

# Jungbunzlauer

*From nature to ingredients®*



## Product Range

Bio-based ingredients



# Vision

From nature to ingredients®

# About Jungbunzlauer

**Jungbunzlauer is one of the world's leading producers of biodegradable ingredients of natural origin. The Swiss-based, international company's roots date back to 1867. Today, Jungbunzlauer specialises in citric acid, biogums, gluconates, lactics, specialties, special salts and sweeteners for the food, beverage, pharmaceutical and cosmetic industry, as well as for various other industrial applications.**

Jungbunzlauer's products are manufactured utilising natural fermentation processes based on renewable raw materials. All its products can be used, transported and disposed of in a secure and ecologically safe way. Jungbunzlauer operates manufacturing plants in Austria, Canada, France and Germany.

A worldwide network of sales companies and distributors with a thorough understanding of target markets and client requirements underlies Jungbunzlauer's strong market and customer focus. Committed to its rigorous quality standards, Jungbunzlauer guarantees for the excellence and sustainability of its products and services.

With their expert knowledge, Jungbunzlauer's Technical Service, Market Development and Application Technology teams support our customers in resolving their commercial and technical challenges with solutions tailor-made to their individual requirements and with up-to-date technical information on our products.

The high-class quality of our products combines decades of experience with up-to-date know-how.

# Products

Based on years of experience and acquired knowledge, Jungbunzlauer offers a broad spectrum of biodegradable key ingredients of natural origin to a diversified range of industries worldwide. Jungbunzlauer's added value products are manufactured to the highest quality standards and are available in different grades with a wide variety of specifications and performances.

## CITRICS

Citric Acid  
LIQUINAT®  
Trisodium Citrate Dihydrate  
Trisodium Citrate Anhydrous

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## LACTICS

Lactic Acid  
Lactic Acid Blends  
Sodium Lactate  
Potassium Lactate  
Lactate Blends

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## SPECIALTIES

Functional Acids  
CITROFOL® AI, AII  
CITROFOL® BI, BII

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## BIOGUMS

Xanthan Gum  
TayaGel®

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## GLUCONATES

Gluconic Acid  
Glucono-delta-Lactone  
Microencapsulated Glucono-delta-Lactone (eGdL)  
Sodium Gluconate  
NAGLUSOL®  
sub4salt®  
sub4salt® cure  
sub4salt® plus 50

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## SPECIAL SALTS

Tripotassium Citrate  
Potassium Gluconate  
Tricalcium Citrate  
Calcium Lactate Gluconate  
Trimagnesium Citrate  
Monomagnesium Citrate  
Magnesium Lactate  
Zinc Citrate  
Zinc Lactate  
Zinc Gluconate  
Monosodium Citrate

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## SWEETENERS

ERYLITE®  
ERYLITE® Stevia  
ERYLITE® Bronze

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# Citrics

Citrics represent the largest product group within the Jungbunzlauer product portfolio. This product group contains citric acid – the most important organic fruit acid – and trisodium citrate – the most widely used salt of citric acid. Citric acid is marketed in dry form as well as in solution under the trade name of LIQUINAT®. Citric acid as well as trisodium citrate are readily biodegradable and safe for both industry and consumers. These properties underline their utility as food and pharmaceutical ingredients. Other citrate salts are covered by Jungbunzlauer's Special Salts product group.



## Citric Acid

Citric acid is a naturally occurring fruit acid produced commercially by microbial fermentation of a carbohydrate substrate. Characterised by a pleasant tart taste and easy solubility, it is the most widely used organic acid and pH-control agent in foods and beverages. Its excellent ability to form complexes with trace metals makes it a powerful antioxidant synergist. It stabilises colour, taste, flavour and vitamins in various food applications.

The unique properties of citric acid can also be applied over a broad range of industrial applications. Many industries have already taken advantage of its outstanding chelating ability and its non-toxicity to pioneer new uses.

Crystalline citric acid from Jungbunzlauer is commercially available in two forms: citric acid anhydrous and citric acid monohydrate.

