



Safety Data Sheet
Decabromodiphenyl oxide (DBDO)
Revision 5, Date 29 Jun 18

1. IDENTIFICATION

Product Name	Decabromodiphenyl oxide (DBDO)
Other Names	Bis(pentabromophenyl) ether; Decabromobiphenyl ether
Uses	Flame retardant for thermoplastics, textiles and adhesives.
Chemical Family	No Data Available
Chemical Formula	C ₁₂ Br ₁₀ O
Chemical Name	Benzene, 1,1'-oxybis[2,3,4,5,6-pentabromo-
Product Description	No Data Available

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
Redox Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Ltd	11 Mayo Road Wiri Auckland 2104 New Zealand	+64-9-2506222
Redox Inc.	3960 Paramount Boulevard Suite 107 Lakewood CA 90712 USA	+1-424-675-3200
Redox Chemicals Sdn Bhd	Level 2, No. 8, Jalan Sapir 33/7 Seksyen 33, Shah Alam Premier Industrial Park 40400 Shah Alam Sengalor, Malaysia	+60-3-5614-2111

Emergency Contact Details

For emergencies only; DO NOT contact these companies for general product advice.

Organisation	Location	Telephone
Poisons Information Centre	Westmead NSW	1800-251525 131126
Chemcall	Australia	1800-127406 +64-4-9179888
Chemcall	Malaysia	+64-4-9179888
Chemcall	New Zealand	0800-243622 +64-4-9179888
National Poisons Centre	New Zealand	0800-764766
CHEMTREC	USA & Canada	1-800-424-9300 CN723420 +1-703-527-3887

2. HAZARD IDENTIFICATION

Poisons Schedule (Aust) Not Scheduled

Globally Harmonised System



Hazard Classification

NOT hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)

Signal Word

None

National Transport Commission (Australia)

Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification

NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

3. COMPOSITION/INFORMATION ON INGREDIENTS**Ingredients**

Chemical Entity	Formula	CAS Number	Proportion
Bis(pentabromophenyl) ether	C12Br10O	1163-19-5	<=100 %

4. FIRST AID MEASURES**Description of necessary measures according to routes of exposure****Swallowed**

IF SWALLOWED: Rinse mouth, then drink plenty of water. Do not induce vomiting. Get medical advice/attention if you feel unwell.

Eye

IF IN EYES: Immediately flush eyes with running water for several minutes, holding eyelids open and occasionally lifting the upper and lower lids. Remove contact lenses if present and easy to do. Continue rinsing for at least 15 minutes. Get medical advice/attention.

Skin

IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing and wash before reuse. If skin irritation occurs, get medical advice/attention.

Inhaled

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If respiratory symptoms persist, get medical advice/attention. Apply resuscitation if victim is not breathing - Administer oxygen if breathing is difficult.

Advice to Doctor

Treat symptomatically. Ensure that attending medical personnel are aware of the identity and nature of the product(s) involved, and take precautions to protect themselves.

Medical Conditions Aggravated by Exposure

No information available.

5. FIRE FIGHTING MEASURES**General Measures**

If safe to do so, move undamaged containers from fire area. Cool containers with water spray until well after fire is out.

Flammability Conditions

May burn but does not ignite readily.

Extinguishing Media

Use dry chemical, Carbon dioxide (CO2), foam or water spray for extinction - Extinguish fire using an agent suitable for type of surrounding fire.

Fire and Explosion Hazard

Further processing of solid materials may result in the formation of combustible dusts.

Hazardous Products of Combustion

Fire or heat will produce irritating and/or toxic gases, including Hydrogen bromide, Carbonyl bromide, Bromine and oxides of Carbon.

Special Fire Fighting Instructions

Contain runoff from fire control or dilution water - Runoff may pollute waterways.

Personal Protective Equipment

Wear self-contained breathing apparatus (SCBA) and chemical splash suit. SCBA and structural firefighter's uniform may provide limited protection.

