Vinclozolin

sc-251425

Material Safety Data Sheet

Hazard Alert Code Key:	EXTREME	HIGH	MODERATE	LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
Vinclozolin

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

NFPA


SUPPLIER
Company: Santa Cruz Biotechnology, Inc.
Address:
2145 Delaware Ave
Santa Cruz, CA 95060
Telephone: 800.457.3801 or 831.457.3800
Emergency Tel: CHEMWATCH: From within the US and Canada: 877-715-9305
Emergency Tel: From outside the US and Canada: +800 2436 2255 (1-800-CHEMCALL) or call +613 9573 3112

PRODUCT USE
Fungicide for the control of Botrytis cinerea and Sclerotinia sclerotioriun.

SYNONYMS
C12-H9-Cl2-N-O3, C12-H9-Cl2-N-O3, "3-(3, 5-dichlorophenyl)-5-ethenyl-5-methyl-2, 4-oxyzolidindione", "3-(3, 5-dichlorophenyl)-5-ethenyl-5-methyl-2, 4-oxyzolidindione", "3-(3, 5-dichlorophenyl)-5-ethenyl-5-methyl-2, 4-oxazolidinedione", "3-(3, 5-dichlorophenyl)-5-ethenyl-5-methyl-2, 4-oxazolidinedione", "3-(3, 5-dichlorphenyl)-5-methyl-5-vinyl-1, 3-oxazolin-2, 4-dione", "3-(3, 5-dichlorphenyl)-5-methyl-5-vinyl-1, 3-oxazolin-2, 4-dione", "2, 4-oxazolidinedione, 3-(3, 5-dichlorophenyl)-5-methyl-5-vinyl-", "2, 4-oxazolidinedione, 3-(3, 5-dichlorophenyl)-5-methyl-5-vinyl-", "dicarboximide fungicide", Ornalin, Ronilan, Vinclozoline

Section 2 - HAZARDS IDENTIFICATION

CANADIAN WHMIS SYMBOLS


EMERGENCY OVERVIEW
RISK
May cause SENSITIZATION by skin contact.

Limited evidence of a carcinogenic effect.
May impair fertility.
May cause harm to the unborn child.
Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED
• The material has NOT been classified as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g. liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality (death) rather than those producing morbidity (disease, ill-health). Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, unintentional ingestion is not thought to be cause for concern.

EYE
• There is some evidence to suggest that this material can causeeye irritation and damage in some persons.
• Because of their alkaline nature eye contact with oxazolidines may produces moderate to severe irritation depending on the duration of contact.

SKIN
• Skin contact is not thought to have harmful health effects, however the material may still produce health damage following entry through wounds, lesions or abrasions.
• There is some evidence to suggest that this material can cause inflammation of the skin on contact in some persons.
• 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.
• Oxazolidines generally do not produce systemic harmful following skin contact but, because of their alkaline nature, may produce moderate to severe irritation. Dermal reactions may include necrosis, sloughing and scab formation.

INHALED
• The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.
• 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.

