

Dazomet

sc-252662



The Power is Question

Material Safety Data Sheet

Hazard Alert Code Key:

EXTREME

HIGH

MODERATE

LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

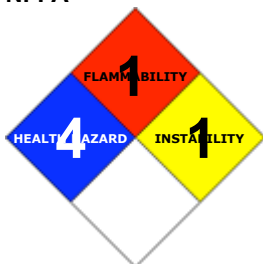
PRODUCT NAME

Dazomet

STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA



SUPPLIER

Santa Cruz Biotechnology, Inc.
2145 Delaware Avenue
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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

C5-H10-N2-S2, "2H-1, 3, 5-thiadiazine-2-thione, tetrahydro-3, 5-dimethyl-", dimethylformocarbthialdine, "3, 5-dimethyltetrahydro-1, 3, 5-thiadiazine-2-thione", "3, 5-dimethyl-1, 2, 3, 5-tetrahydro-1, 3, 5-thiadiazinethione-2", "3, 5-dimethyltetrahydro-1, 3, 5-2H-thiadiazine-2-thione", "3, 5-dimethyl-1, 3, 5-2H-tetrahydrothiadiazine-2-thione", "3, 5-dimethyl tetrahydro-2H-1, 3, 5-thiadiazine-2-thione", "3, 5-dimethyl-2-thionotetrahydro-1, 3, 5-thiadiazine", "tetrahydro-2H-3, 5-dimethyl-1, 3, 5-thiadiazine-2-thione", "tetrahydro-3, 5, -dimethyl-2H-1, 3, 5-thiadiazine-2-thione", "2-thio-3, 5-dimethyltetrahydro-1, 3, 5-thiadiazine", DMTT, "Carbothialdine Basamid G Granular Basamid P Powder Stauffer N 521", "Fennosan B 100 Crag Nemacide 974", Micofume, "Crag 85W", "Mylone 85", "Nalcon 243", Nefusan, Preservit, "Protectol DZ", Salvo, Thiazone, Thiazon, Tiazon, "Troysan 142", N-521, UCC-974, "nematocide/ fungicide/ herbicide/ insecticide nematicide"

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

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

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.

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.

■ Large doses of ammonia or injected ammonium salts may produce diarrhea and may be sufficiently absorbed to produce increased production of urine and systemic poisoning.

Symptoms include weakening of facial muscle, tremor, anxiety, reduced muscle and limb control.

■ Ingestion of formaldehyde may cause immediate severe abdominal pain, with vomiting, nausea, diarrhoea, anuria, dizziness, followed by unconsciousness, convulsions and may result in death.

The methanol stabiliser in solutions is a cause of visual impairment and possible permanent blindness.

■ Ingestion of small amounts of carbon disulfide may result in headache, nausea, dizziness, abdominal pain, vomiting, diarrhoea, burns to the mouth and oesophagus, numbness of the limbs, dyspnea, dizziness, spasmodic terror, hyperactive tendon reflexes, hyperaesthesia, cardiac arrhythmias, hallucinations, prostration, peripheral vascular collapse, hypothermia, cyanosis, mydriasis, convulsions, coma, and death within a few hours, from respiratory paralysis.

Non-fatal exposures may produce delayed effects including motor agitation, disorientation, psychic disturbances, narcosis, delirium, areflexia, mydriasis and permanent damage to the peripheral nervous system.

EYE

■ Evidence exists, or practical experience predicts, that the material may cause eye irritation in a substantial number of individuals.

Prolonged eye contact may cause inflammation characterized by a temporary redness of the conjunctiva (similar to windburn).

SKIN

■ Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.

■ Mild irritation is produced on moist skin when vapour concentrations of ammonia exceed 10000 ppm.

High vapour concentrations (>30000 ppm) or direct contact with solutions produces severe pain, a stinging sensation, burns and vesiculation and possible brown stains.

■ Minor regular skin contact with formaldehyde results in hardening of skin - tanning.

Formaldehyde is a sensitising agent capable of inducing contact dermatitis.

■ Concentrated solutions of carbon disulfide may cause skin pain, redness, and sloughing.

Second or third degree burns can occur after only a few minutes of contact.

■ 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.

■ This material can cause inflammation of the skin oncontact in some persons.

INHALED

■ Inhalation of dusts, generated by the material, during the course of normalhandling, may be harmful.

■ 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.

■ The highly irritant properties of ammonia vapor result as the gas dissolves in mucous fluids and forms irritant, even corrosive solutions.

■ Inhalation of vapour at relatively low concentrations may cause a tingling sensation in the nose and upper respiratory tract.

Slightly higher concentrations may cause a burning sensation, headache.

■ Acute inhalation of carbon disulfide produces rapid onset of both local irritation and central nervous system symptoms ranging from pharyngitis, nausea, vomiting, dizziness, fatigue, headache, mood changes, lethargy and blurred vision, to agitation, uncontrollable anger, suicidal tendencies, delirium, hallucinations, convulsions, coma and death.

Carbon disulfide inhalation can result in local irritation and pharyngitis and central nervous system effects.

■ Inhalation of methyl isothiocyanate (MITC) may irritate nose, throat and lungs causing coughing, wheezing and /or shortness of breath.

Symptoms of exposure include headache, dizziness, depression, irritability, seizures, nausea, vomiting and loss of consciousness MITC This has been implicated in dystrophic changes (disorders arising from nutritional defects) and disintegration of liver cells.

CHRONIC HEALTH EFFECTS

■ Skin contact with the material is more likely to cause a sensitization reaction in some persons compared to the general population.

Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

There is some evidence that inhaling this product is more likely to cause a sensitization reaction in some persons compared to the general population.

Prolonged or repeated minor exposure to ammonia gas/vapour may cause long-term irritation to the eyes, nose and upper respiratory tract.

Repeated exposure or prolonged contact may produce dermatitis, and conjunctivitis.

Other effects may include ulcerative changes to the mouth and bronchial and gastrointestinal disturbances. Adaptation to usually irritating concentrations may result in tolerance. In animals, repeated exposures to sub-lethal levels produces adverse effects on the respiratory tract, liver, kidneys and spleen. Exposure at 675 ppm for several weeks produced eye irritation in dogs and rabbits; corneal opacity, covering between a quarter to one half of the total surface area, was evident in rabbits.

When administered by inhalation, formaldehyde induced squamous cell carcinomas of the nasal cavity in rats of both sexes. Although excess occurrence of a number of cancers has been reported in humans, the evidence for a possible involvement of formaldehyde is strongest for nasal and nasopharyngeal cancer. The occurrence of these cancers showed an exposure-response gradient in more than one study, but the numbers of exposed cases were often small and some studies did not show excesses in humans. Formaldehyde exposure has been associated with cancers of the lung, nasopharynx and oropharynx and nasal passages.

Several investigations have concluded that specific respiratory sensitisation occurs based on positive bronchial provocation tests amongst formaldehyde-exposed workers. These studies have been criticised for methodological reasons. One large study however revealed that 5% of persons exposed to formaldehyde and had asthma-like symptoms met the study criteria for formaldehyde-induced asthma; this included a positive response on a bronchial provocation test with 2.5 mg/m³ formaldehyde. Although differential individual sensitivity has been established, the mechanism for this increased sensitivity is unknown.

