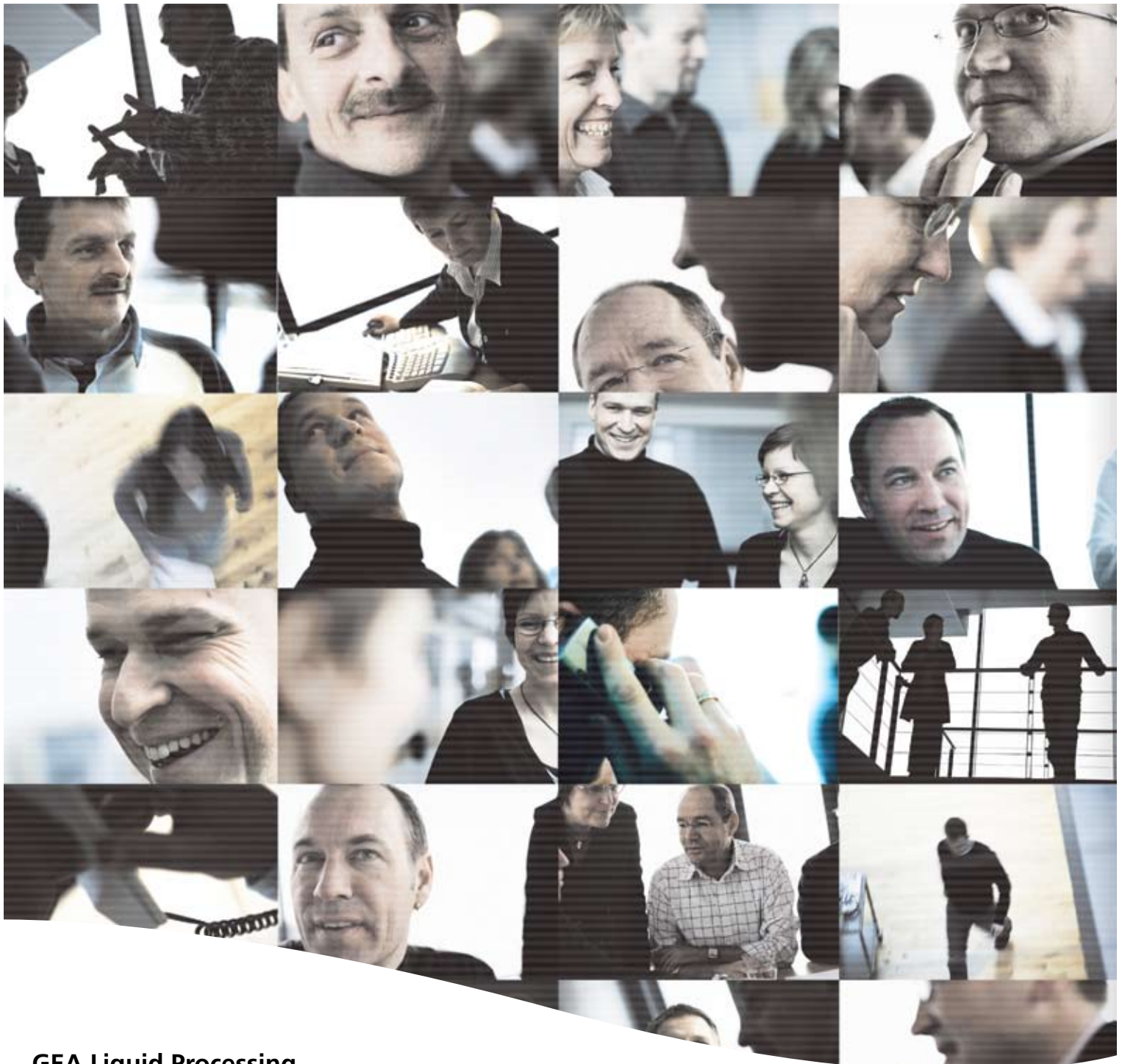




PharmaBio Solutions

Putting the best into practice



GEA Liquid Processing



Beyond theory

Sure, there's a place for in-depth analysis, strategic thinking and inspired planning in any progressive company - even a whiteboard drawing or two. But all too often, the outcome of these exercises is yet another report, not results.

