EnSolv® Spec 490

SAFETY DATA SHEET

Preparation Date: February 1, 2023 Revision 2 - Replaces June 22, 2022

1. Product and Company Identification

Product Name:	***EnSolv® Spec 490***
Product Description:	Non-flammable Stabilizer Booster
Product General Use:	Re-stabilization of **EnSolv®, Techkleen®** and other 1-bromopropane based solvents. **INDUSTRIAL USE ONLY. NOT FOR CONSUMER SALE OR USE.**
Manufacturer:	Enviro Tech International, Inc. 1800 N. 25th Avenue Melrose Park, IL, 60160 www.envirotechint.com
Emergency Contact:	Velocity EHS 24-HR EMERGENCY CONTACT U.S. & Canada,(800) 255-3924 - INTERNATIONAL CALLS: +01-813-248-0585. Non-Emergency (708) 344-6641 Hours: Mon-Fri 8am-4pm CST

2. Hazards Identification

Classification

Skin irritation	Category 2
Eye irritation	Category 2
Carcinogen	Category 2B (IARC) Category 1B (California)
Reproductive toxicity	Category 1B
Specific target organ toxicity (single exposure)	Category 3
Ingestion (Acute Toxicity Oral)	Category 4
Specific target organ toxicity (repeated exposure)	Category 2

Emergency Overview

This product has no flash point and is non-flammable per OSHA and DOT regulations. (OSHA 2021). Vapors may form a flammable mixture at a concentration of 3.8% to 9.5% by volume with air based on 1-bromopropane (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.
H372 Presumed to have the potential to produce significant nervous system toxicity in humans through prolonged or repeated exposure

Prevention

P103 Read label before use.
P102 Keep out of reach of children.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat/sparks/open flames/hot surfaces.
P211 Do not spray on an open flame or other ignition source.
P233 Keep container tightly closed.
P260 Do not breathe vapors.
P262 Do not get in eyes, on skin or clothing.
P263 Avoid contact during pregnancy/while nursing.
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.
P281 Use personal protective equipment as required.
P282 Wear Viton or Silvershield gloves. DO NOT use natural rubber or cloth gloves when handling this product.
P284 Wear respiratory protection. Wear full face mask.

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 all contaminated clothing immediately. Wash contaminated clothing before reuse

Storage:

P403	Store in a dry place. Store indoors.
P404 + P233	Store in a well-ventilated place. Keep container tightly closed.

Disposal:

P501	Dispose of contents/container in accordance with Federal, state and local regulations.

3. Composition and Ingredient Information

1-bromopropane	CAS 106-94-5	50.00 % by weight
1,2-butylene oxide	CAS 106-88-7	50.00 % by weight

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	Remove contaminated clothing and shoes. Wash contaminated areas immediately with soap and water. Seek medical advice.
INGESTION	Drink large amounts of water. DO NOT induce vomiting. Seek emergency medical advice. Rinse mouth with water.
NOTE TO PHYSICIAN	Treat symptomatically.

5. Fire Fighting Measures

Flash Point:	None
LEL/UEL:	3.8% to 9.5% (based on volume 1-BP/air)
Extinguishing Media:	Extinguishing media should be chosen based on surrounding conditions - use carbon dioxide, dry chemical powder, alcohol foam or polymer foam. Water may be effective for cooling but not extinguishing.
Unsuitable Extinguishing Media:	Do not use water jet as an extinguisher, as this will spread the fire.
Hazardous Combustion Products:	Thermal decomposition or combustion may liberate carbon oxides and other toxic gases/vapors such as gaseous hydrogen fluoride (HF), carbonyl fluoride, carbon monoxide and carbon dioxide. May form explosive mixtures with air.
Special Fire Fighting Procedures:	Avoid breathing fire vapors. Keep run-off water out of sewers and water sources. Dike for water control.
Protective Equipment:	Use NIOSH/MSHA approved/equivalent self-contained breathing apparatus in positive pressure mode\ and full protective clothing must be worn in case of fire. Use water spray or fog to cool exposed equipment and containers.

