Atrazine

sc-210846

Material Safety Data Sheet

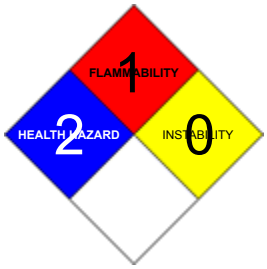
Hazard Alert Code Key:	EXTREME	HIGH	MODERATE	LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
Atrazine

STATEMENT OF HAZARDOUS NATURE
CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA



SUPPLIER
Santa Cruz Biotechnology, Inc.
2145 Delaware Avenue
Santa Cruz, California 95060
800.457.3801 or 831.457.3800

EMERGENCY
ChemWatch
Within the US & Canada: 877-715-9305
Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112

SYNONYMS
C8-H14-Cl-N5, 2-chloro-4-ethylamino-6-isopropylamino-s-triazine, "2-chloro-4-ethylamino-6-isopropylamino-1, 3, 5-triazine", "6-chloro-N-ethyl-N' -(1-methylethyl)-1, 3, 5-triazine-2, 4-diamine", 2-chloro-4-(2-propylamino)-6-ethylamino-s-triazine, 2-chloro-4-ethylamineisopropylamine-s-triazine, 1-chloro-3-ethylamino-5-isopropylamino-s-triazine, "1-chloro-3-ethylamino-5-isopropylamino-2, 4, 6-triazine", "s-triazine, 2-chloro-4-ethylamino-6-isopropylamino-", "1, 3, 5-triazine-2, 4-diamine", Aatrex, Aktikon, Argezin, Atazinax, Atranex, Atrasine, "Atratol A", Atrazin, Atred, Atrex, Candex, Cekuzina-T, Crisatrina, Crisazine, Cyazin, Fenamin, Fenamine, Fenatrol, Gesoprim, Griffex, Hungazin, Inakor, Oleogesaprim, Primatol, Primaze, Radazin, Radizine, "Atrazine Herbicide", Strazine, "Triazine A 1294", Vectal, "Weedex A", Wonuk, Atragranz, Zeazin, Zeazine, Nu-Trazine, Atradex, "Gesaprim Nine-O"

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

		Min	Max
Flammability	1		
Toxicity	2		
Body Contact	2		
Reactivity	1		
Chronic	3		

Min/Nil=0
Low=1
Moderate=2
High=3
Extreme=4

CANADIAN WHMIS SYMBOLS

EMERGENCY OVERVIEW

RISK

Irritating to eyes.
May cause SENSITISATION by skin contact.
Limited evidence of a carcinogenic effect.
Harmful danger of serious damage to health by prolonged exposure if swallowed.
Harmful by inhalation and if swallowed.
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.
■ No cases of human poisonings have been reported following ingestion of atrazine. Acutely poisoned animals showed muscular spasms, twitching, stiff gait, increased respiratory rate, adrenal degeneration, disturbed protein and glucose metabolism and congestion of the lungs, liver. [Merck,ILO].
■ Triazine derivatives have been shown to cause structural damage to theliver in animal studies.

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.
■ Eye contact with atrazine can cause irritation but is not expected to cause damage if first-aid is administered promptly. [CCINFO].

SKIN

■ There is some evidence to suggest that the material may cause mild but significant 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.
■ Open cuts, abraded or irritated skin should not be exposed to this material.
■ 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.
■ Prolonged skin contact with atrazine may be mildly irritating and may cause contact dermatitis and/or skin sensitisation. [ILO].

INHALED

■ The material is not thought to produce respiratory irritation (as classified using animal models). Nevertheless inhalation of dusts, or fume, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.
■ Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.
■ Inhalation of atrazine may cause coughing, choking and loss of breath. General inhalation hazard is low in humans. Groups of rats exposed to 80% wettable powder for one hour at concentrations up to 4900 mg/m3 did not exhibit toxicological or pharmacological effects.

