

Product name: N-SERVE* Nitrogen Stabilizer

Issue Date: 01/19/2018

CORTEVA AGRISCIENCE CANADA COMPANY encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: N-SERVE* Nitrogen Stabilizer

Recommended use of the chemical and restrictions on use
Identified uses: Stabilizer

COMPANY IDENTIFICATION

CORTEVA AGRISCIENCE CANADA COMPANY
#2450, 215 - 2ND STREET S.W.
CALGARY AB T2P 1M4
CANADA

Customer Information Number:

800-667-3852
solutions@corteva.com

EMERGENCY TELEPHONE

24-Hour Emergency Contact: 1-888-226-8832

Local Emergency Contact: 1-800-667-3852

2. HAZARDS IDENTIFICATION

Hazard classification

This product is hazardous under the criteria of the Hazardous Products Regulation (HPR) as implemented under the Workplace Hazardous Materials Information System (WHMIS 2015).

Flammable liquids - Category 3

Acute toxicity - Category 4 - Oral

Skin irritation - Category 2

Skin sensitisation - Sub-category 1B

Specific target organ toxicity - single exposure - Category 3

Aspiration hazard - Category 1

Label elements

Hazard pictograms



Signal word: **DANGER!**

Hazards

Flammable liquid and vapour.

Harmful if swallowed.

May be fatal if swallowed and enters airways.
Causes skin irritation.
May cause an allergic skin reaction.
May cause respiratory irritation.
May cause drowsiness or dizziness.

Precautionary statements**Prevention**

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Keep container tightly closed.
Ground and bond container and receiving equipment.
Use explosion-proof electrical/ ventilating/ lighting equipment.
Use non-sparking tools.
Take action to prevent static discharges.
Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Contaminated work clothing should not be allowed out of the workplace.
Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response

IF SWALLOWED: Immediately call a POISON CENTER/doctor.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
Do NOT induce vomiting.
If skin irritation or rash occurs: Get medical advice/ attention.
In case of fire: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide to extinguish.

Storage

Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.

Disposal

Dispose of contents/ container to an approved waste disposal plant.

Other hazards

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	CASRN	Concentration
Nitrapyrin	1929-82-4	22.2%
Solvent naphtha (petroleum), light arom	64742-95-6	63.0%
1,2,4-Trimethylbenzene	95-63-6	18.9% *

Xylene	1330-20-7	11.4% *
1,3,5-Trimethylbenzene	108-67-8	5.0% *
Cumene	98-82-8	2.5% *

Note

The " * ", or "asterisk", denotes component is present in the product as a sub-component of naphtha solvent.

4. FIRST AID MEASURES

Description of first aid measures**General advice:**

First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice. If breathing is difficult, oxygen should be administered by qualified personnel.

Skin contact: Take off contaminated clothing. Wash skin with soap and plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. Wash clothing before reuse. Shoes and other leather items which cannot be decontaminated should be disposed of properly.

Eye contact: Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes. Call a poison control center or doctor for treatment advice.

Ingestion: Immediately call a poison control center or doctor. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give any liquid to the person. Do not give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed: Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed

Notes to physician: Maintain adequate ventilation and oxygenation of the patient. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment. Skin contact may aggravate preexisting dermatitis.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. General purpose synthetic foams (including AFFF type) or protein foams are preferred if available. Alcohol resistant foams (ATC type) may function.

Unsuitable extinguishing media: No data available

Special hazards arising from the substance or mixture

Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Nitrogen oxides. Hydrogen chloride. Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Electrically ground and bond all equipment. Flammable mixtures of this product are readily ignited even by static discharge. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Dense smoke is produced when product burns.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Consider feasibility of a controlled burn to minimize environment damage. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Do not use direct water stream. May spread fire. Eliminate ignition sources. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Keep personnel out of low areas. Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. Vapor explosion hazard. Keep out of sewers. Refer to section 7, Handling, for additional precautionary measures. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Pump with explosion-proof equipment. If available, use foam to smother or suppress. Small spills: Absorb with materials such as: Clay. Dirt. Sand. Sweep up. Collect in suitable and properly labeled containers. Large spills: Contact Dow AgroSciences for clean-up assistance. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Keep out of reach of children. Keep away from heat, sparks and flame. Do not swallow. Avoid contact with eyes, skin, and clothing. Avoid breathing vapor or mist. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. No smoking, open flames or sources of ignition in handling and storage area. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition and/or flash back may occur. Electrically ground and bond all equipment. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Use of non-sparking or explosion-proof equipment may be necessary, depending upon the type of operation. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Store in a dry place. Store in original container. Keep container tightly closed when not in use. Do not store near food, foodstuffs, drugs or potable water supplies. Minimize sources of ignition, such as static build-up, heat, spark or flame.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

Consult local authorities for recommended exposure limits.

