

SENGUARD

Chemwatch Material Safety Data Sheet
May-17-2007
NB293EC

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Version No:4
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Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

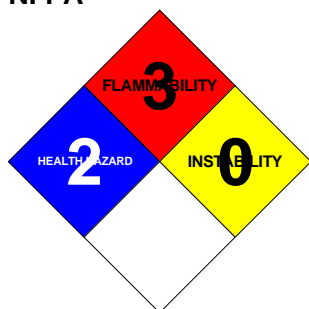
PRODUCT NAME

SENGUARD

STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA



SUPPLIER

Company: Dry- Treat Inc.

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PRODUCT USE

Water and stain protection for masonry substrate.

SYNONYMS

"stain preventer", "masonry sealant"

Section 2 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

RISK

Irritating to eyes and skin.

Highly flammable.

Harmful to aquatic organisms.

POTENTIAL HEALTH EFFECTS

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Section 2 - HAZARDS IDENTIFICATION

ACUTE HEALTH EFFECTS

SWALLOWED

Accidental ingestion of the material may be damaging to the health of the individual. Ingestion of ethanol (ethyl alcohol, "alcohol") may produce nausea, vomiting, bleeding from the digestive tract, abdominal pain, and diarrhea. Effects on the body:

Blood concentration

<1.5 g/L

1.5- 3.0 g/L

3- 5 g/L

Effects

Mild: impaired vision, co- ordination and reaction time; emotional instability

Moderate: Slurred speech, confusion, inco-ordination, emotional instability, disturbances in perception and senses, possible blackouts, and impaired objective performance in standardized tests. Possible double vision, flushing, fast heart rate, sweating and incontinence. Slow breathing may occur rarely and fast breathing may develop in cases of metabolic acidosis, low blood sugar and low blood potassium. Central nervous system depression may progress to coma.

Severe: cold clammy skin, low body temperature and low blood pressure. Atrial fibrillation and heart block have been reported. Depression of breathing may occur, respiratory failure may follow serious poisoning, choking on vomit may result in lung inflammation and swelling. Convulsions due to severe low blood sugar may also occur. Acute liver inflammation may develop.

EYE

There is evidence that material may produce eye irritation in some persons and produce eye damage 24 hours or more after instillation. Severe inflammation may be expected with pain. There may be damage to the cornea. Unless treatment is prompt and adequate there may be permanent loss of vision. Conjunctivitis can occur following repeated exposure. Direct contact of the eye with ethanol may cause immediate stinging and burning with reflex closure of the lid and tearing, transient injury of the corneal epithelium and hyperaemia of the conjunctiva. Foreign-body type discomfort may persist for up to 2 days but healing is usually spontaneous and complete.

SKIN

The material may cause moderate inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterized by redness, swelling and blistering.

Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

Inhalation of high concentrations of gas/vapor causes lung irritation with coughing and nausea, central nervous depression with headache and dizziness, slowing of reflexes, fatigue and inco-ordination.

Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by narcosis, reduced alertness, loss of reflexes, lack of coordination and vertigo.

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Section 2 - HAZARDS IDENTIFICATION

The most common signs of inhalation overexposure to ethanol, in animals, include ataxia, incoordination and drowsiness for those surviving narcosis. The narcotic dose for rats, after 2 hours of exposure, is 19260 ppm.

CHRONIC HEALTH EFFECTS

Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems. Prolonged exposure to ethanol may cause damage to the liver and cause scarring. It may also worsen damage caused by other agents. Large amounts of ethanol taken in pregnancy may result in "fetal alcohol syndrome", characterized by delay in mental and physical development, learning difficulties, behavioral problems and small head size. A small number of people develop allergic reactions to ethanol, which include eye infections, skin swelling, shortness of breath, and itchy rashes with blisters.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
alkylalkoxysilane		30-60
ethanol	64-17-5	30-60
n- butyl acetate	123-86-4	<10
ingredients not contributing to the classification		10-30

Section 4 - FIRST AID MEASURES

SWALLOWED

- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Seek medical advice.

