

**PRODUCT: DIOCTYL ADIPATE(DOA)**

ISSUE DATE: 07/25/02

REVISION DATE: 10/04/07

Nº MSDS: 79

REV. Nº: 4

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**1. PRODUCT AND COMPANY IDENTIFICATION**

- Product name (label): **DIOCTYL ADIPATE (DOA)**
- Name in English: Dioctyl Adipate.
- Supplier name, address and telephone number:  
Elekeiroz S.A. (Unit Várzea Paulista-SP) - Rua Dr. Edgardo de Azevedo Soares, 392  
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**2. COMPOSITION AND INFORMATION ABOUT INGREDIENTS**

- Common chemical name of the substance:  
**Diocil Adipate**
- Synonyms:  
Adipol 2EH, Di (2 Etylhexyl) Adipate.
- Register in *Chemical Abstract Service* (nº C.A.S):  
[103-23-1]
- Ingredients that contribute to hazard:  
Dioctyl Adipate = 99% minimum.

**3. HAZARDS IDENTIFICATION**

- Specific hazards and most important effects:  
Low toxicity.  
It can be irritating. It can be harmful. Combustible.  
Entry routes: skin, eyes and vapours inhalation, specially at high temperatures.

**4. FIRST AID MEASURES**

- Inhalation:  
Remove the victim to fresh air. Keep the victim laid, warm and under rest. If available, apply medicinal oxygen by qualified person. If needed, apply artificial respiration, by qualified person.
- Contact with eyes:  
Wash the eyes immediately with plenty of water during, at least, 15 minutes, including under the eyelids.  
Contact lenses should be removed only by qualified persons.

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- **Contact with skin:**  
Wash the affected área with plenty of water (during 15 minutes) and soap, if available. Remove contaminated clothes and shoes.
- **Ingestion:**  
DO NOT INDUCE TO VÔMIT and do not give anything through the mouth, to an unconscious victim. If the victim is conscious and alert, give him/her a glass of water.
- **Observation:** In all cases, the victim should be sent to emergency medical assistance.
- **Notes to the physician:**  
Symptomatic treatment. There is not known antidotes.

**5. FIREFIGHTING MEASURES**

- **Proper extinguishing media:**  
Chemical foam; powder for fire extinguishing; carbon dioxide (CO<sub>2</sub>).  
Water spray (pulverized) or fog – only for large fires.
- **Specific hazards:**  
Combustible product. Risk of fire when exposed to heat and flames. Heating can cause expansion or decomposition with violent rupture of the containers. During combustion, it can release toxic fumes of carbon monoxide (CO). It can release irritant fumes. Mixtures containing combustible materials can be explosive. Other combustion product includes carbon dioxide (CO<sub>2</sub>).
- **Incompatibilities with fire:**  
Avoid contamination with strong oxidizer agents, which can cause ignition.
- **Special methods and firemen protection:**  
Remove containers from fire area, if this can be done without risks. Cool with water the containers sides which are exposed to flames, until the fire is completely extinguished. Avoid water jet directly inside liquid reservoirs. Do not approach of containers suspect of being heated. Evacuate personnel from the affected area, turn off electricity (if in safe condition), remove containers containing combustible and flammable materials. Use vaporized water to dispersar/spread vapours, cool surfaces or to protect personnel working to minimize damages or spills. Do not discharge firefighting water into sewage systems, rivers, streams or lakes. The personnel involved in firefighting should wear self contained breathing apparatus and full protection clothes.

**6. CONTROL MEASURES FOR SPILLS OR LEAKAGES**

- **Personal precautions:**  
Slippery when spilled. Keep away espectadores, isolate the hazard área and prevent the entrance of persons, remove ignition sources, do not smoke, keep upwind/vento pelas costas and stay away fom low areas. Wear protection equipment according to item 8. Do not touch the spilled material. Contain the spillage, if this can be done without risks. Avoid product flowing/running/escoamento to water bodies and sewage galleries. Prevent contact with skin, eyes and respiratory ways through personal protection, mentioned in item 8. Use only antisparking tools and explosion proof equipment. There is no dust formation.

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- **Environmental precautions:**

-Little spills: absorb with vermiculite, sand or other absorbant and non combustible material and put in adequate containers, closed and identified, for later disposal. Remove containers from the spill area. If possible, keep the waste in proper containers for flammable materials.

-Large spills: confine for later removal. Slippery when spilled. Keep the area free from persons and move downwind. It can occur violent and explosive reaction. Wear self contained breathing apparatus and protection gloves, according to item 8. Collect material in adequate containers, closed and identified, for later disposal. Contamination in water bodies should be communicated to emergency response services.

