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Submitting Organization
ETHYL CORP

Contractor

Document Title
INITIAL SUBMISSION: MATERIAL DATA SAFETY SHEET ON 2,6-DI-TERT-BUTYLPHENOL (DTBP) WITH COVER LETTER DATED 02/29/84

Chemical Category
2,6-DI-TERT-BUTYLPHENOL

COVERING FORM FOR GLOBAL INDEXING

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→ Will Perry

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ETHYL CORPORATION

TOXICOLOGY AND INDUSTRIAL HYGIENE DEPARTMENT

ETHYL TECHNICAL CENTER
8000 GSRI AVENUE
BATON ROUGE, LOUISIANA 70820
(504) 388-7717

Contains No CBI

February 29, 1984

79-94-7 1R-405
128-39-2 1R-412B
68457-79-4 1R-429B

Mr. Martin Greif, Executive Secretary
Interagency Testing Committee
401 M Street, S. W.
Washington, D. C. 20460

Dear Mr. Greif:

This follows up my letter to you of February 1, 1984 concerning the ITC's request for information noticed in 48 FR, Nov. 9, 1983, pp. 51519-21.

Additional information to cover tetrabromobisphenol A (CAS 79-94-7) and 2,6-di-tert-butylphenol (CAS 128-39-2) is attached. None of the material submitted is considered to be of a confidential nature and may be used by the ITC in preparing their assessment of priority considerations for testing rules under section 4(a) of TSCA.

With the five products covered in my 2/1/84 submission, the two covered here bring the Ethyl total to seven. An additional product listing, phosphorodithioic acid, 0,0-bis (mixed iso-bu and pentyl) esters, zinc salts (CAS 68457-79-4), while nominally an Ethyl compound, is manufactured overseas and used there. Thus, it is not a U. S. product.

As additional information becomes available to us, this will be sent along to you. Any questions you have may be directed to me. Thanks for your past helpfulness in handling these information requests.

Robert L. Smith

Robert L. Smith
Manager, Regulatory Affairs

RLS:nh
Attachments

94 JUL 26 PM 3:30

OPPT CBIC
RECEIVED

PRODUCT NAME: 2,6-Di-tert-butylphenol

CAS No.: 128-39-2

- **Attached**

  - Technical Bulletin
  - Material Safety Data Sheet

- **Production**

  Quantity manufactured is in the multimillion pound per year range. The exact production figures are considered to be confidential information.

- **Worker Exposure**

  Occupational exposure is confined to reactor operators, maintenance people and during loading and off loading of bulk shipments. The subject material is manufactured and used as an intermediate primarily in closed systems resulting in minimal exposure in the workplace. No risk to human life is known to exist during manufacture and/or use.

- **Use Data**

  The subject material is used primarily (about 95% of the total manufactured) as an intermediate to produce high molecular weight "hindered phenolic" compounds commercially known as antioxidants. These become an integral part of synthetic polymers or plastics, e.g. polypropylene, acting to prevent oxidative degradation in processing and during the service life of the polymers and plastics. 2,6-Di-tert-butylphenol is also utilized directly as an oxidation inhibitor and stabilizer for fuels, oils, plastics, rubber and other products.

- **Environmental Data**

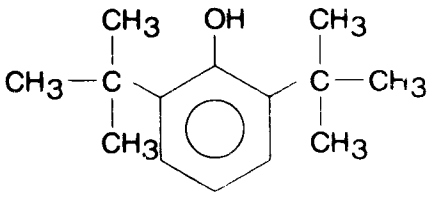
  Except for accidental spills, 95% of the total manufactured is not expected to enter the environment since it is reacted by consumers to produce higher molecular weight antioxidants. The 5% of the total manufactured which goes into direct application as an oxidation inhibitor or stabilizer is ordinarily present as a minor component in fuels (which are burned) or in oils, plastics, rubber and similar products (which are disposed of in various, generally well known, ways).

