



# GEA Niro Soavi

Leading Pressure

no Soavi

*The future looks brighter when you lead it.*

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Soavi Bruno & Figli, specialized in dairy production systems, was first established in Parma, Italy, in 1947, and it soon committed to engineering and producing high pressure homogenizers. Thanks to the introduction of innovative technical opportunities the company expanded towards new international markets to become a point of reference for the whole Europe.

Growth was combined to research and development of new solutions and reliability, with systems that could reach increasingly high pressure ranges for newer and more complex applications.

In 1990 the company was acquired by Danish Niro Atomizer thus becoming Niro Soavi S.p.A. and continued consolidating its presence in worldwide markets with dynamic high pressure homogenizers and pumps, the one and only technology the company has always developed.

In 1993, Niro Soavi became part of the GEA Group. Today the ram logo featured on all GEA Niro Soavi systems, with its strength and adaptability to the most difficult situations, still symbolizes continuity between past tradition and drive towards the future.



*Leaders for over 60 years.  
Un primato che dura da più di 60 anni.*

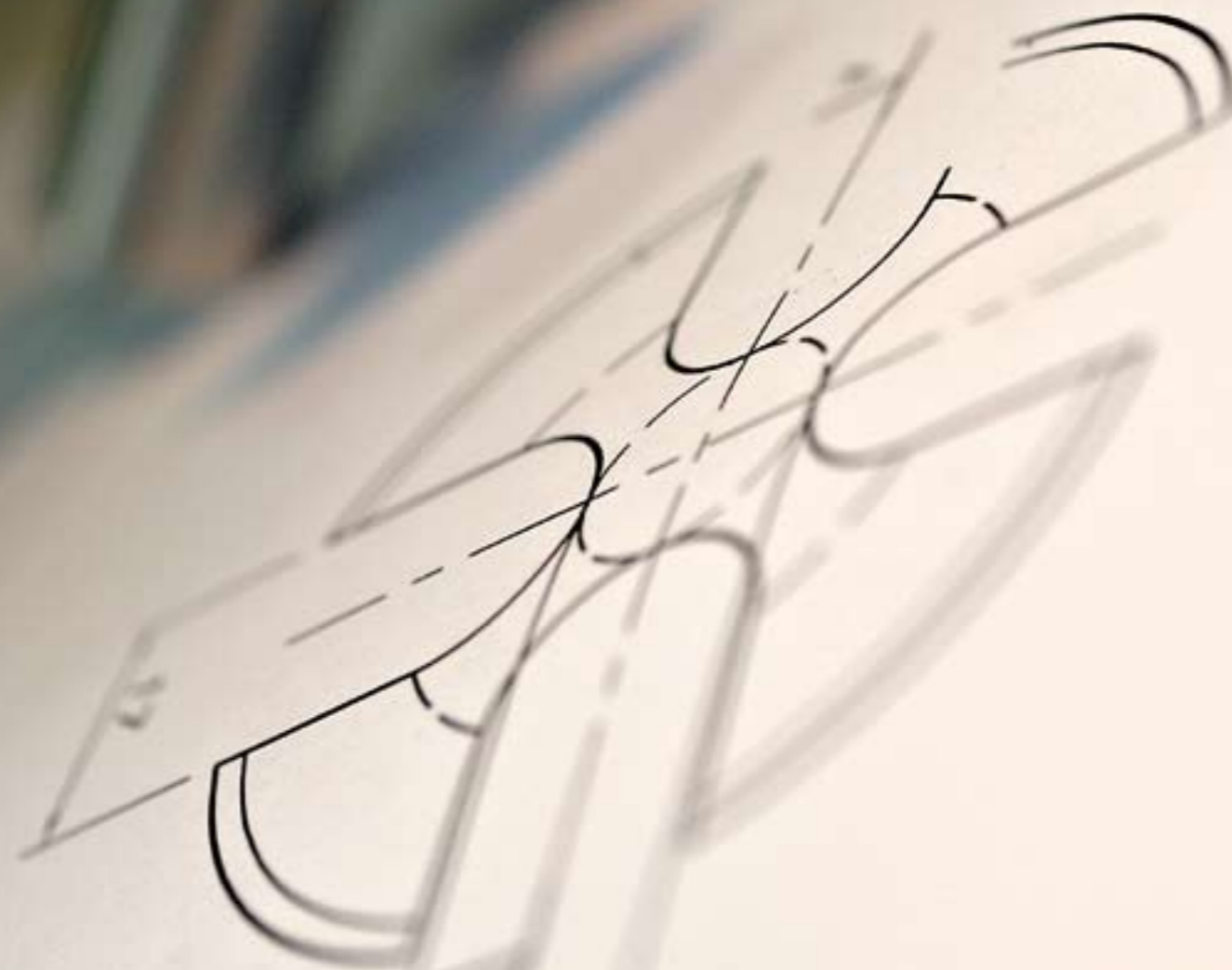


An international network, in constant and direct contact with Parma's technology and production center, guarantees the presence of an organization close to every market worldwide and integrated by regional GEA divisions. An acronym for Global Engineering Alliance, GEA represents one of the most important international companies in engineering and production of technologically advanced solutions.

