

MATERIAL SAFETY DATA SHEET

Illumina, Inc.

Prepared to U.S. OSHA, CMA, ANSI, Canadian WHMIS, European Union, Australian NOHSC, Japanese Industrial, and Global Harmonization Standards

PART I *What is the material and what do I need to know in an emergency?*

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

PRODUCT IDENTIFIER

<u>TRADE NAME (AS LABELED):</u>	Infinium™ II Assay System Reagents
<u>CHEMICAL NAME/CLASS:</u>	
<u>SYNONYMS:</u>	
<u>DOCUMENT NUMBER:</u>	11195131
<u>PRODUCT USE:</u>	Genotyping with Illumina's Infinium™ II Assays
<u>SUPPLIER OF THE SAFETY DATA SHEET:</u>	ILLUMINA, Inc.
<u>Address:</u>	9885 Towne Centre Drive San Diego, CA 92121-1975
<u>Business Phone:</u>	+1-800-809-ILMN (toll-free) +1-800-809-4566 (toll-free) +1-858-202-4566 (outside North America)
<u>Emergency Phone:</u>	1-858-202-4566 (North America) +1-858-202-4566 (outside North America)
<u>Email Address/Competent Person for MSDS:</u>	techsupport@illumina.com

AUSTRALIAN SUPPLIER/DISTRIBUTOR'S NAME:

Address:

Business Phone:

EUROPEAN SUPPLIER/ DISTRIBUTOR'S NAME:

Address:

Business Phone:

DATE OF PREPARATION:

January 31, 2011

DATE OF REVISION:

April 7, 2011


NOTE: ALL United States Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalent Standards, Canadian WHMIS [Controlled Products Regulations], EU Directives [67/548/EEC and subsequent amendments to the directive], European Union Regulations [(EC) 1272/2008 and subsequent amendments to the regulation], Global Harmonization Standard, Australian [NOHSC:2011 (2003)], and Japanese Industrial Standard (JIS Z 7250: 2005) required information is included in appropriate sections based on the U.S. ANSI Z400.1-2010 format. This product has been classified in accordance with the hazard criteria of the countries listed above.

2. HAZARD IDENTIFICATION

This Material Safety Data sheet describes the Infinium II Assay System Reagents. This product consists of thirty-two solutions. This Material Safety Data Sheet provides complete information on all the components described in the following tables. Unless otherwise specified, the information in each section of this document is pertinent to each solution. The solutions of this product are mixtures (preparations) of chemical compounds.

GLOBAL HARMONIZATION AND EU CLP REGULATION (EC) 1272/2008 LABELING AND CLASSIFICATION: This product has been classified per CLP Regulation (EC) 1272/2008 and Japanese Industrial Standard Z 7251:2006.

Code WG#-RA1 and Code WG#-WB1 Components:


<u>Classification:</u> Reproductive Toxicant Category 1B.	<u>Signal Word:</u> Danger	<u>Hazard Statement Codes:</u> H360
<u>Precautionary Statement Codes:</u> P201, P202, P28, P308 + P313, P405, P501		<u>Hazard Symbol/Pictogram:</u> 

All Other Components:

<u>Classification:</u> Not applicable.	<u>Signal Word:</u> Not applicable.	<u>Hazard Statement Codes:</u> Not applicable.
<u>Precautionary Statement Codes:</u> Not applicable.		<u>Hazard Symbol/Pictogram:</u> Not applicable.

EU/AUSTRALIAN LABELING AND CLASSIFICATION: This product has been classified per European Union Council Directive 67/548/EEC and subsequent Directives and Australian National Occupational Health and Safety Commission [NOHSC(1008:2004)].

Code WG#-RA1 and Code WG#-WB1 Components:

<u>Classification:</u> Toxic to Reproduction, Category 2.	<u>Risk Phrases:</u> R: 61	<u>Symbol:</u> 
---	----------------------------	--

All Other Components:

<u>Classification:</u> Not applicable.	<u>Risk Phrases:</u> Not applicable.	<u>Symbol:</u> Not applicable.
--	--------------------------------------	--------------------------------

See Section 16 for full text of Risk Phrases/Precautionary Statements

EMERGENCY OVERVIEW: Code WG#-RA1 and Code WG#-WB1 Components: These solutions are clear, colorless liquids with a slight sulfur odor. Code WG#-PA1 Component: This solution is an odorless, light blue liquid. Code WG#-LTM Component: This solution is an odorless, light pink liquid. Code WG#-MA1 Component: This solution is an oily, odorless, blue liquid. All Other Components: These solutions are clear, colorless, odorless liquids.

2. HAZARD IDENTIFICATION (Continued)

EMERGENCY OVERVIEW (continued): Health Hazards: Code WG#-RA1 and Code WG#-WB1 Components: The Aliphatic Amide constituent of these components is considered toxic to reproduction. All Other Components: The chief hazard in event of overexposure is the potential for irritation of contaminated skin or eyes. **Flammability Hazards:** Code WG#-MA1 Component: This solution is combustible, it must be substantially preheated for ignition to become a potential hazard. All Other Components: These solutions present no significant fire hazards. **Reactivity Hazards:** These solutions are not reactive. **Environmental Hazards:** Negligible. **Other Hazards:** No other information currently known. **Emergency Recommendations:** Emergency responders must wear personal protective equipment suitable for the situation to which they are responding.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	EINECS#	ENCS#	% v/v	EU Classification (67/548/EEC) GHS & EU Classification (1272/2008 EC)
---------------	-------	---------	-------	-------	--

COMPONENT 1: Code WG#-AMM

Aliphatic Triol	Proprietary			0.5–1.5	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Deoxyadenosine Salt	Proprietary		NE	1.0–5.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Deoxycytidine Salt	Proprietary	Unlisted	NE	1.0–5.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Deoxyguanosine Salt	Proprietary			1.0–5.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Deoxythymidine Salt	Proprietary	Unlisted	NE	1.0–5.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Alkanolamine	Proprietary			1.0–5.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Glycol Homopolymer	Proprietary	Unlisted	Proprietary	7.0–13.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Carbohydrate	Proprietary			7.0–13.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.

COMPONENT 2: Code WG#-MP1

Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
--	--	--	--	---------	--

COMPONENT 3: Code WG#-FRG

Aliphatic Triol	Proprietary			3.0–7.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Carbohydrate	Proprietary		NE	7.0–13.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.

COMPONENT 4: Code WG#-PA1

Carboxylic Acid Salt	Proprietary		NE	1.0–5.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Acetate Salt	Proprietary		NE	50.0–60.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.

COMPONENT 5: Code WG#-RA1

Monobasic Potassium Salt	Proprietary			1.0–5.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Sodium Salt	Proprietary			5.0–10.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Dibasic Potassium Salt	Proprietary			10.0–20.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Aliphatic Amide	Proprietary			15.0–25.0	EU 67/548 HAZARD CLASSIFICATION: Toxic to Reproduction Category 2 Risk Phrases: R61; Symbol: T GHS & EU 1272/2008 CLASSIFICATION: Reproductive Toxicant Category 1B Hazard Statement Codes: H360D; Pictogram(s): GHS08
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.

See Section 16 for full text of Ingredient Risk Phrases, Hazard Statements and Precautionary Statements

3. COMPOSITION AND INFORMATION ON INGREDIENTS (Continued)

CHEMICAL NAME	CAS #	EINECS#	ENCS#	% v/v	EU CLASSIFICATION FOR COMPONENTS
COMPONENT 6: Code WG#-PB1					
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 7: Code WG#-PB2					
Aliphatic Diol	Proprietary			50.0–60.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 8: Code WG#-MA1					
Refined Hydrocarbon	Proprietary		NE	> 99.8	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 9: Code WG#-WB1					
Monobasic Potassium Salt	Proprietary			1.0–5.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Sodium Salt	Proprietary			5.0–10.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Dibasic Potassium Salt	Proprietary			10.0–20.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Aliphatic Amide	Proprietary			15.0–25.0	EU 67/548 HAZARD CLASSIFICATION: Toxic to Reproduction Category 2 Risk Phrases: R61; Symbol: T GHS & EU 1272/2008 CLASSIFICATION: Reproductive Toxicant Category 1B Hazard Statement Codes: H360D; Pictogram(s): GHS08
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 10: Code WG#-MA2					
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 11: Code WG#-MSM					
Aliphatic Triol	Proprietary			0.5–1.5	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Deoxyadenosine Salt	Proprietary		NE	1.0–5.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Deoxycytidine Salt	Proprietary	Unlisted	NE	1.0–5.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Deoxyguanosine Salt	Proprietary		NE	1.0–5.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Deoxythymidine Salt	Proprietary	Unlisted	NE	1.0–5.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Alkanolamine	Proprietary			1.0–5.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Glycol Homopolymer	Proprietary	Unlisted	Proprietary	7.0–13.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Carbohydrate	Proprietary		NE	7.0–13.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 12: Code WG#-FMS					
Aliphatic Triol	Proprietary			3.0–7.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Carbohydrate	Proprietary		NE	7.0–13.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 13: Code WG#-PM1					
Carboxylic Acid Salt	Proprietary		NE	1.0–5.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.

See Section 16 for full text of Ingredient Risk Phrases, Hazard Statements and Precautionary Statements

3. COMPOSITION AND INFORMATION ON INGREDIENTS (Continued)

CHEMICAL NAME	CAS #	EINECS#	ENCS#	% v/v	EU CLASSIFICATION FOR COMPONENTS
COMPONENT 13: Code WG#-PM1 (continued)					
Acetate Salt	Proprietary		NE	50.0–60.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 14: Code WG#-XC1					
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 15: Code WG#-XC2					
Carbohydrate	Proprietary		NE	7.0–13.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 16: Code WG#-XC3					
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 17: Code WG#-XC4					
Alkyl Alcohol	Proprietary			1.0–5.0	EU 67/548 HAZARD CLASSIFICATION: Flammable Risk Phrases: R 11; Symbol: F GHS & EU 1272/2008 CLASSIFICATION: Flammable Liquid 2 Hazard Statement Codes: H225; Pictogram(s): GHS02
Quaternized Aminopropyl Polymer	Proprietary	Unlisted	Unlisted	45.0–55.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 18: Code WG#-TEM					
Carbohydrate	Proprietary		NE	7.0–13.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 19: Code WG#-LTM					
Carbohydrate Salt	Proprietary	Unlisted	Unlisted	7.0–13.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Carbohydrate	Proprietary		NE	7.0–13.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 20: Code WG#-ATM					
Carbohydrate	Proprietary		NE	7.0–13.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 21: Code WG#-STM					
Carbohydrate Salt	Proprietary	Unlisted	Unlisted	7.0–13.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Carbohydrate	Proprietary		NE	7.0–13.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 22: Code WG#-AMR					
Glycol Homopolymer	Proprietary	Unlisted	Proprietary	7.0–13.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Carbohydrate	Proprietary		NE	7.0–13.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.

See Section 16 for full text of Ingredient Risk Phrases, Hazard Statements and Precautionary Statements

3. COMPOSITION AND INFORMATION ON INGREDIENTS (Continued)

CHEMICAL NAME	CAS #	EINECS#	ENCS#	% v/v	EU CLASSIFICATION FOR COMPONENTS
COMPONENT 23: Code WG#-PPR					
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 24: Code WG#-CMM					
Sulfonic Acid Derivative	Proprietary		NE	7.0–13.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Carbohydrate	Proprietary		NE	15.0–25.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 25: Code WG#-ERB					
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 26: Code WG#-RPM					
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 27: Code WG#-QCT					
Alkanolamine	Proprietary			1.0–5.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 28: Code WG#-QCP					
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 29: Code WG#-LX2					
Carbohydrate	Proprietary		NE	7.0–13.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 30: Code WG#-EML					
Carbohydrate	Proprietary		NE	7.0–13.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 31: Code WG#-SML					
Carbohydrate Salt	Proprietary	Unlisted	Unlisted	3.0–7.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Carbohydrate	Proprietary		NE	7.0–13.0	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.
COMPONENT 32: Code WG#-LX1					
Water and other constituents. Each of the other constituents is present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers, and mutagens).				Balance	EU 67/548 HAZARD CLASSIFICATION: Not Applicable. GHS & EU 1272/2008 CLASSIFICATION: Not Applicable.

See Section 16 for full text of Ingredient Risk Phrases, Hazard Statements and Precautionary Statements

4. FIRST-AID MEASURES

PROTECTION OF FIRST AID RESPONDERS: Rescuers should be taken for medical attention if necessary.

Remove or cover gross contamination to avoid exposure to rescuers.

DESCRIPTION OF FIRST AID MEASURES: Contaminated individuals must seek medical attention if any adverse effect occurs. Take a copy of label and MSDS to physician or health professional with the contaminated individual.

Skin Exposure: If this product's components contaminate the skin, begin decontamination with copious amounts of running water.

Remove exposed or contaminated clothing, taking care not to contaminate eyes. Contaminated clothing must be removed and laundered before re-use. The contaminated individual must seek medical attention if any adverse effect develops after the area is flushed.

4. FIRST-AID MEASURES (Continued)

DESCRIPTION OF FIRST AID MEASURES (continued):

Eye Exposure: If this product's components contaminate the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have the contaminated individual "roll" eyes. Minimum flushing is for 20 minutes. The contaminated individual must seek medical attention if adverse effects occur after flushing.

Inhalation: If vapors, mists or sprays from this product are inhaled, remove contaminated individual to fresh air. If necessary, use artificial respiration to support vital functions. Remove or cover gross contamination to avoid exposure to rescuers. Seek medical attention if adverse effect continues after removal to fresh air.

Ingestion: If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING unless directed by medical personnel. Have contaminated individual rinse mouth with water. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or unable to swallow. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. If contaminated individual is convulsing, maintain an open airway and obtain immediate medical attention.

IMPORTANT SYMPTOMS AND EFFECTS: See Sections 3 (Hazard Identification) and 11 (Toxicological Information).

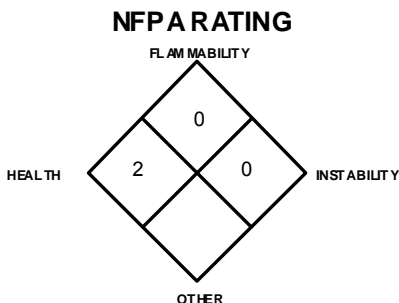
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing dermatitis, other skin conditions, and respiratory conditions may be aggravated by overexposure to components of this product.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate overexposure.

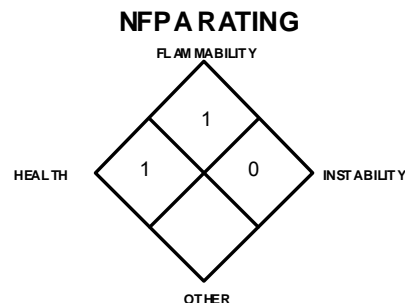
IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED: Treat symptoms and eliminate overexposure.

5. FIRE-FIGHTING MEASURES

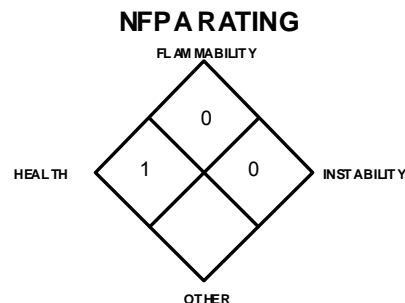
CODE WG#-RA1 AND CODE WG#-WB1 COMPONENTS



CODE WG#-MA1 COMPONENT



ALL OTHER COMPONENTS



Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate
3 = Serious 4 = Severe

FLASH POINT: Not flammable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %): Not applicable.

FIRE EXTINGUISHING MATERIALS: In the event of a fire, use suppression methods for surrounding materials (e.g., water spray, dry chemical, carbon dioxide, foam, any "ABC" class extinguisher).

UNSUITABLE EXTINGUISHING MEDIA: Halon extinguishers should not be used for fires involving this product.

SPECIAL FIRE AND EXPLOSION HAZARDS: Code WG#-MA1 Component: This component must be substantially preheated for ignition to become a potential hazard. When involved in a fire, this product's components will decompose and produce irritating vapors and toxic gases (including carbon oxides, nitrogen oxides, potassium oxides, hydrogen chloride, and sodium oxides).

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Not sensitive.

ADVICE FOR FIREFIGHTERS: Do not use halogenated extinguishing media. Move containers from fire area if it can be done without risk to personnel. Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Chemical resistant clothing may be necessary. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS: In the event of a spill, clear the area and protect people. Trained personnel using pre-planned procedures should respond to uncontrolled releases. The atmosphere must have levels of components lower than those listed in Section 8, (Exposure Controls and Personal Protective Equipment) if applicable, and have at least 19.5 percent oxygen before personnel can be allowed into the area without Self-Contained Breathing Apparatus (SCBA). Monitor area and confirm levels are below exposure limits given in Section 8 (Exposure Controls-Personal Protection), if applicable, before non-response personnel are allowed into the spill area.

6. ACCIDENTAL RELEASE MEASURES (Continued)

PROTECTIVE EQUIPMENT:

Small Spills: For incidental spills (e.g., 1 bottle), wear lightweight gloves, a lab coat, and eye protection.

Large Spills: For large spills (e.g., a case of bottles), protective apparel should be Level C: triple-gloves (rubber gloves and nitrile gloves over latex gloves), chemical resistant suit and boots, hardhat, and Air-Purifying respirator with organic vapor cartridge. Self-Contained Breathing Apparatus must be selected if release occurs in confined or poorly ventilated areas or in situations in which the level of oxygen is below 19.5%.

METHODS FOR CLEANUP AND CONTAINMENT:

Small Spills: Absorb spilled liquid with paper towels.

Large Spills: Absorb spilled liquid with polypads or other suitable absorbent materials. Dike or otherwise contain spill and remove with vacuum truck or pump to storage/salvage vessels.

All Spills: Decontaminate the area of the spill thoroughly using detergent and water. Place all spill residue in an appropriate container and seal. Do not mix with wastes from other materials. If necessary, discard contaminated response equipment or rinse with soapy water before returning such equipment to service. Dispose of in accordance with applicable international, national, state, and local procedures (see Section 13, Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewer or confined spaces, waterways, soil or public waters. Do not flush to sewer. For spills on water, contain, minimize dispersion and collect.

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

PRECAUTIONS FOR SAFE HANDLING: All employees who handle this material should be trained to handle it safely. As with all chemicals, avoid getting this product's components ON YOU or IN YOU. Open containers slowly on a stable surface. Avoid splashing or spraying this product's components. Avoid breathing vapors, mists, or sprays generated by this product's components. Do not eat or drink while handling this product's components. Wash thoroughly after handling this product's components.

CONDITIONS FOR SAFE STORAGE: Ensure containers of this product's components are properly labeled. Store vials as directed in the product insert. Store away from incompatible materials. Material should be stored in secondary containers, as appropriate. Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. Have appropriate extinguishing equipment in the storage area (i.e., sprinkler system, portable fire extinguishers). Keep vials tightly closed when not in use. Inspect vials containing this product's components for leaks or damage. Read instructions provided with the product prior to use.

SPECIFIC END USE(S): This product is for use in laboratory biological research. Follow industry standards for use.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely, as applicable. Collect all rinsates and dispose of according to applicable Federal, State, and local procedures standards.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE LIMITS/CONTROL PARAMETERS:

NOTE: Solutions not specifically listed are primarily water and trace constituents; no exposure limits are applicable.

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR							
		ACGIH-TLVs		OSHA-PELs		NIOSH-RELS		NIOSH	OTHER
		TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³	IDLH mg/m ³	mg/m ³

COMPONENT 1: Code WG#-AMM

Deoxyadenosine Salt	NE	NE	NE	NE	NE	NE	NE	NE
Deoxycytidine Salt	NE	NE	NE	NE	NE	NE	NE	NE
Deoxyguanosine Salt	NE	NE	NE	NE	NE	NE	NE	NE
Deoxythymidine Salt	NE	NE	NE	NE	NE	NE	NE	NE
Aliphatic Triol	10 (mist)	NE	15 (total dust) 5 (resp. frac.) 10 (total dust) 5 (resp. frac.) [vacated 1989 PEL]	NE	NE	NE	NE	DFG MAKs: TWA = 50 (inhalable fraction) PEAK = 2•MAK 15 min. average value, 1-hr interval, 4 per shift Pregnancy Risk Group C
Glycol Homopolymer	NE	NE	NE	NE	NE	NE	NE	NE
Carbohydrate	10	NE	15 (total dust); 5 (resp. frac.)	NE	10 (total dust); 5 (resp. frac.)	NE	NE	NE

NE = Not Established.

