

Material Safety Data for: Dibutyl Phthalate

1. PRODUCT IDENTIFICATION

Name 1,2-benzenedicarboxylic acid, dibutyl ester
Synonyms di-n-butyl phthalate, DBP, phthalic acid, dibutyl ester,
CAS# 84-74-2
Product Uses plasticiser

2. INGREDIENTS

	%	TWAEV / TLV ppm / mg/m ³	LD ₅₀ ORAL	(mg/kg) SKIN	LC ₅₀ ppm INHALATION
Dibutyl Phthalate	100%	0.45 / 5	3475	21,000	375

3. (a) HAZARDS SUMMARY

Hazards, Quick Guide: may be mildly irritating to skin and eyes, reproductive toxin

Canada – WHMIS

Key:

D 2 A

B 2 – Flash Point <38°C, **B 3** – Flash Point >38°C & <93°C

D 1 – Immediately Toxic, **D 2** – Chronic Toxicity

C – Oxidising Substance, **E** – Corrosive

U.S.A. – HMIS

Key:

Health – 1, Fire – 2, Reactivity – 0

0=minimal, 1=slight, 2=moderate, 3=serious, 4=severe

3. (b) HAZARDS – TOXICITY

Effects, Acute Exposure

Skin Contact little to no effect
Skin Absorption slight; no toxic effects likely by this route
Eye Contact may be a mild irritant
Inhalation high aerosol concentration (50x TLV) may irritate & cause headache, dizziness, & nausea; this product cannot form a vapour unless strongly heated
Ingestion not known – low toxicity; *very bitter taste makes ingestion highly unlikely*

Effects, Chronic Exposure

General little to no effect
Sensitising not a sensitiser in humans or animals
Carcinogen/Tumorigen not considered a tumorigen or a carcinogen in humans or animals
Reproductive Effect testicular atrophy, fetotoxin & teratogen in rodents at *oral* doses producing no maternal symptoms; reduced fertility in female rats given oral doses producing no symptoms; no known effect in humans
Mutagen no known effect on humans or animals
Synergistic With not known
LD₅₀ (oral) 7500mg/kg (rat), 10,000mg/kg (guinea pig), 3475mg/kg (mouse),
LD₅₀ (skin) 21,000mg/kg (rabbit)
LC₅₀ (inhalation) 375ppm (rat), 1100ppm (mouse)

* **NOTE:** Small amounts of phthalates can be absorbed from a variety of plastics by ingestion. Metabolism of phthalates can produce substances which mimic sex hormones – they are thought to be “anti androgens” – and may have effects on the developing fetus & young children. There are also weak (and unproven) statistical links to health effects such as obesity, insulin resistance, and attention deficit disorder. Although absorption via the skin is slight, even tiny amounts of phthalates may be able to produce harmful effects. Accordingly, take care to limit skin contact with this product.
Please note that the above is characteristic of phthalates in general, and does not depend on either the source or the manufacturer of the product.

Please ensure that this MSDS is given to, and explained to people using this product.

(Dibutyl Phthalate, cont'd)

4. FIRST AID

- SKIN: Wash with soap and plenty of water. Remove contaminated clothing and do not reuse until thoroughly cleaned or laundered.
- EYES: Wash eyes with plenty of water, holding eyelids open. Seek medical assistance promptly if there is irritation.
- INHALATION: Remove from contaminated area promptly. **CAUTION: Rescuer must not endanger himself!** If breathing stops, administer artificial respiration and seek medical aid promptly.
- INGESTION: Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below hips to prevent inhalation of vomited material. Seek medical help promptly.

Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this relatively low-toxicity substance. The stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.

5. PHYSICAL PROPERTIES

Odour & Appearance	clear, viscous, colourless to pale yellow liquid with faint odour and a very bitter taste
Odour Threshold	not known
Vapour Pressure	1.2x10 ⁻⁵ mmHg / 1.5x10 ⁻⁶ kPa (25°C / 77°F)
Evaporation Rate (<i>Butyl Acetate = 1</i>)	not known – extremely low, not volatile
Vapour Density (air = 1)	9.6
Boiling Range	340°C / 644°F
Freezing Point	-35°C / -31°F
Specific Gravity	1.047 (20/20°C)
Water Solubility	11 milligrams per litre – <i>almost nil</i>
Also soluble in	ethanol, acetone, diethyl ether, aromatic hydrocarbons
Viscosity	21centipoise (20°C / 68°F)
pH	none – (<i>does not liberate hydrogen ions when dissolved</i>)
Conversion Factor	1ppm = 11.4mg/m ³
Molecular Weight	278grams per mole

