

SAFETY DATA SHEET

SECTION 1) CHEMICAL PRODUCT AND SUPPLIER'S IDENTIFICATION

CAS Number: 108-31-6
Product Name: Maleic Anhydride
Revision Date: May 14, 2018 **Date Printed:** May 14, 2018
Version: 1.0 **Supersedes Date:** N.A.
Manufacturer's Name: Thames River Chemical Corp.
Address: 5230 Harvester Road Burlington, ON, CA, L7L 4X4
Emergency Phone: CHEMTREC (800) 424-9300
Information Phone Number: 905-681-5353
Fax: 905-681-5377
Product/Recommended Uses: For laboratory or industrial use only.

SECTION 2) HAZARDS IDENTIFICATION

Classification

Acute toxicity Oral - Category 4
Respiratory Sensitizer (Solid/Liquid) - Category 1
Serious Eye Damage - Category 1
Skin Corrosion - Category 1B
Skin Sensitizer - Category 1

Pictograms



Signal Word

Danger

Hazard Statements - Health

Harmful if swallowed
May cause allergy or asthma symptoms or breathing difficulties if inhaled
Causes serious eye damage
Causes severe skin burns and eye damage
May cause an allergic skin reaction

Precautionary Statements - General

If medical advice is needed, have product container or label at hand.
Keep out of reach of children.
Read label before use.

Precautionary Statements - Prevention

Wash thoroughly/Wash hands thoroughly after handling.

Do not eat, drink or smoke when using this product.
Avoid breathing dust/fume/gas/mist/vapors/spray.
In case of inadequate ventilation, wear respiratory protection.
Wear protective gloves/protective clothing/eye protection/face protection.
Do not breathe dust/fume/gas/mist/vapors/spray.
Contaminated work clothing should not be allowed out of the workplace.

Precautionary Statements - Response

IF SWALLOWED: Call a POISON CENTER or doctor, if you feel unwell.
Rinse mouth.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
If experiencing respiratory symptoms: Call a POISON CENTER or doctor.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER or doctor.
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
Wash contaminated clothing before reuse.
Specific treatment (see first-aid on the SDS).
IF ON SKIN: Wash with plenty of water and soap.
If skin irritation or a rash occurs: Get medical advice/attention.
Take off contaminated clothing. And wash it before reuse.

Precautionary Statements - Storage

Store locked up.

Precautionary Statements - Disposal

Dispose of contents/container in accordance with local/national/international regulation. Waste management should be in full compliance with national, regional and local laws.

Physical Hazards Not Otherwise Classified

No Data Available

Health Hazards Not Otherwise Classified

No Data Available

SECTION 3) COMPOSITION/INFORMATION ON INGREDIENTS

CAS	Chemical Name	% By Weight
0000108-31-6	MALEIC ANHYDRIDE	99.5% - 100.0%
0000110-16-7	MALEIC ACID	0% - 0.6%

Specific chemical identity and/or exact percentage (concentration) of the composition has been withheld to protect confidentiality.

SECTION 4) FIRST-AID MEASURES

Inhalation

Get medical advice/attention if you feel unwell or are concerned. If experiencing respiratory symptoms: Call a POISON CENTER/doctor. Remove source of exposure or move person to fresh air and keep comfortable for breathing. If breathing is difficult, trained personnel should administer emergency oxygen if advised to do so by the POISON CENTER/doctor.

Eye Contact

Immediately call a POISON CENTER/doctor. Rinse eyes cautiously with lukewarm, gently flowing water for several minutes, while holding the eyelids open. Remove contact lenses, if present and easy to do. Continue rinsing for a duration of 30 minutes or until medical aid is available. Take care not to rinse contaminated water into the unaffected eye or onto the face.

Skin Contact

Take off immediately all contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Wash contaminated clothing before re-use. Immediately call a POISON CENTER/doctor. Rinse skin with lukewarm, gently flowing water/shower for a duration of 30 minutes or until medical aid is available.

Ingestion

If vomiting occurs naturally, lie on your side, in the recovery position. Immediately call a POISON CENTER/doctor.

Most Important Symptoms and Effects, Both Acute and Delayed

No Data Available

Indication of Any Immediate Medical Attention and Special Treatment Needed

No Data Available

SECTION 5) FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Carbon dioxide, alcohol foam, water spray or fog. Water or foam may cause frothing. Special "alcohol resistant fire-fighting foams" are recommended for use with any liquid that is completely soluble, like maleic anhydride in water. Foam manufacturers should be consulted for recommendations regarding types of foams and application rates.

