

Material Safety Data for: Cyclopentane

1. PRODUCT IDENTIFICATION

Name	cyclopentane
Synonyms	pentamethylene
CAS#	287-92-3
Product Uses	solvent for fat extraction, cellulose acetate solvent, aerosol propellant, organic synthesis

2. INGREDIENTS

	%	TWAEV / TLV mg/m ³	LD ₅₀ ORAL	(mg/kg) SKIN	LC ₅₀ ppm INHALATION
Cyclopentane	100%	600 / 1720	11,400	not known	25,200

3. (a) HAZARDS SUMMARY

Hazards, Quick Guide: extremely volatile & flammable liquid, heavy vapour travels, distant ignition & flashback are possible

Canada – WHMIS

Key:

B 2

B 2 – Flash Point <38°C, B 3 – Flash Point >38°C & <93°C

D 1 – Immediately Toxic, D 2 – Chronic Toxicity

C – Oxidising Substance, E – Corrosive

U.S.A. – HMIS

Key:

Health – 0, Fire – 4, Reactivity – 0

0=minimal, 1=slight, 2=moderate, 3=serious, 4=severe

3. (b) HAZARDS – TOXICITY

Effects, Acute Exposure

Skin Contact	little to no effect – very rapid evaporation helps prevent harmful effect
Skin Absorption	slight; no toxic effects likely by this route
Eye Contact	vapour & liquid slightly irritating – very rapid evaporation helps prevent harmful effect
Inhalation	may irritate; headache, dizziness, drowsiness, intoxication – <i>symptoms may be partly due to hypoxia as pentane vapour displaces oxygen in the air</i>
Ingestion	very low toxicity;

Effects, Chronic Exposure

General	prolonged exposure may cause dermatitis due to removal of skin oils
Sensitising	not a sensitiser in humans or animals
Carcinogen/Tumorigen	not considered a tumorigen or a carcinogen in humans or animals
Reproductive Effect	no known effect in humans or animals
Mutagen	no known effect on humans or animals
Synergistic With	not known
LD ₅₀ (oral)	11,400mg/kg (rat), 12,800mg/kg (mouse)
LD ₅₀ (skin)	not known
LC ₅₀ (inhalation)	25,200 & 37,000ppm (mouse), 38,460ppm (rat)

Please ensure that this MSDS is given to, and explained to people using this product.

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4. FIRST AID

- SKIN:** Wash with soap and plenty of water. (*Evaporation rapidly removes cyclopentane from clothing. Accordingly, laundering may not be necessary.*)
- EYES:** Wash eyes with plenty of water, holding eyelids open. Seek medical assistance promptly if there is irritation.
- INHALATION:** Remove from contaminated area promptly. **CAUTION: Rescuer must not endanger himself!** If breathing stops, administer artificial respiration and seek medical aid promptly.
- INGESTION:** Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below hips to prevent inhalation of vomited material. Seek medical help promptly.

Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this relatively low-toxicity substance. The stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.

5. PHYSICAL PROPERTIES

Odour & Appearance	clear, colourless liquid with pleasant gasoline-like odour
Odour Threshold	not known
Vapour Pressure	77mmHg / 10kPa (20°C / 68°F); 400mmHg / 53.3kPa (31°C / 88°F)
Evaporation Rate (<i>Butyl Acetate = 1</i>)	6
Vapour Density (air = 1)	2.4
Boiling Range	49.5°C / 121°F
Freezing Point	-93°C / -135°F
Specific Gravity	0.75 (20/20°C)
Water Solubility	150milligrams per litre (20°C / 68°F)
Also soluble in	most organic solvents
Viscosity	below 0.32centipoise (20°C / 68°F)
pH	none – (<i>does not liberate hydrogen ions when dissolved</i>)
Conversion Factor	1ppm = 2.86mg/m ³
Molecular Weight	70grams per mole

6. FLAMMABILITY & FIRE FIGHTING

Flash Point	-37°C / -35°F (closed cup)
Autoignition Temperature	361°C / 682°F
Flammable Limits	1.1% – 8.7%
Combustion Products	carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments
Fire Fighting Precautions	foam, dry chemical; water is ineffective; CO ₂ discharge may produce static which could re-ignite fire; cool intact containers with water spray; fire fighters must wear SCBA
Static Charge Accumulation	<i>readily accumulates a static charge on agitation or pumping, which can cause ignition</i>

7. STABILITY / REACTIVITY

Dangerously Reactive With	strong oxidising agents; chlorine and fluorine
Also Reactive With	not known; dissolves many plastics
Stability	stable; will not polymerize
Decomposes in Presence of	not known
Decomposition Products	none apart from Hazardous Combustion Products
Sensitive to Mechanical Impact	no

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8. PROTECTIVE EQUIPMENT / EXPOSURE CONTROL

ACGIH TLV	600ppm / 1720mg/m ³
OSHA PEL	600ppm / 1720mg/m ³
STEL	not listed
Ventilation procedures	mechanical ventilation required to keep airborne titre below regulated limits; depending on handling

NOTE: Due to extreme volatility & flammability, product should only be used in sealed equipment. Respirators with organic vapour cartridges must be available in the work place for "escape" in case of accidental release. These should be kept in air-tight containers (eg: Tupperware) to preserve "freshness."

