Safety Data Sheet

acc. to NOM-018-STPS-2015 and NMX-R-019-SFCI-2011

MALEIC ANHYDRIDE

Version number: GHS 1.0 Date of compilation: 2017-06-05

SECTION 1: Identification

1.1 Product identifier

Identification of the substance: MALEIC ANHYDRIDE

CAS number: 108-31-6

Synonyms: cis-butenodioic anhydride, Dihydro - 2,5 - dioxofuran, 2,5 - furandiona, Maleic Acid anhydride, MAA, MALA, Toxílc anhydride, Maleic Abhydride.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: Industrial use

1.3 Details of the supplier of the safety data sheet

RETER Comercializadora de Productos Petroquímicos S.A. de C.V.
Km. 154 Carr. México - Veracruz
90640 San Cosme Xaloztoc, Tlaxcala
Mexico

Telephone: +52 241 413 0000
Website: www.grupoidesa.com

e-mail (competent person): jalvarez@idesa.com.mx (Juan Carlos Alvarez)

1.4 Emergency telephone number

Emergency information service: 01-800-00-214-00
Tel. (55) 5559 1588 Cd. de México.
SETIQ

SECTION 2: Hazard(s) identification

2.1 Classification of the substance or mixture

Classification acc. to GHS

Section	Hazard class	Category	Hazard class and category	Hazard state-ment
3.1O	acute toxicity (oral)	4	Acute Tox. 4	H302
3.1D	acute toxicity (dermal)	5	Acute Tox. 5	H313
3.2	skin corrosion/irritation	1B	Skin Corr. 1B	H314
3.3	serious eye damage/eye irritation	1	Eye Dam. 1	H318
3.4R	respiratory sensitization	1	Resp. Sens. 1	H334
3.4S	skin sensitization	1	Skin Sens. 1	H317
3.9	specific target organ toxicity - repeated exposure	1	STOT RE 1	H372
4.1A	hazardous to the aquatic environment - acute hazard	3	Aquatic Acute 3	H402

For full text of abbreviations: see SECTION 16.

The most important adverse physicochemical, human health and environmental effects

Skin corrosion produces an irreversible damage to the skin; namely, visible necrosis through the epidermis and into the dermis. Delayed or immediate effects can be expected after short or long-term exposure. Spillage and fire water can cause pollution of watercourses.

2.2 Label elements

Labeling

- Signal word danger

- Pictograms

GHS05, GHS07, GHS08

- Hazard statements

H302	Harmful if swallowed.
H313	May be harmful in contact with skin.
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.
H372	Causes damage to organs through prolonged or repeated exposure.
H402	Harmful to aquatic life.

- Precautionary statements

P260	Do not breathe dust/fume/gas/mist/vapors/spray.
P280	Wear protective gloves/eye protection/face protection.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P342+P311	If experiencing respiratory symptoms: Call a POISON CENTER/doctor.
P363	Wash contaminated clothing before reuse.
P501	Dispose of contents/container to industrial combustion plant.

2.3 Other hazards

Results of PBT and vPvB assessment

According to the results of its assessment, this substance is not a PBT or a vPvB.

SECTION 3: Composition/information on ingredients

3.1 Substances

Name of substance	MALEIC ANHYDRIDE
Identifiers	
CAS No	108-31-6
Molecular formula	C4H2O3
Molar mass	98.06 $^{g}/_{mol}$

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SECTION 4: First-aid measures

4.1 Description of first- aid measures

General notes

Do not leave affected person unattended. Remove victim out of the danger area. Keep affected person warm, still and covered. Take off immediately all contaminated clothing. In all cases of doubt, or when symptoms persist, seek medical advice. In case of unconsciousness place person in the recovery position. Never give anything by mouth.

Following inhalation

If breathing is irregular or stopped, immediately seek medical assistance and start first aid actions. In case of respiratory tract irritation, consult a physician. Provide fresh air.

Following skin contact

Wash with plenty of soap and water.

Following eye contact

Remove contact lenses, if present and easy to do. Continue rinsing. Irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart.

Following ingestion

Rinse mouth with water (only if the person is conscious). Do NOT induce vomiting.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms and effects are not known to date.

