

# MATERIAL SAFETY DATA SHEET

## MALEIC ANHYDRIDE

### Section 01: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER/SUPPLIER	:	MYSORE PETROCHEMICALS LIMITED
	:	401, RAHEJA CENTRE, 214, NARIMAN POINT,
	:	FREE PRESS JOURNAL MARG,
	:	MUMBAI – 400 021
CONTACT NUMBER	:	+91 22 30286100
PREPARED BY	:	Q.C. DEPARTMENT
PREPARATION DATE	:	29.07.2009
PRODUCT NAME	:	MALEIC ANHYDRIDE
CHEMICAL NAME & SYNONYMS	:	CIS-BUTENEDIOIC ANHYDRIDE
CHEMICAL FORMULA	:	C <sub>4</sub> H <sub>2</sub> O <sub>3</sub> .
PRODUCT USE	:	CHEMICAL SYNTHESIS, INTERMEDIATE

### Section 02: COMPOSITION/INFORMATION ON INGREDIENTS

MALEIC ANHYDRIDE	:	CAS Number:108-31-6
		EC Number :203-571-6
		INDEX-Number:607-096-00-9

### Section 03: HAZARDS IDENTIFICATION

ROUTE OF ENTRY:		
SKIN CONTACT	:	Causes skin burns.
SKIN ABSORPTION	:	Harmful if absorbed through skin.
EYE CONTACT	:	Causes eye burns.
INHALATION	:	Causes respiratory tract irritation and can cause damage.
INGESTION	:	Harmful or fatal if swallowed.
EFFECTS OF ACUTE EXPOSURE	:	Corrosive. Molten product can cause thermal burns. Extremely dangerous in case of skin contact (corrosive, irritant), of eye contact

		(irritant) and inhalation. Very dangerous in case of ingestion. Slightly dangerous in case of skin contact (sensitizer). Eye contact can result in corneal damage or blindness. Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing.
EFFECTS OF CHRONIC EXPOSURE	:	May cause allergic skin and respiratory (asthma like) reaction. Repeated exposure of the eyes to low level dust can produce irritation. Repeated skin exposure can cause local skin destruction Or dermatitis. Repeated inhalation can cause a varying degree of Respiratory irritation or lung damage. Repeated exposure to a Highly toxic material may produce general deterioration of health By accumulation in one or many human organs
HMIS HAZARD RATINGS	:	Health - 3; Flammability - 1; Chemical Reactivity - 1

#### Section 04: FIRST AID MEASURES

3	:	Allow the victim to rest in a well ventilated area. Seek immediate medical attention.
EYE CONTACT	:	Immediately flush with water for at least 15 minutes, keeping eyelids open. Seek medical attention.
SKIN CONTACT	:	After contact with skin, wash immediately with plenty of water. If irritation persists seek medical attention. Wash contaminated clothing before reusing.
INGESTION	:	Do not induce vomiting. Have a conscious person drink several glasses of water or milk. Seek immediate medical attention.
NOTES TO PHYSICIAN	:	No antidotes available

## Section 05: FIRE FIGHTING MEASURES

FLAMMABILITY	:	Non-flammable.
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.
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.
FLASH POINT (C), METHOD	:	102°C (215°F) (PMCC).
AUTO IGNITION TEMPERATURE	:	477°C (890°F).
UPPER FLAMMABLE LIMIT (% BY VOL.)	:	7.1.
LOWER FLAMMABLE LIMIT (% BY VOL.)	:	1.4.
SENSITIVITY TO STATIC DISCHARGE	:	N.AV.
SENSITIVITY TO IMPACT	:	N.AV.
HAZARDOUS COMBUSTION PRODUCTS	:	Carbon Dioxide, Carbon Monoxide.
UNUSUAL FIRE AND EXPLOSION HAZARDS	:	Unstable, or air-reactive or water-reactive chemical involved (see section 10). 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.

