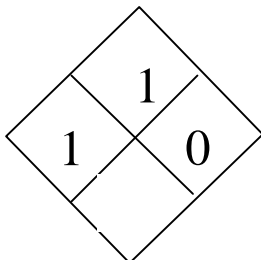


PRODUCT: BIS (2-ETHYLHEXYL) MALEATE

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HAZARDS DIAMMOND**Fire:**

1-Danger in case of strong heating.

Health:

1-Minimum risk.

Reactivity:

0-No reaction risk under normal conditions

1. PRODUCT AND COMPANY IDENTIFICATION

- Product name (label):
Bis(2-ethylhexyl) maleate
- Supplier name, address and telephone number:
Elekeiroz S.A. (Várzea Paulista-SP Plant) - Rua Dr. Edgardo de Azevedo Soares, 392
CEP 13224-030
(00-55-11) 4596-8880 or (00-55-11) 4596-8788 or (00-55-11) 4596-8907(business hours)
(00-55-11) 4596-8800 or (00-55-11) 9961-4808 (24h)
Fax: (00-55-11) 4596-8881
E-mail (customer service):
elisabete.moskalenko@elekeiroz.com.br
carlos.villani@elekeiroz.com.br

2. COMPOSITION AND INFORMATION ABOUT INGREDIENTS

- Common chemical name of the substance:
Bis(2-ethylhexyl) maleate
- Synonyms:
BIS (2-ethylhexyl) maleate.
- Register in *Chemical Abstract Service* (nº C.A.S):
142-16-5
- Ingredients that contribute to risk:
BIS (2-ethylhexyl) maleate 99%

3. HAZARDS IDENTIFICATION

- Specific hazards and most important effects:
Liquid. Irritating to eyes, skin, and respiratory tract. May be harmful by inhalation, ingestion, or skin absorption. Will burn.

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4. FIRST AID MEASURES

- **Inhalation:**
Remove the victim to fresh air. If he/she has dental prosthesis, it should be removed, if possible, before starting first aid procedures. Keep the victim lying down, warm and rested. If available, apply medicinal oxygen by a qualified person. If needed, apply cardiorespiratory resuscitation.
- **Contact with eyes:**
Wash immediately the eyes with plenty of water during, at least, 15 minutes, including under eyelids. Contact lenses should be removed only by qualified person.
- **Contact with skin:**
Wash the affected area with plenty of water (during 15 minutes) and soap, if available. Remove contaminated clothes and shoes carefully.
- **Ingestion:**
DO NOT INDUCE VOMIT. If vomit occurs, bend over the person to the front or position him/her in a left lateral decumbent position (let the person lying over the left side) to keep the aerial ways open and to prevent aspiration. Do not give anything to drink to a unconscious person or with signs of drowsiness or conscience reduction. If the victim is conscious, give him/her water, slowly, in such a way the victim can drink comfortably.

Obs.: in any situation, look for medical help, for complete treatment, observation and post-first aid support.

- **Information to physician:**
Treat symptomatically.

5. FIREFIGHTING MEASURES

- **Proper extinguishing media:**
Control measures compatible with the environment should be applied and keep confined other materials that can be involved.
Use mechanical foam with alcohol, carbon dioxide (CO₂) and dry chemical powder. Use self-contained breathing apparatus and protective clothes.
For situations that involve large fires, use water fog.
- **Specific dangers:**
Combustible product, when exposed to heat and flames. Under combustion, it can release toxic fumes of carbon monoxide (CO) and acrid fumes (pungent), beside CO₂. Heating can cause expansion or decomposition of containers, causing violent rupture. Avoid contamination with oxidizing agents, nitrates, chlorine etc. that can result in ignition.
- **Special firefighting procedures / firemen protection:**
Remove vessels from fire area, if this can be performed without risks. Cool with water the side parts of the containers exposed to flames, long time after the fire is extinguished. Avoid water jets directly inside liquids reservoirs. Do not approach containers suspected of being heated. Evacuate personnel of the affected area, turn off electricity (if in a safe manner), keep away containers that contain combustible and flammable materials. Use fog water to disperse vapors, cool surfaces or to protect people working to minimize damages or leakages. Do not discharge firefighting water in sewage galleries, streams or lakes.

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The personnel involved in firefighting operations should wear self-contained breathing apparatus and full protective clothes.

