



Nature creates the perfect conditions for its bioprocesses.
We come very close.

Our products

Incubation shakers, bioreactors and software for reliable and efficient cultivations, from planning to success

INFORS HT is your specialist for bioreactors, incubation shaker and bioprocess software. You benefit from sophisticated systems that contribute to your success by maximizing the productivity of your cell lines or microorganisms without sacrificing reproducibility.

An eye towards solutions and personal, sustainable customer relationships are our greatest strengths. Come find out for yourself!

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Celltron

Fine-tuned for your incubator.

For the best results in cell culture, every step counts – including the first one. The Celltron is a small shaker, specially developed for use in CO₂ incubators, which ensures an ideal start for the cell culture with minimal energy use and an antimicrobial coating.

- Gentle mixing of the cell culture
- Constant temperatures in the incubator through minimal heat emission
- Can be controlled outside of the incubator using the touch controller
- Long lifespan through corrosion-resistant materials

"We tested Celltron in detail and recommend it for use in our incubators."

**Heinz Bayer, Head of Technical Sales,
Memmert GmbH, Germany**



Orbitron

A true workhorse.

A shaker for demanding continuous operation, even with maximum load. The extremely stable and splash-resistant Orbitron is especially suitable for robust cultivations outside of incubators.

- Quiet, vibration-free operation
- Suitable for a variety of loading capacities
- Fast and easy tray exchange
- Easy to clean
- Loading capacity up to 31 kg

"The Orbitron has proven itself to be a reliable 'workhorse' for us which can handle large loads very well."

**Dr. sc. nat. Nicole Stichling,
Product Manager Shaker, INFORS HT**

INCUBATION SHAKERS



Ecotron

A starter model with refinement.

The Ecotron is the entry-level incubation shaker. Designed for users who want quality and performance with an excellent price-performance ratio, the Ecotron does not skimp on durable materials and sophisticated design

- Quiet, vibration-free operation
- Convenient loading through a front-opening folding door
- Space-saving: on the floor, table, or 2 units stacked on top of each other
- Safety in the event of leaking liquid

"The Ecotron shakers are reliable, versatile, space-saving and very well-priced."

**Sandra Codlin, PhD, Lab Manager,
University College London (UCL), UK**

More information is available at www.infors-ht.com



Multitron Pro

Unrivalled in size and flexibility.

The Multitron family leaves nothing to be desired when it comes to applications in the incubation shaker – either in terms of equipment with numerous options or in terms of capacity. Even when stacked 3 units high, the top device remains easily accessible at a working height of 1.3 m.

- A real marvel when it comes to capacity: cultivate up to 52 liters in less than a square meter of space
- Multiple options for individual adaptation to user requirements
- High degree of temperature conformity and precision
- LED version for phototrophic organisms

"The Multitron Pro has greatly increased the production capacity of our small lab space. I've relied on these shakers for years and couldn't be happier."

**Nicole Lapuyade-Baker, Senior Research
Associate CytomX Therapeutics**



Multitron Cell

Advanced culture for your cells.

- Specially designed for cell cultures with smooth drive, CO₂ regulation and humidification
- Multiple options for individual adaptation to user requirements
- Antimicrobial surface
- High degree of temperature conformity and precision

"The best incubator on the market for culturing mammalian suspension cells in a humid, carbon dioxide atmosphere."

**Matthew Higgins, Department of Biochemistry,
University of Oxford, UK**



Multitron Standard

Ready, set, shake.

- Preconfigured standard system with optimal price-performance ratio and short delivery times
- Ideal for multiple users who utilize the device simultaneously for various applications

"I've worked with the Multitron Standard in the laboratory for 8 years. My conclusion: nearly maintenance-free, reliable temperature and agitation control and extremely flexible loading."

**Dipl. Ing. Biot. MSc (FH) Christian Meier, Managing
Director Infors Latam**



Minitron

Small scale – big results.

An all-around genius in a small space. In terms of capacity, the Minitron is the Multitron's little sister. However it has the same variety of application possibilities for microbial, animal and plant cells.

- Space-saving: on the floor, table, or 2 units stacked on top of each other
- Low CO₂ consumption
- Safety and easy cleaning in the event of leaking liquid
- LED version for phototrophic organisms

"Even with a maximum load with a culture volume totaling 7.5 L, the Minitron's low-vibration, quiet operation is impressive."