Unsuitable Extinguishing Media

DO NOT use dry chemical powder extinguishers on burning maleic anhydride. These extinguishers contain sodium or potassium carbonates which react violently with maleic anhydride.

Specific Hazards in Case of Fire

During a fire, toxic acetylene, carbon monoxide, carbon dioxide and other irritating/toxic gases and fumes may be generated. Incomplete combustion may also produce acrid smoke and irritating fumes. The presence of certain contaminants may cause containers to rupture violently when exposed to fire or excessive heat. Refer to "Materials to Avoid" below for additional information.

Fire-fighting Procedures

Isolate immediate hazard area and keep unauthorized personnel out. Move undamaged containers from immediate hazard area if it can be done safely. Stop spill/release if it can be done safely. Cool containers with flooding quantities of water until well after fire is out. Caution should be exercised when using water or foam as frothing may occur, especially if sprayed into containers of hot, burning liquid. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations. Large Fire: Dike fire-control water for later disposal; do not scatter the material

Special Protective Actions

Wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear. Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

SECTION 6) ACCIDENTAL RELEASE MEASURES

Emergency Procedure

Evacuate persons not wearing protective equipment from area of spill until clean-up is complete. Isolate hazard area and keep unauthorized personnel away. Do not touch damaged containers or spilled materials unless wearing appropriate protective clothing. Ventilate closed spaces before entering. Extinguish or remove all ignition sources.

Recommended Equipment

Wear chemical protective clothing and positive pressure self-contained breathing apparatus (SCBA).

Personal Precautions

Avoid breathing dust. DO NOT get on skin, eyes or clothing.

Environmental Precautions

Evacuate persons not wearing protective equipment from area of spill until clean-up is complete. Stop spill/release if it can be done safely. Prevent spilled material and water from clean-up/firefighting from entering sewers, storm drains, other unauthorized drainage systems and natural waterways by using sand, earth, or other appropriate barriers.

Methods and Materials for Containment and Cleaning up

Do not touch spilled material. Prevent material from entering sewers, waterways or confined spaces. Stop or reduce leak if safe to do so.

Contain spill and solutions with earth, sand, or absorbent material which does not react with spilled material.

SMALL SPILLS OF SOLUTIONS: Soak up spill with absorbent material which does not react with spilled chemical. Put material in suitable, covered, labelled containers. Flush area with water.
Contaminated absorbent material may pose the same hazards as the spilled product.

SMALL SPILLS OF SOLIDS: Avoid generating dust. Use vacuum equipped with HEPA filter(s) for fine powders. Alternatively, shovel into clean, dry, labelled containers and cover.

LARGE SPILLS: Contact fire and emergency services and supplier for advice.

SECTION 7) HANDLING AND STORAGE

General

Wash hands after use. Do not get in eyes, on skin or on clothing. Do not breathe vapors or mists. Use good personal hygiene practices. Eating, drinking and smoking in work areas is prohibited. Remove contaminated clothing and protective equipment before entering eating areas. This product is not intended for human or animal consumption. All containers must be properly labelled. Eyewash stations and showers should be available in areas where this material is used and stored. Avoid generating dusts. Prevent the release of dusts into the workplace air. Protect from accidental contact with water. Do not use with other incompatible materials such as oxidizing agents and alkalis.

Ventilation Requirements

Use only with adequate ventilation to control air contaminants to their exposure limits. Report ventilation failures immediately. The use of local ventilation is recommended to control emissions near the source.

Storage Room Requirements

Segregate acids from bases, inorganic oxidizing acids from organic acids, flammables, and combustibles. Store in dry, cool areas, out of direct sunlight and away from other sources of heat. Empty container retain residue and may be dangerous. Segregate acids from water reactive metals such as sodium, potassium, and magnesium. Keep containers securely sealed when not in use. Protect containers against banging or other physical damage when storing, transferring, or using them. Procedures must be conducted in a fume hood, glove box, or other suitable containment device. Segregate from other hazard classes and store in a cool, dry, well ventilated area, away from sources of ignition and incompatibilities. Provide secondary containment for toxic materials. Store, handle, and use corrosive materials in well-ventilated areas. Keep the smallest amount of material in work areas. Do not store on metal shelves. Store containers in plastic tubs or trays as secondary containment. Never store corrosives above eye level. Stir corrosives slowly and carefully into cold water when the job requires mixing corrosives and water.

SECTION 8) EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye protection

Wear indirect-vent, impact and splash resistant goggles when working with liquids

Skin Protection

Use of gloves approved to relevant standards made from the following materials may provide suitable chemical protection: PVC, neoprene or nitrile rubber gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Use an apron and over-boots of chemically impervious materials such as neoprene or nitrile rubber.