See Section 16 for Definitions of Other Terms Used

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

EXPOSURE LIMITS/CONTROL PARAMETERS (continued):

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR							
		ACGIH-TLVs		OSHA-PELs		NIOSH-RELS		NIOSH	OTHER
		TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³	IDLH mg/m ³	mg/m ³

COMPONENT 1: Code WG#-AMM (continued)

Alkanolamine	NE	NE	NE	NE	NE	NE	NE	NE	NE
--------------	----	----	----	----	----	----	----	----	----

COMPONENT 3: Code WG#-FRG

Aliphatic Triol	10 (mist)	NE	15 (total dust) 5 (resp. frac.) 10 (total dust) 5 (resp. frac.) [vacated 1989 PEL]	NE	NE	NE	NE	DFG MAKs: TWA = 50 (inhalable fraction) PEAK = 2•MAK 15 min. average value, 1-hr interval, 4 per shift Pregnancy Risk Group C
Carbohydrate	10	NE	15 (total dust); 5 (resp. frac.)	NE	10 (total dust); 5 (resp. frac.)	NE	NE	NE

COMPONENT 4: Code WG#-PA1

Acetate Salt	NE	NE	NE	NE	NE	NE	NE	NE	NE
Carboxylic Acid Salt	NE	NE	NE	NE	NE	NE	NE	NE	NE

COMPONENT 5: Code WG#-RA1

Aliphatic Amide	18 (skin)	NE	15 (skin)	NE	NE	NE	NE	DFG MAK: Danger of cutaneous absorption
Dibasic Potassium Salt	NE	NE	NE	NE	NE	NE	NE	NE
Monobasic Potassium Salt	NE	NE	NE	NE	NE	NE	NE	NE
Sodium Salt	NE	NE	NE	NE	NE	NE	NE	NE

COMPONENT 7: Code WG#-PB2

Aliphatic Diol	NE	NE	NE	NE	NE	NE	NE	AIHA WEELS: TWA = 10
----------------	----	----	----	----	----	----	----	-------------------------

COMPONENT 8: Code WG#-MA1

Refined Hydrocarbon	5 (inhal. frac.)	NE	NE	NE	NE	NE	NE	NE	NE
---------------------	---------------------	----	----	----	----	----	----	----	----

COMPONENT 9: Code WG#-WB1

Aliphatic Amide	18 (skin)	NE	15 (skin)	NE	NE	NE	NE	DFG MAK: Danger of cutaneous absorption
Dibasic Potassium Salt	NE	NE	NE	NE	NE	NE	NE	NE
Monobasic Potassium Salt	NE	NE	NE	NE	NE	NE	NE	NE
Sodium Salt	NE	NE	NE	NE	NE	NE	NE	NE

COMPONENT 11: Code WG#-MSM

Deoxyadenosine Salt	NE	NE	NE	NE	NE	NE	NE	NE	NE
Deoxycytidine Salt	NE	NE	NE	NE	NE	NE	NE	NE	NE
Deoxyguanosine Salt	NE	NE	NE	NE	NE	NE	NE	NE	NE
Deoxythymidine Salt	NE	NE	NE	NE	NE	NE	NE	NE	NE
Aliphatic Triol	10 (mist)	NE	15 (total dust) 5 (resp. frac.) 10 (total dust) 5 (resp. frac.) [vacated 1989 PEL]	NE	NE	NE	NE	DFG MAKs: TWA = 50 (inhalable fraction) PEAK = 2•MAK 15 min. average value, 1-hr interval, 4 per shift Pregnancy Risk Group C	
Glycol Homopolymer	NE	NE	NE	NE	NE	NE	NE	NE	NE
Carbohydrate	10	NE	15 (total dust); 5 (resp. frac.)	NE	10 (total dust); 5 (resp. frac.)	NE	NE	NE	NE
Alkanolamine	NE	NE	NE	NE	NE	NE	NE	NE	NE

NE = Not Established. See Section 16 for Definitions of Other Terms Used

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

EXPOSURE LIMITS/CONTROL PARAMETERS (continued):

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR							
		ACGIH-TLVs		OSHA-PELs		NIOSH-RELs		NIOSH	OTHER
		TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³	IDLH mg/m ³	mg/m ³

COMPONENT 12: Code WG#-FMS

Aliphatic Triol	10 (mist)	NE	15 (total dust) 5 (resp. frac.) 10 (total dust) 5 (resp. frac.) [vacated 1989 PEL]	NE	NE	NE	NE	NE	DFG MAKs: TWA = 50 (inhalable fraction) PEAK = 2•MAK 15 min. average value, 1-hr interval, 4 per shift Pregnancy Risk Group C
Carbohydrate	10	NE	15 (total dust); 5 (resp. frac.)	NE	10 (total dust); 5 (resp. frac.)	NE	NE	NE	NE

COMPONENT 13: Code WG#-PM1

Acetate Salt	NE	NE	NE	NE	NE	NE	NE	NE	NE
Carboxylic Acid Salt	NE	NE	NE	NE	NE	NE	NE	NE	NE

COMPONENT 15: Code WG#-XC2

Carbohydrate	10	NE	15 (total dust); 5 (resp. frac.)	NE	10 (total dust); 5 (resp. frac.)	NE	NE	NE	NE
--------------	----	----	----------------------------------	----	----------------------------------	----	----	----	----

COMPONENT 17: Code WG#-XC4

Alkyl Alcohol	NE	1880	1900	NE	1900	NE	5940 (based on 10% of LEL)	NE	DFG MAKs: TWA = 960 PEAK = 2•MAK 15 min. average value, 1-hr interval, 4 per shift Pregnancy Risk Group C Germ Cell Mutagen Classification 5 Carcinogen: MAK-5, TLV-A4
Quaternized Aminopropyl Polymer	NE	NE	NE	NE	NE	NE	NE	NE	NE

COMPONENT 18: Code WG#-TEM

Carbohydrate	10	NE	15 (total dust); 5 (resp. frac.)	NE	10 (total dust); 5 (resp. frac.)	NE	NE	NE	NE
--------------	----	----	----------------------------------	----	----------------------------------	----	----	----	----

COMPONENT 19: LIGATION TWO COLOR MASTER MIX; Code WG#-LTM

Carbohydrate Salt	NE	NE	NE	NE	NE	NE	NE	NE	NE
-------------------	----	----	----	----	----	----	----	----	----

COMPONENT 19: LIGATION TWO COLOR MASTER MIX; Code WG#-LTM (continued)

Carbohydrate	10	NE	15 (total dust); 5 (resp. frac.)	NE	10 (total dust); 5 (resp. frac.)	NE	NE	NE	NE
--------------	----	----	----------------------------------	----	----------------------------------	----	----	----	----

COMPONENT 20: Code WG#-ATM

Carbohydrate	10	NE	15 (total dust); 5 (resp. frac.)	NE	10 (total dust); 5 (resp. frac.)	NE	NE	NE	NE
--------------	----	----	----------------------------------	----	----------------------------------	----	----	----	----

COMPONENT 21: Code WG#-STM

Carbohydrate Salt	NE	NE	NE	NE	NE	NE	NE	NE	NE
Carbohydrate	10	NE	15 (total dust); 5 (resp. frac.)	NE	10 (total dust); 5 (resp. frac.)	NE	NE	NE	NE

COMPONENT 22: Code WG#-AMR

Glycol Homopolymer	NE	NE	NE	NE	NE	NE	NE	NE	NE
Carbohydrate	10	NE	15 (total dust); 5 (resp. frac.)	NE	10 (total dust); 5 (resp. frac.)	NE	NE	NE	NE

COMPONENT 24: Code WG#-CMM

Sulfonic Acid Derivative	NE	NE	NE	NE	NE	NE	NE	NE	NE
Carbohydrate	10	NE	15 (total dust); 5 (resp. frac.)	NE	10 (total dust); 5 (resp. frac.)	NE	NE	NE	NE

COMPONENT 27: Code WG#-QCT

Alkanolamine	NE	NE	NE	NE	NE	NE	NE	NE	NE
--------------	----	----	----	----	----	----	----	----	----

NE = Not Established.

See Section 16 for Definitions of Other Terms Used

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

EXPOSURE LIMITS/CONTROL PARAMETERS (continued):

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR							
		ACGIH-TLVs		OSHA-PELs		NIOSH-RELS		NIOSH	OTHER
		TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³	IDLH mg/m ³	mg/m ³

COMPONENT 29: Code WG#-LX2

Carbohydrate	10	NE	15 (total dust); 5 (resp. frac.)	NE	10 (total dust); 5 (resp. frac.)	NE	NE	NE
--------------	----	----	-------------------------------------	----	-------------------------------------	----	----	----

COMPONENT 30: Code WG#-EML

Carbohydrate	10	NE	15 (total dust); 5 (resp. frac.)	NE	10 (total dust); 5 (resp. frac.)	NE	NE	NE
--------------	----	----	-------------------------------------	----	-------------------------------------	----	----	----

COMPONENT 31: Code WG#-SML

Carbohydrate Salt	NE	NE	NE	NE	NE	NE	NE	NE
Carbohydrate	10	NE	15 (total dust); 5 (resp. frac.)	NE	10 (total dust); 5 (resp. frac.)	NE	NE	NE

NE = Not Established. See Section 16 for Definitions of Other Terms Used

International Occupational Exposure Limits: In addition to the exposure limit values cited in this section, other exposure limits have been established by various countries for the components of this product. The exposure limits given may not be the most current; individual country authorities should be contacted to check on more current limits.

ALKYL ALCOHOL:

Australia: TWA = 1000 ppm (1880 mg/m³), JUL 2008
 Belgium: TWA = 1000 ppm (1907 mg/m³), MAR 2002
 Denmark: TWA = 1000 ppm (1900 mg/m³), OCT 2002
 Finland: TWA = 1000 ppm (1900 mg/m³), STEL = 1300 ppm (2500 mg/m³), SEP 2009
 France: VME = 1000 ppm (1900 mg/m³), VLE = 5000 ppm (9500), FE B2006
 Germany: MAK = 960 mg/m³ (500 mL/m³), 2005
 Hungary: TWA = 1900 mg/m³, STEL = 7600 mg/m³, SEP 2000
 Korea: TWA = 1000 ppm (1900 mg/m³), 2006
 Mexico: TWA = 1000 ppm (1900 mg/m³), 2004
 The Netherlands: MAC-TGG = 1000 mg/m³, 2003
 New Zealand: TWA = 1000 ppm (1880 mg/m³), JAN 2002
 Norway: TWA = 500 ppm (950 mg/m³), JAN 1999
 The Philippines: TWA = 1000 ppm (1900 mg/m³), JAN 1993
 Poland: MAC(TWA) = 1000 mg/m³, MAC(STEL) = 3000 mg/m³, JAN 1999
 Russia: TWA = 1000 mg/m³, STEL = 2000 mg/m³, JUN 2003
 Sweden: TWA = 500 ppm (1000 mg/m³); STEL = 1000 ppm (1900 mg/m³), JUN 2005
 Switzerland: MAK-W = 500 ppm (960 mg/m³), KZG-W = 1000 ppm (1920 mg/m³), DEC 2006
 Thailand: TWA = 1000 ppm (1900 mg/m³), JAN 1993

ALKYL ALCOHOL (continued):

Turkey: TWA = 1000 ppm (1900 mg/m³), JAN 1993
 United Kingdom: TWA = 1000 ppm (1920 mg/m³), 2005
 In Argentina, Bulgaria, Colombia, Jordan, Singapore, Vietnam check ACGIH TLV
ALIPHATIC AMIDE:
 Australia: TWA = 10 ppm (18 mg/m³), JUL 2008
 Belgium: TWA = 10 ppm (18 mg/m³), Skin, MAR 2002
 Denmark: TWA = 10 ppm (18 mg/m³), OCT 2002
 Finland: TWA = 10 ppm (19 mg/m³), STEL = 20 ppm (37 mg/m³), Skin, SEP 2009
 France: VME = 20 ppm (30 mg/m³), FEB 2006
 Korea: TWA = 10 ppm (15 mg/m³), skin, 2006
 Mexico: TWA = 20 ppm (30 mg/m³); STEL = 30 ppm (45 mg/m³), 2004
 The Netherlands: MAC-TGG = 16 mg/m³, 2003
 New Zealand: TWA = 10 ppm (18 mg/m³), skin, JAN 2002
 Norway: TWA = 10 ppm (18 mg/m³), JAN 1999
 Russia: STEL = 3 mg/m³, JUN 2003
 Sweden: TWA = 10 ppm (20 mg/m³); STEL = 15 ppm (30 mg/m³), Skin, JUN 2005
 Switzerland: MAK-W = 10 ppm (18 mg/m³), Skin, DEC 2006
 United Kingdom: TWA = 20 ppm (37 mg/m³); STEL = 30 ppm, 2005
 In Argentina, Bulgaria, Colombia, Jordan, Singapore, Vietnam check ACGIH TLV

ALIPHATIC TRIOL:

Belgium: TWA = 10 mg/m³, MAR 2002
 Denmark: TWA = 1000 mg/m³, OCT 2002
 Finland: TWA = 20 mg/m³, SEP 2009
 France: VME = 10 mg/m³, FEB 2006
 Korea: TWA = 10 mg/m³ (mist), 2006
 Mexico: TWA = 10 mg/m³ (inhalable), 2004
 The Netherlands: MAC-TGG = 10 mg/m³, 2003
 New Zealand: TWA = 10 mg/m³ (mist), JAN 2002
 Switzerland: MAK-W = 50 mg/m³, KZG-W = 100 mg/m³, DEC 2006
 United Kingdom: TWA = 10 mg/m³, 2005
 In Argentina, Bulgaria, Colombia, Jordan, Singapore, Vietnam check ACGIH TLV
REFINED HYDROCARBON:
 Russia: STEL = 5 mg/m³, Skin, JUN 2003
CARBOHYDRATE:
 Belgium: TWA = 10 mg/m³, MAR 2002
 France: VME = 10 mg/m³, FEB 2006
 Korea: TWA = 10 mg/m³, 2006
 Mexico: TWA = 10 mg/m³, STEL = 20 mg/m³, 2004
 The Netherlands: MAC-TGG = 10 mg/m³, 2003
 New Zealand: TWA = 10 mg/m³ (inspirable dust), JAN 2002
 United Kingdom: TWA = 10 mg/m³; STEL = 20 mg/m³, 2005
 In Argentina, Bulgaria, Colombia, Jordan, Singapore, Vietnam check ACGIH TLV
ALKANOLAMINE:
 Russia: STEL = 5 mg/m³, JUN 2003

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132), equivalent standards of Canada (including CSA Standard Z94.4-02 and CSA Standard Z94.3-07), standards of EU member states (including EN 529:2005 for respiratory PPE, CEN/TR 15419:2006 for hand/body protection, and CR 13464:1999 for face/eye protection), standards of Australia (including AS/NZS 1715:1994 for respiratory PPE, AS/NZS 4501.2:2006 for protective clothing, AS/NZS 2161.1:2000 for glove selection, and AS/NZS 1336:1997 for eye protection), or standards of Japan (including JIS T 8116:2005 for glove selection, JIS T 8150:2006 for respiratory PPE, JIS T 8147:2003 for eye protectors, and JIS T 8030:2005 for protective clothing). Please reference applicable regulations and standards for relevant details.

EXPOSURE CONTROLS:

Ventilation And Engineering: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in Section 3 (Composition and Information on Ingredients) if applicable. Ensure eyewash/safety shower stations are available near areas where this product is used.

Respiratory Protection: Respiratory protection is not generally needed when using this product. Maintain airborne contaminant concentrations below limits listed in Section 3 (Composition and Information on Ingredients). In instances where inhalable mists or sprays of product may be generated, and respiratory protection is necessary, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), or equivalent U.S. State standards, Canadian CSA Standard Z94.4-93, the European Standard EN149, and EU member states, or the Australian Standard 1716-Respiratory Protective Devices, the Australian Standard 1715-Selection, Use, and Maintenance of Respiratory Protective Devices, as well as requirements of Japan. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, SAR with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

EXPOSURE CONTROLS (continued):

Eye Protection: Depending on the use of this product, splash goggles or safety glasses may be worn. Use goggles or safety glasses for spill response, as stated in Section 6 (Accidental Release Measures) of this MSDS. If necessary, refer to U.S. OSHA 29 CFR 1910.133, Canadian Standards, or the European Standard EN166, the Australian Standard 1337-Eye Protection for Industrial Applications and Australian Standard 1336-Recommended Practices for Eye Protection in the Industrial Environment, as well as requirements of Japan for further information.

Hand Protection: Wear butyl rubber, neoprene, or nitrile rubber or latex gloves for routine use. If necessary, refer to U.S. OSHA 29 CFR 1910.138, the European Standard DIN EN 374, appropriate Standards of Canada, or the Australian Standard 2161-Industrial Safety Gloves and Mittens, and applicable Standards of Japan, for further information.

Body Protection: Use body protection appropriate for task, such as a lab coat. If necessary, use body protection appropriate for task (e.g., Tyvek suit, rubber apron). If necessary, refer appropriate Standards of Canada, the European Standard DIN EN 465, the Australian Standard 3765-Clothing for Protection Against Hazardous Chemicals, or Standards of Japan for further information. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136.

9. PHYSICAL and CHEMICAL PROPERTIES

The following information applies to all components, in general.

MOLECULAR WEIGHT (single entity only): Not applicable.

APPEARANCE: All components are clear.

RELATIVE VAPOR DENSITY (air = 1): Not established.

FLASH POINT: Not applicable.

UPPER EXPLOSIVE LIMIT: Not established.

AUTOIGNITION TEMPERATURE: Not established.

EXPLOSIVE PROPERTIES: Not explosive.

BOILING POINT: Not established.

MELTING/FREEZING POINT: Not established.

DENSITY/SPECIFIC GRAVITY: Not established.

VISCOSITY: Not established.

PARTITION COEFFICIENT (n-octanol/water): Not established

The following information is component specific.

pH:

Code WG#-PA1 Component: 7.5

Code WG#-LTM Component: 7.4

All Other Components: 5.0–8.1

PHYSICAL STATE: All components are liquids.

VAPOR PRESSURE: Not established.

FLAMMABILITY: Not flammable.

LOWER EXPLOSIVE LIMIT: Not established.

DECOMPOSITION TEMPERATURE: Not established.

OXIDIZING PROPERTIES: Not oxidizers.

EVAPORATION RATE (n-BuAc = 1): Not established.

% VOLATILITY: Not established.

ODOR THRESHOLD: Not established.

SOLUBILITY: Not established.

Code WG#-RA1 and Code WG#-WB1 Components: 7.2–8.2

Code WG#-MA1 Component: Not applicable

COLOR:

Code WG#-PA1 Component: Light blue

Code WG#-LTM Component: Light pink

All Other Components: Colorless

Code WG#-RA1 and Code WG#-WB1 Components: Colorless

Code WG#-MA1 Component: Blue

ODOR:

Code WG#-RA1 and Code WG#-WB1 Components: Slightly sulfurous

All Other Components: Odorless

HOW TO DETECT THIS SUBSTANCE:

Code WG#-PA1, Code WG#-LTM, and Code WG#-MA1 Components: The appearance may act as a warning property associated with this component.

Code WG#-RA1 and Code WG#-WB1 Components: The odor may act as a warning property associated with these components.

All Other Components: There are no unusual warning properties associated with these components.

10. STABILITY AND REACTIVITY

REACTIVITY/CHEMICAL STABILITY: Stable at room temperature in sealed containers.

POSSIBILITY OF HAZARDOUS REACTIONS OR POLYMERIZATION: No data available.

CONDITIONS TO AVOID: Contact with incompatible materials and excessive temperatures.

INCOMPATIBLE MATERIALS:

Code WG#-PA1 Component: Sodium hypochlorite, strong oxidizers, strong acids, substances that are incompatible with water.

Code WG#-RA1 and Code WG#-WB1 Components: Karl Fischer reagent (mixture of toluene, pyridine and sulfur trioxide), strong oxidizers, strong acids, some metals, substances that are incompatible with water.

Code WG#-PB2: Acid chlorides, acid anhydrides, oxidizers, chloroformates, reducers, substances that are incompatible with water.

Code WG#-MA1: Strong oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS:

Combustion: Carbon oxides, dimethyl amine, hydrogen sulfide, phosphine, cyanides, hydrogen iodide, and phosphorous, sodium and nitrogen oxides

Hydrolysis: None known.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: No adverse health effects should occur from routine, occupational use of this product’s components in the manner specified by the manufacturer’s instructions. The potential health effects of this product’s components, via route of exposure, described further in this section.

INHALATION:

Code WG#-PA1, Code WG#-PM1, and Code WG#-PB2 Components: Inhalation of mists or sprays of these components may irritate the nose and upper respiratory tract. Symptoms of such overexposure may include sneezing, coughing, and nasal congestion.

Code WG#-RA1 and Code WG#-WB1 Components: Inhalation of vapors, mists, or sprays of these components will irritate the nose, throat, and lungs. Symptoms may include nausea, headache, and vomiting.

Code WG#-MA1 Component: Inhalation of mists or sprays of this component may irritate the nose and upper respiratory tract. Symptoms of such overexposure may include sneezing, coughing, and nasal congestion.

All Other Components: Inhalation of vapors, mists, or sprays of these components may slightly irritate the nose, throat, and lungs. Symptoms are generally alleviated upon breathing fresh air.

CONTACT WITH SKIN or EYES:

Code WG#-PA1, Code WG#-PB2, and Code WG#-RA1 Components: Depending on the duration and concentration of overexposure, skin and eye contact can irritate contaminated tissue. Symptoms of skin overexposure may include redness and discomfort. Symptoms of eye overexposure may include redness, tearing, and pain.

All Other Components: Contact with the skin or eyes may cause mild irritation, which is alleviated upon rinsing.

SKIN ABSORPTION:

Code WG#-RA1 and Code WG#-WB1 Components: The Aliphatic Amide constituent can be absorbed through the skin and may cause adverse reproductive effects.



All Other Components: No constituents of these components are known to be absorbed via intact skin.

INGESTION: Ingestion is not anticipated to be a significant route of exposure for the product’s solutions. If ingested, symptoms of such overexposure are described below.

Code WG#-PA1 Components: If this component is swallowed, it may cause gastric distress. Large volumes may cause nausea, vomiting, flaccidity of facial muscles, tremor, generalized discomfort, anxiety, and impairment of motor performance.

Code WG#-RA1 and Code WG#-WB1 Components: If these components are swallowed, irritation of the mouth, throat, and other tissues of the digestive system may occur. Ingestion may cause adverse reproductive effects.

CODE WG#-MA1

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM			
HEALTH HAZARD	(BLUE)	2	
FLAMMABILITY HAZARD	(RED)	0	
PHYSICAL HAZARD	(YELLOW)	0	
PROTECTIVE EQUIPMENT			
EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8
For Routine Industrial Use and Handling Applications			

CODE WG#-RA1 AND CODE WG#-WB1

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM			
HEALTH HAZARD	(BLUE)	1	
FLAMMABILITY HAZARD	(RED)	1	
PHYSICAL HAZARD	(YELLOW)	0	
PROTECTIVE EQUIPMENT			
EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8
For Routine Industrial Use and Handling Applications			

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate
3 = Serious 4 = Severe * = Chronic hazard

11. TOXICOLOGICAL INFORMATION (Continued)

INGESTION (continued):

Code WG#-PB2 Component: If this component is swallowed, it may cause gastric distress. Large volumes may cause nausea, vomiting, gastrointestinal upset, diarrhea, general anesthesia, convulsions, and changes in surface EEG.

All Other Components: If these components are swallowed they may cause gastric distress. Large doses may cause nausea, vomiting, and diarrhea.

INJECTION: Accidental injection of this product's components, via laceration or puncture by a contaminated object, may cause local reddening, tissue swelling, and discomfort in addition to the wound.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms.

Acute:

Code WG#-PA1, Code WG#-PM1, and Code WG#-PB2 Components:

Inhalation of mists or sprays of these components may irritate the nose and upper respiratory tract. Symptoms of such overexposure may include sneezing, coughing, and nasal congestion. Depending on the duration and concentration of overexposure, skin and eye contact can irritate contaminated tissue.

Code WG#-RA1 and Code WG#-WB1 Components:

Inhalation of vapors, mists, or sprays of these components may cause nausea, headache, and vomiting. Depending on the duration and concentration of overexposure, skin and eye contact can irritate contaminated tissue. The Aliphatic Amide constituent can be absorbed through the skin and may cause adverse reproductive effects. Ingestion may cause adverse reproductive effects.

Code WG#-MA1 Component:

Inhalation of mists or sprays of this component may irritate the nose and upper respiratory tract. Symptoms of such overexposure may include sneezing, coughing, and nasal congestion.

All Other Components: Beyond mild irritation of the skin or eyes, contact with these components does not usually cause acute health effects.

Chronic: The components of this product are not known to cause any significant chronic health effects.

TARGET ORGANS:

Acute:

Code WG#-RA1 and Code WG#-WB1 Components: Eyes, skin, reproductive system.

All Other Components: Eyes, gastrointestinal tract.

Chronic/Delayed:

Code WG#-RA1 and Code WG#-WB1 Components: Skin.

All Other Components: None known.

TOXICITY DATA: The following information is available for the constituents in components of this product present in greater than 1 percent concentration and listed in Section 3 (Composition and Information on Ingredients).

