

SAFETY DATA SHEET

1. Product and Company Identification

Product Name: n-Propyl Bromide MRS-655
Product Code: MRS655
Product Use:

Chemical Type: Solvent Blend

Manufacturer: Plastic Process Equipment Inc. **Revision Date:** 1/15/2019
Address: 8303 Corporate Park Drive. **Emergency:** 1-800-262-8200 ID 1195 (UNITED STATES)
Macedonia, OH 44056 **Phone:** 1-800-362-0607

2. Hazards Identification

GHS Classification

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

GHS Label elements, including precautionary statements

Signal word: Danger



Pictogram

Hazard statement(s)

May be harmful if swallowed. Causes skin irritation. Causes eye irritation. May be harmful if inhaled. May cause respiratory irritation. May cause drowsiness or dizziness. May cause cancer. May damage fertility.

Precautionary statement(s)

Prevention

Do not handle until all safety precautions have been read and understood. Keep container tightly closed. Do not breathe vapors. Do not get in eyes, on skin or clothing. Do not eat, drink or smoke when using this product. Use in a well-ventilated area. Avoid release into the environment. 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. Use personal protective equipment as required. Wear respiratory protection.

Response

IF EXPOSED or concerned: Get medical advice/attention.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention.
IF ON SKIN: remove immediately all contaminated clothing. Wash with plenty of soap and water. If skin irritation occurs, get medical advice/attention.
IF INHALED: Remove individual to fresh air and keep at rest in a position comfortable for breathing.
IF SWALLOWED: Rinse mouth. DO NOT induce vomiting.
IF ON CLOTHING: remove immediately all contaminated clothing. Wash contaminated clothing before reuse.

Storage: Store in well ventilated area in tightly closed containers

Disposal: Dispose of containers at an approved waste disposal plant.

HMIS Classification

Health hazard: 2 **Chronic Health Hazard: *** **Flammability: 1** **Physical hazards: 0**

NFPA Rating

Health hazard: 2 **Fire: 1** **Reactivity Hazard: 0**

Potential Health Effects

Inhalation- May be harmful if inhaled. Causes respiratory tract irritation. Vapors may cause drowsiness and dizziness.

Skin- May be harmful if absorbed through skin. Causes skin irritation.

Eyes- Causes eye irritation.

Ingestion- May be harmful if swallowed.

3. Composition / Information on Ingredients

Ingredients	CAS #	Percent by Weight
n-Propyl bromide	106-94-5	> 94
1,2 Epoxybutane	106-88-7	< 1
Tert-butanol	75-65-0	< 1
1,3-dioxolane	646-06-0	<3

4. First Aid Measures

Description of first aid measures

General advice: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact: Wash off with soap and plenty of water. Consult a physician.

In case of eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

Delayed and chronic effects: Generally similar to acute effects. Allergic contact dermatitis may be seen in sensitive individuals following repeated exposures. Repeated and/or prolonged contact may cause dermatitis.

5. Fire Fighting Measures

Flash Point: None to boiling (ASTM D 56)

Conditions of flammability: Not flammable or combustible.

Suitable extinguishing media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for firefighters: Emergency responders should wear self-contained breathing apparatus. Wear other protective gear as conditions warrant. Keep unauthorized people out and try to contain spills or leaks if it can be done safely. Material will float on water, avoid spreading the fire.

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen bromide gas

Further information: Use water spray to cool unopened containers. NPB-Ds 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).

6. Accidental Release Measures

Spill or Leak Instructions

Contain spill with dikes of soil or nonflammable absorbent to minimize contaminated area. Avoid run-off into storm sewers and ditches leading to waterways. If required, notify state and local authorities. Place leaking containers in well-ventilated area. Clean up small spills by using a nonflammable absorbent or flushing sparingly with water. Contain larger spills with nonflammable diking or absorbent. Clean up by vacuuming or sweeping.

Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind; keep out of low areas. Assess the spill situation, as the spill may not evolve large amounts of hazardous airborne contaminants in many outdoor spill situations. It may be advisable in some cases to simply monitor the situation until spilled product is removed.

7. Handling and Storage

Handling: FOR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF CHILDREN

Handling: Put on appropriate personal protective equipment. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Do not breathe vapor or mist. Do not swallow. Avoid contact with eyes, skin and clothing. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8. Exposure Controls / Personal Protection

Protective Equipment: Use synthetic gloves if necessary to prevent excessive skin contact. Do not wear contacts and always use ANSI approved safety glasses or splash shield.

Engineering Controls: General or dilution ventilation is frequently insufficient as the sole means of controlling employee exposure. Local ventilation is usually preferred. Use a NIOSH approved respirator if ventilation is not adequate to maintain exposures below TLV levels.

