



Piperidine Safety Data Sheet

According to the federal final rule of hazard communication revised on 2012 (HazCom 2012)

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Piperidine

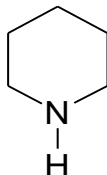
Safety Data Sheet

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SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

PRODUCT NAME : Piperidine
CAS RN : 110-89-4
EC# : 203-813-0
SYNONYMS : Azacyclohexane; Cyclopentimine; Cypentil; Hexahydropyridine; Hexazane; Pentamethyleneimine; Pentamethylenimine; Pyridine, Hexahydro-
SYSTEMATIC NAME : Piperidine
MOLECULAR FORMULA : C₅H₁₁N
STRUCTURAL FORMULA



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

1.2.1. Relevant identified uses

It is used as a solvent and intermediate; curing agent for rubber and epoxy resins; catalyst for condensation reactions; ingredient in oils and fuels; complexing agent and as a synthetic flavoring. Present in Table 2 of the 1988 Convention of intermediates that are listed as precursors to the illicit manufacture of narcotic drugs and psychotropic substances.

Uses advised against: None

1.3. Details of the supplier of the safety data sheet

Jubilant Life Sciences India

FACTORY OFFICE: Jubilant Life Sciences Ltd., Nimbut Village – Nira (R.S.), Dist – Pune, Maharashtra, India – 412102

PHONE NO: +91-2112-269155-57 T +91-120-4361000 E-mail: support@jubl.com

HEAD OFFICE: Jubilant Life Sciences Ltd., Plot 1-A, Sector 16-A, Institutional Area, Noida, Uttar Pradesh, 201301 - India

T +91-120-4361000 - F +91-120-4234881 / 84 / 85 / 87 / 95 / 96 support@jubl.com - www.jubl.com

1.4. Emergency telephone number

CHEMTEL 24-HOUR EMERGENCY TELEPHONE NUMBERS :

North America: 1-800-255-3924

International: +1-813-248-0585

India: 000-800-100-4086

Brazil: 0-800-591-6042

Mexico: 01-800-099-0731

SECTION 2: HAZARD(S) IDENTIFICATION

2.1. Classification of the substance or mixture

GHS-US classification

Flammable Liquid: Category 2

Acute Toxicity Dermal: Category 3

Acute toxicity inhalation: Category 3

Skin corrosion/irritation: Category 1C

2.2. Label Elements

Hazard Pictogram: GHS 05, GHS 02, GHS 06

Signal Word: Danger!



HAZARD AND PRECAUTIONARY STATEMENTS:

HAZARD STATEMENTS

- H225: Highly flammable liquid and vapour.
- H311: Toxic in contact with skin.
- H331: Toxic if inhaled.
- H314: Causes severe skin burns and eye damage.

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PRECAUTIONARY STATEMENTS

- P210: Keep away from heat/sparks/open flames/.../hot surfaces. ... No smoking.
- P233: Keep container tightly closed
- P240: Ground/bond container and receiving equipment.
- P241: Use explosion-proof electrical/ventilating/lighting/.../ equipment.
- P280: Wear protective gloves/protective clothing/eye protection/face protection.
- P270: Do not eat, drink or smoke when using this product.
- P261: Avoid breathing dust/fume/gas/mist/vapours/spray.
- P271: Use only outdoors or in a well-ventilated area.
- P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P370+P378: In case of fire: Use water for extinction.
- P301+P312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
- P302+P352: IF ON SKIN: Wash with plenty of soap and water.
- P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P301+P330+P331: IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
- P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P337+P313: If eye irritation persists: Get medical advice/attention.
- P403+233: Store in a well-ventilated place. Keep container tightly closed.
- P501: Dispose of contents/container to local/regional/national/international regulations.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Chemical	CAS #	Purity	GHS-US classification
Piperidine	110-89-4	>98%	Flammable Liquid: Category 2 Acute Toxicity Dermal: Category 3 Acute toxicity inhalation: Category 3 Skin corrosion/irritation: Category 1C

SECTION 4: First aid measures

4.1. Description of first aid measures

Key symptoms

Acute effects

Piperidine causes serious eye irritation and skin burns. It is toxic in contact with skin and if inhaled.

