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PROPANE

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UPPER FLAMMABLE LIMIT (% BY VOLUME)

9.5%

LOWER FLAMMABLE LIMIT (% BY VOLUME)

2.4%

AUTO IGNITION TEMPERATURE (DEG C)

432 deg C

TDG FLAMMABILITY CLASSIFICATION

UN 1978 / 2.1

HAZARDOUS COMBUSTION PRODUCTS

SMOKE, CARBON MONOXIDE, CARBON DIOXIDE

EXPLOSION SENSITIVITY TO IMPACT

SENSITIVITY TO STATIC DISCHARGE

DATA

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6. FIRST AID MEASURES

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INHALATION

REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF BREATHING HAS STOPPED.
CALL DOCTOR.

INGESTION

NOT EXPECTED TO BE AN INGESTION PROBLEM.

EYE

IF THE LIQUID SPLASHED IN EYES FLUSH IMMEDIATELY WITH FRESH WATER FOR AT
LEAST 15 MINUTES. CALL A DOCTOR.

SKIN

SOAK THE AFFECTED AREA IN LUKEWARM WATER. SEE DOCTOR FOR FROSTBITE OR

BURNS.

GENERAL ADVICE

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7. PREVENTIVE AND CORRECTIVE MEASURES

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PERSONAL PROTECTIVE EQUIPMENT

PROTECT FROM SKIN CONTACT

GLOVES (SPECIFY)

IMPERVIOUS PROTECTIVE GLOVES

RESPIRATORY (SPECIFY)

CARTRIDGE RESPIRATOR-OR-AIR SUPPLIED

EYE (SPECIFY)

CHEMICAL SAFETY GLASSES

FOOTWEAR (SPECIFY)

CLOTHING (SPECIFY)

IMPERVIOUS PROTECTIVE CLOTHING

OTHER (SPECIFY)

ENGINEERING CONTROLS (SPECIFY, E.G. VENTILATION, ENCLOSED PROCESS)

LEAK AND SPILL PROCEDURE

EVACUATE AREA - ELIMINATE ALL SOURCES OF IGNITION - WEAR PROTECTIVE CLOTHING

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PROPANE

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FOR CLEANUP.
WASTE DISPOSAL
NOT AVAILABLE
HANDLING PROCEDURES AND EQUIPMENT
HANDLE AND OPEN CONTAINERS WITH CARE.
STORAGE REQUIREMENTS
STORE IN COOL WELL VENTILATED AREA. KEEP AWAY FROM STRONG OXIDIZING
MATERIAL AND SOURCES OF IGNITION.
SPECIAL SHIPPING INFORMATION
STORE AND LOAD AT NORMAL TEMPERATURE (UP TO 38 C) AND AT ATMOSPHERIC
PRESSURE

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8. REACTIVITY DATA

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CHEMICAL STABILITY IF NO, UNDER
YES [X] NO [] WHICH CONDITIONS?

INCOMPATIBILITY WITH OTHER SUBSTANCES
YES [X] NO [] IF SO, MAY REACT WITH STRONG OXIDIZING MATERIALS
WHICH ONES?

REACTIVITY, AND UNDER WHAT CONDITIONS

HAZARDOUS DECOMPOSITION PRODUCTS
NORMAL COMBUSTION FORMS CARBON DIOXIDE AND WATER VAPOR. INCOMPLETE
COMBUSTION CAN PRODUCE CARBON MONOXIDE.

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9. PREPARATION

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PREPARED BY: IRVING OIL LIMITED, DATE: FEB. 18, 1997
SAINT JOHN, N.B.
(506) 632-2000

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Cette fiche signalétique est aussi disponible en français

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QUICKLIME

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* * * * *

* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2265230

PRODUCT NAME(S) : High-Calcium Quicklime

Calcium Oxide, Quicklime

DATE OF MSDS : 2000-01-06

*** MANUFACTURER INFORMATION ***

MANUFACTURER : Beachville Lime Limited

ADDRESS : Oxford County Road 6

Ingersoll Ontario

Canada N5C 3K5

EMERGENCY TELEPHONE NO. : 519-423-6283

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : Beachville Lime Limited

ADDRESS : Oxford County Road 6

Ingersoll Ontario

Canada N5C 3K5

EMERGENCY TELEPHONE NO. : 519-423-6283

*** MATERIAL SAFETY DATA ***

MATERIAL SAFETY DATA SHEET

SEC. I: MATERIAL IDENTIFICATION

MATERIAL: High-Calcium Quicklime

SYNONYMS: Calcium Oxide, Quicklime

MANUFACTURER: Beachville Lime Limited

Oxford County Road 6

Ingersoll, Ontario, N5C 3K5

Emergency Tel. No.: 519-423-6283

SUPPLIER: Same as Manufacturer

CHEMICAL NAME: Calcium Oxide

FORMULA: CaO

HAZARD CLASSIFICATION: Class E: Corrosive Substance

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QUICKLIME

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SEC. II: HAZARDOUS INGREDIENTS

INGREDIENT	% BY WT.	C.A.S. NO.	EXPOSURE LIMITS	LD50/LC50
Calcium Oxide	98	1305-78-8	2 mg/cu.m TWAEV	No published data

SEC. III: PHYSICAL DATA

PHYSICAL STATE:	Solid	ODOUR & APPEARANCE:	Odourless, white lumps or powder
SPECIFIC GRAVITY:	3.35	pH:	12.45 (Saturated Solution) at 25.0'C
MELTING PT. 'C:	2580	BOILING PT. 'C:	2850
VAPOUR PRESSURE:	Non-volatile		
COEFFICIENT OF WATER/OIL DISTRIBUTION:			Greater than 1

SEC. IV: FIRE AND EXPLOSION HAZARD

FIRE:	Non-flammable, non-combustible	EXPLOSION:	Non-explosive
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SEC. V: REACTIVITY

STABILITY:	Stable.
INCOMPATIBLE MATERIALS:	Water, Acids, Boric Oxide, Phosphorus Pentoxide.
REACTIVITY:	Reacts with liquid water to expand and produce heat; could burst containers or ignite combustible substances in contact.
HAZARDOUS DECOMPOSITION PRODUCTS:	None.