Component	CAS NO.	Weight %	OSHA PEL	ACGIH TLV
n-Propyl bromide	106-94-5	>94	Not est	10 ppm
1,2 Epoxybutane	106-88-7	< 1	Not est. Not est.	WEEL: 2ppm
Tert-butanol	75-65-0	<1	100 ppm	100 ppm
1,3-dioxolane	646-06-0	<3	Not est.	20 ppm

PEL= Permissible Exposure Limits
TLV= Threshold Limit Value
EL= Excursion Limit

TWA= Time Weighted Average (8 hr.)
STEL= Short Term Exposure Limit (15 min.)
WEEL= Workplace Environmental Exposure Level

Other Suggested Equipment: Eye wash station and emergency showers should be available. Spill containment equipment should be available.

Discretion Advised: Chemical Solvents Inc. takes no responsibility for determining what measures are required for personal protection in any specific application. The general information should be used with discretion.

9. Physical and Chemical Properties

Appearance and Odor : Clear colorless liquid with a sweet odor.
Boiling Point (760 mm Hg): 158 F (70 C) Vapor Density (Air = 1): >1
% Volatile (By weight): 100 Evaporation Rate (BUAC = 1): <1
Solubility in Water: Negligible Vapor Pressure (20°C): 110.8 mm Hg (NPB)
Flash Point: None (TAG CLOSED CUP)
Flammable Limits (% By Volume in Air): no data available
Auto-ignition Temperature 490 C (NPB) pH no data available
Melting point/range: not available Boiling point 71 °C (160 °F) - lit. (NPB)
Auto-ignition temperature no data available Lower & Upper explosion limit no data available
Vapor pressure no data available Density 1.32 g/cm³ at 25 °C (77 °F)
Water solubility: slight soluble Partition coefficient: n-octanol/water log Pow: 2.1 (NPB)
Relative vapor density 4.25 - (Air = 1.0) Odor sweet
Odor Threshold no data available Evaporation rate no data available
VOLATILE ORGANIC COMPOUND (VOC) INFORMATION: VOC 1320 g/l

10. Stability and Reactivity

Stability: Stable **Conditions to Avoid:** Heat, spark, and open flame
Incompatibility: Strong Oxidizing Agents
Hazardous Decomposition: Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen bromide gas
Hazardous Polymerization: Will not occur

11. Toxicological Information

Component Data:

Propyl bromide **106-94-5**
Acute toxicity
Oral LD50: no data available
Inhalation LC50: LC50 Inhalation - rat - 30 h - 253,000 mg/m³
Dermal LD50: no data available
Other information on acute toxicity
LD50 Intraperitoneal - rat - 2,950 mg/kg
Skin corrosion/irritation: no data available
Serious eye damage/eye irritation: no data available
Respiratory or skin sensitization: no data available
Germ cell mutagenicity: no data available
Carcinogenicity
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
Reproductive toxicity
Reproductive toxicity - rat - Inhalation
Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count).
Reproductive toxicity - rat - Inhalation
Paternal Effects: Prostate, seminal vesicle, Cowper's gland, accessory glands.

May cause reproductive disorders. May damage fertility.

Teratogenicity : May cause congenital malformation in the fetus. May damage the unborn child.

Presumed human reproductive toxicant

Specific target organ toxicity - single exposure (Globally Harmonized System)

May cause damage to organs. May cause respiratory irritation. May cause drowsiness or dizziness.

1,3-dioxolane 646-06-0

Oral: Type of value: LD50 Species: rat Value: > 6.4 g/kg (BASF-Test) An aqueous solution was tested.

Inhalation: Type of value: LC50 Species: rat Value: 68.4 mg/l (other) Exposure time: 4 h The vapour was tested.

Dermal: Type of value: LD50 Species: rabbit Value: 15,000 mg/kg (other)

Irritation / corrosion Skin: Species: rabbit Result: Slightly irritating. Method: BASF-Test

Eye: Species: rabbit Result: Irritant. Method: BASF-Test

Tert-butanol 75-65-0

Acute Toxicity - Lethal Doses

LC50 (Inhl): Rat > 14,100 PPM 4 HOURS

LD50 (Oral): Rat 2,733 MG/KG BWT

LD50 (Skin): Rabbit > 2000 MG/KG BWT

Irritation

Skin-May be irritating to the skin. No significant signs or symptoms indicative of any health hazard are expected to occur as a result of skin absorption exposure. Not expected to be a sensitizer.

Eye -Neat liquid may produce moderate to severe, reversible eye irritation. Washing the eyes after 30 seconds did not significantly reduce the irritation.

Target Organ Effects: Skin. Eye. Respiratory system. Central nervous system.

