



Safety Data Sheet

1. PRODUCT IDENTIFICATION

Name	n-Propyl Bromide
Synonyms	1-bromopropane
CAS#	106-94-5
Europe EC#	203-445-0
Product Uses	adhesive solvent; cleaning solvent – <i>suggested replacement for 1,1,1-trichloroethane, but see Part 5, Flammability</i>

2. HAZARDS

Quick Guide: flammable liquid, heavy vapour may travel, distant ignition & flashback possible, irritating to skin & eyes; may be neurotoxic and/or carcinogenic on prolonged exposure

Canada – WHMIS

Key:

B 2*, D 2A

* - see Part 5, Flammability

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 – 2, Fire – 2, Reactivity – 0

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

3. COMPOSITION

	%	TWAEV / TLV mg/m ³	LD ₅₀ (mg/kg) ORAL	LD ₅₀ (mg/kg) SKIN	LC ₅₀ ppm INHALATION
1-bromopropane	100%	10 / 50	3600	not known	7100

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.

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5. FIRE FIGHTING & FLAMMABILITY

Flash Point	-10°C to 70°C / 14°F to 158°F – <i>wide range of values reported, including “will not flash”</i>
Autoignition Temperature	409 & 490°C / 768 & 914°F (see NOTE , below)
Flammable Limits	3.5% & 4.6% – 9%
Combustion Products	carbon monoxide, nitrogen oxides, hydrogen bromide, part oxidised hydrocarbon fragments
Firefighting Precautions	CO ₂ , foam, dry chemical, water fog / spray; firefighters must wear SCBA
Static Discharge	not known – may accumulate a static charge

NOTE: Various flash points are published for *n*-propyl bromide. The range given above is from: **Federal Register**, vol 68, #106, June 3, 2003, page 33303 (EPA, 40CFR Part 82). **Hazardous Substances Data Bank**, (HSDB 2006/04/20) calls it “highly flammable” & “dangerous fire hazard”, but gives no flash point. **Scientific Material International**, Miami, tested it (March 2005) reporting “no flash point observed to 160°F” using 3 protocols: ASTM D 92 (COC), ASTM D 93 (P-M CC), & ASTM D 56 (Tag CC). U.S.A. Dept of Transport (**49 CFR**) list “bromopropanes” as Flammable Liquids, Class 3, Packing Group II, (Aug. 1, 2007). **European Database, ESIS**, classifies 1-bromopropane as “highly flammable”. **U.S.A. OSHA** database gives the flash point as 22°C.

On the other hand, it has been reported that *n*-propyl bromide vapour, once ignited, extinguishes itself within minutes.

Megaloid Laboratories recommends this product should only be used in & around fully explosion-proof equipment. Megaloid Laboratories takes no responsibility if this product is used without all the precautions required for flammable materials.

6. ACCIDENTAL RELEASE MEASURES

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

7. HANDLING & STORAGE

Store and use in a cool dry environment, away from sources of ignition, heat and oxidising agents. ***Take care to avoid sparks – use non-sparking bronze or aluminium hand tools. All electrical and mechanical equipment (lighting, switchgear, forklift trucks, etc) used with or around this product must be explosion-proof. (see “NOTE”, Part 6)***

This product may accumulate a static charge on agitation or on transfer between containers. Ground containers, mixers, and transfer equipment before handling to prevent static discharge, which may cause ignition. On transfer, ensure that the delivery nozzle is below the surface in the receiving container to prevent splash.

Empty containers may contain a flammable/explosive vapour. Never cut, drill, weld or grind on or near this container, whether empty or full. ***Always replace drum, pail or IBC cap prior to moving the container!***

Avoid breathing product vapour. Use with adequate ventilation to maintain airborne concentration of the product below the TLV (see IV, IX above). If dealing with a spill, and ventilation is impractical, wear a suitable respirator with organic vapour cartridge. Avoid contact with skin and wash work clothes frequently. An eye bath and safety shower should be available near the workplace.

