DIBUTYL PHTHALATE

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
DIBUTYL PHTHALATE

OTHER NAMES

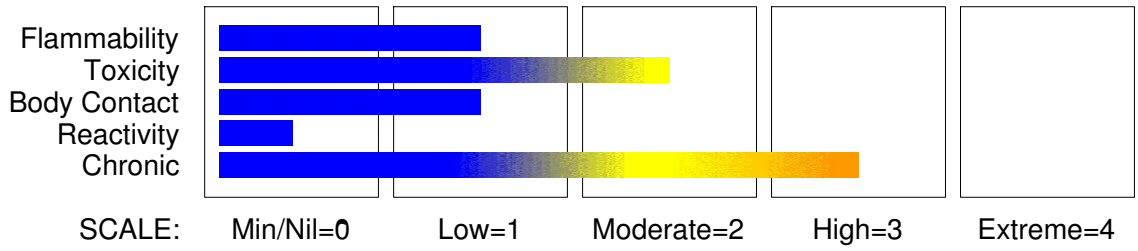
C16-H22-O4, "o-benzenedicarboxylic acid, dibutyl ester", "o-benzenedicarboxylic acid, dibutyl ester", "benzene-o-dicarboxylic acid di-n-butyl ester", "benzene-o-dicarboxylic acid di-n-butyl ester", "dibutyl 1, 2-benzenediacarboxylate", "dibutyl 1, 2 -benzenediacarboxylate", "di-n-butyl phthalate", "di-n-butyl phthalate", dibutylphthalate , "phthalic acid, dibutyl ester", "butyl phthalate"

PROPER SHIPPING NAME
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

PRODUCT USE
As a plasticizer in nitrocellulose lacquers, elastomers, explosives, nail polish and in solid rocket propellants; solvent / fixative for perfumes. Resin solvent; paper coatings; adhesives; insect repellent for textiles.

SUPPLIER
Company: S D FINE- CHEM LIMITED
Address:
315- 317, T.V. INDUSTRIAL ESTATE,
248, WORLI,
MUMBAI- 400030.INDIA.
technical@sdfine.com
Telephone: 91- 22- 24959898
Telephone: 91- 22- 24959899
Fax: 91- 22- 24937232

HAZARD RATINGS



continued...

Section 2 - HAZARDS IDENTIFICATION

GHS Classification

Acute Toxicity (Oral) Category 5
Chronic Aquatic Hazard Category 1
Reproductive Toxicity Category 1B
Reproductive Toxicity Category 2

EMERGENCY OVERVIEW

HAZARD

DANGER
Determined by using GHS criteria:
H303 H360 H361 H410
May be harmful if swallowed
May damage the unborn child
Suspected of damaging fertility
Very toxic to aquatic life with long lasting effects
Harmful to life in the soil

PRECAUTIONARY STATEMENTS

Prevention

Do not handle until all safety precautions have been read and understood.
Obtain special instructions before use.
Use personal protective equipment as required.

Response

If exposed or concerned: Get medical attention advice.
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

Storage

Store locked up.

Disposal

Dispose of contents and container in accordance with relevant legislation.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
dibutyl phthalate	84-74-2	>99

continued...

Section 4 - FIRST AID MEASURES

SWALLOWED

· If swallowed do NOT induce vomiting.
· If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
· Observe the patient carefully.
· Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
· Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
· Seek medical advice.

EYE

If this product comes in contact with the eyes:
· Immediately hold eyelids apart and flush the eye continuously with running water.
· Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
· Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
· Transport to hospital or doctor without delay.
· Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

If skin contact occurs:
· Immediately remove all contaminated clothing, including footwear.
· Flush skin and hair with running water (and soap if available).
· Seek medical attention in event of irritation.

INHALED

· If fumes or combustion products are inhaled remove from contaminated area.
· Lay patient down. Keep warm and rested.
· Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
· Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
· Transport to hospital, or doctor.

NOTES TO PHYSICIAN

Treat symptomatically.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

· Foam.
· Dry chemical powder.
· BCF (where regulations permit).
· Carbon dioxide.

continued...

· Water spray or fog - Large fires only.

FIRE FIGHTING
· Alert Fire Brigade and tell them location and nature of hazard.
· Wear breathing apparatus plus protective gloves.
· Prevent, by any means available, spillage from entering drains or water course.
· Use water delivered as a fine spray to control fire and cool adjacent area.
· Avoid spraying water onto liquid pools.
· Do not approach containers suspected to be hot.
· Cool fire exposed containers with water spray from a protected location.
· If safe to do so, remove containers from path of fire.

