization by adsorption.

Ajowan Oil [*8001-99-8] H002-4966
Ptychotis ajowan or Carum ajowan, Umbelliferae

Almond Oil, Bitter [*8013-76-1] H002-5056
Prunus amygdalus or Prunus armeniaca, Rosaceae

Amber Oil [*8002-67-3] H002-5160
Pinus succinifera

Ammoniac Gum [*9000-03-7] H002-5276
Extractives and their physically modified derivatives.
Dorema ammoniacum, Umbelliferae

Amyris Oil [*8015-65-4] H002-5394
Extractives and their physically modified derivatives.
Amyris balsamifera, Rutaceae

Angelica Root Oil [*8015-64-3] H002-5414
Extractives and their physically modified derivatives.
Root Oil, Seed Oil. Angelica archangelica, Umbelliferae

Anise Oil [*8007-70-3] H002-5630
Extractives and their physically modified derivatives.
Pimpinella anisum, Umbelliferae

Apopin Oil [*8022-78-4] H002-5744
Cinnamonum camphora

Araucaria Oil [*8015-68-7] H002-5866
Extractives and their physically modified derivatives.
Callitropsis araucarioides, Cupressaceae

Asafoetida Gum [*9000-04-8] H002-5972
Extractives and their physically modified derivatives.
Ferula asafoe or F. asafoetida L. or F. alliacea Boiss,
Unbelliferae

Basil Oil [*8015-73-4] H002-6062
Extractives and their physically modified derivatives.
Ocimum basilicum, Labiatae

Bergamot Oil [*8007-75-8] H002-6175
Extractives and their physically modified derivatives.
Citrus bergamia, Citrus

Birch Tar Oil [*8001-88-5] H002-6288
Extractives and their physically modified derivatives.
Betula pubescens, Betulaceae

Bois de Rose Oil [*8015-77-8] H002-6313
Extractives and their physically modified derivatives.
Aniba rosaeodora, Lauraceae

Boldo Leaf Oil [*8022-81-9] H002-6428
Peumus boldus

Boronia Oil [*8053-33-6] H002-6536
Extractives and their physically modified derivatives.
Boronia megastigma, Rutaceae

Cade Oil [*8013-10-3] H002-6643
Extractives and their physically modified derivatives.
Juniperus oxycedrus, Cupressaceae

Cajuput Oil [*8008-98-8] H002-6756
Melaleuca minor, Myrtaceae

Calamus Oil [illegible] H002-6873
Acorus calamus, Araceae

Camphor Oil [*8008-51-3] H002-6984
Extractives and their physically modified derivatives.
Cinnamomum camphora, Lauraceae

Canada Balsam [illegible] H002-7074
Extractives and their physically modified derivatives.
Abies balsamea or Tsuga canadiensis, Pinaceae

Cape Oil [*8022-45-5] H002-5529
Popowia capea

Capsicum Oleoresin [*8023-77-6] H002-7184
Extractives and their physically modified derivatives.
Capsicum annuum or Capsicum longum, Capsicum Frutescens,
or Capsicum fastigiatum, or Capsicum minimum mill, Solanaceae

Caraway Oil [*8000-42-8] H002-7295
Extractives and their physically modified derivatives.
Carum carvi, Umbelliferae

Cherry Laurel Oil [*8000-44-0] H002-8663
Prunus laurocerasus, Rosaceae

Cognac Oil, Green [*8016-21-5] H002-8776
Extractives and their physically modified derivatives.
Wine lees oil

Coriander Oil [*8008-52-4] H002-8896
Extractives and their physically modified derivatives.
Coriandrum sativum, Umbelliferae

Costus Oil [*8023-88-9] H002-8911
Extractives and their physically modified derivatives.
Saussurea lappa, Compositae

Cubeb Oil [*8007-87-2] H002-9001
Extractives and their physically modified derivatives.
Piper cubeba, Piperaceae

Cumin Oil [*8014-13-9] H002-9114
Extractives and their physically modified derivatives.
Cuminum cyminum, Umbelliferae

Curcuma Oil [*8024-37-1] H002-9225
Extractives and their physically modified derivatives.
Curcuma longa, Zingiberaceae

Cypress Oil [*8013-86-3] H002-9335
Extractives and their physically modified derivatives.
Cypressus sempervirens, Cupressaceae

Davana Oil [*8016-03-3] H002-9451
Artemisia pallens, Compositae

Dill Seed Oil, European [*8016-06-6] H002-9565
Extractives and their physically modified derivatives.
Anethum graveolens, Umbelliferae

Dill Weed Oil [*8006-75-5] H002-9677
Anethum graveolens, Umbelliferae

Estragon (Tarragon) Oil [*8016-88-4] H002-9781
Extractives and their physically modified derivatives.
Artemisia dracunculus, Compositae

Fennel Oil, Bitter [*8006-84-6] H002-9819
Foeniculum vulgare, Umbelliferae

Cardamom Oil [*8000-66-6] H002-7312
Extractives and their physically modified derivatives.
Elettaria cardamomum, Zingiberaceae

Carnation Oil [*8021-43-0] H002-7437
Extractives and their physically modified derivatives.
Dianthus caryophyllus, Caryophyllaceae

Carrot Seed Oil [*8015-88-1] H002-7543
Daucus corota, Umbelliferae

Cascarilla Oil [*8007-06-5] H002-7659
Croton eluteria, Euphorbiaceae

Cashew Nut Shell Oil [*8007-24-7] H002-7761

Cassia Oil [*8007-80-5] H002-7884
(Chinese Cinnamon Oil)
Extractives and their physically modified derivatives.
Cinnamomum cassia, Lauraceae

Catnip Oil [*8023-84-5] H002-7903
Nepata cataria, Labiatae

Cedarleaf Oil [*8007-20-3] H002-8081
Extractives and their physically modified derivatives.
Thuja occidentalis, pinaceae