- **Eyes: Redness, pain, burns, loss of vision.**
- **Skin:** Pain, redness, burns. Behavioral somnolence observed in test animals. Neurotoxicity indication in rats via dermal adsorption.
- **Ingestion:** Cause nausea, vomiting, salivation, headache, dizziness, muscle weakness, depression and abdominal pain.
- **Inhalation:** Sore throat, cough, burning sensation, shortness of breath, labored breathing, headache, nausea and vomiting. It can irritate the nose and throat causing coughing and wheezing.

Chronic effects:

- It may affect the liver and kidneys. There is limited evidence that it may damage the developing fetus.

FIRST AID:

- **Eyes:** If in eyes rinse cautiously with water for at least 15 minutes. Remove contact lenses if easy to do so. Continue rinsing. Seek medical attention.
- **Skin:** Immediately take off all contaminated clothing. Wash thoroughly with water for at least 15 minutes. Wash contaminated clothes before reuse. Seek immediate medical attention.
- **Inhalation:** Remove to fresh air and keep at rest in a position comfortable for breathing. Call a physician if you feel unwell.
- **Ingestion:** If swallowed call a poison center if you feel unwell. Rinse mouth. Do NOT induce vomiting by use of emetics. Seek medical attention.

SECTION 5 : FIRE-FIGHTING MEASURES

5.1. Extinguishing media

- *Appropriate extinguishing media:*
- *Appropriate extinguishing media:* Dry chemical powder, chemical foam, and alcohol resistant foam. Do not use water jet or fog (spray) to extinguish. Water can be effective in cooling down the fire-exposed containers. Use water spray to knock down fire fumes if possible.

5.2. Special Protective Equipment and Precautions for Fire Fighter

- Evacuate the area and fight fires from a safe distance.
- Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Do not breathe vapors.



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- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Always stay away from tanks engulfed in fire.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.
- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions or as per locally valid procedures.
- Fire fighters must wear Self Contained Breathing Apparatus (SCBA) and full protective clothing. The chemical is harmful in contact with skin.
- Report any run-off of fire waters contaminated with this chemical as per local and federal procedures applicable.

5.3. Unusual fire and explosion hazard

- Toxic vapors may be released on thermal decomposition including nitrogen oxides, carbon monoxide and cyanide.
- High vapor concentration may result in an explosion hazard.
- Vapors are heavier than air. May travel considerable distance from source and flashback.

SECTION 6 : ACCIDENTAL RELEASE MEASURES

Minor Spills

- Clean up all spills immediately following relevant Standard Operating Procedures.
- Avoid breathing vapors and contact with skin and eyes.
- Shut off leak source if possible.
- Shut off all possible sources of ignition.
- Wear protective clothing, boots, impervious gloves and safety glasses.
- Wipe up.
- Decontaminate all equipment.
- Use non-sparking tools.

Major Spill

- Alert Emergency Responders and tell them location and nature of hazard.
- Shut off all possible sources of ignition and increase ventilation.
- Wear protective clothing, full boots, impervious gloves, safety glasses and Self Contained Breathing Apparatus (SCBA), as may be deemed appropriate.
- Clear area of personnel and move upwind.
- Stop leaks if possible.
- Prevent, by any means available, spillage from entering drains or water and watercourses.
- Collect recoverable product into labeled containers for recycling, recovery or disposal.
- Contain spill with sand, earth or vermiculite.
- Spread area with lime or absorbent material, and leave for at least 1 hour before washing.
- Clean up all tools and equipment.
- Inform authorities in event of contamination of any public sewers, drains or water bodies.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

- Do not breathe vapor or mist.
- Wear protective gloves/clothing and eye/face protection.
- Wash thoroughly after handling.
- Ground and secure containers when dispensing or pouring product.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Launder contaminated clothing before re-use.
- If on skin or hair, IMMEDIATELY remove all contaminated clothing and rinse/shower with plenty of water.
- Use in a well-ventilated place/Use protective clothing commensurate with exposure levels.