Dr. Daniel Brücher,
Product Specialist Shakers INFORS HT

ACCESSORIES



Cell Growth Quantifier (CGQ) from aquila biolabs

- Online measurement of biomass in shake flasks
- Non-invasive OD measurements ensure an undisturbed bioprocess run
- Time-saving production of precise, microbial growth curves as well as real-time analysis of important growth parameters
- Resource-optimised process development through screening under optimal culture conditions in up to 16 shake flasks simultaneously



Liquid Injection System (LIS) from aquila biolabs

- Automated and parallelized feeding of liquids in shake flasks
- Easy handling of single use cartridge, drive and software
- Compatible with various substances, e.g. sugar solutions, alcohols and more
- Customizable feeding profiles, predefined or fully configurable



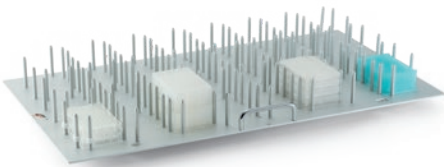
Retaining clamps

- Stainless steel retaining brackets can be screwed onto universal trays
- For Erlenmeyer and Fernbach flasks
- Holders for special vessels upon request



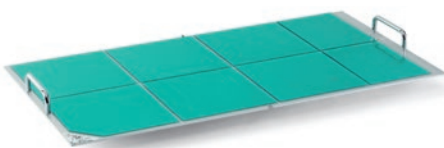
Test tube holders

- Perforated inserts made of foam rubber ensure a reliable hold and prevent rattling noises
- Test tubes can be incubated in a vertical position or at an adjustable angle
- Can be used on universal as well as on "Sticky Stuff" trays



Trays

- Made of corrosion-resistant, anodized aluminum
- Can be loaded in a combined fashion as needed and changed at any time
- Can be sterilized in the autoclave



"Sticky Stuff" adhesive matting

- Compatible with all vessels with a smooth bottom
- Reliable fixation even with high agitation speeds and temperatures
- Long lifespan
- Easy cleaning with water



Minifors 2

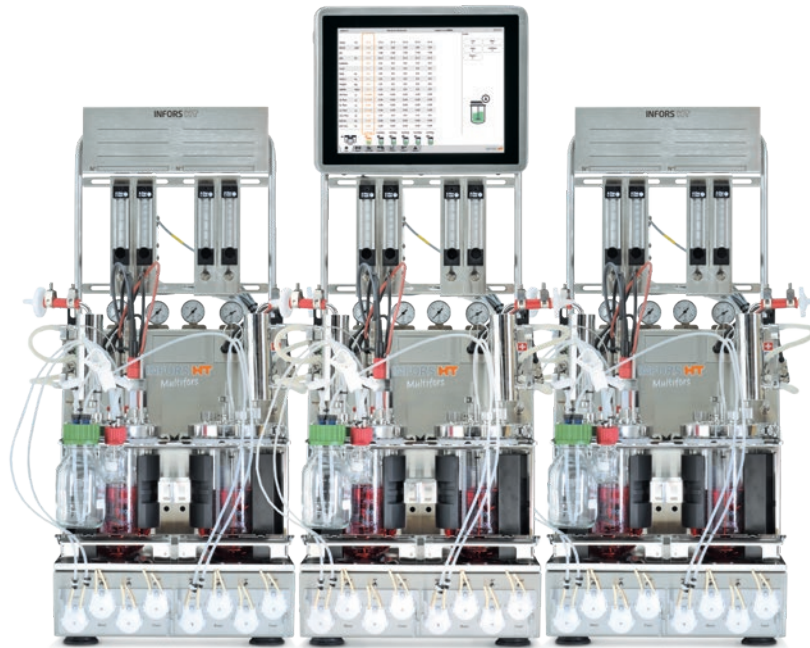
Unbeatable in its class.

The Minifors 2 is a compact and easy-to-use bioreactor with a full range of application possibilities. It is a complete package that enables both beginners and experienced users to easily perform microbial applications.

- Complete package consisting of a fully equipped culture vessel, four freely configurable pumps and two fully automatic gas lines with Mass Flow Controller (MFC)
- Delivered preconfigured and ready for use
- Compact, user-friendly design with a small footprint and few connections
- Easy operation in several languages via touch screen
- Can be used in stand-alone operation without a PC

"We are thoroughly impressed by the practical design. It allows us to save time during calibration and preparation for cultivation."

Mohd Razif Mamat,
Head Of Technical Administration &
Operation, Malaysia Genome Institute



Multifors 2

Big technology on a small scale.

