



Specification

Product Name: Malic Acid

Product Code: SPEC0041

Description:

Malic Acid is a natural compound, which is the active ingredient in many sour or tart foods. It is tarter than either Ascorbic or Citric Acid. Malic Acid is a tart-tasting acid and is used to enhance flavour profiles. It is a natural substance that is found in fruits and vegetables, most associated with apples. Suitable for Vegans and Ova-Lacto Vegetarians, Non-GMO, Gluten Free.

E Number	E-296
Usage	Food
Chemical Name	DL-Malic Acid, Hydroxybutanedioic acid, hydroxy succinic acid
Formula	$C^4H^6O^5$
Molecular Weight	134,09
CAS No.	6915-15-7

Specifications	
Assay	99-100.5%
Melting point	127-132 °C
Fumaric Acid	Max 1%
Maleic Acid	Max 0.05%
Water insoluble	Max 0.1%
Residue On Ignition (Ash)	Max 0.1%
Heavy Metals	Max 10 ppm, mg/kg
Arsenic	Max 2 ppm, mg/kg
Lead	Max 2 ppm, mg/kg
Specific Rotation	-0.1 to +0.1
Mercury	Max 1 ppm, mg/kg

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Malate	Positive
Mesh size (on 25)	Max 15%
Mesh size (through 100)	Max 5%

Ingredients:

Malic Acid (E296)

Dietary Information:

Suitable for Vegans and Ova-Lacto Vegetarians, Non-GMO, Gluten Free.

Nutritional Information:

Based on typical content/100g: Energy: 999kj/239kcal, Fat: 0g, Carbohydrates: 0g, Protein: 0g, Salt: <0.05g.

Storage:

Store in dry, cool conditions and not in direct sunlight.

Packaging:

50g, 100g, 250g, 500g, 5kg, 10kg.

Shelf Life:

48 months from production date.

Allergen Declaration

Allergen	Contains (Y/N)
Cereals containing Gluten	N
Crustaceans	N
Eggs	N
Fish	N
Peanuts	N
Soybeans	N
Milk	N
Nuts	N
Celery	N
Mustard	N
Sesame Seeds	N

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Sulphur Dioxide and Sulphites (at concentration of more than 10mg/kg or 10mg/L in terms of Sulphur Dioxide)	N
Lupin	N
Molluscs	N

Material Safety Data Sheet

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

1.1 – Product identifier – Identification of the substance: DL- Malic acid, Registration number (REACH): 01-2119552463-40-xxxx, EC Number: 210-514-9, CAS Number: 617-48-1.

1.2 – Relevant identified uses of the substance or mixtures and uses advised against – Relevant identified uses: Professional use, Industrial use, for additional information on uses please see Exposure scenarios(s) in attachment of the SDS

Details of the Supplier: Special Ingredients Ltd, 4 Foxwood View, Chesterfield, S41 9RN. Tel: 0044 (0)1246 906247. E-mail address: <https://specialingredients.co.uk/pages/contact>,

1.3 – Emergency Telephone Number: Emergency Telephone Contact: 07701 095864.

2: Classification of the substance or mixture:

Section	Hazard class	Category	Hazard class and category	Hazard statement
3.3	Serious eye damage/ eye irritation	2	Eye Irrit.2	H319

For full text of abbreviations see section 16.

2.2: Label elements:

Labelling according to Regulation (EC) No 1272/2008 (CLP):

Signal word: Warning, Pictograms: GHS07

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Hazard statements: H319: Causes serious eye irritation, Precautionary statements: P264: Wash thoroughly after handling, P280: Wear protective gloves/Protective clothing/eye protection/face protection/hearing protection, P350+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes, Remove contact lenses, if present and easy to do, continue rinsing, P337+P313: If eye irritation persists: get medical attention.

2.3: Other Hazards:

There is no additional information, Results of PBT and vPvB assessment: According to the results of its assessment, this substance is not a PBT or a vPvB.

3: Composition/Information on Ingredients:

3.1 Substances:

Name of substance: DL-malic acid, Identifiers, Reach Reg.No:01-2119552463-40-xxxx, CAS No:617-48-1, EC No: 210-514-9, Purity: ≥99 %.