Jungbunzlauer LIQUINAT® is a ready to use aqueous solution of citric acid, which makes it easy to handle.

LIQUINAT® is used as acid and pH-control agent in foods, beverages and pharmaceuticals.

## Trisodium Citrate

This tribasic salt of citric acid is being offered in two forms: trisodium citrate dihydrate and trisodium citrate anhydrous. The dihydrate form of trisodium citrate is commonly used in foods, beverages and various industrial applications as buffering and sequestering agent as well as an emulsifying salt. As builder in automatic dish washing detergents (ADWD) it replaces phosphates and hence substantially contributes in alleviating eutrophication (excessive growth of plants and algae in water bodies).

Its anhydrous form is manufactured from trisodium citrate dihydrate by a patented drying process. Trisodium citrate anhydrous crystals have a porous matrix that can be used as a carrier for inorganic and/or organic substances.

It is not prone to caking and can be used in applications where excess water is not desired. Thus, trisodium citrate anhydrous finds its usage in water sensitive applications such as dry blends and instant beverages, detergents as well as in tablets and over-the-counter (OTC) drugs.

# Gluconates

**Jungbunzlauer Gluconates are multifunctional ingredients for food, personal care, pharmaceutical and technical applications. Naturally occurring in fruits, wine, honey and produced by fermentation of renewable carbohydrates, they are sustainable, readily biodegradable and safe products. The product group consists of glucono-delta-lactone (GdL), sodium gluconate, the liquid gluconates and sub4salt. Mineral salts of gluconic acid, produced by Jungbunzlauer, are part of the Special Salts product group.**

## Glucono-delta-Lactone

Glucono-delta-lactone (GdL), a white crystalline powder, is a dry form of gluconic acid obtained by removing water during crystallisation. When GdL comes in contact with water, it dissolves completely and hydrolyses progressively to gluconic acid, while at the same time reducing the pH-value. Gluconic acid has a mild taste profile, which is why GdL is commonly used as an acidifier in the production of many food categories. GdL is used in silken tofu and white cheese products as a coagulant for soy and milk proteins, in bakery products as sodium and phosphate free leavening acid, in meat products as an alternative to starter cultures for faster curing of raw sausages and in combination with starter cultures for pathogens control and as preservative for ready-to-eat pasta, noodles and rice. In personal care applications, GdL turns out to be a skin-friendly exfoliant as well as a moisturising agent.

## Microencapsulated Glucono-delta-Lactone (eGdL)

Jungbunzlauer also offers a microencapsulated GdL grade, using a vegetable oil as encapsulating agent. This coated grade provides great benefits in baking applications such as modulating the rate of reaction during dough preparation and bringing stability during the storage of the baking powder.

## Gluconic Acid

Gluconic acid occurs naturally in fruit, honey, kombucha tea, and wine. Jungbunzlauer provides both food and technical grade gluconic acid as a 50% solution in water. In food applications, gluconic acid does not only regulate the pH of the finished product, but also provides a long-lasting and mild tasting profile that is preferred in beverages, sauces and dressings. Technical grade gluconic acid is used in cleaning products (CIP), where it dissolves mineral deposits.

## Sodium Gluconate

Sodium gluconate, a white crystalline powder, is the sodium salt of gluconic acid. It is predominately used for technical applications as an effective set retarder and plasticiser in concrete admixtures, as well as a chelating agent for calcium and magnesium ions in industrial, institutional and household cleaning products. It is also used for the

cleaning of metal surfaces in the metal plating and electronic industry, and as formulations aid in agriculture to enhance micronutrient uptake. In personal care products, sodium gluconate is used as a chelating agent (replacement of EDTA) as well as a powerful moisturising ingredient. In the past years sodium gluconate's use in food applications has become more widespread. It is used to cover bitter flavours of high intensity sweeteners, mineral salts and caffeine in beverages.

## NAGLUSOL®

NAGLUSOL® is a 60% technical grade solution of equal parts of gluconic acid and sodium gluconate. As a concentrated non-corrosive solution, stable at low temperatures (down to -10°C), it combines the advantages of sodium gluconate and gluconic acid. It is used in the same applications as its components.



