

EnSolv®

Preparation Date: May 1, 2017

1. Product and Company Identification

Product Name: *EnSolv®* Precision Cleaning Solvent
Synonyms: None
Product Description: Stabilized n-Propyl Bromide Mixture. Canadian Patent 2284792. Israeli Patent 132000. Australian Patent 720172. Mexican Patent No. 212927.
Product General Use: Precision Vapor Degreasing and Ultrasonic Cleaning Solvent
General Description: Patented Non-flammable Cleaning Solvent Mixture
Manufacturer: Enviro Tech International, Inc.
1800 N. 25th Avenue
Melrose Park, IL, 60160
www.envirotechint.com
Emergency Contact: CHEM-TEL 24-HR EMERGENCY CONTACT
U.S, Canada, Puerto Rico, U.S. Virgin Islands (800) 255-3924
INTERNATIONAL CALLS: +01-813-248-0585
Non-Emergency Contact: (708) 343-6641
Hours: Mon-Fri 8am-4pm CST

2. Hazards Identification

Classification

Skin irritation	Category 2
Eye irritation	Category 2B
Carcinogen	Category 1B
Reproductive toxicity	Category 1B
Specific target organ toxicity (single exposure)	Category 3 – (H335, H336)
Ingestion (Acute Toxicity Oral)	Category 4

Emergency Overview

EnSolv® has no flash point and is non-flammable per OSHA and DOT regulations. Vapors will form a flammable mixture at a concentration of 3.8% to 9.5% by volume with air (ASTM E-681).

Signal Word: Danger



Hazard Statements

- H303 May be harmful if swallowed
- H315 Causes skin irritation.
- H320 Causes eye irritation.
- H333 May be harmful if inhaled.
- H335 May cause respiratory irritation.
- H336 May cause drowsiness or dizziness.
- H350 May cause cancer.
- H360 May damage fertility.

Prevention

- P202 Do not handle until all safety precautions have been read and understood.
- P233 Keep container tightly closed.
- P260 Do not breathe vapors.
- P262 Do not get in eyes, on skin or clothing.
- P270 Do not eat, drink or smoke when using this product
- P271 Use in a well-ventilated area.
- P273 Avoid release into the environment.
- P280 Wash face, hands and any exposed skin thoroughly after handling. Wear safety glasses or full face shield. Wear Viton gloves. DO NOT use natural rubber gloves when handling this product.
- P281 Use personal protective equipment as required.
- P284 Wear respiratory protection.

Response

- P308 + P313 IF EXPOSED or concerned: Get medical advice/attention
- P305 + P351 + P338 + P337 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P337 + P313 If eye irritation persists, get medical advice/attention
- P303 + P361 + P353 + P352 IF ON SKIN: remove immediately all contaminated clothing. Wash with plenty of soap and water. P332 + P313 If skin irritation occurs, get medical advice/attention.
- P304 + P340 IF INHALED: Remove individual to fresh air and keep at rest in a position comfortable for breathing.
- P301 + P330 + P331 IF SWALLOWED: Rinse mouth. DO NOT induce vomiting.
- P306 + P361+ P363 IF ON CLOTHING: remove immediately all contaminated clothing. Wash contaminated clothing before reuse.

Storage & Disposal: Store in well ventilated area in tightly closed containers. Dispose of containers at an approved waste disposal plant.

3. Composition and Ingredient Information

n-Propyl Bromide Molecular Formula: C ₃ H ₇ Br Synonyms: 1-Bromopropane, nPB, 1-BP	CAS 106-94-5	> 93% by weight
Nitromethane	CAS 75-52-5	<0.6% by weight
1,2-butylene oxide Synonym: 1,2 epoxybutane	CAS 106-88-7	<0.6% by weight

Stabilizer Package	< 7% by weight. Other specific components and amounts of components comprise Trade Secrets per 1920.1200(i)(1)
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4. First Aid Measures

INHALATION	Remove person to fresh air. Give oxygen if breathing is difficult. Apply CPR respiration if individual is not breathing.
EYE	Flush eyes with water for at least 15 minutes. Seek emergency medical advice.
SKIN	Wash contaminated areas immediately with soap and water. Remove contaminated clothing and shoes. Seek medical advice.
INGESTION	Drink large amounts of water. DO NOT induce vomiting. Seek emergency medical advice. Rinse mouth with water.

