

BIOPROCESS

Up Stream & Down Stream

**THURNE**
TEKNIK

Our delivery program is covering most of the critical steps within the field of Bioprocess.

From small scale to industrial production we could be your partner for building up and optimize your complete processes.





“What I see in Nature is a magnificent structure that we can comprehend only very imperfectly, and that must fill a thinking person with a feeling of humility. This is a genuinely religious feeling that has nothing to do with mysticism.”

Albert Einstein

Up Stream



BIOREACTORS & FERMENTERS

Classical stirred tank bioreactors & fermenters suitable for microbial, yeast, algae, plant and animal cells are offered in all sizes from laboratory to production.

Technical details:

Either as stand alone unit or as part of a complete system (seed to harvest), all controlled by one control system.



SINGLE-USE MIXING SYSTEM

The single-use mixing system is perfectly suited for laboratory environment, process development centers, clinical material supply and flexible GMP manufacturing.

Technical details:

Available vessel sizes: 10-1000 L. Mixing system is integrated with a magnetically impelled turbine.



GAS / VENT FILTERS

Filters for sterile air/gas can be used in applications such as cultivation and fermentation, filling machines as well as venting of gas from storage tanks.

Technical details:

Both capsules and cartridges available in sizes ranging from 1,5" to 30" and in materials PTFE, glass fiber, impregnated glass fiber.



POWDER CHARGING

Flexible, transparent, funnel-shaped bags with tri-clamp interfaces for powder storage and transfer applications such as media, buffers and pharmaceutical ingredients.

Technical details:

Bag capacity from 5 to 100 L with tri-clamp connector sizes from 2" to 6". All bags are 100% integrity tested and made of antistatic contact film.



COMPONENTS

A full range of peripherals, accessories, probes and measuring systems and components is offered for bioreactors & fermenters.

Technical details:

Examples include CIP-valve, sampling systems, foam separator systems, mobile CIP systems and magnetic and direct drive stirrer systems.

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PRE-FILTRATION

A comprehensive range of protection filtration solutions including everything from clarification to pre-filtration in different filter media and their combinations.

Technical details:

Filter capsules and cartridges in a wide range of different pore sizes and surface areas.



FINAL FILTRATION

Highly validated filter units adapted to final filtration in critical applications. All filter units are designed to be integrity tested.

Technical details:

Sterilizing grade filter range based on PES membrane, demonstrating high flow and high capacity performance in critical applications. For ophthalmic applications a hydrophilic PTFE membrane is used, giving low preservative binding and retention of diminutive organisms.



DISPOSABLE ASSEMBLIES

Combining disposable assemblies that can make complete single-use upstream and downstream processing unit. The assemblies are used in media preparation systems, sampling systems and downstream systems for multiple purposes. Fully disposable formats for ease of use and less validation requirement.

Technical details:

Film material have high oxygen barrier: $0.1 \text{ cc}/(\text{m}^2 \cdot \text{day} \cdot \text{bar})$, resistant to gamma sterilization and has inert PE fluid contact layer.

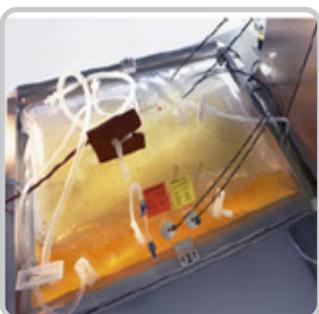


SINGLE-USE MIXING

The JetMixer is specially designed to give a scalable, fast, efficient, cost effective, homogeneous mixing of liquids with differing densities.

Technical details:

Integrated magnetically impelled turbine. Accommodates scaling from 10L to 1000L, portable, easy to set-up, simple and reliable.



STORAGE BAGS 2D & 3D

The disposable bag products have been developed to meet the demand for cost-effective, scalable single-use liquid storage containers. The bag program consists of the product line below.