CHRONIC HEALTH EFFECTS
• There has been concern that this material can cause cancer or mutations, but there is not enough data to make an assessment.
Skin contact with the material is more likely to cause a sensitization reaction in some persons compared to the general population.
Ample evidence exists from experimentation that reduced human fertility is directly caused by exposure to the material.
Ample evidence exists, from results in experimentation, that developmental disorders are directly caused by human exposure to the material.
Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.
Although oxazolidines are able to cross-link with dermal proteins, there is no indication, at present, that they are dermal sensitisers.
Oral teratology studies indicate that foetal toxicity occurs occurs at maternally toxic doses but that birth defects are not a feature of exposure.
Oxazolidines are generally not mutagenic in a battery of tests designed to investigate this effect.
Because they occur as secondary and tertiary amines, the concomitant use of nitrates may result in the production of potentially carcinogenic N-nitrosoamines. There is no evidence available to suggest that oxazolidines constitute a class of carcinogenic substance.
The material may exhibit antiandrogenic activity or estrogenic activity. Although increased levels of developmental or environmental estrogens have been linked to the increased incidence of prostate disease , chemicals with antiandrogenic activity are potentially of greater importance because androgens are critical to establishing the male phenotype Environmental chemicals with antiandrogenic activity offer profound implications with regard to recent clinical observations that suggest an increasing incidence of human male genital tract malformations, male infertility, and female breast cancer.
During foetal and neonatal life, reproductive tract development is hormonally regulated, and the reproductive tract is in an undifferentiated state, lacking compensatory homeostatic mechanisms to prevent adverse effects of EDCs .This has the potential to alter the action of gonadal steroid hormones Thus, the organisational effects of EDCs on the developing reproductive tract can be permanent and irreversible. When EDC's upset the balance of hormones or otherwise delay, block or scramble necessary messages offspring may have abnormalities ranging from reproductive impairment, feminisation/ demasculinisation, embryonic deformities, and abnormalities in sexual development later in life.
Exposure to antiandrogens, in rodents, during reproductive tract development induces malformations such as cryptorchidism, hypospadias, and Leydig cell hyperplasia, and permanent changes in sexually dimorphic structures, such as anogenital distance (AGD) and areola/nipple retention
Androgens are critical for specifying prostate development, with the foetal prostate sensitive to altered hormone levels and endocrine-disrupting chemicals (EDCs) that exhibit estrogenic or antiandrogenic properties. In later life EDCs may be the cause of prostatic inflammation (prostatitis). Prostatitis affects 9% of men of all ages, and > 90% of cases are of unknown etiology.Most prostatitis cases are ascribed to unknown (nonbacterial) origins, and the symptoms, both acute and chronic, are common, bothersome, and burdensome in terms of health-related quality of life Prostatitis is a common feature of endocrine disruption by estrogenic and antiandrogenic chemicals.
The role of the endocrine system and EDC's in cancerous tumor production in humans and wildlife is still unclear. Still, a sizable body of evidence links EDC's to certain types of cancer and impaired immune functions.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

HAZARD RATINGS

		Min	Max
Flammability:	1		
Toxicity:	0		
Body Contact:	2		
Reactivity:	1		
Chronic:	3		

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

NAME	CAS RN	%
vinclozolin	50471-44-8	> 99

Section 4 - FIRST AID MEASURES

SWALLOWED

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- Immediately give a glass of water.
- First aid is not generally required. If in doubt, contact a Poisons Information Center or a doctor.

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.
- If pain persists or recurs seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

• If skin contact occurs:

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

INHALED

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- If dust is inhaled, remove from contaminated area.
- Encourage patient to blow nose to ensure clear passage of breathing.
- If irritation or discomfort persists seek medical attention.

NOTES TO PHYSICIAN

• Treat symptomatically.

Section 5 - FIRE FIGHTING MEASURES

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

EXTINGUISHING MEDIA

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

FIRE FIGHTING

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- Alert Emergency Responders and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

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- 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.
- Dry dust can be charged electrostatically by turbulence, pneumatic transport, pouring, in exhaust ducts and during transport.
- Build-up of electrostatic charge may be prevented by bonding and grounding.
- Powder handling equipment such as dust collectors, dryers and mills may require additional protection measures such as explosion venting.

Combustion products include: carbon monoxide (CO), carbon dioxide (CO_2), hydrogen chloride, phosgene, nitrogen oxides (NOx), 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:
Chemical goggles.
Gloves:
Respirator:
Particulate

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

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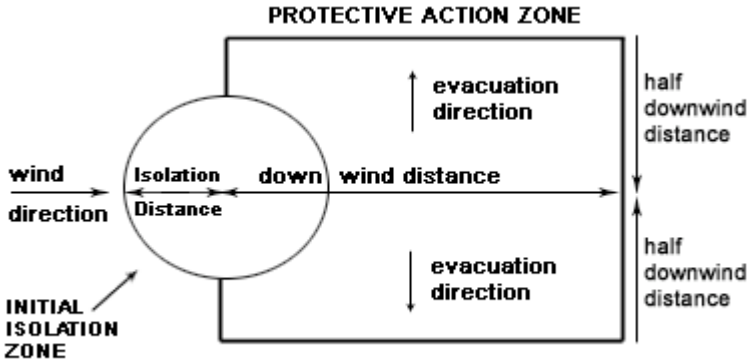
- Clean up waste regularly and abnormal spills immediately.
- Avoid breathing dust and contact with skin and eyes.
- Wear protective clothing, gloves, safety glasses and dust respirator.
- Use dry clean up procedures and avoid generating dust.
- Vacuum up or sweep up. NOTE: Vacuum cleaner must be fitted 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.
- Control personal contact by wearing protective clothing.
- Prevent, by any means available, spillage from entering drains or water courses.
- Recover product wherever possible.
- IF DRY: Use dry clean up procedures and avoid generating dust. Collect residues and place in sealed plastic bags or other containers for disposal. IF WET: Vacuum/shovel up and place in labelled containers for disposal.
- ALWAYS: Wash area down with large amounts of water and prevent runoff into drains.
- If contamination of drains or waterways occurs, advise emergency services.

