

# Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
	<p><b>Corrosive to eyes and skin on contact.</b>  <b>Toxic compound, do not ingest or inhale. Avoid all contact with this material.</b>  <b>This compound is a skin sensitizer.</b>  <b>Sternutator.</b></p>	

## Section I. Chemical Product and Company Identification

Chemical Name	<b>Maleic Anhydride</b>		
Catalog Number	M0005	Supplier	TCI America 9211 N. Harborsgate St. Portland OR 1-800-423-8616
Synonym	2,5-Furandione		
Chemical Formula	C <sub>4</sub> H <sub>2</sub> O <sub>3</sub>		
CAS Number	108-31-6	In case of Emergency Call	<b>Chemtrec®</b> <b>(800) 424-9300 (U.S.)</b> <b>(703) 527-3887 (International)</b>

## Section II. Composition and Information on Ingredients

Chemical Name	CAS Number	Percent (%)	TLV/PEL	Toxicology Data
Maleic Anhydride	108-31-6	Min. 99.0 (GC, T)	Not available.	Rat LD <sub>50</sub> (oral) 400mg/kg Rabbit LD <sub>50</sub> (dermal) 2620mg/kg Rabbit LD <sub>50</sub> (oral) 875mg/kg

## Section III. Hazards Identification

Acute Health Effects	<p>Corrosive to skin, eyes, and respiratory system. Liquid or spray mist may produce tissue damage, particularly in mucous membranes of the eyes, mouth and respiratory tract. Skin contact may produce burns. Eye contact can result in corneal damage or blindness. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Corrosive materials may cause serious injury if ingested.</p> <p>Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Skin contact may result in sensitization. Always cover all exposed skin with an impermeable layer and use proper eye protection. A OSHA/MSHA approved dust and vapor respirator is required when working with this material.</p> <p>Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.</p>
Chronic Health Effects	<p><b>CARCINOGENIC EFFECTS</b> : Not available.  <b>MUTAGENIC EFFECTS</b> : Not available.  <b>TERATOGENIC EFFECTS</b> : Tumorigenic Effects:                      Rat TDLo (Subcutaneous) 1220mg/kg/61 weeks, intermittent.                      Toxic Effects:                      Tumorigenic - Equival tumorigenic agent by RTECS criteria.                      Tumorigenic - Tumors at site of application.  <b>DEVELOPMENTAL TOXICITY</b>: Reproductive Effects:                      Rat TDLo (oral) 4060mg/kg, female multigenerations.                      Toxic Effects:                      Effects on Newborn - Growth statistics.                      Rat TDLo (oral) 1400mg/kg, female 6-15 days of pregnancy.                      Toxic Effects:                      Effects on Embryo or Fetus - Fetotoxicity.                      Rat TDLo (oral) 150mg/kg, female multigeneration.                      Toxic Effects:                      Effects on Fertility - Female fertility index.                      Effects on Fertility - Male fertility index.                      Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage.</p>

## Section IV. First Aid Measures

Eye Contact	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.
Skin Contact	Wash with soap and water. Get medical attention if irritation develops.
Inhalation	If the victim is not breathing, perform mouth-to-mouth resuscitation. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, oxygen can be administered. Seek medical attention if respiration problems do not improve.
Ingestion	INDUCE VOMITING by sticking finger in throat. Lower the head so that the vomit will not reenter the mouth and throat. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. SEEK IMMEDIATE MEDICAL ATTENTION in case of ingestion of a radioactive material.

**Section V. Fire and Explosion Data**

Flammability	May be combustible at high temperature.	Auto-Ignition	Not available.
Flash Points	103°C (217.4°F).	Flammable Limits	LOWER: 1.4% UPPER: 7.1%
Combustion Products	These products are toxic carbon oxides (CO, CO <sub>2</sub> ).		
Fire Hazards	Not available.		
Explosion Hazards	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.		
Fire Fighting Media and Instructions	SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet. Consult with local fire authorities before attempting large scale fire-fighting operations.		

**Section VI. Accidental Release Measures**

Spill Cleanup Instructions	Corrosive material. Toxic material. Sensitizing material. Sternutatory material. Stop leak if without risk. DO NOT get water inside container. DO NOT touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all sources of ignition. Consult federal, state, and/or local authorities for assistance on disposal.
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**Section VII. Handling and Storage**

Handling and Storage Information	CORROSIVE. TOXIC. SENSITIZER. STERNUTATOR. Keep container dry. Keep away from heat. Mechanical exhaust required. When not in use, tightly seal the container and store in a dry, cool place. Avoid excessive heat and light. DO NOT ingest. Do not breathe dust. Never add water to this product. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Treat symptomatically and supportively. Always store away from incompatible compounds such as oxidizing agents, reducing agents, acids, alkalis (bases).
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**Section VIII. Exposure Controls/Personal Protection**

Engineering Controls	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
Personal Protection	Splash goggles. Lab coat. Dust respirator. Boots. Gloves. A MSHA/NIOSH approved respirator must be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. 
Exposure Limits	Not available.