Listed in Germany's MDAX stock market, the GEA Group is specialized in mechanical engineering, particularly for process engineering and equipment, in the design of energy systems, consumables production systems, and a variety of products that are part of and improve consumers' everyday life.



*Strength in numbers.  
Quando l'unione, oltre alla forza, fa anche la differenza.*





*Excellence as a winning choice.  
L'eccellenza come scelta vincente.*

## Internal production, for total quality control.

Today, with thousands of systems operating all over the world, GEA Niro Soavi is the world leader for high pressure homogenizers and pumps, both in terms of technology and market presence.

Committed to this mission, the company has achieved it thanks to constant innovation and a clear production advantage over its competitors, under the vision that a continuous commitment to research and development will open new innovative applications to high pressure homogenizers.

GEA Niro Soavi offers the widest variety of solutions to the market, from small companies to leading international corporations, combined with total reliability of components.

Precisely in order to guarantee excellent performance and duration over time, each system is entirely designed, produced, assembled, and tested within GEA Niro Soavi premises in Parma by highly qualified and certified personnel following a full cycle internal production process.

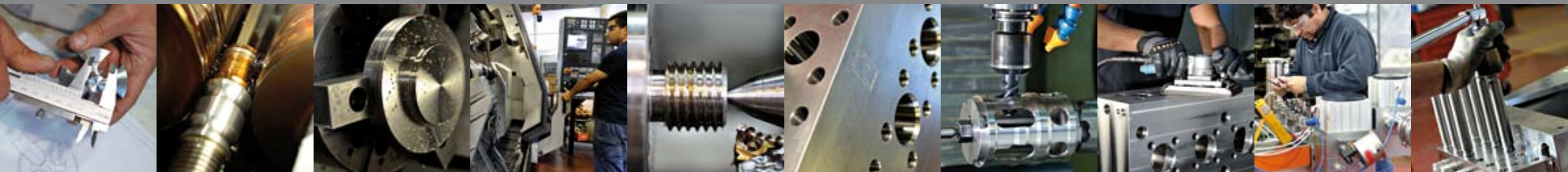
Every individual component in the liquid end is produced with care, engineering proficiency in every detail, and passion for excellence.

The better quality of our products is the result of an internal production cycle which can guarantee the highest reliability of each and every process system thanks to total and stringent quality control. This also allows to maximize processing, maintenance, and energy consumption costs while allowing delivery times to always be met - even in the case of highly customized solutions - and the immediate availability of any spare part, even for less recent machines.

This is the only philosophy for ensuring future success and our trade partners' satisfaction all around the world.

For this reason GEA Niro Soavi international sales network offers far-reaching assistance with local support ensuring a long and specialized experience in the field.

GEA NIRO SOAVI NETWORK: A GLOBAL COVERAGE





*Ready to meet any and every need.  
La giusta risposta ad ogni esigenza.*

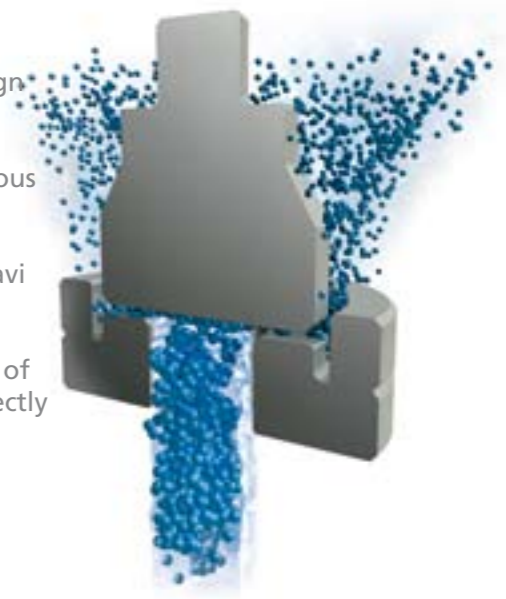
#### **DYNAMIC HIGH PRESSURE**

Homogenization utilizes pressure energy to subdivide particles or droplets that are present in fluids to reduce them to the smallest possible size (under one micron) thus creating a stable dispersion in a finished product or providing a starting point for further production processes. The fluid transit through an especially designed valve – called homogenizing valve – under high pressure conditions and through a high energy density field is able to downsize dispersed particles to the order of magnitude of micrometers and nanometers. GEA Niro Soavi homogenizing valves are designed and dimensioned in order to obtain the required degree of micronization and dispersion to the lowest