6. FLAMMABILITY & FIRE FIGHTING

Flash Point	157°C / 315°F (closed cup)
Autoignition Temperature	402°C / 757°F
Flammable Limits	lower 0.5% – upper limit not known
Combustion Products	carbon monoxide, nitrogen oxides, smoke, polycyclic aromatics, part oxidised hydrocarbon fragments, including phthalic anhydride (highly irritating & allergenic) & polycyclic aromatic hydrocarbons
Fire Fighting Precautions	alcohol or polymer foam, dry chemical, water fog, water spray only to cool & dilute, water jet spreads flames; fire fighters must wear SCBA
Static Charge Accumulation	cannot accumulate a static charge

7. STABILITY / REACTIVITY

Dangerously Reactive With	strong oxidising agents; strong acids or strong alkalies; explosive with chlorine bleach
Also Reactive With	none known
Stability	stable; will not polymerize
Decomposes in Presence of	hydrolyses gradually under either alkaline or acidic conditions
Decomposition Products	none apart from Hazardous Combustion Products
Sensitive to Mechanical Impact	no

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8. PROTECTIVE EQUIPMENT / EXPOSURE CONTROL

ACGIH TLV	0.45ppm / 5mg/m ³
OSHA PEL	0.45ppm / 5mg/m ³
STEL	not known
Ventilation	mechanical ventilation is probably not required due to very low vapour pressure
Hands	butyl or nitrile gloves may be worn – <i>other types may also protect; consult supplier to confirm suitability</i>
Eyes	safety glasses with side shields – <i>always protect the eyes</i>
Clothing	no special protective clothing required

9. HANDLING & STORAGE

Store in a cool environment, away from open flame, oxidising agents strong alkalis or strong acids. Always ensure that containers, whether empty or full, or part full, are tightly sealed unless in use.

Although evidence for chronic toxicity following inhalation is unreliable, avoid breathing product vapour or mist. Use with adequate ventilation.

Never cut, drill, weld or grind on or near this container. Avoid prolonged contact with skin and wash work clothes frequently. An eye bath and safety shower must be available near the workplace.

NOTE: Many phthalates appear to alter the action of sex hormones in the fetus and in young children. Although there is less evidence of an effect in adults, it is prudent to minimise skin contact with these substances. (see also NOTE in Part 3b)

10. SPILL PROCEDURES

Leak Precaution	dyke to control spillage and prevent environmental contamination
Handling Spill	ventilate contaminated area; recover free liquid with suitable pumps; absorb residue on an inert sorbent, sweep & pick up using plastic or aluminium shovel, & store in closed containers for recycling or disposal

11. DISPOSAL

Waste Disposal	do not flush to sewer , recycle if possible, may be incinerated in approved facility: liquid injection at >650°C, rotary kiln at >820°C, or fluidised bed at >450°C
Containers	Drums should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use. Pails must be vented and thoroughly dried prior to crushing and recycling. IBCs (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs). Steel containers must be inspected, pressure tested & recertified every 5 years. <i>Never cut, drill, weld or grind on or near this container, even if empty</i>

12. ENVIRONMENTAL INFORMATION

Bioaccumulation	although this product is water insoluble & ought to bioaccumulate, readily metabolised by aquatic organisms and probably cannot bioaccumulate; oral dose excreted within 24 hours
Biodegradation	this product degrades readily in the presence of oxygen; biodegradation is very rapid in acclimated water – 70-99% degradation in 5 days; rapid also after 5day lag period in unacclimated water
Abiotic Degradation	this product reacts with atmospheric hydroxyl radicals; its estimated half-life in air is 42 hours
Mobility in soil, water	this product is water insoluble and moves very slowly or not at all in soil and water
Aquatic Toxicity	
LC ₅₀ (Fish, 96hr)	0.6mg/litre (Cyprinodon variegatus), 0.7-1.2mg/litre (Pimephales promelas), 1.1-1.2mg/litre (Salmo gairdneri), 2.9mg/litre (Ictalurus punctatus), 0.7-1.0mg/litre (Lepomis macrochirus) & <i>many others</i>
LC ₅₀ (Crustacea, 24hr)	8mg/litre (Artemia salina), 17mg/litre (Daphnia magna) & <i>many others</i>
EC ₅₀ (Algae)	3.5 & 9mg/litre (Scenedesmus subspicatus), 0.75mg/litre (Selenastrum capricornutum)
EC ₅₀ (Bacteria)	10.9mg/litre (Photobacterium phosphoreum), 2.2mg/litre (Tetrahymena pyriformis)

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(Dibutyl Phthalate, cont'd)

13. TRANSPORT REGULATIONS

Canada TDG	PIN	UN- 3082
AND	Shipping Name	environmentally hazardous substance, liquid, N.O.S. (dibutyl phthalate)
U.S.A. 49 CFR	Class	9
	Packing Group	III
Marine Pollutant		P

14. EMERGENCY INFORMATION

Canada	Call CANUTEC (collect)	(613) 996-6666
U.S.A.	Call CHEMTREC	(800) 424-9300

15. REGULATIONS

Canada DSL	on inventory
U.S.A. TSCA	on inventory
Europe EINECS	on inventory (EC# 201-557-4)

Immediately Dangerous to Life or Health: 4000 mg/cu m

OSHA Standards: Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 5 mg/cu m.

