Jungbunzlauer

# Data Packet
## Lactic Acid Food Grade

**Attached documents:**

- Product Information
- International Registry Numbers and Classifications
- Microbiological Data
- SDS
- Nutritional Data
- Description of the Production Process
- Shelf Life Data Sheet
- Allergen Statement – Food Safety and Suitability
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- California Proposition 65
- Certificate of Origin
- FSSC 22000 Certificate
- GMO Statement
- Halal Certificate
- ISO 9001 Certificate
- Kosher Certificate

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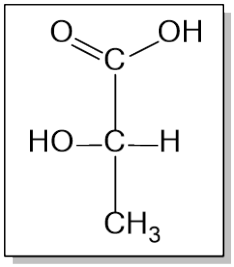
# Product Information
## L(+)-Lactic Acid
Food Grade

### General Information
Lactic acid is an organic acid occurring naturally in the human body and in fermented foods. The commercial production of lactic acid is typically done by fermentation. There are two optical forms of lactic acid existing whereby Jungbunzlauer has chosen to produce pure L(+)-lactic acid by traditional fermentation of carbohydrates. L(+)-lactic acid is better metabolised.
Jungbunzlauer L(+)-lactic acid is a mild tasting acidity regulator with flavour enhancing and antibacterial and antiviral properties. It can be used in a wide range of food, personal care and chemical products. Jungbunzlauer L(+)-lactic acid is vegan and manufactured from renewable raw materials without the use of GMO.

### Chemical Data

| | |
|---|---|
| Chem. Nomenclature | S(+)-2-hydroxypropanoic acid |
| Chem. Formula | $C_3H_6O_3$ |
| Molecular weight | 90.08 g/mol |
| pH (50%) | < 2 |
| Density at 20°C | 1.11 – 1.13 g/cm$^3$ (50 %) |
| | 1.18 – 1.20 g/cm$^3$ (80 %) |
| | 1.19 – 1.21 g/cm$^3$ (88 %) |
| | 1.20 – 1.21 g/cm$^3$ (90 %) |
| EC No. | 201-196-2 (general 200-018-0) |
| CAS No. | 79-33-4 (general 50-21-5) |
| E-No. | E 270 |




### Characteristics
Jungbunzlauer L(+)-lactic acid is a colourless to yellowish, nearly odourless, syrupy liquid with a mild acid taste. It is commercially available as aqueous solutions of various concentrations. These solutions are stable under normal storage conditions.
L(+)-lactic acid is non-toxic to human and the environment, but concentrated solutions of L(+)-lactic acid can cause skin corrosion and eye damage. They have thus to be labelled with a hazard pictogram and related statements. L(+)-lactic acid falls under the dangerous goods definition and carries the UN number 3265 (Corrosive liquid, acidic, organic, n.o.s. (lactic acid)).
L(+)-lactic acid is readily biodegradable.

### Legal Aspects
In Europe, lactic acid is listed as a generally permitted food additive (E 270) and may be added to all foodstuffs, following the “quantum satis“ principle, as long as no special regulation restricts the use.
The US Food and Drug Administration (FDA) affirmed lactic acid as GRAS (generally recognized as safe) substance and permitted the use in food except infant food with no limitation other than current good manufacturing practice for use as antimicrobial agent, curing or pickling agent, flavor enhancer, flavoring agent or adjuvant, pH control agent, solvent or vehicle (CFR § 184.1061).

L(+)-lactic acid is classified and labelled according to GHS (Globally Harmonized System), implemented by the European Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation) as follows:

| Pictogram: | Signal Word: | Hazard statement: | Precautionary statements: |
|---|---|---|---|
|  | Danger | H314 Causes severe skin burns and eye damage.<br>EUH071 Corrosive to the respiratory tract. | P260 Do not breathe vapours.<br>P264 Wash hands thoroughly after handling.<br>P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.<br>P301 + P330 + P331 + P310 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER/ doctor.<br>P303 + P361 + P353 + P310 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Immediately call a POISON CENTER/ doctor.<br>P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.<br>P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if pre-sent and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.<br>P501 Dispose of contents/ container to an approved waste disposal plant. |

## Packaging and Storage

Jungbunzlauer L(+)-lactic acid is currently supplied in bulk, in intermediate bulk containers (IBCs) with 1200 kg net weight (1100 kg net for 50% solution), in drums with 250 kg net weight (240 kg net for 50% solution) and small drums with 25 kg net weight. We recommend not to triple stack the pallets. Our L(+)-lactic acid packaging conforms to the UN packaging group III.

Jungbunzlauer guarantees a shelf life of 36 months from production date for L(+)-lactic acid if the product is stored in its original packaging at temperatures between 5 and 30 °C.

L(+)-lactic acid has to be stored as corrosive material. The relevant regulations for storing hazardous materials are not harmonised but defined individually by each country (e.g. Code de l'Environnement/ICPE in France, GefStoffVO/TRGS 510 in Germany, PGS15 in the Netherlands, MIEAPQ in Spain, COSHH in the UK). Please check your local requirements.

## Standards and Certificates

Jungbunzlauer L(+)-lactic acid is Halal certified. A Halal certificate is available on request.

Jungbunzlauer L(+)-lactic acid is Kosher certified. A Kosher certificate is available on request.
The Kosher certified Jungbunzlauer products carry a Kosher U on the original packaging.
Kosher product in bulk is supplied as follows:

- For deliveries in bulk tank truck there is a specific (Kosher) material number, since the tank truck for transport of bulk Kosher material has to be maintained by Kosher wash.

**Unique Formulation Identifier (UFI)**

| | |
|---|---|
| L(+)-Lactic Acid 50% | Y51V-4JJG-T000-W2SX |
| L(+)-Lactic Acid 80% | 6R3V-AJ8D-Y00U-RA8V |
| L(+)-Lactic Acid 88% | JF4V-CJSK-E00T-11XD |
| L(+)-Lactic Acid 90% | 5M4V-DJ5D-100S-CR3H |

## Specification

Jungbunzlauer L(+)-lactic acid food grade is supplied in accordance with the requirements of Commission Regulation (EU) No 231/2012 and of the latest edition of the Food Chemicals Codex (FCC).

| Jungbunzlauer parameters and limits | 50% | 80% | 80% heat stable | 88% | 88% heat stable | 90% heat stable |
|---|---|---|---|---|---|---|
| **Assay** | 50.0 – 51.0 % | 79.5 – 80.5 % | 79.5 – 80.5 % | 87.5 – 88.5 % | 88.0 – 89.0 % | 89.5 – 90.5 % |
| **Stereochemical purity (L-isomer)** | min. 97 % | | | | | |
| **Colour fresh** | max. 50 apha | max. 50 apha | max. 35 apha | max. 50 apha | max. 35 apha | max. 35 apha |
| **Colour (6 months, 25°C)** | max. 50 apha | max. 50 apha | not specified | max. 50 apha | not specified | not specified |
| **Colour (after heating at 200°C, 2h)** | not specified | not specified | max. 50 apha | not specified | max. 50 apha | max. 50 apha |
| **Identification** | conforms | | | | | |
| **Density (20°C)** | 1.11 – 1.13 g/cm$^3$ | 1.18 – 1.20 g/cm$^3$ | | 1.19 – 1.21 g/cm$^3$ | | 1.20 – 1.21 g/cm$^3$ |
| **Sulphated Ash** | max. 0.05 % w/w | max. 0.1 % w/w | max. 0.05 % w/w | max. 0.1 % w/w | max. 0.05 % w/w | max. 0.05 % w/w |
| **Chloride** | max. 10 mg/kg | max. 20 mg/kg | | | | |
| **Sulphate** | max. 100 mg/kg | max. 100 mg/kg | max. 20 mg/kg | max. 100 mg/kg | max. 20 mg/kg | max. 20 mg/kg |
| **Cyanide** | max. 5 mg/kg | max. 5 mg/kg | max. 1 mg/kg | max. 5 mg/kg | max. 1 mg/kg | max. 1 mg/kg |
| **Iron** | max. 5 mg/kg | max. 10 mg/kg | max. 5 mg/kg | max. 10 mg/kg | max. 5 mg/kg | max. 5 mg/kg |
| **Arsenic** | max. 1 mg/kg | | | | | |
| **Lead** | max. 0.5 mg/kg | | | | | |
| **Mercury** | max. 0.5 mg/kg | max. 1 mg/kg | | | | |
| **Calcium** | max. 20 mg/kg | | | | | |
| **Citric, oxalic, phosphoric, or tartaric acid** | conforms | | | | | |
| **Readily carbonisable substances** | conforms | | | | | |
| **Reducing sugars** | conforms | | | | | |

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# International Registry Numbers and Classifications
## Lactic Acid

**Customs Tariff Number** 29181100
according harmonised system (HS code)

Chemicals Inventory Listing

| | | |
|---|---|---|
| Europe | **EINECS Nr. (EC No.)**<br>European Inventory of Existing Chemical Substances | 200-018-0<br>(L: 201-196-2) |
| Unites States of America | **CAS No.**<br>Chemical Abstracts Service | 50-21-5<br>(L: 79-33-4) |
| Australia | **AICS**<br>Australian Inventory of Chemical Substances | listed (=CAS No.) |
| Canada | **DSL**<br>Domestic Substances List | listed (=CAS No.) |
| | **NDSL**<br>Non-Domestic Substances List | not listed |
| China | **IECSC**<br>Inventory of Existing Chemical Substances | listed (=CAS No.) |
| Japan | **ENCS No. (MITI No.)**<br>Existing and New Chemical Substances | listed (=CAS No.) |
| | **ISHL**<br>Industrial Safety and Health Law | not listed |
| Mexico | **INSQ**<br>National Inventory of Chemical Substances | listed (=CAS No.) |
| New Zealand | **NZIoC**<br>New Zealand Inventory of Chemicals | listed |
| Philippines | **PICCS**<br>Philippine Inventory of Chemicals and Chemical Substances | listed |
| South Korea | **KECI**<br>Korea Existing Chemicals Inventory | KE-21803 |
| | **TCCL**<br>Toxic Chemical Control Law | not listed |
| Taiwan | **NCSI**<br>National Existing Chemical Inventory | listed (=CAS No.) |
| Turkey | **CICR**<br>Turkish Regulation on the Inventory and Control of Chemicals | listed (= EINECS Nr./EC No.) |

**REACH**
Registration number 01-2119474164-39-0004

Food Additive Listing

**EU Food additive** E 270

**INS number** 270

**FDA (Food and Drug Administration, USA)** 21 CFR § 184.1061
Code of Federal Regulations

Cosmetic Listing

**PCPC, INCI** listed as lactic acid
Personal Care Products Council
International Nomenclature of Cosmetic Ingredients

US Environmental Listing - Environmental Protection Agency (EPA)

**TSCA No.** 79-33-4 (= CAS No.)
Toxic Substances Control Act, USA

**CERCLA** not listed
Comprehensive Environmental Response, Compensation, and Liability Act

**SARA** not listed
Superfund Amendments and Reauthorization Act
Section 302 Extremely Hazardous Substances
Section 313 Toxic Chemical Release

**California Proposition 65** not listed
Proposition 65 State Drinking Water and Toxic Enforcement Act

**OSHA** not considered highly hazardous by OSHA

EC Environmental Listing - European Environment Agency (EEA)

**EC Symbols**
Signal word: Danger

**EC Risk Phrases** H318/H315
P264, P280, P302 + P352, P332 + P313, P305 + P351 + P338, P310

**WGK** 1 (Self-Classification)
Water Hazard Classes, Germany

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# Microbiological Data

## L(+)-Lactic Acid

All food grades

| | | |
|---|---|---|
| Product name | L(+)-lactic acid 50% food grade | $C_3H_6O_3$ |
| | L(+)-lactic acid 80% food grade | |
| | L(+)-lactic acid 80% heat stable food grade | |
| | L(+)-lactic acid 88% food grade | |
| | L(+)-lactic acid 88% heat stable food grade | |
| | L(+)-lactic acid 90% heat stable food grade | |
| EC No. | 201-196-2 (general 200-018-0) | |
| CAS No. | 79-33-4 (general 50-21-5) | |
| E-No. | E 270 | |

| | |
|---|---|
| Total Plate Count | max. 100 cfu / 1 g |
| Yeasts | max. 10 cfu / 1 g |
| Moulds | max. 10 cfu / 1 g |
| Listeria monocytogenes | absence / 25 g |
| Salmonella | absence / 25 g |
| Escherichia coli | negative to test |
| Enterobacteriaceae | negative to test |
| Staphylococcus aureus (as coagulase-positive staphylococci) | negative to test |

All analytical methods are in accordance with the requirements of the International Organization for Standardization (ISO) or equivalent test methods.

| Version | Revision Date: | SDS Number: | Date of last issue: - |
|---|---|---|---|
| 1.0 | 11/29/2021 | 100000000512 | Date of first issue: 11/29/2021 |
| US / EN | | | |

## SECTION 1. IDENTIFICATION

| | | |
|---|---|---|
| Product name | : | L(+)-Lactic Acid 50% |
| Substance name | : | L(+)-lactic acid aqueous solution 50% |
| Trade name | : | L(+)-Lactic Acid 50% |
| Molecular formula | : | C3-H6-O3 |
| Chemical identity | : | S(+)-2-Hydroxypropanoic acid |
| CAS-No. | : | 79-33-4 |
| Chemical nature | : | Liquid |

**Manufacturer or supplier's details**

**Details of the supplier of the safety data sheet**

| | | |
|---|---|---|
| Company | : | Jungbunzlauer Inc.<br>95 Wells Avenue, Suite 150<br>Newton, Massachusetts 02459<br>USA<br>www.jungbunzlauer.com |
| Telephone | : | +1 617 969-0900 |
| Telefax | : | +1 617 964-2921 |
| E-mail address Responsible/issuing person | : | msds@jungbunzlauer.com |

**Emergency telephone number**

National Chemical Emergency Centre (NCEC)
+1 202 464 2554

**Recommended use of the chemical and restrictions on use**

| | | |
|---|---|---|
| Recommended use | : | Food additive<br>Personal care<br>Cleaning agent<br>Biocidal product<br>Industrial use<br>Pharmaceutical raw material |
| Restrictions on use | : | None known. |

## SECTION 2. HAZARDS IDENTIFICATION

**GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)**

| | | |
|---|---|---|
| Skin corrosion | : | Category 1 |

Serious eye damage : Category 1

**GHS label elements**

Hazard pictograms :

Signal word : Danger

Hazard statements : H314 Causes severe skin burns and eye damage.

Precautionary statements :

**Prevention:**

P260 Do not breathe vapours.
P264 Wash skin 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/ shower.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P363 Wash contaminated clothing before reuse.

**Storage:**

P405 Store locked up.

**Disposal:**

P501 Dispose of contents/ container to an approved waste disposal plant.

**Hazards Not Otherwise Classified**

None known.

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Chemical nature : Liquid

**Hazardous components**

| Chemical name | CAS-No. | Concentration (% w/w) |
|---|---|---|
| L(+)-lactic acid | 79-33-4 | >= 50 - < 70 |

**Non-hazardous ingredients**

| Chemical name | CAS-No. | Concentration (% w/w) |
|---|---|---|
| H2O | 7732-18-5 | >= 30 - <= 50 |

## SECTION 4. FIRST AID MEASURES

| | | |
|---|---|---|
| General advice | : | Move out of dangerous area.<br>Consult a physician.<br>Show this safety data sheet to the doctor in attendance.<br>Do not leave the victim unattended. |
| If inhaled | : | If unconscious, place in recovery position and seek medical advice.<br>If symptoms persist, call a physician.<br><br>If breathed in, move person into fresh air.<br>No artificial respiration, mouth-to-mouth or mouth to nose. Use suitable instruments/apparatus. |
| In case of skin contact | : | Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.<br>If on skin, rinse well with water.<br>If on clothes, remove clothes. |
| In case of eye contact | : | Small amounts splashed into eyes can cause irreversible tissue damage and blindness.<br>In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.<br>Continue rinsing eyes during transport to hospital.<br>Remove contact lenses.<br>Protect unharmed eye.<br>Keep eye wide open while rinsing.<br>If eye irritation persists, consult a specialist.<br><br>Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. |
| If swallowed | : | Clean mouth with water and drink afterwards plenty of water.<br>Keep respiratory tract clear.<br>Do NOT induce vomiting.<br>Do not give milk or alcoholic beverages.<br>Never give anything by mouth to an unconscious person.<br>If symptoms persist, call a physician.<br>Take victim immediately to hospital. |
| Most important symptoms and effects, both acute and delayed | : | Severe eye irritation<br>Erythema<br>Skin disorders<br>Causes serious eye damage.<br>Causes severe burns. |
| Protection of first-aiders | : | Wear personal protective equipment. |
| Notes to physician | : | Treat symptomatically. |

## SECTION 5. FIREFIGHTING MEASURES

| | | |
|---|---|---|
| Suitable extinguishing media | : | Water mist<br>Dry powder<br>Carbon dioxide (CO2)<br>Foam |
| Unsuitable extinguishing media | : | High volume water jet |
| Specific hazards during fire-fighting | : | Do not allow run-off from fire fighting to enter drains or water courses.<br><br>Exposure to decomposition products may be a hazard to health. |
| Hazardous combustion products | : | Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke). |
| Further information | : | Collect contaminated fire extinguishing water separately. This must not be discharged into drains.<br>Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.<br><br>Standard procedure for chemical fires.<br>Use water spray to cool unopened containers.<br>In the event of fire and/or explosion do not breathe fumes. |
| Special protective equipment for firefighters | : | Wear self-contained breathing apparatus for firefighting if necessary.<br><br>Use personal protective equipment. |

## SECTION 6. ACCIDENTAL RELEASE MEASURES

| | | |
|---|---|---|
| Personal precautions, protective equipment and emergency procedures | : | Use personal protective equipment.<br>Material can create slippery conditions. |
| Environmental precautions | : | Prevent product from entering drains.<br>Prevent further leakage or spillage if safe to do so.<br>If the product contaminates rivers and lakes or drains inform respective authorities. |
| Methods and materials for containment and cleaning up | : | Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).<br>Keep in suitable, closed containers for disposal.<br><br>Clean contaminated surface thoroughly. |