ACETATE SALT:

LD₅₀ (intraperitoneal, rat) = 632 mg/kg; Lungs, Thorax, Respiration: dyspnea, muscle contraction or spasticity; Endocrine: hypoglycemia
 LD₅₀ (intraperitoneal, mouse) = 736 mg/kg
 LDLo (intravenous, mouse) = 386 mg/kg
 LDLo (intraperitoneal, chicken) = 1735 mg/kg; Behavioral: altered sleep time (including change in righting reflex), coma; Lungs, Thorax, or Respiration: dyspnea
 TDLo (oral, rat) = 353 mg/kg/20 days/continuous; Brain and Coverings: other degenerative changes; Behavioral: alteration of classical conditioning

DEOXYADENOSINE SALT:

DNA Inhibition (lymphocyte, human) = 33,600 nmol/L

CARBOXYLIC ACID SALT:

Cytogenetic Analysis (lung, hamster) = 200 mg/L

ALKYL ALCOHOL:

Open Irritation Test (Skin-Rabbit) 400 mg/ Mild
 Standard Draize Test (Skin-Rabbit) 20 mg/24 hours: Moderate
 Standard Draize Test (Eye-Rabbit) 500 mg/ Severe
 Standard Draize Test (Eye-Rabbit) 500 mg/24 hours: Mild
 Rinsed with Water (Eye-Rabbit) 100 mg/ seconds: Moderate
 TDLo (Oral-Human) 22,500 mg/kg/4 weeks-intermittent: Endocrine: other changes; Blood: other changes



ALKYL ALCOHOL (continued):

TDLo (Oral-Human) 0.5 mg/kg: Behavioral: changes in psychophysiological tests
 TDLo (Oral-Human) 400 mg/kg: Behavioral: alteration of operant conditioning
 TDLo (Oral-Human) 0.7 g/kg/10 minutes: Behavioral: changes in psychophysiological tests
 TDLo (Oral-Human) 0.5 g/kg: Behavioral: somnolence (general depressed activity), changes in psychophysiological tests
 TDLo (Oral-Human) 1.4 g/kg: Behavioral: euphoria, changes in psychophysiological tests; Gastrointestinal: nausea or vomiting
 TDLo (Oral-Infant) 11,712 µL/kg: Behavioral: general anesthetic; Cardiac: arrhythmias (including changes in conduction); Lungs, Thorax, or Respiration; dyspnea
 TDLo (Oral-Child) 14400 mg/kg/30 minutes (intermittent): Behavioral: coma; Lungs, Thorax, or Respiration: dyspnea; Gastrointestinal: nausea or vomiting
 TDLo (Oral-Woman) 1200 mg/kg/3 hours: Endocrine: changes in gonadotropins; Endocrine: other changes; Blood: other changes
 TDLo (Oral-Woman) 256 g/kg/12 weeks: Behavioral: hallucinations, distorted perceptions; Endocrine: effect on menstrual cycle

ALKYL ALCOHOL (continued):

TDLo (Oral-Woman) 0.7 g/kg: Behavioral: changes in psychophysiological tests
 TDLo (Oral-Woman) 41 g/kg: female 41 week(s) after conception: Reproductive: Effects on Newborn: Apgar score (human only), other neonatal measures or effects, drug dependence
 TDLo (Oral-Woman) 250 mg/kg: female 37 week(s) after conception: Reproductive: Effects on Embryo or Fetus: other effects to embryo
 TDLo (Oral-Woman) 5860 mL/kg: female 3 year(s) pre-mating; 100 day(s) post-birth: Reproductive: Specific Developmental Abnormalities: craniofacial (including nose and tongue); Effects on Newborn: behavioral, delayed effects
 TDLo (Oral-Man) 3371 µL/kg: Behavioral: altered sleep time (including change in righting reflex), excitement, coma
 TDLo (Oral-Man) 700 mg/kg: Behavioral: changes in psychophysiological tests
 TDLo (Oral-Man) 50 mg/kg: Gastrointestinal: alteration in gastric secretion, other changes
 TDLo (Oral-Man) 1430 µg/kg: Behavioral: changes in motor activity (specific assay), ataxia, antipsychotic
 TDLo (Intravenous-Human) 1.6 g/kg/6 hours: Biochemical: Metabolism (Intermediary): other
 TDLo (Intravenous-Human) 0.89 mL/kg: Vascular: regional or general arteriolar constriction, measurement of regional blood flow

All Other Solutions

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM			
HEALTH HAZARD	(BLUE)		1
FLAMMABILITY HAZARD	(RED)		0
PHYSICAL HAZARD	(YELLOW)		0
PROTECTIVE EQUIPMENT			
EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8
For Routine Industrial Use and Handling Applications			

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate
 3 = Serious 4 = Severe * = Chronic hazard

11. TOXICOLOGICAL INFORMATION (Continued)

TOXICITY DATA (continued):

ALKYL ALCOHOL (continued):

TDLo (Intravenous-Man) 0.57 g/kg: Behavioral: changes in psychophysiological tests

TDLo (Intravenous-Woman) 8 g/kg: female 32 week(s) after conception: Reproductive: Effects on Newborn: Apgar score (human only), other neonatal measures or effects

TDLo (Intraarterial-Man) 0.071 mL/kg: Vascular: acute arterial occlusion

TDLo (Intrauterine-Woman) 200 mg/kg: female 5 day(s) pre-mating: Reproductive: Fertility: female fertility index (e.g. # females pregnant per # sperm positive females; # females pregnant per # females mated)

TDLo (Multiple Routes-Man) 3660 mg/kg: Endocrine: evidence of thyroid hypofunction

TDLo (Inhalation-Human) 2500 mg/m³/20 minutes: Peripheral Nerve and Sensation: recording from afferent nerve

LDLo (Oral-Child) 2 g/kg: Lungs, Thorax, or Respiration: other changes; Liver: fatty liver degeneration; Blood: other changes

LDLo (Oral-Human) 1400 mg/kg: Behavioral: sleep, headache; Gastrointestinal: nausea or vomiting

LDLo (Subcutaneous-Infant) 19,440 mg/kg: Behavioral: convulsions or effect on seizure threshold, coma; Nutritional and Gross Metabolic: body temperature decrease

LC₅₀ (Inhalation-Rat) 20,000 ppm/10 hours

LC₅₀ (Inhalation-Mouse) 39 gm/m³/4 hours

LD₅₀ (Oral-Rat) 7060 mg/kg: Lungs, Thorax, or Respiration: other changes

LD₅₀ (Oral-Rat) 7 g/kg

LD₅₀ (Oral-Mouse) 3450 mg/kg

LD₅₀ (Oral-Rabbit) 6300 mg/kg

LD₅₀ (Oral-Guinea Pig) 5560 mg/kg

LD₅₀ (Intraperitoneal-Rat) 3600 µg/kg

LD₅₀ (Intraperitoneal-Mouse) 528 mg/kg

LD₅₀ (Intraperitoneal-Rabbit) 963 mg/kg

LD₅₀ (Intraperitoneal-Guinea Pig) 3414 mg/kg

LD₅₀ (Intraperitoneal-Hamster) 5068 mg/kg

LD₅₀ (Intraperitoneal-Mammal-Species Unspecified) 4300 mg/kg: Behavioral: somnolence (general depressed activity), convulsions or effect on seizure threshold, changes in motor activity (specific assay)

LD₅₀ (Intravenous-Rat) 1440 mg/kg: Lungs, Thorax, or Respiration: dyspnea

LD₅₀ (Intravenous-Mouse) 1973 mg/kg

LD₅₀ (Intravenous-Rabbit) 2374 mg/kg

LD₅₀ (Intraarterial-Rat) 11 mg/kg: Lungs, Thorax, or Respiration: chronic pulmonary edema, dyspnea

LD₅₀ (Subcutaneous-Mouse) 8285 mg/kg

LCLo (Inhalation-Guinea Pig) 21900 ppm

LCLo (Inhalation-Mouse) 117,000 mg/m³/2 hours

LDLo (Oral-Dog) 5500 mg/kg

LDLo (Oral-Cat) 6 g/kg: Gastrointestinal: gastritis; Liver: hepatitis (hepatocellular necrosis), diffuse; Kidney/Ureter/Bladder: interstitial nephritis

LDLo (Intraperitoneal-Mouse) 4000 mg/kg: Behavioral: alteration of classical conditioning; Nutritional and Gross Metabolic: body temperature decrease

LDLo (Intraperitoneal-Dog) 3 g/kg

LDLo (Subcutaneous-Dog) 6 g/kg

LDLo (Subcutaneous-Rabbit) 20 g/kg

LDLo (Subcutaneous-Pigeon) 5 g/kg

LDLo (Subcutaneous-Chicken) 5 g/kg

LDLo (Subcutaneous-Frog) 7100 mg/kg

LDLo (Intravenous-Dog) 1600 mg/kg: Behavioral: ataxia; Lungs, Thorax, or Respiration: dyspnea; Gastrointestinal: hypermotility, diarrhea

LDLo (Intravenous-Cat) 3945 mg/kg

LDLo (Intravenous-Chicken) 8216 mg/kg: Vascular: other changes

LDLo (Skin-Rabbit) 20 g/kg

LDLo (Parenteral-Frog) 36 g/kg: Peripheral Nerve and Sensation: spastic paralysis with or without sensory change; Behavioral: somnolence (general depressed activity)

TDLo (Oral-Rat) 6.4 g/kg: Gastrointestinal: alteration in gastric secretion, ulceration or bleeding from stomach

TDLo (Oral-Rat) 1500 mg/kg: Behavioral: ataxia

TDLo (Oral-Rat) 2.5 g/kg: Gastrointestinal: other changes

TDLo (Oral-Rat) 8000 mg/kg: Brain and Coverings: other degenerative changes; Cardiac: cardiomyopathy including infarction; Liver: multiple effects

TDLo (Oral-Rat) 3 g/kg: Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: other Enzymes

ALKYL ALCOHOL (continued):

TDLo (Oral-Rat) 5 g/kg: Behavioral: changes in motor activity (specific assay)

TDLo (Oral-Rat) 6000 mg/kg: Biochemical: Metabolism (Intermediary): effect on mitochondrial function

TDLo (Oral-Rat) 4800 mg/kg: Gastrointestinal: ulceration or bleeding from stomach

TDLo (Oral-Rat) 5 mL/kg: Gastrointestinal: alteration in gastric secretion, ulceration or bleeding from stomach

TDLo (Oral-Rat) 10 mL/kg: Gastrointestinal: gastritis

TDLo (Oral-Rat) 5.25 g/kg: Brain and Coverings: other degenerative changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: catalyses

TDLo (Oral-Rat) 1600 mg/kg: Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Biochemical: Metabolism (Intermediary): lipids including transport.

TDLo (Oral-Rat) 0.5 g/kg: Brain and Coverings: other degenerative changes

TDLo (Oral-Rat) 5250 mg/kg: Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (Oral-Rat) 3 g/kg: Liver: other changes; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: phosphatases

TDLo (Oral-Rat) 5000 mg/kg: Endocrine: other changes; Blood: changes in other cell count (unspecified)

TDLo (Oral-Rat) 5000 mg/kg: Immunological Including Allergic: decrease in cellular immune response

TDLo (Oral-Rat) 1500 mg/kg: Behavioral: alteration of classical conditioning

TDLo (Oral-Rat) 6 g/kg: Behavioral: alteration of classical conditioning; Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (Oral-Rat) 10.5 g/kg/2 hours: Brain and Coverings: other degenerative changes; Biochemical: Metabolism (Intermediary): other

TDLo (Oral-Rat) 5 g/kg: Behavioral: anticonvulsant

TDLo (Oral-Rat) 0.72 g/kg: Behavioral: abuse; Endocrine: differential effect of sex or castration on observed toxicity

TDLo (Oral-Rat) 5000 mg/kg: Behavioral: general anesthetic

TDLo (Oral-Rat) 6000 mg/kg: Behavioral: changes in psychophysiological tests

TDLo (Oral-Rat) 5 mL/kg: Gastrointestinal: ulceration or bleeding from stomach

TDLo (Oral-Rat) 4 mL/kg: Gastrointestinal: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: other oxidoreductases

TDLo (Oral-Rat) 10 mL/kg: Gastrointestinal: ulceration or bleeding from stomach, other changes

TDLo (Oral-Rat) 10 mL/kg: Gastrointestinal: other changes

TDLo (Oral-Rat) 1825 g/kg/1 year-continuous: Liver: fatty liver degeneration, changes in liver weight; Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (Oral-Rat) 19 g/kg/21 days-continuous: Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: hepatic microsomal mixed oxidase (dealkylation, hydroxylation, etc.)

TDLo (Oral-Rat) 280 g/kg/5 weeks-intermittent: Cardiac: changes in heart weight; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Related to Chronic Data: changes in testicular weight

TDLo (Oral-Rat) 7 mL/kg/7 days-intermittent: Liver: other changes; Biochemical: Effect on specific coenzyme: B vitamins including folate

TDLo (Oral-Rat) 851 g/kg/10 weeks-continuous: Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: hepatic microsomal mixed oxidase (dealkylation, hydroxylation, etc.), Enzyme inhibition, induction, or change in blood or tissue levels: dehydrogenases

TDLo (Oral-Rat) 6300 mg/kg/9 weeks-intermittent: Liver: other changes, changes in liver weight; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: other transferases

TDLo (Oral-Rat) 45 g/kg/30 days-intermittent: Behavioral: changes in psychophysiological tests

TDLo (Oral-Rat) 62.5 g/kg/5 days-continuous: Brain and Coverings: other degenerative changes; Endocrine: effect on menstrual cycle, changes in gonadotropins

TDLo (Oral-Rat) 62.5 g/kg/6 days-continuous: Endocrine: effect on menstrual cycle

ALKYL ALCOHOL (continued):

TDLo (Oral-Rat) 65 g/kg/13 days-continuous: Endocrine: other changes

TDLo (Oral-Rat) 900 mL/kg/62 days-continuous: Behavioral: fluid intake; Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (Oral-Rat) 240,000 mg/kg/30 days-intermittent: Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count)

TDLo (Oral-Rat) 35,000 mg/kg/7 days-intermittent: Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (Oral-Rat) 115,000 mg/kg/23 days-intermittent: Behavioral: alteration of classical conditioning

TDLo (Oral-Rat) 67.5 mg/kg/15 days-continuous: Brain and Coverings: other degenerative changes; Biochemical: Metabolism (Intermediary): xanthine, purine or nucleotides including urate; other proteins

TDLo (Oral-Rat) 93.8 mL/kg/2 weeks-intermittent: Liver: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: multiple enzyme effects, Metabolism (Intermediary): lipids including transport

TDLo (Oral-Rat) 882 g/kg/75 days-intermittent: Musculoskeletal: other changes

TDLo (Oral-Rat) 72 g/kg/7 days-continuous: Kidney/Ureter/Bladder: other changes in urine composition; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: dehydrogenases

TDLo (Oral-Rat) 908 mg/kg/4 weeks-continuous: Liver: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: multiple enzyme effects

TDLo (Oral-Rat) 1372 g/kg/20 weeks-continuous: Behavioral: food intake (animal); Vascular: regional or general arteriolar constriction, other changes

TDLo (Oral-Rat) 210 g/kg/10 weeks-continuous: Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Biochemical: Metabolism (Intermediary): lipids including transport

TDLo (Oral-Rat) 4500 g/kg/24 weeks-intermittent: Behavioral: food intake (animal); Cardiac: change in force of contraction; Endocrine: differential effect of sex or castration on observed toxicity

TDLo (Oral-Rat) 84 g/kg/4 weeks-intermittent: Behavioral: food intake (animal); Endocrine changes; Nutritional and Gross Metabolic: other changes

TDLo (Oral-Rat) 14 g/kg/7 days-intermittent: Brain and Coverings: other degenerative changes

TDLo (Oral-Rat) 28 g/kg/7 days-intermittent: Brain and Coverings: Degenerative changes; Biochemical: Neurotransmitters or modulators (putative): catecholamine levels in CNS, dopamine in striatum

TDLo (Oral-Rat) 8 mg/kg/4 days-intermittent: Brain and Coverings: other degenerative changes; Biochemical: Metabolism (Intermediary): other proteins

TDLo (Oral-Rat) 9660 g/kg/56 weeks-intermittent: Cardiac: change in resting or action potential; Endocrine: differential effect of sex or castration on observed toxicity; Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (Oral-Rat) 240 g/kg/60 days-intermittent: Liver: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: catalyses, Enzyme inhibition, induction, or change in blood or tissue levels: other oxidoreductases

TDLo (Oral-Rat) 12 g/kg/20 days-continuous: Behavioral: tolerance, alteration of operant conditioning

TDLo (Oral-Rat) 875 mg/kg/10 weeks-intermittent: Kidney/Ureter/Bladder: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: multiple enzyme effects, Metabolism (Intermediary): effect on Sodium-Potassium pump

TDLo (Oral-Rat) 41.6 g/kg/4 days-continuous: Behavioral: analgesia

TDLo (Oral-Rat) 130 g/kg/10 days-continuous: Behavioral: tolerance, withdrawal

TDLo (Oral-Rat) 36,000 mg/kg/6 days-continuous: Behavioral: changes in motor activity (specific assay), alteration of classical conditioning, alteration of operant conditioning

TDLo (Oral-Rat) 8 g/kg/10 days-intermittent: Behavioral: abuse

TDLo (Oral-Rat) 27,000 mg/kg/6 days-intermittent: Brain and Coverings: other degenerative changes

11. TOXICOLOGICAL INFORMATION (Continued)

TOXICITY DATA (continued):

ALKYL ALCOHOL (continued):

TDLo (Oral-Rat) 300 mg/kg/12 weeks-intermittent: Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: catalyses, Enzyme inhibition, induction, or change in blood or tissue levels: other oxidoreductases

TDLo (Oral-Rat) 31,500 mg/kg/6 days-intermittent: Cardiac: change in rate

TDLo (Oral-Rat) 21,000 mg/kg/7 days-intermittent: Brain and Coverings: other degenerative changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: cytochrome oxidases (including oxidative phosphorylation)

TDLo (Oral-Rat) 15 g/kg/15 days-intermittent: Endocrine: androgenic

TDLo (Oral-Rat) 30 g/kg/15 days-intermittent: Endocrine: estrogenic

TDLo (Oral-Rat) 90 g/kg/15 days-intermittent: Reproductive: Paternal Effects: testes, epididymis, sperm duct

TDLo (Oral-Rat) 108 g/kg/4 weeks-intermittent: Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: other oxidoreductases, catalyses; Liver: other changes

TDLo (Oral-Rat) 10,400 mg/kg/13 days-intermittent: Endocrine: estrogenic

TDLo (Oral-Rat) 875 g/kg/35 days-continuous: Liver: liver function tests impaired

TDLo (Oral-Rat) 42 g/kg/7 days-intermittent: Behavioral: changes in psychophysiological tests

TDLo (Oral-Rat) 25,000 mg/kg/5 days-intermittent: Behavioral: alteration of operant conditioning

TDLo (Oral-Rat) 420 g/kg/10 weeks-intermittent: Brain and Coverings: other degenerative changes; Musculoskeletal: other changes; Biochemical: Metabolism (Intermediary): lipids including transport

TDLo (Oral-Rat) 48,000 mg/kg/12 weeks-intermittent: Cardiac changes; BP elevation not characterized in autonomic section; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: multiple enzyme effects

TDLo (Oral-Rat) 273,000 mg/kg/21 days-continuous: Musculoskeletal: osteoporosis

TDLo (Oral-Rat) 6650 mL/kg/10 weeks-continuous: Liver: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: hepatic microsomal mixed oxidase (dealkylation, hydroxylation, etc.), cytochrome oxidases (including oxidative phosphorylation)

TDLo (Oral-Rat) 1,428,000 mg/kg/14 days-continuous: Behavioral: fluid intake; Liver: other changes; Nutritional and Gross Metabolic: conditioned vitamin deficiency

TDLo (Oral-Rat) 168 g/kg/12 weeks-intermittent: Cardiac: other changes; Vascular: BP elevation not characterized in autonomic section; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: other Enzymes

TDLo (Oral-Rat) 270 g/kg/90 days-intermittent: Brain and Coverings: other degenerative changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: multiple enzyme effects, Metabolism (Intermediary): other proteins

TDLo (Oral-Rat) 54 g/kg/9 days-intermittent: Endocrine: other changes; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Musculoskeletal: other changes

TDLo (Oral-Rat) 54 g/kg/9 days-intermittent: Endocrine: other changes; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol); Musculoskeletal: osteoporosis

TDLo (Oral-Rat) 60 g/kg/30 days-intermittent: Biochemical: Neurotransmitters or modulators (putative): catecholamine levels in CNS; Biochemical: Neurotransmitters or modulators (putative): dopamine in striatum

TDLo (Oral-Rat) 50 g/kg/10 days-intermittent: Liver: other changes; Biochemical: Metabolism (Intermediary): other

TDLo (Oral-Rat) 600,000 mg/kg/75 days-intermittent: Musculoskeletal: other changes Nutritional and Gross Metabolic: changes in calcium

TDLo (Oral-Rat) 354,000 mg/kg/30 days-intermittent: Musculoskeletal: other changes; Nutritional and Gross Metabolic: changes in calcium

TDLo (Oral-Rat) 462,000 mg/kg/6 weeks-intermittent: Musculoskeletal: other changes

ALKYL ALCOHOL (continued):

TDLo (Oral-Rat) 31.5 g/kg/6 days-intermittent: Behavioral: changes in psychophysiological tests; Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (Oral-Rat) 126 g/kg/12 weeks-continuous: Vascular: BP lowering not characterized in autonomic section

TDLo (Oral-Rat) 400 g/kg/8 weeks-intermittent: Brain and Coverings: recordings from specific areas of CNS; Behavioral: withdrawal

TDLo (Oral-Rat) 52,800 mg/kg/6 days-intermittent: Behavioral: convulsions or effect on seizure threshold, withdrawal; Gastrointestinal: other changes

TDLo (Oral-Rat) 52,800 mg/kg/6 days-intermittent: Liver: other changes; Nutritional and Gross Metabolic: weight loss or decreased weight gain; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: transaminases

TDLo (Oral-Rat) 52,800 mg/kg/6 days-intermittent: Related to Chronic Data: death

TDLo (Oral-Rat) 30 g/kg/3 days-continuous: Biochemical: Effect on specific coenzyme: proportion of isoenzymes; Liver: other changes

TDLo (Oral-Rat) 195 g/kg/30 days-continuous: Brain and Coverings: other degenerative changes

TDLo (Oral-Rat) 420,000 mg/kg/12 weeks-intermittent: 420,000 mg/kg/12 weeks-intermittent: Liver: other changes; Kidney/Ureter/Bladder: other changes in urine composition, other changes

TDLo (Oral-Rat) 210 g/kg/6 weeks-intermittent: Nutritional and Gross Metabolic: weight loss or decreased weight gain; Liver: changes in liver weight; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: transaminases

TDLo (Oral-Rat) 78 g/kg: female 7-19 day(s) after conception: Reproductive: Effects on Newborn: biochemical and metabolic

TDLo (Oral-Rat) 4 g/kg: female 13 day(s) after conception: Reproductive: Effects on Embryo or Fetus: cytological changes (including somatic cell genetic material)

TDLo (Oral-Rat) 322 g/kg: male 35 day(s) pre-mating: Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count), testes, epididymis, sperm duct

TDLo (Oral-Rat) 12 g/kg: female 9-12 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)

TDLo (Oral-Rat) 132 g/kg: female 1-22 day(s) after conception: Reproductive: Maternal Effects: parturition; Effects on Newborn: growth statistics (e.g.%, reduced weight gain), behavioral

TDLo (Oral-Rat) 24 g/kg: female 14-16 day(s) after conception: Reproductive: Specific Developmental Abnormalities: Central Nervous System, other developmental abnormalities

TDLo (Oral-Rat) 354 g/kg: lactating female 10 day(s) post-birth: Reproductive: Effects on Newborn: biochemical and metabolic

TDLo (Oral-Rat) 4 g/kg: female 6-15 day(s) after conception: Reproductive: Specific Developmental Abnormalities: eye/ear, urogenital system

TDLo (Oral-Rat) 44 g/kg: female 7-17 day(s) after conception: Reproductive: Specific Developmental Abnormalities: musculoskeletal system, urogenital system

TDLo (Oral-Rat) 35,295 mg/kg: female 1-15 day(s) after conception: Reproductive: Fertility: female fertility index (e.g. # females pregnant per # sperm positive females; # females pregnant per # females mated), pre-implantation mortality (e.g. reduction in number of implants per female; total number of implants per corpora lutea), post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants)

TDLo (Oral-Rat) 191,220 mg/kg: female 2-20 day(s) after conception: Reproductive: Specific Developmental Abnormalities: Central Nervous System; Effects on Newborn: behavioral; Effects on Newborn: other postnatal measures or effects

TDLo (Oral-Rat) 30 g/kg: female 1-20 day(s) after conception: Reproductive: Specific Developmental Abnormalities: Central Nervous System; Effects on Newborn: other neonatal measures or effects

TDLo (Oral-Rat) 22.5 g/kg: female 11-20 day(s) after conception: Reproductive: Specific Developmental Abnormalities: Central Nervous System; Effects on Newborn: other postnatal measures or effects

ALKYL ALCOHOL (continued):

TDLo (Oral-Rat) 40 g/kg: female 1-20 day(s) after conception: Reproductive: Specific Developmental Abnormalities: other developmental abnormalities, Central Nervous System

TDLo (Oral-Rat) 42 g/kg: female 1-21 day(s) after conception: Reproductive: Specific Developmental Abnormalities: other developmental abnormalities

TDLo (Oral-Rat) 240 g/kg: male 30 day(s) pre-mating: Reproductive: Specific Developmental Abnormalities: urogenital system

TDLo (Oral-Rat) 65 g/kg: female 7-19 day(s) after conception: Reproductive: Specific Developmental Abnormalities: endocrine system

TDLo (Oral-Rat) 75 g/kg: female 7-21 day(s) after conception: Reproductive: Specific Developmental Abnormalities: endocrine system

TDLo (Oral-Rat) 112 mg/kg: male 14 day(s) pre-mating: Reproductive: Effects on Newborn: biochemical and metabolic

TDLo (Oral-Rat) 147 mg/kg: female 1-21 day(s) after conception: Reproductive: Specific Developmental Abnormalities: endocrine system; Effects on Newborn: delayed effects