Repeated Dose Toxicity

Subchronic and chronic administration of t-butanol in the drinking water of male rats at concentrations of 1.25 mg/ml (estimated at 90 mg/kg bwt and higher) resulted in kidney pathology. The kidney pathology is mediated through the alpha 2micro-globulin mode of action. In male and female rats that received 90 mg/kg bwt and higher t-butanol, there was an increase in the severity of chronic progressive nephropathy, a disease not relevant for humans. In male and female mice at concentrations in drinking water of 10 mg/ml (~1000 mg/kg bwt), an increased incidence of thyroid follicular cell hyperplasia was observed, and at ~2000 mg/kg bwt, the mice exhibited an increased inflammation of the urinary bladder resulting in hyperplasia.

Reproductive Effects: No adverse effects on testes and ovary structure were seen in rats that received repeated high oral doses (up to 8200 mg/kg bwt). No studies assessing fertility effects are currently available.

Developmental Effects: Results from limited studies in pregnant rats and mice indicate that t-butanol is not teratogenic but at high oral doses (1550 mg/kg bwt) produces embryo/fetotoxicity and developmental delay.

Genetic Toxicity: Negative for genotoxicity both in vitro and in vivo tests.

Carcinogenicity:

In a drinking water study, t-butanol induced benign kidney tumors in male rats via an alpha-2microglobulin mode of action, a tumor mechanism not relevant to humans. In female mice, there was an increased incidence of benign thyroid tumors. t-Butanol is not classified as to carcinogenicity by OSHA, NTP, IARC or EPA.

1,2 Epoxybutane 106-88-7

Oral: LD50/rat: 1,180 mg/kg Literature data.

Inhalation: Inhalation-risk test (IRT): No mortality within 2 minutes as shown in animal studies. Deaths possible with prolonged exposure.

Dermal: LD50/rabbit: 1,760 mg/kg Literature data.

Skin irritation: rabbit: Irritant. (BASF-Test)

The European Union (EU) has classified this substance with 'Irritating to skin' (R38).

Eye irritation : rabbit: Irritant. (BASF-Test)

The European Union (EU) has classified this substance with 'Irritating to eyes'.(R36).

Genetic toxicity: The substance was mutagenic in various test systems with microorganisms and cell cultures; however, these results could not be confirmed in tests with mammals.

Carcinogenicity: In long-term animal studies with concentrations irritating to the mucous membrane a carcinogenic effect was observed. NTP listed carcinogen. IARC: 2B - Group 2B: Possibly carcinogenic to humans (1,2-Epoxybutane)

Experiences in humans: Danger of skin sensitization on repeated contact.

12. Ecological Information

Toxicity N-Propyl Bromide

Toxicity to fish LC50 - Pimephales promelas (fathead minnow) - 67.3 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna (Water flea) - 208.9 mg/l - 48 h
Persistence and degradability: Biodegradability Result: 19.20 % - Not readily biodegradable.

13. Disposal Considerations

Dispose of spilled material in accordance with state and local regulations for waste that is non-hazardous by Federal definition. Note that this information applies to the material as manufactured; processing, use, or contamination may make this information inappropriate, inaccurate, or incomplete.

Note that this handling and disposal information may also apply to empty containers, liners and rinsate. State or local regulations or restrictions are complex and may differ from federal regulations. This information is intended as an aid to proper handling and disposal; the final responsibility for handling and disposal is with the owner of the waste.

14. Transport Information

Not Regulated by D.O.T.

15. Regulatory Information

Environmental Regulations

OSHA Hazards: Irritant, Teratogen, Reproductive hazard

SARA 302/304

This material contains a component(s) with known CAS numbers classified as hazardous substances subject to the reporting of CERCLA (40 CFR 302) and/or to the release reporting requirements of SARA (Section 302) based on reportable quantities (RQs).

Component	RQ
Tert-Butyl Alcohol / CAS# 75-65-0.	100 lbs
1,2-Epoxybutane /CAS-No. 106-88-7	100 lbs

SARA 313

This material contains the following chemicals with known CAS numbers subject to the reporting requirements of SARA Title III, Section 313 and 40 CFR 372:

Component

tert-Butyl Alcohol / CAS# 75-65-0
1,2-Epoxybutane /CAS-No. 106-88-7

SARA 311/312 Hazards: Acute Health Hazard, Chronic Health Hazard

California Prop. 65 Components

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. 1-Bromopropane CAS-No. 106-94-5 1,2 Epoxybutane 106-88-7

All the chemicals used in this product are TSCA listed.
Check with your local regulators to be sure all local regulations are met.

16. Other Information

Note:

For industrial use only. The information contained herein is accurate to the best of our knowledge. We do not suggest or guarantee that any hazards listed herein are the only ones which exist. Plastic Process Equipmentm, Inc makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances. Effects can be aggravated by other materials and/or this material may aggravate or add to the effects of other materials. This material may be released from gas, liquid, or solid materials made directly or indirectly from it. User has the sole responsibility to determine the suitability of the materials for any use and the manner of use contemplated. User must meet all applicable safety and health standards. Possession of an MSDS does not indicate that the possessor of the MSDS was a purchaser or user of the subject product.

Revision Date: 1/15/2019