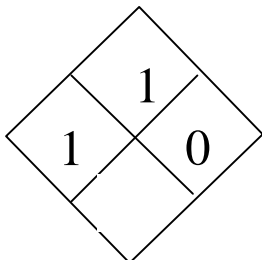


PRODUCT: PHTHALIC ANHYDRIDE

ISSUE DATE: 09/09/91 REV. DATE: 19/08/2006 MSDS Nº: 10-B REV. Nº: 7 PAGE: 1/9

HAZARDS DIAMMOND – NFPA 704**Fire 1 – risk 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): Phthalic Anhydride
- 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

- **Substance: Phthalic Anhydride**
- **Common chemical name: Phthalic Anhydride**
- Formula: C₈-H₄-O₃
- Name in English: Phthalic Anhydride.
- Synonyms: Anhydride of Phthalic Acid, Anhydride of Acid 1,2 Benzene Di-Carboxylic
- Register in *Chemical Abstract Service* (n° C.A.S):
[0085-44-9]
- Ingredients that contribute to risk:
Phthalic Anhydride (99,5%, minimum). N° C.A.S.: [0085-44-9]

3. HAZARDS IDENTIFICATION

- Hazards and most important effects of the product:
Harmful if swallowed. Irritating to respiratory system and skin. Risk of serious damage to eyes. May cause sensitization by inhalation and skin contact. May pollute water, air and soil, and damage flora and fauna. When in contact with water it forms Phthalic Acid.

PRODUCT: PHTHALIC ANHYDRIDE

ISSUE DATE: 09/09/91 REV. DATE: 19/08/2006 MSDS Nº: 10-B REV. Nº: 7 PAGE: 2/9

- Specific hazards:
Not applicable.

4. FIRST AID MEASURES

- Inhalation:
In case of excessive inhalation of Phthalic Anhydride vapours, remove the exposed person to ventilated place and apply artificial respiration, if necessary, by qualified person. Keep the victim quiet and warm to maintain the normal temperature of the body. If the victim is coughing too much or have difficult breath, it is indicated oxygen inhalation.
- Contact with skin:
Wash the skin with plenty of water and soap (15 minutes) when removing the contaminated clothing.
- Contact with eyes:
Wash the eyes with plenty of water (15 minutes), including under eyelids. Remove contact lenses, if the person is wearing them, with the help of a physician.
- Ingestion:
Do not induce to vomit. Dilute with milk or water, from 120 to 240 ml.
- Observation: in any situation, the victim should be sent to emergency medical treatment.
- Information to physician:
Persons that suffer of chronic inflammation in eyes and respiratory system, chronic sinusitis, bronchitis and asthma show more susceptibility to the toxicity caused by repeated exposures.
Interruption of the burning process (first aid).
Subsequent treatment: similar to a thermic burning of the same size and depth; inhalation: oxygen therapy/corticosteroid therapy. Ingestion: administer two soup spoons of activated carbon, mixed with water.

5. FIREFIGHTING MEASURES

- Proper extinguishing media:
Light fire: dry powder, CO₂, and water fog or foam.
Intense fire: water fog or foam, vapour or inert gases are effective when firefighting fires in tanks.
- Specific hazards:
Vapour as well as dust of this combustible product can form explosive mixtures with air. Phthalic Anhydride when stored in liquid form (thus, above its flash point) presents higher fire risk.

PRODUCT: PHTHALIC ANHYDRIDE**ISSUE DATE: 09/09/91 REV. DATE: 19/08/2006 MSDS Nº: 10-B REV. Nº: 7 PAGE: 3/9**

- Specific methods and firemen protection:
Evacuate personnel in the affected area; do not enter in the area without selfcontained apparatus and proper protection clothing; remove vessels from the fire area, if this procedure can be accomplished without risks; cool with water the side parts of the containers exposed to flames, long time after the fire is extinguished.

