

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Name of the substance	Maleic anhydride
Identification number	607-096-00-9 (Index number)
Registration number	01-2119472428-31
Synonyms	MAN
Issue date	07-March-2019
Version number	01
Revision date	-
Supersedes date	-

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses	This material is used in unsaturated polyester resins, paper sizing, lubricating oil additives, flavor enhancers, personal care products and other consumer products.
Uses advised against	Other uses are not recommended unless an assessment is completed, prior to commencement of that use, which demonstrates that the use will be controlled.

1.3. Details of the supplier of the safety data sheet

Supplier	INEOS Joliet Europe, SARL Corso Elvezia 23 6900 Lugano Switzerland
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**Telephone Numbers - 24
hour Emergency
Assistance**

Carechem24 (Europe, Africa & South America)	44 (0) 1235 239 670 (UK)
Carechem24 (Africa (Arabic) and Middle East)	44 (0) 1235 239 671 (UK)
Carechem24 (India (Hindi))	65 3158 1198 (Singapore)

Telephone numbers

General Assistance	
24 HR (7 DAYS) (Wichita Customer Service)	886-400-4343
Customer Service	
8-5 (M-F, CST)	815-467-3360
SDS Assistance E-mail	JOLChemorders@INEOS.com

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

The substance has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies.

Classification according to Regulation (EC) No 1272/2008 as amended

Health hazards

Acute toxicity, oral	Category 4	H302 - Harmful if swallowed.
Skin corrosion/irritation	Category 1B	H314 - Causes severe skin burns and eye damage.
Serious eye damage/eye irritation	Category 1	
Respiratory sensitisation	Category 1	H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin sensitisation	Category 1B	H317 - May cause an allergic skin reaction.

Specific target organ toxicity - repeated exposure

Category 1 (Lung and respiratory system)

H372 - Causes damage to organs (Lung and respiratory system) through prolonged or repeated exposure.

Specific target organ toxicity - repeated exposure

Category 2 (Lung and respiratory system)

H373 - May cause damage to organs (Lung and respiratory system) through prolonged or repeated exposure.

Hazard summary

May form explosible dust-air mixture if dispersed. Causes severe skin burns and eye damage. Harmful if swallowed. Causes damage to organs through prolonged or repeated exposure. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. Occupational exposure to the substance or mixture may cause adverse health effects.

2.2. Label elements

Label according to Regulation (EC) No. 1272/2008 as amended

Contains:

Maleic anhydride

Hazard pictograms



Signal word

Danger

Hazard statements

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.
H372	Causes damage to organs (Lung and respiratory system) through prolonged or repeated exposure.
H373	May cause damage to organs (Lung and respiratory system) through prolonged or repeated exposure.

Precautionary statements

Prevention

P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P264	Wash thoroughly after handling.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

Response

P301 + P330 + P331	IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304 + P340	IF INHALED: Remove person to fresh air and keep 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.
P310	Immediately call a POISON CENTRE/doctor.

Storage

Not available.

Disposal

Not available.

Supplemental label information None.

2.3. Other hazards

Not a PBT or vPvB substance or mixture. May form explosible dust-air mixture if dispersed.

SECTION 3: Composition/information on ingredients

3.1. Substances

General information

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	Index No.	Notes
Maleic anhydride	100	108-31-6 203-571-6	01-2119472428-31	607-096-00-9	
Classification:	Acute Tox. 4;H302, Skin Corr. 1B;H314, Skin Sens. 1B;H317, Resp. Sens. 1;H334, STOT RE 1;H372, STOT RE 2;H373				

List of abbreviations and symbols that may be used above

#: This substance has been assigned Union workplace exposure limit(s).
M: M-factor
PBT: persistent, bioaccumulative and toxic substance.
vPvB: very persistent and very bioaccumulative substance.

Composition comments

The full text for all H-statements is displayed in section 16.