TDLo (Oral-Rat) 60,000 mg/kg: lactating female 1-30 day(s) post-birth: Reproductive: Specific Developmental Abnormalities: endocrine system; Effects on Newborn: biochemical and metabolic, delayed effects

TDLo (Oral-Rat) 900 mL/kg: female 19 day(s) pre-mating: 21 day(s) post-birth: Reproductive: Specific Developmental Abnormalities: Central Nervous System, Effects on Newborn: growth statistics (e.g.%, reduced weight gain), biochemical and metabolic

TDLo (Oral-Rat) 110 g/kg: female 1-23 day(s) after conception: Reproductive: Effects on Newborn: behavioral, physical

TDLo (Oral-Rat) 135 g/kg: female 1 day(s) after conception: 7 day(s) post-birth: Reproductive: Effects on Newborn: behavioral, physical

TDLo (Oral-Rat) 210 g/kg: female 6-20 day(s) after conception: Reproductive: Fertility: abortion; Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus), growth statistics (e.g.%, reduced weight gain)

TDLo (Oral-Rat) 90 mg/kg: male 30 day(s) pre-mating: Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count), other effects on male; Fertility: male fertility index (e.g. # males impregnating females per # males exposed to fertile non-pregnant females)

TDLo (Oral-Rat) 30 g/kg: female 16-20 day(s) after conception: Reproductive: Effects on Newborn: other postnatal measures or effects

TDLo (Oral-Rat) 120 g/kg: female 1-20 day(s) after conception: Reproductive: Effects on Newborn: other postnatal measures or effects

TDLo (Oral-Rat) 45 g/kg: female 15-22 day(s) after conception lactating female 7 day(s) post-birth: Reproductive: Effects on Newborn: behavioral

TDLo (Oral-Rat) 45 g/kg: female 15-22 day(s) after conception lactating female 7 day(s) post-birth: Reproductive: Effects on Newborn: behavioral, other postnatal measures or effects

TDLo (Oral-Rat) 10,400 mg/kg: female 7-19 day(s) after conception: Reproductive: Tumorigenic effects: transplacental; Effects on Newborn: delayed effects

TDLo (Oral-Rat) 110 g/kg: female 10-20 day(s) after conception: Reproductive: Effects on Newborn: viability index (e.g., # alive at day 4 per # born alive), weaning or lactation index (e.g., # alive at weaning per # alive at day 4), biochemical and metabolic

TDLo (Oral-Rat) 120 g/kg: female 6-15 day(s) after conception: Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants), litter size (e.g. # fetuses per litter; measured before birth); Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)

TDLo (Oral-Rat) 16.25 g/kg: female 7-19 day(s) after conception: Reproductive: Maternal Effects: other effects; Tumorigenic effects: other reproductive system tumors; Effects on Newborn: biochemical and metabolic

TDLo (Oral-Rat) 54 g/kg: female 6-14 day(s) after conception: Reproductive: Maternal Effects: other effects

TDLo (Oral-Rat) 36.5 g/kg: female 30 days pre mating: 21 days post-birth: Reproductive: Fertility: litter size (e.g. # fetuses per litter; measured before birth); Effects on Newborn: behavioral

11. TOXICOLOGICAL INFORMATION (Continued)

TOXICITY DATA (continued):

ALKYL ALCOHOL (continued):

TDLo (Oral-Rat) 292 g/kg: female 30 day(s) pre-mating; 21 day(s) post-birth: Reproductive: Fertility: litter size (e.g. # fetuses per litter; measured before birth); Effects on Newborn: biochemical and metabolic, behavioral

TDLo (Oral-Rat) 94,500 mg/kg: female 1-21 day(s) after conception: Reproductive: Effects on Newborn: stillbirth, growth statistics (e.g.%, reduced weight gain), behavioral

TDLo (Oral-Rat) 94,500 mg/kg: female 1-21 day(s) after conception: Reproductive: Effects on Newborn: physical, other postnatal measures or effects

TDLo (Oral-Rat) 99,000 mg/kg: Multi-generations: Reproductive: Effects on Newborn: biochemical and metabolic

TDLo (Oral-Mouse) 5 g/kg: Brain and Coverings: other degenerative changes; Vascular: other changes; Liver: other changes

TDLo (Oral-Mouse) 5 g/kg: Blood: other changes

TDLo (Oral-Mouse) 5 g/kg: Liver: changes in liver weight

TDLo (Oral-Mouse) 1 g/kg: Behavioral: changes in motor activity (specific assay), aggression

TDLo (Oral-Mouse) 6 g/kg: Liver: other changes; Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol)

TDLo (Oral-Mouse) 4 g/kg: Endocrine: other changes; Blood: changes in spleen; Immunological Including Allergic: decrease in cellular immune response

TDLo (Oral-Mouse) 1000 mg/kg: Behavioral: aggression

TDLo (Oral-Mouse) 5000 mg/kg: Endocrine: other changes; Blood: changes in other cell count (unspecified)

TDLo (Oral-Mouse) 6000 mg/kg: Changes in spleen

TDLo (Oral-Mouse) 5000 mg/kg: Liver: other changes

TDLo (Oral-Mouse) 6000 mg/kg: Immunological Including Allergic: decrease in cellular immune response

TDLo (Oral-Mouse) 1.5 mg/kg: Behavioral: alteration of classical conditioning

TDLo (Oral-Mouse) 3500 g/kg/10 weeks-continuous: Reproductive: Fertility: male fertility index (e.g. # males impregnating females per # males exposed to fertile non-pregnant females)

TDLo (Oral-Mouse) 2100 g/kg/5 weeks-continuous: Reproductive: Fertility: male fertility index (e.g. # males impregnating females per # males exposed to fertile non-pregnant females)

TDLo (Oral-Mouse) 1750 g/kg/5 weeks-continuous: Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count)

TDLo (Oral-Mouse) 448 g/kg/4 weeks-continuous: Behavioral: fluid intake

TDLo (Oral-Mouse) 24,000 mL/kg/120 days-continuous: Kidney/Ureter/Bladder: other changes in urine composition

TDLo (Oral-Mouse) 36,000 mL/kg/180 days-continuous: Liver: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: other Enzymes

TDLo (Oral-Mouse) 36,000 mL/kg/180 days-continuous: Liver: other changes; Nutritional and Gross Metabolic: changes in iron; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: other Enzymes

TDLo (Oral-Mouse) 1120 g/kg/4 weeks-intermittent: Blood: changes in spleen; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TDLo (Oral-Mouse) 98,800 mg/kg/13 days-continuous: Behavioral: withdrawal, alteration of classical conditioning

TDLo (Oral-Mouse) 295.2 g/kg/10 weeks-intermittent

TDLo (Oral-Mouse) Cardiac: cardiomyopathy including infarction, other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: phosphokinase

TDLo (Oral-Mouse) 480,000 mg/kg/60 days-continuous: Gastrointestinal: changes in structure or function of endocrine pancreas

TDLo (Oral-Mouse) 396 g/kg/198 days-continuous: Liver: other changes; Biochemical: Metabolism (Intermediary): porphyrin including bile pigments

TDLo (Oral-Mouse) 396 g/kg/198 days-continuous: Liver: other changes; Nutritional and Gross Metabolic: changes in iron; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: multiple enzyme effects

ALKYL ALCOHOL (continued):

TDLo (Oral-Mouse) 15,000 mg/kg/2 days-intermittent: Liver: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: transaminases, Metabolism (Intermediary): other

TDLo (Oral-Mouse) 35 g/kg/5 weeks-intermittent: Liver changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: hepatic microsomal mixed oxidase (dealkylation, hydroxylation, etc.), Metabolism (Intermediary): other proteins

TDLo (Oral-Mouse) 95,200 mg/kg/4 weeks-intermittent: Behavioral: food & fluid intake

TDLo (Oral-Mouse) 78,400 mg/kg/4 weeks-intermittent: Liver: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: cytochrome oxidases (including oxidative phosphorylation)

TDLo (Oral-Mouse) 496,000 mg/kg/80 weeks-intermittent: Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (Oral-Mouse) 2,920,000 mg/kg/2 years-intermittent: Liver: other changes, tumors, changes in liver weight

TDLo (Oral-Mouse) 5,256,000 mg/kg/2 years-intermittent: Liver: tumors

TDLo (Oral-Mouse) 320 mg/kg/50 weeks-intermittent: Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Liver: tumors; Blood: lymphoma, including Hodgkin's disease

TDLo (Oral-Mouse) 162 g/kg: female 11-19 day(s) after conception: Reproductive: Effects on Embryo or Fetus: extra-embryonic structures (e.g., placenta, umbilical cord).

TDLo (Oral-Mouse) 21 g/kg: female 1-21 days after conception: Reproductive: Effects on Newborn: biochemical and metabolic, behavioral

TDLo (Oral-Mouse) 5800 mg/kg: female 7 day(s) after conception: Reproductive: Specific Developmental Abnormalities: Central Nervous System, eye/ear

TDLo (Oral-Mouse) 75,600 mg/kg: female 5-11 day(s) after conception: Reproductive: Specific Developmental Abnormalities: urogenital system; Effects on Newborn: live birth index (measured after birth), growth statistics (e.g.%, reduced weight gain)

TDLo (Oral-Mouse) 5500 mg/kg: female 9 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)

TDLo (Oral-Mouse) 1680 g/kg: male 70 day(s) pre-mating: Reproductive: Paternal Effects: spermatogenesis (incl. genetic material, sperm morphology, motility, and count)

TDLo (Oral-Mouse) 700 g/kg: male 7 day(s) pre-mating female 7 day(s) pre-mating 21 day(s) after conception: Reproductive: Effects on Newborn: live birth index (measured after birth)

TDLo (Oral-Mouse) 20 g/kg: Multi-generations: Reproductive: Specific Developmental Abnormalities: hepatobiliary system, urogenital system; Effects on Newborn: growth statistics (e.g.%, reduced weight gain)TDLo (Oral-Mouse) 20 g/kg: Multi-generations: Reproductive: Effects on Newborn: growth statistics (e.g.%, reduced weight gain)

TDLo (Oral-Mouse) 20 g/kg: Multi-generations: Reproductive: Specific Developmental: Abnormalities: urogenital system

TDLo (Oral-Mouse) 50 g/kg: female 6-15 day(s) after conception: Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants); Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus), fetal death

TDLo (Oral-Mouse) 50 g/kg: female 6-15 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus); Specific Developmental Abnormalities: musculoskeletal system

TDLo (Oral-Mouse) 60 g/kg: female 6-15 day(s) after conception: Reproductive: Specific Developmental Abnormalities: Central Nervous System

TDLo (Oral-Mouse) 102 mg/kg: Behavioral: alteration of operant conditioning

TDLo (Oral-Mouse) 4.8 mg/kg: Behavioral: abuse

TDLo (Oral-Mouse) 210 g/kg/5 weeks-intermittent: Liver: fatty liver degeneration

TDLo (Oral-Mouse) 260 g/kg/2 years-intermittent: Behavioral: alteration of classical conditioning, aggression

TDLo (Oral-Mouse) 78 g/kg: female 4-23 week(s) after conception: Reproductive: Fertility: abortion

ALKYL ALCOHOL (continued):

TDLo (Oral-Mouse) 400 mg/kg: female 2-21 week(s) after conception: Reproductive: Effects on Newborn: growth statistics (e.g.%, reduced weight gain)

TDLo (Oral-Mouse) 206 g/kg: female 90 day(s) pre-mating: Reproductive: Maternal Effects: menstrual cycle changes or disorders

TDLo (Oral-Mouse) 32,400 mg/kg: female 2-19 week(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus); Specific Developmental Abnormalities: Central Nervous System, craniofacial (including nose and tongue)

TDLo (Oral-Mouse) 43,200 mg/kg: female 1-24 week(s) after conception: Reproductive: Effects on Embryo or Fetus: extra-embryonic structures (e.g., placenta, umbilical cord)

TDLo (Oral-Rabbit) 3945 mg/kg: female 1 day(s) pre-mating: Reproductive: Fertility: female fertility index (e.g. # females pregnant per # sperm positive females; # females pregnant per # females mated)

TDLo (Oral-Rabbit) 3750 mg/kg: female 1 day(s) pre-mating: Reproductive: Fertility: other measures of fertility

TDLo (Oral-Dog) 2 g/kg: Behavioral: changes in psychophysiological tests

TDLo (Oral-Dog) 560 mL/kg/10 weeks-continuous: Brain and Coverings: other degenerative changes; Cardiac changes; Liver changes

TDLo (Oral-Dog) 21,600 mg/kg: female 1-60 days after conception: Effects on Newborn: stillbirth, live birth index (measured after birth), growth statistics (e.g.%, reduced weight gain)

TDLo (Oral-Dog) 260 g/kg: female 1-62 day(s) after conception: Reproductive: Effects on Newborn: viability index (e.g., # alive at day 4 per # born alive)

TDLo (Oral-Dog) 221 g/kg: female 1-47 day(s) after conception: Reproductive: Fertility: abortion

TDLo (Oral-Guinea Pig) 204 g/kg/68 days-continuous: Reproductive: Other Maternal Effects

TDLo (Oral-Guinea Pig) 90 g/kg: female 1-68 day(s) after conception: Reproductive: Effects on Newborn: growth statistics (e.g.%, reduced weight gain), behavioral

TDLo (Oral-Guinea Pig) 240 g/kg: female 2-61 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus); Specific Developmental Abnormalities: Central Nervous System

TDLo (Oral-Guinea Pig) 264 g/kg: female 2-67 day(s) after conception: Reproductive: Effects on Newborn: growth statistics (e.g.%, reduced weight gain), biochemical and metabolic, physical

TDLo (Oral-Guinea Pig) 72 g/kg: female 45-62 day(s) after conception: Reproductive: Specific Developmental Abnormalities: craniofacial (including nose and tongue)

TDLo (Oral-Guinea Pig) 76,000 mg/kg: female 43-62 day(s) after conception: Reproductive: Maternal Effects: other effects; Effects on Newborn: other neonatal measures or effects; Effects on Embryo or Fetus: other effects to embryo

TDLo (Oral-Guinea Pig) 264,000 mg/kg: female 2-67 day(s) after conception: Reproductive: Maternal Effects: other effects; Specific Developmental Abnormalities: Central Nervous System; Reproductive: Effects on Newborn: physical

TDLo (Oral-Guinea Pig) 264 g/kg: female 2-67 day(s) after conception: Reproductive: Effects on Newborn: biochemical and metabolic, other postnatal measures or effects

TDLo (Oral-Guinea Pig) 272 g/kg: female 2-67 day(s) after conception: Reproductive: Effects on Newborn: other postnatal measures or effects, delayed effects

TDLo (Oral-Guinea Pig) 57 g/kg: female 43-62 days after conception: Reproductive: Effects on Newborn: growth statistics (e.g.%, reduced weight gain)

TDLo (Oral-Guinea Pig) 204 g/kg: female 0-67 day(s) after conception: Reproductive: Specific Developmental Abnormalities: Central Nervous System; Effects on Newborn: behavioral

TDLo (Oral-Guinea Pig) 264 g/kg: female 2-67 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus); Effects on Newborn: behavioral

TDLo (Oral-Pig) 2648 g/kg: female 78 week(s) pre-mating 1-16 week(s) after conception: Reproductive: Effects on Newborn: live birth index (measured after birth), growth statistics (e.g.%, reduced weight gain)

11. TOXICOLOGICAL INFORMATION (Continued)

TOXICITY DATA (continued):

ALKYL ALCOHOL (continued):

TDLo (Oral-Hamster) 512 mg/kg/30 days-continuous: Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: cytochrome oxidases (including oxidative phosphorylation), Enzyme inhibition, induction, or change in blood or tissue levels: dehydrogenases

TDLo (Oral-Hamster) 559 mg/kg/30 days-continuous: Liver: changes in liver weight; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: cytochrome oxidases (including oxidative phosphorylation), Enzyme inhibition, induction, or change in blood or tissue levels: dehydrogenases

TDLo (Oral-Pigeon) 1 g/kg: Behavioral: changes in psychophysiological tests

TDLo (Oral-Mammal-Species Unspecified) 4000 mg/kg: Endocrine: other changes; Immunological Including Allergic: decrease in humoral immune response

TDLo (Oral-Mammal-Species Unspecified) 112,000 mg/kg/28 days-intermittent: Immunological Including Allergic: decrease in cellular immune response

TDLo (Oral-Mammal-Species Unspecified) 31,500 mg/kg: female 15-35 day(s) after conception: Reproductive: Specific Developmental Abnormalities: craniofacial (including nose and tongue)

TDLo (Intraperitoneal-Rat) 2.45 g/kg: Behavioral: altered sleep time (including change in righting reflex)

TDLo (Intraperitoneal-Rat) 3000 mg/kg: Nutritional and Gross Metabolic: body temperature decrease

TDLo (Intraperitoneal-Rat) 3500 mg/kg: Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: dehydrogenases

TDLo (Intraperitoneal-Rat) 1000 mg/kg: Brain and Coverings: other degenerative changes; Liver: other changes; Biochemical: Metabolism (Intermediary): lipids including transport

TDLo (Intraperitoneal-Rat) 0.5 g/kg: Behavioral: changes in psychophysiological tests

TDLo (Intraperitoneal-Rat) 3000 mg/kg: Behavioral: sleep

TDLo (Intraperitoneal-Rat) 2 g/kg: Brain and Coverings: other degenerative changes; Endocrine: differential effect of sex or castration on observed toxicity; Biochemical: Metabolism (Intermediary): other

TDLo (Intraperitoneal-Rat) 1 g/kg: Sense Organs and Special Senses (Taste): change in function

TDLo (Intraperitoneal-Rat) 1.5 g/kg: Biochemical: Neurotransmitters or modulators (putative): dopamine in striatum

TDLo (Intraperitoneal-Rat) 1.25 mg/kg: Behavioral: changes in motor activity (specific assay)

TDLo (Intraperitoneal-Rat) 2.4 mg/kg: Brain and Coverings: other degenerative changes; Biochemical: Neurotransmitters or modulators (putative): dopamine at other sites

TDLo (Intraperitoneal-Rat) 2700 mg/kg: Behavioral: ataxia

TDLo (Intraperitoneal-Rat) 500 mg/kg: Behavioral: analgesia

TDLo (Intraperitoneal-Rat) 0.25 g/kg: Behavioral: alteration of operant conditioning

TDLo (Intraperitoneal-Rat) 0.5 g/kg: Behavioral: changes in motor activity (specific assay), alteration of operant conditioning

TDLo (Intraperitoneal-Rat) 1000 mg/kg: Behavioral: food intake (animal)

TDLo (Intraperitoneal-Rat) 2000 mg/kg: Brain and Coverings: other degenerative changes; Biochemical: Metabolism (Intermediary): other

TDLo (Intraperitoneal-Rat) 2 g/kg: Brain and Coverings: other degenerative changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: phosphokinase

TDLo (Intraperitoneal-Rat) 4.8 mg/kg/4 days-intermittent: Behavioral: changes in motor activity (specific assay)

TDLo (Intraperitoneal-Rat) 15 g/kg: female 8-13 day(s) after conception: Reproductive: Effects on Newborn: behavioral, physical

TDLo (Intraperitoneal-Rat) 2240 mg/kg: female 9-12 day(s) after conception: Reproductive: Effects on Embryo or Fetus: extra-embryonic structures (e.g., placenta, umbilical cord)

TDLo (Intraperitoneal-Rat) 600 mg/kg: female 8-15 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)

TDLo (Intraperitoneal-Rat) 3600 mg/kg: female 7-8 day(s) after conception: Reproductive: Effects on Newborn: behavioral

ALKYL ALCOHOL (continued):

TDLo (Intraperitoneal-Rat) 600 mg/kg: female 8-15 day(s) after conception: Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants); Effects on Embryo or Fetus: extra-embryonic structures (e.g., placenta, umbilical cord), fetotoxicity (except death, e.g., stunted fetus)

TDLo (Intraperitoneal-Rat) 600 mg/kg: female 8-15 day(s) after conception: Reproductive: Specific Developmental Abnormalities: craniofacial (including nose and tongue), musculoskeletal system

TDLo (Intraperitoneal-Rat) 11.25 mg/kg: female 7-9 day(s) after conception: Reproductive: Specific Developmental Abnormalities: Central Nervous System, craniofacial (including nose and tongue), other developmental abnormalities

TDLo (Intraperitoneal-Mouse) 4.2 g/kg: Nutritional and Gross Metabolic: body temperature decrease

TDLo (Intraperitoneal-Mouse) 1.75 g/kg: Behavioral: ataxia

TDLo (Intraperitoneal-Mouse) 0.5 g/kg: Behavioral: changes in motor activity (specific assay)

TDLo (Intraperitoneal-Mouse) 4.25 g/kg: Behavioral: sleep

TDLo (Intraperitoneal-Mouse) 2 mg/kg: Brain and Coverings: recordings from specific areas of CNS

TDLo (Intraperitoneal-Mouse) 1.5 mg/kg: Behavioral: anti-anxiety

TDLo (Intraperitoneal-Mouse) 2 g/kg: Behavioral: alteration of operant conditioning, changes in psychophysiological tests

TDLo (Intraperitoneal-Mouse) 2.5 g/kg: Behavioral: somnolence (general depressed activity), alteration of operant conditioning, changes in psychophysiological tests

TDLo (Intraperitoneal-Mouse) 2 mg/kg: Behavioral: changes in motor activity (specific assay), alteration of classical conditioning

TDLo (Intraperitoneal-Mouse) 1000 mg/kg: Liver: other changes

TDLo (Intraperitoneal-Mouse) 1 g/kg: Behavioral: anti-anxiety, changes in psychophysiological tests

TDLo (Intraperitoneal-Mouse) 2.0 g/kg: Behavioral: ataxia Nutritional and Gross Metabolic: body temperature decrease

TDLo (Intraperitoneal-Mouse) 3.8 g/kg: Behavioral: altered sleep time (including change in righting reflex)

TDLo (Intraperitoneal-Mouse) 2.25 g/kg: Behavioral: alteration of operant conditioning

TDLo (Intraperitoneal-Mouse) 0.25 g/kg: Behavioral: analgesia

TDLo (Intraperitoneal-Mouse) 2 g/kg: Behavioral: changes in psychophysiological tests

TDLo (Intraperitoneal-Mouse) 4 g/kg: Behavioral: withdrawal

TDLo (Intraperitoneal-Mouse) 12 mg/kg/3 days-intermittent: Behavioral: alteration of classical conditioning

TDLo (Intraperitoneal-Mouse) 4 g/kg/8 days-intermittent: Behavioral: alteration of classical conditioning, changes in psychophysiological tests

TDLo (Intraperitoneal-Mouse) 5800 mg/kg: female 10 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus); Specific Developmental Abnormalities: musculoskeletal system

TDLo (Intraperitoneal-Mouse) 5800 mg/kg: female 7 day(s) after conception: Reproductive: Specific Developmental Abnormalities: Central Nervous System, eye/ear, craniofacial (including nose and tongue).