CHRONIC HEALTH EFFECTS

■ Harmful danger of serious damage to health by prolonged exposure if swallowed.
This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects.
There is some evidence to provide a presumption that human exposure to the material may result in impaired fertility on the basis of some evidence in animal studies of impaired fertility in the absence of toxic effects, or evidence of impaired fertility occurring at around the same dose levels as other toxic effects but which is not a

secondary non-specific consequence of other toxic effects.
Chronic inhalation exposures to atrazine may cause decreased body weight and anaemia.
Rats, dogs, horses and cattle fed at dietary levels of more than 25 ppm for extended periods showed no observable effects. There were no gross or microscopic signs of toxicity when 100 ppm was given daily to rats for two years in the diet. No teratogenic effects were observed in rats and sheep and 100 ppm was reported as the no-observed effect-level (NOEL) in a three generation rat reproduction study.
Chronic feeding studies, in one investigation, examining the effect of atrazine (technical) on female Sprague-Dawley rats, demonstrated an increase in the incidence of mammary tumours. This result was not repeated in similar studies. Epidemiological studies, conducted on atrazine production workers, have not demonstrated a link between health problems and exposure to the substance. [Ciba-Geigy 1992]
Bacteria may metabolise atrazine sprayed on feed crops to produce cyanuric acid which then enters the food chain. Cyanuric acid is a potential carcinogen.
Epidemiological studies have associated long-term exposures to triazine herbicides with increase risk of ovarian cancer in female farm workers in Italy and of breast cancer in the general population of Kentucky in the United States. In experiments with female F344 rats, atrazine induced tumours of the mammary gland and reproductive organs. Atrazine also caused lengthening of the oestrus cycle, a dose-dependent increase in the plasma levels of 17beta-oestradiol and early onset of mammary and pituitary tumours in female Prague-Dawley rats.
Investigations into the mechanism of these apparent oestrogenic effects have not been able to demonstrate any consistent interactions with triazine herbicides with the oestrogen receptor or effects on receptor-mediated responses. Atrazine, simazine and propazine have been shown to induce aromatase activity in a human adrenocortical carcinoma cell line. This response was observed at concentrations in the submicromolar range. Aromatase is a circulating enzyme which converts androstenedione (generated in the adrenals) to oestrone in peripheral tissues such as adipose tissues. Oestrone subsequently undergoes conversion to oestradiol which binds to oestrogen receptors in many tissues with induction of tumours. In addition, many human breast cancers contain aromatase. (Breast cancer therapies, based on aromatase inhibitors, are now available.)
The effects of triazine herbicides and some of their metabolites on aromatase activity may provide a partial explanation for the observed increase in plasma oestradiol in rats, together with the observed oestrogen-mediated toxicities in vivo. [1]
[1] Sanderson et al Environmental Health Perspectives, 109, pp 1027-1031, 2001
Suggestive evidence between atrazine (or triazines) exposure and an increased risk of prostate cancer, breast cancer, and ovarian cancer have been reported. Although these data provide a suspicion of carcinogenicity, the limited number of investigations and study limitations preclude drawing conclusions regarding these cancer types.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
atrazine	1912-24-9	>98

Section 4 - FIRST AID MEASURES

SWALLOWED

- IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.
- Where Medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise

EYE

If this product comes in contact with the eyes

- Wash out immediately with fresh 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.

SKIN

If skin contact occurs

- Immediately remove all contaminated clothing, including footwear
- Flush skin and hair with running water (and soap if available).

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.

- Lay patient down. Keep warm and rested.

NOTES TO PHYSICIAN

■ for poisons (where specific treatment regime is absent)

----------BASIC TREATMENT

- Establish a patent airway with suction where necessary.
- Watch for signs of respiratory insufficiency and assist ventilation as necessary.

Treat symptomatically.

s-Triazine herbicides are retained for relatively short times in body tissues and fluids. After 72 hours of dosing rats with radioactive labelled material excreted 65.5% of the label in the urine and 20.3%

in faeces. About 15.8% was retained in the tissues with relatively high concentrations in the liver, kidneys and lungs.

Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG)	Negligible.
Upper Explosive Limit (%)	Not Available
Specific Gravity (water=1)	Not available.
Lower Explosive Limit (%)	Not Available

EXTINGUISHING MEDIA

- Foam.
- Dry chemical powder.

FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.

Use water spray to knock down dust.

When any large container (including road and rail tankers) is involved in a fire,

consider evacuation by 100 metres in all directions.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Combustible solid which burns but propagates flame with difficulty.
- Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust may burn rapidly and fiercely if ignited.

Combustion products include carbon monoxide (CO), carbon dioxide (CO_2), hydrogen chloride, phosgene, nitrogen oxides (NOx), other pyrolysis products typical of burning organic material.