## sub4salt®

The rising number of sodium reduction initiatives worldwide encourages food manufacturers to reduce sodium levels in their products. This patented mineral salt blend based on either rock or sea salt helps to reduce sodium by up to 50% without compromising taste or functionality. Jungbunzlauer's sub4salt® product range includes different reduction levels, granulations and additives such as iodine or nitrite for cured meat products and helps to meet required national sodium reduction target levels and the consumers demand for low sodium products.



# Lactics

**Lactics is Jungbunzlauer's newest product group. The backbone of this group is L(+)-lactic acid, the second largest edible organic acid after citric acid. Jungbunzlauer's Lactics portfolio also contains lactates and blends.**

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

Lactic acid is an organic acid which occurs naturally in the human body and in fermented foods. The commercial production of lactic acid is typically done by fermentation. Because the L(+) form is preferred for its superior metabolism, Jungbunzlauer has chosen to produce pure L(+)-lactic acid by traditional fermentation of natural carbohydrates. Available as colourless to yellowish aqueous solutions of various concentrations, Jungbunzlauer L(+)-lactic acid is a mild tasting acidity regulator with flavour enhancing and antibacterial properties. It can be used in a wide range of food, personal care and chemical products.

## **Lactic Acid Blends**

Lactic acid buffered is the first lactic acid blend offered by Jungbunzlauer. It is a liquid mixture of L(+)-lactic acid and sodium lactate. Lactic acid buffered provides an even milder acidification than lactic acid and is particularly beneficial in confectionery products to reduce sugar inversion. Blends of lactic acid with other food acids can be produced on request.

## **Sodium Lactate**

Jungbunzlauer sodium lactate is the sodium salt of L(+)-lactic acid, obtained by neutralisation of the acid of natural origin with a high purity sodium source. It is available as a 60% solution in water. Sodium lactate is a safe preservative for processed meat and fish products. It is also used as a buffering agent in confectionery and, as a result of its high water holding capacity, as a humectant and moisturiser in personal and home care products.

## **Potassium Lactate**

Jungbunzlauer potassium lactate is a liquid potassium salt of L(+)-lactic acid, obtained by neutralisation of the acid of natural origin with a high purity potassium source. Used as a sodium free pathogen control agent in meat and fish products, it addresses the concerns of health organisations and consumers about reducing sodium intake. As a component of the natural moisturising factor (NMF) of the skin, it also serves as a powerful, yet smooth moisturiser in beauty care.

## **Lactate Blends**

Jungbunzlauer offers a variety of blends of sodium or potassium lactate with sodium or potassium acetate or diacetate. Combinations of lactates and acetates create a synergistic effect for pathogen and overall microbial control, thus increasing safety and shelf life of processed meat and fish products without taste compromise. The combination of potassium lactate and organic vinegar provides the additional benefit of a cleaner label shelf life control in processed meat.



# Special Salts

Jungbunzlauer's Special Salts product group comprises a unique range of high-purity organic sources of potassium, calcium, magnesium, zinc and sodium derived from citric, gluconic or lactic acid.



## **Tripotassium Citrate**

Tripotassium citrate displays a similar functionality to trisodium citrate and is a recommended food additive in all products which require low sodium content. Being an excellent potassium source and systemic alkaliser, tripotassium citrate is also used in pharmaceuticals as an active ingredient, e.g. for the treatment of kidney stones. Added to dentifrice, it is clinically proven to reduce pain for people with sensitive teeth. Moreover, it is used in several technical applications, e.g. as an environmental friendly flame retardant.

## **Potassium Gluconate**

Potassium gluconate is used to replace sodium-containing salts in food and serves as a potassium source in supplements and food products, e.g. to maintain healthy blood pressure. In pharmaceuticals, it is used as a systemic alkaliser or to fight potassium deficiency. Potassium gluconate shows excellent compressibility and is therefore commonly used for tablets. In technical applications, it combines an outstanding chelating capacity with an excellent biodegradability and good solubility.