## SECTION 7. HANDLING AND STORAGE

| | | |
|---|---|---|
| Technical measures | : | Avoid temperatures above 200°C. |
| Local/Total ventilation | : | Ensure adequate ventilation, especially in confined areas. |
| Advice on protection against fire and explosion | : | Normal measures for preventive fire protection. |
| Advice on safe handling | : | Do not breathe vapours/dust.<br>Avoid contact with skin and eyes.<br>For personal protection see section 8.<br>Smoking, eating and drinking should be prohibited in the application area.<br>To avoid spills during handling keep bottle on a metal tray.<br>Dispose of rinse water in accordance with local and national regulations. |
| Conditions for safe storage | : | Keep container tightly closed in a dry and well-ventilated place.<br>Observe label precautions.<br>Electrical installations / working materials must comply with the technological safety standards.<br><br>Keep in an area equipped with acid resistant flooring.<br>Store in original container. |
| Further information on storage conditions | : | Keep away from direct sunlight. |
| Materials to avoid | : | Incompatible with bases. |
| Recommended storage temperature | : | > 41 °F |
| Further information on storage stability | : | No decomposition if stored and applied as directed. |
| Packaging material | : | Suitable material: Plastic container of HDPE, Stainless steel 316L |

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Components with workplace control parameters**

Contains no substances with occupational exposure limit values.

| | | |
|---|---|---|
| **Engineering measures** | : | Ensure adequate ventilation, especially in confined areas. |

**Personal protective equipment**

| | | |
|---|---|---|
| Respiratory protection | : | No personal respiratory protective equipment normally required.<br><br>In the case of vapour formation use a respirator with an approved filter.<br>Use NIOSH approved respiratory protection. |

Hand protection

| | | |
|---|---|---|
| Remarks | : | The suitability for a specific workplace should be discussed with the producers of the protective gloves.<br>Wear suitable gloves tested to EN374. |
| Eye protection | : | Eye wash bottle with pure water<br>Tightly fitting safety goggles<br>Wear face-shield and protective suit for abnormal processing problems.<br>Ensure that eyewash stations and safety showers are close to the workstation location.<br>Safety glasses with side-shields |
| Skin and body protection | : | Impervious clothing<br>Choose body protection according to the amount and concentration of the dangerous substance at the work place.<br>acid-resistant protective clothing<br>Long sleeved clothing<br>Footwear protecting against chemicals |
| Hygiene measures | : | When using do not eat or drink.<br>When using do not smoke.<br>Wash hands before breaks and at the end of workday.<br>Handle in accordance with good industrial hygiene and safety practice.<br>Take off all contaminated clothing immediately.<br>Wash contaminated clothing before re-use. |

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| Appearance | : | Aqueous solution, viscous |
| Colour | : | colourless, light yellow |
| Odour | : | characteristic |
| Odour Threshold | : | Not relevant |
| pH | : | < 2 (77 °F / 25 °C) |
| Melting point/freezing point | : | < -112 °F / < -80 °C<br>(ca. 1,013.25 hPa) |
| Boiling point/boiling range | : | 230 - 266 °F / 110 - 130 °C |
| Flash point | : | Not applicable |
| Evaporation rate | : | Not applicable |
| Flammability (solid, gas) | : | Not applicable |
| Flammability (liquids) | : | Not applicable |

| | | |
|---|---|---|
| Upper explosion limit / Upper flammability limit | : | Not applicable |
| Lower explosion limit / Lower flammability limit | : | Not applicable |
| Vapour pressure | : | ca. 0.038 Pa (68 °F / 20 °C) |
| Relative vapour density | : | No data available |
| Density | : | 1.0 - 1.3 g/cm3 |
| Solubility(ies) | | |
| Water solubility | : | completely miscible |
| Partition coefficient: n-octanol/water | : | log Pow: -0.54 (68 °F / 20 °C) |
| Auto-ignition temperature | : | 752 °F / 400 °C |
| Decomposition temperature | : | No data available |
| Viscosity | | |
| Viscosity, dynamic | : | 18.4 mPa.s (77 °F / 25 °C) |
| Viscosity, kinematic | : | No data available |
| Explosive properties | : | Not applicable |
| Oxidizing properties | : | Not applicable |
| Surface tension | : | 70.7 mN/m, 1 g/l, 68 °F / 20 °C |
| Metal corrosion rate | : | Not corrosive to metals |

## SECTION 10. STABILITY AND REACTIVITY

| | | |
|---|---|---|
| Reactivity | : | No decomposition if stored and applied as directed. |
| Chemical stability | : | No decomposition if stored and applied as directed. |
| Possibility of hazardous reactions | : | No decomposition if stored and applied as directed. |
| Conditions to avoid | : | Temperature > 200 °C |
| Incompatible materials | : | Bases<br>Oxidizing agents |
| Hazardous decomposition products | : | Build-up of dangerous/toxic fumes possible in cases of fire/high temperature.<br>Carbon dioxide ($CO_2$)<br>Carbon monoxide |

## SECTION 11. TOXICOLOGICAL INFORMATION

**Acute toxicity**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Acute oral toxicity | : | LD50 Oral (Rat, female): 3,543 mg/kg<br>Test substance: Lactic acid<br>Assessment: The substance or mixture has no acute oral toxicity<br><br>LD50 Oral (Rat, male): 4,936 mg/kg<br>Test substance: Lactic acid<br>Assessment: The substance or mixture has no acute oral toxicity |
| Acute inhalation toxicity | : | LC50 (Rat, male and female): 7.94 mg/l<br>Exposure time: 4 h<br>Test atmosphere: vapour<br>Test substance: Lactic acid<br>Assessment: The substance or mixture has no acute inhalation toxicity, Corrosive to the respiratory tract. |
| Acute dermal toxicity | : | LD50 Dermal (Rabbit): 2,000 mg/kg<br>Test substance: Lactic acid<br>Assessment: The substance or mixture has no acute dermal toxicity |

**Skin corrosion/irritation**

Causes severe burns.

**Product:**

| | | |
|---|---|---|
| Remarks | : | Extremely corrosive and destructive to tissue. |

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Species | : | Rabbit |
| Exposure time | : | 4 h |
| Assessment | : | Corrosive after 1 to 4 hours of exposure |
| Result | : | Corrosive after 1 to 4 hours of exposure |
| Test substance | : | Lactic acid |

**Serious eye damage/eye irritation**

Causes serious eye damage.

**Product:**

| | | |
|---|---|---|
| Remarks | : | May cause irreversible eye damage. |

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Species | : | chicken |
| Result | : | Severe irritation |
| Test substance | : | Lactic acid |

**Respiratory or skin sensitisation**

**Skin sensitisation**

Not classified based on available information.

**Respiratory sensitisation**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Species | : | Guinea pig |
| Result | : | Does not cause skin sensitisation. |

**Germ cell mutagenicity**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Germ cell mutagenicity - Assessment | : | In vitro tests did not show mutagenic effects |

**Carcinogenicity**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Species | : | Rat, male and female |
| Result | : | Animal testing did not show any carcinogenic effects. |
| Test substance | : | Calcium lactate |

**IARC** No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**OSHA** No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

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

**Reproductive toxicity**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

**STOT - single exposure**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

Assessment : No data available

**STOT - repeated exposure**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

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

**Repeated dose toxicity**

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Species | : | Rat |
| LOAEL | : | 886 mg/kg |
| Application Route | : | Dermal |
| Exposure time | : | 13 wk |
| Number of exposures | : | 5 d/wk |
| Dose | : | 886 mg/kg bw |
| Test substance | : | Lactic acid |
| Assessment | : | slight irritation |

| | | |
|---|---|---|
| Species | : | Rat, female |
| NOAEL | : | 50,000 mg/l |
| Application Route | : | Oral |
| Exposure time | : | 13 wk |
| Number of exposures | : | 1/d |
| Dose | : | 5% |
| Test substance | : | Calcium lactate |
| Assessment | : | No adverse effects |

**Aspiration toxicity**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

No data available

**Experience with human exposure**

**Product:**

| | | |
|---|---|---|
| Inhalation | : | Target Organs: Respiratory system<br>Symptoms: No information available. |
| Skin contact | : | Target Organs: Skin<br>Symptoms: May cause skin irritation in susceptible persons. |
| Eye contact | : | Target Organs: Eyes<br>Symptoms: Redness, Itching |
| Ingestion | : | Target Organs: Digestive organs<br>Symptoms: No information available. |

**Further information**

**Product:**

| | | |
|---|---|---|
| Remarks | : | No data available |

## SECTION 12. ECOLOGICAL INFORMATION

**Ecotoxicity**

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Toxicity to fish | : | LC50 (Oncorhynchus mykiss (rainbow trout)): 130 mg/l<br>Exposure time: 96 h<br>Test substance: Lactic acid<br>Remarks: Not classified |
| Toxicity to daphnia and other aquatic invertebrates | : | EC50 (Daphnia magna (Water flea)): 130 mg/l<br>End point: Immobilization<br>Exposure time: 48 h<br>Test substance: Lactic acid<br>Remarks: Not classified due to data which are conclusive although insufficient for classification. |
| Toxicity to algae/aquatic plants | : | EC50 (Pseudokirchneriella subcapitata (algae)): > 2,800 mg/l<br>Exposure time: 72 h<br>Test substance: Lactic acid<br>Remarks: Not classified due to data which are conclusive although insufficient for classification.<br><br>NOEC (Pseudokirchneriella subcapitata (green algae)): 1,900 mg/l<br>Exposure time: 70 h<br>Test substance: Lactic acid<br>Remarks: Not classified due to data which are conclusive although insufficient for classification. |
| Toxicity to fish (Chronic toxicity) | : | LOEC (Fish (Oreochromus mossambica)): ca. 2.18 mg/l<br>Exposure time: 90 d |

Test substance: Lactic acid
Remarks: Environmental exposure assessment for this scenario is not relevant.

Toxicity to microorganisms : EC50 (activated sludge): > 100 mg/l
Exposure time: 3 h
Test Type: Respiration inhibition
Test substance: Lactic acid
Remarks: Not classified due to data which are conclusive although insufficient for classification.

Toxicity to terrestrial organisms : LC50 (Colinus virginianus (Bobwhite quail)): > 2,250 mg/kg
Exposure time: 14 d
Test substance: Lactic acid

**Persistence and degradability**

**Components:**

**L(+)-lactic acid:**

Biodegradability : Closed Bottle test
Inoculum: activated sludge
Biochemical oxygen demand
Biodegradation: 80 %
Exposure time: 28 d
Method: OECD Test Guideline 301
Test substance: L(+)-Lactic acid
Remarks: Readily biodegradable.

Ready biodegradability
Method: QSAR
Test substance: Lactic acid
Remarks: Readily biodegradable.

Stability in water : Remarks: Not applicable

**Bioaccumulative potential**

**Components:**

**L(+)-lactic acid:**

Bioaccumulation : Remarks: The product is miscible in water and readily biodegradable in both water and soil. Accumulation is not expected.

Partition coefficient: n-octanol/water : log Pow: -0.54 (68 °F / 20 °C)

**Mobility in soil**

**Components:**

**L(+)-lactic acid:**

Mobility : Method: Calculation, Mackay Level III Fugacity Model
Remarks: After release, disperses through ground water.

| | | |
|---|---|---|
| Distribution among environmental compartments | : | Koc: < 20.9, log Koc: < 1.32<br>Method: OECD Test Guideline 121<br>Remarks: Lactic acid |
| Stability in soil | : | Remarks: Readily biodegradable. |

**Other adverse effects**

**Product:**

| | | |
|---|---|---|
| Ozone-Depletion Potential | : | Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances<br>Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B). |
| Additional ecological information | : | No data available |

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Results of PBT and vPvB assessment | : | This substance is not considered to be persistent, bioaccumulating and toxic (PBT). |
| Additional ecological information | : | No data available |

## SECTION 13. DISPOSAL CONSIDERATIONS

**Disposal methods**

| | | |
|---|---|---|
| Waste from residues | : | Do not dispose of waste into sewer.<br>Do not contaminate ponds, waterways or ditches with chemical or used container.<br>Send to a licensed waste management company.<br><br>In accordance with local and national regulations. |
| Contaminated packaging | : | Empty remaining contents.<br>Dispose of as unused product.<br>Do not re-use empty containers. |

## SECTION 14. TRANSPORT INFORMATION

**International Regulations**

**IATA-DGR**

| | | |
|---|---|---|
| UN/ID No. | : | UN 3265 |
| Proper shipping name | : | Corrosive liquid, acidic, organic, n.o.s.<br>(lactic acid) |

| | | |
|---|---|---|
| Class | : | 8 |
| Packing group | : | III |
| Labels | : | Class 8 - Corrosive substances |
| Packing instruction (cargo aircraft) | : | 856 |
| Packing instruction (passenger aircraft) | : | 852 |

**IMDG-Code**

| | | |
|---|---|---|
| UN number | : | UN 3265 |
| Proper shipping name | : | CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (lactic acid) |
| Class | : | 8 |
| Packing group | : | III |
| Labels | : | 8 |
| EmS Code | : | F-A, S-B |
| Marine pollutant | : | no |

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable for product as supplied.

**National Regulations**

**DOT**

| | | |
|---|---|---|
| UN/ID/NA number | : | UN 3265 |
| Proper shipping name | : | Corrosive liquid, acidic, organic, n.o.s. (lactic acid) |
| Class | : | 8 |
| Packing group | : | III |
| Labels | : | CORROSIVE |
| ERG Code | : | 153 |
| Marine pollutant | : | no |

**Special precautions for user**

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

## SECTION 15. REGULATORY INFORMATION

**CERCLA Reportable Quantity**

This material does not contain any components with a CERCLA RQ.

**SARA 304 Extremely Hazardous Substances Reportable Quantity**

This material does not contain any components with a section 304 EHS RQ.

**SARA 302 Extremely Hazardous Substances Threshold Planning Quantity**

This material does not contain any components with a section 302 EHS TPQ.

| | | |
|---|---|---|
| **SARA 311/312 Hazards** | : | Skin corrosion or irritation<br>Serious eye damage or eye irritation |
| **SARA 313** | : | This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313. |

**Clean Air Act**

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

**Clean Water Act**

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.
This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.
This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307
This product does not contain any priority pollutants related to the U.S. Clean Water Act

**US State Regulations**

**Massachusetts Right To Know**

No components are subject to the Massachusetts Right to Know Act.

**Pennsylvania Right To Know**

| | |
|---|---|
| H2O | Not Assigned |
| L(+)-lactic acid | Not Assigned |

**Maine Chemicals of High Concern**

Product does not contain any listed chemicals

**Vermont Chemicals of High Concern**

Product does not contain any listed chemicals

**Washington Chemicals of High Concern**

Product does not contain any listed chemicals

**The components of this product are reported in the following inventories:**

| | | |
|---|---|---|
| TCSI | : | On the inventory, or in compliance with the inventory |
| TSCA | : | All substances listed as active on the TSCA inventory |
| AIIC | : | On the inventory, or in compliance with the inventory |
| DSL | : | All components of this product are on the Canadian DSL |
| ENCS | : | On the inventory, or in compliance with the inventory |
| ISHL | : | On the inventory, or in compliance with the inventory |
| KECI | : | On the inventory, or in compliance with the inventory |
| PICCS | : | On the inventory, or in compliance with the inventory |
| IECSC | : | On the inventory, or in compliance with the inventory |
| NZIoC | : | On the inventory, or in compliance with the inventory |

REACH : This substance has been registered according to Regulation (EC) No. 1907/2006 (REACH).

**TSCA list**

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

## SECTION 16. OTHER INFORMATION

**Full text of other abbreviations**

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Items where relevant changes have been made to the previous version are highlighted in the body of this document by two vertical lines, red letters and grey shading.

Revision Date : 11/29/2021

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

US / EN

| Version | Revision Date: | SDS Number: | Date of last issue: - |
|---|---|---|---|
| 1.0 | 11/29/2021 | 100000000513 | Date of first issue: 11/29/2021 |
| US / EN | | | |

## SECTION 1. IDENTIFICATION

| | | |
|---|---|---|
| Product name | : | L(+)-Lactic Acid 80% |
| Substance name | : | L(+)-lactic acid aqueous solution 80% |
| Trade name | : | L(+)-Lactic Acid 80% |
| Molecular formula | : | C3-H6-O3 |
| Chemical identity | : | S(+)-2-Hydroxypropanoic acid |
| CAS-No. | : | 79-33-4 |
| Chemical nature | : | Liquid |

**Manufacturer or supplier's details**

**Details of the supplier of the safety data sheet**

| | | |
|---|---|---|
| Company | : | Jungbunzlauer Inc.<br>95 Wells Avenue, Suite 150<br>Newton, Massachusetts 02459<br>USA<br>www.jungbunzlauer.com |
| Telephone | : | +1 617 969-0900 |
| Telefax | : | +1 617 964-2921 |
| E-mail address Responsible/issuing person | : | msds@jungbunzlauer.com |

**Emergency telephone number**

National Chemical Emergency Centre (NCEC)
+1 202 464 2554

**Recommended use of the chemical and restrictions on use**

| | | |
|---|---|---|
| Recommended use | : | Food additive<br>Personal care<br>Cleaning agent<br>Biocidal product<br>Industrial use<br>Pharmaceutical raw material |
| Restrictions on use | : | None known. |

## SECTION 2. HAZARDS IDENTIFICATION

**GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)**

| | | |
|---|---|---|
| Skin corrosion | : | Category 1 |

Serious eye damage : Category 1

**GHS label elements**

Hazard pictograms :

Signal word : Danger

Hazard statements : H314 Causes severe skin burns and eye damage.

Precautionary statements :

**Prevention:**

P260 Do not breathe vapours.
P264 Wash skin 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/ shower.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P363 Wash contaminated clothing before reuse.

**Storage:**

P405 Store locked up.

**Disposal:**

P501 Dispose of contents/ container to an approved waste disposal plant.

**Hazards Not Otherwise Classified**

None known.

