## **Material Safety Data Sheet**

Product Name: **Red-X Indicating Liquid** Product Part Numbers: **1122, 1178, 3392, 3374 & 1844-28, -38, -49, -59, -70, -74, -240** 

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:	.C2HCBr4
Percent of Mixture (by volume)	.95%
Manufacturer	.Broomchemie B.V.
Distributor	Spectrum Laboratory Products, Inc.
MSDS	Attached

## **Chemical Ingredient No. 2**

Common Name:	DuPont Oil Red
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 Petro-Meter Corporation.





# **Material Safety Data Sheet**

NFPA	HMIS	Personal Protective Equipment
301	Health Hazard 2   Fire Hazard 1	
$\sim$		See Section 15.

Section 1. Chemical Product and Company Identification			Page Number: 1
Common Name/ Trade Name	1,1,2,2-Tetrabromoethane	Catalog Number(s).	T1021, T1022
		CAS#	79-27-6
Manufacturer	SPECTRUM LABORATORY PRODUCTS INC.	RTECS	KI8225000
	14422 S. SAN PEDRO STREET GARDENA, CA 90248	TSCA	TSCA 8(b) inventory: 1,1,2,2–Tetrabromoethane
Commercial Name(s)	Not available.	CI#	Not applicable.
Synonym	sym-Tetrabromoethane; TBE; Tetrabromacetylene s-Tetrabromoethane; Acetylene tetrabromide	IN CASE OF	EMERGENCY
Chemical Name	Ethane, 1,1,2,2-tetrabromo-	CHEMIKEC	<u>(24nr) 800-424-9300</u>
Chemical Family	Alkylated hydrocarbon. (Aliphatic.)	CALL (310) 51	6-8000
Chemical Formula	C2-H2-Br4		
Supplier	SPECTRUM LABORATORY PRODUCTS INC. 14422 S. SAN PEDRO STREET GARDENA, CA 90248		

Section 2.Composition and Information on Ingredients					
			Exposure Limits		
Name	CAS #	TWA (mg/m <sup>3</sup> )	STEL (mg/m <sup>3</sup> )	CEIL (mg/m <sup>3</sup> )	% by Weight
1) {1,1,2,2-}Tetrabromoethane	79-27-6	14			100

Toxicological Data on Ingredients 1,1,2,2-Tetrabromoethane:

ORAL (LD50):	Acute: 1200 mg/kg [Rat].	269 mg/kg [Mouse].	400 mg/kg [Rabbit].
DERMAL (LD50):	Acute: 5250 mg/kg [Rat].		

Section 3. Hazards Identification

Potential Acute Health Effects	Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator). Severe over-exposure can result in death.
Potential Chronic Health Effects	CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, liver, skin. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

## Section 4. First Aid Measures

Eye Contact	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. WARM water MUST be used. Get medical attention.	
Skin Contact	In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.	
Serious Skin Contact	Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.	
Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.	
Serious Inhalation	Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.	
Ingestion	Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.	
Serious Ingestion	Not available.	

## Section 5. Fire and Explosion Data

May be combustible at high temperature.
335°C (635°F)
Not available.
Not available.
These products are carbon oxides (CO, CO2), halogenated compounds.
Slightly flammable to flammable in presence of open flames and sparks, of heat.
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.
When heated to decomposition it emits highly toxic fumes of carbonyl bromide and bromide. Decomposes at 190 deg. C to also liberate flammable and highly toxic vapors of hydrogen bromide and carbon monoxide
Not available.

## Section 6. Accidental Release Measures

Small Spill	Absorb with an inert material and put the spilled material in an appropriate waste disposal.	
Large Spill	Poisonous liquid. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.	

## Section 7. Handling and Storage

Precautions	Keep locked up Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as metals, alkalis.
Storage	Keep container tightly closed. Keep container in a cool, well-ventilated area.