There is limited evidence that formaldehyde has any adverse effect on reproduction or development in humans. An investigation of reproductive function in female workers exposed to formaldehyde in the garment industry, revealed an increased incidence of menstrual disorders, inflammatory disease of the reproductive tract, sterility, anaemia, and low birth weights amongst off-spring.

Long-term exposure to carbon disulfide (CS₂) may cause serious damage to the central nervous system (degeneration of the peripheral nerves), vision problems, liver and kidney damage, anaemia, fatigue and debility. Other symptoms of chronic exposure include insomnia, nightmares, defective memory and impotency. Coronary heart disease has also been significantly linked to CS₂ exposure.

A daily four hour exposure at concentrations exceeding 150 ppm produces chronic intoxication after a few months; 100-150 ppm is thought to produce chronic poisoning after a year or more whilst 50-100 ppm produces sporadic cases of mild intoxication.

Exposure to 144-321 ppm (445-1000 mg/m³) for 5 years or longer resulted in polyneuritis in 88 of 100 workers. Encephalopathy was observed in 43 cases. Also seen were tremors, vertigo, psychosis, and myopathy. Polyneuritis has been reported following exposure to 5 ppm (15.6 mg/m³), and reductions in nerve fiber conduction velocity have been reported after exposure to 1.0-7.6 ppm for an average of about 12 years

Persons with pre-existing central nervous system, gastrointestinal tract, liver, kidneys, skin and blood disorders are potentially more susceptible to symptoms of exposure and should be excluded from all forms of exposure. The toxic effects of carbon disulfide, particularly on the nervous system, can be intensified by consumption of alcohol or simultaneous exposure to hydrogen sulfide.

Concentrations as low as 20 ppm may produce neurological damage - women appear to be more susceptible to the neurological effects of carbon disulfide. These effects include headache, apprehension, lethargy, sleepiness, hearing and position sense loss, paraesthesias, muscle pain, tremors, ataxia, staggering gait, weakness, loss of lower extremity reflexes, and paralysis. Visual disturbances include decreased visual acuity, impaired recognition of red and green, nystagmus, diplopia, disturbed pupillary reaction to light - optic nerve atrophy may also occur. A decrease in corneal reflex may be an indication of chronic intoxication.

Psychiatric symptoms may include loss of memory, nightmares leading to loss of sleep, mental deterioration, acoustic and visual hallucinations, rapid mood changes ranging from irritability to manic-depressive psychoses, and suicidal tendencies. Disturbances to the libido and impotence (with effects on sperm) have also been recorded. Menstrual and ovarian function disorders and an increased risk of spontaneous abortion may also occur.

Liver damage may be indicated by a palpable, tender liver and minor derangement of liver function. Chronic renal dysfunction may occur at concentrations not sufficiently great to produce neurological damage. Gastric or duodenal ulcers may also be produced as a result of chronic exposure.

Coronary heart disease has been significantly linked to carbon disulfide. A series of studies in Finland showed a significant excess mortality from cardiovascular disease in workers exposed to carbon disulfide for at least 5 years to concentrations estimated to range from 20-40 ppm in the 1950's and 10-30 ppm in the 1960's. Most workers, however, had been exposed repeatedly to far higher concentrations at various times.

Nutritional factors may account for variations in response shown amongst workers. Experimental rabbit diets reinforced with a high mineral mixture, especially copper and zinc, permitted daily exposures at 1100 ppm CS₂ without the observed effects seen in the controls (body weight loss, serum lipoprotein and total cholesterol increase, adrenal hypertrophy and pathological changes to the brain and spinal cord).

Epidemiology studies revealed no definitive increased risk for cancer among workers who were exposed to carbon disulfide for up to 15 years. Other studies reported no association between occupational exposure to carbon disulfide and cancer mortality. In some cases mortality due to cancer was less in the carbon disulfide population than in the control group.

Prolonged inhalation exposure to low levels of carbon disulfide can cause adverse reproductive system effects in humans. An increased incidence of fetal resorptions has been reported in rabbits exposed to carbon disulfide. Inhalation exposure does not appear to damage the developing offspring of laboratory animals.

A number of epidemiological studies have reported that inhalation exposure to 13-77 ppm carbon disulfide resulted in changes in sperm morphology, decreased hormone levels, and decreased libido in males; and menstrual irregularities in females. One report indicated increased menstrual disorders and greater incidence of toxemia in pregnancy after occupational exposure to about 12-18 ppm carbon disulfide. An increase in spontaneous abortions was reported in one study following occupational exposure to about 9 ppm. There are no data that indicate an increase in congenital malformations in children born to mothers exposed by any route to carbon disulfide

Foetal resorption was reported in rabbits exposed orally to 25 mg/kg/day during gestation, but was not seen in rats exposed to 100 mg/kg/day. The 25 mg/kg/day dose was a frank-effect-level (FEL) for fetal resorption in rabbits. Inhalation experiments failed to show any effects on foetal development in rats or rabbits exposed to 62.3 or 124.6 mg/m³ (5 and 10 mg/kg/day, rats; 11, 22 mg/kg/day, rabbits) given from 34 weeks before breeding through the entire gestation period. The highest no-observed- adverse effect level (NOAEL) for the study was 22 mg/kg/day; however, this NOAEL was close to the FEL seen in the previous experiment.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
dazomet	533-74-4	>90
hydrolysis yields		
methyl isothiocyanate	556-61-6	

formaldehyde	50-00-0
methylamine	74-89-5
ammonia	1336-21-6
carbon disulfide	75-15-0

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

■ Treat symptomatically.

for irritant gas exposures:

- the presence of the agent when it is inhaled is evanescent (of short duration) and therefore, cannot be washed away or otherwise removed
 - arterial blood gases are of primary importance to aid in determination of the extent of damage. Never discharge a patient significantly exposed to an irritant gas without obtaining an arterial blood sample.
 - supportive measures include suctioning (intubation may be required), volume cycle ventilator support (positive and expiratory pressure (PEEP), steroids and antibiotics, after a culture is taken
 - If the eyes are involved, an ophthalmologic consultation is recommended
- Occupational Medicine: Third Edition; Zenz, Dickerson, Horvath 1994 Pub: Mosby.

For acute or short term repeated exposures to ammonia and its solutions:

- Mild to moderate inhalation exposures produce headache, cough, bronchospasm, nausea, vomiting, pharyngeal and retrosternal pain and conjunctivitis. Severe inhalation produces laryngospasm, signs of upper airway obstruction (stridor, hoarseness, difficulty in speaking) and, in excessively, high doses, pulmonary edema.
- Warm humidified air may soothe bronchial irritation.
- Carbon disulfide intoxication results in severe debilitating CNS symptoms (irritability, mania, hallucinations, tremors, memory loss).
- Chronic industrial exposures may cause neuropsychiatric changes, peripheral neuropathies and accelerated atherogenic changes.

