



# Cargill Texturizing Solutions

## Press File

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# Cargill Texturizing Solutions

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## Introduction to Cargill Texturizing Solutions

Cargill Texturizing Solutions is a leading worldwide producer of hydrocolloids (alginates, carrageenans, pectins, guar and locust bean gums, biopolymers), emulsifiers, lecithins, cultures and enzymes, starches, soy flours, and functional systems. Its markets include the local, regional and global food & beverages industries as well as the industrial, cosmetic and pharmaceutical sectors. Its ingredients are based on nature: they come in the form of carefully selected renewable resources such as corn, soy, seaweeds, apple pomace, citrus peel, and seeds.

Cargill Texturizing Solutions' extensive product portfolio enables it to organize and focus its business around market categories. A broad resource base provides the opportunity to take the consumer view fully into account when developing new texturizing solutions: 'consumer pull' is the integrating force and the momentum for change and innovation within the business.

With in-depth category knowledge and consumer understanding, Cargill Texturizing Solutions is able to launch new marketable texturizing solutions for customers rapidly and in response to market developments.

Particular expertise in the following product areas is offered : lecithin, starches, pectin, locust bean and guar gums, carrageenans, soy flours, biopolymers, cultures & enzymes and alginates.

From design through development to manufacturing, Cargill Texturizing Solutions is committed to creating with its customers innovative new products for consumers to enjoy.

## Application expertise

Cargill Texturizing Solutions' application and product development centers around the globe offer customers a unique resource, bridging the gap between research and market needs. Its laboratories and pilot plants are equipped with the latest professional equipment. This enables its teams of scientists to work at close to industrial scale to improve process efficiency, boost the performance of products and help to explore new market possibilities.

Moreover, by understanding individual constraints and working within the limits specified, total solutions can be developed through a partnership approach – the right product at the right time - whilst lowering overall process and material costs.

An intimate knowledge of markets from the Americas, through Western and Eastern Europe to Asia Pacific, enables Cargill Texturizing Solutions to propose specifically tailored solutions based on a wide range of advanced products and process ideas. This global knowledge can be customized to suit customers' local needs in terms of seasonal demands and specific production processes.

## Broad product portfolio serving customers across multiple categories

	Starches	Soy Proteins	Lecithin	Cultures & Enzymes	Hydrocolloids*	Functional Systems
Baby Food	•		•		•	
Bakery	•	•	•		•	•
Beverage	•	•		•	•	•
Confectionery	•	•	•		•	•
Dairy	•	•	•	•	•	•
Food processing	•		•		•	•
Fruit	•				•	•
Ice Cream	•	•	•		•	•
Meat, Fish & Pet food	•	•	•	•	•	•
Oils & Fats	•		•		•	•
Soups, Sauces & Dressings	•	•	•		•	•
Feed	•	•	•		•	•
Home Care	•				•	•
Industrial	•	•	•	•	•	•
Pharma	•	•	•		•	
Personal Care	•		•		•	

\*Hydrocolloids : Alginates, Carrageenans, guar gum, locust bean gum, pectins, xanthan gum, scleroglucan



# Starch

Starch is the primary source of stored energy in cereal grains, potatoes, rice, maize, tapioca, pasta and pulses.

Today, glucose and dextrose remain core products of the starch industry, but new technology and innovations in microbiology are expanding the industry's product portfolio, leading to the creation of new markets for both food and non-food starch applications.

## Production sites

Native and modified food starches and spray-dried specialty starches/maltodextrins are produced in plants located in Germany, Italy, the Netherlands, France, Spain and the United States.

To meet customer requirements at a global and local level and pursue its commitment to innovation, Cargill has established food application centers in:

- North America (Hammond)
- Europe (Vilvoorde) and
- Asia (Shanghai).

These centers contain laboratories and pilot manufacturing facilities, together with a network of dedicated application specialists. The aim of this approach is to build lasting and successful partnerships with customers using starch technology as a key element in formulating new products.

