Material Safety Data Sheet
Maleic anhydride

ACC# 04738

Section 1 - Chemical Product and Company Identification

MSDS Name: Maleic anhydride
Catalog Numbers: AC125240000, AC125240010, AC125240040, AC125240250, AC364940000, AC364940010, AC364940050, AC364940250, NC9301287, XXAC36494-5KG
Synonyms: MA; 2,5-Furandione; cis-Butenedioic anhydride; Maleic acid anhydride.
Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
108-31-6	Maleic anhydride	99	203-571-6

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white solid.
Danger! Causes eye and skin burns. Causes digestive and respiratory tract burns. Harmful if swallowed. May cause allergic respiratory and skin reaction. Moisture sensitive. Sublimes (goes directly from solid to vapor form) readily at room temperature. Corrosive to metal in aqueous solution.
Target Organs: Lungs, respiratory system, eyes, skin.

Potential Health Effects
Eye: Causes eye burns. Exposure to high fume concentrations cause photophobia, double vision, and "halo" vision.
Skin: May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Contact with skin causes irritation and possible burns, especially if the skin is wet or moist.
Ingestion: Harmful if swallowed. Causes gastrointestinal tract burns.
Inhalation: May cause asthmatic attacks due to allergic sensitization of the respiratory tract. Causes chemical burns to the respiratory tract. Inhalation of high concentrations may cause pulmonary edema.
Chronic: Prolonged or repeated skin contact may cause dermatitis. Repeated exposure may cause allergic respiratory reaction (asthma).

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for a t least 15 minutes. Get medical aid immediately.
Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.
Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.
Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Contact with metals may evolve flammable hydrogen gas. Hazardous polymerization may occur under fire conditions.
Extinguishing Media: Use water spray or carbon dioxide. Do not use dry chemical powder extinguisher because they contain carbonates which react with product.
Flash Point: 102 deg C (215.60 deg F)
Autoignition Temperature: 477 deg C (890.60 deg F)
Explosion Limits, Lower:1.4 vol %
Upper: 7.1 vol %
NFPA Rating: (estimated) Health: 3; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep away from strong bases and metals. Do not breathe dust or fumes. Use only with adequate ventilation. Pure vapor will be uninhibited and may polymerize in vents or other confined spaces.
Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area. Store protected from moisture. Store away from alkalies. Separate from oxidizing materials.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Maleic anhydride	0.1 ppm TWA	0.25 ppm TWA; 1 mg/m3 TWA 10 mg/m3 IDLH	0.25 ppm TWA; 1 mg/m3 TWA

OSHA Vacated PELs: Maleic anhydride: 0.25 ppm TWA; 1 mg/m3 TWA
Personal Protective Equipment
Eyes: Wear chemical splash goggles.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: white
Odor: pungent odor - acrid odor
pH: 2.42 (0.01 M soln)
Vapor Pressure: 0.16 mm Hg @ 20 deg C
Vapor Density: 3.4 (air=1)
Evaporation Rate: Not available.
Viscosity: 1.6 mPa.s @60 deg C
Boiling Point: 200 deg C @ 760 mm Hg
Freezing/Melting Point:52-55 deg C
Decomposition Temperature:> 150 deg C
Solubility: 79g/100 ml water (25°C)
Specific Gravity/Density:1.48
Molecular Formula:C4H2O3
Molecular Weight:98.06

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Moisture sensitive. Slowly hydrolyzed by moisture to maleic acid.
Conditions to Avoid: Dust generation, metals, exposure to moist air or water.
Incompatibilities with Other Materials: Strong oxidizing agents, strong reducing agents, alcohols, alkali metals, alkaline earth metals, amines, carbonates, pyridine, ammonium ions, hydroxides, olefins + catalyst (may undergo uncontrolled co-polymerization).
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: May occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 108-31-6: ON3675000
LD50/LC50:
CAS# 108-31-6:
Dermal, guinea pig: LD50 = >20 gm/kg;
Draize test, rabbit, eye: 1% Severe;
Oral, mouse: LD50 = 465 mg/kg;
Oral, rabbit: LD50 = 875 mg/kg;
Oral, rat: LD50 = 400 mg/kg;
Skin, rabbit: LD50 = 2620 mg/kg;
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Carcinogenicity:
CAS# 108-31-6: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Bluegill/Sunfish: LC50 = 138 mg/L; 48 Hr.; UnspecifiedFish: Mosquito Fish: LC50 = 240 mg/L; 96 Hr.; UnspecifiedBacteria: Phytobacterium phosphoreum: EC50 = 44.0 mg/L; 30 Minutes; Microtox test No data available.
Environmental: Maleic anhydride's fate in soil is unknown. Since it biodegrades in sewage treatment plants and hydrolyzes, it's likely that it will degrade in soil. A combination of these processes should be important. Maleic anhydride released into water will hydrolyze rapidly (half-life 0.37 min) to maleic acid.
Physical: Maleic anhydride released into the atmosphere will degrade by reaction with ozone and photochemically produced hydroxyl radical (estimated half-life 1.7 hr).
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series:
CAS# 108-31-6: waste number U147.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	MALEIC ANHYDRIDE	MALEIC ANHYDRIDE
Hazard Class:	8	8
UN Number:	UN2215	UN2215
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 108-31-6 is listed on the TSCA inventory.
Health & Safety Reporting List
CAS# 108-31-6: Effective 9/10/84, Sunset 9/10/94
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
CAS# 108-31-6: 5000 lb final RQ; 2270 kg final RQ
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 108-31-6: immediate, reactive.
Section 313
This material contains Maleic anhydride (CAS# 108-31-6, 99%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.
Clean Air Act:
CAS# 108-31-6 is listed as a hazardous air pollutant (HAP).
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
CAS# 108-31-6 is listed as a Hazardous Substance under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 108-31-6 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

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California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

C

Risk Phrases:

R 22 Harmful if swallowed.
R 34 Causes burns.
R 42/43 May cause sensitization by inhalation and skin contact.

Safety Phrases:

S 22 Do not breathe dust.
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 108-31-6: 1

Canada - DSL/NDSL

CAS# 108-31-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2A, E, D2B.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 108-31-6 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 1/16/2002
Revision #3 Date: 9/06/2005