6. Accidental Release Measures

Personal Precautions:	Wear protective clothing as described in Section 8 of this Safety Data Sheet. Ventilate enclosed areas. Do not walk through spilled material. Avoid direct contact. Avoid contact with skin, eyes, and clothing. Avoid breathing mist, vapors, spray.
Environmental Precautions:	Do not discharge into drains, water courses or onto the ground. Contain spillages with sand, earth or any suitable adsorbent material.
Spill Clean Up Methods:	Provide ventilation and confine spill. Do not allow runoff to sewer or waterways. Dam and absorb spillage with sand, sawdust or other absorbent. Collect spillage in containers, seal securely and deliver for disposal according to local regulations.
Reference to other Sections:	For personal protection, see Section 8. For waste disposal, see Section 13.

7. Handling and Storage

Handling:	Open container carefully - contents may be under pressure. Avoid skin and eye contact. Use Viton or Silvershield gloves for extended protection. Nitrile, neoprene or butyl gloves offer less protection and should be used

	for splash protection only. DO NOT use natural rubber or cloth gloves when handling this product. Avoid inhalation of vapors and spray mists. Wear full face mask and NIOSH approved respirator with organic vapor respirator cartridge. Provide adequate ventilation. In use, may form flammable/explosive vapor-air mixture. Handling, storage and use procedures must be carefully monitored to avoid spills or leaks. Contamination that does occur cannot be easily corrected. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco. Do not allow product to contact open flame or electrical heating elements because dangerous decomposition products may form.
Storage:	Store in tightly closed original container in a dry, cool and well- ventilated place. Separate from oxidizing materials. Empty containers retain product residue and can be hazardous. Do not cut, weld, puncture or incinerate container.

8. Exposure Controls and Personal Protection

Exposure Limits	Worker exposure to all chemicals, including this product, should be kept as low as possible at all times. No OSHA PEL has been published for 1-bromopropane. USEPA: An exposure level to 1-BP in the range of 18 to 30 ppm is protective of workers (Federal Register May 30, 2007). ACGIH TLV - .10 ppm for 1-bromopropane. The documentation for the ACGIH 1-BP TLV states that the TLV applies to 1-bromopropane with an iPB content of 0.1 to 0.2 % by weight. The iPB content of 1-bromopropane in this product is shown by GC analysis to be at or below 0.01%, more than an order of magnitude below the iPB level set forth by ACGIH. Therefore, it is questionable whether or not the TLV is applicable to this product.
Respiratory	Wear full face mask with NIOSH/MSHA approved/equivalent organic vapor respirator.
Clothing/gloves	Wear approved gloves when handling this product. Use Viton or Silvershield gloves for extended protection. Nitrile, neoprene or butyl gloves offer less protection and should be used only for splash protection. DO NOT use natural rubber, cloth or synthetic material gloves when handling this product.
Eye Protection	Wear full face mask.
Hygienic Practices	Do not eat, drink or smoke while working with this product. Launder soiled clothes. Provide emergency eye bath and safety shower. Handle in accordance with good industrial hygiene and safety practice.
Engineering Controls	Safety shower, eye wash stations, ventilation systems.

9. Physical Properties

APPEARANCE	Clear, colorless to yellow liquid
ODOR	Characteristic
INITIAL BOILING POINT	148.6°F (64.8°C)
FLASH POINT	None ASTM D-56 TCC. ASTM D-92 COC. ASTM D-93 TCC. OSHA - 2021
UPPER/LOWER FLAMMABILITY LIMITS	3.8% to 9.5% (1-BP/air) - estimated
VAPOR PRESSURE, mm Hg	137.5 @ 20°C (ESTIMATED)
SPECIFIC GRAVITY (25°C ± 5°C, H_2O = 1)	1.08 ± 0.01
AUTO-IGNITION TEMPERATURE	860°F (460°C) estimated based on 1-BP
DECOMPOSITION TEMPERATURE	860°F (460°C) estimated based on 1-BP

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

Carcinogenicity:	**NTP**	**IARC**	**OSHA**
1-bromopropane	Reasonably anticipated to be a human carcinogen	Group 2B	No
1,2-Butylene oxide	No	Group 2B	No

Specific Components:

