

**SAFETY DATA SHEET****Product: MALEIC ANHYDRIDE**

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**1- IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING**

## Identification of the substance:

Product name: **MALEIC ANHYDRIDE**

Use of the substance: Manufacturing of plasticizers, polyester resins, alkydic and maleic resins, additives for lubrication oils, insecticides, herbicides and fungicides, fumaric acid and glue for paper.

## Supplier identification

Company **ELEKEIROZ S.A**Address: Elekeiroz S.A. (Várzea Paulista-SP Plant)  
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(00-55-11) 4596-8907 (business hours).  
Fax: (00-55-11) 4596-8881**2- HAZARDS IDENTIFICATION**Most important hazards: Harmful if swallowed.  
Causes burns.  
May cause sensitization by inhalation and skin contact.

## Product effects

Adverse human health effects: Harmful if swallowed and in contact with through skin. May cause burns to the upper respiratory tract, skin and eyes. May cause damage to kidneys and lungs. May cause allergic reactions.

Environmental effects: Product may cause damage to the environment due to its corrosiveness.

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Physical and chemical hazards: Reacts with water and produces corrosive maleic acid. May produce acrid smoke and fumes if burning.

Specific hazards: Not applicable.

Main symptoms: Abdominal pain, burning sensation, headache, nausea, vomiting and dizziness. Sore throat, cough and shortness of breath. Irritation with redness of the throat and nose. Nosebleed. Painful red eye, photophobia, conjunctivitis, blurred vision and redness.

## Classification of the chemical product:

Classification system adopted: European Chemical Bureau - European Community Directive 67/548/EEC (substances).

Hazard Class and Category: Acute toxicity (oral)  
Skin corrosion  
Respiratory and skin sensitization

Risk Phrases: R22: Harmful if swallowed.  
R34: Causes burns.  
R42/43: May cause sensitization by inhalation and skin contact.

Classification system adopted: REGULATION (EC) No 1272/2008 of the European Parliament and of the Council, of 16 December 2008.

Hazard Class and Category: Acute toxicity (oral) – Category 4  
Skin sensitization - Category 1  
Skin corrosion - Category 1B  
Respiratory sensitization - Category 1

Hazard statement: H302 Harmful if swallowed  
H314 Causes severe skin burns and eye damage  
H317 May cause an allergic skin reaction  
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled

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**3- COMPOSITION/INFORMATION ON INGREDIENTS**

Substance name:	MALEIC ANHYDRIDE
Chemical formula:	C <sub>4</sub> H <sub>2</sub> O <sub>3</sub>
Synonym:	Anhydride Cis-butenodioic Anhydride; 2,5-Furanedione; Toxylic Anhydride; 2,5-Dioxihydrofurane; Anhydride of Acid Maleic
Concentration:	> 99.5%
CAS Number:	108-31-6
EINECS number:	203-571-6
Classification:	<b>Directive 67/548/EEC</b> Xn; R22 - C; R34 - R42/43 <b>REGULATION (EC) No 1272/2008</b> Acute Tox. 4 (oral); H302 - Skin Corr. 1B; H314; Skin Sens. 1; H334 - Skin Sens. 1; H317

**4- FIRST-AID MEASURES**

Exposure routes	
Inhalation:	Remove to fresh air and keep at rest. Monitor respiratory function. If breathing is difficult, give oxygen. If necessary, give artificial respiration. Seek medical attention. Take this SDS.
Skin contact:	Remove contaminated clothing and shoes. Wash with plenty of soap and water. Seek medical attention. Take this SDS.
Eye contact:	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Seek medical attention. Take this SDS.
Ingestion:	Rinse mouth of victim with plenty of water. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Seek medical attention. Take this SDS.
Protection of first-aiders and/or special notes to a physician:	Avoid contact with this product while helping the victim; keep the victim warmed. Symptomatic treatment should include, above all, measured of support as correction of hydro electrolytic and metabolic disturbances.

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**5- FIRE-FIGHTING MEASURES**

Suitable extinguishing media:	Combustible if heated. Water spray, carbon dioxide and polyvalent foam.
Unsuitable extinguishing media:	Dry powder cannot be used, because it contains sodium.
Special hazard arising from the chemical:	May produce irritating and toxic gases if burning.
Special protective equipment for fire-fighters:	Use self-contained breathing apparatus (SCBA) operated in positive pressure mode and complete protective clothing.