## Cargill's offer

Starch type	Applications	Cargill brand names*
Native starches (maize, wheat or tapioca)	<ul style="list-style-type: none"> <li>• 'instant' soups and savory mixes</li> <li>• sweet pudding powders</li> <li>• processed meat</li> <li>• bakery mixes</li> <li>• creamy spreads and fillings</li> <li>• salad dressings</li> <li>• sauces.</li> </ul>	<u>EU</u> C*Gel™, C*AmyloGel™  <u>US</u> Amylogel®, CreamGel™, DryGel™, Gel™
Thinned starches	<ul style="list-style-type: none"> <li>• confectionery products</li> <li>• coated foods such as breaded or battered products</li> <li>• flavor encapsulation</li> <li>• processed meats</li> <li>• powdered foods for 'instant' applications.</li> </ul>	<u>EU</u> C*Set™, C*DrySet™  <u>US</u> Cargill Set™, Cargill DrySet®
Stabilized starches	<ul style="list-style-type: none"> <li>• soups</li> <li>• dairy desserts</li> <li>• canned and frozen convenience foods</li> <li>• gravies, dressings and sauces</li> <li>• spreads</li> <li>• noodles</li> <li>• fruit pie fillings.</li> </ul>	<u>EU</u> C*Tex™, C*StabiTex™, C*PolarTex™, C*CreamTex™  <u>US</u> Cargill Tex®, CreamTex®, PolarTex®, StabiTex®

<b>Starch type</b>	<b>Applications</b>	<b>Cargill brand names*</b>
Roll-dried starches and cold water swelling starches	<ul style="list-style-type: none"> <li>• instant food powders</li> <li>• instant sauces,</li> <li>• instant desserts</li> <li>• instant pie fillings</li> <li>• extruded snacks</li> <li>• spices and seasonings</li> <li>• baby foods</li> </ul>	<u>EU</u> C*Gel-Instant™, C*StabiTex-Instant™ C*Tex-Instant™ C*PolarTex-Instant™ C*HiForm™, C*HiForm A™  <u>US</u> Cargill Tex-Instant™, Gel-Instant™, StabiTex-Instant®, PolarTex-Instant®, HiForm®, HiForm A™
Specialty starches	<ul style="list-style-type: none"> <li>• Arabic gum &amp; gelatin replacement</li> <li>• Confectionery molds</li> <li>• Egg &amp; caseinate replacement</li> <li>• UHT applications</li> <li>• Potato flake / tomato flour replacement</li> <li>• Batter coatings</li> <li>• Bakery mixes &amp; fillings</li> </ul>	<u>EU</u> C*Araset™ C*ClearSet™ C*CleanSet™ C*EmTex™ C*DeliTex™ C*PulpTex™ C*EmCap™ C*BatterCrisp™ C*Mix™ TexDesign™  <u>US</u> AccuCoat®, AccuFlo™ Araset™, BatterCrisp® Clean Set®, DeliTex™, EmCap®, EmTex®, EZ Fill™, Salioca®
Resistant starches	<ul style="list-style-type: none"> <li>• Bread</li> <li>• Muesli</li> <li>• Cereal bars</li> <li>• Dairy drinks</li> <li>• Instant soups</li> <li>• Soft biscuits</li> </ul>	<u>EU</u> C*Actistar™  <u>US</u> Actistar™

\* Cargill brand names : within the Asian Pacific region, both EU and/or US brand names are available.

As an innovator, Cargill knows that its customers rely on the company's technical expertise in starches. These combine application chemistry, product development and technical knowledge and assistance. Selecting the best starch ingredient possible and ensuring maximum effectiveness in use is fundamental to guarantee optimal end-product quality.

With its worldwide processing capabilities, Cargill has been specializing for decades in the production of starches with carefully designed performance characteristics. These have been developed according to strict environmental and ecological principles, while respecting the value of naturally grown raw materials.

## Soy proteins

Cargill's soy proteins offer flexibility and functionality such as texture improvement, protein enhancement, viscosity building, water and oil management and gelling properties, while ensuring a consistent final performance.

Cargill has developed a showcase of breads, baked goods, meats and other foods that contain soy proteins in sufficient levels to promote its health benefits. Different combinations can be used to achieve specific tastes, mouthfeel functionality and nutrition profiles.

### Production sites

Cargill has worldwide processing capabilities, with plants in The Netherlands, Belgium and the US.

### Cargill's offer

**ProFull™** is a wholesome soy flour product range consisting (in dry form) of 40% protein and 20% soy lipids, which are rich in unsaturated fatty acids (linoleic and linolenic), lecithin, vitamin E and sterols.

Cargill produces three types of full-fat soy flours, currently marketed throughout Europe: enzyme-active, toasted (debittered) and full-fat grits.