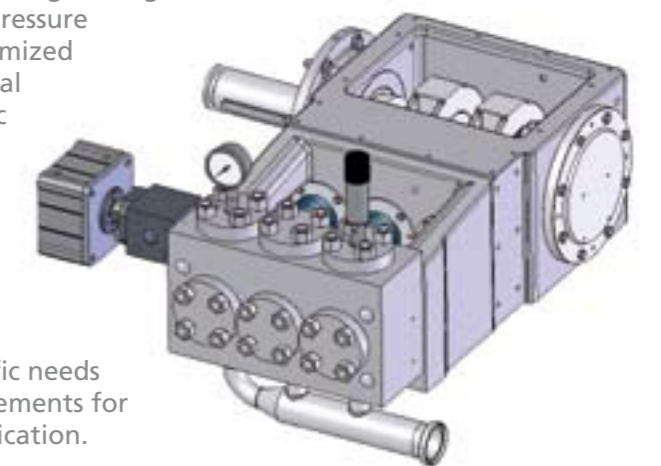
#### **DYNAMIC HIGH PRESSURE HOMOGENIZERS**

Dynamic high pressure homogenizers are made of a single acting reciprocating multi-plunger pump with a specific adjustable valve designed to create the required pressure to micronize different fluid products. Dynamic high pressure can be applied under continuous flow conditions in order to process fluids such as emulsions and dispersions for a large variety of applications, viscosities and physical properties. GEA Niro Soavi homogenizers are

possible pressure, based on the widest range of applications. Dynamic high pressure homogenization technology includes several sciences and competences: from system design to material study and selection, from the knowledge of fluid dynamic phenomena to all various production processes. With its leadership position on the global market GEA Niro Soavi has the best know-how in each of these fields and the biggest flexibility in providing any kind of required customization to perfectly meet the client's processing requirements.



available in a wide range of high pressure and low pressure models, with customized solutions and special versions for specific needs. A wide selection of options allows each system to be set up and equipped with features that exactly meet specific needs and process requirements for any industrial application.





**THE LIQUID END**

The liquid end is the part of a homogenizer where the product is pumped under pressure. GEA Niro Soavi liquid ends are designed according to different pressure ranges using CAD 3D modeling and FEM analysis systems, are produced in-house

**MONOBLOCK LIQUID END**

GEA Niro Soavi Monoblock Liquid End stems from design maximization aimed at simplicity, reliability, hygiene and easy cleaning requirements. Generally used under medium-high