1-bromopropane

Acute Effects

LD_{50} oral rat (male & female):	4,260 mg/kg >2,000 mg/kg (OECD 401)
LD_{50} dermal rat (male & female):	>2,000 mg/kg (OECD 402)
LC_{50} inhalation rat:	30 min - 50,291 ppm 4 hour - 14,374 ppm 35 mg/l 4 hr OECD 403 Remarks: No mortality observed at this dose.
Skin:	Rabbit (standard method) No skin irritation. (EC)Reg. 1272/2008 Annex VI - Irritating to skin.
Maximization Test - Skin contact	Guinea pig: Did not cause sensitization (OECD 406)
Eyes:	Rabbit (standard method) Irritating to eyes.
Mutagenicity:	**in vitro:** Multiple Ames tests with and without metabolic activation. NEGATIVE. (OECD 471) in vivo: 1) Transgenic rodent somatic cell gene mutation assay. Mouse (female) - Inhalation. Result: NEGATIVE. (OECD 488). Test results duplicated in subsequent testing. 2) In vivo micronucleus test - rat (male & female) Result: NEGATIVE. (OECD 474)
Reproductive & developmental:	Two-generation inhalation study - Rat, male and female General Toxicity Parent: NOAEL: 100 ppm F_1: NOAEL: 100 ppm
Fertility:	NOAEL: 100 ppm
Early Embryonic Development:	NOAEL: 100 ppm
Fetal development:	Pre-/postnatal development - Rat, female - Inhalation
General Toxicity Maternal:	NOEL: 100 ppm
Teratogenicity:	NOEL: 996 ppm
Embryo-fetal toxicity:	NOEL: 100 ppm
Repeated Dose Toxicity:	Rat, male and female - 90 day inhalation NOAEC >= 125 ppm. Liver, Reproductive organs

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.

1,2-Butylene oxide

Acute oral toxicity LD_{50}:	Rat - 900 mg/kg
Acute dermal toxicity LD_{50}	Rabbit - > 1,500 - < 2,950 mg/kg
Acute inhalation toxicityLC_{50}:	Rat (male & female): 4 Hour, vapor, > 6.3 mg/l.
Skin corrosion/irritation:	Prolonged or repeated contact may cause skin burns and a more severe response if skin is abraded (scratched or cut) or covered (under clothing, gloves). Did not cause allergic skin reactions when tested in guinea pigs.
Eye Irritation:	May cause serious to moderate eye irritation. May cause slight corneal injury.
Specific Target Organ Systemic Toxicity (Single Exposure - Inhalation):	May cause respiratory tract irritation.
Specific Target Organ Systemic Toxicity (Repeated Exposure):	In animals, peripheral nervous system & respiratory tract.
Mutagenicity:	In vitro genetic toxicity studies were positive. Animal genetic toxicity studies were negative.
Carcinogenicity:	Butylene oxide has been shown to produce benign and malignant tumors in rats but not mice. These tumors occurred only following high exposure levels which first produced chronic upper respiratory tract irritation
Reproductive & Developmental:	Limited data in test animals suggest that the material does not affect reproduction. Did not cause birth defects or fetal effects in test animals.

12. Ecological Information

1-bromopropane

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 1-bromopropane is less persistent in the environment than many solvents and would be of low to moderate concern for movement in soil. Based on the LC_{50}, the acute concentration at which 50% of tested animals die, 1-bromopropane'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 1-bromopropane 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, 1-bromopropane 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 B 4.4 DAYS
LC_{50} (96 HOURS) FOR FATHEAD MINNOWS	67 mg/l
LOG K_{OW}	2.10
BIOCONCENTRATION FACTOR	23

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

1,2 butylene oxide

Acute toxicity to fish:	Material is slightly toxic to aquatic organisms on an acute basis (LC_{50}/EC_{50} between 10 and 100 mg/L in the most sensitive species tested).
LC_{50}	Leuciscusidus (Golden orfe), static test, 96 Hour > 100 mg/I
Acute toxicity to aquatic invertebrates EC_{50}:	Daphnia magna (Water flea), static test, 48 Hour, 70 mg/I, OECD Test Guideline 202 or Equivalent
Acute toxicity to aquatic plants ErC_{50}:	Desmodesmus subspicatus (green algae), 72 Hour, Growth rate inhibition, > 500 mg/I
Toxicity to bacteria $EC_{50:}$	Activated sludge, static test, 0.5 Hour, Respiration rates, 900 mg/I (OECD 209)
Biodegradability:	Material is readily biodegradable. Passes OECD test for ready biodegradability.
10-day Window:	Pass
Biodegradation:	90%. Exposure time: 28 d. Method: OECD 310 or Equivalent
Theoretical Oxygen Demand:	2.44 mg/mg
Stability in Water (1/2-life)	Hydrolysis, half-life, 11 d
Photodegradation	Atmospheric half-life: 6 days (estimated)
Bioaccumulation:	Does not accumulate in organisms. Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient:	n-octanol/water (log Pow) - 0.68 at 25 °C
Mobility in soil:	K_{OC} between O and 50
Partition coefficient (Koc):	4.49 Estimated. 96 hours [Fathead Minnow]

