Jungbunzlauer

Product Specification

Xanthan Gum FN

Food & Pharmaceutical Grade

Product name	Xanthan Gum FN
EC No.	234-394-2
CAS No.	11138-66-2
E-No.	E 415
Characteristics	A white or yellowish-white, free-flowing powder, having a typical odour and taste, soluble in water giving a highly viscous solution, practically insoluble in organic solvents.

Granulation:	
- through 60 mesh (< 0.250 mm)	min. 99%
- through 80 mesh (< 0.180 mm)	min. 95%
Viscosity:	
- 1% xanthan gum in 1% KCl solution (60 rpm)	1400 – 1600 mPa·s
Viscosity Ratio V1:V2	1.02 – 1.45
Description	free flowing powder
Identification	conforms
Assay	91.0 – 108.0%
Loss on Drying	max. 12.0%
pH (of 1% solution)	6.0 – 8.0
Isopropyl Alcohol	max. 500 mg/kg
Powder Colour	min. 60
Pyruvic Acid	min. 1.5%
Ash	6.5 – 16.0%
Nitrogen	max. 1.5%
Arsenic	max. 2 mg/kg
Lead	max. 2 mg/kg
Mercury	max. 1 mg/kg
Cadmium	max. 1 mg/kg
Total Aerobic Microbial Count	max. 1000 cfu/g
Escherichia coli	negative/25 g
Salmonella spp.	negative/25 g
Bile-tolerant gram-negative bacteria	negative/g
Pseudomonas aeruginosa	negative/g
Staphylococcus aureus	negative/g
Total Yeast and Mould Count	max. 100 cfu/g
Viable Cells of Xanthomonas campestris	negative/g

We herewith confirm that this product is specified to meet the requirements of the latest edition of the European Pharmacopoeia (Ph. Eur.), the United States Pharmacopeia (USP), the Food Chemicals Codex (FCC) and of Commission Regulation (EU) No 231/2012. All analytical methods are in accordance with the latest requirements of the Ph. Eur., the USP, the FCC or are equivalent. Test methods are available on request.

Jungbunzlauer

Ingredient Statement - Biogums

Product	Ingredient Declaration for Labeling Purposes
TayaGel® HA TayaGel® HA-D	Gellan Gum
XG FN XG FF XG FG XG FNLD XG FED XG FEDCS XG FFST XG FNST XG FNP XG FNPP XG FNCS XG FNCS-LD XG FFCS XG FNOC XG FNCS-OC XG FFOC XG FFCS-OC XG FNPC XG FNCS-PC XG FNCSP-PC XG FFPC XG FFCS-PC XG FFCSP-PC XG FEDCS-PC	Xanthan Gum
XG FNDF XG FFDF XG FGDF	Xanthan Gum, approx. 1 % edible vegetable oil
XG Instant Thickener	Maltodextrin, Erythritol, Xanthan Gum

We hereby confirm that that the products listed do not contain any ingredients other than those identified above.

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**
- **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.

To the best of our knowledge, the manufacturing processes of the above mentioned products do not leave any contaminants or by-products known to the State of California to cause cancer or reproductive toxicity as listed under Proposition 65 State Drinking Water and Toxic Enforcement Act (last update 27 January 2023), except of unavoidable traces of heavy metals.

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

Jungbunzlauer

Elemental Analysis

Xanthan Gum

Food & Pharmaceutical Grade

Product name	Xanthan Gum	$(C_{35}H_{49}O_{29})_n$
EC No.	234-394-2	
CAS No.	11138-66-2	
E-No.	E 415	

Typical Values (* = detection limit)

Aluminium	Al	< 0.5 mg/kg*
Antimony	Sb	< 0.05 mg/kg*
Arsenic	As	< 0.1 mg/kg*
Barium	Ba	< 0.2 mg/kg*
Cadmium	Cd	< 0.01 mg/kg*
Calcium	Ca	~ 120 mg/kg
Chromium	Cr	< 0.05 mg/kg*
Cobalt	Co	< 0.1 mg/kg*
Copper	Cu	< 0.1 mg/kg*
Iridium	Ir	< 0.1 mg/kg
Iron	Fe	~ 6 mg/kg
Lead	Pb	< 0.01 mg/kg*
Lithium	Li	< 0.5 mg/kg*
Manganese	Mn	~ 9 mg/kg
Magnesium	Mg	~ 600 mg/kg
Mercury	Hg	< 0.01 mg/kg*
Molybdenum	Mo	< 0.1 mg/kg*
Nickel	Ni	< 0.1 mg/kg*
Palladium	Pd	< 0.1 mg/kg
Platinum	Pt	< 0.1 mg/kg
Phosphor	P	~ 4.0 g/kg
Potassium	K	~2.7 g/kg
Rhodium	Rh	< 0.1 mg/kg
Ruthenium	Ru	< 0.1 mg/kg
Sodium	Na	~ 42 g/kg
Selenium	Se	< 0.2 mg/kg*
Tin	Sn	< 0.2 mg/kg*
Vanadium	V	< 0.2 mg/kg*
Zinc	Zn	~ 1 mg/kg

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

Jungbunzlauer

Gluten-Free

COMMISSION IMPLEMENTING REGULATION (EU) No 828/2014 of 30 July 2014 (on the requirements for the provision of information to consumers on the absence or reduced presence of gluten in food) permits only foods that contain less than 20 mg/kg of gluten to use the term "gluten-free" on their packaging.

The following Jungbunzlauer products

- **Calcium Lactate Gluconate**
- **Citric Acid**
- **Citric Acid DC**
- **CITROCOAT® EP**
- **CITROCOAT® N**
- **CITROFOL® AI Extra**
- **Encapsulated Glucono-delta-Lactone eGdL**
- **ERYLITE®**
- **ERYLITE® Bronze**
- **ERYLITE® Stevia**
- **ERYLITE® Monkfruit**
- **Gluconic Acid**
- **Glucono-delta-Lactone**
- **L(+)-Lactic Acid**
- **L(+)-Lactic Acid Buffered**
- **LIQUINAT®**
- **Magnesium Lactate**
- **Monomagnesium Citrate**
- **Monosodium Citrate**
- **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 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, we can exclude that the above mentioned products contain gluten above the limitation set for “gluten-free” labelling of the end product.

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**
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- **Monomagnesium Citrate**
- **Monosodium Citrate**
- **NAGLUSOL®**
- **Potassium Gluconate**
- **Potassium L(+)-Lactate**
- **Potassium L(+)-Lactate/Potassium Acetate**
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- **Potassium L(+)-Lactate/Sodium Diacetate**
- **Potassium L(+)-Lactate/Vinegar**
- **Sodium Gluconate**
- **Sodium Gluconate EMF**
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- **Sodium L(+)-Lactate/Sodium Diacetate**
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- **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

Legal, Ethical and Social Commitments

All Jungbunzlauer production sites and offices adhere proudly to a high standard of social responsibility.

Jungbunzlauer herewith confirms for its facilities in Austria, Germany, France and Canada that they comply with the Local, European and/or Canadian Law on labour, employment, occupational health and safety laying down the rights of employees.