Section 5 - FIRE FIGHTING MEASURES

Vapor Pressure (mmHg):	2.25 x 10 ⁻⁶
Upper Explosive Limit (%):	Not available
Specific Gravity (water=1):	1.37 (0.7 Bulk)
Lower Explosive Limit (%):	30 mg/M3 dust

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.
- 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 (CO₂), nitrogen oxides (NO_x), sulfur oxides (SO_x), other pyrolysis products typical of 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:
Safety Glasses.
Chemical goggles.
- Gloves:
Respirator:

Type BKAX-P Filter of sufficient capacity

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Remove all ignition sources.
 - Clean up all spills immediately.
 - Avoid contact with skin and eyes.
 - Control personal contact by using protective equipment.
 - Use dry clean up procedures and avoid generating dust.
 - Place in a suitable, labelled container for waste 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/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	TWA F/CC	Notes
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)	formaldehyde (FORMALDEHYDE)	0.04							
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)	formaldehyde (FORMALDEHYDE)	0.03							
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)	formaldehyde (FORMALDEHYDE)	0.008							
Canada - Ontario Occupational Exposure Limits	formaldehyde (Formaldehyde)					1.5			
US NIOSH Recommended Exposure Limits (RELs)	formaldehyde (Formalin (as formaldehyde))	0.016				0.1			See Appendix A; Ca; (Ceiling ([15-minute]))

Canada - Alberta Occupational Exposure Limits	formaldehyde (Formaldehyde)	0.75	0.9	1	1.3	
Canada - Ontario Occupational Exposure Limits	formaldehyde (Formaldehyde)			1		
Canada - British Columbia Occupational Exposure Limits	formaldehyde (Formaldehyde)	0.3		1		A2, 1; S
US - Idaho - Acceptable Maximum Peak Concentrations	formaldehyde (Formaldehyde (Z37.16-1967))	3		5		
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	formaldehyde (Rosin core solder pyrolysis products, as formaldehyde)		0.1			
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	formaldehyde (Formaldehyde; see 1910.1048)	3		5		
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	formaldehyde (Formaldehyde; see 1910.1048)			See Table Z-2 for		
US - California Permissible Exposure Limits for Chemical Contaminants	formaldehyde (Rosin core solder, pyrolysis products, as formaldehyde)		0.1			
US - California Permissible Exposure Limits for Chemical Contaminants	formaldehyde (Formaldehyde, see Section 5217)	0.75		2		
US ACGIH Threshold Limit Values (TLV)	formaldehyde (Formaldehyde)			0.3		TLV Basis: upper respiratory tract & eye irritation
US - Alaska Limits for Air Contaminants	formaldehyde (Rosin core solder pyrolysis products, as formaldehyde)		0.1			
US - Michigan Exposure Limits for Air Contaminants	formaldehyde (Formaldehyde; see R325.51451 et seq.F)	0.75	0.9	2	2.5	
US - Oregon Permissible Exposure Limits (Z-1)	formaldehyde (Rosin core solder pyrolysis products (as Formaldehyde))		0.1			*
US - Oregon Permissible Exposure Limits (Z-1)	formaldehyde (Formaldehyde)	0.75				TWA (See 1910.1048)
US - Hawaii Air Contaminant Limits	formaldehyde (Formaldehyde)	0.75				See °12-202-37

Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	formaldehyde (Rosin core solder pyrolysis products (as formaldehyde))	-	0.1	-	0.3	
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	formaldehyde (Formaldehyde)	2	3	-	-	
US - Washington Permissible exposure limits of air contaminants	formaldehyde (Formaldehyde (see chapter 296-856 WAC))	0.75		2		
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	formaldehyde (Formaldehyde)				0.3	SEN, T20
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	formaldehyde (Formaldehyde)				2	3
US - Wyoming Toxic and Hazardous Substances Table Z-2 Acceptable ceiling concentration, Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift	formaldehyde (Formaldehyde: see 1910.1048)	0.75		2		
US OSHA Permissible Exposure Levels (PELs) - Table Z1	formaldehyde (Formaldehyde; see 1910.1048)	0.75		2		
US OSHA Permissible Exposure Levels (PELs) - Table Z2	formaldehyde (Formaldehyde; see 1910.1048)			2		
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	formaldehyde (Formaldehyde; see 1910.1048)	0.75		2		
Canada - Northwest Territories Occupational Exposure Limits (English)	formaldehyde (Formaldehyde)				2	2.4

Canada - Northwest Territories Occupational Exposure Limits (English)	formaldehyde (Rosin core solder pyrolysis products (as formaldehyde))		0.1		0.3	
Canada - Prince Edward Island Occupational Exposure Limits	formaldehyde (Formaldehyde)				0.3	TLV Basis: upper respiratory tract & eye irritation
Canada - Nova Scotia Occupational Exposure Limits	formaldehyde (Formaldehyde)				0.3	TLV Basis: upper respiratory tract & eye irritation
Canada - Alberta Occupational Exposure Limits	methylamine (Methylamine)	5	6.4	15	19	
Canada - British Columbia Occupational Exposure Limits	methylamine (Methylamine)	5		15		
US NIOSH Recommended Exposure Limits (RELs)	methylamine (Methylamine)	10	12			
US OSHA Permissible Exposure Levels (PELs) - Table Z1	methylamine (Methylamine)	10	12			
US ACGIH Threshold Limit Values (TLV)	methylamine (Methylamine)	5		15		TLV Basis: eye, skin & upper respiratory tract irritation
US - Minnesota Permissible Exposure Limits (PELs)	methylamine (Methylamine)	10	12			
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	methylamine (Methylamine)	10	12			
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	methylamine (Methylamine)	10	12			
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	methylamine (Methylamine)	10	12			
US - California Permissible Exposure Limits for Chemical Contaminants	methylamine (Methylamine)	5	6.4	15	19	
US - Idaho - Limits for Air Contaminants	methylamine (Methylamine)	10	12			

Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	methylamine (Methylamine)	5	6,4		
US - Hawaii Air Contaminant Limits	methylamine (Methylamine)	10	12		
US - Alaska Limits for Air Contaminants	methylamine (Methylamine)	10	12		
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	methylamine (Methylamine)	5	15		
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	methylamine (Methylamine)	10	12	10	12
US - Washington Permissible exposure limits of air contaminants	methylamine (Methylamine)	10	20		
US - Michigan Exposure Limits for Air Contaminants	methylamine (Methylamine)	10	12		
Canada - Prince Edward Island Occupational Exposure Limits	methylamine (Methylamine)	5	15		TLV Basis: eye, skin & upper respiratory tract irritation
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	methylamine (Methylamine)	10	12		
Canada - Nova Scotia Occupational Exposure Limits	methylamine (Methylamine)	5	15		TLV Basis: eye, skin & upper respiratory tract irritation
US - Oregon Permissible Exposure Limits (Z-1)	methylamine (Methylamine)	10	12		
Canada - Northwest Territories Occupational Exposure Limits (English)	methylamine (Methylamine)	10	12	20	25
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	ammonia (Ammonia)	25	18	40	30

US - Minnesota Permissible Exposure Limits (PELs)	ammonia (Ammonia)			35	27	
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)	ammonia (AMMONIA)	1.7				
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)	ammonia (AMMONIA)	0.1				
US NIOSH Recommended Exposure Limits (RELs)	ammonia (Ammonia)	25	18	35	27	
Canada - Alberta Occupational Exposure Limits	ammonia (Ammonia)	25	17	35	24	
Canada - British Columbia Occupational Exposure Limits	ammonia (Ammonia)	25		35		
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	ammonia (Ammonia)			35	27	
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	ammonia (Ammonia)	50	35			
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	ammonia (Ammonia)			35	27	
US - California Permissible Exposure Limits for Chemical Contaminants	ammonia (Ammonia)	25	18	35	27	
US - Idaho - Limits for Air Contaminants	ammonia (Ammonia)	50	35			
US ACGIH Threshold Limit Values (TLV)	ammonia (Ammonia)	25		35		TLV Basis: eye damage; upper respiratory tract irritation
US - Alaska Limits for Air Contaminants	ammonia (Ammonia)			35	27	
US - Michigan Exposure Limits for Air Contaminants	ammonia (Ammonia)			35	27	