More results in a small space? You can get this with the Multifors 2 with 2, 4 or 6 bioreactors on one device. With a choice of preconfigured packages and a variety of connection possibilities and options, you will be ideally equipped for small-volume yet demanding experiments.

- Complete, well-equipped bioreactors on a small scale
- Small vessel with multiple Pg13.5 ports
- Simple handling through a bottom drive and fast autoclaving of all bottles and pumps
- For microorganisms and cell cultures
- Same sensor technology as larger bioreactors for comparable scale-up

"The option to run up to 6 units from a simple control unit creates a small bench foot print and makes experimental design simple and efficient."

**Dr. Emma Allen-Vercos, Associate Professor,
University of Guelph, Canada**



Labfors 5

High-end All-rounder.

The Labfors 5 offers numerous features in a small space and an easy-to-operate, flexible system which can be upgraded as desired, e.g., by integrating additional sensors and balances or controlling up to 6 devices via a single touch screen.

- Configurations for cell cultures and microorganisms adapted to customer requirements
- Fully equipped culture vessels with multiple Pg13.5 and 19 mm ports
- Up to 5 MFCs
- Microbial version: automatic *in situ* cleaning and sterilisation as an option

"The Labfors bioreactors, with their modular philosophy, give us enormous flexibility."

**Prof. Dr. Christoph Herwig,
Head of Biochemical Engineering,
Vienna Technical University**



Labfors 5 BioEtOH

The ideal 2-in-1 bioreactor.

- Complete equipment for various types of enzymatic hydrolysis and fermentation (SSF)
- Very powerful motor for optimal mixing, even in cases of high viscosity or a large amount of dry matter in the starting material
- Easy addition of solid material through the 4-cm port in the vessel top plate
- Accurate and gentle temperature regulation through an additional sensor in the temperature control circuit
- Special protective cover for pH sensor

"We have been impressed with the efficient mixing behavior of the Labfors 5 BioEtOH."

**Dr. Mats Galbe, Dept. Chemical Engineering,
Lund University, Sweden**



Labfors 5 Lux

Putting your cultures in the spotlight.

- Very high light intensity with up to $3000 \mu\text{mol m}^{-2} \text{s}^{-1}$
- Suitable for pilot or production scale-up
- LED stirred tank option
- CO_2 enrichment possible
- Optional light sensor for luminostat or turbidostat

"The Labfors 5 Lux enables diverse process development with possibilities we originally had never even thought about at all."

**Prof. Dr. Fabian Fischer,
Institut Life Technologies, HES-SO Valais**



Techfors-S

In situ made easy.

Your entry into the *in situ* world. Techfors-S brings you the benefits of this technology and yet is still as easy to operate as a bench-top bioreactor.

- For cells and microorganisms
- Mobile device with easy access to components on the back
- Low minimum working volume
- Cleaning-in-place (TechCIP) as an option
- *In situ* sterilisation, optionally with integrated steam generator

"The Techfors-S bioreactor systems have been a key component to our mammalian cells grown in continuous culture."

Eva Bric-Furlong, Automation Specialist and Scientific Research Investigator, Sanofi US



Techfors

As individual as your requirements.

There are practically no limits on flexibility with regard to design and operation, since each pilot bioreactor model is built individually according to your needs. You specify the requirements – we implement them after performing a thorough feasibility study.

- Broad spectrum of total volumes from up to 1000 L
- Temperature regulation up to 90 °C
- Numerous options individually according to customer requirements, e.g.: stirrer speed, gassing strategy and number of ports, *in situ* sterilisation, semi- or fully automatic cleaning-in-place

"Techfors is the bioreactor for demanding professionals. It provides unrivalled flexibility for individual specifications coupled with simple operation via the touch screen."

Dr. Tony Allman,
Product Manager Fermentation INFORS HT



Terrafors

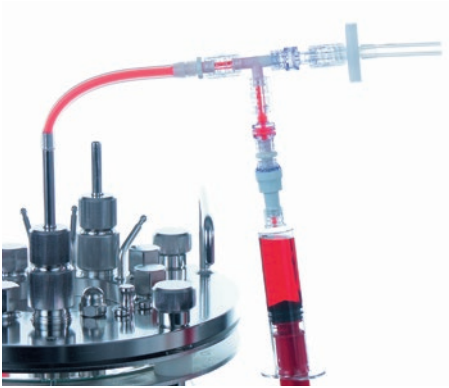
Award-winning and uniquely designed.