- **Toxicological Data**

  A summary of the available toxicological information is given in the accompanying technical bulletin and MSDS.

DTBP

2,6-DI-TERT-BUTYLPHENOL



TYPICAL PROPERTIES

Form	Crystalline solid	Density at 20°C, 68°F g/ml	0.914
Color	Light Straw	lb/gal	7.61
Boiling point	265°C (509°F)	Molecular weight	206.3
Melting point	37°C (99°F)	Flash point (TCC), °F	>210
Vapor pressure at 50°C	<0.01mm	Viscosity at 20°C, cs	7.3

APPLICATIONS

Chemical intermediate for antioxidants, synthetic resins, pesticides and other products.

SOLUBILITY (Wt. % at 20° C)

Acetone	66	Ethyl alcohol	48
Carbon tetrachloride	67	Water	Insoluble
Heptane	75	10% NaOH	Insoluble

TOXICITY AND HANDLING

Animal tests indicate that DTBP is slightly toxic by oral administration to rats (LD_{50} of 9200 mg/kg) and dermal application to rabbits (LD_{50} >10,000 mg/kg). It is a mild eye irritant and a mild, but not primary, skin irritant. At temperatures up to 100°C, insufficient DTBP is vaporized to produce any signs of illness in rats exposed for six hours.

Avoid contact with eyes, wash thoroughly after handling. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Call a physician.

Refer to product as:

2,6-DI-TERT-BUTYLPHENOL

Container sizes:

Tank Cars
Tank trucks

Drums, steel, nonreturnable	55-gal.	5-gal.	1-gal.
Net contents, gal. (nominal)	53	5	1
Net contents, lb.	400	40	8
Tare, lb., approx.	48	5	1
Dimensions, diameter, in.	23	11.5	6.75
Dimensions, height, in.	35	13.75	8.5
Volume, cu. ft.	10.71	1.07	0.26
Specification, ICC	17E	17E	17E

Shipping Point (at Ethyl's option): Ethyl's plant in Orangeburg, South Carolina, or Houston, Texas, U.S.A.

Shipping Classifications:

U.S. DOT description: Nonregulated
U.S. TSCA Chemical Inventory Registry Number: CAS 128-39-2
IMCO classifications: Nonregulated
U.S. Schedule B Number: 404.1860
UN Number: None

For Order Placement:

U.S.A.
Ethyl Corporation, Chemicals Group
451 Florida Boulevard
Baton Rouge, Louisiana 70801 U.S.A.
Telex: 586-431 or 441
TWX: 510-993-3597
Tel: (504) 388-7556 or Toll Free (800) 535-3030

CANADA
Ethyl Canada, Inc.
48 St. Claire Avenue West
Toronto, Ontario M4V 2Z2, Canada
Tel: (416) 962-1611

LATIN AMERICA
Ethyl — Latin America
451 Florida Boulevard
Baton Rouge, Louisiana 70801 U.S.A.
Telex: 586-431 or 441
TWX: 510-993-3597
Tel: (504) 388-7491

EUROPE, MIDDLE EAST, AFRICA
Ethyl S.A.
523 Avenue Louise — Bte. 19
1050 Brussels, Belgium
Twlwx: 84622549
Cable: ETHYLBRU
Tel: (32.2) 640.3800

ASIA/PACIFIC
Ethyl Asia Pacific Co.
1601 Goldhill Plaza
Thomson Road
Singapore 1130
Telex: RS21161 or RS25733
Tel: (65) 252-8412

Chemicals Group

MATERIAL SAFETY DATA SHEET

Emergency Phone 504-344-7147

SECTION I

CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS
2,6-Di-tert-butylphenol	DTBP
CHEMICAL FAMILY	**FORMULA**
Alkylated Phenol	$C_{14}H_{22}O$

SECTION II - PRODUCT COMPOSITION

	%	TLV (Units)		%	TLV (Units)

