

Material Safety Data for: Diisooctyl Phthalate

1. PRODUCT IDENTIFICATION

Name	1,2-benzenedicarboxylic acid, diisooctyl ester
Synonyms	Diisooctyl 1,2-benzenedicarboxylate, DIOP, phthalic acid, diisooctyl ester
CAS#	27554-26-3
Product Uses	plasticiser

2. INGREDIENTS

	%	TWAEV / TLV ppm / mg/m ³	LD ₅₀ ORAL	(mg/kg) SKIN	LC ₅₀ ppm INHALATION
Diisooctyl Phthalate	100%	not listed	2770	12,600	not known

3. (a) HAZARDS SUMMARY

Hazards, Quick Guide: reproductive toxin

Canada – WHMIS

Key:

D 2B

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 – 1, 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	extremely low vapour pressure & high viscosity makes inhalation of vapour or mist unlikely
Ingestion	not known – low toxicity & very bitter taste makes ingestion unlikely

Effects, Chronic Exposure

General	liver damage after long-term ingestion by rodents; no reported human effect
Sensitising	not a sensitiser in humans or animals
Carcinogen/Tumorigen	not a tumorigen or carcinogen in animals or humans
Reproductive Effect	reduced fertility in rats; may be teratogenic in rodents; no known effect in humans
Mutagen	not a mutagen <i>in vitro</i> or in rodents; no known effect on humans
Synergistic With	not known
LD ₅₀ (oral)	22,000 & 22,600mg/kg (rat), 2770 & 26,000mg/kg (mouse)
LD ₅₀ (skin)	12,600mg/kg (rabbit)
LC ₅₀ (inhalation)	not known

** 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.

(Diisooctyl 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
Odour Threshold	not known
Vapour Pressure	5.5x10 ⁻⁶ mmHg / 4.2x10 ⁻⁷ kPa (25°C / 77°F)
Evaporation Rate (<i>Butyl Acetate = 1</i>)	not known – not volatile
Vapour Density (air = 1)	approx 16 (theoretical)
Boiling Range	370°C / 698°F – ICI (Runcorn, UK): 230°C / 446°F at reduced pressure (5kPa)
Melting Point	-4°C / 25°F – ICI (Runcorn, UK): -45°C / -49°F
Specific Gravity	0.984 (20/20°C)
Water Solubility	0.09 milligrams per litre (ICI, Runcorn, UK gives this as 100mg/litre) – almost nil
Also soluble in	ethanol, acetone, diethyl ether, aromatic hydrocarbons
Viscosity	83centipoise (20°C / 68°F)
pH	none – (does not liberate hydrogen ions when dissolved)
Molecular Weight	390grams per mole
Conversion Factor	1ppm = 15.9mg/m ³

6. FLAMMABILITY & FIRE FIGHTING

Flash Point	232°C / 450°F (closed cup); 227°C / 440°F – ICI, Runcorn, UK, method not disclosed
Autoignition Temperature	393°C / 739°F
Flammable Limits	not known
Combustion Products	carbon monoxide, nitrogen oxides, smoke, polycyclic aromatics, part oxidised hydrocarbon fragments, & phthalic anhydride (highly irritating & allergenic)
Firefighting Precautions	alcohol or polymer foam, dry chemical, water fog, water spray only to cool & dilute, water jet spreads flames; firefighters must wear SCBA
Static Charge Accumulation	probably 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	nitrates
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

Diisooctyl Phthalate is not listed by ACGIH or OSHA. However, it would be prudent to apply the limits they give for Dioctyl Phthalate.

ACGIH TLV	5mg/m ³ – for DOP
OSHA PEL	5mg/m ³ – for DOP
STEL	10mg/m ³ – for DOP
Ventilation	mechanical ventilation is probably not required due to very low vapour pressure
Hands	butyl or nitrile gloves may be worn – <i>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, dry environment, away from open flame and oxidising agents. Empty containers may contain a flammable / explosive vapour. Always ensure that containers, whether empty or full, or part full, are tightly sealed unless in use.

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, shovel, & store in closed containers for recycling or disposal

11. DISPOSAL

Waste Disposal	do not flush to sewer , recycle solvent if possible, may be incinerated in approved facility with flue gas monitoring and scrubbing – after mixing with a suitable flammable waste
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 DIOP should bioconcentrate, it is rapidly metabolised and cannot bioaccumulate
Biodegradation	this product degrades readily and rapidly in the presence of oxygen; 75% biodegradation in 96 hours and 99% in 28days
Abiotic Degradation	this product reacts with atmospheric hydroxyl radicals; its estimated half-life in air is 19 hours
Mobility in soil, water	this product is water insoluble & adsorbs strongly to soil particles – it is immobile in soil & water
Aquatic Toxicity	
LC ₅₀ (Fish, 96hr)	90mg/l (Pimephelas promelas)
EC ₅₀ (Crustacea, 48hr)	>90mg/litre (unidentified aquatic arthropod) – <i>ICI Chemicals, Runcorn U.K.</i>

NOTE: Despite the lack of test data, the very low water solubility & rapid biodegradability of DIOP suggest that it should not be very toxic to aquatic life.

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13. TRANSPORT REGULATIONS

<i>Canada TDG</i>	PIN	UN- not regulated for transport
AND	Shipping Name	not regulated for transport
<i>U.S.A. 49 CFR</i>	Class	not regulated for transport
	Packing Group	not regulated for transport
Marine Pollutant		not a marine pollutant

14. EMERGENCY INFORMATION

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

15. REGULATIONS

Canada DSL	on inventory
U.S.A. TSCA	on inventory
Europe EINECS	on inventory (EC# 248-523-5)

Atmospheric Standards: This action promulgates standards of performance for equipment leaks of Volatile Organic Compounds (VOC) in the Synthetic Organic Chemical Manufacturing Industry (SOCMI). The intended effect of these standards is to require all newly constructed, modified, and reconstructed SOCMI process units to use the best demonstrated system of continuous emission reduction for equipment leaks of VOC, considering costs, non air quality health and environmental impact and energy requirements. Diisooctyl phthalate is produced, as an intermediate or final product, by process units covered under this subpart.

Clean Water Act Requirements: Toxic pollutant designated pursuant to section 307(a)(1) of the Clean Water Act and is subject to effluent limitations. /Phthalate esters/

TSCA Requirements: 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, diisooctyl ester is included on this list.

FDA Requirements: Diisooctyl phthalate is an indirect food additive for use only as a component of adhesives. Diisooctyl phthalate is classified as a plasticizer when migrating from food-packaging material (for foods of high water content only).

16. PREPARATION INFORMATION

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

File Name: DIOP

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**

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