Cedarwood ''Atlas'' Oil [*8000-27-9] H002-8191
Extractives and their physically modified derivatives.
Cedrus atlantica, Pinaceae

Celery Seed Oil [*8015-90-5] H002-8219
Extractives and their physically modified derivatives.
Apium graveolens, Umbelliferae

Chamomile Oil, German [*8002-66-2] H002-8322
Extractives and their physically modified derivatives.
Matricaria chamomilla, Compositae

Chamomile Oil, Roman [*8015-92-7] H002-8442
Anthemis nobilis, Compositae

Champaca Oil [*8006-76-6] H002-8555
Extractives and their physically modified derivatives.
Michalea champaca or Michalea longifolia, Magnoliaceae

Fennel Oil, Sweet [*8024-24-6] H002-9925
Extractives and their physically modified derivatives.
Foeniculum vulgare, var. dulce, Umbelliferae

Fir Needle Oil, Canadian [*8021-28-1] H00[illegible]-0062
Extractives and their physically modified derivatives.
Tsuga canadensis, Pinaceae

Fir Needle Oil, Siberian [*8021-29-2] H003-0171
Extractives and their physically modified derivatives.
Abies siberica, Pinaceae

Fir Needle Oil, Silver [*8021-27-0] H003-0283
Extractives and their physically modified derivatives.
Abies alba, Pinaceae

Galangal Oil [*8024-40-6] H003-0314
Extractives and their physically modified derivatives.
Alpinia officinarum, Zingiberaceae

Galbanum Gum [*9000-24-2] H003-0424
Ferula, Umbelliferae

Galbanum Oil [*8023-91-4] H003-0535
Extractives and their physically modified derivatives.
Ferula, Umbelliferae

Garlic Oil [*8000-78-0] H003-0647
Extractives and their physically modified derivatives.
Allium sativum, Liliaceae

Geranium Oil [*8000-46-2] H003-0755
Extractives and their physically modified derivatives.
Pelargonium graveolens, Geraniaceae

Ginger Oil [*8007-08-7] H003-0872
Extractives and their physically modified derivatives.
Zingiber officinale, Zingiberaceae

Gingergrass Oil [*8023-92-5] H003-0989
Extractives and their physically modified derivatives.
Cymbopogon martini, var. sofia, Gramineae

Grapefruit Oil [*8016-20-4] H003-1075
Extractives and their physically modified derivatives.
Citrus paradisi, Citrus

Guaiacwood Oil [*8016-23-7] H003-1188
Extractives and their physically modified derivatives.
Bulnesia sarmienti, Zygophyllaceae

Gum Benzoin [*9000-05-9] H003-1295
Extractives and their physically modified derivatives.
Styrax tonkinensis, Rosaceae

Hay Oil [*8031-00-3] H003-1315
Extractives and their physically modified derivatives.
Hierochlea alpina

Hop Oil [*8007-04-3] H003-1438
Extractives and their physically modified derivatives.
Humulus lupulus, Moraceae

Huon Pine Wood Oil [*8028-76-0] H003-1547
Dacrydium franklinii

Hyssop Oil [*8006-83-5] H003-1653
Hyssopus officinalis, Labiatae

Iva Oil [*8026-97-9] H003-1761
Achillea moschata, Compositae

Juniperberry Oil [*8012-91-7] H003-1882
Extractives and their physically modified derivatives.
Juniperus communis, Cupressaceae

Juniper Wood Oil [*8002-68-4] H003-1902
Juniperus communis, Cupressaceae

Kuromoji Oil [*8026-92-4] H003-2088
Lindera sericea

Labdanum Oil (Cistus Oil) [*8016-26-0] H003-2191
Extractives and their physically modified derivatives.
Cistus ladaniferus, Cistaceae

Laurel Berry Oil [*8002-41-3] H003-2322
Extractives and their physically modified derivatives.
Laurus nobilis, Lauraceae

Laurel Leaf Oil [*8006-78-8] H003-2441
Extractives and their physically modified derivatives.
Laurus nobilis, Lauraceae

Lavandin Oil [*8022-15-9] H003-2558
Extractives and their physically modified derivatives.
Lavandula hydride = Lavandula officinalis + Lavandula latifolia, Labiatae

Lavender Oil [*8000-28-0] H003-2661
Extractives and their physically modified derivatives.
Lanandula officinalis, Labiatae

Lawang Oil [*8022-16-0] H003-2771
Cinnamomum culilawan, Lauraceae

Lemongrass Oil [*8007-02-1] H003-2894
Extractives and their physically modified derivatives.
Cymbopogon citratus, Gramineae

Lemon Oil [*8008-56-8] H003-2916
Extractives and their physically modified derivatives.
Citrus limonum, Citrus

Lime Oil [*8008-26-2] H003-3001
Extractives and their physically modified derivatives.
Citrus aurantifolia, Citrus

Mace Oil [*8007-12-3] H003-3115
Extractives and their physically modified derivatives.
Myristica fragrans, Myristicaceae

Mandarin-Petitgrain Oil [*8052-30-0] H003-3228
Extractives and their physically modified derivatives.
Citrus reticulata, Citrus

Marjoram Oil [*8015-01-8] H003-3338
Extractives and their physically modified derivatives.
Origanum majorana, Labiatae

Marjoram Oil, Wild (Spanish) [*8016-33-9] H003-3456
Extractives and their physically modified derivatives.
Thymus masticina, Labiatae

Mawah Oil [*8000-46-2] H003-3566
Pelargonium radula, Geraniaceae

Melissa Oil [*8014-71-9] H003-3677
Melissa officinalis, Labiatae

Milfoil Oil [*8022-07-9] H003-3785
Achillae millefolium, Compositae

Mustard Oil [*8007-40-7] H003-3811
Brassica nigra, Cruciferae

Myrrh, Oleo-Gum-Resin [*9000-45-7] H003-3924
Commiphora, Burseraceae

Myrrh Oil [*8016-37-3] H003-4018
Extractives and their physically modified derivatives.
Commiphora, Burseraceae