7.2. Storage

- Store at ambient temperature in a dry and well ventilated place.
- Store in a flame proof area.
- Store away from incompatible materials.
- Keep only in original container.
- Store in a tightly closed container.

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SECTION 8 : EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

- Exposure Limits Values

CONTROL PARAMETERS:

Chemical name	ACGIH TLV	OSHA PEL	NIOSH
Piperidine	None listed	None listed	None listed

Exposure Limits (International):

- AIHA WEEL = 0.1 ppm (3.5 mg/m³)

8.2. Exposure Controls

Appropriate Engineering Controls:

- Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits. Local ventilation is usually preferred. Ensure that eyewash stations and safety showers are close to the workstation location.

8.3. Personal Protection:

- Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.

- Hands:** Wear appropriate protective gloves to prevent skin exposure.

In full Contact:

Glove material: butyl rubber
 Layer thickness: 0.70 mm
 Breakthrough Time: >480 Min

In Splash Contact:

Glove material: Nitrile Rubber
 Layer thickness: 0.40 mm
 Breakthrough Time: >120 Min

- Eyes:** Safety goggles/ Chemical Safety glasses and Face shield.
- Clothing:** Boots and clothing to prevent contact.
- Respirator:** Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

General Hygiene and general comments:

- Wash hands and face after working with substance.
- Immediately change contaminated clothing.
- Apply skin protective barrier cream.

SECTION 9 : PHYSICAL AND CHEMICAL PROPERTIES

- Information on basic physical and chemical properties.

Sr.No.	Parameter	Typical value
1.	Appearance	Clear, colorless liquid.
2.	Odor	Like amine.
3.	Odor Threshold	Not available
4.	pH	12.6 (100 g/L Aqueous solution)
5.	Melting point/Freezing point	-10 to -13°C
6.	Boiling Point	106°C @ 760 mm Hg
7.	Flash point	27°C closed cup (80.6°F)
8.	Evaporation rate (n-BuAc=1)	Not available
9.	Flammability	Flammable
10.	Upper/lower flammability or Explosive limits	Not Available
11.	Vapor pressure	34 hPa @ 20 °C
12.	Vapor density (air=1)	2.94

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13.	Relative density	0.861
14.	Solubility	Soluble in water
15.	Partition coefficient : n-(Octanol / water)	0.84
16.	Auto-ignition temperature	Not available
17.	Decomposition temperature	Not available
18.	Viscosity	Not available
19.	Explosive property	No
20.	Oxidizing property	No

SECTION 10: STABILITY AND REACTIVITY

- **Stability:** Stable under normal temperature and pressures.
- **Conditions to avoid:** Keep away from heat, sparks, flame, high temperature and incompatible chemicals.
- **Incompatible chemicals:** Acids, acid chlorides, acid anhydrides, carbon dioxide, strong oxidizing agents, dicyanofurazan, N-nitrosoacetanilide, 1-perchlorylpiperidine.
- **Hazardous decomposition:** Thermal decomposition may produce carbon monoxide, carbon dioxides, oxides of nitrogen.
- **Hazardous Polymerization:** Not reported.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

- **Acute toxicity**
Piperidine causes serious eye irritation and skin burns. It is toxic in contact with skin and if inhaled.