We support a policy with regard to:

- Freely chosen recognized employment relationships
  (abolition of forced or compulsory labour, no harsh or inhumane treatment/punishment)
- Safe and healthy working environment
- Regulated working time according to applicable laws and industry standards
- Wages according to national legal standards
- Forming and joining trade unions
  (freedom of association and the right to collective bargaining)
- Ban of child labour
- Ban of discrimination for any reason
  (equality without distinction to race, sex, language, religion etc.)
- Zero tolerance of any kind of corruption, bribery, fraud etc.

At Jungbunzlauer we strive to provide our customers with products and services that meet today's market demands also on legal-, ethical- and social correctness among the whole supply chain. Our Corporate Social Responsibility Policy is available on request.

Jungbunzlauer does respect the rules of conduct stated in the International Labour Organization's Fundamental Conventions as well as the Universal Declaration of Human Rights.

We meet the requirements of the Social Accountability 8000 (SA 8000) as well as BSCI Code of Conduct.

We have a system in place to assure the compliance of our suppliers to the above mentioned principles, standards and/or codes of practice.

Jungbunzlauer is a member of SEDEX (Supplier Ethical Data Exchange).
Company Reference Jungbunzlauer International AG: ZC1032576

Jungbunzlauer International AG
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Nitrosamine

Jungbunzlauer

Basel, 08 August 2022

Dear customer

The following Jungbunzlauer product

- **Xanthan Gum**

is manufactured by fermentation of carbohydrates containing raw materials like glucose syrup from maize. The product undergoes several purification steps and is finally obtained in its highly pure form.

Based on the production process as well as on the raw materials used, we can exclude to the best of our knowledge that the above-mentioned product contain nitrosamine. Moreover, we herewith confirm that no nitrosamine is added intentionally to the above-mentioned product at any step during or after manufacturing.

Kindly note that we do not specifically test for nitrosamine.

Kind regards
Jungbunzlauer International AG

Nadine Roth
Junior Technical Service Manager

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Natural Status of Xanthan Gum

Jungbunzlauer

Basel, 30 January 2018

Dear customer

Xanthan gum is occurring in nature and is manufactured by the natural process of fermentation by using naturally derived raw materials like glucose syrup from maize as well as sugar from sugar beet. The strains used for the manufacturing are not genetically modified according to European Directive 2009/41/EC which replaces Directive 90/219/EEC and its successive amendments.

During the fermentation chemicals are used to neutralize the fermentation broth. Additionally, isopropyl alcohol is used to precipitate xanthan gum fibres from the fermentation broth. The structure of our xanthan gum is identical to the structure of xanthan gum found in nature.

There is no particular law known to us that defines the requirements for a "natural" product. As a consequence, we leave it up to you if you would like to indicate the end product as natural.

Kind regards

Jungbunzlauer
Technical Service

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To whom it may concern

Jungbunzlauer

Basel, 17 August 2022

Animal Testing

Dear customers,

We herewith confirm that Jungbunzlauer does not and has never conducted or commissioned any animal testing with its products for cosmetic purposes as defined in Article 18 of the Regulation (EU) No 1223/2009.

However, most food, cosmetic and pharmaceutical substances have been tested in the past by different companies and/or organisations in order to prove their safe status.

Please note that we cannot exclude that in the future any authority (e.g. European Chemicals Agency) will request animal studies (e.g. for a dossier evaluation) for any of our products used as chemicals.

Kind regards
Jungbunzlauer International AG

Michael Streit
Technical Service Manager

Jungbunzlauer

Pesticides

The following Jungbunzlauer products

- **Calcium Lactate Gluconate**
- **Citric Acid**
- **Citric Acid DC**
- **CITROCOAT® EP**
- **CITROCOAT® N**
- **CITROFOL® AI Extra**
- **Encapsulated Glucono-delta-Lactone eGdL**
- **ERYLITE®**
- **ERYLITE® Bronze**
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- **Glucono-delta-Lactone**
- **L(+)-Lactic Acid**
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- **Monosodium Citrate**
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- **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.

Corn/maize is regularly tested on pesticide residues according to Commission Regulation (EU) No. 396/2005 and all its amendments.

Based on these tests and on the production process, we can exclude that possible traces of substances which are currently authorized for the intended use as pesticides are transferred from our raw material corn into our final products.
For more details or other specific contaminants, please do not hesitate to contact us.

Please note that the above-mentioned products do not fall into the scope of Commission Regulation (EU) No. 396/2005.

Jungbunzlauer

Nanotechnology and Nanomaterial

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**
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- **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.

We herewith confirm that the above mentioned products are not to be classified as nanomaterials according to the new EU Commission recommendation on the definition of nanomaterials of June 10, 2022 (C(2022) 3689).[1)]

In addition, we confirm that the above mentioned products are neither intentionally produced by nanotechnology nor contain engineered nanomaterial as defined in:

- Article 2, paragraph 2 (t) of the Regulation (EU) No 1169/2011 [2)]
- Article 2 (k) of the Regulation (EU) No 1223/2009 [3)]

Furthermore, the packaging materials used by Jungbunzlauer are not nano-coated.

[1] **Definition of ‘nanomaterials’ according to EU recommendation C(2022) 3689**

'Nanomaterial' means a natural, incidental or manufactured material consisting of solid particles that are present, either on their own or as identifiable constituent particles in aggregates or agglomerates, and where 50 % or more of these particles in the number-based size distribution fulfil at least one of the following conditions:

(a) one or more external dimensions of the particle are in the size range 1 nm to 100 nm;
(b) the particle has an elongated shape, such as a rod, fibre or tube, where two external dimensions are smaller than 1 nm and the other dimension is larger than 100 nm;
(c) the particle has a plate-like shape, where one external dimension is smaller than 1 nm and the other dimensions are larger than 100 nm.

In the determination of the particle number-based size distribution, particles with at least two orthogonal external dimensions larger than 100 µm need not be considered. However, a material with a specific surface area by volume of < 6 m2/cm3 shall not be considered a nanomaterial.

[2] **Definition according to -Article 2, paragraph 2 (t) of the Regulation (EU) No 1169/2011**

‘Engineered nanomaterial’ means any intentionally produced material that has one or more dimensions of the order of 100 nm or less or that is composed of discrete functional parts, either internally or at the surface, many of which have one or more dimensions of the order of 100 nm or less, including structures, agglomerates or aggregates, which may have a size above the order of 100 nm but retain properties that are characteristic of the nanoscale. Properties that are characteristic of the nanoscale include:

(i) those related to the large specific surface area of the materials considered; and/or
(ii) specific physico-chemical properties that are different from those of the non-nanoform of the same material.

[3] **Definition according to Article 2 (k) of Regulation (EU) No 1223/2009**

‘Nanomaterial’ means an insoluble or biopersistant and intentionally manufactured material with one or more external dimensions, or an internal structure, on the scale from 1 to 100 nm.