Impurities and additives, classification acc. To GHS				
Name of substance	Identifier	Wt%	Classification acc. GHS	Pictograms
Fumaric acid	CAS No 110-17-8 EC No 203-742-5	≤ 1	Acute Tox. 4 / H332 Eye Irrit. 2 / H319	
Maleic Acid	Cas No 110-16-7 EC No 203-742-5	≤ 0.5	Acute Tox. 4 / H302 Skin Irrit. 2 / H315 Eye Irrit. 2 / H319 Skin Sens. 1 / H317 STOT SE 3 / H335	

Specific Conc. Limits	M-factors	ATE	Exposure Route
-	-	2,000 mg/kg	Dermal



Molecular formula: C₄H₆O₅, Molar Mass: 134.1 g/mol, For full text of abbreviations: see section 16.

4: First Aid Measures:

4.1 – First aid measures:

General notes: Do not leave affected person unattended. Remove victim out of the danger area, Keep affected person warm, still and covered. Take off immediately all contaminated clothing, In all cases of doubt, or when symptoms persist, seek medical advice. In case of unconsciousness place person in recovery position, Never give anything by mouth. Following inhalation: If breathing is irregular or stopped, immediately seek medical assistance and start first aid actions, Provide fresh air. Following skin contact: Rinse skin with water/ shower, Wash skin with water and soap or mild detergent, If skin irritation or rash occurs: Get medical advice/ attention. Following eye contact: Remove contact lenses, if present and easy to do, Continue rinsing, Irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart. Avoid strong water stream – the risk of corneal damage, If eye irritation persists: Get medical advice/ attention. Following ingestion: Rinse mouth with water (only if the person is conscious), Do not induce vomiting.

4.2 – Most important symptoms and effects, both acute and delayed:

Description of known symptoms following exposure, if relevant – see section 11.

4.3 – Indication of any immediate medical attention and special treatment needed:

Treat symptomatically.

5: Firefighting Measures:

5.1 Extinguishing Media:

The product is non-flammable. Extinguishing measures to surroundings. Suitable extinguishing media: Water, Foam, Sand. Unsuitable extinguishing media: Information not available.

5.2 Special hazards arising from the substance or mixture:

Not flammable, but will support combustion. The substance does not spontaneously combust or react with water or damp air to form flammable gases. Hazardous combustion products: Information not available.

5.3 Advise for firefighters:

In case of fire and/or explosion do not breathe fumes, Co-ordinate firefighting measures to the fire surroundings. Do not allow firefighting water to enter drains or water courses. Fight fire with normal precautions from a reasonable distance. Fire fighting crew should be adequately trained and equipped with self-contained breathing apparatus and full protective clothing. Cool closed containers exposed to fire with water spray.

6: Accidental Release Measures:

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

Stop the leak if possible and safe to do so (seal, close the liquid isolation valve, put the leaking or damaged container to emergency container), Eliminate all sources of ignition. Ventilate affected area. For non-emergency personnel: Remove persons to safety, For emergency responders: Wear breathing apparatus if exposed to vapours/dust/spray/gases. Personal protective equipment: see section 8.

6.2 Environment Precautions:

Keep away from drains, surface and ground water.

6.3 Methods and Materials for containment and cleaning up:

Advice on how to contain a spill: covering of drains, Advice on how to clean up a spill: Take up mechanically, Other information relating to spills and releases: Place in appropriate containers for disposal, Ventilate affected area, Collected waste water is directed to the waste water treatment facility, Collection of waste water prior to discharge off site to ensure that the concentration of the substance is less than 0.1 mg/l in waste water at the water treatment plant.

6.4 Reference to other sections:

Hazardous combustion products: see section 5, Personal protective equipment: see section 8, Incompatible materials: see section 10, Disposal considerations: see section 13.

7: Handling and Storage:**7.1 Precautions for safe handling:**

Comply with the current legislation concerning the prevention of industrial risks. Control spills and residues, destroying them with safe methods (section 6). Containers which were opened must be carefully closed and kept upright to prevent leakage. Recommendations: Measures to prevent fire as well as aerosol and dust generation: Use only in well-ventilated areas. Take precautionary measures against static discharge, Prevent generation of dust, through handling in closed conditions and ensuring good ventilation in the workplace. Advice on general occupational hygiene: Wash hands after use. Do not eat, drink and smoke in work areas. Remove contaminated clothing and protective equipment before entering eating areas. Never place chemicals in containers that are normally used for food or drink. Keep away from food, drink and animal feeding stuffs.