May emit clouds of acrid smoke.

FIRE INCOMPATIBILITY

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

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Clean up waste regularly and abnormal spills immediately.
- Avoid breathing dust and contact with skin and eyes.
- Wear protective clothing, gloves, safety glasses and dust respirator.
- Use dry clean up procedures and avoid generating dust.
- Vacuum up or sweep up. NOTE Vacuum cleaner must be fitted with an exhaust micro filter (HEPA type) (consider explosion-proof machines designed to be grounded during storage and use).
- Dampen with water to prevent dusting before sweeping.
- Place in suitable containers for disposal.

Environmental hazard - contain spillage.

MAJOR SPILLS

Environmental hazard - contain spillage.

Moderate hazard.

- CAUTION Advise personnel in area.
- Alert Emergency Responders and tell them location and nature of hazard.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.

Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.

- Do NOT cut, drill, grind or weld such containers.
- In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.

RECOMMENDED STORAGE METHODS

- Polyethylene or polypropylene container.
- Check all containers are clearly labelled and free from leaks.

STORAGE REQUIREMENTS

Observe manufacturer's storing and handling recommendations.

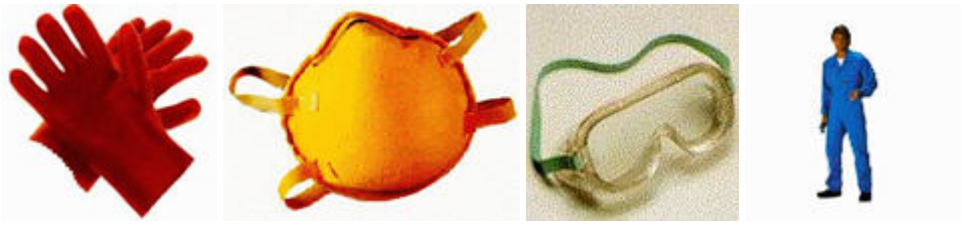
Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m³	STEL ppm	STEL mg/m³	Peak ppm	Peak mg/m³	TWA F/CC	Notes
Canada - British Columbia Occupational Exposure Limits	atrazine (Atrazine)		5						
US - Minnesota Permissible Exposure Limits (PELs)	atrazine (Atrazine)		5						
Canada - Alberta Occupational Exposure Limits	atrazine (Atrazine)		5						
US NIOSH Recommended Exposure Limits (RELs)	atrazine (Atrazine)		5						
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	atrazine (Atrazine)		5						
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	atrazine (Atrizine)		5						
US - California Permissible Exposure Limits for Chemical Contaminants	atrazine (Atrazine)		5						

US - Hawaii Air Contaminant Limits	atrazine (Atrazine)		5				
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	atrazine (Atrazine)		5		10		T20
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	atrazine (Atrazine)	-	10	-	15		
US - Washington Permissible exposure limits of air contaminants	atrazine (Atrazine)		5		10		
US - Alaska Limits for Air Contaminants	atrazine (Atrazine)		5				
Canada - Prince Edward Island Occupational Exposure Limits	atrazine (Atrazine)		5				TLV Basis central nervous system convulsions
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	atrazine (Atrazine)		5				
Canada - Nova Scotia Occupational Exposure Limits	atrazine (Atrazine)		5				TLV Basis central nervous system convulsions
US - Michigan Exposure Limits for Air Contaminants	atrazine (Atrazine)		5				
Canada - Northwest Territories Occupational Exposure Limits (English)	atrazine (Atrazine)		10		20		

PERSONAL PROTECTION



RESPIRATOR

•Particulate. (AS/NZS 1716 & 1715, EN 1432000 & 1492001, ANSI Z88 or national equivalent)

EYE

- Safety glasses with side shields.
- Chemical goggles.

HANDS/FEET

Wear chemical protective gloves, eg. PVC.

NOTE The material may produce skin sensitization in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include

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

- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).

- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
- Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

OTHER

- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

ENGINEERING CONTROLS

Concentrate material is measured and mixed, preferably outdoors, in proportions as recommended by manufacturer.

- Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.
- Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Solid.
Does not mix with water.

