GEA Homogenization technology

State-of-the-art equipment
and solutions for your production

engineering for
a better world

gea.com

Homogenization

GEA is the leading supplier of high pressure homogenization technology for a complete range of industries and applications.

Every applications

Homogenization plays a primary role in many industries and is applied to a wide variety of products. GEA excels with this technology as a result of experience know-how, a passion for innovation and constantly focusing on improving process performance.

Highly customized solutions

GEA offers highly specific and customized process solutions to always ensure excellent and safe product quality.

Leader in high pressure homogenization

High pressure homogenization uses pressure to reduce particles or droplets in emulsions to the required size (usually sub micron). This reduction creates a stable dispersion in the finished product, and provides a starting point for further production processes.

As a global leader, GEA has the best know-how in each of this fields and the greatest flexibility in providing any kind of required customization to perfectly meet the client's processing requirements.

Applications

The benefits of high pressure homogenization are well known in dairy, pharmaceutical, food and beverage industries. High pressure processing offers distinct advantages in terms of time and cost saving to the customer. Particle micronization also has an essential role with emulsion and dispersion in pharmaceutical applications for the production of inhalation products, intravenous emulsions and in biologic cell lysis (bacteria, yeast, algae).

Dairy

GEA homogenizers set the industry standard for sanitary and aseptic processing, automation and cleanability.

The homogenization process is used on dairy products to improve their stability and shelf life, as well as increase digestibility and taste.

- Fresh and pasteurized milk
- UHT milk
- Milk for yoghurt
- Yoghurt drinks
- Desserts
- Cream cheese
- Fermented milk products
- Spray dryed products

Food & Beverage

Homogenization in the food industry is widely used to obtain a stable product, with a longer shelf life. It reduces the amount of additives used while improving improves the dispersion of ingredients and the absorption of flavors.

- Food emulsions
- Baby foods
- Fruits juices
- Cloudifiers/aromas
- Dressing
- Egg and mayonnaise
- Tomato products (paste/concentrate)
- Starches

Pharmaceutical

Liquid pharmaceutical products are homogenized to make the dispersion of active ingredients much more stable for enhanced clinical effectiveness, improved drug tolerance and reduced dosage.

- Intravenous emulsions
- Inhalation products
- Liposomes
- Syrups

Biotechnology

High pressure homogenization is used for cell rupture operations on yeast and bacteria to extract intra-cellular substances without using solvents or chemicals for the cell wall breakage. This releases proteins, enzymes and vitamins.

- Vaccines
- Yeast
- Enzymes
- Algae
- Bacteria

Home & Personal Care

High pressure homogenization can effectively reduce the particle size, resulting in uniform dimensional distribution, for stable and longer shelf life of cosmetic products, along with a better active ingredient dispersion.

- Ointments
- Lotions
- Nail varnish
- Hair colorants
- Detergents

Chemical

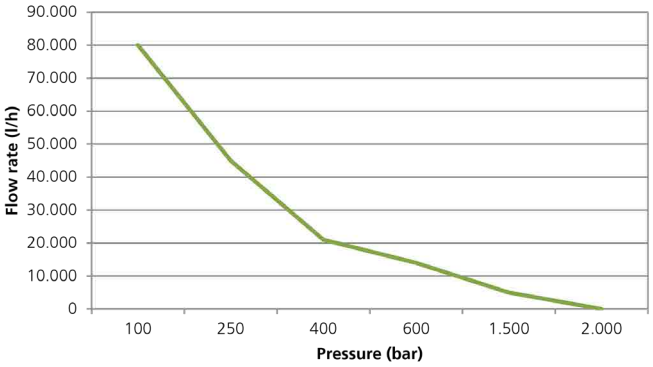
High pressure homogenization creates stable emulsions, dispersions and mixes for chemical products. It can also improve chemical reaction and extraction processes, polymer properties and pigment color.

- Chemical slurries
- Paints
- Greases
- Latex
- Polymers
- Pesticides/fertilizers
- Cellulose fibers

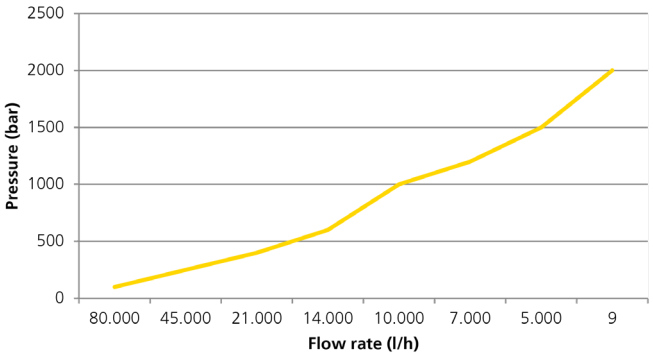
Homogenizers range

GEA offers a wide range of high pressure homogenizers that guarantee the best results with the lowest consumption of energy and resources.
The complete portfolio of GEA homogenizers ranges from laboratory to industrial scale, allowing scalability up to 80,000 l/h.

