



# MATERIAL SAFETY DATA SHEET

(According to GHS rev. 5)




## ANHIDRIDO MALEICO FUNDIDO

### 1. IDENTIFICATION

<b>Company:</b> YPF S.A. <b>Address:</b> Av. Macacha Güemes n° 515 CP C1106BKK <b>Buenos Aires - ARGENTINA</b> <b>Tel# (+ 5411) 5441-2000</b> <b>Fax# (+ 5411) 5441-5796</b>	<b>Commercial name:</b> MOLTEN MALEIC ANHYDRIDE <b>Chemical name:</b> 2,5-Furandione
	<b>Synonyms:</b> Cis-butenedioic anhydride. Maleic acid anhydride. Dihydro-2,5-dioxofuran. Toxilic anhidride.
	<b>Emergency Telephone:</b> <b>Argentina: 0800-222-2933</b> <b>Other countries: (+5411) 4611 2007</b>

### 2. HAZARD IDENTIFICATION

#### 2.1 LABEL ELEMENTS

<b>Pictograms</b>			
<b>Warning word</b>	Peligro		
<b>Hazard statement</b>	H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled. H317 - May cause an allergic skin reaction.	H314 - Causes severe skin burns and eye damage.	H302 - Harmful if swallowed.
<b>Classification criteria</b>	Skin sensitizing (Category 1) Resp. Sensitization (Category 1)	Skin corrosion (Category 1)	Acute toxicity, oral (Category 4)
<b>Other regulations</b>	-		
<b>OTHER HAZARDS</b>			
Corrosive liquid.			

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

**General composition:** Maleic anhydride.

Main components	Range %	Classification	S Phrases
Maleic anhydride CAS # 108-31-6 CE # 203-571-6	100	Acute Tox. 4 Skin Corr. 1B Resp. Sens. 1 Skin Sens. 1	

#### 4. FIRST-AID MEASURES

**Inhalation:** Move the affected to fresh air. If breathing is difficult, apply artificial respiration or administer oxygen. Keep the victim quiet and warm. Call for medical attention urgently.

**Ingestion/Aspiration:** DO NOT INDUCE VOMITING. Call for medical attention urgently.

**Contact skin/eyes:** Remove contaminated clothing as soon as possible. Wash the affected area thoroughly with soap and water. Call for medical attention. In case of contact with eyes, flush with copious amounts of water for up to 15 minutes. Call for medical attention.

**General measures:** Call for medical attention.

#### 5. FIRE-FIGHTING MEASURES

**Extinguishing agents:** Foam, CO<sub>2</sub>.

**Non suitable extinguishing agents:** WATER: It may react with water releasing maleic acid and heat.  
DRY CHEMICALS: Maleic anhydride may react with basic sodium compounds content in dry chemicals.

**Combustion products:** CO<sub>2</sub>, CO (in incomplete combustion)

**Special measures:** Move containers away from fire area. Keep fire-exposed containers cool. In case of massive fire, withdraw from area and let fire burn. Consult and follow existing emergency standard procedures.

**Special hazards:** Combustible liquid. Vapours are heavier than air and may travel to ignition sources and flash back. When heated, vapour may form explosive mixtures with air. Containers may explode when heated or if contaminated with water.

**Protective equipment:** Firefighters' protective clothing. At high concentration of vapours, mists or fumes, self-contained breathing apparatus will be needed.

#### 6. ACCIDENTAL RELEASE MEASURES

**Environmental precautions:** Avoid spillages into sewers and waterways and product dispersion.

**Cleanup methods:** Stop the spillage, if is possible without risk. Take up with dry sand or other non combustible adsorbent material and place into appropriate containers. Don't insert water into the containers.

**Personal precautions:** Isolate the area. Keep unnecessary people away. Avoid contact with liquid and inhalation of vapours of hot product. Eliminate all ignition sources.

**Personal protection:** In presence of dust concentrations, face shield is recommended. Safety goggles, gloves and suitable protective clothing to prevent contact with the product.

## 7. HANDLING AND STORAGE

### Handling:

*General precautions:* Wear suitable protective clothing and gloves to prevent direct contact with the product. Avoid product inhalation. Do not smoke, eat nor drink in areas where the material is stored, handled or used. Eliminate all ignition sources in handling and storage areas.

