

## MATERIAL SAFETY DATA SHEET

### 1. General Information

<b>Supplier :</b>	D&J Chemicals Co., Ltd.
<b>Trade Name :</b>	Maleic Anhydride
<b>Molecular Formula:</b>	C <sub>4</sub> H <sub>2</sub> O <sub>3</sub>
<b>Molecular Weight:</b>	98
<b>CAS No:</b>	108-31-6
<b>EINECS No:</b>	
<b>Chemical family :</b>	Organic Chemicals
<b>Chemical Name:</b>	cis-butenediic anhydride, lytron 820, NCI-C54660 2,5-furanedione, toxilic anhydride, lytron 810, dihydro-2,5-dioxofuran,

### 2. Physical Data Information

<b>Appearance:</b>	White briquettes/flakes
<b>Odor:</b>	With acrid odour
<b>Solubility:</b>	Soluble; decomposes in hot solution
<b>Specific Gravity:</b>	
<b>pH:</b>	No information found.
<b>% Volatiles by volume @ 21C (70F):</b>	
<b>Density (g cm-3):</b>	1.43
<b>Boiling Point:</b>	201
<b>Melting Point:</b>	53C
<b>Flash point( ):</b>	102 (closed cup)
<b>Vapor Density (Air=1):</b>	3.4
<b>Vapor Pressure (mm Hg):</b>	0.16 mm Hg at 20( )
<b>Evaporation Rate (BuAc=1):</b>	No information found.

### 3. Hazards Identification

**Emergency Overview:**

**DANGER! CORROSIVE. CAUSES BURNS TO SKIN AND EYES. MAY**

**CAUSE IRRITATION AND/OR ALLERGIC REACTION IN THE RESPIRATORY TRACT. MELTED MATERIAL CAUSES THERMAL BURNS. MAY BE HARMFUL IF SWALLOWED.**

**Potential Health Effects**

**Inhalation:**

Inhalation of dust or vapor may cause irritation of the nose and throat. Coughing, sneezing, and burning of the throat may be experienced. Can cause allergic respiratory reactions.

**Ingestion:**

Corrosive. Toxic. Swallowing can cause sore throat, abdominal pain, and vomiting. May cause burns to the digestive tract.

**Skin Contact:**

Corrosive. May not cause immediate burning of the skin, but prolonged contact with moist skin cause reddening and blistering or burns.

**Eye Contact:**

Corrosive. Dust or vapor cause burns or irritation of the eyes with swelling. Sensitivity to light and double vision may occur.

**Chronic Exposure:**

Repeated inhalation may cause chronic bronchitis of the asthmatic type. Repeated skin contact may lead to dermatitis or sensitization.

**Aggravation of Pre-existing Conditions:**

No information found.

## 4. First Aid Measures

**Inhalation:**

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

**Ingestion:**

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

**Skin Contact:**

Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention if irritation develops or persists.

**Eye Contact:**

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

## 5. Fire Fighting Measures

**Fire:**

Flash point: 102C (216F) CC

Autoignition temperature: 477C (891F)

Flammable limits in air % by volume:

lel: 1.4; uel: 7.1

**Explosion:**

Above flash point, vapor-air mixtures are explosive within flammable limits noted above.

**Fire Extinguishing Media:**

Alcohol foam, carbon dioxide. DO NOT USE dry chemical, multipurpose dry chemical, or loaded stream media because of explosion potential due to reactivity of basic compounds in these extinguishing media.

**Special Information:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container. Evacuate area of all unnecessary personnel. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Do not reuse container. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product. Avoid dust formation and control ignition sources. Employ grounding, venting and explosion relief provisions in accord with

accepted engineering practices in any process capable of generating dust and/or static electricity. Empty only into inert or non-flammable atmosphere. Emptying contents into a non-inert atmosphere where flammable vapors may be present could cause a flash fire or explosion due to electrostatic discharge.

## 8. Exposure Controls/Personal Protection

### **Airborne Exposure Limits:**

-OSHA Permissible Exposure Limit (PEL): 0.25 ppm, 1 mg/m<sup>3</sup> (TWA)

-ACGIH Threshold Limit Value (TLV): 0.1 ppm, (TWA), Sensitizer, A4 - Not classifiable as a human carcinogen.