- Enzyme-active soy flour has high lipoxygenase activity, which softens and whitens the breadcrumb. This product is specifically developed for flour and bread improvers.
- Full-fat soy flour is produced utilizing a unique toasting process. This functional protein product has a pleasant and nutty-like taste, a pleasant creamy color and very high functionality. The high lecithin and Vit. E content emulsifies oils and protects them against oxidation, which makes it an excellent homogenizer and stabilizer in fat based fillings and chocolate spreads. Its high water and fat binding and coating properties makes debittered soy flour a valuable ingredient for cakes, pancakes and cookies, replacing eggs in their formulation and extending their shelf life.
- ProFull toasted grits are golden-yellow grains with a mild, nutty taste and distinctive bite. They make an excellent nut alternative for multi-grain bars, breads and nut-based fillings.

The **Prolía™** line of defatted soy products is produced from high quality beans which are further processed into a variety of soy products, including flour, flakes, and grits.

Prolía™ soy flour can be used in multiple applications to create many functional attributes. Defatted soy flours give a protein boost to recipes (54% protein).

In bakery, defatted soy flour contributes to a better crumb structure, improves dough machineability (making the dough more elastic), increases water absorption and retention and replaces eggs. Due to its film-forming properties, the shelf-life stability of baked products is significantly increased, preventing fat migration and water uptake.

In breads Prolía™ soy flour increases yields in white and specialty breads by absorbing and holding more water through baking. Results demonstrate that it is capable of binding more than 3 x its weight in water – and more cost effectively than other protein ingredients.

In hamburger buns low cost ingredients are an important factor, but poor quality can quickly mean lost customers. Supplementing the baking mix with Prolía™ soy flour can reduce total ingredient cost, increase yield, and enhance bun consistency and quality through increased moisture retention. Pasta made with Prolía™ soy flour is low in fat and cholesterol-free, and can also be made egg-free whilst still providing a good source of protein. Macaroni, spaghetti, and soup noodles can be fortified with Prolía™ soy flour to increase their nutritional value.

In snacks a blend of soy and wheat flours results in a pleasant, slightly nutty-flavored cracker. One of the fastest-growing bakery categories, snack crackers is an ideal way to offer convenient soy protein.

Prolia™ relecithinated soy flour is an economical way to reduce the fat content in donuts, giving a less greasy appearance, and saving the cost of lost oil from the fryer.

In pancakes, studies have shown that replacing egg in a mix with Prolia™ relecithinated soy flour yielded more pancakes and reduced cost by >14%. These pancakes were virtually indistinguishable from egg-containing versions in height, diameter, texture, color, flavor, and mouthfeel.

Prolia™ soy flour also boosts protein and has been shown to successfully replace dairy or egg ingredients in cakes, cookies, muffins, waffles, tortillas, cereals and more.

**Prosanté™ Textured Soy Flour** is a complete source of proteins with the proven economics of a textured vegetable protein. It is prepared by processing soy flour through an extruder that yields an expanded, porous ingredient. Textured soy flour in its dry form has a protein content over 50% (with a fat content of 1% or less) and is available in different sizes (flakes, mince, chunk).

Prosanté™ Textured Soy Flour increases the juiciness and yield of meat and meat analogue products while maintaining high quality. In its hydrated form, textured soy flour can be used in many formulations and to replace a substantial portion of the raw meat.

Prosanté™ Textured Soy Flour is widely used in vegetarian dishes and prepared foods such as dumplings, ravioli, vegetarian lasagna, patties and sausages. In cereals and confectionary bar applications, Prosanté™ Textured Soy Flour adds a crunchy appeal while also boosting protein levels.

**Prosanté™XCL Textured Soy Protein** is in the shape of a diced chunk or crumble and is available in different colors and sizes. As it hydrates very fast in warm water, it is very convenient to use for replacing meat in existing recipes. It exhibits excellent retort and freeze-thaw stability and will keep its properties when the prepared meal is reheated. Due to its overall neutral taste profile, Prosanté™ XCL Textured Soy Protein does not contribute off flavors but absorbs the inherent flavors of accompanying ingredients.

Prosanté™XCL Textured Soy Protein offers a protein-complete replacement for beef, poultry, pork and tuna in soups, stir-fry entrees, meat fillings, meat salads and prepared meals, while closely matching meat's natural fibrous structure, texture and chewing properties.

**Prosanté™Plus Flavored Textured Soy Flour** : Cargill's popular savory imitation bacon bits provide an economical vegetarian alternative, with all the sensory characteristics of traditional crumbled, fried bacon. Additional benefits include: no cholesterol, no saturated fat, reduced total fat, reduced sodium and long shelf-life. Offered in a variety of flavors and a range of sizes, from bits to chips, bacon bits add visual and savory appeal and texture as toppings or ingredients.