US - Oregon Permissible Exposure Limits (Z-1)	ammonia (Ammonia)	25	18			*
US - Washington Permissible exposure limits of air contaminants	ammonia (Ammonia)	25		35		
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	ammonia (Ammonia)	25		35		
US - Hawaii Air Contaminant Limits	ammonia (Ammonia)	25	18	35	27	
Canada - Northwest Territories Occupational Exposure Limits (English)	ammonia (Ammonia)	25	17	35	24	
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	ammonia (Ammonia)	25	17	35	24	
US OSHA Permissible Exposure Levels (PELs) - Table Z1	ammonia (Ammonia)	50	35			
Canada - Nova Scotia Occupational Exposure Limits	ammonia (Ammonia)	25		35		TLV Basis: eye damage; upper respiratory tract irritation
Canada - Prince Edward Island Occupational Exposure Limits	ammonia (Ammonia)	25		35		TLV Basis: eye damage; upper respiratory tract irritation
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	ammonia (Ammonia)	50	35			
US - Minnesota Permissible Exposure Limits (PELs)	carbon disulfide (Carbon disulfide)	4	12	12	36	
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)	carbon disulfide (CARBON DISULFIDE)	0.3				
Canada - British Columbia Occupational Exposure Limits	carbon disulfide (Carbon disulfide)	4		12		Skin

US ACGIH Threshold Limit Values (TLV)	carbon disulfide (Carbon disulfide)	1						TLV Basis: peripheral nervous system impairment
US NIOSH Recommended Exposure Limits (RELs)	carbon disulfide (Carbon disulfide)	1	3	10	30			[skin]
Canada - Alberta Occupational Exposure Limits	carbon disulfide (Carbon disulfide)	1	3.1					
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	carbon disulfide (Carbon disulfide)	4	12	12	36			
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	carbon disulfide (Carbon disulfide)		See Table Z-2					
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	carbon disulfide (Carbon disulfide*)	4	12	12	36	30		
US - Idaho - Acceptable Maximum Peak Concentrations	carbon disulfide (Carbon disulfide (Z37.3-1968))	20				30		
US - California Permissible Exposure Limits for Chemical Contaminants	carbon disulfide (Carbon disulfide)	4	12	12	36	30		
US - Idaho - Limits for Air Contaminants	carbon disulfide (Carbon disulfide)		[2]					
US OSHA Permissible Exposure Levels (PELs) - Table Z2	carbon disulfide (Carbon disulfide (Z37.3-1968))					30		
US - Alaska Limits for Air Contaminants	carbon disulfide (Carbon disulfide)	4	12	12	36			
US - Michigan Exposure Limits for Air Contaminants	carbon disulfide (Carbon disulfide)	4	12	12	36			
US - Hawaii Air Contaminant Limits	carbon disulfide (Carbon disulfide)	4	12	12	36			
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	carbon disulfide (Carbon disulphide - Skin)	20	60	30	90			
US - Washington Permissible exposure limits of air contaminants	carbon disulfide (Carbon disulfide)	4		12				

Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	carbon disulfide (Carbon disulphide)	10		15			Skin
Canada - Northwest Territories Occupational Exposure Limits (English)	carbon disulfide (Carbon disulfide - Skin)	10	31	20	62		
US - Wyoming Toxic and Hazardous Substances Table Z-2 Acceptable ceiling concentration, Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift	carbon disulfide (Carbon disulfide (Z37.3-1968))	20				30	
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	carbon disulfide (Carbon disulfide)	4	12	12	36		
US - Oregon Permissible Exposure Limits (Z-2)	carbon disulfide (Carbon disulfide (Z37.3-1968))	20				30	
Canada - Nova Scotia Occupational Exposure Limits	carbon disulfide (Carbon disulfide)	1					TLV Basis: peripheral nervous system impairment
Canada - Prince Edward Island Occupational Exposure Limits	carbon disulfide (Carbon disulfide)	1					TLV Basis: peripheral nervous system impairment

ENDOELTABLE

The following materials had no OELs on our records

- dazomet: CAS:533-74-4
- methyl isothiocyanate: CAS:556-61-6

PERSONAL PROTECTION



RESPIRATOR

Type BKAX-P Filter of sufficient capacity
Consult your EHS staff for recommendations

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: such as:

- 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).

- 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) 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) 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

■ CARE: Explosive vapour air mixtures may be present on opening vessels which have contained liquid ammonia. Fatalities have occurred.

- 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.

State	Divided solid	Molecular Weight	162.29
Melting Range (°F)	219.2- 221	Viscosity	Not Applicable
Boiling Range (°F)	Not available.	Solubility in water (g/L)	Reacts
Flash Point (°F)	Not available	pH (1% solution)	Not applicable.
Decomposition Temp (°F)	219.2 (tech.)	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not available	Vapor Pressure (mmHg)	2.25 x 10 ⁻⁶
Upper Explosive Limit (%)	Not available	Specific Gravity (water=1)	1.37 (0.7 Bulk)
Lower Explosive Limit (%)	30 mg/M3 dust	Relative Vapor Density (air=1)	Not Applicable
Volatile Component (%vol)	Nil	Evaporation Rate	Not applicable

APPEARANCE

White to greyish granules with a slight pungent odour. Solubility in water is 3 g/l @ 20 C with decomposition. Solubilities (g/kg, 20 C): cyclohexanone 400, chloroform 391, acetone 173, benzene 51, ethanol 15, diethyl ether 6. Sensitive to temperatures exceeding 50 C. Hydrolysed in acidic media to carbon disulfide, formaldehyde, and methylamine.

log Kow 1.70-4.16 Estimated bioconcentration factor (BCF) values (equal to 2.94 x 10³) were calculated from solubility and Kow, (log Kow is 2.16) data. The calculated values, 6.8 and 25.8 respectively for solubility and Kow data, indicate that CS₂ will not significantly bioaccumulate in aquatic organisms. log Kow 0.1461 log Kow 1.374 log Kow 0-0.35 AQUATIC FATE Based Koc values methylamine is expected to adsorb to suspended solids and sediment. The pKa indicates methylamine will exist almost entirely in the cation form at pH values of 5 to 9 and therefore volatilisation from water surfaces is not expected to be an important fate process. An estimated BCF of 3, from its log Kow of -0.57 suggests the potential for bioconcentration in aquatic organisms is low. Under anaerobic conditions, mixed cultures from anaerobic marine sediments degraded methylamine. Using aerobic mixed cultures, methylamine biodegradation was 96% and 107% in the OECD screening test and the closed bottle test, respectively.

Material	Value
----------	-------

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

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

STORAGE INCOMPATIBILITY

■ Segregate from alcohol, water.

Avoid reaction with oxidizing agents.

