

## L-Threonine

### Product SPECIFICATION

<b>Product Name</b>	L-Threonine
<b>INCI Name</b>	L-threonine
<b>EINECS Number</b>	200-774-1
<b>CAS Code</b>	72-19-5

The product meets OR exceeds:  
**EP5 USP29 AJI97**

<b>AJI97</b>	
<b>Identification</b>	Infrared Absorption
<b>Specific rotation [α]<sub>D20</sub></b>	-27.6° to -29.0°
<b>State of Solution (Transmittance)</b>	Clear and Colorless not less than 98.0%
<b>Chloride (Cl)</b>	Not more than 0.020%
<b>Ammonium (NH<sub>4</sub>)</b>	Not more than 0.02%
<b>Sulfate (SO<sub>4</sub>)</b>	Not more than 0.020%
<b>Iron (Fe)</b>	Not more than 10 ppm
<b>Heavy metals (Pb)</b>	Not more than 10 ppm
<b>Arsenic (As<sub>2</sub>O<sub>3</sub>)</b>	Not more than 1 ppm
<b>Other amino acids</b>	Conforms
<b>Loss on drying</b>	Not more than 0.20%
<b>Residue on ignition</b>	Not more than 0.10%
<b>Assay</b>	99.0 to 101.0%
<b>PH</b>	5.2 to 6.2
<b>SPECIAL SPECIFICATION (EU)</b>	
<b>Arsenic</b>	Less than 2 ppm
<b>Lead</b>	Less than 3 ppm
<b>Mercury</b>	Less than 0.1 ppm
<b>Cadmium</b>	Less than 1 ppm
<b>EP5</b>	
<b>Characters</b>	White or almost white crystalline powder or shiny flakes
<b>Identification</b>	As per EP5 (Chemical examine & Infrared Absorption)
<b>Appearance of solution</b>	Clear and not more intensely coloured than reference solution
<b>pH</b>	5.0 to 6.5
<b>Specific rotation</b>	-27.6° to -29.0°
<b>Ninhydrin-positive substances</b>	Examine by thin-layer chromatography
<b>Chlorides</b>	Not more than 200 ppm
<b>Sulphates</b>	Not more than 300 ppm
<b>Ammonium</b>	Not more than 200 ppm

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<b>Iron (Fe)</b>	Not more than 10 ppm
<b>Heavy Metals (Pb)</b>	Not more than 10 ppm
<b>Loss on drying</b>	Not more than 0.5%
<b>Sulphated ash</b>	Not more than 0.1%
<b>Assay</b>	99.0 to 101.0%
<b>SPECIAL SPECIFICATION (EU)</b>	
<b>Arsenic</b>	Less than 2 ppm
<b>Lead</b>	Less than 3 ppm
<b>Mercury</b>	Less than 0.1 ppm
<b>Cadmium</b>	Less than 1 ppm
<b>USP29</b>	
<b>Identification</b>	Infrared Absorption
<b>Specific rotation</b>	-26.7° to -29.1°
<b>pH</b>	5.0 to 6.5
<b>Loss on drying</b>	Not more than 0.2%
<b>Residue on ignition</b>	Not more than 0.4%
<b>Chloride</b>	Not more than 0.05%
<b>Sulphate</b>	Not more than 0.03%
<b>Iron</b>	Not more than 0.003%
<b>Heavy Metals</b>	Not more than 0.0015%
<b>Chromatographic purity</b>	As per USP29 (By TLC)
<b>Individual Impurity</b>	< 0.5%
<b>Total Impurity</b>	< 2.0%
<b>Organic volatile impurities</b>	Meets the requirements
<b>Residual Solvents</b>	Meets the requirements
<b>Assay</b>	98.5 to 101.5%
<b>SPECIAL SPECIFICATION (EU)</b>	
<b>Arsenic</b>	Less than 2 ppm
<b>Lead</b>	Less than 3 ppm
<b>Mercury</b>	Less than 0.1 ppm
<b>Cadmium</b>	Less than 1 ppm