SECTION 4: First aid measures

General information	If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before reuse.
4.1. Description of first aid measures	
Inhalation	If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If experiencing respiratory symptoms: Call a poison center or doctor/physician.
Skin contact	Remove contaminated clothing immediately and wash skin with soap and water. Call a physician or poison control centre immediately. Chemical burns must be treated by a physician. Wash contaminated clothing before reuse.
Eye contact	Do not rub eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control centre immediately.
Ingestion	Call a physician or poison control centre immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.
4.2. Most important symptoms and effects, both acute and delayed	Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. Difficulty in breathing. Prolonged exposure may cause chronic effects.
4.3. Indication of any immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Chemical burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

SECTION 5: Firefighting measures

General fire hazards	May form explosible dust-air mixture if dispersed.
5.1. Extinguishing media	
Suitable extinguishing media	Water fog. Alcohol resistant foam. Dry chemical powder. Carbon dioxide (CO ₂).
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
5.2. Special hazards arising from the substance or mixture	Explosion hazard: Avoid generating dust; fine dust dispersed in air in sufficient concentrations and in the presence of an ignition source is a potential dust explosion hazard. During fire, gases hazardous to health may be formed.
5.3. Advice for firefighters	
Special protective equipment for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Special fire fighting procedures	In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures	
For non-emergency personnel	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained.
For emergency responders	Keep unnecessary personnel away. Use personal protection recommended in Section 8 of the SDS.
6.2. Environmental precautions	Avoid discharge into drains, water courses or onto the ground.
6.3. Methods and material for containment and cleaning up	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Take precautionary measures against static discharge. Use only non-sparking tools. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). This product is miscible in water. Stop the flow of material, if this is without risk. Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Following product recovery, flush area with water. Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use.

6.4. Reference to other sections

For personal protection, see section 8 of the SDS. For waste disposal, see section 13 of the SDS.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Minimise dust generation and accumulation. Avoid significant deposits of material, especially on horizontal surfaces, which may become airborne and form combustible dust clouds and may contribute to secondary explosions. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Explosion-proof general and local exhaust ventilation. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Avoid breathing dust/fume/gas/mist/vapours/spray. Avoid prolonged exposure. When using, do not eat, drink or smoke. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices.

7.2. Conditions for safe storage, including any incompatibilities

Store locked up. Keep containers tightly closed in a dry, cool and well-ventilated place. Store away from incompatible materials (see section 10 of the SDS).

7.3. Specific end use(s)

This material is used in unsaturated polyester resins, paper sizing, lubricating oil additives, flavor enhancers, personal care products and other consumer products.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

UK. EH40 Workplace Exposure Limits (WELs)

Material	Type	Value
Maleic anhydride (CAS 108-31-6)	STEL	3 mg/m3
	TWA	1 mg/m3

Biological limit values

No biological exposure limits noted for the ingredient(s).

Recommended monitoring procedures

Follow standard monitoring procedures.

Derived no effect levels (DNELs)

Workers

Product	Value	Assessment factor	Notes
Maleic Anhydride - INEOS Joliet Europe (CAS 108-31-6)			
Long-term, Local, Inhalation	0.4 mg/m3	2	respiratory tract irritation
Long-term, Systemic, Inhalation	0.4 mg/m3	2	respiratory tract irritation
Short-term, Local, Inhalation	0.8 mg/m3	1	
Short-term, Systemic, Inhalation	0.8 mg/m3	1	respiratory tract irritation

Predicted no effect concentrations (PNECs)

Product	Value	Assessment factor	Notes
Maleic Anhydride - INEOS Joliet Europe (CAS 108-31-6)			
Freshwater	0.1 mg/l	100	
Sediment (freshwater)	0.334 mg/kg		
Sediment (marine water)	0.033 mg/kg		
Soil	0.042 mg/kg		
STP (Sewage treatment plant)	44.6 mg/l	1	

8.2. Exposure controls

Appropriate engineering controls

Explosion-proof general and local exhaust ventilation. Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment

General information

Use personal protective equipment as required. Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.

