MATERIAL SAFETY DATA SHEET

ALPHA PICOLINE

Section 1: Product & Company Information

1.1 Product Information

Product Name : **Alpha-Picoline**

Synonyms : 2-Methylpyridine; 2-Picoline; Pyridine, 2-methyl-

Chemical Abstracts Registry No : 109-06-8

Chemical Formula : C6H7N

1.2 Supplier Information

M/s Shakambari Aromatics Private Limited
Village: Dudiya-Matewa, Tehsil: Gunderdehi
District: Balod, Chhattisgarh: 491225, India
Ph: +91 95893 77899

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture (According to Regulation (EC) No 1272/2008, 29 CFR 1910.1200 and the Globally Harmonized System)

Self-Classification (according to GHS)
Flammable Liquids Category 3
Skin Corrosion/Irritation Category 1C
Serious Eye Damage Category 1
Acute Toxicity Oral Category 4
Acute Toxicity Dermal Category 3
Acute Toxicity Inhalation Vapour Category 4

Harmonized Classification & Labeling (EU Only)
Flammable Liquids Category 3
Serious Eye Irritation Category 2
Acute Toxicity Oral Category 4
Acute Toxicity Dermal Category 3
Acute Toxicity Inhalation Vapour Category 3
Specific Target Organ Systemic Toxicity Single Exposure Category 3

2.2. Label elements

Hazard Symbols (Pictogram):

(NOTE: use no corrosive symbol in EU)

Signal Word: Danger

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Hazard Precautions:

H226 - Flammable liquid and vapour.
H314 - Causes severe skin burns and eye damage. **(All countries except EU)**
H319 - Causes serious eye irritation. **(EU ONLY)**
H302 - Harmful if swallowed.
H311 - Toxic in contact with skin.
H331 - Toxic if inhaled.
H335 - May cause respiratory irritation.

Prevention Precautionary Statements:

P210 - Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
P240 - Ground/bond container and receiving equipment.
P241 - Use explosion-proof electrical/ventilating/lighting/telecommunication/computer/ equipment.
P242 - Use only non-sparking tools.
P243 - Take precautionary measures against static discharge.
P261 - Avoid breathing dust/fume/gas/mist/vapours/spray.
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.
P312 - Call a POISON CENTER or doctor/physician if you feel unwell.
P363 - Wash contaminated clothing before reuse.
P310 - Immediately call a POISON CENTER or doctor/physician.
P301+P330+P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

Storage Precautionary Statements:

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

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 CLP Classification (1272/2008)
Alpha Picoline	109-06-8	~ 100	203-643-7	613-036-00-2	Flam. Liq. 3; H226 Eye Irr. 2; H319 Acute Tox. 4; H302 Acute Tox. 3; H311 Acute Tox. 3; H331 STOT SE 3; H335

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

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.

Eye Contact: Rinse eyes immediately with large amounts of water for at least 15 minutes, occasionally lifting the eyelids. GET MEDICAL ATTENTION.

Inhalation: Remove from exposure area to fresh air immediately. If breathing has stopped, give artificial respiration. Keep affected person warm and at rest. GET MEDICAL ATTENTION.

Ingestion: Do NOT induce vomiting, this material is corrosive. If swallowed, contact physician or poison control center immediately.

4.2 Most important symptoms and effects, both acute and delayed

Acute: Alpha Picoline is corrosive to skin, eyes and mucous membranes. Vapors may be irritating to the respiratory tract. Alpha 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. Alpha 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.

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.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Appropriate Extinguishing Media: Water fog, Foam, Alcohol foam, Carbon dioxide, Dry chemical

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 b

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

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.

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

8.1. Control parameters

Country	Occupational Exposure Limit
United States	AIHA Workplace Environmental Exposure Level = 2 ppm (skin) as 8-hr TWA; 5 ppm as 15 minute STEL

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 body weight/day
Acute - systemic effects (inhalation)	7.5 mg/m^3
Long-term - systemic effects (dermal)	0.14 mg/kg body weight/day
Long-term - systemic effects (inhalation)	2.5 mg/m^3

Derived No Effect Levels (DNELs) – General Population:

Route	DNEL
Long-term - systemic effects (dermal)	0.07 mg/kg body weight/day
Long-term - systemic effects (inhalation)	0.6 mg/m^3
Long-term - systemic effects (oral)	0.7 mg/kg body weight/day