EYE

- If this product comes in contact with the eyes:
- Immediately hold eyelids apart and flush the eye continuously with running water.
 - Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
 - Continue flushing until advised to stop by the Poisons Information Center or a doctor, or for at least 15 minutes.
 - Transport to hospital or doctor without delay.
 - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

- If skin contact occurs:
- Immediately remove all contaminated clothing, including footwear
 - Flush skin and hair with running water (and soap if available).
 - Seek medical attention in event of irritation.

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.

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Section 4 - FIRST AID MEASURES

- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor.

NOTES TO PHYSICIAN

For acute or short term repeated exposures to ethanol:

- Acute ingestion in non-tolerant patients usually responds to supportive care with special attention to prevention of aspiration, replacement of fluid and correction of nutritional deficiencies (magnesium, thiamine pyrodoxine, Vitamins C K)
- Give 50% dextrose (50-100 ml) IV to obtunded patients following blood draw for glucose determination.
- Comatose patients should be treated with initial attention to airway, breathing, circulation and drugs of immediate importance (glucose, thiamine)
- Decontamination is probably unnecessary more than 1 hour after a single observed ingestion. Cathartics and charcoal may be given but are probably not effective in single ingestions.
- Fructose administration is contra-indicated due to side effects.

Section 5 - FIRE FIGHTING MEASURES

Flash Point (°F): Martens CC)
Lower Explosive Limit (%): Not Available
Upper Explosive Limit (%): Not Available
Autoignition Temp (°F): Not Available

EXTINGUISHING MEDIA

- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.
- Water spray or fog - Large fires only.

FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- May be violently or explosively reactive.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- Consider evacuation (or protect in place).
- Fight fire from a safe distance, with adequate cover.
- If safe, switch off electrical equipment until vapor fire hazard removed.
- Use water delivered as a fine spray to control the fire and cool adjacent area.
- Avoid spraying water onto liquid pools.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protective location.
- If safe to do so, remove containers from path of fire.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 1640 feet in all directions.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Liquid and vapor are highly flammable.
 - Severe fire hazard when exposed to heat, flame and/or oxidizers.
 - Vapor may travel a considerable distance to source of ignition.
 - Heating may cause expansion or decomposition leading to violent rupture of containers.
 - On combustion, may emit toxic fumes of carbon monoxide (CO).
- Combustion products include: carbon dioxide (CO₂), other pyrolysis products typical of

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Section 5 - FIRE FIGHTING MEASURES

burning organic material.

FIRE INCOMPATIBILITY

Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

PERSONAL PROTECTION

Glasses:
Chemical goggles.
Gloves:
PVC chemical resistant type.
Respirator:
Type A Filter of sufficient capacity

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid breathing vapors and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb small quantities with vermiculite or other absorbent material.
- Wipe up.
- Collect residues in a flammable waste container.

MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.
- May be violently or explosively reactive.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- Consider evacuation (or protect in place).
- No smoking, naked lights or ignition sources.
- Increase ventilation.
- Stop leak if safe to do so.
- Water spray or fog may be used to disperse / absorb vapor.
- Contain spill with sand, earth or vermiculite.
- Use only spark-free shovels and explosion proof equipment.
- Collect recoverable product into labeled containers for recycling.
- Absorb remaining product with sand, earth or vermiculite.
- Collect solid residues and seal in labeled drums for disposal.
- Wash area and prevent runoff into drains.
- If contamination of drains or waterways occurs, advise emergency services.

PROTECTIVE ACTIONS FOR SPILL

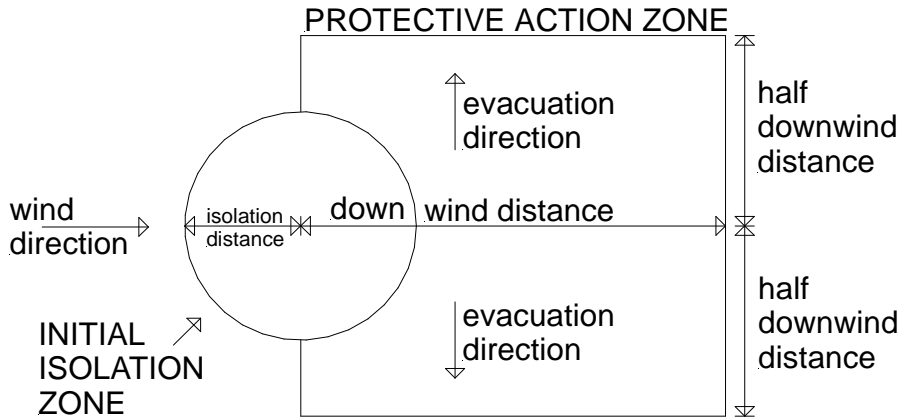
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Section 6 - ACCIDENTAL RELEASE MEASURES



