

Cyclopentane Safety Instructions

CAS No. 287-92-3 | Chemical Formula: C_5H_{10} | Alternative Name: Pentamethylene

Intended use: Cyclopentane is used as an organic solvent, chemical feedstock, and blowing agent for rigid polyurethane insulation foam. Its liquid and vapour are highly flammable and must be used only in areas with suitable fire protection, explosion protection, and ventilation.

This document is a general safety reference for industrial, laboratory, production, storage, and logistics activities. It does not replace the supplier's official Safety Data Sheet (SDS), product label, site-specific risk assessment, workplace procedures, or applicable legal requirements.

1. Hazard Identification

Cyclopentane is a colourless, volatile liquid. Its vapour can form explosive mixtures with air. Heating can increase pressure inside a container, creating a risk of bursting or explosion. Vapour may collect in low-lying areas, trenches, drains, and sewers, and may be ignited by a distant ignition source.

- Inhalation of high vapour concentrations may cause coughing, nausea, headache, dizziness, drowsiness, impaired coordination, or loss of consciousness.
- May irritate the eyes and respiratory tract. Skin contact may cause redness, defatting, or dryness.
- If swallowed and aspirated into the airways, serious harm may occur. Do not induce vomiting.
- Toxic to aquatic life. Prevent release to soil, storm drains, sewers, and water bodies.

2. Preparation Before Use

- Ensure good general ventilation. Provide local exhaust ventilation for large-scale use, filling, mixing, transfer, or heating.
- Use explosion-proof electrical equipment, lighting, fans, and instruments where vapour may be present.
- Ground or bond equipment, metal containers, transfer lines, and receiving containers to prevent electrostatic discharge.
- Prohibit open flames, smoking, welding, cutting, grinding, and all other spark-producing work in the area.
- Keep suitable fire extinguishers available, such as foam, carbon dioxide, or dry powder. Keep non-combustible inert absorbent material and suitable spill-collection containers nearby.

3. Personal Protective Equipment

Protection area	Recommended controls and equipment
Respiratory protection	Where ventilation is inadequate, concentrations may rise, or emergency response is underway, use respiratory protection suitable for low-boiling organic vapours.
Eye and face protection	Wear chemical safety goggles. Add a face shield when splashing is possible.
Hand protection	Wear chemical-resistant protective gloves and inspect them for damage before use.
Body protection	Wear antistatic workwear and safety footwear. Use a chemical-resistant apron or protective clothing where appropriate.
Static control	Avoid clothing that readily generates static electricity. Follow site grounding and static-discharge procedures.

Wash hands and exposed skin thoroughly after work. Do not eat, drink, or smoke in the work area.

4. Safe Handling Procedures

1. Before use, inspect containers, valves, hoses, seals, and grounding arrangements. Confirm that there is no leak.
2. Open containers only in a well-ventilated area free from ignition sources. Use closed transfer or closed charging whenever practicable.
3. Handle slowly to avoid violent pouring, splashing, and excessive vapour release.
4. Do not use compressed air for filling, unloading, or transfer. Use explosion-protected equipment and non-sparking tools.
5. Keep away from heat, sparks, open flames, hot surfaces, strong oxidizers, and other incompatible materials.
6. Close containers immediately when not in use. Reseal opened containers securely and keep them upright to prevent leakage.
7. Do not discharge product or waste into drains, ditches, stormwater systems, sewers, or the environment.

Example: When transferring cyclopentane from a drum to a process vessel, first confirm that the supply drum and receiving vessel are bonded and grounded. Activate local exhaust ventilation, then use an approved explosion-proof pump or closed transfer system. Stop work immediately if a strong solvent odour, abnormal liquid level, or damaged hose or fitting is observed.

5. Storage Requirements

- Store in a cool, dry, well-ventilated area designated for flammable liquids. Keep containers tightly closed.
- Keep away from direct sunlight, heat sources, sparks, open flames, and hot equipment.
- Store separately from strong oxidizers, food, feed, and incompatible materials.
- Use explosion-proof electrical equipment in storage areas and display clear “Flammable Liquid” and “No Smoking / No Open Flame” warning signs.
- Empty containers may retain flammable vapour. Do not weld, cut, drill, crush, or perform work that could ignite vapour in an empty container.

6. Spill Response

1. Stop work and remove all ignition sources.
2. Evacuate non-essential personnel to a safe area and move upwind where possible.
3. Increase ventilation and prevent vapour accumulation in low areas, trenches, drains, and sewers.
4. Stop the leak only if it can be done safely; do not enter an area with high vapour concentrations without appropriate protection.
5. Collect liquid using sand or another non-combustible, inert absorbent material and place it in a suitable sealed container.
6. Do not use sawdust or other combustible absorbent materials.
7. Prevent product from entering sewers, water bodies, or soil. Arrange disposal through an authorized waste contractor in accordance with applicable requirements.
8. For a major spill, vapour cloud, or fire risk, activate the site emergency plan and contact emergency services or trained response personnel.

7. Fire Emergency Response

Use foam, carbon dioxide, dry powder, or dry sand for extinguishing. Avoid using a strong water jet directly on spilled liquid because it may spread the material. Water spray may be used to cool containers exposed to fire. Fight fire from upwind or a safe distance and avoid inhaling combustion products. Heated containers may rupture; evacuation and response by trained fire personnel should take priority.

8. First Aid Measures

Exposure route	Immediate action
Inhalation	Move the person to fresh air and keep at rest. Seek immediate medical attention for dizziness, drowsiness, breathing difficulty, or altered consciousness.
Skin contact	Remove contaminated clothing. Rinse with plenty of water, then wash with soap and water. Obtain medical advice if irritation persists.
Eye contact	Rinse cautiously with plenty of running water for several minutes. Remove contact lenses if easy to do, continue rinsing, and seek prompt medical attention.
Ingestion	Rinse the mouth. Do not induce vomiting. Contact a physician or emergency service immediately and identify the product as cyclopentane.

For serious exposure, unconsciousness, seizures, respiratory arrest, or suspected aspiration injury, call emergency medical services immediately. Provide the product label or SDS to medical personnel where available.

9. Waste Disposal

Treat residual cyclopentane, contaminated absorbents, wipes, personal protective equipment, and empty containers as hazardous waste or flammable-organic-solvent waste. Do not dispose of these materials in household waste, drains, sewers, or the environment. Arrange disposal through an authorized contractor in accordance with local requirements.

10. Key Safety Reminders

- The principal hazards of cyclopentane are high flammability and explosive vapour-air mixtures.
- Even a small release may create a hazardous vapour concentration in low-lying or poorly ventilated areas.
- Fire prevention, explosion protection, ventilation, grounding, bonding, and static control must be implemented together.
- This guide does not replace the official supplier SDS. Actual product labels and SDSs take precedence because purity, packaging, transport, and intended use may introduce additional hazards.

Source basis: International Chemical Safety Card (ICSC) 0353 — Cyclopentane.