

SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier **Beta Picoline**
Synonyms: 3-Picoline; 3-Methylpyridine
Chemical Abstracts Registry No: 108-99-6
REACH Registration Number: 01-2119493104-42-0000

1.2. Relevant identified uses of the substance or mixture and uses advised against

Chemical intermediate

1.3. Details of the supplier of the safety data sheet

Vertellus Agriculture & Nutrition Specialties LLC
1500 South Tibbs Avenue
Indianapolis, Indiana 46241 USA
1-317-247-8141

Only Representative for EU REACH Registration:

Vertellus Specialties Belgium NV
Haven 611, Tijsmanstunnel West 3
Antwerp 2040 Belgium
Phone: +32 3 250-6188

e-mail Address: sds@vertellus.com

1.4. Emergency telephone number **Vertellus:** 1-317-247-8141
CHEMTREC (USA): 1-800-424-9300 (collect calls accepted)
CHEMTREC (International): 1-703-527-3887 (collect calls accepted)
NRCC (China): +86 532 83889090

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

(According to Regulation (EC) No 1272/2008)

Skin Corrosion/Irritation Category 1C
Serious Eye Damage Category 1
Flammable Liquids Category 3
Acute Toxicity Inhalation Vapour Category 3
Acute Toxicity Dermal Category 3
Acute Toxicity Oral Category 4
EUH071 - Corrosive to the respiratory tract.

(According to Directive 67/548/EEC)

Symbol: C, Xn
Risk Phrases: R20/21/22: Harmful by inhalation, in contact with skin and if swallowed.
R34: Causes burns.
R10: Flammable.
Safety Phrases: S9: Keep container in a well ventilated place.
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39: Wear suitable protective clothing, gloves and eye/face protection.
S45: In case of accident or if you feel unwell, seek medical advice immediately.
S16: Keep away from sources of ignition - No smoking.

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2.2. Label elements

Hazard Symbols
(Pictogram):



Signal Word:

Danger

Hazard Precautions:

H226 - Flammable liquid and vapour.
H302 - Harmful if swallowed.
H311+H331 - Toxic in contact with skin or if inhaled.
H314 - Causes severe skin burns and eye damage.
H318 - Causes serious eye damage.
EUH071 - Corrosive to the respiratory tract.

Prevention Precautionary
Statements:

P210 - Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
P270 - Do not eat, drink or smoke when using this product.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.

First Aid Precautionary
Statements:

P302+P352 - IF ON SKIN: Wash with plenty of soap and water.
P303+P361+P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 - Immediately call a POISON CENTER or doctor/physician.

Storage Precautionary
Statements:

P403+P233 - Store in a well-ventilated place. Keep container tightly closed.

Disposal Precautionary
Statements:

P501 - Dispose of contents/container in accordance with local/regional/national/international regulations for hazardous wastes.

SECTION 3: Composition/information on ingredients

3.1. Substances or 3.2. Mixtures

Ingredient	CAS Number	Concentration (weight %)	EC Number	CLP Inventory/ Annex VI	EU DSD Classification (67/548/EEC)	EU CLP Classification (1272/2008)
Beta Picoline	108-99-6	~ 100	203-636-9	Not listed.	Xn, C; R20/21/22, R10, R34	Acute Tox. 3; H311 Acute Tox. 4; H302 Acute Tox. 3; H331 Eye Dam. 1; H318 Flam. Liq. 3; H226 Skin Corr. 1C; H314

NOTE: See Section 8 for exposure limit data for these ingredients. See Section 15 for trade secret information (where applicable). See Section 16 for the full text of the R-phrases above.

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SECTION 4: First aid measures

4.1. Description of first aid measures

Skin Contact:	Wash exposed area twice with soap and water. The exposed area should be examined by medical personnel if irritation or pain persists after the area has been washed. Remove contaminated clothing and continue flushing with water. Prolonged contact with contaminated clothing or shoes/boots may cause burns to appear after an extended exposure period.
Eye Contact:	Rinse eyes immediately with large amounts of water for at least 15 minutes, occasionally lifting the eyelids. Get medical attention if irritation or other symptoms exist.
Inhalation:	Remove from exposure area to fresh air immediately. If breathing has stopped, give artificial respiration. Keep affected person warm and at rest. Obtain immediate medical attention
Ingestion:	Do NOT induce vomiting, this material is corrosive. If swallowed, contact physician or poison control center immediately. Give oxygen if respiration is shallow. Do not give anything by mouth to an unconscious person. Due to this material's corrosivity, it is essential to get medical attention as quickly as possible.