4.3 Indication of any immediate medical attention and special treatment needed

none

SECTION 5: Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Water, Foam, Alcohol resistant foam, ABC-powder

Unsuitable extinguishing media

Water jet

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products

Nitrogen oxides (NOx), Carbon monoxide (CO), Carbon dioxide (CO2)

5.3 Advice for firefighters

In case of fire and/or explosion do not breathe fumes. Co-ordinate firefighting measures to the fire surroundings. Do not allow firefighting water to enter drains or water courses. Collect contaminated firefighting water separately. Fight fire with normal precautions from a reasonable distance.

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SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Remove persons to safety.

For emergency responders

Wear breathing apparatus if exposed to vapors/dust/aerosols/gases.

6.2 Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.

6.3 Methods and material for containment and cleaning up

Advices on how to contain a spill

Covering of drains, Take up mechanically

Advices on how to clean up a spill

Take up mechanically.

Other information relating to spills and releases

Place in appropriate containers for disposal. Ventilate affected area.

6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 9. Incompatible materials: see section 10. Disposal considerations: see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Recommendations

- Measures to prevent fire as well as aerosol and dust generation

Use local and general ventilation. Use only in well-ventilated areas. Ground/bond container and receiving equipment.

- Specific notes/details

Dust deposits may accumulate on all deposition surfaces in a technical room. The product in the delivered form is not dust explosion capable; the enrichment of fine dust however leads to the danger of dust explosion.

Advice on general occupational hygiene

Wash hands after use. Do not eat, drink and smoke in work areas. Remove contaminated clothing and protective equipment before entering eating areas. Never keep food or drink in the vicinity of chemicals. Never place chemicals in containers that are normally used for food or drink. Keep away from food, drink and animal feedingstuffs.

7.2 Conditions for safe storage, including any incompatibilities

Managing of associated risks

- Explosive atmospheres

Removal of dust deposits.

- Packaging compatibilities

Only packagings which are approved (e.g. acc. to the Dangerous Goods Regulations) may be used.

7.3 Specific end use(s)

See section 16 for a general overview.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limit values (Workplace Exposure Limits)

Country	Name of agent	CAS No	Identifier	TWA [ppm]	TWA [mg/m³]	STEL [ppm]	STEL [mg/m³]	Source
MX	maleic anhydride	108-31-6	VLE		0.01			NOM-010-STPS

Notation

STEL short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period unless otherwise specified

TWA time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average

Human health values

Relevant DNELs and other threshold levels

Endpoint	Threshold level	Protection goal, route of exposure	Used in	Exposure time
DNEL	0.4 mg/m³	human, inhalatory	worker (industry)	chronic - systemic effects
DNEL	0.8 mg/m³	human, inhalatory	worker (industry)	acute - systemic effects
DNEL	0.4 mg/m³	human, inhalatory	worker (industry)	chronic - local effects
DNEL	0.8 mg/m³	human, inhalatory	worker (industry)	acute - local effects

Environment values

Relevant PNECs and other threshold levels

Endpoint	Threshold level	Organism	Environmental compartment	Exposure time
PNEC	0.1 mg/l	aquatic organisms	freshwater	short-term (single instance)
PNEC	0.01 mg/l	aquatic organisms	marine water	short-term (single instance)
PNEC	44.6 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
PNEC	0.334 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
PNEC	0.033 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
PNEC	0.042 mg/kg	terrestrial organisms	soil	short-term (single instance)

8.2 Exposure controls

Appropriate engineering controls
General ventilation.

Individual protection measures (personal protective equipment)

Eye/face protection
Wear eye/face protection.

Skin protection

- Hand protection
In the case of wanting to use the gloves again, clean them before taking off and air them well.

- Other protection measures
Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended. Wash hands thoroughly after handling.

Respiratory protection
In case of inadequate ventilation wear respiratory protection.

Environmental exposure controls
Use appropriate container to avoid environmental contamination. Keep away from drains, surface and ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state	solid Crystaline.
Color	Colourless or White.
Odor	Irritant, Acre, Asphyxiant.

Other safety parameters

pH (value)	not applicable
Melting point/freezing point	53 °C
Initial boiling point and boiling range	200.1 °C at 1,014 hPa
Flash point	103 °C
Evaporation rate	not determined
Flammability (solid, gas)	this material is combustible, but will not ignite readily
Lower explosion limit (LEL)	57 g/m³ , 1.4%.
Upper explosion limit (UEL)	290 g/m³ , 7.1%.
Vapor pressure	15.1 Pa at 22 °C
Density	0.93 $^{g}/_{cm^3}$ at 20 °C

Vapor density	this information is not available

Solubility(ies)