· NOTE: May develop pressure in containers; open carefully. Vent periodically.

Formaldehyde:

- is a strong reducing agent
- may polymerise in air unless properly inhibited (usually with methanol up to 15%) and stored at controlled temperatures
- will polymerize with active organic material such as phenol
- reacts violently with strong oxidisers, hydrogen peroxide, potassium permanganate, acrylonitrile, caustics (sodium hydroxide, yielding formic acid and flammable hydrogen), magnesium carbonate, nitromethane, nitrogen oxides (especially at elevated temperatures), peroxyformic acid
- is incompatible with strong acids (hydrochloric acid forms carcinogenic bis(chloromethyl)ether*), amines, ammonia, aniline, bisulfides, gelatin, iodine, magnesite, phenol, some monomers, tannins, salts of copper, iron, silver.
- acid catalysis can produce impurities: methylal, methyl formate

Aqueous solutions of formaldehyde:

- slowly oxidise in air to produce formic acid
- attack carbon steel

Concentrated solutions containing formaldehyde are:

- unstable, both oxidising slowly to form formic acid and polymerising; in dilute aqueous solutions formaldehyde appears as monomeric hydrate (methylene glycol) - the more concentrated the solution the more polyoxymethylene glycol occurs as oligomers and polymers (methanol and amine-containing compounds inhibit polymer formation)
- readily subject to polymerisation, at room temperature, in the presence of air and moisture, to form paraformaldehyde (8-100 units of formaldehyde), a solid mixture of linear polyoxymethylene glycols containing 90-99% formaldehyde; a cyclic trimer, trioxane (CH₂O₃), may also form

Flammable and/or toxic gases are generated by the combination of aldehydes with azo, diazo compounds, dithiocarbamates, nitrides, and strong reducing agents

*The empirical equation may be used to determine the concentration of bis(chloromethyl)ether (BCME) formed by reaction with HCl:

$$\log(\text{BCME})\text{ppb} = -2.25 + 0.67 \log(\text{HCHO}) \text{ppm} + 0.77 \log(\text{HCl})\text{ppm}$$

Assume values for formaldehyde, in air, of 1 ppm and for HCl of 5 ppm, resulting BCME concentration, in air, would be 0.02 ppb.

Carbon disulfide:

- may decompose explosively when subject to shock, friction or concussion
- may ignite spontaneously on contact with air, or with hot surfaces releasing toxic and flammable hydrogen sulfide gas
- vapours may be ignited by contact with an ordinary light bulb, a warm steam pipe or a hot exhaust pipe
- the vapour or liquid may ignite in contact with hot steam pipes, particularly if rusted
- may release hydrogen sulfide on contact with acids or acid fumes
- contact with metal oxides may lower ignition point
- reacts with zinc with incandescence
- is incompatible with chemically active metals (sodium, potassium, aluminium, magnesium)
- ignites or reacts violently with alkali metals, strong oxidisers, reducing agents, including hydrides, nitrides and sulfides, alkali metals, nitrogen oxide
- vapour may cause ignition or explosion of finely divided aluminium, dichlorine oxide, fluorine, chlorine, phosphorus oxychloride
- mixtures with potassium-sodium alloy, potassium, sodium or lithium are capable of detonation by shock (the explosive power decreases in that order), though not by heating
- explosively reacts with azides, active metals, metal oxides, metal azides, amines, imines, halogens, nitrogen oxides, permanganates and sulfuric acid.
- aqueous solutions with metal azides produce metal azodithioformates, most of which are explosive with varying degrees of power and sensitivity to shock or heat
- forms impact-sensitive explosive with potassium azide
- is incompatible with aliphatic amines, alkanolamines, carbon monoxide, chlorine monoxide, ethylene, diamine, ethyleneimine, halogens, organic amines
- attacks some forms of plastic, rubber and coatings
- flow or agitation may generate electrostatic charges.

Methyl isothiocyanate:

- is incompatible with strong acids, strong bases, caustics, chlorates (e.g. potassium chlorate, sodium chlorate), ammonia, amines, amides, alcohols, glycols, caprolactam solution, nitric acid, nitrates, organic peroxides, peroxides, strong oxidisers
- is corrosive to zinc, copper, aluminium, and their alloys, iron and other metals - rapidly forms black precipitate on contact with ordinary steel.

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

Section 11 - TOXICOLOGICAL INFORMATION

DAZOMET

TOXICITY AND IRRITATION

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

FORMALDEHYDE:

AMMONIA:

METHYL ISOTHIOCYANATE:

■ The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

FORMALDEHYDE:

METHYLAMINE:

AMMONIA:

METHYL ISOTHIOCYANATE:

■ Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic

condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.

METHYLAMINE:

FORMALDEHYDE:

■ The material may cause severe 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. Repeated exposures may produce severe ulceration.

METHYL ISOTHIOCYANATE:

FORMALDEHYDE:

DAZOMET:

■ 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.

DAZOMET:

TOXICITY	IRRITATION
Oral (rat) LD50: 320 mg/kg	Eye (rabbit): 500 mg/24h - Mild
Oral (rat) LD50: 520 mg/kg *	Skin (rabbit): Moderate
Inhalation (rat) LC50: 8400 mg/m ³ /4h	
Dermal (rat) LD50: 2260 mg/kg	
Subcutaneous (rat) LD50: 470 mg/kg	
Oral (mouse) LD50: 180 mg/kg	
Dermal (mouse) LD50: 2400 mg/kg	
Subcutaneous (mouse) LD50: 248 mg/kg	
Oral (rabbit) LD50: 120 mg/kg	
Dermal (rabbit) LD50: 7000 mg/kg	
Oral (guinea pig) LD50: 127 mg/kg	
Oral (mouse) LD50: 455 mg/kg (male) *	
Oral (mouse) LD50: 710 mg/kg (female) *	

■ [* The Pesticides Manual, Incorporating The Agrochemicals Handbook, 10th Edition, Editor Clive Tomlin, 1994, British Crop Protection Council].

Oral (rabbit) LD50: 320-620 mg/kg *

NOEL in rats 20 mg/kg diet. *

Toxicity Class WHO III; EPA III *

Non-oncogenic *

ADI: 0.0005 mg/kg/day

TOXICITY	IRRITATION
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METHYL ISOTHIOCYANATE:

Oral (woman) LDLo: 1000 mg/kg

Skin
(rabbit):
500
mg/24h -
Moderate

Oral (rat) LD50: 72 mg/kg	Eye (rabbit): 100 mg - SEVERE
Inhalation (rat) LC50: 1900 mg/m ³ /1h	
Dermal (rat) LD50: 2780 mg/kg	
Oral (mouse) LD50: 90 mg/kg	
Dermal (mouse) LD50: 1820 mg/kg	

■ 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.

A single dose oral toxicity test of methyl isothiocyanate was conducted in female rats according to the OECD Test Guideline 423. Deaths resulted in all animals at 300 mg/kg, but in none at 50 mg/kg. In the 300 mg/kg group, pale skin, salivation, restlessness, clonic convulsions, reddish lungs and dark red focal areas in the lungs were noted. From the results, methyl isothiocyanate was classified in category 3 of the GHS regarding acute toxicity and the LD50 cut-off value was estimated to be 200 mg/kg.