In case of emergencies involving fires wear selfcontained apparatus and complete clothing. For large spills, wear proper clothing (see item 8 – PPE).

6. MEASURES TO CONTROL SPILLS OR LEAKAGES

- Personal precautions:
If you are in the area where the product is handled, communicate Safety personnel and the person in charge of the area, isolate the area and keep away bystanders. Prevent dust formation. Prevent the contact of the product with skin, eyes and respiratory system, wearing personal protective equipment, mentioned in item 8. Remove ignition sources.
- Environment precautions:
Avoid product discharge into bodies of water and to the soil.
- Cleaning methods:
Liquid: contain the flow of product away of the spilling area; product will solidify.
Solid: collect with a clean shovel, put in clean and dry vessels and cover them. Remove them from the spilling area.
Neutralize traces of residues or very little spills that remained over the soil with sodium carbonate or bicarbonate and water, or alkaline substances.

7. HANDLING AND STORAGE

- Handling – technical measures – precautions for a safe handling (specially when collecting samples, during lab analysis, or when the product is solid):
Prevent contact with eyes and skin. Do not inhale the vapours. Keep the container closed and sealed. Keep exhaustion system in the area where the product is being handled. It is necessary to have eyes washing fountains and emergency showers in the handling area. Wear adequate PPE (see item 8). Contact lenses should not be worn when handling the product.
- Fire and explosion prevention:
Avoid dust formation and control ignition sources. Empty vessels can be dangerous if they contain dust or solid residues.
- Storage:
–Proper technical measures, adequate storage conditions and safe materials for recommended packages:

PRODUCT: PHTHALIC ANHYDRIDE

ISSUE DATE: 09/09/91 REV. DATE: 19/08/2006 MSDS Nº: 10-B REV. Nº: 7 PAGE: 4/9

Molten: Bulk product, molten, should be stored in 316 stainless steel tanks (with steam coil), at temperatures between 160 and 165°C and inert atmosphere with nitrogen. All tanks used for Phthalic Anhydride storage should be grounded to dissipate electrical and static charges. Storage area should be provided with containment dike. Tanks should be heated with steam.

Solid: the product packed in polyethylene bags should be stored in covered area, signalized, well ventilated and protected from the sun and from ignition sources.

–Incompatible products and materials:

See item 10.

- Safe materials for package:

Recommended:

Milky polyethylene bags of 180 g/m². For other packages, consult the supplier.

Inadequate:

Consult the supplier.

8. EXPOSURE CONTROL AND PERSONAL PROTECTION

- Control parameters:
Governmental Decree 3214/78, Standard Regulating NR-15 (Brazil), chart I: there is no limit.
ACGIH-TLV/TWA (revision 2005) = 1 ppm (6,1 mg/m³). Limit for chemical substance.
- Recommended procedure for monitoring:
NIOSH 3 (S-179).
- Collective Protection Equipment:
Exhausting local ventilation system to collect vapours in their emission points; emergency shower and eyes washing fountains; compressed air lines used for respiratory protection should be provided with purifiers.
- Proper personal protective equipment:
Molten:
Respiratory protection for liquid vapours: facial mask with filter for organic vapours, selfcontained apparatus, or supplied with air.
Scrap gloves, strap jacket and trousers and facial protection.

Solid:
Respiratory protection for dusts and vapours: facial mask with filter for organic vapours, selfcontained apparatus or supplied with air.
Latex or PVC gloves; overalls of single canvas with long sleeves and hood; safety shoes.