SECTION III - PHYSICAL DATA

BOILING POINT (°F) At 760mm Hg	487	SPECIFIC GRAVITY (H_2O = 1)	0.92
VAPOR PRESSURE (mm Hg) At 68°F	<0.01	PERCENT VOLATILE BY VOLUME	Not Available
VAPOR DENSITY (AIR = 1)	Not Available	EVAPORATION RATE (_____ = 1)	Not Available
SOLUBILITY IN WATER	Insoluble	Melting Point (°F)	97

APPEARANCE AND ODOR
Crystalline solid with little odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	LEL
224°F (PMCC)	Not Established	

EXTINGUISHING MEDIA
Water spray, foam, dry chemical or CO_2

SPECIAL FIRE FIGHTING PROCEDURES

None.

UNUSUAL FIRE AND EXPLOSION HAZARDS

None.

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
None established by OSHA or ACGIH.

EFFECTS OF OVEREXPOSURE Ethanox® 701 is expected to be practically nontoxic by ingestion and dermal exposure. Rat oral LD_{50} = 9200 mg/kg and the rabbit dermal LD_{50} > 10,000 mg/kg. This material is expected to be a mild eye irritant and a mild skin irritant (Draize = 0.8/8).

EMERGENCY AND FIRST AID PROCEDURES

EYES: Begin immediate eye irrigation with cool water for at least 15 minutes with the eyelids held open by gently separating them with the fingers. Seek medical attention.

SKIN: Wash contaminated area(s) with soap and water. Wash clothing before reuse. Do not reuse heavily contaminated clothing.

INGESTION: Give a minimum of two glasses (16 oz) of water. Seek medical attention.

Ethyl Corporation - Chemicals Group
Ethyl Tower 451 Florida Blvd., Baton Rouge, LA 70801

CHEMICAL OR TRADE NAME Ethanox® 701

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	Avoid extremely high temperatures.

INCOMPATIBILITY (Materials to avoid)
Avoid strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS
Includes oxides of carbon. Under extreme conditions - phenol.

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Absorb on suitable material.

WASTE DISPOSAL METHOD Under EPA's Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA-"Superfund"), this product is not by EPA's definition a toxic chemical and its flash point is above 140°F (PMCC). Therefore, it may be disposed of as an industrial waste in a manner acceptable to good waste management practice and in compliance with any applicable local, state and federal regulation.

SECTION VIII - SPECIAL PROTECTIVE INFORMATON

RESPIRATORY PROTECTION (Specify type)
Dust respirator when dusting may occur.

VENTILATION	LOCAL EXHAUST	SPECIAL
	To control dust when handling.	
	MECHANICAL (General)	OTHER
	Recommended.	

PROTECTIVE GLOVES	EYE PROTECTION
Chemical Resistant.	Chemical Goggles.

OTHER PROTECTIVE EQUIPMENT
Chemically resistant clothing to avoid repeated or prolonged contact.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

None.

OTHER PRECAUTIONS

None.

(Essentially Similar to Fonn OSHA-20)

DATE January 16, 1984

ICDIAM

PRODUCT NAME: Tetrabromobisphenol A

CAS No.: 79-94-7

TRADE NAME: SAYTEX RB-100

- Attached

  - Technical Bulletin
  - Toxicological Evaluation Summary
  - Material Safety Data Sheet

- Production

  Annual production is considered confidential information and is based on market trends and demands. The Ethyl/Saytech production facility for tetrabromobisphenol A was opened in December 1983. Although the facility was designed for a specific volume, there has not been sufficient time to determine if the projected volumes can be produced or if the market demand will require the achievable volumes.

- Worker Exposur

  Tetrabromobisphenol A is manufactured by a continuous batch operation which involves a closed vessel procedure during the reaction and drying cycles. The dry, finished material is stored in a silo and air conveyed to the packaging room, located in a separate building.

  Employee exposure to tetrabromobisphenol A is limited to small amounts of dust that may be generated by upsets during the loadout. The packaging area and equipment are serviced by air pollution control devices to minimize release of the chemical into the work place and/or the environment. Packaging is not a continuous operation and employes one (1) operator per shift as needed.