TDLo (Intraperitoneal-Mouse) 5622 µg/kg: female 10 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetal death; Specific Developmental Abnormalities: eye/ear, musculoskeletal system

TDLo (Intraperitoneal-Mouse) 4 mg/kg: female 10 day(s) after conception: Reproductive: Effects on Embryo or Fetus: cytological changes (including somatic cell genetic material)

TDLo (Intraperitoneal-Mouse) 4300 mg/kg: female 10 day(s) after conception: Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants)

TDLo (Intraperitoneal-Mouse) 2.9 g/kg: female 8 day(s) after conception: Reproductive: Effects on Embryo or Fetus: cytological changes (including somatic cell genetic material)

ALKYL ALCOHOL (continued):

TDLo (Intraperitoneal-Mouse) 15 mg/kg: female 6-8 day(s) after conception: Reproductive: Specific Developmental Abnormalities: eye/ear, craniofacial (including nose and tongue), other developmental abnormalities

TDLo (Intraperitoneal-Mouse) 22.8 g/kg: female 6-8 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus); Specific Developmental Abnormalities: Central Nervous System, craniofacial (including nose and tongue)

TDLo (Intraperitoneal-Mouse) 22.8 g/kg: female 6-8 day(s) after conception: Reproductive: Effects on Embryo or Fetus: other effects to embryo; Specific Developmental Abnormalities: eye/ear

TDLo (Intraperitoneal-Mouse) 22.8 g/kg: female 6-8 day(s) after conception: Reproductive: Specific Developmental Abnormalities: craniofacial (including nose and tongue), other developmental abnormalities

TDLo (Intravenous-Rat) 0.5 g/kg: Brain and Coverings: recordings from specific areas of CNS

TDLo (Intravenous-Rat) 4 g/kg: female 6-7 day(s) after conception: Reproductive: Effects on Embryo or Fetus: extra-embryonic structures (e.g., placenta, umbilical cord), other effects to embryo; Specific Developmental Abnormalities: musculoskeletal system

TDLo (Intravenous-Rat) 3 g/kg: female 6-7 day(s) after conception: Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants)

TDLo (Intravenous-Rat) 4 g/kg: female 6-7 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus); Specific Developmental Abnormalities: musculoskeletal system, other developmental abnormalities

TDLo (Intravenous-Mouse) 3 g/kg: Behavioral: sleep

TDLo (Intravenous-Mouse) 3 g/kg: Behavioral: sleep, tolerance

TDLo (Intravenous-Rabbit) 15 mg/kg: female 15-29 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus), other effects to embryo

TDLo (Intravenous-Mammal-Domestic) 94 g/kg: female 14-21 week(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)

TDLo (Intravenous-Mammal-Domestic) 40 g/kg: female 14-17 week(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus); Effects on Newborn: biochemical and metabolic

TDLo (Intravenous-Mammal-Domestic) 1 g/kg: female 18 week(s) after conception: Reproductive: Specific Developmental Abnormalities: respiratory system

TDLo (Intravenous-Mammal-Domestic) 29,000 mg/kg: female 106-134 day(s) after conception: Reproductive: Maternal Effects: other effects; Effects on Newborn: other neonatal measures or effects, behavioral

TDLo (Intracerebral-Rat) 363.6 µg/kg: Behavioral: alteration of operant conditioning

TDLo (Intracerebral-Rat) 106 µg/kg: Behavioral: changes in motor activity (specific assay)

TDLo (Intracerebral-Rat) 5 mg/kg: female 1 day(s) pre-mating: Reproductive: Fertility: other measures of fertility

TDLo (Intramuscular-Rat) 420 g/kg/6 weeks-intermittent: Liver: hepatitis (hepatocellular necrosis), diffuse, fatty liver degeneration; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation

TDLo (Intramuscular-Mouse) 42 g/kg/14 days-intermittent: Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: transaminases; Liver: other changes

TDLo (Intramuscular-Mouse) 63 g/kg/21 days-intermittent: Liver: fatty liver degeneration, liver function tests impaired

TDLo (Intramuscular-Non-Mammalian Species) 0.1 g/kg: Cardiac: other changes Musculoskeletal; other changes

TDLo (Parenteral-Rat) 50,000 mg/kg/50 days-intermittent: Liver: hepatitis (hepatocellular necrosis), zonal; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: hepatic microsomal mixed oxidase (dealkylation, hydroxylation, etc.), transaminases

11. TOXICOLOGICAL INFORMATION (Continued)

TOXICITY DATA (continued):

ALKYL ALCOHOL (continued):

TDLo (Intratesticular-Rat) 400 mg/kg; male 1 day(s) pre-mating; Reproductive: Fertility: male fertility index (e.g. # males impregnating females per # males exposed to fertile non-pregnant females)

TDLo (Intratesticular-Dog) 100 mg/kg; male 1 day(s) pre-mating; Reproductive: Paternal Effects: testes, epididymis, sperm duct

TDLo (Subcutaneous-Mouse) 5 g/kg; Liver: hepatitis (hepatocellular necrosis), zonal

TDLo (Subcutaneous-Mouse) 5000 mg/kg/20 days-intermittent; Liver: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels; other Enzymes

TDLo (Intrauterine-Rat) 2400 mg/kg; female 10 day(s) after conception; Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants)

TDLo (Rectal-Mouse) 120 g/kg/18 weeks-intermittent; Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Gastrointestinal: tumors; Liver: tumors

TDLo (Multiple Routes-Rat) 642 g/kg; female 1-21 day(s) after conception lactating female 23 day(s) post-birth; Reproductive: Maternal Effects: parturition; Effects on Newborn: weaning or lactation index (e.g., # alive at weaning per # alive at day 4), growth statistics (e.g.%, reduced weight gain)

TDLo (Multiple Routes-Rat) 373 g/kg; lactating female 23 day(s) post-birth; Reproductive: Effects on Newborn: behavioral, physical

TDLo (Unreported-Rat) 3 g/kg; Brain and Coverings: other degenerative changes; Biochemical: Metabolism (Intermediary): other proteins

TDLo (Unreported-Rat) 60 g/kg; female 9-14 day(s) after conception; Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants); Effects on Embryo or Fetus: fetal death

TD (Oral-Rat) 400 g/kg/57 weeks-intermittent; Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Gastrointestinal: tumors

TCLo (Inhalation-Rat) 12,000 mg/m³/8 hours; Behavioral: general anesthetic

TCLo (Inhalation-Rat) 4930 mg/m³

TCLo (Inhalation-Rat) 1110 mg/m³/4 hours; Skin and Appendages: primary irritation (after topical exposure)

TCLo (Inhalation-Rat) 8000 mg/m³/4 hours/17 weeks-intermittent; Brain and Coverings: other degenerative changes; Endocrine: other changes; Immunological Including Allergic: decreased immune response

TCLo (Inhalation-Rat) 6130 ppm/4 weeks-intermittent; Endocrine: changes in thymus weight

TCLo (Inhalation-Rat) 6130 ppm/4 weeks-intermittent; Brain and Coverings: other degenerative changes; Cardiac: changes in heart weight; Endocrine: hyperglycemia

TCLo (Inhalation-Rat) 6130 ppm/4 weeks-intermittent; Biochemical: Metabolism (Intermediary): other

TCLo (Inhalation-Rat) 4930 mg/m³/4 days-intermittent; Peripheral Nerve and Sensation: recording from peripheral motor nerve; Lungs, Thorax, or Respiration: other changes

TCLo (Inhalation-Rat) 4930 mg/m³/8 days-intermittent; Behavioral: alteration of classical conditioning

TCLo (Inhalation-Rat) 4930 mg/m³/14 days-intermittent; Behavioral: changes in motor activity (specific assay)

TCLo (Inhalation-Rat) 1110 mg/m³/14 days-intermittent; Vascular: other changes

TCLo (Inhalation-Rat) 20,000 ppm/7 hours; female 1-22 day(s) after conception; Reproductive: Specific Developmental Abnormalities: other developmental abnormalities

TCLo (Inhalation-Mouse) 50,000 mg/m³/2 hours; Behavioral: alteration of classical conditioning

TCLo (Inhalation-Mouse) 2500 mg/m³/40 minutes; Brain and Coverings: other degenerative changes

TCLo (Inhalation-Mouse) 8000 mg/m³/4 hours/17 weeks-intermittent; Brain and Coverings: other degenerative changes; Endocrine: other changes; Immunological Including Allergic: decreased immune response

TCLo (Inhalation-Guinea Pig) 12,000 mg/m³/8 hours; Behavioral: general anesthetic

TCLo (Inhalation-Rabbit) 2500 mg/m³/40 minutes; Brain and Coverings: other degenerative changes

TCLo (Inhalation-Rabbit) 8000 mg/m³/4 hours/17 weeks-intermittent; Brain and Coverings: other degenerative changes; Endocrine: other changes; Immunological Including Allergic: decreased immune response

DNA Inhibition (Human-Lymphocyte) 220 mmol/L

ALKYL ALCOHOL (continued):

Micronucleus Test (Oral-Human) 817.6 g/kg/6 years-intermittent

Cytogenetic Analysis (Human-Lymphocyte) 2.5 pph/24 hours

Cytogenetic Analysis (Human-Lymphocyte) 1160 gm/L

Cytogenetic Analysis (Human-Fibroblast) 12,000 ppm

Cytogenetic Analysis (Human-Leukocyte) 1 pph/72 hours-continuous

Cytogenetic Analysis (Oral-Human) 49,014 g/kg/25 years

Sister Chromatid Exchange (Human-Lymphocyte) 500 ppm/72 hours-continuous

Mutation in Microorganisms (Bacteria-*Salmonella typhimurium*) 11 pph

Mutation in Microorganisms (Bacteria-*Escherichia coli*) 140 gm/L

Mutation in Microorganisms (Yeast-*Saccharomyces cerevisiae*) 24 pph

Mutation in Microorganisms (Mold-*Aspergillus nidulans*) 20 pph/20 pph

Cytogenetic Analysis (Insect-grasshopper) 500 mmol/L

Cytogenetic Analysis (Oral-Rat) 2 g/kg

Cytogenetic Analysis (Oral-Mouse) 40 g/kg

Cytogenetic Analysis (Hamster-Ovary) 100 ppm

Cytogenetic Analysis (Hamster-Embryo) 1 pph

Cytogenetic Analysis (Hamster-Ovary) 160 mmol/L

Cytogenetic Analysis (Intramuscular-Fish-Not Otherwise Specified) 1 pph

Sex Chromosome Loss and Non-Disjunction (Oral-Mouse) 5 g/kg

Sex Chromosome Loss and Non-Disjunction (Oral-*Drosophila melanogaster*) 10 pph

Sex Chromosome Loss and Non-Disjunction (Mold-*Aspergillus nidulans*) 30 gm/L

Sister Chromatid Exchange (Oral-Mouse) 420 mg/kg/3 weeks

Sister Chromatid Exchange (Hamster-Ovary) 3900 mg/L

DNA Damage (Bacteria-*Salmonella typhimurium*) 15 pph/120 minutes

DNA Damage (Yeast-*Saccharomyces cerevisiae*) 850 mmol/L

DNA Damage (Oral-Rat) 4 g/kg

Mutation Test Systems-Not Otherwise Specified (Intraperitoneal-Rat) 250 g/kg/16 days-continuous

Mutation Test Systems-Not Otherwise Specified (Oral-Rat) 3 g/kg

DNA Repair (Bacteria-*Escherichia coli*) 5 mg/well

DNA Repair (Bacteria-*Salmonella typhimurium*) 15 pph/120 minutes

Micronucleus Test (Intraperitoneal-Mouse) 1240 mg/kg/2 days

Micronucleus Test (Dog-Lymphocyte) 400 µmol/L

Micronucleus Test (Fish-not otherwise specified) 1 pph

Micronucleus Test (Human-Liver) 15 mmol/L/24 hours

DNA Adduct (Oral-Rat) 5 g/kg

DNA Adduct (Oral-Rat) 3 g/kg/7 days

Gene Conversion and Mitotic Recombination (Mold-*Aspergillus nidulans*) 5 pph

Dominant Lethal Test (Oral-Mouse) 3720 mg/kg/3 days

Sperm Morphology (Oral-Mouse) 1500 mg/kg/50 days

Specific Locus Test (Oral-Rat) 56 g/kg/4 weeks

ALIPHATIC AMIDE:

Mutation Test Systems (Non-Mammalian Species Cells) = 500 mmol/L

Cytogenetic Analysis (Non-Mammalian Species Cells) = 500 mmol/L

Standard Draize Test (eye, rabbit) = 100 mg; severe

TDLo (oral, rat) = 910 mg/kg/26 weeks/intermittent; Brain and Coverings: recordings from specific areas of CNS; Liver: liver function tests impaired Kidney, Ureter, Bladder: proteinuria

TDLo (oral, rat) = 2 g/kg/female 7 days after conception; Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants); Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)

TDLo (oral, rat) = 7980 mg/kg/female 7-12 days after conception; Reproductive: Specific Developmental Abnormalities: craniofacial (including nose and tongue); musculoskeletal system

TDLo (inhalation, rat) = 1500 ppm/6 hours/2 weeks/intermittent; Blood: changes in leukocyte (WBC) count; Blood: changes in platelet count; Nutritional and Gross Metabolic: weight loss or decreased weight gain

TDLo (skin, rat) = 1200 mg/kg/female 10-11 days after conception; Reproductive: Effects on Embryo or Fetus: fetal death

ALIPHATIC AMIDE (continued):

TDLo (skin, rabbit) = 910 mg/kg/female 6-18 days after conception; Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants); Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus); Specific Developmental Abnormalities: musculoskeletal system

LD (skin, rat) > 13500 mg/kg

LD₅₀ (oral, rat) = 5577 mg/kg; Autonomic Nervous System: other (direct) parasympathomimetic; Behavioral: ataxia Incontinence

LD₅₀ (intraperitoneal, rat) = 5700 mg/kg

LD₅₀ (subcutaneous, rat) > 4 g/kg

LD₅₀ (oral, mouse) > 3150 mg/kg

LD₅₀ (intraperitoneal, mouse) = 2450 mg/kg

LDLo (skin, rabbit) = 6 g/kg

LDLo (intravenous, dog) = 1500 mg/kg

LD₅₀ (intraperitoneal, guinea pig) = 1250 mg/kg; Autonomic Nervous System: other (direct) parasympathomimetic; Behavioral: somnolence (general depressed activity); Behavioral: convulsions or effect on seizure threshold

LDLo (subcutaneous, frog) = 30 mg/kg

LD₅₀ (oral, mammal) = 3150 mg/kg

ALIPHATIC TRIOL:

Skin Irritancy (rabbit) = 500 mg/24 hours; mild

Eye Irritancy (rabbit) = 126 mg; mild

Eye Irritancy (rabbit) = 500 mg/24 hours; mild

LC₅₀ (inhalation, rat) > 570 mg/m³/1 hour

LD₅₀ (oral, rat) = 12600 mg/kg; general anesthetic, muscle weakness, Liver: other changes

LD₅₀ (oral, mouse) = 4090 mg/kg

LD₅₀ (oral, rabbit) = 27 g/kg

LD₅₀ (oral, guinea pig) = 7750 mg/kg

LD₅₀ (oral, guinea pig) = 7750 mg/kg

LD₅₀ (skin, rabbit) > 10 g/kg

LD₅₀ (intraperitoneal, rat) = 4420 mg/kg; toxic psychosis; Cardiac; other changes; Kidney, Urethra, Bladder: other changes

LD₅₀ (intraperitoneal, mouse) = 8700 mg/kg

LD₅₀ (intravenous, rat) = 5566 mg/kg

LD₅₀ (intravenous, mouse) = 4250 mg/kg

LD₅₀ (intravenous, rabbit) = 53 g/kg

LD₅₀ (subcutaneous, rat) = 100 mg/kg

LD₅₀ (subcutaneous, mouse) = 91 mg/kg

TDLo (oral, rat) = 16800 mg/kg/28 days/continuous; Endocrine: changes in adrenal weight

TDLo (oral, rat) = 96 g/kg/30 days/intermittent; Blood: changes in leukocyte (WBC) count, changes in serum composition (e.g. TP, bilirubin, cholesterol); Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: true cholinesterase

TDLo (oral, rat) = 100 mg/kg/male 1 day pre-mating; Reproductive: Fertility: post-implantation mortality

TDLo (intratesticular, rat) = 280 mg/kg/male 2 days pre-mating; Reproductive: Paternal Effects: spermatogenesis, testes, epididymis, sperm duct

TDLo (intratesticular, rat) = 1600 mg/kg/male 1 day pre-mating; Reproductive: Fertility: male fertility index

TDLo (intratesticular, rat) = 862 mg/kg/male 1 day pre-mating; Reproductive: Paternal Effects: spermatogenesis

TDLo (intratesticular, monkey) = 119 mg/kg/male 1 day pre-mating; Reproductive: Paternal Effects: spermatogenesis, testes, epididymis, sperm duct

TDLo (oral, mouse) = 560 g/kg/8 weeks/continuous; Lungs, Thorax, or Respiration: structural or functional change in trachea or bronchi

DNA Inhibition (human, lymphocyte) = 200 mmol/L

Cytogenetic Analysis (oral, rat) = 1 g/kg

REFINED HYDROCARBON:

TDLo (oral, rat) = 92 g/kg/92 days/continuous; Liver: changes in liver weight; Blood: changes in leukocyte (WBC) count; Nutritional and Gross Metabolic: weight loss or decreased weight gain

GLYCOL HOMOPOLYMER:

Standard Draize Test (skin, human) = 500 mg/48 hours

LD₅₀ (oral, rat) = 27,500 mg/kg; Kidney, Ureter, Bladder: other changes

LD₅₀ (oral, rat) = 32 g/kg

LD₅₀ (oral, rat) = 22 g/kg

LD₅₀ (oral, rat) = 30,200 mg/kg

LD₅₀ (oral, rat) = 44,200 mg/kg; Kidney, Ureter, Bladder: other changes

LD₅₀ (oral, rat) = 600 mg/kg

LD₅₀ (oral, rat) = 30 g/kg

LD₅₀ (oral, rat) = 31,600 mg/kg

LD₅₀ (oral, rat) = 31,640 mg/kg; Kidney, Ureter, Bladder: other changes

LD₅₀ (oral, rat) = 51,200 mg/kg; Kidney, Ureter, Bladder: other changes

11. TOXICOLOGICAL INFORMATION (Continued)

TOXICITY DATA (continued):

GLYCOL HOMOPOLYMER (continued):

LD₅₀ (oral, rat) = 50 g/kg
 LD₅₀ (oral, rat) = 1054 mg/kg
 LD₅₀ (oral, rat) = 45 g/kg
 LD₅₀ (oral, rat) = 51,310 mg/kg; Kidney, Ureter, Bladder: other changes
 LD₅₀ (oral, rat) > 4 g/kg
 LD₅₀ (intraperitoneal, rat) = 9 g/kg; Kidney, Ureter, Bladder: other changes
 LD₅₀ (intraperitoneal, rat) = 9708 mg/kg
 LD₅₀ (intraperitoneal, rat) = 16 g/kg; Kidney, Ureter, Bladder: other changes
 LD₅₀ (intraperitoneal, rat) = 17 g/kg
 LD₅₀ (intraperitoneal, rat) = 6790 mg/kg; Kidney, Ureter, Bladder: other changes
 LD₅₀ (intraperitoneal, rat) = 15,390 mg/kg; Kidney, Ureter, Bladder: other changes
 LD₅₀ (intraperitoneal, rat) = 473 mg/kg
 LD₅₀ (intraperitoneal, rat) = 14,100 mg/kg
 LD₅₀ (intraperitoneal, rat) = 15,570 mg/kg; Kidney, Ureter, Bladder: other changes
 LD₅₀ (intraperitoneal, rat) = 12,600 mg/kg; Kidney, Ureter, Bladder: other changes
 LD₅₀ (subcutaneous, rat) = 16 g/kg; Kidney, Ureter, Bladder: other changes
 LD₅₀ (intravenous, rat) = 7500 mg/kg
 LD₅₀ (intravenous, rat) = 8550 mg/kg
 LD₅₀ (intravenous, rat) = 8 g/kg; Blood: change in clotting factors
 LD₅₀ (intravenous, rat) = 7130 mg/kg
 LD₅₀ (intravenous, rat) = 13 g/kg; Kidney, Ureter, Bladder: other changes
 LD₅₀ (intravenous, rat) = 7900 µg/kg
 LD₅₀ (oral, mouse) = 31 g/kg
 LD₅₀ (oral, mouse) = 28,915 mg/kg
 LD₅₀ (oral, mouse) = 36 g/kg
 LD₅₀ (intraperitoneal, mouse) = 2 g/kg; Lungs, Thorax, or Respiration: respiratory depression
 LD₅₀ (intraperitoneal, mouse) = 8 g/kg; Lungs, Thorax, or Respiration: respiratory depression
 LD₅₀ (intraperitoneal, mouse) = 9700 mg/kg
 LD₅₀ (intravenous, mouse) = 16 g/kg; Kidney, Ureter, Bladder: other changes
 LD₅₀ (subcutaneous, mouse) = 18 g/kg; Kidney, Ureter, Bladder: other changes
 LD₅₀ (oral, rabbit) = 17,300 mg/kg; Kidney, Ureter, Bladder: other changes
 LD₅₀ (oral, rabbit) = 26,800 mg/kg; Kidney, Ureter, Bladder: other changes
 LD₅₀ (oral, rabbit) = 76 g/kg
 LD₅₀ (oral, rabbit) = 28,900 mg/kg; Kidney, Ureter, Bladder: other changes
 LD₅₀ (oral, rabbit) = 17,300 mg/kg
 LD₅₀ (oral, rabbit) = 76 g/kg; Kidney, Ureter, Bladder: other changes
 LD₅₀ (oral, rabbit) = 19 g/kg
 LD₅₀ (skin, rabbit) > 20 mL/kg
 LD₅₀ (skin, rabbit) > 20 g/kg
 LD₅₀ (skin, rabbit) > 20 g/kg
 LD₅₀ (oral, guinea pig) = 15,700 mg/kg; Kidney, Ureter, Bladder: other changes
 LD₅₀ (oral, guinea pig) = 19,600 mg/kg; Kidney, Ureter, Bladder: other changes
 LD₅₀ (oral, guinea pig) = 28,900 mg/kg; Kidney, Ureter, Bladder: other changes
 LD₅₀ (oral, guinea pig) = 28 g/kg
 LD₅₀ (oral, guinea pig) = 22,500 mg/kg
 LD₅₀ (oral, guinea pig) = 50,900 mg/kg; Kidney, Ureter, Bladder: other changes
 LD₅₀ (intravenous, dog) 3 g/kg
 LD (oral, rat) > 4 g/kg
 LD (oral, rabbit) > 1 g/kg
 LDLo (intravenous, rat) = 22 g/kg; Cardiac: arrhythmias (including changes in conduction); Vascular: BP lowering not characterized in autonomic section; Kidney, Ureter, Bladder: hematuria
 LDLo (intravenous, rat) = 3 mg/kg
 TDLo (oral, rat) = 1845 mg/kg/90 days/continuous; Liver: other changes; Kidney, Ureter, Bladder: changes primarily in glomeruli; Nutritional and Gross Metabolic: weight loss or decreased weight gain
 TDLo (oral, rat) = 1476 mg/kg/90 days/continuous; Nutritional and Gross Metabolic - weight loss or decreased weight gain; Related to Chronic Data: death
 TCLo (inhalation, rat) = 567 mg/m³/6 hours/2 weeks/intermittent; Lungs, Thorax, or Respiration: changes in lung weight; Nutritional and Gross Metabolic: weight loss or decreased weight gain

GLYCOL HOMOPOLYMER (continued):