FIRE/EXPLOSION HAZARD
· Combustible.
· Slight fire hazard when exposed to heat or flame.
· Heating may cause expansion or decomposition leading to violent rupture of containers.
· On combustion, may emit toxic fumes of carbon monoxide (CO).
· May emit acrid smoke.
· Mists containing combustible materials may be explosive.

FIRE INCOMPATIBILITY
Avoid contamination with.
oxidising agents.
nitrates and chlorine.

Personal Protective Equipment
Breathing apparatus.
Gas tight chemical resistant suit.
Limit exposure duration to 1 BA set 30 mins.

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS
Slippery when spilt.
· Remove all ignition sources.
· Clean up all spills immediately.
· Avoid breathing vapours and contact with skin and eyes.
· Control personal contact by using protective equipment.
· Contain and absorb spill with sand, earth, inert material or vermiculite.
· Wipe up.
· Place in a suitable labelled container for waste disposal.

MAJOR SPILLS
Slippery when spilt.
Remove all ignition sources.
Minor hazard.
· Clear area of personnel.
· Alert Fire Brigade and tell them location and nature of hazard.
· Control personal contact by using protective equipment as required.
· Prevent spillage from entering drains or water ways.
· Contain spill with sand, earth or vermiculite.

continued...

· Collect recoverable product into labelled containers for recycling.
· Absorb remaining product with sand, earth or vermiculite and place in appropriate containers for disposal.
· Wash area and prevent runoff into drains or waterways.
· If contamination of drains or waterways occurs, advise emergency services.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:
dibutyl phthalate 500 mg/m³

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:
dibutyl phthalate 250 mg/m³

other than mild, transient adverse effects without perceiving a clearly defined odour is:
dibutyl phthalate 15 mg/m³

The threshold concentration below which most people will experience no appreciable risk of health effects:
dibutyl phthalate 5 mg/m³

American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

Very Toxic (T+)	>= 0.1%	Toxic (T)	>= 3.0%
R50	>= 0.25%	Corrosive (C)	>= 5.0%
R51	>= 2.5%		
else	>= 10%		

where percentage is percentage of ingredient found in the mixture

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS

X	X	+	X	X	+

+: May be stored together
O: May be stored together with specific preventions
X: Must not be stored together

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

· Limit all unnecessary personal contact.
· Wear protective clothing when risk of exposure occurs.
· Use in a well-ventilated area.
· Avoid contact with incompatible materials.

continued...

· When handling, DO NOT eat, drink or smoke.
· Keep containers securely sealed when not in use.
· Avoid physical damage to containers.
· Always wash hands with soap and water after handling.
· Work clothes should be laundered separately.
· Use good occupational work practice.
· Observe manufacturer's storing and handling recommendations.
· Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

SUITABLE CONTAINER

· Metal can or drum
· Packaging as recommended by manufacturer.
· Check all containers are clearly labelled and free from leaks.

STORAGE INCOMPATIBILITY

Segregate from.
oxidising agents.
nitrates and chlorine.

STORAGE REQUIREMENTS

· Store in original containers.
· Keep containers securely sealed.
· No smoking, naked lights or ignition sources.
· Store in a cool, dry, well-ventilated area.
· Store away from incompatible materials and foodstuff containers.
· Protect containers against physical damage and check regularly for leaks.
· Observe manufacturer's storing and handling recommendations.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

The following materials had no OELs on our records
• dibutyl phthalate: CAS:84- 74- 2

EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m3)	Revised IDLH Value (ppm)
dibutyl phthalate	4, 000	

MATERIAL DATA

In animal testing the reproductive system has been the prime target.
Exposure at or below the TLV has not caused either systemic effects or irritation in man.

PERSONAL PROTECTION

continued...




EYE
· Safety glasses with side shields; or as required,
· Chemical goggles.
· Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

HANDS/FEET
Polyethylene gloves.
Wear chemical protective gloves, eg. PVC.
Wear safety footwear.

OTHER
· Overalls.
· Barrier cream
· Eyewash unit.

GLOVE SELECTION INDEX
Glove selection is based on a modified presentation of the:
" Forsberg Clothing Performance Index" .
The effect(s) of the following substance(s) are taken into account in the computer- generated selection: dibutyl phthalate

Protective Material CPI *.

BUTYL	A
NATURAL+NEOPRENE	A
NEOPRENE/NATURAL	A
NITRILE	A
PE/EVAL/PE	A
PVA	A
VITON	A
NATURAL RUBBER	A
NEOPRENE	A

A: Best Selection
B: Satisfactory; may degrade after 4 hours continuous immersion
C: Poor to Dangerous Choice for other than short term immersion

continued...

NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half- face Respirator	Full- Face Respirator
1000	10	A- AUS P	-
1000	50	-	A- AUS P
5000	50	Airline *	-
5000	100	-	A- 2 P
10000	100	-	A- 3 P
	100+		Airline**

* - Continuous Flow ** - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.
For further information consult
your
Occupational Health and Safety Advisor.