6. MEASURES TO CONTROL SPILLS OR LEAKAGES

- **Personal precautions:**
Keep away bystanders, isolate risk area and forbid the entrance of persons, remove ignition sources, do not smoke, keep on the wind and keep away from low areas. Wear protective equipment according to item 8. Do not touch the spilled material. Contain the spilled material, if this can be done without risks. Avoid product flowing off to water bodies or to sewage galleries. Prevent the contact of the product with skin, eyes and respiratory ways, by wearing personal protective equipment, mentioned in item 8. Use only antisparking tools and explosion proof equipment. There is no dust formation.
- **Environmental precautions:**
-Little spills: absorb with vermiculite, sand or other absorbant and non-combustible material and put in proper containers, closed and identified, for later disposal. Remove the containers from the spillage area. If possible, keep the waste in proper containers for flammable materials.

-Big spills: confine to later removal. Slippery when spilled. Keep the area free from persons and move on the wind. Wear self-contained breathing apparatus and protective gloves, according to item 8. Collect the material in adequate containers, closed and identified, for later disposal. Contamination of water bodies should be communicated to emergency services.
- **Cleaning methods:**
Follow the above recommendations.

7. HANDLING AND STORAGE

- **Handling (technical measures):**
Chemical products should be handled only by those who are trained about the risks during hazardous materials handling. Do not smoke, drink or take meals in areas where the material is handled. Wear the recommended Personal Protective Equipment (see item 8). Keep good personal hygiene, specially before eating, drinking, smoking or using toilet. Wear always clean clothes. Avoid prolonged contact with the product. Avoid inhale vapours. Contact lenses pose an special risk and can absorb contaminants.
- **Storage (technical measures):**
Prevent contact of the product with skin, eyes and respiratory ways. Wear protective equipment according to item 8. Do not smoke, drink or take meals in handling, processing or storage areas. Keep personal hygiene. Wear clothes that can be washed separately. The area should be provided with safety showers and eyes washing emergency facilities. Prevent soil and water bodies from contamination. Avoid the formation and inhalation of smoke. Avoid vapours concentration in galleries and trenches. Do not enter in confined spaces without a previous check. Earth all lines and equipment. Avoid contact with incompatible substances (item 10). Keep containers tightly closed, when not in use. Avoid physical damages to containers. The atmosphere should be regularly monitored in terms of explosion formation. Empty containers only under inert or non-flammable atmosphere, due to the risk of fires or explosion caused by static electricity. Storage area should have adequate ventilation. Product empty containers/tanks can be dangerous since they retain residues.

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Packages:

Should be stored in a covered area, dry and ventilated environment, protected from heat, weather and standard temperature. Packages should be stored in flat floor, preferably non-combustible and piled vertically, maximum three layers. Damaged or perforated packages should be emptied. Packages should be kept always standing (with plugs facing upward), avoiding physical damages. If the package is a drum, the maximum recommended piling is of 3 units (height), considering adequate palletization, preferably non-combustible. In case of other types of packages, consult the package supplier. It should be tightly closed.

Bulk storage:

The product should be stored, when in bulk, in closed containers, provided with vent, outdoors or separately, avoiding always to store with incompatible materials (oxidizing agents, see item 10). To prevent sparks from static electricity, earth every container and equipment involved in charge, discharge and transfer operations in production areas or storage areas. Protect the containers against physical damages.

Safe materials for package:**Recommended:**

Container of metallic cans/drum. Other packages, consult the supplier. Be sure that the packages are correctly identified and free of leakages.

Inadequate:

Consult the supplier for different materials from the above mentioned.

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

Use in ventilated area. Local exhaustion can be required under specific conditions. Provide adequate ventilation in closed warehouses and storage areas. Safety showers and eyes washing emergency facilities in areas where the product is handled.

• Specific control parameters:

- Governmental Decree 3214/78, Regulating Standard NR-15: it is not mentioned (Brazil).
- ACGIH-TLV/TWA(revision 2005) = it is not mentioned.

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

• Environmental evaluation:

Not available.

• Personal Protective Equipment:

- Respiratory protection: semi-mask or complete facial piece, with chemical filter for organic vapors.
- Full vision glasses (in case, it is not applied respiratory protection with complete facial piece). Take care with the use of contact lenses, because they pose a special risk, due to the absorption and concentration of irritant products.

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-PVC, neoprene, nitrilic or natural rubber gloves.

-Safety shoes

-PVC or trevira apron.

