

Material Safety Data Sheet

Date Printed: 15/DEC/2004

Date Updated: 18/MAR/2004

Version 1.1

According to 91/155/EEC

1 - Product and Company Information

Product Name	MALEIC ANHYDRIDE
Product Number	63200
Company	Sigma-Aldrich Pte Ltd #08-01 Citilink Warehouse Singapore 118529 Singapore
Technical Phone #	65 271 1089
Fax	65 271 1571

2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
MALEIC ANHYDRIDE	108-31-6	203-571-6	607-096-00-9
Formula	C4H2O3		
Molecular Weight	98.06 AMU		
Synonyms	Anhydrid kyseliny maleinove (Czech) * cis-Butenedioic anhydride * 2,5-Furandione * Maleic acid anhydride * Maleic anhydride (ACGIH:OSHA) * Maleinanhydrid (Czech) * Toxilic anhydride * RCRA waste number U147		

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT
Harmful if swallowed. Causes burns. May cause sensitization by
inhalation and skin contact.

4 - First Aid Measures

AFTER INHALATION

If inhaled, remove to fresh air. If not breathing give
artificial respiration. If breathing is difficult, give oxygen.

AFTER SKIN CONTACT

In case of skin contact, flush with copious amounts of water for
at least 15 minutes. Remove contaminated clothing and shoes.
Call a physician.

AFTER EYE CONTACT

In case of contact with eyes, flush with copious amounts of
water for at least 15 minutes. Assure adequate flushing by
separating the eyelids with fingers. Call a physician.

AFTER INGESTION

If swallowed, wash out mouth with water provided person is
conscious. Call a physician immediately. Do not induce vomiting.

5 - Fire Fighting Measures

EXTINGUISHING MEDIA

Suitable: Carbon dioxide.

Unsuitable: Do not use dry chemical powder extinguisher on this material.

SPECIAL RISKS

Specific Hazard(s): Emits toxic fumes under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6 - Accidental Release Measures

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Sweep up, place in a bag and hold for waste disposal. Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING

Directions for Safe Handling: Do not breathe dust. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE

Conditions of Storage: Keep tightly closed.

SPECIAL REQUIREMENTS: Moisture sensitive.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS

Safety shower and eye bath. Use only in a chemical fume hood.

GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Discard contaminated shoes. Wash thoroughly after handling.

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	0.5 MG/M3
Poland		NDSch	1 MG/M3
Poland		NDSP	-

EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	0.4 mg/m3
		0.1 ppm

EXPOSURE LIMITS - GERMANY

Source	Type	Value
TRGS 900	OEL	0.4 mg/m3
		0.1 ppm

Remarks: =1=

Remarks: Y

EXPOSURE LIMITS - NORWAY

Source	Type	Value
	OEL	0.8 mg/m3
		0.2 ppm

Remarks: A

EXPOSURE LIMITS - SWEDEN

Source	Type	Value
	LLV (Level)	11.2 mg/m3
		0.3 ppm

Remarks: S

EXPOSURE LIMITS - SWITZERLAND

Source	Type	Value
OEL	OEL	0.4 mg/m3
		0.1 ppm

Remarks: S C

EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL	OEL	1 mg/m3
OEL	STEL	3 mg/m3

Remarks: Sensitizer.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Government approved respirator.

Hand Protection: Compatible chemical-resistant gloves.

Eye Protection: Chemical safety goggles.

9 - Physical and Chemical Properties

Appearance	Physical State: Solid
	Color: White

Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	N/A	
MP/MP Range	52 °C	
Flash Point	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	N/A	
Vapor Pressure	N/A	
SG/Density	N/A	
Partition Coefficient	N/A	
Viscosity	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	N/A	
Decomposition Temp.	N/A	
Solvent Content	N/A	
Water Content	N/A	
Surface Tension	N/A	
Conductivity	N/A	
Miscellaneous Data	N/A	

10 - Stability and Reactivity

STABILITY

Stable: Stable.

Conditions of Instability: May decompose on exposure to moist air or water.

Materials to Avoid: Strong oxidizing agents, Strong acids, Strong bases, Strong reducing agents, Alkali metals, Amines.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: ON3675000

ACUTE TOXICITY

LD50
Oral
Rat
400 mg/kg

LD50
Intraperitoneal
Rat
97 MG/KG

LD50
Oral
Mouse
465 mg/kg

LD50
Oral
Rabbit
875 mg/kg

LD50
Skin
Rabbit
2620 mg/kg

LD50
Oral
Guinea pig
390 mg/kg

LD50
Skin
Guinea pig
> 20000 mg/kg

IRRITATION DATA

Eyes
Rabbit

1 %

Remarks: Severe irritation effect

SENSITIZATION

Sensitization: May cause allergic respiratory and skin reactions

SIGNS AND SYMPTOMS OF EXPOSURE

Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. May cause sneezing. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

ROUTE OF EXPOSURE

Skin Contact: Causes burns.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: Causes burns.

Inhalation: Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. May be harmful if inhaled.

Ingestion: Harmful if swallowed.

CHRONIC EXPOSURE - CARCINOGEN

Rat

Route of Application: Subcutaneous

Exposure Time: 61W

Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Tumorigenic: Tumors at site or application.

CHRONIC EXPOSURE - MUTAGEN

Hamster

230 MG/L

Cell Type: lung

Cytogenetic analysis

CHRONIC EXPOSURE - TERATOGEN

Species: Rat

Dose: 1400 MG/KG

Route of Application: Oral

Exposure Time: (6-15D PREG)

Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat

Dose: 4060 MG/KG

Route of Application: Oral

Exposure Time: (MULTIGENERATIONS)

Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain).

Species: Rat

Dose: 150 MG/KG

Route of Application: Oral

Exposure Time: (MULTIGENERATION)
Result: Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated). Effects on Fertility: Male fertility index (e.g., # males impregnating females per # males exposed to fertile nonpregnant females).

12 - Ecological Information

No data available.

13 - Disposal Considerations

SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR

UN#: 2215
Class: 8
PG: III
Proper Shipping Name: Maleic anhydride

IMDG

UN#: 2215
Class: 8
PG: III
Proper Shipping Name: Maleic anhydride
Marine Pollutant: No
Severe Marine Pollutant: No

IATA

UN#: 2215
Class: 8
PG: III
Proper Shipping Name: Maleic anhydride
Inhalation Packing Group I: No

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

ANNEX I INDEX NUMBER: 607-096-00-9

INDICATION OF DANGER: C

Corrosive.

R-PHRASES: 22 34 42/43

Harmful if swallowed. Causes burns. May cause sensitization by inhalation and skin contact.

S-PHRASES: 22 26 36/37/39 45

Do not breathe dust. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

COUNTRY SPECIFIC INFORMATION

Germany

WGK: 1

SWITZERLAND

SWISS POISON CLASS: 3

16 - Other Information

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2004 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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