State	Divided solid	Molecular Weight	215.68
Melting Range (°F)	336- 349	Viscosity	Not Applicable
Boiling Range (°F)	Decomposes.	Solubility in water (g/L)	Partly miscible
Flash Point (°F)	Not available.	pH (1% solution)	Not available.
Decomposition Temp (°F)	Not available.	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not available.	Vapor Pressure (mmHG)	Negligible.
Upper Explosive Limit (%)	Not Available	Specific Gravity (water=1)	Not available.
Lower Explosive Limit (%)	Not Available	Relative Vapor Density (air=1)	Not Applicable
Volatile Component (%vol)	Negligible	Evaporation Rate	Not applicable

atrazine	
log Kow (Sangster 1997)	2.61

APPEARANCE

Crystalline powder. V. slightly soluble in water. Slightly soluble in organic solvents. Bulk Density 0.448 approx Decomposes in soil after 1-2 years. Solubility (25 deg.C.) in water 70 ppm ether 12,000 ppm

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.

STORAGE INCOMPATIBILITY
¦ Avoid reaction with oxidizing agents.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

atrazine

TOXICITY AND IRRITATION
ATRAZINE
unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY	IRRITATION
Oral (rat) LD50 672 mg/kg	Skin (rabbit)38 mg (open) - Mild
Inhalation (rat) LC50 5200 mg/m³/4h	Eye (rabbit)6.32 mg - SEVERE
Dermal (rabbit) LD50 7500 mg/kg	
Oral (rat) LD50 1869-3080 mg/kg	

Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's edema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type.
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.
for atrazine
The primary adverse health effects of atrazine exposure are reproductive/developmental effects following inhalation, oral, and dermal exposure.
The reproductive system and the developing organism are primary targets of atrazine toxicity. There was a possible association between atrazine use/exposure of male farmers and increased pre-term delivery, but not decreased fecundity. The lack of information on exposure levels and the concomitant exposure to other pesticides makes these studies inadequate to assess the contribution of atrazine to these effects. Several animal studies have shown that atrazine exposure disrupts oestrus cyclicity and alters plasma hormone levels; these effects appear to be mediated by changes in the gonadal-hypothalamic-pituitary axis. Epidemiological studies, examining developmental end points, have found an association between Iowa communities exposed to atrazine in the drinking water and an increased risk of small for gestational age babies and other birth defects. Farm couples living year-round on farms in Ontario, Canada did not have altered sex ratios, and the risk of small for gestational age deliveries was not increased in relation to pesticide exposure. Developmental effects have been observed following pre-gestational, gestational, and lactational exposure of rat and rabbit dams or post-weaning exposure of rat pups to atrazine. The observed effects included post-implantation losses, decreases in fetal body weight, incomplete ossification, neurodevelopmental effects, and impaired development of the reproductive system.
A few epidemiology studies suggest evidence of a possible association between atrazine exposure and increased cancer risk, but many others do not, and the data are insufficient to adequately assess atrazine's carcinogenic potential. The animal data associate atrazine with early onset of mammary tumors believed to be the result of atrazine-induced acceleration of reproductive senescence. It is unlikely that the mechanism by which atrazine induces mammary tumors in female Sprague-Dawley rats is operational in humans.
A limited number of animal studies have shown that atrazine exposure may affect other end points, including systemic effects, and damage to the heart, liver, and kidneys.
The substance is classified by IARC as Group 3
NOT classifiable as to its carcinogenicity to humans.
Evidence of carcinogenicity may be inadequate or limited in animal testing.
For atrazine technical
ADI 0.005 mg/kg/day
NOEl 0.5 mg/kg/day

CARCINOGEN

atrazine	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	3
Atrazine	US ACGIH Threshold Limit Values (TLV) - Carcinogens	Carcinogen Category	A4
atrazine	US - Rhode Island Hazardous Substance List	IARC	
ATRAZINE	US Environmental Defense Scorecard Suspected Carcinogens	Reference(s)	EPA-TRI, NTP-BR, OEHHA-TCD, SCDM
TWAPPM~	US - Maine Chemicals of High Concern List	Carcinogen	A4
VPVB_(VERY~	US - Maine Chemicals of High Concern List	Carcinogen	
TWAPPM~	Canada - Prince Edward Island Occupational Exposure Limits - Carcinogens	Notes	TLV Basis central nervous system convulsions

Section 12 - ECOLOGICAL INFORMATION

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
This material and its container must be disposed of as hazardous waste.
Avoid release to the environment.
Refer to special instructions/ safety data sheets.

