



# MATERIAL SAFETY DATA SHEET

according to the Hazard Communication Standard (29 CFR 1910.1200)

Date of issue: 12/20/2012

Version 1.0

## SECTION 1. Identification

### Product identifier

Product number 800408  
Product name Maleic anhydride for synthesis

### Relevant identified uses of the substance or mixture and uses advised against

Identified uses Chemical for synthesis

### Details of the supplier of the safety data sheet

Company EMD Millipore Corporation | 290 Concord Road, Billerica, MA 01821,  
United States of America | SDS Phone Support: +1-978-715-1335 |  
General Inquiries: +1-978-751-4321 | Monday to Friday, 9:00 AM to  
4:00 PM Eastern Time (GMT-5)

e-mail: mm\_sds@merckgroup.com

Emergency telephone 800-424-9300 CHEMTREC (USA)  
+1-703-527-3887 CHEMTREC (International)  
24 Hours/day; 7 Days/week

## SECTION 2. Hazards identification

### GHS Classification

Acute toxicity, Category 4, Oral, H302  
Skin corrosion, Category 1B, H314  
Respiratory sensitization, Category 1, H334  
Skin sensitization, Category 1, H317

For the full text of the H-Statements mentioned in this Section, see Section 16.

### GHS-Labeling

#### Hazard pictograms



Signal Word  
Danger

#### Hazard Statements

H302 Harmful if swallowed.  
H314 Causes severe skin burns and eye damage.

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H317 May cause an allergic skin reaction.

H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

### *Precautionary Statements*

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

P301 + P330 + P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

P304 + P341 IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P309 + P310 IF exposed or if you feel unwell: Immediately call a POISON CENTER or doctor/physician.

### **OSHA Hazards**

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

### **Other hazards**

None known.

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## **SECTION 3. Composition/information on ingredients**

Formula	C <sub>4</sub> H <sub>2</sub> O <sub>3</sub> (Hill)
CAS-No.	108-31-6
Molar mass	98.06 g/mol

### **Hazardous ingredients**

*Chemical Name ( Concentration)*

CAS-No.

*maleic anhydride ( >= 90 % - <= 100 % )*

108-31-6

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## **SECTION 4. First aid measures**

### **Description of first-aid measures**

#### *Inhalation*

After inhalation: fresh air. Call in physician.

#### *Skin contact*

After skin contact: wash off with plenty of water. Immediately remove contaminated clothing. If available swab with polyethylene glycol 400. Call a physician immediately.

#### *Eye contact*

After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist.

#### *Ingestion*

After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation!). Call a physician immediately. Do not attempt to neutralize.

Never give anything by mouth to an unconscious person.

### **Most important symptoms and effects, both acute and delayed**

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Irritation and corrosion, Asthmatic appearance, Allergic reactions, Cough, Shortness of breath  
Risk of blindness!

**Indication of any immediate medical attention and special treatment needed**

No information available.

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**SECTION 5. Fire-fighting measures**

**Extinguishing media**

*Suitable extinguishing media*

Water, Carbon dioxide (CO<sub>2</sub>), Foam, Dry powder

*Unsuitable extinguishing media*

For this substance/mixture no limitations of extinguishing agents are given.

**Special hazards arising from the substance or mixture**

Combustible.

Risk of dust explosion.

Forms explosive mixtures with air on intense heating.

Development of hazardous combustion gases or vapors possible in the event of fire.

**Advice for firefighters**

*Special protective equipment for fire-fighters*

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

*Further information*

Prevent fire extinguishing water from contaminating surface water or the ground water system.  
Suppress (knock down) gases/vapors/mists with a water spray jet. Remove container from danger zone and cool with water.

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**SECTION 6. Accidental release measures**

**Personal precautions, protective equipment and emergency procedures**

Advice for non-emergency personnel: Avoid inhalation of dusts. Avoid substance contact.

Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

**Environmental precautions**

Do not empty into drains.

**Methods and materials for containment and cleaning up**

Cover drains. Collect, bind, and pump off spills.

Observe possible material restrictions (see sections 7 and 10).

Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

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**SECTION 7. Handling and storage**

**Precautions for safe handling**

Observe label precautions.

Work under hood. Do not inhale substance/mixture.