## Section 06: ACCIDENTAL RELEASE MEASURES

PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL	:	Avoid breathing dust. Pressure demand air supplied respirators should always be worn
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		<p>when the airborne concentration of the Contaminant or oxygen is unknown. Otherwise, wear respiratory Protection and other personal protective equipment as appropriate</p> <p>For the potential exposure hazard. Wear gloves, goggles, and Protective clothing to avoid contact with eyes, skin, or clothing.</p> <p>Use appropriate tools to put the spilled solid in a waste disposal Container. If necessary, neutralize the residue with a dilute Solution of sodium hydroxide.</p> <p>Do not dry sweep or use methods that Increase dusting.</p> <p>Prevent entry into sewers and waterways.</p>
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**Section 07: HANDLING AND STORAGE**

<p>HANDLING PROCEDURES AND EQUIPMENT</p>	<p>:</p>	<p>Minimum feasible handling temperatures should be maintained. Avoid generating mist or dust. Exercise care when opening bleeders and Sampling ports. Do not breathe gas, fumes, vapor or spray. Do not</p> <p>Ingest. Avoid contact with skin and eyes. After handling, always Wash hands thoroughly with soap and water.</p> <p>Store away from incompatible materials. Store at temperatures not exceeding 70°C (158°F). Contains moisture sensitive material - store in a dry place.</p>
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**Section 08: EXPOSURE CONTROLS/PERSONAL PROTECTION**

<p>EYE/FACE PROTECTION</p>	<p>:</p>	<p>Chemical type goggles with face shield must</p>
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		be worn. Do not wear contact lenses.
SKIN PROTECTION	:	Gloves resistant to chemicals and petroleum distillates required.
RESPIRATORY PROTECTION	:	If dust is generated and the occupational exposure limit of the product is exceeded, use appropriate niosh or msha approved air purifying or air supplied respirator after determining the airborne Concentration of the contaminant. Air supplied respirators should Always be worn when airborne concentration of the contaminant Or oxygen content is unknown.
PROTECTIVE CLOTHING	:	Protective clothing such as coveralls or lab coats must be worn. When handling large quantities, impervious suits, gloves, and rubber Boots must be worn. Remove and dry-clean or launder clothing  Soaked or spoiled with this material before reuse. Dry cleaning of Contaminated clothing may be more effective than normal Laundering. Inform individuals responsible for cleaning of potential  Hazards associated with handling contaminated clothing.
OTHER	:	Eye wash and safety shower should be available nearby when this product is handled or used.
ENGINEERING CONTROLS	:	Adequate to meet occupational exposure limits.

## Section 09: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	:	Molten/solid.
APPEARANCE	:	Water White/ White Flakes
ODOUR	:	Strong irritating acrid odour/Pungent.
ODOUR THRESHOLD	:	0.5 PPM.
VAPOUR PRESSURE (MMHG)	:	0.2 MM HG AT 25°C.

VAPOUR DENSITY (AIR=1)	:	3.38.VOLUME/WT
EVAPORATION RATE	:	N.AV.
MELTING POINT	:	52.4 deg C
BOILING POINT	:	200 deg C
FLASH POINT	:	103 deg C
LOWER EXPLOSION LIMIT	:	1.4%(V)
UPPER EXPLOSION LIMIT	:	7%(V)
IGNITION TEMPERATURE	:	475 deg C
DENSITY AT 20 deg C	:	1.48 g/cubic CM

### Section 09: PHYSICAL AND CHEMICAL PROPERTIES

PH	:	2.42 (0.1 M solution).
SPECIFIC GRAVITY (WATER=1)	:	Molten: 1.3 AT 70 (C).
SOLUBILITY IN WATER (% W/W)	:	Very soluble (40gm/100ml).
SOLUBLE IN OTHER SOLVENTS	:	Chloroform, Acetone, Ethyl Acetate, Benzene, Hydrocarbons,Dioxane
COEFFICIENT OF WATER/OIL DIST	:	N.AV.

### Section 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY	:	Stable except when in contact with water
CONDITIONS TO AVOID	:	Moisture.
INCOMPATIBILITY, MATERIALS TO AVOID	:	May react violently with amines, alkali metal ions such as sodium or potassium, and bases. At temperatures above 150°C, these materials, at concentrations as low as 200 ppm., can trigger a rapid decomposition and polymerization reaction that would produce heat and gas and cause equipment to rupture.
REACTIVITY CONDITIONS	:	Contact with incompatibles.
HAZARDOUS PRODUCTS OF	:	Toxic levels of carbon monoxide, carbon dioxide, irritating decomposition aldehydes and ketones may be formed on burning. Heating in air may produce irritating aldehydes, acids, and ketones.
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HAZARDOUS POLYMERIZATION	:	Will not self-polymerize but can undergo

		uncontrolled co-polymerization in the presence of other monomers and catalysts (see incompatible materials, above).
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## Section 11: TOXICOLOGICAL INFORMATION