ENGINEERING CONTROLS

None under normal operating conditions.
If inhalation risk of overexposure exists, wear SAA approved organic-vapour respirator.
If mist is present, use air supplied breathing apparatus.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Colourless oily liquid; does not mix with water.
Soluble in alcohol, ether, acetone and benzene. No odour.

PHYSICAL PROPERTIES

Liquid.
Does not mix with water.
Sinks in water.

Molecular Weight: 278.4
Melting Range (°C): - 35
Solubility in water (g/L): Immiscible
pH (1% solution): Not applicable
Volatile Component (%vol): Not available
Relative Vapour Density (air=1): 9.6
Lower Explosive Limit (%): 0.47

Boiling Range (°C): 340
Specific Gravity (water=1): 1.05
pH (as supplied): Not applicable
Vapour Pressure (kPa): 1.64 @ 20 C
Evaporation Rate: Not available
Flash Point (°C): 188 OC
Upper Explosive Limit (%): Not available.

continued...

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Autoignition Temp (°C): 403
State: Liquid

Decomposition Temp (°C): Not available
Viscosity: Not available

log Kow (Sangster 1997): 4.72
log Kow: 4.72

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED
Although ingestion is not thought to produce harmful effects (as classified under EC Directives), the material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality rather than those producing morbidity (disease, ill-health).
Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, ingestion of insignificant quantities is not thought to be cause for concern.
Considered an unlikely route of entry in commercial/industrial environments.

EYE
Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised by tearing or conjunctival redness (as with windburn).

SKIN
Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.
The material is not thought to be a skin irritant (i.e. is unlikely to produce irritant dermatitis as described in EC Directives using animal models). Temporary discomfort, however, may result from prolonged dermal exposures. Good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.
Toxic effects may result from skin absorption.

INHALED
The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.

continued...

Section 11 - TOXICOLOGICAL INFORMATION

Not normally a hazard due to non-volatile nature of product.
Inhalation hazard is increased at higher temperatures.

CHRONIC HEALTH EFFECTS
There is sufficient evidence to provide a strong presumption that human exposure to the material may result in developmental toxicity, generally on the basis of:
- clear results in appropriate animal studies where effects have been observed in the absence of marked maternal toxicity, or at around the same dose levels as other toxic effects but which are not secondary non-specific consequences of the other toxic effects.
Principal routes of exposure are usually by.
skin contact/absorption and inhalation of vapour from heated material.
Inhalation of vapour may result in nausea, headache.
Prolonged or repeated skin contact may cause drying with cracking, irritation and possible dermatitis following.
Oral or intraperitoneal administration at high doses relative to the TLV produced a number of resorptions, neural tube defects, skeletal abnormalities and increased foetal deaths.

TOXICITY AND IRRITATION

TOXICITY	IRRITATION
Oral (human) TDLo: 140 mg/kg	Nil Reported
Oral (rat) LD50: 8000 mg/kg	
Inhalation (rat) LD50: 4250 mg/m³	
Oral (rat) LOAEL: 66 mg/kg/day	

Section 12 - ECOLOGICAL INFORMATION

Marine Pollutant:Not Determined

Hazardous Air Pollutant:	Yes
Algae IC50 (72hr.) (mg/l):	10- 50 (24h
log Kow (Sangster 1997):	4.72
Half- life Soil - High (hours):	552
Half- life Soil - Low (hours):	48
Half- life Air - High (hours):	74
Half- life Air - Low (hours):	7.4
Half- life Surface water - High (hours):	336
Half- life Surface water - Low (hours):	24
Half- life Ground water - High (hours):	552
Half- life Ground water - Low (hours):	48
Aqueous biodegradation - Aerobic - High (hours):	552
Aqueous biodegradation - Aerobic - Low (hours):	24
Aqueous biodegradation - Anaerobic - High (hours):	552
Aqueous biodegradation - Anaerobic - Low (hours):	48
Aqueous biodegradation - Removal secondary treatment - High (hours):	95%
Aqueous biodegradation - Removal secondary treatment - Low (hours):	35%
Photolysis maximum light absorption - High (nano- m):	274
Photolysis maximum light absorption - Low (nano- m):	224.5
Aqueous photolysis half- life - Low (hours):	3466
Photooxidation half- life water - High (hours):	1.10E+06
Photooxidation half- life water - Low (hours):	2.10E+04
Photooxidation half- life air - High (hours):	74
Photooxidation half- life air - Low (hours):	7.4
First order hydrolysis half- life (hours):	10

continued...