Translating theory into reality is seldom an easy task. It just seems easy with GEA PharmaBio Solutions. We've got a down-to-earth approach to getting down to business. And for decades now we've been helping some of the world's leading names in pharma and biotech get the most out of their plans - and processing plants.

Engineers not consultants

Name your challenge; our 100+ specialized engineers will roll up their sleeves and deliver a working solution, not a stack of reports. Our experts in hygienic designs will make sure you're up-to-date on the latest developments as well.

Projects not parts

Our mission is to provide fully integrated process solutions from concept to completion . . . which includes quotations, design and planning, CAD, automation, installation, test and commissioning, qualification, documentation, components and

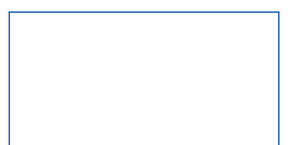
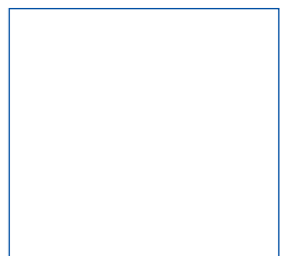
spares, financial engineering and after-sales service. It's our responsibility to ensure a project's success - not yours to hold together the reins of different suppliers.

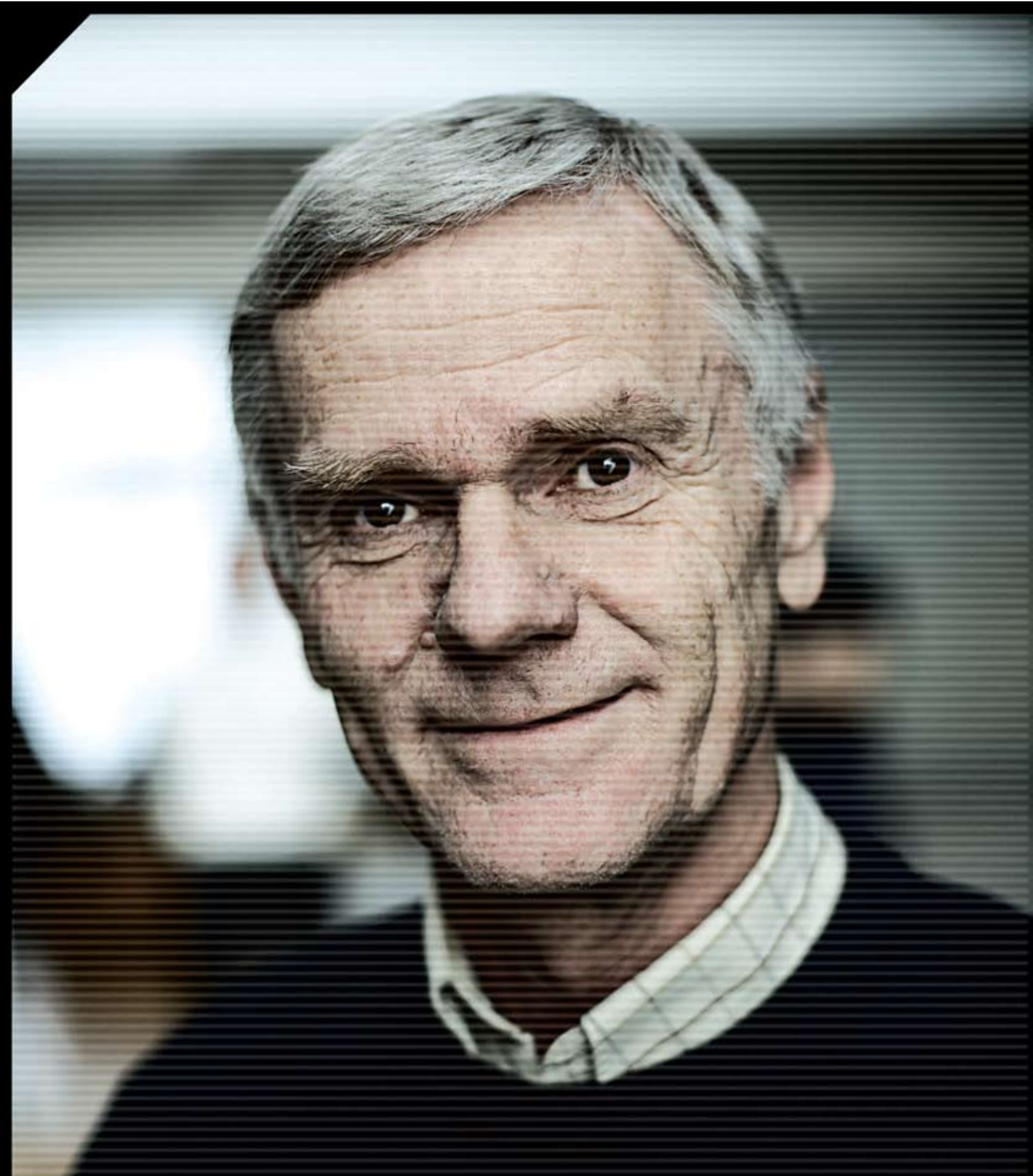
Unique not standard

Looking for a standard solution? No cookie cutters here. You get new thinking that relates to precisely your requirements, and new insights that add value to your business.

Independent not bound

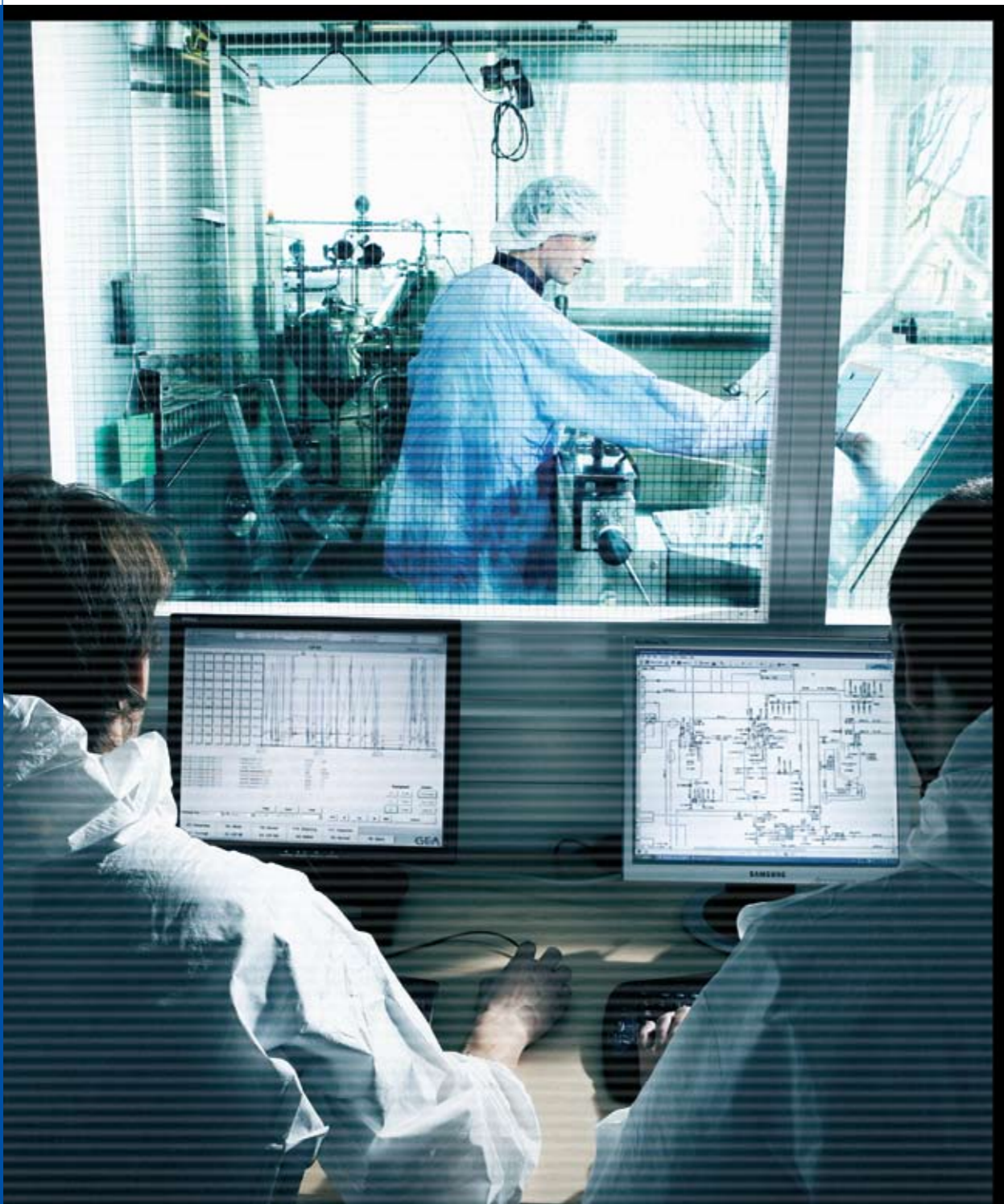
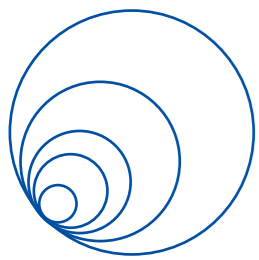
Unlike some engineering groups, we're not tied to the use of particular components. We suggest the products that are most ideally suited to your specific requirements, whether it's GEA's process equipment or somebody else's. The only thing we're bound to is the best solution to your challenge.