Jungbunzlauer

Residual Solvents

Xanthan Gum

Food & Pharmaceutical Grade

Product name	Xanthan Gum
EC No.	234-394-2
CAS No.	11138-66-2
E-No.	E 415

The content of this document is based on the requirements as defined in:

ICH Q3C Impurities: Guideline for Residual Solvents

USP General Chapter <467> Residual Solvents

Ph. Eur. Chapter 5.4 Residual Solvents

According to the above mentioned guidelines, residual solvents were evaluated for their possible risk to human health and placed into one of three classes as follows:

Class 1 solvents: Solvents to be avoided

Known human carcinogens, strongly suspected human carcinogens, and environmental hazards.

Class 2 solvents: Solvents to be limited

Non-genotoxic animal carcinogens or possible causative agents of other irreversible toxicity such as neurotoxicity or teratogenicity. Solvents suspected of other significant but reversible toxicities.

Class 3 solvents: Solvents with low toxic potential

Solvents with low toxic potential to humans; no health-based exposure limit is needed. Class 3 solvents have "permitted daily exposures" (PDE's) of 50 mg or more per day.

Class 1 Solvents

Are class 1 solvents:

- **used in the manufacture or purification of the Product**
- **likely to be produced during manufacture of the Product**
- **impurities of the starting materials used to manufacture the Product**

Yes [ ] **No [X]**

Benzene		1,1-Dichloroethene	
Carbon tetrachloride		1,1,1-Trichloroethane	
1,2-Dichloroethane			

Class 2 Solvents

Are class 2 solvents:

- **used in the manufacture or purification of the Product**
- **likely to be produced during manufacture of the Product**
- **impurities of the starting materials used to manufacture the Product**

Yes [ ] No [X]

Acetonitrile		2-Methoxyethanol	
Chlorobenzene		Methylbutylketone	
Chloroform		Methylcyclohexane	
Cumene		Methylisobutylketone (acc. to ICH Q3C)	
Cyclohexane		Methylen chloride (acc. to USP)	
Cyclopentyl methyl ether (acc. to ICH Q3C)		N-Methylpyrrolidone	
1,2-Dichloroethane		Nitromethane	
Dichloromethane (acc. to ICH Q3C and Ph. Eur.)		Pyridine	
1,2-Dimethoxyethane		Sulfolane	
N,N-Dimethylacetamide		Tertiary-butyl alcohol (acc. to ICH Q3C)	
N,N-Dimethylformamide		Tetrahydrofuran	
1,4-Dioxane		Tetralin	
2-Ethoxyethanol		Toluene	
Ethylene glycol		1,1,2-Trichloroethene (acc. to ICH Q3C and Ph. Eur.)	
Formamide		Trichloroethylene (acc. to USP)	
Hexane		Xylene	
Methanol			

Class 3 Solvents

Are class 3 solvents:

- **used in the manufacture or purification of the Product**
- **likely to be produced during manufacture of the Product**
- **impurities of the starting materials used to manufacture the Product**

Yes [X] No [ ]

Acetic acid		Isobutyl acetate	
Acetone		Isopropyl acetate	

Anisole		Methyl acetate	
1-Butanol		3-Methyl-1-butanol	
2-Butanol		Methylethylketone	
Butyl acetate		Methylisobutylketone (acc. to Ph. Eur. and USP)	
tert-Butylmethyl ether		2-Methyl-1-propanol	
Dimethyl sulfoxide		2-Methyltetrahydrofuruan (acc. to ICH Q3C)	
Ethanol		Pentane	
Ethyl acetate		1-Pentanol	
Ethyl ether		1-Propanol	
Ethyl formate		2-Propanol	**x**
Formic acid		Propyl acetate	
Heptane		Triethylamine (acc. to ICH Q3C)	

Other Solvents

Are the following solvents [Solvents for which no adequate toxicological data was found]:

- **used in the manufacture or purification of the Product**
- **likely to be produced during manufacture of the Product**
- **impurities of the starting materials used to manufacture the Product**

Yes [ ] No [X]

1,1-Diethoxypropane		Methyltetrahydrofuran	
1,1-Dimethoxymethane		Petroleum ether (acc. to ICH Q3C and Ph. Eur.)	
2,2-Dimethoxypropane		Solvent hexane (acc. to USP)	
Isooctane		Trichloroacetic acid	
Isopropyl ether		Trifluoroacetic acid	
Methyl isopropyl ketone			

If any of the above mentioned solvents are likely to be present, please state the corresponding acceptance limit(s) in the Product as defined by your company.

Substance	**Acceptance limit**	**JBL Specification**
2-Propanol	≤ 500	mg/kg

Comments

The above mentioned product is manufactured by fermentation of carbohydrates. Except for the above mentioned 2-Propanol, the product does not get in to contact with solvents listed above.

As a class 3 solvent, 2-Propanol should be limited by GMP or other quality based requirements. As a consequence, the Jungbunzlauer acceptance limit of 2-Propanol in Xanthan Gum follows the strictest regulatory levels of max. 500 ppm.

Jungbunzlauer
Technical Service

Jungbunzlauer

TEST PROCEDURES FOR XANTHAN GUM
REFERRING TO SPECIFICATIONS AND CERTIFICATES OF ANALYSIS

IDENTITY
Test according to the latest edition of the European Pharmacopoeia monograph for xanthan gum.

ASSAY
Test according to the latest edition of the USP-NF monograph for xanthan gum.

VISCOSITY
Test in accordance with FCC.
1% xanthan gum in 1% KCl, Brookfield viscometer LVDV, spindle 3, 60 rpm at room temperature:
- Prepare a solution of 1% KCl and place 99 ml thereof in a beaker.
- Weigh in 1.000 g of xanthan gum using an analytical scale and slowly add it to the beaker while stirring at 250-300 rpm, using a propeller type stirrer (LRW 10).
- Stir for 1.5 hours at 800 rpm at room temperature
- Pour the solution into centrifuge tubes and centrifuge the solution for 2 minutes at 3500 rpm. Foam formed during the centrifugation is removed subsequently using a spoon.
- Measure the viscosity with a Brookfield LVDV viscometer, spindle 3, at 60 rpm. The steady state viscosity is reached after 3-5 minutes and is shown on the display.

VISCOSITY RATIO V1:V2
Test according to the latest edition of the FCC monograph for xanthan gum.

LOSS ON DRYING
For the determination of the loss on drying, a Halogen Moisture Analyzer is used. Weigh 3.4 – 4.6 g of xanthan gum in the aluminium sample pan for the moisture analysis. After starting the analysis the sample in the Halogen Moisture Analyzer absorbs the infrared radiation from the halogen lamp. As a result, the sample heats up very quickly and is dried. The switch-off criterion (AK) determines the point at which measurement is automatically ended and the result is displayed (AK 4 = 1 mg/90 s).

pH of 1% SOLUTION
Prepare a 1% solution of xanthan gum by adding 1 g xanthan gum to 99 g distilled water. Dissolve with a propeller type stirrer at 800 rpm for 120 minutes. Centrifuge the solution for 2 minutes at 3500 rpm. Foam formed during the centrifugation is removed subsequently using a spoon. Determine the pH-value using a standardized pH-meter according to the method of European Pharmacopoeia (Ph. Eur.).

