

MATERIAL SAFETY DATA SHEET

Product name **DBDPO**

Supersedes 26/08/2008

1. Identification of the substance & the company

Chemical name Decabromodiphenyl oxide

Synonym(s) DBDPO (decabromodiphenyl oxide), bis(pentabromophenyl),ether, decabromodiphenyl ether, Deca, Benzene,1,1'-oxybis(2,3,4,5,6-pentabromo-, DBDPE (decabromodiphenyl ether), Deca-BDE

Chemical formula C₁₂ Br₁₀ O

Chemical family Polybrominated diphenyl oxides

Molecular weight 959.2

Type of product and use An inert additive flame retardant for use in a variety of polymers and fibers

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2. Hazards identification

Adverse human health effects No adverse health effects in human are known

GHS classification

Not subject to labelling in accordance with Regulation (EC) No. 1272/2008 (CLP)

3. Composition / information on ingredients

Components	Weight %	Index No.	EC No.	EU Classification
Decabromodiphenyl oxide 1163-19-5	97		214-604-9	None

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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 if irritation occurs.

Inhalation In case of dust 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. Get medical attention immediately

NOTE: Never give an unconscious person anything to drink

Notes to the physician No specific antidote
Treat symptomatically and supportively.

5. Fire - fighting measures

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 areas, provide fire-fighters with self-contained breathing apparatus in positive pressure mode.

Unusual fire and explosion hazards When heated to decomposition, may release poisonous and corrosive fumes of Bromine, Carbon Monoxide, Carbon Dioxide and Hydrogen Bromide.

6. Accidental release measures

Personal precautions Wear respirator, chemical safety goggles, rubber gloves and boots.

Methods for cleaning up Shovel into intact packaging and hold for waste disposal or possible re-use. Avoid raising dust. 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 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
Decabromodiphenyl oxide 1163-19-5	Not determined	Not determined

Other Exposure Limits : The American Industrial Hygiene Association (AIHA) recommends Workplace Environmental Exposure Level (WEEL): 8-hr Time-weighted Average (TWA) of 5 mg/m³, skin.

Ventilation requirements Ventilation must be sufficient to maintain atmospheric concentration below recommended exposure limit.

Personal protective equipment:

- **Respiratory protection** Dust respirator
- **Hand protection** Protective gloves
- **Eye protection** Chemical safety goggles
- **Skin and body protection** Body covering clothes and boots

Hygiene measures Wash hands thoroughly after handling and before eating or smoking. Do not eat, smoke or drink where material is handled, processed or stored. Safety shower and eye bath should be provided.

9. Physical and chemical properties

Appearance White to off-white, fine, free-flowing powder, odourless
Boiling point/range Not applicable
Melting point/range 300-310°C
Flash point None
Flammable/Explosion limits Not flammable
Auto-ignition temperature Not applicable
Vapour pressure 4.63x10⁽⁻⁶⁾ Pa (21°C)
Evaporation rate (ether=1) Not applicable under standard conditions
Vapor density Not applicable under standard conditions

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Viscosity	Not applicable
Solubility:	
- Solubility in water	<0.1µg/l at 25°C
- Solubility in other solvents	Very slightly soluble in common organic solvents
Specific gravity	3.0
Density	3.4 g/mL (25°C)
Decomposition temperature	362°C
Partition coefficient (n-octanol/water)	Log Kow - 6.265
Explosive properties	There are no chemical groups associated with explosive properties present in the molecule
Oxidising properties	The structure indicates non oxidizing properties

10. Stability and reactivity

Stability	Stable under normal conditions
Materials to avoid	Strong oxidants.
Conditions to avoid	Heating above decomposition temperature
Hazardous decomposition products	CO, CO ₂ , HBr & Br ₂
Hazardous polymerization	Will not occur

11. Toxicological information

Acute toxicity:	Acute toxicity:
- Rat oral LD50	>5,000 mg/kg
- Rabbit dermal LD50	> 2000 mg/kg
- Rat inhalation LC50	> 48.2 mg/l
- Dermal irritation (rabbit)	Not irritant
- Eye irritation (rabbit)	Not irritant
Effects of overexposure : Chronic toxicity	No data available
Mutagenicity	Not mutagenic by the Ames Test and by mouse lymphoma assay Negative in chromosome aberration and sister chromatid exchange tests in Chinese hamster ovary cells.

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Carcinogenicity	IARC Group 3 (animal inadequate evidence, human no data available) NTP 2-year feed studies with decabromodiphenyl ether showed some evidence of liver nodules in male and female rats and equivocal evidence for male mice at very high doses (>25,000 ppm) No evidence for this effect in female mice Not included in NTP 12th Report on Carcinogens
Developmental toxicity	In the oral developmental toxicity study in rats with decabromodiphenyl ether the NOEL (No Observed Effect Level) for maternal and developmental toxicity was 1000 mg/kg/day

12. Ecological information

Information on ecological effects	Plastic containing DBDPO treated in a modern up to date incinerator produces an incineration gas, which is analysed, showed no polybrominated Dibenzodioxins and Dibenzofurans present at a level higher than the limits of quantitation (LOQs) specified by US EPA Toxic Substances Control Act (TSCA) 40 CFR 766.27 and are below the limits specified in the German Ordinance "Chemikalien - Verbotsverordnung".
Environmental fate	FR-1210 was determined to be persistent: Not readily biodegradable. Not inherently biodegradable. The high log Kow value (6.27) indicates that the product will adsorb strongly onto sludge and sediments and is not expected to be mobile in soil. The potential for uptake and accumulation of the substance by fish and other aquatic and terrestrial organisms appears to be low.
Aquatic toxicity :	No effects on aquatic organisms are expected to occur at concentrations up to the substances water solubility.
Reproduction	The No Observed Effect Concentration (NOEC) for reproduction in Earthworm after exposure of 28 day is 4910 mg/kg dry soil.
Note:	Deca-BDE is persistent, bioaccumulative and toxic (PBT) substance and vPvB in accordance with the criteria set out in Annex XIII of the REACH Regulation The substance meets the criteria in Annex XIII of REACH because of the PBT properties of its potential degradation products.

