



## Safety Data Sheet

### 1. PRODUCT IDENTIFICATION

Name	<b><i>n</i>-Pentane or normal-Pentane</b>
Synonyms	pentane
CAS#	109-66-0
Europe EC#	203-692-4
Product Uses	gasoline component, low temperature thermometers, foam blowing agent, aerosol propellant, solvent, heat transfer fluid (refrigeration – <i>mainly in Europe</i> ) & others

### 2. HAZARDS

**Quick Guide:** extremely flammable liquid, heavy vapour may travel, distant ignition & flashback 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, **F** – Reactive Substance

#### U.S.A. – HMIS

Key:

#### Health – 1, Fire – 4, Reactivity – 0

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

### 3. COMPOSITION

	%	TWAEV / TLV mg/m <sup>3</sup>	LD <sub>50</sub> (mg/kg) ORAL	LD <sub>50</sub> (mg/kg) SKIN	LC <sub>50</sub> ppm INHALATION
Pentane	100%	500 / 1760	>2000	not known	123,800

### 4. FIRST AID

**SKIN:** Wash with plenty of water. Remove contaminated clothing and do not reuse until thoroughly laundered.

*Rapid evaporation may make washing irrelevant . . .*

**EYES:** Wash eyes with plenty of water, holding eyelids open. *Very rapid evaporation may make washing irrelevant . . .*

**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. FIRE FIGHTING & FLAMMABILITY

Flash Point	-40°C / -40°F (closed cup)
Autoignition Temperature	260°C / 500°F
Flammable Limits	1.5% – 7.8%
Combustion Products	carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments
Fire Fighting Precautions	foam, dry chemical, water fog or spray only to cool, product floats on water – water jet spreads flames; fire fighters must wear SCBA
Static Charge Accumulation	readily accumulates a static charge on agitation or pumping

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

## 6. ACCIDENTAL RELEASE MEASURES

***Very Serious Fire Potential: Blanket spill with foam as a precaution against accidental ignition. Take extreme 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; *residue likely to evaporate rapidly . . .*

## 7. HANDLING & STORAGE

Store in a cool environment, away from sources of ignition, heat and oxidising agents. ***Use only heavy gauge drums capable of containing at least 1 atmosphere pressure. Keep drums out of direct sunlight. 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. Empty containers may contain a flammable / explosive vapour. Always ensure that containers, whether empty or full, or part full, are tightly sealed unless in use. ***Before opening a drum check the drum head. If it is bulging, open the bung slowly to release pressure, keeping your face as far from the bung as possible. Consider wearing a face shield when doing this.***

Avoid breathing product vapour. Use with adequate ventilation to control vapour titre in the workplace to regulated limits (Part 8). ***If dealing with a spill & thorough ventilation is not possible, wear an air-supplied respirator.***

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

*Pentane volatilises readily*

## 8. EXPOSURE CONTROL & PERSONAL PROTECTION

Ontario TWAEV	600ppm / 1770mg/m <sup>3</sup>
Ontario STEV	750ppm / 2210mg/m <sup>3</sup>
ACGIH TLV	600ppm / 1770mg/m <sup>3</sup>
OSHA PEL	500ppm / 1500mg/m <sup>3</sup>
Ventilation	mechanical ventilation may be required to maintain airborne titre below TWAEV / TLV
Hands	no special protective glove required; nitrile or “Viton” gloves are resistant – <i>other types may also protect</i>
Eyes	safety glasses with side shields – <i>always protect the eyes</i>
Clothing	no special protective clothing required; <i>a face shield is recommended if opening drums which may be under internal pressure</i>

## 9. PHYSICAL PROPERTIES

Odour & Appearance	clear, colourless, mobile liquid with pleasant gasoline odour
Odour Threshold	120 – 1150ppm – <i>very wide range</i>
Vapour Pressure	488mmHg / 65kPa (20°C / 68°F)
Evaporation Rate ( <i>Butyl Acetate = 1</i> )	12-13
Vapour Density (air = 1)	2.5
Boiling Range	36°C / 97°F – <b><i>boils at slightly below body temperature</i></b>
Freezing Point	-130°C / -202°F
Specific Gravity	0.626 (20/20°C)
Water Solubility	38mg/litre (25°C / 77°F) – <i>virtually insoluble</i>
Also soluble in alcohols	non-polar organic solvents, poor solubility in methanol, soluble in ethanol and other alcohols
Viscosity	0.23centipoise (20°C / 68°F) – <i>very thin, mobile liquid; splashes readily</i>
pH	none – ( <i>does not liberate hydrogen ions when dissolved</i> )
Conversion Factor	1ppm = 2.94mg/m <sup>3</sup>
Molecular Weight	72grams per mole

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

**10. REACTIVITY**

Dangerously Reactive With	strong oxidising agents; fluorine or chlorine gas may cause explosion with pentane
Also Reactive With	bromine; damages plastics – eg: polypropylene, ABS, polyurethane & some grades of polyethylene
Stability	stable; will not polymerize
Decomposes in Presence of	not known
Decomposition Products	none apart from Hazardous Combustion Products
Sensitive to Mechanical Impact	no