- **Cleaning methods:**

Follow above recommendations.

## **7. HANDLING AND STORAGE**

- **Handling (technical measures):**

Transfer equipment should allow flowing of static discharges and it should be used anti-deflagrante equipment. Prevent product contact with skin, eyes and respiratory ways. Wear protection equipment according to item 8. Do not smoke, eat in handling, processing or product storage areas. Keep personal hygiene. Wear clothes that can be washed separately. The area should have emergency shower and eye washing fountains. Prevent soil and water bodies contamination. Avoid formation and inhalation of fog. Avoid vapours concentration in galleries and ditches/valas. Do not enter confined spaces without previous checking. Do not use plastic containers. Ground all lines and equipment. Avoid contact with incompatible substances (item 10). Keep containers firmly closed when not in use. Avoid physical damages to containers. The atmosphere should be regularly monitored against explosion formation.

- **Storage (technical measures):**

**Packages:**

They should be stored in covered area, dry and ventilated environment, protected against sun rays and weather. Storage temperature should be below 25°C. Packages should stored over pallets, preferably made of non combustible material and piled vertically, maximum, three layers. Damaged or perforated packages should be emptied.

**Bulk storage:**

Recommended carbon steel tanks with nitrogen seal, and precautions against moisture action. When using stainless steel product shelf life increases, on the other hand, without sealing, the tendency of moisture absorption increases. Tanks should be grounded.

Storage temperature: 25 to 30°C.

**Safe materials for package:**

**Recommended:**

Cans, drums and intermediate metallic containers or made of stainless steel. For other packages, consult the manufacturer.

**Inadequate:**

Plastic containers. Consult the manufacturer.

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The area should be provided with protection against atmospheric discharges and static discharges. Empty the containers under inert or non flammable atmosphere, due the risk of fire or explosion caused by static discharges. Storage area should have adequate ventilation. Product empty containers/tanks can be dangerous since they retain residues.

**8. EXPOSURE CONTROLS AND PERSONAL PROTECTION****• Engineering Measures:**

-Use in ventilated area. Local ventilation can be required for safe work, for instance, to keep exposure levels below limits. General exhaustion is adequate under normal operation conditions. Local exhaustion can be required under specific conditions. If there is exposure risk above limits, wear adequate respirator. Provide adequate ventilation in closed sheds and storage areas.

**• Specific Control Parameters:**

- Decree 3214/78, Regulatory Standard NR-15: not included.
- ACGIH-TLV/TWA(revision 2006): not included.

ACGIH – American Conference of Governmental Industrial Hygienists.  
TLV/TWA – Threshold Limit Value / Time-weighted average.

**• Personal Protective Equipment:**

- Respiratory protection, semi-mask with chemical cartridge for organic vapours, in case of overexposure.
- Full vision glasses (in case, it's not required respiratory protection with full facial piece).
- PVC or nitrilic gloves.
- Safety shoes
- PVC apron
- Intense handling, wear PVC or Tyvek cloth (under the recommended specification) and PVC boots.

**9. PHYSICAL-CHEMICAL PROPERTIES**

- Chemical formula:  $C_{22}H_{42}O_4$ .
- Physical state: liquid.
- Color: colorless.
- Odour: odorless.
- pH: not applicable.
- Specific temperatures at which occur physical state changes:
  - Boiling point: 224°C (10mmHg).
  - Melting point: -65,0°C.
- Flash point: 191.5°C (closed cup method).
- Autoignition temperature: 377°C.
- Explosion limits:
  - Lower: 0.38% by air volume.
  - Upper: not available.
- Vapour pressure:  $8.5 \times 10^{-7}$  mmHg at 20°C.
- Vapor density (air=1): 7.72 at lbs/gal at 25°C.
- Liquid density (20/4°C): 0.924 to 0.929. Water = 1.

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- Solubility:  
Water: <0.01% to 25°C.

**10. STABILITY AND REACTIVITY**

- Specific conditions:  
The product is considered stable. Hazardous polymerizations do not occur.
- Incompatible substances:  
Avoid storing with oxidizing agents.
- Hazardous decomposition products:  
Under combustion, it can release Carbon Monoxide (CO) toxic fumes. It can release irritant fumes. Other decomposition products can include Carbon Dioxide (CO<sub>2</sub>).

**11. TOXICOLOGICAL INFORMATION**

- Information according to different exposure routes:
- Acute toxicity: low toxicity.

- Inhalation:

- Vapour/mist is unpleasant to upper respiratory tract.
- Normally, it is not considered a risk due to the lack of natural volatility for the product.
- Inhalation risk increases at high temperatures.