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### GENERAL PRODUCT INFORMATION

Mesh of the product	40-100
Taped density	0.6-0.7 g/ml
Bulk density	0.5-0.6 g/ml
Water solubility	200g/l 25°C
Origin (Synthetic, Fermentation)	Fermentation
Origin (Animal, Vegetal, etc.)	From corn
Is the product and their ingredients FREE of GLUTEN?	Yes
Product is suitable for Vegans	Yes
Product is suitable for Vegetarians	Yes
Product is free of fructose	Yes
Is this product suitable for food?	Yes
Can be the product used in baby food (According to Directive 2006/141/CE)?	No
Pharmacopoeias that product meets	USP
Melting Point	256°C
Country of the raw material/s	China
Storage conditions (In the warehouse)	Preserve in well-closed containers, drying place and avoid from light.

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### TECHNICAL PRODUCT INFORMATION

Name of the product	L-Threonine
Molecular Formula	C <sub>4</sub> H <sub>9</sub> NO <sub>3</sub>
Molecular mass	119.12
Frequency of analysis of each contaminant?	Every batch
Frequency of analysis of microbiology?	Every batch , Every batch
Frequency of analysis of each heavy metals?	Every batch , Every batch

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## L-Threonine

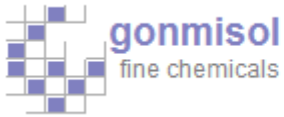
### FOREIGN BODIES

Explanation about control of the foreign bodies during the manufacturing process:

Metal detector	Yes
Sieve	Yes
Filter	Yes
X-Ray	No

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### INGREDIENTS

In accordance with the Directive 2003/89/EC We confirm this is the ingredients and their content in %

L-Threonine 100%

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### BSE/TSE

The product does not contain and is not derived from Specified Risk Material as defined in Commission Directive European and it is conform to the EU legislation relating to the risk of Transmission of Spongiform Encephalopathy (TSE).

### GMO

Following EU regulations have been published in the Official Journal of the European Union:

- Regulation (EC) No.1829/2003 of the European Parliament and the Council of 22nd September 2003 on genetically modified food and feed
- Regulation (EC) No.1830/2003 of the European Parliament and the Council of 22nd September 2003 concerning tractability and labeling on genetically modified organisms and tractability of food and feed products produced from genetically modified organisms and amending Directive 2001/18/EC.

This product has not been genetically modified so there is no obligation of GMO labeling as defined by the above mentioned regulations.

### NON IRRADIATION/NON IONIZED

According to directives 1992/2/EC and 1999/3/EC, We confirm is not made from irradiated/ionized raw materials or was irradiated/ionized the product.

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### PESTICIDES

To our actual knowledge of production process, raw materials and equipment used potential pesticide residues in the above mentioned product comply with the European legislation on pesticide residues, esp. Regulation (EC)None. 396/2005. However, we do no test for pesticide residues on a routine basis.

### CONTAMINANTS

The product is in accordance and meets with the commission regulation (EC) No.629/2008 of 2 July 2008 amending regulation (EC) No.1881/2006 setting maximum levels for certain contaminants in foodstuffs.

### PCBS and MELAMINE

The product is in accordance and meets with the commission regulation (EU) No.594/2012 of 5 July 2012 amending regulation (EC) No.1881/2006 as regards the maximum levels of the contaminants Ochratoxin a, non dioxin-like PCBS and melamine in foodstuffs.

### ANTI-DOPING

As per the list of 2012 of the world anti-doping agency the ingredient is not a doping substance and not a combination of doping substances. The ingredient does not contain any doping substance. The ingredient does not result from a doping substance.

As per the list of 2016 of the world anti-doping agency the ingredient is not a doping substance and not a combination of doping substances. The ingredient does not contain any doping substance. The ingredient does not result from a doping substance.