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**Conditions for safe storage, including any incompatibilities**

Tightly closed. Dry. Keep locked up or in an area accessible only to qualified or authorized persons.

Store at +15°C to +25°C (+59°F to +77°F).

**SECTION 8. Exposure controls/personal protection**

**Exposure limit(s)**

*Ingredients*

Basis	Value	Threshold limits	Remarks
<i>maleic anhydride 108-31-6</i>			
ACGIH	Time Weighted Average (TWA):	0.01 mg/m <sup>3</sup>	
NIOSH/GUIDE	Recommended exposure limit (REL):	0.25 ppm 1 mg/m <sup>3</sup>	
OSHA_TRANS	PEL:	0.25 ppm 1 mg/m <sup>3</sup>	
Z1A	Time Weighted Average (TWA):	0.25 ppm 1 mg/m <sup>3</sup>	

**Engineering measures**

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

**Individual protection measures**

Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled. The chemical resistance of the protective equipment should be inquired at the respective supplier.

*Hygiene measures*

Immediately change contaminated clothing. Apply skin- protective barrier cream. Wash hands and face after working with substance.

*Eye/face protection*

Tightly fitting safety goggles

*Hand protection*

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

*Other protective equipment:*

protective clothing

*Respiratory protection*

required when dusts are generated.

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

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**SECTION 9. Physical and chemical properties**

Physical state	scales
Color	white
Odor	aromatic
Odor Threshold	No information available.
pH	0.8 at 550 g/l 68 °F ( 20 °C) Hydrolyzis
Melting point	124 - 127 °F ( 51 - 53 °C)
Boiling point/boiling range	396 °F ( 202 °C) at 1,013 hPa
Flash point	217 °F ( 103 °C) Method: c.c.
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	1.4 %(V)
Upper explosion limit	7.1 %(V)
Vapor pressure	1.33 hPa at 111 °F ( 44 °C)
Relative vapor density	3.4
Relative density	1.32 g/cm <sup>3</sup> at 131 °F ( 55 °C)
Water solubility	at 68 °F ( 20 °C) soluble, (decomposition)
Partition coefficient: n-octanol/water	No information available.
Autoignition temperature	No information available.
Decomposition temperature	> 392 °F ( > 200 °C)
Viscosity, dynamic	1.6 mPa.s at 140 °F ( 60 °C)

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Explosive properties Not classified as explosive.  
Ignition temperature 887 °F ( 475 °C)  
DIN 51794  
Bulk density 700 - 800 kg/m<sup>3</sup>

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## SECTION 10. Stability and reactivity

### Reactivity

Risk of dust explosion.  
Forms explosive mixtures with air on intense heating.

### Chemical stability

sensitive to moisture

### Possibility of hazardous reactions

Violent reactions possible with:

Exothermic reaction with:

Alkali metals, alkali hydroxides, Amines, strong alkalis, pyridine, alkaline earth hydroxides,  
Alcohols

sodium carbonate, with

Heat.

Exothermic reaction with:

alkaline earth hydroxides, Oxidizing agents

Water, with

Heat.

Generates dangerous gases or fumes in contact with:

ammonium compounds

### Conditions to avoid

Strong heating.

A range from approx. 15 Kelvin below the flash point is to be rated as critical.

### Incompatible materials

no information available

### Hazardous decomposition products

no information available

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## SECTION 11. Toxicological information

### Information on toxicological effects

*Likely route of exposure*

Eye contact, Skin contact, Ingestion

*Target Organs*

Eyes

Skin

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Respiratory system

*Acute oral toxicity*

LD50 rat: 1,090 mg/kg  
OECD Test Guideline 401

absorption

Symptoms: Burns of: mouth, pharynx, oesophagus, Gastrointestinal tract

*Acute inhalation toxicity*

Symptoms: mucosal irritations, Cough, Shortness of breath, Asthmatic appearance, Lung edema, Possible damages: damage of respiratory tract

Corrosive to respiratory system

*Acute dermal toxicity*

LD50 rabbit: 2,620 mg/kg  
(RTECS)

*Skin irritation*

rabbit

Result: Severe irritations  
OECD Test Guideline 404

Causes burns.