From IERG (Canada/Australia)

Isolation Distance	25 meters
Downwind Protection Distance	300 meters

FOOTNOTES

- 1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapor plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.
- 2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapor concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.
- 3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localized wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.
- 4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrican or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills".
LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.
- 5 Guide 128 is taken from the US DOT emergency response guide book.
- 6 IERG information is derived from CANUTEC - Transport Canada.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

ethanol 3300 ppm

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

ethanol 3300 ppm

other than mild, transient adverse effects without perceiving a clearly defined odour is:

ethanol 3000 ppm

The threshold concentration below which most people will experience no appreciable risk of health effects:

ethanol 1000 ppm

American Industrial Hygiene Association (AIHA)

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Section 6 - ACCIDENTAL RELEASE MEASURES

Ingredients considered according to the following cutoffs

Very Toxic (T+)	$\geq 0.1\%$	Toxic (T)	$\geq 3.0\%$
R50	$\geq 0.25\%$	Corrosive (C)	$\geq 5.0\%$
R51	$\geq 2.5\%$		
else	$\geq 10\%$		

where percentage is percentage of ingredient found in the mixture

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Containers, even those that have been emptied, may contain explosive vapors.
- Do NOT cut, drill, grind, weld or perform similar operations on or near containers. DO NOT allow clothing wet with material to stay in contact with skin.
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- Avoid smoking, naked lights, heat or ignition sources.
- When handling, DO NOT eat, drink or smoke.
- Vapor may ignite on pumping or pouring due to static electricity.
- DO NOT use plastic buckets.
- Earth and secure metal containers when dispensing or pouring product.
- Use spark-free tools when handling.
- Avoid contact with incompatible materials.
- Keep containers securely sealed.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.

RECOMMENDED STORAGE METHODS

Packing as supplied by manufacturer. Plastic containers may only be used if approved for flammable liquid. Check that containers are clearly labeled and free from leaks.

- For low viscosity materials (i): Drums and jerricans must be of the non-removable head type. (ii): Where a can is to be used as an inner package, the can must have a screwed enclosure.
- For materials with a viscosity of at least 2680 cSt. (23 deg. C)
- For manufactured product having a viscosity of at least 250 cSt. (23 deg. C)
- Manufactured product that requires stirring before use and having a viscosity of at least 20 cSt (23 deg. C) - (i): Removable head packaging; (ii): Cans with friction closures and (iii): low pressure tubes and cartridges may be used.
- Where combination packages are used, and the inner packages are of glass, there must be sufficient inert cushioning material in contact with inner and outer packages
- In addition, where inner packagings are glass and contain liquids of packing group I there must be sufficient inert absorbent to absorb any spillage, unless the outer packaging is a close fitting molded plastic box and the substances are not incompatible with the plastic.

STORAGE REQUIREMENTS

- Store in original containers in approved flame-proof area.
- No smoking, naked lights, heat or ignition sources.

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Section 7 - HANDLING AND STORAGE

- DO NOT store in pits, depressions, basements or areas where vapors may be trapped.
- Keep containers securely sealed.
- Store away from incompatible materials in a cool, dry well ventilated area.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

US OSHA Permissible Exposure Levels (PELs)

Z	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	Max excursion ppm	Max excursion mg/m ³	Max excursion duration (mins)	TWA F/CC
Z1	Ethyl alcohol (Ethanol)	1000	1900								
Z1	n-Butyl-acetate	150	710								

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	TWA F/CC
Canada - Quebec Occupational Exposure Limits (French)	ethanol (Alcool éthylique)	1000	1880					
US - Minnesota Permissible Exposure Limits (PELs)	ethanol (Ethyl alcohol (Ethanol))	1000	1900					
Canada - British Columbia Occupational Exposure Limits	ethanol (Ethanol)	1000						
Canada - Ontario Occupational Exposure Limits	ethanol (Ethanol)	1,000	1,900					
US - California	ethanol (Ethyl alcohol;	1000	1900					