TDLo (intravaginal, mouse) = 416 mg/kg; years-intermittent; Tumorigenic: equivocal tumorigenic agent by RTECS criteria; Reproductive: Tumorigenic effects: other reproductive system tumors
 Standard Draize Test (skin, rabbit) = 500 mg/24 hours; Mild
 Standard Draize Test (eye, rabbit) = 500 mg/24 hours; Mild
 Standard Draize Test (eye, rabbit) = 100 µL; Mild
 DNA Damage (microorganism) = 100 g/L
 Cytogenetic Analysis (hamster cells) = 50 pph
MONOBASIC POTASSIUM SALT:
 LDLo (oral, rat) = 4640 mg/kg; Behavioral: somnolence (general depressed activity); Gastrointestinal: other changes
 LD₅₀ (skin, rabbit) > 4640 mg/kg
ALIPHATIC DIOL:
 Skin Irritancy (human) = 500 mg/7 days; mild
 Skin Irritancy (human) = 104 mg/3 days/intermittent; moderate
 Skin Irritancy (man) = 10%/2 days
 TDLo (oral, child) = 79 g/kg/56 weeks/intermittent; Central nervous system effects, BRN
 TDLo (parenteral, infant) = 10 g/kg/3 days/continuous; Systemic effects
 LD₅₀ (oral, rat) = 20 g/kg
 LD₅₀ (intraperitoneal, rat) = 6660 mg/kg
 LD₅₀ (subcutaneous, rat) = 22,500 mg/kg
 LD₅₀ (intravenous, rat) = 6423 mg/kg
 LD₅₀ (intramuscular, rat) = 14 g/kg
 LD₅₀ (oral, mouse) = 22 g/kg
 LD₅₀ (intraperitoneal, mouse) = 9718 mg/kg
 LD₅₀ (subcutaneous, mouse) = 17,370 mg/kg
 LD₅₀ (intravenous, mouse) = 6630 mg/kg
 LD₅₀ (oral, rabbit) 18500 mg/kg
 LD₅₀ (skin, rabbit) = 20800 mg/kg
 LD₅₀ (intravenous, rabbit) = 6500 mg/kg
 LDLo (intramuscular, rabbit) = 6300 mg/kg; Behavioral: somnolence (general depressed activity); Behavioral: coma; Lungs, Thorax, or Respiration: respiratory stimulation
 LD₅₀ (oral, dog) = 22 g/kg
 LD₅₀ (intravenous, dog) = 26 g/kg
 LD₅₀ (oral, guinea pig) = 18350 mg/kg
 LDLo (subcutaneous, guinea pig) = 15500 mg/kg
 LD₅₀ (oral, quail) > 2080 mg/kg
 LDLo (intravenous, chicken) = 27 g/kg; Vascular: other changes
 TCLo (inhalation, rat) = 2180 mg/m³/6 hours/90 days/intermittent; Behavioral: food intake (animal); Endocrine: changes in spleen weight; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: dehydrogenases
 TDLo (intraperitoneal, mouse) = 100 mg/kg/15 days preg; Teratogenic effects
 TDLo (intraperitoneal, mouse) = 100 mg/kg/11 days preg; Reproductive effects
 Eye Irritancy (rabbit) = 100 mg; mild
 Eye Irritancy (rabbit) = 500 mg/24 hours; mild
 DNA Inhibition (subcutaneous, mouse) = 8000 mg/kg
 Cytogenetic Analysis (subcutaneous, mouse) = 8000 mg/kg
 Cytogenetic Analysis (fibroblast, hamster) = 32
SODIUM SALT:
 TDLo (Oral-Man) 12,357 mg/kg/23 days-continuous; Vascular: BP elevation not characterized in autonomic section
 TDLo (Oral-Man) 1 g/kg; Sense Organs and Special Senses (Eye): effect, not otherwise specified; Behavioral: changes in motor activity (specific assay); Nutritional and Gross Metabolic: changes in sodium
 TDLo (Intraplacental-Woman) 27 mg/kg; female 15 week(s) after conception; Reproductive: abortion
 LD₅₀ (Oral-Rat) 3000 mg/kg
 LD₅₀ (Oral-Mouse) 4 g/kg
 LD₅₀ (Intraperitoneal-Rat) 2600 mg/kg
 LD₅₀ (Intraperitoneal-Mouse) 2602 mg/kg
 LD₅₀ (Subcutaneous-Mouse) 3 g/kg
 LD₅₀ (Intravenous-Mouse) 645 mg/kg
 LD₅₀ (Intracervical-Mouse) 131 mg/kg
 LDLo (Oral-Rabbit) 8 g/kg
 LDLo (Subcutaneous-Rat) 3500 mg/kg; Behavioral: irritability
 LDLo (Subcutaneous-Guinea Pig) 2160 mg/kg
 LDLo (Intraperitoneal-Rat) 3.72 g/kg; Behavioral: tremor, convulsions or effect on seizure threshold
 LDLo (Intravenous-Rabbit) 1.5 mg/kg

SODIUM SALT (continued):

LDLo (Intravenous-Rabbit) 1100 mg/kg; Behavioral: convulsions or effect on seizure threshold, muscle contraction or spasticity; Cardiac: other changes
 LDLo (Intravenous-Guinea Pig) 300 mg/kg
 LDLo (Intravenous-Dog) 2 g/kg; Behavioral: somnolence (general depressed activity)
 LDLo (Parenteral-Guinea Pig) 300 mg/kg
 LDLo (Intraarterial-Guinea Pig) 300 mg/kg
 TDLo (Oral-Rat) 1 mg/kg/24 hours; Biochemical: Metabolism (Intermediary): effect on Sodium-Potassium pump
 TDLo (Oral-Rat) 1.43 mg/kg; Gastrointestinal: ulceration or bleeding from stomach
 TDLo (Oral-Rat) 37,500 mg/kg/30 days-continuous; Vascular: BP elevation not characterized in autonomic section; Kidney/Ureter/Bladder: urine volume increased
 TDLo (Oral-Rat) 12,500 mg/kg/10 days-continuous; Kidney/Ureter/Bladder: urine volume decreased, other changes in urine composition
 TDLo (Oral-Rat) 37.5 g/kg/10 days-continuous; Vascular: BP elevation not characterized in autonomic section; Kidney/Ureter/Bladder: other, changes in urine composition
 TDLo (Oral-Rat) 201.6 g/kg/6 weeks-intermittent; Vascular: BP elevation not characterized in autonomic section
 TDLo (Oral-Rat) 145 g/kg; female 7 days pre-mating 1-22 day(s) after conception; Reproductive: Effects on Newborn: delayed effects
 TDLo (Oral-Rat) 56,400 mg/kg; female 5 day(s) pre-mating; 21 day(s) post-birth; Reproductive: Maternal Effects: postpartum; Effects on Newborn: biochemical and metabolic
 TDLo (Intraperitoneal-Rat) 1710 mg/kg; female 13 day(s) after conception; Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus), fetal death; Specific Developmental Abnormalities: musculoskeletal system
 TDLo (Intraperitoneal-Rat) 10 g/kg; female 17-20 day(s) after conception; Reproductive: Effects on Newborn: behavioral
 TDLo (Subcutaneous-Mouse) 1900 mg/kg; female 11 day(s) after conception; Reproductive: Effects on Embryo or Fetus: fetal death
 TDLo (Subcutaneous-Mouse) 1900 mg/kg; female 10 day(s) after conception; Reproductive: Specific Developmental Abnormalities: musculoskeletal system
 TDLo (Subcutaneous-Mouse) 2500 mg/kg; female 10 day(s) after conception; Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)
 TDLo (Subcutaneous-Mouse) 13,440 mg/kg; female 2-6 day(s) after conception; Reproductive: Fertility: abortion
 TDLo (Subcutaneous-Rabbit) 0.04 mg/kg; Vascular: other changes; Skin and Appendages: dermatitis, irritative (after systemic exposure)
 TDLo (Intravenous-Mouse) 2.1 mg/kg; Vascular: other changes; Blood: hemorrhage; Skin and Appendages: dermatitis, irritative (after systemic exposure)
 TDLo (Intravenous-Rabbit) 0.04 mg/kg; Vascular: other changes; Blood: hemorrhage; Skin and Appendages: dermatitis, irritative (after systemic exposure)
 TDLo (Parenteral-Rat) 10 mg/kg; female 1 day(s) pre-mating; Reproductive: Maternal Effects: ovaries, fallopian tubes
 TDLo (Intrauterine-Rat) 500 mg/kg; female 4 day(s) after conception; Reproductive: Fertility: pre-implantation mortality (e.g. reduction in number of implants per female; total number of implants per corpora lutea)
 TDLo (Intrauterine-Rat) 50 mg/kg; female 6 day(s) after conception; Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants)
 TDLo (Intrauterine-Monkey) 6 g/kg; female 18 week(s) after conception; Reproductive: Fertility: abortion
 TDLo (Intraplacental-Horse, Donkey) 480 mg/kg; female 45 day(s) after conception; Reproductive: Maternal Effects: other effects; Endocrine: estrogenic; Reproductive: Effects on Embryo or Fetus: fetal death
 DNA Inhibition (Human Fibroblast) 125 mmol/L
 Mutation Test Systems-Not Otherwise Specified (Bacteria-*Escherichia coli*) 150 mmol/L

11. TOXICOLOGICAL INFORMATION (Continued)

TOXICITY DATA (continued):

SODIUM SALT (continued):

Mutation Test Systems-Not Otherwise Specified (Oral-Rat) 400 mg/kg
 Unscheduled DNA Synthesis (Oral-Rat) 16,800 mg/kg/4 weeks-continuous
 Cytogenetic Analysis (Intraperitoneal-Rat) 2338 mg/kg
 Cytogenetic Analysis (Hamster Ovary) 160 mmol/L
 Cytogenetic Analysis (Hamster Lung) 7500 mg/L
 Mutation in Microorganisms (Yeast-*Saccharomyces cerevisiae*) 2 mol/L
 DNA Damage (Bacteria-*Salmonella typhimurium*) 10 gm/L/120 minutes
 DNA Damage (Mouse Lymphocyte) 101 mmol/L
 DNA Damage (Hamster Ovary) 275 mmol/L
 Mutation in Mammalian Somatic Cells (Mouse Lymphocyte) 57,200 µmol/L
 Mutation in Mammalian Somatic Cells (Mouse Cells-Not Otherwise Specified) 5000 mg/L/4 hours
 DNA Repair (Bacteria-*Salmonella typhimurium*) 10 gm/L/120 minutes
 Micronucleus Test (Hamster-Lung) 4 gm/L
 Micronucleus Test (Oral-Rat) 2 pph/14 days
 Micronucleus Test (Mouse Cells-Not Otherwise Specified) 0.5 pph/4 hours

CARBOHYDRATE:

LD₅₀ (oral, rat) = 29,700 mg/kg; Behavioral: somnolence (general depressed activity); Lungs, Thorax, or Respiration: cyanosis; Gastrointestinal: hypermotility, diarrhea
 LD₅₀ (intraperitoneal, mouse) = 14,000 mg/kg
 LDLo (oral, mammal) = 40 g/kg; Behavioral: somnolence (general depressed activity); Lungs, Thorax, or Respiration: respiratory stimulation; Gastrointestinal: hypermotility, diarrhea

CARBOHYDRATE (continued):

TDLo (oral, rat) = 1548 g/kg/female 21 days pre-mating/female 1–22 days after conception; Reproductive: Specific Developmental Abnormalities: Central Nervous System
 TDLo (oral, rat) = 683 g/kg/female 1–21 days after conception; Reproductive: Specific Developmental Abnormalities: hepatobiliary system; Reproductive: Effects on Newborn: growth statistics (e.g.%, reduced weight gain)
 TDLo (oral, rat) = 683 g/kg/lactating female 21 days post-birth; Reproductive: Effects on Newborn: growth statistics (e.g.%, reduced weight gain)
 TDLo (oral, mammal) = 54,810 mg/kg/female 15–35 days after conception; Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)
 Mutation in Microorganisms (bacteria, *Salmonella typhimurium*) = 600 µg/plate
 DNA Repair (yeast, *Saccharomyces cerevisiae*) = 300 mg/L
 Cytogenetic Analysis (lung, hamster) = 10 g/L
 Cytogenetic Analysis (ovary, hamster) = 275 mmol/L

ALKANOLAMINE:

Standard Draize Test (Skin-Rat) 100 mg
 Standard Draize Test (Skin-Rabbit) 25%: Moderate
 Standard Draize Test (Eye-Rabbit) 500 mg: Severe
 LD₅₀ (Oral-Rat) > 3000 mg/kg
 LD₅₀ (Oral-Mouse) 5500 mg/kg
 LD₅₀ (Intravenous-Rat) 1800 mg/kg
 LD₅₀ (Intravenous-Rat) 3.28 g/kg: Liver: hepatitis (hepatocellular necrosis), diffuse; Kidney/Ureter/Bladder: changes in tubules (including acute renal failure & tubular necrosis)

ALKANOLAMINE (continued):

LD₅₀ (Intravenous-Mouse) 1210 mg/kg
 LD₅₀ (Intravenous-Mouse) 6100 mg/kg; Behavioral: muscle weakness; Lungs, Thorax, or Respiration: respiratory depression
 LD₅₀ (Intraperitoneal-Mouse) 3350 mg/kg
 TDLo (Oral-Rat) 12,000 mg/kg; female 14 day(s) pre-mating; 4 day(s) post-birth; Reproductive: Maternal Effects: other effects; Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants); Sense Organs and Special Senses (Ear): effect, not otherwise specified
 TDLo (Oral-Rat) 3000 mg/kg; Kidney/Ureter/Bladder: urine volume increased
 TDLo (Oral-Mouse) 3000 mg/kg; Kidney/Ureter/Bladder: urine volume increased
 TDLo (Intravenous-Rat) 6000 mg/kg/20 days-intermittent; Gastrointestinal: ulceration or bleeding from stomach; Kidney/Ureter/Bladder: changes in both tubules and glomeruli
 TDLo (Intravenous-Rabbit) 500 mg/kg; Lungs, Thorax, or Respiration: dyspnea
 TDLo (Intravenous-Rabbit) 10,000 mg/kg/4 weeks-intermittent; Sense Organs and Special Senses (Ear): effect, not otherwise specified; Blood: changes in leukocyte (WBC) count; Biochemical: Metabolism (Intermediary): effect on inflammation or mediation of inflammation
 TDLo (Intravenous-Dog) 125 mg/kg; Lungs, Thorax, or Respiration: dyspnea
 LDLo (Oral-Mouse) 1 g/kg; Behavioral: somnolence (general depressed activity), muscle weakness, coma

CARCINOGENIC POTENTIAL OF COMPONENTS: The components of this product are listed by agencies tracking the carcinogenic potential of chemical compounds, as follows:

REFINED HYDROCARBON: ACGIH TLV-A4 (Not Classifiable as Human Carcinogen)

CARBOHYDRATE: ACGIH TLV-A4 (Not Classifiable as Human Carcinogen)

The remaining constituents in the solutions of this product are not found on the following lists: U.S. EPA, U.S. NTP, U.S. OSHA, U.S. NIOSH, GERMAN MAK, IARC, or ACGIH and therefore are neither considered to be nor suspected to be cancer causing agents by these agencies.

IRRITANCY OF PRODUCT:

Code WG#-RA1 and Code WG#-WB1 Components: Depending on the duration and concentration of overexposure, skin and eye contact can irritate contaminated tissue.

All Other Components: Contact with the skin or eyes may cause mild irritation, which is alleviated upon rinsing.

SENSITIZATION TO THE PRODUCT: The components of this product are not known to cause skin or respiratory sensitization.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: The constituents in the solutions in this product are not reported to produce mutagenic effects in humans. Human mutation data are available for the Alkyl Alcohol and Aliphatic Triol constituents in this product's solutions; these data were obtained during clinical studies on specific human tissues exposed to high doses of these compounds. Animal mutation data are available for the Aliphatic Amide, Aliphatic Diol, and Carbohydrate constituents in this product's solutions; these data were obtained during clinical studies on specific animal tissues exposed to high doses of this compound.

Embryotoxicity: The constituents in the solutions in this product are not reported to cause human embryotoxic effects.

Teratogenicity: The constituents in the solutions in this product are reported to cause teratogenic effects in humans. Clinical studies on test animals exposed to relatively high doses of the Alkyl Alcohol, Aliphatic Amide, Refined Hydrocarbon, Aliphatic Diol, and Carbohydrate constituents in this product's solutions, indicate teratogenic effects.

Reproductive Toxicity: The constituents in the solutions in this product are not reported to cause adverse reproductive effects in humans. Clinical studies on human tissues exposed to relatively high doses of the Alkyl Alcohol constituent in this product's solutions indicate adverse reproductive effects. Clinical studies on test animals exposed to relatively high doses of the Aliphatic Amide, Aliphatic Triol, and Aliphatic Diol constituents in this product's solutions indicate adverse reproductive effects.

BIOLOGICAL EXPOSURE INDICES: Currently, there are no Biological Exposure Indices (BEIs) determined for the constituents in this product's components.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

MOBILITY IN SOIL: This product has not been tested for mobility in soil. The following information is available for some constituents.

ALKYL ALCOHOL:

Using a structure estimation method based on molecular connectivity indices, the Koc for Alkyl Alcohol can be estimated to be 1. According to a classification scheme, this estimated Koc value suggests that Alkyl Alcohol is expected to have very high mobility in soil

ALIPHATIC AMIDE:

The Koc of Aliphatic Amide is 3.6. According to a classification scheme, this Koc value suggests that Aliphatic Amide is expected to have very high mobility in soil.

12. ECOLOGICAL INFORMATION (Continued)

MOBILITY IN SOIL (continued):

ALIPHATIC TRIOL:

Based on an experimental log octanol/water partition coefficient of -1.76 and its water solubility, 1,220,000 mg/L at 5°C, soil adsorption coefficients for Aliphatic Triol can be estimated at 3 and 2, respectively, using regression-derived equations. The magnitude of these values indicate that Aliphatic Triol will display very high mobility in soil.

GLYCOL HOMOPOLYMER:

Solubility: Readily soluble in water.

Degradation: This compound is chemically identical to the natural amino acid L-Serine and can therefore be degraded microbiologically.

ALIPHATIC DIOL:

The Koc of Aliphatic Diol is estimated as 8, using a log Kow of -0.92 and a regression-derived equation. According to a classification scheme, this estimated Koc value suggests that Aliphatic Diol is expected to have very high mobility in soil.

SODIUM SALT: Water solubility = 37 g/ 100 mL @ 0°C; 39.12 g/100 ml of water @ 100°C; Log Kow = -3.0

ALKANOLAMINE: Water solubility = 55-80 g/ 100 mL (20°C)

PERSISTENCE AND BIODEGRADABILITY: This product has not been tested for persistence or biodegradability. It is expected that the constituents of this product will slowly degrade in the environment and form a variety of organic and inorganic materials; however, no specific information is known. The following information is available for some constituents.

ETHYL ALCOHOL:

If released to the atmosphere, an extrapolated vapor pressure of 59.3 mm Hg at 25°C indicates that Alkyl Alcohol will exist solely in the vapor phase. Vapor phase Alkyl Alcohol is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 5 days. If released to soil, Alkyl Alcohol is expected to have very high mobility based upon an estimated Koc of 1. Volatilization from moist soil surfaces is expected to be an important fate process based upon a Henry's Law constant of 5×10^{-6} atm-cu m/mole. Alkyl Alcohol may also volatilize from dry soils based upon its vapor pressure. Biodegradation is expected to occur rapidly in the environment based on numerous screening tests using different types of inocula and incubation periods. Alkyl Alcohol was degraded with half-lives on the order of a few days using microcosms constructed with a low organic sandy soil and groundwater, indicating it is unlikely to be persistent in the environment. If released into water, Alkyl Alcohol is not expected to adsorb to suspended solids and sediment based upon the estimated Koc. Volatilization from water surfaces is expected to be an important fate process based upon this compound's Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 3 and 39 days, respectively. An estimated BCF of 3 suggests the potential for bioconcentration in aquatic organisms is low. Hydrolysis of Alkyl Alcohol and photolysis in sunlight surface waters are not expected since Alkyl Alcohol lacks functional groups that are susceptible to hydrolysis or photolysis under environmental conditions.

ALIPHATIC AMIDE:

If released to air, a vapor pressure of 6.1×10^{-2} mm Hg at 25°C indicates Aliphatic Amide will exist solely as a vapor in the ambient atmosphere. Vapor-phase Aliphatic Amide will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 8.0 days. If released to soil, Aliphatic Amide is expected to have very high mobility based upon a Koc of 3.6. Volatilization from moist soil surfaces is not expected to be an important fate process based upon an estimated Henry's Law constant of 1.4×10^{-9} atm-cu m/mole. If released into water, Aliphatic Amide is not expected to adsorb to suspended solids and sediment based upon the Koc. Several biodegradation screening studies have observed significant biodegradation of Aliphatic Amide which suggests that biodegradation may be important. Volatilization from water surfaces is not expected to be an important fate process based upon this compound's estimated Henry's Law constant. Hydrolysis is expected to be slow.

ALIPHATIC TRIOL:

If released to soil, Aliphatic Triol is expected to undergo rapid biodegradation under aerobic conditions. It is expected to display very high mobility in soil and it is not expected to significantly volatilize to the atmosphere. If released to water, Aliphatic Triol is expected to rapidly degrade under aerobic conditions. Biodegradation in seawater and under anaerobic conditions is also expected. Aliphatic Triol is not expected to bioconcentrate in fish and aquatic organisms nor is it expected to adsorb to sediment and suspended organic matter. Volatilization to the atmosphere is expected to be slower than for water itself. If released to the atmosphere, Aliphatic Triol may undergo a gas-phase oxidation with photochemically produced hydroxyl radicals with a half-life of 33 hrs. It may also undergo atmospheric removal by wet deposition processes.

GLYCOL HOMOPOLYMER:

Solubility: Readily soluble in water.

Degradation: This compound is chemically identical to the natural amino acid L-Serine and can therefore be degraded microbiologically.

ALIPHATIC DIOL:

Based on a classification scheme, an estimated Koc value of 8, determined from a log Kow of -0.92 and a regression-derived equation, indicates that Aliphatic Diol is expected to have very high mobility in soil. Volatilization of Aliphatic Diol from moist soil surfaces is not expected to be an important fate process given an estimated Henry's Law constant of 1.3×10^{-8} atm-cu m/mole, derived from its vapor pressure, 0.13 mmHg, and water solubility, 1×10^6 mg/liter. Aliphatic Diol is not expected to volatilize from dry soil surfaces based upon its vapor pressure. Laboratory experiments using agricultural soils from South Carolina conducted at 22 deg C and a fortification of 1,000 ppm Aliphatic Diol, yielded 73-78% mineralization during a 51 day incubation period, suggesting that biodegradation will be an important fate process in soils. Based on a classification scheme, an estimated Koc value of 8, determined from a log Kow of -0.92 and a regression-derived equation, indicates that Aliphatic Diol is not expected to adsorb to suspended solids and sediment. Volatilization from water surfaces is not expected based upon an estimated Henry's Law constant of 1.3×10^{-8} atm-cu m/mole, derived from its vapor pressure, 0.13 mmHg, and water solubility, 1×10^6 mg/L. Numerous screening studies using wastewater or sewage inoculum as seed, suggests that Aliphatic Diol will be degraded readily under aqueous environments. According to a model of gas/particle partitioning of semi-volatile organic compounds in the atmosphere, Aliphatic Diol, which has a vapor pressure of 0.13 mmHg at 25°C, is expected to exist solely as a vapor in the ambient atmosphere. Vapor-phase Aliphatic Diol is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 32 hours, calculated from its rate constant of 1.2×10^{-11} cu cm/molecule-sec at 25°C

BIO-ACCUMULATIVE POTENTIAL: This product has not been tested for bio-accumulation potential. The following information is available for some constituents.

ETHYL ALCOHOL:

An estimated BCF of 3 was calculated for Alkyl Alcohol, using a log Kow of -0.31 and a regression-derived equation. According to a classification scheme, this BCF suggests the potential for bioconcentration in aquatic organisms is low.

ALIPHATIC AMIDE:

An estimated BCF of 3 was calculated for Aliphatic Amide, using a log Kow of -1.51 and a regression-derived equation. According to a classification scheme, this BCF suggests the potential for bioconcentration in aquatic organisms is low.

ALIPHATIC TRIOL:

Based on an experimental log octanol/water partition coefficient of -1.76 and its water solubility, 1,220,000 mg/L at 5°C, bioconcentration factors for Aliphatic Triol can be estimated at 3 and 0.2, respectively, using regression-derived equations. The magnitude of these values indicate that bioconcentration of Aliphatic Triol in fish and aquatic organisms will not be significant. Log K_{OW} = -1.76.

ALIPHATIC DIOL:

An estimated BCF of 3 was calculated for Aliphatic Diol, using a log Kow of -0.92 and a regression-derived equation. According to a classification scheme, this BCF suggests the potential for bioconcentration in aquatic organisms is low.

ECOTOXICITY: This product has not been tested for aquatic or animal toxicity. All releases to terrestrial, atmospheric and aquatic environments should be avoided.

12. ECOLOGICAL INFORMATION (Continued)

ECOTOXICITY (continued): The following aquatic toxicity data are available for some constituents of this product.