7.2 Condition for safe storage, including any incompatibilities:

Protect against frost, fire and direct sunlight, Managing of associated risks: Explosive atmospheres: Removal of dust deposits. Handling equipment should be earthed and sources of ignition isolated, Flammability hazards: Ensure easy access to fire fighting measures in the place of use and storage. Ventilation Requirements: Use local and general ventilation.

7.3 Specific and uses:

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See section 16 for a general overview.

8: Exposure Controls/Personal Protection:

8.1 Control parameters:

National limit values: occupational exposure limit values (Workplace Exposure Limits):

Coun try	Name of substa nce	C AS N o	Identi fier	TW A (pp m)	TWA (mg/ m ₃)	STE L (pp m)	STEL (mg/ m ₃)	Ceili ng - C (pp m)	Ceili ng (mg/ m ₃)	Notat ion	Source
GB	Fumari c acid		WEL		10					I	EH40/2 005
GB	Fumari c acid		WEL		4					R	EH40/2 005

Notation: Ceiling-C: ceiling value is a limit value above which exposure should not occur, I: inhalable fraction, r: Respirable fraction, STEL: short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period (unless otherwise specified), TWA: time-weighted average (long term exposure limit): measured or calculated in relation to a reference period of 8 hours' time-weighted average (unless otherwise specified).

Human Health Values:

Relevant DNELS and other threshold levels				
Endpoint	Threshold levels	Protection goal, route of exposure	Used in	Exposure time
DNEL	175	Human,	Worker	Chronic –
	mg/m ³	inhalatory	(industry)	systemic effects
DNEL	50 mg/kg	Human, dermal	Worker (industry)	Chronic –
				systemic effects

Environmental values:

Relevant PNECs and other threshold levels				
Endpoint	Threshold level	Organism	Environmental compartment	Exposure time
PNEC	0,1 mg/l	Aquatic organisms	Freshwater	Short-term (single instance)



PNEC	0.01 mg/l	Aquatic organisms	Marine water	Short-term (single instance)
PNEC	3 mg/l	Aquatic organisms	Sewage treatment plant (STP)	Short-term (single instance)
PNEC	1 mg/l	Not specified	Water	Intermittent release

8.2 - Exposure controls:

Appropriate engineering controls: see attached exposure scenario, Individual protection measures (personal protective equipment): use personal protective equipment with CE marking, coveralls, eye protection and dust masks should be worn when handling the substance, Eye/face protection: Wear eye/face protection, wear safety glasses or face protection when there is a likelihood of exposure, skin protection: Hand protection: Chemical protection gloves are suitable which are tested according to EN 374. Protective gloves should be replaced immediately if damaged or in case of signs of wear, Other protection measures: Take recovery periods for skin regeneration, Preventative skin protection (barriers creams/ ointments) is recommended. Wash hands thoroughly after handling. Respiratory protection: Not required under normal conditions of use. When workers are facing concentrations above the exposure limit, they must use appropriate certified respirators. Conforming to EN 143 eg P2/P3 particle filters. Thermal hazards: In case of working with hot/molten metal, Environmental exposure controls: Use appropriate container to avoid environmental contamination, Keep away from drains, surface and ground water.

9: Physical and Chemical Properties:

9.1 - Information on basic physical and chemical properties:

Physical state	Solid (powder, crystalline)
Colour	White
Odour	Characteristic
Melting point, Freezing point	129°C at 1,013 hPa
Boiling point or initial boiling point and boiling range	150°C at 1,013 hPa
Flammability	Not flammable, but will support combustion
Lower and upper explosion limit	Not determined
Flash point	Not applicable
Auto-ignition	Not determined
Decomposition Temperature	Not relevant
pH (value)	Not applicable



Kinematic viscosity	Not relevant
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Solubility(ies)

Water solubility	>500 g/l at 25°C
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Partition coefficient

Partition coefficient n-octanol/water (log value)	1.6 (pH value: ~2.3, 24°C)
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Vapour pressure	0.0004 Pa at 25°C
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Density and/or relative density:

Density	1.601 g/cm ³ at 20°C
Relative vapour density	Information on this property is not available

9.2 - Other safety information:

Information with regard to physical hazard classes	Hazard classes acc. GHS (physical hazards): not relevant
Other safety characteristics	There is no additional information

10: - Stability and Reactivity:**10.1 - Reactivity:**

This material is not reactive under normal ambient conditions.