5. Fire Fighting Measures

EXTINGUISHING MEDIA	Extinguishing media should be chosen based on surrounding conditions. Water may be effective for cooling but not extinguishing. Carbon dioxide, dry chemical powder, alcohol foam or polymer foam.
FIRE FIGHTING PROCEDURE	Use NIOSH approved self-contained breathing apparatus in positive pressure mode. Use water spray or fog to cool exposed equipment and containers.
UNUSUAL FIRE AND EXPLOSION HAZARDS	Do not weld or torch cut drums containing residual vapors, as vapors may be in the flammable range and an explosion could occur. Thermal decomposition may produce carbon monoxide, carbon dioxide, hydrogen halide and bromides.

6. Accidental Release Measures

Contain spillage or leakage with dikes or absorbent material to prevent migration into sewer or waterway. For large spills, evacuate and ventilate the area. Wear self-contained breathing apparatus and recommended personal protective equipment. Absorb with earth, sand, or other non-combustible absorbent material and place in closed container for disposal.

7. Handling and Storage

HANDLING	Wear safety glasses or full face mask. Use gloves when contact with product may occur. DO NOT use natural rubber gloves when handling this product. Viton or Silvershield gloves offer the best extended protection. Nitrile, neoprene or butyl gloves offer less protection and should be used for splash protection only.
STORAGE	Store in well ventilated, cool, dry area away from incompatible materials (see materials to avoid). Keep container closed when not in use. Minimize introduction of water or moisture into the product. Keep away from heat, sparks, and open flame.

8. Exposure Controls and Personal Protection

EXPOSURE LIMITS	In all cases, worker exposure to all chemicals, including EnSolv®, should be kept as low as possible. No OSHA PEL has been published for n-propyl bromide. USEPA states an exposure level to nPB in the range of 18 to 30 ppm is protective of workers. (Federal Register May 30, 2007). ACGIH TLV - .10 ppm for n-propyl bromide. The documentation for the ACGIH nPB TLV states that the TLV applies to nPB with an iPB content of 0.1 to 0.2 % by weight. The iPB content of nPB in EnSolv® products is shown by GC analysis to be at or more than an order of magnitude below that level, at 0.01% or below. Nitromethane OSHA PEL 100 ppm ACGIH TLV 20 ppm isopropyl alcohol OSHA PEL 400 ppm ACGIH TLV 200 2-butanol OSHA PEL 1500 ppm
RESPIRATORY PROTECTION	Use full face piece, NIOSH approved organic vapor respirator.
CLOTHING/GLOVES	Use gloves when contact with product may occur. DO NOT use natural rubber gloves when handling this product. Viton or Silvershield gloves offer the best extended protection. Nitrile, neoprene or butyl gloves offer less protection and should be used for splash protection only.
EYE PROTECTION	Always wear safety goggles or full face shield.
WORK/HYGIENIC PRACTICES	Do not eat, drink or smoke while working with this product. Launder soiled clothes. Provide emergency eye bath and safety shower.