ACETATE SALT:

LC₅₀ (mosquito fish) 24-96 hours = 238 mg/L
TLm (Mosquito fish) 24 hours = 238 ppm fresh water/Conditions of bioassay not specified

ALKYL ALCOHOL:

LC₅₀ (*Palaemonetes pugio*, grass shrimp) 96 hours = 250 µg/L

LC₅₀ (*Salmo gairdneri*, rainbow trout) 96 hours = 13000 mg/L

LC₅₀ (*Pimephales promelas*, fathead minnow) 96 hours = 15.3 mg/L

LC₅₀ (*Pimephales promelas*, fathead minnow) 96 hours = 14.2 mg/L

LC₅₀ (*Artemia salina*) 24 hours = 24,000 mg/L

LC₅₀ (*Streptocephalus proboscideus*) 24 hours = 19,000 mg/L

LC₅₀ (*Daphnia magna*) 24 hours = 11,000 mg/L

LC₅₀ (*Brachionus calyciflorus*) 24 hours = 30,000 mg/L

LC₅₀ (fingerling trout) 24 hours = 7,200 mg/L

LC₅₀ (*Semotilus atromaculatus*, creek chub) 24 hours = > 7,000 mg/L

LC₅₀ (*Poecilia reticulata*, guppy) 7 days = 11,050 ppm

LC₅₀ (*Alburnus alburnus*, bleak) 96 hours = 11,000 mg/L

LC₅₀ (*Nitocra spinipes*) 96 hours = 7,200 mg/L

EC₀ (*Pseudomonas putida*, bacteria) 16 hours = 6,500 mg/L

EC₀ (*Microcystis aeruginosa*, algae) 8 days = 1,450 mg/L

EC₀ (*Scenedesmus quadricauda*, green algae) 7 days = 5,000 mg/L

EC₀ (*Entosiphon sulcatum*, protozoa) 72 hours = 65 mg/L

EC₀ (*Uronema parduczi* Chatton-Lwoff, protozoa) = 6,120 mg/L

EC₅₀ (*Pimephales promelas*, fathead minnow) 96 hr = 12.9 mg/L

EC₅₀ (*Photobacterium*) 5 minutes = 32,000 mg/L

IC₁₀ (*Scenedesmus subspicatus*, algae) = 18,400 mg/L; inhibition of fluorescence

IC₁₀ (*Scenedesmus subspicatus*, algae) = 400 mg/L; growth inhibition

IC₁₀ (Ribulose-P2-carboxylase in protoplasts) = 11,500 mg/L; inhibition of enzyme activity

LD₀ (creek chub) 24 hours = 7,000 mg/L

LD₁₀₀ (creek chub) 24 hours = 9,000 mg/L

ALIPHATIC AMIDE:

LC₅₀ (minnow) > 500 mg/L/ 48 hours

ALIPHATIC TRIOL:

EC₀ (*Pseudomonas putida* bacteria) 16 hours = >10,000 mg/L

EC₀ (*Microcystis aeruginosa* algae) 8 days = 2,900 mg/L

EC₀ (*Scenedesmus quadricauda* green algae) 7 days = > 10,000 mg/L

EC₀ (*Entosiphon sulcatum* protozoa) 72 hours = 3,200 mg/L

EC₀ (*Uronema parduczi* Chatton-Lwoff protozoa) = > 10,000 mg/L

LC₅₀ (goldfish) 24 hours = > 5,000 mg/L

GLYCOL HOMOPOLYMER:

Toxic to fishes

ALIPHATIC DIOL:

TD (*Chlorella pyrenoidosa*, algae) = 92,000 mg/L

EC₅₀ (*Photobacterium phosphoreum*, bacteria) 30 minutes = 26,800 mg/L

EC₀ (*Daphnia magna*, crustacean) 48 hours = < 4,295 mg/L

EC₅₀ (*Daphnia magna*, crustacean) 48 hours = 34,400 mg/L

EC₁₀₀ (*Daphnia magna*, crustacean) 48 hours = 50,000 mg/L

EC₅₀ (*Daphnia magna*, crustacean) 24 hr = > 10,000 mg/L

EC₁₀₀ (*Daphnia magna*, crustacean) 24 hours = > 10,000 mg/L

EC₅₀ (*Nitocra spinipes*, crustacean) 96 hours = > 10,000 mg/L

LC₅₀ (*Lebistes reticulatus*, guppy) 48 hours > 10,000 mg/L

LC₅₀ (*Carassius auratus*) 24 hours = > 5,000 mg/L

LC₅₀ (*Salmo gairdneri*) 24 hours = 50,000 mg/L

LC₅₀ (*Pimephales promelas*) 96 hours = 54,900 mg/L

LC₅₀ (*Artemia salina*) 24 hours = >10,000 mg/L

ALIPHATIC DIOL (continued):

LC₁₀₀ (*Pimephales promelas*) 96 hours = 65,610 mg/L
NOEC (*Pimephales promelas*) 96 hours < 47,829 mg/L
fingerling trout: at 50,000 mg/L at 10°C: no mortality or apparent signs of stress were produced during a 25-hr exposure period (static bioassay)

SODIUM SALT:

EC₅₀ (*Daphnia magna* Water flea) 21 days = 1,480,000 µg/L (95% confidence limit: 1,180,000 to 1,840,000 µg/L); Conditions: freshwater; renewal; Effect: intoxication, immobile

EC₅₀ (*Daphnia magna* Water flea) 21 days = 1,020,000 µg/L; Conditions: freshwater; renewal; Effect: reproduction, reproduction, general

EC₅₀ (*Daphnia magna* Water flea) 48 hours = 402,600 µg/L (95% confidence limit: 340,700 to 469,200 µg/L); Conditions: freshwater; static; Effect: intoxication, immobile

EC₅₀ (*Daphnia magna* Water flea) 24 hours = 402,600 µg/L (95% confidence limit: 340,700 to 469,200 µg/L); Conditions: freshwater; static; Effect: intoxication, immobile

EC₅₀ (*Daphnia magna* Water flea) 64 hours = 3,680,000 µg/L; Conditions: freshwater; static; Effect: intoxication, immobile

EC₅₀ (*Daphnia pulex* Water flea) 24 hours = 56.4 mM; Conditions: freshwater; static; Effect: intoxication, immobile

EC₅₀ (*Lemna minor* Duckweed) 7 days = 4,880,000 µg/L (95% confidence limit: 3,950,000 to 6,020,000 µg/L); Conditions: freshwater; renewal; Effect: population, biomass

EC₅₀ (*Ceriodaphnia dubia* Water flea) 48 hr = 2122.55 mg/L (95% confidence limit: 1493 to 2644 mg/L); Conditions: freshwater; Effect: intoxication, immobile

EC₅₀ (*Ceriodaphnia dubia* Water flea) 192 hours = (95% confidence limit: > 1500 to < 2000 mg/L); Conditions: freshwater; renewal; Effect: reproduction, progeny

LC₅₀ (*Ceriodaphnia dubia* Water flea) 192 hours = ~ 2000 mg/L; Conditions: freshwater; renewal; temp 25.6-26.8°C, pH 8.4 (8.3-8.5), hardness 102 mg/L CaCO₃ (94-104 mg/L), salinity <1 ppt, alkalinity 80 mg/L CaCO₃ (75-87 mg/L), conductivity 493 µmhos/cm (460-550 µmhos/cm), dissolved oxygen 8.6 mg/L (8.3-9.6 mg/L); Effect: mortality, survival

EC₅₀ (*Danio rerio* Zebra danio, fertilized eggs) 205.5 mmol/L; Conditions: freshwater; static; Effect: Developmental endpoints: coagulation of the eggs, development of gastrulation, number of somites, development of organs, circulation, heartbeat, otolithanilage and pigmentation

LC₅₀ (*Ceriodaphnia dubia* Water flea) 7 days = 280,000 µg/L; Conditions: freshwater; renewal

LC₅₀ (*Ceriodaphnia dubia* Water flea) 48 hours = 1,960,000 µg/L (95% confidence limit: 1,770,000 to 2,330,000 µg/L); Conditions: freshwater; static

LC₅₀ (*Ceriodaphnia dubia* Water flea) 24 hours = 3,380,000 µg/L (95% confidence limit: 3,080,000 to 3,540,000 µg/L); Conditions: freshwater; static

LC₅₀ (*Cyprinus carpio* common carp, fry) 0.5 hour = 21,500,000 µg/L; Conditions: static

LC₅₀ (*Daphnia magna* Water flea) 48 hours = 81.19799 mmol/L; Conditions: freshwater; renewal

LC₅₀ (*Daphnia magna* Water flea) 4.2 days = 3,114,000 µg/L; Conditions: freshwater; static, temp 21-25°C

LC₅₀ (*Daphnia magna* Water flea) 48 hours = 3,310,000 µg/L; Conditions: freshwater; static, temp 21-25°C

LC₅₀ (*Daphnia magna* Water flea, 4th instar or adult) 24 hours = 3,412,000 µg/L; Conditions: freshwater; static

LC₅₀ (*Daphnia magna*, age < 24 hr) 48 hours = 4,770,000 µg/L (95% confidence limit: 3,790,000 to 5,740,000 µg/L); Conditions: freshwater; static, pH 7.5-9.0, dissolved oxygen > 40%

LC₅₀ (*Daphnia magna* Water flea) 50 hours = 5,874,000 µg/L; Conditions: freshwater; static, temp 21-25°C

LC₅₀ (*Daphnia magna* Water flea, age < 24 hr) 24 hours = 6,380,000 µg/L (95% confidence limit: 6,160,000 to 6,600,000 µg/L); Conditions: freshwater; static, pH 7.5-9.0, dissolved oxygen >4 0%

SODIUM SALT (continued):

LC₅₀ (*Daphnia magna* Water flea) 25 hours = 6,447,000 µg/L; Conditions: freshwater; static, temp 21-25°C
LC₅₀ (*Daphnia pulex* Water flea) 48 hr = 1.47 g/L (95% confidence limit: 1.38-1.57 g/L); Conditions: freshwater; static, pH 7.83, hardness 92.8 mg/L CaCO₃, alkalinity 60.8 mg/L, conductivity 314 µmhos/cm, dissolved oxygen 8.7 mg/L

LC₅₀ (*Daphnia pulex* Water flea) 48 hours = 3.05 g/L (95% confidence limit: 2.06 to 5.91 g/L); Conditions: freshwater; static, pH 7.47, alkalinity 74 mg/L CaCO₃, conductivity 10001 µmhos/cm, dissolved oxygen 8.7 mg/L, organic carbon 27 mg/L

LC₅₀ (*Gambusia affinis* Western mosquitofish) 96 hours = 17,550,000 µg/L; Conditions: freshwater; static

LC₅₀ (*Gambusia affinis* Western mosquitofish) 24 hr = 18,100,000 µg/L; Conditions: freshwater; static

LC₅₀ (*Gambusia affinis* Western mosquitofish) 48 hr = 18,100,000 µg/L; Conditions: freshwater; static

LC₅₀ (*Gambusia holbrooki* Eastern mosquitofish) 96 hours = 11,540,000 µg/L (95% confidence limit: 11,290,000 to 11,800,000 µg/L); Conditions: freshwater; flow-through

LC₅₀ (*Lepomis macrochirus* Bluegill, wt 0.260 g wwtg) 96 hours = 5.84 g/L (95% confidence limit: 5.56 to 6.08 g/L); Conditions: freshwater; flow-through

LC₅₀ (*Lepomis macrochirus* Bluegill, size 5-9 cm, wt 1-9 g) 96 hours = 12,94,600 µg/L; Conditions: freshwater; static

LC₅₀ (*Lepomis macrochirus* Bluegill, size 5.3-7.2 cm, wt 3.5-3.9 g) 96 hours = 12,946,000 µg/L; Conditions: freshwater; static

LC₅₀ (*Oncorhynchus mykiss* Rainbow trout, size 15-20 cm tl) 24 hours = 175 mOsm; Conditions: freshwater; static

LC₅₀ (*Oncorhynchus mykiss* Rainbow trout, eggs) 96 hours = 6094 mg/L (95% confidence limit: 4747 to 7824 mg/L); Conditions: freshwater; flow-through, pH 7.65, hardness 46 mg/L CaCO₃, alkalinity 42 mg/L CaCO₃, conductivity 91 uS/cm, dissolved oxygen 10.8 mg/L

LC₅₀ (*Lepomis macrochirus* Bluegill) 24 hours = 14,125,000 µg/L; Conditions: freshwater; static

LC₅₀ (*Pimephales promelas* Fathead minnow, wt 0.217 g wwtg) 96 hours = 6.57 g/L (95% confidence limit: 6.42 to 6.7 g/L); Conditions: freshwater; flow-through; Concentration: for 96 hr; Effect: mortality, survival

LC₅₀ (*Pimephales promelas* Fathead minnow) 96 hours = 6,390,000 µg/L (95% confidence limit: 6,020,000 to 7,070,000 µg/L); Conditions: freshwater; static

LC₅₀ (*Pimephales promelas* Fathead minnow, size 27.2 mm tl, wt 0.24 g) 96 hours = 7,050,000 µg/L; Conditions: freshwater; renewal

LC₅₀ (*Pimephales promelas* Fathead minnow) 48 hours = 6,510,000 µg/L (95% confidence limit: 6,090,000 to 7,070,000 µg/L); Conditions: freshwater; renewal

LC₅₀ (*Pimephales promelas* Fathead minnow, size 27.2 mm tl, wt 0.24 g) 48 hours = 7,050,000 µg/L; Conditions: freshwater; renewal

LC₅₀ (*Pimephales promelas* Fathead minnow, size 27.6 mm tl, wt 0.26 g) 24 hours = 7,100,000 µg/L; Conditions: freshwater; renewal

LC₅₀ (*Pimephales promelas* Fathead minnow, size 22.8 mm tl, wt 0.19 g) 48 hours = 7,300,000 µg/L; Conditions: freshwater; renewal

LC₅₀ (*Pimephales promelas* Fathead minnow, size 24.2 mm tl, wt 0.21 g) 24 hours = 7,400,000 µg/L; Conditions: freshwater; renewal

LC₅₀ (*Pimephales promelas* Fathead minnow, size 26.4 mm tl, wt 0.24 g) 96 hours = 7,450,000 µg/L; Conditions: freshwater; renewal

LC₅₀ (*Pimephales promelas* Fathead minnow, size 22.8 mm tl, wt 0.19 g) 24 hours = 7,500,000 µg/L; Conditions: freshwater; renewal

RESULTS OF PBT AND vPvB ASSESSMENT: No data available. PBT and vPvB assessments are part of the chemical safety report required for some substances in European Union Regulation (EC) 1907/2006, Article 14.

OTHER ADVERSE EFFECTS: This product does not contain any constituents with known ozone depletion potential.

ENVIRONMENTAL EXPOSURE CONTROLS: Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

13. DISPOSAL CONSIDERATIONS

WASTE TREATMENT/DISPOSAL METHODS: Do NOT dispose of any solution of this product by pouring down the drain. It is the responsibility of the generator to determine at the time of disposal whether the product meets the criteria of a hazardous waste per regulations of the area in which the waste is generated and/or disposed of. Waste disposal must be in accordance with appropriate Federal, State, and local regulations. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority. Shipment of wastes must be done with appropriately permitted and registered transporters.

DISPOSAL CONTAINERS: Waste materials must be placed in and shipped in appropriate 5-gallon or 55-gallon poly or metal waste pails or drums. Permeable cardboard containers are not appropriate and should not be used. Ensure that any required marking or labeling of the containers be done to all applicable regulations.

PRECAUTIONS TO BE FOLLOWED DURING WASTE HANDLING: Wear proper protective equipment when handling waste materials.

U.S. EPA WASTE NUMBER: Not applicable.

EUROPEAN WASTE CODE: Wastes from research, diagnoses, treatment, or preventions of disease involving animals: chemicals other than containing dangerous substances: 18-02-06

14. TRANSPORTATION INFORMATION

This product is not classified under any jurisdiction as Dangerous Goods and has no UN Number, Hazard Class or Packing Group or Special Precautions for User.

U.S. DEPARTMENT OF TRANSPORTATION: This product is NOT classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101.

TRANSPORT CANADA: This product is NOT classified as Dangerous Goods, per the Transportation of Dangerous Goods regulations.

INTERNATIONAL AIR TRANSPORT ASSOCIATION/ICAO (IATA/ICAO): This product is NOT classified as dangerous goods, per rules of IATA.

INTERNATIONAL MARITIME ORGANIZATION (IMO): This product is NOT dangerous goods, per the rules of IMO.

UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE (UNECE): This product is NOT classified as dangerous goods, per the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR).

AUSTRALIAN FEDERAL OFFICE OF ROAD SAFETY: This product is NOT dangerous goods, per the Code for the Transportation of Dangerous Goods by Road or Rail.

ENVIRONMENTAL HAZARDS: This product is neither environmentally hazardous according to the criteria of the UN Model Regulations (as reflected in the IMDG Code, ADR, RID, and ADN) nor a marine pollutant according to the IMDG Code.

TRANSPORT IN BULK ACCORDING TO ANNEX II OF MARPOL 73/78 AND THE IBC CODE: Not applicable.

15. REGULATORY INFORMATION

ADDITIONAL UNITED STATES REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: The constituents in this product's solutions are not subject to Sections 302, 304, and 313 reporting requirements under the Superfund Amendment and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the constituents in this product's solutions. The default Federal MSDS submission and inventory requirement filing may be required.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

U.S. TSCA INVENTORY STATUS: The constituents in the solutions of this product listed in Section 3 (Composition and Information on Ingredients) are on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No constituent in the solutions of this product is on the California Proposition 65 lists.

ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDL INVENTORY STATUS: The constituents in the solutions of this product listed in Section 3 (Composition and Information on Ingredients) are on the DSL Inventory.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): The constituents in this product's solutions are not on the CEPA Priority Substances Lists.

CANADIAN WHMIS CLASSIFICATION AND SYMBOLS:

Code WG#-RA1 and Code WG#-WB1 Components: D2B Materials Causing Other Toxic Effects (Contains Aliphatic Amide)



All Other Components: Not applicable.

15. REGULATORY INFORMATION (Continued)

ADDITIONAL EUROPEAN UNION REGULATIONS:

SAFETY, HEALTH, AND ENVIRONMENTAL REGULATIONS/LEGISLATION SPECIFIC FOR THE PRODUCT:

Currently, there is no specific legislation pertaining to this product.

CHEMICAL SAFETY ASSESSMENT: No data available. The chemical safety assessment is required for some substances according to European Union Regulation (EC) 1907/2006, Article 14.

ADDITIONAL AUSTRALIAN REGULATIONS:

AUSTRALIAN INVENTORY OF CHEMICAL SUBSTANCES (AICS) STATUS: The constituents in the solutions of this product listed in Section 3 (Composition and Information on Ingredients) are on the AICS. Hydrates of listed compounds and biological materials are exempt from listing. Any chemical not included in AICS is regarded as a new industrial chemical unless it is outside the scope of the Industrial Chemicals (Notification and Assessment) Act 1989 OR is otherwise exempt from notification. New industrial chemicals must be notified and assessed before being manufactured or imported into Australia.

HAZARDOUS SUBSTANCES INFORMATION SYSTEM (HSIS): The Aliphatic Amide and Alkyl Alcohol constituents in this product's solutions is listed in the HSIS.

STANDARD FOR THE UNIFORM SCHEDULING OF MEDICINES AND POISONS: Not applicable.

ADDITIONAL JAPANESE REGULATIONS:

JAPANESE ENCS: The constituents in this product's solutions are on the ENCS Inventory as indicated in composition tables in Section 3 (Composition and Information on Ingredients).

POISONOUS AND DELETERIOUS SUBSTANCES CONTROL LAW: No constituent in this product's solutions is listed under the Poisonous and Deleterious Substances Control Law.

16. OTHER INFORMATION

U.S. ANSI LABELING (Z129.1; Provided to Summarize Occupational Hazard Information):

Code WG#-RA1 and Code WG#-WB1 Components: WARNING! POSSIBLE BIRTH DEFECT HAZARD. CONTAINS MATERIAL THAT MAY CAUSE BIRTH DEFECTS BASED ON ANIMAL DATA. MAY CAUSE SKIN AND EYE IRRITATION. MAY CAUSE DISCOMFORT IF SWALLOWED OR INHALED. Do not taste or swallow. Avoid skin or eye contact. Avoid prolonged or repeated skin contact. Avoid breathing mists or sprays. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves and goggles. FIRST-AID: In case of contact, immediately flush skin or eyes with plenty of water. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention if necessary. IN CASE OF FIRE: Use water fog, dry chemical, CO₂, or "alcohol" foam. IN CASE OF SPILL: Absorb spill with polypads and place in suitable container. Consult Material Safety Data Sheet for additional information.

Code WG#-MA1 Component: CAUTION! COMBUSTIBLE LIQUID AND VAPOR. MAY CAUSE SKIN AND EYE IRRITATION. MAY CAUSE DISCOMFORT IF SWALLOWED OR INHALED. Keep away from heat and flame. Do not taste or swallow. Avoid skin or eye contact. Avoid prolonged or repeated skin contact. Avoid breathing mists or sprays. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves and goggles. FIRST-AID: In case of contact, immediately flush skin or eyes with plenty of water. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention if necessary. IN CASE OF FIRE: Use water fog, dry chemical, CO₂, or "alcohol" foam. IN CASE OF SPILL: Absorb spill with polypads and place in suitable container. Consult Material Safety Data Sheet for additional information.

All Other Solutions: CAUTION! MAY CAUSE SKIN AND EYE IRRITATION. MAY CAUSE DISCOMFORT IF SWALLOWED OR INHALED. Do not taste or swallow. Avoid skin or eye contact. Avoid prolonged or repeated skin contact. Avoid breathing mists or sprays. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves and goggles. FIRST-AID: In case of contact, immediately flush skin or eyes with plenty of water. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention if necessary. IN CASE OF FIRE: Use water fog, dry chemical, CO₂, or "alcohol" foam. IN CASE OF SPILL: Absorb spill with polypads and place in suitable container. Consult Material Safety Data Sheet for additional information.

GLOBAL HARMONIZATION AND EU CLP REGULATION (EC) 1272/2008 LABELING AND CLASSIFICATION FULL TEXT:

Code WG#-RA1 and Code WG#-WB1 Components:

Classification: Reproductive Toxicant Category 1B.

Hazard Statements: H360D: May damage fertility or the unborn child.

Signal Word: Danger

Precautionary Statements:

Prevention: P201: Obtain special instructions before use. P202: Do not handle until all safety precautions have been read and understood. P281: Use personal protective equipment as required.

Response: P308 + P313: IF exposed or concerned: Get medical advice/attention.

Storage: P405: Store locked up.

Disposal: P501: Dispose of contents/containers in accordance with all local, regional, national and international regulations.

Hazard Symbol/Pictogram: GHS08

All Other Components:

Classification: Not applicable.

Hazard Statements: Not applicable.

Precautionary Statements: Not applicable.

16. OTHER INFORMATION (Continued)

EU LABELING/CLASSIFICATION FULL TEXT UNDER 67/548/EEC AND 2001/59/EC AUSTRALIAN NATIONAL OCCUPATION HEALTH AND SAFETY COMMISSION LABELING/CLASSIFICATION FULL TEXT:

Code WG#-RA1 and Code WG#-WB1 Components:

Classification: Toxic to Reproduction, Category 2.

Risk Phrases: R61: May cause harm to the unborn child.

Safety Phrases: S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S53: Avoid exposure; obtain special instructions before use.

Hazard Symbol: T

All Other Components:

Classification: Not applicable.

Risk Phrases: Not applicable.

Safety Phrases: Not applicable.

REVISION DETAILS: New

REFERENCES AND DATA SOURCES: Contact the supplier for information.

METHODS OF EVALUATING INFORMATION FOR THE PURPOSE OF CLASSIFICATION: Bridging principles were used to classify this product.

PREPARED BY:

CHEMICAL SAFETY ASSOCIATES, Inc.

PO Box 1961, Hilo, HI 96721

800/441-3365 • 808/969-4846

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these, which are commonly used, include the following:

CAS #: This is the Chemical Abstract Service Number that uniquely identifies each constituent.

EXPOSURE LIMITS IN AIR:

CEILING LEVEL: The concentration that shall not be exceeded during any part of the working exposure.

DFG MAKs: Federal Republic of Germany Maximum Concentration Values in the workplace. Exposure limits are given as TWA (Time-Weighted Average) or PEAK (short-term exposure) values.