Prosanté™Plus Intermediate Moisture imitation bacon bits provide the sensory characteristics more closely associated with traditional, crumbled fried bacon.

Customized flavor opportunities are also available for simulating meat, cheese, fruit, nut or sweet products.

## Cultures & Enzymes

For centuries natural fermentation has been used to preserve highly perishable foods, such as milk and meat. Fermentation is characterized as the growth of the natural bacteria present in food without the use of oxygen. Acid is a by-product of this process and it serves to lower the pH, reduce water activity and inhibit the growth of spoilage organisms.

In cheese production, cultures play an important role in all manufacturing phases. During ripening, proper culture selection contributes to the development of the desired flavor, texture and appearance, as well as preventing the development of undesirable flavors. Cultures also play a key role in determining the final moisture level and product yield of cheeses.

In the production of yogurt and other fresh fermented dairy products such as sour cream, quark and buttermilk, cultures are used to produce acidity, flavor, and in some cases, carbon dioxide and / or polysaccharides. These ensure the development of the desired taste, texture and appearance.

Probiotic cultures in particular are known for their contribution to a healthy diet. There are strong indications that probiotics help to improve digestion, balance the intestinal flora and safeguard the immune system.

Many meat products are made using molds and bacteria. Primary applications include dried sausages (e.g. salami) and hams. Cultures provide flavor development in meat and protection against microbial contamination, either by acidification of the meat or by covering the surface. They can be inoculated directly into the meat or applied to the meat surface by soaking or spraying it with a culture solution.

### Production sites

The Cargill Texturizing Solutions' cultures group is a global leader that began over 100 years ago as a French culture company called Laboratories Roger. Today, with research and manufacturing operations in the US as well as Cargill's original site in France, the group is a modern highly integrated global business.

Cargill's cultures production facilities in France and in the United States are amongst the most advanced in the world. Highly sophisticated manufacturing processes ensure a fast and flexible response to customers' requirements.

Cargill manufactures cultures, culture media, enzymes, coagulants and related products at the following sites:

- |                     |                     |
|---------------------|---------------------|
| ▪ Germantown (USA)  | AIB-Superior Rating |
| ▪ Waukesha (USA)    | AIB-Superior Rating |
| ▪ La Ferté (France) | ISO 9001: 2000      |
| ▪ Lannilis (France) | ISO 9001:2000       |

### Cargill's offer

With its highly characterized culture systems, lipase enzyme systems and animal and microbial coagulants for use in a full range of dairy applications, Cargill has a deep understanding of the dairy industry. Applying this extensive knowledge of culture and enzyme performance to bring total solutions to Cargill's customers forms the foundation of the group's efforts.

Cargill Texturizing Solutions has in-depth expertise in many end use applications for cultures and works in close contact with its customers to deliver the specific functionality and performance required in various consumer products.

Cargill's cultures business includes the following products:

**Dairy applications – cheese and fresh cultured products**

Yogurt, sour cream, buttermilk, fresh cheese, cottage cheese, Mozzarella-type cheeses, hard cheese varieties like cheddar, blue cheese and hard Italian cheeses (e.g. Parmesan).

Cargill has exceptional expertise in flavor systems for cheese – for accelerated cheese ripening, as well as for developing desired flavor notes and minimizing off-flavors. A wide range of acidifying cultures, adjunct cultures and enzymes are available as mix-and-match components. This program allows a cheese manufacturer to select a customized combination of culture and enzyme components to meet the specific needs of their customers and markets.

**Fermented meat applications:**

Dried sausages and hams

**Brewing and distilling:**

Protective culture for use during malt production

# HYDROCOLLOIDS

Cargill Texturizing Solutions offers a broad range of hydrocolloids such as:

- Alginates,
- Carrageenans,
- Galactomannans (guar and locust bean gum)
- Pectin
- Xanthan gum.

Those gums are used in all areas of the food industry and in a growing number of cosmetic, pharmaceutical and technical applications.

Hydrocolloids are polysaccharides of high molecular weight extracted from plants and seaweeds or produced by microbial synthesis.

The polysaccharide industry started in the first decades of the 20th century. Since then, the knowledge of carbohydrates combined with the latest industrial techniques has permitted the production of hydrocolloids with consistently higher purity, continuously meeting more demanding market specifications. As always, all of our products conform to international standards.

