1. **PRODUCT IDENTIFICATION**

**Name**  
Dioctyl Adipate

**Synonyms**  
di(2-ethylhexyl) adipate; bis(2-ethylhexyl) adipate; adipic acid, dioctyl ester; hexanedioic acid, dioctyl ester

**CAS#**  
103-23-1

**Product Uses**  
plasticizer, broad temperature range lubricant

2. **HAZARDS**

<table>
<thead>
<tr>
<th>Quick Guide:</th>
<th>not hazardous</th>
</tr>
</thead>
</table>

**Canada – WHMIS**

<table>
<thead>
<tr>
<th>Key:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>B 2 – Flash Point &lt;38°C, B 3 – Flash Point &gt;38°C &amp; &lt;93°C</td>
<td></td>
</tr>
<tr>
<td>D 1 – Immediately Toxic, D 2 – Chronic Toxicity</td>
<td></td>
</tr>
<tr>
<td>C – Oxidising Substance, E – Corrosive, F – Reactive Substance</td>
<td></td>
</tr>
</tbody>
</table>

**U.S.A. – HMIS**

<table>
<thead>
<tr>
<th>Health – 0, Fire – 1, Reactivity – 0</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0= minimal, 1= slight, 2= moderate, 3= serious, 4= severe</td>
<td></td>
</tr>
</tbody>
</table>

3. **COMPOSITION**

<table>
<thead>
<tr>
<th>%</th>
<th>TWAEV / TLV mg/m³</th>
<th>LD₅₀ (mg/kg) ORAL</th>
<th>LD₅₀ (mg/kg) SKIN</th>
<th>LC₅₀ ppm INHALATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>di(2-ethylhexyl) adipate</td>
<td>100%</td>
<td>not listed</td>
<td>5600</td>
<td>8410</td>
</tr>
</tbody>
</table>

4. **FIRST AID**

**SKIN:**  
Wash with soap & plenty of water. Remove contaminated clothing and do not reuse until 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. **FIRE FIGHTING & FLAMMABILITY**

**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

**Firefighting Precautions**  
as for an oil fire; foam, dry chemical, water spray to cool; firefighters must wear SCBA

**Static Charge Accumulation**  
unlikely to accumulate a static charge on agitation or pumping – **ignition by static discharge unlikely due to very high flash point**

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

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

7. **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.

8. **EXPOSURE CONTROL & PERSONAL PROTECTION**

**Ontario TWAEV** not listed

ACGIH TLV not listed

OSHA PEL not listed

Ventilation no special exhaust ventilation required

Hands no special protective glove required; “Viton” gloves may be worn – consult supplier for suitability

Eyes safety glasses with side shields – always protect the eyes

Clothing no special protective clothing required

9. **PHYSICAL PROPERTIES**

**Odour & Appearance** clear, viscous, colourless or pale yellow liquid with faint odour & a bitter taste

**Odour Threshold** not known

**Vapour Pressure** $8.5 \times 10^{-7} \text{mmHg} / 1.13 \times 10^{-7} \text{kPa} (20^\circ \text{C} / 68^\circ \text{F})$ – very low

**Evaporation Rate** ($\text{Butyl Acetate}=1$) nil – not volatile

**Vapour Density** ($\text{air} = 1$) above 12 (theoretical)

**Boiling Range** $417^\circ \text{C} / 783^\circ \text{F}$

**Freezing Point** -68°C / -90°F

**Specific Gravity** 0.926 (20/20°C)

**Water Solubility** 0.8mg/litre (22°C/72°F) – emulsion probably formed; 0.003mg/litre may be true limit*

Also soluble in acetone and other ketones

**Viscosity** 13.7centipoise (20°C / 68°F)

**pH** none – (does not liberate hydrogen ions when dissolved)

**Molecular Weight** 371grams per mole

10. **REACTIVITY**

Dangerously Reactive With strong oxidising agents

Also Reactive With none known

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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11. 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; damage to rats liver & kidneys at 2500mg/kg/day (oral) for 2-3wk & in mice at 15,000mg/kg/day (oral) for 2wk, *(These tests & results are not relevant to industrial exposure.)*
- **Sensitising**: not a sensitisier in humans or animals
- **Carcinogen/Tumorigen**: not considered a tumorigen or a carcinogen in humans or animals; 2 year feeding studies in rats found the risk of liver cancer to be negligible
- **Reproductive Effect**: no known effect in humans or animals
- **Mutagen**: no known effect on humans or animals
- **Synergistic With**: not known

- **LD₅₀ (oral)**: 5600, 7390, 9100, 14,800, 25,600 & 45,000mg/kg (rat), 12,900mg/kg (guinea pig), 15,000 & 24,600mg/kg (mouse)
- **LD₅₀ (skin)**: 8410 & 15,100mg/kg (rabbit)
- **LC₅₀ (inhalation)**: not known

*The wide variability in oral LD₅₀ suggests that the above data may not be a reliable guide to human toxicity. In any case, dioctyl adipate is considered to have very low toxicity.* *See NOTE at the end of this document.*

12. ECOLOGICAL INFORMATION

- **Bioaccumulation**: not a bioaccumulator – biological ½-life ~2.7 days in fish*
- **Biodegradation**: biodegrades readily in the presence of oxygen; 83% in 28 days*, also 66% & 98% in 28 days
- **Abiotic Degradation**: estimated ½-life in air 2.6hr *(clean air), 26hr (polluted air)*
- **Mobility in soil, water**: water insoluble; cannot move in soil and water

**Aquatic Toxicity**

- **LC₅₀ (Fish, 96hr)**: 54-150mg/litre (Salmo gairdneri) & others showing LC₅₀ >0.78mg/litre
- **EC₅₀ (Crustacea, 48hr)**: 1.6mg/litre (Daphnia magna)
- **EC₅₀ (Algae)**: >0.78mg/litre *(Selenastrum capricornutum & scenedesmus subspicatus)*
- **EC₅₀ (Bacteria)**: >0.35mg/litre *(“activated sludge”)*

*Many tests of aquatic life have been reported; all show LC₅₀s & EC₅₀s to be far higher than the water solubility of dioctyl adipate. See NOTE at end.* *

13. DISPOSAL

- **Waste Disposal**: do not flush to sewer, recycle if possible, may be incinerated in approved facility 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. Never cut, drill, weld or grind on or near this container, even if empty

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14. **TRANSPORT CLASSIFICATION**

<table>
<thead>
<tr>
<th></th>
<th>PIN</th>
<th>UN- not regulated for transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada TDG</td>
<td>Shipping Name</td>
<td>not regulated for transport</td>
</tr>
<tr>
<td>AND</td>
<td>U.S.A. 49 CFR</td>
<td>Class &amp; Packing Group</td>
</tr>
<tr>
<td>Marine Pollutant</td>
<td></td>
<td>not regulated for transport</td>
</tr>
<tr>
<td>ERAP Required</td>
<td></td>
<td>not a marine pollutant</td>
</tr>
</tbody>
</table>

**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
- **Europe Classification**
  - not classified as hazardous in Europe

- **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. **OTHER INFORMATION**

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

Data from RTECS, HSDB (Haz. Substance Data Base), Cheminfo (CCOHS), IUCLID Datasheets (ESIS – European Chem. Substance Info. System), & others.

Preparation Date: **December 2009**  Revision Date: **December 2012**