HYGIENIC PROCESSING

“Providing hygienic engineered solutions is our core business. Every single process design detail must meet our high standards for hygienic integrity.”



We'll work with you to carefully analyze, test and document every aspect of hygienic process technology.

Setting standards

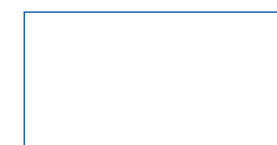
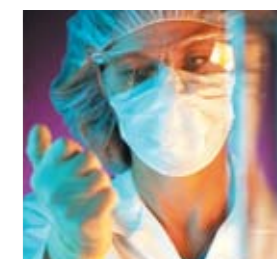
All it takes is one little air pocket, a slight dome or a tiny crevice. And once product residues get trapped, well, your processing line isn't the only thing that's in trouble.

GEA PharmaBio Solutions' core competency is providing secure outcomes through hygienic process solutions. Whether we design process plants for the biotech industry or pharmaceutical process plants for infusion solutions, blood plasma separation, injectables or vaccines, our mindset is the same - easy to clean is easy to sterilize.

Hygiene isn't just a method our engineers employ; it's a mindset. No dead legs. No T-pieces. No cleaning residues. No worries. Just flush-mounted, drainable systems you can depend on.

Fully compliant

Repeatable accuracy and validation of system processes to comply with GMP and relevant regulatory standards are standard with every GEA project. We'll help you integrate production with CIP/SIP, utilizing valuable production time to the full and minimizing the use of detergents and energy.