Myrtle Oil [*8008-46-6] H003-4124
Myrtus communis, Myrtaceae

Neroli Oil [*8016-38-4] H003-4235
Extractives and their physically modified derivatives.
Citrus aurantium, Citrus

Niaouli Oil [*8014-68-4] H003-4344
Melaleuca viridiflora, Myrtaceae

Nutmeg Oil [*8008-45-5] H003-4467
Extractives and their physically modified derivatives.
Myristica fragrans, Myristicaceae

Olibanum Oil [*8016-36-2] H003-4575
Extractives and their physically modified derivatives.
Species boswellia, Burseraceae

Onion Oil [*8002-72-0] H003-4681
Extractives and their physically modified derivatives.
Allium cepa, Liliaceae

Opopanax Gum [*9000-78-6] H003-4799
Extractives and their physically modified derivatives.
Commiphora erythrea, Burseraceae

Opopanax Oil [*8021-36-1] H003-4811
Extractives and their physically modified derivatives.
Commiphora erythrea, Burseraceae

Origanum Oil [*8007-11-2] H003-4931
Extractives and their physically modified derivatives.
Thymus capitatus, Labiatae

Palmarosa Oil [*8014-19-5] H003-5023
Extractives and their physically modified derivatives.
Cymbopogon martini, Gramineae

Patchouli Oil [*8014-09-3] H003-5131
Extractives and their physically modified derivatives.
Pogostemon cablin (Pogostemon patchouli), Labiatae

Pennyroyal Oil, American [*8007-44-1] H003-5247
Extractives and their physically modified derivatives.
Hedeoma pulegioides, Labiatae

Pennyroyal Oil, European [*8013-99-8] H003-5355
Extractives and their physically modified derivatives.
Mentha pulegium, Labiatae

Peppermint Oil [*8006-90-4] H003-5474
Extractives and their physically modified derivatives.
Mentha arvensis, Labiatae

Pimenta Berry Oil [*8006-77-7] H003-5589
Extractives and their physically modified derivatives.
Pimenta officinalis, Myrtaceae

Pimenta Leaf Oil [*8016-45-3] H003-5697
Extractives and their physically modified derivatives.
Pimenta officinalis, Myrtaceae

Pinus Pumilio Oil [*8000-26-8] H003-5718
Extractives and their physically modified derivatives.
Pinus pumilio (a.k.a. Pinus montana or Pinus mugo), Pinaceae

Pinus Sylvestris Oil [*8023-99-2] H003-5829
Extractives and their physically modified derivatives.
Pinus sylvestris, Pinaceae

Rapeseed Oil [*8002-13-9] H003-5944
Extractives and their physically modified derivatives.
Brassica napus

Rose Oil [*8007-01-0] H003-6032
Extractives and their physically modified derivatives.
Rosa centifolia, Rosaceae

Rosemary Oil [*8000-25-7] H003-6142
Extractives and their physically modified derivatives.
Rosmarinum officinalis, Labiatae

Rue Oil [*8014-29-7] H003-6254
Extractives and their physically modified derivatives.
Ruta graveolens, Rutaceae

Saffron Oil [*8022-19-3] H003-6360
Extractives and their physically modified derivatives.
Crocus sativus, Iridaceae

Sage (Clary) Oil [*8016-63-5] H003-6485
Extractives and their physically modified derivatives.
Salvia sclarea, Labiatae

Sage Oil, Dalmatian [*8016-64-6] H003-6501
Extractives and their physically modified derivatives.
Salvia officinalis, Labiatae

Sage Oil, Spanish [*8016-65-7] H003-6619
Extractives and their physically modified derivatives.
Salvia lavandulaefolia, Labiatae

Sandalwood Oil, East Indian [*8006-87-9] H003-6727
Extractives and their physically modified derivatives.
Santalum album, Santalaceae

Sassafras Oil [*8006-80-2] H003-6837
Extractives and their physically modified derivatives.
Sassafras albidum, Lauraceae

Savin Oil [*8024-00-8] H003-6953
Juniperus sabina, Cupressaceae

Siam Wood Oil [*8022-47-7] H003-7041
Fokiena hodginsii

Snakeroot (Canadian) Oil [*8016-69-1] H003-7159
Asarum canadense, Aristolochiaceae

Spearmint Oil [*8008-79-5] H003-7267
Extractives and their physically modified derivatives.
Mentha spicata, Labiatae

Spike Lavender Oil [*8016-78-2] H003-7379
Extractives and their physically modified derivatives.
Lavandula latifolia, Labiatae

Spikenard Oil [*8022-22-8] H003-7495
Nardostachys jatamansi

Tansy Oil [*8016-87-3] H003-7511
Tanacetum vulgare, Compositae

Valerian Oil [*8008-88-6] H003-7622
Extractives and their physically modified derivatives.
Valerian officinalis, Valerianaceae

Verbena Oil [*8024-12-2] H003-7733
Extractives and their physically modified derivatives.
Lippia citriodora, Verbenaceae

Verbena Oil, Spanish [*8022-79-5] H003-7844
Extractives and their physically modified derivatives.
Thymus hiemalis, Verbenaceae

Vetiver Oil [*8016-96-4] H003-7969
Extractives and their physically modified derivatives.
Vetiveria zizanoides, Gramineae

Wormseed Oil (American) [*8024-11-1] H003-8051
Extractives and their physically modified derivatives.
Chenopodium ambrosioides, var. anthelminthicum, Compositae

Wormwood Oil [*8008-93-3] H003-8163
Extractives and their physically modified derivatives.
Artemisia absinthium, Compositae

Ylang-Ylang Oil [*8006-81-3] H003-8274
Extractives and their physically modified derivatives.
Cananga odorata, Anonaceae