4.2 Most important symptoms and effects, both acute and delayed

Acute:	Beta Picoline is corrosive to skin, eyes and mucous membranes. Vapors may be irritating to the respiratory tract. Beta Picoline is readily absorbed through the skin and is considered toxic via oral and dermal routes. Extended exposure (e.g., from saturated clothing) may lead to skin burns and/or systemic poisoning. Symptoms may include headache, dizziness, nausea, nervousness, weakness, narcosis, sleeplessness, loss of appetite and possibly loss of consciousness. Symptoms seen after ingestion or inhalation overexposures are expected to be essentially the same as those listed previously. Beta Picoline is a corrosive, so damage to the mouth and throat is a possibility if large amounts are ingested. Ingestion is not likely to be a primary route of exposure. Delayed Effects: none known.
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4.3. Indication of any immediate medical attention and special treatment needed

Note to Physician:	No specific indications. Treatment should be based on the judgment of the physician in response to the reactions of the patient.
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SECTION 5: Firefighting measures

5.1. Extinguishing media

Appropriate Extinguishing Media:	Water fog, Foam, Alcohol foam, Carbon dioxide, Dry chemical
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5.2. Special hazards arising from the substance or mixture

Hazardous Products of Combustion:	Toxic vapors may be released upon thermal decomposition (cyanides, nitrogen oxides, carbon monoxide).
Potential for Dust Explosion:	Not applicable.
Special Flammability Hazards:	Severe explosion hazard in the form of vapor (within flammability limits) when exposed to heat, flame or static discharge.

5.3. Advice for firefighters

Basic Fire Fighting Guidance:	Wear self-contained breathing apparatus and full protective clothing (i.e., Bunker gear). Skin and eye contact should be avoided. Normal fire fighting procedures may be used.
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SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- Evacuation Procedures:** Isolate the hazard area and deny entry to unnecessary and unprotected personnel.
- Special Instructions:** See Section 8 for personal protective equipment recommendations. Remove all contaminated clothing to prevent further absorption. Decontaminate affected personnel using the first aid procedures in Section 4. Leather shoes that have been saturated must be discarded.

6.2. Environmental precautions

Prevent releases to soils, drains, sewers and waterways.

6.3. Methods and material for containment and cleaning up

Remove all ignition sources. Ventilate the area of spill or leak. Wear protective equipment during clean-up. For small spills, use suitable absorbent material and collect for later disposal. For large spills, the area may require diking to contain the spill. Material can then be collected (eg., suction) for later disposal. After collection of material, flush area with water. Dispose of the material in accordance with standard practice for disposal of potentially hazardous materials as required by applicable federal, state or local laws.

6.4. Reference to other sections

Refer to section 8 for information on selecting personal protective equipment. Refer to section 13 for information on spilled product, absorbent and clean up material disposal instructions.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for Unique Hazards:** Not applicable.
- Practices to Minimize Risk:** Wear appropriate protective equipment when performing maintenance on contaminated equipment. Wash hands thoroughly before eating or smoking after handling this material. Do not eat, drink or smoke in work areas. Prevent contact with incompatible materials. Avoid spills and keep away from drains. Handle in a manner to prevent generation of aerosols, vapors or dust clouds.
- Special Handling Equipment:** Not applicable.

7.2. Conditions for safe storage, including any incompatibilities

- Storage Precautions & Recommendations:** Maintain dry, ventilated conditions for storage. Protect containers against physical damage. Outside or detached storage is preferable. Inside storage should be in standard flammable liquids storage room or cabinet. Keep away from strong acids and oxidizing agents. Should be periodically inspected.
- Dangerous Incompatibility Reactions:** Avoid contact with strong acids and oxidizing agents.
- Incompatibilities with Materials of Construction:** May cause some forms of plastics and rubbers to deteriorate.

7.3. Specific end use(s)

If a chemical safety assessment has been completed an exposure scenario is attached as an annex to this Safety Data Sheet. Refer to this annex for the specific exposure scenario control parameters for uses identified in subsection 1.2.

SECTION 8: Exposure controls/personal protection

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8.1. Control parameters

Air Monitoring Method: Collection media: Charcoal; Analysis Method: GC/FID

Derived No Effect Levels (DNELs) – Workers:

Route	DNEL
Acute - systemic effects (dermal)	0.42 mg/kg bw/day
Acute - systemic effects (inhalation)	7.5 mg/m ³
Long-term - systemic effects (dermal)	0.14 mg/kg bw/day
Long-term - systemic effects (inhalation)	2.5 mg/m ³
Acute and long-term - local effects (dermal, inhalation)	Qualitative assessment - skin/eye irritant

Derived No Effect Levels (DNELs) – General Population:

Route	DNEL
Acute - systemic effects (oral, dermal, inhalation)	No applications involving general population
Long-term - systemic effects (dermal)	0.07 mg/kg bw/day
Long-term - systemic effects (inhalation)	0.6 mg/m ³
Long-term - systemic effects (oral)	0.070 mg/kg bw/day
Acute and long-term - local effects (dermal, inhalation)	No applications involving general population

Predicted No Effect Concentrations (PNECs):

Route	PNEC
PNEC aqua (freshwater)	0.3 mg/L
PNEC aqua (marine water)	0.03 mg/L
PNEC aqua (intermittent releases)	3 mg/L
PNEC aqua (STP)	2 mg/L
PNEC sediment (freshwater)	4.5 mg/kg sediment dw
PNEC sediment (marine water)	0.45 mg/kg sediment dw
PNEC soil	0.73 mg/kg soil dw
PNEC oral (wildlife exposures)	Derivation waived - no potential for bioaccumulation

8.2. Exposure controls

Also see the annex to this SDS (if applicable) for specific exposure scenario controls.

