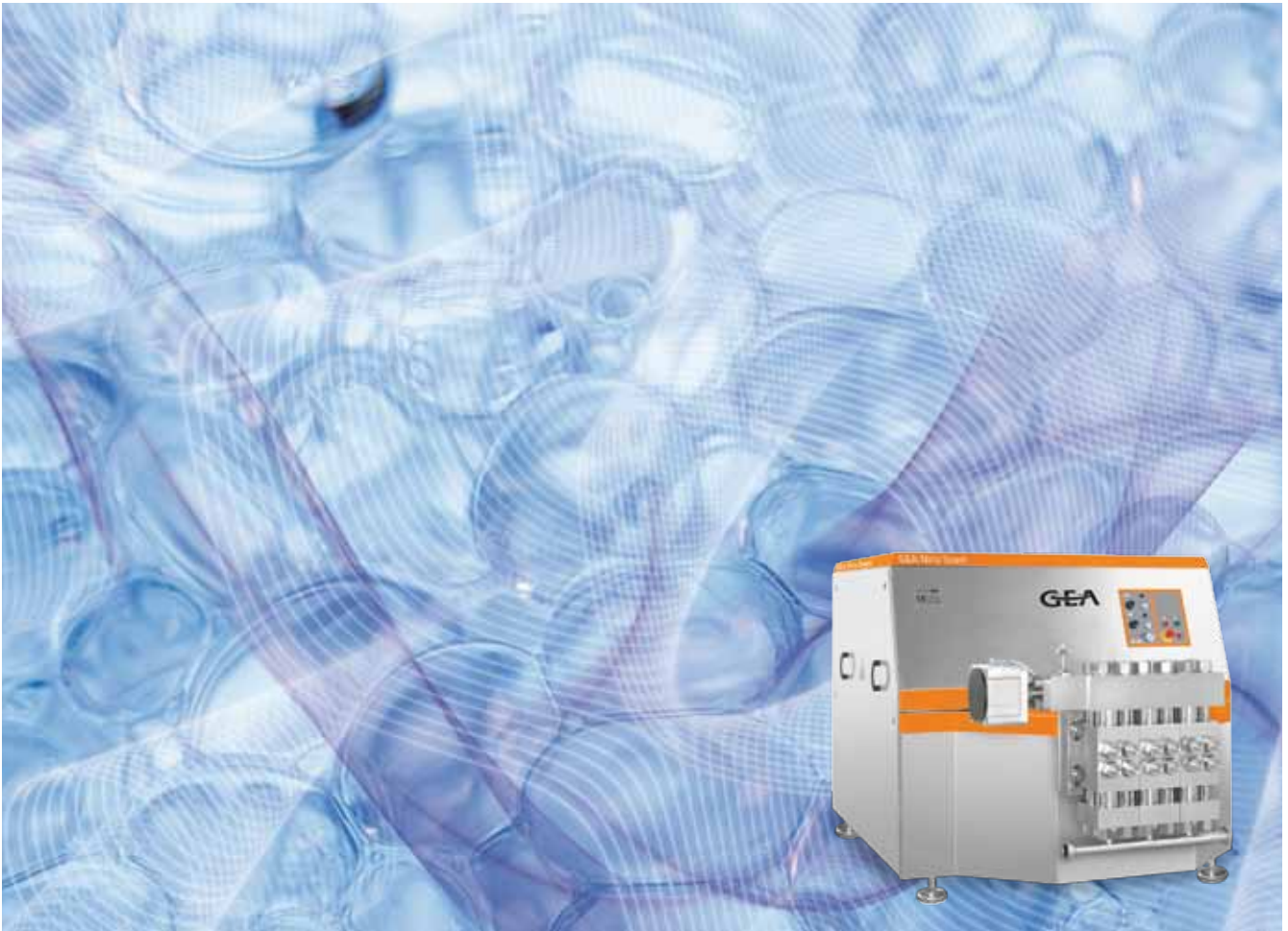


GEA Niro Soavi Very High Pressure Power

Technical Leaflet: Multiblock VHP



GEA Niro Soavi technologies include VHP Homogenizers which have become the world standard for particle size reduction and cell rupture in pharmaceutical and biotech processes.

The homogenizer used for the treatment is a machine designed for 1000 - 1500 bar whit VHP compression block for high abrasion and viscosity.

A VHP Homogenizer can be easily scaled-up from the lab and pilot systems to commercial size systems. GEA Niro Soavi has

introduced the first UHP (Ultra High Pressure) homogenizer, a unique prototype able to reach up to 4000 bar under dynamic flow conditions. This UHP technology is covered by international patents (US 7.240.862 B2; EP 1740293 B1) and is the technological development platform to explore potential new applications and process solutions in food, dairy, chemical, pharmaceutical, biotech and cosmetic industries.

Biotechnology and pharmaceutical applications.

Cell Rupture and Particle Size Reduction.

For biologic cell lysing (bacteria, yeast, algae and plants) cells can be successfully disrupted in order to collect the intracellular materials, drastically reducing the production time and costs. In this respect VHP Homogenizer offers distinct advantages over chemical lysing and impinging flow type technologies.

Whereas chemical lysing require additional costly purification and recovery process steps to yield the desired product, GEA Niro Soavi VHP technology require no additional processing steps, achieving yields higher than 90% on a single pass.

Nanoparticles Dispersions and Emulsions.

The GEA Niro Soavi VHP technology is the most effective to process nanoemulsions, such as oral dosage, intravenous parenterals, nanosuspensions.