The phthalate esters are distributed throughout the environment ubiquitously. They are found complexed with fulvic acid components of the humic substances in soil and marine and estuarine waters. Fulvic acid appears to act as a solubiliser for the otherwise insoluble ester and serves to mediate its transport and mobilisation in water or immobilisation in soil. Phthalate esters have been found in open ocean environments, in deep sea jelly fish, Atlantic herring and in mackerel. Phthalic ester plasticisers are clearly recognised as general contaminants of almost every soil and water ecosystem. In general they have low acute toxicity but the weight of evidence supporting their carcinogenicity is substantial. Other subtle chronic effects have also been reported. As little as 4 ug/ml in culture medium is lethal to chick embryo heart cells. This concentration is similar to that reached in human blood stored in vinyl plastic bags for as little as one day. Some phthalates (notably di2-ethylhexyl phthalate and dibutyl phthalate) may also be detrimental to the reproduction of the water flea (Daphnia magna), zebra fish and guppies. As phthalates are present in drinking water and food, concerns have been raised about their long term effects on humans.
log Kow: 4.72
Koc: 160-6400
Half-life (hr) air: 18
Half-life (hr) H2O surface water: 1824
Henry's atm m^3 /mol: 4.60E-07
BOD 5 if unstated: 0.43
ThOD: 2.24
BCF: 5000
Log BCF: 1.07-1.5
Fish - Salmo gairdneri LC50 (96h): 1.6 mg/L.
Daphnia Magna EC50 (48h): 3.4 mg/L.
Algae - Selenastrum capricornutum EC50 (96h): 0.75 mg/L.
Phytotoxicity: Vapours of DBP at low concentrations can cause serious damage to plants.

Section 13 - DISPOSAL CONSIDERATIONS

- Consult manufacturer for recycling options and recycle where possible .
- Consult State Land Waste Management Authority for disposal.
- Incinerate residue at an approved site.
- Recycle containers if possible, or dispose of in an authorised landfill.

Section 14 - TRANSPORTATION INFORMATION

Labels Required: MISCELLANEOUS
HAZCHEM: 2X

UNDG:

Dangerous Goods Class:	9	Subrisk:	None
UN Number:	3082	Packing Group:	III

continued...

Section 14 - TRANSPORTATION INFORMATION

Shipping Name:ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Air Transport IATA:

ICAO/IATA Class:	9	ICAO/IATA Subrisk:	None
UN/ID Number:	3082	Packing Group:	III
ERG Code:	9L		

Shipping name:ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Maritime Transport IMDG:

IMDG Class:	9	IMDG Subrisk:	None
UN Number:	3082	Packing Group:	III
EMS Number:	F- A, S- F	Marine Pollutant:	Not Determined

Shipping name:ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

Section 15 - REGULATORY INFORMATION

REGULATIONS

dibutyl phthalate (CAS: 84-74-2) is found on the following regulatory lists;
IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk
OECD Representative List of High Production Volume (HPV) Chemicals
OSPAR List of Chemicals for Priority Action
OSPAR List of Substances of Possible Concern

Section 16 - OTHER INFORMATION

Denmark Advisory list for selfclassification of dangerous substances

Substance	CAS	Suggested codes
dibutyl phthalate	84- 74- 2	N; R51/53

REPRODUCTIVE HEALTH GUIDELINES

Established occupational exposure limits frequently do not take into consideration reproductive end points that are clearly below the thresholds for other toxic effects. Occupational reproductive guidelines (ORGs) have been suggested as an additional standard. These have been established after a literature search for reproductive no -observed-adverse effect-level (NOAEL) and the lowest-observed-adverse-effect-level (LOAEL). In addition the US EPA's procedures for risk assessment for hazard identification and dose-response assessment as applied by NIOSH were used in the creation of such limits. Uncertainty factors (UFs) have also been incorporated.

Ingredient	ORG	UF	Endpoint	CR	Adeq TLV
dibutyl phthalate	0.72 mg/m3	1000	D	NA	-

These exposure guidelines have been derived from a screening level of risk assessment and should not be construed as unequivocally safe limits. ORGS represent an 8-hour time -weighted average unless specified otherwise.
CR = Cancer Risk/10000; UF = Uncertainty factor:

continued...

TLV believed to be adequate to protect reproductive health:
LOD: Limit of detection
Toxic endpoints have also been identified as:
D = Developmental; R = Reproductive; TC = Transplacental carcinogen
Jankovic J., Drake F.: A Screening Method for Occupational Reproductive
American Industrial Hygiene Association Journal 57: 641-649 (1996).

The above information is believed to be accurate and represent the best information currently available to us, but does not represent any warranty expressed or implied of the properties of the product. User should make their own investigation to determine the suitability of the information for their particular purpose.

Issue Date: 26-Mar-2018