ISOPROPYL ALCOHOL
Determine the content of isopropyl alcohol with a gas-chromatograph (head-space method).

POWDER COLOUR
Place xanthan gum in a glass dish and determine the powder colour with a Kodak Chromameter (Type CR-410) which is standardized and uses the L*a*b colour space.

TRANSMITTANCE
Prepare a 1% solution of xanthan gum by adding 1 g xanthan gum to 99 g distilled water. Dissolve with a propeller type stirrer at 800 rpm for 90 minutes. Centrifuge the solution for 2 minutes at 3500 rpm. Foam formed during the centrifugation is removed subsequently using a spoon. Transfer approximately 5 ml xanthan solution into a 10 mm cuvette. Measure the transmittance at 600 nm using a spectrophotometer.

PYRUVIC ACID
Preparations: Prepare a buffer solution by dissolving 14.0 g triethanolamine hydrochloride and 0.28 g disodium-EDTA in 80 ml distilled water using a 100 ml volumetric flask. Adjust the pH to 7.6 using NaOH (10%). Add distilled water to 100 ml. Prepare a NADH solution by dissolving 30 mg NADH and 60 mg of $NaHCO_3$ in 6 ml distillied water. Purchase a ready-to-use LDH solution (specific activity ~550 units/mg).
Procedure: in a vial weight out 0.03 g of xanthan gum (W_{XG}) and add 5 ml sulfuric acid (0.5 M). Dissolve the xanthan gum at 105 °C for 30 min on a heating block, prolong if neccesary until xanthan gum is fully dissolved . Cool down and transfer the solution quantitatively to a 100 ml volumetric flask and dilute with distilled water to 100 ml.
Prepare two 10 mm cuvettes and add 1.00 ml of buffer solution and 0.1 ml of NADH solution to each. Add 2.00 mL distillied water to one cuvette (blank) and 2.00 ml of xanthan gum solution to the other cuvette (sample). Mix gently and measure the extinction (E_0) of blank and sample at 340 nm.
Add 0.02 ml LDH solution to each cuvette and mix gently. Wait for 5 min and measure the extinction (E_1) of the blank and sample at 340 nm.
Use the following formula for calculation of pyruvate content:

$$Pyruvate\ content\ [\%] = \left[(E_0 - E_1)_{Sample} - (E_0 - E_1)_{Blank}\right] \cdot \frac{V_t\ [ml]}{V_s\ [ml]} \cdot \frac{M_{Pyruvat}\ [g\ mol^{-1}]}{\varepsilon_{NADH}\ [L\ mol^{-1}\ cm^{-1}] \cdot d\ [cm]} \cdot \frac{1}{\frac{10 \cdot W_{XG}[g]}{10 \cdot 100\ [ml]} \cdot \frac{100\ [\%] - LoD\ [\%]}{100\ [\%]}} \cdot 100\ [\%]$$

with: test volume (V_t = 3.12 ml), sample volume (V_s = 2.00 ml), molar mass of Pyruvate ($M_{Pyruvate}$ = 88.1 g mol^{-1}), molar extinction coefficient of NADH (ε_{NADH} = 6300 L mol^{-1} cm^{-1}), cuvette thickness (d = 1 cm), the amount of xanthan gum (W_{XG}; measured sample weight), and the Loss on Drying (*LoD*; measured separately).

ASH
Test according to the European Pharmacopoeia: Evenly distribute 1.00 g of the substance in a tared crucible. Dry at 100 °C to 105 °C for 1 h and ignite to constant mass in a muffle furnace at 600 °C ± 25 °C, allowing the crucible to cool in a desiccator after each ignition. The weight of the ash is between 6.5% and 16.0%.

NITROGEN
Determine the nitrogen content according to Kjeldahl-Buechi.

ARSENIC
Determination with ICP-MS (Inductively Coupled Plasma Mass Spectrometry).

LEAD
Determination with ICP-MS (Inductively Coupled Plasma Mass Spectrometry).

MERCURY
Determination with ICP-MS (Inductively Coupled Plasma Mass Spectrometry).

CADMIUM
Determination with ICP-MS (Inductively Coupled Plasma Mass Spectrometry).

MICROBIOLOGICAL PARAMETERS

TOTAL AEROBIC MICROBIAL COUNT
Add 1 g xanthan gum to 1 g Tween and 8 g MCT-oil and 90 g TSB broth; homogenize by shaking for at least 5 min. Add 100 µL of the homogenized solution with a spiralplater on a TSA-agar plate. Repeat procedure as required: for ≤1000 cfu/g limit use 2 TSA agar plates (100 µL solution each), for ≤500 cfu/g limit use 4 TSA agar plates (100 µL solution each) and for ≤100 cfu/g limit use 10 TSA agar plates (100 µL solution each). Incubate the plates at 32.5 °C for 72 hours. Determine the total aerobic microbial count.

SALMONELLA SPP.
Add 25 g xanthan gum to 25 g Tween and 200 g MCT-oil and 2450 g TSB broth; homogenize by shaking for at least 5 min. Incubate the solution at 32.5 °C for 24 h. After incubation, add 0.1 ml of the solution to 10 mL RV-bouillon and incubate for further 24 h, 32.5 °C. Streak on XLD-agar plates and incubate for 24 h at 32.5 °C. Lot is released if no growth is visible.

PSEUDOMONAS AERUGINOSA
Add 1 g xanthan gum to 1 g Tween and 8 g MCT-oil and 90 g TSB broth; homogenize by shaking for at least 5 min. Incubate the solution at 32.5 °C for 24 h. Streak on CETA-agar plates and incubate for 24 h at 32.5 °C. Lot is released if no growth is visible.

STAPHYLOCOCCUS AUREUS
Add 1 g xanthan gum to 1 g Tween and 8 g MCT-oil and 90 g TSB broth. Homogenize by shaking for at least 5 min. Incubate the solution at 32.5 °C for 24 h. Streak on MSA-agar plates and incubate for 24 h at 32.5 °C. Lot is released if no growth is visible. If necessary, verify the result by microscopy.

TOTAL YEASTS AND MOULD COUNT
Add 1 g xanthan gum to 1 g Tween and 8 g MCT-oil and 90 g TSB broth. Homogenize by shaking for at least 5 min. Add 200 µL of the homogenized solution with a spiralplater on a SAB-agar plate, repeat the procedure 4 times. Incubate the 5 plates at 23 °C for 5 days. Determine the total yeast and mould count.

XANTHOMONAS CAMPESTRIS
Add 1 g xanthan gum to 1 g Tween and 8 g MCT-oil and 90 g TSB broth. Homogenize by shaking for at least 5 min. Incubate the solution at 32.5 °C for 24 h. Streak on TSA-agar plates and incubate for 72 h at 32.5 °C. Lot is released if no growth is visible. If necessary, verifiy the result by microscopy.

ESCHERICHIA COLI
Add 25 g xanthan gum to 25 g Tween and 200 g MCT-oil and 2450 g TSB broth. Homogenize by shaking for at least 5 min. Incubate the solution at 32.5 °C for 24 h. After incubation, add 1 ml of the solution to 10 mL MacConkey-Broth and incubate for further 24 h at 43 °C. Streak on MCA-agar plates and incubate for 24 h at 32.5 °C. Lot is released if no growth is visible.