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Chemical nature : Liquid

**Hazardous components**

| Chemical name | CAS-No. | Concentration (% w/w) |
|---|---|---|
| L(+)-lactic acid | 79-33-4 | >= 70 - < 90 |

**Non-hazardous ingredients**

| Chemical name | CAS-No. | Concentration (% w/w) |
|---|---|---|
| H2O | 7732-18-5 | >= 19.5 - <= 20.5 |

## SECTION 4. FIRST AID MEASURES

| | | |
|---|---|---|
| General advice | : | Move out of dangerous area.<br>Consult a physician.<br>Show this safety data sheet to the doctor in attendance.<br>Do not leave the victim unattended. |
| If inhaled | : | If breathed in, move person into fresh air.<br>No artificial respiration, mouth-to-mouth or mouth to nose. Use suitable instruments/apparatus.<br><br>If unconscious, place in recovery position and seek medical advice.<br>If symptoms persist, call a physician. |
| In case of skin contact | : | Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.<br>If on skin, rinse well with water.<br>If on clothes, remove clothes. |
| In case of eye contact | : | Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.<br><br>Small amounts splashed into eyes can cause irreversible tissue damage and blindness.<br>In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.<br>Continue rinsing eyes during transport to hospital.<br>Remove contact lenses.<br>Protect unharmed eye.<br>Keep eye wide open while rinsing.<br>If eye irritation persists, consult a specialist. |
| If swallowed | : | Clean mouth with water and drink afterwards plenty of water.<br>Keep respiratory tract clear.<br>Do NOT induce vomiting.<br>Do not give milk or alcoholic beverages.<br>Never give anything by mouth to an unconscious person.<br>If symptoms persist, call a physician.<br>Take victim immediately to hospital. |
| Most important symptoms and effects, both acute and delayed | : | Severe eye irritation<br>Erythema<br>Skin disorders<br>Causes serious eye damage.<br>Causes severe burns. |
| Protection of first-aiders | : | Wear personal protective equipment. |
| Notes to physician | : | Treat symptomatically. |

## SECTION 5. FIREFIGHTING MEASURES

| | | |
|---|---|---|
| Suitable extinguishing media | : | Water mist<br>Dry powder<br>Carbon dioxide (CO2)<br>Foam |
| Unsuitable extinguishing media | : | High volume water jet |
| Specific hazards during fire-fighting | : | Exposure to decomposition products may be a hazard to health.<br><br>Do not allow run-off from fire fighting to enter drains or water courses. |
| Hazardous combustion products | : | Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke). |
| Further information | : | Standard procedure for chemical fires.<br>Use water spray to cool unopened containers.<br>In the event of fire and/or explosion do not breathe fumes.<br><br>Collect contaminated fire extinguishing water separately. This must not be discharged into drains.<br>Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. |
| Special protective equipment for firefighters | : | Use personal protective equipment.<br><br>Wear self-contained breathing apparatus for firefighting if necessary. |

## SECTION 6. ACCIDENTAL RELEASE MEASURES

| | | |
|---|---|---|
| Personal precautions, protective equipment and emergency procedures | : | Material can create slippery conditions.<br>Use personal protective equipment. |
| Environmental precautions | : | Prevent product from entering drains.<br>Prevent further leakage or spillage if safe to do so.<br>If the product contaminates rivers and lakes or drains inform respective authorities. |
| Methods and materials for containment and cleaning up | : | Clean contaminated surface thoroughly.<br><br>Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).<br>Keep in suitable, closed containers for disposal. |

## SECTION 7. HANDLING AND STORAGE

| | | |
|---|---|---|
| Technical measures | : | Avoid temperatures above 200°C. |
| Local/Total ventilation | : | Ensure adequate ventilation, especially in confined areas. |
| Advice on protection against fire and explosion | : | Normal measures for preventive fire protection. |
| Advice on safe handling | : | Do not breathe vapours/dust.<br>Avoid contact with skin and eyes.<br>For personal protection see section 8.<br>Smoking, eating and drinking should be prohibited in the application area.<br>To avoid spills during handling keep bottle on a metal tray.<br>Dispose of rinse water in accordance with local and national regulations. |
| Conditions for safe storage | : | Keep in an area equipped with acid resistant flooring.<br>Store in original container.<br><br>Keep container tightly closed in a dry and well-ventilated place.<br>Observe label precautions.<br>Electrical installations / working materials must comply with the technological safety standards. |
| Further information on storage conditions | : | Keep away from direct sunlight. |
| Materials to avoid | : | Incompatible with bases. |
| Recommended storage temperature | : | > 41 °F |
| Further information on storage stability | : | No decomposition if stored and applied as directed. |
| Packaging material | : | Suitable material: Plastic container of HDPE, Stainless steel 316L |

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Components with workplace control parameters**

Contains no substances with occupational exposure limit values.

| | | |
|---|---|---|
| **Engineering measures** | : | Ensure adequate ventilation, especially in confined areas. |

**Personal protective equipment**

| | | |
|---|---|---|
| Respiratory protection | : | No personal respiratory protective equipment normally required.<br><br>In the case of vapour formation use a respirator with an ap- |

proved filter.
Use NIOSH approved respiratory protection.

Hand protection

| | | |
|---|---|---|
| Remarks | : | Wear suitable gloves tested to EN374.<br>The suitability for a specific workplace should be discussed with the producers of the protective gloves. |
| Eye protection | : | Ensure that eyewash stations and safety showers are close to the workstation location.<br>Safety glasses with side-shields<br>Eye wash bottle with pure water<br>Tightly fitting safety goggles<br>Wear face-shield and protective suit for abnormal processing problems. |
| Skin and body protection | : | acid-resistant protective clothing<br>Long sleeved clothing<br>Footwear protecting against chemicals<br>Impervious clothing<br>Choose body protection according to the amount and concentration of the dangerous substance at the work place. |
| Hygiene measures | : | Handle in accordance with good industrial hygiene and safety practice.<br>Take off all contaminated clothing immediately.<br>Wash contaminated clothing before re-use.<br>When using do not eat or drink.<br>When using do not smoke.<br>Wash hands before breaks and at the end of workday. |

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| Appearance | : | Aqueous solution, viscous |
| Colour | : | colourless, light yellow |
| Odour | : | characteristic |
| Odour Threshold | : | Not relevant |
| pH | : | < 2 (77 °F / 25 °C) |
| Melting point/freezing point | : | < -112 °F / < -80 °C<br>(ca. 1,013.25 hPa) |
| Boiling point/boiling range | : | 230 - 266 °F / 110 - 130 °C |
| Flash point | : | Not applicable |
| Evaporation rate | : | Not applicable |
| Flammability (solid, gas) | : | Not applicable |

| | | |
|---|---|---|
| Flammability (liquids) | : | Not applicable |
| Upper explosion limit / Upper flammability limit | : | Not applicable |
| Lower explosion limit / Lower flammability limit | : | Not applicable |
| Vapour pressure | : | ca. 0.038 Pa (68 °F / 20 °C) |
| Relative vapour density | : | No data available |
| Density | : | 1.0 - 1.3 g/cm3 |
| Solubility(ies) | | |
| Water solubility | : | completely miscible |
| Partition coefficient: n-octanol/water | : | log Pow: -0.54 (68 °F / 20 °C) |
| Auto-ignition temperature | : | 752 °F / 400 °C |
| Decomposition temperature | : | No data available |
| Viscosity | | |
| Viscosity, dynamic | : | 18.4 mPa.s (77 °F / 25 °C) |
| Viscosity, kinematic | : | No data available |
| Explosive properties | : | Not applicable |
| Oxidizing properties | : | Not applicable |
| Surface tension | : | 70.7 mN/m, 1 g/l, 68 °F / 20 °C |
| Metal corrosion rate | : | Not corrosive to metals |

## SECTION 10. STABILITY AND REACTIVITY

| | | |
|---|---|---|
| Reactivity | : | No decomposition if stored and applied as directed. |
| Chemical stability | : | No decomposition if stored and applied as directed. |
| Possibility of hazardous reactions | : | No decomposition if stored and applied as directed. |
| Conditions to avoid | : | Temperature > 200 °C |
| Incompatible materials | : | Bases<br>Oxidizing agents |
| Hazardous decomposition products | : | Build-up of dangerous/toxic fumes possible in cases of fire/high temperature.<br>Carbon dioxide ($CO_2$) |

Carbon monoxide

## SECTION 11. TOXICOLOGICAL INFORMATION

**Acute toxicity**
Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Acute oral toxicity | : | LD50 Oral (Rat, female): 3,543 mg/kg<br>Test substance: Lactic acid<br>Assessment: The substance or mixture has no acute oral toxicity<br><br>LD50 Oral (Rat, male): 4,936 mg/kg<br>Test substance: Lactic acid<br>Assessment: The substance or mixture has no acute oral toxicity |
| Acute inhalation toxicity | : | LC50 (Rat, male and female): 7.94 mg/l<br>Exposure time: 4 h<br>Test atmosphere: vapour<br>Test substance: Lactic acid<br>Assessment: The substance or mixture has no acute inhalation toxicity, Corrosive to the respiratory tract. |
| Acute dermal toxicity | : | LD50 Dermal (Rabbit): 2,000 mg/kg<br>Test substance: Lactic acid<br>Assessment: The substance or mixture has no acute dermal toxicity |

**Skin corrosion/irritation**
Causes severe burns.

**Product:**

| | | |
|---|---|---|
| Remarks | : | Extremely corrosive and destructive to tissue. |

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Species | : | Rabbit |
| Exposure time | : | 4 h |
| Assessment | : | Corrosive after 1 to 4 hours of exposure |
| Result | : | Corrosive after 1 to 4 hours of exposure |
| Test substance | : | Lactic acid |

**Serious eye damage/eye irritation**
Causes serious eye damage.

**Product:**

| | | |
|---|---|---|
| Remarks | : | May cause irreversible eye damage. |

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Species | : | chicken |
| Result | : | Severe irritation |
| Test substance | : | Lactic acid |

**Respiratory or skin sensitisation**

**Skin sensitisation**

Not classified based on available information.

**Respiratory sensitisation**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Species | : | Guinea pig |
| Result | : | Does not cause skin sensitisation. |

**Germ cell mutagenicity**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Germ cell mutagenicity - Assessment | : | In vitro tests did not show mutagenic effects |

**Carcinogenicity**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Species | : | Rat, male and female |
| Result | : | Animal testing did not show any carcinogenic effects. |
| Test substance | : | Calcium lactate |

**IARC** No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**OSHA** No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

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

**Reproductive toxicity**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

**STOT - single exposure**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

Assessment : No data available

**STOT - repeated exposure**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

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

**Repeated dose toxicity**

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Species | : | Rat |
| LOAEL | : | 886 mg/kg |
| Application Route | : | Dermal |
| Exposure time | : | 13 wk |
| Number of exposures | : | 5 d/wk |
| Dose | : | 886 mg/kg bw |
| Test substance | : | Lactic acid |
| Assessment | : | slight irritation |

| | | |
|---|---|---|
| Species | : | Rat, female |
| NOAEL | : | 50,000 mg/l |
| Application Route | : | Oral |
| Exposure time | : | 13 wk |
| Number of exposures | : | 1/d |
| Dose | : | 5% |
| Test substance | : | Calcium lactate |
| Assessment | : | No adverse effects |

**Aspiration toxicity**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

No data available

**Experience with human exposure**

**Product:**

| | | |
|---|---|---|
| Inhalation | : | Target Organs: Respiratory system<br>Symptoms: No information available. |
| Skin contact | : | Target Organs: Skin<br>Symptoms: May cause skin irritation in susceptible persons. |
| Eye contact | : | Target Organs: Eyes<br>Symptoms: Redness, Itching |
| Ingestion | : | Target Organs: Digestive organs<br>Symptoms: No information available. |

**Further information**

**Product:**

| | | |
|---|---|---|
| Remarks | : | No data available |

## SECTION 12. ECOLOGICAL INFORMATION

**Ecotoxicity**

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Toxicity to fish | : | LC50 (Oncorhynchus mykiss (rainbow trout)): 130 mg/l<br>Exposure time: 96 h<br>Test substance: Lactic acid<br>Remarks: Not classified |
| Toxicity to daphnia and other aquatic invertebrates | : | EC50 (Daphnia magna (Water flea)): 130 mg/l<br>End point: Immobilization<br>Exposure time: 48 h<br>Test substance: Lactic acid<br>Remarks: Not classified due to data which are conclusive although insufficient for classification. |
| Toxicity to algae/aquatic plants | : | EC50 (Pseudokirchneriella subcapitata (algae)): > 2,800 mg/l<br>Exposure time: 72 h<br>Test substance: Lactic acid<br>Remarks: Not classified due to data which are conclusive although insufficient for classification.<br><br>NOEC (Pseudokirchneriella subcapitata (green algae)): 1,900 mg/l<br>Exposure time: 70 h<br>Test substance: Lactic acid<br>Remarks: Not classified due to data which are conclusive although insufficient for classification. |
| Toxicity to fish (Chronic toxicity) | : | LOEC (Fish (Oreochromus mossambica)): ca. 2.18 mg/l<br>Exposure time: 90 d |

Test substance: Lactic acid
Remarks: Environmental exposure assessment for this scenario is not relevant.

Toxicity to microorganisms : EC50 (activated sludge): > 100 mg/l
Exposure time: 3 h
Test Type: Respiration inhibition
Test substance: Lactic acid
Remarks: Not classified due to data which are conclusive although insufficient for classification.

Toxicity to terrestrial organisms : LC50 (Colinus virginianus (Bobwhite quail)): > 2,250 mg/kg
Exposure time: 14 d
Test substance: Lactic acid

**Persistence and degradability**

**Components:**

**L(+)-lactic acid:**

Biodegradability : Closed Bottle test
Inoculum: activated sludge
Biochemical oxygen demand
Biodegradation: 80 %
Exposure time: 28 d
Method: OECD Test Guideline 301
Test substance: L(+)-Lactic acid
Remarks: Readily biodegradable.

Ready biodegradability
Method: QSAR
Test substance: Lactic acid
Remarks: Readily biodegradable.

Stability in water : Remarks: Not applicable

**Bioaccumulative potential**

**Components:**

**L(+)-lactic acid:**

Bioaccumulation : Remarks: The product is miscible in water and readily biodegradable in both water and soil. Accumulation is not expected.

Partition coefficient: n-octanol/water : log Pow: -0.54 (68 °F / 20 °C)

**Mobility in soil**

**Components:**

**L(+)-lactic acid:**

Mobility : Method: Calculation, Mackay Level III Fugacity Model
Remarks: After release, disperses through ground water.

| | | |
|---|---|---|
| Distribution among environmental compartments | : | Koc: < 20.9, log Koc: < 1.32<br>Method: OECD Test Guideline 121<br>Remarks: Lactic acid |
| Stability in soil | : | Remarks: Readily biodegradable. |

**Other adverse effects**

**Product:**

| | | |
|---|---|---|
| Ozone-Depletion Potential | : | Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances<br>Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B). |
| Additional ecological information | : | No data available |

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Results of PBT and vPvB assessment | : | This substance is not considered to be persistent, bioaccumulating and toxic (PBT). |
| Additional ecological information | : | No data available |

## SECTION 13. DISPOSAL CONSIDERATIONS

**Disposal methods**

| | | |
|---|---|---|
| Waste from residues | : | In accordance with local and national regulations.<br><br>Do not dispose of waste into sewer.<br>Do not contaminate ponds, waterways or ditches with chemical or used container.<br>Send to a licensed waste management company. |
| Contaminated packaging | : | Empty remaining contents.<br>Dispose of as unused product.<br>Do not re-use empty containers. |

## SECTION 14. TRANSPORT INFORMATION

**International Regulations**

**IATA-DGR**

| | | |
|---|---|---|
| UN/ID No. | : | UN 3265 |
| Proper shipping name | : | Corrosive liquid, acidic, organic, n.o.s.<br>(lactic acid) |

| | | |
|---|---|---|
| Class | : | 8 |
| Packing group | : | III |
| Labels | : | Class 8 - Corrosive substances |
| Packing instruction (cargo aircraft) | : | 856 |
| Packing instruction (passenger aircraft) | : | 852 |

**IMDG-Code**

| | | |
|---|---|---|
| UN number | : | UN 3265 |
| Proper shipping name | : | CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (lactic acid) |
| Class | : | 8 |
| Packing group | : | III |
| Labels | : | 8 |
| EmS Code | : | F-A, S-B |
| Marine pollutant | : | no |

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable for product as supplied.

**National Regulations**

**DOT**

| | | |
|---|---|---|
| UN/ID/NA number | : | UN 3265 |
| Proper shipping name | : | Corrosive liquid, acidic, organic, n.o.s. (lactic acid) |
| Class | : | 8 |
| Packing group | : | III |
| Labels | : | CORROSIVE |
| ERG Code | : | 153 |
| Marine pollutant | : | no |

**Special precautions for user**

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

## SECTION 15. REGULATORY INFORMATION

**CERCLA Reportable Quantity**

This material does not contain any components with a CERCLA RQ.

**SARA 304 Extremely Hazardous Substances Reportable Quantity**

This material does not contain any components with a section 304 EHS RQ.

**SARA 302 Extremely Hazardous Substances Threshold Planning Quantity**

This material does not contain any components with a section 302 EHS TPQ.

| | | |
|---|---|---|
| **SARA 311/312 Hazards** | : | Skin corrosion or irritation<br>Serious eye damage or eye irritation |
| **SARA 313** | : | This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313. |

**Clean Air Act**

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

**Clean Water Act**

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.
This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.
This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307
This product does not contain any priority pollutants related to the U.S. Clean Water Act

**US State Regulations**

**Massachusetts Right To Know**

No components are subject to the Massachusetts Right to Know Act.

**Pennsylvania Right To Know**

| | |
|---|---|
| L(+)-lactic acid | Not Assigned |
| H2O | Not Assigned |

**Maine Chemicals of High Concern**

Product does not contain any listed chemicals

**Vermont Chemicals of High Concern**

Product does not contain any listed chemicals

**Washington Chemicals of High Concern**

Product does not contain any listed chemicals

**The components of this product are reported in the following inventories:**

| | | |
|---|---|---|
| TCSI | : | On the inventory, or in compliance with the inventory |
| TSCA | : | All substances listed as active on the TSCA inventory |
| AIIC | : | On the inventory, or in compliance with the inventory |
| DSL | : | All components of this product are on the Canadian DSL |
| ENCS | : | On the inventory, or in compliance with the inventory |
| ISHL | : | On the inventory, or in compliance with the inventory |
| KECI | : | On the inventory, or in compliance with the inventory |
| PICCS | : | On the inventory, or in compliance with the inventory |
| IECSC | : | On the inventory, or in compliance with the inventory |
| NZIoC | : | On the inventory, or in compliance with the inventory |

REACH : This substance has been registered according to Regulation (EC) No. 1907/2006 (REACH).