## Alginates

It is reported that both the ancient Chinese and the Romans knew the useful properties of brown seaweeds and used them for medical and cosmetic purposes. The industrial processing of brown seaweeds was pioneered in the late 19<sup>th</sup> century and the early 20<sup>th</sup> century. Initially, alginates were produced as canned food products for use at sea.

There are more than 300 known commercial applications of alginates. Being cold soluble, partially thermostable and having various gelation mechanisms, alginates are a very versatile type of hydrocolloid widely used in many industries.

### Production sites

Cargill started producing alginates in 1968 in Lannilis, France. The site is located close to a major seaweed site on the Brittany coast. Continuous investment in the site ensures the most up-to-date processes are in use, enabling a high level of flexibility in response to customers' requirements.

The Lannilis site is ISO 9001: 2000 certified.

### Cargill's offer

Cargill offers a very extensive range of commercially available alginates. These are based on a wide variety of different types of brown seaweeds (phaeophyceae), all of which are found along rocky coasts, which are matched by a range of proven production processes.

Cargill's recognized formulation expertise enables the formulation of commercial alginate products tailored to very specific needs in different applications.

Cargill offers various types of alginate to suit different applications. The main types are:

- Laminariaceae: Laminaria Hyperborea and Laminaria digitata
- Fucales: Ascophyllum nodosum and Fucus serratus

Applications	Cargill brand name
Thickening alginates: Food and pharmaceutical grades	Satialgine™
Thickening alginates: Technical grades	Cecalgum™
Gelling alginates: Food and pharmaceutical grades	Algogel™

The manufacturing of alginate in all its forms for different applications requires a high level of production expertise. Thanks to its direct raw material access along the Brittany coasts and its in-depth technical knowledge, Cargill is well recognized for its ability to offer thickening alginates with a high degree of viscosity (> 1800 cPs).

Cargill Texturizing Solutions has in-depth experience of many end use applications for alginates and works in close contact with its customers to deliver the specific functionality and performance required in various consumer products.

## Carrageenans

The functionality of carrageenans was first discovered more than six hundred years ago. In the Middle Ages Irish moss was used in Carraghen on the south Irish coast for medicinal and food purposes. It was particularly known for its unique property of gelling milk. Also on the coasts of Normandy and Brittany in France it was used for its gelling properties. With bleached lichen or "goémon blanc" (blanc-mange), flans were made simply by cooking seaweed in milk.

It was not until after the Second World War, however, that extracts were manufactured industrially. Although originally only extracted from Irish moss, today Carrageenans are manufactured from numerous red seaweed species.

### Production sites

Cargill started its carrageenan production in 1956 in Baupte, Normandy, France using the local seaweed (Chondrus Crispus)

Today, Cargill's production facilities in France and the Philippines are amongst the most advanced in the world. Highly sophisticated manufacturing processes are employed to ensure a fast and flexible response to customers' requirements.

Cargill manufactures carrageenans at the following sites:

- Baupte (France) ISO 9001: 2000 certification
- Canlubang (The Philippines) ISO 9001: 2000 certification

### Cargill's offer

Cargill offers one of the widest ranges of commercially available carrageenans, employing proven production processes and using a large variety of different types of red seaweeds (Rhodophyceae) from the Gigartinales group. The main varieties of seaweed used are:

- Gigartina (France, Argentina/Chile, Morocco)
- Chondrus (France, North Atlantic)
- Iridaea (Chile)
- Eucheuma denticulatum (East coast of Africa)
- Kappaphycus alvarezii (Philippines, Indonesia)

Together with Cargill's recognized formulation expertise this enables the formulation of commercial carrageenan products tailored to very specific needs in different applications.

Cargill's carrageenan products are available under the following trade names:

- SATIAGEL™: gelling extracts
- SATIAGUM™: thickening extract
- AUBYGEL™: gelling PES.

Cargill's carrageenans are used as thermo reversible gelling, thickening and stabilizing agents in a wide variety of applications. Their specific interactions with proteins and their synergetic effects with other hydrocolloids such as locust bean gum and konjac gum makes them very suitable for use in:

- **Dairy:**
  - Stabilization of chocolate drinks and creams
  - Dairy desserts, like gelled milks, flans, multi-layered desserts, mousses

- **Meat (and fish) products:**
  - Injections (hams, poultry)
  - Fat reduction (hamburgers)

Canned foods: in combination with locust bean gum for human and pet food

- **Powder products:**
  - Homemade flans
  - Dessert, custard and bakery creams
  - Water gel desserts, glazings

- **Ice cream:**
  - In combination with guar gum, locust bean gum and alginates

# Guar and locust bean gum

Guar and Locust bean gums are galactomannans, polysaccharides with thickening properties. Guar originates from India and Pakistan but today it is also cultivated in the USA. Locust bean gum is extracted from the seeds of the European carob tree. Guar and Locust bean are the most frequently used raw materials for thickening gums.