Hands	not required; "Viton" gloves may be worn – other types may also protect; consult supplier
Eyes	safety glasses with side shields – always protect the eyes
Clothing	no special protective clothing required

9. HANDLING & STORAGE

Store **a minimum quantity** in a cool (below 30°C / 86°F) environment, away from sources of ignition, heat and oxidising agents. **Always use non-sparking bronze or aluminium hand tools. All electrical and mechanical equipment (including lighting, switchgear and forklift trucks) used with or around this product must be explosion-proof.** Always ground or electrically bond both the source container and the receiving container, and transfer pump before transferring contents. Avoid splashing by ensuring that the product nozzle is below the surface in the receiving container.

Bulk storage should be outdoors, but under a roof to prevent exposure to the sun. Tanks must be vented, and the vents equipped with spark arrestors. Drums must be kept away from oxidisers and corrosives. Drums should have pressure/vacuum relief venting. Drums should be bonded or grounded – *contact with an appropriately conductive concrete floor may be adequate.* Drum storage area must be well ventilated – *with floor level venting!* Storage area should have raised sills to contain spills. Storage area must be kept clean and free of rags, mops, and similar equipment.

Never use a cloth dampened with this product for wiping or cleaning surfaces! The friction of wiping is likely to generate a static charge which may ignite the cyclopentane.

Avoid breathing product vapour. Use with adequate ventilation. If dealing with a spill, and ventilation is impossible or impractical, wear a suitable respirator with organic vapour cartridge. *An air-supplied respirator may be necessary because cyclopentane is so volatile that it may displace oxygen, potentially asphyxiating an unprotected worker.*

Never cut, drill, weld or grind on or near this container. Avoid contact with skin and wash work clothes frequently. An eye bath and safety shower must be available near the workplace.

10. SPILL PROCEDURES

Extreme Fire Risk: blanket spill with foam as a precaution against accidental ignition. Take great care to avoid sparks – do not operate (turn on OR off) electrical appliances near spill, unless explosion proof.

Leak Precaution	dyke to control spillage and prevent environmental contamination
Handling Spill	ventilate contaminated area; recover free liquid with suitable pumps; absorb residue on an inert sorbent, sweep & pick up using plastic or aluminium shovel, & store in closed containers for recycling or disposal (<i>residue will probably evaporate before any formal cleanup can be attempted</i>)

11. DISPOSAL

Waste Disposal	do not flush to sewer , recycle solvent if possible, may be incinerated in approved facility
Containers	Drums should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use. Pails must be vented and thoroughly dried prior to crushing and recycling. IBCs (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs). Steel containers must be inspected, pressure tested & recertified every 5 years. <i>Never cut, drill, weld or grind on or near this container, even if empty</i>

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12. ENVIRONMENTAL INFORMATION

Bioaccumulation cyclopentane is poorly absorbed but may bioaccumulate moderately
Biodegradation cyclopentane degrades slowly in the presence of oxygen
Abiotic Degradation cyclopentane reacts with atmospheric hydroxyl radicals; its estimated half-life in air is 66 hours
Mobility in soil, water cyclopentane is water insoluble and cannot move readily in soil and water; evaporation is rapid, reducing the likelihood of soil or water contamination

Aquatic Toxicity

EC₅₀ (Crustacea, 48hr) 19.6mg/litre (artemia salina), 10.5mg/litre (daphnia magna)
EC₅₀ (Algae, 3hr) 124mg/litre (chlamydomonas species), 116mg/litre (chlorella vulgaris)

13. TRANSPORT REGULATIONS

<i>Canada TDG</i>	PIN	UN-1146
AND	Shipping Name	cyclopentane
<i>U.S.A. 49 CFR</i>	Class	3
	Packing Group	II
Marine Pollutant		not a marine pollutant

14. EMERGENCY INFORMATION

<i>Canada</i>	Call CANUTEC (collect)	(613) 996-6666
<i>U.S.A.</i>	Call CHEMTREC	(800) 424-9300

15. REGULATIONS

Canada DSL	on inventory
U.S.A. TSCA	on inventory
Europe EINECS	on inventory (EC# 206-016-6)

OSHA Standards: Vacated 1989 OSHA PEL TWA 600 ppm (1720 mg/cu m) is still enforced in some states.

NIOSH Recommendations: Recommended Exposure Limit: 10 Hr Time-Weighted Avg: 600 ppm (1720 mg/cu m).

Threshold Limit Values: 8 hr Time Weighted Avg (TWA): 600 ppm. Excursion Limit Recommendation: Excursions in worker exposure levels may exceed 3 times the TLV-TWA for no more than a total of 30 minutes during a work day, and under no circumstances should they exceed 5 times the TLV-TWA, provided that the TLV-TWA is not exceeded.

TSCA Requirements: Section 8(a) of TSCA requires manufacturers of this chemical substance to report preliminary assessment information concerned with production, use, and exposure to EPA as cited in the preamble in 51 FR 41329. Pursuant to section 8(d) of TSCA, EPA promulgated a model Health and Safety Data Reporting Rule. The section 8(d) model rule requires manufacturers, importers, and processors of listed chemical substances and mixtures to submit to EPA copies and lists of unpublished health and safety studies. Cyclopentane is included on this list.

16. PREPARATION INFORMATION

Prepared for Megaloid Laboratories by Peter Bursztyn, (705) 734-1577

File Name: **Cyclopentane**

With data from RTECS, Haz. Substance Data Base, Cheminfo (CCOHS), IUCLID Datasheets (European Chem. Substance Info. System), & others, as available

Preparation Date: **November 2003** Revision Date: **September 2006, September 2009**

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