SECTION VIII

SELECTED POLYMERS

Adipic acid, phthalic anhydride, trimethylolpropane, neopentyl glycol, α-hydro-ω-hydroxypoly[oxy[methyl(2-phenylethyl)silylene]], α-hydro-ω-hydroxypoly[oxy(dimethylsilylene)]polymer	[66085-51-6]	H000-8281
Allyl alcohol, linoleic acid, maleated styrene polymer	[*66070-57-3]	H000-8303
Azelaic acid, isophthalic acid, trimethylolethane, trimethylolpropane, α-hydro-ω-hydroxypoly[oxy[methyl(2-phenylethyl)silylene]], α-hydro-ω-hydroxypoly[oxy(dimethylsilylene)]polymer	[66085-54-9]	H000-8417
Benzoic acid, isophthalic acid, pentaerythritol, safflower oil polymer	[*66071-38-3]	H000-8527
Benzoic acid, isophthalic acid, trimethylolethane, dehydrated castor oil fatty acids, methyl methacrylate polymer	[*66071-51-0]	H000-8635
Benzoic acid, phthalic anhydride, trimethylolethane, coconut oil polymer	[*66071-24-7]	H000-8751
Bisphenol A bis(2-hydroxypropyl)ether, isophthalic acid, tall oil fatty acids, neopentyl glycol, 3-hydroxy-2,2-dimethylpropyl 3-hydroxy-2,2-dimethylpropionate polymer	[*66071-40-7]	H000-8866
Bisphenol A, dicyclopentadiene, epichlorohydrin, maleic anhydride, soybean oil fatty acids polymer	[*66071-06-5]	H000-9062
Bisphenol A, epichlorohydrin, butyl glycidyl ether, polymer acrylate	[66085-58-3]	H000-8973
Bisphenol A, epichlorohydrin, isophthalic acid polymer	[26284-23-1]	H000-9171
Bisphenol A, epichlorohydrin polymer stearate	[59111-89-6]	H000-9294

Bisphenol A, tall oil fatty acid, epichlorohydrin polymer	[*66070-75-5]	H000-9314
p-t-Butylbenzoic acid, phthalic anhydride, pentaerythritol, soybean fatty acid polymer	[*66071-26-9]	H000-9428
p-t-Butylbenzoic acid, phthalic anhydride, soybean oil, trimethylolethane polymer	[*66071-22-5]	H000-9535
2-(N-Butylcarbamoyl)ethyl acrylate and acrylic acid polymer with maleated bisphenol A epichlorohydrin copolymer	[*66070-56-2]	H000-9648
Chlorendic acid, glycerin, soybean oil polymer	[*66070-90-4]	H000-9763
1-Decene 1-octene polymer	[53621-22-0]	H000-9870
Dehydrated castor oil fatty acid, bisphenol A, epichlorohydrin polymer	[*66070-77-7]	H000-9985
Dehydrated castor oil fatty acid, dimer fatty acid, bisphenol A, epichlorohydrin polymer	[*66070-78-8]	H001-0033
Dehydrated castor oil fatty acids, maleated soybean oil, pentaerythritol, rosin polymer	[*66071-36-1]	H001-0145
Dehydrated castor oil fatty acids, maleic acid, oiticica oil, soybean oil polymer	[*66071-78-1]	H001-0265
Dehydrated castor oil fatty acids, maleic anhydride, rosin, dicyclopentadiene polymer	[*66071-65-6]	H001-0378
Dehydrated castor oil, rosin, formaldehyde, phenol polymer	[*66071-49-6]	H001-0486
Dicyclopentadiene modified linseed oil, fatty acids, dehydrated castor oil, maleic anhydride, safflower oil polymer	[*66071-75-8]	H001-0591

Dicyclopentadiene, modified tall oil fatty acids, bisphenol A, epichlorohydrin polymer	[*66071-39-4]	H001-0617
Dicyclopentadiene, phthalic anhydride, glycerin, pentaerythritol, tall oil fatty acids, linseed oil polymer	[*66071-43-0]	H001-0733
Dimer fatty acid, aniline, cyclohexylamine, bisphenol A, epichlorohydrin polymer	[*66071-00-8]	H001-0842
Dimethyl phthlate, phthalic anhydride, benzoic acid, glycerin, soybean oil fatty acids polymer	[*66071-52-1]	H001-0954
Ethylene oxide, styrene, butadiene polymer	[31292-96-3]	H001-1043
Fatty acids, dehydrated castor oil, maleic anhydride, rosin, dicyclopentadiene, gilsonite polymer	[*66071-61-2]	H001-1158
Formaldehyde, phenol, triethylenetetramine polymer	[32610-77-8]	H001-1277
Hydrogenated (1-decene 1-octene polymer)	[*66070-54-0]	H001-1388
Hydrogenated (styrene-butadiene polymer)	[*66070-58-4]	H001-1494
2-Hydroxyethyl acrylate, styrene, butyl acrylate, methyl methacrylate polymer	[42767-92-0]	H001-1512
Isophthalic acid, azeleic acid, trimethylolpropane, trimethylolethane, neopentyl glycol, α-hydro-ω-hydroxypoly[oxy[methyl(2-phenylethyl)silylene]], α-hydro-ω-hydroxypoly[oxy(dimethylsilylene)]polymer	[66085-59-7]	H001-1625
Isophthalic acid, glycerin, linseed oil, pentaerythritol polymer	[*66070-96-0]	H001-1744
Isophthalic acid, glycerin, pentaerythritol, linseed oil, styrene, vinyltoluene polymer	[*66071-77-0]	H001-1852