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QUICKLIME

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SEC. VI: TOXICOLOGICAL PROPERTIES

ROUTE OF ENTRY:	Skin Contact, Eye Contact, Inhalation of Dust, and Ingestion are potential routes of entry.
EFFECTS OF ACUTE EXPOSURE:	Irritation or burns to skin, nose, throat, and mucous membranes, sneezing, lacrimation. Coarse particles in eyes can cause serious burns. Burning sensation in mouth and stomach if sufficient ingested.
EFFECTS OF CHRONIC EXPOSURE:	Drying or cracking of skin, blinking of eye.
EXPOSURE LIMITS:	TWAEV - 2 mg/cu.m
IRRITANCY:	Irritates skin, eye, mucous membranes.
SENSITIZATION:	None reported.
SYNERGISTIC MATERIALS:	None.
OTHER:	No reported Carcinogenicity, Reproductive Effects, Teratogenicity or Mutagenicity.

SEC. VII: PREVENTATIVE MEASURES

PROTECTIVE EQUIPMENT:	Long-sleeved shirt, long pants extending over tops of work boots. Gauntlet-type work gloves. Eye goggles, Lightweight face mask.
ENGINEERING CONTROLS:	Provide mechanical ventilation in dusty areas.
LEAK AND SPILL PROCEDURES:	Substantial spills into streams or ponds should be contained and neutralized with acid. Normal clean-up for spills on land.
WASTE DISPOSAL:	Dispose in secure landfill.
HANDLING, STORAGE & SHIPPING:	No special handling equipment. Minimize production of dust. Keep product dry in storage and shipping.

SEC. VIII: FIRST AID MEASURES

INHALATION:	Remove from exposure.
INGESTION:	Drink plenty of water, fruit juice, or a mixture of 1 part vinegar in 2 parts water.
EYE:	Flush immediately with plenty of water and get medical attention.
SKIN:	Wash affected area with plenty of water.

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QUICKLIME

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PREPARATION OF MSDS:

Prepared By:-----Brenda Doucette-Carter----- Date: January 6, 2000

The information is, to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty or guarantee is made to its accuracy, reliability or completeness. It is the user's responsibility to review this information, satisfy themselves as to its suitability and completeness, and pass on the information to its employees or customers. Beachville Lime Limited does not accept responsibility for any loss or damage which may occur from the use of this information.

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SODIUM CYANIDE

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* M S D S *

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* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2437760

PRODUCT NAME(S) : Cyanide of Sodium
Prussiate of Soda
Sodium Cyanide

PRODUCT IDENTIFICATION : MSDS NUMBER: CEC00007

DATE OF MSDS : 2000-05-25

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-10-30

*** MANUFACTURER INFORMATION ***

MANUFACTURER : DuPont Canada, Inc

ADDRESS : Post Office Box 2200
Streetsville
Mississauga Ontario
Canada L5M 2H3
Telephone: 800-387-2122 (Product
Information)

EMERGENCY TELEPHONE NO. : 613-348-3616 (Transport, 24 HOURS)
613-348-3616 (Medical, 24 HOURS)

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : DuPont Canada, Inc

ADDRESS : Post Office Box 2200
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Telephone: 800-387-2122 (Product
Information)

EMERGENCY TELEPHONE NO. : 613-348-3616 (Transport, 24 HOURS)
613-348-3616 (Medical, 24 HOURS)

*** MATERIAL SAFETY DATA ***

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SODIUM CYANIDE

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CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

"Cyanobrick", "Cyanogran" are registered trademarks of DuPont.

Corporate MSDS Number : DU000290
CAS Number : 143-33-9
Formula : NaCN
CAS Name : SODIUM CYANIDE
Grade : "CYANOBRIK"; "CYANOGRAN"

Product Use

Ore leaching and flotation

Tradenames and Synonyms

Cyanide of Sodium
Prussiate of Soda

Company Identification

MANUFACTURER/DISTRIBUTOR

DuPont Canada, Inc.
P.O. Box 2200
Streetsville
Mississauga, Ontario L5M 2H3

PHONE NUMBERS

Product Information : 1-800-387-2122
Transport Emergency : 1-613-348-3616 (24 HOURS)
Medical Emergency : 1-613-348-3616 (24 HOURS)

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
*SODIUM CYANIDE	143-33-9	>96 WT%
OTHER SODIUM SALTS		<4 WT%

* Disclosure as a toxic chemical is required under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

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SODIUM CYANIDE

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HAZARDS IDENTIFICATION

Potential Health Effects

May be fatal if inhaled, swallowed, or absorbed through the skin. Contact with acids or weak alkalies liberates poisonous gas. May cause eye burns and skin irritation and rashes. May cause rapid respirations and pulse, reddened eyes, flushed skin, weakness, headache, dizziness, confusion, nausea and vomiting. These may be followed by unconsciousness, convulsions, cessation of breathing, loss of blood pressure, heart beat irregularities, dilation of pupils and death. The lungs may fill with liquid.

SODIUM CYANIDE:

Skin contact with Sodium cyanide may cause skin irritation with discomfort or rash; strong solutions may cause skin burns or ulceration. Evidence suggests that significant skin permeation can occur. There are no reports of human sensitization.

Eye contact with Sodium cyanide may cause eye irritation with discomfort, tearing, or blurred vision. Prolonged exposure may cause eye corrosion with corneal or conjunctival ulceration.

Inhalation, ingestion or skin contact of Sodium cyanide may cause nonspecific discomfort such as:

Reddening of the eyes	Nausea
Irritation of the throat	Headache
Palpitation	Weakness of arms and legs
Difficulty in breathing	Giddiness
Salivation	Collapse
Numbness	Convulsions

Central nervous system stimulation followed by central nervous system depression may occur with hypoxic convulsions and death due to respiratory arrest.