- Water solubility	400 $^{g}/_{l}$ at 20 °C

Partition coefficient

- n-octanol/water (log KOW)	-2.61 (19.8 °C) (ECHA)
- Soil organic carbon/water (log KOC)	1.624 (ECHA)

Auto-ignition temperature	not determined
Decomposition temperature	290 °C (ECHA)
Viscosity	not relevant (solid matter)
Explosive properties	none
Oxidizing properties	none

9.2	**Other information**

SECTION 10: Stability and reactivity

10.1 Reactivity

Strong oxidizing agents (perchlorates, peroxides, chromates, sodium hypochlorite) - may react violently or explosively.
Increased risk of fire and explosion.
Water: reacts slowly with cold water, quickly with hot water, producing heat. It forms maleic acid. Warm water may cause foam. .

10.2 Chemical stability

See below "Conditions to avoid".

10.3 Possibility of hazardous reactions

No known hazardous reactions.

10.4 Conditions to avoid

Metals of alkali (sodium or potassium), alkalis (eg sodium hydroxide or potassium hydroxide), alkaline earth metals, (Calcium, magnesium or barium), alkaline earth hydroxides (calcium hydroxide), amines (eg dimethylamine, triethylamine), pyridine, Quinoline, sodium or potassium carbonates, aqueous ammonia, ammonium hydroxide or ammonium salts-at temperatures over 150 DEG c, mixtures can react to produce carbon dioxide, heat and pressure. Under these conditions, a mixture can be explosive. Small amounts as low as 200 ppm of the above chemicals are sufficient to begin decomposition.
Olefins (eg, ethylene, propylene or diethylene) and the catalyst mixtures may be subjected to a copolymerization uncontrolled.
Strong reducing agents (eg, phosphorus, tin (II) chloride, metal hydrides) may react vigorously or violently. Increased risk of fire.
Alcohols-react to the esters of the form.
Static load, sparks, heat, other sources of ignition, generation of dust and moisture.

Hints to prevent fire or explosion

The product in the delivered form is not dust explosion capable; the enrichment of fine dust however leads to the danger of dust explosion.

10.5 Incompatible materials

Oxidizers

10.6 Hazardous decomposition products

Reasonably anticipated hazardous decomposition products produced as a result of use, storage, spill and heating are not known. Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Classification acc. to GHS

Acute toxicity

Harmful if swallowed. May be harmful in contact with skin.

- Acute toxicity estimate (ATE)

Oral	1,090 $^{mg}/_{kg}$
Dermal	2,620 $^{mg}/_{kg}$

Skin corrosion/irritation

Causes severe skin burns and eye damage.

Serious eye damage/eye irritation

Causes serious eye damage.

Respiratory or skin sensitization

May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.

Germ cell mutagenicity

Shall not be classified as germ cell mutagenic.

Carcinogenicity

Shall not be classified as carcinogenic.

Reproductive toxicity

Shall not be classified as a reproductive toxicant.

Specific target organ toxicity - single exposure

Shall not be classified as a specific target organ toxicant (single exposure).

Specific target organ toxicity - repeated exposure

Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard

Shall not be classified as presenting an aspiration hazard.

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SECTION 12: Ecological information

12.1 Toxicity

Harmful to aquatic life.

Aquatic toxicity (acute)			
Endpoint	**Value**	**Species**	**Exposure time**
LC50	75 $^{mg}/_{l}$	fish	96 h
EC50	42.81 $^{mg}/_{l}$	aquatic invertebrates	48 h
ErC50	74.35 $^{mg}/_{l}$	algae	72 h

12.2 Persistence and degradability

Data are not available.

12.3 Bioaccumulative potential

Data are not available.

n-octanol/water (log KOW)	-2.61 (19.8 °C) (ECHA)

12.4 Mobility in soil

Data are not available.

Henry's law constant	0 $^{Pa\ m^3}/_{mol}$ at 25 °C
The Organic Carbon normalised adsorption coefficient	1.624 (ECHA)

12.5 Results of PBT and vPvB assessment

Data are not available.

12.6 Other adverse effects

Data are not available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Sewage disposal-relevant information

Do not empty into drains. Avoid release to the environment. Refer to special instructions/safety data sheets.

Waste treatment of containers/packages

Only packagings which are approved (e.g. acc. to the Dangerous Goods Regulations) may be used. Completely emptied packages can be recycled. Handle contaminated packages in the same way as the substance itself.

Remarks

Please consider the relevant national or regional provisions. Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities.