Intermediate Status: Where the substance has been registered as an isolated intermediate (on-site or transported), this safety data sheet is consistent with the specific conditions relied on to justify the registration in accordance with Article 17 or 18 of regulation (EC) No 1907/2006.

Other Engineering Controls: All operations should be conducted in well-ventilated conditions. Local exhaust ventilation should be provided.

Personal Protective Equipment: Use NIOSH approved chemical cartridge-respirator or supplied air breathing equipment. Chemical goggles should be worn at all times; use face shields as conditions warrant. Neoprene, nitrile or PVC-coated gloves (Standard EN 374). Safety glasses or chemical goggles (Standard EN166).

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Chemical resistant clothing (Standard EN368). Impervious clothing and boots.

Respirator Caution:	Observe OSHA regulations for respirator use (29 CFR 1910.134). Air-purifying respirators must not be used in oxygen-deficient atmospheres.
Thermal Hazards:	Not applicable.
Environmental Exposure Controls:	The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance, State & Odor (ambient temperature):	Colorless to yellow liquid with a strong, sweetish odor.		
Molecular Formula:	C ₆ H ₇ N	Molecular Weight:	93.13
Vapor Pressure:	0.81 kPa 25°C	Evaporation Rate:	No data available.
Specific Gravity or Density:	0.9568 @ 20°C	Vapor Density (air = 1):	3.2
Boiling Point:	144 °C	Freezing / Melting Point:	-18 °C
Solubility in Water:	miscible	Octanol / Water Coefficient:	log Kow = 1.20
pH:	10 (as 100 g/L solution in water at 20°C); pKa = 5.63	Odor Threshold:	< 1 ppm
Viscosity:	Not available	Autoignition Temperature:	488°C
Flash Point and Method:	100°F (37°C) Tag Closed Cup	Flammable Limits:	1.3% (LEL) –8.7% (UEL)
Flammability (solid, gas):	Not applicable	Decomposition Temperature:	No data available.
Explosive Properties:	Not explosive	Oxidizing Properties:	Non-oxidizing

SECTION 10: Stability and reactivity

10.1. Reactivity	Not classified as dangerously reactive.
10.2. Chemical stability	Stable
10.3. Possibility of hazardous reactions	Will not occur.
10.4. Conditions to avoid	Avoid static discharge and uncontrolled exposure to high temperatures.
10.5. Incompatible materials	Avoid contact with strong acids and oxidizing agents.
10.6. Hazardous decomposition products	Toxic vapors may be released upon thermal decomposition (cyanides, nitrogen oxides, carbon monoxide).