A combined repeated dose and reproductive/developmental toxicity screening test of methyl isothiocyanate was also conducted in rats according to the OECD Test Guideline 422. Oral administration of the compound at doses of 0, 0.5, 2 and 8 mg/kg did not cause death. Salivation was observed in both sexes at 8 mg/kg and in 1 male at 2 mg/kg group. Suppression of body weight gain and food consumption was further observed in males of the 8 mg/kg group along with increases in the red blood cell count and hemoglobin concentration. Thickening/edema of the mucosa and diffuse squamous cell hyperplasia of the forestomach were observed in both sexes at 2 mg/kg and above. Adverse effects on body weight and hematological parameters proved reversible; however, pathological changes in the forestomach persisted 14 days after withdrawal. In the 8 mg/kg group, abnormal parturition/lactation was observed, resulting in decrease in the number of pups and the viability index. The NOEL for repeated dose toxicity of methyl isothiocyanate is considered to be 0.5 mg/kg/day in both sexes and the NOEL for reproductive toxicity is considered to be 2 mg/kg in females and 8 mg/kg in males and offspring.

A reverse mutation test using bacteria was performed to examine the mutagenic potential of methyl isothiocyanate. The compound did not induce gene mutations in bacteria under the conditions of this study.

An in vitro chromosomal aberration test of methyl isothiocyanate was performed using a fibroblast cell line (CHL/IU) derived from the lung of a Chinese hamster. Methyl isothiocyanate induced chromosomal aberrations under the conditions of this study.

Convulsions, change in motor activity, coma recorded.

FORMALDEHYDE:

Oral (woman) LDLo: 108 mg/kg		Skin (human): 0.15 mg/3d-I Mild
Oral (man) TDLo: 643 mg/kg	Skin (rabbit): 2 mg/24H SEVERE	
Oral (rat) LD50: 100 mg/kg		Eye (human): 4 ppm/5m
Inhalation (man) TCLo: 0.3 mg/m ³	Eye (rabbit): 0.75 mg/24H SEVERE	
Inhalation (rat) LC50: 203 mg/m ³		
Dermal (rabbit) LD50: 270 mg/kg		

■ **WARNING:** This substance has been classified by the IARC as Group 1: CARCINOGENIC TO HUMANS.

Tenth Annual Report on Carcinogens: Substance anticipated to be Carcinogen

[National Toxicology Program: U.S. Dep. of Health & Human Services 2002].

METHYLAMINE:

Inhalation (mouse) LC50: 2400 ppm/m ³ /2h		Skin (guinea pig):100 mg(open)
Inhalation (mammal) LC50: 2400 mg/m ³	- SEVERE	
Oral (Rat) LD50: 100 mg/kg		
Subcutaneous (Rat) LD: 200 mg/kg		
Inhalation (Mouse) LC50: 2400 mg/m ³ /2h		
Subcutaneous (Mouse) LD: 2500 mg/kg		
Subcutaneous (Guinea pig) LD: 200 mg/kg		

AMMONIA:

Oral (rat) LD50: 350 mg/kg		Eye (rabbit): 0.25 mg SEVERE
Oral (human) LDLo: 43 mg/kg	Eye (rabbit): 1 mg/30s SEVERE	
Inhalation (human) LCLo: 5000 ppm/5m		

Inhalation (human) TCLO: 20 ppm

Inhalation (rat) LC50: 2000 ppm/4h

Unreported (man) LDLo: 132 mg/kg

Oral (Human) LD: 43 mg/kg

Inhalation (Human) LC: 5000 ppm/4h

Inhalation (Human) TCLO: 408 ppm/4h

Subcutaneous (Mouse) LD: 160 mg/kg

Intravenous (Mouse) LD50: 91 mg/kg

Oral (Cat) LD: 750 mg/kg

Subcutaneous (Rabbit) LD: 200 mg/kg

Intravenous (Rabbit) LD: 10 mg/kg

CARBON DISULFIDE:

Oral (human) LDLo: 14 mg/kg

Nil
Reported

Oral (human) TCLO: 40 mg/m³

Oral (rat) LD50: 3188 mg/kg

Inhalation (human) LCLo: 4000 ppm/30
min

Inhalation (human) LCLo: 2000
ppm/5 min

Inhalation (rat) LC50: 25000 mg/m³/2 h

Inhalation (Human) LC: 10000
mg/m³/4h

Inhalation (Human) TCLO: 0.08
mg/m³/4h

Oral (Rat) LD50: 1200 mg/kg

Intraperitoneal (Guinea pig) LD: 400
mg/kg

Oral (Mouse) LD50: 2780 mg/kg

Oral (Guinea pig) LD50: 2125 mg/kg

Oral (Rabbit) LD50: 2550 mg/kg

Inhalation (Mouse) LC50: 10000
mg/m³/4h

Inhalation (Rat) LC50: 25000
mg/m³/4h

■ NOTE: Substance has been shown to be mutagenic in at least one assay, or belongs to a family of chemicals producing damage or change to cellular DNA.

Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).

Fatty liver degeneration, paternal effects, effects on fertility,

foetotoxicity, effects on newborn recorded.

CARCINOGEN

FORMALDEHYDE

US Environmental
Defense Scorecard
Recognized

Reference(s)

P65

Carcinogens			
FORMALDEHYDE	US Environmental Defense Scorecard Suspected Carcinogens	Reference(s)	P65
Formaldehyde	US Air Toxics Hot Spots TSD for Describing Available Cancer Potency Factors	IARC Class	2A
REPROTOXIN			
carbon disulfide	ILO Chemicals in the electronics industry that have toxic effects on reproduction	Reduced fertility or sterility	H A si
SKIN			
carbon disulfide	US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants - Skin	Skin Designation	X
carbon disulfide	US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants - Skin	Skin Designation	X
carbon disulfide	US - Washington Permissible exposure limits of air contaminants - Skin	Skin	X
carbon disulfide	US - Minnesota Permissible Exposure Limits (PELs) - Skin	Skin Designation	X
carbon disulfide	US - Hawaii Air Contaminant Limits - Skin Designation	Skin Designation	X
carbon disulfide	US OSHA Permissible Exposure Levels (PELs) - Skin	Skin Designation	X
carbon disulfide	Canada - Alberta Occupational Exposure Limits - Skin	Substance Interaction	1

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.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
dazomet	HIGH		LOW	HIGH
methyl isothiocyanate	HIGH		LOW	HIGH
formaldehyde	LOW	LOW	LOW	HIGH
methylamine	LOW		HIGH	HIGH
ammonia	LOW		LOW	HIGH
carbon disulfide	HIGH		LOW	HIGH

Section 13 - DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions

B. Component Waste Numbers

When formaldehyde is present as a solid waste as a discarded commercial chemical product, off-specification species, as a container residue, or a spill residue, use EPA waste number U122 (waste code T).

When carbon disulfide is present as a solid waste as a discarded commercial chemical product, off-specification species, as a container residue, or a spill residue, use EPA waste number P022 (waste code T).

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.