Isophthalic acid, glycerin, soybean oil polymer	[*66070-91-5]	H001-1969
Isophthalic acid, glycerin, tall oil fatty acid polymer	[*66071-17-8]	H001-2053
Isophthalic acid, pentaerythritol, soybean oil polymer	[*66071-86-1]	H001-2164
Isophthalic acid, pentaerythritol, tall oil fatty acid, soybean oil polymer	[*66070-94-8]	H001-2286
Isophthalic acid, trimellitic anhydride, trimethylolpropane, tall oil fatty acid polymer	[*66071-08-7]	H001-2307
Isophthalic acid, trimethylolethane, soybean oil polymer	[*66070-63-1]	H001-2416
Isophthalic acid, trimethylolethane, trimethylolpropane, α-hydro-ω-hydroxy⊂ poly[oxy[methyl(2-phenylethyl)silylene]], α-hydro-ω-hydroxypoly[oxy(dimethyl⊂ silylene)]polymer	[66085-53-8]	H001-2520
Itaconic acid, phthalic anhydride, glycerin, pentaerythritol, safflower oil polymer	[*66071-45-2]	H001-2633
Itaconic acid, phthalic anhydride, glycerin, pentaerythritol, safflower oil, styrene polymer	[*66071-48-5]	H001-2752
Itaconic acid, phthalic anhydride, trimethylolethane, safflower oil, tung oil polymer	[*66070-67-5]	H001-2867
Itaconic acid, phthalic anhydride, trimethylolethane, safflower oil, tung oil, styrene polymer	[*66071-54-3]	H001-2975
Linseed oil fatty acid, soybean oil fatty acid, bisphenol A, epichloro⊂ hydrin polymer	[*66070-79-9]	H001-3061

Linseed oil, oiticica oil, formaldehyde, phenol polymer	[*66071-41-8]	H001-3171
Linseed oil polymer with oxygen	[*66071-03-2]	H001-3291
Linseed oil, tung oil modified formaldehyde, phenol polymer	[*66071-31-6]	H001-3316
Maleated styrene, allyl alcohol, linoleic acid polymer compound with 2-(dimethylamino)ethanol	[*66070-55-1]	H001-3421
Maleic anhydride, glycerin, pentaerythritol, polyethylene glycol, tall oil fatty acid polymer	[*66071-14-5]	H001-3538
Maleic anhydride, soya oil polymer	[*66071-16-7]	H001-3641
Maleic anhydride, styrene, allyl alcohol, linseed oil fatty acid polymer	[*66071-15-6]	H001-3760
Oiticica oil modified rosin, pentaerythritol ester polymer	[*66071-23-6]	H001-3871
Phenol, formaldehyde, phthalic anhydride, glycerin, linseed oil fatty acids, dehydrated castor oil polymer	[*66071-67-8]	H001-3981
Phenol, formaldehyde, phthalic anhydride, glycerin, pentaerythritol, linseed oil, tall oil fatty acids polymer	[*66071-32-7]	H001-4075
Phenol, formaldehyde, phthalic anhydride, glycerin, soybean oil, tung oil polymer	[*66071-35-0]	H001-4186
p-Phenylphenol, formaldehyde, phenol, gilsonite, tung oil polymer	[*66071-64-5]	H001-4219
Phthalic anhydride, benzoic acid, glycerin, linseed oil, soybean oil polymer	[*66070-72-2]	H001-4323

Phthalic anhydride, benzoic acid, glycerin, pentaerythritol, tall oil fatty acid polymer	[*66070-85-7]	H001-4436
Phthalic anhydride, benzoic acid, glycerin, soybean oil fatty acid polymer	[*66070-73-3]	H001-4548
Phthalic anhydride, benzoic acid, pentaerythritol, tall oil fatty acid polymer	[*66070-84-6]	H001-4657
Phthalic anhydride, benzoic acid, pentaerythritol, tall oil fatty acid, tall oil polymer	[*66070-74-4]	H001-4779
Phthalic anhydride, p-t-butylbenzoic acid, glycerin, pentaerythritol, linseed oil, dehydrated castor oil polymer	[*66071-70-3]	H001-4884
Phthalic anhydride, p-t-butylbenzoic acid, glycerin, pentaerythritol, linseed oil, dehydrated castor oil, styrene polymer	[*66071-60-1]	H001-4902
Phthalic anhydride, p-tert-butylbenzoic acid, trimethylolethane, dehydrated castor oil polymer	[*66071-44-1]	H001-5084
Phthalic anhydride, p-tert-butylbenzoic acid, trimethylolethane, pentaerythritol, soybean oil fatty acid, castor oil polymer	[*66071-42-9]	H001-5199
Phthalic anhydride, fatty acids dehydrated castor oil, pentaerythritol, trimethylolethane polymer	[*66071-02-1]	H001-5216
Phthalic anhydride, glycerin, bisphenol A bis(2-hydroxypropyl)ether, safflower oil polymer	[*66071-66-7]	H001-5339
Phthalic anhydride, glycerin, castor oil polymer	[*66070-88-0]	H001-5448

Phthalic anhydride, glycerin, coconut oil polymer	[*66070-87-9]	H001-5556
Phthalic anhydride, glycerin, dehydrated castor oil polymer	[*66071-50-9]	H001-5669
Phthalic anhydride, glycerin, linseed oil polymer	[*66070-59-5]	H001-5782
Phthalic anhydride, glycerin, linseed oil, tung oil polymer	[*66071-18-9]	H001-5806
Phthalic anhydride, glycerin, linseed oil, vinyltoluene polymer	[*66071-76-9]	H001-5919
Phthalic anhydride, glycerin, pentaerythritol, cottonseed oil polymer	[*66070-92-6]	H001-6096
Phthalic anhydride, glycerin, pentaerythritol, linseed oil polymer	[*66070-66-4]	H001-6112
Phthalic anhydride, glycerin, pentaerythritol, linseed oil and soybean oil polymer	[*66070-65-3]	H001-6226
Phthalic anhydride, glycerin, pentaerythritol, linseed oil, styrene polymer	[*66071-63-4]	H001-6341
Phthalic anhydride, glycerin, pentaerythritol, safflower oil polymer	[*66071-07-6]	H001-6455
Phthalic anhydride, glycerin, pentaerythritol, soybean oil and dehydrated castor oil polymer	[*66071-56-5]	H001-6562
Phthalic anhydride, glycerin, pentaerythritol, soybean oil, dehydrated castor oil, styrene polymer	[*66071-57-6]	H001-6671
Phthalic anhydride, glycerin, pentaerythritol, soybean oil polymer	[*66070-93-7]	H001-6792