Higher exposures may lead to rapid respiration and pulse, flushing, cyanosis, acidosis, thyroid effects sometimes observed in individuals with nutritional deficiencies symptoms associated with Parkinsonian Syndrome; or pulmonary edema and fatality from gross overexposure. In the few cases of disturbance of vision or damage to the optic nerve or retina attributable to cyanide poisoning, the poisoning has been acute and severe, and lethal or near lethal. There are reports of increased incidence of insomnia, agitated sleep, tremors, dermatitis and nose bleed in electroplating workers.

Individuals with preexisting diseases of the central nervous system may have increased susceptibility to the toxicity of

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SODIUM CYANIDE

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excessive exposures.

Carcinogenicity Information

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

FIRST AID MEASURES

Compound-Specific First Aid & Notes to Physicians

A step-wise procedure of "First Aid" and "Medical Treatment" is recommended for any cyanide poisoning. Treatment requires immediate action to prevent harm or death. First Aid is given initially, and experience shows that when given promptly it is usually the only treatment needed for typical accidental poisonings. Medical treatment may be needed for more severe poisoning.

First aid treatment uses oxygen and amyl nitrite and can be given by a first responder before medical help arrives.

Medical treatment is given if the patient does not respond to First Aid. Medical Treatment is a more aggressive treatment requiring intravenous injections of sodium nitrite and sodium thiosulfate, and must be administered by qualified medical personnel. It provides a larger quantity of antidote which helps eliminate cyanide from the body. Even if a doctor or nurse is present, the need for fast treatment dictates using the First Aid procedure with oxygen and amyl nitrite while Medical Treatment materials for intravenous injection are being prepared. When antidotal treatment is necessary, it should be started immediately.

IN CASE OF CYANIDE POISONING, START FIRST AID TREATMENT IMMEDIATELY, THEN CALL A PHYSICIAN.

In most cases, cyanide poisoning causes a deceptively healthy pink to red skin color. However, if a physical injury or lack of oxygen is involved, the skin color may be bluish. Reddening of the eyes and pupil dilation are also symptoms of cyanide poisoning. Cyanosis (blue discoloration of the skin) tends to be associated with severe cyanide poisonings whereas red coloration

of the skin is more common in industrial accidents that involve less cyanide.

All persons with the potential for cyanide poisoning should be trained to provide immediate First Aid using oxygen and amyl nitrite. Always have on hand the materials listed below in the FIRST AID and MEDICAL TREATMENT Sections. Actions to be taken in case of cyanide poisoning should be planned and practiced before beginning work with cyanides. Identification of community

SODIUM CYANIDE

hospital resources and emergency medical squads in order to equip and train them on handling of cyanide emergencies is essential.

FIRST AID SUPPLIES

Adequate First Aid supplies for cyanide poisoning should be conveniently placed throughout the cyanide areas and should be immediately accessible at all times, but secured against tampering or theft. Supplies should be routinely inspected (typically daily) by people who would use them in an emergency. The total number of each item listed below should be adequate to handle the largest number of exposure cases reasonably anticipated, taking into account that some supplies may be wasted, destroyed, or inaccessible in the emergency.

1. Oxygen Resuscitators - Any positive pressure resuscitator capable of giving oxygen in conjunction with amyl nitrite can be used.

2. Amyl Nitrite Ampoules (antidote) - One box of one dozen ampoules per station is usually satisfactory. Locate stations throughout the cyanide area.

CAUTION: Amyl nitrite is not stable and must be replaced every 1-2 years, or earlier depending on storage conditions. Store in the original dated box away from heat and freezing temperatures. Do not store amyl nitrite or Medical Treatment Kits (see below) in enclosed areas where temperatures can exceed 60-66 deg C (140-150 deg F) or where freezing may occur. Storage in high temperature climates may require replacement before the expiration date, unless cool storage is provided. Avoid excessive cold storage which will reduce the vapor pressure of amyl nitrite and, hence, its effectiveness. A common DuPont practice is to use the resuscitator as the storage point for the amyl nitrite ampoules.

3. A set of cyanide first aid instructions should be located at each amyl nitrite storage location. Workers should be fully trained since in a real emergency there will be insufficient time to "read the book".

Amyl Nitrite Notes:

1. Amyl nitrite is highly volatile and flammable; do not smoke or use around a source of ignition.

2. If treating a patient in a windy or drafty area, provide something--a rag, shirt, wall, drum, cupped hand, etc.--to prevent the amyl nitrite vapors from being blown away. Keep the ampoule upwind from the nose. The objective is to get amyl nitrite into the patient's lungs.

3. Rescuers should avoid amyl nitrite inhalation to avoid becoming dizzy and losing competence.

4. Lay the patient down. Since amyl nitrite dilates blood vessels and lowers blood pressure, laying the patient down will help prevent unconsciousness.

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SODIUM CYANIDE

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5. Do not overuse. Monitor the patient for shock which would indicate excessive use. This has not occurred in practice at DuPont plants, and we are not aware of any serious after effects

from treatment with amyl nitrite.

6. Review and adhere to proper storage, inspection and replacement requirements given above.

FIRST AID PROCEDURE

The exposed person should be removed from the contaminated area, contaminated clothing removed and the individual washed off. The rescuer and/or person providing first aid is subject to exposure if the affected person's clothing is wetted with cyanide. For HYDROGEN CYANIDE, rescue of a wetted person should be done wearing self-contained breathing air (SCBA), rubber gloves, and other personal protective equipment as necessary. For SODIUM CYANIDE or POTASSIUM CYANIDE dusts or solutions, SCBA is normally not needed. Contact with HYDROGEN CYANIDE must be avoided by rescuers, but short contact from solid cyanide or solutions is normally not a problem if skin washing is prompt. As soon as possible, even while clothing is being removed or washing is taking place, First Aid should be started.