Component	Regulation	Type of listing	Value/Notation
Nitrapyrin	ACGIH	TWA	10 mg/m3
	ACGIH	STEL	20 mg/m3
	CA AB OEL	TWA	10 mg/m3
	CA AB OEL	STEL	20 mg/m3
	CA BC OEL	STEL	20 mg/m3
	CA QC OEL	TWAEV	10 mg/m3
	CA QC OEL	STEV	20 mg/m3
	CA BC OEL	TWA Total dust	10 mg/m3
	CA BC OEL	TWA respirable dust fraction	3 mg/m3
Solvent naphtha (petroleum), light arom	ACGIH	TWA	200 mg/m3 , total hydrocarbon vapor
	Dow IHG	TWA	100 mg/m3
	Dow IHG	STEL	300 mg/m3
	CA AB OEL	TWA	200 mg/m3 , total hydrocarbon vapor
1,2,4-Trimethylbenzene	ACGIH	TWA	25 ppm
	CA BC OEL	TWA	25 ppm
	CA AB OEL	TWA	123 mg/m3 25 ppm
	CA QC OEL	TWAEV	123 mg/m3 25 ppm
Xylene	ACGIH	TWA	BEI
	ACGIH	STEL	BEI
	ACGIH	TWA	100 ppm
	ACGIH	STEL	150 ppm
	CA AB OEL	STEL	651 mg/m3 150 ppm
	CA AB OEL	TWA	434 mg/m3 100 ppm
	CA QC OEL	TWAEV	434 mg/m3 100 ppm
CA QC OEL	STEV	651 mg/m3 150 ppm	

	CA BC OEL	TWA	100 ppm
	CA BC OEL	STEL	150 ppm
1,3,5-Trimethylbenzene	ACGIH	TWA	25 ppm
	CA BC OEL	TWA	25 ppm
	CA AB OEL	TWA	123 mg/m3 25 ppm
	CA QC OEL	TWAEV	123 mg/m3 25 ppm
Cumene	ACGIH	TWA	50 ppm
	CA AB OEL	TWA	246 mg/m3 50 ppm
	CA QC OEL	TWAEV	246 mg/m3 50 ppm

RECOMMENDATIONS IN THIS SECTION ARE FOR MANUFACTURING, COMMERCIAL BLENDING AND PACKAGING WORKERS. APPLICATORS AND HANDLERS SHOULD SEE THE PRODUCT LABEL FOR PROPER PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING.

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Xylene	1330-20-7	Methylhippuric acids	Urine	End of shift (As soon as possible after exposure ceases)	1.5 g/g creatinine	ACGIH BEI

Exposure controls

Engineering controls: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use safety glasses (with side shields).

Skin protection

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Chlorinated polyethylene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). Viton. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use an approved respirator. Selection of air-purifying or positive-pressure supplied-air will depend on the specific operation and the potential airborne concentration of the material. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus.

The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Liquid.
Color	Colorless to yellow
Odor	Aromatic
Odor Threshold	No test data available
pH	6.26
Melting point/range	Not applicable
Freezing point	No test data available
Boiling point (760 mmHg)	161 °C <i>Literature</i> Approx.
Flash point	closed cup 40 °C <i>ASTM D 56</i>
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	No data available
Lower explosion limit	No test data available
Upper explosion limit	7.0 % vol <i>Literature</i>
Vapor Pressure	4 mmHg at 20 °C <i>Literature</i> Approx.
Relative Vapor Density (air = 1)	3.7 <i>Literature</i> Calculated.
Relative Density (water = 1)	0.98 at 20 °C <i>Literature</i>
Water solubility	<i>Literature</i> Immiscible
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No test data available
Decomposition temperature	No test data available
Dynamic Viscosity	> 3 mPa.s at 20 °C
Kinematic Viscosity	No test data available
Explosive properties	No test data available
Oxidizing properties	No test data available
Liquid Density	0.98 g/cm ³ at 20 °C <i>Literature</i>
Molecular weight	No data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: No dangerous reaction known under conditions of normal use.

Chemical stability: Thermally stable at recommended temperatures and pressures.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Active ingredient decomposes at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems. Avoid static discharge.