RTECS#: TM3500000

LD50/LC50

Acute Oral LD50Rat	400 mg/kg
Acute Dermal LD50 Rabbit	276 mg/kg
Acute Inhalation (LC50) Rat	6,000 mg/m ³ /2H
Skin Rabbit 100 µg/24 hour open irritation test	Severe
Eye Rabbit 250 µg/24 hour	Severe

- Skin corrosion/irritation**
Causes skin irritation.
- Serious eye damage/irritation**
Causes serious eye irritation.
- Respiratory or skin sensitization**
Causes irritation to respiratory system and skin burns.
- Germ cell mutagenicity**
There is limited evidence that it may damage the developing fetus.
- Carcinogenicity**
Not listed by NTP, IARC and OSHA.
Not present on the EU CMR list.
According to information presently available. Piperidine is not found to be carcinogenic.
- Reproductive toxicity**
No data is available.
- STOT-single exposure**
No data is available.
- STOT-repeated exposure**
No data available.
- Aspiration Hazards**
No data available.

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SECTION 12: ECOLOGICAL INFORMATION

Toxicity

Ecotoxicity:

- Fish LC50 96-hr (*Leuciscusidus*) =130mg/l (American Chemistry Council's HPV programme).
- Invertebrates EC50 = 8.2 mg/l (American Chemistry Council's HPV programme).
- Aquatic plants EC50 =10.4 mg/l (American Chemistry Council's HPV programme).

Based on the estimated values it is expected that it may be toxic to invertebrates and algae at relatively low concentrations.

Persistence and degradability

- Piperidine is expected to be found predominantly in soil. It is also expected to be found in water but not in sediment. It undergoes rapid biodegradation when exposed to UV light in the atmosphere.

Bioaccumulative potential

- BCF = 3.162
- Log Kow = 0.84. Low potential to bio accumulate.

Based on the Log Kow and Bio concentration factor value it is expected to have low potential to concentrate in fatty tissue of fish and aquatic organisms.

Mobility in soil

- Log Koc = 93.39 (predicted). Moderate absorption in soil.
- Henry's Law Constant = 9.805E-006 atm-m³/mole .
- Log Kow = 0.84. Low potential to bio accumulate.

Other adverse effects

Environment Fate:

- Based on the environmental modeling, this material has a low potential to get moderate absorbed in the organic matter of soil and is slightly volatile from water bodies. Since this is an estimated result it is recommended that the material should not be disposed into the environment. The material should never be disposed into the sewage.

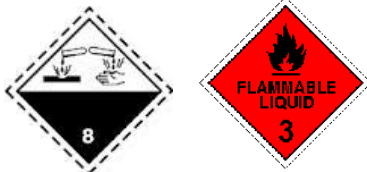
SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

- Burn in a chemical incinerator equipped with an afterburner and scrubber.
- Exert extra care in igniting, as this material is flammable.
- Dispose of this material in accordance with standard practice for disposal of potentially hazardous materials as required by applicable federal, state or local laws. Note that disposal regulations may also apply to empty containers and equipment rinsates.

SECTION 14: TRANSPORT INFORMATION

- This substance is considered to be Hazardous for transport by Air/Road and Sea and thus regulated by IATA/ICAO/US DOT/IMO/IMDG.

Agency	UN Number	Proper Shipping name	Hazard Class	Packing Group
DOT	UN 2401	Piperidine	8 (3) Corrosive, Flammable liquid.	I
IMDG	UN 2401	PIPERIDINE	8 (3) Corrosive, Flammable liquid.	I
IATA	UN 2401	Piperidine	8 (3) Corrosive, Flammable liquid.	I
Hazard Label	8 (3) Corrosive, Flammable liquid.			

Environmental hazards

- Marine pollutant: No



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SECTION 15: REGULATORY INFORMATION

- **European Union Information**

Classification as per CLP Regulation 1272/2008:

- **Hazards Class and Category:** Flammable liquid Cat.2, Acute tox dermal Cat.3, Acute tox inh cat.3,
- **Hazard Statements:** H225; H311; H331; H314

Chemical Inventory Lists:	Status
TSCA:	Present
EINECS:	203-813-0
Canada(DSL/NDSL):	Listed DSL
Japan:	5-765
Korea:	KE-28769
Australia:	Not Listed
China: IECSC	Listed

US information

- **Health & Safety Reporting List**
None of the chemicals are on the Health & Safety Reporting List.
- **Chemical Test Rules**
None of the chemicals in this product are under a Chemical Test Rule.
- **Section 12b**
None of the chemicals are listed under TSCA Section 12b.
- **TSCA Significant New Use Rule**
None of the chemicals in this material have a SNUR under TSCA.