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SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute Oral LD₅₀:	710 mg/kg (rat) 630 mg/kg (rat)	Birch 1972 Carreon 1983 (KEY)
Acute Dermal LD₅₀:	200 - 1000 mg/kg (rabbit) 126 - 200 mg/kg (rabbit) > 400 mg/kg (rat)	Fitzgerald (1991a & b) Birch 1972 Oley 2008 (KEY)
Acute Inhalation LC₅₀:	1300 - 3300 ppm (rat) < 12 mg/L (rat)	Kinney 1984 (KEY) Birch 1972
Skin Irritation:	Corrosive to skin.	
Eye Irritation:	Corrosive to eyes.	
Skin Sensitization:	Not a sensitizer	
Mutagenicity:	Genotoxic activity was absent (i.e., DNA lesions were not induced and mutagenic activity was not induced) when tested using the following tests: DNA single-strand breaks measurement in V79 cells, HGPRT gene mutation assay in V79 cells, Salmonella/microsome test, and micronucleus assay.	
Reproductive / Developmental Toxicity:	No data available.	
Carcinogenicity:	In a two-year drinking water study in mice, pyridine was reported to increase the incidence of hepatocellular carcinomas and hepatoblastomas. In male Fischer 344 rats, pyridine was reported to increase the incidence of renal tubule adenomas, but this was not observed in male Wistar rats. (NOTE: These studies were audited for data quality and several major concerns have been noted. Tumor incidence rates in control rats reached 76 to 84%. There is also evidence that normal metabolic pathways were saturated, leading to results of questionable biological significance.) No increase in tumor incidence at any site was observed in rats following subcutaneous injection of pyridine for one year. (NTP 1997)	
Target Organs:	Several repeated dose toxicity tests have been performed in mice and rats, both as gavage and drinking water studies. Most tests showed evidence of adverse liver effects after subchronic/chronic oral exposures; there were isolated reports of kidney, cardiac, blood and reproductive effects, but these endpoints were not as reproducibly observed as liver effects. NOAEL levels ranged from 1 to 15 mg/kg/day in gavage and drinking water studies conducted from 13 weeks to 2 years in duration. A single subchronic inhalation study showed development of olfactory lesions in rats exposed to levels exceeding regulatory exposure limits over a 4-day period.	
Primary Route(s) of Exposure:	Skin contact and absorption, eye contact, and inhalation. Ingestion is not likely to be a primary route of exposure.	
Most important symptoms and effects, both acute and delayed	Beta Picoline is corrosive to skin, eyes and mucous membranes. Vapors may be irritating to the respiratory tract. Beta Picoline is readily absorbed through the skin and is considered toxic via oral and dermal routes. Extended exposure (e.g., from saturated clothing) may lead to skin burns and/or systemic poisoning. Symptoms may include headache, dizziness, nausea, nervousness, weakness, narcosis, sleeplessness, loss of appetite and possibly loss of consciousness. Symptoms seen after ingestion or inhalation overexposures are expected to be essentially the same as those listed previously. Beta Picoline is a corrosive, so damage to the mouth and throat is a possibility if large amounts are ingested. Ingestion is not likely to be a primary route of exposure. Delayed Effects: None known	
Additive or Synergistic effects:	None known.	

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SECTION 12: Ecological information

12.1. Toxicity	LC50 (96h) Brachydanio rerio (Zebra fish) = 560 - 1000 mg/L EC50 (48h) Daphnia = 320 mg/L EC50 (72h) Selenastrum capricornutum (algae) = 320 mg/L	Weytjens (1991a) Weytjens (1991b) Weytjens (1991c)
12.2. Persistence and degradability	Readily biodegradable.	
12.3. Bioaccumulative potential	Bioconcentration is not expected to occur.	
12.4. Mobility in soil	This material is expected to have high mobility in soil. It absorbs weakly to most soil types.	
12.5. Results of PBT and vPvB assessment	This substance is not a PBT or vPvB.	

SECTION 13: Disposal considerations

13.1. Waste treatment methods

US EPA Waste Number:	D001
Waste Classification: (per US regulations)	Ignitable.
Waste Disposal:	NOTE: Generator is responsible for proper waste characterization. State hazardous waste regulations may differ substantially from federal regulations. Dispose of this material responsibly, and in accordance with standard practice for disposal of potentially hazardous materials as required by applicable international, national, regional, state or local laws, and environmental protection duty of care principles. Do NOT dump into any sewers, on the ground, or into any body of water. For disposal within the EC, the appropriate classification code according to the European Community List of Wastes should be used. Note that disposal regulations may also apply to empty containers and equipment rinsates.

SECTION 14: Transport information

The following information applies to all shipping modes (DOT/IATA/ICAO/IMDG/ADR/RID/ADN), unless otherwise indicated:

14.1. UN number	UN2313	14.2. UN proper shipping name	Picolines
14.3. Transport hazard class(es)	3	14.4. Packing group	PG III
14.5. Environmental hazards	Not applicable		
14.6. Special precautions for user	(3-Picoline)		
NA Emergency Guidebook Numbers:	129	IMDG EMS:	S-D; F-E
14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code			Category Z

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Chemical Inventory Lists:	Status:		
USA TSCA:	Listed	EINECS:	203-636-9


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Canada(DSL/NDSL):	DSL	Japan:	(5)-711
Korea:	2003-3-2408	Australia:	Listed
China:	Listed	Philippines:	Listed
Taiwan:	Listed	New Zealand:	Listed
WHMIS Classification:	Class B, Division 3: Combustible Liquid. Class E: Corrosive Material. Class D, Division 1, Subdivision B: Toxic Material.		
German Water Hazard Classification:	ID Number 1601, hazard class 1 - low hazard to waters (<i>3-Methylpyridin</i>)		
SARA 313:	Not listed.		
Reportable Quantities:	Not applicable.		
State Regulations:	Not applicable.		
Other Regulatory Listings:	This material is listed as a Volatile Organic Compound (VOC) by U.S. EPA; see 40 CFR 60.		

HMIS:

HEALTH	3
FLAMMABILITY	2
REACTIVITY	0

NFPA:



15.2. Chemical safety assessment

A chemical safety assessment has been prepared for this product.