Terrafors is the world's only standardised solution for the fermentation of solid materials, semi-solid substrates like soil or compost as well as oils in the laboratory.

- Compact design takes up very little space
- Automatic *in situ* sterilisation
- Simple control of up to 24 parameters simultaneously
- Suitable for bioremediation, isolation of thermophilic organisms, enzyme production, and more

"The ideal solid-material bioreactor for our work to increase the value of organic materials."

**Nicolas Thevenin, Study Engineer,
RITTMO-Agroenvironnement, France**



Super-Safe Sampler

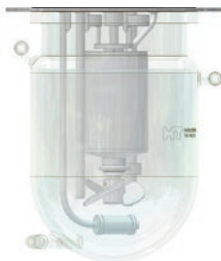
- Allows to take smallest aseptic samples without laminar flow
- Air backflushing
- No dead volume
- Needle-free
- Reusable



© BlueSens

Gas Analyser

- CO₂ or O₂ analysis integrated in your bioreactor
- Calculation of parameters such as, e.g., the rate of Carbon evolution rate (CER), the oxygen uptake rate rate (OUR) and therefore the respiration quotient (RQ) with eve®



Perfusion, e.g. with spin filters

- Cell-free removal (harvest) of culture supernatants
- Available in different sizes and pore diameters



Online sensors for cell density and biomass

ASD12-N and ASD25-N absorption sensors from Optek

- Recording of the total cell density in the near-infrared range (NIR) at 840 to 910 nm
- Independent of color changes of the culture medium
- Space-saving: compact transmitter is built directly into the control device of the bioreactor

Alternatively, **InPro 8100 sensors from Mettler** for the determination of the overall cell density and the **Aber Futura System** for the determination of the live cell density can be used.



eve[®] – The Bioprocess Platform Software

Be on top of things.

Able to do more than just plan, control and analyze your bioprocesses, eve[®] software integrates workflows, devices, bioprocess information and big data in a platform that lets you organize your projects in the cloud, no matter how complex they are.

- High-performance database technology (NoSQL)
- Integrates bioreactors, shakers, and analytical instruments, regardless of the manufacturer
- Integrates the entire workflow, from planning to data analysis
- Can be individually adapted to your requirements using expansion packages
- Libraries for organizing bioprocess information
- Web-based – Data are available via a browser, independent of the operating system

"My staff and I are very enthusiastic by eve[®]. The handling is easy and logical, which makes it quick to learn."

Prof. Dr.-Ing. Richard Biener,
Bioprocess Technology, Esslingen University
of Applied Sciences

More information is available at www.infors-ht.com/eve

Packages: Customized & selective

eve® has a modular structure. The eve® core software can be expanded with additional packages any way you like and tailored to your individual needs. Additional packages with a variety of features are continually being released.

P & C package

Plan & Control

Ideal for bioreactor and advanced shaker users. Obtain more information from your bioprocesses and easily draft complex batch strategies in just a few steps.

U & R package

User Management & Reporting

With clever user management, you can track all activities relating to your bioprocesses and create detailed reports at the touch of a button – even as a PowerPoint presentation.

DoE package

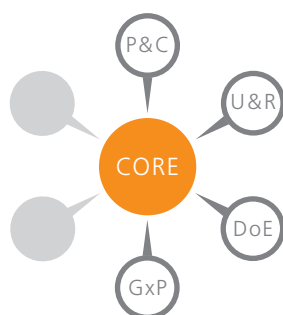
Design of Experiment

Available soon: the first DoE tool which was specially designed for biotechnology applications.

GxP package

Validation documentation

For validating eve® in accordance with GMP requirements for computer-assisted processes.



System requirements

Processor	Multicore 64 bit (Intel i5 and higher)
Memory	8 GB (16 GB recommended)
Hard drive	HDD 250 GB (SSD 512 GB recommended)
Screen resolution	1280 x 720 (1920 x 1080 recommended)
Network	LAN adapter
Operating system	(64bit) Windows 7 Pro, Windows 8.1 Pro, Windows 10 Pro. For multiuser access: Windows 2012 Server R2
Recommended browser	IE 11, Edge, Chrome
Compatibility	Current and earlier versions of all INFORS HT bioreactors as well as Minitron and Multitron shakers; compatibility testing with devices from other manufacturers upon request
Connectivity	OPC XML DA, OPC DA, OPC UA, REST API