Flash Point

No Data Available

Lower Explosion Limit	No Data Available
Upper Explosion Limit	No Data Available
Auto Ignition Temperature	No Data Available
Hazchem Code	No Data Available

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Ensure adequate ventilation. ELIMINATE all ignition sources. Do not touch or walk through spilled material. Avoid breathing dust and contact with eyes, skin and clothing.
Clean Up Procedures	Collect material (sweep or vacuum up) and place it into suitable, labelled containers for later disposal (see SECTION 13); if appropriate, moisten first to prevent dusting.
Containment	Stop leak if safe to do so – Prevent entry into waterways, drains or confined areas. Prevent dust cloud.
Decontamination	Ventilate and wash area after clean-up is complete.
Environmental Precautionary Measures	Prevent entry into drains and waterways.
Evacuation Criteria	Spill or leak area should be isolated immediately. Keep unauthorised personnel away.
Personal Precautionary Measures	Use personal protective equipment as required; In case of inadequate ventilation, wear respiratory protection (see SECTION 8).

7. HANDLING AND STORAGE

Handling	Safety showers and eyewash facilities should be provided within the immediate work area for emergency use. Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Minimise dust generation and accumulation. Avoid breathing dust and contact with eyes, skin and clothing. Do not ingest. Use personal protective equipment as required; In case of inadequate ventilation, wear respiratory protection (see SECTION 8). Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres.
Storage	Store in a cool, dry and well-ventilated place, out of direct sunlight. Keep container tightly closed. Protect from moisture. Keep away from heat and sources of ignition - No smoking. Keep away from food/feedstuffs and incompatible materials (see SECTION 10).
Container	Keep in the original container.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	No specific exposure standards are available for this product. For dusts from solid substances without specific occupational exposure standards: - Safe Work Australia Exposure Standard (Nuisance dusts): 8 hr TWA = 10 mg/m ³ (measured as inhalable dust). - New Zealand WES (Particulates not otherwise classified): TWA = 10 mg/m ³ ; TWA = 3 mg/m ³ (respirable dust).
Exposure Limits	No Data Available
Biological Limits	Derived no-effect levels (DNELs) for workers: - Inhalation, Long-term systemic effects: 6 mg/m ³ (corrected dose descriptor: 150 mg/m ³ , based on AF of 25). Predicted no-effect concentrations (PNECs): - Freshwater sediment: 384 mg/kg sediment dw. (Assessment factor: 10). - Marine sediment: 10 mg/kg sediment dw. (Assessment factor: 500). - Soil: 98 mg/kg soil dw. (Assessment factor: 50). - STP: 1.5 mg/L (Assessment factor: 10). - Oral: 222 mg/kg food (Assessment factor: 90).
Engineering Measures	A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. 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.
Personal Protection Equipment	- Respiratory protection: In case of inadequate ventilation, wear respiratory protection. Recommended: Approved particulate filter respirator. Where the potential for higher exposure exists, use an approved supplied-air respirator (full facepiece) operated in pressure-demand or other positive-pressure mode, or self-contained breathing apparatus (SCBA).

- Eye/face protection: Wear appropriate eye protection to avoid eye contact. Recommended: Safety glasses with side-shields or chemical goggles.
- Hand protection: Handle with gloves. Recommended: Chemical-resistant gloves, e.g. Nitrile, natural rubber, polyvinyl chloride.
- Skin/body protection: Wear appropriate personal protective clothing to avoid skin contact. Recommended: Coveralls.

Special Hazards Precautions

No information available.