**11. TOXICITY****Effects, Acute Exposure**

Skin Contact	little or no effect – <i>evaporates very rapidly</i>
Skin Absorption	nil to slight; no toxic effects likely by this route
Eye Contact	may be slightly irritating – <i>evaporates very rapidly</i>
Inhalation	headache, dizziness, drowsiness, intoxication; <i>pentane concentration from spill can become high enough to displace oxygen, causing asphyxia</i>
Ingestion	not known – <i>not a route of industrial exposure</i>

**Effects, Chronic Exposure**

General	prolonged exposure may cause dermatitis; <i>long term neurological effects occur with n-hexane exposure by inhalation; may also happen with n-pentane, but there is no actual evidence for this</i>
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 <sub>50</sub> (oral)	above 2000mg/kg (rat)
LD <sub>50</sub> (skin)	not known
LC <sub>50</sub> (inhalation)	123,800ppm (rat)

**12. ECOLOGICAL INFORMATION**

Bioaccumulation	moderate bioaccumulator – <i>evaporates very rapidly limiting exposure</i>
Biodegradation	degrades readily & rapidly in the presence of oxygen; over 90% of theoretical BOD in 4 weeks ( <i>Japanese MITI Test</i> ); 72% in 8 days ( <i>Total Solvents, France</i> )
Abiotic Degradation	reacts with atmospheric hydroxyl radicals; estimated ½-life in air is 4 days; in water photooxidation by
Mobility in soil, water	ultraviolet light gives a degradation rate to CO <sub>2</sub> of 31% in 24 hours
<b>Aquatic Toxicity</b>	may move readily in soil and water; <i>however rapid evaporation may limit mobility</i>
LC <sub>0</sub> (Fish, 96hr)	no mortality observed at 100mg/litre ( <i>Oncorhynchus kisutch</i> )
EC <sub>50</sub> (Crustacea)	11.8mg/litre ( <i>Artemia salina</i> , 24hr), 9.7mg/litre ( <i>Daphnia magna</i> , 48hr)

*NOTE: Very rapid evaporation of pentane makes it hard to carry out a meaningful aquatic toxicity test . . .*

**13. DISPOSAL**

Waste Disposal	<b>do not flush to sewer</b> , recycle solvent if possible, if local regulations permit, may be put in sanitary landfill, may be incinerated in approved facility
Containers	<b>Drums</b> should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use. <b>Pails</b> must be vented and thoroughly dried prior to crushing and recycling. <b>IBCs</b> (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>

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

**14. TRANSPORT CLASSIFICATION**

<b>Canada TDG</b>	<b>PIN</b>	<b>UN-1265</b>
<b>AND</b>	<b>Shipping Name</b>	<b>pentanes</b>
<b>U.S.A. 49 CFR</b>	<b>Class</b>	<b>3</b>
	<b>Packing Group</b>	<b>I</b>
<b>Marine Pollutant</b>		<b>not a marine pollutant</b>
<b>ERAP Required</b>		<b>NO</b>

**EMERGENCY INFORMATION**

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

**15. REGULATIONS**

<b>Canada DSL</b>	<b>on inventory</b>
<b>U.S.A. TSCA</b>	<b>on inventory</b>
<b>Europe EINECS</b>	<b>on inventory</b>

**Immediately Dangerous to Life or Health:** 1500 ppm (Based on 10% of the lower explosion limit for safety considerations even though the relevant toxicological data indicated that irreversible health effects or impairment of escape existed only at higher concentrations.)

**OSHA Standards:** Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 1000 ppm (2950 mg/cu m). Vacated 1989 OSHA PEL TWA 600 ppm (1800 mg/cu m); STEL 750 ppm (2250 mg/cu m) is still enforced in some states.

**NIOSH Recommendations:** Recommended Exposure Limit: 10 Hr Time-Weighted Avg: 120 ppm (350 mg/cu m). Recommended Exposure Limit: (15 Min) Ceiling value: 610 ppm (1800 mg/cu m).

**Threshold Limit Values:** 8 hr Time Weighted Avg (TWA): 600 ppm. /Pentane, all isomers/ 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. /Pentane, all isomers/

**Atmospheric Standards:** This action promulgates standards of performance for equipment leaks of Volatile Organic Compounds (VOC) in the Synthetic Organic Chemical Manufacturing Industry (SOCMI). The intended effect of these standards is to require all newly constructed, modified, and reconstructed SOCMI process units to use the best demonstrated system of continuous emission reduction for equipment leaks of VOC, considering costs, non air quality health and environmental impact and energy requirements. n-Pentane is produced, as an intermediate or final product, by process units covered under this subpart.

**TSCA Requirements:** Section 8(a) of TSCA requires manufacturers of this chemical substance to report preliminary assessment information concerned with production, exposure, and use 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. Pentane is included on this list.

**16. OTHER INFORMATION**

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

*Data from RTECS, HSDB (Haz. Substance Data Base), Cheminfo (CCOHS), IUCLID Datasheets (ESIS – European Chem. Substance Info. System), & others.*

*Preparation Date: August 2006 Revision Date: July 2009, June 2012*

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