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	TWA F/CC
Permissible Exposure Limits for Chemical Contaminants	ethanol)							
US - Vermont Permissible Exposure Limits Table Z-1- A Transitional Limits for Air Contaminants	ethanol (Ethyl alcohol (Ethanol))	1000	1900					
US - Vermont Permissible Exposure Limits Table Z-1- A Final Rule Limits for Air Contaminants	ethanol (Ethyl alcohol (Ethanol))	1000	1900					
US - Idaho - Limits for Air Contaminants	ethanol (Ethyl alcohol (ethanol))	1000	1900					
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	ethanol (Ethyl alcohol (Ethonal))	1000	1900					
Canada - Alberta Occupational Exposure Limits	ethanol (Ethyl alcohol (Ethanol))	1000	1880					
Canada - Saskatchewan Occupational Health	ethanol (Ethanol)		1880		2350			

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	TWA F/CC
and Safety Regulation								
s - Contaminant Limits								
US - Hawaii Air Contaminant Limits	ethanol (Ethyl alcohol (Ethanol))	1,000	1,900					
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	ethanol (Ethanol) (Ethyl alcohol (Ethanol))	1,000	1,900	1,000	1,900			
US - Washington Permissible exposure limits of air contaminants	ethanol (Ethanol) (Ethyl alcohol))	1,000		1,250				
US OSHA Permissible Exposure Levels (PELs) - Table Z1	ethanol (Ethyl alcohol (Ethanol))	1000	1900					
US NIOSH Recommended Exposure Limits (RELs)	ethanol (Ethyl alcohol)	1000	1900					
Canada - Alberta Occupational Exposure Limits	ethanol (Ethanol) (Ethyl alcohol))	1000	1880					
US ACGIH Threshold Limit Values (TLV)	ethanol (Ethanol)	1000						
Canada - Quebec Occupational Exposure Limits	n- butyl acetate (Acétate de butyle normal)	150	713	200	950			

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	TWA F/CC
Contaminants								
US - Tennessee Occupational Exposure Limits - Limits For Air	n- butyl acetate (n- butyl- acetate)	150	710	200	950			
Contaminants								
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	n- butyl acetate (n- Butyl acetate)		95		142			
US - Hawaii Air Contaminant Limits	n- butyl acetate (n- Butyl- acetate)	150	710	200	950			
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	n- butyl acetate (n- Butyl acetate)	150	710	200	950			
US - Washington Permissible exposure limits of air contaminants	n- butyl acetate (n- Butyl acetate)	150		200				
US OSHA Permissible Exposure Levels (PELs) - Table Z1	n- butyl acetate (n- Butyl- acetate)	150	710					
US NIOSH Recommended Exposure Limits (RELs)	n- butyl acetate (n- Butyl acetate)	150	710	200	950			

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Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	TWA F/CC
Canada - Alberta Occupation al Exposure Limits	n- butyl acetate (n- Butyl acetate)	150	713	200	950			
US ACGIH Threshold Limit Values (TLV)	n- butyl acetate (n- Butyl acetate)	150		200				

EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m ³)	Revised IDLH Value (ppm)
ethanol		3, 300 [LEL]
n- butyl acetate		1, 700 [LEL]

NOTES

Values marked LEL indicate that the IDLH was based on 10% of the lower explosive limit for safety considerations even though the relevant toxicological data indicated that irreversible health effects or impairment of escape existed only at higher concentrations.

MATERIAL DATA

Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations. Present day expectations require that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety factors of 5 to 10 or more. On occasion animal no-observable-effect-levels (NOEL) are used to determine these limits where human results are unavailable. An additional approach, typically used by the TLV committee (USA) in determining respiratory standards for this group of chemicals, has been to assign ceiling values (TLV C) to rapidly acting irritants and to assign short-term exposure limits (TLV STELs) when the weight of evidence from irritation, bioaccumulation and other endpoints combine to warrant such a limit. In contrast the MAK Commission (Germany) uses a five-category system based on intensive odour, local irritation, and elimination half-life. However this system is being replaced to be consistent with the European Union (EU) Scientific Committee for Occupational Exposure Limits (SCOEL); this is more closely allied to that of the USA.