## Production sites

Cargill started its locust bean gum production in 1981 in Essaouira and later on in Fès, Morocco. The Fès site is located near the major carob trees field in the North of the country in the mountainous Middle Atlas region.

Thanks to this direct access to the raw materials for locust bean production, Cargill is widely recognized for its product traceability. The Moroccan carob seed, along with the Portuguese variety, is regarded as one of the best seed types available in terms of seed quality and manufacturing performance. Carob seeds play a prominent role in the Moroccan economy and Cargill is able to benefit from its close links with a number of universities in the country which are actively involved in researching the properties of different varieties of carob seeds.

Since its foundation, Cargill has continuously invested in its production sites in order to ensure most up-to-date processes and a high level of flexibility in response to customers' requirements.

Cargill's locust bean gum is produced in :

- Fès, Morocco (flour) ISO 9001:2000; ISO 22000 certification
- Essaouira, Morocco
- Zibo, China (extracts) ISO 9001:2000; ISO 22000 certification

## Cargill's offer

Cargill offers various types of locust bean gum and guar gum flour or extract. Each product has been formulated to suit the requirements of a specific area of application. Cargill's products are available under the generic Viscogum™ trade name.

Locust bean gum and guar gum can be used alone, but are also often used in combination with carrageenan or other hydrocolloids in food applications.

Major applications include:

### Desserts and dairy products

- Neutral and acid dairy desserts in combination with carrageenan, agar or pectin
- Water jellies: in combination with carrageenan
- Ice creams, sorbets and frozen desserts

### Dressings, sauces and soups

**Fruit spreads, jams and fillings** (in combination with low methoxyl pectin)

### Beverages

### Bakery products

- Bread, brioche

**The key benefits of locust bean gum include:**

- Viscosity development after a heating step
- Creates a pleasant texture with a good flavor release
- Strong interaction (gelation) with k-carrageenan, agar and xanthan

**The key benefits of guar gum include:**

- Instant viscosity development at room temperature (cold soluble)
- Creates a long texture with a reduced flavor release
- No interaction (gelation) with other polysaccharides but high synergistic effect with xanthan (viscosity).

Cargill is recognized as a leading global producer of locust bean gum and guar gum products, with over 26 years of experience in this field.

Cargill Texturizing Solutions has in-depth expertise in many end use applications for locust bean and guar gum and works in close contact with its customers to deliver the specific functionality and performance required in various consumer products.

# Pectin

Pectin is a natural component of plants. Its functionality has long been used in preparing jams and jellies from various fruits. Pectin was first isolated in the 1820s, but has been industrially produced only since the early 20<sup>th</sup> century.

Pectin occurs in many fruits, but is especially abundant in citrus fruits and apples. Pectin is derived from cellulose in plant tissues, which gives the plant its strength and flexibility. Many aspects of plant physiology, plant pathology, food texture, and juice and wine production involve pectin.

Today, commercial pectin is used in such diverse applications as jams, yogurt, acid dairy drinks and confectionery. As a natural product with acknowledged nutritional benefits, pectin is in high demand not only in the food industry where new applications are constantly being discovered, but also increasingly in pharmaceutical and cosmetics applications.

## Production sites

Cargill started its pectin production in 1948 for HM pectins and 1965 for LM pectins. Both types of pectin were made from apple. Later both apple and citrus raw material were used and production has increased progressively year on year.

Today, Cargill's production facilities in France and Germany are amongst the most advanced in the world. Highly sophisticated manufacturing processes are used to ensure a fast and flexible response to customers' requirements.

Cargill manufactures pectin at the following locations:

- Redon (France)                      ISO 9001/ 2000 certification
- Malchin (Germany)                ISO 9001/ 2000 certification

## Cargill's offer

Cargill offers one of the widest ranges of commercially available pectins, employing proven and state-of-the-art production processes. Together with the company's recognized formulation expertise, this enables the formulation of commercial pectin products tailored to very specific needs in different applications.