PROTECTIVE ACTIONS FOR SPILL



From IERG (Canada/Australia)	
Isolation Distance	-
Downwind Protection Distance	10 meters

FOOTNOTES

1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapour plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.
2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within

the protective action zone a level of vapour concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.
3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localised wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.
4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrican or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills". LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.
5 Guide 171 is taken from the US DOT emergency response guide book.
6 IERG information is derived from CANUTEC - Transport Canada.

ACUTE EXPOSURE GUIDELINE LEVELS (AEGL) (in ppm)

AEGL 1: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.
AEGL 2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.
AEGL 3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

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- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- DO NOT allow material to contact humans, exposed food or food utensils.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately.
- Launder contaminated clothing before re-use.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

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

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

STORAGE REQUIREMENTS

• Observe manufacturer's storing and handling recommendations.

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS

X	X	+	X	X	+

X: Must not be stored together
O: May be stored together with specific preventions
+: May be stored together

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
US - Oregon Permissible Exposure Limits (Z3)	vinclozolin (Inert or Nuisance Dust: (d) Total dust)		10						*
US OSHA Permissible Exposure Levels (PELs) - Table Z3	vinclozolin (Inert or Nuisance Dust: (d) Respirable fraction)		5						
US OSHA Permissible Exposure Levels (PELs) - Table Z3	vinclozolin (Inert or Nuisance Dust: (d) Total dust)		15						
US - Hawaii Air Contaminant Limits	vinclozolin (Particulates not other wise regulated - Total dust)		10						
US - Hawaii Air Contaminant Limits	vinclozolin (Particulates not other wise regulated - Respirable fraction)		5						
US - Oregon Permissible Exposure Limits (Z3)	vinclozolin (Inert or Nuisance Dust: (d) Respirable fraction)		5						*
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	vinclozolin (Particulates not otherwise regulated Respirable fraction)		5						
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	vinclozolin (Particulates not otherwise regulated (PNOR)(f)-Respirable fraction)		5						
US - Michigan Exposure Limits for Air Contaminants	vinclozolin (Particulates not otherwise regulated, Respirable dust)		5						

MATERIAL DATA

VINCLOZOLIN:

• It is the goal of the ACGIH (and other Agencies) to recommend TLVs (or their equivalent) for all substances for which there is evidence of health effects at airborne concentrations encountered in the workplace.

At this time no TLV has been established, even though this material may produce adverse health effects (as evidenced in animal experiments or clinical experience). Airborne concentrations must be maintained as low as is practically possible and occupational exposure must be kept to a minimum.

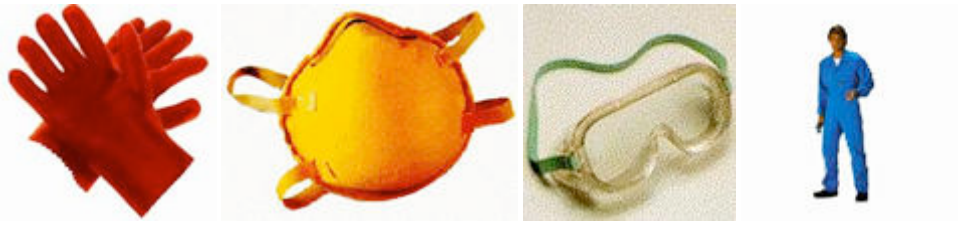
NOTE: The ACGIH occupational exposure standard for Particles Not Otherwise Specified (P.N.O.S) does NOT apply.

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

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

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

PERSONAL PROTECTION



Consult your EHS staff for recommendations

EYE

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- Safety glasses with side shields.

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

HANDS/FEET

• Wear chemical protective gloves, eg. PVC.

Wear safety footwear or safety gumboots, eg. Rubber.

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

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

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- Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
- The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).
- Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory . These may be government mandated or vendor recommended.
- Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.
- Use approved positive flow mask if significant quantities of dust becomes airborne.
- Try to avoid creating dust conditions.

RESPIRATOR

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Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
10 x PEL	P1	-	PAPR-P1
	Air-line*	-	-
50 x PEL	Air-line**	P2	PAPR-P2
100 x PEL	-	P3	-
		Air-line*	-
100+ x PEL	-	Air-line**	PAPR-P3

* - Negative pressure demand ** - Continuous flow

Explanation of Respirator Codes:

Class 1 low to medium absorption capacity filters.