BILE-TOLERANT GRAM-NEGATIVE BACTERIA (includes COLIFORMS*)*
Add 1 g xanthan gum to 1 g Tween and 8 g MCT-oil and 90 g TSB broth. Homogenize by shaking for at least 5 min. Incubate the solution at 32.5 °C for 24 h. After incubation, add 1 ml of the solution to 10 mL Mossel-Bouillon and incubate for further 24 h at 32.5 °C. Streak on VRBD-agar plates and incubate for 24 h at 32.5 °C. Lot is released if no growth is visible.

GRANULATION

DIGITAL IMAGING METHOD (standard method)

This method uses Dynamic Image Analysis (ISO 13322-2) as measuring principle. The equipment used is a RETSCH CAMSIZER XT equipped with X-Dry modulus and X-Jet cartridge.
For the analysis, 15 g of xanthan gum are evenly distributed on a feed chute with distribution brush and metal pin. When starting the analysis, the material is transferred into the detector. Before passing the dual camera system for detection, it is further distributed using an air jet. Material remaining on the feed chute is transferred into the detector using an distinct brush. The measurement stops when the sample has passed the detector completely. Based on the pictures taken, the results are calculated by the corresponding software RETSCH CamsizerXT64 and provided with the defined sieving fractions in %.

SIEVING METHOD

Blend :

Place 50 g xanthan gum in a sieve shaker (RETSCH Vibratory Sieve Shaker AS 200 control) and add beads as an auxiliary material. Shake for 5 minutes at an amplitude of 1.300 mm. Weigh each sieve and calculate the sieving fractions in %.

FINE:

Place 10 g xanthan gum in an air jet sieving machine (RETSCH AS 200 jet). The sieves are then one by one sieved by the air jet. Weigh each sieve and calculate the sieving fractions in %.

NORMAL:

Place 50 g xanthan gum in a sieve shaker (RETSCH Vibratory Sieve Shaker AS 200 control) and add beads as an auxiliary material. Shake for 5 minutes at an amplitude of 1.300 mm. Weigh each sieve and calculate the sieving fractions in %.

COARSE:

Place 50 g xanthan gum in a sieve shaker (RETSCH Vibratory Sieve Shaker AS 200 control) and add beads as an auxiliary material. Shake for 5 minutes at an amplitude of 1.300 mm. Weigh each sieve and calculate the sieving fractions in %.

Jungbunzlauer

Organic Statement

The following Jungbunzlauer products:

Citric Acid
Glucono-delta-Lactone
TayaGel® (gellan gum)
Lactic Acid
Potassium Lactate
Sodium Lactate
Tricalcium Citrate
Tripotassium Citrate
Trisodium Citrate
Xanthan Gum

are manufactured by fermentation of carbohydrates. The products undergo several purification steps and are finally obtained in their highly pure form.

Jungbunzlauer confirms that neither the raw materials we use for the manufacture of our products, nor the products themselves, are treated with ionizing radiation. Also, sewage sludge is not used in our production process and handling.

The National Organic Program specifies a “National List of Approved and Prohibited Substances“. Relevant excerpts of the National Organic Program are below which indicate that the above mentioned products are allowed substances when meeting the requirements of the sections.

Please refer to the National Organic Program for further clarification. We advise companies using this information to discuss this matter with their own regulatory and label experts.

*Excerpts from Title 7 - Part 205 - National Organic Program

§205.105 Allowed and prohibited substances, methods, and ingredients in organic production and handling.

To be sold or labeled as “100 percent organic,” “organic,” or “made with organic (specified ingredients or food group(s)),” the product must be produced and handled without the use of:

(a) Synthetic substances and ingredients, except as provided in §205.601 or §205.603;

(b) Nonsynthetic substances prohibited in §205.602 or §205.604;

(c) Nonagricultural substances used in or on processed products, except as otherwise provided in §205.605;

(d) Nonorganic agricultural substances used in or on processed products, except as otherwise provided in §205.606;

(e) Excluded methods, except for vaccines: Provided, That, the vaccines are approved in accordance with §205.600(a);

(f) Ionizing radiation, as described in Food and Drug Administration regulation, 21 CFR 179.26; and

(g) Sewage sludge.

§205.605 Nonagricultural (nonorganic) substances allowed as ingredients in or on processed products labeled as "organic" or "made with organic (specified ingredients or food group(s))."

The following nonagricultural substances may be used as ingredients in or on processed products labeled as "organic" or "made with organic (specified ingredients or food group(s))" only in accordance with any restrictions specified in this section.

(a) Nonsynthetics allowed:

Acids (Citric—produced by microbial fermentation of carbohydrate substances; and Lactic).
Gellan gum—high-acyl form only
Glucono delta-lactone—production by the oxidation of D-glucose with bromine water is prohibited.

(a) Synthetics allowed:

Calcium citrate.
Potassium citrate.
Potassium lactate – for use as an antimicrobial agent and pH regulator only.
Sodium citrate.
Sodium lactate – for use as an antimicrobial agent and pH regulator only.
Xanthan gum.

Jungbunzlauer

Recall Procedure
Jungbunzlauer Inc.

In the event of product or products necessitating a recall or market withdrawal, the following Jungbunzlauer Inc. contacts are to be notified:

Recall Committee	
Dan Rainville, President Carlos Torres, Sales Director Kendall Tyler, Head of Order Processing	Tze-Mai Wong, Technical Service Manager Anne Wimette, Financial Controller

If none of the above are available, contact Head Finance and Administration.
In case of personal injury, contact Corporate Council.

Definitions (US Food and Drug Administration)

Recalls are actions taken by a firm to remove a product from the market. Recalls may be conducted on a firm's own initiative, by FDA request, or by FDA order under statutory authority.

Class I
A Class I recall is a situation in which there is a reasonable probability that the use of or exposure to a violative product will cause serious adverse health consequences or death.

Class II
A Class II recall is a situation in which use of or exposure to a violative product may cause temporary or medically reversible adverse health consequences or where the probability of serious adverse health consequences is remote.

Class III
A Class III recall is a situation in which use of or exposure to a violative product is not likely to cause adverse health consequences.

Market withdrawal
A market withdrawal occurs when a product has a minor violation that would not be subject to FDA legal action. The firm removes the product from the market or corrects the violation. For example, a product removed from the market due to tampering, without evidence of manufacturing or distribution problems, would be a market withdrawal.

Information Gathering
The nature of the problem or cause for recall, the product, lot numbers in question must be identified and recorded. All other relevant information such as the person reporting the emergency, their phone numbers, location and affiliation should also be taken.

Management Notification
The Recall Committee shall be immediately notified.

Determination of Recall Class
If possible, the class of recall is I, II, III or market withdrawal as defined is determined.

Determination of the location and distribution of the product(s)
Using our business system and any other available information, all customers and warehouses to whom the lot was sent will be immediately identified.

Notification, Quarantine and Containment
Using fax and phone, each customer and warehouse will be personally contacted and shall be requested to immediately determine the status of the inventory of the material and quarantine any of the product in question.