Cargill's pectins are available under the trade name Unipectine™, which is well known in the industry and has been synonymous with high quality for many years. Unipectine™ products offer full functional flexibility regarding gelation, setting speed, viscosity, mouthfeel and stabilization, while ensuring full controllability and consistent final performance.

.../... (ctd)

## Cargill's offer (ctd)

Application category	Pectin type	Specific applications
Dairy	HM pectin	Acid dairy drinks
	LM pectin	Yoghurts Fruit preparations for yoghurt Fruit preparations for dessert creams
Fruit	HM pectin	Traditional jams Fruit juices and fruit drinks
	LM pectin	Low calorie jams Fruit preparations for yoghurts Preparations for baking / pastry fillings
Confectionery	HM pectin	Confectionery jellies
Convenience Foods	HM pectin	Beverage emulsions, ketchup, marinades, mayonnaise, powdered dessert mixes, salad dressings, sauces, yellow fat spreads
	LM pectin	Baby foods, ketchup, marinades, mayonnaise, powdered dessert mixes, salad dressings, sauces, yellow fat spreads

The manufacture of pectin in all its varieties requires a high level of production expertise. Raw materials selection, production processes, formulation know-how and quality management are all key areas of expertise supported by Cargill's research and application centers.

# Xanthan gum

Xanthan gum was discovered 50 years ago in Illinois (USA). It is a polysaccharide produced as a secondary metabolite by a biotechnological fermentation process, based on the culture, in aerobic conditions, of a microorganism: *Xanthomonas campestris*.

Many microorganisms, bacteria in particular, are capable of metabolizing extra-cellular polysaccharides. However, xanthan is the only bacterial polysaccharide produced industrially on a large scale.

Xanthan gum produced by Cargill Texturizing Solutions complies with all legal, religious, and safety requirements, and can be supplied and certified free of any genetically modified organism (GMO).

## Production sites

Xanthan gum is produced at Cargill's plants in :

- Baupré (Normandy), France - ISO 9001: 2000 certification
- Zibo (Shandong), China - ISO 9001:2000; ISO 22000 certification

## Cargill's offer

Cargill's xanthan gum is used in the following food applications:

- Sauces and dressings (emulsified sauces, tomato-based sauces, sauces with particles in suspension, dry mix sauces)
- Bakery and pastry (bread type products, cake type products)
- Meat products
- Beverages
- Ice creams and dairy products
- Fruit preparations
- Powder products
- Personal care (toothpaste and cosmetics)
- Industrial applications

Xanthan gum from Cargill Texturizing Solutions is sold under the brand name Satiaxane™ for food applications, and under the brands VerXan™ and Actigum™ for non-food applications.

## Functional Systems

Cargill's functional systems start with the combination of at least two ingredients delivering distinctive functionality other than achievable with separate ingredients. They provide innovative solutions that meet food manufacturers exact needs regardless of the quality of the raw materials or technology level of the processing equipments.

Cargill's functional systems provide multiple benefits to customers : they save time and costs by speeding processing and reducing time to market.

Cargill's key to customers' success includes :

- Applications & ingredients knowledge, through backwards integration of in-house ingredients, in-depths knowledge of process interactions
- Global applications network leveraging solutions offered by wide product portfolio
- Blending expertise and quality management, with 40 years experience in blending technologies
- State-of-the-art pilot facilities
- World class quality management
- Optimized supply chain and flexible packaging
- Customer focus and proximity, sharing consumer and market insights from around the world

The basic constituents used in these ready-blended formulations include polysaccharides such as carrageenans, pectins, alginates, xanthan gum, locust bean gum and guar gum; and other raw materials such as starches, soy proteins, dairy proteins, gelatin and emulsifiers which may be added to meet specific requirements.

### Production sites

Cargill's blending operations are strategically located around the globe in Atlanta (USA), Mexico City (Mexico), Baupte (France), Vigonza (Italy), Kalisz (Poland), Rubi (Spain) and Beijing (China), with research and development (R&D) and applications support at each site. This ensures that Cargill can meet its customers' specific needs locally while ensuring world class quality levels.

Cargill's functional systems production sites are ISO 9001 : 2000 certified, as well as Halal, Kosher, AIB, organic and NGM (by SGS) certified.

Cargill is a global company. As such, its food safety programs and policies are set up to ensure a broad perspective capable of providing an international approach ; operations in the USA, Europe and Asia are conducted under the Recommended International Code of Practice General Principles of the Food Hygiene from Codex Alimentarius.