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 dry weight
PNEC sediment (marine water)	0.45 mg/kg sediment dry weight
PNEC soil	0.73 mg/kg soil dry weight

8.2. Exposure controls

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

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). 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, unpleasant odor.		
Molecular Formula:	C_6H_7N	**Molecular Weight:**	93.13
Vapor Pressure:	11.2 mm Hg @ 25°C	**Evaporation Rate:**	No data available.
Specific Gravity or Density:	0.944 @ 20°C	**Vapor Density (air = 1):**	3.2
Boiling Point:	128 - 129 °C	**Freezing / Melting Point:**	-70 - -67 °C
Solubility in Water:	miscible	**Octanol / Water Coefficient:**	log Kow = 1.11
pH:	8.5 (100 g/L solution in water at 20°C); pKa = 6.00	**Odor Threshold:**	< 0.1 ppm
Viscosity:	0.81 mPa▪s @ 20°C	**Autoignition Temperature:**	535-538°C
Flash Point and Method:	81°F (27°C) Tag Closed Cup	**Flammable Limits:**	1.4% (LEL) – 8.6% (UEL)
Flammability (solid, gas):	No data available.	**Decomposition Temperature:**	No data available.
Explosive Properties:	Not explosive.	**Oxidizing Properties:**	Not an oxidizer.

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 autopolymerize.
10.4. Conditions to avoid	Uncontrolled exposure to high temperatures. Static discharge.
10.5. Incompatible materials	Avoid contact with strong acids and oxidizing agents.
10.6. Hazardous decomposition products	Vapor mixture comprising cyanide, pyridine, ammonia, and oxides of nitrogen, and carbon.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute Oral LD_{50}:	> 950 mg/kg (rat)	KEY STUDY
	810 mg/kg (rat)	Supporting
Acute Dermal LD_{50}:	200 - 316 mg/kg (rabbit)	KEY STUDY
	388 mg/kg (rabbit)	Supporting
Acute Inhalation LC_{50}:	> 9.4 mg/L (4h, rat)	KEY STUDY
	2000 - 4000 ppm (4h, rat)	Supporting study
	< 13.2 mg/L (4h, rat)	Supporting study
Skin Irritation:	Corrosive to skin.	
Eye Irritation:	Corrosive to eyes.	
Skin Sensitization:	Not sensitizing (Weight of evidence)	
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, and Salmonella/microsome test.	
Reproductive / Developmental Toxicity:	Pyridine and its methyl derivatives have been adequately studied in animal protocols and there is no targeted toxicity to the reproductive system.	
Carcinogenicity:	This material is not listed by IARC, NTP or OSHA as a carcinogen. No test data is available that indicates this material is a carcinogen.	
Target Organs:	May cause respiratory irritation.	
Aspiration Hazard:	Based on physical properties, not likely to be an aspiration hazard.	
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	Alpha Picoline is corrosive to skin, eyes and mucous membranes. Vapors may be irritating to the respiratory tract. Alpha 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. Alpha 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.	

SECTION 12: Ecological information

12.1. Toxicity

Read-across (3-Methylpyridine)

LC_{50} *Brachydanio rerio* (Zebra fish) = 560 - 1000 mg/L/96 hr
NOEC *Brachydanio rerio* (Zebra fish) = 560 mg/L/96 hr
NOEC *Brachydanio rerio* (Zebra fish) = 320 mg/L/96 hr
EC_{50} *Daphnia magna* = 320 mg/L/48 hr
NOEC *Daphnia magna* = 180 mg/L/48 hr
EC_{50} *Pseudokirchneriella subcapitata* = 320 mg/L/72 hr

12.2. Persistence and degradability	Material is readily biodegradable under aerobic conditions.
12.3. Bioaccumulative potential	Not expected to bioconcentrate in aquatic species.
12.4. Mobility in soil	This material is soluble in water. Its adsorption to soil and sediment should not be significant.
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, U191
Waste Classification: (per US regulations)	Ignitable. The waste is a listed hazardous waste.
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	(2-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:**	Listed (203-643-7)
Canada(DSL/NDSL):	Listed (DSL)	**Japan:**	Listed (5-711)
Korea:	Listed (KE-25315)	**Australia:**	Listed
China:	Listed	**Philippines:**	Listed
Taiwan:	Listed	**New Zealand:**	Listed

German Water Hazard Classification: ID Number 1603, hazard class 1 - low hazard to waters *(2-Methylpyridin)*

SARA 313: 2-Methylpyridine (1% de minimis)

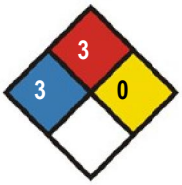
Reportable Quantities: 5000 lbs. (approximately 634 gallons)

State Regulations:

- This product contains chemicals listed on the Massachusetts Substance List for Right-to-Know Law.
- This product contains chemicals listed on the New Jersey Department of Health Hazard Right-to-Know Program Hazardous Substance List.
- This product contains chemicals listed on the New York State List of Hazardous Substances.
- This product contains chemicals listed on the Pennsylvania Department of Labor and Industry Hazardous Substance List.

