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

## 1.1. Product identifier

<table>
<thead>
<tr>
<th>Product form</th>
<th>Substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade name</td>
<td>PIPERIDINE</td>
</tr>
<tr>
<td>CAS No</td>
<td>110-89-4</td>
</tr>
<tr>
<td>Product code</td>
<td>AB02304</td>
</tr>
<tr>
<td>Formula</td>
<td>C5H11N</td>
</tr>
</tbody>
</table>

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

Use of the substance/mixture: Chemical raw material

## 1.3. Details of the supplier of the safety data sheet

AmericanBio, Inc.
15 Erie Dr.
Natick, MA 01760 - USA
T 800.443.0600 - F 508.655.2754
info@americanbio.com - www.americanbio.com

## 1.4. Emergency telephone number

Emergency number: 855.835.2572 (U.S.) :: 760.602.8703 (Outside U.S.)

# SECTION 2: Hazards identification

## 2.1. Classification of the substance or mixture

### Classification (GHS-US)

<table>
<thead>
<tr>
<th>Classification</th>
<th>H225</th>
<th>H311</th>
<th>H331</th>
<th>H314</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flam. Liq. 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute Tox. 3 (Dermal)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute Tox. 3 (Inhalation:dust,mist)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skin Corr. 1A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## 2.2. Label elements

### GHS-US labeling

- **Hazard pictograms (GHS-US):**
  - GHS02
  - GHS05
  - GHS06

- **Signal word (GHS-US):** Danger

- **Hazard statements (GHS-US):**
  1. H225 - Highly flammable liquid and vapor
  2. H311 + H331 - Toxic in contact with skin or if inhaled
  3. H314 - Causes severe skin burns and eye damage

- **Precautionary statements (GHS-US):**
  1. P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking
  2. P233 - Keep container tightly closed
  3. P240 - Ground/bond container and receiving equipment
  4. P241 - Use explosion-proof production equipment
  5. P242 - Use only non-sparking tools
  6. P243 - Take precautionary measures against static discharge
  7. P260 - Do not breathe fume, gas, mist, spray, vapors
  8. P261 - Avoid breathing fume, gas, mist, spray, vapors
  9. P264 - Wash hands, forearms, face thoroughly after handling
  10. P271 - Use only outdoors or in a well-ventilated area
  11. P280 - Wear eye protection, face protection, protective clothing, protective gloves
  12. P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
  13. P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
  14. P303 + P361 + P330 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
  15. P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
  16. P305 + P351 + P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
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2.3. Other hazards
No additional information available

2.4. Unknown acute toxicity (GHS-US)
No data available

SECTION 3: Composition/information on ingredients

3.1. Substance

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>Classification (GHS-US)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIPERIDINE</td>
<td>(CAS No) 110-89-4</td>
<td>100</td>
<td>Flam. Liq. 2, H225 Acute Tox. 3 (Dermal), H311 Acute Tox. 3 (Inhalation:dust,mist), H331 Skin Corr. 1A, H314</td>
</tr>
</tbody>
</table>

Full text of H-phrases: see section 16

3.2. Mixture
Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures


First-aid measures after inhalation: Remove the victim into fresh air. Immediately consult a doctor/medical service. Remove to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician. Specific treatment (see If you feel unwell, seek medical advice. on this label).

First-aid measures after skin contact: Wash immediately with lots of water (15 minutes)/shower. Wash immediately with PE-glycol 400. Do not apply (chemical) neutralizing agents. Remove clothing while washing. Do not remove clothing if it sticks to the skin. Cover wounds with sterile bandage. Consult a doctor/medical service. If burned surface > 10%: take victim to hospital. Rinse skin with water/shower. Remove/Take off immediately all contaminated clothing. Immediately call a POISON CENTER or doctor/physician. Wash with plenty of soap and water. Specific measures (see Consult a doctor/medical service on this label). Wash contaminated clothing before reuse.

First-aid measures after eye contact: Rinse immediately with plenty of water for 15 minutes. Do not apply neutralizing agents. Take victim to an ophthalmologist. Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.


4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries: Causes severe skin burns and eye damage.
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### Symptoms/injuries after inhalation

### Symptoms/injuries after skin contact
- Blisters. Caustic burns/corrosion of the skin. Destruction of tissue. Symptoms similar to those listed under inhalation. Repeated exposure to this material can result in absorption through skin causing significant health hazard. Toxic in contact with skin.

### Symptoms/injuries after eye contact
- Corrosion of the eye tissue.

### Symptoms/injuries after ingestion
- Risk of aspiration pneumonia. Burns to the gastric/intestinal mucosa. Difficulty in swallowing. Symptoms similar to those listed under inhalation.

4.3. Indication of any immediate medical attention and special treatment needed
No additional information available

### SECTION 5: Firefighting measures

#### 5.1. Extinguishing media
- Unsuitable extinguishing media: Solid water jet ineffective as extinguishing medium. Do not use a heavy water stream.