1. If no symptoms are evident, no treatment is necessary; decontaminate patient.
2. If conscious but symptoms (nausea, difficult breathing, dizziness, etc.) are evident, give oxygen.
3. If consciousness is impaired (non-responsiveness, slurred speech, confusion, drowsiness) or the patient is unconscious but breathing, give oxygen and amyl nitrite by means of a resuscitator.

To give amyl nitrite, break an ampoule in a gauze pad and insert into lip of the resuscitator mask for 15 seconds, then take away for fifteen seconds. Repeat 5-6 times. If necessary, use a fresh ampoule every 3 minutes until the patient regains consciousness (usually 1-4 ampoules). Administer oxygen continuously. Guard against the ampoule entering the patient's mouth.

4. If not breathing, give oxygen and amyl nitrite immediately by means of a positive pressure resuscitator (artificial respiration).

Administer amyl nitrite as discussed in #3 and continue to give oxygen simultaneously to aid recovery. If massive exposure occurred, consider keeping the first one or two ampoules in the lip of the resuscitator mask continuously. Guard against the ampoule entering the patient's mouth.

INHALATION

If consciousness is impaired, oxygen and amyl nitrite should be administered as indicated under First Aid Procedure. Carry the

SODIUM CYANIDE

patient to an uncontaminated atmosphere. Keep the patient warm and calm. Call a physician.

SKIN CONTACT

If consciousness is impaired, oxygen and amyl nitrite should be administered as indicated under First Aid Procedure. Immediately flush with large quantities of water for up to 5 minutes after contact or suspected contact, and completely remove all contaminated clothing (including shoes or boots). Flushing with water for up to 5 minutes is generally sufficient to effectively remove cyanide from the patient's skin. Call a physician.

EYE CONTACT

Immediately flush the eyes with large quantities of water for up to 5 minutes while holding the eyelids apart. Do not try to neutralize with "acids" or "alkalis". Eye contact will require further evaluation and possibly treatment. Continue rinsing the eye during transport to the hospital. See a physician. Oxygen and amyl nitrite should be used as indicated above.

INGESTION

If the patient is conscious, immediately have patient spit and rinse mouth with water then give patient activated charcoal slurry. If consciousness is impaired, or the patient is unconscious, immediately administer oxygen and amyl nitrite as discussed in the First Aid Procedure Section. Never give anything by mouth to an unconscious person. Give patient activated charcoal slurry ONLY when consciousness is regained. DO NOT give Syrup of Ipecac or other emetics since they will induce vomiting which could interfere with resuscitator use. Continue to give oxygen. Call a physician.

NOTE: To prepare activated charcoal slurry, mix 50 grams of activated charcoal in 400 mL (about 2 cups) water and mix thoroughly. Give 5 mL/kg, or 350 mL for an average adult.

MEDICAL TREATMENT

EXPERIENCE SHOWS THAT FIRST AID GIVEN PROMPTLY IS USUALLY THE ONLY TREATMENT NEEDED FOR TYPICAL INDUSTRIAL CYANIDE POISONING. LARGER CYANIDE POISONINGS INCREASE THE NEED FOR MEDICAL TREATMENT.

Do not over-react. Although prompt action is essential when poisoning has occurred, a lucid, conscious person who can communicate may not have significant cyanide poisoning and Medical Treatment will rarely be necessary. "Treat what you see" is a good rule of thumb. Mildly symptomatic patients who remain alert may be managed by supportive care only.

The half-life of cyanide in the body is about 20-90 minutes. In diagnosis and monitoring of patients, the critical period for treatment is short. Normally the effects from cyanide poisoning occur in the first few minutes and will indicate the degree of poisoning.

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SODIUM CYANIDE

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"Preventive" use of cyanide antidote in the absence of impaired consciousness is not normally warranted. Keep the patient calm by assurance over the next 30 minutes, and closely monitor the patient's condition. If skin contact with cyanide has been prolonged and/or extensive cyanide has been ingested, watch the individual closely for at least 30 minutes to assure there are no effects from delayed absorption of cyanide into the blood stream.

Consider assuring intravenous access in cases where significant toxicity is possible. Establishment of IV access with normal saline, Ringer's lactate, or other available IV fluid will facilitate administration of the antidote if necessary.

MEDICAL TREATMENT KITS

Medical Treatment Kits for cyanide poisoning should be conveniently located for easy access. Materials for intravenous injection are intended for use only by a physician or fully qualified medical personnel. The location of kits should be carefully planned as part of the emergency program. Kits should always be taken with patient during transport to medical facilities to ensure availability. Suggested locations for kits include:

- o in or near the cyanide area
- o plant medical station
- o guard house entrance
- o local hospital
- o doctor's office and residence

CAUTION: Avoid storing amyl nitrite or Medical Treatment Kits in areas subject to extreme heat or freezing conditions. Kits and amyl nitrite should be accessible but secured against tampering. They should be inspected regularly and the amyl nitrite ampoules replaced every 1-2 years (See First Aid Supplies Section). Medical Treatment Kits should contain the following:

1. One box containing one dozen (12) amyl nitrite ampoules.
2. Two sterile ampoules of sodium nitrite solution (10 mL of a 3% solution in each).
3. Two sterile ampoules of sodium thiosulfate solution (50 mL of a 25% solution in each).
4. One 10 mL sterile syringe. One 50 mL sterile syringe. Two sterile intravenous needles. One tourniquet.
5. One dozen gauze pads.
6. Latex gloves.

SODIUM CYANIDE

7. A "Biohazard" bag for disposal of bloody/contaminated equipment.
8. A set of cyanide instructions on first aid and medical treatment.

NOTE: Amyl nitrite ampoules and Medical Treatment Supplies can be purchased through local pharmacies with a physician's prescription.