## Section 8. Exposure Controls/Personal Protection

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection	Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection in Case of a Large Spill	Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
Exposure Limits	TWA: 1 (ppm) from ACGIH (TLV) [United States] TWA: 1 (ppm) from OSHA (PEL) [United States] TWA: 14 (mg/m <sup>3</sup> ) from OSHA (PEL) [United States] TWA: 1 (ppm) from NIOSH [United States] TWA: 1 STEL: 1.5 (ppm) [Canada] TWA: 0.5 (ppm) [United Kingdom (UK)] TWA: 7.2 (mg/m <sup>3</sup> ) [United Kingdom (UK)]
	Consult local authorities for acceptable exposure limits.

Section 9. Physical and Chemical Properties
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Physical state and appearance	Liquid.	Odor	Camphor and Iodoform
Molecular Weight	345.65 g/mole	Taste	Not available.
pH (1% soln/water)	Not available.	Color	Colorless to light yellow.
Boiling Point	243.5°C (470.3°F)		
Melting Point	0°C (32°F)		
Critical Temperature	Not available.		
Specific Gravity	2.9656 (Water = 1)		
Vapor Pressure	0 kPa (@ 20°C)		
Vapor Density	11.9 (Air = 1)		
Volatility	Not available.		
Odor Threshold	Not available.		
Water/Oil Dist. Coeff.	Not available.		
Ionicity (in Water)	Not available.		
<b>Dispersion Properties</b>	See solubility in water, diethyl ether, acetone.		
Solubility	Soluble in acetone. Very slightly soluble in cold water, hot water. Miscible in ethanol, ether, chloroform, aniline, acetic Soluble in benzene. slightly soluble in carbon tetrachloride. Solubility in Water: 678 mg/l @ 25 deg. C; 0.065 g	: acid. /100 ml @	30 eg. C; 0.28 g/100 g @ 80 deg. C.

#### Section 10. Stability and Reactivity Data Stability The product is stable. **Instability Temperature** Not available. **Conditions of Instability** Excess heat, incompatible materials **Incompatibility with various** Reactive with metals, alkalis. substances Corrosivity Non-corrosive in presence of glass. **Special Remarks on** Incompatible with active metals, reducing metals such as aluminum, magnesium and zinc, strong caustics, hot Reactivity iron, or zinc in the presence steam. Special Remarks on Not available. Corrosivity

Polymerization

Section 11. Toxicological Information

Will not occur.

Routes of Entry	Absorbed through skin. Eye contact. Ingestion.
Toxicity to Animals	WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 269 mg/kg [Mouse]. Acute dermal toxicity (LD50): 5250 mg/kg [Rat]. Acute toxicity of the vapor (LC50): 549 mg/m <sup>3</sup> 4 hours [Rat].
Chronic Effects on Humans	MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. May cause damage to the following organs: kidneys, liver, skin.
Other Toxic Effects on Humans	Hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).
Special Remarks on Toxicity to Animals	Lethal Dose/Conc 50% Kill: LD50[Guinea Pig] - Route: Oral; Dose: 400 mg/kg
Special Remarks on Chronic Effects on Humans	May affect genetic material (mutagenic). May cause cancer based on animal test data
Special Remarks on other Toxic Effects on Humans	Acute Potential Health Effects: Skin: Causes moderate skin irritation. It can be absorbed throurgh the skin and cause systemic effects. Eyes: Causes mild to moderate eye irritation with pain and slight irritation of the conjunctiva. It may cause superficial, transitory corneal injury which disappears within 24 hours. Inhalation: Inhalation of high concentrations of mist or vapor can cause upper respiratory tract irritation. It can affect behavior/central nervous system with symptoms such as central nervous system depression, headaches, fatigue, lightedness, dizziness, drowsiness, seizures, fainting. It may cause pulmonary edema. It may also cause stomach pain, nausea, and vomiting, and anorexia and affect the liver, kidneys, and blood (monocytosis). Yellowing of the skin can result from liver damage, and dark urine can result from kidney damage. Ingestion: Harmful if swallowed. It can cause nausea, stomach pain, vomiting and other symptoms similar to that of acute inhalation. It may affect behavior/central nervous system (symptoms similar to that of acute inhalation) Chronic Potential Health Effects: Inhalation: Prolonged or repeated inhalation may affect the lungs and may cause liver damage (liver function tests impaired, fatty liver degneration, hepatitis) and kidney damage. It may also affect metabolism and cause weight loss. Skin: Prolonged or repeated skin contact may cause drying and cracking of the skin.

