



# MATERIAL SAFETY DATA SHEET

## ABS\_Flame Retardant VH-0816

Date of issue: 2010-08-03

Revision Date: 2020-08-04

### 1. IDENTIFICATION

#### A. Product name

- ABS\_FR VH-0816

#### B. Recommended use and restriction on use

- General use : Plastic materials of synthetic resin
- Restriction on use : Do not use without advised use

#### C. Manufacturer / Supplier / Distributor information

##### ○ Manufacturer/Supplier/Distributor information

- Company name : LOTTE CHEMICAL CORPORATION
- Address : Lotte World Tower, 300, Olympic-ro, Songpa-gu, Seoul, 05551 Rep. of KOREA
- Dept. : Quality Control Team
- Telephone number : Head-Office +82-2-829-4190  
: Yeosu Plant +82-61-689-1531
- Fax number : +82-2-834-6070

### 2. HAZARD IDENTIFICATION

#### A. GHS Classification

- Carcinogenicity : Category 1B
- Acute aquatic toxicity: Category 1 (Added comment: Refer to <12.A.Ecotoxicity> in this data sheet.)
- Chronic aquatic toxicity: Category 1 (Added comment: Refer to <12.A.Ecotoxicity> in this data sheet.)

#### B. GHS label elements

##### ○ Hazard symbols



##### ○ Signal words

- Danger

##### ○ Hazard statements

- H350 May cause cancer
- H400 Very toxic to aquatic life
- H410 Very toxic to aquatic life with long lasting effects

##### ○ Precautionary statements

###### 1) Prevention

- P201 Obtain special instructions before use.
- P202 Do not handle until all safety precautions have been read and understood.
- P273 Avoid release to the environment.
- P280 Wear protective gloves/protective clothing/eye protection/face protection

**2) Response**

- P308+P313 If exposed or concerned: Get medical advice/attention.
- P391 Collect spillage.

**3) Storage**

- P405 Store locked up.

**4) Disposal**

- P501 Dispose of contents/container in accordance with waste treatment management regulation.

**C. Other hazards which do not result in classification : (NFPA Classification)**o **NFPA grade (0 ~ 4 level)**

- Health : 2, Flammability : 0, Reactivity : 0

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Chemical Name	Trade names and Synonyms	CAS No.	Content(%)
2-Propenenitrile polymer with 1,3-butadiene and ethenylbenzene	ABS resin	9003-56-9	70~80
Diantimony trioxide	Antimony trioxide	1309-64-4	2~4
4,4'-(1-Methylethylidene)bis[2,6-dibromophenol]	Tetrabromobisphenol A, TBBA	79-94-7	10~16
Additive	-	-	1~10

\* Other ingredients which do not contribute to classification of the product

**4. FIRST AID MEASURES****A. Eye contact**

- Do not rub your eyes.
- Immediately flush eyes with plenty of water for at least 15minutes and call a doctor/physician.
- Get medical attention immediately.

**B. Skin contact**

- Flush skin with plenty of wter for at least 15 minutes while removing contaminated clothing and shoes.
- Laundering enough contaminated clothing before reuse.
- Get medical attention immediately.
- Remove contaminated clothing, shoes and isolate.
- Wear gloves when washing the patient, and please avoid contact with contaminated clothing.

**C. Inhalation contact**

- When exposed to large amounts of steam and mist, move to fresh air.
- Take specific treatment if needed.
- Get medical attention immediately.
- If breathing is stopped or irregular, give artificial respiration and supply oxygen.

**D. Ingestion contact**

- About whether I should induce vomiting Take the advice of a doctor.
- Rinse your mouth with water immediately.
- Get medical attention immediately.

**E. Delayed and immediate effects and also chronic effects from short and long term exposure**

- Not available

**F. Notes to physician**

- Notify medical personnel of contaminated situations and have them take appropriate protective measures.
- If exposed or concerned, get medical attention/advice.