MEDICAL TREATMENT PROCEDURE

1. Sodium nitrite: Adult - 10 mL of 3% solution (300 mg)
Draw solution from the ampoule and inject slowly over 4-5 minutes (2 to 2.5 mL/minute). As soon as practical, monitor blood pressure and continue checking pulse. Slow the rate of injection if hypotension (low blood pressure) occurs.

2. Sodium thiosulfate: Adult - 50 mL of 25% solution (12.5 grams)
Follow sodium nitrite with sodium thiosulfate injected at a rate of 2.5 mL/minute (10-20 minutes).

The total time for injection of these initial doses of both components at the recommended rates is lengthy, approximately 20-25 minutes.

Consider the body weight and condition of the patient when treating a cyanide exposed patient with sodium nitrite. Both amyl nitrite and sodium nitrite produce methemoglobin, which reduces the oxygen carrying capacity of the blood. Methemoglobinemia is potentially harmful when methemoglobin levels exceed 20-30% (See Antidotal Effects Section).

If symptoms persist or recur after the initial treatment, repeat the antidote at one half the original doses one hour after the original administration. Monitor methemoglobin levels when practical in every patient treated with the intravenous antidote.

AVOID OVER-TREATMENT.

The above sodium nitrite injection discussed in the Medical Treatment Procedure Section is about one-third the lethal dose, so care should be taken to avoid excessive use. It is not essential that full quantities of antidote be given just because treatment was started. Should injection be stopped for any reason, keep track of the amount administered in case treatment needs to be restarted.

ANTIDOTAL EFFECTS

Nitrites can produce hypotension through peripheral vasodilatation (widening of the blood vessels). Methemoglobin formation, although considered a therapeutic effect, may cause symptoms if levels exceed 20-30%. Recommended intravenous doses of sodium nitrite discussed in the Medical Treatment Procedure Section usually produce methemoglobin levels under 20%. Headache, nausea, vomiting, and syncope (fainting) may follow nitrite administration, and syncope may occur if the patient is not lying down. While it is important to be aware of the effects from

SODIUM CYANIDE

nitrite therapy, there have been no long-lasting effects associated with this treatment regimen for cyanide exposure in DuPont's experience and knowledge.

RECOVERY AND DISPOSITION

For most accidental poisonings, patients can be revived in a few minutes using oxygen and amyl nitrite with complete recovery within a few hours.

If necessary, the patient should be monitored for 24-48 hours. Any patient whose symptoms require the use of IV antidote should be considered for admittance to an intensive care unit.

Observe for return of symptoms. Monitor methemoglobin levels, blood pH and oxygenation through arterial blood gas analysis. Calculate anion gap from serum electrolytes. Cyanide poisoning causes lactate accumulation and an anion gap metabolic acidosis.

Delayed neurotoxic effects are not expected consequences of cyanide exposure although neurotoxic effects may occur if hypoxia (oxygen deficiency) was prolonged or occurred following massive cyanide exposure.

In the presence of smoke inhalation that can occur during fires, withholding amyl nitrite or sodium nitrite administration should be considered because of the potential for high carboxyhemoglobin levels. However, administration of oxygen and possibly sodium thiosulfate should be continued.

FIRE FIGHTING MEASURES

Flammable Properties

Will not burn.

Follow appropriate National Fire Protection Association (NFPA) codes.

Sodium Cyanide may not be completely destroyed in an ordinary fire involving combustible materials such as paper or wood. While sodium cyanide does not support combustion, it can oxidize in a fire.

Extinguishing Media

Use water on fires near cyanide but minimize the amount of water if containers are opened or burned to avoid cyanide runoff (see "Incompatibility with Other Materials" and "Fire Fighting Instructions"). DO NOT use carbon dioxide (CO₂) on wet cyanide where carbonic acid (H₂O + CO₂) could release cyanide.

SODIUM CYANIDE

Fire Fighting Instructions

Sodium Cyanide dissolves readily in water; therefore, cyanide solution runoff may occur if containers are opened or burned. Runoff should be contained to avoid environmental or safety problems. Contained cyanide solution can be detoxified with hypochlorite. In some cases it may be desirable to let a fire burn out by itself since sodium cyanide will not normally be affected by the fire.

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Spill Clean Up

Shovel and sweep up spilled material into a covered container or plastic bag pending transfer. Cover and keep spillage dry. Flush spill area with a dilute solution of sodium hypochlorite or calcium hypochlorite to destroy the cyanide. Call DuPont for guidance. Comply with Federal, State, and local regulations reporting releases. The EPA Reportable Quantity (RQ) is 10 pounds.

HANDLING AND STORAGE

Handling (Personnel)

Emergency planning and training are needed before beginning work with cyanide since prompt treatment is essential in cases of cyanide poisoning. Always have Cyanide Antidote Kits on hand. Do not breathe dust, mist, or cyanide gas. Do not get in eyes. Avoid contact with skin and clothing. Do not carry foodstuffs, beverages, or tobacco where contamination with cyanide is possible. Wash thoroughly after handling. Wash contaminated clothing before reuse.

Storage

Store in properly labeled containers in dry, ventilated, secured areas. Keep containers closed and contents dry. Do not store with acids or acid salts, containers with water or weak alkalis, or oxidizing agents. Do not handle or store food, beverages, or tobacco in cyanide areas. Do not store near combustibles or flammables because subsequent fire

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SODIUM CYANIDE

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fighting with water could lead to cyanide solution runoff.
If legal, do not store under sprinkler systems.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

Use sufficient ventilation to keep employee exposure below recommended limits.

Personal Protective Equipment

Recommended minimum protection: Chemical splash goggles and rubber gloves (butyl or neoprene preferred).

Have available and use as appropriate: face shield; rubber suits, aprons, and boots; NIOSH approved disposable air purifying respirator with appropriate particulate filter; self-contained breathing air supply (in case of emergency); hydrogen cyanide detector; First Aid and Medical Treatment supplies, including oxygen resuscitators.