Class 2 medium absorption capacity filters.

Class 3 high absorption capacity filters.

PAPR Powered Air Purifying Respirator (positive pressure) cartridge.

Type A for use against certain organic gases and vapors.

Type AX for use against low boiling point organic compounds (less than 65ºC).

Type B for use against certain inorganic gases and other acid gases and vapors.

Type E for use against sulfur dioxide and other acid gases and vapors.

Type K for use against ammonia and organic ammonia derivatives

Class P1 intended for use against mechanically generated particulates of sizes most commonly encountered in industry, e.g. asbestos, silica.

Class P2 intended for use against both mechanically and thermally generated particulates, e.g. metal fume.

Class P3 intended for use against all particulates containing highly toxic materials, e.g. beryllium.

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

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

ENGINEERING CONTROLS

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- 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.
- If in spite of local exhaust an adverse concentration of the substance in air could occur, respiratory protection should be considered. Such protection might consist of:

(a): particle dust respirators, if necessary, combined with an absorption cartridge;
(b): filter respirators with absorption cartridge or canister of the right type;
(c): fresh-air hoods or masks

- Build-up of electrostatic charge on the dust particle, may be prevented by bonding and grounding.
- Powder handling equipment such as dust collectors, dryers and mills may require additional protection measures such as explosion venting.

Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to efficiently remove the contaminant.

Type of Contaminant:	Air Speed:
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5-10 m/s (500-2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favorable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood-local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 4-10 m/s (800-2000 f/min) for extraction of crusher dusts generated 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Solid.
Does not mix with water.

State	Divided solid	Molecular Weight	286.12
Melting Range (°F)	222.8- 226.4	Viscosity	Not Applicable
Boiling Range (°F)	Not available.	Solubility in water (g/L)	Immiscible
Flash Point (°F)	Not Available	pH (1% solution)	Not applicable.
Decomposition Temp (°F)	Not available.	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not available	Vapour Pressure (mmHG)	Not applicable.
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)	Not applicable.	Evaporation Rate	Not applicable

APPEARANCE

White powder; slightly soluble in water (1 g/l @ 20 deg.C). Soluble in acetone, benzene, chloroform and ethyl acetate.

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

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

STORAGE INCOMPATIBILITY

• Oxazolidines:

- are saturated heterocyclic compounds which behave, chemically, both as aldehydes and amines.
- may hydrolyse in water to yield free amine and hydroxyl groups that react with isocyanate to form urea and urethane linkages

- react readily with most phenolic compounds although phenol itself is the least reactive species requiring elevated temperatures for useful reaction rates
- reaction rates may be diminished by strong bases, lower alcohols and glycols and alkylhydroxylamines
- are effective crosslinkers for proteins with reaction occurring under acidic or alkaline conditions -reaction is thought to involve an opening of the heterocyclic ring followed by reaction with amino groups on the protein
- emulsify oils and waxes due to their alkaline nature and their esters may decompose in the presence of acids
- contact with copper, brass and aluminium should be avoided.

Avoid reaction with oxidizing agents.

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

Section 11 - TOXICOLOGICAL INFORMATION

vinclozolin

TOXICITY AND IRRITATION

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

TOXICITY	IRRITATION
Oral (rat) LD50: 10000 mg/kg	Nil Reported

• 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. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitization potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitizing substance which is widely distributed can be a more important allergen than one with stronger sensitizing potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested.
For vinclozolin

- Acute toxicity: Vinclozolin is practically nontoxic in experimental animals. The acute oral LD50 for vinclozolin is greater than 10,000 mg/kg in rats and around 8000 mg/kg in guinea pigs. The compound is a moderate skin irritant and will slightly irritate the membranes in the nose and throat The reported dermal LD50 value is 72,000 mg/kg. The 4-hour inhalation LC50 of a 50% concentration of vinclozolin is greater than 29 mg/L of air in rats, indicating a rather low toxicity by this route of exposure. Vindozolin is a moderate eye irritant.

