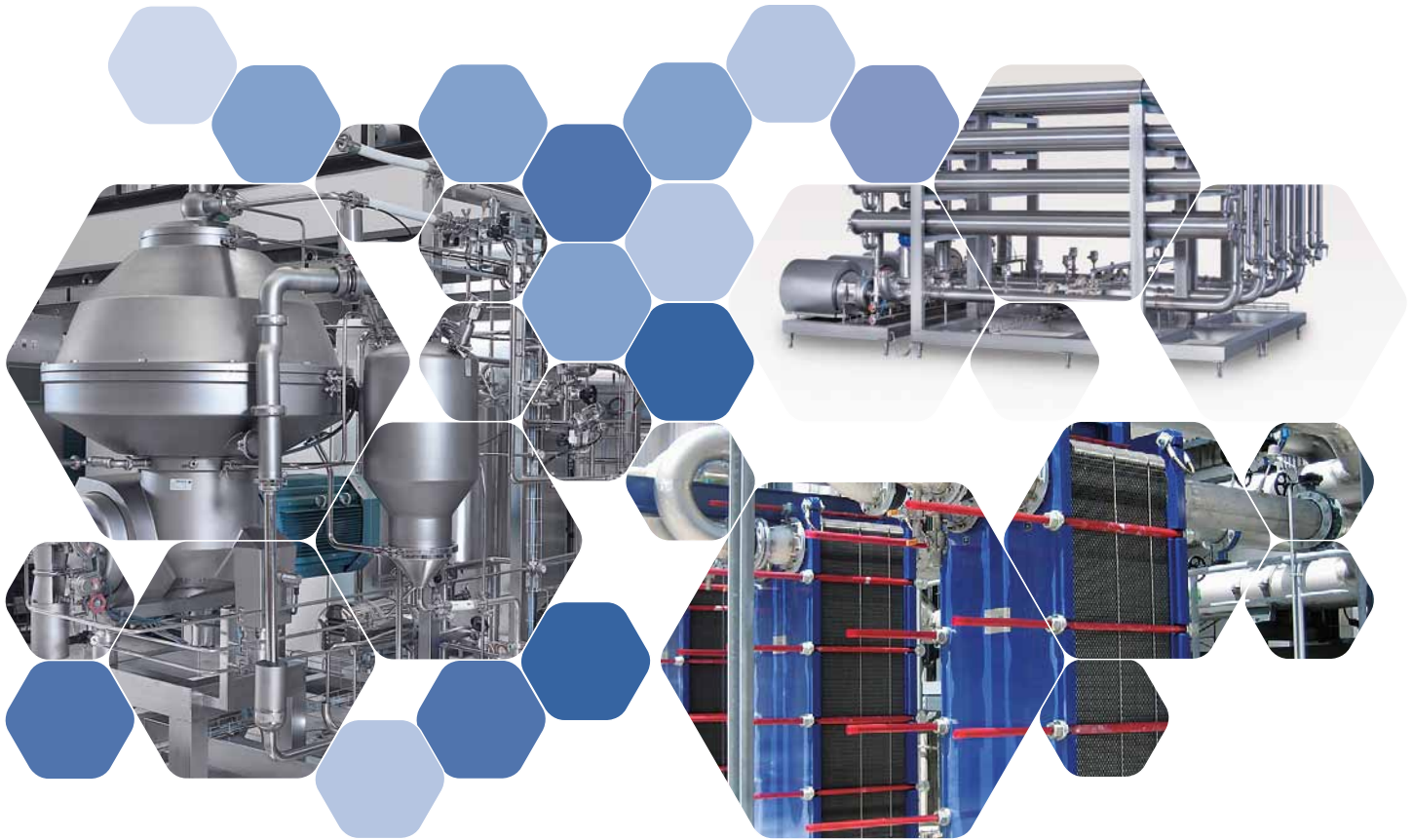


Equipped for success

Putting it all together with the right process equipment



Tell us about your processes and we'll help you get the most out of them

When you're in the bio-based chemical business, your success and profitability depend on matching your equipment to the specifics of your processes and products.

Alfa Laval has been helping industrial-biotechnology customers select the right equipment for over 100 years. From high-speed separators and decanter centrifuges to membranes, evaporation systems, heat exchangers, and more, our wide selection of equipment and our engineered solutions provide

the right answers to the right questions. And we're experts at examining the individual aspects of your process with an eye to optimizing the whole.

We can help you make your processes work efficiently – to improve your profitability – whether you're setting up a pilot plant, a demo plant or a full-scale production plant. Partner with us and optimize your investment. With reliable equipment, higher product yield, lower operating costs and optimized maintenance every step of the way.

How will you remove impurities?

How much does your steam cost?

How fibrous is your feedstock?

Is your process based on yeast or bacteria?

What's the ratio between liquid and cell?

These are just a few of the variables that impact your choice of equipment – and thus your success and profitability. And they're just a few of the things we'll ask you to tell us about, so we can help you succeed.