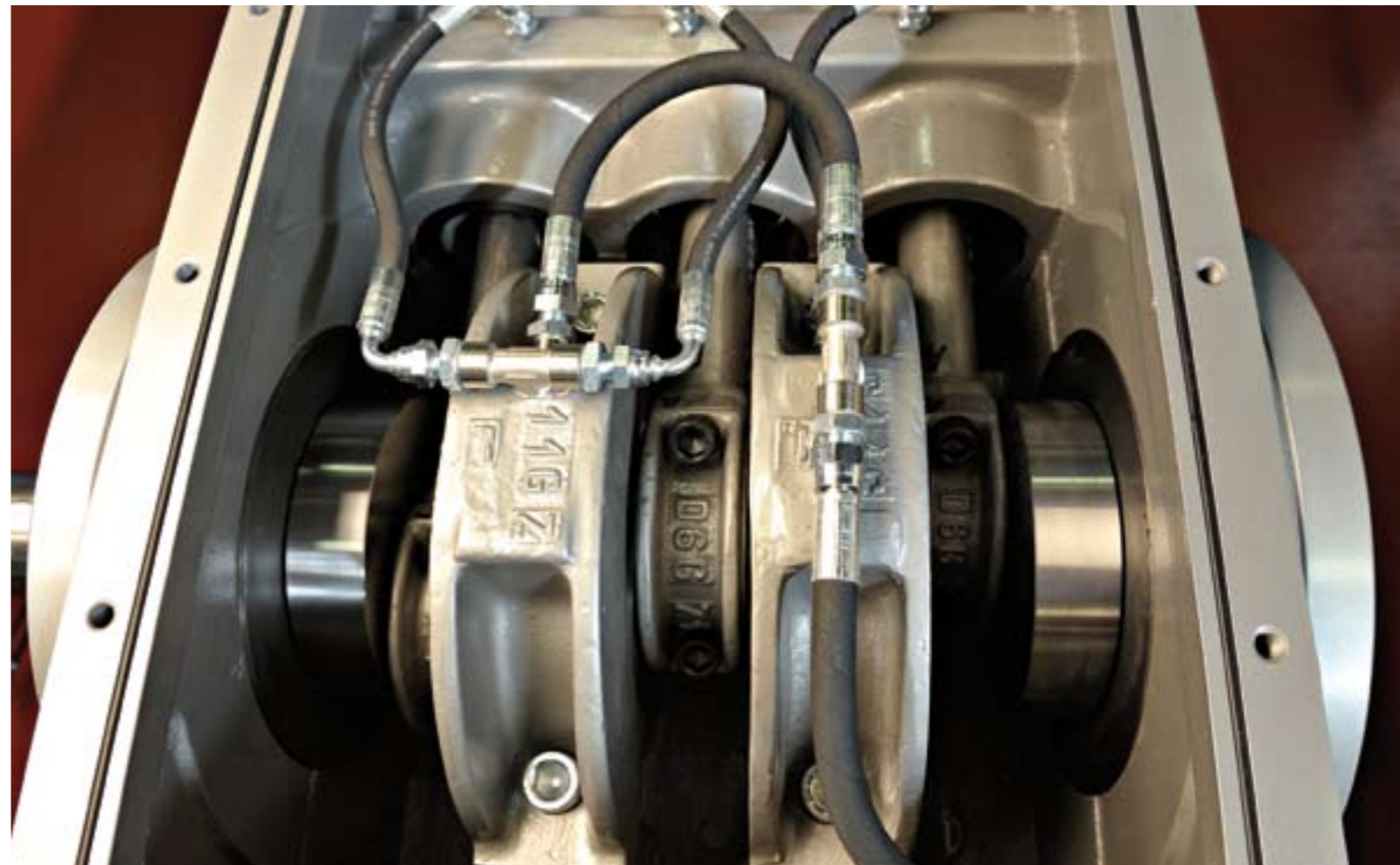
**VHP MULTIBLOCK LIQUID END**

The VHP Multiblock Liquid End, completely developed with the aid of advanced FEM structural analyses tools, has a specific configuration for systems operating at very

using special materials tested for maximum reliability and resistance to standard and occasional or unexpected stress, and have an ultra clean configuration (with 3-A approval), suitable for any application in food and non-food industries.

operating pressures it represents an excellent combination of over half-a-century-long experience in materials selection, production technology and fluid dynamic and structural analysis.

high pressure ranges. The VHP Multiblock features a split block construction, each block produced and controlled separately, which minimizes materials fatigue and stress due to peak pulsating pressure.



**ASEPTIC PROCESS CONFIGURATION**

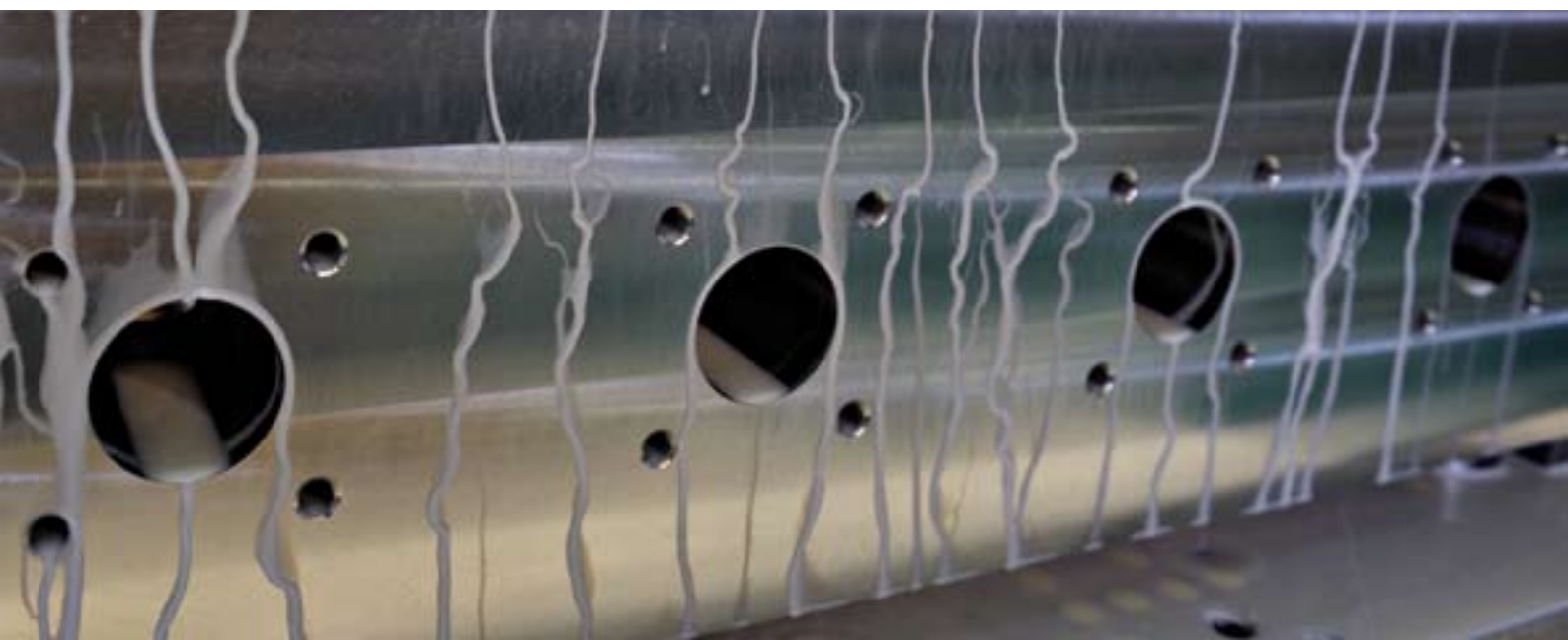
GEA Niro Soavi has a long experience in supplying aseptic homogenizers to the leading global producers of sterile products, not only in the food and dairy field but also for pharmaceutical and biotech products.