#### 5.2. Special hazards arising from the substance or mixture
- Fire hazard: DIRECT FIRE HAZARD. Highly flammable. Gas/vapour flammable with air within explosion limits. INDIRECT FIRE HAZARD. May be ignited by sparks. Gas/vapour spreads at floor level: ignition hazard. Highly flammable liquid and vapor.
- Explosion hazard: DIRECT EXPLOSION HAZARD. Gas/vapour explosive with air within explosion limits. INDIRECT EXPLOSION HAZARD. May be ignited by sparks. May form flammable/explosive vapor-air mixture.

#### 5.3. Advice for firefighters
- Firefighting instructions: Cool tanks/drums with water spray/remove them into safety. Do not move the load if exposed to heat. Dilute toxic gases with water spray. Take account of toxic fire-fighting water. Use water moderately and if possible collect or contain it. Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Avoid (reject) fire-fighting water to enter environment.
- Protection during firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures
- General measures: Remove ignition sources. Use special care to avoid static electric charges. No naked lights. No smoking.

#### 6.1.1. For non-emergency personnel

#### 6.1.2. For emergency responders
- Protective equipment: Equip cleanup crew with proper protection.
- Emergency procedures: Ventilate area.

#### 6.2. Environmental precautions
Prevent soil and water pollution. Prevent spreading in sewers. Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.
### 6.3 Methods and material for containment and cleaning up

**For containment**: Contain released substance, pump into suitable containers. Consult "Material-handling" to select material of containers. Plug the leak, cut off the supply. Dam up the liquid spill. Try to reduce evaporation. Measure the concentration of the explosive gas-air mixture. Dilute combustible/toxic gases/vapours with water spray. Take account of toxic/corrosive precipitation water. Provide equipment/receptacles with earthing. Do not use compressed air for pumping over spills.

**Methods for cleaning up**: Take up liquid spill into absorbent material, e.g.: sand, earth, vermiculite kieselguhr, powdered limestone. Do not take up in combustible material such as: saw dust. Scoop absorbed substance into closing containers. See "Material-handling" for suitable container materials. Carefully collect the spill/leftovers. Damaged/cooled tanks must be emptied. Do not use compressed air for pumping over spills. Clean contaminated surfaces with an excess of water. Take collected spill to manufacturer/competent authority. Wash clothing and equipment after handling. Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials.

### 6.4 Reference to other sections

See Heading 8. Exposure controls and personal protection.

### SECTION 7: Handling and storage

#### 7.1 Precautions for safe handling

**Additional hazards when processed**: Handle empty containers with care because residual vapors are flammable.

**Precautions for safe handling**: Comply with the legal requirements. Remove contaminated clothing immediately. Clean contaminated clothing. Handle uncleansed empty containers as full ones. Thoroughly clean/dry the installation before use. Do not discharge the waste into the drain. Do not use compressed air for pumping over. Use spark-/explosionproof appliances and lighting system. Take precautions against electrostatic charges. Keep away from naked flames/heat. Keep away from ignition sources/sparks. Observe strict hygiene. Keep container tightly closed. Measure the concentration in the air regularly. Work under local exhaust/ventilation. Wash hands and other exposed areas with mild soap and water before eat, drink or smoke and when leaving work. Provide good ventilation in process area to prevent formation of vapor. No naked lights. No smoking. Use only non-sparking tools. Use only outdoors or in a well-ventilated area. Avoid breathing fume/gas/mist/vapours/spray. Do not breathe fume/gas/mist/vapours/spray. Avoid contact during pregnancy/while nursing.

**Hygiene measures**: Wash hands, forearms, face thoroughly after handling.

#### 7.2 Conditions for safe storage, including any incompatibilities

**Technical measures**: Proper grounding procedures to avoid static electricity should be followed. Ground/bond container and receiving equipment. Use explosion-proof production equipment. Comply with applicable regulations.

**Storage conditions**: Keep only in the original container in a cool, well ventilated place away from : Direct sunlight., Heat sources. Keep in fireproof place. Keep container tightly closed.

**Incompatible products**: Strong bases. strong acids.

**Incompatible materials**: Sources of ignition. Direct sunlight. Heat sources.

**Heat-ignition**: KEEP SUBSTANCE AWAY FROM: heat sources. Ignition sources.

**Prohibitions on mixed storage**: KEEP SUBSTANCE AWAY FROM: oxidizing agents. (strong) acids.

**Storage area**: Store at room temperature. Keep out of direct sunlight. Store in a dry area. Ventilation at floor level. Fireproof storeroom. Keep locked up. Provide for a tub to collect spills. Provide the tank with earthing. Unauthorized persons are not admitted. Under a shelter/in the open. May be stored under nitrogen. Meet the legal requirements.