Eye/face protection

Wear eye/face protection.

Skin protection

- Hand protection

Wear appropriate chemical resistant gloves.

- Other	Wear appropriate chemical resistant clothing.
Respiratory protection	Wear suitable respiratory protection.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
Hygiene measures	When using, do not eat, drink or smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Contaminated work clothing should not be allowed out of the workplace.
Environmental exposure controls	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. Fume scrubbers, filters or engineering modifications to the process equipment may be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance

Physical state	Solid.
Form	Solid. Transported as molten liquid.
Colour	Colourless.
Odour	Strong acidic.
Odour threshold	Not available.
pH	Not available.
Melting point/freezing point	52.8 °C (127.04 °F)
Initial boiling point and boiling range	200 °C (392 °F) 101.325 kPa
Flash point	100.0 - 110.0 °C (212.0 - 230.0 °F) (molten)
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	1.4 %
Flammability limit - upper (%)	7.1 %
Vapour pressure	0 kPa at 20°C (20 °C (68 °F)) 0.03 kPa at 25°C
Vapour density	3.38 (Air=1 at boiling point of maleic anhydride)
Relative density	1.48
Relative density temperature	20 °C (68 °F)
Solubility(ies)	400 g/l at 20 °C (68 °F)
Partition coefficient (n-octanol/water)	-2.61 at 20 °C (68 °F) (Log Kow)
Auto-ignition temperature	Not available.
Decomposition temperature	> 150 °C (> 302 °F)
Viscosity	Not available.
Explosive properties	May form explosive mixtures with air.
Oxidising properties	Not oxidising.

9.2. Other information

Density	1.48 g/cm ³
Dissociation constant	0.0000006 pKa at 20 °C (68 °F)
Dynamic viscosity	0.6 mPa.s (150 °C (302 °F))
Kinematic viscosity	0.4054 mm ² /s estimated
Molecular formula	C ₄ H ₂ O ₃
Molecular weight	98.06 g/mol
Surface tension	Not surface active.

SECTION 10: Stability and reactivity

10.1. Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
10.2. Chemical stability	Material is stable under normal conditions.

10.3. Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
10.4. Conditions to avoid	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Avoid temperatures exceeding the decomposition temperature. Contact with incompatible materials. Minimise dust generation and accumulation.
10.5. Incompatible materials	Alcohols. Alkali metals. Alkali metals. Amines. Caustics. Water, moisture. Strong oxidising agents.
10.6. Hazardous decomposition products	No hazardous decomposition products are known.

SECTION 11: Toxicological information

General information	Occupational exposure to the substance or mixture may cause adverse effects.
Information on likely routes of exposure	
Inhalation	May cause irritation to the respiratory system. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Prolonged inhalation may be harmful.
Skin contact	Causes severe skin burns. May cause an allergic skin reaction.
Eye contact	Causes serious eye damage.
Ingestion	Causes digestive tract burns. Harmful if swallowed.
Symptoms	Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. Dusts may irritate the respiratory tract, skin and eyes. Difficulty in breathing.
11.1. Information on toxicological effects	
Acute toxicity	Harmful if swallowed.
Skin corrosion/irritation	Causes severe skin burns.
Serious eye damage/eye irritation	Causes serious eye damage.
Respiratory sensitisation	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin sensitisation	May cause an allergic skin reaction.
Germ cell mutagenicity	Due to partial or complete lack of data the classification is not possible.
Carcinogenicity	Due to partial or complete lack of data the classification is not possible.
Reproductive toxicity	Due to partial or complete lack of data the classification is not possible.
Specific target organ toxicity - single exposure	Due to partial or complete lack of data the classification is not possible.
Specific target organ toxicity - repeated exposure	Causes damage to organs (Lung and respiratory system) through prolonged or repeated exposure. May cause damage to organs (Lung and respiratory system) through prolonged or repeated exposure.
Aspiration hazard	Due to partial or complete lack of data the classification is not possible.
Mixture versus substance information	No information available.
Other information	Not available.

