

SAFETY DATA SHEET



Ibne Sina Petrochemical Company

Section 1. Identification

Product identifier MALEIC ANHYDRIDE (molten) liquid
Chemical name maleic anhydride
Chemical family Furan derivative
Identified uses Chemical industry
Supplier/Manufacturer Ibne Sina Petrochemical Company

Unit 6, 8th Floor, Kiyān Tower,
No. 2551, Vali Asr Street, Tehran
1968643152, Iran
Tel: +98 21 88645242
Fax: +98 21 88645241

In case of emergency Tel: +98 615 211 4102 - 8
Fax: +98 615 211 4100

Section 2. Hazards identification

HAZCOM Standard Status This material is considered hazardous by the OSHA Hazard Communication Standard CFR 1910.1200. 2

Physical state Liquid
Color Colorless

Classification of the substance or mixture ACUTE TOXICITY: ORAL - Category 4
SKIN CORROSION/IRRITATION - Category 1
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
RESPIRATORY SENSITIZATION. - Category 1
SKIN SENSITIZATION. - Category 1A
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [lungs] - Category 1

Hazard pictograms



Signal word Danger

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

Hazard Not Otherwise Classified (HNOC) Causes damage to organs. (lungs)

Precautionary statement Causes digestive tract burns. Contact with hot material will cause thermal burns

Prevention Wear protective gloves/clothing and eye/face protection. In case of inadequate ventilation wear respiratory protection. Do not breathe vapor or spray. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.

Section 2. Hazards identification

Response	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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. IF ON SKIN: Wash with plenty of soap and water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.
Storage	Store locked up
Disposal	Dispose of contents and container in accordance with all local, regional, national and international regulations.
Supplemental label elements	Do not taste or swallow. Wash thoroughly after handling. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials and food and drink. Corrosive to digestive tract

Section 3. Composition/information on ingredients

Substance/mixture	Substance
Chemical name	maleic anhydride

Ingredient name	%	CAS number
Maleic Anhydride	95 - 100%	108-31-6

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of first aid measures

Eye contact	Get medical attention immediately. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. In case of contact with eyes, flush eyes with plenty of water for at least 30 minutes. Chemical burns must be treated promptly by a physician.
Inhalation	Get medical attention immediately. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In the event of any complaints or symptoms, avoid further exposure. If not breathing, if breathing is irregular or respiratory arrest occurs, provide artificial respiration, or oxygen by a trained professional, using a pocket type respirator.
Skin contact	In case of contact, flush skin with plenty of water for at least 30 minutes. Cool melted product on skin with plenty of water. Do not remove solidified product. Call a physician immediately. Immediately remove contaminated clothing and shoes. Wash affected areas, including hair, beneath nails and other concealed areas with Polyethylene Glycol 400. Repeat the washing with soap and water.
Ingestion	Get medical attention immediately. Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Potential acute health effects

Eye contact	Causes serious eye damage
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Section 4. First aid measures

Inhalation	May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin contact	Causes severe burns. May cause an allergic skin reaction. Contact with hot material will cause thermal burns.
Ingestion	Harmful if swallowed. Corrosive to the digestive tract. Causes burns. May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact	Adverse symptoms may include the following pain watering redness
Inhalation	Adverse symptoms may include the following: wheezing and breathing difficulties asthma
Skin contact	Corrosive with symptoms of reddening, itching, swelling, burning and possible permanent damage. Symptoms include: wheezing and breathing difficulties Once sensitized, an allergic skin reaction may occur with reddening, swelling, and rash when subsequently exposed to very low levels.
Ingestion	Corrosive with symptoms of coughing, burning, ulceration, and pain Symptoms of ingestion may include abdominal pain, nausea, vomiting, and diarrhea

Potential chronic health effects

Causes damage to organs through prolonged or repeated exposure. Repeated and prolonged contact may cause an allergic respiratory reaction in sensitive individuals. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels. Potent skin sensitizer. Once sensitized, an individual may react to direct skin contact with reddening, swelling, rash and in severe cases blistering and hives. These symptoms may be immediate or delayed several hours. May cause asthma with symptoms of shortness of breath and tightness of chest. May cause pulmonary edema with symptoms of breathing difficulty and tightness of chest. Prolonged vapor contact may cause conjunctivitis. Repeated or prolonged eye contact may cause photophobia (sensitivity to light).

Notes to physician	Treat symptomatically. No specific treatment
Protection of first-aiders	If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media	Carbon dioxide blanket, water spray, Water fog, alcohol-resistant foam
Unsuitable extinguishing media	dry chemical

Specific hazards arising from the chemical

In a fire or if heated, a pressure increase will occur and the container may burst. Toxic and irritating gases/fumes may be given off during burning or thermal decomposition. Water runoff from fire fighting may be corrosive.