## Section 12. Ecological Information

e e e e e e e e e e e e e e e e e e e	
Ecotoxicity	Ecotoxicity in water (LC50): 19 mg/l 48 hours [Fish (Orange-red killifish)].
BOD5 and COD	Not available.
Products of Biodegradation	Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.
Toxicity of the Products of Biodegradation	The products of degradation are as toxic as the product itself.
Special Remarks on the	Not available.
Products of Biodegradation	

### Section 13. Disposal Considerations

Waste Disposal

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14. Transport Information		
DOT Classification	CLASS 6.1: Poisonous material.	
Identification	: Tetrabromoethane UNNA: 2504 PG: III	
Special Provisions for Transport	Marine Pollutant	
DOT (Pictograms)	ELECTRIC STORY	
Section 15. Other	Regulatory Information and Pictograms	

Federal and State Regulations	Illinois toxic substances disclosure to employee act: 1,1,2,2-Tetrabromoethane Rhode Island RTK hazardous substances: 1,1,2,2-Tetrabromoethane Pennsylvania RTK: 1,1,2,2-Tetrabromoethane Minnesota: 1,1,2,2-Tetrabromoethane Massachusetts RTK: 1,1,2,2-Tetrabromoethane Massachusetts spill list: 1,1,2,2-Tetrabromoethane New Jersey: 1,1,2,2-Tetrabromoethane California Director's List of Hazardous Substances: 1,1,2,2-Tetrabromoethane TSCA 8(b) inventory: 1,1,2,2-Tetrabromoethane	
Cantornia Proposition 65 Warnings	California prop. 65: This product contains the following ingredients for which the State of California has to cause cancer which would require a warning under the statute: No products were found. California prop. 65: This product contains the following ingredients for which the State of California has to cause birth defects which would require a warning under the statute: No products were found.	found found
Other Regulations	OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances (EINECS 201-191-5). Canada: Listed on Canadian Domestic Substance List (DSL). China: Listed on National Inventory. Japan: Listed on National Inventory (ENCS). Korea: Listed on National Inventory (KECI). Philippines: Listed on National Inventory (PICCS). Australia: Listed on AICS.	S No.
Other Classifications	WHMIS (Canada)       CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC).         CLASS D-2A: Material causing other toxic effects (VERY TOXIC).	
Continued on Ne	t Page	

1,1,2,2-Tetrabromoe	thane				Page Number: 6
	DSCL (EEC)	R26- Very R36- Irrita R52/53- I may caus in the aqu	y toxic by inhalation. ating to eyes. Harmful to aquatic organisms, e long-term adverse effects atic environment.	S24- Avoid contact S27- Take off imme clothing. S45- In case of acc seek medical advice label where possible S61- Avoid release special instructions.	with skin. ediately all contaminated sident or if you feel unwell, e immediately (show the e). to the environment. Refer to /Safety data sheets.
HMIS (U.S.A.)	Health Hazard Fire Hazard Reactivity Personal Protect	2 1 0 ion h	National Fire Protection Association (U.S.A.)	Health	Flammability Reactivity Specific hazard
WHMIS (Canada) (Pictograms)					
DSCL (Europe) (Pictograms)		~~			
TDG (Canada) (Pictograms)					
ADR (Europe) (Pictograms)					
Protective Equipment		Gloves. Lab coat.			
		Vapor respirator approved/certifie	. Be sure to use an d respirator or		
		equivalent. Wea when ventilation Splash goggles.	ar appropriate respirator is inadequate.		

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#### Section 16. Other Information

MSDS Code	T3180		
References	Not available.		
Other Special Considerations	Major Uses: Separating minerals by specific gravity (liquid in specific gravity separation of solids-EG, ores); solvent for fats, oils, and waxes; solvent in microscopy; mercury substitute in gauges and balances; catalyst or catalytic initiator in synthetic fibers; polymer additive in flame-proof, flame-retardant polystyrenes, polyurethanes, and polyolefins; catalyst in production of Terephthalic acid from p-Xylene; level in sight gauges		
Validated by Sonia Owen on 10/19/2006.		Verified by Sonia Owen. Printed 10/19/2006.	
CALL (310) 516-8000			

Notice to Reader

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum Quality Products, Inc. assumes no responsibility for the completeness or accuracy of the information contained herein.