Third Party Notification
If the product has been subject to further distribution, the customer will be asked to contact subsequent customers to do likewise.

Advisory of Containment and Quarantine
Warehouses and customers will notify Jungbunzlauer of their success and/or failure to locate and quarantine the recall material. If the product has been incorporated into another product, this should also be noted. Based on the situation, subsequent products may need to be recalled.

Reporting
Jungbunzlauer personnel will report to the recall committee the status of the quarantined materials and or subsequent usage thereof.

Resolution and/or Retrieval
As necessary, arrangements will be made to retrieve the quarantined product and handle appropriately.

Investigation and Corrective Actions
Investigation into the cause of the problem will be made and corrective actions taken. Preventative actions will be taken to minimize the possibilities of future occurrences.

Customer Notifications
Customers involved will be notified of the results of the investigation and the corrective actions to be taken. If there are liability issues and or financal considerations, information releases should be approved by corporate council.

Conclusion
A follow-up meeting of the Recall Committee will be held to de the efficiency of the Recall, review the results, and if necessary institute any changes needed in recall procedures.

Questions, comment, suggestions, etc. regarding this recall procedure should be directed to the Technical Service Manager.

Any liability issues will be referred to Corporate Council.

Emergency Contact List

National Chemical Emergency Centre 24 Hour Emergency Phone Number **NCEC 1 202 464 2554**	**President** **(24/7 Emergency Contact)** Dan Rainville Phone: 781 532 8607 Mobile: 508 400 7575 dan.rainville@jungbunzlauer.com
Sales Director Carlos Torres Phone: 781 532 8605 Mobile: 774 278 3758 carlos.torres@jungbunzlauer.com	**Head of Order Processing** **(24/7 Emergency Contact)** Kendall Tyler Phone: 781 532 8615 Mobile: 617 417 3763 kendall.tyler@jungbunzlauer.com
Financial Controller Anne Wimette Phone: 781 532 8604 Mobile: 774 573 9549 anne.wimette@jungbunzlauer.com	**Technical Contact** Tze-Mai Wong Phone: 781 532 8624 tze-mai.wong@jungbunzlauer.com

Jungbunzlauer

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www.jungbunzlauer.com

Americold Logistics
JBL Warehouse - EDISON
100 Saw Mill Pond Road
Edison NJ 08817
USA

Certificate of Analysis

Date format	MM/DD/YYYY
Creation date	05/09/2023
Your order no.	4500769959
Date	01/18/2023
Delivery note	81017757 | 000010
Date of dispatch	05/09/2023
Our reference	932417 | 000010
Date	01/18/2023
Client number	101710
Date of arrival	06/16/2023

Material / Product / Description

101563 / / Xanthan Gum FN food grade normal in 50 lbs cartons

Shipping point

Jungbunzlauer Austria AG, Factory Pernhofen, 2064 Wulzeshofen

Batch	Quantity	Date of production	Date of expiry	Production plant, country	Country of Origin
2555992	13,200 LB	04/20/2023	04/2026	Pernhofen, AT	AT

Parameter	Unit	Specification	Value
Particles < 0.250 mm (mesh 60)	%	>= 99	100
Particles < 0.180 mm (mesh 80)	%	>= 95	98
Viscosity 1%XG in 1%KCl-Sol. (60 rpm)	mPa.s	1400 - 1600	1540
Viscosity Ratio V1:V2 (24°C:66°C)		1.02 - 1.45	conforms*
Description			conforms
free flowing powder			
Identification			conforms*
Assay	%	91.0 - 108.0	conforms*
Loss on Drying	%	<= 12.0	8.9
pH (of 1% solution)		6.0 - 8.0	7.3
Isopropyl Alcohol	mg/kg	<= 500	13
Powder Colour		>= 60	79
Pyruvic Acid	%	>= 1.5	conforms*
Ash	%	6.5 - 16.0	11.5
Nitrogen	%	<= 1.5	conforms*
Arsenic	mg/kg	<= 2	conforms*
Lead	mg/kg	<= 2	conforms*
Mercury	mg/kg	<= 1	conforms*
Cadmium	mg/kg	<= 1	conforms*
Total Aerobic Microbial Count	CFU/g	<= 1000	<= 1000
Escherichia coli		negative/25g	conforms
Salmonella spp.		negative/25g	conforms
Bile-tolerant gram-negative bacteria		negative/g	conforms
Pseudomonas aeruginosa		negative/g	conforms
Staphylococcus aureus		negative/g	conforms
Total Yeast and Mould Count	CFU/g	<= 100	<= 100
Xanthomonas campestris, viable cells		negative/g	conforms

We herewith confirm that this product is specified to meet the requirements of the latest edition of the European Pharmacopoeia (Ph. Eur.), the United States Pharmacopeia (USP), the Food Chemicals Codex (FCC) and of Commission Regulation (EU) No 231/2012. All analytical methods are in accordance with the latest requirements of the Ph. Eur., the USP, the FCC or are equivalent. Test methods are available on request.

*) Analysis is confirmed based on In-Process-Control or by random testing.

QUALITY CONTROL MANAGER

DI Clemens Brunner

FSSC 22000 certified by LRQA- Reg. No. 10382348 - Certificate Expiry on Aug. 27th, 2023
GMP+B1+B3 certified by LRQA- Reg. No. 10373162 - Certificate Expiry on July 31st, 2023
ISO 9001:2015 certified by LRQA - Certificate No. 10370717 - Certificate Expiry on July 8th, 2023
This computer generated certificate is valid without signature.

Jungbunzlauer Inc.
95 Wells Avenue, Suite 150
Newton, MA 02459
Phone: 617-969-0900
Fax: 617-964-2921
www.jungbunzlauer.com

January 1, 2023

Jungbunzlauer

To Jungbunzlauer Customers,

Please be advised that each and every article as described in Appendix "A" hereafter shipped or otherwise delivered by Jungbunzlauer Inc. ("Jungbunzlauer") including any of its affiliated companies, is hereby guaranteed to be (1) not adulterated or misbranded within the meaning of the Federal Food, Drug and Cosmetic Act, as amended ("the Act"), and not an article which may not, under the provisions of Section 404 or Section 505 of that Act, be introduced into interstate commerce, and (2) not adulterated or misbranded within the meaning of the Federal Insecticide, Fungicide and Rodenticide Act, the Federal Hazardous Substances Labeling Act, or any applicable State pure foods act or any other applicable Federal, State or Local Law, and not an article which cannot be legally transported or sold under the provisions of any Federal or any applicable State or Local Law, and (3) not misbranded within the meaning of any Federal or any applicable State or Local Law when bearing labels furnished by the seller and affixed to such articles on repacking by the buyer in accordance with instructions furnished by the seller.

This guarantee shall be applicable to all valid state laws or municipal ordinances in which, both in express terms and as judicially and administratively interpreted, the definitions of adulteration and misbranding are the same as, or substantially similar to, the definitions of the Act.