SECTION 16: Other information

Full text of R phrases in Section 3:
 R20/21/22: Harmful by inhalation, in contact with skin and if swallowed.
 R34: Causes burns.
 R23/24: Toxic by inhalation and in contact with skin.
 R10: Flammable.

- Key Data Sources:**
- Birch, MD, 1972, Toxicological Investigation of 0.4 Mole Fraction; 3-Methylpyridine Lot: QET 195729, American Chemistry Council, Pyridine and Pyridine Derivatives HPV Work Group, Testing Laboratory: Monsanto Company, ST Louis, MO, USA.
 - Carreon, RE, 1983, 3-Methylpyridine: Acute Toxicological Properties and Industrial Handling Hazards, American Council, Pyridine and Pyridine Derivatives HPV Work Group 2003, Owner: Dow Chemical Company.
 - Chen HC and Krauss, WC, 1984, Subchronic Inhalation Toxicity of 3-Methylpyridine, Testing Laboratory: El DuPont de Nemours & Co., Wilmington, DE, USA, EPA Document Number 878214922.
 - Claxton, LD, et al., 1987, Mutation Research, 176:185-198.
 - Clayton G. D and F. E. Clayton (eds.), 1994, Patty's Industrial Hygiene and Toxicology, 4th ed. New York, NY: John Wiley & Sons Inc.
 - Fitzgerald GB, 1991a, Acute Dermal Toxicity Study (LD50): 3-Methylpyridine. Testing laboratory: Toxikon Corp., Woburn, MA., USA, Report no.: Report Number 91-0351.1. Owner company: Reilly Industries Inc.
 - Fitzgerald, GB, 1991b, Acute Dermal Toxicity Study (LC50): 3-Methylpyridine Testing Laboratory: Toxikon Corporation, Woburn, MA, USA, Report no: 91-0351.2 Owner: Reilly Industries.
 - Fitzgerald, GB, 1991c, DOT Skin Corrosion Study with Beta-Picoline, Testing Laboratory: Toxikon Corporation, Woburn, MA USA, Report no 91-0352 Owner: Reilly Industries.
 - International Agency for Research on Cancer (IARC), 2000, Pyridine: IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, 77:503-528.

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- Ho, C.H et al. 1981, Mutation Research, 85: 335-345
- Kinney, LA et al. 1984 Lethal Concentration(s) by inhalation of Pyridine and 3-Methylpyridine, US EPA, Testing Laboratory: El DuPont de Nemours & Co Inc, Wilmington, DE, USA, EPA Document Number 878214921
- MITI 2002. Bioconcentration Test on 3-Methylpyridine, Japanese National Institute of Technology and Industry, Official Bulletin of Economy, Trade and Industry Report No. 1-336in 5-711
- National Toxicology Program (NTP), 1997, NTP Technical Report on the Toxicology and Carcinogenesis Studies of Pyridine (CAS RN 110-86-1) in F344/N Rats, Wistar Rats and B6C3F1 Mice (Drinking Water Studies), NIH, Testing laboratory: U. S. Department of Health and Human Services, Public Health Service, National Institute of Health, Washington, DC, Report no.: TR470: NIH publication NO. 98-3960.
- National Toxicology Program (NTP), 2000, NTP Technical Report on the Toxicology and Carcinogenesis Studies of Pyridine (CAS RN 110-86-1) in F344/N Rats, Wistar Rats and B6C3F1 Mice (Drinking Water Studies), NIH, Testing laboratory: U. S. Department of Health and Human Services, Public Health Service, National Institute of Health, Washington, DC, Report no.: TR470: NIH publication NO. 98-3960.
- National Toxicology Program (NTP), Mouse Micronucleus Study, Report No A31463
- Oley, SD, 2008 Acute Dermal Toxicity in Rats - Limit Test, Testing Laboratory Eurofins / Product Safety Laboratories, Report No 26492 Owner: Vertellus Specialties
- Singh BB & Chandra R, 2005, Bull Environ Contam Toxicol, 75:482-9.
- Spear, H 1984 DOT Skin Corrosion Test, Department of Transportation CFR Title 49, 173.1200, Testing Laboratory: Product Safety Labs, 340 Commercial Ave, New Brunswick, NJ 08901 US, Report T-4008, Owner: Nepera Inc., Route 17, Harriman, NY US 10926
- Spear, H 1984 DOT Skin Corrosion Test, Department of Transportation CFR Title 49, 173.1200, Testing Laboratory: Product Safety Labs, 340 Commercial Ave, New Brunswick, NJ 08901 US, Report T-5276, Owner: Nepera Inc., Route 17, Harriman, NY US 10926
- Trochimowicz, HL, 1994, Heterocyclic and Miscellaneous Nitrogen Compounds in Patty's Industrial Hygiene and Toxicology, 4th Ed. (GD Clayton and FE Clayton, eds), New York, John Wiley and Sons.
- Vleminckx, C, et al, 1993, Evaluation of the Genotoxic Potential of Pyridine and Methylated Pyridines. A Salmonella/Microsome Test, Testing laboratory: Institute of Hygiene and Epidemiology, Brussels, Belgium. Report no.: IHE-TOX-1003, Owner company: Reilly Industries, Report date: 1993-03-08, unpublished data.
- Vleminckx, C, et al, 1993, Evaluation of the Genotoxic Potential of Pyridine and Methylated Pyridines. HGPRT gene mutation test in V79 cells, Testing laboratory: Institute of Hygiene and Epidemiology, Brussels, Belgium, Report no.: IHE-TOX-1003b, Owner company: Reilly Industries, Report date: 1993-03-08, unpublished data.
- Vleminckx, C, et al, 1993, Evaluation of the Genotoxic Potential of Pyridine and Methylated Pyridines. DNA single strand breaks measurement in mammalian cells in vitro, Testing laboratory: Institute of Hygiene and Epidemiology, Brussels, Belgium, Report no.: IHE-TOX-1003c, Owner company: Reilly Industries, Report date: 1993-03-08, unpublished data.
- Weytjens, D, 1991, The Acute Toxicity Of B-Picoline (3-methyl pyridine) In The Zebra Fish (Brachydanio rerio), Testing laboratory: Janssen Pharmaceutica, Report no.: AFB/0010, Owner company: Reilly Chemicals SA, Report date: 1991-12-11, unpublished data.
- Weytjens, D, 1991, The Acute Toxicity of B-Picoline (3-methyl pyridine) In the Water-Flea (Daphnia Magna), Testing laboratory: Janssen Pharmaceutica, Report no.: ADK6/0012, Owner company: Reilly Chemicals SA, Report date: 1991-12-11, unpublished data.
- Weytjens, D, 1991, The Effect of B-Picoline (3-methyl pyridine) On The Growth Of The Unicellular Green Alga Selanastrum capricornutum, Testing laboratory: Janssen Pharmaceutica, Report no.: AASc/0002, Owner company: Reilly Chemicals SA, Report date: 1991-12-11, unpublished data.
- Workplace Environmental Exposure Level, 1988, Picolines, American Industrial Hygiene Association
- Yuill, L, 2008, Reproduction/Developmental Toxicity Screening Test in Rats, Testing laboratory: Charles River Laboratories, Tranent, Edinburgh, UK. Report no.: 28038. Owner company: Pyridine Group of American Chemistry Council (Vertellus Specialties Inc.), Study number: 494646, Report date: 2008-08-29, unpublished data.