**Special rules on packaging**: SPECIAL REQUIREMENTS: closing. clean. correctly labelled. meet the legal requirements. Secure fragile packagings in solid containers.

**Packaging materials**: SUITABLE MATERIAL: glass. MATERIAL TO AVOID: aluminium. zinc.

### 7.3 Specific end use(s)

No additional information available

### SECTION 8: Exposure controls/personal protection

#### 8.1 Control parameters

No additional information available

#### 8.2 Exposure controls

**Personal protective equipment**: Avoid all unnecessary exposure.

**Materials for protective clothing**: GIVE EXCELLENT RESISTANCE: butyl rubber. GIVE GOOD RESISTANCE: nitrile rubber. GIVE POOR RESISTANCE: natural rubber. PVC. neoprene.
Hand protection: Gloves. Wear protective gloves.
Eye protection: Chemical goggles or face shield. Safety glasses.
Skin and body protection: Head/neck protection. Corrosion-proof clothing. Wear suitable protective clothing.
Other information: When using, do not eat, drink or smoke.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Liquid</td>
</tr>
<tr>
<td>Molecular mass</td>
<td>85.15 g/mol</td>
</tr>
<tr>
<td>Color</td>
<td>Colourless.</td>
</tr>
<tr>
<td>Odor</td>
<td>Irritating/pungent odour. Ammonia odour.</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>&lt; 2 ppm</td>
</tr>
<tr>
<td></td>
<td>&lt; 7.1 mg/m³</td>
</tr>
<tr>
<td>pH</td>
<td>12.6</td>
</tr>
<tr>
<td>Relative evaporation rate (butyl acetate=1)</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting point</td>
<td>-10 °C</td>
</tr>
<tr>
<td>Freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling point</td>
<td>106 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>16 °C</td>
</tr>
<tr>
<td>Self ignition temperature</td>
<td>320 °C</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>&gt; 100 °C</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>34 hPa</td>
</tr>
<tr>
<td>Vapor pressure at 50 °C</td>
<td>140 hPa</td>
</tr>
<tr>
<td>Relative vapor density at 20 °C</td>
<td>3.0</td>
</tr>
<tr>
<td>Relative density</td>
<td>0.86</td>
</tr>
<tr>
<td>Relative density of saturated gas/air mixture</td>
<td>1.06</td>
</tr>
<tr>
<td>Density</td>
<td>861 kg/m³</td>
</tr>
<tr>
<td>Log Pow</td>
<td>0.84</td>
</tr>
<tr>
<td>Log Kow</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>0.00146 Pa.s (20 °C)</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive limits</td>
<td>1.5 - 10.3 vol %</td>
</tr>
</tbody>
</table>

9.2. Other information

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturation concentration</td>
<td>115 g/m³</td>
</tr>
<tr>
<td>VOC content</td>
<td>100 %</td>
</tr>
<tr>
<td>Other properties</td>
<td>Gas/vapour heavier than air at 20°C. Clear. Volatile. Substance has basic reaction.</td>
</tr>
</tbody>
</table>

SECTION 10: Stability and reactivity

10.1. Reactivity


10.2. Chemical stability

Stable under normal conditions. Not established. Highly flammable liquid and vapor. May form flammable/explosive vapor-air mixture.
10.3. Possibility of hazardous reactions
Not established.

10.4. Conditions to avoid
Direct sunlight. Extremely high or low temperatures. Open flame.

10.5. Incompatible materials
strong acids. Strong bases.

10.6. Hazardous decomposition products

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity: Toxic in contact with skin. Toxic if inhaled.

<table>
<thead>
<tr>
<th>PIPERIDINE (110-89-4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 dermal rabbit</td>
</tr>
<tr>
<td>LC50 inhalation rat (mg/l)</td>
</tr>
<tr>
<td>LC50 inhalation rat (ppm)</td>
</tr>
</tbody>
</table>

Skin corrosion/irritation: Causes severe skin burns and eye damage.

| pH: 12.6 |

Serious eye damage/irritation: Not classified

| pH: 12.6 |

Respiratory or skin sensitization: Not classified

| |

Germ cell mutagenicity: Not classified

Carcinogenicity: Not classified

Reproductive toxicity: Not classified

Specific target organ toxicity (single exposure): Not classified

Specific target organ toxicity (repeated exposure): Not classified

Aspiration hazard: Not classified

Potential Adverse human health effects and symptoms: Based on available data, the classification criteria are not met. Toxic in contact with skin. Toxic if inhaled.


Symptoms/injuries after skin contact: Blisters. Caustic burns/corrosion of the skin. Destruction of tissue. Symptoms similar to those listed under inhalation. Repeated exposure to this material can result in absorption through skin causing significant health hazard. Toxic in contact with skin.

Symptoms/injuries after eye contact: Corrosion of the eye tissue.