13. Disposal considerations

Waste disposal	The recommended method is incineration (see also section 16) Dispose of in a safe manner in accordance with local/national regulations.
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14. Transportation information

IMDG	Not regulated
ADR/RID	Not regulated
ICAO/IATA	Not regulated
DOT	Not regulated

15. Regulatory information

EU	EU risk assesment under Regulation 793/93/EC conducted on Deca-BDE confirms that there are no significant risks to the environment or human health which would justify risk reduction measures In contradiction to this publication, commercial deca-BDE is restricted under the European Union Directive 2002/95/EC, "Restriction on Use of Hazardous Substances" (RoHS) restrictions in electronics and electrical equipment As from December 19, 2012, DECA-BDE has been included in the Regulation (EC) No. 1907/2006 of 18 December 2006 (REACH) Candidate list as a substance of very high concern (SVHC) on the basis of the PBT/ vPvB properties of its potential degradation products.
USA	Reported in the EPA TSCA Inventory TSCA Section 12b - Export notification is required per a final test rule under Section 4(a).
Australia	Listed in AICS This substance is on the National Pollutant Inventory (NPI) of Australia. This substance is listed under PART 1, Group 1 Substances
Canada	Listed in DSL This substance is listed under Part 1, Group 1 Substances in the National Pollutant Release Inventory (NPRI) for 2008. Information about this substance must be reported to the Minister of the Environment in accordance with subsection 46(1) of the Canadian Environmental Protection Act, 1999. Not listed in WHMIS.
CHINA - China inventory	Listed in IECSC
Japan	ISHL No. 4-(14)-149
Japanese METI	ENCS No.3-2846
Korea	Listed in ECL (KE-27715)

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New Zealand Inventory Listed in NZIoC

Philippines Listed in PICCS

Singapore Listed in the Hazardous Substances Control List as a member of the generic group; Polybrominated diphenyl ethers.

Switzerland Listed in Giftliste 1 (G-8308)
Taiwan Taiwan Toxic Chemical Substances List.
This is Class IV toxic chemical. Minimum control level is 30 w/w%. TAIWAN No.:91-01

16. Other information

Note:

All sections reformatted in accordance with REACH Annex II revision

This data sheet contains changes from the previous version in section(s)

11, 12, 15

The product DBDPO is not classified as a dangerous chemical under the criteria of Directive 67/548/EC (see § 15). The product DBDPO was investigated in an EU Risk Assessment and no risks for human health or the environment were identified. However, the product is persistent, therefore, manufacturers using DBDPO should adopt good working practice during processing and avoid any emissions to the environment. It is recommended that DBDPO waste should be incinerated under appropriate conditions.

1. Different countries, have prohibited the manufacture, import, and commercialisation of Deca-BDE and/or products (the scope of such products is to be determined in accordance with every such country's applicable law) containing Deca-BDE. 2. The use of Deca-BDE must be in conformity with the applicable law including the aforesaid prohibition. It is the responsibility of the holder of this Safety Data Sheet to verify the existence of any such prohibition and not to sell, import, commercialise or otherwise use of Deca-BDE in products, articles, preparations and other objects designated for electrical and electronic equipment in any jurisdiction where regulations prohibiting such sale, import, commercialisation or other such use are in application. 3. It is the responsibility of the holder of this Safety Data Sheet to ensure that its customers or any other party receiving from it products containing Deca-BDE are prohibited to the same extent mentioned above in sections 1 and 2.

Health, Safety & Environment Policy

We will strive to ensure that our operations and products meet the needs of the present global community without compromising the ability of future generations to meet their needs We accept that the success of our business is dependent on the supply of products and services that will benefit society whilst ensuring human safety and protection of the environment and natural resources Within the framework of our commitment to the Responsible Care program, we will provide a healthy and safe work environment for employees and will responsibly manage our products at all stages of their life cycle in order to protect human health and the environment whilst maintaining high production standards of operation

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TO MEET THIS COMMITMENT WE WILL: Comply with or exceed applicable national and international regulatory requirements and other requirements to which we subscribe Communicate openly and actively encourage dialogue with employees, customers and community concerning our products and operations Implement documented management systems consistent with and for promotion of the Responsible Care ethics

Develop and supply products that can be manufactured, transported, used and disposed of safely whilst best meeting the needs of our customers Regularly assess, continually improve and responsibly manage health, safety and environmental risks associated with products and processes throughout their life-cycles Share knowledge and expertise with others and seek to learn from and incorporate improved practices into our own operations

Educate and train employees, contractors and customers to improve their HSE performance Communicate up-to-date information to enable our workers, customers and other interested parties to handle our products in a safe and environmentally responsible manner Endeavor to work with customers, suppliers, distributors and contractors to foster the safe use, transport and disposal of our chemicals Support Product Stewardship programs in cooperation with customers, distributors and transporters

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