Phthalic anhydride, glycerin, pentaerythritol, soybean oil, tall oil fatty acid polymer	[*66070-97-1]	H001-6812
Phthalic anhydride, glycerin, pentaerythritol, tall oil fatty acid polymer	[*66070-62-0]	H001-6922
Phthalic anhydride, glycerin, pentaerythritol, tall oil polymer	[*66071-30-5]	H001-7012
Phthalic anhydride, glycerin, pentaerythritol, soybean fatty acid polymer	[*66070-98-2]	H001-7129
Phthalic anhydride, glycerin, soybean oil, oiticica oil polymer	[*66070-81-3]	H001-7233
Phthalic anhydride, glycerin, soybean oil polymer	[*66070-61-9]	H001-7359
Phthalic anhydride, glycerin, soybean oil, tall oil fatty acid polymer	[*66070-69-7]	H001-7463
Phthalic anhydride, glycerin, tall oil fatty acid polymer	[*66070-71-1]	H001-7579
Phthalic anhydride, glycerin, tall oil fatty acid polymer	[*66070-82-4]	H001-7687
Phthalic anhydride, linseed oil, pentaerythritol, dipentaerythritol polymer	[*66070-95-9]	H001-7712
Phthalic anhydride, pentaerythritol, ethylene glycol, coconut oil polymer	[*66070-89-1]	H001-7827
Phthalic anhydride, pentaerythritol, linseed oil polymer	[*66070-64-2]	H001-7935
Phthalic anhydride, pentaerythritol, soybean oil polymer	[*66070-60-8]	H001-8021
Phthalic anhydride, pentaerythritol, soybean oil polymer, ester with hydroabietyl alcohol	[*66071-53-2]	H001-8130

Phthalic anhydride, pentaerythritol, soybean oil, trimethylolpropane polymer	[*66071-01-0]	H001-8248
Phthalic anhydride, pentaerythritol, trimethylolethane, soybean oil, safflower oil polymer	[*66071-00-9]	H001-8362
Phthalic anhydride, pentaerythritol, tung oil, tung oil fatty acid, linseed oil fatty acid polymer	[*66071-13-4]	H001-8471
Phthalic anhydride, trimethylolethane, cottonseed oil fatty acid polymer	[*66070-99-3]	H001-8582
Phthalic anhydride, trimethylolethane, pentaerythritol, dehydrated castor oil, methylmethacrylate, styrene polymer	[*66071-73-6]	H001-8696
Phthalic anhydride, trimethylolethane, tall oil fatty acid polymer	[*66070-83-5]	H001-8711
Phthalic anhydride, trimethylolpropane, tall oil fatty acid polymer	[*66070-86-8]	H001-8831
Poly[oxy[methyl(2-phenylethyl)silylene]], α-hydro-ω-hydroxy-, polymer with α-hydro-ω-hydroxypoly[oxy(dimethylsilylene], phthalic anhydride, pentaerythritol, soybean oil polymer	[*66071-34-9]	H001-8947
Rosin, fumaric acid, phthalic anhydride, glycerin, soybean oil, dehydrated castor oil polymer	[*66071-47-4]	H001-9032
Rosin, isophthalic acid, pentaerythritol, linseed oil polymer	[*66071-55-4]	H001-9143
Rosin, isophthalic acid, trimellitic anhydride, trimethylolpropane, linoleic acid polymer	[*66071-58-7]	H001-9256

Rosin, linseed oil modified gilsonite polymer	[*66071-37-2]	H001-9377
Rosin, methyl abietate, modified menhaden oil polymer	[*66071-27-0]	H001-9485
Rosin modified phthalic anhydride, glycerin, linseed oil, oiticica oil polymer	[*66071-72-5]	H001-9595
Rosin modified phthalic anhydride, glycerin, safflower oil polymer	[*66071-68-9]	H001-9614
Rosin modified tung oil, linseed oil, soybean oil, glycerin polymer	[*66071-21-4]	H001-9721
Rosin modified tung oil polymer	[*66071-19-0]	H001-9848
Rosin, phenol, formaldehyde, phthalic anhydride, glycerin, linseed oil, tung oil polymer	[*66070-68-6]	H001-9952
Rosin, phthalic anhydride, fatty acids, dehydrated castor oil, glycerin, linseed oil polymer	[*66071-28-1]	H002-0092
Rosin, phthalic anhydride, glycerin, linseed oil, soya oil, tung oil polymer	[*66070-70-0]	H002-0114
Rosin, phthalic anhydride, glycerin, pentaerythritol, tall oil fatty acids polymer	[*66071-79-2]	H002-0226
Soya oil, oiticica oil modified tripentaerythritol, dicyclopentadiene polymer	[*66071-25-8]	H002-0349
Soybean oil fatty acid, bisphenol A, epichlorohydrin polymer	[*66070-76-6]	H002-0453
Soybean oil fatty acid, dimer fatty acid, bisphenol A, epichlorohydrin polymer	[*66070-80-2]	H002-0565