Respiratory Protection

If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker, a respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 should be followed. Check with respiratory protective equipment suppliers.

Appropriate Engineering Controls

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

Chemical Name	CANsmg	CANspmm	CANtmg	CANtppm	OSHA STEL (mg/m3)	OSHA STEL (ppm)	OSHA TWA (mg/m3)	OSHA TWA (ppm)	OSHA Carcinogen	OSHA Tables (Z1, Z2, Z3)	OSHA Skin designation	ACGIH STEL (mg/m3)
MALEIC ANHYDRIDE	3	0.75	1	0.25			1	0.25		1		

Chemical Name	ACGIH STEL (ppm)	ACGIH TWA (mg/m3)	ACGIH TWA (ppm)	ACGIH TLV Basis	ACGIH Carcinogen	ACGIH Notations
MALEIC ANHYDRIDE		0.01 (IFV)		Resp sens	A4	DSEN; RSEN; A4

(IFV) - Inhalable fraction and vapor, A4 - Not Classifiable as a Human Carcinogen, DSEN - Dermal sensitization, resp - respiratory , RSEN - Respiratory sensitization, sens - sensitization

SECTION 9) PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties

Density	12.35 lb/gal
Specific Gravity	1.48
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Appearance	colourless or white crystalline solid
Odor Description	irritating, acrid, choking odour
Odor Threshold	N/A
pH	2.42 (0.01 M solution)
Melting/Freezing Point	52.9 °C
Low Boiling Point	202 °C
High Boiling Point	N/A
Flash Point	102 °C
Vapor Pressure	0.021 kPa (20°C)
Vapor Density	3.38 (air = 1)
Evaporation Rate	not known – not volatile
Upper Explosion Level	N/A
Lower Explosion Level	N/A
Water Solubility	163 grams
Coefficient Water/Oil	No Data Available
Viscosity	N/A - solid substance

SECTION 10) STABILITY AND REACTIVITY

Reactivity

Reacts slowly with water, including moisture in the air, to form maleic acid.

Stability

Stable under normal storage and handling conditions.

Conditions to Avoid

Static charge, sparks, heat, fire, other ignition sources, direct physical contact with incompatible materials, generation of dust, water or moisture.

Hazardous Reactions/Polymerization

Does not polymerize on its own. Hazardous co-polymerization reactions can occur, for example, when mixed with olefins (unsaturated aliphatic hydrocarbons) and a catalyst.

Incompatible Materials

WATER - reacts slowly with cold water, rapidly with hot water, producing heat. Forms maleic acid. Hot water may cause frothing.

STRONG OXIDIZING AGENTS (e.g. perchlorates, peroxides, chromates, sodium hypochlorite) - may react violently or explosively. Increased risk of fire and explosion.

ALKALI METALS (e.g. sodium or potassium), ALKALIS (e.g. sodium hydroxide or potassium hydroxide), ALKALINE EARTH METALS (e.g. calcium, magnesium or barium), ALKALINE EARTH HYDROXIDES (e.g. calcium hydroxide), AMINES (e.g. dimethylamine, triethylamine), PYRIDINE, QUINOLINE, SODIUM OR POTASSIUM CARBONATES, AQUEOUS AMMONIA, AMMONIUM HYDROXIDE or AMMONIUM

SALTS - at temperatures above 150 deg C, mixtures can react producing carbon dioxide, heat and pressure. Under these conditions, a mixture may be explosive. Small amounts (as low as 200 ppm) of the above chemicals are sufficient to start the decomposition.

OLEFINS (e.g. ethylene, propylene or diethylene) and CATALYSTS - mixtures can undergo uncontrolled co-polymerization.

STRONG REDUCING AGENTS (e.g. phosphorus, tin (II) chloride, metal hydrides) - may react vigorously or violently. Increased risk of fire.

ALCOHOLS - react to form esters.