SECTION 12: Ecological information

12.1. Toxicity	The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.
12.2. Persistence and degradability	The product is readily biodegradable. Not persistent.
12.3. Bioaccumulative potential	
Partition coefficient n-octanol/water (log Kow)	
-2.61, at 20 °C (68 °F) (Log Kow)	
Bioconcentration factor (BCF)	Not available.
12.4. Mobility in soil	This product is water soluble and may disperse in soil.
12.5. Results of PBT and vPvB assessment	Not a PBT or vPvB substance or mixture.
12.6. Other adverse effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Residual waste	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.
EU waste code	The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Disposal methods/information	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.
Special precautions	Dispose in accordance with all applicable regulations.

SECTION 14: Transport information

ADR

14.1. UN number	UN2215
14.2. UN proper shipping name	MALEIC ANHYDRIDE
14.3. Transport hazard class(es)	
Class	8
Subsidiary risk	-
Label(s)	8
Hazard No. (ADR)	80
Tunnel restriction code	E
14.4. Packing group	III
14.5. Environmental hazards	No.
14.6. Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

RID

14.1. UN number	UN2215
14.2. UN proper shipping name	MALEIC ANHYDRIDE
14.3. Transport hazard class(es)	
Class	8
Subsidiary risk	-
Label(s)	8
14.4. Packing group	III
14.5. Environmental hazards	No.
14.6. Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

ADN

14.1. UN number	UN2215
14.2. UN proper shipping name	MALEIC ANHYDRIDE
14.3. Transport hazard class(es)	
Class	8
Subsidiary risk	-
Label(s)	8
14.4. Packing group	III
14.5. Environmental hazards	No.
14.6. Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IATA

14.1. UN number	UN2215
14.2. UN proper shipping name	Maleic anhydride
14.3. Transport hazard class(es)	
Class	8
Subsidiary risk	-
14.4. Packing group	III
14.5. Environmental hazards	No.
ERG Code	8L
14.6. Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IMDG

14.1. UN number	UN2215
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14.2. UN proper shipping name MALEIC ANHYDRIDE

14.3. Transport hazard class(es)

Class 8

Subsidiary risk -

14.4. Packing group III

14.5. Environmental hazards

Marine pollutant No.

EmS F-A, S-B

14.6. Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU regulations

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and II, as amended
Not listed.

Regulation (EC) No. 850/2004 On persistent organic pollutants, Annex I as amended
Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended
Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended
Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended
Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended
Not listed.

Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry, as amended
Not listed.

Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA
Not listed.

Authorisations

Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorization, as amended
Not listed.

Restrictions on use

Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended
Not listed.

Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work, as amended.
Not listed.

Other EU regulations

Directive 2012/18/EU on major accident hazards involving dangerous substances, as amended
Not listed.

Other regulations

The product is classified and labelled in accordance with Regulation (EC) 1272/2008 (CLP Regulation) as amended. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006, as amended.

National regulations

Young people under 18 years old are not allowed to work with this product according to EU Directive 94/33/EC on the protection of young people at work, as amended. Follow national regulation for work with chemical agents in accordance with Directive 98/24/EC, as amended.

15.2. Chemical safety assessment

Chemical Safety Assessment has been carried out.

SECTION 16: Other information

List of abbreviations

PBT: Persistent, bioaccumulative and toxic.
vPvB: Very Persistent and very Bioaccumulative.
STEL: Short-Term Exposure Limit.

References	TWA: Time Weighted Average Value. ECHA registered substances database
Information on evaluation method leading to the classification of mixture	Not applicable.
Full text of any H-statements not written out in full under Sections 2 to 15	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. H372 Causes damage to organs through prolonged or repeated exposure. H373 May cause damage to organs through prolonged or repeated exposure.
Training information	Follow training instructions when handling this material.
Disclaimer	INEOS Joliet Europe, SARL 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 user's 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. The information in the sheet was written based on the best knowledge and experience currently available.