**TSCA list**

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

## SECTION 16. OTHER INFORMATION

**Full text of other abbreviations**

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Items where relevant changes have been made to the previous version are highlighted in the body of this document by two vertical lines, red letters and grey shading.

Revision Date : 11/29/2021

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

US / EN

| Version | Revision Date: | SDS Number: | Date of last issue: - |
|---|---|---|---|
| 1.0 | 11/29/2021 | 100000000514 | Date of first issue: 11/29/2021 |
| US / EN | | | |

## SECTION 1. IDENTIFICATION

| | | |
|---|---|---|
| Product name | : | L(+)-Lactic Acid 88% |
| Substance name | : | L(+)-lactic acid aqueous solution 88% |
| Trade name | : | L(+)-Lactic Acid 88% |
| Molecular formula | : | C3-H6-O3 |
| Chemical identity | : | S(+)-2-Hydroxypropanoic acid |
| CAS-No. | : | 79-33-4 |
| Chemical nature | : | Liquid |

**Manufacturer or supplier's details**

**Details of the supplier of the safety data sheet**

| | | |
|---|---|---|
| Company | : | Jungbunzlauer Inc.<br>95 Wells Avenue, Suite 150<br>Newton, Massachusetts 02459<br>USA<br>www.jungbunzlauer.com |
| Telephone | : | +1 617 969-0900 |
| Telefax | : | +1 617 964-2921 |
| E-mail address Responsible/issuing person | : | msds@jungbunzlauer.com |

**Emergency telephone number**

National Chemical Emergency Centre (NCEC)
+1 202 464 2554

**Recommended use of the chemical and restrictions on use**

| | | |
|---|---|---|
| Recommended use | : | Food additive<br>Personal care<br>Cleaning agent<br>Biocidal product<br>Industrial use<br>Pharmaceutical raw material |
| Restrictions on use | : | None known. |

## SECTION 2. HAZARDS IDENTIFICATION

**GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)**

| | | |
|---|---|---|
| Skin corrosion | : | Category 1 |

Serious eye damage : Category 1

**GHS label elements**

Hazard pictograms :

Signal word : Danger

Hazard statements : H314 Causes severe skin burns and eye damage.

Precautionary statements :

**Prevention:**

P260 Do not breathe vapours.
P264 Wash skin 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/ shower.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P363 Wash contaminated clothing before reuse.

**Storage:**

P405 Store locked up.

**Disposal:**

P501 Dispose of contents/ container to an approved waste disposal plant.

**Hazards Not Otherwise Classified**

None known.

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Chemical nature : Liquid

**Hazardous components**

| Chemical name | CAS-No. | Concentration (% w/w) |
|---|---|---|
| L(+)-lactic acid | 79-33-4 | >= 70 - < 90 |

**Non-hazardous ingredients**

| Chemical name | CAS-No. | Concentration (% w/w) |
|---|---|---|
| H2O | 7732-18-5 | >= 11.5 - < 12.5 |

## SECTION 4. FIRST AID MEASURES

| | | |
|---|---|---|
| General advice | : | Move out of dangerous area.<br>Consult a physician.<br>Show this safety data sheet to the doctor in attendance.<br>Do not leave the victim unattended. |
| If inhaled | : | If breathed in, move person into fresh air.<br>No artificial respiration, mouth-to-mouth or mouth to nose. Use suitable instruments/apparatus.<br><br>If unconscious, place in recovery position and seek medical advice.<br>If symptoms persist, call a physician. |
| In case of skin contact | : | Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.<br>If on skin, rinse well with water.<br>If on clothes, remove clothes. |
| In case of eye contact | : | Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.<br><br>Small amounts splashed into eyes can cause irreversible tissue damage and blindness.<br>In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.<br>Continue rinsing eyes during transport to hospital.<br>Remove contact lenses.<br>Protect unharmed eye.<br>Keep eye wide open while rinsing.<br>If eye irritation persists, consult a specialist. |
| If swallowed | : | Clean mouth with water and drink afterwards plenty of water.<br>Keep respiratory tract clear.<br>Do NOT induce vomiting.<br>Do not give milk or alcoholic beverages.<br>Never give anything by mouth to an unconscious person.<br>If symptoms persist, call a physician.<br>Take victim immediately to hospital. |
| Most important symptoms and effects, both acute and delayed | : | Severe eye irritation<br>Erythema<br>Skin disorders<br>Causes serious eye damage.<br>Causes severe burns. |
| Protection of first-aiders | : | Wear personal protective equipment. |
| Notes to physician | : | Treat symptomatically. |

## SECTION 5. FIREFIGHTING MEASURES

| | | |
|---|---|---|
| Suitable extinguishing media | : | Water mist<br>Dry powder<br>Carbon dioxide (CO2)<br>Foam |
| Unsuitable extinguishing media | : | High volume water jet |
| Specific hazards during fire-fighting | : | Exposure to decomposition products may be a hazard to health.<br><br>Do not allow run-off from fire fighting to enter drains or water courses. |
| Hazardous combustion products | : | Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke). |
| Further information | : | Standard procedure for chemical fires.<br>Use water spray to cool unopened containers.<br>In the event of fire and/or explosion do not breathe fumes.<br><br>Collect contaminated fire extinguishing water separately. This must not be discharged into drains.<br>Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. |
| Special protective equipment for firefighters | : | Use personal protective equipment.<br><br>Wear self-contained breathing apparatus for firefighting if necessary. |

## SECTION 6. ACCIDENTAL RELEASE MEASURES

| | | |
|---|---|---|
| Personal precautions, protective equipment and emergency procedures | : | Material can create slippery conditions.<br>Use personal protective equipment. |
| Environmental precautions | : | Prevent product from entering drains.<br>Prevent further leakage or spillage if safe to do so.<br>If the product contaminates rivers and lakes or drains inform respective authorities. |
| Methods and materials for containment and cleaning up | : | Clean contaminated surface thoroughly.<br><br>Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).<br>Keep in suitable, closed containers for disposal. |

## SECTION 7. HANDLING AND STORAGE

| | | |
|---|---|---|
| Technical measures | : | Avoid temperatures above 200°C. |
| Local/Total ventilation | : | Ensure adequate ventilation, especially in confined areas. |
| Advice on protection against fire and explosion | : | Normal measures for preventive fire protection. |
| Advice on safe handling | : | Do not breathe vapours/dust.<br>Avoid contact with skin and eyes.<br>For personal protection see section 8.<br>Smoking, eating and drinking should be prohibited in the application area.<br>To avoid spills during handling keep bottle on a metal tray.<br>Dispose of rinse water in accordance with local and national regulations. |
| Conditions for safe storage | : | Keep in an area equipped with acid resistant flooring.<br>Store in original container.<br><br>Keep container tightly closed in a dry and well-ventilated place.<br>Observe label precautions.<br>Electrical installations / working materials must comply with the technological safety standards. |
| Further information on storage conditions | : | Keep away from direct sunlight. |
| Materials to avoid | : | Incompatible with bases. |
| Recommended storage temperature | : | > 41 °F |
| Further information on storage stability | : | No decomposition if stored and applied as directed. |
| Packaging material | : | Suitable material: Plastic container of HDPE, Stainless steel 316L |

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Components with workplace control parameters**

Contains no substances with occupational exposure limit values.

| | | |
|---|---|---|
| **Engineering measures** | : | Ensure adequate ventilation, especially in confined areas. |

**Personal protective equipment**

| | | |
|---|---|---|
| Respiratory protection | : | No personal respiratory protective equipment normally required.<br><br>In the case of vapour formation use a respirator with an ap- |

proved filter.
Use NIOSH approved respiratory protection.

Hand protection

| | | |
|---|---|---|
| Remarks | : | Wear suitable gloves tested to EN374.<br>The suitability for a specific workplace should be discussed with the producers of the protective gloves. |
| Eye protection | : | Ensure that eyewash stations and safety showers are close to the workstation location.<br>Safety glasses with side-shields<br>Eye wash bottle with pure water<br>Tightly fitting safety goggles<br>Wear face-shield and protective suit for abnormal processing problems. |
| Skin and body protection | : | acid-resistant protective clothing<br>Long sleeved clothing<br>Footwear protecting against chemicals<br>Impervious clothing<br>Choose body protection according to the amount and concentration of the dangerous substance at the work place. |
| Hygiene measures | : | Handle in accordance with good industrial hygiene and safety practice.<br>Take off all contaminated clothing immediately.<br>Wash contaminated clothing before re-use.<br>When using do not eat or drink.<br>When using do not smoke.<br>Wash hands before breaks and at the end of workday. |

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| Appearance | : | Aqueous solution, viscous |
| Colour | : | colourless, light yellow |
| Odour | : | characteristic |
| Odour Threshold | : | Not relevant |
| pH | : | < 2 (77 °F / 25 °C) |
| Melting point/freezing point | : | < -112 °F / < -80 °C<br>(ca. 1,013.25 hPa) |
| Boiling point/boiling range | : | 230 - 266 °F / 110 - 130 °C |
| Flash point | : | Not applicable |
| Evaporation rate | : | Not applicable |
| Flammability (solid, gas) | : | Not applicable |

| | | |
|---|---|---|
| Flammability (liquids) | : | Not applicable |
| Upper explosion limit / Upper flammability limit | : | Not applicable |
| Lower explosion limit / Lower flammability limit | : | Not applicable |
| Vapour pressure | : | ca. 0.038 Pa (68 °F / 20 °C) |
| Relative vapour density | : | No data available |
| Density | : | 1.0 - 1.3 g/cm3 |
| Solubility(ies) | | |
| Water solubility | : | completely miscible |
| Partition coefficient: n-octanol/water | : | log Pow: -0.54 (68 °F / 20 °C) |
| Auto-ignition temperature | : | 752 °F / 400 °C |
| Decomposition temperature | : | No data available |
| Viscosity | | |
| Viscosity, dynamic | : | 18.4 mPa.s (77 °F / 25 °C) |
| Viscosity, kinematic | : | No data available |
| Explosive properties | : | Not applicable |
| Oxidizing properties | : | Not applicable |
| Surface tension | : | 70.7 mN/m, 1 g/l, 68 °F / 20 °C |
| Metal corrosion rate | : | Not corrosive to metals |

## SECTION 10. STABILITY AND REACTIVITY

| | | |
|---|---|---|
| Reactivity | : | No decomposition if stored and applied as directed. |
| Chemical stability | : | No decomposition if stored and applied as directed. |
| Possibility of hazardous reactions | : | No decomposition if stored and applied as directed. |
| Conditions to avoid | : | Temperature > 200 °C |
| Incompatible materials | : | Bases<br>Oxidizing agents |
| Hazardous decomposition products | : | Build-up of dangerous/toxic fumes possible in cases of fire/high temperature.<br>Carbon dioxide ($CO_2$) |

Carbon monoxide

## SECTION 11. TOXICOLOGICAL INFORMATION

**Acute toxicity**
Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Acute oral toxicity | : | LD50 Oral (Rat, female): 3,543 mg/kg<br>Test substance: Lactic acid<br>Assessment: The substance or mixture has no acute oral toxicity<br><br>LD50 Oral (Rat, male): 4,936 mg/kg<br>Test substance: Lactic acid<br>Assessment: The substance or mixture has no acute oral toxicity |
| Acute inhalation toxicity | : | LC50 (Rat, male and female): 7.94 mg/l<br>Exposure time: 4 h<br>Test atmosphere: vapour<br>Test substance: Lactic acid<br>Assessment: The substance or mixture has no acute inhalation toxicity, Corrosive to the respiratory tract. |
| Acute dermal toxicity | : | LD50 Dermal (Rabbit): 2,000 mg/kg<br>Test substance: Lactic acid<br>Assessment: The substance or mixture has no acute dermal toxicity |

**Skin corrosion/irritation**
Causes severe burns.

**Product:**

| | | |
|---|---|---|
| Remarks | : | Extremely corrosive and destructive to tissue. |

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Species | : | Rabbit |
| Exposure time | : | 4 h |
| Assessment | : | Corrosive after 1 to 4 hours of exposure |
| Result | : | Corrosive after 1 to 4 hours of exposure |
| Test substance | : | Lactic acid |

**Serious eye damage/eye irritation**
Causes serious eye damage.

**Product:**

| | | |
|---|---|---|
| Remarks | : | May cause irreversible eye damage. |

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Species | : | chicken |
| Result | : | Severe irritation |
| Test substance | : | Lactic acid |

**Respiratory or skin sensitisation**

**Skin sensitisation**

Not classified based on available information.

**Respiratory sensitisation**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Species | : | Guinea pig |
| Result | : | Does not cause skin sensitisation. |

**Germ cell mutagenicity**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Germ cell mutagenicity - Assessment | : | In vitro tests did not show mutagenic effects |

**Carcinogenicity**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Species | : | Rat, male and female |
| Result | : | Animal testing did not show any carcinogenic effects. |
| Test substance | : | Calcium lactate |

**IARC** No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**OSHA** No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

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

**Reproductive toxicity**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

**STOT - single exposure**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

Assessment : No data available

**STOT - repeated exposure**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

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

**Repeated dose toxicity**

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Species | : | Rat |
| LOAEL | : | 886 mg/kg |
| Application Route | : | Dermal |
| Exposure time | : | 13 wk |
| Number of exposures | : | 5 d/wk |
| Dose | : | 886 mg/kg bw |
| Test substance | : | Lactic acid |
| Assessment | : | slight irritation |

| | | |
|---|---|---|
| Species | : | Rat, female |
| NOAEL | : | 50,000 mg/l |
| Application Route | : | Oral |
| Exposure time | : | 13 wk |
| Number of exposures | : | 1/d |
| Dose | : | 5% |
| Test substance | : | Calcium lactate |
| Assessment | : | No adverse effects |

**Aspiration toxicity**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

No data available

**Experience with human exposure**

**Product:**

| | | |
|---|---|---|
| Inhalation | : | Target Organs: Respiratory system<br>Symptoms: No information available. |
| Skin contact | : | Target Organs: Skin<br>Symptoms: May cause skin irritation in susceptible persons. |
| Eye contact | : | Target Organs: Eyes<br>Symptoms: Redness, Itching |
| Ingestion | : | Target Organs: Digestive organs<br>Symptoms: No information available. |

**Further information**

**Product:**

| | | |
|---|---|---|
| Remarks | : | No data available |

## SECTION 12. ECOLOGICAL INFORMATION

**Ecotoxicity**

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Toxicity to fish | : | LC50 (Oncorhynchus mykiss (rainbow trout)): 130 mg/l<br>Exposure time: 96 h<br>Test substance: Lactic acid<br>Remarks: Not classified |
| Toxicity to daphnia and other aquatic invertebrates | : | EC50 (Daphnia magna (Water flea)): 130 mg/l<br>End point: Immobilization<br>Exposure time: 48 h<br>Test substance: Lactic acid<br>Remarks: Not classified due to data which are conclusive although insufficient for classification. |
| Toxicity to algae/aquatic plants | : | EC50 (Pseudokirchneriella subcapitata (algae)): > 2,800 mg/l<br>Exposure time: 72 h<br>Test substance: Lactic acid<br>Remarks: Not classified due to data which are conclusive although insufficient for classification.<br><br>NOEC (Pseudokirchneriella subcapitata (green algae)): 1,900 mg/l<br>Exposure time: 70 h<br>Test substance: Lactic acid<br>Remarks: Not classified due to data which are conclusive although insufficient for classification. |
| Toxicity to fish (Chronic toxicity) | : | LOEC (Fish (Oreochromus mossambica)): ca. 2.18 mg/l<br>Exposure time: 90 d |

Test substance: Lactic acid
Remarks: Environmental exposure assessment for this scenario is not relevant.

Toxicity to microorganisms : EC50 (activated sludge): > 100 mg/l
Exposure time: 3 h
Test Type: Respiration inhibition
Test substance: Lactic acid
Remarks: Not classified due to data which are conclusive although insufficient for classification.

Toxicity to terrestrial organisms : LC50 (Colinus virginianus (Bobwhite quail)): > 2,250 mg/kg
Exposure time: 14 d
Test substance: Lactic acid

**Persistence and degradability**

**Components:**

**L(+)-lactic acid:**

Biodegradability : Closed Bottle test
Inoculum: activated sludge
Biochemical oxygen demand
Biodegradation: 80 %
Exposure time: 28 d
Method: OECD Test Guideline 301
Test substance: L(+)-Lactic acid
Remarks: Readily biodegradable.

Ready biodegradability
Method: QSAR
Test substance: Lactic acid
Remarks: Readily biodegradable.

Stability in water : Remarks: Not applicable

**Bioaccumulative potential**

**Components:**

**L(+)-lactic acid:**

Bioaccumulation : Remarks: The product is miscible in water and readily biodegradable in both water and soil. Accumulation is not expected.

