Established in 1981
megaloid laboratories limited
2221 Ninth Line | Oakville, ON L6H 7G7
Phone: 905-337-7411 | Fax: 905-337-1686
megaloid.ca

Material Safety Data for: Heptane

1. PRODUCT INDENTIFICATION

Name	**Heptane**
Synonyms	***several heptane isomers have specific names – eg: 2-methylhexane, 2,3-dimethylpentane***
CAS#	**142-82-5**
Europe EC#	**205-563-8**
Product Uses	**solvent in glue, ink, etc; fuel ("zero" standard for octane testing of gasoline),**

2. INGREDIENTS

	%	TWAEV / TLV mg/m^3	LD_{50} (mg/kg) ORAL	LD_{50} (mg/kg) SKIN	LC_{50} ppm INHALATION
Heptane	100%	400 / 1640	>5,000	>3000	25,200

3. (a) HAZARDS SUMMARY

Hazards, Quick Guide: flammable liquid, heavy vapour travels, distant ignition and flashback may occur, fire cannot be extinguished by water alone, central nervous depressant

Canada – WHMIS	**B 2, D 2B**
Key:	***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	**Health – 2, Fire – 3, Reactivity – 0**
Key:	***0****=minimal,* ***1****=slight,* ***2****=moderate,* ***3****=serious,* ***4****=severe*

3. (b) HAZARDS – TOXICITY

Effects, Acute Exposure

Skin Contact	drying, irritating if not removed – *note that rapid evaporation makes prolonged accidental contact unlikely*
Skin Absorption	slight; no toxic effects likely by this route
Eye Contact	irritating if not removed, will not damage eyes; vapour apparently *not* irritating at 5000ppm
Inhalation	at 5000ppm*, dizziness, drowsiness, intoxication – persisting for 15-20 minutes (*some giddiness is seen even at 1000ppm [in 6 min] & 2000ppm [in 4 min]*)
Ingestion	very low toxicity – dizziness, drowsiness, intoxication may occur, possible diarrhoea

* *This product is volatile enough that 5000ppm is readily achieved, even at ambient temperature.*

Effects, Chronic Exposure

General	prolonged exposure (one hour) may cause redness, swelling & pain; repeated application may cause dermatitis due to aggressive solvency; *rapid evaporation – prolonged contact cannot be accidental*
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)	17,000mg/kg mg/kg (rat); 5000mg/kg (mouse)
LD_{50} (skin)	>3000mg/kg (rabbit)
LC_{50} (inhalation)	25,200ppm (rat)

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4. FIRST AID

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

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	>230ppm – ***too close to the TLV for reliable warning***
Vapour Pressure	40mmHg / 5.3kPa* (22°C / 72°F)
Evaporation Rate (*Butyl Acetate = 1*)	5.5
Vapour Density (air = 1)	3.5
Boiling Range	90-100°C / 194-212°F*
Freezing Point	below -90°C / -130°F*
Specific Gravity	0.68* (20/20°C)
Water Solubility	3milligrams per litre (20°C / 68°F)
Also soluble in	most organic solvents
Viscosity	0.49centipoise* (25°C / 77°F)
pH	none – (*does not liberate hydrogen ions when dissolved*)
Conversion Factor	1ppm = 4.09mg/m^3
Molecular Weight	100grams per mole

** This product is a mixture of heptane isomers. The values for many physical properties may not be precise.*

6. FLAMMABILITY & FIRE FIGHTING

Flash Point	-4°C / 25°F* (closed cup)
Autoignition Temperature	204°C / 399°F*
Flammable Limits	1.0% – 6.7% - *readily achieved at ambient temperature (15-25°C)*
Combustion Products	carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments
Fire Fighting Precautions	alcohol or polymer foam, dry chemical, water fog, water spray only to cool & dilute, 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; readily ignited by a spark****

This product is a mixture of heptane isomers. The values for many physical properties cannot be given precisely.