OSHA (USA) concluded that exposure to sensory irritants can:

- cause inflammation
- cause increased susceptibility to other irritants and infectious agents
- lead to permanent injury or dysfunction
- permit greater absorption of hazardous substances and
- acclimate the worker to the irritant warning properties of these substances thus increasing the risk of overexposure.

INGREDIENT DATA

ETHANOL:

Odour Threshold Value: 49-716 ppm (detection), 101 ppm (recognition)
Eye and respiratory tract irritation do not appear to occur at exposure levels of less than 5000 ppm and the TLV-TWA is thought to provide an adequate margin of safety against such effects.

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Experiments in man show that inhalation of 1000 ppm caused slight symptoms of poisoning and 5000 ppm caused strong stupor and morbid sleepiness. Subjects exposed to 5000 ppm to 10000 ppm experienced smarting of the eyes and nose and coughing. Symptoms disappeared within minutes. Inhalation also causes local irritating effects to the eyes and upper respiratory tract, headaches, sensation of heat intraocular tension, stupor, fatigue and a need to sleep. At 15000 ppm there was continuous lachrymation and coughing.

N-BUTYL ACETATE:

Exposed individuals are reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.

Odor Safety Factor (OSF) is determined to fall into either Class A or B.

The Odor Safety Factor (OSF) is defined as:

$OSF = \frac{\text{Exposure Standard (TWA) ppm}}{\text{Odor Threshold Value (OTV) ppm}}$

Classification into classes follows:

Class	OSF	Description
A	550	Over 90% of exposed individuals are aware by smell that the Exposure Standard (TLV- TWA for example) is being reached, even when distracted by working activities
B	26- 550	Idem for 50- 90% of persons being distracted
C	1- 26	Idem for less than 50% of persons being distracted
D	0.18- 1	0- 50% of persons aware of being tested perceive by smell that the Exposure Standard is being reached
E	<0.18	Idem for less than 10% of persons aware of being tested

Amoore and Hautala * have determined that it is only at an OSF value of 26 that 50% of distracted persons can detect the substance at the Exposure Standard value. In the case of alerted persons, an OSF of 26 means that 99% of them can detect the odor at the Exposure Standard value. It is ONLY for substances belonging to Class A and B that there is a reasonable chance of being warned in time, that the Exposure Standard is being exceeded. * Journal Applied Toxicology: Vol 3, 1983, p272

NOTE: The use of the OSF may be inappropriate for mixtures where substances mask the odor of others.

Odour Threshold Value: 0.0063 ppm (detection), 0.038-12 ppm (recognition)

Exposure at or below the recommended TLV-TWA is thought to prevent significant irritation of the eyes and respiratory passages as well as narcotic effects. In light of the lack of substantive evidence regarding teratogenicity and a review of acute oral data a STEL is considered inappropriate.

PERSONAL PROTECTION

EYE

- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them. DO NOT wear contact lenses.

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

HANDS/FEET

Suitability and durability of glove type is dependent on usage. Factors such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity,

are important in the selection of gloves.

Wear chemical protective gloves, eg. PVC.

Wear safety footwear or safety gumboots, eg. Rubber.

OTHER

- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half- face Respirator	Full- Face Respirator
1000	10	A- 1	-
1000	50	-	A- 1
5000	50	Airline*	-
5000	100	-	A- 2
10000	100	-	A- 3
	100+		Airline* *

* - Continuous Flow ** - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

ENGINEERING CONTROLS

For flammable liquids and flammable gases, local exhaust ventilation or a process enclosure ventilation system may be required. Ventilation equipment should be explosion-resistant.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Molecular Weight: Not Applicable
Melting Range (°F): Not Available
Solubility in water (g/L): Partly Miscible
pH (1% solution): Not Available

Boiling Range (°F): Not Available
Specific Gravity (water= 1): 0.86
pH (as supplied): Not Applicable
Vapor Pressure (mmHg): 33.7 @ 20 degC

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Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Volatile Component (%vol): Not Available
Relative Vapor Density (air=1): Not Available
Lower Explosive Limit (%): Not Available
Autoignition Temp (°F): Not Available
State: LIQUID