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: No limit

Passenger aircraft/rail:

Quantity Limitations: Cargo No limit Vessel stowage: Location: A aircraft only:

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: None

UN/ID Number: 3077 Packing Group: III

Special provisions: A97

Cargo Only

Packing Instructions: 911 Maximum Qty/Pack: 400 kg

Passenger and Cargo Passenger and Cargo

Packing Instructions: 911 Maximum Qty/Pack: 400 kg

Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity

Packing Instructions: Y911 Maximum Qty/Pack: 30 kg G

Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID,

N.O.S. *(CONTAINS DAZOMET)

Maritime Transport IMDG:

IMDG Class: 9 IMDG Subrisk: None

UN Number: 3077 Packing Group: III

EMS Number: F-A , S-F Special provisions: 179 274 335 909

Limited Quantities: 5 kg Marine Pollutant: Yes

Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

Section 15 - REGULATORY INFORMATION

dazomet (CAS: 533-74-4) is found on the following regulatory lists;

"Canada Domestic Substances List (DSL)", "Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)", "OECD Representative List of High Production Volume (HPV) Chemicals", "US - Vermont Hazardous Constituents", "US - Washington Dangerous waste constituents list", "US EPA High Production Volume Program Chemical List", "US EPCRA Section 313 Chemical

List", "US FDA Indirect Food Additives: Adhesives and Components of Coatings - Substances for Use Only as Components of Adhesives - Adhesives", "US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act", "US NFPA 499 Combustible Dusts", "US RCRA (Resource Conservation & Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261", "US Toxic Substances Control Act (TSCA) - Inventory"

Regulations for ingredients

methyl isothiocyanate (CAS: 556-61-6) is found on the following regulatory lists;

"Canada Domestic Substances List (DSL)", "FEMA Generally Recognized as Safe (GRAS) Flavoring Substances 23 - Primary Names and Synonyms", "US - Massachusetts Oil & Hazardous Material List", "US - New Jersey Right to Know Hazardous Substances", "US - Pennsylvania - Hazardous Substance List", "US DOE Temporary Emergency Exposure Limits (TEELs)", "US EPA Acute Exposure Guideline Levels (AEGs) - Interim", "US EPA High Production Volume Program Chemical List", "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 SARA Section 302 Extremely Hazardous Substances", "US Toxic Substances Control Act (TSCA) - Inventory"

formaldehyde

(CAS:

50-00-0,8005-38-7,8006-07-3,8013-13-6,112068-71-0) is found on the following regulatory lists;

"Canada - Alberta Ambient Air Quality Objectives", "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 - Ontario 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 Industrial 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 ARET (Accelerated Reduction / Elimination of Toxics) Substance List", "Canada Domestic Substances List (DSL)", "Canada Environmental Protection Act (CEPA) 1999 - Schedule 1 Toxic Substances List", "Canada Ingredient Disclosure List (SOR/88-64)", "Canada National Pollutant Release Inventory (NPRI)", "Canada Priority Substances List (PSL1, PSL 2)", "Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)", "GESAMP/EHS Composite List - GESAMP Hazard Profiles", "IMO IBC Code Chapter 17: Summary of minimum requirements", "IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk", "International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs", "International Chemical Secretariat (ChemSec) REACH SIN* List (*Substitute It Now!) 1.0", "International Council of Chemical Associations (ICCA) - High Production Volume List", "OECD Representative List of High Production Volume (HPV) Chemicals", "US - Alaska Limits for Air Contaminants", "US - California Air Toxics ""Hot Spots"" List (Assembly Bill 2588) Substances for which emissions must be quantified", "US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List", "US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELS)", "US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELS)", "US - California Permissible Exposure Limits for Chemical Contaminants", "US - California Proposition 65 - Carcinogens", "US - California Proposition 65 - No Significant Risk Levels (NSRLs) for Carcinogens", "US - California Toxic Air Contaminant List Category II", "US - Connecticut Hazardous Air Pollutants", "US - Hawaii Air Contaminant Limits", "US - Idaho - Acceptable Maximum Peak Concentrations", "US - Idaho - Limits for Air Contaminants", "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 - Oregon Hazardous Materials", "US - Oregon Permissible Exposure Limits (Z-1)", "US - Oregon Permissible Exposure Limits (Z-2)", "US - Pennsylvania - Hazardous Substance List", "US - Rhode Island Hazardous Substance List", "US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants", "US - Vermont Hazardous Constituents", "US - Vermont Hazardous wastes which are Discarded Commercial Chemical Products or Off-Specification Batches of Commercial Chemical Products or Spill Residues of Either", "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 Class A toxic air pollutants: Known and Probable Carcinogens", "US - Washington Dangerous waste constituents list", "US - Washington Discarded Chemical Products List - ""U"" Chemical Products", "US - Washington Permissible exposure limits of air contaminants", "US - Wyoming List of Highly Hazardous Chemicals, Toxics and Reactives", "US - Wyoming

Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants", "US - Wyoming Toxic and Hazardous Substances Table Z-2 Acceptable ceiling concentration, Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift", "US ACGIH Threshold Limit Values (TLV)", "US ACGIH Threshold Limit Values (TLV) - Carcinogens", "US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)", "US CAA (Clean Air Act) - HON Rule - Organic HAPs (Hazardous Air Pollutants)", "US CERCLA Priority List of Hazardous Substances", "US Clean Air Act - Hazardous Air Pollutants", "US Cosmetic Ingredient Review (CIR) Cosmetic ingredients found safe, with qualifications", "US CWA (Clean Water Act) - List of Hazardous Substances", "US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances", "US Department of Homeland Security Chemical Facility Anti-Terrorism Standards - Chemicals of Interest", "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 EPA Acute Exposure Guideline Levels (AEGs) - Interim", "US EPA Carcinogens Listing", "US EPA High Production Volume Program Chemical List", "US EPA Master Testing List - Index I Chemicals Listed", "US EPCRA Section 313 Chemical List", "US FDA Indirect Food Additives: Adhesives and Components of Coatings - Substances for Use as Components of Coatings - Acrylate ester copolymer coating", "US FDA Indirect Food Additives: Adhesives and Components of Coatings - Substances for Use Only as Components of Adhesives - Adhesives", "US Food Additive Database", "US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act", "US National Toxicology Program (NTP) 11th Report Part B. Reasonably Anticipated to be a Human Carcinogen", "US NFPA 45 Fire Protection for Laboratories Using Chemicals - Flammability Characteristics of Common Compressed and Liquefied Gases", "US NIOSH Recommended Exposure Limits (RELs)", "US OSHA Carcinogens Listing", "US OSHA List of Highly Hazardous Chemicals, Toxics and Reactives", "US OSHA Permissible Exposure Levels (PELs) - Table Z1", "US OSHA Permissible Exposure Levels (PELs) - Table Z2", "US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide", "US RCRA (Resource Conservation & Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261", "US RCRA (Resource Conservation & Recovery Act) - List of Hazardous Wastes", "US SARA Section 302 Extremely Hazardous Substances", "US Spacecraft Maximum Allowable Concentrations (SMACs) for Airborne Contaminants", "US -Texas Air Monitoring Comparison Values for Evaluating VOCs", "US Toxic Substances Control Act (TSCA) - Inventory", "USA: Chemical Facility Anti-Terrorism Standards - List Appendix A - 6CFR 27", "WHO Guidelines for Drinking-water Quality - Guideline values for chemicals that are of health significance in drinking-water"

methylamine (CAS: 74-89-5,42939-70-8,85404-17-7,119775-09-6) 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 - Quebec Permissible Exposure Values for Airborne Contaminants (English)", "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 Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)", "GESAMP/EHS Composite List - GESAMP Hazard Profiles", "IMO IBC Code Chapter 17: Summary of minimum requirements", "IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk", "International Council of Chemical Associations (ICCA) - High Production Volume List", "OECD Representative List of High Production Volume (HPV) Chemicals", "US - Alabama Precursor Chemicals", "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 - Idaho - Limits for Air Contaminants", "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 - Oregon Hazardous Materials", "US - Oregon Permissible Exposure Limits (Z-1)", "US - Pennsylvania - Hazardous Substance List", "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 - Wyoming List of Highly Hazardous Chemicals, Toxics and Reactives", "US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants", "US ACGIH Threshold Limit Values (TLV)", "US CWA (Clean Water Act) - List of Hazardous Substances", "US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances", "US Department of Homeland Security Chemical Facility