Hazardous thermal decomposition products

Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

Special protective actions for fire-fighters

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Section 5. Fire-fighting measures

Special protective equipment for fire-fighters

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

Environmental precautions

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Stop leak if without risk. Move containers from spill area. Approach release from upwind. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal. Prevent entry into sewers, water courses, basements or confined areas.

Section 7. Handling and storage

Precautions for safe handling

Protective measures

Persons with a history of skin sensitization problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container. Remove contaminated clothing and protective equipment before entering eating areas. Workers should wash hands and face before eating, drinking and smoking. Put on appropriate personal protection equipment. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. This product is used in a molten state. Contact may cause thermal burns.

Conditions for safe storage

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. Empty containers retain product residue and can be hazardous. Do not reuse container. Hot water or low pressure steam is required in handling molten maleic anhydride. The optimum temperature range of 131 - 140F (55 - 60C) can be maintained by the use of 30 psig steam on external heating coils. All vessels in this service should be equipped with a high temperature alarm. Provision should be made so that there is no possibility of high pressure steam being substituted accidentally. Storage tanks for molten maleic anhydride should be provided with a vertical steam coil or lance in addition to usual heating coils. The lance should extend vertically to the bottom of the tank for the purpose of melting a vent through the solid cake when remelting a solidified tank. Failure to do so could result in rupture of the tank from expansion of material around the coils. The storage tank should be equipped with a temperature indicator. Storage tank temperature should not exceed 212F (100C) since the product flash point is 215F (102C). Storage tanks should be electrically grounded.

Section 8. Exposure controls/personal protection

Occupational exposure limits

Ingredient name	Exposure limits
Maleic Anhydride	TWA: 0.01 mg/m ³ 8 hours. Form: Inhalable fraction and vapor TWA: 0.25 ppm 8 hours. TWA: 1 mg/m ³ 8 hours.

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Appropriate engineering controls Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Personal protection

Hygiene measures Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Respiratory protection A NIOSH approved air purifying respirator with organic vapor cartridges and particulate prefilter can be used to minimize exposure. Maintain levels below the recommended exposure limits.

Skin protection Permeation resistant gloves. Recommended: Viton gloves. Polyvinyl chloride - PVC Heat resistant gloves

Eye/face protection When directly handling liquid product, eye protection is required. Examples of eye protection include a chemical safety goggle, or chemical safety goggle in combination with a full face shield when there is a greater risk of splash

Medical Surveillance Not available

Section 9. Physical and chemical properties

Physical state	Liquid. [hot melt]
Color	Colorless.
Odor	Pungent smelling.
Odor threshold	Not available.
Boiling point	200°C at 1013 hPa
Melting point	53 to 58°C (127.4 to 136.4°F)
Flash point	Closed cup: >93.3°C (>199.9°F)
Evaporation rate	Not available.
Explosion limits	Lower: 1.4% Upper: 7.1%
Vapor pressure	- 0.992barg
Density	1.48g/cm ³ at 20°C
Specific gravity	1.3

Section 9. Physical and chemical properties

Solubility	400 g/l (water)
-Partition coefficient: n octanol/water	Not available.
Vapor density	Not available.
Viscosity	Not available.
Auto-ignition temperature	476.67°C (890°F)
Decomposition temperature	Not available

Section 10. Stability and reactivity

Reactivity	No specific test data related to reactivity available for this product or its ingredients
Chemical stability	Contact with alkali metals, caustics, and amines may cause polymerization if temperature is greater than 150F (66C).The product is stable
Possibility of hazardous reactions	Hazardous reactions or instability may occur under certain conditions of storage or use
Conditions to avoid	Avoid contact with moisture / water.
Incompatible materials	amines, alkalis Metal.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on the likely routes of exposure	Dermal contact. Eye contact. Inhalation. Ingestion
Potential acute health effects	
Eye contact	Causes serious eye damage
Inhalation	May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin contact	Causes severe burns. May cause an allergic skin reaction.Contact with hot material will cause thermal burns
Ingestion	Harmful if swallowed. Corrosive to the digestive tract. Causes burns. May cause burns to mouth, throat and stomach
Symptoms related to the physical, chemical and toxicological characteristics	
Eye contact	Adverse symptoms may include the following pain watering redness
Inhalation	Adverse symptoms may include the following: wheezing and breathing difficulties asthma
Skin contact	Corrosive with symptoms of reddening, itching, swelling, burning and possible permanent damage. Symptoms include: wheezing and breathing difficulties Once sensitized, an allergic skin reaction may occur with reddening, swelling, and rash when subsequently exposed to very low levels.
Ingestion	Corrosive with symptoms of coughing, burning, ulceration, and pain. Symptoms of ingestion may include abdominal pain, nausea, vomiting, and diarrhea.
Potential chronic health effects	
Short term exposure	
Potential immediate effects	Not available
Long term exposure	
Potential delayed effects	Not available