Think Alfa Laval process equipment is just about separation technology? Think again.

We developed some of the first industrial biotechnology equipment for applications like yeast and alcohol. And for breakthrough applications in the biopharm industry using genetically modified organisms (GMOs). Now we're applying the knowledge we've gained over all those years to the field of bio-based chemicals.

You may know us for our high-speed separators and decanter centrifuges. And rightly so: We're one of the world's leading suppliers of separation technology. What you may not know is that we also provide other kinds of process equipment. You can find our products in almost every process step.

And we take your complete production process into account when we recommend equipment. So we can help you optimize your entire operation in terms of yield, quality and investment.



Substrate pretreatment
High-speed separators
Decanter centrifuges
Continuous sterilizers
Heat exchangers
Evaporation systems
Strainers

Fermentation
Heat exchangers
Fluid handling equipment

Microbial cell removal
High-speed separators
Decanter centrifuges
Membrane filters
Fluid handling equipment

Concentration & Purification
High-speed separators
Decanter centrifuges
Membrane filters
Evaporation systems
Heat exchangers
Fluid handling equipment

All the pieces you need to optimize your bio-based chemical production

Centrifugal separation – an ideal option for every process

Matching the right equipment with the specifics of your process, your organism selection, your feedstock and your fermentation medium is absolutely crucial to the success of your production. We offer high-speed separators and decanter centrifuges to suit every possible combination of circumstances and requirements. And we'll help you choose the equipment that's precisely right for you.



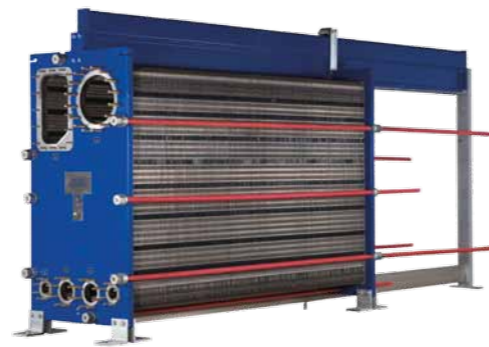
Membrane filtration – higher yield, better quality, lower costs

Membranes are appropriate for filtering out everything from large protein molecules to single ions, and are often used in combination with centrifugal separation. We help you optimize your production by finding the best setup for your specific conditions.



Evaporation – complete, optimized systems

We offer complete evaporator systems optimized for your specific circumstances. For example, is low capital outlay your priority? Or is it more important to minimize steam consumption and achieve the lowest possible operating costs over the long term? Either way, we can design the system that best answers your needs.



Heat transfer – small, efficient, cost effective

Heat exchangers play a role in many aspects of industrial biotechnology, including feed preparation, sterilization and fermenter temperature control. Our reliable, compact heat exchangers offer higher thermal efficiency, and easier cleaning than traditional shell-and-tube heat exchangers.



Fluid handling – a comprehensive offer

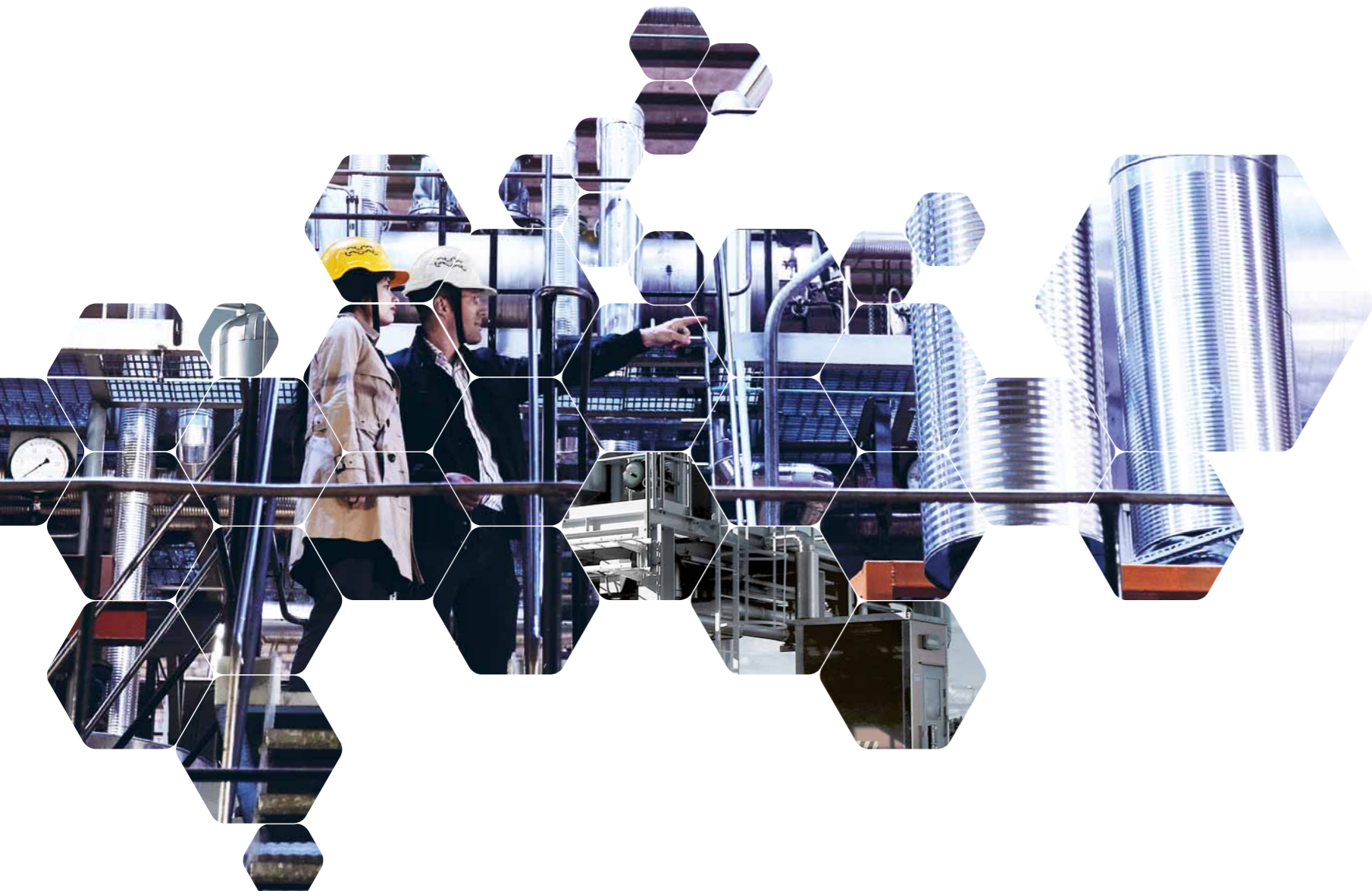
We offer pumps, valves, fittings and tubes for controlling, diverting, managing and measuring the movement of fluids in your production processes. We also supply tank-cleaning equipment.