Partition coefficient: n-octanol/water : log Pow: -0.54 (68 °F / 20 °C)

**Mobility in soil**

**Components:**

**L(+)-lactic acid:**

Mobility : Method: Calculation, Mackay Level III Fugacity Model
Remarks: After release, disperses through ground water.

| | | |
|---|---|---|
| Distribution among environmental compartments | : | Koc: < 20.9, log Koc: < 1.32<br>Method: OECD Test Guideline 121<br>Remarks: Lactic acid |
| Stability in soil | : | Remarks: Readily biodegradable. |

**Other adverse effects**

**Product:**

| | | |
|---|---|---|
| Ozone-Depletion Potential | : | Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances<br>Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B). |
| Additional ecological information | : | No data available |

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Results of PBT and vPvB assessment | : | This substance is not considered to be persistent, bioaccumulating and toxic (PBT). |
| Additional ecological information | : | No data available |

## SECTION 13. DISPOSAL CONSIDERATIONS

**Disposal methods**

| | | |
|---|---|---|
| Waste from residues | : | In accordance with local and national regulations.<br><br>Do not dispose of waste into sewer.<br>Do not contaminate ponds, waterways or ditches with chemical or used container.<br>Send to a licensed waste management company. |
| Contaminated packaging | : | Empty remaining contents.<br>Dispose of as unused product.<br>Do not re-use empty containers. |

## SECTION 14. TRANSPORT INFORMATION

**International Regulations**

**IATA-DGR**

| | | |
|---|---|---|
| UN/ID No. | : | UN 3265 |
| Proper shipping name | : | Corrosive liquid, acidic, organic, n.o.s.<br>(lactic acid) |

| | | |
|---|---|---|
| Class | : | 8 |
| Packing group | : | III |
| Labels | : | Class 8 - Corrosive substances |
| Packing instruction (cargo aircraft) | : | 856 |
| Packing instruction (passenger aircraft) | : | 852 |

**IMDG-Code**

| | | |
|---|---|---|
| UN number | : | UN 3265 |
| Proper shipping name | : | CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (lactic acid) |
| Class | : | 8 |
| Packing group | : | III |
| Labels | : | 8 |
| EmS Code | : | F-A, S-B |
| Marine pollutant | : | no |

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable for product as supplied.

**National Regulations**

**DOT**

| | | |
|---|---|---|
| UN/ID/NA number | : | UN 3265 |
| Proper shipping name | : | Corrosive liquid, acidic, organic, n.o.s. (lactic acid) |
| Class | : | 8 |
| Packing group | : | III |
| Labels | : | CORROSIVE |
| ERG Code | : | 153 |
| Marine pollutant | : | no |

**Special precautions for user**

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

## SECTION 15. REGULATORY INFORMATION

**CERCLA Reportable Quantity**

This material does not contain any components with a CERCLA RQ.

**SARA 304 Extremely Hazardous Substances Reportable Quantity**

This material does not contain any components with a section 304 EHS RQ.

**SARA 302 Extremely Hazardous Substances Threshold Planning Quantity**

This material does not contain any components with a section 302 EHS TPQ.

| | | |
|---|---|---|
| **SARA 311/312 Hazards** | : | Skin corrosion or irritation<br>Serious eye damage or eye irritation |
| **SARA 313** | : | This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313. |

**Clean Air Act**

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

**Clean Water Act**

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.
This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.
This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307
This product does not contain any priority pollutants related to the U.S. Clean Water Act

**US State Regulations**

**Massachusetts Right To Know**

No components are subject to the Massachusetts Right to Know Act.

**Pennsylvania Right To Know**

| | |
|---|---|
| L(+)-lactic acid | Not Assigned |
| H2O | Not Assigned |

**Maine Chemicals of High Concern**

Product does not contain any listed chemicals

**Vermont Chemicals of High Concern**

Product does not contain any listed chemicals

**Washington Chemicals of High Concern**

Product does not contain any listed chemicals

**The components of this product are reported in the following inventories:**

| | | |
|---|---|---|
| TCSI | : | On the inventory, or in compliance with the inventory |
| TSCA | : | All substances listed as active on the TSCA inventory |
| AIIC | : | On the inventory, or in compliance with the inventory |
| DSL | : | All components of this product are on the Canadian DSL |
| ENCS | : | On the inventory, or in compliance with the inventory |
| ISHL | : | On the inventory, or in compliance with the inventory |
| KECI | : | On the inventory, or in compliance with the inventory |
| PICCS | : | On the inventory, or in compliance with the inventory |
| IECSC | : | On the inventory, or in compliance with the inventory |
| NZIoC | : | On the inventory, or in compliance with the inventory |

REACH : This substance has been registered according to Regulation (EC) No. 1907/2006 (REACH).

**TSCA list**

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

## SECTION 16. OTHER INFORMATION

**Full text of other abbreviations**

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Items where relevant changes have been made to the previous version are highlighted in the body of this document by two vertical lines, red letters and grey shading.

Revision Date : 11/29/2021

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

US / EN

| Version | Revision Date: | SDS Number: | Date of last issue: - |
|---|---|---|---|
| 1.0 | 11/29/2021 | 100000000515 | Date of first issue: 11/29/2021 |
| US / EN | | | |

## SECTION 1. IDENTIFICATION

| | | |
|---|---|---|
| Product name | : | L(+)-Lactic Acid 90% |
| Substance name | : | L(+)-lactic acid aqueous solution 90% |
| Trade name | : | L(+)-Lactic Acid 90% |
| Molecular formula | : | C3-H6-O3 |
| Chemical identity | : | S(+)-2-Hydroxypropanoic acid |
| CAS-No. | : | 79-33-4 |
| Chemical nature | : | Liquid |

**Manufacturer or supplier's details**

**Details of the supplier of the safety data sheet**

| | | |
|---|---|---|
| Company | : | Jungbunzlauer Inc.<br>95 Wells Avenue, Suite 150<br>Newton, Massachusetts 02459<br>USA<br>www.jungbunzlauer.com |
| Telephone | : | +1 617 969-0900 |
| Telefax | : | +1 617 964-2921 |
| E-mail address Responsible/issuing person | : | msds@jungbunzlauer.com |

**Emergency telephone number**

National Chemical Emergency Centre (NCEC)
+1 202 464 2554

**Recommended use of the chemical and restrictions on use**

| | | |
|---|---|---|
| Recommended use | : | Food additive<br>Personal care<br>Cleaning agent<br>Biocidal product<br>Industrial use<br>Pharmaceutical raw material |
| Restrictions on use | : | None known. |

## SECTION 2. HAZARDS IDENTIFICATION

**GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)**

| | | |
|---|---|---|
| Skin corrosion | : | Category 1 |

Serious eye damage : Category 1

**GHS label elements**

Hazard pictograms :

Signal word : Danger

Hazard statements : H314 Causes severe skin burns and eye damage.

Precautionary statements :

**Prevention:**

P260 Do not breathe vapours.
P264 Wash skin 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/ shower.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P363 Wash contaminated clothing before reuse.

**Storage:**

P405 Store locked up.

**Disposal:**

P501 Dispose of contents/ container to an approved waste disposal plant.

**Hazards Not Otherwise Classified**

None known.

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Chemical nature : Liquid

**Hazardous components**

| Chemical name | CAS-No. | Concentration (% w/w) |
|---|---|---|
| L(+)-lactic acid | 79-33-4 | >= 90 - <= 100 |

**Non-hazardous ingredients**

| Chemical name | CAS-No. | Concentration (% w/w) |
|---|---|---|
| H2O | 7732-18-5 | >= 9.5 - < 10.5 |

## SECTION 4. FIRST AID MEASURES

| | | |
|---|---|---|
| General advice | : | Move out of dangerous area.<br>Consult a physician.<br>Show this safety data sheet to the doctor in attendance.<br>Do not leave the victim unattended. |
| If inhaled | : | If breathed in, move person into fresh air.<br>No artificial respiration, mouth-to-mouth or mouth to nose. Use suitable instruments/apparatus.<br><br>If unconscious, place in recovery position and seek medical advice.<br>If symptoms persist, call a physician. |
| In case of skin contact | : | Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.<br>If on skin, rinse well with water.<br>If on clothes, remove clothes. |
| In case of eye contact | : | Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.<br><br>Small amounts splashed into eyes can cause irreversible tissue damage and blindness.<br>In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.<br>Continue rinsing eyes during transport to hospital.<br>Remove contact lenses.<br>Protect unharmed eye.<br>Keep eye wide open while rinsing.<br>If eye irritation persists, consult a specialist. |
| If swallowed | : | Clean mouth with water and drink afterwards plenty of water.<br>Keep respiratory tract clear.<br>Do NOT induce vomiting.<br>Do not give milk or alcoholic beverages.<br>Never give anything by mouth to an unconscious person.<br>If symptoms persist, call a physician.<br>Take victim immediately to hospital. |
| Most important symptoms and effects, both acute and delayed | : | Severe eye irritation<br>Erythema<br>Skin disorders<br>Causes serious eye damage.<br>Causes severe burns. |
| Protection of first-aiders | : | Wear personal protective equipment. |
| Notes to physician | : | Treat symptomatically. |

## SECTION 5. FIREFIGHTING MEASURES

| | | |
|---|---|---|
| Suitable extinguishing media | : | Water mist<br>Dry powder<br>Carbon dioxide (CO2)<br>Foam |
| Unsuitable extinguishing media | : | High volume water jet |
| Specific hazards during fire-fighting | : | Exposure to decomposition products may be a hazard to health.<br><br>Do not allow run-off from fire fighting to enter drains or water courses. |
| Hazardous combustion products | : | Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke). |
| Further information | : | Standard procedure for chemical fires.<br>Use water spray to cool unopened containers.<br>In the event of fire and/or explosion do not breathe fumes.<br><br>Collect contaminated fire extinguishing water separately. This must not be discharged into drains.<br>Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. |
| Special protective equipment for firefighters | : | Use personal protective equipment.<br><br>Wear self-contained breathing apparatus for firefighting if necessary. |

## SECTION 6. ACCIDENTAL RELEASE MEASURES

| | | |
|---|---|---|
| Personal precautions, protective equipment and emergency procedures | : | Material can create slippery conditions.<br>Use personal protective equipment. |
| Environmental precautions | : | Prevent product from entering drains.<br>Prevent further leakage or spillage if safe to do so.<br>If the product contaminates rivers and lakes or drains inform respective authorities. |
| Methods and materials for containment and cleaning up | : | Clean contaminated surface thoroughly.<br><br>Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).<br>Keep in suitable, closed containers for disposal. |

## SECTION 7. HANDLING AND STORAGE

| | | |
|---|---|---|
| Technical measures | : | Avoid temperatures above 200°C. |
| Local/Total ventilation | : | Ensure adequate ventilation, especially in confined areas. |
| Advice on protection against fire and explosion | : | Normal measures for preventive fire protection. |
| Advice on safe handling | : | Do not breathe vapours/dust.<br>Avoid contact with skin and eyes.<br>For personal protection see section 8.<br>Smoking, eating and drinking should be prohibited in the application area.<br>To avoid spills during handling keep bottle on a metal tray.<br>Dispose of rinse water in accordance with local and national regulations. |
| Conditions for safe storage | : | Keep in an area equipped with acid resistant flooring.<br>Store in original container.<br><br>Keep container tightly closed in a dry and well-ventilated place.<br>Observe label precautions.<br>Electrical installations / working materials must comply with the technological safety standards. |
| Further information on storage conditions | : | Keep away from direct sunlight. |
| Materials to avoid | : | Incompatible with bases. |
| Recommended storage temperature | : | > 41 °F |
| Further information on storage stability | : | No decomposition if stored and applied as directed. |
| Packaging material | : | Suitable material: Plastic container of HDPE, Stainless steel 316L |

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Components with workplace control parameters**

Contains no substances with occupational exposure limit values.

| | | |
|---|---|---|
| **Engineering measures** | : | Ensure adequate ventilation, especially in confined areas. |

**Personal protective equipment**

| | | |
|---|---|---|
| Respiratory protection | : | No personal respiratory protective equipment normally required.<br><br>In the case of vapour formation use a respirator with an ap- |

proved filter.
Use NIOSH approved respiratory protection.

Hand protection

| | | |
|---|---|---|
| Remarks | : | Wear suitable gloves tested to EN374.<br>The suitability for a specific workplace should be discussed with the producers of the protective gloves. |
| Eye protection | : | Ensure that eyewash stations and safety showers are close to the workstation location.<br>Safety glasses with side-shields<br>Eye wash bottle with pure water<br>Tightly fitting safety goggles<br>Wear face-shield and protective suit for abnormal processing problems. |
| Skin and body protection | : | acid-resistant protective clothing<br>Long sleeved clothing<br>Footwear protecting against chemicals<br>Impervious clothing<br>Choose body protection according to the amount and concentration of the dangerous substance at the work place. |
| Hygiene measures | : | Handle in accordance with good industrial hygiene and safety practice.<br>Take off all contaminated clothing immediately.<br>Wash contaminated clothing before re-use.<br>When using do not eat or drink.<br>When using do not smoke.<br>Wash hands before breaks and at the end of workday. |

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|---|
| Appearance | : | Aqueous solution, viscous |
| Colour | : | colourless, light yellow |
| Odour | : | characteristic |
| Odour Threshold | : | Not relevant |
| pH | : | < 2 (77 °F / 25 °C) |
| Melting point/freezing point | : | < -112 °F / < -80 °C<br>(ca. 1,013.25 hPa) |
| Boiling point/boiling range | : | 230 - 266 °F / 110 - 130 °C |
| Flash point | : | Not applicable |
| Evaporation rate | : | Not applicable |
| Flammability (solid, gas) | : | Not applicable |

| | | |
|---|---|---|
| Flammability (liquids) | : | Not applicable |
| Upper explosion limit / Upper flammability limit | : | Not applicable |
| Lower explosion limit / Lower flammability limit | : | Not applicable |
| Vapour pressure | : | ca. 0.038 Pa (68 °F / 20 °C) |
| Relative vapour density | : | No data available |
| Density | : | 1.0 - 1.3 g/cm3 |
| Solubility(ies) | | |
| Water solubility | : | completely miscible |
| Partition coefficient: n-octanol/water | : | log Pow: -0.54 (68 °F / 20 °C) |
| Auto-ignition temperature | : | 752 °F / 400 °C |
| Decomposition temperature | : | No data available |
| Viscosity | | |
| Viscosity, dynamic | : | 18.4 mPa.s (77 °F / 25 °C) |
| Viscosity, kinematic | : | No data available |
| Explosive properties | : | Not applicable |
| Oxidizing properties | : | Not applicable |
| Surface tension | : | 70.7 mN/m, 1 g/l, 68 °F / 20 °C |
| Metal corrosion rate | : | Not corrosive to metals |

## SECTION 10. STABILITY AND REACTIVITY

| | | |
|---|---|---|
| Reactivity | : | No decomposition if stored and applied as directed. |
| Chemical stability | : | No decomposition if stored and applied as directed. |
| Possibility of hazardous reactions | : | No decomposition if stored and applied as directed. |
| Conditions to avoid | : | Temperature > 200 °C |
| Incompatible materials | : | Bases<br>Oxidizing agents |
| Hazardous decomposition products | : | Build-up of dangerous/toxic fumes possible in cases of fire/high temperature.<br>Carbon dioxide ($CO_2$) |

Carbon monoxide

## SECTION 11. TOXICOLOGICAL INFORMATION

**Acute toxicity**
Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Acute oral toxicity | : | LD50 Oral (Rat, female): 3,543 mg/kg<br>Test substance: Lactic acid<br>Assessment: The substance or mixture has no acute oral toxicity<br><br>LD50 Oral (Rat, male): 4,936 mg/kg<br>Test substance: Lactic acid<br>Assessment: The substance or mixture has no acute oral toxicity |
| Acute inhalation toxicity | : | LC50 (Rat, male and female): 7.94 mg/l<br>Exposure time: 4 h<br>Test atmosphere: vapour<br>Test substance: Lactic acid<br>Assessment: The substance or mixture has no acute inhalation toxicity, Corrosive to the respiratory tract. |
| Acute dermal toxicity | : | LD50 Dermal (Rabbit): 2,000 mg/kg<br>Test substance: Lactic acid<br>Assessment: The substance or mixture has no acute dermal toxicity |

**Skin corrosion/irritation**
Causes severe burns.

**Product:**

| | | |
|---|---|---|
| Remarks | : | Extremely corrosive and destructive to tissue. |

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Species | : | Rabbit |
| Exposure time | : | 4 h |
| Assessment | : | Corrosive after 1 to 4 hours of exposure |
| Result | : | Corrosive after 1 to 4 hours of exposure |
| Test substance | : | Lactic acid |

**Serious eye damage/eye irritation**
Causes serious eye damage.

**Product:**

| | | |
|---|---|---|
| Remarks | : | May cause irreversible eye damage. |

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Species | : | chicken |
| Result | : | Severe irritation |
| Test substance | : | Lactic acid |

**Respiratory or skin sensitisation**

**Skin sensitisation**

Not classified based on available information.

**Respiratory sensitisation**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Species | : | Guinea pig |
| Result | : | Does not cause skin sensitisation. |

**Germ cell mutagenicity**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Germ cell mutagenicity - Assessment | : | In vitro tests did not show mutagenic effects |

**Carcinogenicity**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Species | : | Rat, male and female |
| Result | : | Animal testing did not show any carcinogenic effects. |
| Test substance | : | Calcium lactate |

**IARC** No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**OSHA** No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

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

**Reproductive toxicity**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

**STOT - single exposure**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

Assessment : No data available

**STOT - repeated exposure**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

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

**Repeated dose toxicity**

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Species | : | Rat |
| LOAEL | : | 886 mg/kg |
| Application Route | : | Dermal |
| Exposure time | : | 13 wk |
| Number of exposures | : | 5 d/wk |
| Dose | : | 886 mg/kg bw |
| Test substance | : | Lactic acid |
| Assessment | : | slight irritation |

| | | |
|---|---|---|
| Species | : | Rat, female |
| NOAEL | : | 50,000 mg/l |
| Application Route | : | Oral |
| Exposure time | : | 13 wk |
| Number of exposures | : | 1/d |
| Dose | : | 5% |
| Test substance | : | Calcium lactate |
| Assessment | : | No adverse effects |

**Aspiration toxicity**

Not classified based on available information.