**5. FIREFIGHTING MEASURES****A. Suitable (Unsuitable) extinguishing media**

- Dry chemical, carbon dioxide, regular foam extinguishing agent, spray
- Avoid use of water jet for extinguishing

**B. Specific hazards arising from the chemical**

- May Ignite by Heat, sparks, flames.
- Easy to burn, but not easy to fire.
- Irritating, or toxic gases may occur by fire.
- Inhalation of materials may be harmful.

**C. Special protective actions for firefighters**

- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Using a unattended and water devices in case of large fire and leave alone to burn if you do not imperative.
- Avoid inhalation of materials or combustion by-products.
- Do not access if the tank on fire.
- Use appropriate extinguishing measure suitable for surrounding fire.
- Keep containers cool with water spray.

**6. ACCIDENTAL RELEASE MEASURES****A. Personal precautions, protective equipment and emergency procedures**

- Ventilate closed spaces before entering.
- Do not touch spilled material. Stop leak if you can do it without risk.
- Handling the damaged containers or spilled material after wearing protective equipment.
- Cleanup and disposal under expert supervision is advised.
- Keep unauthorized people away, isolate hazard area and deny entry.

**B. Environmental precautions**

- Prevent runoff and contact with waterways, drains or sewers.
- If large amounts have been spilled, inform the relevant authorities.

**C. Methods and materials for containment and cleaning up**

- Large spill : Stay upwind and keep out of low areas. Dike for later disposal.
- Notification to central government, local government. When emissions at least of the standard amount
- Dispose of waste in accordance with local regulation.
- Appropriate container for disposal of spilled material collected.
- Small liquid state spills: Appropriate container for disposal of spilled material collected.
- For disposal of spilled material in appropriate containers collected and clear surface.
- Spilled material should be treated as a potential risk of waste collected.

**7. HANDLING AND STORAGE****A. Precautions for safe handling**

- Avoid direct physical contact.
- Since emptied containers retain product residue(vapor, liquid, solid) follow all MSDS and label warnings even after container is emptied.
- Comply with all applicable laws and regulations for handling
- Dealing only with a well-ventilated place.
- Contaminated work clothing should not be allowed out of the workplace.

**B. Conditions for safe storage, including any incompatibilities**

- Save applicable laws and regulations.
- Do not apply any physical shock to container.
- Avoid direct sunlight.
- Keep in the original container.
- Please pay attention to incompatibilities materials and conditions to avoid.
- By specifying a storage area for carcinogenic substances.
- Collected them in sealed containers.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

## A. Exposure limits

- **ACGIH TLV**
  - [Diantimony trioxide] : TWA : 0.02 mg/m<sup>3</sup> (inhalable particulate matter)

## B. Engineering controls

- A system of local and/or general exhaust is recommended to keep employee exposures above the Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. The use of local exhaust ventilation is recommended to control emissions near the source.
- Follow the appropriate engineering controls because unconfirmed gases for hazard among extrusion process may expose.

## C. Personal protective equipment

- **Respiratory protection**
  - Under conditions of frequent use or heavy exposure, Respiratory protection may be needed.
  - Respiratory protection is ranked in order from minimum to maximum.
  - Consider warning properties before use.
  - Dust, mist, fume-purifying respiratory protection
  - Any air-purifying respirator with a corpuscle filter of high efficiency
  - Any respiratory protection with a electromotion fan(for dust, mist, fume-purifying)
  - Self-contained breathing apparatus with a corpuscle filter of high efficiency
  - For Unknown Concentration or Immediately Dangerous to Life or Health : Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.
- **Eye protection**
  - Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield.
  - Provide an emergency eye wash station and quick drench shower in the immediate work area.
- **Hand protection**
  - Wear appropriate glove.
- **Skin protection**
  - Wear appropriate clothing.
- **Others**
  - Not available