Styrene, methylmethacrylate, phthalic anhydride, pentaerythritol, ethylene glycol, safflower oil polymer	[*66071-71-4]	H002-0672
Sulfur, isobutylene polymer	[66085-57-2]	H002-0795
Tall oil fatty acid, oiticica oil, rosin, formaldehyde, phenol, styrene, allyl alcohol polymer	[*66071-29-2]	H002-0811
Tetraethyl silicate, ethylene glycol polymer	[38742-72-2]	H002-0927
Toluene 2,4-diisocyanate, castor oil polymer	[*66071-12-3]	H002-1016
Triethylenetetramine, linoleic acid dimer polymer	[66085-55-0]	H002-1128
Trimellitic anhydride, adipic acid, dehydrated castor oil fatty acid, bisphenol A, epichlorohydrin polymer	[*66071-05-4]	H002-1237
Trimellitic anhydride, adipic acid, dehydrated castor oil fatty acid, bisphenol A, epichlorohydrin polymer, compound with ammonia	[*66071-58-8]	H002-1351
Trimellitic anhydride, azelaic acid, dehydrated castor oil fatty acid, bisphenol A, epichlorohydrin polymer	[*66071-04-3]	H002-1463
Trimellitic anhydride, azelaic acid, dehydrated castor oil fatty acid, bisphenol A, epichlorohydrin polymer, compound with 2-(dimethylamino)ethanol	[*66071-62-3]	H002-1577
Tung oil, m-cresol, formaldehyde polymer	[*66071-10-1]	H002-1686
Tung oil, dicyclopentadiene, formaldehyde, phenol polymer	[*66071-74-7]	H002-1715

Tung oil, linseed oil, maleic anhydride, phenol, formaldehyde polymer	[illegible]	H002-1823
Tung oil modified formaldehyde, phenol polymer	[illegible]	H002-1933
Tung oil, p-phenylphenol, formaldehyde, phenol polymer	[illegible]	H002-2021
Tung oil, soybean oil, formaldehyde, phenol, dicyclopentadiene polymer	[illegible]	H002-2135

SECTION IX

CHEMICAL SUBSTANCES MANUFACTURED AS PART OF MIXTURES

Developed in Conjunction with:
The Portland Cement Association
The Glass Packaging Institute
Corning Glass Works
Owen-Illinois, Incorporated
The Porcelain Enamel Institute

Chemical Substances Manufactured in the Production of Portland Cement [*65997-15-1] H000-7151

Portland cement is a mixture of chemical substances produced by burning or sintering at high temperatures (greater than 1200°C) raw materials which are predominantly calcium carbonate, aluminum oxide, silica, and iron oxide. The chemical substances which are manufactured are confined in a crystalline mass.

This category includes all of the chemical substances specified below when they are intentionally manufactured in the production of Portland cement. The primary members of the category are Ca_2SiO_4 and Ca_3SiO_5. Other compounds listed below may also be included in combination with these primary substances.

$CaAl_2O_4$
$CaAl_4O_7$
$CaAl_{12}O_{19}$
$Ca_3Al_2O_6$
$Ca_{12}Al_{14}O_{33}$
CaO
$Ca_2Fe_2O_5$
$CaSO_4$
$Ca_2Al_2SiO_7$
$Ca_4Al_6SO_{16}$
$Ca_{12}Al_{14}Cl_2O_{32}$
$Ca_{12}Al_{14}F_2O_{32}$
$Ca_4Al_2Fe_2O_{10}$
$Ca_6Al_4Fe_2O_{15}$
Ca_3TiO_5
K_2SO_4
Na_2SO_4

Chemical Substances Manufactured in the Production of High-Alumina Cement [*65997-16-2] H000-7274

High-Alumina cement is a mixture of chemical substances produced by burning or sintering at high temperature (greater than 1200°C) raw materials which are predominantly calcium carbonate, aluminum oxide, silica, and iron oxide. The chemical substances which are manufactured are confined in a crystalline mass.

This category includes all of the chemical substances specified below when they are intentionally manufactured in the production of high-alumina cement. The primary members of this category are $CaAl_2O_4$, $Ca_4Al_2Fe_2O_{10}$, $Ca_{12}Al_{14}O_{33}$, and Ca_2SiO_4. Other compounds listed below may also be included in the combination with these primary substances.

$CaAl_4O_7$
$CaAl_{12}O_{19}$
$Ca_3Al_2O_6$
CaO
Ca_3SiO_5
$Ca_2Fe_2O_5$
$CaSO_4$
$Ca_2Al_2SiO_7$
$Ca_4Al_6SO_{16}$
$Ca_{12}Al_{14}Cl_2O_{32}$
$Ca_{12}Al_{14}F_2O_{32}$
$Ca_6Al_4Fe_2O_{15}$
Ca_3TiO_5
K_2SO_4
Na_2SO_4

Chemical Substances Manufactured in the Production of Inorganic Glass [*65997-17-3] H000-7384

This category encompasses the various chemical substances manufactured in the production of inorganic glasses by the glass industry. For purposes of this category, ''glass'' is defined as: ''An amorphous, inorganic, usually transparent or translucent substance consisting of a mixture of silicates, or sometimes, borates or phosphates, formed by a fusion of silica, or of oxides of boron or phosphorous, with a flux and a stabilizer, into a mass that cools to a rigid condition without crystallization.'' This category consists of the various chemical substances (other than byproducts or impurities)[1] which are (1) formed in melting furnaces during the production of various glasses and concurrently incorporated into a glass mixture and (2) reportable for the inventory unless excluded, e.g., under section 710.4(d) of the EPA regulations. These are substances whose presence and form are, insofar as identified herein, known, assumed, or reasonably ascertainable. Any glass contains one or more of these substances, but few, if any, contain all of them. In this category description, chemical substances are generally identified in the conventional nomenclature used by the glass industry[2]. The elements listed below are principally present as oxides but may also be present as halides or sulfides,

in multiple oxidation states, or in more complex compounds. An oxides or other compounds (other than byproducts or impurities) which are not identified herein but which are present in some glasses are neither known nor reasonably ascertainable, and any such substances probably are present only in very small proportions, e.g., less than one percent.

The following elements are principally present as oxides but may also be present as halides (fluorides, chlorides, bromides, or iodides) or sulfides, in multiple oxidation states, or in more complex compounds. Oxides of the first seven elements listed* collectively comprise more than 95 percent, by weight, of the glass produced in the United States.