### Cargill's offer

Cargill's functional systems can combine all types of single ingredients and therefore provide all types of functionalities as needed, for a well suited final texture. From core systems to compounds, they find their main usage in texturizing/stabilizing, but also in coloring, flavoring, protection and health.

The main texturizing/stabilizing food applications are in :

- Dairy (cheeses, fresh dairy products)
- Meat products (fresh processed meats, cooked meats, dry meats, specialties : aspics, meat and fat analogues)
- Ice cream & frozen desserts
- Instant products & water dessert gels

- Bakery (yeast breads & rolls, sweet goods, frozen doughs, glazes & icings)
- Fruit products (fruit sauces, syrups, fruit preparations, compotes)
- Sauces & dressings, dips, gravies
- Confectionery (fruit snacks and jelly candies, cake decorations, hard candies)
- Beverages (fruit juices, near water drinks)

Cargill's functional systems are sold under a number of well established brand names, of which the most popular ones are : Lygomme™, Flanogen™, Gelogen™, Vitex™, Emulthin™, Emulzym™, Protex™, Daritech™, Diana™, Fosfosal™, Unimix™, Gel'Dor™.

## Cargill Texturizing Solutions

Global Headquarters	Office Park Mechelen Bedrijvenlaan 7/9 2800 Mechelen Belgium
Board of Directors:  Business Unit Leader Business Unit Controller Business Unit HR Manager Business Unit Technology Director Global Operations Director Global Business Director Hydrocolloids Global Business Director Cultures and Regional Director Latin America Regional Director Europe, Middle-East, Africa Regional Director North America Regional Director Asia Pacific	Ralph Appel Ludger Te Laak Koen Sercu Geert Maesmans Ken Yoerg Fabrice Bohin Gerald Dard  Alexandre Luneau Jeanne McCaherty Weiyu Fan
People	C 2,280 employees
Countries	24
Headquarters	Mechelen, Belgium
Global manufacturing sites	32
Global application laboratories	10
<b>Americas:</b> Application laboratories Manufacturing sites Locations	C 600 employees 3 8 Minneapolis, USA Decatur, USA Atlanta, USA Germantown, USA Cedar Rapids, USA Hammond, USA Waukesha, USA Mexico City, Mexico
<b>EMEA:</b> Application laboratories Manufacturing sites Locations	C 1290 employees 4 21 Amsterdam, The Netherlands Baupte, France Castelmassa, Italy Essaouira, Morocco Fez, Morocco Ghent, Belgium Hamburg, Germany Haubourdin, France Kalisz, Poland Krefeld, Germany La Ferte-sous-Jouarre, France Lannilis, France Malchin, Germany Martorell, Spain Redon, France Rubi, Spain Sas Van Ghent, Belgium Vigonza, Italy Zaandam, Netherlands

<b>Asia Pacific:</b> Application laboratories Manufacturing sites Locations	c 390 employees 3 3 Beijing, China Canlubang, Philippines Shanghai, China Zibo, China
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For more information, visit <http://www.cargilltexturizing.com>

# Cargill Corporation

Global Headquarters	Cargill Incorporated PO Box 9300 Minneapolis MN 55440-9300 USA
Chief Executive Officer	Gregory R. Page
People	131,000 employees
Countries	66
Headquarters	Minneapolis, USA

Cargill is an international producer and marketer of food, agricultural, financial and industrial products and services. Founded in 1865, the privately held company employs 131,000 people in 66 countries. Cargill helps customers succeed through collaboration and innovation, and is committed to applying its global knowledge and experience to help meet economic, environmental and social challenges wherever it does business.

Founded first as a single grain elevator in the US, Cargill has a long and rich history in grain storage and trading. A century and a half later, Cargill is still a family-owned company but now has a worldwide reach with processing, research and application facilities in all continents. Cargill is able to provide food, agricultural, engineering and risk management solutions around the globe.

The key customer segments served by the company are:

- Animal nutrition and feed
- Commodity trading and processing
- Industrial / Bio-industrial
- Energy & Fuels
- Farmer services
- Financial & risk management
- Food & Beverage Ingredients
- Foodservice
- Pharma & Personal Care
- Salt

The company goal is to be the world's premier food and agricultural company. It is achieving this by focusing on sourcing and processing high quality ingredients supported by innovative technical research. Cargill's commitment is to share its knowledge and expertise with its customers to ensure that they can grow and profit.

For more information, visit <http://www.cargill.com>.