## 9. PHYSICAL AND CHEMICAL PROPERTIES

A. Appearance	
- Appearance	Solid(Pellets)
- Color	- (Please Follow the request for clients)
B. Odor	Odourless
C. Odor threshold	Not applicable
D. pH	Not applicable
E. Melting point/Freezing point	Not applicable
F. Initial Boiling Point/Boiling Ranges	Not applicable
G. Flash point	Not available
H. Evaporation rate	Not applicable
I. Flammability(solid, gas)	1.5mm V-0 (UL94)
J. Upper/Lower Flammability or explosive limits	Not applicable
K. Vapour pressure	Not applicable
L. Solubility	Insolubility (solubility in water)
M. Vapour density	Not applicable
N. Specific gravity	1.12 ~ 1.30
O. Partition coefficient of n-octanol/water	Not applicable
P. Autoignition temperature	Over 466 °C
Q. Decomposition temperature	Over 400 °C
R. Viscosity	Not applicable
S. Molecular weight	60,000-200,000 (main substance)

## 10. STABILITY AND REACTIVITY

**A. Chemical stability**

- This material is stable under recommended storage and handling conditions.
- This material is stable under conditions at room temperature and normal pressure.

**B. Possibility of hazardous reactions**

- Hazardous Polymerization will not occur.
- Containers may explode if heated..
- Easy to burn, but not easy to fire.
- Irritating, or toxic gases may occur by fire.
- Inhalation of materials may be harmful.

**C. Conditions to avoid**

- Avoid contact with incompatible materials and condition.
- Avoid : Accumulation of electrostatic charges, Heating, Flames and hot surfaces

**D. Incompatible materials**

- Combustible materials, irritating, toxic gases

**E. Hazardous decomposition products**

- Not available

**11. TOXICOLOGICAL INFORMATION****A. Information on the likely routes of exposure**

- (Respiratory tracts)
  - Not available
- (Oral)
  - Not available
- (Eye·Skin)
  - Not available

**B. Delayed and immediate effects and also chronic effects from short and long term exposure**

- Acute toxicity
  - \* Oral : Not classified
    - [4,4'-(1-Methylethylidene)bis[2,6-dibromophenol]] : LD50 > 5000 mg/kg Rat
  - \* Dermal : Not classified
    - [4,4'-(1-Methylethylidene)bis[2,6-dibromophenol]] : LD50 > 2000 mg/kg Rabbit
    - [Diantimony trioxide] : LD50 > 8300 mg/kg Rat
  - \* Inhalation : Not classified
    - [4,4'-(1-Methylethylidene)bis[2,6-dibromophenol]] : dust LC50 > 1 mg/ℓ 4 hr Rabbit
    - [Diantimony trioxide] : LC50 > 5.2 mg/ℓ 4 hr Rat
- Skin corrosion/irritation
  - Not available
- Serious eye damage/irritation
  - Not available
- Respiratory sensitization
  - Not available
- Skin sensitization
  - Not available
- Carcinogenicity
  - \* IARC
    - [Diantimony trioxide] : 2B
  - \* OSHA
    - [4,4'-(1-Methylethylidene)bis[2,6-dibromophenol]] : Applicable
    - [Diantimony trioxide] : Applicable
  - \* ACGIH
    - [Diantimony trioxide] : A2
  - \* NTP

- Not available
- \* **EU CLP**
  - [Diantimony trioxide] : Carc.2
- **Germ cell mutagenicity**
  - Not available
- **Reproductive toxicity**
  - Not available
- **STOT-single exposure**
  - Not available
- **STOT-repeated exposure**
  - Not available
- **Aspiration hazard**
  - Not available