10.2 - Chemical stability

Stable under normal conditions of use.

10.3 - Possibility of hazardous reactions:

No known hazardous reactions.

10.4 - Conditions to avoid:

There are no specific conditions known which have to be avoided. Hints to prevent fire or explosion: The product in the delivered form is not dust explosion capable, the enrichment of fine dust however leads to the danger of dust explosion.

10.5 - Incompatible materials:

Under the normal conditions of use there are no dangerous reactions known.

10.6 - Hazardous decomposition products:

Reasonably anticipated hazardous decomposition products produced as a result of use, storage, spill and heating are not known. Hazardous combustion products: see section 5.

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11: - Toxicological Information:

11.1 - Information on hazard classes as defined in Regulation (EC) No 1272/2008:

Classification according to GHS (1272/2008/EC, CLP): Acute toxicity: based on available data, the classification criteria are not met, Skin corrosion/irritation: shall not be classified as corrosive/irritant to skin, serious eye damage/eye irritation: Causes serious eye irritation, Respiratory or skin sensitisation: Shall not be classified as a respiratory or skin sensitiser, Germ cell mutagenicity: Shall not be classified as germ cell mutagenic, Carcinogenicity: shall not be classified as carcinogenic, reproductive toxicity: shall not be classified as a reproductive toxicant, Specific target organ toxicity – single exposure: shall not be classified as a specific target organ toxicant (single exposure). Specific target organ toxicity – repeated exposure: Shall not be classified as a specific target organ toxicant (repeated exposure), Aspiration hazard: shall not be classified as presenting an aspiration hazard. Symptoms related to the physical, chemical and toxicological characteristics: If swallowed: No information specified, If in eyes: May cause serious irritation and redness of the eyes, If on skin: May caused local irritation.

11.2 - Information on other hazards:

There is no additional information.

12: Ecological Information:

12.1 – Toxicity:

Shall not be classified as hazardous to the aquatic environment. Biodegradation: the substance is readily biodegradable. The relevant substances of the mixture are readily biodegradable.

12.2 Persistence and degradability:

The substance will readily biodegrade in the environment and will not persist.

12.3 Bioaccumulative potential:

It is not expected that the mixture or its components are capable of bioaccumulation.

n-octanol/water (log KOW)	1.6 (pH value: ~2.3, 24 °C)
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12.4 Mobility in soil:

Henry's law constant	0 Pa m ³ /mol at 25°C
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12.5 Results of PBT and vPvB Assessment:

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Not considered to be vPvB or PBT.

12.6 – Endocrine disrupting properties:

Not listed.

**12.7 – Other adverse effects:**

Harmful effects to aquatic organisms due to pH-shift

13: - Disposal Considerations:**13.1 - Waste treatment methods:**

Dispose of contents/container to a facility in accordance with local and national regulations, Waste should be recovered or disposed of in authorized incineration plants or waste facilities in accordance with applicable regulations. Sewage disposal-relevant information: Do not empty in to drains, Avoid release to the environment, refer to special instructions/ safety data sheets. Waste treatment of containers/packaging: Completely emptied packages can be recycled, Handle contaminated packages in the same way as the substance itself. Remarks: Please consider the relevant national or regional provisions. Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities.

14 - Transport Information:**14.1 - UN number or ID number:**

Not subject to transport regulations.

14.2 - UN proper shipping name:

Not relevant.

14.3 - Transport hazard class(es):

none

14.4 - Packaging group:

Not assigned

14.5 - Environmental hazards:

Non-environmentally hazardous acc. To the dangerous goods regulations

14.6 - Special precautions for use:

There is no additional information.