Test equipment – let us help you get started

We offer test equipment appropriate for pilot and demonstration plants. Testing can be carried out on your premises in the industrial environment. And we partner with you to optimize your processes and profitability when you're ready to scale up to a full-size commercial plant.





Smart combinations for better results

Achieving the best possible performance requires maximum efficiency in each step of your process. But combining steps and equipment in just the right way is equally important.

That's why we take your entire process into consideration when we help you choose your equipment. For example, when a producer of an organic acid wanted to scale up from demo to full scale production, we demonstrated how to improve both costs and yield by integrating two separate process steps into one.

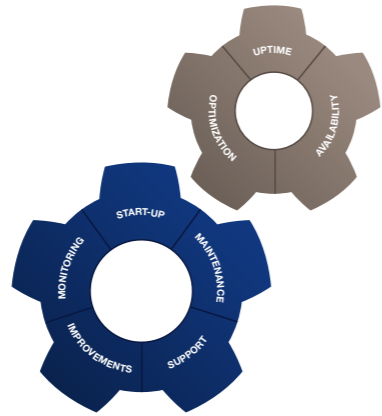
When 1+1=1

In the demo plant, microbial cells were removed from the fermentation broth in two separate steps: First, a high-speed separator eliminated most of the cells. Then, a membrane filtration system took care of the rest.

But the same two-step setup in a scaled-up plant would have required ten high-speed separators and a seven-loop ultrafiltration system. So our engineers proposed integrating the two steps into one, requiring just two high-speed separators and an ultrafiltration system with a single additional loop.

80% lower costs

The result was an 80% drop in capital outlay and maintenance costs for the separators. In addition, product yield was improved. Service and energy costs for the ultrafiltration system were reduced by 10-20%, while the capital outlay remained the same. In addition, product yield was improved.



Global support that makes a difference on your bottom line

We partner with you to provide top lifecycle performance of equipment and processes for the best possible return on your investment. Our service offering, technical know-how and global network ensure high uptime and efficient operation every step of the way.

The Alfa Laval 360° Service Portfolio

The Alfa Laval 360° Service Portfolio includes all the services you need from start-up to maintenance and ongoing monitoring and support, to original-part supply and improvements down the line. And our performance agreements provide reliability and fixed costs that make budgeting easy. Whatever level of service you need, we can provide a tailor-made performance agreement that's right for you.

A worldwide network of service and distribution centres

Our worldwide network of service centres is manned by experts. They work with our field service engineers to ensure you get the attention you require.

And our global spare-parts distribution network with its regional centres gets you the right parts at the right time – at great value for your money.



Alfa Laval in brief

Alfa Laval is a leading global provider of specialized products and engineered solutions.

Our equipment, systems and services are dedicated to helping customers to optimize the performance of their processes. Time and time again.

We help our customers to heat, cool, separate and transport products, such as oil, water, chemicals, beverages, foodstuffs, starch and pharmaceuticals.

Our worldwide organization works closely with customers in almost 100 countries to help them stay ahead.

How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com.