The VHP homogenizing system reduces the particles size efficiently at reduced pressure and fewer passes, for products with enhanced shelf life, also minimizing and optimising the usage of emulsifier agents and stabilizers.

By means of the VHP homogenization it is possible to prevent coagulation and phase separation, improving structure, colour and taste and changing the viscosity.

Sterile VHP homogenization can be used to produce nanoparticles for injectable intravenous emulsions.



Very high pressure homogenizing technology.

Operating Principle.

The homogenization technology is based on the adjustable homogenizing valve concept, which allows independent setting of pressure and flow rate under continuous flow conditions, to cover all possible requirements for testing and performance scalability. The GEA Niro Soavi VHP homogenizer consists of a single acting reciprocating multi plunger pump (single plunger for table top lab units) with a homogenizing valve installed on the high-pressure outlet manifold.

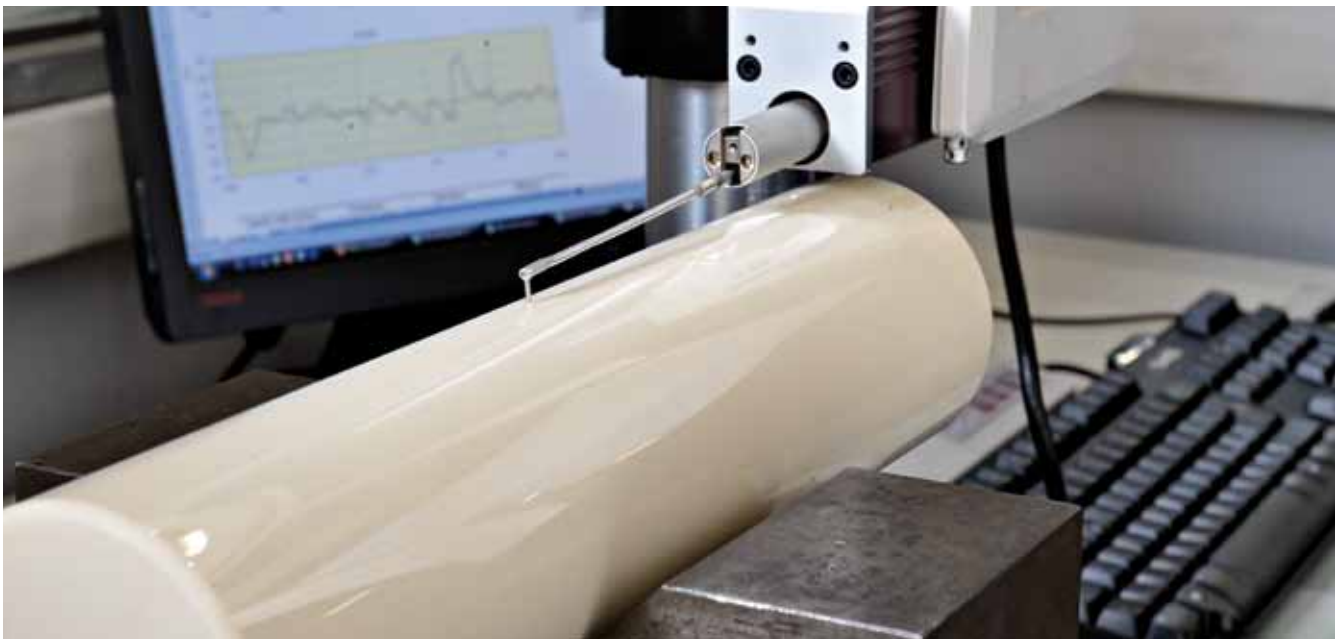
Homogenizing pressure is increased when pressure is applied by the pneumatic actuator to the valve shaft, closing the adjustable gap (flow area) between the impact head and the passage head. The homogenizing effect is achieved by the product entering the valve inlet at pressure, as it passes through the nano gap, the velocity rapidly increases, while the pressure rapidly decreases to atmospheric, as a combination of complex fluid-dynamics effects.

Compliant to Pharmaceutical Specifications.

Pharmaceutical and Biotechnology applications require specifically designed equipment which must be fully compliant with the stringent applicable regulations, such as FDA requirements and cGMP Guidelines.

The GEA Niro Soavi Aseptic configuration allows SIP and CIP cleanability on the process side and on the aseptic containment system for sterile product processes. These specific competences are applied to the GEA Niro Soavi VHP design combined into a unique solution in both the high pressure functionality features and the most effective Cleanable-In-Place design.

Product contact materials and surface finish are selected to comply not only with functional requirements but also with the applicable FDA regulations. A full set of documentation package is available to be integrated into cGMP validated facilities and processes, including material traceability and certificates, surface roughness reports and FAT protocols, based on years of partnership with worldwide pharma and biotech companies. All machines can be supplied with full ATEX directive compliance for hazardous areas.



GEA Niro Soavi in the world.

GEA Niro Soavi, part of GEA Group, is the global technology leader in high pressure homogenizers and high pressure pumps for dairy & food, pharmaceutical, chemical and biotechnology industries. It provides leading technology with the widest product range available, R&D facilities and first class after sales service to its business partners.

GEA Niro Soavi engineering and manufacturing is certified according to ISO 9001:2000 Quality System to supply homogenizing technology through a worldwide sales and service organization.

GEA Niro Soavi offers a full equipped laboratory available to customer to test the effects of homogenization on the products, and develop new applications. By simulating the conditions during full-scale production it is possible to analyse results in the laboratory before settling on the perfect machine configuration.



- GEA Niro Soavi Hubs/Sales Offices
- GEA Group Offices

GEA Mechanical Equipment

GEA Niro Soavi

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