## **Tricalcium Citrate**

Tricalcium citrate is one of the most important calcium salts used in dairy products, processed fruits, baby foods (especially infant formula), clinical nutrition, tablets, beverages and other calcium-fortified products. Its main characteristics are high calcium content (21%), excellent bioavailability and neutral taste. Direct compressible types make tricalcium citrate the preferred choice for calcium tablets. Furthermore, tricalcium citrate displays specific functionalities as a heat-stable pH regulator or firming agent in processed foods. It is also used as an anti-caking agent due to its non-hygroscopic characteristics.

## **Calcium Lactate Gluconate**

Calcium lactate gluconate is a mixture of calcium lactate and calcium gluconate. In pharmaceuticals, it is used in effervescent tablets and instant preparations as a calcium source with excellent bioavailability. In food and beverages, the outstanding characteristics of calcium lactate gluconate combining high solubility (400 g/l) and neutral taste lead to new applications in a wide range of products, such as clear, carbonated or concentrated beverages as well as dairy drinks and confectionery.



### **Trimagnesium Citrate**

Trimagnesium citrates are high-purity organic salts of magnesium, characterised by superior bioavailability, good solubility and high mineral content. Jungbunzlauer offers the two commonly available forms trimagnesium citrate anhydrous and nonahydrate. Due to their neutral taste and ease of use, they are a preferred source for magnesium in food, beverages, nutritional supplements and pharmaceuticals. Agglomerated forms of trimagnesium citrate allow the direct compression of tablets. Being an excellent desiccant, it is commonly used to stabilise dry blends and to protect water sensitive ingredients.

### **Monomagnesium Citrate**

Monomagnesium citrate is a monobasic magnesium salt of citric acid with a molar ratio of 1:1. It is used as mineral source in functional food, beverages, and food supplements. Due to its pleasant sour taste and high solubility, it is the magnesium salt of choice for mineral fortified beverage powders. As a partly neutralised salt it can be used as mild acidifier and acts as a magnesium source at the same time.

### **Magnesium Lactate**

Magnesium lactate derives from neutralisation of lactic acid with a high purity magnesium source. Magnesium plays a vital role in the human metabolism and magnesium lactate is due to its good bioavailability used in dietary supplements and pharmaceuticals. Because of its neutral taste and high solubility magnesium lactate is also a perfect source for fortification of beverages and other liquid formulations.

### **Monosodium Citrate**

Monosodium citrate, an anhydrous acid salt, occupies an intermediate position between citric acid and the neutral trisodium citrate. It is applied as a mild acid in effervescent tablets, dry blends and baking powder. Furthermore, monosodium citrate is also commonly used as non-toxic blowing agent, e.g. to foam food contact plastics.

### **Zinc Citrate**

Zinc citrate is an organic zinc salt with a high mineral content (31%) and neutral taste. Due to its superior bioavailability, physiological compatibility and wide range of health benefits it is used for zinc fortification, food supplements and beauty products. In dental care products it is used due to its antimicrobial and anti-inflammatory effects and its ability to reduce the formation of dental plaque and tartar.

### **Zinc Lactate**

Neutralisation of lactic acid with a high purity zinc source and subsequent crystallisation results in zinc lactate. Compared to zinc citrate it displays a higher solubility. Its ability to reduce the formation of dental plaque and tartar combined with nearly neutral taste makes it an ideal ingredient for oral care products. Furthermore, it is used as antimicrobial and skin-soothing agent in skin care products.

### **Zinc Gluconate**

Zinc Gluconate is one of the most important organic zinc sources in food supplements and fortified foods and beverages. It shows excellent solubility properties, a fast dissolution speed and a nearly neutral taste. As an organic mineral salt it is well absorbed by the body and offers a wide range of health benefits.



# Specialties

**Based on our core products, Jungbunzlauer offers a number of Specialties products which are used in food, pharmaceutical and also technical applications.**

## Functional Acids

Certain applications require more than the standard functionalities a regular grade of citric acid offers. Unique surface modification techniques or added high-quality materials to the core product allow for the production of an interesting and exceptional range of functional acids.