### NANOMATERIALS

According to the the definition of 'nanomaterials' of the UE REGULATION (EU) No 1169/2011 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 25 October 2011 on the provision of food information to consumers , we hereby attest that no nanomaterials are used in the formulation nor in the packaging materials of our product.

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### PACKING

We confirm that the packing used is in compliance with:

- Commission Directive 2002/72/EC of 6 August 2002 relating to plastic materials and articles intended to come into contact with foodstuffs.
- Regulation (EC) No 1935/2004 of the European Parliament and of the Council of 27 October 2004 on materials and articles intended to come into contact with food and repealing Directives 80/590/EEC and 89/109/EEC
- Commission Regulation (EU) No 10/2011 of 14 January 2011 on plastic materials and articles intended to come into contact with food.

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### ALLERGENS

In accordance with the Directive 2003/89/EC and Council amending Directive 2000/13/EC and taking Directive 2005/26/EC, Directive 2005/63/EC and Directive 2006/142/EC of 22.12.2006 into consideration. We confirm the following information:

Note: Does the raw material CONTAIN or is it DERIVED from or could it be CROSS-CONTAMINATED by any of the following.

Cereals containing gluten (i.e. wheat, rye, barley, oats, spelt, kamut or their hybridised strains) and products thereof	No
Crustaceans and products thereof	No
Eggs and products thereof	No
Fish and products thereof	No
Peanuts and products thereof	No
Soybeans and products thereof	No
Milk and products thereof (including lactose)	No
Nuts (i.e. Almond, Hazelnut, Walnut, Cashew, Pecan nut, Brazil nut, Pistachio nut, Macadamia nut and Queensland nut and products thereof)	No
Celery and products thereof	No
Mustard and products thereof	No
Sesame seeds and products thereof	No
Sulphur dioxide and sulphite at concentrations of more than 10 mg/kg or 10 mg/l expressed as SO <sub>2</sub>	No
Lupine and products thereof	No
Molluscs and products thereof	No

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### ALBA LIST (ALLERGENS)

When it is written 'No' means that there's no contamination in:

Contain in recipe, Handled on same production line or Handled at same side.

Where: 1) Contain in recipe 2) Handled on same production line 3) Handled at same side.

	Cross contamination (mg/kg)?	Where?
Cow milk protein	No	-
Lactose	No	-
Chicken egg	No	-
Soya protein	No	-
Soya oil	No	-
Gluten	No	-
Wheat	No	-
Rye	No	-
Cattle	No	-
Pork	No	-
Chicken	No	-
Fish	No	-
Shellfish and Crustaceae	No	-
Corn	No	-
Cocoa	No	-
Leguminous plants	No	-
Nuts	No	-
Nut oil	No	-
Peanut	No	-
Peanut oil	No	-
Sesame	No	-
Sesame oil	No	-
Glutamate	No	-
Sulphide (E220 to E228)	No	-
Coriander	No	-
Celery	No	-
Carrot	No	-
Lupines	No	-

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### NUTRITIONAL INFORMATION

The values given are approximate

Unit Weight 100 gram  
Amount Per Unit  
Total Fat 0 gram  
Saturated Fat 0 gram  
Trans Fat 0 gram  
Cholesterol 0 gram  
Total Carbohydrate 0 gram  
Dietary Fiber 0 gram  
Sugars 0 gram  
Protein 0 gram  
Sodium 0 gram  
Calcium 0 gram  
Total Calories 0 KJ / 0 Calorie

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### RESIDUE LIMITS

For the products/s mentioned above We herewith certify that the ingredient mentioned is in compliance with: commission regulation (EU) 2016/355 of 11 march 2016 amending Annex III to regulation (EC) No. 853/2004 of the European parliament and of the council as regards the specific requirements for gelatine, collagen and highly refined products of animal origin intended for human consumption.

### HYGIENE OF FOODSTUFFS

For the products/s mentioned above We herewith certify that the production complies with regulation (EC) No. 852/2004 of the European parliament on the hygiene of foodstuffs and all its amendments.