- Use Data

  Suggested uses are listed on the attached Technical Bulletin.

- Environmental Data

  The subject chemical is not intended for use as an end product. Its environmental fate and/or degradation rate is dependent on the use application. No attempt has been made to compile this data.

- Toxicological Data

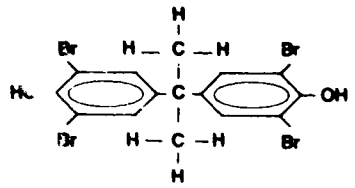
  A summary sheet listing all of the toxicological information known, either through actual testing or from literature references is attached.

Compiled by: LaVerne J. Makfinsky
ETHYL CORPORATION
Bromine Chemicals Division
Sayreville, NJ 08872
February, 1984

Saytech®
A Member of the Ethyl Chemicals Group

FLAME RETARDANTS

SAYTEX® RB-100



SAYTEX RB-100, tetrabromobisphenol A, is an effective reactive or additive source of bromine for flame retardancy. It offers these key performance features:

- stable form of aromatic bromine
- low cost
- reactive groups

SUGGESTED USES:

Reactive intermediate for preparation of brominated epoxy resins, polycarbonates, and unsaturated polyesters. Additive for ABS, polystyrene and phenolic resins.

TYPICAL PROPERTIES:

Formula	$C_{15}H_{12}Br_4O_2$
Molecular Weight	543.9
TBBPA content by HPLC	99%
Bromine Content	58.4%
Appearance	white free flowing solid
Solubility	soluble in alcohols and ketones; slightly soluble in aromatic and halogenated solvents; insoluble in water

SPECIFICATIONS:

	Saytex RB-100	Saytex RB-100 PC
Freezing Point, °C	178 min.	179.5 min.
APHA Color in Methanol (10g. in 50ml.)	50	25
Water Content	< 0.1%	< 0.1%
Iron Content, ppm	3	1

SAFETY AND HANDLING:

Although SAYTEX RB-100 is not considered to be a hazardous material, reasonable care should be taken to avoid unnecessary physical exposure. Avoid prolonged or repeated contact with skin and eyes and excessive inhalation of dust. Protective gloves, chemical safety goggles and approved dust respirators should be worn when over-exposure is anticipated. Smoking and eating should be avoided when handling the product. Good personal hygiene is recommended when handling this material.

A Material Safety Data Sheet and a Summary of Toxicological Evaluations are available upon request.

The data reported above is based upon laboratory flammability tests and should not be used to predict performance under actual fire conditions.

The facts stated and the recommendations made in this publication are based on our own research and the research of others, and are believed to be accurate. However, no guarantee of their accuracy is made because we cannot cover every possible contingency in manufacturing equipment and methods for the same reason the products discussed are sold without warranty, express or implied, and on the condition that purchasers shall make their own tests to determine the suitability of such products for their particular purposes. Statements concerning the possible use of our products are not intended as recommendations to use our products in the infringement of any patent.

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Ethyl Saytech

Saytech®
A Member of the Ethyl Chemicals Group

FLAME RETARDANTS

tech talk

SAYTEX RB-100

Summary: Toxicological Evaluations

	Type of Study	Results
I.	Skin Irritation	Not an irritant
II.	Eye Irritation	Not an irritant
III.	Oral LD_{50}	>5000mg/kg
IV.	Dermal LD_{50}	>2000mg/kg
V.	Inhalation 10da.	2, 6, 18mg/L x 4 hr./day nasal, lung irritation no lesions
VI.	Mutagenicity (Ames)	Negative response
VII.	Sensitization Guinea Pig	Not a sensitizer
VIII.	Dietary 28 day (rat)	No compound effects reported
IX.	Bromacnegenic	Non-bromacnegenic

Prepared by: LaVerne J. Makfinsky
Manager, Technical Compliance
February 23, 1983

The data reported above is based upon laboratory flammability tests and should not be used to predict performance under actual fire conditions.

