

# Material Safety Data for: *n*-Propyl Alcohol (*n*-Propanol)

## 1. PRODUCT IDENTIFICATION

<b>Name</b>	1-propanol
<b>Synonyms</b>	n-propanol, n-propyl alcohol, <i>normal</i> propyl alcohol, 1-hydroxypropane
<b>CAS#</b>	71-23-8
<b>Europe EC#</b>	200-746-9
<b>Product Uses</b>	paint & ink solvent, chemical feedstock, and others

## 2. INGREDIENTS

	%	TWAEV / TLV mg/m <sup>3</sup>	LD <sub>50</sub> ORAL	(mg/kg) SKIN	LC <sub>50</sub> ppm INHALATION
n-Propyl Alcohol	100%	100 / 245	1870	5040	4000

## 3. (a) HAZARDS SUMMARY

**Hazards, Quick Guide:** flammable liquid, heavy vapour may travel, distant ignition and flashback are possible, irritating to eyes, central nervous system depressant

### Canada – WHMIS

Key:

### B 2, D 2B

*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 – 1, Fire – 3, 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 after 24-hour contact
Skin Absorption	slight; no toxic effects likely by this route
Eye Contact	severely irritating; vapour irritating at 10,000ppm
Inhalation	not known – probably causes dizziness, drowsiness, intoxication, nausea
Ingestion	dizziness, drowsiness, intoxication, nausea – not a route of industrial exposure, particularly
in	view of propanol's strong, unpleasant odour

### Effects, Chronic Exposure

General	prolonged exposure may cause dermatitis
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; fetotoxic & teratogenic at doses causing maternal toxicity
Mutagen	no known effect on humans or animals
Synergistic With	liver toxins; chlorinated solvents
LD <sub>50</sub> (oral)	1870, 2200, 6500 & 8000mg/kg (rat), 2825 & 3500mg/kg (rabbit), 3000mg/kg (dog), 4500 & 6800mg/kg (mouse)
LD <sub>50</sub> (skin)	5040mg/kg (rabbit)
LC <sub>50</sub> (inhalation)	>4000 & >13,550ppm (rat), 19,600ppm (mouse)

**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 plenty of water. Remove contaminated clothing and do not reuse until thoroughly 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 sharp, pungent odour – <i>similar to rubbing alcohol but stronger</i>
Odour Threshold	5-11 ppm
Vapour Pressure	14.5mmHg / 1.95kPa (20°C / 68°F)
Evaporation Rate ( <i>Butyl Acetate = 1</i> )	0.9
Vapour Density (air = 1)	2.1
Boiling Range	98°C / 208°F
Freezing Point	-127°C / -197°F
Specific Gravity	0.805 (20/20°C)
Water Solubility	complete
Also soluble in	most organic solvents, polar and non-polar
Viscosity	2.2centipoise (20°C / 68°F)
pH	none – ( <i>does not liberate hydrogen ions when dissolved</i> )
Conversion Factor	1ppm = 2.45
Molecular Weight	60grams per mole

**6. FLAMMABILITY & FIRE FIGHTING**

Flash Point	above 15°C / 59°F (closed cup); also 23°C / 74°F (closed cup)
Autoignition Temperature	above 371°C / 700°F – <i>higher values are also reported</i>
Flammable Limits	2.2% – 13.7%
Combustion Products	carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments
Fire Fighting Precautions	polymer foam, dry chemical, water fog or spray only to cool containers; product floats on water – water jet spreads flames; fire fighters must wear SCBA
Static Charge Accumulation	cannot accumulate a static charge on agitation or pumping

**7. STABILITY / REACTIVITY**

Dangerously Reactive With	strong oxidising agents, strong acids, acid chlorides, acid anhydrides,
Also Reactive With	alkali metals, alkaline earth metals release hydrogen – reaction may be vigorous
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	100ppm / 245mg/m <sup>3</sup> ,
OSHA PEL	200ppm / 490mg/m <sup>3</sup> , OSHA STEL 250 / 615mg/m <sup>3</sup>
Ventilation	mechanical ventilation may be required to control airborne titre; depending on handling procedures
Hands	no special protective gloves required; butyl or "Viton" gloves are resistant
Eyes	safety glasses with side shields – <i>always protect the eyes</i>
Clothing	no special protective clothing required

## 9. HANDLING & STORAGE

Store in a cool, dry environment, away from sources of ignition, heat, oxidising agents and substances listed in Part 7. 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. 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 creating or breathing product vapour. If vapour is created in use, install adequate exhaust 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.