DFG MAK Germ Cell Mutagen Categories: **1:** Germ cell mutagens that have been shown to increase the mutant frequency in the progeny of exposed humans. **2:** Germ cell mutagens that have been shown to increase the mutant frequency in the progeny of exposed mammals. **3A:** Substances that have been shown to induce genetic damage in germ cells of human of animals, or which produce mutagenic effects in somatic cells of mammals *in vivo* and have been shown to reach the germ cells in an active form. **3B:** Substances that are suspected of being germ cell mutagens because of their genotoxic effects in mammalian somatic cell *in vivo*; in exceptional cases, substances for which there are no *in vivo* data, but that are clearly mutagenic *in vitro* and structurally related to known *in vivo* mutagens. **4:** Not applicable (Category 4 carcinogenic substances are those with non-genotoxic mechanisms of action. By definition, germ cell mutagens are genotoxic. Therefore, a Category 4 for germ cell mutagens cannot apply. At some time in the future, it is conceivable that a Category 4 could be established for genotoxic substances with primary targets other than DNA [e.g. purely aneugenic substances] if research results make this seem sensible.) **5:** Germ cell mutagens, the potency of which is considered to be so low that, provided the MAK value is observed, their contribution to genetic risk for humans is expected not to be significant.

DFG MAK Pregnancy Risk Group Classification: Group A: A risk of damage to the developing embryo or fetus has been unequivocally demonstrated. Exposure of pregnant women can lead to damage of the developing organism, even when MAK and BAT (Biological Tolerance Value for Working Materials) values are observed.

Group B: Currently available information indicates a risk of damage to the developing embryo or fetus must be considered to be probable. Damage to the developing organism cannot be excluded when pregnant women are exposed, even when MAK and BAT values are observed. **Group C:** There is no reason to fear a risk of damage to the developing embryo or fetus when MAK and BAT values are observed. **Group D:** Classification in one of the groups A–C is not yet possible because, although the data available may indicate a trend, they are not sufficient for final evaluation.

IDLH: Immediately Dangerous to Life and Health. This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury.

LOQ: Limit of Quantitation.

NE: Not Established. When no exposure guidelines are established, an entry of NE is made for reference.

NIC: Notice of Intended Change.

NIOSH CEILING: The exposure that shall not be exceeded during any part of the workday. If instantaneous monitoring is not feasible, the ceiling shall be assumed as a 15-minute TWA exposure (unless otherwise specified) that shall not be exceeded at any time during a workday.

NIOSH RELs: NIOSH's Recommended Exposure Limits.

PEL: OSHA's Permissible Exposure Limits. This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL" is placed next to the PEL that was vacated by Court Order.

SKIN: Used when there is a danger of cutaneous absorption.

STEL: Short Term Exposure Limit, usually a 15-minute time-weighted average (TWA) exposure that should not be exceeded at any time during a workday, even if the 8-hr TWA is within the TLV-TWA, PEL-TWA or REL-TWA.

TLV: Threshold Limit Value. An airborne concentration of a substance that represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour.

EXPOSURE LIMITS IN AIR (continued):

TWA: Time Weighted Average exposure concentration for a conventional 8-hr (TLV, PEL) or up to a 10-hr (REL) workday and a 40-hr workweek.

WEEL: Workplace Environmental Exposure Limits from the AIHA.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS:

This rating system was developed by the National Paint and Coating Association and has been adopted by industry to identify the degree of chemical hazards.

HEALTH HAZARD: 0 Minimal Hazard: No significant health risk, irritation of skin or eyes not anticipated. *Skin Irritation:* Essentially non-irritating. Mechanical irritation may occur. *Pil or Draize = 0. Eye Irritation:* Essentially non-irritating, minimal effects clearing in < 24 hours. Mechanical irritation may occur. *Draize = 0. Oral Toxicity LD₅₀ Rat: > 5000 mg/kg. Dermal Toxicity LD₅₀ Rat or Rabbit: > 2000 mg/kg. Inhalation Toxicity 4-hrs LC₅₀ Rat: > 20 mg/L. 1 Slight Hazard:* Minor reversible injury may occur; may irritate the stomach if swallowed; may defat the skin and exacerbate existing dermatitis. *Skin Irritation:* Slightly or mildly irritating. *Pil or Draize > 0 < 5. Eye Irritation:* Slightly to mildly irritating, but reversible within 7 days. *Draize > 0 ≤ 25. Oral Toxicity LD₅₀ Rat: > 500–5000 mg/kg. Dermal Toxicity LD₅₀ Rat or Rabbit: > 1000–2000 mg/kg. Inhalation Toxicity LC₅₀ 4-hrs Rat: > 2–20 mg/L. 2 Moderate Hazard:* Temporary or transitory injury may occur; prolonged exposure may affect the CNS. *Skin Irritation:* Moderately irritating; primary irritant; sensitizer. *Pil or Draize ≥ 5, with no destruction of dermal tissue. Eye Irritation:* Moderately to severely irritating; reversible corneal opacity; corneal involvement or irritation clearing in 8–21 days. *Draize = 26–100, with reversible effects. Oral Toxicity LD₅₀ Rat: > 50–500 mg/kg. Dermal Toxicity LD₅₀ Rat or Rabbit: > 200–1000 mg/kg. Inhalation Toxicity LC₅₀ 4-hrs Rat: > 0.5–2 mg/L. 3 Serious Hazard:* Major injury likely unless prompt action is taken and medical treatment is given; high level of toxicity; corrosive. *Skin Irritation:* Severely irritating and/or corrosive; may cause destruction of dermal tissue, skin burns, and dermal necrosis. *Pil or Draize > 5–8, with destruction of tissue. Eye Irritation:* Corrosive, irreversible destruction of ocular tissue; corneal involvement or irritation persisting for more than 21 days. *Draize > 80 with effects irreversible in 21 days. Oral Toxicity LD₅₀ Rat: > 1–50 mg/kg. Dermal Toxicity LD₅₀ Rat or Rabbit: > 20–200 mg/kg. Inhalation Toxicity LC₅₀ 4-hrs Rat: > 0.05–0.5 mg/L. 4 Severe Hazard:* Life-threatening; major or permanent damage may result from single or repeated exposures; extremely toxic; irreversible injury may result from brief contact. *Skin Irritation:* Not appropriate. Do not rate as a 4, based on skin irritation alone. *Eye Irritation:* Not appropriate. Do not rate as a 4, based on eye irritation alone. *Oral Toxicity LD₅₀ Rat: ≤ 1 mg/kg. Dermal Toxicity LD₅₀ Rat or Rabbit: ≤ 20 mg/kg. Inhalation Toxicity LC₅₀ 4-hrs Rat: ≤ 0.05 mg/L.*

FLAMMABILITY HAZARD: 0 Minimal Hazard: Materials that will not burn in air when exposed to a temperature of 815.5°C (1500°F) for a period of 5 minutes. **1 Slight Hazard:** Materials that must be pre-heated before ignition can occur. Material requires considerable pre-heating, under all ambient temperature conditions before ignition and combustion can occur. This usually includes the following: Materials that will burn in air when exposed to a temperature of 815.5°C (1500°F) for a period of 5 minutes or less; Liquids, solids and semisolids having a flash point at or above 93.3°C (200°F) (i.e. OSHA Class IIIB); and Most ordinary combustible materials (e.g. wood, paper, etc.). **2 Moderate Hazard:** Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this degree would not, under normal conditions, form hazardous atmospheres in air, but under high ambient temperatures or moderate heating may release vapor in sufficient quantities to produce hazardous atmospheres with air. This usually includes the following: Liquids having a flash-point at or above 37.8°C (100°F); Solid materials in the form of course dusts that may burn rapidly but that generally do not form explosive atmospheres; Solid materials in a fibrous or shredded form that may burn rapidly and create flash fire hazards (e.g. cotton, sisal, hemp); and Solids and semisolids (e.g. viscous and slow flowing as asphalt) that readily give off flammable vapors. **3 Serious Hazard:** Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures, or, unaffected by ambient temperature, are readily ignited under almost all conditions. This usually includes the following: Liquids having a flash point below 22.8°C (73°F) and having a boiling point at or above 38°C (100°F) and those liquids having a flash point at or above 22.8°C (73°F) and below 37.8°C (100°F) (i.e. OSHA Class IB and IC);

DEFINITIONS OF TERMS (Continued)

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS (continued):

HEALTH HAZARD (continued): 3 (continued): Materials that on account of their physical form or environmental conditions can form explosive mixtures with air and are readily dispersed in air (e.g., dusts of combustible solids, mists or droplets of flammable liquids); Materials that burn extremely rapidly, usually by reason of self-contained oxygen (e.g. dry nitrocellulose and many organic peroxides). **4 Severe Hazard:** Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air, and that will burn readily. This usually includes the following: Flammable gases; Flammable cryogenic materials; Any liquid or gaseous material that is liquid while under pressure and has a flash point below 22.8°C (73°F) and a boiling point below 37.8°C (100°F) (i.e. OSHA Class IA); and Materials that ignite spontaneously when exposed to air at a temperature of 54.4°C (130°F) or below (pyrophoric).

PHYSICAL HAZARD: 0 Water Reactivity: Materials that do not react with water. **Organic Peroxides:** Materials that are normally stable, even under fire conditions and will not react with water. **Explosives:** Substances that are Non-Explosive. **Compressed Gases:** No Rating. **Pyrophorics:** No Rating. **Oxidizers:** No 0 rating. **Unstable Reactives:** Substances that will not polymerize, decompose, condense, or self-react. **1 Water Reactivity:** Materials that change or decompose upon exposure to moisture. **Organic Peroxides:** Materials that are normally stable, but can become unstable at high temperatures and pressures. These materials may react with water, but will not release energy violently. **Explosives:** Division 1.5 & 1.6 explosives. Substances that are very insensitive explosives or that do not have a mass explosion hazard. **Compressed Gases:** Pressure below OSHA definition. **Pyrophorics:** No Rating. **Oxidizers:** Packaging Group III oxidizers; Solids: any material that in either concentration tested, exhibits a mean burning time less than or equal to the mean burning time of a 3:7 potassium bromate/cellulose mixture and the criteria for Packing Group I and II are not met. Liquids: any material that exhibits a mean pressure rise time less than or equal to the pressure rise time of a 1:1 nitric acid (65%/cellulose mixture and the criteria for Packing Group I and II are not met. **Unstable Reactives:** Substances that may decompose, condense, or self-react, but only under conditions of high temperature and/or pressure and have little or no potential to cause significant heat generation or explosion hazard. Substances that readily undergo hazardous polymerization in the absence of inhibitors. **2 Water Reactivity:** Materials that may react violently with water. **Organic Peroxides:** Materials that, in themselves, are normally unstable and will readily undergo violent chemical change, but will not detonate. These materials may also react violently with water. **Explosives:** Division 1.4 explosives. Explosive substances where the explosive effects are largely confined to the package and no projection of fragments of appreciable size or range are expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package. **Compressed Gases:** Pressurized and meet OSHA definition but < 514.7 psi absolute at 21.1°C (70°F) [500 psig]. **Pyrophorics:** No Rating. **Oxidizers:** Packaging Group II oxidizers. Solids: any material that, either in concentration tested, exhibits a mean burning time of less than or equal to the mean burning time of a 2:3 potassium bromate/cellulose mixture and the criteria for Packing Group I are not met. Liquids: any material that exhibits a mean pressure rise time less than or equal to the pressure rise of a 1:1 aqueous sodium chlorate solution (40%/cellulose mixture and the criteria for Packing Group I are not met. **Reactive:** Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure, but have a low potential (or low risk) for significant heat generation or explosion. Substances that readily form peroxides upon exposure to air or oxygen at room temperature. **3 Water Reactivity:** Materials that may form explosive reactions with water. **Organic Peroxides:** Materials that are capable of detonation or explosive reaction, but require a strong initiating source or must be heated under confinement before initiation; or materials that react explosively with water. **Explosives:** Division 1.3 explosives. Explosive substances that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but do not have a mass explosion hazard. **Compressed Gases:** Pressure ≥ 514.7 psi absolute at 21.1°C (70°F) [500 psig]. **Pyrophorics:** No Rating. **Oxidizers:** Packaging Group I oxidizers. Solids: any material that, in either concentration tested, exhibits a mean burning time less than the mean burning time of a 3:2 potassium bromate/cellulose mixture. Liquids: any material that spontaneously ignites when mixed with cellulose in a 1:1 ratio, or which exhibits a mean pressure rise time less than the pressure rise time of a 1:1 perchloric acid (50%/cellulose mixture. **Unstable Reactives:** Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure and have a moderate potential (or moderate risk) to cause significant heat generation or explosion. **4 Water Reactivity:** Materials that react explosively with water without requiring heat or confinement. **Organic Peroxides:** Materials that are readily capable of detonation or explosive decomposition at normal temperature and pressures. **Explosives:** Division 1.1 & 1.2 explosives. Explosive substances that have a mass explosion hazard or have a projection hazard. A mass explosion is one that affects almost the entire load instantaneously. **Compressed Gases:** No Rating. **Pyrophorics:** Add to the definition of Flammability 4. **Oxidizers:** No 4 rating. **Unstable Reactives:** Substances that may polymerize, decompose, condense, or self-react at ambient temperature and/or pressure and have a high potential (or high risk) to cause significant heat generation or explosion.

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS:

HEALTH HAZARD: 0 Materials that, under emergency conditions, would offer no hazard beyond that of ordinary combustible materials. Gases and vapors with an LC₅₀ for acute inhalation toxicity greater than 10,000 ppm. Dusts and mists with an LC₅₀ for acute inhalation toxicity greater than 200 mg/L. Materials with an LD₅₀ for acute dermal toxicity greater than 2000 mg/kg. Materials with an LD₅₀ for acute oral toxicity greater than 2000 mg/kg. Materials essentially non-irritating to the respiratory tract, eyes, and skin. **1** Materials that, under emergency conditions, can cause significant irritation. Gases and vapors with an LC₅₀ for acute inhalation toxicity greater than 5,000 ppm but less than or equal to 10,000 ppm. Dusts and mists with an LC₅₀ for acute inhalation toxicity greater than 10 mg/L but less than or equal to 200 mg/L.

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

HEALTH HAZARD (continued): 1 (continued): Materials with an LD₅₀ for acute dermal toxicity greater than 1000 mg/kg but less than or equal to 2000 mg/kg. Materials that slightly to moderately irritate the respiratory tract, eyes and skin. Materials with an LD₅₀ for acute oral toxicity greater than 500 mg/kg but less than or equal to 2000 mg/kg. **2** Materials that, under emergency conditions, can cause temporary incapacitation or residual injury. Gases with an LC₅₀ for acute inhalation toxicity greater than 3,000 ppm but less than or equal to 5,000 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than one-fifth its LC₅₀ for acute inhalation toxicity, if its LC₅₀ is less than or equal to 5000 ppm and that does not meet the criteria for either degree of hazard 3 or degree of hazard 4. Dusts and mists with an LC₅₀ for acute inhalation toxicity greater than 2 mg/L but less than or equal to 10 mg/L. Materials with an LD₅₀ for acute dermal toxicity greater than 200 mg/kg but less than or equal to 1000 mg/kg. Compressed liquefied gases with boiling points between -30°C (-22°F) and -55°C (-66.5°F) that cause severe tissue damage, depending on duration of exposure. Materials that are respiratory irritants. Materials that cause severe, but reversible irritation to the eyes or are lachrymators. Materials that are primary skin irritants or sensitizers. Materials whose LD₅₀ for acute oral toxicity is greater than 50 mg/kg but less than or equal to 500 mg/kg. **3** Materials that, under emergency conditions, can cause serious or permanent injury. Gases with an LC₅₀ for acute inhalation toxicity greater than 1,000 ppm but less than or equal to 3,000 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater its LC₅₀ for acute inhalation toxicity, if its LC₅₀ is less than or equal to 3000 ppm and that does not meet the criteria for degree of hazard 4. Dusts and mists with an LC₅₀ for acute inhalation toxicity greater than 0.5 mg/L but less than or equal to 2 mg/L. Materials with an LD₅₀ for acute dermal toxicity greater than 40 mg/kg but less than or equal to 200 mg/kg. Materials that are corrosive to the respiratory tract. Materials that are corrosive to the eyes or cause irreversible corneal opacity. Materials corrosive to the skin. Cryogenic gases that cause frostbite and irreversible tissue damage. Compressed liquefied gases with boiling points below -55°C (-66.5°F) that cause frostbite and irreversible tissue damage. Materials with an LD₅₀ for acute oral toxicity greater than 5 mg/kg but less than or equal to 50 mg/kg. **4** Materials that, under emergency conditions, can be lethal. Gases with an LC₅₀ for acute inhalation toxicity less than or equal to 1,000 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than ten times its LC₅₀ for acute inhalation toxicity, if its LC₅₀ is less than or equal to 1000 ppm. Dusts and mists whose LC₅₀ for acute inhalation toxicity is less than or equal to 0.5 mg/L. Materials whose LD₅₀ for acute dermal toxicity is less than or equal to 40 mg/kg. Materials whose LD₅₀ for acute oral toxicity is less than or equal to 5 mg/kg.

FLAMMABILITY HAZARD: 0 Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand. Materials that will not burn in air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes in according with Annex D of NFPA 704. **1** Materials that must be preheated before ignition can occur. Materials in this degree require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur. Materials that will burn in air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes in according with Annex D of NFPA 704. Liquids, solids, and semisolids having a flash point at or above 93.4°C (200°F) (i.e. Class IIIB liquids). Liquids with a flash point greater than 35°C (95°F) that do not sustain combustion when tested using the *Method of Testing for Sustained Combustibility*, per 49 CFR 173, Appendix H or the UN *Recommendations on the Transport of Dangerous Goods, Model Regulations* (current edition) and the related *Manual of Tests and Criteria* (current edition). Liquids with a flash point greater than 35°C (95°F) in a water-miscible solution or dispersion with a water non-combustible liquid/solid content of more than 85% by weight. Liquids that have no fire point when tested by ASTM D 92, *Standard Test Method for Flash and Fire Points by Cleveland Open Cup*, up to the boiling point of the liquid or up to a temperature at which the sample being tested shows an obvious physical change. Combustible pellets with a representative diameter of greater than 2 mm (10 mesh). Most ordinary combustible materials. Solids containing greater than 0.5% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. **2** Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Materials in this degree would not under normal conditions form hazardous atmospheres with air, but under high ambient temperatures or under moderate heating could release vapor in sufficient quantities to produce hazardous atmospheres with air. Liquids having a flash point at or above 37.8°C (100°F) and below 93.4°C (200°F) (i.e. Class II and Class IIIA liquids.) Solid materials in the form of powders or coarse dusts of representative diameter between 420 microns (40 mesh) and 2 mm (10 mesh) that burn rapidly but that generally do not form explosive mixtures with air. Solid materials in fibrous or shredded form that burn rapidly and create flash fire hazards, such as cotton, sisal, and hemp. Solids and semisolids that readily give off flammable vapors. Solids containing greater than 0.5% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. **3** Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures or, though unaffected by ambient temperatures, are readily ignited under almost all conditions. Liquids having a flash point below 22.8°C (73°F) and having a boiling point at or above 37.8°C (100°F) and those liquids having a flash point at or above 22.8°C (73°F) and below 37.8°C (100°F) (i.e. Class IB and IC liquids.) Materials that on account of their physical form or environmental conditions can form explosive mixtures with air and are readily dispersed in air. Flammable or combustible dusts with representative diameter less than 420 microns (40 mesh). Materials that burn with extreme rapidity, usually by reason of self-contained oxygen (e.g. dry nitrocellulose and many organic peroxides). Solids containing greater than 0.5% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. **4** Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and will burn readily. Flammable gases. Flammable cryogenic materials. Any liquid or gaseous materials that is liquid while under pressure and has a flash point below 22.8°C (73°F) and a boiling point below 37.8°C (100°F) (i.e. Class IA liquids). Materials that ignite when exposed to air, Solids containing greater than 0.5% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent.

DEFINITIONS OF TERMS (Continued)

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS

(continued):

INSTABILITY HAZARD: **0** Materials that in themselves are normally stable, even under fire conditions. Materials that have an instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) below 0.01 W/mL. Materials that do not exhibit an exotherm at temperatures less than or equal to 500°C (932°F) when tested by differential scanning calorimetry. **1** Materials that in themselves are normally stable, but that can become unstable at elevated temperatures and pressures. Materials that have an instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 0.01 W/mL and below 10 W/mL. **2** Materials that readily undergo violent chemical change at elevated temperatures and pressures. Materials that have an instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 10 W/mL and below 100W/mL. **3** Materials that in themselves are capable of detonation or explosive decomposition or explosive reaction, but that require a strong initiating source or that must be heated under confinement before initiation. Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 100 W/mL and below 1000 W/mL. Materials that are sensitive to thermal or mechanical shock at elevated temperatures and pressures. **4** Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures. Materials that are sensitive to localized thermal or mechanical shock at normal temperatures and pressures. Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) of 1000 W/mL or greater.

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (**NFPA**). **Flash Point:** Minimum temperature at which a liquid gives off sufficient vapor to form an ignitable mixture with air near the surface of the liquid or within the test vessel used. **Autoignition Temperature:** Minimum temperature of a solid, liquid, or gas required to initiate or cause self-sustained combustion in air with no other source of ignition. **LEL:** Lowest concentration of a flammable vapor or gas/air mixture that will ignite and burn with a flame. **UEL:** Highest concentration of a flammable vapor or gas/air mixture that will ignite and burn with a flame.

TOXICOLOGICAL INFORMATION:

Human and Animal Toxicology: Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. **LD₅₀:** Lethal Dose (solids & liquids) that kills 50% of the exposed animals. **LC₅₀:** Lethal Concentration (gases) that kills 50% of the exposed animals. **ppm:** Concentration expressed in parts of material per million parts of air or water. **mg/m³:** Concentration expressed in weight of substance per volume of air. **mg/kg:** Quantity of material, by weight, administered to a test subject, based on their body weight in kg. **TDLo:** Lowest dose to cause a symptom. **TCLo:** Lowest concentration to cause a symptom. **TD₀, LDLo, and LDo,** or **TC, TCo, LCLo, and LCo:** Lowest dose (or concentration) to cause lethal or toxic effects. **Cancer Information:** **IARC:** International Agency for Research on Cancer. **NTP:** National Toxicology Program. **RTECS:** Registry of Toxic Effects of Chemical Substances. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. **Other Information:** **BEI:** ACGIH Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV.

ECOLOGICAL INFORMATION:

EC: Effect concentration in water. **BCE:** Bioconcentration Factor, which is used to determine if a substance will concentrate in life forms that consume contaminated plant or animal matter. **TLm:** Median threshold limit. **log K_{OW}** or **log K_{OC}:** Coefficient of Oil/Water Distribution is used to assess a substance's behavior in the environment.

REGULATORY INFORMATION: This section explains the impact of various laws and regulations on the material.

U.S.:

EPA: U.S. Environmental Protection Agency. **ACGIH:** American Conference of Governmental Industrial Hygienists, a professional association that establishes exposure limits. **OSHA:** U.S. Occupational Safety and Health Administration. **NIOSH:** National Institute of Occupational Safety and Health, which is the research arm of OSHA. **DOT:** U.S. Department of Transportation. **TC:** Transport Canada. **SARA:** Superfund Amendments and Reauthorization Act. **TSCA:** U.S. Toxic Substance Control Act. **CERCLA:** Comprehensive Environmental Response, Compensation, and Liability Act. Marine Pollutant status according to the DOT; CERCLA or Superfund; and various state regulations. This section also includes information on the precautionary warnings that appear on the material's package label.

CANADA:

WHMIS: Canadian Workplace Hazardous Materials Information System. **TC:** Transport Canada. **DSL/NDSL:** Canadian Domestic/Non-Domestic Substances List.

EUROPE:

EU: European Union (formerly known as the EEC, European Economic Community). **EINECS:** European Inventory of Now-Existing Chemical Substances. **ARD:** European Agreement Concerning the International Carriage of Dangerous Goods by Road. **RID:** International Regulations Concerning the Carriage of Dangerous Goods by Rail.

AUSTRALIA:

AICS: Australian Inventory of Chemical Substances. **NOHSC:** National Occupational Health & Safety Code.

JAPAN:

METI: Ministry of Economy, Trade and Industry.