- Eyes:

- Liquid is unpleasant/desconfortável to the eyes and it is capable of causing moderate temporary redness of the conjunctiva, temporary vision impairment and other transitory damages/ulcerations.
- Product can be irritant to eyes during prolonged contact, causing inflammation.
- Repeated and prolonged exposure to irritant materials can produce conjunctivitis.

- Skin:

- Liquid is uncomfortable to the skin if the exposure is prolonged and capable of causing dermic reactions due to repeated exposures during long periods.

- Ingestion:

- It is considered an uncommon entry route in commercial and industrial environments.
- Liquid is uncomfortable to gastrointestinal tract.
- Ingestion can result in nausea, pain, vomits. Vomit secretion in lungs due to aspiration can cause potential lethality by chemical pneumonia.

- Toxicity:  
Rat (oral) LD50: 9110 mg/kg;  
Rabbit (skin) LD50: 3410 mg/kg.
- Irritation:

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Rabbit (skin): 500mg (open) moderate;

Rabbit (eyes): 500 mg (open);

Rabbit (eyes): 500mg/24h – moderate.

- Carcinogenicity:

NTP – not listed; IARC – group 3, not classified as carcinogenic for humans; OSHA – not listed; NIOSH – not listed; ACGIH – not listed; EPA – class C, possible human carcinogenic; MAK – not listed.

NTP – National Toxicology Program.

IARC – International Agency for Research on Cancer.

OSHA – Occupational Safety and Health Administration.

NIOSH – National Institute of Occupational Safety and Health.

ACGIH – American Conference of Governmental Industrial Hygienists.

EPA – Environmental Protection Act.

- Chronic toxicity:

Not available.

## 12. ECOLOGICAL INFORMATION

Environmental effects, behaviors and impacts of the product:

If released to air, it can exist in both phases, vapour and particulate. Vapor phase will degrade relatively fast through photooxidation reaction by hydroxyl radicals (estimated half life 16 hr). Particulate phase can be physically removed from air through wet and dry deposition.

If released to soil or water, it's expected biodegradation; tests like *screening* have shown that it degrades quickly. Estimated K value of 5004-48.600 suggest that it will relatively imóvel in the soil (does not leach) and will sediment in aquatic environment.

- Ecotoxicity:

Algae: *Scenedesmus subspicatus* 72hr EC<sub>20</sub>400mg/l; Crustacean: *Daphnia magna Straus* 24 h EC<sub>0</sub>500mg/l.

- Henry law constant:  $4,34 \times 10^{-7}$ .

- Bioaccumulation factor: *bluegill* 27.

- Partition coefficient soil/sorption:  $\log K_{oc} = 5004$ .

- DBO (Oxygen Biochemical Demand): 1.1 to 1.92 lb/lb, 5 days.

- Partition coefficient octanol/water:  $\log K_{ow} =$  measured at  $> 6.11$ .

## 13. CONSIDERATIONS ABOUT TREATMENT AND DISPOSAL

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- Treatment and disposal methods of product, wastes and used packages:  
Any wastes treatment should be in accordance with local and national regulation. Consult the manufacturer for recycling options. Incineration can be made in approved site. Dispose containers with wastes in authorized landfills.

**14. INFORMATION ABOUT TRANSPORTATION**

Not comprised by current Decree about hazardous products transportation, Resolution ANTT 420/04 and updatings up to the date; Transportation Ministry, Decree Nº 96.044/88 and updatings.

- IATA (international, aerial): not mentioned.

IMO (international marine): not mentioned.

**15. REGULATIONS**

Transportation: follow item 14.  
Consult national and international related regulation.  
Consult Brazilian Standards related to the product.

EPA regulation:

- RCRA 40 CFR: non listed
- CERCLA 40 CFR 302.4: non listed.
- SARA 40 CFR 372.65: non listed.
- SARA EHS 40 CFR 355: non listed.
- TSCA: listed.

EPA – Environmental Protection Agency  
SARA - Superfund Amendments and Reauthorization Act  
RCRA - Resource Conservation and Recovery Act  
CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act  
TSCA - Toxic Substances Control Act

**16. OTHER INFORMATION**

References:

- ACGIH manual, Portuguese version, 2006 (translation: ABHO).
- Commented Regulatory Standards – Occupational Safety and Health Volume I – Press GVC 2005.
- Elekeiroz specifications/Technical Bulletin.
- MSDS – Genium Group, Inc. Issue June/06. Reference BIS4740.
- IATA – International Air Transport Association –2007 Edition.
- IMDG – International Maritime Dangerous Goods –2006 Edition.

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Observation:

The information contained in this MSDS are offered in good faith and as guide tool, without incurring expressed or implicit liability. If clearings or additional information are needed, consult the manufacturer.