- Chronic toxicity: Vinclozolin was fed to dogs at relatively low levels (up to 50 mg/kg/day) for 6 months. Increases in the weight of the adrenal gland occurred in the dogs at the middle doses (7.5 mg/kg/day) for both sexes and males had enlarged prostates. Slightly higher doses in females caused changes in the structure of the adrenal gland. Another study with dogs fed small amounts of vinclozolin showed chronic effects (unspecified) at levels of 2.5 mg/kg and above. Dogs are the most sensitive species of animal tested so far. A 2-year feeding study with rats showed reductions in body weight and changes in the blood chemistry at low doses (about 25 mg/kg/day) . Male dogs experienced changes in absolute weight and fat content of the kidney at relatively low doses administered for 6 months. At slightly higher doses (15 mg/kg) for the same length of time (6 months), fat droplets appeared in the tubes within the kidney. A single moderate dose (about 285 mg/kg) administered by injection to male mice resulted in only minor changes in their kidneys.

- Reproductive effects: A study which followed female rats through three successive litters showed no effects on the reproduction of those litters at doses of 72.9 mg/kg/day. These data suggest that vinclozolin does not cause reproductive effects. However previous reports show that vinclozolin exposure in rodents during reproductive tract development induces malformations such as cryptorchidism, hypospadias, and Leydig cell hyperplasia, and permanent changes in sexually dimorphic structures, such as anogenital distance (AGD) and areola/nipple retention . These effects occur before formation of the hypothalamic-pituitary-gonadal axis and long after vinclozolin has been cleared from the pup; thus, these effects are organisational rather than due to interruption of a feedback loop via the pituitary . Interest in vinclozolin arose from a report that transient embryonic exposure in the rat during embryonic gonadal sex determination [gestation days (GD) 8–14] appears to alter the male germline epigenome and subsequently promotes transgenerational adult-onset disease, including testis and immune abnormalities, prostate and kidney disease, and tumor development. A preliminary report, stated that prostate disease, including inflammation and epithelial atrophy, occurred in aged rats (12-14 months of age) prenatally exposed to vinclozolin, although the incidence of prostatic lesions across four generations of male rats was only 10%. Although the low incidence of prostatic lesions is not compelling, at the same time these findings were controversial because of the vinclozolin purity and the timing and route of its administration in utero.

- Teratogenic effects: In one study on mice, no birth defects were noted in the offspring of pregnant females given large doses of vinclozolin (900 mg/kg/day). However, the fungicide was toxic to the foetuses. In a similar study on rats, no teratogenic effects were observed at the same dose level. In another study, rabbits were fed moderate amounts (up to 300 mg/kg/day) of the fungicide for an undisclosed amount of time. No effects were noted in the animals at the highest doses tested. It appears that vinclozolin is not teratogenic.

- Mutagenic effects: A number of tests on the mutagenicity of vinclozolin have been negative. One of the mutation tests was run at very high doses (2000 mg/kg/day). Based on the information available, it is unlikely that vinclozolin is mutagenic.

- Carcinogenic effects: A 2-year study on rats showed no carcinogenic effects at the highest dose tested (219 mg/kg). Another study conducted over a wide range of doses, produced some evidence of liver tumors at 219 mg/kg/day over 2 years. These data suggest that this compound is unlikely to have carcinogenic effects in humans.

- Organ toxicity: Tests on dogs have shown effects on the adrenal and prostate glands.

- Fate in humans and animals: Rats which had been given a single dose of vinclozolin (level not indicated) eliminated equal portions of the breakdown products in urine and faeces. Vinclozolin is degraded to the metabolites 2-[(3,5-dichlorophenyl)-carbamoyl]oxy-2-methyl-

3-butenoic acid (M1) and 3',5'-dichloro-2-hydroxy-2-methyl-but-3-enanilide (M2), which are competitive antagonists of androgen receptor (AR) ligand binding, rather than 5alpha-reductase enzyme inhibitors . Human exposure to vinclozolin occurs by oral ingestion, enabling metabolism to the more potent AR antagonists The timing of vinclozolin exposure varies the effect on male reproductive tract development in rodents. A window of sensitivity for prostate development occurs when ARs are activated between GD14 and GD19, rather than during embryonic gonadal sex determination around GD8–GD14

ADI: 0.2 mg/kg/day
NOEL: 25 mg/kg/day

CARCINOGEN

VINCLOZOLIN	US Environmental Defense Scorecard Recognized Carcinogens	Reference(s)	P65
VINCLOZOLIN	US Environmental Defense Scorecard Suspected Carcinogens	Reference(s)	P65

