Material Safety Data Sheet

Product Name: **Purple Indicating Liquid**
Product Part Number: **9175**

This product is a mixture of two or more chemicals as defined under O.S.H.A. Standard 29 CFR 1910.1200. An individual MSDS for each chemical ingredient which comprises 1% or greater of the mixture (for Carcinogens concentrations of 0.1% or greater) is included with and is considered as part of the complete material safety data sheet.

Chemical Ingredient No. 1

Common Name:	Tetrabromoethane (TBE)
Chemical Name:	1,1,2,2-Tetrabromoethane
Chemical Formula:	C2H2Br4
Percent of Mixture (by volume)	12%
Manufacturer	ICL-IP Terneuzen (formerly Broomchemie B.V.)
Distributor	Morre-Tec Industries, Inc.
MSDS	Attached

Chemical Ingredient No. 2

Common Name:	Diazene-42
Chemical Family:	Brominated ethylbenzene isomers
Percent of Mixture (by volume):	88%
Manufacturer:	Diaz Chemical Corp.
MSDS:	Attached

Chemical Ingredient No. 3

Common Name:	Purple Dye
Percent of Mixture (by volume):	Less than 1%

The information herein is provided in good faith, but no warranty, either expressed or implied, is made by King Engineering.

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MATERIAL SAFETY DATA SHEET

Product Name	**Tetrabromoethane (TBE)**		
Product id	2360		
Revision date	18/11/1999	**Revision:**	3
Supersedes	21/06/1998		

1. Identification of the substance & the company

Chemical name 1,1,2,2-Tetrabromoethane

Chemical formula C2H2Br4

Molecular weight 345.7

Type of product and use For use in polymer/polyester fiber industry and for mineral separation

Company Broomchemie B.V.
P.O. Box 318, 4530 AH Terneuzen, The Netherlands,
Tel. (+ 31) 115 689000

Emergency telephone number:
- For Europe (+31) 115 689000

- For UK and Ireland (01865)407333

- For USA Chemtrec (800) 424-9300

2. Composition / information on ingredients

Components	Weight %	Annex No.	EINECS No.	Classification	Notes
1,1,2,2-TETRABROMOETHANE 79-27-6	98.6	# 602-016-00-9	201-191-5	R52-53 T+; R26 Xi; R36	–

3.Hazards identification

Adverse human health effects Very toxic by inhalation
TBE is a central nervous system depressant and a hepatotoxin.
Irritant to eyes, skin and mucous membranes

4. First-aid measures

Eye contact Holding the eyelids apart, flush eyes promptly with copious flowing water for at least 20 minutes. Get medical attention immediately.

Skin contact	Remove contaminated clothing. Wash skin thoroughly with mild soap and plenty of water for at least 15 minutes. Wash clothing before re-use. Get medical attention immediately.
Inhalation	In case of mist inhalation or breathing fumes released from heated material, remove person to fresh air. Keep him quiet and warm. Apply artificial respiration if necessary and get medical attention immediately.
Ingestion	If swallowed, wash mouth thoroughly with plenty of water and give water to drink. Get medical attention immediately. ********** NOTE: Never give an unconscious person anything to drink. **********
Notes to the physician	No specific antidote. Treat symptomatically and supportively. In case of ingestion DO NOT induce vomiting. Signs and symptoms of toxicity are primarily referrable to the CNS, respiratory tract.

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5. Fire - fighting measures

Flash point	None
Flammable/Explosion limits	Not flammable
Auto-ignition temperature	335°C
Suitable extinguishing media	Material is not combustible. Use extinguishing media appropriate to surrounding fire conditions.
Fire fighting procedure	Cool containers with water spray. In closed stores, provide fire-fighters with self-contained breathing apparatus in positive pressure mode.
Unusual fire and explosion hazards	Will decompose from ca. 239°C releasing poisonous and corrosive fumes of Hydrogen bromide, bromine and carbonyl bromide.

6. Accidental release measures

Personal precautions	Evacuate area. Full protective clothing, including self-contained breathing apparatus, must be used.
Methods for cleaning up	Absorb on sand or vermiculite and place in closed container for disposal. Ventilate area and wash spill site after material pickup is complete.

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7. Handling and storage

Handling

Keep containers tightly closed.
Avoid breathing vapours and any other bodily contact.

Storage

Store in a dry, cool, well-ventilated area away from incompatible materials (see “materials to avoid”).

8. Exposure controls / personal protection

Exposure Limits :

Components	ACGIH-TLV Data	OSHA (PEL) Data
1,1,2,2- TETRABROMOETHANE 79-27-6	Not determined	Not determined

Ventilation requirements

Mechanical exhaust required.
Ventilation must be sufficient to maintain atmospheric concentration below TLV.