Technical details:

Pillow bags 50mL to 50L, 3D cubic or cylindrical bags 50 – 3500L and carrier bags.

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DISPOSABLE SENSORS

The sensors - pressure, conductivity and temperature - provide high precision sensing capabilities in a compact, disposable package also suitable for reuse.

Technical details:

Pre-calibrated, certified calibration, gamma-stable, autoclavable, NaOH stable, real-time documentation. Available in several sizes and connectors.



DYNAMIC CROSSFLOW FILTRATION

The DCF system works with overlapping rotating ceramic filter discs, which generate a turbulent differential flow of the feed towards the filter surface and minimize clogging.

Technical details:

High filtration throughput and handling of high viscosities compared to traditional TFF. Suitable for SIP and filtration in dead-end mode.



TRADITIONAL CROSS FLOW FILTRATION

A range covering user friendly complete TFF systems from laboratory to pilot plant and production scale applications is offered based on single-use technology.

Technical details:

Filter surface areas from 0.1 to 5 m². Suitable for cassettes from different suppliers.



PROCESS THERMOSTATS

Complete, turn-key stand alone units for heating/cooling applications in which the unit operates with a single heat transfer fluid and controls the temperature of the process.

Technical details:

Available from heating and cooling capacity from 1 kW and upward and with both water based and oil based heat transfer fluids.



PUMPS

The pumps provide high precision capabilities in a compact design. All pumps collect real-time data/graphing and can be programmed to monitor and control the process.

Technical details:

Capacities from few mL/min to 2,5 L/min and available with different pump heads (peristaltic, piston head, magnetic gear, "piggy-back" tandem, q-piston).

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PLATE & FRAME FILTER SYSTEMS AND FILTER SHEETS

The filter sheets, with or without filter aids such as DE and perlites, provide high dirt holding capacity and wide range of filtration ratings from coarse pre-filtration up to fine filtration towards the end of the process.

Technical details:

Filter systems from 200x200 to 1200x1200mm filter sheets + special designs available. Filtration ratings from 0,2 to 35 μm .



SINGLE USE LENTICULAR FILTER FOR CELL SEPARATION

A lenticular filter module in fully disposable format is now available specially designed for cell harvesting. Gentle alternative to centrifugation.

Technical details:

Fully scalable from 0,02 up to 2 m² filter units. Pharma grade filter aid is included within the filter units.

Service & Support



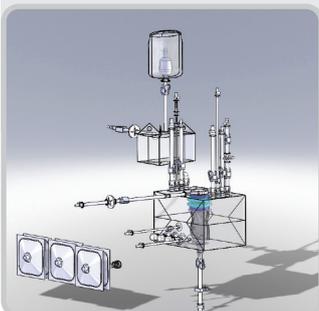
INTEGRITY TESTING

As an added value, we offer integrity testing of filters, both gas and liquid, on customer site or by customer sending the filters to us.

FILTER SCHOOL

It is one thing to understand a filter itself as a product, and it is another thing to understand how it works when fulfilling a filtration task. Therefore, we offer a basic filtration course to explain the theoretical background of separation by filtration.

The theory is varied with practical examples. Duration of the course is half a day. For more information check our website.



CUSTOMIZED SOLUTIONS

Many processes deliver optimal results only when customized process equipment is used. Therefore, especially on the single-use technology, we design tailor made solutions to fit its purpose at its very best.



SUPPLIERS

Up Stream & Down Stream



Some equipment may not be available from Thurne Teknik in certain geographical areas.

A network for life.

In the beginning of the year 2000, Thurne Teknik started to build up the program for the Biotech Industry by cooperation with Bioengineering.

In the same way as for our technology group Chemical Process, Thurne Teknik started with the heart of the process, the bioreactor or fermenter. Since then we have continuously developed our program and included buffer preparation, media handling, process filters, pre-filters, membrane technology and all kinds of Single Use Technology.

We are proud to present our partners below:



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