### **Ventilation System:**

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

### **Personal Respirators (NIOSH Approved):**

If the exposure limit is exceeded, and engineering controls are not feasible, a full-face piece respirator with an organic vapor cartridge and particulate filter (NIOSH type N100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P particulate filter. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.

### **Skin Protection:**

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

### **Eye Protection:**

Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

## 9. Stability and Reactivity

**Stability:**

Stable under ordinary conditions of use and storage. Readily sublimes. Decomposes slowly with water forming maleic acid. When dissolved in water it is a strong acid. Molten product should be stored under 70C (158F)

**Hazardous Decomposition Products:**

Carbon dioxide and carbon monoxide may form when heated to decomposition.

**Hazardous Polymerization:**

Will not occur.

**Incompatibilities:**

Incompatible with alkali metals, alkaline earth metals, amines > 66C (150F). Reacts violently with bases. Contact with strong oxidizers may cause fires and explosions.

**Conditions to Avoid:**

Moisture, heat, flames, ignition sources and incompatibles.

## 10. Toxicology Information

Harmful if swallowed, inhaled or absorbed through the skin. Corrosive - causes burns. Irritant.

Typical TLV/TWA 0.25 ppm.

Typical PEL 0.25 ppm.

ORL-RAT LD50 481 mg kg<sup>-1</sup>

ORL-MUS LD50 465 mg kg<sup>-1</sup>

SKN-RBT LD50 2620 mg kg<sup>-1</sup>

## 11. Ecological Information

**Environmental Fate:**

When released to air, soil and water; maleic anhydride will probably hydrolyze to maleic acid and be processed as follows. When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material is expected to readily biodegrade. When released into water, this material is expected to readily biodegrade. When released into water, this material is not expected to evaporate significantly. When released into the air, this material is expected to exist in the aerosol phase with a short half-life. When released into the air, this material is not expected to be subject to wet deposition. When released into the air, this material is expected to be degraded by reaction with ozone and photochemically produced hydroxyl radicals. This

material is not expected to significantly bioaccumulate. This material has an estimated bioconcentration factor (BCF) of less than 100.

**Environmental Toxicity:**

When released to soil and water; maleic anhydride will probably hydrolyze to maleic acid and be represented by the following data for maleic acid.

TLm /Fathead minnow/5ppm/96 hr./fresh water

TLm/Mosquito fish/240 ppm/24-48 hr./fresh water

## 12. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 13. Transport Information

**Domestic (Land, D.O.T.)**

-----

**Proper Shipping Name:** MALEIC ANHYDRIDE

**Hazard Class:** 8

**UN/NA:** UN2215

**Packing Group:** III

**Information reported for product/size:** 500G

**International (Water, I.M.O.)**

-----

**Proper Shipping Name:** MALEIC ANHYDRIDE

**Hazard Class:** 8

**UN/NA:** UN2215

**Packing Group:** III

**Information reported for product/size:** 500G

## 14. Other Information

**NFPA Ratings:** Health: 3 Flammability: 1 Reactivity: 1

**Label Hazard Warning:**

DANGER! CORROSIVE. CAUSES BURNS TO SKIN AND EYES. MAY CAUSE IRRITATION AND/OR ALLERGIC REACTION IN THE RESPIRATORY TRACT. MELTED MATERIAL CAUSES THERMAL BURNS. MAY BE HARMFUL IF SWALLOWED.

**Label Precautions:**

Do not breathe dust or vapor.  
Do not get in eyes, on skin, or on clothing.  
Keep container closed.  
Use only with adequate ventilation.  
Wash thoroughly after handling.  
Keep away from heat, sparks and flame.

**Label First Aid:**

In all cases call a physician immediately. If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of skin contact, immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. In all cases call a physician immediately..

**Product Use:**

Laboratory Reagent.

**Revision Information:**

No Changes.

**Disclaimer:**

The information above is believed to be accurate. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, of damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, even if the company has been advised of the possibility of such damages.