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Instructions
All waste must be handled in accordance with local, state and federal regulations.
¦ Puncture containers to prevent re-use and bury at an authorized landfill.
Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.
A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.
DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

- 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.

Small amounts of material can be decomposed with caustic acid or buried 18 inches or deeper away from water supplies.

Section 14 - TRANSPORTATION INFORMATION

DOT:

Symbols:	G	Hazard class or Division:	9
Identification Numbers:	UN3077	PG:	III
Label Codes:	9	Special provisions:	8, 146, 335, B54, IB8, IP3, N20, T1, TP33
Packaging: Exceptions:	155	Packaging: Non-bulk:	213
Packaging: Exceptions:	155	Quantity limitations: Passenger aircraft/rail:	No limit
Quantity Limitations: Cargo aircraft only:	No limit	Vessel stowage: Location:	A
Vessel stowage: Other:	None		

Hazardous materials descriptions and proper shipping names:
Environmentally hazardous substance, solid, n.o.s

Air Transport IATA:

ICAO/IATA Class:	9	ICAO/IATA Subrisk:	麝
UN/ID Number:	3077	Packing Group:	III
Special provisions:	A97		
Cargo Only			
Packing Instructions:	956	Maximum Qty/Pack:	400 kg
Passenger and Cargo		Passenger and Cargo	
Packing Instructions:	956	Maximum Qty/Pack:	400 kg
Passenger and Cargo Limited Quantity		Passenger and Cargo Limited Quantity	
Packing Instructions:	Y956	Maximum Qty/Pack:	30 kg G

Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. *(CONTAINS ATRAZINE)

Maritime Transport IMDG:

IMDG Class:	9	IMDG Subrisk:	None
UN Number:	3077	Packing Group:	III
EMS Number:	F-A,S-F	Special provisions:	274 335
Limited Quantities:	5 kg	Marine Pollutant:	Yes

Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.(contains atrazine)

Section 15 - REGULATORY INFORMATION

atrazine (CAS: 1912-24-9) is found on the following regulatory lists;
"Canada - Alberta Occupational Exposure Limits","Canada - British Columbia Occupational Exposure Limits","Canada - Northwest Territories Occupational Exposure Limits (English)","Canada - Nova Scotia Occupational Exposure Limits","Canada - Prince Edward Island Occupational Exposure Limits","Canada - Prince Edward Island Occupational Exposure Limits - Carcinogens","Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)","Canada - Saskatchewan Environmental Persistent or Chronic Hazardous Substances","Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits","Canada - Saskatchewan Occupational Health and Safety Regulations - Designated Chemical Substances","Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances","Canada Domestic Substances List (DSL)","Canada Environmental Quality Guidelines (EQGs) Water: Aquatic life","Canada Environmental Quality Guidelines (EQGs) Water: Community","International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs","OSPAR List of Substances of Possible Concern","US - Alaska Limits for Air Contaminants","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 - Maine Chemicals of High Concern List","US - Massachusetts Oil & Hazardous Material List","US - Michigan Exposure Limits for Air Contaminants","US - Minnesota Hazardous Substance List","US - Minnesota Permissible Exposure Limits (PELs)","US - New Jersey Right to Know Hazardous Substances","US - Pennsylvania - Hazardous Substance List","US - Rhode Island Hazardous Substance List","US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants","US - Texas Drinking Water Standards - Maximum Contaminant Levels (MCLs) for synthetic organic 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 Threshold Limit Values (TLV)","US ACGIH Threshold Limit Values (TLV) - Carcinogens","US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)","US EPA High Production Volume Program Chemical List","US EPA Master Testing List - Index I Chemicals Listed","US EPA Master Testing List - Index II Chemicals Removed","US EPCRA Section 313 Chemical List","US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act","US NIOSH Recommended Exposure Limits (RELs)","US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory","US TSCA Section 4 (e) - ITC Priority Testing List","US TSCA Section 8 (a) - Preliminary Assessment Information Rules (PAIR) - Reporting List","US TSCA Section 8 (d) - Health and Safety Data Reporting","WHO Guidelines for Drinking-water Quality - Guideline values for chemicals that are of health significance in drinking-water"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE

■ May produce skin discomfort*.
■ May affect fertility*.
* (limited evidence).

Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. For additional technical information please call our toxicology department on +800 CHEMCALL.

■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
A list of reference resources used to assist the committee may be found at:
www.chemwatch.net/references.

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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