Incompatible materials: Avoid contact with: Acids. Oxidizers. Avoid contact with metals such as: Aluminum alloys. Magnesium. Magnesium alloys.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Carbon monoxide. Carbon dioxide. Hydrogen chloride. Nitrogen oxides. Toxic gases are released during decomposition.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity

Acute oral toxicity

Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

As product:

LD50, Rat, female, 1,405 mg/kg

Acute dermal toxicity

Prolonged skin contact is unlikely to result in absorption of harmful amounts.

As product:

LD50, Rat, male and female, > 5,000 mg/kg

Acute inhalation toxicity

Prolonged excessive exposure to mist may cause adverse effects. May cause respiratory irritation and central nervous system depression. Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness.

As product:

LC50, Rat, male and female, 4 Hour, dust/mist, > 6.0 mg/l

Skin corrosion/irritation

Brief contact may cause moderate skin irritation with local redness.

Effects may be slow to heal.

May cause drying and flaking of the skin.

Serious eye damage/eye irritation

May cause slight eye irritation.

Corneal injury is unlikely.

Sensitization

Has demonstrated the potential for contact allergy in mice.

For respiratory sensitization:

No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

May cause respiratory irritation.

May cause drowsiness or dizziness.

Specific Target Organ Systemic Toxicity (Repeated Exposure)

For the active ingredient(s):

In animals, effects have been reported on the following organs:

Kidney.

Liver.

Blood.

Female reproductive organs.

Dose levels producing these effects were many times higher than any dose levels expected from exposure due to use.

Based on information for component(s):

In animals, effects have been reported on the following organs:

Liver.

Respiratory tract.

Blood.

Kidney.

Xylene is reported to have caused hearing loss in laboratory animals upon exposure to high concentrations; such effects have not been reported in humans.

Cataracts were observed in rats exposed to cumene vapors.

Carcinogenicity

For the active ingredient(s): Kidney effects and/or tumors have been observed in male rats. These effects are believed to be species specific and unlikely to occur in humans. For the minor component(s) Has caused cancer in laboratory animals. However, the relevance of this to humans is unknown.

Teratogenicity

For the active ingredient(s): Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

For the solvent(s): Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Has caused birth defects in laboratory animals only at doses producing severe toxicity in the mother. Exaggerated doses of xylene given orally to pregnant mice resulted in an increase in cleft palate, a common developmental abnormality in mice. In animal inhalation studies, xylene caused toxicity to the fetus but did not cause birth defects.

Reproductive toxicity

For the active ingredient(s): In animal studies, did not interfere with reproduction.

For the solvent(s): In laboratory animal studies, effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals.

Mutagenicity

For the active ingredient(s): In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Aspiration Hazard

May be fatal if swallowed and enters airways.

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Toxicity

Nitrapyrin

Acute toxicity to fish

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

LC50, *Lepomis macrochirus* (Bluegill sunfish), static test, 96 Hour, 3.4 - 7.9 mg/l, OECD Test Guideline 203 or Equivalent

LC50, Rainbow trout (*Oncorhynchus mykiss*), static test, 96 Hour, 4 mg/l

Acute toxicity to aquatic invertebrates

EC50, eastern oyster (*Crassostrea virginica*), flow-through test, 96 Hour, 1.8 mg/l

LC50, *Daphnia magna* (Water flea), flow-through test, 48 Hour, 2.2 mg/l

Acute toxicity to algae/aquatic plants

ErC50, *Pseudokirchneriella subcapitata* (green algae), 72 Hour, Growth rate inhibition, 1.7 mg/l

Chronic toxicity to fish

NOEC, Fathead minnow (*Pimephales promelas*), 34 d, 2.87 mg/l

Toxicity to Above Ground Organisms

Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).

Material is slightly toxic to birds on a dietary basis (LC50 between 1001 and 5000 ppm).

oral LD50, *Anas platyrhynchos* (Mallard duck), 2708mg/kg bodyweight.

dietary LC50, *Anas platyrhynchos* (Mallard duck), 1466mg/kg diet.

dietary LC50, *Coturnix japonica* (Japanese quail), 820mg/kg diet.

oral LD50, *Apis mellifera* (bees), 48 Hour, > 100µg/bee

contact LD50, *Apis mellifera* (bees), 48 Hour, > 100µg/bee

Toxicity to soil-dwelling organisms

LC50, *Eisenia fetida* (earthworms), 15 d, survival, 209 mg/kg

Solvent naphtha (petroleum), light arom

Acute toxicity to fish

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

LC50, *Oncorhynchus mykiss* (rainbow trout), static test, 96 Hour, 9.22 mg/l, OECD Test Guideline 203 or Equivalent

Toxicity to Above Ground Organisms

Material is practically non-toxic to birds on an acute basis (LD50 > 2000 mg/kg).

Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm).

dietary LC50, *Colinus virginianus* (Bobwhite quail), 8 d, > 6500mg/kg diet.

oral LD50, *Colinus virginianus* (Bobwhite quail), 21 d, > 2150mg/kg bodyweight.

1,2,4-Trimethylbenzene

Acute toxicity to fish

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

LC50, *Pimephales promelas* (fathead minnow), flow-through test, 96 Hour, 7.7 mg/l

Acute toxicity to aquatic invertebrates

EC50, *Daphnia magna* (Water flea), 48 Hour, 3.6 mg/l

Xylene

Acute toxicity to fish

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

LC50, *Oncorhynchus mykiss* (rainbow trout), semi-static test, 96 Hour, 2.6 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

IC50, *Daphnia magna* (Water flea), 24 Hour, 1 - 4.7 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (algae), Static, 73 Hour, Growth rate, 4.36 mg/l, OECD Test Guideline 201 or Equivalent
NOEC, Pseudokirchneriella subcapitata (green algae), 73 Hour, Growth rate, 0.44 mg/l, OECD Test Guideline 201 or Equivalent

Chronic toxicity to fish

NOEC, Oncorhynchus mykiss (rainbow trout), flow-through, 56 d, mortality, > 1.3 mg/l

1,3,5-Trimethylbenzene

Acute toxicity to fish

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).
LC50, Carassius auratus (goldfish), flow-through test, 96 Hour, 12.5 mg/l, Method Not Specified.

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), Static, 48 Hour, 6 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

EbC50, Desmodesmus subspicatus (green algae), 48 Hour, Biomass, 25 mg/l, OECD Test Guideline 201 or Equivalent

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia magna (Water flea), semi-static test, 21 d, number of offspring, 0.4 mg/l

Cumene

Acute toxicity to fish

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).
LC50, Oncorhynchus mykiss (rainbow trout), semi-static test, 96 Hour, 2.7 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), static test, 48 Hour, 4.0 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

EbC50, Pseudokirchneriella subcapitata (green algae), static test, 72 Hour, Biomass, 2.6 mg/l, OECD Test Guideline 201 or Equivalent

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia magna (Water flea), semi-static test, 21 d, number of offspring, 0.35 mg/l

Toxicity to Above Ground Organisms

oral LD50, redwing blackbird (Agelaius phoeniceus), > 98 mg/kg

Persistence and degradability

Nitrapyrin

Biodegradability: Chemical degradation (hydrolysis) is expected in the environment within days to weeks. Degradation is expected in the soil environment within days to weeks.

Theoretical Oxygen Demand: 0.97 mg/mg

Stability in Water (1/2-life)

Hydrolysis, half-life, 186 Hour, pH 5, Half-life Temperature 25 °C

Hydrolysis, half-life, 173 - 233 Hour, pH 7, Half-life Temperature 25 °C
 Hydrolysis, half-life, 129 Hour, pH 9, Half-life Temperature 25 °C

Solvent naphtha (petroleum), light arom

Biodegradability: For the major component(s): Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD > 40%). For some component(s): Biodegradation under aerobic static laboratory conditions is low (BOD20 or BOD28/ThOD between 2.5 and 10%).

1,2,4-Trimethylbenzene

Biodegradability: Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).

Biodegradation: 100 %
Exposure time: 1 d

Theoretical Oxygen Demand: 3.19 mg/mg

Photodegradation

Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 0.641 d
Method: Estimated.

Xylene

Biodegradability: Material is expected to be readily biodegradable.

10-day Window: Pass

Biodegradation: > 60 %

Exposure time: 10 d

Method: OECD Test Guideline 301F or Equivalent

Theoretical Oxygen Demand: 3.17 mg/mg

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	37.000 %
10 d	58.000 %
20 d	72.000 %

Photodegradation

Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 19.7 Hour
Method: Estimated.

1,3,5-Trimethylbenzene

Biodegradability: Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

10-day Window: Not applicable

Biodegradation: 0 %

Exposure time: 28 d

Method: OECD Test Guideline 301C or Equivalent

10-day Window: Not applicable

Biodegradation: 50 %

Exposure time: 4.4 d

Method: Calculated.

Theoretical Oxygen Demand: 3.19 mg/mg

Photodegradation

Test Type: Half-life (indirect photolysis)

Sensitization: OH radicals

Atmospheric half-life: 3.7 Hour

Method: Estimated.