Dead Sea Bromine Group

**MORRE-TEC INDUSTRIES, INC.** 



1600 Route 22 East, 3rd Floor • Union, NJ 07083-3410 TEL: 908-688-9009 • FAX 908-688-9005

## MATERIAL SAFETY DATA SHEET

Product	Tetrabromoethane (TBE)	Page: 1/5
MSDS code: 2360	Version: 1	Date 24/04/1995
Identification of the substan	ce & the company	
Chemical Name	1,1,2,2-Tetrabromeoethane	
Chemical formula	C2HCBr4	
CAS number	79-27-6	
Molecular weight	345.7	
Type of product and use	For use in polymer/polyester separation	fiber industry and for mineral
Company identification	Broomchemie B.V.	
Address and telephone	P.O. Box 318, 4530 AH Tern 1150-89000	euzen, The Netherlands, Tel. (0931)
Emergency telephone number:		
-For USA	Chemtrec (800)424-9300	
Composition/information or	ningredients	
Hazardous component(s)	1,1,2,2-Tetrabromeoethane -	- 98.6%
Physical and chemical prop	erties	
Appearance	Colourless to yellowish liquid	I with a sweet pungent odour.
Melting point/range	1ºC +-1ºC	
Boiling point/range	119⁰C (at 15 mmHg)	
	150ºC (at 50 mm Hg)	
Specific gravity	2.96	
Vapour pressure	0.04 mm Hg at 24ºC	
Relative vapour density (air=1)	11.92	
Evaporation rate (ether = 1)	>100	
Solubility:		
- Solubility in water	0.063 gr/1000ml at 20°C	
	0.28 gr/1000ml at 80°C	
-Solubility in other Solvents	Soluble in most organic solve	ents
Thermal decomposition	From ca. 239ºC	
Hazards identification		
Adverse human health effects	Very toxic by inhalation	
	TBE is central nervous syste	m depressant and a hepatotoxin.
	Irritant to eyes, skin and muc	cous membranes
Fire - fighting measures		
Flash point	None	
Auto-ignition temperature	335°C	

Product MSDS code: 2360	Tetrabromoethane (TBE) Version: 1	Page: 2/5 Date 24/04/1995
Flammable/Explosion limits	Non flammable	
Extinguishing media	Material is non combustible.	Use extinguishing media appropri-
	ate to surrounding fire condi	tions.
Fire fighting procedure	Cool containers with water s	pray.
	In closed stores, provide fire	-fighters with self-contained breath-
	ing apparatus in positive pre	ssure mode.
Unusual fire and explosion hazards	Will decompose from ca. 23	9°C releasing poisonous and corro-
	sive fumes of Hydrogen bror	mide, bromine and
	carbonyl bromide.	
Toxicological information		
Toxicity:		
-Rat oral LD50	1200 mg/kg	
-Rat dermal LD50	5250 mg/kg	
-Rat inhalation LC50	549 mg/m3/4 hour	
Effects of overexposure:		
-Ocular	Irritant	
-Dermal	Irritant	
- Inhalation	Irritant to upper respiratory t	ract.
	Symptoms of overexposure	may include headache, abdominal
	cramps, vomiting, anorexia,	drowsiness, yellowing of the skin,
	dark urine and unconscious	ness in severe cases.
	May cause bilirubinrla, mono	cytosis, pulmonary edema, liver and
	kidney damage.	
-Ingestion	Irritant to mucous membrane	es.
	Symptoms as of inhalation.	
Carcinogenicity	Not classified by IARC.	
	Not included in NTP 7th A	nnual Report on Carcinogens.
Mutagenicity	Mutagenic by the Ames Tes	t
	Was found mutagenic in DN	A repair test with E. coli.
	Was found clastogenic in sis	ster chromatid exchange with Chi-
	nese hamster ovary cells.	
Chronic toxicity	Prolonged exposure may ca	use liver and kidney damage.
First-aid measures		
Eye contact	Holding the eyelids apart, flu	sh eyes promptly with copious
	flowing water for at least 20	minutes. Get medical attention
	immediately.	
Skin contact	Remove contaminated cloth	ing. Wash clothing before re-use.
	Get medical attention immed	diately.
Inhalation	In case of mist inhalation or	breathing fumes released from
	heated material, remove per	son to fresh air.