This guarantee is executed by Jungbunzlauer subject to the condition that if an item or article is delivered under a label designed or furnished by the buyer, Jungbunzlauer's liability for misbranding shall be limited to that resulting from the failure of the item or article to conform to the standard, if any, for the product, the purchase specifications or the statements contained on such label.

This guarantee shall be void and of no effect in any instance where the particular use or sale of any article to which this guarantee would otherwise apply, results in a use which in not in compliance with the requirements of the Act, and any regulations promulgated there under.

Jungbunzlauer does not guarantee against adulteration or misbranding due to circumstances or causes beyond its control.

This guarantee shall continue in effect from the date hereof, until such date as Jungbunzlauer notifies in writing of its revocation.

Dan Rainville

President
Jungbunzlauer Inc.

Appendix "A"

Biogums	TayaGel® (gellan gum) Xanthan Gum Xanthan Gum Blends
Citrics	Citric Acid LIQUINAT® (citric acid solution) Trisodium Citrate
Gluconates	Encapsulated Glucono-delta-Lactone eGdL Gluconic Acid Glucono-delta-Lactone NAGLUSOL® Sodium Gluconate sub4salt®
Lactics	L(+)-Lactic Acid L(+)-Lactic Acid Buffered 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 L(+)-Lactate Sodium L(+)-Lactate/Sodium Diacetate
Specialties	Citric Acid DC CITROCOAT® N (coated citric acid) CITROFOL® (citrate esters)
Special Salts	Calcium Lactate Gluconate Magnesium Lactate Monomagnesium Citrate Monosodium Citrate Potassium Gluconate Tricalcium Citrate Trimagnesium Citrate Tripotassium Citrate Zinc Citrate Zinc Gluconate Zinc Lactate
Sweeteners	ERYLITE® (erythritol) ERYLITE® Bronze ERYLITE® Stevia ERYLITE® Monkfruit

Current issue date: 9 July 2023
Expiry date: 8 July 2026
Certificate identity number: 10534028

Original approval(s):
ISO 9001 - 26 October 1994

Certificate of Approval

This is to certify that the Management System of:

Jungbunzlauer Austria AG

Werk Pernhofen, Pernhofen 1, 2064 Wulzeshofen, Austria

has been approved by LRQA to the following standards:

ISO 9001:2015

Approval number(s): ISO 9001 – 0026601

The scope of this approval is applicable to:

Manufacture of Citric Acid Anhydrous, Citric Acid Monohydrate, LIQUINAT® (Citric Acid Solution), Trisodium Citrate Dihydrate, Trisodium Citrate Anhydrous, Magnesium Citrate, Magnesium Lactate, Zinc Citrate, Zinc Lactate, Xanthan Gum, TayaGel® (Gellan Gum), Xanthan Instant Thickener, Tricalcium Citrate Anhydrous, Glucose Sirup (SIRODEX 431), Citrofeed, Gypsum, Corngerms, Corn Gluten Feed, Corn Gluten Meal, Corn Fibres, Corn Steep Liquor, Broken Corn.

Paul Graaf

Area Operations Manager, Europe

Issued by: LRQA Limited

UKAS MANAGEMENT SYSTEMS
0001

Current issue date:	28 August 2023	Initial date of certification:	28 August 2011
Expiry date:	31 May 2025	Certification decision date:	7 August 2023
Certificate identity number:	10544726		

Certificate of Approval

This is to certify that the Food Safety Management System of:

Jungbunzlauer Austria AG

Werk Pernhofen, Pernhofen 1, 2064 Wulzeshofen, Austria

has been assessed by LRQA and determined to comply with the requirements of:

Food Safety System Certification 22000, FSSC 22000

Certification scheme for food safety management systems consisting of the following elements:

ISO22000:2018, ISO/TS 22002-1:2009 and additional FSSC22000 requirements (version 5.1)

Food Chain (Sub) Category: K

Approval number(s): FSSC 22000 – 0018606

COID: AUT-1-9228-840965

The scope of this approval is applicable to:

Production of Citric Acid, Citrates, Lactates, Xanthan Gum and Gellan Gum as food ingredient and production of Glucose syrup. This audit included the following central FSMS processes managed by Jungbunzlauer Suisse AG, Basel: Product Development & Product Management.

Paul Graaf

Area Operations Manager, Europe

Issued by: LRQA Limited

FSSC 22000

UKAS MANAGEMENT SYSTEMS 0001

Halal Quality Control

شهادة حلال

Scan to verify

HALAL CERTIFICATE

Awarded to:

Jungbunzlauer Austria AG

Factory Pernhofen , AT-2064 Wulzeshofen, Austria

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 | GSO 2055-1:2015 | HAS 23000-1
Scope of Certification:	Production of biodegradable ingredients of natural origin
Product Category:	C, K
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.

This certificate is valid until July 7, 2025

Chief Executive Officer:
Dr. A.M. ALCHAMAN

Control Office of Halal Slaughtering and Halal Quality Control B.V.
Laan van Meerdervoort 53d | 2517 AE Den Haag | The Hague | Netherlands
Tel or WhatsApp: +31 70 3469795 | info@halalqualitycontrol.com | www.halalqualitycontrol.com
Legal Registration Nr: 85104019 | VAT Nr: NL863510486B01

Client ID:	DE10410405287
Issue Date:	24/06/2024
Expiry Date:	07/07/2025
Cert. No:	DE10410401659

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: DE10410401659

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	Citric Acid Anhydrous
2	LIQUINAT ® (Citric Acid Solution)
3	Citric Acid Monohydrate
4	Trisodium Citrate Dihydrate
5	Trisodium Citrate Anhydrous
6	Zinc Citrate
7	Xanthan Gum
8	GlucoDex® D96 (Glucose Syrup)
9	Magnesium Lactate
10	Zinc Lactate
11	Citrofeed
12	Xanthan Gum CA-MD-E
13	Xanthan Gum MD-E
14	Xanthan Gum FEDCS
15	Xanthan Gum FED
16	Tricalcium Citrate Anhydrous
17	TayaGel® (Gellan Gum)
18	Mono Magnesium Citrate
19	Trimagnesium Citrate Anhydrous
20	Cornsteep Liquor -Maisquellwasser

Certificate No: DE10410401659
Date of Issue: 24/06/2024
Date of Expiry: 07/07/2025

Annex number: 01
Revision number: 5.0
Revision date: 24/06/2024

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

Control Office of Halal Slaughtering and Halal Quality Control B.V.
Laan van Meerdervoort 53d | 2517 AE Den Haag | The Hague | Netherlands
Tel or WhatsApp: +31 70 3469795 | info@halalqualitycontrol.com | www.halalqualitycontrol.com
Legal Registration Nr: 85104019 | VAT Nr: NL863510486B01

Jungbunzlauer

Lot Code Explanation for Standard Jungbunzlauer Products

Jungbunzlauer lot codes/batch numbers are a 7 digit number generated by SAP.