Work Hygienic Practices

Do not eat, drink and smoke in work areas. Wash hands after use. Remove contaminated clothing and protective equipment before entering eating areas and wash before storage or reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Solid
Appearance	Powder
Odour	Odourless
Colour	White
pH	No Data Available
Vapour Pressure	No Data Available
Relative Vapour Density	No Data Available
Boiling Point	No Data Available
Melting Point	300 - 310 °C
Freezing Point	No Data Available
Solubility	Insoluble in water
Specific Gravity	~3.15 (Water = 1)
Flash Point	No Data Available
Auto Ignition Temp	No Data Available
Evaporation Rate	No Data Available
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	No Data Available
Density	~3.15 g/cm ³
Specific Heat	No Data Available
Molecular Weight	No Data Available
Net Propellant Weight	No Data Available
Octanol Water Coefficient	No Data Available
Particle Size	<=3 um (average)
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	No Data Available
Volatile Percent	<=0.05%
VOC Volume	No Data Available
Additional Characteristics	No information available.
Potential for Dust Explosion	Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Fast or Intensely Burning Characteristics	No information available.
Flame Propagation or Burning Rate of Solid Materials	No information available.
Non-Flammables That Could Contribute Unusual Hazards to a Fire	No information available.

Properties That May Initiate or Contribute to Fire Intensity

May burn but does not ignite readily.

Reactions That Release Gases or Vapours

Fire/thermal decomposition will produce irritating and/or toxic gases, including Hydrogen bromide, Carbonyl bromide, Bromine and oxides of Carbon.

Release of Invisible Flammable Vapours and Gases

No information available.

10. STABILITY AND REACTIVITY**General Information**

No dangerous reactions known.

Chemical Stability

The substance is stable under normal storage and handling conditions.

Conditions to Avoid

Avoid generating dust. Protect from moisture. Keep away from heat and sources of ignition.

Materials to Avoid

Incompatible/reactive with oxidising agents.

Hazardous Decomposition Products

Fire/thermal decomposition will produce irritating and/or toxic gases, including Hydrogen bromide, Carbonyl bromide, Bromine and oxides of Carbon.

Hazardous Polymerisation

No information available.

11. TOXICOLOGICAL INFORMATION**General Information**

Information on possible routes of exposure:

- Ingestion: May be harmful if swallowed. May cause irritation to the digestive tract.
- Eye/contact: May cause eye irritation.
- Skin contact: May cause mild skin irritation. May be absorbed through the skin.
- Inhalation: May irritate the nose and throat; May cause irritation to the respiratory tract.

Chronic effects: High exposure may affect the liver. Repeated exposure may affect thyroid function and enlarge the thyroid gland (goiter).

*Decabromodiphenyl oxide (CAS No. 1163-19-5) is listed in Group 3 of the IARC Monographs: Not classifiable as to its carcinogenicity to humans.

Acute**Ingestion**

Acute toxicity (Oral):

- LD50, Rat: >2,000 mg/kg bw.

Other

Acute toxicity (Dermal):

- LD50, Rabbit: >8,000 mg/kg bw.

Inhalation

Acute toxicity (Inhalation):

- LC50, Rat: >48.2 mg/L (2 h)

Carcinogen Category

None

12. ECOLOGICAL INFORMATION**Ecotoxicity**

Aquatic toxicity:

- LC50, Fish: >500 mg/L nominal (48 wk) [Japanese Industrial Standard JIS K 0102-1986-71].
- EC50, Algae: >1 mg/L (72 h, 96 h) [Effect of growth media on response of algae to the test article (cell number)].

Persistence/Degradability

Not readily biodegradable by a mixture of sewage sludge, soil, sediment, and water under aerobic conditions.

Mobility

No information available.

Environmental Fate

Prevent entry into drains and waterways.

Bioaccumulation Potential

Not bioaccumulative.

Environmental Impact

No Data Available

13. DISPOSAL CONSIDERATIONS

General Information

Dispose of contents/container in accordance with local/regional/national regulations.

Special Precautions for Land Fill

Contaminated packaging: If empty container retains product residues, all label precautions must be observed.

14. TRANSPORT INFORMATION**Land Transport (Australia)**

ADG Code

Proper Shipping Name	Decabromodiphenyl oxide (DBDO)
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (Malaysia)

ADR Code

Proper Shipping Name	Decabromodiphenyl oxide (DBDO)
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (New Zealand)

NZS5433

Proper Shipping Name	Decabromodiphenyl oxide (DBDO)
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (United States of America)

US DOT

Proper Shipping Name	Decabromodiphenyl oxide (DBDO)
Class	No Data Available

Subsidiary Risk(s)	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Sea Transport

IMDG Code

Proper Shipping Name	Decabromodiphenyl oxide (DBDO)
Class	No Data Available
Subsidiary Risk(s)	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
EMS	No Data Available
Marine Pollutant	No
Comments	NON-DANGEROUS GOODS: Not regulated for SEA transport.

