



Food Ingredients

Equipment and Solutions for
Food Ingredients and Starch



engineering for
a better world

gea.com

Quality ingredients for competitive products

As a trusted supplier of customized and innovative process solutions, GEA adds value to the food ingredients industry around the world.

From carbohydrates and proteins to extracts and flavors, the increasingly diverse food ingredient sector spans a wide range of products that are used to maintain or improve the safety, freshness and nutritional value of our foods, as well as their taste, texture and appearance. To be successful, food and beverage manufacturers are dependant on high quality and innovative ingredients.

GEA has supplied the world's food ingredients industry for more than 50 years. We focus on developing world-leading equipment and solutions for sophisticated production processes that meet the needs of our customers, help to drive innovation and add important value to their business.

From standard equipment to customized solutions, GEA's technologies are designed to meet optimum hygiene and quality standards, while operating efficiently and sustainably.

Single units and complete solutions

Our proprietary technologies and full line integration capabilities mean that we can provide integrated solutions for a wide range of products, and all from a single source. GEA's expertise and solutions span every stage of food ingredient processing, from ingredient reception and bulk handling to liquid and powder processing, control systems and packaging services.

Whatever the complexity or scale of process line or plant, GEA's industry experts, technical specialists and project managers work with each customer at every stage to tailor the right solution, from initial consulting and planning through to installation and commissioning.

And, with our world-class service offerings, we can ensure reliable and robust operation of every piece of GEA technology throughout the entire lifecycle of the plant and its equipment.

Applications

Fermentation derived ingredients (e.g. probiotics, cultures, enzymes, algae)

To recover and process products such as baker's yeast, yeast extracts, probiotics, algae, enzymes and starter cultures, GEA technology ensures maximum quality, gentle handling and a high degree of end product purity. We can supply complete lines for almost any type of fermentation based food ingredient. Our scope of supply includes media preparation, sterilization, fermentation, centrifugation, membrane filtration, evaporation, freeze drying and spray drying.

Furthermore, high quality powders can be produced from yeast extracts and hydrolyzed yeast using GEA's membrane-based clarification, fractionation or concentration followed by spray drying. GEA's falling film evaporators are used to concentrate yeast extracts as well as yeast stillage. GEA separators and decanters are used to harvest, wash and concentrate yeast and yeast extracts.



Fibers

Fibers, from soluble and insoluble fiber-based byproducts of different viscosities to coarse fibers such as hulls and bran – as well as specialty high value fiber products such as inulin and Fructooligosaccharides (FOS) – can be difficult to process. However, GEA offers a choice of spray and solid feed dryers (ring, flash and swirl) in different configurations that can be adapted to dry any specific fiber product.

A broad range of feed materials, including powders, cakes, granules, flakes, pastes, gels and slurries can be processed, and a particular design can be chosen to provide a precise residence time to dry difficult products or a low temperature recycling system for heat-sensitive ones.



Flavors

GEA technologies cover the entire process of flavor powder production, including mixing, emulsification, drying, agglomeration and packing solutions. Whether you already have a specific formulation or not, we can help you to develop an emulsification and spray drying solution to optimize both process capacity and yield, and enhance the quality and stability of the final powdered product.

As well as spray drying flavor emulsions, we can also assist with alternative encapsulation processes based on spray congealing (also called spray cooling) or fluidized bed coating.





Coffee/tea whiteners

All GEA food processing technology is designed and engineered to meet strict hygiene, food safety and quality standards. To produce highly dispersible – “instant” – agglomerated powders, we can supply complete formulation systems that combine emulsification, spray drying and agglomeration.

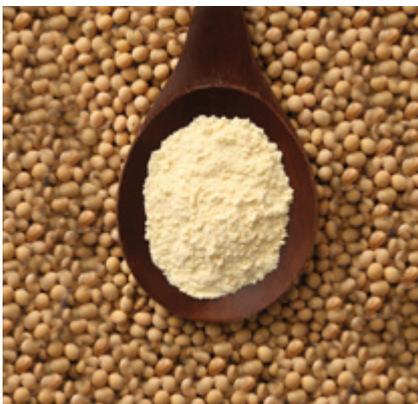
For products with very high oil content, GEA offers the FILTERMAT® technology, which has been designed to handle challenging products. Mixing is a key unit process that fundamentally affects the consistency and quality of non-dairy creamers. For stable, consistent emulsions, our BATCH FORMULA® Mixer can help to reduce the size of any oil droplets and our integrated process control system ensures product integrity by monitoring vital parameters to guarantee that product specifications are achieved.



Pet food ingredients

As an industry leading provider of manufacturing technologies for pet food ingredients, our microfiltration and ultrafiltration technologies ensure the efficient fractionation and concentration of pet food flavorings.