**6- ACCIDENTAL RELEASE MEASURES**

Personal precautions:	Remove ignition sources. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Avoid contact with skin and eyes. Use protective gloves, safety goggles and protective clothing, in accordance with item 8. Solid: avoid dust formation.
Environmental precautions:	Prevent from entering into watercourses, sewerage and confined areas.
Cleaning up methods:	
Appropriate containment techniques:	Collect product and place in appropriate seal containers. Solid: Collect with a clean shovel, put in clean and dry vessels. Remove them from the spill area. Molten: In case of significant spill contain it with earth dikes, sand, vermiculite or other inert material.
Appropriate clean up procedures:	Discard any product, waste, container or wrapper available in an appropriate manner as not to harm the environment, according to federal regulations, state and local.
Inappropriate containment or clean up techniques:	Do not discard directly in the environment or the sewage network.

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**7- HANDLING AND STORAGE**

## Appropriate technical measures for handling

Precautions for safe handling:

In case of the product inhalation, handle with general/local ventilation system. Avoid inhalation, contact with skin and eyes. Do not handle near incompatible materials. Use proper personal protective equipment as indicated in Section 8.

Hygiene measures:

Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Wash hands before eating, drinking, smoking or going to the toilet. Take off all contaminated clothing and wash before reuse.

## Appropriate technical measures for storage

Conditions for safe storage:

Keep only in original container, in a cool, dry, well ventilated place. Keep away from food. Store locked up. Keep out of reach of children. Avoid static electricity by grounding.

Solid:

It is not advisable to store the product for long periods in order to avoid acidity increasing and aggregation due to crystallization bridges because of its hygroscopic characteristic.

Molten:

Store grounded with inert atmosphere by using nitrogen and keep temperature between 60 and 65°C, but not higher than 80°C.

Incompatible products:

Strong oxidants, alkaline metals, piridine, amines, alkalis, quinoline.

## Packaging compatibilities

Recommended use:

Solid: Polypropylene packages.  
Molten: Stainless steel tanks

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**8- EXPOSURE CONTROLS/PERSONAL PROTECTION**

Exposure limit values:	Substance	TLV – TWA (ACGIH)	REL – TWA (NIOSH)	PEL - TWA (OSHA)
		(mg/m <sup>3</sup> )	(mg/m <sup>3</sup> )	(mg/m <sup>3</sup> )
	<b>Maleic Anhydride</b>	0,1	1	1

Exposure controls:

 Engineering controls  
 measures:

The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. It is recommended safety shower and eye bath available near work side. Engineering controls are the most effective way of reducing product exposure.

Personal protective equipment:

Eye/face protection:

Protective safety goggles.

Protective clothing. Safety leather shoes with rubber impermeable sole.

Skin/body protection:

Solid: Single canvas overalls with long sleeves and hood. Latex or PVC gloves.

Molten: Scrap trousers and jacket, scrap gloves.

Respiratory protection:

Full face piece for organic vapors. In cases of high potential of exposure use a supplied-air respirator, full facepiece, operated in positive-pressure mode.

Special precautions:

Avoid wear contact lenses while using this product.

Hygiene measures:

Do not eat, drink or smoke while using this product. Wash hands before eating, drinking, smoking or going to the toilet. Take off all contaminated clothing and wash before reuse.

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**9- PHYSICAL AND CHEMICAL PROPERTIES**

## General information:

Apperance: Solid or liquid

Color: Solid: White crystalline  
Liquid: Colorless

Odor: Strong.

## Important health, safety and environmental information:

pH: Not available.

Boiling point: 202°C at 760 mm Hg

Flash point: 102°C (closed cup)

Explosive properties: Lower: 1.4% v/v  
Upper: 7.1% v/v

Vapor pressure (kPa): 0.025 at 25 °C; 0.13 at 44 °C; 0.40 at 52 °C; 0.53 at 60 °C; 1.466 at 80°C; 3.466 at 100 °C

Solubility (g/100g of solvent)  
at 25 °C: Ketone: 227.0  
Ethyl Acetate: 112.0  
Chlorophorm: 52.5  
Benzene: 50.0  
Toluene: 23.4  
Orto-xylene: 19.4  
Carbon Tetrachloryde: 0.6  
Kerosene: 0.25

Solubility in water : Slow hydrolisis

Vapor density (Air=1): 3.4

Viscosity (cP): 21 at 52°C; 18 at 60°C;13 at 80°C; 9,8 at 100°C; 6,8 at 120°C

Ignition point: 477°C

Melting point: 52.8°C

Density (g/m<sup>3</sup>): 1.47 at 25°C; 1.39 at 40°C; 1.32 at 52 °C; 1.31 at 60°C; 1.29 at 80°C

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**10- STABILITY AND REACTIVITY**

Stability:	Stable under normal conditions of storage and handling. Polymerization will not occur.
Incompatible materials:	Strong oxidants, alkaline metals, piridine, amines, alkalis, quinoline.
Hazardous decomposition products:	May produce acrid smoke and fumes if burning. Carbon monoxide and dioxide and various hydrocarbons.