Personal protective equipment:

- Respiratory protection	Approved respirator
- Hand protection	Protective gloves
- Eye protection	Chemical safety goggles
- Skin and body protection	Body covering clothes and boots
Hygiene measures	Safety shower and eye bath should be provided. Do not eat, drink or smoke until after-work showering and changing clothes.

9. Physical and chemical properties

Appearance	Colourless to yellowish liquid with a sweet pungent odour.
Melting point/range	1°C ±1°C
Boiling point/range	119°C (at 15 mm Hg) 150°C (at 50 mm Hg)
Vapour pressure	0.04 mm Hg at 24°C
Vapor density	11.92
Evaporation rate (ether=1)	Not available
Solubility:	
- Solubility in water	0.28 gr/100ml at 80°C 0.063 g/100ml at 20°C
- Solubility in other solvents	Soluble in most organic solvents
Specific gravity	2.96
Decomposition temperature	From ca. 239°C

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10. Stability and reactivity

Stability	Stable under normal conditions.
Materials to avoid	Reacts with chemically active metals or strong caustics. In the presence of steam, contact with hot iron, aluminium and zinc may cause formation of toxic vapours. Softens or destroys most plastics and rubbers.
Conditions to avoid	High temperatures
Hazardous decomposition products	Hydrogen bromide, bromine and carbonil bromide
Hazardous polymerization	Will not occur

11. Toxicological information

Acute toxicity:	
- Rat oral LD50	1200 mg/kg
- Rat dermal LD50	5250 mg/kg
- Rat inhalation LC50	549 mg/m•/4 hour
Effects of overexposure :	
- Ocular	Irritant
- Dermal	Irritant
- Inhalation	Irritant to upper respiratory tract Symptoms of overexposure may include headache, abdominal cramps, vomiting, anorexia, drowsiness, yellowing of the skin, dark urine and unconsciousness in severe cases. May cause bilirubinuria, monocytosis, pulmonary edema, liver and kidney damage.
- Ingestion	Irritant to mucous membranes Symptoms as of inhalation.
Chronic toxicity	Prolonged exposure may cause liver and kidney damage.
Mutagenicity	Mutagenic by the Ames Test Was found mutagenic in DNA repair test with E. coli. Was found clastogenic in sister chromatid exchange test with Chinese hamster ovary cells.
Carcinogenicity	Not classified by IARC. Not included in NTP 8th Report on Carcinogens.

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12. Ecological information

Information on ecological effects	TBE is classified by IMO as a Marine Pollutant.
- LC50, fish	19 mg/l, 48 Hours (orange red-killifish)
- BOD % of TOD	29% (2 weeks)
Bioaccumulative potential	BCF 0.5~7.0 (10 ug/l, 6 weeks) BCF <2.9~8.2 (1 ug/l, 6 weeks)

13. Disposal considerations

Waste disposal	Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state and local environmental regulations when disposing of this material.

14. Transportation information

UN No.	2504
IMO	Proper shipping name: TETRABROMOETHANE Class: 6.1 Toxic substances Label: TOXIC (6.1) Marking: MARINE POLLUTANT Packing Group: III (IMDG CODE - page 6263, amdt.29-98)
ADR/RID	Class and Item Nos.: 6.1, 15°(c) Danger Label Model No.: 6.1 Hazard/Substance Nos.: 60/2504
ICAO/IATA	Class: 6.1 Packing group: III
DOT	Proper shipping name: TETRABROMOETHANE Packing Group: III Class: 6.1 - Poisons Marking: MARINE POLLUTANT Label: TOXIC (6.1)

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15. Regulatory information

EEC	Reported in EINECS (No. 2011915)
- Indication of danger	Very Toxic, symbol required (T+) and Irritant
- Risk Phrases	R 26 : Very toxic by inhalation. R 36 :Irritating to eyes. R 52/53: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment
- Safety Phrases	S 24 :Avoid contact with skin. S 27 :Take off immediately all contaminated clothing. S 45 :In case of accident or if you feel unwell, seek medical advice immediately (show the label when possible). S 61: Avoid release to the environment. Refer to special instructions/ Safety data sheets.
Australia	Listed in AICS
USA	Reported in the EPA TSCA Inventory
Canada	Listed in DSL
Japan	Listed in MITI (ENCS No.2-77X)
South Korea	Listed in ECL (KE-33261)

16. Other information

The HSE Policy of Dead Sea Bromine Group

Dead Sea Bromine Group (DSBG) is the world's largest producer of elemental bromine and a recognized leader in the development and supply of bromine compounds.

DSBG is committed to responsibly manage its products at all stages of their life cycle in order to protect human health and the environment.

This responsibility applies throughout development, manufacture, transportation, use, recycle and disposal of DSBG products.