8. EXPOSURE CONTROL & PERSONAL PROTECTION

Ontario TWAEV	10ppm / 50mg/m ³
ACGIH TLV	10ppm / 50mg/m ³
OSHA PEL	not listed
STEL	not listed
Ventilation	mechanical ventilation may be required to maintain airborne titre below TWAEV; depending on handling procedures
Hands	nitrile or “Viton” gloves recommended – <i>other types may also protect; consult supplier to confirm suitability</i>
Eyes	safety glasses with side shields – <i>always protect the eyes</i>
Clothing	wear impermeable (above) apron, boots, & long sleeves if there is any danger of splashing,

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9. PHYSICAL PROPERTIES

Odour & Appearance	clear, colourless to pale yellow liquid with sweetish, characteristic odour
Odour Threshold	not known
Vapour Pressure	111mmHg / 14.8kPa (20°C/ 68°F)
Evaporation Rate (<i>Butyl Acetate</i> = 1)	not known – approx. 4
Vapour Density (air = 1)	4.25
Boiling Point	71°C / 160°F – <i>decomposes above 204°C – 400°F</i>
Freezing Point	-110°C / -166°F
Specific Gravity	1.35 (20/20°C)
Water Solubility	2.5 grams per litre (20°C / 68°F)
- in other solvents	most organic solvents
Viscosity	0.5 centipoise (20°C / 68°F)
pH	none – <i>does not yield hydrogen ions in solution</i>
Conversion Factor	1ppm = 5.02mg/m ³
Molecular Weight	123grams per mole

10. REACTIVITY

Dangerously Reactive With	strong oxidising agents; alkali metals; strong alkalies
Also Reactive With	may react with finely powdered aluminum
Chemical Stability	stable; will not polymerize
Decomposes in Presence of	heat – temperatures above 204°C / 400°F
Decomposition Products	thermal decomposition yields corrosive hydrogen bromide
Mechanical Impact	not sensitive

11. TOXICITY**Effects, Acute Exposure**

Skin Contact	may be irritating; redness, itching
Skin Absorption	slight; toxic effects unlikely by this route
Eye Contact	may be irritating; redness, itching; unlikely to damage eyes
Inhalation	may irritate; headache, dizziness, drowsiness, intoxication, numbness & weakness of extremities
Ingestion	stomach pain, nausea, vomiting, diarrhoea – not a normal route of industrial exposure

Effects, Chronic Exposure

General	prolonged or repeated exposure may cause dermatitis; the USA Centres for Disease Control suggest that <i>n</i> -propyl bromide vapour may be neurotoxic in chronically exposed workers ¹
Sensitising	not a sensitiser
Carcinogen/Tumorigen carcinogenic	not known to be a carcinogen in humans; animal testing suggests <i>n</i> -propyl bromide is in rats & mice on inhalation ²
Reproductive Effect	no known effect on humans; reproductive toxin in rats @ 500-750ppm (6hr/day) – <i>a high dose!</i>
Mutagen	not known to be a mutagen or teratogen in humans or animals
Synergistic With	not known
LD ₅₀ (oral)	3600 & >4000mg/kg (rat), 4700mg/kg (mouse)
LD ₅₀ (skin)	not known
LC ₅₀ (inhalation)	7100ppm (mouse), 17,800ppm (rat)

(1) <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5748a2.htm>(2) http://ntp.niehs.nih.gov/INDEXF0D9_2.HTM?objectid=4E0C03A9-F1F6-975E-79F1E370B9027815

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12. ECOLOGICAL INFORMATION

Bioaccumulation	<i>n</i> -propyl bromide has a low bioaccumulation potential
Biodegradation	<i>n</i> -propyl bromide is debrominated completely in 6 days yielding 1-propanol which degrades readily & rapidly in the presence of oxygen
Abiotic Degradation days	<i>n</i> -propyl bromide reacts with atmospheric hydroxyl (OH) radicals; estimated ½-life in air is 17 days
Mobility in soil, water the	<i>n</i> -propyl bromide is slightly water soluble and moves slowly through soil and the water column; product is quite volatile and much of a spill is likely to evaporate
Aquatic Toxicity	
LC ₅₀ (Fish, 96hr)	67mg/litre (Pimephelas promelas)
EC ₅₀ (Crustacea, 24hr)	no data
EC ₅₀ (Algae)	no data

13. DISPOSAL

Waste Disposal	do not flush to sewer , recycle solvent if possible, may be incinerated in approved facility with flue gas monitoring and scrubbing
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>

14. TRANSPORT CLASSIFICATION

<i>Canada TDG</i>	PIN	UN - 2344
AND	Shipping Name	bromopropanes
<i>U.S.A. 49 CFR</i>	Class & Packing Group	3 (II)
Marine Pollutant		not a marine pollutant
ERAP Required		NO

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

16. OTHER INFORMATION

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

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