**11- TOXICOLOGICAL INFORMATION**

Acute toxicity:	LD <sub>50</sub> (oral, rats): 400 mg/Kg. LD <sub>50</sub> (dermal, rats): 610 mg/kg Harmful if swallowed with abdominal pain, burning sensation, headache, nausea, vomiting and dizziness. May cause kidney damage and lung edema. Harmful in contact with skin. May cause irritation or burns to upper respiratory tract with sore throat, cough and shortness of breath, nosebleeding, redness of the throat and nose.
Skin corrosion/irritation:	Causes skin irritation with redness, burns and pain.
Serious eye damage/irritation:	Causes severe damage to the eyes with redness, pain, photophobia, conjunctivitis and blurred vision.
Respiratory or skin sensitization:	May cause bronchitis, asthma and pulmonary edema. May cause dermatitis.
Carcinogenicity:	Not listed as carcinogenic to humans (IARC).

**12- ECOLOGICAL INFORMATION**

Ecotoxicity:	The product may cause environmental damage because of its corrosivity.
Mobility in soil:	Moderate mobility.
Persistence/degradability:	It is expected that this product present rapid degradability and low persistence.
Bioaccumulative potential:	It presents low potential of bioaccumulation in aquatic organisms.

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**13- DISPOSAL CONSIDERATION**

Recommended methods for safe and environmentally preferred disposal

Disposal methods: Prior to implementing land disposal of waste residue (including waste sludge), consult local legislation for adequate disposal methods. Empty containers can retain product residues and shall be disposed in accordance with the provisions proposed for the product.

**14- TRANSPORT INFORMATION**

International regulations

Land: **UN - "United Nations"**  
**Recommendations on the TRANSPORT OF DANGEROUS GOODS. Model Regulations, 15th Edition, 2007.**  
**European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR), 2009.**

Sea: **IMO - "International Maritime Organization"**  
**International Maritime Dangerous Goods Code (IMDG Code) - Incorporating Amendment 34-08; 2008 Edition.**

Air: **IATA - "International Air Transport Association"**  
**Dangerous Goods Regulation (DGR) - 51th Edition, 2010.**

UN classification number: UN2215

Proper Shipping Name/Description: MALEIC ANHYDRIDE

Class or Division: 8

Packing group III

**15- REGULATORY INFORMATION**

Regulatory: REGULATION (EC) No 1907/2006 of the European Parliament and of the Council, of 18 December 2006.

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Labeling: health, safety and environmental information

**Hazard Classes:** Acute toxicity (oral), hazard category 4 and Skin sensitization, hazard category 1  
Skin corrosion, hazard category 1B  
Respiratory sensitization, hazard category 1

**Hazard Pictograms:**  GHS07

 GHS05

 GHS08

**Signal word:** Danger.

**Hazard statement:** H302 Harmful if swallowed  
H314 Causes severe skin burns and eye damage  
H317 May cause an allergic skin reaction  
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled

**Precautionary statement:** P260: Do not breathe dust/fume/gas/mist/vapours/spray.  
P261: Avoid breathing dust/fume/gas/mist/vapours/spray.  
P264: Wash thoroughly after handling.  
P270: Do not eat, drink or smoke when using this product.  
P272: Contaminated work clothing should not be allowed out of the workplace.  
P280: Wear protective gloves/protective clothing/eye protection/face protection.  
P285: In case of inadequate ventilation wear respiratory protection.

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P301 + P312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.  
P301 + P330 + P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.  
P302 + P352: IF ON SKIN: Wash with plenty of soap and water.  
P303 + P361 + P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.  
P304 + P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.  
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.  
P332 + P313: If skin irritation occurs: Get medical advice/attention.  
P363: Wash contaminated clothing before reuse.  
P405: Store locked up.  
P501: Dispose of contents/container in accordance to local legislation.

**16- OTHER INFORMATION**

This information had been based on the current knowledge of the product and intended to describe safety, health and environmental hazards.

Warns that the manuscript of any chemical substance requires the previous knowledge of its hazards for the user. It is contained in the using company of the product promotes training of its employees about possible risks come upon of the product.

SDS elaborated by InterTox: October, 2009 – <http://www.intertox.com.br>

**Abbreviations:**

**ACGIH** – American Conference of Governmental Industrial Hygienists

**BCF** – Bioconcentration Factor

**CAS** – Chemical Abstracts Service

**EINECS** – European INventory of Existing Commercial chemical Substances

**IARC** – International Agency for Research on Cancer

**LC<sub>50</sub>** – Lethal Concentration 50

**LD<sub>50</sub>** – Lethal Dose 50

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**NIOSH** - National Institute for Occupational Safety and Health**OSHA** - Occupational Safety & Health Administration**PEL** – Permissible exposure limit**REL** - Recommended Exposure Limit**TLV** – Threshold Limit Value**TWA** – Time Weighted Average**Bibliography:**

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