**Components:**

**L(+)-lactic acid:**

No data available

**Experience with human exposure**

**Product:**

| | | |
|---|---|---|
| Inhalation | : | Target Organs: Respiratory system<br>Symptoms: No information available. |
| Skin contact | : | Target Organs: Skin<br>Symptoms: May cause skin irritation in susceptible persons. |
| Eye contact | : | Target Organs: Eyes<br>Symptoms: Redness, Itching |
| Ingestion | : | Target Organs: Digestive organs<br>Symptoms: No information available. |

**Further information**

**Product:**

| | | |
|---|---|---|
| Remarks | : | No data available |

## SECTION 12. ECOLOGICAL INFORMATION

**Ecotoxicity**

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Toxicity to fish | : | LC50 (Oncorhynchus mykiss (rainbow trout)): 130 mg/l<br>Exposure time: 96 h<br>Test substance: Lactic acid<br>Remarks: Not classified |
| Toxicity to daphnia and other aquatic invertebrates | : | EC50 (Daphnia magna (Water flea)): 130 mg/l<br>End point: Immobilization<br>Exposure time: 48 h<br>Test substance: Lactic acid<br>Remarks: Not classified due to data which are conclusive although insufficient for classification. |
| Toxicity to algae/aquatic plants | : | EC50 (Pseudokirchneriella subcapitata (algae)): > 2,800 mg/l<br>Exposure time: 72 h<br>Test substance: Lactic acid<br>Remarks: Not classified due to data which are conclusive although insufficient for classification.<br><br>NOEC (Pseudokirchneriella subcapitata (green algae)): 1,900 mg/l<br>Exposure time: 70 h<br>Test substance: Lactic acid<br>Remarks: Not classified due to data which are conclusive although insufficient for classification. |
| Toxicity to fish (Chronic toxicity) | : | LOEC (Fish (Oreochromus mossambica)): ca. 2.18 mg/l<br>Exposure time: 90 d |

Test substance: Lactic acid
Remarks: Environmental exposure assessment for this scenario is not relevant.

Toxicity to microorganisms : EC50 (activated sludge): > 100 mg/l
Exposure time: 3 h
Test Type: Respiration inhibition
Test substance: Lactic acid
Remarks: Not classified due to data which are conclusive although insufficient for classification.

Toxicity to terrestrial organisms : LC50 (Colinus virginianus (Bobwhite quail)): > 2,250 mg/kg
Exposure time: 14 d
Test substance: Lactic acid

**Persistence and degradability**

**Components:**

**L(+)-lactic acid:**

Biodegradability : Closed Bottle test
Inoculum: activated sludge
Biochemical oxygen demand
Biodegradation: 80 %
Exposure time: 28 d
Method: OECD Test Guideline 301
Test substance: L(+)-Lactic acid
Remarks: Readily biodegradable.

Ready biodegradability
Method: QSAR
Test substance: Lactic acid
Remarks: Readily biodegradable.

Stability in water : Remarks: Not applicable

**Bioaccumulative potential**

**Components:**

**L(+)-lactic acid:**

Bioaccumulation : Remarks: The product is miscible in water and readily biodegradable in both water and soil. Accumulation is not expected.

Partition coefficient: n-octanol/water : log Pow: -0.54 (68 °F / 20 °C)

**Mobility in soil**

**Components:**

**L(+)-lactic acid:**

Mobility : Method: Calculation, Mackay Level III Fugacity Model
Remarks: After release, disperses through ground water.

| | | |
|---|---|---|
| Distribution among environmental compartments | : | Koc: < 20.9, log Koc: < 1.32<br>Method: OECD Test Guideline 121<br>Remarks: Lactic acid |
| Stability in soil | : | Remarks: Readily biodegradable. |

**Other adverse effects**

**Product:**

| | | |
|---|---|---|
| Ozone-Depletion Potential | : | Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances<br>Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B). |
| Additional ecological information | : | No data available |

**Components:**

**L(+)-lactic acid:**

| | | |
|---|---|---|
| Results of PBT and vPvB assessment | : | This substance is not considered to be persistent, bioaccumulating and toxic (PBT). |
| Additional ecological information | : | No data available |

## SECTION 13. DISPOSAL CONSIDERATIONS

**Disposal methods**

| | | |
|---|---|---|
| Waste from residues | : | In accordance with local and national regulations.<br><br>Do not dispose of waste into sewer.<br>Do not contaminate ponds, waterways or ditches with chemical or used container.<br>Send to a licensed waste management company. |
| Contaminated packaging | : | Empty remaining contents.<br>Dispose of as unused product.<br>Do not re-use empty containers. |

## SECTION 14. TRANSPORT INFORMATION

**International Regulations**

**IATA-DGR**

| | | |
|---|---|---|
| UN/ID No. | : | UN 3265 |
| Proper shipping name | : | Corrosive liquid, acidic, organic, n.o.s.<br>(lactic acid) |

| | | |
|---|---|---|
| Class | : | 8 |
| Packing group | : | III |
| Labels | : | Class 8 - Corrosive substances |
| Packing instruction (cargo aircraft) | : | 856 |
| Packing instruction (passenger aircraft) | : | 852 |

**IMDG-Code**

| | | |
|---|---|---|
| UN number | : | UN 3265 |
| Proper shipping name | : | CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (lactic acid) |
| Class | : | 8 |
| Packing group | : | III |
| Labels | : | 8 |
| EmS Code | : | F-A, S-B |
| Marine pollutant | : | no |

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable for product as supplied.

**National Regulations**

**DOT**

| | | |
|---|---|---|
| UN/ID/NA number | : | UN 3265 |
| Proper shipping name | : | Corrosive liquid, acidic, organic, n.o.s. (lactic acid) |
| Class | : | 8 |
| Packing group | : | III |
| Labels | : | CORROSIVE |
| ERG Code | : | 153 |
| Marine pollutant | : | no |

**Special precautions for user**

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

## SECTION 15. REGULATORY INFORMATION

**CERCLA Reportable Quantity**

This material does not contain any components with a CERCLA RQ.

**SARA 304 Extremely Hazardous Substances Reportable Quantity**

This material does not contain any components with a section 304 EHS RQ.

**SARA 302 Extremely Hazardous Substances Threshold Planning Quantity**

This material does not contain any components with a section 302 EHS TPQ.

| | | |
|---|---|---|
| **SARA 311/312 Hazards** | : | Skin corrosion or irritation<br>Serious eye damage or eye irritation |
| **SARA 313** | : | This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313. |

**Clean Air Act**

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

**Clean Water Act**

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.
This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.
This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307
This product does not contain any priority pollutants related to the U.S. Clean Water Act

**US State Regulations**

**Massachusetts Right To Know**

No components are subject to the Massachusetts Right to Know Act.

**Pennsylvania Right To Know**

| | |
|---|---|
| L(+)-lactic acid | Not Assigned |
| H2O | Not Assigned |

**Maine Chemicals of High Concern**

Product does not contain any listed chemicals

**Vermont Chemicals of High Concern**

Product does not contain any listed chemicals

**Washington Chemicals of High Concern**

Product does not contain any listed chemicals

**The components of this product are reported in the following inventories:**

| | | |
|---|---|---|
| TCSI | : | On the inventory, or in compliance with the inventory |
| TSCA | : | All substances listed as active on the TSCA inventory |
| AIIC | : | On the inventory, or in compliance with the inventory |
| DSL | : | All components of this product are on the Canadian DSL |
| ENCS | : | On the inventory, or in compliance with the inventory |
| ISHL | : | On the inventory, or in compliance with the inventory |
| KECI | : | On the inventory, or in compliance with the inventory |
| PICCS | : | On the inventory, or in compliance with the inventory |
| IECSC | : | On the inventory, or in compliance with the inventory |
| NZIoC | : | On the inventory, or in compliance with the inventory |

REACH : This substance has been registered according to Regulation (EC) No. 1907/2006 (REACH).

**TSCA list**

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

## SECTION 16. OTHER INFORMATION

**Full text of other abbreviations**

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Items where relevant changes have been made to the previous version are highlighted in the body of this document by two vertical lines, red letters and grey shading.

Revision Date : 11/29/2021

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

US / EN

Jungbunzlauer

# Nutritional Data

## L(+)-Lactic Acid

50 % aqueous solution, food grade (EC, FCC)

| | | |
|---|---|---|
| Product name | L(+)-lactic acid 50% food grade | $C_3H_6O_3$ |
| EC No. | 201-196-2 (general 200-018-0) | |
| CAS No. | 79-33-4 (general 50-21-5) | |
| E-No. | E 270 | |

Nutritional data (typical values) according Regulation (EU) No. 1169/2011
Basis: weight of dry nutrients per 100 g of material

| | |
|---|---|
| **Energy value:** | 650 kJ / 150 kcal |
| **Protein:** | - g |
| **Carbohydrate:** | < 0.5 g (as glucose) |
| of which | |
| sugars | < 0.5 g (as glucose) |
| polyols | - g |
| starch | - g |
| **Fat:** | - g |
| of which | |
| saturates | - g |
| mono-unsaturates | - g |
| polyunsaturates | - g |
| cholesterol | - mg |
| transfatty acids | - mg |
| **Fibre:** | - g |
| **Polydextrose:** | - g |
| **Inulin:** | - g |
| **Sodium:** | < 0.3 mg |
| **Organic acid:** | 50 g |
| **Alcohol:** | - g |

| **Vitamins:** | | **Minerals:** | |
|---|---|---|---|
| Vitamin A | - µg | Calcium | < 0.5 mg |
| Vitamin B1 | - mg | Iodine | < 0.02 mg |
| Vitamin B2 | - mg | Iron | < 0.05 mg |
| Vitamin B6 | - mg | Magnesium | < 0.05 mg |
| Vitamin B12 | - µg | Phosphorus | < 0.3 mg |
| Vitamin C | - mg | Potassium | < 0.3 mg |
| Vitamin D | - µg | Zinc | < 0.1 mg |
| Vitamin E | - mg | | |
| Biotin | - mg | | |
| Folic acid | - µg | | |
| Niacin | - mg | | |
| Pantothenic acid | - mg | | |

Jungbunzlauer

# Nutritional Data

## L(+)-Lactic Acid

80 % aqueous solution, food grade (EC, FCC)

| | | |
|---|---|---|
| Product name | L(+)-lactic acid 80% food grade | $C_3H_6O_3$ |
| EC No. | 201-196-2 (general 200-018-0) | |
| CAS No. | 79-33-4 (general 50-21-5) | |
| E-No. | E 270 | |

Nutritional data (typical values) according Regulation (EU) No. 1169/2011
Basis: weight of dry nutrients per 100 g of material

| | |
|---|---|
| **Energy value:** | 1040 kJ / 240 kcal |
| **Protein:** | - g |
| **Carbohydrate:** | < 0.5 g (as glucose) |
| of which | |
| sugars | < 0.5 g (as glucose) |
| polyols | - g |
| starch | - g |
| **Fat:** | - g |
| of which | |
| saturates | - g |
| mono-unsaturates | - g |
| polyunsaturates | - g |
| cholesterol | - mg |
| transfatty acids | - mg |
| **Fibre:** | - g |
| **Polydextrose:** | - g |
| **Inulin:** | - g |
| **Sodium:** | < 0.3 mg |
| **Organic acid:** | 80 g |
| **Alcohol:** | - g |

| **Vitamins:** | | **Minerals:** | |
|---|---|---|---|
| Vitamin A | - µg | Calcium | < 0.5 mg |
| Vitamin B1 | - mg | Iodine | < 0.02 mg |
| Vitamin B2 | - mg | Iron | < 0.05 mg |
| Vitamin B6 | - mg | Magnesium | < 0.05 mg |
| Vitamin B12 | - µg | Phosphorus | < 0.3 mg |
| Vitamin C | - mg | Potassium | < 0.3 mg |
| Vitamin D | - µg | Zinc | < 0.1 mg |
| Vitamin E | - mg | | |
| Biotin | - mg | | |
| Folic acid | - µg | | |
| Niacin | - mg | | |
| Pantothenic acid | - mg | | |

Jungbunzlauer

# Nutritional Data

## L(+)-Lactic Acid

88 % aqueous solution, food grade (EC, FCC)

| | | |
|---|---|---|
| Product name | L(+)-lactic acid 88% food grade | $C_3H_6O_3$ |
| EC No. | 201-196-2 (general 200-018-0) | |
| CAS No. | 79-33-4 (general 50-21-5) | |
| E-No. | E 270 | |

Nutritional data (typical values) according Regulation (EU) No. 1169/2011
Basis: weight of dry nutrients per 100 g of material

| | |
|---|---|
| **Energy value:** | 1144 kJ / 264 kcal |
| **Protein:** | - g |
| **Carbohydrate:** | < 0.5 g (as glucose) |
| of which | |
| sugars | < 0.5 g (as glucose) |
| polyols | - g |
| starch | - g |
| **Fat:** | - g |
| of which | |
| saturates | - g |
| mono-unsaturates | - g |
| polyunsaturates | - g |
| cholesterol | - mg |
| transfatty acids | - mg |
| **Fibre:** | - g |
| **Polydextrose:** | - g |
| **Inulin:** | - g |
| **Sodium:** | < 0.3 mg |
| **Organic acid:** | 88 g |
| **Alcohol:** | - g |

| **Vitamins:** | | **Minerals:** | |
|---|---|---|---|
| Vitamin A | - µg | Calcium | < 0.5 mg |
| Vitamin B1 | - mg | Iodine | < 0.02 mg |
| Vitamin B2 | - mg | Iron | < 0.05 mg |
| Vitamin B6 | - mg | Magnesium | < 0.05 mg |
| Vitamin B12 | - µg | Phosphorus | < 0.3 mg |
| Vitamin C | - mg | Potassium | < 0.3 mg |
| Vitamin D | - µg | Zinc | < 0.1 mg |
| Vitamin E | - mg | | |
| Biotin | - mg | | |
| Folic acid | - µg | | |
| Niacin | - mg | | |
| Pantothenic acid | - mg | | |

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# Nutritional Data

## L(+)-Lactic Acid

90 % aqueous solution, heat stable, food grade (EC, FCC)

| | | |
|---|---|---|
| Product name | L(+)-lactic acid 90% heat stable food grade | $C_3H_6O_3$ |
| EC No. | 201-196-2 (general 200-018-0) | |
| CAS No. | 79-33-4 (general 50-21-5) | |
| E-No. | E 270 | |

Nutritional data (typical values) according Regulation (EU) No. 1169/2011
Basis: weight of dry nutrients per 100 g of material

| | |
|---|---|
| **Energy value:** | 1170 kJ / 270 kcal |
| **Protein:** | - g |
| **Carbohydrate:** | < 0.5 g (as glucose) |
| of which | |
| sugars | < 0.5 g (as glucose) |
| polyols | - g |
| starch | - g |
| **Fat:** | - g |
| of which | |
| saturates | - g |
| mono-unsaturates | - g |
| polyunsaturates | - g |
| cholesterol | - mg |
| transfatty acids | - mg |
| **Fibre:** | - g |
| **Polydextrose:** | - g |
| **Inulin:** | - g |
| **Sodium:** | < 0.3 mg |
| **Organic acid:** | 90 g |
| **Alcohol:** | - g |

| **Vitamins:** | | **Minerals:** | |
|---|---|---|---|
| Vitamin A | - µg | Calcium | < 0.5 mg |
| Vitamin B1 | - mg | Iodine | < 0.02 mg |
| Vitamin B2 | - mg | Iron | < 0.05 mg |
| Vitamin B6 | - mg | Magnesium | < 0.05 mg |
| Vitamin B12 | - µg | Phosphorus | < 0.3 mg |
| Vitamin C | - mg | Potassium | < 0.3 mg |
| Vitamin D | - µg | Zinc | < 0.1 mg |
| Vitamin E | - mg | | |
| Biotin | - mg | | |
| Folic acid | - µg | | |
| Niacin | - mg | | |
| Pantothenic acid | - mg | | |

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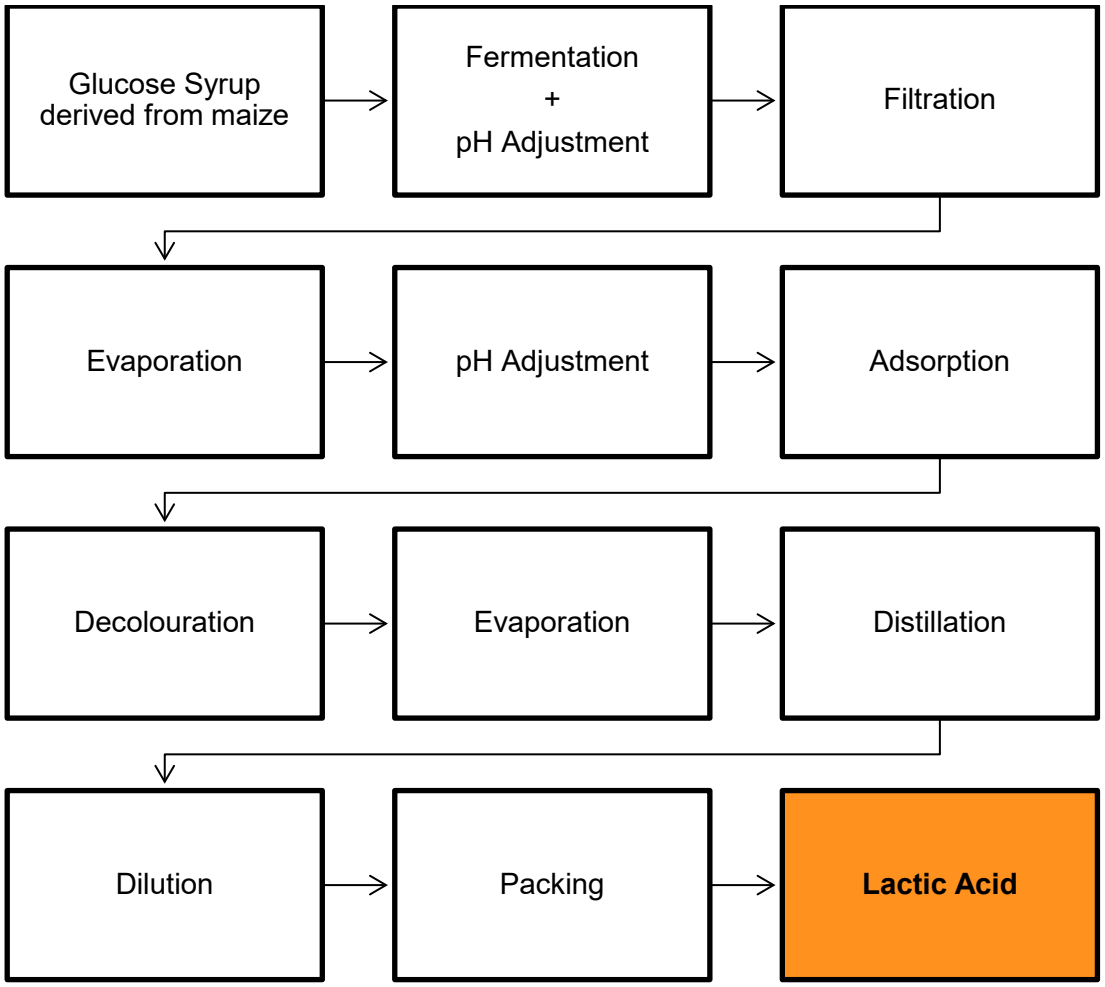
# Production Flow Chart
## Lactic Acid




**Fermentation Process**
Jungbunzlauer L(+)-lactic acid is manufactured by the natural process of fermentation of glucose syrup derived from maize by enzymatic conversion, using a bacterial strain. Since fermentation requires a specific pH, the fermentation step includes pH adjustment. No other solvents than water nor catalysts are used during the complete process.