Air Transport

IATA DGR

Proper Shipping Name	Decabromodiphenyl oxide (DBDO)
Class	No Data Available
Subsidiary Risk(s)	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for AIR transport.

National Transport Commission (Australia)

Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)
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15. REGULATORY INFORMATION

General Information	No Data Available
Poisons Schedule (Aust)	Not Scheduled

Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

Approval Code	Not Hazardous
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National/Regional Inventories

Australia (AIC)	Listed
Canada (DSL)	Not Determined
Canada (NDSL)	Not Determined
China (IECSC)	Not Determined
Europe (EINECS)	214-604-9
Europe (REACH)	01-2119472302-47-XXXX
Japan (ENCS/METI)	Not Determined
Korea (KECI)	Not Determined
Malaysia (EHS Register)	Not Determined
New Zealand (NZIoC)	Listed
Philippines (PICCS)	Not Determined
Switzerland (Giftliste 1)	Not Determined
Switzerland (Inventory of Notified Substances)	Not Determined
Taiwan (NCSR)	Not Determined
USA (TSCA)	Not Determined

16. OTHER INFORMATION

Related Product Codes	DEBRDO1000, DEBRDO1001, DEBRDO1002, DEBRDO1003, DEBRDO1004, DEBRDO1005, DEBRDO1006, DEBRDO1007, DEBRDO1008, DEBRDO2000, DEBRDO2001, DEBRDO2050, DEBRDO3000, DEBRDO4000, DEBRDO5000, DEBRDO5100, DEBRDO6000, DEBRDO6001, DEBRDO7000
Revision	5
Revision Date	29 Jun 2018
Key/Legend	<p>< Less Than > Greater Than AICS Australian Inventory of Chemical Substances atm Atmosphere CAS Chemical Abstracts Service (Registry Number) cm² Square Centimetres CO₂ Carbon Dioxide COD Chemical Oxygen Demand deg C (°C) Degrees Celcius EPA (New Zealand) Environmental Protection Authority of New Zealand deg F (°F) Degrees Farenheit g Grams g/cm³ Grams per Cubic Centimetre g/l Grams per Litre HSNO Hazardous Substance and New Organism IDLH Immediately Dangerous to Life and Health immiscible Liquids are insoluble in each other. inHg Inch of Mercury inH₂O Inch of Water K Kelvin kg Kilogram kg/m³ Kilograms per Cubic Metre lb Pound LC50 LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of</p>

50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours.

LD50 LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals.

ltr or **L** Litre

m³ Cubic Metre

mbar Millibar

mg Milligram

mg/24H Milligrams per 24 Hours

mg/kg Milligrams per Kilogram

mg/m³ Milligrams per Cubic Metre

Misc or **Miscible** Liquids form one homogeneous liquid phase regardless of the amount of either component present.

mm Millimetre

mmH₂O Millimetres of Water

mPa.s Millipascals per Second

N/A Not Applicable

NIOSH National Institute for Occupational Safety and Health

NOHSC National Occupational Health and Safety Commission

OECD Organisation for Economic Co-operation and Development

Oz Ounce

PEL Permissible Exposure Limit

Pa Pascal

ppb Parts per Billion

ppm Parts per Million

ppm/2h Parts per Million per 2 Hours

ppm/6h Parts per Million per 6 Hours

psi Pounds per Square Inch

R Rankine

RCP Reciprocal Calculation Procedure

STEL Short Term Exposure Limit

TLV Threshold Limit Value

tne Tonne

TWA Time Weighted Average

ug/24H Micrograms per 24 Hours

UN United Nations

wt Weight