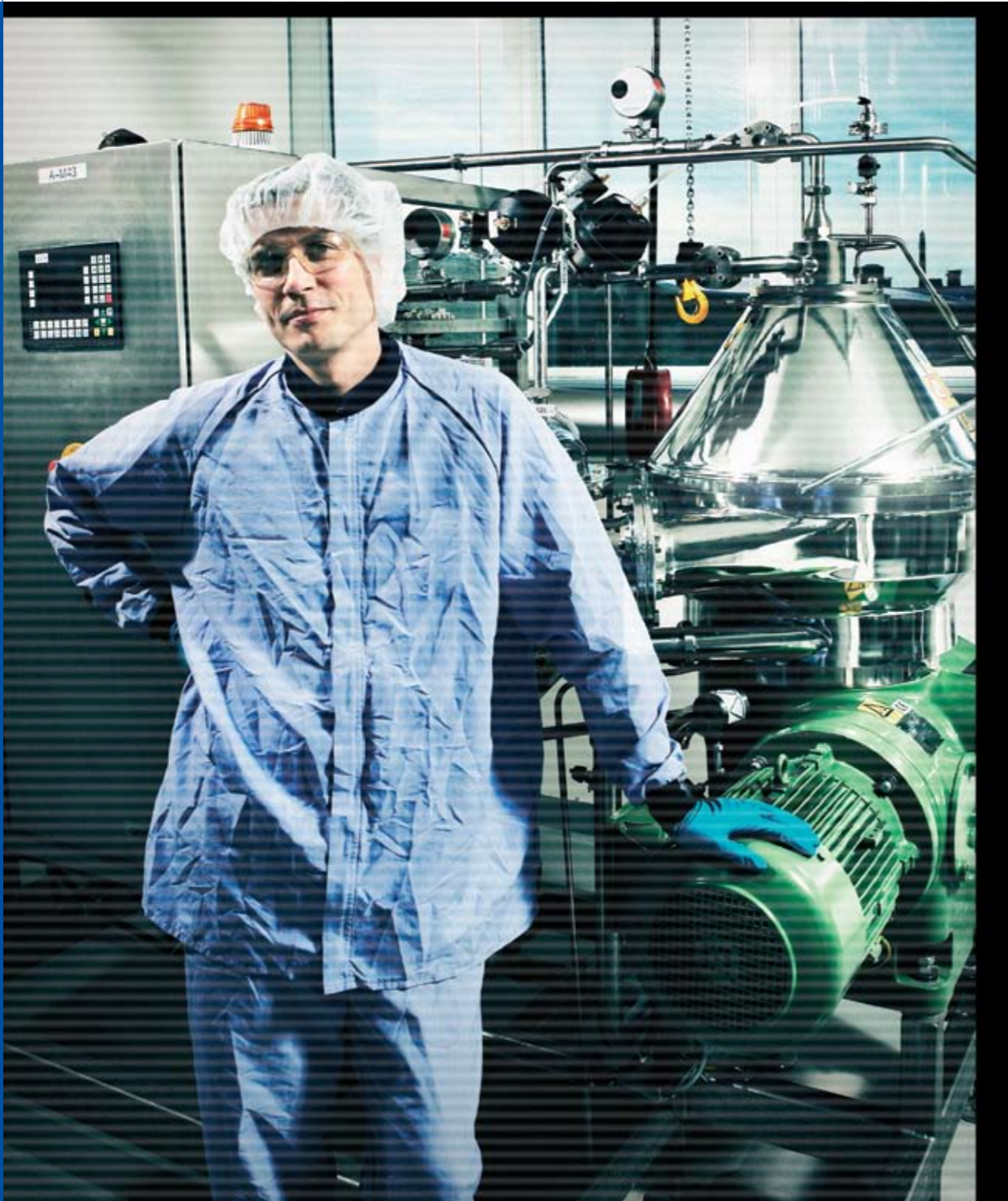
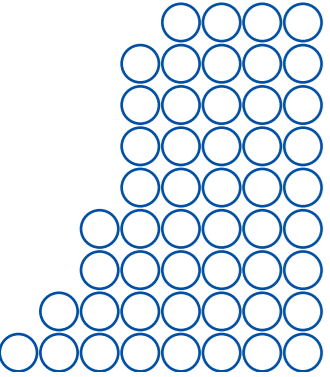




UPSTREAM CULTIVATION

“It can take weeks or even longer to develop certain high-value cell cultures - meaning a great deal of time and money is at stake during the process.”

Malene Boesen, Project Manager



GEA PharmaBio Solutions' Unit Operations are fully compliant to cGMP and GAMP requirements and meet or exceed ASME-BPE guidelines.