WITHIN THIS FRAMEWORK DSBG IS COMMITTED TO:

* Comply with national and international regulatory requirements
* Conform to the ISO 14001 and OHSAS 18001 requirements for environmental and occupational health & safety management systems and periodically evaluate performance as part of the company's existing quality audits system

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* Design products and processes which prevent risk to health and the environment at production sites and along the supply chain
* Improve efficiency in use of energy & natural resources, promote recycling and waste management through safe & environmentally sound end of life programs
* Work for continual improvement in HSE performance
* Regularly assess and responsibly manage health, safety and environmental risks associated with products and processes
* Educate and train all managers and employees to improve their HSE performance
* Distribute updated information concerning its policy and products to its workers, customers and other interested parties through Material Safety Data Sheet (MSDS), workers' safety sheets and through the DSBG Internet Site
* Develop business relationships with responsible suppliers, transporters and distributors and provide them with HSE support, information and training
* Support Product Stewardship programs in cooperation with customers, distributors and transporters
* Allocate the necessary resources for implementation of this policy

DSBG Disclaimer

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Prepared By

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End of safety data sheet

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mendatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY *(As Used on Label end List)*
DIAZENE-42

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

N/A= Not Available

Manufacturer's Name DIAZ CHEMICAL CORPORATION	**Emergency Telephone Number** (716) 638-6321
Address *(Number, Street, City, State, and ZIP Code)* P.O.BOX 194	**Telephone Number for Information** (716) 638-6321
40JACKSON STREET	**Date Prepared** May 28, 1986
HOLLEY, NEW YORK 14470	**Signature of Preparer** *(optional)* Marie S. MacClare

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% *(optional)*
BROMOETHYLBENZENES CAS# 1585-07-5	N/A	N/A	N/A	
DIBROMOETHYLBENZENES CAS# 30812-87-4	N/A	N/A	N/A	
TRIBROMOETHYLBENZENES CAS# 31195-17-2	N/A	N/A	N/A	

Section III — Physical/Chemical Characteristics

Boiling Point 390-580°F	200-300°C	**Specific Gravity** (H_2O - 1) $^{15}/_{15}$°C	1.73-1.75
Vapor Pressure (mm Hg.) N/A		**Melting Point** less than 0°C	N/A
Vapor Density (AIR - 1) 9.4		**Evaporation Rate** (Butyl Acatate - 1)	less than

Solubility in Water
Negligible

Appeanance and Odor
Clear liquid, colorless to light yellow, mothball odor

Section IV — Fire and Explosion Hazard Data

Flesh Point (Method Used) NONE, greater than 200°F	**Flammable Limits** N/A	**LEL** N/A	**UEL** N/A

Extinguishing Media
WATER, CO_2, CHEMICAL FOAM

Special Fire Fighting Procedures
NONE

Unususl Fire and Explosion Hazards
NONE

Section V — Reactivity Data

Stability			
	Unstable		Conditions to Avoid: Avoid contact with finely divided reducing
	Stable	X	metals, such as powdered aluminum

Incompatibility (*Materials to Avoid*): Avoid contact with finely divided reducing metals

Hazardous Decomposition or Byproducts: Hydrogen Bromide, Carbon Monoxide, Carbon Dioxide

Hazardous olymerization			
	May Occur		Conditions to Avoid
	Will Not Occur	X	

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? X Skin? X Ingestion? X

Health Hazards (*Acute and Chronic*): INHALATION- Probable nasal irritation possible liver and kidney damage upon repeated or long term contact.

SKIN-May cause irritation

Carcinogenicity: N/A NTP? NO IARC Monographs? NO OSHA Regulated? NO

Signs and Symptoms of Exposure: Nasal or skin irritation

Medical Conditions Generally Aggravated by Exposure: N/A

Emergency and First Aid Procedures: SKIN-Wash with soap and water. EYE-Irrigate with large volumes of water. INGESTION-Induce vomiting. INHALATION-Remove to fresh air. See a physician.

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled: Position pail or drum to minimize leak. Absorb spilled material in absorbant such as clay, or other appropriate material.

Waste Disposal Method: LIQUID- Incineration at Hazardous Waste Incineration Facility

SOLIDS (from spill clean-up)- Landfill at Secure Chemical Landfill

Precautions to Be Taken in Handling and Storing: Practice reasonable care to avoid skin and eye contact and to avoid breathing vapors.

Other Precautions: N/A

Section VIII — Control Measures

Respiratory Protection (*Specify Type*): Organic Vapor Cannister

Ventilation			
	Local Exhaust: "Adequate" Ventilation	Special: N/A	
	Mechanical (*General*): N/A	Other: N/A	

Protective Gloves: Rubber Gloves

Eye Protection: Safety Glasses

Other Protective Clothing or Equipment: Coveralls