*Specific conditions:* Good local exhaust ventilation. Protective mask in presence of hot vapours from molten product.

*Specific Use:* Polyester and alkyd-type resins manufacture; raw material in the manufacture of fumaric and tartaric acid; component of pesticides, oils and fats preservative, etc.

### Storage:

*Temperature and decomposition products:* At high temperature, alkali metals and amines cause explosive decomposition of maleic anhydride.

*Dangerous reactions:* It reacts exothermically with water and water steam.

*Storage conditions:* Keep the product in properly sealed and labelled appropriate containers in cool and well-ventilated place. Keep them away from heat and ignition sources.

*Incompatible materials:* Bases (sodium, potassium or calcium hydroxide), amines, lithium, pyridine.

## 8.EXPOSURE CONTROLS/PERSONAL PROTECTION

### Personal protection:

*Eye protection:* Safety goggles or face-shield to prevent direct contact with the product.

### Respiratory protection:

*Skin protection:* Gloves, suitable protective clothing and appropriate footwear are recommended.

*Other protective equipment:* Showers and eye-washers in working area.

**General precautions:** Good local exhaust ventilation. Do not smoke and eliminate all ignition sources. Avoid direct contact with the product.

**Specific hygiene measures:** Washing/Showering facilities with a non-solvent based skin cleaner; hot water and soap must be provided and used. Overalls should be changed frequently and dry cleaned. Care should be taken to ensure proper skin cleaning by washing thoroughly with soap and water, followed by the application of a skin re-conditioning cream. Use skin reconditioning cream after work.

**Exposure controls:** TLV/TWA (ACGIH): 0.1 ppm, A4  
VLA (INSHT): 0.25 ppm  
Odour threshold limit: 0.32 ppm

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance:**Liquid.

**pH:** 7 (1% water solution)

**Colour:**Colourless.

**Odour:** Choking.

**Boiling point:** 202°C (395.6°F)

**Melting/Freezing point:** 52.8 °C (127°F)

**Flash point:** 103.3 (218°F) C/C

**Autoignition temperature:** 476.7°C (890°F)

**Explosive properties:** Lower Explosive Limit: 1.4 %  
Upper Explosive Limit: 7.1 %

**Oxidizing properties:** NP

**Vapour pressure:** 0.16 mm Hg a 20°C

**Density:** (sol.) 1.43 g/cm<sup>3</sup>

**Surface tension:** NP

**Viscosity:** (at 70 °C) 15 m Poise

**Vapour density:**

**Partition coefficient (n-octanol/water):** NP

**Water solubility:** Soluble with slowly hydrolysis.

**Solubility:** Acetone, ether, ethyl acetate, chloroform, benzene, o-xylene, alcohol, toluene, carbon tetrachloride.

**Other data:** Molecular weight: 98.06 g/mol

## 10. STABILITY AND REACTIVITY

**Stability:** Stable at room temperature.

**Conditions to avoid:** Ignition sources, static electricity, light sources, humid.

**Materials to avoid:** Strong oxidants, reducing agents and acids. Maleic anhydride is very reactive in contact with alkali metals.

**Hazardous decomposition/combustion products:** At high temperature (over 150 °C), the product decomposes in presence of alkali metals or amines.

**Polymerizations risk:** NP

**Conditions to avoid:** NP

## 11. TOXICOLOGICAL INFORMATION

**Routes of exposure:** Contact with skin, eyes and inhalation. Ingestion is easy to prevent and not frequent; but if it occurs is very dangerous.

**Acute and chronic effects:** Very toxic by inhalation, in contact with skin and if swallowed. Acute exposure may produce death from respiratory arrest. Contact with melted product may cause burns.

**Carcinogenicity:** NP

**Reproductive toxicity:** No data available.

**Medical conditions wich increase hazard to exposure:** Dermatological problems.

## 12. ECOLOGICAL INFORMATION

### Pollutant potential:

*Persistence and degradability:* Maleic anhydride hydrolyses rapidly in water at room temperature to maleic acid (half-life: 0.37 min.). Maleic anhydride released into the atmosphere is degraded by reaction with ozone and photochemically produced hydroxyl radicals (estimated half-life: 1.7 h). In soil, it may be degraded or hydrolysed.