PRODUCT: PHTHALIC ANHYDRIDE

ISSUE DATE: 09/09/91 REV. DATE: 19/08/2006 MSDS N°: 10-B REV. N°: 7 PAGE: 5/9

9. PHYSICAL AND CHEMICAL PROPERTIES

- Physical state: solid or molten.
- Colour: solid, white, crystalline needles, molten, colourless.
- Odour: irritant.
- pH: acid.
- Specific temperatures where occur physical state changes:
 - Solidification point: 131°C.
 - Boiling point: 295 °C (sublimation).
- Flash point: 165 °C (open cup)
152 °C (closed cup).
- Ignition point: 570 °C.
- Explosion limits: lower, 1,7% per air volume
upper, 10,5% per air volume.
- Vapour pressure: 1,33 mbar (96,5 °C)
10,0 mbar (134,0 °C).
- Density: solid, 1,527 g/cm³ at 25 °C
liquid, 1,131 g/cm³ (at 220 °C), up to 1,206 g/cm³ (at 140°C).
vapour, 6,610 g/ Nm³
- Solubility: 162 parts of water with conversion to Phthalic Acid
125 parts of Carbon Sulfide
Alcohol
Partially soluble: Ether.
- Molecular weight: 148,12.

10. STABILITY AND REACTIVITY

- Specific conditions, instability, dangerous reactions:
Phthalic Anhydride is stable under normal conditions of temperature and storage. Dangerous polymerization do not occur.
- Incompatibility:
Alkaline materials,
Oxidizers and strong acids: Copper Oxide (explosion due to heating), Nitric Acid and Sulfuric Acid (explosive decomposition), Sodium nitrite (possible explosion due to heating).

PRODUCT: PHTHALIC ANHYDRIDE

ISSUE DATE: 09/09/91 REV. DATE: 19/08/2006 MSDS Nº: 10-B REV. Nº: 7 PAGE: 6/9

- Hazardous decomposition products:
Carbon Dioxide and Carbon Monoxide. Reacts slowly with water to form Phthalic Acid.

11. TOXICOLOGICAL INFORMATION

- Acute toxicity and local effects:
Contact with the skin: Phthalic Anhydride usually does not cause burning sensation immediately after contact, specially if the skin is dry. However, it may cause redness and severe dermatitis if it is not removed through washing and the exposure is intense and prolonged. It may occur skin scaling. Contact with the product in molten form, will produce severe termic burns aggravated by the chemical effects. In the presence of tissue moisture, it hydrolizes to Phthalic Acid and produces irritant effects to the skin.
Contact with eyes: eyes are particularly sensitive to dust and vapours of Phthalic Anhydride. And a prolonged exposure in a atmosphere rich in vapours can cause severe cornea and conjunctiva irritation, if it is not promptly removed.
Inhalation: it can cause coughing, coryza, nose bleeding and burn sensation in the nose and in the throat due to its irritant effect.
Ingestion: causes burns in the gastrointestinal tract.
- Chronic intoxication effects:
Repeated exposure may cause contact dermatitis, skin sensibilization, cronic eye irritation, asthmatic bronchitis in individuals with predisposition, ulceration in nasal mucosa. There is not known cases of nasal septum perforation due to repeated exposure.
- Known toxicological data:
Acute effect:
Rat (oral) LD₅₀: 4.020 mg/kg
Rat (inhalation) LC₅₀: >210 mg/m³/1hr.
Rabbit (skin) LD₅₀: >10 g/kg.
- Data about damage to reproduction:
Not available.

12. ECOLOGICAL INFORMATION

- Environmental effects, behavior and product impacts:
May pollute water, air, soil and can damage flora and fauna.
When released to soil, it is expected to hydrolize (wet soils) or to lixiviate (dry soils) to ground water.
In water will hydrolize with half life of 1.5 min.
In air, is suscetible to direct photolysis (absorbs light > 290 nm) with an estimated half life in vapour phase of 32 days as a result of hydroxile radicals produced photochemically.
Persistence/degradability: bioaccumulation is not expected (BCF=5).

PRODUCT: PHTHALIC ANHYDRIDE

ISSUE DATE: 09/09/91 REV. DATE: 19/08/2006 MSDS Nº: 10-B REV. Nº: 7 PAGE: 7/9

- Ecotoxicity
DBO = 106% / 5 days.
Fathead minnow, TL_m: > 56ppm/96 hr.
Henry Law Constant: $6,2 \times 10^{-9}$ atm/m³/mol (est.).