-In case of emergency involving the product (spills, fire) wear selfcontained breathing apparatus and full protection clothes.

9. CHEMICAL AND PHYSICAL PROPERTIES

- Chemical formula: $C_{80}H_{36}O_4$
- Physical state: liquid.
- Color: from colorless to light yellow.
- Odour: faint.
- pH: not available .
- Specific temperatures at which occur physical state changes:
 - Boiling point: 209°C (10 mm Hg).
 - Melting point: -60°C.
- Flash point: 182°C
- Explosion limits: not available.
- Vapor pressure kPa: 0.665 kPa at 200°C.
- Vapor density: >1 (Air = 1).
- Liquid density: 0,9436 at 4 °C. ($H_2O=1$).
- Solubility: alcohol, acetone, ether, toluene.

10. STABILITY AND REACTIVITY

- Specific conditions:
The product is considered stable. It does not occur hazardous polymerization.
- Incompatible substances:
Avoid storing with oxidizers, nitrates, chlorine substances.
- Hazardous products of decomposition:
Toxic fumes of carbon monoxide (burn).

11. TOXICOLOGICAL INFORMATION

- Information according to different routes of exposure:
- Toxicity: minimum.

- Inhalation:

- The vapor is discomforting to the upper respiratory tract. Inhalation hazard is increased at higher temperatures. Inhalation of vapor may aggravate a pre-existing respiratory condition.

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- Eyes:

- The liquid is discomforting to the eyes and is capable of causing a mild, temporary redness of the conjunctiva (similar to wind-burn), temporary impairment of vision and/ or other transient eye damage/ ulceration. The vapor is discomforting to the eyes. The material may be irritating to the eye, with contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

- Skin:

- The liquid may produce skin discomfort following prolonged contact. Drying of the skin may lead to dermatitis. Open cuts and abraded or irritated skin should not be exposed to this material. The material may accentuate any pre-existing skin condition. The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterized by skin redness (erythema) and swelling (edema) which may progress to vesiculation, scaling and thickening of the epidermis.

- Ingestion:

- Considered an unlikely route of entry in commercial/industrial environments. The liquid is discomforting to the gastrointestinal tract and may be harmful if swallowed in large quantity. Ingestion may result in nausea, pain, vomiting. Vomit entering the lungs by aspiration may cause potentially lethal chemical pneumonitis.

- Toxicological information:

Oral (rat) LD50: 14000 mg/kg

Intraperitoneal (rat) LD50: >5000 mg/kg

Intraperitoneal (mouse) LD50: >1000 mg/kg

Dermal (rabbit) LD50: 15 mL/kg

0

- Irritation:

Skin (rabbit):500 mg/24 hr - mild

Eye (rabbit): 500 mg/24 hr - mild

- Carcinogenicity:

NTP – non listed; IARC – non listed; OSHA – non listed; NIOSH – non listed; ACGIH – non listed; EPA – non listed; MAK – non 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:

There are no available data about human exposure.

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12. ECOLOGICAL INFORMATION

- Environmental effects, behavior and impacts of the product:
 - not available.

13. CONSIDERATIONS ABOUT TREATMENT AND DISPOSAL

- Treatment and disposal methods for the product, wastes and used packages:
Any waste treatment should be in accordance with local and national regulations. Consult the supplier about recycling options. Incineration should be made in approved sites. Dispose containers with wastes in authorized landfills.

14. INFORMATION ABOUT TRANSPORTATION

It is not comprised by current Governmental Decree about hazardous products transportation, Resolution ANTT 420/04 and revisions up to this date, Transportation Ministry, Decree N° 96.044/88 (Brazil).

- IATA (aerial international): not mentioned.
- IMO (maritime international): not mentioned.
- DOT (road US): not mentioned.

15. REGULATION

Transportation: follow item 14.
Consult related national and international regulations.
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

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16. OTHER INFORMATION

References:

- MSDS - GENIUM GROUP. CORP., issue Dec/04, reference DIE8000.
- IATA/DGR – International Air Transport Association – Edition 2005.
- IMO/IMDG – International Maritime Dangerous Goods – Edition 2002.
- Manual ACGIH, portugueses version, 2002 (translation: ABHO).
- Occupational Safety and Health Manual – GVC edition 2005 (Brazil).

Observation:

The information contained in this MSDS are offered in good faith and as an orientation instrument. The company cannot be liable for improper use of the product or of the information in this document. If additional information or explanations are needed, consult the supplier.