Evaporation Rate: Not Available
Flash Point (°F): Martens CC)
Upper Explosive Limit (%): Not Available
Decomposition Temp (°F): Not Available
Viscosity: Not Available

APPEARANCE

Highly flammable liquid with a characteristic odour; partly mixes with water.
Refractive Index @ 20°C: 1.38 to 1.39
Moisture by Karl Fisher: 235 ppm (0.024%)
Viscosity @ 20°C: 1.49 cSt
USA VOC content: < 615 g/litre

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

STORAGE INCOMPATIBILITY

Avoid strong bases.
Incompatible with aluminium. DO NOT heat above 49 deg. C. in aluminium equipment.
- Avoid oxidizing agents, acids, acid chlorides, acid anhydrides.

Section 11 - TOXICOLOGICAL INFORMATION

Senguard

TOXICITY AND IRRITATION

The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

ETHANOL:

TOXICITY

Oral (rat) LD50: 7060 mg/kg
Oral (human) LDLo: 1400 mg/kg
Oral (man) TDLo: 50 mg/kg
Oral (man) TDLo: 1.40 mg/kg
Oral (woman) TDLo: 256 mg/kg/12 wks
Inhalation (rat) LC50: 20, 000 ppm/10h
Inhalation (rat) LC50: 64000 ppm/4h

IRRITATION

Skin (rabbit):20 mg/24hr- Moderate
Skin (rabbit):400 mg (open)- Mild
Eye (rabbit):100mg/24hr- Moderate
Eye (rabbit): 500 mg SEVERE

N-BUTYL ACETATE:

TOXICITY

Oral (rat) LD50: 13100 mg/kg
Dermal (rabbit) LD50: 3200 mg/kg*
Inhalation (human) TClO: 200 ppm
Inhalation (rat) LC50: 2000 ppm/4h
Inhalation (Human) TClO: 200 ppm/4h * [PPG]
Oral (Rat) LD50: 10768 mg/kg
Inhalation (Rat) LC50: 390 ppm/4h
Intraperitoneal (Mouse) LD50: 1230 mg/kg

IRRITATION

Skin (rabbit): 500 mg/24h- Moderate
Eye (rabbit): 20 mg (open)- SEVERE
Eye (rabbit): 20 mg/24h - Moderate
Eye (human): 300 mg

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Section 11 - TOXICOLOGICAL INFORMATION

Oral (Rabbit) LD50: 3200 mg/kg

Oral (Guinea) pig: LD50 4700 mg/kg

Intraperitoneal (Guinea) pig: LD 1500 mg/kg

The material may produce severe irritation to the eye causing pronounced inflammation.

Repeated or prolonged exposure to irritants may produce conjunctivitis.

The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

MATERIAL	CARCINOGEN	SENSITIZER	SKIN	MUTAGEN	REPROTOXIN
ethanol	ACGIH:A4				CP65:Yes

CARCINOGEN

ACGIH: ethanol: A4

REPROTOXIN

Californian Proposition 65 - Reproductive Toxicity:

TYPE: ethanol: developmental

DATE LISTED: October 1, 1987

Section 12 - ECOLOGICAL INFORMATION

Marine Pollutant:Not Determined

DO NOT discharge into sewer or waterways.

Refer to data for ingredients, which follows:

ETHANOL:

Fish LC50 (96hr.) (mg/l):	13480
Algae IC50 (72hr.) (mg/l):	1450
log Kow (Sangster 1997):	- 0.3
BOD5:	63%
ThOD:	2.1
Half- life Soil - High (hours):	24
Half- life Soil - Low (hours):	2.6
Half- life Air - High (hours):	122
Half- life Air - Low (hours):	12.2
Half- life Surface water - High (hours):	26
Half- life Surface water - Low (hours):	6.5
Half- life Ground water - High (hours):	52
Half- life Ground water - Low (hours):	13
Aqueous biodegradation - Aerobic - High (hours):	26
Aqueous biodegradation - Aerobic - Low (hours):	6.5
Aqueous biodegradation - Anaerobic - High (hours):	104
Aqueous biodegradation - Anaerobic - Low (hours):	26
Aqueous biodegradation - Removal secondary treatment - High (hours):	67%
Photooxidation half- life water - High (hours):	3.20E+05
Photooxidation half- life water - Low (hours):	8020
Photooxidation half- life air - High (hours):	122
Photooxidation half- life air - Low (hours):	12.2