13. Disposal Considerations

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

14. Transportation Information

PROPER SHIPPING NAME : (Domestic Transportation Only)	**NA3082, Other regulated substances, liquid, n.o.s., (1-bromopropane mixture, non-flammable), 9, III**

The above transportation information is valid as of the date of publication of this SDS. Given that regulatory changes are made on an ongoing basis, ETI recommends checking new transportation regulations regularly.

15. Regulatory Information

USMCA	Complies
US TCSA	All of the components of this product are in the TSCA inventory and are active. No substances are subject to a Significant New Use Rule. No substances are subject to TSCA 12(b) export notification requirements.
US RCRA	Not regulate as of the date of this SDS
US HAP	**1-bromopropane:** YES. CAS 106-94-5 50% by weight. Federal Register Vol 87. No.3. January 5, 2022 pg. 393 - 396. As of January 5, 2022 [t]his action will have no direct, immediate impacts under 40 CFR part 63 on emissions of 1-BP, but the addition of 1-BP to the HAP list could have immediate impacts to facilities that emit 1-BP (e.g., the operating permits program under Title V of the CAA). USEPA determined that additional guidance may be needed on the listing of 1-BP and intends to publish such guidance upon promulgation of this rule. **1,2-butylene oxide: YES.** CAS 106-88-7 50 % by weight
US NESHAP	No regulations specific to 1-bromopropane or 1,2-butylene oxide have been promulgated as of the date of this SDS. It is recommended users follow current NESHAP rules until further regulations are enacted.
VOC	1,080 g/l - 9.01 lbs/gal
GWP	.31 to 1.57
ODP	.0013
SARA 302	This material does not contain any components with a section 302 EHS TPQ.
SARA 304	This material does not contain any components with a section 304 EHS RQ.
SARA 313	Subject to reporting: 1,2-butylene oxide CAS 106-88-7 50 % weight 1-bromopropane CAS 106-94-5 50 % weight
SARA 311/312	Hazardous Categorization Acute Health Hazard: Yes Chronic Health Hazard: Yes Fire Hazard: No Sudden Release of Pressure Hazard: No Reactive Hazard: No
CERCLA	40 CFR 302.4 Component: 1,2-butylene oxide CAS 106-88-7 50 % weight RQ 100 lbs 1-bromopropane CAS 106-94-5 50 % weight RQ 1 lb
US Clean Water Act:	This product does not contain any Hazardous Substances listed under the U.S. Clean Water Act, Section 311/Table 116.4A, Section 311/Table 117.3 or any pollutant listed under the U.S. Clean Water Act Section 307
US SNAP	The Environmental Protection Agency (EPA) approved 1-bromopropane (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).

STATE REGULATION

1-bromopropane:	CA PROP 65: 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. CA Airborne

	Contaminants - 1-bromopropane - Can be absorbed through the skin. Right to Know: Massachusetts: Higher hazard substance under TURA, New Jersey, Pennsylvania.
1,2-Butylene oxide:	Right to Know: California Air Toxics Hit Spots A-1 - Present. Massachusetts, New Jersey, Rhode Island, Minnesota. Pennsylvania: To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

International:

1-bromopropane & 1,2 butylene oxide

Canada WHMIS	Class D Division 2B, WHMIS - HC-1
EU EINECS	On or in compliance with the inventory
Australia AICS	On or in compliance with the inventory
Canada DSL	All components Listed
China IECSC	On or in compliance with the inventory.
Japan ENCS\ISHL	On or in compliance with the inventory
Korea KECI (ECL)	On or in compliance with the inventory
New Zealand	Not in compliance with inventory
Philippine PICCS	On or in compliance with the inventory
Taiwan TCSI	On or in compliance with the inventory

1-bromopropane

China	On December 1, 2020, regulation GB 38508-2020, *Limits for Volatile Organic Compounds Content in Cleaning Agents* became effective throughout China. Use of 1-bromopropane in China is restricted or prohibited due to VOC content under this regulation. However, the regulation does not apply to such industries as aerospace, nuclear industry, military and semiconductor (including integrated circuit) manufacturing.

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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