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Training Advice: Not applicable.

Legend of Abbreviations:

ACGIH = American Conference on Governmental Industrial Hygienists.

CAS = Chemical Abstracts Service.

CFR = Code of Federal Regulations.

DSL/NDSL = Domestic Substances List/Non-Domestic Substances List.

EC = European Community.

EINECS = European Inventory of Existing Commercial Chemical Substances.

ELINCS = European List of Notified Chemical Substances.

EU = European Union.

GHS = Globally Harmonized System.

LC = Lethal Concentration.

LD = Lethal Dose.

NFPA = National Fire Protection Association.

NIOSH = National Institute of Occupational Safety and Health.

NTP = National Toxicology Program.

OSHA = Occupational Safety and Health Administration

PEL = Permissible Exposure Limit.

RQ = Reportable Quantity.

SARA = Superfund Amendments and Reauthorization Act of 1986.

TLV = Threshold Limit Value.

WHMIS = Workplace Hazardous Materials Information System.

Important Note: Please note that the information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. The information contained herein may change without prior notice. **THIS SAFETY DATA SHEET SUPERSEDES ALL PREVIOUS EDITIONS.**

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Email: SDS@Vertellus.com

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Annex Beta Picoline - Summary of Uses

ES Number	Name	SU	ERC	PROC
1	Use as a non-reactive processing aid	3/8	4	3, 8b, 15

Beta Picoline Exposure Scenario

Note: Guidance below is in addition to that indicated in 1-16 of the SDS

<p>Title: Use of processing aids.</p> <p>Exposure scenario covering the following activities:</p> <p>Main Sector of Use Group</p> <ul style="list-style-type: none"> • SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites Sector of end use <ul style="list-style-type: none"> ○ SU 8: Manufacture of bulk, large scale chemicals <p>Process categories:</p> <ul style="list-style-type: none"> • <u>PROC 3</u>: Use in closed batch process (synthesis or formulation) • <u>PROC 8b</u>: Transfer of substance (charging/discharging) from/to vessels/large containers at dedicated facilities • <u>PROC 15</u>: Use in quality control <p>Environmental Release category</p> <ul style="list-style-type: none"> • ERC 4: Industrial use of processing aids in processes and products, not becoming part of articles <p>Processes, tasks, activities covered: See Table 1.</p> <p>Assessment Method: EUSES and ECETOC TRA v2 supplemented for risk management measures as included in CHESAR.</p>
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2. Control of worker exposure

Product characteristic

- The concentration of the substance, as supplied, from 95% to 100%.