## 12. ECOLOGICAL INFORMATION

### A. Ecotoxicity

- **Fish**
  - [2-Propenenitrile polymer with 1,3-butadiene and ethenylbenzene] : 96hr-LC50(Lepomis macrochirus) = 3600 mg/L promelas
  - [4,4'-(1-Methylethylidene)bis[2,6-dibromophenol]] : LC50 0.54 mg/l 96 hr Pimephales promelas
  - [Diantimony trioxide] : LC50 6.9 mg/l 96 hr Pimephales promelas
- **Crustaceans**
  - [4,4'-(1-Methylethylidene)bis[2,6-dibromophenol]] : 96hr-EC50(Crassostrea virginica) = 0.098 mg/L
  - [Diantimony trioxide] : LC50 1.77 mg/l 96 hr
- **Algae**
  - [Diantimony trioxide] : EC50 > 36.6 mg/l 72 hr

(Added comment: As a result of the test on solution/extraction behavior of polymers in water(OECD TG 120), 4,4'-(1-Methylethylidene)bis[2,6-dibromophenol]("TBBA") was not detected, and the water solubility of TBBA was very low (0.148 ~ 2.34 mg/L). In conclusion, the product is verified to be not hazardous to aquatic environment. So, the aquatic hazard classification(refer to section 2) and the ecotoxicity information(refer to section 12) of TBBA are stated to give information to users/workers, and the product is not classified as dangerous goods for transportation(refer to section14).

### B. Persistence and degradability

- **Persistence**
  - [4,4'-(1-Methylethylidene)bis[2,6-dibromophenol]] : High persistency (log Kow is more than 4 estimated.)
- **Degradability**
  - Not available

### C. Bioaccumulative potential

- **Bioaccumulative potential**
  - [4,4'-(1-Methylethylidene)bis[2,6-dibromophenol]] : Bioaccumulation is expected to be moderate according to the BCF > 500 (BCF = 1713)(in low organic carbon sediment)
  - [Diantimony trioxide] : Bioaccumulation is expected to be low according to the BCF < 500 (BCF = 114)
- **Biodegradation**
  - [4,4'-(1-Methylethylidene)bis[2,6-dibromophenol]] : under test conditions no biodegradation observed

### D. Mobility in soil

- [4,4'-(1-Methylethylidene)bis[2,6-dibromophenol]] : Strong potency of mobility to soil. (log Koc = 5.62)
- [Diantimony trioxide] : Strong potency of mobility to soil. (Koc = 3.2 - 3.8)

### E. Other adverse effects

- Not available

## 13. DISPOSAL CONSIDERATIONS

### A. Disposal methods

- Since more than two kinds of designaed waste is mixed, it is difficult to treat sepatatly, then can be reduction or stabilization by incineration or similar process.

- If water separation is possible, pre-process with Water separation process.
- Dispose by incineration.

### B. Special precautions for disposal

- The user of this product must disposal by oneself or entrust to waste disposer or person who other's waste recycle and dispose, person who establish and operate waste disposal facilities.
- Dispose of waste in accordance with all applicable laws and regulations.

## 14. TRANSPORT INFORMATION

### A. UN number

- Not applicable

(Added comment: As a result of the test on solution/extraction behavior of polymers in water(OECD TG 120), 4,4'-(1-Methylethylidene)bis[2,6-dibromophenol]("TBBA") was not detected, and the water solubility of TBBA was very low (0.148 ~ 2.34 mg/L). In conclusion, the product is verified to be not hazardous to aquatic environment. So, the aquatic hazard classification(refer to section 2) and the ecotoxicity information(refer to section 12) of TBBA are stated to give information to users/workers, and the product is not classified as dangerous goods for transportation(refer to section14).

### B. Proper shipping name

- Not applicable (Added comment: Refer to <14.A UN number> in this data sheet.)

### C. Hazard class

- Not applicable (Added comment: Refer to <14.A UN number> in this data sheet.)

### D. Packing group

- Not applicable (Added comment: Refer to <14.A UN number> in this data sheet.)

### E. Marine pollutant

- Not applicable (Added comment: Refer to <14.A UN number> in this data sheet.)