*Mobility/bioaccumulative potential:* This product is not expected to accumulate in any organisms.

**Ecotoxicological effects:** No data available.

## 13. DISPOSAL CONSIDERATIONS

**Disposal methods (surplus):** Recycling when possible.

### Waste:

*Disposal:* Controlled combustion.

*Handling:* Labelled and sealed containers.

*Provisions:* Companies that recover, dispose, store, transport or handle waste should comply with local and/or national provisions in force on waste management.

## 14. TRANSPORT INFORMATION

**Special precautions:** Stable at room temperature during transport. Transport in properly sealed and labelled containers to prevent spillages.

### Additional Information:

#### LAND TRANSPORT:

Proper shipping name :	MALEIC ANHYDRIDE, MOLTEN
UN Number :	2215
Hazard class :	8
Hazard identification number :	80
Packing group :	III
Exempt amount :	500 Kg

#### AIR TRANSPORT (ICAO/IATA) :

Proper shipping name :	MALEIC ANHYDRIDE, MOLTEN
UN Number :	2215
Hazard class :	8
Packing group :	III
CRE :	8L
Passenger and cargo aircraft :	FORBIDDEN
Cargo aircraft only :	FORBIDDEN

#### MARITIME TRANSPORT (IMDG/IMO) :

Proper shipping name :	MALEIC ANHYDRIDE, MOLTEN
UN Number :	2215
Hazard class :	8
Packing group :	III
Marine pollutant :	NO
Stowage and segregation :	Category A
Ems :	F-A; S-B

## 15. REGULATORY INFORMATION

**CLASIFICACION:** LABELLING

**Symbols:**

**Phrases R:**

**Phrases S:**

**Other regulations:** The product is listed in TSCA Inventory (EPA).

## 16. OTHER INFORMATION

### Data Bases consulted

EINECS: European Inventory of Existing Commercial Substances.  
TSCA: Toxic Substances Control Act, US Environmental Protection Agency  
HSDB: US National Library of Medicine.  
RTECS: US Dept. of Health & Human Services

### R phrases show in the document:

### Legislation consulted:

Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).  
Dir. 67/548/EEC about classification, labelling and packaging of dangerous substances (including amendments and adaptations in force).  
Dir. 1999/45/EC about classification, labelling and packaging of dangerous preparations (including amendments and adaptations in force).  
Dir. 91/689/EEC dangerous waste; Dir. 91/156/EEC waste management.  
Royal Decree 363/95: Regulation about notification of new substances and classification, packaging and labelling of dangerous substances.  
Royal Decree 255/2003: Regulation about classification, packaging and labelling of dangerous preparations.  
European Agreement concerning the international carriage of dangerous goods by road (ADR).  
Regulation on the international transport of dangerous goods on the railway. (RID)  
International maritime code of dangerous goods. (IMDG)  
International Air Transport Association (IATA) regulation pertaining to air shipment.

### Glossary:

CAS: Chemical Abstract Service	VLA-ED: Valor Límite Ambiental – Exposición Diaria
IARC: International Agency for Research on Cancer	VLA-EC: Valor Límite Ambiental – Exposición Corta
ACGIH: American Conference of Governmental Industrial Hygienists.	LD <sub>50</sub> : Lethal Dose Medium
TLV: Threshold Limit Value	LC <sub>50</sub> : Lethal Concentration Medium
TWA: Time Weighted Average	EC <sub>50</sub> : Effective Concentration Medium
STEL: Short-term Exposure Level	IC <sub>50</sub> : Inhibitory Concentration Medium
REL: Recommendable Exposure Limit	BOD: Biological Oxygen Demand.
PEL: Permissible Exposure Limit	NP: Not Pertinent
INSHT: Instituto Nal. de Seguridad e Higiene en el Trabajo	: Changes from the last revision

The information given in this document has been compiled based on the best existing information sources, latest available knowledge and according to the current requirements on classification, packaging and labelling of hazardous substances. It does not imply the information is exhaustive or accurate in all cases. It is the user's responsibility to determine the validity of the information contained in this Material Safety Data Sheet to apply depending on the case.