Amounts used

- Not relevant for human health risk assessment.

Frequency and duration of use/exposure

- PROC 3, 15: > 4 hours for each day / 5 days per week
- PROC 8b: 15 minutes – 1 hour per day / 5 days per week

Human factors not influenced by risk management

- Exposure to the head not covered by PPE

Other given operational conditions affecting workers exposure

- PROC 3: Work is performed outdoors.
- PROC 8b: Local exhaust ventilation with at least 90% efficiency required.
- PROC 15: Quality control is performed indoors

Technical conditions and measures at process level (source) to prevent release

- See Section 7 of SDS.

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Technical conditions and measures to control dispersion from source towards the worker

- Local exhaust ventilation systems for PROC 8b and 15 (fume hood).

Organizational measures to prevent /limit releases, dispersion and exposure

- See Section 7 of SDS.

Conditions and measures related to personal protection, hygiene and health evaluation

- Section 7, 8, and 10 of the SDS.

3. Control of Environmental Exposure

Product characteristics

- The substance is a liquid.

Frequency and duration of use

- Continuous and intermittent release possible.

Environment factors not influenced by risk management

- Default values of 18,000 m³/day for receiving waters

Other given operational conditions affecting environmental exposure

- Default release rates prior to risk management measures: Water: 100%, Air 100%, Soil 5%
- Operations are outdoors, except Quality Control.
- Production is in closed systems.

Technical conditions and measures at process level (source) to prevent release

- See Sections 5 and 8 of the SDS
- Approximately 85% of substance is retained with the process for subsequent use
- Approximately 10% of the substance is collected in discharge fraction for offsite recycling and return
- Approximately 5% of substance is lost to water discharge which is collected on site.

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Water

- Waste water collected for recovery or incinerated at an external facility; no discharge to STP or surface water

Air

- Air emissions are during loading/fraction discharge. The spERC value of 0.0001% is used in the ECETOC TRA assessment.

Soil

- No release to soil was assumed in the ECETOC TRA assessment.

Organizational measures to prevent/limit release from site

- See Section 8 of the SDS

Conditions and measures related to municipal sewage treatment plant disposal

- There is no discharge to municipal sewage treatment plant.

Conditions and measures related to external treatment of waste for disposal

- See Section 13 of the SDS.
- Waste water routed for treatment at approved facility (50 kg /day) EU waste code 07 01 99.
- Residual in shipping containers assumed to be <0.1%.
- Empty raw material packaging containers - EU waste code: 15 01 10.

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Conditions and measures related to external recovery of waste

- Emptied containers sent to dedicated recovery facility.

4. Exposure estimation and reference to its source

The human health risk assessment and the environmental risk assessment were performed using EUSES and ECETOC TRA v2.0. as included in the CHESAR software tool. Tables 2a/b and 3a/b below summarize the calculated exposures and resulting Risk Characterization Ratios (RCR) at <1.0. Note that worker exposures in ECETOC TRA are calculated by multiplying full shift calculations by the following factors:

- > 4 hours: 1
- 1 - 4 hours: 0.6
- 15 minutes – 1 hour: 0.2
- < 15 minutes: 0.1

5. Guidance to Downstream User - Operational Conditions and Risk Management Measures

The worker activities summarized in Table 1 result in controlled exposure if individually implemented by an industrial facility considering the operational conditions and the risk management measures (RMM), as defined above.

The downstream user may re-calculate the RCR values based on variations in the local operational conditions and application of RMM to confirm that operations are within the control limits.

Table 1. Worker – Operational Conditions Used in Assessment

PROC	Frequency / Duration of work (hours)	LEV Efficiency (%)	Respirator Efficiency (%)	Gloves
PROC 3: Use in closed batch process (synthesis or formulation)	Daily, > 4 hours	NA*	90	Chemically resistant gloves (Level B)
PROC 8b: Transfer of chemicals from/to vessels/ large containers at dedicated facilities	Daily, 15 minutes to 1 hour	90	90	Chemically resistant gloves with basic employee training (Level C)
PROC 15: Use a laboratory reagent, Non-industrial setting	Daily, > 4 hours	90	NA	Chemically resistant gloves (Level B)

*Not Applicable

Table 2a. Predicted Exposure Concentrations - Environmental

Compartment	Local PEC
Water: Fresh	5.4E-11 mg/L
Water: Fresh Sediment	8.17E10 mg/kg
Water: Marine	8.3E-12 mg/L
Water: Marine Sediment	1.25E-10 mg/kg
Water: STP	0
Air	2.44E-7 mg/m ³
Soil	4.84E-8 mg/kg