Section 11. Toxicological information

General	Causes damage to organs through prolonged or repeated exposure. Repeated and prolonged contact may cause an allergic respiratory reaction in sensitive individuals. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels. Potent skin sensitizer. Once sensitized, an individual may react to direct skin contact with reddening, swelling, rash and in severe cases blistering and hives. These symptoms may be immediate or delayed several hours. May cause asthma with symptoms of shortness of breath and tightness of chest. May cause pulmonary edema with symptoms of breathing difficulty and tightness of chest. Prolonged vapor contact may cause conjunctivitis. Repeated or prolonged eye contact may cause photophobia (sensitivity to light).
Carcinogenicity	No known significant effects or critical hazards
Mutagenicity	No known significant effects or critical hazards
Teratogenicity	No known significant effects or critical hazards
Developmental effects	No known significant effects or critical hazards
Fertility effects	No known significant effects or critical hazards

Section 12. Ecological information

Product/ingredient name	Test	Result	Species	Exposure
Maleic Anhydride	OECD 201 Alga, Growth Inhibition Test	IC10 11.8 mg/l	Algae - Pseudokirchneriella subcapitata	72 hours
	DIN 38412 part 8 (growth rate)	Acute EC50 >44.6 mg/l	Bacteria - Pseudomonas putida	18 hours
	OECD 202 <i>Daphnia</i> sp. Acute Immobilization Test	Acute EC50 42.81 mg/l	Daphnia - <i>Daphnia magna</i>	48 hours
	OECD 201 Alga, Growth Inhibition Test	Acute IC50 74.35 mg/l	Algae - Pseudokirchneriella subcapitata	72 hours
	-	Acute LC50 75 mg/l	Fish - <i>Salmo gairdneri</i>	96 hours
	-	Chronic NOEC 10 mg/l	Daphnia - <i>Daphnia magna</i>	21 days

Conclusion/Summary Not available

Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
Maleic Anhydride	OECD 301B Ready Biodegradability - CO ₂ Evolution Test	>90 % - Readily - 25 days	-	-

Conclusion/Summary Not available

Product/ingredient name	Aquatic half-life	Photolysis 50% ^{0.175} day(s)	Biodegradability
Maleic Anhydride	-		Readily

Bioaccumulative potential

Not available.

Mobility in soil

Not available

Soil/water partition coefficient K_{oc}

Other adverse effects



No known significant effects or critical hazards

Section 13. Disposal considerations

Disposal methods The generation of waste should be avoided or minimized wherever possible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Waste disposal should be in accordance with existing federal state, provincial and or local environmental controls laws.

RCRA classification U147: When discarded in its purchased form, this product is a listed RCRA hazardous waste and should be managed as a hazardous waste. (40 CFR 261.20-24) Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product, should be classified as a hazardous waste. (40 CFR 261.20-24)

Section 14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	*PG	Label	Additional information
DOT Classification	UN2215	MALEIC ANHYDRIDE, MOLTEN	8	III		IB8, IP3, T4, TP1, T1
IMDG Class	UN2215	MALEIC ANHYDRIDE, MOLTEN	8	III		Emergency schedules (EmS) F-A, S-B
IATA-DGR Class	-	-	-	-		Forbidden

PG* : Packing group

RQ

lbs 5011

Section 15. Regulatory information

SARA 311/312 Immediate (acute) health hazard

SARA Title III Section 302 Extremely Hazardous Substances None

	Ingredient name	CAS number	Concentration (%)
SARA Title III Section 313 Toxic Chemicals	Maleic Anhydride	108-31-6	95 - 100%

	Ingredient name	CAS number	RQ
US EPA CERCLA Hazardous Substances (CFR 302 40)	Maleic Anhydride	108-31-6	5000 lbs. (2270 kg)

State regulations

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections on the SDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

Ingredient name	CAS number	State Code	Concentration (%)
Maleic Anhydride	108-31-6	MA - S, NJ - HS, PA - RTK HS	95 - 100%

Section 16. Other information

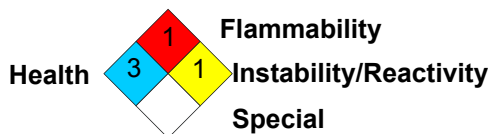
Hazardous Material Information System

Health	*	3
Flammability		1
Physical hazards		1

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme
 *=Chronic

The customer is responsible for determining the PPE code for this material. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

National Fire Protection Association of USA



0= Minimal 1=Slight 2=Moderate 3=Serious 4=Severe

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