Exposure Guidelines

Exposure Limits

Sodium Cyanide

PEL	(OSHA)	: 5 mg/m ³ , as CN, 8 Hr. TWA, Skin
TLV	(ACGIH)	: Ceiling 5 mg/m ³ , as CN, Skin
AEL *	(DuPont)	: 5 mg/m ³ , 15 minute TWA, as CN, Skin

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

Exposure Guideline Comments

The "Skin" notation in the Exposure Limits Section indicates that liquid or vapor may penetrate the skin (especially if the skin is broken). Control of vapor, dust, and mist inhalation alone may not be sufficient to prevent an excessive dose.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

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SODIUM CYANIDE

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Boiling Point	: 1496 C (2725 F) @ 760 mm Hg
Vapor Pressure	: Negligible
Vapor Density	: Nil
Melting Point	: 564 C (1047 F)
Solubility in Water	: 37 WT% @ 20 C (68 F)
pH	: 11-12

The pH listed above is typical for 5-25 % solutions with no pH adjustment.

Form	: Solid, Granular, Briquettes.
Color	: White.
Specific Gravity	: 1.6
Bulk Density (Packed)	: 50-55 lb/cu ft

Solid cyanide has no odor, but it can have a slight ammonia and/or hydrogen cyanide odor if damp.

STABILITY AND REACTIVITY

Chemical Stability

Very stable when dry.

Incompatibility with Other Materials

Large amounts of poisonous, flammable hydrogen cyanide (HCN) gas will be evolved from contact with acids. Reacts violently with strong oxidizing agents when heated. Water or weak alkaline solutions can produce dangerous amounts of hydrogen cyanide in confined areas.

Decomposition

Moisture will cause slow decomposition, releasing poisonous hydrogen cyanide and ammonia gases.

Polymerization

Polymerization will not occur.

TOXICOLOGICAL INFORMATION

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SODIUM CYANIDE

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Animal Data

SODIUM CYANIDE:

Oral LD50: 15 mg/kg in rats
Dermal LD50: 11.28-14.63 mg/kg in rabbits
Inhalation LC50: no information found but considered to
be highly toxic as CN by inhalation

Solid Sodium cyanide has not been tested for skin and eye irritation, or for skin sensitization.

NOTE: Administration of Sodium cyanide to rats, cats, or dogs by the intravenous or intraperitoneal routes resulted in rapid respiration, confusion, unconsciousness, vomiting, decreased blood pressure, cardiac rate changes, seizures and respiratory failure.

Eye: As with other routes of exposure, systemic toxicity and death is possible from contamination of the eye; LD50 dose in rabbits is approximately 5 mg/kg.

Sodium cyanide applied to the skin of rabbits produced tremors, retrocolic spasms, convulsions, abnormal breathing patterns, and prostration.

Ingestion: Repeated administration of cassava diets containing unspecified cyanide ion caused decreased thyroid activity and kidney changes. Long-term administration of 0.5, 1.0, or 2.0 mg/kg/day to dogs produced unspecified acute intoxication symptoms and increased numbers of red blood cells and decreased proteins were observed at doses greater than 1.0 mg/kg/day. Central nervous system changes occurred in all treated dogs.

No animal test reports are available to define carcinogenic hazards of Sodium cyanide. Limited reproductive studies do not suggest effects. Some tests have shown the potential for developmental toxicity but only at exposure levels producing toxic effects in the adult animal.

Sodium cyanide does not produce genetic damage in bacterial cell cultures, and has not been tested in animals.

ECOLOGICAL INFORMATION

Ecotoxicological Information

AQUATIC TOXICITY:

96 hour LC50 - Fathead minnows: 0.43-0.66 mg/L.

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SODIUM CYANIDE

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Extremely toxic.

DISPOSAL CONSIDERATIONS

Waste Disposal

This material may be a RCRA Hazardous waste. Do not flush cyanide into sewers which may contain an acid. Detoxify with dilute sodium hypochlorite, hydrogen peroxide, or calcium hypochlorite. Comply with Federal, State, and local regulations on disposal methods used to achieve the constituent based treatment standard, if permitted; or transfer to a licensed disposal contractor.

TRANSPORTATION INFORMATION

Shipping Information

DOT
Proper Shipping Name : SODIUM CYANIDE
Hazard Class : 6.1
I.D. No. (UN/NA) : UN1689
DOT Label(s) : TOXIC
Special Information : MARINE POLLUTANT
Packing Group : I

DOT/IMO
Proper Shipping Name : SODIUM CYANIDE, SOLID
Hazard Class : 6.1
UN No. : 1689
DOT/IMO Label : TOXIC
Special Information : MARINE POLLUTANT
Packing Group : I

Reportable Quantity : 10 lb (4.54 kg)

Shipping Containers

Steel Drums : 50 kg, 100 kg

"CYANO-DOL" Railcars and Trucks
Excel I and Excel II Trucks
Hopper Railcars
"FLO-BINS" (3,000 lb. net; 3,600 lb. gross)
Bag in a Box (1,000 kg./2,200 lb.)

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SODIUM CYANIDE

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Tuff Paks: 48, 20 kg bags in a box (960 kg or 2112 lbs).

Shipping Information -- Canada

TDG
Proper Shipping Name : SODIUM CYANIDE SOLID
PIN No. : UN 1689
TDG Class : 6.1 (9.2)
TDG Packing Group : I

REGULATORY INFORMATION

U.S. Federal Regulations

TSCA Inventory Status : Reported/Included.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute : Yes
Chronic : No
Fire : No
Reactivity : Yes
Pressure : No

HAZARDOUS CHEMICAL LISTS

SARA Extremely Hazardous Substance: Yes
CERCLA Hazardous Substance : Yes
SARA Toxic Chemical : Yes

Canadian Regulations

WHMIS Classification:

CLASS D Division 1 Subdivision A - Very Toxic Material/Acute Lethality.