The facts stated and the recommendations made in this publication are based on our own research and the research of others, and are believed to be accurate. However, no guarantee of their accuracy is made because we cannot cover every possible contingency in manufacturing equipment and methods. For the same reason, the products discussed are sold without warranty, express or implied, and on the condition that purchasers shall make their own tests to determine the suitability of such products for their particular purposes. Statements concerning the possible use of our products are not intended as recommendations to use our products in the infringement of any patent.

Printed in U.S.A.

Ethyl Saytech

Saytech Inc.
879 Main Street • Sayreville, New Jersey 08872
(201) 721-2100 • Telex: 833095

Ethyl Corporation

MATERIAL SAFETY DATA SHEET

(Essentially Similar To Form OSHA-20)

Rev. May 72

SECTION I

Ethyl Corporation, Bromine Chemicals Division	EMERGENCY TELEPHONE NO. (201) 721-2100
ADDRESS 879 Main Street, Sayreville, NJ 08872	
CHEMICAL NAME AND SYNONYMS Tetrabromobisphenol A	TRADE NAME AND SYNONYMS SAYTEX RB-100, TBBPA
CHEMICAL FAMILY Alkylated bromo phenol	FORMULA $C_{15}H_{12}O_2Br_4$

SECTION II - HAZARDOUS INGREDIENTS

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)		SPECIFIC GRAVITY (H_2O=1) g/cc at 25°C	2.12
VAPOR PRESSURE (mm Hg.)		PERCENT, VOLATILE BY VOLUME (%)	none
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (butyl acetate =1)	<1
SOLUBILITY IN WATER g/100g H_2O	0.2	Melting point, °C	180
APPEARANCE AND ODOR White crystalline powder - mildly phenolic			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) Solid	FLAMMABLE LIMITS	Lel	Uel
EXTINGUISHING MEDIA Water, CO_2, dry chemical or foam			
SPECIAL FIRE FIGHTING PROCEDURES Hydrogen bromide and other gases may be liberated at high temperatures. Self-contained breathing apparatus may be necessary.			
UNUSUAL FIRE AND EXPLOSION HAZARDS			

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: None established by OSHA or ACGIH

EFFECTS OF OVEREXPOSURE: TBBPA is considered to be practically non-toxic following acute oral (LD_{50}>5g/kg) or acute dermal (LD_{50}>2g/kg) exposure. It is non-irritating to the eyes (Draize score of 0/24 hrs.-7 days) and non-irritating to the skin (Draize score of 0/24 - 72 hrs.) It is also a non-sensitizing agent (Buehler), non-Bromacnegenic and a non-mutagen (Ames, with and without metabolic activation).

EMERGENCY AND FIRST AID PROCEDURES: Exercise good personal hygiene when handling this material. If contact should produce skin or eye irritation, flush with plenty of water. Seek medical attention if condition persists.

CHEMICAL OR TRADE NAME Saytex RB-100, TBBPA

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	Temperatures above 250°C
INCOMPATABILITY (Materials to Avoid)			
HAZARDOUS DECOMPOSITION PRODUCTS	HBr		
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Sweep or shovel into a container, Use nuisance dust respirator and safety glasses or goggles.

WASTE DISPOSAL METHOD

Dispose of in accordance with Federal, State and Local regulations. If incinerated system must be equipped with a scrubber designed to effectively handle corrosive off gases.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)

If dusting occurs use approved nuisance dust respirator.

VENTILATION	LOCAL EXHAUST: To control dusting during handling	SPECIAL
	MECHANICAL (General): Recommended	OTHER
PROTECTIVE GLOVES: Not required	EYE PROTECTION: Safety glasses or goggles	
OTHER PROTECTIVE EQUIPMENT: Not required		

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Practice reasonable care to avoid unnecessary physical exposure.

OTHER PRECAUTIONS

Store in a dry area. Do not store with eatables.

DATE February 9, 1982