DO NOT discharge into sewer or waterways.

log Kow: -0.31- -0.32

Half-life (hr) air: 144

Half-life (hr) H2O surface water: 144

Henry's atm m³ /mol: 6.29E-06

BOD 5 if unstated: 0.93-1.67,63%

COD: 1.99-2.11,97%

ThOD: 2.1

When ethanol is released into the soil it readily and quickly biodegrades

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Section 12 - ECOLOGICAL INFORMATION

but may leach into ground water; most is lost by evaporation. When released into water the material readily evaporates and is biodegradable. Ethanol does not bioaccumulate to an appreciable extent. The material is readily degraded by reaction with photochemically produced hydroxy radicals; release into air will result in photodegradation and wet deposition.

N-BUTYL ACETATE:

Fish LC50 (96hr.) (mg/l):	18
Daphnia magna EC50 (48hr.) (mg/l):	44
log Kow (Prager 1995):	1.82
Fish LC50 (96hr.) (mg/l):	100- 185
Daphnia magna EC50 (48hr.) (mg/l):	44
Algae IC50 (72hr.) (mg/l):	280
log Kow (Sangster 1997):	1.78
COD:	78%

DO NOT discharge into sewer or waterways.

Half-life (hr) air: 144

Half-life (hr) H₂O surface water: 178-27156

Henry's atm m³/mol: 3.20E-04

BOD 5 if unstated: 0.15-1.02,7%

COD: 78%

ThOD: 2.207

BCF: 4-14

Toxicity Fish: LC50(96)100-185ppm

Toxicity invertebrate: cell mult. inhib.78-3700mg/L

Effects on algae and plankton: cell mult. inhib.21-280mg/L

Degradation Biological: sig

processes Abiotic: hydrol,RxnOH*

Section 13 - DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions

A. General Product Information

Ignitability characteristic: use EPA hazardous waste number D001 (waste code I)

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

- Recycle wherever possible.

- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.

- Dispose of by: Burial in a licensed land-fill or Incineration in a licensed apparatus (after admixture with suitable combustible material)

- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

Section 14 - TRANSPORTATION INFORMATION

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Section 14 - TRANSPORTATION INFORMATION



DOT Information:

Dangerous Goods Class:	3	Subrisk:	None
UN Number:	1993	Packing Group:	II
Shipping Name: FLAMMABLE LIQUID, N.O.S. (contains ethanol)			

Air Transport IATA:

ICAO/IATA Class:	3	ICAO/IATA Subrisk:	None
UN/ID Number:	1993	Packing Group:	II
ERG Code:	3H		
Shipping name: FLAMMABLE LIQUID, N.O.S. (contains ethanol)			

Maritime Transport IMDG:

IMDG Class:	3	IMDG Subrisk:	None
UN Number:	1993	Packing Group:	II
EMS Number:	F- E, S- E	Marine Pollutant:	Not Determined
Shipping name: FLAMMABLE LIQUID, N.O.S. (contains ethanol)			

Section 15 - REGULATORY INFORMATION

REGULATIONS

ethanol (CAS: 64-17-5) is found on the following regulatory lists;

- Canada - Alberta Occupational Exposure Limits
- Canada - British Columbia Occupational Exposure Limits
- Canada - Ontario Occupational Exposure Limits
- Canada - Quebec Occupational Exposure Limits (French)
- Canada - Saskatchewan Industrial Hazardous Substances
- Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits
- Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances
- Canada ARET (Accelerated Reduction / Elimination of Toxics) Substance List
- Canada Domestic Substances List (DSL)
- Canada Ingredient Disclosure List (SOR/88-64)
- Canada National Pollutant Release Inventory (NPRI)
- IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances
- International Air Transport Association (IATA) Dangerous Goods Regulations
- International Council of Chemical Associations (ICCA) - High Production Volume List
- Mexico Maximum Permissible Exposure Limits
- OECD Representative List of High Production Volume (HPV) Chemicals
- US - Arizona Ambient Air Quality Guidelines
- US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List
- US - California Permissible Exposure Limits for Chemical Contaminants
- US - California Proposition 65 - Priority List for the Development of MADLs for Chemicals Causing Reproductive Toxicity