### FULL TRACEABILITY

For the products/s mentioned above We herewith the full traceability as mentioned in regulation (EC) No. 178/2002 of the European parliament and of the council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European food safety authority and laying down procedures in matters of food safety.

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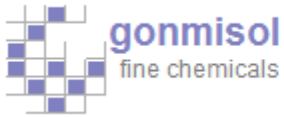
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### FACTORY ACCREDITATIONS/CERTIFICATIONS

ISO 9001	Yes
ISO 14001	Yes
ISO 22000	No
HACCP	Yes
GMP	Yes
FAMI QS	No

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### NON ANIMAL TESTING

We certify that the product has not been tested on animals for cosmetic purposes.

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### MSDS (Material Safety Data Sheet)

#### Section 1: Chemical Product and Company Identification

Product Name: L-Threonine

CAS Number: 72-19-5

Synonym: (S)-2-Amino-3-hydroxybutyric acid

Synonym: (S)-Allothreonine

#### Supplier Information:

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#### Section 2: Composition and Information on Ingredients

Composition:

Name CAS # % by Weight

{L-}Threonine 72-19-5 100

Toxicological Data on Ingredients: L-Threonine LD50: Not available. LC50: Not available.

#### Section 3: Hazards Identification

Potential Acute Health Effects:

Hazardous in case of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact(irritant).

Potential Chronic Health Effects:

Hazardous in case of eye contact (irritant), of ingestion, of inhalation.

Slightly hazardous in case of skin contact (irritant).

CARCINOGENIC EFFECTS: Not available.

MUTAGENIC EFFECTS: Not available.

TERATOGENIC EFFECTS: Not available.

DEVELOPMENTAL TOXICITY: Not available.

#### Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

Skin Contact:

After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin.

Cold water may be used. Cover the irritated skin with an emollient. If irritation persists, seek medical attention.

Wash contaminated clothing before reusing.

Serious Skin Contact: Not available.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation: Not available.

Ingestion:

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### MSDS (Material Safety Data Sheet)

Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.  
Serious Ingestion: Not available.

#### Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: These products are carbon oxides (CO, CO<sub>2</sub>), nitrogen oxides (NO, NO<sub>2</sub>...).

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available.

Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:

SMALL FIRE: Use DRY chemical powder.

LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

#### Section 6: Accidental Release Measures

Small Spill:

Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:

Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

#### Section 7: Handling and Storage

Precautions:

Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not breathe dust. Avoid contact with eyes. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If

you feel unwell, seek medical attention and show the label when possible.

Storage:

Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Combustible materials should be stored away from extreme heat and away from strong oxidizing agents.

#### Section 8: Exposure Controls/Personal Protection

Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

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### MSDS (Material Safety Data Sheet)

#### Personal Protection:

Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent.  
Gloves.

#### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

#### Section 9: Physical and Chemical Properties

For this information, please, refer directly to the Certificate of Analysis OR Specifications

#### Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

#### Section 11: Toxicological Information

Routes of Entry: Eye contact. Inhalation. Ingestion.

Toxicity to Animals:

LD50: Not available.

LC50: Not available.

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans:

Hazardous in case of ingestion, of inhalation.

Slightly hazardous in case of skin contact (irritant).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Passes through the placental barrier in human.

Special Remarks on other Toxic Effects on Humans: Not available.

#### Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

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## L-Threonine

### MSDS (Material Safety Data Sheet)

#### Section 13: Disposal Considerations

Waste Disposal:

#### Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

#### Section 15: Other Regulatory Information

Federal and State Regulations: TSCA 8(b) inventory: L-Threonine

Other Regulations: Not available..

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCl (EEC): R36- Irritating to eyes.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:

Gloves.

Lab coat.

Dust respirator. Be sure to use an approved/certified respirator or equivalent.

Splash goggles.

#### Section 16: Other Information

References: Not available.

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