Product MSDS code: 2360	Tetrabromoethane (TBE) Version: 1	Page: 3/5 Date 24/04/1995	
Ingestion	Keep him quiet and warm. Apply artificial respiration if necessary and get medical attention immediately. If swallowed, wash mouth thoroughly with plenty of water and give water or milk to drink. Get medical attention immediately. NOTE: Never give an unconscious person anything to drink.		
Ecological information			
Information on ecological effects -LC50, fish -BOD Bioaccumulative potential	TBE is classified by IMO as 19mg/l, 48 Hours (orange re 29.0% (2 weeks) BCF 0.5 ~ 7.0 (10 ug/l, 6 we BCF <2.9~8.2 (ug/l, 6 weeks	a Marine Pollutant d-killifish) eks) s)	
Stability and reactivity			
Stability Materials to avoid	Stable under normal condition Reacts with chemically activ In the presence of steam, co zinc may cause the formation	ons e metals or strong caustics. ontact with hot iron, aluminum and n of toxic vapours.	
Conditions to avoid Hazardous decomposition	Softens or destroys most pla High temperatures	astics and rubbers.	
–products Hazardous polymerization	Hydrogen bromide, bromine Will not occur	and carbonil bromide	
Accidental release measures			
Personal precautions	Evacuate area. Full protective clothing, inclu apparatus, must be used	ding self-contained breathing	
After spillage/leakage	Absorb on sand or vermiculi disposal. Ventilate area and wash spil plete.	te and place in closed container for I site after material pickup is com-	
Disposal considerations			
Waste disposal	Dissolve or mix the material in a chemical incinerator equ scrubber. Observe all federal, state an when disposing of this mater	with a combustible solvent and burn upped with an afterburner and d local environmental regulations rial.	

Product MSDS code: 2360	Tetrabromoethane (TBE) Version: 1	Page: 4/5 Date 24/04/1995
Exposure controls/personal	protection	
Exposure limits:		
-TLV-TWA	1ppm (14mg/m3)	
Ventilation requirements	Mechanical exhaust required	I.
	Ventilation must be sufficient	to maintain atmospheric concentra-
Developed events ation and interacti	tion below TLV.	
Personal protection equipment:		
-Respiratory protection	Approved respirator	
- Gloves	Chamical asfatu as and	
- Eye protection	Chemical safety goggle	4-
- Others	Body covering clothes and b	oots
industrial hygiene	Safety shower and eyebath s	should be provided. Do not eat, drink
	or smoke until after-work sho	owering and changing clothes
Handling and storage		
Handling	Keep containers tightly closed.	
	Avoid breathing vapours and	any other bodily contact.
Storage	Store in a dry, cool, well-ven	tilated area away from incompatible
	materials (see "materials to a	avoid")
Transportation information		
UN No.	2504	
IMO-IMDG code	Proper shipping name: TETF	RABROMOETHANE
	Class: 6.1 - Toxic substance	S
	Packing Group: III	
	Label: Toxic (6)	
	Marking: MARINE POLLUTA	NT
	(IMDG CODE - 6263, amdt.2	27-94)
ICAO/IATA	Class:6.1	
	Packing Group: III	
US DOT	Proper shipping name: TETF	RABROMOETHANE
	Class: 6.1 - Poisons	
	Packing Group: III	
	Label: HARMFUL - Stow Aw	ay from Foodstuffs (6)
	or POISON (6) OR TOXIC (6	S)
	Marking: MARINE POLLUTA	NT
REGULATORY INFORMATION		
USA	Reported in the EPA TSCA I	nventorv

Reported in the EPA TSCA Inventory

Product	Tetrabromoethane (TBE)	Page: 5/5
MSDS code: 2360	Version: 1	Date 24/04/1995

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Prepared by the HSE Division in Israel telefax: +/972-7-297832 telephone: +/972-7-297830 telex: 5343

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