Anti-Terrorism Standards - Chemicals of Interest", "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 EPA Acute Exposure Guideline Levels (AEGs) - Interim", "US EPA High Production Volume Program Chemical List", "US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act", "US NFPA 45 Fire Protection for Laboratories Using Chemicals - Flammability Characteristics of Common Compressed and Liquefied Gases", "US NIOSH Recommended Exposure Limits (RELs)", "US OSHA List of Highly Hazardous Chemicals, Toxics and Reactives", "US OSHA Permissible Exposure Levels (PELs) - Table Z1", "US Toxic Substances Control Act (TSCA) - Inventory", "USA: Chemical Facility Anti-Terrorism Standards - List Appendix A - 6CFR 27"

ammonia (CAS: 1336-21-6) is found on the following regulatory lists;

"Canada - Saskatchewan Industrial Hazardous Substances", "Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances", "Canada Domestic Substances List (DSL)", "Canada Environmental Protection Act (CEPA) 1999 - Schedule 1 Toxic Substances List", "Canada Environmental Quality Guidelines (EQGs) Water: Aquatic life", "Canada Ingredient Disclosure List (SOR/88-64)", "Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)", "CODEX General Standard for Food Additives (GSFA) - Additives Permitted for Use in Food in General, Unless Otherwise Specified, in Accordance with GMP", "IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk", "International Council of Chemical Associations (ICCA) - High Production Volume List", "International Fragrance Association (IFRA) Survey: Transparency List", "OECD Representative List of High Production Volume (HPV) Chemicals", "US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List", "US - Massachusetts Oil & Hazardous Material List", "US - New Jersey Right to Know Hazardous Substances", "US - Pennsylvania - Hazardous Substance List", "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 Department of Transportation (DOT), Hazardous Material Table", "US DOE Temporary Emergency Exposure Limits (TEELs)", "US EPA High Production Volume Chemicals Additional List", "US Food Additive Database", "US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act", "US NFPA 45 Fire Protection for Laboratories Using Chemicals - Flammability Characteristics of Common Compressed and Liquefied Gases", "US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide", "US Toxic Substances Control Act (TSCA) - Inventory"

carbon disulfide (CAS: 75-15-0) is found on the following regulatory lists;

"Canada - Alberta Ambient Air Quality Objectives", "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 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)", "Canada Priority Substances List (PSL1, PSL 2)", "Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)", "GESAMP/EHS Composite List - GESAMP Hazard Profiles", "IMO IBC Code Chapter 17: Summary of minimum requirements", "IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk", "International Council of Chemical Associations (ICCA) - High Production Volume List", "OECD Representative List of High Production Volume (HPV) Chemicals", "US - Alaska Limits for Air Contaminants", "US - California Air Toxics ""Hot Spots"" List (Assembly Bill 2588) Substances for which emissions must be quantified", "US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List", "US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs)", "US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)", "US - California Permissible Exposure Limits for Chemical Contaminants", "US - California Proposition 65 - Priority List for the Development of MADLs for Chemicals Causing Reproductive Toxicity", "US - California Proposition 65 - Reproductive Toxicity", "US - California Toxic Air Contaminant List Category II", "US - Connecticut Hazardous Air Pollutants", "US - Hawaii Air Contaminant Limits", "US - Idaho - Acceptable Maximum Peak Concentrations", "US - Idaho - Limits for Air Contaminants", "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 - Oregon Permissible Exposure Limits (Z-1)", "US - Oregon Permissible Exposure Limits (Z-2)", "US - Pennsylvania - Hazardous Substance List", "US - Rhode Island Hazardous Substance List", "US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants", "US - Vermont Hazardous Constituents", "US - Vermont Hazardous Waste - Acutely Hazardous Wastes", "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 Dangerous waste constituents list", "US - Washington Discarded Chemical Products List - "P" Chemical Products", "US - Washington Permissible exposure limits of air contaminants", "US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants", "US - Wyoming Toxic and Hazardous Substances Table Z-2 Acceptable ceiling concentration, Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift", "US ACGIH Threshold Limit Values (TLV)", "US ACGIH Threshold Limit Values (TLV) - Carcinogens", "US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)", "US CAA (Clean Air Act) - HON Rule - Organic HAPs (Hazardous Air Pollutants)", "US CERCLA Priority List of Hazardous Substances", "US Clean Air Act - Hazardous Air Pollutants", "US CWA (Clean Water Act) - List of Hazardous Substances", "US CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances", "US Department of Homeland Security Chemical Facility Anti-Terrorism Standards - Chemicals of Interest", "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 EPA Acute Exposure Guideline Levels (AEGLs) - Final", "US EPA High Production Volume Program Chemical List", "US EPA Master Testing List - Index I Chemicals Listed", "US EPA National Priorities List - Superfund Chemical Data Matrix (SCDM) - Hazard Ranking System - Hazardous Substance Benchmarks", "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 OSHA Permissible Exposure Levels (PELs) - Table Z1", "US OSHA Permissible Exposure Levels (PELs) - Table Z2", "US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide", "US RCRA (Resource Conservation & Recovery Act) - Appendix IX to Part 264 Ground-Water Monitoring List 1", "US RCRA (Resource Conservation & Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261", "US RCRA (Resource Conservation & Recovery Act) - List of Hazardous Inorganic and Organic Constituents 1", "US RCRA (Resource Conservation & Recovery Act) - List of Hazardous Wastes", "US RCRA (Resource Conservation & Recovery Act) - Phase 4 LDR Rule - Universal Treatment Standards", "US SARA Section 302 Extremely Hazardous Substances", "US Toxic Substances Control Act (TSCA) - Inventory", "US TSCA Section 12(b) - List of Chemical Substances Subject to Export Notification Requirements", "US TSCA Section 4/12 (b) - Sunset Date/Status", "US TSCA Section 8 (a) - Preliminary Assessment Information Rules (PAIR) - Reporting List", "US TSCA Section 8 (d) - Health and Safety Data Reporting", "USA: Chemical Facility Anti-Terrorism Standards - List Appendix A - 6CFR 27"

Section 16 - OTHER INFORMATION

Ingredients with multiple CAS Nos

Ingredient Name CAS formaldehyde 50-00-0, 8005-38-7, 8006-07-3, 8013-13-6, 112068-71-0 methylamine 74-89-5, 42939-70-8, 85404-17-7, 119775-09-6

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■ 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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