Often containing high concentrations of oils and hydrolyzed proteins, low temperature drying is required to achieve the right final product quality of pet food ingredients and flavors. To meet these requirements, GEA's spray dryers and FILTERMAT® dryers for pet food production are manufactured to the same high standards as food plant, making them easy to clean and service. GEA offers equipment designed to avoid product deterioration and maintain its organoleptic properties. Furthermore, our dryers can optimize powders for use in extruded or pelletized products.



Proteins (vegetable, hydrolyzed fish and animal proteins)

From protein concentrates to isolates, our extraction, separation, purification, concentration and drying technologies will enable you to design the most optimal process for your application, whether it's an animal feed or enrichment for human food and beverage use.

GEA's membrane separation technology ensures high recovery levels of top quality product, and our decanter centrifuges and centrifugal separators are designed for maximum separation efficiency, minimum energy consumption and hygienic process management. Beyond vegetable protein concentrates and plant isolates, we also offer complete solutions for hydrolyzed fish and animal proteins.

Starch, modified starch & starch derivatives (e.g. sugars, sweeteners, maltodextrins)

For the complete extraction of starches and their by-products GEA offers extraction, separation and drying technologies. GEA's high yield membrane filtration units operate to clarify and fractionate syrups and reduce the amount of wastewater. Sweeteners and maltodextrins can be concentrated with GEA's evaporators.

Nutrients may also be recovered from corn steep liquor or wheat starch effluent; the concentrate from which can be used in combination with our rotary/ring dryers to produce animal feed as the final product. We also provide flash/ring dryers for starch, gluten and vegetable proteins, spray dryers for maltodextrins and glucose syrups and spray coolers to produce pregelatinized starches.

Texturizers

Food texturizers are used to give final products a certain consistency, mouthfeel and taste. GEA is a leading supplier of hybrid systems comprising membrane and evaporation finishers to concentrate gelatin and other collagen derivatives.

Our expertise also covers products including gum arabic, pectin, microcrystalline cellulose (MCC) and ethyl cellulose (EC). For the concentration of gelatin we supply falling film, plate and forced circulation evaporators. We can also provide spray congealing plants to solidify oils and waxes, such as fatty acid derived mono- and diglycerides, and ingredients used as emulsifiers.



Applied equipment, technology and solution



Mixing & feed preparation

- Batch & Inline Mixing (for example BATCH FORMULA®)
- Fermentation & Inoculation Systems
- Aseptic Tanks & Storage



Fractionation & concentration

- Membrane Filtration (MF, UF, NF, RO)
- Falling Film, Forced Circulation & Plate Evaporation
- Thermal & Mechanical Vapor Recompression (TVR & MVR)
- Freeze Concentration
- Crystallization



Drying & specialized powder processes

- Freeze Drying
- Spray Drying
- Spray Congealing (Spray Cooling)
- Solid Feed Drying (e.g. Ring, Flash & Swirl)
- Fluid Bed Drying & Agglomeration



Homogenization & flow components

- High Pressure Pumps and Homogenizers
- Hygienic and Aseptic Valves
- Hygienic and Aseptic Pumps
- Cleaning Technology



Heat treatment & pasteurization

- Tubular Heat Exchangers
- High Temperature Short Time Heating (HTST)
- Highest Temperature Short Time (HHST)
- Ultra High Temperature Process (UHT)
- Direct Steam Injection (DSI)



Clean-in-Place (CIP) & Steam-in-Place (SIP)

- CIP Units
- CIP Integration
- CIP Optimization
- SIP Design
- SIP Integration
- SIP Optimization



Extraction & centrifugal separation

- Separating (disk stack centrifuges)
- Decanting (2- and 3-phase decanters)
- Continuous Extraction



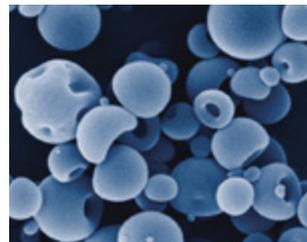
Powder filling

- Bag, Box and Drum Filling
- Powder Sampling
- Container Closing
- Sealing
- Palletizing



Automation

- Automation solutions based on international standards
- Analytical, In-line Control & Measurement Devices
- Manufacturing Execution System (MES)
- Traceability Solutions
- Data Historian
- Dynamic Process Simulation



Test facilities & process optimization

- Laboratory Testing
- Pilot Plant Testing
- Pilot Equipment
- Process Optimization



Solution provider

- Process Integration
- Process Design
- Hygienic Design
- Process Safety
- Project Management



Service

- Installation & Commissioning
- Training
- Spare Parts
- Corrective & Preventive Maintenance
- Upgrades, Modernization & Optimization
- Predictive Maintenance
- Performance Contracts & On-site Support
- Service Software Products



We live our values.

Excellence • Passion • Integrity • Responsibility • GEA-versity

GEA is a global technology company with multi-billion euro sales operations in more than 50 countries. Founded in 1881 the company is one of the largest providers of innovative equipment and process technology. GEA is listed in the STOXX® Europe 600 Index. In addition, the company is included in selected MSCI Global Sustainability Indexes.

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