CLASS D Division 2 Subdivision B - Toxic Material. Skin or Eye Irritant.

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

OTHER INFORMATION

NFPA, NPCA-HMIS

NFPA Rating
Health : 3
Flammability : 0
Reactivity : 1

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SODIUM CYANIDE

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NPCA-HMIS Rating

Health : 3

Flammability : 0

Reactivity : 1

Personal Protection rating to be supplied by user depending on use conditions.

Additional Information

For further information, see DuPont Cyanide Storage and Handling Bulletin.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS

CHEMICALS

DuPont Canada Inc.

7070 Mississauga Rd.

Mississauga, Ontario, L5M 2H3

(905) 821-5369.

Indicates updated section.

End of MSDS

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SODIUM SULPHATE

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2428877

PRODUCT NAME(S) : SODIUM SULPHATE

DATE OF MSDS : 1998-02-16

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-09-27

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : CANADA COLORS AND CHEMICALS LIMITED

ADDRESS : 80 ScarSDale Road
Don Mills Ontario
Canada M3B 2R7
Telephone: 416-449-7750

EMERGENCY TELEPHONE NO. : 416-444-2112

SUPPLIER/DISTRIBUTOR NOTE :
For further information about this product please contact the Canada
Colors Customer Service Department at 416-449-7750.

*** MATERIAL SAFETY DATA ***

MATERIAL SAFETY DATA SHEET : 00001598

CANADA COLORS AND CHEMICALS LI
80 SCARSDALE ROAD
DON MILLS, ONTARIO M3B 2R7
(416) 449-7750

Product: SODIUM SULPHATE

SECTION 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER..... SASKATCHEWAN MINERALS
P.O. BOX 120
CHAPLIN, SASKATCHEWAN
CANADA
S0H 0V0

PRODUCT NAME.....

PRODUCT CODE.....

CHEMICAL FORMULA..... Na2SO4.

MOLECULAR WEIGHT..... 142.04.

CHEMICAL FAMILY..... INORGANIC.

MATERIAL USE..... REFER TO TECHNICAL LITERATURE.

EMERGENCY PHONE NO..... (416)-444-2112.

SECTION 02: COMPOSITION/INFORMATION ON INGREDIENTS

*NONE

ROUTE OF ENTRY:

EFFECTS OF ACUTE EXPOSURE..... DUST OR VAPORS MAY BE IRRITATING TO SKIN,
EYES, AND RESPIRATORY TRACT.

SECTION 04: FIRST AID MEASURES

SECTION 05: FIRE FIGHTING MEASURES

FLASH POINT (C), METHOD..... N.AV.

SODIUM SULPHATE	
AUTO IGNITION TEMPERATURE.....	N.AV.
UPPER FLAMMABLE LIMIT (% BY.....	N.AV.
VOL.)	
LOWER FLAMMABLE LIMIT (% BY.....	N.AV.
VOL.)	
EXPLOSION DATA.....	
EXPLOSIVE POWER.....	N.AV.
RATE OF BURNING.....	N.AV.
SENSITIVITY TO STATIC.....	N.AV.
DISCHARGE	
SENSITIVITY TO IMPACT.....	N.AV.
HAZARDOUS COMBUSTION PRODUCTS.....	BURNING CAN PRODUCE, . OXIDES OF SODIUM.

SECTION 06: ACCIDENTAL RELEASE MEASURES

LEAK/SPILL..... COLLECT AND CONTAIN IN SUITABLE DISPOSAL
CONTAINERS.

SECTION 07: HANDLING AND STORAGE	
HANDLING PROCEDURES AND EQUIPMENT	AVOID ALL SKIN CONTACT.AVOID GETTING IN EYES.USE ADEQUATE VENTILATION.KEEP CONTAINERS CLOSED OR SEALED.MAINTAIN A GOOD PERSONAL HYGIENE.
STORAGE NEEDS	KEEP THE CONTAINER TIGHTLY CLOSED WHEN NOT IN USE.STORE AWAY FROM INCOMPATIBLE MATERIALS.STORE IN A COOL AND WELL-VENTILATED AREA.

SECTION 08: EXPOSURE CONTROLS/PERSONAL PROTECTION	
GLOVES/ TYPE.....	RUBBER.
RESPIRATORY/TYPE.....	USE NIOSH OR MSHA APPROVED SELF-CONTAINED BREATHING APPARATUS IN HIGH CONCENTRATIONS.
EYE/TYPE.....	SAFETY GLASSES. GOGGLES.
FOOTWEAR/TYPE.....	BOOTS.
CLOTHING/TYPE.....	WEAR IMPERVIOUS PROTECTIVE CLOTHING.
OTHER/TYPE.....	N.AV.
ENGINEERING CONTROLS.....	VENTILATE ADEQUATELY.

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SODIUM SULPHATE

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SECTION 09: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE..... SOLID.
ODOUR..... NO ODOUR.
ODOUR THRESHOLD..... N.AV.
VAPOUR PRESSURE (MMHG)..... N.AP.
VAPOUR DENSITY (AIR=1)..... N.AP.
EVAPORATION RATE..... N.AP.
BOILING POINT..... 1100 (C). DECOMPOSES.
PH..... 8.3.
SPECIFIC GRAVITY (WATER=1)..... 2.7.
SOLUBILITY IN WATER (% W/W)..... 15.9.
COEFFICIENT OF WATER/OIL DIST..... N.AV.