*Eye irritation*

rabbit

Result: Causes burns.  
OECD Test Guideline 405

Causes serious eye damage. Risk of blindness!

*Sensitization*

Sensitization test: guinea pig  
Result: positive  
Method: OECD Test Guideline 406

May cause an allergic skin reaction.

May cause allergy or asthma symptoms or breathing difficulties if inhaled.

*Genotoxicity in vitro*

Ames test  
Salmonella typhimurium  
Result: negative  
(National Toxicology Program)

*Specific target organ systemic toxicity - single exposure*

The substance or mixture is not classified as specific target organ toxicant, single exposure.

*Specific target organ systemic toxicity - repeated exposure*

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

*Aspiration hazard*

Regarding the available data the classification criteria are not fulfilled.

**Carcinogenicity**

IARC No ingredient of this product present at levels greater than or

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equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

NTP No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

ACGIH No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

**Further information**

Decomposition of the substance with tissue moisture.  
After absorption:  
Headache, Nausea, Impairment of vision  
Other dangerous properties can not be excluded.  
Handle in accordance with good industrial hygiene and safety practice.

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**SECTION 12. Ecological information**

**Ecotoxicity**

*Toxicity to fish*

LC50 Lepomis macrochirus (Bluegill sunfish): 138 mg/l; 48 h (IUCLID)

*Toxicity to daphnia and other aquatic invertebrates*

EC50 Daphnia magna (Water flea): 88 mg/l; 24 h (IUCLID)

*Toxicity to algae*

IC50 Desmodesmus subspicatus (green algae): 29 mg/l; 72 h (IUCLID)

*Toxicity to bacteria*

EC10 Pseudomonas putida: 44.6 mg/l; 18 h (IUCLID)

**Persistence and degradability**

*Biodegradability*

98 %; 7 d

OECD Test Guideline 301E

Readily biodegradable.

**Bioaccumulative potential**

No information available.

**Mobility in soil**

No information available.

**Other adverse effects**

*Additional ecological information*

Discharge into the environment must be avoided.



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## SECTION 13. Disposal considerations

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

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## SECTION 14. Transport information

### Land transport (DOT)

UN number	UN 2215
Proper shipping name	MALEIC ANHYDRIDE
Class	8
Packing group	III
Environmentally hazardous	--

### Air transport (IATA)

UN number	UN 2215
Proper shipping name	MALEIC ANHYDRIDE
Class	8
Packing group	III
Environmentally hazardous	--
Special precautions for user	no

### Sea transport (IMDG)

UN number	UN 2215
Proper shipping name	MALEIC ANHYDRIDE
Class	8
Packing group	III
Environmentally hazardous	--
Special precautions for user	yes
EmS	F-A S-B

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## SECTION 15. Regulatory information

### United States of America

#### OSHA Hazards

Harmful if swallowed.  
Corrosive to skin  
Skin sensitizer  
Respiratory sensitizer  
Corrosive by inhalation.  
Target organ effects  
Corrosive to eyes

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This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS, and may deviate from the GHS information on the label and in section 2.

**SARA 311/312 Hazards**

Acute Health Hazard  
Chronic Health Hazard

**SARA 313**

The following components are subject to reporting levels established by SARA Title III, Section 313:

*Ingredients*

maleic anhydride 108-31-6

**Clean Water Act**

The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:

*Ingredients*

maleic anhydride

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

*Ingredients*

maleic anhydride

**US State Regulations**

**Massachusetts Right To Know**

*Ingredients*

maleic anhydride

**Pennsylvania Right To Know**

*Ingredients*

maleic anhydride

**New Jersey Right To Know**

*Ingredients*

maleic anhydride

**California Prop 65 Components**

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

**Notification status**

TSCA: On TSCA Inventory

DSL: All components of this product are on the Canadian DSL.

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**SECTION 16. Other information**

**Training advice**

Provide adequate information, instruction and training for operators.

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**Full text of H-Statements referred to under sections 2 and 3.**

H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.

**Key or legend to abbreviations and acronyms used in the safety data sheet**

Used abbreviations and acronyms can be looked up at [www.wikipedia.org](http://www.wikipedia.org).

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The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to appropriate safety precautions. It does not represent a warranty of any product properties and we assume no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.

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