Table 2b. Predicted Exposure Concentrations - Worker

Route of exposure	PROC 3	PROC 8b	PROC 15
Inhalation: Acute Systemic: mg/m ³	0.978	0.81	5.82

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Inhalation: Long Term Systemic: mg/m ³	0.163	0.027	1.94
Dermal: Acute Systemic: mg/kg bw/day	0.207	0.207	0.021
Dermal: Long Term Local: mg/cm ²	0.02	0.01	0.002
Dermal: Long Term Systemic: mg/kg/bw/day	0.069	0.069	0.007

Table 3a. Risk Characterization Ratio - Environmental

Compartment	RCR
Water: Fresh	1.803E-10
Water: Fresh Sediment	1.816E10
Water: Marine	2.767E10
Water: Marine Sediment	2.778E-10
Water: STP	0
Air	4.06E-7
Soil	6.63E-8

Table 3b. Risk Characterization Ratio - Worker

Route of exposure	PROC 3 RCR	PROC 8b RCR	PROC 15 RCR
Inhalation: Acute Systemic:	0.13	0.108	0.776
Inhalation: Long Term Systemic:	0.065	0.011	0.776
Dermal: Acute Systemic:	0.493	0.493	0.05
Dermal: Long Term Systemic:	0.49	0.49	0.049
Combined Routes: Long Term Systemic	0.555	0.501	0.825

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Summary of RMM				
Beta Picoline				
Risk Management Measures are defined below:				
· Proper labeling of the substance in storage and lines used for transfer				
· Use of appropriate equipment:				
- Bonded and grounded tanks, lines and vessels				
- Applicable storage tank controls , i.e. pressure and temperature gauging, pressure relief venting with routing to safe areas				
- Applicable processing vessel controls, i.e. rupture discs with routing to overfill vessels of adequate capacity				
- Ventilation for storage areas				
- Inside storage in rooms compliant for flammable materials				
- Processing in areas of good ventilation, with local exhaust or in closed systems				
- Transfers in closed, dedicated lines				
- Electrical equipment with explosion proof rating				
- Impervious secondary containment with volume greater than the largest container / vessel in the area				
- Other equipment, including fire control systems, consistent with and required for the storage and use of flammable materials				
- Fire extinguishing media: Water fog, Alcohol foam, Carbon Dioxide, Dry chemical				
· Proper operations and storage conditions				
- Controls to maintain the substance at appropriate temperature and pressure				
- Isolation from uncontrolled heat sources, such as steam lines				
· Organization Controls				
- Written operating procedures for storage, transfer, substance use and emergency				
- Keep away from heat/sparks/open flames/hot surfaces				
- Ground / bond container and receiving equipment				
- Take precautionary measures against static discharge				
- Store in well-ventilated area, keep cool				
- Keep containers tightly closed				
- No smoking				
- Monitor of substance vapor concentration prior to activities such as equipment maintenance and repair				
- Implementation of formal hot work procedures				
- Training of employees on chemical process safety and emergency response				
- Access to SDS				
- Use of non-sparking tools				
- Avoid contact with strong acids and oxidizing agents				

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Annex Beta Picoline - Summary of Uses

ES Number	Name	SU	ERC	PROC
1	Use as a non-reactive processing aid	3/8	4	3, 8b, 15

Beta Picoline Exposure Scenario

Note: Guidance below is in addition to that indicated in 1-16 of the SDS

<p>Title: Use of processing aids.</p> <p>Exposure scenario covering the following activities:</p> <p>Main Sector of Use Group</p> <ul style="list-style-type: none"> • SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites Sector of end use <ul style="list-style-type: none"> ○ SU 8: Manufacture of bulk, large scale chemicals <p>Process categories:</p> <ul style="list-style-type: none"> • <u>PROC 3</u>: Use in closed batch process (synthesis or formulation) • <u>PROC 8b</u>: Transfer of substance (charging/discharging) from/to vessels/large containers at dedicated facilities • <u>PROC 15</u>: Use in quality control <p>Environmental Release category</p> <ul style="list-style-type: none"> • ERC 4: Industrial use of processing aids in processes and products, not becoming part of articles <p>Processes, tasks, activities covered: See Table 1.</p> <p>Assessment Method: EUSES and ECETOC TRA v2 supplemented for risk management measures as included in CHESAR.</p>
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2. Control of worker exposure

Product characteristic

- The concentration of the substance, as supplied, from 95% to 100%.

Amounts used

- Not relevant for human health risk assessment.

Frequency and duration of use/exposure

- PROC 3, 15: > 4 hours for each day / 5 days per week
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Human factors not influenced by risk management

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Other given operational conditions affecting workers exposure

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Soil

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