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SECTION 14: Transport information

14.1	**UN number**	2215
14.2	**UN proper shipping name**	MALEIC ANHYDRIDE
14.3	**Transport hazard class(es)**	
	Class	8 (corrosive substances)
14.4	**Packing group**	III (substance presenting low danger)
14.5	**Environmental hazards**	non-environmentally hazardous acc. to the dangerous goods regulations

14.6 Special precautions for user

There is no additional information.

14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code

The cargo is not intended to be carried in bulk.

Information for each of the UN Model Regulations

Transport information - National regulations - Additional information (UN RTDG)

UN number	2215
Proper shipping name	MALEIC ANHYDRIDE
Class	8
Packing group	III
Danger label(s)	8

Special provisions (SP)	- (UN RTDG)
Excepted quantities (EQ)	E0 (UN RTDG)
Limited quantities (LQ)	0 (UN RTDG)

International Maritime Dangerous Goods Code (IMDG)

UN number	2215
Proper shipping name	MALEIC ANHYDRIDE
Class	8
Packing group	III
Danger label(s)	8

Special provisions (SP)	-
Excepted quantities (EQ)	E0
Limited quantities (LQ)	0
EmS	F-A, S-B
Stowage category	A

Segregation group	1 - Acids

International Civil Aviation Organization (ICAO-IATA/DGR)

UN number	2215
Proper shipping name	Maleic anhydride
Class	8
Packing group	III
Danger label(s)	8

Excepted quantities (EQ)	E1
Limited quantities (LQ)	5 kg

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

There is no additional information.

National regulations (United States)

Toxic Substance Control Act (TSCA) substance is listed

SARA TITLE III (Superfund Amendment and Reauthorization Act)

- List of Extremely Hazardous Substances (40 CFR 355) (EPCRA Section 302 and 304)
not listed

- Specific Toxic Chemical Listings (40 CFR 372) (EPCRA Section 313)

Toxics Release Inventory: Specific Toxic Chemical Listings

Name acc. to inventory	CAS No	Remarks	Effective date
maleic anhydride	108-31-6		1986-12-31

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act)

- Section 102(A) Hazardous Substances (40 CFR 302.4)

Name of substance	CAS No	Remarks	Statutory code	Final RQ pounds (Kg)
maleic anhydride	108-31-6		1 3 4	5000 (2270)

Legend

1	"1" indicates that the statutory source is section 311(b)(2) of the Clean Water Act
3	"3" indicates that the source is section 112 of the Clean Air Act
4	"4" indicates that the source is section 3001 of the Resource Conservation and Recovery Act (RCRA)

Clean Air Act
not listed

New Jersey Worker and Community Right to Know Act N.J.S.A. 34:5A-1 et. seq.

Right to Know Hazardous Substance List

Name acc. to inventory	CAS No	Remarks	Classifications
maleic anhydride	108-31-6		CO R1

Legend
CO Corrosive
R1 Reactive - First Degree

California Environmental Protection Agency (Cal/EPA): Proposition 65 Chemicals known to the State to cause cancer or reproductive toxicity
not listed

15.2 Chemical Safety Assessment
No Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information, including date of preparation or last revision

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
DGR	Dangerous Goods Regulations (see IATA/DGR)
DNEL	Derived No-Effect Level
EmS	Emergency Schedule
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods Code
MARPOL	International Convention for the Prevention of Pollution from Ships (abbr. of "Marine Pollutant")
NOM-010-STPS	NORMA Oficial Mexicana NOM-010-STPS: Agentes químicos contaminantes del ambiente laboral-Reconocimiento, evaluación y control
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
ppm	Parts per million
STEL	Short-term exposure limit
TWA	Time-weighted average
VLE	Permissible exposure limit
vPvB	Very Persistent and very Bioaccumulative

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Key literature references and sources for data

Norma Oficial Mexicana NOM-018-STPS-2015, Sistema armonizado para la identificación y comunicación de peligros y riesgos por sustancias químicas peligrosas en los centros de trabajo y NMX-R-019-SCFI-2011 Sistema Armonizado de Clasificación y Comunicación de Peligros de los Productos Químicos.

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UN Recommendations on the Transport of Dangerous Good. International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

List of relevant phrases (code and full text as stated in chapter 2 and 3)

Code	Text
H302	Harmful if swallowed.
H313	May be harmful in contact with skin.
H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H372	Causes damage to organs through prolonged or repeated exposure.
H402	Harmful to aquatic life.

Disclaimer

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