GEA Niro Soavi aseptic technology uses sterile condensate for the flushing of the aseptic chambers installed on the system. This prevents the sterile products to be contaminated during the homogenization process.

**SPECIAL MATERIALS**

When it comes to pulsating pressure, high flow velocities, and abrasiveness of processed fluids, material selection is crucial. GEA Niro Soavi know-how is able to provide tailor-made materials in order to tackle extremely challenging technical requirements, such as fatigue and wear and tear resistant sintered alloys and materials, or integral ceramic parts. A long term reliable

solution, based on a synergic combination of materials and design features, customized on the product and process requirements. GEA Niro Soavi offers safe solutions in a large variety of industrial applications, including the use of materials compliant with FDA provisions as well as full traceability of parts in contact with the product, from the raw material to the finished component.





*Always looking ahead.  
Guardare avanti prima ancora di arrivarci.*

Researching new technological solutions has always been GEA Niro Soavi most important strategic factor. Innovation means searching for new potential applications that can adapt dynamic high pressure homogenization to the expectations of the market and anticipate its needs.

As a global leader, GEA Niro Soavi has all the resources to invest today in what will be tomorrow's answers.





**OUR OPEN XFLO™ TECHNOLOGY THE COMPRESSION BLOCK THAT NEVER GETS BLOCKED.**

OpenXFLO™ is a patented compression block design which can be optionally installed on standard drives to meet special products' pumping requirements. Thanks to its design concept, OpenXFLO™ can pump fluid products with agglomerates and solids without any accumulation or clogging across the liquid end.

It offers the following unique advantages:

- No solid build up
- No production downtime
- Optimized valve guide design
- No interference of pumping plunger with valve in full forward position
- Free flow through the pumping valves
- Optimized product flow to the homogenizing valve



**NANOVALVE™ HOW TO GET THE BEST OUT OF PRESSURE.**

NanoValve™ is a high efficiency valve whose design is based on fluid dynamic analysis and CFD modeling to allow a better particle homogenization than standard valves under the same operating conditions.

The high efficiency NanoValve™ optimizes the use of dynamic high pressure which results in an excellent stabilization of the product

and a more efficient use of additives. NanoValve™ suits for different applications, not only in the food and dairy industry, but also for beverages and chemical emulsions. It features tungsten carbide internal components ensuring consistent and long lasting operation even with abrasive products.



**UHP 4000 BAR THE HIGHEST DYNAMIC PRESSURE EVER ACHIEVED.**

GEA Niro Soavi has introduced the first UHP (Ultra High Pressure) homogenizer, a unique prototype, able to reach a maximum dynamic pressure of 4000 bar. Ultra High Pressure is the most innovative solution to approach new markets opportunities with the development of high technology and new and effective indus-

trial processes for the launch of new products. UHP technology is covered by international patents and has become the technological development platform for all new applications and for maximizing design solutions, materials, and production technologies of all GEA Niro Soavi homogenizers currently available on the market.



**LAB SYSTEMS FROM A FEW DROPS TO INDUSTRIAL PRODUCTION.**

GEA Niro Soavi laboratory scale homogenizers are ideal for research and development applications when product formulation and process simulation are the basic innovation tools for industrial competition. GEA Niro Soavi lab systems do not require a process plant, are able to operate at several pressure ranges and with limited sample volumes thanks to

a full configuration that allows to assess in an easy and repeatable way dynamic high pressure effects. Lab systems are also available with different homogenizing valves for multiple products and processes. Our lab systems ensure the same results as larger systems and allow an easy scale-up from lab trials to industrial production while guaranteeing results scalability.