13. CONSIDERATIONS ABOUT TREATMENT AND DISPOSAL

- Treatment and disposal methods of the product, wastes and used packages:
Any wastes treatment should be in accordance to local and national regulation.
Do not release the product or waste in bodies of water or sewage galleries.
Consult NBR 10004 (Wastes Classification), and NBR 13221 (Waste Transportation).

14. TRANSPORTATION INFORMATION

Solid product: Not regulated.

ADR: not regulated.

RID: not regulated.

IATA Cargo: not regulated. According Special Provision A74

IATA passenger: not regulated. According Special Provision A74

IMDG-Code: not regulated. Special Provision 169 and 939.

Brazil: it is not comprised by current Governmental Decree about hazardous products transportation., Resolution ANTT 420/04, special provision 169; and updatings; Transportation Ministry, Decree Nº 96.044/88. Solid Phthalic Anhydride, considering with up to 0,05 of maleic anhydride, is not classified as a hazardous product.

Molten product:

- National and international regulation:
Follow regulation for road transportation for hazardous products according to decree nº 96044, 05/18/88 and Resolution ANTT 420/04(Brazil).
Follow regulation for railroad transportation for hazardous products according to decree nº 98973, 02/21/90(Brazil).
Follow Mercosul regulation for hazardous products transportation according to decree nº 1797, 01/25/96.

PRODUCT: PHTHALIC ANHYDRIDE

ISSUE DATE: 09/09/91 REV. DATE: 19/08/2006 MSDS Nº: 10-B REV. Nº: 7 PAGE: 8/9

- Road transportation (Brazil and MERCOSUL):
Proper shipping name: LIQUID AT ELEVATED TEMPERATURE, FLAMMABLE, N.E.
Hazard class: 3
Hazard number: 30
UN number: 3256
Packing group: III
- IATA (international, aerial): Forbidden for aerial transportation.
- IMDG (international, maritime):
Proper Shipping Name: ELEVATED TEMPERATURE LIQUID, FLAMMABLE, NOS.
Hazard Class: 3.
UN: 3256.
Packing Group: III.

15. REGULATION

Additional advice: classification and labelling according to Directive 67/548/EEC:

Symbols/indications of danger:



R-phrases: R22: Harmful if swallowed
R37: Irritating to respiratory system
R38: Irritating to skin
R41: Risk of serious damage to eyes
R42: May cause sensitisation by inhalation
R43: May cause sensitisation by skin contact

S-phrases: S23: Do not breathe vapour or powder;
S24: Avoid contact with skin
S25: Avoid contact with eyes
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S37: Wear suitable gloves
S38: In case of insufficient ventilation wear suitable respiratory equipment
S39: Wear eye/face protection
S46: If swallowed, seek medical advice immediately and show this container or label

PRODUCT: PHTHALIC ANHYDRIDE**ISSUE DATE: 09/09/91 REV. DATE: 19/08/2006 MSDS Nº: 10-B REV. Nº: 7 PAGE: 9/9**

Package certification: consult Resolution ANTT 420/04 (Brazil) and International Regulation IATA/IMDG.

EPA regulation:

- RCRA 40 CFR: listed as toxic waste (U190)
- CERCLA 40 CFR 302.4: listed by RCRA Section 3001 5000 lb (2268 kg).
- SARA 40 CFR 372.65: Listed.
- SARA EHS 40 CFR 355: not 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:

- IATA/DGR – International Air Transport Association – 2006 edition.
- IMO/IMDG – International Maritime Dangerous Goods – 2004 edition.
- MSDS - GENIUM PUBLISHING CORP. (ficha n.º PHT5800, revision 02/2003);
- ACGIH, 2005.
- Brazilian Regulation 2005 edition. GVC.
- Safety Data Sheet – Lonza Group – version: 27/03/2000

Observation:

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