NIOSH Recommendations: Recommended Exposure Limit: 10 Hr Time-Weighted Avg: 5 mg/cu m.

Threshold Limit Values: 8 hr Time Weighted Avg (TWA): 5 mg/cu m. Excursion Limit Recommendation: Excursions in worker exposure levels may exceed three times the TLV-TWA for no more than a total of 30 min during a work day, and under no circumstances should they exceed five times the TLV-TWA, provided that the TLV-TWA is not exceeded.

Atmospheric Standards: Listed as a hazardous air pollutant (HAP) generally known or suspected to cause serious health problems. The Clean Air Act, as amended in 1990, directs EPA to set standards requiring major sources to sharply reduce routine emissions of toxic pollutants. EPA is required to establish and phase in specific performance based standards for all air emission sources that emit one or more of the listed pollutants. Dibutyl phthalate is included on this list.

State Drinking Water Guidelines: Maine 700 ug/l, Florida 700 ug/l, Minnesota 700 ug/l, New Hampshire 800 ug/l, Wisconsin 100 ug/l

Clean Water Act Requirements: Protection of human health from the toxic properties of dibutyl phthalate ingested through water and contaminated organisms, the ambient water criterion is calculated at 34 mg/l. For the protection of human health from the toxic properties of dibutyl phthalate ingested through contaminated aquatic organisms alone, the ambient water criterion is determined to be 154 mg/l. Dibutyl phthalate is designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance. This designation includes any isomers and hydrates, as well as any solutions and mixtures containing this substance.

CERCLA Reportable Quantities: Persons in charge of vessels or facilities are required to notify the National Response Center (NRC) immediately, when there is a release of this designated hazardous substance, in an amount equal to or greater than its reportable quantity of 10 lb or 4.54 kg. The toll free number of the NRC is (800) 424-8802. The rule for determining when notification is required is stated in 40 CFR 302.4 (section IV. D.3.b).

TSCA Requirements: A testing consent order is in effect for di-n-butyl phthalate for environmental effects testing. FR citation: 1/9/89. Pursuant to section 8(d) of TSCA, EPA promulgated a model Health and Safety Data Reporting Rule. The section 8(d) model rule requires manufacturers, importers, and processors of listed chemical substances and mixtures to submit to EPA copies and lists of unpublished health and safety studies. 1,2-Benzenedicarboxylic acid, dibutyl ester is included on this list. Effective date 10/04/82; Sunset date 10/04/92.

RCRA Requirements: As stipulated in 40 CFR 261.33, when 1,2-benzenedicarboxylic acid, dibutyl ester, as a commercial chemical product or manufacturing chemical intermediate or an off-specification commercial chemical product or a manufacturing chemical intermediate, becomes a waste, it must be managed according to Federal and/or State hazardous waste regulations. Also defined as a hazardous waste is any residue, contaminated soil, water, or other debris resulting from the cleanup of a spill, into water or on dry land, of this waste. Generators of small quantities of this waste may qualify for partial exclusion from hazardous waste regulations (40 CFR 261.5).

FIFRA Requirements: As the federal pesticide law FIFRA directs, EPA is conducting a comprehensive review of older pesticides to consider their health and environmental effects and make decisions about their future use. Under this pesticide reregistration program, EPA examines health and safety data for pesticide active ingredients initially registered before November 1, 1984, and determines whether they are eligible for reregistration. In addition, all pesticides must meet the new safety standard of the Food Quality Protection Act of 1996. Pesticides for which EPA had not issued Registration Standards prior to the effective date of FIFRA, as amended in 1988, were divided into three lists based upon their potential for human exposure and other factors, with List B containing pesticides of greater concern and List D pesticides of less concern. Dibutyl phthalate is found on List C. Case No: 3112; Case Status: OPP is reviewing data from the pesticide's producers regarding its human health and/or environmental effects, or OPP is determining the pesticide's eligibility for reregistration and developing the Reregistration Eligibility Decision document.

FDA Requirements: Dibutyl phthalate is an indirect food additive for use only as a component of adhesives.

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16. PREPARATION INFORMATION

Prepared for Megaloid Laboratories by Peter Bursztyn, (705) 734-1577

File Name: **DBP**

With data from RTECS, Haz. Substance Data Base, Cheminfo (CCOHS), IUCLID Datasheets (European Chem. Substance Info. System), & others, as available

*Preparation Date: **December 2003** Revision Date: **October 2006, October 2009, August 2010***

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