SARA

- **Section 302 (RQ)**
None of the chemicals in this material have an RQ.
- **Section 302 (TPQ)**
CAS# 110-89-4: TPQ = 1000 pounds; RQ = 1000 pounds
- **SARA Codes**
CAS # 110-89-4: acute, flammable.
- **Section 313**
No chemicals are reportable under Section 313.
- **Clean Air Act:**
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depleters.
This material does not contain any Class 2 Ozone depleters.
- **Clean Water Act:**
None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
- **OSHA**
None of the chemicals in this product are considered highly hazardous by OSHA.
- **STATE**
Piperidine can be found on the following state right to know lists: New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.
- **California**
No Significant Risk Level

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SECTION 16: OTHER INFORMATION

a) Compilation information of safety data sheet

Date of compilation : April 05, 2012
Chemical : Piperidine
CAS # : 110-89-4
File Name : 0025Nr Ghs12 Div.2 sds Piperidine
Revision Number : 12
Date of Revision : January 15, 2019
Revision Due Date : December, 2021
Supersedes date : March 14, 2019

b) A key or legend to aberrations and acronyms used in the safety data sheet

- PBT =Persistent Bioaccumulative and Toxic.
- vPvB= Very Persistent and Very Bioaccumulative.
- SCBA= Self Contained Breathing Apparatus.
- NIOSH REL= National Institute for Occupational Safety and Health Recommended Exposure Limit.
- OSHA PEL=Occupational Safety and Health Administration Permissible Exposure Limit.
- OELTWA= Occupational Exposure Limit Time Weighted Averages.
- IDLH= Immediately Dangerous to Life or Health.
- UEL= Upper Explosive Limit.
- LEL= Lower Explosive Limit.
- RTECS= Registry of Toxic Effects of Chemical Substances.
- NTP=National Toxicology Program.
- IARC= International Agency for Research on Cancer.
- EPA=Environmental Protection Agency.
- TSCA= Toxic Substances Control Act.
- CERCLA= Comprehensive Environmental Response, Compensation, and Liability Act.
- SARA= Superfund Amendments and Reauthorization Act.
- NFPA= National Fire Protection Association.
- WHIMS= Workplace Hazardous Materials Information System.
- DSL/NDSL= Domestic/Non-Domestic Substances List.
- CSR=Chemical Safety Report.
- BCF = Bio Concentration Factor.
- DNEL = Derived No Effect Level.
- PNEC = Predicted No Effect Concentration.
- TLV = Threshold Limit Value.
- ACGIH = American Conference of Governmental Industrial Hygienists.
- REACH = Registration, Evaluation .Authorization and Restriction of Chemicals.
- CLP = Classification, Labeling and Packaging.
- LD / LC = Lethal Doses / Lethal Concentration.
- GHS = Globally Harmonized System.
- ADR = Accord europeen relative au transport international de marchandises.
- IMDG-Code = International Maritime Code for Dangerous Goods.
- EmS = Emergency measures on Sea.
- ICAO = International Civil Aviation Organization.
- IATA/DGR= International Air Transport Association/Dangerous Goods Regulation.

c) Key Literature reference and sources for data

Biographical reference and data sources

- Globally Harmonized System of Classification and Labelling of Chemicals.
- CLP REG (regulation) (EC) no. 1272/2008, last modification by regulation (EC) no. 790/2009.
- APCISS

SDS US (GHS HazCom 2012)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

(End of Safety Data Sheet)