From food to cosmetic products, from drugs to chemical and biotech applications, homogenization technology plays a primary role and is applied to a variety of everyday, widely used products. GEA Niro Soavi is the leading supplier of dynamic high pressure homogenization technology for a complete range of industries and applications.

This is the result of specific know-how and a spirit of innovation constantly focused on process performance. Thanks to a strategy of development of both established and potential applications often based on cooperation with our customers' Research and Development Centers, GEA Niro Soavi can offer highly specific and customized process solutions to always meet, ensure and repeat over time product quality excellence.



*Technology for your daily life.  
Tecnologia per la vita di tutti i giorni.*



### DAIRY

High pressure homogenization for dairy products was originally introduced at the end of the 19th century in the milk industry to achieve constant and durable product quality. Since then it has been widely applied to dairy products in combination with heat treatment technologies to improve their stability and shelf life, thus becoming a standard industrial process. The purpose of high pressure homogenization is to break up large oil or fat globules in an initially coarse suspension and produce dispersion of very small and similarly sized globules, using pressure-produced fluid dynamic energy.

Homogenization minimizes particle separation by gravity and consequently fat floating thus ensuring durable product stability. GEA Niro Soavi high pressure homogenizers are widely used for stabilization applications and guarantee extended shelf life to products such as UHT and ESL milk and cream: it is thanks to the homogenization process that milk can remain stable up to six months with no fat separation.

In addition, this process is essential for optimizing the quality of beverages and yogurts, improving additives' dispersion in flavored and vitamin/protein-added milk products, or obtaining better performance and stability in ice cream mixes to ensure the best consumer-perceived quality as well as over time stability of the finished product.



### FOOD

The benefits of homogenization are well known within the food industry.

High pressure homogenization is the process of reducing and standardizing particle size of fluid products such as fruit juices, beverages, flavors and sauces, in order to make them more stable and to achieve better texture and taste. Also, it allows to maximize product composition and reduce the use of emulsifying and additive agents. Liquid products with dispersed or suspended particles and extremely variable sizes are processed through a high pressure homogenizer thanks to which it is possible to achieve micronized particles with consistently distributed sizes. A great variety of food products are processed using this technology to improve their quality and organoleptic features, such as fruit juices, often with added fibers and vitamins, fruit pulps and concentrates, and vegetables. Other complex formulation products, such as ketchup and mayonnaise and others that are found on consumers' daily life all over the world, benefit from a natural improvement with homogenization processing.





### PHARMACEUTICAL

Homogenization micronization is the process of reducing particle size of liquid pharmaceutical products through dynamic high pressure to obtain a much more stable dispersion of active ingredients for enhanced clinical effectiveness.

Thanks to particle micronization to nanometer range the availability of active ingredients for treatment use increases and tolerance of drugs improves, which allows calibrated and reduced dosage. Micronization processing is essential in pharmaceutical applications for the production of emulsions and dispersions such as creams, syrups, micronized inhalation products, but especially for intravenous emulsions.

### BIOTECHNOLOGY

In biologic cell lysis (bacteria, yeast, algae and plants) cells can be effectively disrupted with a pressure shock producing release and collection of proteins, enzymes, and vitamins, and dramatically reducing production time and costs.

In this respect GEA Niro Soavi high pressure homogenization offers distinct advantages over traditional chemical lysis and impinging flow type technologies. Whereas chemical lysis requires additional costly purification and recovery process phases to yield the desired product, GEA Niro Soavi VHP systems require no additional processing steps, achieving yields higher than 90% on a single pass.

Unlike impinging flow type equipment, GEA Niro Soavi homogenizers can be easily scaled-up from lab and pilot systems to industrial systems, consistently replicating process results.



### PHARMACEUTICAL DESIGN

Pharmaceutical and biotech applications require specifically designed equipment, fully compliant with the most stringent applicable provisions such as FDA and ASME (American Society of Mechanical Engineers), ASME BPE (ASME Bioprocessing Equipment) provisions and cGMP guidelines. GEA Niro Soavi high pressure homogenization technology is the optimal and industry-recognized solution for cell disruption and biotech and pharmaceutical applications. A complete documentation package is available to implement high pressure homogenizers into cGMP certified high pressure processes and equipments.

GEA Niro Soavi offers focused and competent support for validation of high pressure homogenization processing equipment, with specific FAT, SAT, and IQ/OQ protocols, maintenance and operation on-site training, and customized solutions. In addition, all systems can be supplied with ATEX explosion-proof certification for hazardous areas.