Cumene

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

10-day Window: Pass

Biodegradation: 70 %

Exposure time: 20 d

Method: OECD Test Guideline 301D or Equivalent

Theoretical Oxygen Demand: 3.20 mg/mg Estimated.

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	40%
10 d	62%
20 d	70%

Photodegradation

Test Type: Half-life (indirect photolysis)

Sensitization: OH radicals

Atmospheric half-life: 1.55 d

Method: Estimated.

Bioaccumulative potential

Nitrapyrin

Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Partition coefficient: n-octanol/water(log Pow): 3.324 Measured

Bioconcentration factor (BCF): < 85 Lepomis macrochirus (Bluegill sunfish) 30 d Measured

Solvent naphtha (petroleum), light arom

Bioaccumulation: For the major component(s): Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5). For the minor component(s): Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

1,2,4-Trimethylbenzene

Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Partition coefficient: n-octanol/water(log Pow): 3.63 Measured

Bioconcentration factor (BCF): 33 - 275 Cyprinus carpio (Carp) 56 d Measured

Xylene

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient: n-octanol/water(log Pow): 3.12 Measured

Bioconcentration factor (BCF): 25.9 Rainbow trout (Salmo gairdneri) Measured

1,3,5-Trimethylbenzene

Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Partition coefficient: n-octanol/water(log Pow): 3.42 Measured

Bioconcentration factor (BCF): 161 Pimephales promelas (fathead minnow) Measured

Cumene

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient: n-octanol/water(log Pow): 3.4 - 3.7 Measured

Bioconcentration factor (BCF): 35.5 Fish Measured

Mobility in soil**Nitrapyrin**

Potential for mobility in soil is medium (Koc between 150 and 500).

Partition coefficient (Koc): 321 Measured

Solvent naphtha (petroleum), light arom

For the major component(s):

Potential for mobility in soil is low (Koc between 500 and 2000).

1,2,4-Trimethylbenzene

Potential for mobility in soil is low (Koc between 500 and 2000).

Partition coefficient (Koc): 720 Estimated.

Xylene

Potential for mobility in soil is medium (Koc between 150 and 500).

Partition coefficient (Koc): 443 Estimated.

1,3,5-Trimethylbenzene

Potential for mobility in soil is low (Koc between 500 and 2000).

Partition coefficient (Koc): 741.65 Estimated.

Cumene

Potential for mobility in soil is low (Koc between 500 and 2000).

Partition coefficient (Koc): 800 - 2800 Estimated.

13. DISPOSAL CONSIDERATIONS

Disposal methods: If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

14. TRANSPORT INFORMATION

TDG

Proper shipping name

FLAMMABLE LIQUID, N.O.S.(XYLENE RANGE AROMATIC SOLVENT)

UN number UN 1993
 Class 3
 Packing group III
 Marine pollutant 1,2,4-Trimethylbenzene, Nitrapyrin

Classification for SEA transport (IMO-IMDG):

Proper shipping name FLAMMABLE LIQUID, N.O.S.(XYLENE RANGE AROMATIC SOLVENT)

UN number UN 1993
 Class 3
 Packing group III
 Marine pollutant 1,2,4-Trimethylbenzene, Nitrapyrin
 Transport in bulk Consult IMO regulations before transporting ocean bulk
 according to Annex I or II
 of MARPOL 73/78 and the
 IBC or IGC Code

Classification for AIR transport (IATA/ICAO):

Proper shipping name Flammable liquid, n.o.s.(XYLENE RANGE AROMATIC SOLVENT)

UN number UN 1993
 Class 3
 Packing group III

Further information:

NOT REGULATED PER TDG EXEMPTION 1.33 FOR ROAD OR RAIL SHIPMENTS 450L OR LESS

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

National Fire Code of Canada

Class II

Canadian Domestic Substances List (DSL)

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

16. OTHER INFORMATION

Hazard Rating System**NFPA**

Health	Fire	Reactivity
2	2	0

Revision

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Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

ACGIH	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	ACGIH - Biological Exposure Indices (BEI)
BEI	Biological Exposure Indices
CA AB OEL	Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)
CA BC OEL	Canada. British Columbia OEL
CA QC OEL	Québec. Regulation respecting occupational health and safety, Schedule 1, Part 1: Permissible exposure values for airborne contaminants
Dow IHG	Dow Industrial Hygiene Guideline
STEL	15-minute occupational exposure limit
STEV	Short-term exposure value
TWA	8-hour time weighted average
TWAEV	Time-weighted average exposure value

Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Information Source and References

This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

CORTEVA AGRISCIENCE CANADA COMPANY urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here

pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

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