Appropriate Engineering Controls: Showers, Eye wash stations, Ventilation systems

9. Physical Properties

APPEARANCE	Clear, colorless to yellow liquid
ODOR	Characteristic
pH LEVEL (water extract)	6.8 estimated based on nPB
INITIAL BOILING POINT AND BOILING POINT RANGE	158°F (70°C)
MELTING POINT / FREEZING POINT	-110° C estimated based on nPB
FLASH POINT	None ASTM D-56 TCC, ASTM D-92 COC, ASTM D-93 TCC
EVAPORATION RATE	4.7
UPPER/LOWER FLAMMABILITY LIMITS	3.8% to 9.5% by volume with air
VAPOR PRESSURE, mm Hg	134 @ 25°C
VAPOR DENSITY	4.24 estimated based on nPB
SPECIFIC GRAVITY (25/25° C, H ₂ O = 1)	1.31 ± 0.01
WATER SOLUBILITY g/100mL @ 25°C	0.24 estimated based on nPB
PARTITION COEFFICIENT (noctanol/water)	No information available

AUTO-IGNITION TEMPERATURE	860°F (460°C)
DECOMPOSITION TEMPERATURE	No information available
VISCOSITY	No information available

10. Stability and Reactivity

STABILITY	Stable under normal conditions.
CONDITIONS TO AVOID	Avoid open flame, electric arc and other high energy ignition sources. Prolonged contact with free water may result in diminished stabilizer and corrosion.
INCOMPATIBILITY	Incompatible with strong alkalies, oxidizers, bases, reactive metals and natural rubber.
HAZARDOUS DECOMPOSITION	Thermal decomposition produces carbon monoxide, carbon dioxide, and hydrogen bromide.
HAZARDOUS POLYMERIZATION	Will not occur.
REACTIVITY	Organic Peroxide: No; Pyroforic: No; Water Reactive: No

11. Toxicological Information

EnSolv®

In human liver cell bioassays, *EnSolv*® mixtures showed no effects to DNA or for altered enzyme function at all cell concentrations tested and no effects for acute cytotoxicity at cell concentrations below 500 ppm.

n propyl bromide

LD₅₀ oral rat: 4,260 mg/kg

LC₅₀ inhalation rat: 30 min. 50,291 ppm
4 hr 14,374 ppm

High concentrations are irritating to the respiratory tract and may cause headache, dizziness, nausea, vomiting or narcosis. Chronic overexposure at high levels may cause adverse effects in the central nervous system, reproductive system, respiratory system, kidney and liver. Persons having pre-existing diseases of the lungs, eyes or skin may have an increased susceptibility to the hazards of excessive exposure. Cancer: NTP: - reasonably anticipated to be a human carcinogen. IARC - Not listed. Mutagenic Effects: In vivo mutagenicity tests: Negative

Stabilizer Package

Nitromethane (< 0.6% by weight of total product) NTP: Reasonably anticipated to be a human carcinogen IARC: NO OSHA: NO

1,2-Butylene oxide (< 0.6% by weight of total product) NTP: NO IARC: Group 2B OSHA: NO
isopropyl alcohol: NTP: No IARC: Group 3 OSHA: No

12. Ecological Information

“Available data on the organic carbon partition coefficient (K_{OC}) the breakdown processes in water and hydrolysis half-life, and the volatilization half-life indicate that nPB is less persistent

in the environment than many solvents and would be of low to moderate concern for movement in soil. Based on the LC₅₀, the acute concentration at which 50% of tested animals die, nPB's toxicity to aquatic life is moderate, being less than that for ... trichloroethylene, hexane, *d*-limonene, and possibly some aqueous cleaners. Based on EPA's criteria for listing under the Toxics Release Inventory (U.S. EPA, 1992), we believe that nPB would not be sufficiently toxic to aquatic life to warrant listing under the Toxics Release Inventory. Based on its relatively low bio-concentration factor and log K_{ow} value, nPB is not prone to bioaccumulation." (USEPA - Federal Register May 30, 2007).

K _{OC} , ORGANIC-CARBON PARTITION COEFFICIENT	330
BREAK DOWN IN WATER	Hydrolysis is significant
HYDROLYSIS HALF-LIFE	26 DAYS
VOLATILIZATION HALF-LIFE FROM SURFACE WATERS	3.4 HOURS – 4.4 DAYS
LC ₅₀ (96 HOURS) FOR FATHEAD MINNOWS	67 mg/l
LOG K _{ow}	2.10
BIOCONCENTRATION FACTOR	23

13. Disposal Considerations

Follow Federal, State and Local governmental regulations. DO NOT flush into sanitary sewer or waterway. Do not reuse container.