EXPOSURE LIMIT OF MATERIAL	:	TLV-TWA: 0.1 PPM (ACGIH TLV, United States, 2008); TWA: 0.25 PPM 8 HOURS (OSHA PEL, United States, 1971); TWA: 1 MG/M <sup>3</sup> 8 HOURS (OSHA PEL, United States, 1971).
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LC 50 OF MATERIAL, SPECIES & ROUTE	:	TCLO (Inhalation, Rodent - Rat): 9800 UG/M <sup>3</sup> /6H/26W-I. Reference: FAATDF Fundamental And Applied Toxicology..
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LD 50 OF MATERIAL, SPECIES & ROUTE	:	LD50 (ORAL, RAT): 1030 MG/KG; LD50 (DERMAL, RABBIT): 2620 MG/KG.
CARCINOGENICITY OF MATERIAL	:	IARC: NOT LISTED.
REPRODUCTIVE EFFECTS	:	N.AV.
TERATOGENICITY	:	N.AV.
MUTAGENICITY	:	N.AV.
IRRITANCY OF MATERIAL	:	SEE SECTION 03.
SYNERGISTIC MATERIALS	:	N.AV.

## Section 12: ECOLOGICAL CONSIDERATIONS

AQUATIC TOXICITY	:	LC50 - 96HR 230 MG/liter (Mosquito Fish) Practically Non-Toxic. LC50 - 24HR 150 MG/liter (Blue Gill Sunfish) practically non-toxic. This Product will hydrolyze rapidly to the acid. Expected to be slightly toxic to aquatic species because of acidity
MOBILITY	:	This product is not likely to volatilize rapidly into the air because of its low vapour pressure.
BIOACCUMULATIVE POTENTIAL	:	This product is not expected to bio-accumulate through food chains in the environment.

## Section 13: DISPOSAL CONSIDERATIONS



WASTE DISPOSAL	:	Dispose of in accordance with all applicable federal, provincial/state and local regulations.
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**Section 14: TRANSPORT INFORMATION**

D.O.T. CLASSIFICATION	:	8.
D.O.T. SHIPPING NAME	:	MALEIC ANHYDRIDE.
TDG CLASSIFICATION	:	8.
PROPER SHIPPING NAME	:	MALEIC ANHYDRIDE.
UN NUMBER	:	2215.
PACKING GROUP	:	III.

**Section 15: REGULATORY INFORMATION**

US REGULATIONS	:	
TSCA INVENTORY	:	LISTED.
SARA TITLE III	:	Section 302: this product is not regulated under section 302 of sara and 40cfr part 355. Section 311: Maleic Anhydride, immediate (acute) health hazard, delayed (chronic) health hazard. Section 313: Maleic Anhydride 100%.
CERCLA 102 A	:	MALEIC ANHYDRIDE 100%, RQ 5000 LBS.
STATE REGULATIONS	:	Pennsylvania Rtk: Maleic Anhydride (Environmental hazard, generic environmental hazard). Massachusetts Rtk: Maleic Anhydride. New Jersey Rtk: Maleic Anhydride. Connecticut Rtk: Maleic Anhydride. Florida Rtk: Maleic Anhydride. Illinois Rtk: Maleic Anhydride. Rhode Island Rtk: Maleic Anhydride. California Prop. 65: no products were Found.
CANADIAN REGULATIONS	:	
WHMIS CLASSIFICATION	:	D1B. D2A. D2B. E.
CPR COMPLIANCE	:	This product has been classified in accordance with the hazard criteria of the CPR and the





		MSDS contains all the information required by the CPR.
DSL	:	This material is listed on the canadian domestic substances list.

**Section 16: OTHER INFORMATION**

ADDITIONAL INFORMATION	:	<p>Mysore Petrochemicals Ltd cannot anticipate all conditions under which this information and its product, or the products of other Manufacturers in combination with its product, may be used. It is the</p> <p>Users' responsibility to ensure safe conditions for handling, Storage and disposal of the product, and to assume liability for Loss, injury, damage or expense due to improper use. This Information is given in good faith, but no warranty, express or</p> <p>Implied is made.</p>
N.AP.	:	Not applicable
N.AV.	:	Not available