HMIS IV:

NFPA:



15.2. Chemical safety assessment

A chemical safety assessment has been prepared for this product.

SECTION 16: Other information

Key Data Sources: Unpublished toxicology reports owned by Vertellus.

Classification Method: On basis of test data; Bridging principle - similar substance

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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Issued by:	Regulatory Management Department	**Email:**	SDS@Vertellus.com
Revision Details:	Updated to REACH eSDS format and added Annex		

Annex

2-Methylpyridine - Summary of Uses

ES Number	Name	ERC	PROC
ES1	Industrial use as solvent in chemical reactions	4	1,2,4,8a,8b,15
ES2	Use as an intermediate in chemical reactions	6a	1,2,4,8a,8b,15

Exposure Scenarios

Note: Guidance below is in addition to that indicated in sections 1-16 of the Safety Data Sheet (SDS).

ES1

Title: Industrial use as a solvent in chemical reactions

Main Sector of Use Group

- **SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites**
  - SU8: Manufacture of bulk, large scale chemicals

Process Categories

- PROC 1: Use of solvents in closed systems, no exposure
- PROC 2: Use of solvents in closed, continuous systems with occasional controlled exposure
- PROC 4: Use of solvents in batch processes (synthesis)
- PROC 8a: Transfer of substance at non-dedicated facilities
- PROC 8b: Transfer of substance at dedicated facilities

Environmental Release Categories

- ERC4: Industrial use as solvent in chemical reactions

ES2

Title: Use as an intermediate in chemical reactions

Main Sector of Use Group

- **SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites**
  - SU8: Manufacture of bulk, large scale chemicals

Process Categories

- PROC 1: Use of solvents in closed systems, no exposure
- PROC 2: Use of solvents in closed, continuous systems with occasional controlled exposure
- PROC 4: Use of solvents in batch processes (synthesis)
- PROC 8a: Transfer of substance at non-dedicated facilities
- PROC 8b: Transfer of substance at dedicated facilities

Environmental Release Categories

ERC 6a: Use as an intermediate in chemical reactions

1. Control of Worker Exposure

Product Characteristics

- Physical Form: liquid

ES	Location	Concentration %
1	indoor	Substance as such
2	Indoor	Substance as such

Amounts used

- Not relevant for human risk assessment

Frequency and duration of use/exposure, personal protective equipment, ventilation, local exhaust

PROC	Application	Local Exhaust %	Hours / Shift	Respirator	Gloves	Eye	Ventilation
1	Use of solvents in closed systems, no exposure	Not applicable	8	no	no	yes	General (1-3 air changes per hour)
2	Use of solvents in closed, continuous systems with occasional controlled exposure.	Not applicable	8	90%	95%	yes	Enhanced (5-10 air changes per hour)
4	Use of solvents in batch processes (synthesis).	90%	8	90%	95%	yes	Enhanced (5-10 air changes per hour)
8a	Transfer of substance at Non-dedicated facilities	90%	4	90%	95%	yes	Enhanced (5-10 air changes per hour)
8b	Transfer of substance at dedicated facilities	90%	4	90%	95%	yes	Enhanced (5-10 air changes per hour)
15	Sampling / Laboratory Use	Not applicable	4	90%	95%	yes	Enhanced (5-10 air changes per hour)

Other given operational conditions affecting workers exposure

- The work is performed indoors

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

- See Section 7 of SDS

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

- See Section 7 and 8 of SDS
- See "Ventilation" comments above

Organisational measures to prevent /limit releases, dispersion and exposure:

- See SDS

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

- See sections 7, 8 and 10 of SDS
- Respirators: see table above
- Wear chemically resistant gloves, protective clothing with long sleeves and use suitable eye protection
- Practice good personal hygiene such as washing hands thoroughly before eating, smoking and handling this material.