Hazardous Decomposition Products

During a fire, toxic acetylene, carbon monoxide, carbon dioxide and other irritating/toxic gases and fumes may be generated. Incomplete combustion may also produce acrid smoke and irritating fumes. Thermal decomposition produces acetylene, carbon monoxide, carbon dioxide

SECTION 11) TOXICOLOGICAL INFORMATION

Likely Route of Exposure

Inhalation, ingestion, skin absorption

Acute Toxicity

Harmful if swallowed

Aspiration Hazard

No Data Available

Carcinogenicity

No Data Available

Germ Cell Mutagenicity

No Data Available

Reproductive Toxicity

No Data Available

Respiratory/Skin Sensitization

May cause allergy or asthma symptoms or breathing difficulties if inhaled

May cause an allergic skin reaction

Serious Eye Damage/Irritation

Causes serious eye damage

Skin Corrosion/Irritation

Causes severe skin burns and eye damage

Specific Target Organ Toxicity - Repeated Exposure

No Data Available

Specific Target Organ Toxicity - Single Exposure

No Data Available

0000108-31-6 MALEIC ANHYDRIDE

LD50 (oral, rat): 400 mg/kg (17, unconfirmed); 625 mg/kg (18); 850 mg/kg (19); 900 mg/kg (in water) (20); 1050 mg/kg (in corn oil) (20)

LD50 (oral, mouse): 465 mg/kg (19)

LD50 (oral, guinea pig): 390 mg/kg (18)

LD50 (oral, rabbit): 875 mg/kg (18)

LD50 (d

SECTION 12) ECOLOGICAL INFORMATION

Toxicity

LD50 (oral): 465mg/kg (mouse), 875mg/kg (rabbit), 390mg/kg (guinea pig)
LD50 (skin) 610mg/kg (rat), 2620mg/kg (rabbit), >20,000mg/kg (guinea pig) – severe burns, no mortality
LC50 (inhalation) 152mg/m³ (rat)

Mobility in Soil

Water soluble; moves readily through soil & the water column.

Bio-accumulative Potential

Cannot bioaccumulate due to rapid (0.5 sec) hydrolysis & biodegradation as maleic acid.

Persistence and Degradability

As maleic acid, this product degrades rapidly in the presence of oxygen; above 40% in 5 days; one report claims 98% biodegradation in several hours.

Other Adverse Effects

No Data Available

SECTION 13) DISPOSAL CONSIDERATIONS

Waste Disposal

Empty Containers retain product residue which may exhibit hazards of material, therefore do not pressurize, cut, glaze, weld or use for any other purposes. It is the responsibility of the user of the product to determine at the time of disposal whether the product meets local criteria for hazardous waste. Waste management should be in full compliance with national, provincial and local laws.

SECTION 14) TRANSPORT INFORMATION

U.S. DOT Information

UN number: UN2215
Proper shipping name: Maleic anhydride
Hazard class: 8
Packaging group: II
Hazardous substance (RQ): No Data Available
Toxic-Inhalation Hazard: No Data Available
Marine Pollutant: No Data Available
Note / Special Provision: No Data Available

Transport Canada Information

UN number: UN2215
Proper shipping name: Maleic anhydride
Hazard class: 8
Packaging group: II
Marine Pollutant: No Data Available
Transport in bulk (according to Annex II of MARPOL 73/78): No Data Available
Note / Special Provision: Note / Special Provision

SECTION 15) REGULATORY INFORMATION

CAS	Chemical Name	% By Weight	Regulation List
0000108-31-6	MALEIC ANHYDRIDE	99.5% - 100.0%	DSL, TSCA
0000110-16-7	MALEIC ACID	0% - 0.6%	DSL, TSCA

SECTION 16) OTHER INFORMATION

Glossary

ACGIH- American Conference of Governmental Industrial Hygienists; ANSI- American National Standards Institute; Canadian TDG- Canadian Transportation of Dangerous Goods; CANsmg or CANspmm - Canadian Short Term Exposure Level in mg/L or in ppm; CANtmg or CANtppm - Canadian Time Weighted Average in mg/L or in ppm; CAS- Chemical Abstract Service; Chemtrec- Chemical Transportation Emergency Center(US); CHIP- Chemical Hazard Information and Packaging; DSL- Domestic Substances List; EC- Equivalent Concentration; EH40 (UK)- HSE Guidance Note EH40 Occupational Exposure Limits; EPCRA- Emergency Planning and Community Right-To-Know Act; ESL Effects screening levels; HMIS- Hazardous Material Information Service; LC- Lethal Concentration; LD- Lethal Dose; NFPA- National Fire Protection Association; OEL- Occupational Exposure Limits; OSHA- Occupational Safety and Health Administration, US Department of Labor; PEL- Permissible Exposure Limit; SARA (Title III)- Superfund Amendments and Reauthorization Act; SARA 313- Superfund Amendments and Reauthorization Act, Section 313; SCBA- Self Contained Breathing Apparatus; STEL-Short Term Exposure Limit; TCEQ Texas Commission on Environmental Quality; TLV- Threshold Limit Value; TSCA- Toxic Substances Control Act Public Law 94-469; TWA Time Weighted Value; US DOT- US Department of Transportation; WHMIS- Workplace Hazardous Materials Information System.

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