### F. Special precautions for user related to transport or transportation measures

- Local transport follows in accordance with Dangerous goods Safety Management Law.
- Package and transport follow in accordance with Department of Transportation (DOT) and other regulatory agency requirements.
- EmS FIRE SCHEDULE : Not applicable
- EmS SPILLAGE SCHEDULE : Not applicable

## 15. REGULATORY INFORMATION

### A. National and/or international regulatory information

#### o POPs Management Law

- Not applicable

#### o Information of EU Classification

##### \* Classification

- [Diantimony trioxide] : Carc. 2(H351)
- [4,4'-(1-Methylethylidene)bis[2,6-dibromophenol]] : Aquatic Acute 1(H400), Aquatic Chronic 1(H410)

##### \* Risk Phrases

- [Diantimony trioxide] : R40
- [4,4'-(1-Methylethylidene)bis[2,6-dibromophenol]] : R50/53

##### \* Safety Phrase

- [Diantimony trioxide] : S2, S22, S36/37
- [4,4'-(1-Methylethylidene)bis[2,6-dibromophenol]] : S60, S61

#### o U.S. Federal regulations

##### \* OSHA PROCESS SAFETY (29CFR1910.119)

- [Diantimony trioxide] : Applicable

##### \* CERCLA Section 103 (40CFR302.4)

- [Diantimony trioxide] : 453.599 kg 1000 lb

- \* **EPCRA Section 302 (40CFR355.30)**
  - Not applicable
- \* **EPCRA Section 304 (40CFR355.40)**
  - Not applicable
- \* **EPCRA Section 313 (40CFR372.65)**
  - [4,4'-(1-Methylethylidene)bis[2,6-dibromophenol]] : Applicable
- o **Rotterdam Convention listed ingredients**
  - Not applicable
- o **Stockholm Convention listed ingredients**
  - Not applicable
- o **Montreal Protocol listed ingredients**
  - Not applicable

## 16. OTHER INFORMATION

### A. Reference

- The information contained herein is believed to be accurate. It is provided independently of any sale of the product for purpose of hazard communication. It is not intended to constitute performance information concerning the product. No express warranty, or implied warranty of merchantability or fitness for a particular purpose is made with respect to the product or the information contained herein.
- ACGIH( American Conference of Governmental Industrial Hygienists )
- CCRIS(Chemical Carcinogenesis Information)
- ChemIDplus(Chemical Identification/Dictionary)
- CICADs(Concise International Chemical Assessment Documents)
- CPDB(Carcinogenic Potency Database)
- CRC Handbook
- CTD(Comparative Toxicogenomics Database)
- ECHA Registered Substance(REACH)
- e-ChemPortal
- Environmental Health Criteria (EHC) Monographs
- ERG(emergency response guidebook)
- ESIS(European chemical Substances Information System)
- Harmonization Project Publications
- HSDB(Hazardous Substances Data Bank)
- International Agency for Research on Cancer (IARC) - Summaries and Evaluations
- International Chemical Safety Cards (ICSCs)
- IPCS INCHEM(International Programme on Chemical Safety)
- IPCS/CEC Evaluation of Antidotes Series
- IRIS(Integrated Risk Information)
- IUCLID(International Uniform Chemical Information Database)
- Joint Expert Committee on Food Additives (JECFA) - Monographs and Evaluations
- NLM(National Library of Medicine)
- NTP(National Toxicity Program)
- Pesticide Documents (PDs)
- Poisons Information Monographs Archive (PIMs, 1989-2002)
- Screening Information Data Set (SIDS) for High Production Volume Chemicals
- The Merck Index 13th Ed.
- UK Poison Information Documents (UKPID)
- UN RTDG
- Globally Harmonized System of Classification and Labeling of Chemicals
- Chemicals Information System (NCIS)
- National Emergency Management Agency / Korea dangerous material inventory management system
- Korea Occupational Safety & Health Agency (KOSHA)

### B. Issue date

- 2010-08-03

### C. Revision number and Last date revised

- 2020-08-04



**D. Other**

- This MSDS is prepared according to the Globally Harmonized System (GHS).