Aluminum*	Lanthanum
Boron*	Lead
Calcium*	Lithium
Magnesium*	Manganese
Potassium*	Molybdenum
Silicon*	Neodymium
Sodium*	Nickel
Antimony	Niobium
Arsenic	Phosphorus
Barium	Praseodymium
Bismuth	Rubidium
Cadmium	Selenium
Carbon	Silver
Cerium	Strontium
Cesium	Tin
Chromium	Titanium
Cobalt	Tungsten
Copper	Uranium
Germanium	Vanadium
Gold	Zinc
Holmium	Zirconium
Iron	

[1]40 C.F.R. 710.4(d) (I)-(2) (42 Federal Register 64577).

[2]Common references on glass composition and structure include:

(1) G.W. Morey, The Properties of Glass, 2nd edition, Reinhold Publication Corporation (1938).

(2) J.R. Hutchins and R.V. Harrington, ''Glass,'' Encyclopedia of Chemical Technology, 2nd edition, pages 533-604, John Wiley and Sons, Inc. (1968).

(3) F.V. Tooley, the Handbook of Glass Manufacture, Ogden Publication Company (Volume 1, 1974).

Chemical Substances Manufactured in the Production of Frit

[*65997-18-4] H000-7493

Frit is a mixture of inorganic chemical substances produced by rapidly quenching a molten, complex combination of materials, confining the chemical substances thus manufactured as non-migratory components of glassy solid flakes or granules.

This category includes all of the chemical substances specified below when they are intentionally manufactured in the production of frit. The primary members of this category are oxides of some or all of the elements listed below. Fluorides of these elements may also be included in combination with these primary substances.

Ag	Ca	K	Nb	Sn
Al	Cd	La	Nd	Sr
As	Ce	Li	Ni	Ti
Au	Co	Mg	P	V
Ba	Cr	Mn	Pb	W
Bi	Cu	Mo	Sb	Zn
B	Fe	Na	Si	Zr

SECTION X

OTHER CLASS 2 CHEMICAL SUBSTANCES

Developed in Conjunction
with the

Leather Tanners Council

International Technical
Caramel Association

Corn Refiners Association

Hair and Hair Pulp [*65997-21-9] H000-7512

A biological material consisting predominantly of partially hydrolyzed keratin.

Recovered Vegetable Tannins [*65997-20-8] H000-7626

A complex combination of vegetable tanning materials recovered from the tanning of leather. It consists of natural tannins, which are predominantly polyphenolic compounds, and/or synthetic tannins, such as aromatic sulfonic acid derivatives.

Caramel (Color) [*8028-89-5] H000-7743

Substance obtained by controlled heat treatment of food-grade carbohydrates. Food-grade acids, alkalies, and salts may be used to assist carmelization. Food-grade antifoaming agents may be used in an amount not greater than that required to produce the intended effect. Consists essentially of colloidal aggregates that are dispersible in water but only partly dispersible in alcohol-water solutions. Depending upon the particular carmelizing agent used, may have a positive or negative colloidal charge in solution.

Corn Gluten Meal [*66071-96-3] H000-7967

The dried residue from corn after the removal of the larger part of the starch and germ and the separation of the bran in the wet-milling manufacture of corn starch or syrup, or by enzymatic treatment of the endosperm.

Corn Steepwater [*66071-94-1] H000-8054

Synonym: Condensed Fermented Corn Extractives

Substance obtained by the partial removal of water from the liquid resulting from steeping corn in a water and sulphur dioxide solution which is allowed to ferment by the action of naturally occurring lactic acid-producing microorganisms.

Starch Molasses [*8052-91-3] H000-8163

A by-product of the manufacture of dextrose from starch derived from corn or grain sorghum. The starch is hydrolyzed by the use of enzymes and/or acid.

Castor oil, dehydrated	[*64147-40-6]	H002-2243
Castor oil fatty acids, diethanolamine salt	[*66071-87-2]	H002-2368
Castor oil fatty acids, isopropylaminoethanol salt	[*66071-83-8]	H002-2470
Castor oil fatty acids, monoethanolamine salt	[*66071-85-0]	H002-2587
Castor oil fatty acids, triethanolamine salt	[*66071-88-3]	H002-2692
Castor oil, hydrogenated, calcium salt	[*66072-09-1]	H002-2714
Coconut oil acids, monoethanolamine salt	[*66071-80-5]	H002-2831
Cod oil fatty acids, ammonium salt	[*66071-97-4]	H002-2949
Cottonseed fatty acids, potassium salt	[*66071-93-0]	H002-3032
Cottonseed fatty acids, sodium salt	[*66071-95-2]	H002-3143
Lard oil fatty acids, ammonium salt	[*66072-01-3]	H002-3252
Lard oil fatty acids, diethanolamine salt	[*66071-99-6]	H002-3371
Lard oil fatty acids, monoethanolamine salt	[*66071-98-5]	H002-3485
Lard oil fatty acids, potassium salt	[*66072-02-4]	H002-3590
Lard oil fatty acids, sodium salt	[*66072-03-5]	H002-3615
Lard oil fatty acids, triethanolamine salt	[*66072-00-2]	H002-3724
Naphthenic acids, petroleum, potassium salt	[*66072-08-0]	H002-3842
Palm oil fatty acids, diethanolamine salt	[*66072-05-7]	H002-3955
Palm oil fatty acids, monoethanolamine salt	[*66072-04-6]	H002-4044
Palm oil fatty acids, potassium salt	[*66072-07-9]	H002-4158
Palm oil fatty acids, triethanolamine salt	[*66072-06-8]	H002-4262
Tall oil acids, cyclohexylamine salt	[*66071-89-4]	H002-4381
Tall oil acids, monoethanolamine salt	[*66071-90-7]	H002-4404
Tall oil acids, triethanolamine salt	[*66071-91-8]	H002-4513

Tallow acids, hydrogenated, calcium salt	[*66071-81-6]	H002-4621
Tallow acids, hydrogenated, lithium salt	[*66071-82-7]	H002-4731
Tallow acids, hydrogenated, triethanol⊃ amine salt	[*66071-84-9]	H002-4856