

MATERIAL SAFETY DATA SHEET

Product Name: MALEIC ANHYDRIDE

Revision Date: 04.09.2007

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1. Manufacturer and Substance Identification

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Chemical Name : Maleic Anhydride
Molecular Formula : C₄H₂O₃
Molecular Weight : 98.06
Synonyms : 2,5-Furandione, Cis-Butenedioic Anhydride

2. Composition /Information on ingredient

<u>Chemical Name</u>	<u>CAS No.</u>	<u>Content (W/W)</u>	<u>EINECS</u>
Maleic Anhydride	108-31-6	More than 99.5 %	203-571-6

3. Hazard Identification

Hazard Symbol : Xn - Harmful
R-Phrases : R22, R34, R42/43
S-Phrases : S2, S22, S26, S36/37/39, S45

4. First Aid Measures

General advice : Remove contaminated clothing. If danger of loss of consciousness, place patient in recovery position and transport accordingly. Apply artificial respiration if necessary. First aid personnel should pay attention to their own safety.

If inhaled : Remove the affected individual to fresh air and keep the person calm. Assist in breathing if necessary. Immediate medical attention required.

If on skin : Remove contaminated clothing. Wash affected areas thoroughly with soap and water. If irritation develops, seek medical attention.

If in eye : In case of contact with the eyes, rinse immediately for at least 15 minutes with plenty of water. Immediate medical attention required.

If swallowed : Rinse mouth and then drink plenty of water. Never induce vomiting or give anything by mouth. Immediate medical attention required.

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5. Fire Fighting Measures

Flash Point : 102°C
Auto ignition : 477°C
Lower Explosion Limit : 3.4%(V) (Calculated)
Upper explosion Limit : 7.1%(V)
Extinguishing Media : Small fire: Carbon dioxide, water, foam.
Large fire: Water spray, fog or foam, do not use water jet.
DO NOT USE DRY CHEMICAL Large volumes of gases could be produced by reaction with Maleic Anhydride.

Special Fire-Fighting Procedures: Wear self-contained breathing apparatus with full face Piece operated in the positive pressure demand mode and full body protection when fighting fires .

Hazardous Combustion Products: Carbon Dioxide, Carbon Monoxide.

Special Hazards : Vapors from melted material can be ignited. Keep melted material away from ignition sources. May form flammable dust-air mixtures when finely divided. Prevent dust buildup by providing adequate ventilation during grinding or milling operations.

6. Accidental Release Measures

Personal precautions : Avoid Inhalation. Use personal protective equipment. Ensure adequate ventilation.
Environmental precautions : Remove all sources of ignition. Avoid discharge into environment
Methods for cleaning up : Use mechanical handling equipment. Avoid raising dust. Flush with plenty of water. Dispose of in compliance with local and national regulations.

7. Handling and Storage

Handling

General advice : Ensure thorough ventilation of stores and work areas.
Take precautionary measures against static discharges.
Keep away from sources of ignition - No smoking

Protection against fire and Explosion : Avoid dust formation. Dust can form an explosive mixture with air. Prevent electrostatic charge - sources of ignition should be kept well clear - fire extinguishers should be kept handy. Electrical devices must meet the specified temperature class.

Storage

General advice : Protect against moisture. Containers should be stored tightly sealed in a dry place.

8. Exposure Controls/Personal Protection

Engineering Controls : Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

	<u>ACGIH</u>	<u>NIOSH</u>	<u>OSHA</u>
Maleic Anhydride	TWA: 0.25 ppm (1 mg/m ³)	TWA: 0.25 ppm (1 mg/m ³)	TWA: 0.25 ppm

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Personal Protective Equipment and hygienic measures:

Respiratory : Self contained breathing apparatus
Eye : Closely fitted Safety goggles.
Hand : Impervious Gloves
Skin and body : Approved work boots, protective clothing
Hygiene measure : Keep away from foodstuffs. Wash hands during break and at the end of the work
Other devices : Maintain eye wash facility in work area

9. Physical and Chemical Properties

Form : Briquettes; Molten Liquid
Color : Colorless
Odour : Pungent
Boiling point °C : 202
Melting point °C : 53
Water Solubility g/l at 25° C : 407
Density g/cm³ : 1.48
Vapour Density (air=1) : 3.4
Vapor pressure mmHg at 20° C : 0.16
Flash point ° C : 102

10. Stability and Reactivity

Substances to avoid : Alkalines, water, alcohols, amine Compounds
Hazardous reactions : Reacts with water. Reacts with certain metals (eg iron). Dust explosion hazard.
Decomposition products : Hazardous decomposition products: Maleic acid

11. Toxicological Information

Acute toxicity (lethal doses)
(Literature value)

Toxicity in water : water hazard class 1 (slightly hazardous for water)
LD50/Rat /oral : 235 mg/kg
LD50/Rat/oral : 400 mg/kg

12. Ecological Information

Environmental fate and transport

Biodegradation:

Test method : OECD 301 B
Method of analysis : BOD of the ThOD
Percent Degradation : 78.7 % at 29 days

Environmental toxicity : Acute and prolonged toxicity to fish: Method: EPA 660/3-75-009
Rainbow Trout/LC50 (96 h): 75 mg/l

Toxicity to microorganisms : Method: DIN 38412 Part 8 Pseudomonas Putida/EC₁₀(18 Hours) :
44.6 mg/liter

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13. Disposal Consideration

Disposal method

Product : To be performed as per local regulations.

Contaminated packaging : Can be land filled or incinerated, in compliance with Local Regulations

14. Transport Information

	<u>UN No.</u>	<u>Class</u>	<u>Packaging Group</u>	<u>Label</u>
<u>Road transport ADR/RID</u>	} 2215	8	III	Corrosive
<u>Maritime transport IMDG</u>				
<u>Air transport ICAO/IATA</u>				

15. Regulatory Information

EPA Regulations : Reportable Quantity: 5000 Lbs

NFPA 704 Rating : Health Hazard Rating: 3
Fire Hazard Rating: 1
Reactivity Hazard Rating: 1

NIOSH Guidelines : TWA : 1 mg/m³ , IDLH : 10 mg/m³
Conversion: 1 PPM = 4.01 mg/m³@ 25°C & 1ATM

OSHA Regulations : TWA : 1 mg/m³ , TWA Vacated: 1 mg/m³

Health Risks : Irritant

Responsibility of the receiver to have the knowledge of the local and national regulations.

16. Other Information

The information provided in this Safety Data Sheet is given in good faith and is correct to the best of our knowledge and information at the date of publication. It is designed only as guidance for safe handling, storage, transportation, use and disposal. No warranty is expressed or implied.

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