Section 12 - ECOLOGICAL INFORMATION

Refer to data for ingredients, which follows:
VINCLOZOLIN:
• Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
• Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.
Wastes resulting from use of the product must be disposed of on site or at approved waste sites.
• for vinclozolin:
log Kow : 3
Environmental fate:
Vinclozolin's use as a non-systemic fungicide is expected to result in its direct release to the environment. If released to air, a vapor pressure of 1.2x10-7 mm Hg at 20 deg C indicates vinclozolin will exist in both the vapor and particulate phases in the ambient atmosphere. Vapour-phase vinclozolin will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 12 hours. Particulate-phase vinclozolin will be removed from the atmosphere by wet and dry deposition. Vinclozolin absorbs light up to 300 nm, suggesting a potential for direct photolysis. If released to soil, vinclozolin is expected to have low to high mobility based upon Koc values ranging from 100 to 1,570.
Vinclozolin is of low to moderate persistence in soil. It is only partially broken down by soil microorganismsVinclozolin is not expected to volatilise from moist or dry soil surfaces based upon its estimated Henry's Law constant of 4.5X10-11 atm-cu m/mole and vapor pressure, respectively. Biodegradation in soil is expected to be an important fate process; the extent of degradation will depend on residence time in the soil, the nature of the soil, and whether resident microbial populations have been acclimated.Vinclozolin is bacterially degraded to the metabolites 2-[(3,5-dichlorophenyl)-carbamoyl]oxy-2-methyl-3-butenoic acid (M1) and 3',5'-dichloro-2-hydroxy-2-methyl-but-3-enanilide (M2), which are competitive antagonists of androgen receptor (AR) ligand binding, rather than 5alpha-reductase enzyme inhibitors . These may produce profound endocrine disruption in animals Times for 50% degradation of vinclozolin following second and third application of the fungicide range from 4 to 30 days and 2.5 to 7 days, respectively. Field data indicate that vinclozolin will be strongly sorbed to most soils with a significant proportion of organic matter, and it is unlikely to leach significantly
If released into water, some adsorption of vinclozolin to suspended solids and sediment in the water column is expected based upon the reported Koc values. Volatilisation of vinclozolin from water surfaces is not expected to occur based on this compound's Henry's Law constant. An estimated BCF of 130 suggests the potential for bioconcentration in aquatic organisms is high.
Photolysis and hydrolysis may occur, and are pH dependent, with greater photolysis and hydrolysis under neutral or slightly basic conditions.Hydrolysis half-lives ranging from 541 hours at pH 4.3 to 0.62 hours at pH 8.3 suggest hydrolysis may be an important process in both soil and water.
Occupational exposure to vinclozolin may occur through inhalation of dust particles and dermal contact with this fungicide during and after its application. The general population may be exposed to vinclozolin via ingestion of produce contaminated with this fungicide.
Ecotoxicity:
Bird LD50: bobwhite quail 2510 mg/kg (practically non-toxic)
Fish LC50 (96 h): guppies 130 mg/l; trout 52.2 mg/l (moderately toxic)
Non-toxic to honey bees and to earthworms.
• DO NOT discharge into sewer or waterways.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
vinclozolin	HIGH		LOW	MED

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.
- Dispose of by: Burial in a licensed land-fill or Incineration in a licensed apparatus (after admixture with suitable combustible material)
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

Section 14 - TRANSPORTATION INFORMATION

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:	翿
UN/ID Number:	3077	Packing Group:	III
Special provisions:	A97		

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

Maritime Transport IMDG:

IMDG Class:	9	IMDG Subrisk:	None
UN Number:	3077	Packing Group:	III
EMS Number:	F-A,S-F	Special provisions:	274 909 944
Limited Quantities:	5 kg		

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

Section 15 - REGULATORY INFORMATION

vinclozolin (CAS: 50471-44-8) is found on the following regulatory lists;
"Canada Domestic Substances List (DSL)","OECD Representative List of High Production Volume (HPV) Chemicals","OSPAR List of Substances of Possible Concern","US - California Proposition 65 - Carcinogens","US - California Proposition 65 - Priority List for the Development of MADLs for Chemicals Causing Reproductive Toxicity","US - California Proposition 65 - Priority List for the Development of NSRLs for Carcinogens","US - California Proposition 65 - Reproductive Toxicity","US - Maine Chemicals of High Concern List","US EPCRA Section 313 Chemical List","US List of Lists - Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-to-Know Act (EPCRA) and Section 112(r) of the Clean Air Act"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE
• Cumulative effects may result following exposure*.
• May produce discomfort of the eyes and skin*.
* (limited evidence).

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• Classification of the mixture 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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