**Downstream Process**
After completion of the fermentation, the broth is filtered to separate the buffered lactic acid from biomass and concentrated by evaporation of water. After a second pH adjustment step, the lactic acid is purified by adsorption and decolourized with activated carbon. Thereafter, the lactic acid concentration is further increased by evaporation of water. The final purification step is a distillation which leads to a high purity concentrated lactic acid. Pure concentrated lactic acid solution is then diluted with water to the targeted concentrations.

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# Shelf Life and Storage Conditions
## Lactic Acid, Lactates and Blends

This information refers to following Jungbunzlauer products:

| | |
|---|---|
| **Lactic Acid** | Food Grade, Feed Grade, Personal Care Grade, Biocidal Grade, Technical Grade, Starting Material Grade |
| **Lactic Acid Buffered** | Food Grade |
| **Sodium Lactate** | Food Grade, Personal Care Grade |
| **Potassium Lactate** | Food Grade, Personal Care Grade |
| **Sodium Lactate/Sodium Diacetate** | Food Grade |
| **Potassium Lactate/Sodium Acetate** | Food Grade |
| **Potassium Lactate/Sodium Diacetate** | Food Grade |
| **Potassium Lactate/Potassium Acetate** | Food Grade |
| **Potassium Lactate/Potassium Diacetate** | Food Grade |
| **Potassium Lactate/Vinegar** | Food Grade |

**Storage conditions**
Jungbunzlauer lactic acid, lactates and lactate blends should be stored in their original packaging or in tight containers.

Recommended storage temperature: 5 – 30 °C. Please avoid exposure to direct sunlight.

Lactic acid incl. lactic acid buffered has to be stored as corrosive material. The relevant regulations for storing hazardous materials are not harmonised but defined individually by each country (e.g. Code de l'Environnement/ICPE in France, GefStoffVO/TRGS 510 in Germany, PGS15 in the Netherlands, MIEAPQ in Spain, COSHH in the UK). Please check your local requirements.
This does not apply to lactates and lactate blends.

We recommend not to triple stack the pallets.

**Shelf life**
A shelf life of **X** years (till end of the month) from the date of manufacturing has been defined for above mentioned products (please see Table: Overview of Shelf Life).

This shelf life is guaranteed if the product is stored in original packaging under storage conditions as mentioned above. In the calculation of the shelf life, short-term deviation from the recommended storage conditions during transport of the product have been taken into consideration. The shelf-life is conditional upon compliance at all times by the customer with the above mentioned storage conditions.
Physical properties may change on prolonged storage, thus a retest is recommended after the mentioned shelf life period.

**Table: Overview of Shelf Life**

| **Product** | **Shelf life (X, in years)** |
|---|---|
| Lactic Acid (all grades except L(+)-lactic acid 80% feed grade) | 3 |
| L(+)-lactic acid 80% feed grade | 1 |
| Lactic Acid Buffered | 3 |
| Sodium Lactate (all grades) | 3 |
| Potassium Lactate (all grades) | 3 |
| Sodium Lactate/Sodium Diacetate | 3 |
| Potassium Lactate/Sodium Acetate | 3 |
| Potassium Lactate/Sodium Diacetate | 3 |
| Potassium Lactate/Potassium Acetate | 3 |
| Potassium Lactate/Potassium Diacetate | 3 |
| Potassium Lactate/Vinegar | 3 |

**Expiry date**
The expiry date is consequently **X** years (till end of the month) after the production date.

On the packaging, the production and expiry dates are indicated as follows:

Production date: DD/MM/YYYY
Expiry date: MM/YYYY

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# Food Safety and Suitability
## L(+)-Lactic Acid and Lactates

- L(+)-Lactic Acid
- L(+)-Lactic Acid Buffered
- Sodium L(+)-Lactate
- Potassium L(+)-Lactate
- Potassium L(+)-Lactate/Sodium Acetate
- Potassium L(+)-Lactate / Sodium Diacetate
- Potassium L(+)-Lactate/Potassium Acetate
- Potassium L(+)-Lactate/Potassium Diacetate
- Potassium L(+)-Lactate/Vinegar
- Sodium L(+)-Lactate/Sodium Diacetate

**Statement with regard to the Annex II of Regulation (EU) 1169/2011* (substances or products causing allergies or intolerances), the ALBA-list, other (allergenic) substances and dietetic suitability.**
***supersedes Annex IIIa of Directive 2000/13/EC on 13 December 2014**

Do above mentioned products contain allergenic or other substances, respectively possible traces thereof (cross-contamination)?

| **Products of animal origin** | **Yes** | **No** | **Comments** |
|---|---|---|---|
| Beef and products thereof | | X | BSE free |
| Chicken and products thereof | | X | |
| Crustaceans and products thereof | | X | |
| Dairy products and products thereof (incl. milk constituents, caseinate, whey etc.) | | X | |
| Eggs (chicken's egg) and products thereof (albumin, yolk etc.) | | X | |
| Fish and products thereof | | X | |
| Gelatine | | X | |
| Hydrolysed animal protein (HAP) | | X | |
| Insect derivatives | | X | |
| Milk (cow's milk protein) and products thereof (incl. lactose, milk powder etc.) | | X | |
| Molluscs and products thereof | | X | |
| Pork and products thereof | | X | |
| Royal jelly | | X | |
| Seafood | | X | |
| Shellfish | | X | |
| Other products of animal origin | | X | |

| **Seeds** | **Yes** | **No** | **Comments** |
|---|---|---|---|
| Cotton | | X | |
| Poppy | | X | |
| Rape | | X | |
| Sesame seeds and products thereof | | X | |
| Sesame oil | | X | |
| Sunflower kernels | | X | |

| | | | |
|---|---|---|---|
| Other seeds | | X | |

| **Fruits and vegetables** | **Yes** | **No** | **Comments** |
|---|---|---|---|
| Almond and products thereof (*Amygdalus communis L.*) | | X | |
| Brazil nut and products thereof (*Bertholletia excelsa*) | | X | |
| Carrot | | X | |
| Cashew and products thereof (*Anacardium occidentale*) | | X | |
| Celery and products thereof | | X | |
| Chestnut | | X | |
| Cocoa | | X | |
| Coconut | | X | |
| Hazelnut and products thereof (*Corylus avellana*) | | X | |
| Hydrolysed vegetable protein (HVP) | | X | |
| Macadamia nut, queensland nut and products thereof *(Macadamia ternifolia)* | | X | |
| Mustard and products thereof | | X | |
| Nuts or nut oil | | X | |
| Peanuts and products thereof (incl. peanut oil etc.) | | X | |
| Pecan nut and products thereof (*Carya illinoinensis (Wangenh.) K. Koch*) | | X | |
| Pistachio nut and products thereof (*Pistacia vera*) | | X | |
| Sugar beet | | X | 1) |
| Walnut and products thereof (*Juglans regia*) | | X | |
| Other fruits and products thereof | | X | |
| Other vegetables and products thereof | | X | |

| **Spices and herbs** | **Yes** | **No** | **Comments** |
|---|---|---|---|
| Anise | | X | |
| Caraway | | X | |
| Chervil | | X | |
| Cinnamon | | X | |
| Coriander | | X | |
| Curry | | X | |
| Dill | | X | |
| Fennel | | X | |
| Garlic | | X | |
| Lovage | | X | |
| Myrrh | | X | |
| Paprika | | X | |
| Parsley | | X | |
| Rosemary extract | | X | |
| Umbelliferae | | X | |
| Vanillin | | X | |

| | | | |
|---|---|---|---|
| Other spices or herbs | | X | |

| **Legumes/pulses** | **Yes** | **No** | **Comments** |
|---|---|---|---|
| Beans | | X | |
| Guar gum | | X | |
| Tragacanth | | X | |
| Locust bean gum | | X | |
| Lupin and products thereof | | X | |
| Peas | | X | |
| Soybeans and products thereof (incl. soy oil, soy flour, soy meal, soy protein, soy lecithin etc.) | | X | |
| Tofu | | X | |
| Other legumes/pulses | | X | |

| **Cereals and cereal products** | **Yes** | **No** | **Comments** |
|---|---|---|---|
| Barley or its hybridised strains | | X | |
| Bakery products (bread crumb) | | X | |
| Cereals containing gluten | | X | |
| Gluten (gliadin, avenin, hordein) | | X | |
| Kamut or its hybridised strains | | X | |
| Maize | | X | 2) |
| Millet | | X | |
| Oats or its hybridised strains | | X | |
| Rice | | X | |
| Rye or its hybridised strains | | X | |
| Spelt or its hybridised strains | | X | |
| Starch | | X | |
| Wheat or its hybridised strains | | X | |
| Wheat flour, wheat meal or wheat starch | | X | |
| Other cereals or cereal products | | X | |

| **Starch, sugars and sweeteners** | **Yes** | **No** | **Comments** |
|---|---|---|---|
| Aspartame | | X | |
| Cyclamate | | X | |
| Dextrin | | X | |
| Fructose | | X | |
| Galactose | | X | |
| Glucose | | X | 2) |
| Invert sugar | | X | |
| Lactose | | X | |
| Maltodextrin | | X | 2) |
| Maltose | | X | 2) |
| Mannitol | | X | |
| Saccharose | | X | |
| Sorbitol | | X | |
| Starch | | X | 2) |
| Sucrose | | X | |
| Other starches, sugars or sweeteners | | X | |

| **Preservatives** | **Yes** | **No** | **Comments** |
|---|---|---|---|
| Benzoic acid and salts (E210 – E213) | | X | |
| Parabenes, hydroxybenzoic acid and salts (E214 – E219) | | X | |
| Sorbic acid and salts (E200, E202, E203) | | X | |
| Sulphur dioxide and sulphites at concentrations of more than 10 mg/kg or 10 mg/litre expressed as $SO_2$ | | X | No added $SO_2$ |
| Sulphite (E220 – E228) | | X | |
| Other preservatives | | X | |

| **Antioxidants** | **Yes** | **No** | **Comments** |
|---|---|---|---|
| BHA (E320) | | X | |
| BHT (E321) | | X | |
| Gallate (E310 – E312) | | X | |
| Other antioxidants | | X | |

| **Colours, flavours and flavour enhancers** | **Yes** | **No** | **Comments** |
|---|---|---|---|
| Artificial or natural colours | | X | |
| Azo dye | | X | |
| Flavours or flavour enhancers | | X | |
| Disodium inosinate | | X | |
| Disodium ribonucleotide | | X | |
| Glutamate and glutamic acid (E 620 - 632) | | X | |

| **Others** | **Yes** | **No** | **Comments** |
|---|---|---|---|
| Biogenic amines | | X | |
| Caffeine | | X | |
| Cholesterol | | X | |
| Latex | | X | |
| Lecithin | | X | |
| Peru balsam | | X | |
| Phenylalanine | | X | |
| Purine and purine derivates | | X | |
| Yeast | | X | No added yeast |

| **Suitability for dietetic food** | **Yes** | **No** | **Comments** |
|---|---|---|---|
| Baby/infant food | X | | |
| Patients with coeliac disease | X | | |
| Diabetics | X | | |
| Patients with fructose-intolerance | X | | |
| Patients with galactosaemia | X | | |
| Patients with phenylketonuria | X | | |

1) Sugar beet and sugar from sugar beet might be used as fermentation raw materials, but are not contained in the end product anymore.
2) Glucose syrup from maize is a fermentation raw material, but is not contained in the end product anymore.

Jungbunzlauer

# BSE / TSE

The following Jungbunzlauer products

- **Calcium Lactate Gluconate**
- **Citric Acid**
- **Citric Acid DC**
- **Citric Acid S40**
- **CITROCOAT® EP**
- **CITROCOAT® N**
- **CITROFOL®**
- **Encapsulated Glucono-delta-Lactone eGdL**
- **ERYLITE®**
- **ERYLITE® Bronze**
- **ERYLITE® Stevia**
- **ERYLITE® Monkfruit**
- **Gluconic Acid**
- **Glucono-delta-Lactone**
- **GLUCOSET**
- **L(+)-Lactic Acid**
- **L(+)-Lactic Acid Buffered**
- **LIQUINAT®**
- **Magnesium Lactate**
- **Monomagnesium Citrate**
- **Monosodium Citrate**
- **NAGLUSOL®**
- **Potassium Gluconate**
- **Potassium L(+)-Lactate**
- **Potassium L(+)-Lactate/Potassium Acetate**
- **Potassium L(+)-Lactate/Potassium Diacetate**
- **Potassium L(+)-Lactate/Sodium Acetate**
- **Potassium L(+)-Lactate/Sodium Diacetate**
- **Potassium L(+)-Lactate/Vinegar**
- **Sodium Gluconate**
- **Sodium Gluconate EMF**
- **Sodium L(+)-Lactate**
- **Sodium L(+)-Lactate/Sodium Diacetate**
- **sub4salt®**
- **TayaGel®**
- **Tricalcium Citrate**
- **Trimagnesium Citrate**
- **Tripotassium Citrate**
- **Trisodium Citrate**
- **Xanthan Gum**
- **Xanthan Gum Blends**
- **Zinc Citrate**
- **Zinc Gluconate**
- **Zinc Lactate**

are either manufactured by fermentation of glucose syrup derived from corn or further processing (e.g. neutralisation, esterification, agglomeration, coating, blending etc.). The products undergo several purification steps and are finally obtained in their highly pure form.

Due to the fact that Jungbunzlauer does not use animal derived substances in the manufacturing process of above mentioned products, existing EC regulations and directives concerning BSE / TSE do not apply.

Jungbunzlauer

# California Proposition 65

The following Jungbunzlauer products

- **Calcium Lactate Gluconate**
- **Citric Acid**
- **Citric Acid DC**
- **Citric Acid S40**
- **CITROCOAT® EP**
- **CITROCOAT® N**
- **CITROFOL®**
- **Encapsulated Glucono-delta-Lactone eGdL**
- **ERYLITE®**
- **ERYLITE® Bronze**
- **ERYLITE® Stevia**
- **Gluconic Acid**
- **Glucono-delta-Lactone**
- **GLUCOSET**
- **L(+)-Lactic Acid**
- **L(+)-Lactic Acid Buffered**
- **LIQUINAT®**
- **Magnesium Lactate**
- **Monomagnesium Citrate**
- **Monosodium Citrate**
- **NAGLUSOL®**
- **Potassium Gluconate**
- **Potassium L(+)-Lactate**
- **Potassium L(+)-Lactate/Potassium Acetate**
- **Potassium L(+)-Lactate/Potassium Diacetate**
- **Potassium L(+)-Lactate/Sodium Acetate**
- **Potassium L(+)-Lactate/Sodium Diacetate**
- **Potassium L(+)-Lactate/Vinegar**
- **Sodium Gluconate**
- **Sodium Gluconate EMF**
- **Sodium L(+)-Lactate**
- **Sodium L(+)-Lactate/Sodium Diacetate**
- **sub4salt®**
- **TayaGel®**
- **Tricalcium Citrate**
- **Trimagnesium Citrate**
- **Tripotassium Citrate**
- **Trisodium Citrate**
- **Xanthan Gum**
- **Xanthan Gum Blends**
- **Zinc Citrate**
- **Zinc Gluconate**
- **Zinc Lactate**

are either manufactured by fermentation of glucose syrup derived from corn or further processing (e.g. neutralisation, esterification, agglomeration, coating, blending etc.). The products undergo several purification steps and are finally obtained in their highly pure form.

Based on the production process as well as on the type of raw materials used, we can exclude to the best of our knowledge that the above-mentioned products contain substances listed under Proposition 65 State Drinking Water and Toxic Enforcement Act (last update 29 December 2023). However, we do not specially test for these substances, except for heavy metals.

Heavy metals are regularly tested. Typical data are available on request.

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P.O. Box
CH-4002 Basel
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Fax +41-61-2955 108
www.jungbunzlauer.com

**Certificate of Origin**

Jungbunzlauer

Basel, March 23rd, 2023

Dear customers

The following Jungbunzlauer product

- **L(+)-Lactic Acid**

is manufactured by fermentation of carbohydrates containing raw materials like glucose syrup derived from non-GMO maize.