Citric Acid DC is a direct compressible citric acid. This functionality saves time and energy during the pre-processing steps before compression of effervescent tablets and at the same time leads to a higher tablet hardness at lower pressing force.

CITROCOAT® N is less hygroscopic and less reactive with other ingredients in crystalline form and therefore provides excellent stability for food applications like instant drinks, healthcare products or confectionery where premature reactions must be avoided. Also technical applications like laundry powders and tabs benefit from the stabilising properties of CITROCOAT® N during storage.

Citric acid S40 is a very fine powder with superior free-flowing abilities for easy handling. Adding citric acid S40 to concrete or gypsum improves the rheological properties and increases their mechanical strength.

## CITROFOL®

Citrate esters under the brand CITROFOL® are low viscous, colourless and odourless liquids used across a broad spectrum of industries including food, personal care and technical applications.

## CITROFOL® AI, AII

CITROFOL® AI, triethyl citrate, is an approved food additive and flavour carrier used mainly in beverages and egg processing. Due to its multifunctional properties and ECOCERT approval it is a privileged additive in personal care applications including deodorants, perfumes and as solvent and emollient in skin care products.

In the pharmaceutical industry CITROFOL® AI is a standard film forming agent for acrylic and cellulosic tablet coating, as it complies with high purity and performance requirements. CITROFOL® AII is the acetylated version of triethyl citrate and suitable for many applications where a higher molecular weight and varied polarity is appreciated.

## CITROFOL® BI, BII

These citrate esters are used for multipurpose polymer processing, mainly as plasticiser but also as processing aid and film forming agent and offer an excellent alternative to products under scrutiny. They demonstrate equal plasticiser performance when replacing phthalates and adipates in many applications such as toys, cosmetics, pharmaceutical coatings, food contact films, food closure gaskets, medical devices and other plastic products. All citrate esters are suitable additives for bio-based plastic materials which need to be compostable or biodegradable.

CITROFOL® esters are also widely used in personal care applications with a preferred content of bio-based ingredients. Due to its superior spreading behaviour and the excellent skin feel CITROFOL® types are superior alternatives for traditional emollients.

Another milestone is the usage of butanol from renewable resources. CITROFOL® BI eco is a 100% natural based product while the bio-based share for CITROFOL® BII eco is 90%.



# Sweeteners

The Sweeteners product group contains ERYLITE®, ERYLITE® Stevia and ERYLITE® Bronze. ERYLITE® and ERYLITE® based sweetening systems relate to a number of today's dietary topics, such as natural sweetening, sugar reduction/replacement, glycemic index based diets or tooth-friendliness.

## ERYLITE®

ERYLITE® is the first natural polyol, a fermentation based bulk sweetener. Besides being considered natural its main benefit is a caloric value of zero which makes it an excellent sweetener to formulate mid, low and zero calorie foods and beverages. ERYLITE® has a glycemic index of zero, a clean sweet taste, a 60 - 70% sweetness level of sugar and shows much better digestive tolerance than other polyols.

Furthermore, it is tooth-friendly and works as cariostatic agent which makes it also suitable for dental care products. It is approved in a large number of countries around the world, including the main food markets in Europe, North America and Asia. In personal care products, ERYLITE® is used as a moisturiser and humectant in skin care formulations and hair care products.

## ERYLITE® Stevia

ERYLITE® Stevia is a unique blend of ERYLITE® and Rebaudioside A, a highly pure stevia plant extract. This blend unites the taste quality, the digestive tolerance and the bulking functionality of ERYLITE® with the sweetening capacity of stevia plant extracts. The result, eligible for the 'natural' shelf, is a zero calorie sweetening system with excellent taste and full bulk sweetener functionality. ERYLITE® Stevia is available in a range of different sweetness levels with individual suitability to food and beverage applications.