2. Control of Consumer Exposure

- Not applicable

3. Control of Environmental Exposure

Product characteristics

- The substance is liquid

Frequency and duration of use

- Continuous and Intermittent release possible

ES	Emission days per year	Local volume per day (kg)	Sewage treatment plant efficiency %	On site water treatment efficiency %	Application of sludge to soil
1	20	1000	88.11	Not assumed	No
2	20	1750	88.11	Not assumed	No

Environment factors not influenced by risk management

- Default values of 18,000 m^3/day for receiving waters are assumed
- Discharge rate of sewage treatment plant: 200,000 m^3/day

Other given operational conditions affecting environmental exposure

- None defined

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

- None defined

Water / Air / Soil Release

ES	Air Release Fraction	Water Release Fraction	Soil Release Fraction	Local Release to air (kg/day)	Local release to sewage (kg/day)	Local Release to soil (kg/day)	Criteria
1	0.05	0.01	0.05	50	10	50	(ESIG spERC 1 - Manufacture of substance or use as a process chemical: ERC4)
2	0.025	0.01	0.001	43.75	17.5	4.4	(ESIG spERC 1B - Use as an Intermediate not related to Strictly Controlled Conditions: ERC6A.)

Organizational measures to prevent/limit release from site

- See Sections 6 and 7 of the SDS

Conditions and measures related to municipal sewage treatment plant disposal

- See above

Conditions and measures related to external treatment of waste for disposal

- See section 13 of the SDS
- Observe all regional, state and local environmental regulations
- Retain drain downs in sealed storage pending disposal

Conditions and measures related to external recovery of waste

- There is no recovery at an external waste treatment site
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4. Exposure estimation and reference to its source

The ECETOC Targeted Risk Assessment Tool (TRA) version 2.0 was used for the occupational exposure assessment. Details of the TRA may be found in the ECETOC Technical Report No. 93 (2004), and the accompanying Addendum Technical Report No. 107 (2009), or at https://www.ecetoc-tra.org/. The assessment of environmental exposure was carried out using EUSES v3.0. Documentation for EUSES 3.0 may be found at http://ecb.jrc.ec.europa.eu/euses.
The human health risk assessment and the environmental risk assessment were performed using CHESAR with ECETOC TRA 3.0. Tables below summarize the calculated exposures and resulting Risk Characterization Ratios (RCR) at < 1.0. Note the worker exposures in ECETOC TRA are calculated by multiplying the full shift calculations by the following factors:

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

5. Guidance to DU - Operational conditions and Risk Management Measures

The activities discussed above result in an acceptable exposure if individually performed by an industrial/professional worker, and considering the operational conditions and the risk management measures (RMM) as defined. 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.

Predicted Exposure Concentrations / Risk Characterization – Environmental

Compartment	Local PEC; Use 1	RCR*	Local PEC; Use 2	RCR*
Water: Fresh; mg/L	0.059	0.198	0.104	0.347
Water: Fresh Sediment; mg/kg	0.899	0.2	1.572	0.349
Water: Marine; mg/L	0.006	0.198	0.01	0.347
Water; Marine Sediment; mg/kg	0.09	0.2	0.157	0.349
Water: Sewage Treatment Plant; mg/L	0.595	0.297	1.041	0.52
Soil: mg/kg	1.231E-4	<0.01	0.26	0.357

**RCR = Risk Characterization Rati*

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Predicted Exposure Concentrations / Risk Characterization Ratio– Worker

Qualitative assessment was completed to demonstrate control considering alternate modes and the use of defined operational conditions and risk management measures for other routes.

PROC	Application	Inhalation long-term systemic mg/m³	RCR*	Inhalation acute systemic mg/m³	RCR*	Dermal systemic long-term mg/kg body weight/day	RCR*
1	Use of solvents in closed systems, no exposure	0.039	0.016	0.155	0.021	0.034	0.243
2	Use of solvents in closed, continuous systems with occasional controlled exposure.	0.582	0.233	2.328	0.31	0.068	0.489
4	Use of solvents in batch processes (synthesis).	0.233	0.093	0.931	0.124	0.034	0.245
8a	Transfer of substance at non-dedicated facilities	0.349	0.14	2.328	0.31	0.041	0.294
8b	Transfer of substance at dedicated facilities	0.087	0.035	0.582	0.078	0.021	0.147
15	Sampling / laboratory use	0.698	0.279	4.656	0.621	0.01	0.073

**RCR: Risk Characterization Ratio*

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