FLOW RATE RANGE



PRESSURE RANGE



GEA Lab Homogenizer PandaPLUS

Scalability of results

GEA Ariete Homogenizer 5400

Technology leader

When it comes to pulsating pressure, high flow velocities, and abrasiveness of processed fluids, material selection and dedicated designs are crucial.

Thanks to GEA's commitment towards efficiency and reliability, the core components of the homogenizer are engineered differently, based on the pressure range, product formulations and the process conditions.
More than 300 options are available, offering a considerable flexibility and strong customization, thereby meeting customers' needs both in terms of performance, consumption and environment.

Homogenizing valves

GEA homogenizing valves are designed proportionately to obtain the required degree of micronization and particle size distribution.

- Standard Valve
- NanoVALVE™, able to reduce up to 30% of energy
- NanoVALVE™HP, for pressure up to 700 bar
- Re+VALVE, reversible, reliable, resistant

Compression blocks

GEA compression blocks feature an extremely clean configuration (3-A certified), and are suitable both for food and non-food applications.
They are produced with special materials that have been tested for maximum reliability and resistance under severe stress.

- Standard compression block, the monoblock
- VHP compression block, reliability under Very High Pressure
- OpenXFLO™, to easily pump difficult products to the homogenizing valve
- NiSoCLEAN, top cleanibility compression block

Energy Saving package options

GEA Energy Savings package includes all available options for optimizing the resources used in high pressure homogenizers; reducing TCO:

- NiSoPURE to save 90% of water and steam in aseptic production
- Oil Purification System (O.P.S.) to guarantee a continuous oil regeneration
- Gearbox oil cooling unit to adjust oil temperature with air

GEA Pharma Skid homogenizer 3015

Certifications and validations

Certified quality

GEA meets all relevant international standards for food and dairy hygienic design (3-A), for biotech and pharmaceutical compliance (cGMP, FDA), and is an active partner in the development of EHEDG guidelines for hygienic and safe food processing design equipment.

ISO 9001:2008 certified Quality System represents a point of reference for the company and its operations, from design to production, from sales to after sales services. In addition, systems can be supplied with ATEX explosion-proof certification for hazardous areas.

Tailor-made support to obtain any validation

Equipment for pharmaceutical and biotechnology applications must be fully compliant with industry regulations, such as FDA requirements and cGMP guidelines.

In order to guarantee and validate the equipment, GEA supplies highly qualified technical services to safely implement the machinery into cGMP certified facilities and processes.

Every step of the system validation process is documented and recorded using dedicated procedures and protocols. This is the highest quality point of reference for the industry, developed over years of partnership and cooperation with leading pharmaceutical and biotech companies, and applied to hundreds of installations.

Our services include: preparation of customized FAT, SAT and IQ/OQ protocols, scheduled maintenance, on-site training programs and tailor-made support for PQ when required.

Future solutions developed today

The Product Engineering and Development department in GEA continues to excel in product innovation as well as application know-how to satisfy customers' needs.

Process Technology Center

GEA Process Test Center (PTC) located in Parma (Italy) has a unique portfolio of services for homogenizers:

- Specification of product characteristics
- Selection and design of the machine types, including peripheral equipment
- Pilot tests under real conditions
- Factory acceptances tests (FATs)

The PTC laboratory equipment consists of pilot-scale and laboratory-scale high pressure homogenizers as well as instrument platforms for particle sizes, rheology, microscopy and the determination of stability characteristics. Homogenization parameters are defined alongside customers, thus ensuring a process configuration and install that will produce optimal results.

Homogenization Under Real Working Conditions

The PTC for homogenization offers perfect conditions for testing the homogenization technology on existing or new products and for optimizing the development of the customer's production processes.

- Product pilot tests with scaling to complete installations from 9 to 1000 l/h
- Development and testing of prototypes of new homogenization technology and new homogenizer models

Services

GEA offers the exclusive advantage of the latest technology, combined with competent, on-site, customized support. GEA customer services guarantee high quality spare parts, maintenance and personnel training, as well as continual updates to optimize machine operation and to improve production efficiency.

Main services available:

- Installation
- Commissioning
- Training
- Spare Parts
- Corrective maintenance
- Preventive maintenance
- Upgrades
- Modernization
- Optimization
- Predictive maintenance
- Second-hand equipment
- Performance contracts
- On-site project support
- Service software products

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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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