Example: 1234567

Jungbunzlauer

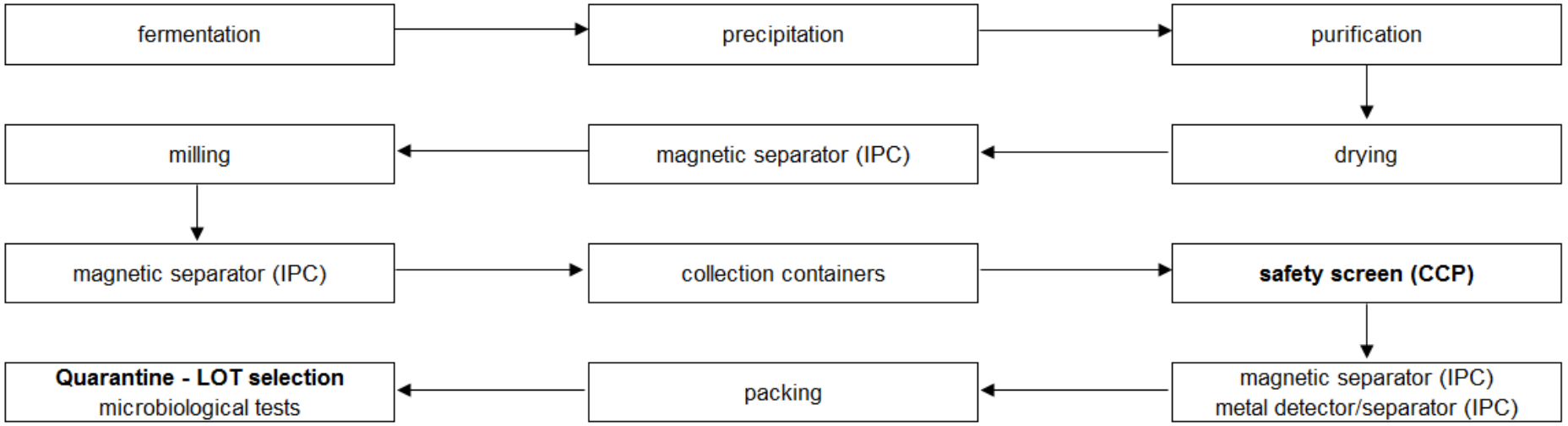
CCP
Xanthan Gum all food grades (except FED and FEDCS)

Jungbunzlauer has established a Hazard Analysis Critical Control Point (HACCP) program for all lines used for the manufacturing of food grade additives or ingredients. The HACCP system is annually reviewed and audited.

Jungbunzlauer Austria AG has defined the following CCP for Xanthan Gum:

- 2 mm safety sieve before the packaging lines (4mm safety sieve for the grades FFDF, FNDF and FGDF)

Please find below a process flow chart including the CCP:



Quarantine - LOT selection
Each manufactured LOT of Xanthan Gum goes in a quarantine status after the packaging. The product is thoroughly tested on different parameters (including many microbiological parameters). If the tests comply with the specification limits the LOT is released. A product specification is available on request.

C-504064-2023

Certificate Number

12/06/2023

Certificate Issue Date
(MM/DD/YYYY)

CERTIFICATE OF VERIFICATION

Participant Name Jungbunzlauer Inc.

Participant ID 23696

Product Name Xanthan Gum FN

Product ID 2-23696-03035

Brand Name Jungbunzlauer

Scope of Verification Goods for human or pet ingestion or topical application

Expiration Date (MM/DD/YYYY) 01/17/2025

Technical Administrator

NSF International

789 N. Dixboro Rd.
Ann Arbor, Michigan 48105
UNITED STATES

The Technical Administrator listed above has confirmed that the product has achieved Non-GMO Project Verified status and is compliant with the Non-GMO Project Standard, which can be downloaded at www.nongmoproject.org. Verification is subject to annual renewal and valid until expired, surrendered, suspended or revoked. The Non-GMO Project reserves the right to revoke this certificate at any time. Please contact the Non-GMO Project if you have any questions concerning a verification status.

בס״ד

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

March 07, 2024

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

Jungbunzlauer Austria AG, Factory Pernhofen, Factory Pernhofen, Wulzeshofen, 2064 AUSTRIA

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			
• Citric Acid Anhydrous	OUV3-D203B6A	Pareve	Ⓤ Symbol required.
• Citric Acid Monohydrate	OUV3-784FD8A	Pareve	Ⓤ Symbol required.
• CITROCOAT N PRO	OUV3-VALPZ9B	Pareve	Ⓤ Symbol required.
• Gellan Gum (TayaGel (R))	OUV3-6EP5Y7E	Pareve	Ⓤ Symbol required.
• Instant Thickener Clarified and Easily Dispersible XG-CA-MD-E *Approved with either rabbi's signature or lot certificate*	OUV2-F864CC2	Pareve	Symbol not required. Packaging/letter bears Rabbi's signature/stamp or OU numbered seal/sticker.
• Instant Thickener Clarified and Easily Dispersible XG-MD-E *Approved with either rabbi's signature or lot certificate*	OUV2-D12D672	Pareve	Symbol not required. Packaging/letter bears Rabbi's signature/stamp or OU numbered seal/sticker.
• LIQUINAT® Citric Acid Solution	OUV4-1E87E15	Pareve	Certified when bulk shipped in OU approved carriers.

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 07, 2024

Jungbunzlauer Austria AG, Factory Pernhofen (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)			
• Magnesium Lactate	OUV3-KRQ82BA	Pareve	Ⓤ Symbol required.
• Mono Magnesium Citrate	OUV3-7VJHNQP	Pareve	Ⓤ Symbol required.
• Trimagnesium Citrate Anhydrous	OUV3-VD5WDN7	Pareve	Ⓤ Symbol required.
• Trisodium Citrate Anhydrous	OUV3-237B181	Pareve	Ⓤ Symbol required.
• Trisodium Citrate Dihydrate	OUV3-5F7324B	Pareve	Ⓤ Symbol required.
• Xanthan Gum	OUV3-FBF5C06	Pareve	Ⓤ Symbol required.
• Xanthan Gum FED *Approved with either Rabbis signature or lot certificate.*	OUV2-5B10179	Pareve	Symbol not required. Packaging/letter bears Rabbi's signature/stamp or OU numbered seal/sticker.
• Xanthan Gum FEDCS *Approved with either Rabbis signature or lot certificate.*	OUV2-EDCF2B7	Pareve	Symbol not required. Packaging/letter bears Rabbi's signature/stamp or OU numbered seal/sticker.

Menachem Genack

This certification is valid through 3/31/2025

Rabbi Menachem Genack, *Rabbinic Adminstrator, CEO*

KOSHER CERTIFICATION SERVICE

ORTHODOX UNION

LETTER OF KOSHER CERTIFICATION

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בס״ד

March 07, 2024

Jungbunzlauer Austria AG, Factory Pernhofen (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)			
• Xanthan Gum FFDCS *Approved with either Rabbis signature or lot certificate.*	OUV2-VRNYDLT	Pareve	Symbol not required. Packaging/letter bears Rabbi's signature/stamp or OU numbered seal/sticker.
• Zinc Citrate	OUV3-E2F6520	Pareve	Ⓤ Symbol required.
• Zinc Lactate	OUV3-J1O72TO	Pareve	Ⓤ Symbol required.

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*