7. STABILITY / REACTIVITY

Dangerously Reactive With	strong oxidising agents
Also Reactive With	none known
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	400ppm / 1640mg/m^3 (also Ontario TWAEV)
OSHA PEL	500ppm / 2000mg/m^3
STEL	500ppm / 2050mg/m^3 (also Ontario STEL)
Ventilation	mechanical ventilation may be required to control airborne titre to regulated limits; respirator masks with *organic vapour cartridge* should be available to all workers in the area should ventilation fail (for "escape"); respirators should be stored in airtight containers (eg: "Tupperware" or "Zip Lock") to maintain "freshness"
Hands	nitrile or "Viton" gloves recommended – *other types may also protect; consult supplier to confirm suitability*
Eyes	safety glasses with side shields – *always protect the eyes*
Clothing	protective clothing is not generally necessary; an impermeable (above) apron, boots, & long sleeves may be worn if there is any danger of splashing

9. HANDLING & STORAGE

Store in a cool, dry environment, away from sources of ignition, heat and oxidising agents. ***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.***

This product will accumulate a static charge on agitation or transfer from one container to another, and the vapour can be readily ignited by a spark. Always ground or electrically bond the source container, receiving container, and transfer pump before transferring contents. Avoid splashing by ensuring that the product nozzle is below the surface in the receiving container.

Do not use as a solvent for manual wiping of surfaces. The accumulation of static charge may cause a fire!

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.

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.

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.

WHEN FILLING STORAGE TANKS WITH THIS PRODUCT, IN ADDITION TO NORMAL GROUNDING PROCEDURES, READ THE FOLLOWING:
This product may form an explosive mixture inside a bulk storage tank. Prior to filling a bulk storage tank with this product, consider ventilating the headspace with nitrogen. In addition, consider asking the supplier to put an anti-static additive in the product when you order. If the bulk tank has a floating product level indicator, this should be inspected regularly. The float MUST HAVE a firmly fixed ground wire connecting it to its support cable. This connection must be free of corrosion.
Consult NFPA 77, 2007: "Recommended Practice on Static Electricity"

10. SPILL PROCEDURES

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 explosion-proof pumps; absorb residue on an inert sorbent, sweep & pick up using plastic or aluminium shovel, & store in closed containers for recycling or disposal.

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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. ***Never cut, drill, weld or grind on or near this container, even if empty***

12. ENVIRONMENTAL INFORMATION

Bioaccumulation	volatile & readily metabolised by microorganisms; cannot bioaccumulate
Biodegradation	degrades readily in the presence of oxygen; 23% - 100% degradation in 5 days depending on bacterial innoculum
Abiotic Degradation	destroyed by direct photolysis with an estimated ½-life in air of 1.1days
Mobility in soil, water	water insoluble; moves slowly in soil & water; evaporation from soil will be rapid

Aquatic Toxicity

LC_{50} (Fish, 96hr) 4924mg/litre (Gambusia affinis), 375mg/litre (Tilapia mossambica), 220-270mg/litre (Leuciscus idus)
EC_{50} (Crustacea, 24hr) >10mg/litre (Daphnia magna), 0.1mg/litre (Mysidopsis bahia),0.2mg/litre(Chaetogammarusmarinus)
EC_{50} (Algae) 1.5mg/litre ("phytoplankton")

13. TRANSPORT REGULATIONS

Canada TDG	**PIN**	**UN-1206**
AND	**Shipping Name**	**heptanes**
U.S.A. 49 CFR	**Class**	**3**
	Packing Group	**II**
Marine Pollutant		**not a marine pollutant**

14. EMERGENCY INFORMATION

Canada	**Call CANUTEC (collect)**	**(613) 996-6666**
U.S.A.	**Call CHEMTREC**	**(800) 424-9300**

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15. REGULATIONS

Canada DSL	**on inventory**
U.S.A. TSCA	**on inventory**
Europe EINECS	**on inventory**

Immediately Dangerous to Life or Health: 750 ppm.

OSHA Standards: Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 500 ppm (2000 mg/cu m). Vacated 1989 OSHA PEL TWA 400 ppm (1600 mg/cu m); STEL 500 ppm (2000 mg/cu m) is still enforced in some states.

NIOSH Recommendations: Recommended Exposure Limit: 10 Hr Time-Weighted Avg: 85 ppm (350 mg/cu m). Recommended Exposure Limit: (15 Min) Ceiling value: 440 ppm (1800 mg/cu m).

Threshold Limit Values: 8 hr Time Weighted Avg (TWA): 400 ppm; 15 min Short Term Exposure Limit (STEL): 500 ppm.

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. Heptane is included on this list.

16. PREPARATION INFORMATION

Prepared for Megaloid Laboratories by Peter Bursztyn, (705) 734-1577
With data from RTECS, Haz. Substance Data Base, Cheminfo (CCOHS), IUCLID Datasheets (European Chem. Substance Info. System), & others, as available
Preparation Date: ***November 2002*** *Revision Date*: ***December 2005, November 2008, November 2011***

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