

# Material Safety Data for: Dioctyl Adipate

## 1. PRODUCT IDENTIFICATION

**Name** di(2-ethylhexyl) adipate *or* bis(2-ethylhexyl) adipate  
**Synonyms** adipic acid, dioctyl ester; hexanedioic acid, dioctyl ester  
**CAS#** 103-23-1  
**EC#** 203-090-1  
**Product Uses** plasticiser; aerospace lubricant

## 2. INGREDIENTS

	%	TWAEV / TLV mg/m <sup>3</sup>	LD <sub>50</sub> ORAL	(mg/kg) SKIN	LC <sub>50</sub> ppm INHALATION
Adipic Acid, Dioctyl Ester	100%	not listed	7390	8410	not known

## 3. (a) HAZARDS SUMMARY

<b>Hazards, Quick Guide:</b>	<i>no known hazards</i>
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### Canada – WHMIS

Key:

**not controlled under WHMIS**

**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 – 0, 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	little to no effect
Inhalation	vapour may irritate but very low vapour pressure & high viscosity makes this unlikely
Ingestion	not known, bitter taste discourages ingestion – not a route of industrial exposure

### Effects, Chronic Exposure

General	prolonged exposure may cause dermatitis & skin cracking; damage to liver & kidneys seen in rats after 2500mg/kg/day (oral) for 2-3 wk & in mice after 15,000mg/kg/day (oral) for 2 wk, ( <i>These ingestion tests are not relevant to industrial exposure.</i> )
Sensitising	not a sensitiser in humans or animals
Carcinogen/Tumorigen	not considered a tumorigen or a carcinogen in humans or animals; <i>2 year rat feeding studies found the risk of liver cancer to be negligible</i>
Reproductive Effect	no known effect in humans or animals
Mutagen	no known effect on humans or animals
Synergistic With	not known
LD <sub>50</sub> (oral)	7390mg/kg (rat), 12,900mg/kg (guinea pig), 15,000mg/kg (mouse)
LD <sub>50</sub> (skin)	8410 & 15,100mg/kg (rabbit)
LC <sub>50</sub> (inhalation)	not known

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

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**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 or pale yellow liquid with faint odour & a bitter taste
Odour Threshold	not known
Vapour Pressure	8.5x10 <sup>-7</sup> mmHg / 1.13x10 <sup>-7</sup> kPa (20°C / 68°F) – very low
Evaporation Rate ( <i>Butyl Acetate = 1</i> )	nil – not volatile
Vapour Density (air = 1)	above 12 (theoretical)
Boiling Range	417°C / 783°F
Freezing Point	-68°C / -90°F
Specific Gravity	0.926 (20/20°C)
Water Solubility	0.8 milligrams per litre (22°C / 72°F)
Also soluble in	acetone and other ketones
Viscosity	13.7centipoise (20°C / 68°F)
pH	none – ( <i>does not liberate hydrogen ions when dissolved</i> )
Molecular Weight	371grams per mole

**6. FLAMMABILITY & FIRE FIGHTING**

Flash Point	196°C / 385°F (closed cup)
Autoignition Temperature	350°C / 662°F
Flammable Limits	0.4% – upper limit not known
Combustion Products	carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments
Fire Fighting Precautions	as for an oil fire; foam, dry chemical, water fog, water spray only to cool & dilute, product floats on water – water jet spreads flames; fire fighters must wear SCBA
Static Charge Accumulation	unlikely to accumulate a static charge on agitation or pumping – <i>ignition by static discharge is highly unlikely due to very high flash point</i>

**7. STABILITY / REACTIVITY**

Dangerously Reactive With	strong oxidising agents
Also Reactive With	acids
Stability	stable; will not polymerize
Decomposes in Presence of	not known
Decomposition Products	none apart from Hazardous Combustion Products
Sensitive to Mechanical Impact	no

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**(Diocetyl Adipate, cont'd)**

**8. PROTECTIVE EQUIPMENT / EXPOSURE CONTROL**

ACGIH TLV	not listed
OSHA PEL	not listed
STEL	not listed
Ventilation	no special exhaust ventilation required
Hands	no special protective glove required; "Viton" 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 dry environment, away from sources of open flame, heat 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.

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 should be available near the workplace.

**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	<b>do not flush to sewer</b> , recycle if possible, may be incinerated in approved facility
Containers	<b>Drums</b> should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use. <b>Pails</b> must be vented and thoroughly dried prior to crushing and recycling. <b>IBCs</b> (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	this product is not a bioaccumulator
Biodegradation	this product degrades readily in the presence of oxygen; over 90% biodegradation in 35 days <i>(1/2-life = 2.7 days)</i>
Abiotic Degradation	this product reacts with atmospheric hydroxyl radicals; its estimated half-life in air ~15 hrs
Mobility in soil, water	this product is water insoluble and cannot move in soil and water
<b>Aquatic Toxicity</b>	
LC <sub>50</sub> (Fish, 96hr)	54-150mg/litre (Salmo gairdneri) – <i>higher values are also given, but substance has very limited water solubility . . .</i>
EC <sub>50</sub> (Crustacea, 48hr)	1.6mg/litre (Daphnia magna)

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**13. TRANSPORT REGULATIONS**

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

**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

Federal Drinking Water Standards: EPA 400 ug/l

Federal Drinking Water Guidelines: EPA 400 ug/l

State Drinking Water Guidelines: Maine 292 ug/l

FDA Requirements: Di(2-ethylhexyl) adipate is an indirect food additive for use only as a component of adhesives.

**16. PREPARATION INFORMATION**

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

File Name: DOA

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: **December 2006, December 2009**

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