Symptoms/injuries after ingestion: Risk of aspiration pneumonia. Burns to the gastric/intestinal mucosa. Difficulty in swallowing. Symptoms similar to those listed under inhalation.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - air: Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009).


<table>
<thead>
<tr>
<th>PIPERIDINE (110-89-4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 fish 1</td>
</tr>
<tr>
<td>LC50 other aquatic organisms 1</td>
</tr>
<tr>
<td>EC50 Daphnia 1</td>
</tr>
<tr>
<td>Threshold limit other aquatic organisms 1</td>
</tr>
</tbody>
</table>
12.2. Persistence and degradability

<table>
<thead>
<tr>
<th>PIPERIDINE (110-89-4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persistence and degradability</td>
</tr>
</tbody>
</table>

12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>PIPERIDINE (110-89-4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log Pow</td>
</tr>
<tr>
<td>Bioaccumulative potential</td>
</tr>
</tbody>
</table>

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Other information : Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations : Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Incinerate under surveillance with energy recovery. Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to local/Federal regulations.

Additional information : LWCA (the Netherlands): KGA category 06. Hazardous waste according to Directive 2008/98/EC. Handle empty containers with care because residual vapors are flammable.

Ecology - waste materials : Hazardous waste due to toxicity. Avoid release to the environment.

SECTION 14: Transport information

In accordance with DOT

No dangerous good in sense of transport regulations

Additional information

Other information : No supplementary information available.

ADR

Transport document description : UN 2401, 8 (3), I, (D/E)
Packing group (ADR) : I
Class (ADR) : 8 - Corrosive substances
Hazard identification number (Kemler No.) : 883
Classification code (ADR) : CF1
Danger labels (ADR) : 8 - Corrosive substances
3 - Flammable liquids

Orange plates

Tunnel restriction code : D/E

Transport by sea

UN-No. (IMDG) : 2401
Class (IMDG) : 8 - Corrosive substances
Subsidiary risks (IMDG) : 3
EmS-No. (1) : F-E
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EmS-No. (2) : S-C

Air transport
UN-No.(IATA) : 2401
Class (IATA) : 8 - Corrosives
Packing group (IATA) : I - Great Danger
Subsidiary risks (IATA) : 3

SECTION 15: Regulatory information

15.1. US Federal regulations
PIPERIDINE (110-89-4)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations
CANADA
No additional information available

EU-Regulations
No additional information available

Classification according to Regulation (EC) No. 1272/2008 [CLP]
Flam. Liq. 2 H225
Acute Tox. 3 (Inhalation) H331
Acute Tox. 3 (Dermal) H311
Skin Corr. 1B H314
Full text of H-phrases: see section 16

Classification according to Directive 67/548/EEC or 1999/45/EC
F; R11
T; R23/24
C; R34
Full text of R-phrases: see section 16

15.2. National regulations
No additional information available

15.3. US State regulations
PIPERIDINE(110-89-4)
State or local regulations U.S. - New Jersey - Right to Know Hazardous Substance List

SECTION 16: Other information

Other information : None.

Full text of H-phrases: see section 16:

Acute Tox. 3 (Dermal) Acute toxicity (dermal) Category 3
Acute Tox. 3 (Inhalation:dust,mist) Acute toxicity (inhalation:dust,mist) Category 3
Flam. Liq. 2 Flammable liquids Category 2
Skin Corr. 1A Skin corrosion/irritation Category 1A
H225 Highly flammable liquid and vapor
H311 Toxic in contact with skin
H314 Causes severe skin burns and eye damage
H331 Toxic if inhaled
# PIPERIDINE
## Safety Data Sheet
According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

<table>
<thead>
<tr>
<th>NFPA health hazard</th>
<th>3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFPA fire hazard</td>
<td>3 - Liquids and solids that can be ignited under almost all ambient conditions.</td>
</tr>
<tr>
<td>NFPA reactivity</td>
<td>0 - Normally stable, even under fire exposure conditions, and are not reactive with water.</td>
</tr>
</tbody>
</table>

SDS US (GHS HazCom 2012)
AmericanBio, Inc. does not make any representations, guaranties or warranties as to the accuracy of the information provided in this Safety Data Sheet, which has been provided by a third party, is made in accordance with United States Global Harmonization System (GHS) initiative HAZCOM 2012 (Federal Register, Vol. 77, No. 58, Monday March 26, 2012/Rules and Regulations), and is intended only to describe the product for the purposes of health, safety and environmental requirements. It is expressly understood and agreed that AmericanBio, Inc. shall in no way be deemed or held to be obligated, liable, or accountable upon or under any guaranties or warranties, express or implied, statutory, by operation of law, or otherwise, in any manner or form, including any implied warranty of merchantability or fitness for a particular purpose, that in any way relates to or arises out of the information provided in this Safety Data Sheet.