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Section 15 - REGULATORY INFORMATION

US - California Proposition 65 - Reproductive Toxicity
US - Connecticut Hazardous Air Pollutants
US - Hawaii Air Contaminant Limits
US - Idaho - Limits for Air Contaminants
US - Minnesota Hazardous Substance List
US - Minnesota Permissible Exposure Limits (PELs)
US - New Jersey Right to Know Hazardous Substances
US - New Jersey Right to Know Hazardous Substances (Spanish)
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US ACGIH Carcinogens Listing
US ACGIH Threshold Limit Values (TLV)
US DOE Temporary Emergency Exposure Limits (TEELs)
US DOT Coast Guard Bulk Hazardous Materials - List of Flammable and Combustible Bulk Liquid Cargoes
US EPA High Production Volume Program Chemical List
US Food Additive Database
US NIOSH Recommended Exposure Limits (RELs)
US OSHA Permissible Exposure Levels (PELs) - Table Z1
US Toxic Substances Control Act (TSCA) - Inventory

n-butyl acetate (CAS: 123-86-4) is found on the following regulatory lists;

Canada - Alberta Occupational Exposure Limits
Canada - British Columbia Occupational Exposure Limits
Canada - Ontario Occupational Exposure Limits
Canada - Quebec Occupational Exposure Limits (French)
Canada - Saskatchewan Industrial Hazardous Substances
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances
Canada Domestic Substances List (DSL)
Canada Ingredient Disclosure List (SOR/88-64)
Canada National Pollutant Release Inventory (NPRI)
IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk
International Council of Chemical Associations (ICCA) - High Production Volume List
Mexico Maximum Permissible Exposure Limits
OECD Representative List of High Production Volume (HPV) Chemicals
United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances - Table II
US - Arizona Ambient Air Quality Guidelines
US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List
US - California Permissible Exposure Limits for Chemical Contaminants
US - Connecticut Hazardous Air Pollutants
US - Hawaii Air Contaminant Limits
US - Idaho - Limits for Air Contaminants
US - Minnesota Hazardous Substance List
US - Minnesota Permissible Exposure Limits (PELs)
US - New Jersey Right to Know Hazardous Substances
US - New Jersey Right to Know Hazardous Substances (Spanish)
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants

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Section 15 - REGULATORY INFORMATION

US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US ACGIH Threshold Limit Values (TLV)
US AIHA Emergency Response Planning Guides (ERPGs)
US CWA (Clean Water Act) - List of Hazardous Substances
US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances
US Department of Transportation (DOT) List of Hazardous Substances and Reportable Quantities - Hazardous Substances Other Than Radionuclides
US DOE Temporary Emergency Exposure Limits (TEELs)
US DOT Coast Guard Bulk Hazardous Materials - List of Flammable and Combustible Bulk Liquid Cargoes
US EPA Hazardous Substances
US EPA High Production Volume Program Chemical List
US Food Additive Database
US NFPA 30B Manufacture and Storage of Aerosol Products - Chemical Heat of Combustion
US NIOSH Recommended Exposure Limits (RELs)
US OSHA Permissible Exposure Levels (PELs) - Table Z1
US Toxic Substances Control Act (TSCA) - Inventory
US TSCA Section 4 - Chemicals Subject to Testing Consent Orders
US TSCA Section 4/12 (b) - Sunset Date/Status

Section 16 - OTHER INFORMATION

REPRODUCTIVE HEALTH GUIDELINES

Ingredient	ORG	UF	Endpoi nt	CR	Adeq TLV
ethanol	1880 mg/m3	NA	NA	NA	Yes

These exposure guidelines have been derived from a screening level of risk assessment and should not be construed as unequivocally safe limits. ORGS represent an 8-hour time-weighted average unless specified otherwise.

CR = Cancer Risk/10000; UF = Uncertainty factor:

TLV believed to be adequate to protect reproductive health:

LOD: Limit of detection

Toxic endpoints have also been identified as:

D = Developmental; R = Reproductive; TC = Transplacental carcinogen

Jankovic J., Drake F.: A Screening Method for Occupational Reproductive Health Risk: American Industrial Hygiene Association Journal 57: 641-649 (1996).

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