## ERYLITE® Bronze

ERYLITE® Bronze is Jungbunzlauer's version of brown or raw sugar. It is a low calorie sweetener of mild sweetness with a bronze colour and the pleasant flavour of malt and caramel. Its functionalities are the same as regular ERYLITE® and it has the same favourable physiological benefits: zero glycemic index, high digestive tolerance and tooth-friendliness.





## Biogums

**The Biogums product group comprises the two unique hydrocolloids xanthan gum and TayaGel®. Both xanthan gum and TayaGel® are bio-based, non-GMO certified ingredients produced by fermentation from renewable carbohydrate sources. Their exceptional rheological properties make them ideally suitable as stabilisers and thickeners for food and technical applications.**

### Xanthan Gum

Xanthan gum from Jungbunzlauer is a unique hydrocolloid with exceptional rheological behaviour. Its highly elastic and shear thinning properties make it an outstanding stabiliser and thickener for water based systems.

The food industry uses xanthan gum alone or in combination with other hydrocolloids in a wide range of applications to impart viscosity, texture, mouthfeel to the product, and for moisture retention, and the control of crystal growth.

The unique characteristics of xanthan gum are specifically used in dressings and sauces, where it provides excellent flow properties combined with more stability than any other hydrocolloid.

In cosmetic and pharmaceutical applications xanthan gum is used to provide stability and appealing viscosity in creams, lotions, emulsions, oral care and syrups, and can be used in the formulation of tablets as release retarder. Because of its unique shear thinning flow behaviour, together with excellent pH and salt stability, xanthan gum is used in household and industrial products such as cleaners, paints and inks.

The petroleum industry makes extensive use of xanthan gum in high performance drilling fluids and in fluids for enhanced oil recovery, because of the high viscosity in concentrated brines, the shear thinning properties and the temperature stability.

### TayaGel®

TayaGel® is Jungbunzlauer's brand name for gellan gum. Gellan gum is an extremely efficient stabilising and suspending agent, even at very low concentrations between 0.02% and 0.05%.

High-acyl gellan gum will form soft, elastic and flexible gels with a remarkably low tendency to syneresis upon cooling after hydration by heating to 80-90°C.

The exceptional ability to stabilise dispersed particles in solution, without imparting a lot of perceived viscosity, makes TayaGel® the product of choice for products like plant-based dairy alternatives, chocolate milk and fruit drinks with pulp.

At higher concentrations, the special soft gelling properties make it suitable for applications in confectionary products, jams and fruit preparations, puddings, pie fillings, icings and frostings, as well as dairy-based products such as ice cream and yoghurt.



# Applications

Jungbunzlauer's know-how and experience in ingredients guarantees innovative solutions for a broad range of applications. In order to respond to changing consumer preferences and market trends, we are continuously monitoring scientific discoveries to apply in the development of new products, as well as the improvement of existing ones.

## Beverages



- Excellent acidification
- Improved mouthfeel
- Taste optimisation
- Mineral fortification
- Calorie reduction

## Industrial Applications



- Drilling fluids
- Concrete set retardation
- Safe polymer softening
- Heavy metal chelation

## Food



- Food safety
- Superior stabilisation
- Sugar replacement
- Sodium reduction
- Mineral fortification

## Personal Care



- Anti-bacterial
- Natural perfume fixation
- Smooth moisturising
- Natural deodorising
- Viscosity control

## Cleaners & Detergents



- Eco-friendly chelation
- Safe descaling
- Anti-bacterial cleaning
- Rheology control
- Surface protection

## Healthcare



- Active ingredients
- Mineral sources
- Excipients
- Natural sweetening



# Cleaners & Detergents • Industrial Applications

## Cleaners & Detergents

Dish Washing	■ ■ ■ ■		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■			■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Industrial Cleaners	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■			■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Laundry Care	■ ■ ■ ■		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■			■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Surface Care	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■