Creating products

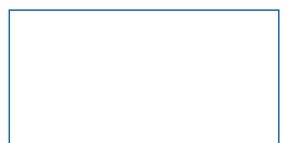
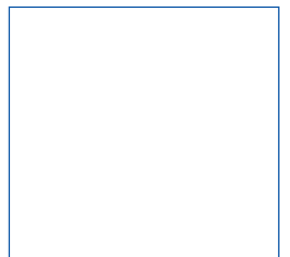
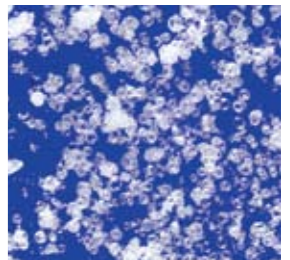
GEA PharmaBio Solutions has decades of specialized experience and in-depth expertise in the process integration activities and operations that are central to the biotech process. Our portfolio of unit operations, which includes units such as specialty mixers, fermentors and homogenizers as well as CIP systems, is fully compliant to cGMP and GAMP requirements and meets or exceeds ASME-BPE guidelines. Featuring a modular design utilizing re-usable engineering, these "plug and play" unit operations not only are cost-effective, but also compress your project schedule - thus improving your time to market.

Media preparation

Mixing, blending, diluting, separating, heating, cooling, cleaning, transporting . . . Because we master all of the processes associated with media preparation, we can ensure that your process line solution meets your exact needs and that the optimal foundation for fermentation is always in place.

Fermentation

All GEA fermentation systems are designed with special attention to hygienic design and construction for the utmost sterile integrity and dependable operation. For instance: GEA Diessel, one of our process engineering companies, is a pioneer in the development of advanced fermentation systems. Diessel's groundbreaking work has resulted in a state-of-the-art range of fermentors for anaerobic and aerobic fermentation, as well as bioreactors for mammalian, animal, plant, algae and insect cell culture.

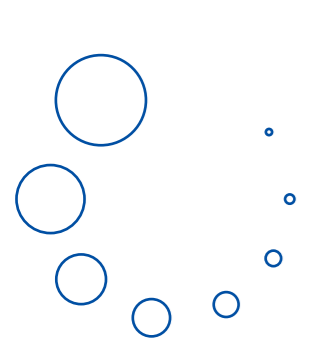




DOWNSTREAM PURIFICATION

“Customers are extracting tiny bits of biological ‘gold’ from huge amounts of raw material. Our processes are designed to squeeze out every drop.”

Frank S. Borgvardt, Project Engineer



Our dependable process line solutions will help you get to market as quickly as possible.



Generating results

The product discovery process is long enough without adding a slow processing partner to the equation. Once your product has cleared its final research hurdles, GEA PharmaBio Solutions helps you win the race to market - without sacrificing quality.

We offer the equipment and plants that are ideal for efficient product development and the technologies that are most well-suited to your needs. Whether the task is cell rupture, filtration or separation, we'll work with you to find the optimal solution.

Cell rupture & particle size reduction

We provide mechanical solutions for cell rupture using a gentle approach that ensures a high yield.

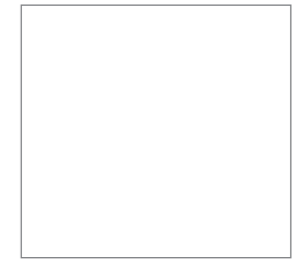
For example Niro Soavi, one of our manufacturing companies, is world renowned for its high-pressure pumps and homogenizer systems. These enable the results gained in cell rupture or particle size reduction to be scalable through to

pilot and production scale machines. With hundreds of units installed worldwide, Niro Soavi is the world leader for lab, pilot and production applications within cell rupture and homogenization.

Regardless of the specific solution that best meets your requirements, we'll ensure you maximize product yield while maintaining product quality.

Purification

We have 20 years of experience in designing high-quality systems for biomass recovery. Your optimal solution might include membrane filtration, centrifugation, chromatographic separation, dia-filtration, polishing or dead-end filtration. No matter the approach, we make sure you get the maximum product yield with minimal operator involvement and maintenance costs.





PharmaBio Solutions

Putting the best into practice

The GEA Process Engineering Division

GEA PharmaBio Solutions is part of the GEA P-Division. One of the world's leaders in process engineering for the life sciences industry, GEA has companies in more than 50 countries - including respected industry names such as Niro, GEA Diessel and Tuchenhagen. With GEA PharmaBio Solutions as your partner, you have one-supplier access to the entire world of GEA resources.

Process Engineering

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