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

## 11. DISPOSAL

Waste Disposal	<b>do not flush to sewer</b> , recycle solvent if possible, 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>

## 12. ENVIRONMENTAL INFORMATION

Bioaccumulation	cannot bioaccumulate
Biodegradation	degrades readily & rapidly in the presence or absence of oxygen, 75% of theoretical BOD in 20 days (aerobic), 77-81% biodegradation in 15 days (an aerobic)
Abiotic Degradation	reacts with atmospheric hydroxyl radicals; estimated ½-life in air is 2.9 days
Mobility in soil, water	highly water soluble and moves readily in soil and water
<b>Aquatic Toxicity</b>	
LC <sub>50</sub> (Fish, 96hr)	3800mg/litre (Alburnus alburnus), 4480 & 4560mg/litre (Pimephelas promelas), 4650mg/litre (Cyprinodon sp.)
EC <sub>50</sub> (Crustacea, 48hr)	3642 & 6300mg/litre (Daphnia magna), 1000mg/litre (Gammarus pulex), 1520m/litre (Nemoura cinerea)
EC <sub>50</sub> (Bacteria)	9600mg/litre ("activated sludge"), 8686 & 18,400mg/litre (Photobacterium phosphoreum)

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### 13. TRANSPORT REGULATIONS

<b>Canada TDG</b>	<b>PIN</b>	<b>UN-1274</b>
<b>AND</b>	<b>Shipping Name</b>	<b>n-propanol OR propyl alcohol, normal</b>
<b>U.S.A. 49 CFR</b>	<b>Class</b>	<b>3</b>
	<b>Packing Group</b>	<b>II</b>
<b>Marine Pollutant</b>		<b>not a marine pollutant</b>

### 14. 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:** 800 ppm

**Allowable Tolerances:** Residues of n-propanol are exempted from the requirement of a tolerance when used as a solvent or cosolvent in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops or to raw agricultural commodities after harvest. n-Propanol is exempted from the requirement of a tolerance when used as a solvent for blended emulsifiers in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops only. n-Propanol is exempted from the requirement of a tolerance when used as a solvent for blended emulsifiers in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to animals.

**OSHA Standards:** Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 200 ppm (500 mg/cu m). Vacated 1989 OSHA PEL TWA 200 ppm (500 mg/cu m); STEL 250 ppm (625 mg/cu m) is still enforced in some states.

**NIOSH Recommendations:** Recommended Exposure Limit: 10 Hr Time-Weighted Avg: 200 ppm (500 mg/cu m), Recommended Exposure Limit: 15 Min Short-Term Exposure Limit: 250 ppm (625 mg/cu m) [skin].

**Threshold Limit Values:** 8 hr Time Weighted Avg (TWA): 100 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. A4: Not classifiable as a human carcinogen.

**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-Propyl alcohol is produced, as an intermediate or a final product, by process units covered under this subpart.

**FIFRA Requirements:** Residues of n-propanol are exempted from the requirement of a tolerance when used as a solvent or cosolvent in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops or to raw agricultural commodities after harvest. n-Propanol is exempted from the requirement of a tolerance when used as a solvent for blended emulsifiers in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops only. n-Propanol is exempted from the requirement of a tolerance when used as a solvent for blended emulsifiers in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to animals.

**FDA Requirements:** Propyl alcohol is a food additive permitted for direct addition to food for human consumption as a synthetic flavoring substance and adjuvant in accordance with the following conditions: a) they are used in the minimum quantity required to produce their intended effect, and otherwise in accordance with all the principles of good manufacturing practice, and 2) they consist of one or more of the following, used alone or in combination with flavoring substances and adjuvants generally recognized as safe in food, prior-sanctioned for such use, or regulated by an appropriate section in this part. Propyl alcohol is an indirect food additive for use only as a component of adhesives. Normal propyl alcohol may be safely used in feeds and feed supplements for cattle as a source of metabolizable energy. It is incorporated in the feed or feed supplement in an amount which provides not more than 54.5 g of the additive per head per day.

### 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

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