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

### 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  
                                      Personal care  
                                      Cleaning agent  
                                      Biocidal product  
                                      Industrial use  
                                      Pharmaceutical raw material  
  
Restrictions on use              : None known.

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## SECTION 2. HAZARDS IDENTIFICATION

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

Skin corrosion                 : Category 1

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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**

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

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## SECTION 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Water mist  
Dry powder  
Carbon dioxide (CO<sub>2</sub>)  
Foam
- Unsuitable extinguishing media : High volume water jet
- Specific hazards during firefighting : Exposure to decomposition products may be a hazard to health.
- 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.  
Use water spray to cool unopened containers.  
In the event of fire and/or explosion do not breathe fumes.
- Collect contaminated fire extinguishing water separately. This must not be discharged into drains.  
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.
- Wear self-contained breathing apparatus for firefighting if necessary.

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## SECTION 6. ACCIDENTAL RELEASE MEASURES

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

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## 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.  
Avoid contact with skin and eyes.  
For personal protection see section 8.  
Smoking, eating and drinking should be prohibited in the application area.  
To avoid spills during handling keep bottle on a metal tray.  
Dispose of rinse water in accordance with local and national regulations.
- Conditions for safe storage : Keep in an area equipped with acid resistant flooring.  
Store in original container.  
  
Keep container tightly closed in a dry and well-ventilated place.  
Observe label precautions.  
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

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## 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.

In the case of vapour formation use a respirator with an

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approved filter.  
Use NIOSH approved respiratory protection.

Hand protection

Remarks : Wear suitable gloves tested to EN374.  
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.  
Safety glasses with side-shields  
Eye wash bottle with pure water  
Tightly fitting safety goggles  
Wear face-shield and protective suit for abnormal processing problems.

Skin and body protection : acid-resistant protective clothing  
Long sleeved clothing  
Footwear protecting against chemicals  
Impervious clothing  
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.  
Take off all contaminated clothing immediately.  
Wash contaminated clothing before re-use.  
When using do not eat or drink.  
When using do not smoke.  
Wash hands before breaks and at the end of workday.

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## 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 (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

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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/cm<sup>3</sup>

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

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**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  
    Oxidizing agents

Hazardous decomposition products       : Build-up of dangerous/toxic fumes possible in cases of fire/high temperature.  
    Carbon dioxide (CO<sub>2</sub>)

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**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 -            : In vitro tests did not show mutagenic effects  
Assessment

**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.





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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

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Remarks: After release, disperses through ground water.

Distribution among environmental compartments : Koc: < 20.9, log Koc: < 1.32  
Method: OECD Test Guideline 121  
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  
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

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## SECTION 13. DISPOSAL CONSIDERATIONS

#### Disposal methods

Waste from residues : In accordance with local and national regulations.

Do not dispose of waste into sewer.  
Do not contaminate ponds, waterways or ditches with  
chemical or used container.  
Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents.  
Dispose of as unused product.  
Do not re-use empty containers.

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## SECTION 14. TRANSPORT INFORMATION

#### International Regulations

IATA-DGR  
UN/ID No. : UN 3265

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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

AIIIC - 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

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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.

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