14.7 – Maritime transport in bulk according to IMO instruments:

This cargo is not intended to be carried in bulk. Information for each of the UN model

Regulations: **International Maritime Dangerous Goods Code (IMDG) – Additional**

information: Not subject to IMDG, **International Civil Aviation Organization (ICAO-**

IATA/DGR) – Additional information: Not subject to ICAO-IATA.

**15: Regulatory Information:****15.1 Safety, health and environmental regulation / legislation specific for the substance or mixture:**

Relevant provisions of the European Union (EU): Regulation of the European parliament and of the council (EC) No 1907/2006 (Reach as amended). Regulation of the European parliament and of the Council (EC) No 1272/2008 (CLP) as amended. Restrictions according to Reach, Annex XVII: the product and listed ingredients are subject to the following restrictions, according to REACH Annex XVII. None of these restrictions are for the identified use of the product.

Dangerous substances with restrictions (REACH, Annex XVII.				
Name of substance	Name acc. to inventory	CAS No .	Restriction	No
Maleic acid	This product meets the criteria for classification in accordance with Regulation No 1272/2008/EC		R3	3
Maleic acid	Substances in tattoo inks and permanent make-up		R75	75
Fumaric acid	Substances in tattoo inks and permanent make-up		R75	75

List of substances subject to authorisation (REACH, Annex XIV) / SVHC - candidate list not listed.

Deco-paint Directive:

VOC Content	0.007%
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Industrial Emissions Directive (IED):

VOC Content	0.007%
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Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS): Not listed, Regulation concerning the establishment of a European Pollutant Release and Transfer Register (PRTR): Not listed, Water Framework Directive (WFD): Not listed, Regulation on persistent organic pollutants (POP): Not listed. National inventories:

Country	Inventory	Status
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EU	REACH Reg.	All ingredients are listed
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Legend: REACH Reg: REACH Registered substances.

15.2 – Chemical Safety Assessment:

No chemical safety assessment has been carried out for this :
assessment is not required for this mixture **16: Other Informa**

Abbreviations and Acronyms:

Abbr.	Descriptions of used abbreviations
Acute Tox.	Acute Tox. Acute toxicity
ADR	Accord relatif au transport international des merchandise's dangereuses par route (Agreement concerning the International Carriage of Dangerous Goods by Road)
ATE	Acute Toxicity Estimate
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
Ceiling-C	Ceiling value
CLP	Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
DGR	Dangerous Goods Regulations (see IATA/DGR)
DNEL	Derived No-Effect Level

Abbr.	Descriptions of used abbreviations
EC No	The EC Inventory (EINECS, ELINCS and the NLPList) is the source for the seven-digit EC number, an identifier of substances commercially available within the EU (European Union)
EH40/2005	EH40/2005 Workplace exposure limits (http://www.nationalarchives.gov.uk/doc/opengovernment-licence/)
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
Eye Dam.	Seriously damaging to the eye
Eye Irrit.	Irritant to the eye



GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods Code
NLP	No-Longer Polymer
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
Ppm	Parts per million
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses
	(Regulations concerning the International carriage of Dangerous goods by Rail)
Skin Corr.	Corrosive to skin
Skin Irrit.	Irritant to skin
Skin Sens.	Skin sensitisation
STEL	Short-term exposure limit
STOT SE	Specific target organ toxicity - single exposure
SVHC	Substance of Very High Concern
TWA	Time-weighted average
VOC	Volatile Organic Compounds
vPvB	Very Persistent and very Bioaccumulative

Key literature references and sources for data

Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures, Regulation (EC) No. 1907/2006 (REACH), amended by 2020/878/EU. Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). Regulations concerning the International Carriage of Dangerous Goods by Rail (RID). International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

List of relevant phrases (code and full text as stated in section 2 and 3):

Code	Text
H302	Harmful if swallowed



H315	Causes skin irritation
H317	May cause an allergic skin reaction
H319	Causes serious eye irritation
H332	Harmful if inhaled
H335	May causes respiratory irritation

Training advice

Training recommendations: Workers must be aware of handling risks and health and environmental protection requirements. Disclaimer: This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.

The information contained in this data sheet is, to the best of our knowledge, true and accurate, but any recommendations or suggestions which may be made are without guarantee, since the conditions of use are beyond our control. We do not accept any liability whatsoever, however arising, which results directly or indirectly from the use of the product.