### COSMETICS

Micronization by means of high pressure homogenization is used in the cosmetic industry to obtain consistent and stable product emulsions, with better active ingredients' dispersion than with conventional stirrers, static or dynamic low energy intensity blending systems, and colloid mills. One of the limiting factors in the performance of some cosmetic products, e.g. beauty creams, is often its ability to be absorbed into the skin. In this respect high pressure homogenization of soaps, creams and lotions ensures effective particle size reduction and consequently better products in terms of quality, color and transparency, more easily absorbed by the skin. Besides, this process allows for enhanced stability and perfume intensity both in water-based products – such as lotions, toothpastes, shampoos, and soaps – and in solvents and nail polishes.





CHEMICAL

High-Pressure pumping and homogenization in chemical processing are less known than their applications in the food and dairy industry. Still homogenization applications in this field are many and varied.

The subdivision of particles in emulsion and suspension increases their available surface area, improves chemical reaction processes by reducing reaction time and temperatures, and minimizes or even eliminates the need for catalysts. The application of high pressure often enhances the potential of extraction processes as well as color intensity in many pigments and paints. It is also used in the petrochemical industry for viscosity control.

GEA Niro Soavi systems are available in ATEX-certified explosion-proof execution for hazardous production areas and can be used for producing natural and synthetic polymers, inks, pigments and colorings for chemical or textile applications, improving coloring effectiveness, finished products' stability, and their efficacy as coating agents.



## GEA Niro Soavi offers a full range of technical services of direct support to its customers around the world, in any situation and for any need.

The big advantage of purchasing GEA Niro Soavi homogenizers and high pressure pumps is that customers can benefit from the latest technology combined with competent, on-site, customized support, able to meet any expectation.

GEA Niro Soavi services are focused on high quality spare parts, available even for decades-old machines, delivered on time and to any corner of the world; maintenance and personnel training to increase productivity and reduce downtimes; constant updates through the implementation of more advanced technologies on customers' machines.

This allows to optimize machines' operating conditions for better product quality as well as to keep up to date with customers' process improvements. Specific advice and technical support services ensure that all applicable production and process validations are obtained through supplying specialized personnel and any required documentation.

*Our mission is total customer satisfaction.  
L'unico obiettivo è la piena soddisfazione dei clienti.*



### THE LAB A UNIQUE RESOURCE AVAILABLE TO THE CUSTOMER.

The GEA Niro Soavi Laboratory in Parma is a unique resource available to customers to test the application of homogenization on a variety of products and to refine the development of production processes. The laboratory has a wide range of high pressure homogenizers and laser equipment for quality control and particle size characterization.

Highly qualified staff is available to perform specific product testing and advise customers on product formulation that will ensure the most efficient effect. By simulating production conditions it is possible to analyze results in the laboratory before defining the system's ideal configuration and the performances expected by the kind of homogenizing valve in use.

### TAILOR-MADE TRIAL PROGRAMS.

GEA Niro Soavi temporary use program enables customers to rent our equipment so that they may test products at their own facilities or at an external lab. GEA Niro Soavi supplies a wide range of test equipment, for any specific need. All of our customized

temporary use machines come with the option to buy in case you decide that is the most suitable equipment to meet your requirements.