SECTION 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY:.....
YES..... YES.
NO, WHICH CONDITIONS?.....
COMPATABILITY WITH OTHER.....
SUBSTANCES:
YES.....
NO, WHICH ONES?..... ALUMINUM.
REACTIVITY CONDITIONS?..... VIOLENT EXPLOSIONS WILL OCCUR WHEN SODIUM
SULPHATE IS MELTED WITH ALUMINUM OR
MAGNESIUM.
HAZARDOUS PRODUCTS OF..... SEE HAZARDOUS COMBUSTION PRODUCTS.
DECOMPOSITION

SECTION 11: TOXICOLOGICAL INFORMATION

EXPOSURE LIMIT OF MATERIAL..... SEE SECTION 02.
LC 50 OF MATERIAL, SPECIES &..... N.AV.
ROUTE
LD 50 OF MATERIAL, SPECIES &..... 5989 MG/KG. (ORAL-MOUSE).
ROUTE
CARCINOGENICITY OF MATERIAL..... NONE.
TERATOGENICITY:..... SODIUM SULPHATE IS NOT INCLUDED ON THE
IARC, NTP, ACGIH LISTS OR ON NIOSH'S
SUBFILE.
REPRODUCTIVE EFFECTS..... CITED IN RTECS FROM INJECTABLE DOSES OF 60
MG/KG IN MICE.
IRRITANCY OF MATERIAL..... SEE SECTION 03.
SENSITIZING CAPABILITY OF..... N.AV.
MATERIAL
SYNERGISTIC MATERIALS..... NONE.

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SODIUM SULPHATE

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SECTION 12: ECOLOGICAL CONSIDERATIONS

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL..... IN ACCORDANCE WITH MUNICIPAL, PROVINCIAL
AND FEDERAL REGULATIONS.

SECTION 14: TRANSPORT INFORMATION

UN NUMBER..... N.AP.
TDG CLASSIFICATION..... NOT REGULATED.
PACKING GROUP..... N.AP.
SPECIAL SHIPPING INSTRUCTIONS..... N.AP.

SECTION 15: REGULATORY INFORMATION

WHMIS CLASSIFICATION..... THIS IS NOT A CONTROLLED PRODUCT.
CPR COMPLIANCE..... THIS PRODUCT HAS BEEN CLASSIFIED IN
ACCORDANCE WITH THE HAZARD CRITERIA OF THE
CPR AND THE MSDS CONTAINS ALL THE
INFORMATION

REQUIRED BY THE CPR.

SECTION 16: OTHER INFORMATION

N.AV.=NOT AVAILABLE.....
N.AP.=NOT APPLICABLE.....
PREPARED BY..... Regulatory Affairs
DATED..... 02161998

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VAR SOL

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* M S D S *

* Canadian Centre for Occupational Health and Safety *

* * * * * Issue : 2001-1 (February, 2001) *

*** IDENTIFICATION ***

MSDS RECORD NUMBER : 2429254

PRODUCT NAME(S) : VAR SOL DX 3641

DATE OF MSDS : 1999-07-20

CURRENCY NOTE : This MSDS was provided to CCOHS in
electronic form on 2000-09-27

*** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR : CANADA COLORS AND CHEMICALS LIMITED

ADDRESS : 80 Scarsdale Road
Don Mills Ontario
Canada M3B 2R7
Telephone: 416-449-7750

EMERGENCY TELEPHONE NO. : 416-444-2112

SUPPLIER/DISTRIBUTOR NOTE :

For further information about this product please contact the Canada
Colors Customer Service Department at 416-449-7750.

MATERIAL SAFETY DATA SHEET : 00004966

CANADA COLORS AND CHEMICALS LI
80 SCARSDALE ROAD
DON MILLS, ONTARIO M3B 2R7
(416) 449-7750

Product: VAR SOL DX 3641

SECTION 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER..... VAN WATERS & ROGERS LTD.
9800 VAN HORNE WAY
RICHMOND, B.C.
CANADA
V6X 1W5

PRODUCT NAME:.....

PRODUCT CODE:.....

CHEMICAL FORMULA..... N.AV.

MOLECULAR WEIGHT..... N.AV.

CHEMICAL FAMILY..... N.AV.

MATERIAL USE..... REFER TO TECHNICAL LITERATURE.

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VAR SOL

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EMERGENCY PHONE NO..... (416)-444-2112.

SECTION 02: COMPOSITION/INFORMATION ON INGREDIENTS

%	CAS / TLV	LD/50, ROUTE, SPECIES	LC/50, ROUTE, SPECIES

NAPHTHA, HYDROTREATED LIGHT			
100	64742-47-8	5000 MG/KG (ORL-RAT)	N.AV.
	---	3000 MG/KG	
		(DERMAL-RABBIT)	

SECTION 03: HAZARDS IDENTIFICATION

ROUTE OF ENTRY:.....

SKIN CONTACT..... IRRITANT.

SKIN ABSORPTION..... N.AV.

EYE CONTACT..... IRRITANT.

INHALATION..... HARMFUL IF INHALED.

INGESTION..... HARMFUL IF SWALLOWED.

EFFECTS OF ACUTE EXPOSURE..... SEE ABOVE.

EFFECTS OF CHRONIC EXPOSURE..... NONE KNOWN.

SECTION 04: FIRST AID MEASURES

INSTRUCTIONS:.....

IN CASE OF INHALATION, REMOVE TO FRESH AIR.GET IMMEDIATE MEDICAL ATTENTION.FLUSH EYES WITH LARGE AMOUNTS OF RUNNING WATER FOR AT LEAST 15 MINUTES. HOLD EYELIDS APART TO ENSURE RINSING OF THE ENTIRE SURFACE OF THE EYE AND LIDS WITH WATER.IN CASE OF SKIN CONTACT.WASH SKIN WITH LARGE AMOUNTS OF RUNNING WATER, AND SOAP IF AVAILABLE, FOR 15 MINUTES.IF IRRITATION PERSISTS, GET MEDICAL ATTENTION.WASH CLOTHING BEFORE REUSE.IN CASE OF INGESTION:. DO NOT INDUCE VOMITING.GET IMMEDIATE MEDICAL ATTENTION.DO NOT GIVE ANYTHING BY MOUTH TO A CONVULSING OR UNCONSCIOUS PERSON.