The following Jungbunzlauer products are manufactured from **L(+)-Lactic Acid** as the main raw material:

- **L(+)-Lactic Acid Buffered**
- **Sodium L(+)-Lactate**
- **Potassium L(+)-Lactate**
- **Potassium L(+)-Lactate/Sodium Acetate**
- **Potassium L(+)-Lactate/Sodium Diacetate**
- **Potassium L(+)-Lactate/Potassium Acetate**
- **Potassium L(+)-Lactate/Potassium Diacetate**
- **Potassium L(+)-Lactate/Vinegar**
- **Sodium L(+)-Lactate/Sodium Diacetate**

Lactates are manufactured through neutralization of L(+)-lactic acid with a sodium or potassium source. Lactate blends are manufactured by blending of sodium lactate or potassium lactate with acetic acid partly or completely neutralised with caustic soda or caustic potash or with vinegar.
The above mentioned products are manufactured in the following Jungbunzlauer plant:

- **Jungbunzlauer S.A**
  **Z.I. et Portuaire, B.P. 32**
  **67390 Marckolsheim**
  **FRANCE**

With best regards

Christoph John
Junior Technical Service Manager

# Certificat

## Certificate

**Certificate n° 2019/82419.6**



AFNOR Certification certifies that the Food Safety Management System implemented by:

# JUNGBUNZLAUER SA

On the following location(s):

**ZI ET PORTUAIRE BP 32 FR 67390 MARCKOLSHEIM**

For the following activities:

**PRODUCTION BY FERMENTATION OF FOOD ADDITIVES: ERYTHRITOL, ERYTHRITOL STEVIA, ERYTHRITOL BRONZE, SODIUM GLUCONATES, GLUCONO-DELTA-LACTONE, GLUCONIC ACID, LACTIC ACID, SODIUM LACTATE, POTASSIUM LACTATE, LACTIC ACID BUFFERED, SODIUM LACTATE/SODIUM DIACETATE, POTASSIUM LACTATE/POTASSIUM DIACETATE, POTASSIUM LACTATE/POTASSIUM ACETATE, POTASSIUM LACTATE/SODIUM DIACETATE, POTASSIUM LACTATE/SODIUM ACETATE, POTASSIUM LACTATE/VINEGAR, AS WELL AS RELATED MIXTURES.**
**Category - K: PRODUCTION OF (BIO)CHEMICALS**

Has been assessed and determine to comply with the requirements of:

# FSSC 22000 (version 5.1 - November 2020)

Certification scheme for food safety management systems consisting of the following elements: ISO 22000:2018, ISO/TS 22002-1:2009 and additional FSSC 22000 (version 5.1 - November 2020) requirements.

Validity of this certificate can be verified in the FSSC 22000 database of certified organization available on www.fssc22000.com

| | |
|---|---|
| Initial certification date: | **2019-04-01** |
| Certification decision date: | **2022-04-01** |
| Issue date: | **2022-03-30** |
| Valid until (expiry date): | **2025-03-31** |

*Scan this QR code to check the validity of the certificate*

Ce document est signé électroniquement. Il constitue un original électronique à valeur probatoire.
*This document is electronically signed. It stands for an electronic original with probationary value.*

**Julien NIZRI**
**Managing Director of AFNOR Certification**

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SAS au capital de 18 187 000 € - 479 076 002 RCS Bobigny - **www.afnor.org**

Jungbunzlauer

# GMO Position
## European Manufacturing Sites

This position paper is valid for the Jungbunzlauer manufacturing sites Pernhofen (Austria), Ladenburg (Germany) and Marckolsheim (France).

The following Jungbunzlauer products

| | |
|---|---|
| **Biogums** | TayaGel® (gellan gum)<br>Xanthan Gum<br>Xanthan Gum Blends (instant thickener) |
| **Citrics** | Citric Acid<br>LIQUINAT® (Citric Acid Solution)<br>Trisodium Citrate |
| **Gluconates** | Encapsulated Glucono-delta-Lactone eGdL<br>Gluconic Acid<br>Glucono-delta-Lactone<br>Sodium Gluconate<br>sub4salt® (salt replacer) |
| **Lactics** | L(+)-Lactic Acid<br>L(+)-Lactic Acid Buffered<br>Potassium L(+)-Lactate<br>Potassium L(+)-Lactate/Potassium Acetate<br>Potassium L(+)-Lactate/Potassium Diacetate<br>Potassium L(+)-Lactate/Sodium Acetate<br>Potassium L(+)-Lactate/Sodium Diacetate<br>Potassium L(+)-Lactate/Vinegar<br>Sodium L(+)-Lactate<br>Sodium L(+)-Lactate/Sodium Diacetate |
| **Specialities** | Citric Acid DC (direct compressible citric acid)<br>CITROCOAT® EP (coated citric acid, sodium bicarbonate, gum arabic)<br>CITROCOAT® N (coated citric acid) |
| **Special Salts** | Calcium Lactate Gluconate<br>Magnesium Lactate<br>Monomagnesium Citrate<br>Monosodium Citrate<br>Potassium Gluconate<br>Tricalcium Citrate<br>Trimagnesium Citrate<br>Tripotassium Citrate<br>Zinc Citrate<br>Zinc Gluconate<br>Zinc Lactate |
| **Sweeteners** | ERYLITE® (erythritol)<br>ERYLITE® Bronze (erythritol with apple extract & natural flavours)<br>ERYLITE® Stevia (blend of erythritol & rebaudioside A)<br>ERYLITE® Monk Fruit (blend of erythritol & Mogroside V) |

are either manufactured by fermentation of glucose syrup derived from corn or further processing (e.g. neutralisation, esterification, agglomeration, coating, blending etc.). The products undergo several purification steps and are finally obtained in their highly pure form.

### Micro-organisms - Production Strains

Jungbunzlauer does not use genetically modified production strains* for the manufacture of above mentioned food additives.

* no GMO in the meaning of the European Directive 2009/41/EC which replaces Directive 90/219/EEC and its successive amendments.

### Fermentation Raw Materials

Jungbunzlauer works together solely with raw material suppliers who can exclude the processing of genetically modified organisms (GMO).

Jungbunzlauer purchases raw materials (e.g. glucose syrup) upon a NON-GMO agreement, if they are derived from crops for which genetically modified varieties exist (e.g. Bt maize).

Glucose syrup from corn is manufactured in dedicated plants at our production sites Pernhofen (Austria) and Marckolsheim (France). We have agreements with all suppliers that only GMO free corn is delivered. Suppliers of corn need to have a traceability system in place.

### Regulation on Genetically Modified Food and Feed

The regulation (EC) No **1829/2003** of the European Parliament and of the Council on genetically modified food and feed is not applicable to above-mentioned Jungbunzlauer food additives.

### Regulation on GMO Traceability

The regulation (EC) No **1830/2003** of the European Parliament and of the Council concerning the traceability and labelling of genetically modified organisms and the traceability of food and feed products produced from genetically modified organisms and amending Directive 2001/18/EC is not applicable to above-mentioned Jungbunzlauer food additives.

### In Summary

1) Above-mentioned Jungbunzlauer food additives are no genetically modified organisms as such and they do not contain genetically modified organisms.
2) Jungbunzlauer does not use genetically modified microorganisms for the fermentation step of above-mentioned food additives according to European Directive 2009/41/EC (We are not using new methods of mutagenesis or genome editing, referring to the latest judgement of the European Court of Justice; Affaire C-528/16).
3) There are no labelling requirements for above-mentioned Jungbunzlauer food additives according to Regulations (EC) No 1829/2003 and 1830/2003.

# Halal Quality Control

شهادة حلال

Scan to verify

# HALAL CERTIFICATE

## Awarded to:

## JUNGBUNZLAUER S.A.

Z.I. et Portuaire BP 32, 67390 Marckolsheim, France

Halal Quality Control BV Netherlands hereby awards this Halal Certificate to the above mentioned company which has been found in compliance with the following criteria:

| | |
|---|---|
| **Reference Halal Standards:** | OIC/SMIIC 1: 2019 \| MS 1500:2019 \| HAS 23000-1 |
| **Scope of Certification:** | Production of biodegradable ingredients of natural origin |
| **Product Category:** | C |
| **For the Products:** | See the Annex for the approved products |

This Halal Certificate is the sole property of the Halal approved company and is not to be shared with unauthorized parties.

**Approvals:**

**Signature of the Chief Executive Officer and Stamp:**

Dr. A.M. ALCHAMAN

**Control Office of Halal Slaughtering and Halal Quality Control BV**
**Laan van Meerdervoort 53d | 2517 AE Den Haag | The Hague | Netherlands**
**Tel or WhatsApp: +31 70 3469795 | info@halaloffice.com | www.halaloffice.com**
**Legal Registration Nr: 85104019**

| | |
|---|---|
| **Client ID:** | DE10410405290 |
| **Issue Date:** | 07/07/2023 |
| **Expiry Date:** | 22/07/2024 |
| **Cert. No:** | DE10410401261 |

**Halal Quality Control is accredited, recognized, and appointed by: JAKIM of Malaysia, BPJPH of Indonesia, MUIS of Singapore, EIAC of UAE, SFDA and SASO of Saudi Arabia, MOPH of Qatar, HAK of Turkiye, and more.**

Scan to verify

**Control Office Of Halal Slaughtering and Halal Quality Control BV Netherlands**

**مكتب مراقبة الذبح حسب الشريعة الإسلامية**
**مكتب مراقبة جودة الحلال في هولندا**

**Annex to Halal Certificate: DE10410401261**

Halal Quality Control confirms that the below mentioned items fully meet the Halal Requirements criteria of the Halal Standards to which it is applied for:

| Nr | Product name |
|---|---|
| 1 | Sodium gluconate |
| 2 | Gluconic acid |
| 3 | Glucono delta Lactone |
| 4 | Erylite®: Erythritol |
| 5 | Erythritol Mother liquor |
| 6 | Naglusol® |
| 7 | Lactic acid |
| 8 | Sodium lactate |
| 9 | Potassium lactate |
| 10 | Lactic acid - Sodium lactate mixtures |
| 11 | Sodium lactate - Sodium diacetate mixtures |
| 12 | Potassium lactate - Sodium diacetate mixtures |
| 13 | Potasssium lactate - Sodium acetate mixtures |
| 14 | Citrofeed 40® |
| 15 | Ammonium sulphate crystals |
| 16 | Lacti Vinasse |
| 17 | Potassium lactate - Potassium diacetate mixtures |
| 18 | Potassium lactate - Potassium acetate mixtures |
| 19 | Potassium Lactate - Vinegar mixtures |
| 20 | ERYLITE STEVIA |
| 21 | ERYLITE BRONZE |
| 22 | ERYLITE MONK FRUIT |
| 23 | eGdL |

Scan to verify

**Control Office Of Halal Slaughtering and Halal Quality Control BV Netherlands**

**مكتب مراقبة الذبح حسب الشريعة الإسلامية**
**مكتب مراقبة جودة الحلال في هولندا**

**Certificate No:** DE10410401261
**Date of Issue:** 07/07/2023
**Date of Expiry:** 22/07/2024

**Annex number:** 1
**Revision number:** 1.0
**Revision date:** 07/07/2023

**Signature of the Chief Executive Officer and Stamp:**
Dr. A.M. ALCHAMAN

# Certificat

## Certificate

**N° 2021/94413.3**

**AFNOR Certification certifie que le système de management mis en place par :**
*AFNOR Certification certifies that the management system implemented by:*

## JUNGBUNZLAUER SA

**pour les activités suivantes :**
*for the following activities:*

**PRODUCTION PAR FERMENTATION ET VENTE D'ADDITIFS ALIMENTAIRES: ERYTHRITOL, ERYTHRITOL STEVIA, ERYTHRITOL BRONZE, eGDL, GLUCONATE DE SODIUM, GLUCONO-DELTA-LACTONE, ACIDE GLUCONIQUE, ACIDE LACTIQUE, LACTATE DE SODIUM, LACTATE DE POTASSIUM, AINSI QUE LEURS MELANGES. PRODUCTION DE GLUCOSE A PARTIR DE CEREALES POUR LES UNITES DE FERMENTATION AINSI QUE DE MATIERES PREMIERES POUR L'ALIMENTATION ANIMALE.**

***PRODUCTION BY FERMENTATION OF FOOD ADDITIVES: ERYTHRITOL, ERYTHRITOL STEVIA, eGDL, SODIUM GLUCONATES, GLUCONO-DELTA-LACTONE, GLUCONIC ACID, LACTIC ACID, SODIUM LACTATE, POTASSIUM LACTATE, AS WELL AS RELATED MIXTURES. PRODUCTION OF GLUCOSE FROM CORN FOR FERMENTATION UNITS, AS WELL AS FEED MATERIALS.***

**a été évalué et jugé conforme aux exigences requises par :**
*has been assessed and found to meet the requirements of:*

## ISO 50001: 2018

**et est déployé sur les sites suivants :**
*and is developed on the following locations:*

| Adresse | N° SIREN |
|---|---|
| ZI ET PORTUAIRE BP 32 FR-67390 MARCKOLSHEIM | 378730790 |

**(L'ensemble des activités de l'entreprise sur le site donné est couvert par la certification)**
*(The scope of certification covers all activities carried out on the above-mentioned location)*

Ce certificat est valable à compter du (année/mois/jour)
*This certificate is valid from (year/month/day)* **2022-09-09**

Jusqu'au
*until* **2024-06-22**

SignatureFournisseur

**Julien NIZRI**
**Directeur Général d'AFNOR Certification**
*Managing Director of AFNOR Certification*

*Flashez ce QR Code pour vérifier la validité du certificat*

KOSHER CERTIFICATION SERVICE

ORTHODOX UNION

UNION OF ORTHODOX JEWISH CONGREGATIONS OF AMERICA איחוד קהילות האורתודוקסים באמריקה

FORTY RECTOR STREET / NEW YORK, NY 10006 / 212-613-8241 / KOSHERLETTER@OU.ORG / OUKOSHER.ORG

בס״ד

# LETTER OF KOSHER CERTIFICATION

March 01, 2024

This is to certify that the following product(s) prepared by

**Jungbunzlauer S.A., ZI et Portuaire - B.P. 32, Marckolsheim, 67390 FRANCE**

are under the supervision of the Kashruth Division of the Orthodox Union and are kosher as indicated below.

| Product Name | UKD-ID | Status | Certification Requirements |
|---|---|---|---|
| **Brand: Jungbunzlauer** | | | |
| • Encapsulated Glucono-delta-Lactone eGdL | OUV3-D25D51F | Pareve | Ⓤ Symbol required. |
| • ERYLITE® (Erythritol) | OUV3-D16DA8B | Pareve | Ⓤ Symbol required. |
| • ERYLITE® Bronze<br>*Approved with either Rabbi's signature or lot certificate.* | OUV2-3972756 | Pareve | Symbol not required. Packaging/letter bears Rabbi's signature/stamp or OU numbered seal/sticker. |
| • ERYLITE® Monkfruit | OUV2-7C72EBB | Pareve | Symbol not required. |
| • ERYLITE® Stevia 100<br>*Approved with either Rabbi's signature or lot certificate* | OUV2-6B4C3EE | Pareve | Symbol not required. Packaging/letter bears Rabbi's signature/stamp or OU numbered seal/sticker. |
| • ERYLITE® Stevia 200<br>*Approved with either Rabbi's signature or lot certificate* | OUV2-267749E | Pareve | Symbol not required. Packaging/letter bears Rabbi's signature/stamp or OU numbered seal/sticker. |

**Use of the OU trademark must comply with the terms set forth in a written agreement with the Orthodox Union. Any other use of the OU trademark is not authorized.**

**This certification is valid through 3/31/2025**

Rabbi Menachem Genack, *Rabbinic Adminstrator, CEO*

March 01, 2024

**Jungbunzlauer S.A. (continued)**

This is to certify that the following product(s) prepared by this company are under the supervision of the Kashruth Division of the Orthodox Union and are kosher as indicated below.

| Product Name | UKD-ID | Status | Certification Requirements |
|---|---|---|---|
| **Brand: Jungbunzlauer (continued)** | | | |
| • ERYLITE® Stevia 400<br>*Approved with either Rabbi's signature or lot certificate* | OUV2-AF1365E | Pareve | Symbol not required. Packaging/letter bears Rabbi's signature/stamp or OU numbered seal/sticker. |
| • Gluconic Acid | OUV3-E9302C9 | Pareve | Ⓤ Symbol required. |
| • Glucono Delta Lactone | OUV3-F372710 | Pareve | Ⓤ Symbol required. |
| • Lactic Acid | OUV3-2E25EAE | Pareve | Ⓤ Symbol required. |
| • Lactic Acid | OUV4-8E8DF9B | Pareve | Certified when bulk shipped in OU approved carriers. |
| • Lactic Acid Buffered | OUV3-611B4BC | Pareve | Ⓤ Symbol required. |
| • Lactic Acid Buffered | OUV4-BC45E38 | Pareve | Certified when bulk shipped in OU approved carriers. |
| • Potassium L (+) - Lactate/Potassium Acetate Food Grade | OUV3-4D6C641 | Pareve | Ⓤ Symbol required. |



Rabbi Menachem Genack, *Rabbinic Adminstrator, CEO*

**This certification is valid through 3/31/2025**

KOSHER CERTIFICATION SERVICE

# ORTHODOX UNION

## LETTER OF KOSHER CERTIFICATION

UNION OF ORTHODOX JEWISH CONGREGATIONS OF AMERICA איחוד קהילות האורתודוקסים באמריקה
FORTY RECTOR STREET / NEW YORK, NY 10006 / 212-613-8241 / KOSHERLETTER@OU.ORG / OUKOSHER.ORG

בס״ד

March 01, 2024

**Jungbunzlauer S.A. (continued)**

This is to certify that the following product(s) prepared by this company are under the supervision of the Kashruth Division of the Orthodox Union and are kosher as indicated below.

| Product Name | UKD-ID | Status | Certification Requirements |
|---|---|---|---|
| **Brand: Jungbunzlauer (continued)** | | | |
| • Potassium L (+) - Lactate/Potassium Diacetate Food Grade | OUV3-6F43B0A | Pareve | Ⓤ Symbol required. |
| • Potassium L (+) - Lactate/Sodium Acetate Food Grade | OUV3-7B2DA51 | Pareve | Ⓤ Symbol required. |
| • Potassium L (+) - Lactate/Sodium Diacetate Food Grade | OUV3-191C118 | Pareve | Ⓤ Symbol required. |
| • Potassium L (+) - Lactate/Vinegar Food Grade | OUV3-177687C | Pareve | Ⓤ Symbol required. |
| • Potassium Lactate | OUV3-F07B821 | Pareve | Ⓤ Symbol required. |
| • Potassium Lactate | OUV4-AE65DCE | Pareve | Certified when bulk shipped in OU approved carriers. |
| • Sodium Gluconate | OUV3-1F4084D | Pareve | Ⓤ Symbol required. |
| • Sodium L (+) - Lactate/Sodium Diacetate Food Grade | OUV3-0AC009D | Pareve | Ⓤ Symbol required. |
| • Sodium Lactate | OUV3-8165211 | Pareve | Ⓤ Symbol required. |
| • Sodium Lactate | OUV4-9283A8C | Pareve | Certified when bulk shipped in OU approved carriers. |



**This certification is valid through 3/31/2025**

Rabbi Menachem Genack, *Rabbinic Adminstrator, CEO*