## Industrial Applications

Adhesives, Sealants	■ ■ ■ ■							■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Agrochemicals, Fertilisers	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Construction	■ ■ ■ ■		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Fine Chemicals	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■			■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Inks, Paints, Coatings	■ ■ ■ ■			■ ■ ■ ■	■ ■ ■ ■			■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Metal Surface Treatment	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Oil Drilling	■ ■ ■ ■				■ ■ ■ ■					■ ■ ■ ■
Ore Mining and Refining	■ ■ ■ ■									■ ■ ■ ■
Paper	■ ■ ■ ■		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Plastics, Polymers	■ ■ ■ ■				■ ■ ■ ■		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Textile, Leather	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■		■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■

Citric Acid	LIQUINAT®	Trisodium Citrate Dihydrate	Trisodium Citrate Anhydrous	Gluconic Acid	Glucono-delta-Lactone	NAGLUSOL®	Sodium Gluconate	Lactic Acid	Sodium Lactate	Potassium Lactate	Tripotassium Citrate	Potassium Gluconate	Tricalcium Citrate	Trimagnesium Citrate	Zinc Citrate	Monosodium Citrate	CITROFOL® AI	CITROFOL® AII	CITROFOL® BII	CITROFOL® BIII	Functional Acids	Xanthan Gum
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# Committed to sustainability and quality

Our environment and climate are threatened by pollution and an unsustainable use of resources. As a consequence, it is important to be aware of our responsibility for the environment and to cooperate for a more sustainable future. One way of doing so is to choose business partners that support this vision. Our mission, 'From nature to ingredients'<sup>®</sup>, aimed at environmental, economic and social sustainability, commits us to the protection of people and their environment.



## Environmental Sustainability

We aim to save as much energy, water, raw material and other sensitive inputs as possible. Jungbunzlauer therefore has the most advanced technologies and processes and we are working steadily to decrease greenhouse gas emissions. That's why our Corporate Carbon Footprint is calculated to ensure a continuous improvement of environmental standards and performance. Furthermore, we follow the goals and initiatives of the global Responsible Care<sup>®</sup> program.



## Economic Sustainability

Jungbunzlauer is committed to preserving long-term sustainable prices by keeping costs at the lowest possible level. Additionally, we provide security of supply and price stability through our established back-integration system. Due to continuous investments, state-of-the-art manufacturing processes and comprehensive quality management, we are able to assure outstanding product quality.



## Social Sustainability

All Jungbunzlauer production sites and offices comply with a high standard of social responsibility. Our personnel are employed on the basis of their qualifications, regardless of their gender, religion or race. This leads to a diverse and open work place for our employees. Through high employment standards, healthy and safe working conditions are also assured.



## Vegan Offering

A continuously growing number of people choose a vegetarian or vegan lifestyle. Veganism does not stop at the edge of a plate, but covers all articles of daily use. Producers world-wide consequently adapt their range to broaden the offerings of animal-free products. Jungbunzlauer offers naturally sourced ingredients which are fully suitable for vegetarians and vegans.



\*Selected Products

## Non-GMO Positioning

Jungbunzlauer can provide products following a strict Non-GMO policy. All raw materials used in our European manufacturing processes are purchased according to strict Non-GMO specifications. All fermentation is done by using natural and non-genetically modified microorganisms.

\*Not valid for Citric Acid DC, CITROCOAT<sup>®</sup> N, CITROFOL<sup>®</sup> BI, CITROFOL<sup>®</sup> BII, eGdL, ERYLITE<sup>®</sup> Blends, sub4salt<sup>®</sup>, Xanthan Gum Blends, Zinc Gluconate, Monomagnesium Citrate



COSMOS APPROVED

## ECOCERT and COSMOS Approval

The bulk of Jungbunzlauer range of personal care and cosmetic ingredients are approved by ECOCERT COSMOS and several of our cleaning and detergent ingredients are approved by ECOCERT as ingredients of 100% natural origin.



NATRUE Approved

Most Jungbunzlauer products used in personal care and cosmetic applications are NATRUE approved as natural or derived natural ingredients.