14. Transportation Information

HAZARDOUS MATERIAL DESCRIPTION	Not regulated for transportation.
DOT DESCRIPTION/PROPER SHIPPING NAMES	Non Hazardous Cleaning Solvent Mixture

15. Regulatory Information

NAFTA	3814.00.50.90 Preference Criteria B - Originating in NAFTA territory.
TCSA	All of the components of this product are in the EPA TSCA inventory and are in compliance with 15 USC 2601-2629.
NESHAP	N/A
RCRA	N/A
HAP	N/A
VOC	1,314.2 g/l - 11 lbs/gal
SARA	SARA 313 Components subject to reporting: 1,2-butylene oxide CAS 106-88-7 <.6% by weight. Nitromethane <.6% 75-52-5 by weight. Sec-butyl alcohol CAS 78-92-2 <2.0 % by weight. N propyl bromide CAS 106-94-5 >93% by weight. isopropyl alcohol CAS 67-63-0 <1% by weight.
CERCLA	40 CFR 302.4 Component: 1,2-butylene oxide CAS 106-88-7 <0.6% by weight.

STATE REGULATION	n-Propyl bromide: WARNING: Known to the State of California to cause developmental, male and female reproductive effects. Known to the State of California to cause cancer. CAL/OSHA PEL 5 ppm Right to Know: Massachusetts: Higher hazard substance under TURA, New Jersey, Pennsylvania.
	Nitromethane: WARNING: Known to the State of California to cause cancer. Right to Know: Massachusetts, New Jersey, Pennsylvania, Florida, Minnesota.
	1,2-Butylene oxide: Right to Know: Massachusetts, New Jersey, Pennsylvania, Rhode Island, Minnesota. California Air Toxics Hit Spots A-1 - Present.
	isopropyl alcohol: Right to Know: Rhode Island, Massachusetts, New Jersey, Pennsylvania, Florida, Minnesota, Tennessee. Connecticut hazardous material survey. Illinois toxic substance disclosure to employee act.
	1,3 dioxolane: Right to Know: Massachusetts, New Jersey, Pennsylvania.
SNAP	The Environmental Protection Agency (EPA) approved n-propyl bromide (nPB) as an acceptable substitute for ozone depleting compounds in the precision cleaning sector under the Significant New Alternatives Program (SNAP) Section 612 Clean Air Act. (USEPA - Federal Register May 30, 2007).
WHMIS	Class D Division 2B, WHMIS - HC-1
EEC (EINECS)	Ingredients Listed
CANADA (DSL)	Ingredients Listed
JAPAN (MITI)	Ingredients Listed
AUSTRALIA (AICS)	Ingredients Listed
SOUTH KOREA (ECL)	Ingredients Listed

16. Other Information

Each user of this product should study this SDS carefully and consult appropriate expertise as necessary to become aware of and understand the data contained in this SDS and any hazards that may be associated with this product. The information provided in this Safety Data Sheet relates only to the specific material designated herein. The user is responsible for determining the conditions of safe use of this product and for complying with all Federal, State and Local governmental laws and regulations concerning its use. The information contained herein is accurate to the best of our knowledge. Enviro Tech International, Inc. makes no warranty, express or implied, including the warranty of merchantability and fitness for a particular purpose, and assumes no liability or responsibility for the accuracy, completeness, timeliness or usefulness of this information. Enviro Tech International, Inc assumes no liability for any damages incurred, whether directly or indirectly, as a result of any errors, omissions or discrepancies in this information. Enviro Tech International, Inc. assumes no liability for reliance on this data and assumes no liability for damages related to the use or misuse of this product in your process or in combination with other substances.

NFPA	Health 2	Flammability 1	Instability 0
HMIS	Health 2	Flammability 1	Physical Hazards 0

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