**TAILOR-MADE SUPPORT TO OBTAIN ANY VALIDATION.**

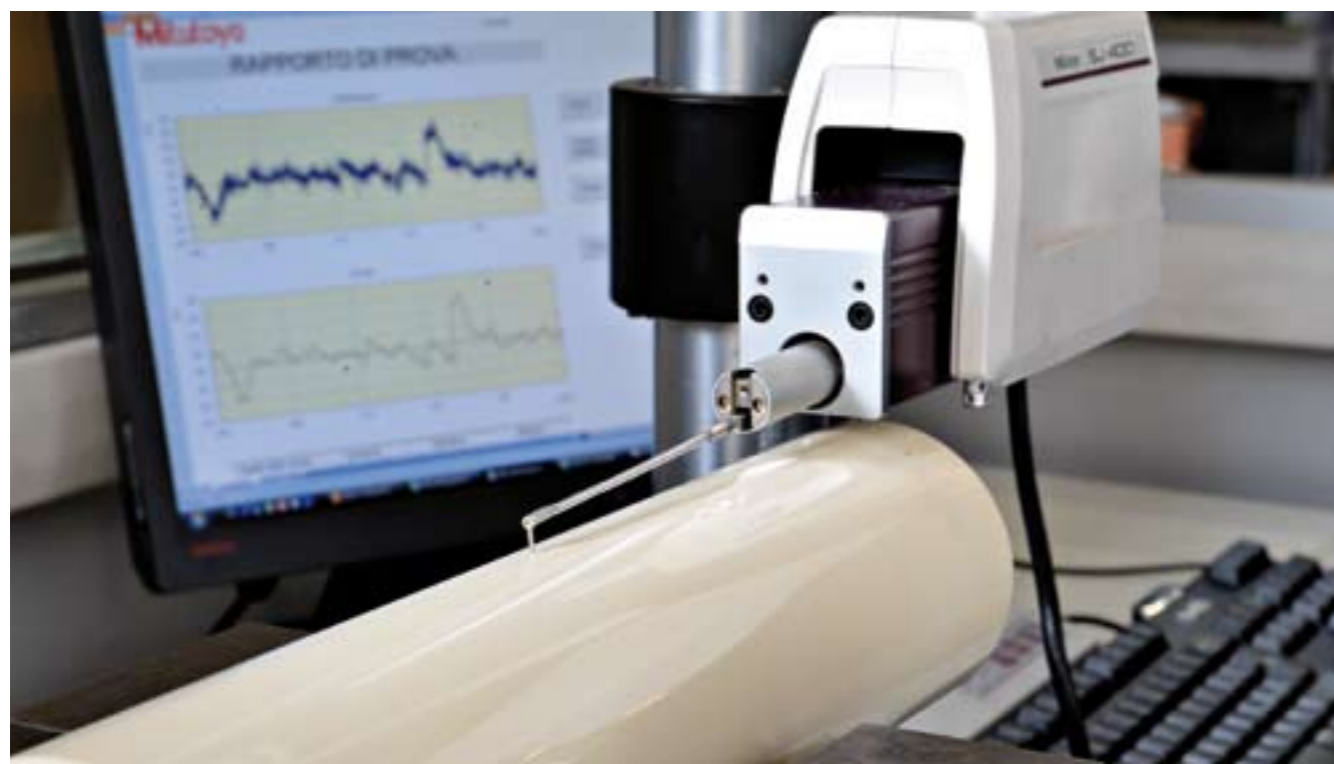
Equipment for pharmaceutical and biotechnology applications must be fully compliant with all stringent applicable regulations, such as FDA requirements and cGMP Guidelines. GEA Niro Soavi can supply not only high pressure homogenizers compliant with the regulations in force in the industry, but also highly qualified technical services to easily and safely implement the high pressure homogenizer into cGMP validated facilities and processes. Every step of the system validation process is documented

**CERTIFIED QUALITY.**

GEA Niro Soavi operates in accordance with the ISO 9001:2000 certified Quality System, which represents a point of reference for company philosophy and operations, from design to production, from sales to after sales services. All system essential technological components are produced within the company facilities through optimized and repeatable production processes. Special materials and custom-made parts are subcontracted to a network of well proven external suppliers

and recorded using dedicated procedures and documentation. This is a 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. GEA Niro Soavi services include preparation of customized FAT, SAT and IQ/OQ protocols, scheduled maintenance, on-site training programs, and tailored support for PQ when required, in order to guarantee straightforward and successful equipment and process validation.

that operate under constant qualification assessment and are directly involved in the design phase. GEA Niro Soavi can satisfy 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 equipments. In addition, all systems can be supplied with ATEX explosion-proof certification for hazardous areas.



**KNOW-HOW FOR A FULL SUPPORT SERVICE.**

GEA Niro Soavi offers high level customized technical support for all types of homogenizers and high pressure pumps, 24-hours a day, 7 days a week, to keep your production up and running with reliable equipment, combined with advice on how to improve and maximize the use of industrial, pilot, and lab applications.



This allows customers to maximize processing equipment efficiency, reduce maintenance costs and guarantee the best finished product. The quality of our technical support service is continuously evolving in order to suit customers' needs and market challenges and always establishes an irreplaceable trust relationship, thanks to a highly competent support.

**ABSOLUTE TRAINING COMPETENCE.**

Training personnel with GEA Niro Soavi specialists gives customers' personnel the necessary knowledge on homogenization and its performance, thus minimizing the risk of downtimes while improving maintenance effectiveness. GEA Niro Soavi can support customers to train their personnel on the systems and teach them how to inspect homogenizers and high pressure pumps, carry out service



**ALWAYS AVAILABLE SPARE PARTS, FOR MAXIMUM EFFICIENCY.**

Genuine spare parts can be supplied anywhere in the world, whenever they're needed, to keep production running at maximum efficiency. GEA Niro Soavi does more than just supply spare parts on time, because it can review its customers' inventory of spare parts and recommend what to keep in stock. GEA Niro Soavi can either deliver original spare parts

and maintenance operations, and optimize original spare parts investments. Tailor-made training sessions are organized directly at GEA Niro Soavi production facilities in Parma which offer the opportunity of directly accessing homogenizer technologies and full production processes. Alternatively training can take place at required locations all over the world.

from its central stock in Parma – Italy, or from distributed spare parts stocks around the world, any day of the year. Alternatively the company will produce critical parts such as compression blocks directly, with a priority schedule. In addition, customers can have machine inspections or scheduled maintenance interventions on site, to verify the need of spare parts and optimize the cost of service for the most efficient and economical use of their system.





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