**Section IX. Physical and Chemical Properties**

Physical state @ 20°C	Solid.	Solubility	Soluble in water, forming maleic acids. Solubility at 25°C: 227g/100g acetone, 112g/100g ethyl acetate, 52.5g/100g chloroform, 50g/100g benzene, 23.4g/100g toluene, 19.4g/100g o-xylene, 0.60g/100g carbontetrachloride, 0.25g/100g ligroin. Soluble in dioxane. Soluble in alcohol with ester formation.
Specific Gravity	1.48 (water=1)	Partition Coefficient	Not available.
Molecular Weight	98.06	Vapor Pressure	Not applicable.
Boiling Point	202°C (395.6°F)	Vapor Density	3.4 (Air = 1)
Melting Point	52.15°C (125.9°F)	Volatility	Not available.
Refractive Index	Not available.	Odor	Choking.
Critical Temperature	Not available.	Taste	Not available.
Viscosity	Not available.		

**Section X. Stability and Reactivity Data**

Stability	This material is stable if stored under proper conditions. (See Section VII for instructions)
Conditions of Instability	Avoid excessive heat and light. May decompose on exposure to moist air or water.
Incompatibilities	Reactive with strong oxidizing agents, strong reducing agents, strong acids, strong alkalis (bases), alkali metals, amines.

**Section XI. Toxicological Information**

RTECS Number	ON3675000
Routes of Exposure	Eye Contact. Ingestion. inhalation.
Toxicity Data	Rat LD <sub>50</sub> (oral) 400mg/kg Rabbit LD <sub>50</sub> (dermal) 2620mg/kg Rabbit LD <sub>50</sub> (oral) 875mg/kg
Chronic Toxic Effects	<b>CARCINOGENIC EFFECTS</b> : Not available. <b>MUTAGENIC EFFECTS</b> : Not available. <b>TERATOGENIC EFFECTS</b> : Tumorigenic Effects: Rat TDLo (Subcutaneous) 1220mg/kg/61 weeks, intermittent. Toxic Effects: Tumorigenic - Equival tumorigenic agent by RTECS criteria. Tumorigenic - Tumors at site of application. <b>DEVELOPMENTAL TOXICITY</b> : Reproductive Effects: Rat TDLo (oral) 4060mg/kg, female multigenerations. Toxic Effects: Effects on Newborn - Growth statistics. Rat TDLo (oral) 1400mg/kg, female 6-15 days of pregnancy. Toxic Effects: Effects on Embryo or Fetus - Fetotoxicity. Rat TDLo (oral) 150mg/kg, female multigeneration. Toxic Effects: Effects on Fertility - Female fertility index. Effects on Fertility - Male fertility index. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage.
Acute Toxic Effects	Corrosive to skin, eyes, and respiratory system. Liquid or spray mist may produce tissue damage, particularly in mucous membranes of the eyes, mouth and respiratory tract. Skin contact may produce burns. Eye contact can result in corneal damage or blindness. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Corrosive materials may cause serious injury if ingested. Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Skin contact may result in sensitization. Always cover all exposed skin with an impermeable layer and use proper eye protection. A OSHA/MSHA approved dust and vapor respirator is required when working with this material. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

**Section XII. Ecological Information**

Ecotoxicity	Not available.
Environmental Fate	Maleic anhydride is an important industrial chemical used as a chemical intermediate or in the production of resins and coatings. Since it hydrolyzes rapidly in water to the acid, maleic anhydride would not appear in wastewater and would quickly degrade to maleic acid if spilled in water. If emitted to the atmosphere from fugitive emissions or vent gases, it will degrade in a few hours by reaction with ozone or photochemically-produced hydroxyl radicals. If spilled on land its fate is unknown but it is apt to biodegrade or hydrolyze. Exposure to maleic anhydride would be primarily limited to occupational settings.

**Section XIII. Disposal Considerations**

Waste Disposal	Recycle to process, if possible. Consult your local regional authorities. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state and local regulations when disposing of the substance.
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**Section XIV. Transport Information**

DOT Classification	Class 8: Corrosive material
PIN Number	UN2215
Proper Shipping Name	Maleic anhydride
Packing Group (PG)	III
DOT Pictograms	

**Section XV. Other Regulatory Information and Pictograms**

TSCA Chemical Inventory (EPA)	This compound is <b>ON</b> the EPA Toxic Substances Control Act (TSCA) inventory list.
WHMIS Classification (Canada)	CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS E: Corrosive solid.
EINECS Number (EEC)	203-571-6
EEC Risk Statements	R24/25- Toxic in contact with skin and if swallowed. R34- Causes burns.
Japanese Regulatory Data	Not available.

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Emergency phone number (800) 424-9300

**Section XVI. Other Information**

**Version 1.0**  
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**Notice to Reader**

TCI laboratory chemicals are for research purposes only and are NOT intended for use as drugs, food additives, household, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our MSDS sheets are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated MSDS sheets for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, facial mask, fume hood). For proper handling and disposal, always comply with federal, state, and local regulations.

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