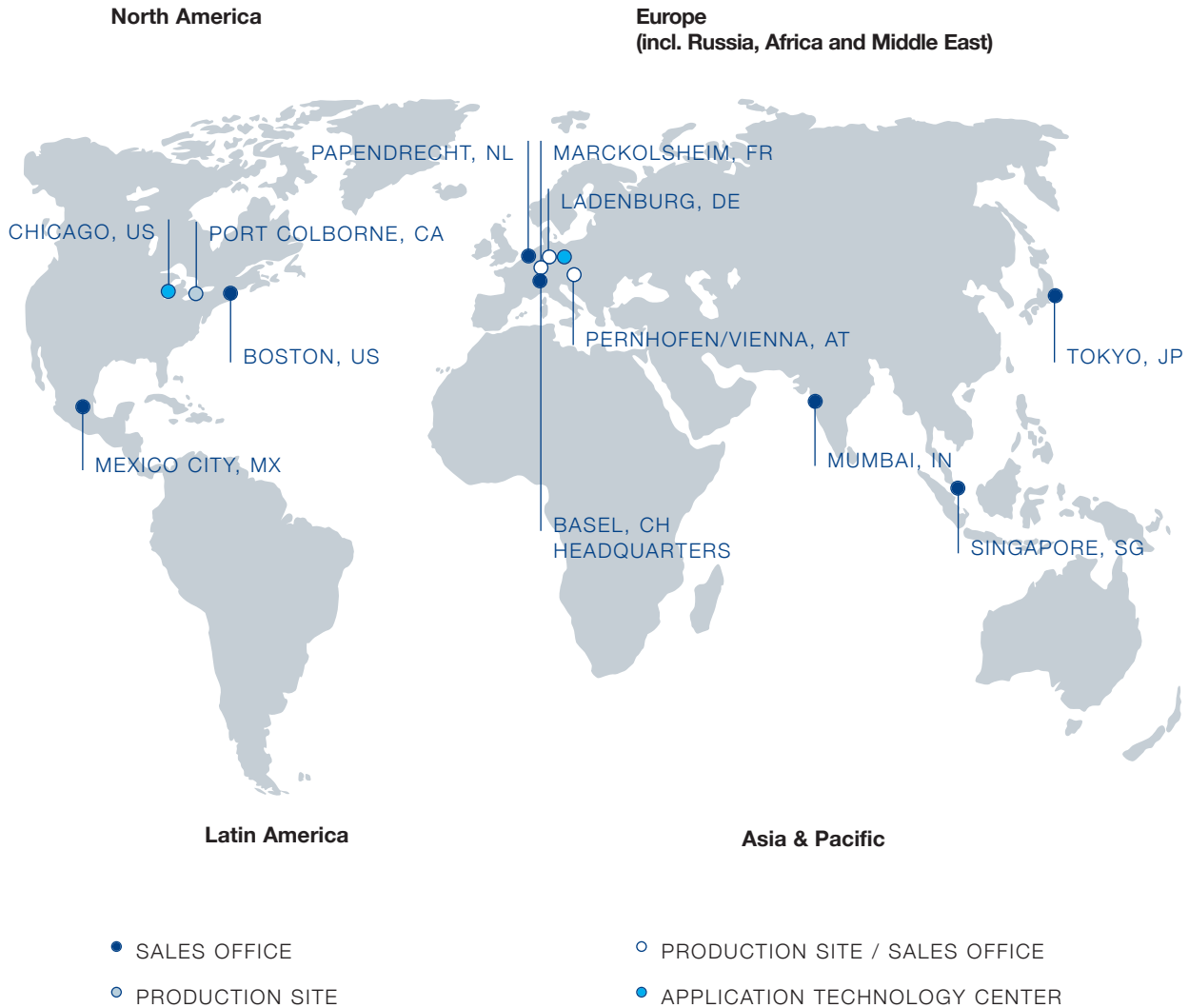


Jungbunzlauer

Offers more

# Jungbunzlauer Group

Jungbunzlauer is represented in all major markets. Our regionalised setup of the sales organisations and respective local distribution partners enable us to provide optimal and efficient service to customers in more than 130 countries.



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