Specifications subject to change

More information is available at www.infors-ht.com/eve

TECHNICAL DATA

Technical data – Shakers

	Bench-top shakers		
	Celltron	Orbitron	Ecotron
Dimensions (W x D x H)	450 x 380 x 90 mm	640 x 600 x 150 mm	635 x 630 x 630 mm
Maximum capacity (Erlenmeyer flask)	4 x 1 L	6 x 5 L (M tray)	2 x 5 L ("Sticky Stuff")
Maximum load	3.5 kg	31 kg	10 kg
Maximum expansion	n/a	n/a	Up to 2 units can be stacked
Stirrer speed range	20–200 min ⁻¹	20–550 min ⁻¹	20–550 min ⁻¹ depending on load and stacking
Shaking throw	25 mm	25 mm	25 mm
Temperature range	4 °C to 60 °C	4 °C to 65 °C	5 °C above RT to 65 °C 10 °C below RT to 65 °C with cooling
Standard parameters	Rotational speed, timer	Rotational speed, timer	Temperature and rotational speed
Optional parameters	n/a	n/a	Cooling
Ambient humidity (rH)	n/a	n/a	n/a
Power supply	110/230V ±10 %, 50–60 Hz	115/230 V ± 10 %, 50–60 Hz	115/230 V ± 10 %, 50/60 Hz

Technical data – Bioreactors

	Bench-top bioreactors			
	Minifors 2	Multifors 2	Labfors 5	Labfors 5 Lux
Vessels	1.5 L, 3 L, 6 L	0.4 L / 0.75 L / 1.4 L (microbial version) 0.4 L / 0.7 L / 1 L (cell version)	2 / 3.6 / 7.5 / 10 (cell version) / 13 L	3.6 L (stirred tank), 1.9 L (flat panel)
Working volume	0.3–1.0 L / 0.6–2.0 L / 1.1–4.0 L	0.1–0.25 L / 0.18–0.5 L / 0.32–1 L 0.075–0.25 L / 0.15–0.5 / 0.22–0.75 L	0.5–1.2 / 0.5–2.3 / 1–5 / 2.1–7 / 2.2–10 L	0.5–2.3 L (stirred tank), 1.6–1.8 L (flat panel)
Dimensions (W x D x H)	455 x 375 x 740 mm	350 x 520 x 960 mm	464 x 462 x 996 mm	624 x 462 x 996 mm (stirred tank) 559 x 442 x 996 mm (flat panel)
max. stirrer speed	1600 min ⁻¹	1600 min ⁻¹ (microbial version) 300 min ⁻¹ (cell version)	1500 min ⁻¹ (microbial version) 300 min ⁻¹ (cell version)	Stirred tank: 1200 min ⁻¹
Temperature range	5 °C above coolant to 60 °C	5 °C above coolant to 70 °C	5 °C above coolant to 70 °C (water jacket) 95 °C (heating mat)	5 °C above coolant to 70 °C, flat panel: 15 °C above coolant to 70 °C
Gassing per vessel	2 MFCs up to 2 min ⁻¹ (vvm)	Up to 4 MFCs 2 min ⁻¹ (vvm) (microbial version) or 0.1 min ⁻¹ (vvm) (cell version)	Up to 5 MFCs 2 min ⁻¹ (vvm) (microbial version) or 0.1 min ⁻¹ (vvm) (cell version)	Up to 5 MFCs 2 min ⁻¹ (vvm)
Pumps per vessel	4 x configurable (fixed or variable speed), ex-works 3 x fixed, 1 x variable	3 fixed, 1 variable, optional 1 additional variable	3 fixed, 1 variable, optional 2 additional variable	3 fixed, 1 variable, optional 2 additional variable
Ports per vessel	7.5 mm 4x 10 mm 4x 12 mm (Pg13.5) max 7	7 mm 4x 10 mm 4x 12 mm (Pg13.5) max 5	7 mm max. 4x 10 mm 2x 12 mm (Pg13.5) max. 6x 19 mm max. 6x	12 mm 6 x (stirred tank) / (Pg13.5) 13 x (flat panel) 19 mm 2 x (stirred tank) 10 mm 2 x (stirred tank) / 3 x (flat panel) 4 mm 1 x (flat panel) 6 mm 1 x (flat panel)
Connectivity	OPC UA	OPC XML DA	OPC XML DA	OPC XML DA
Parallel operation via touch screen controller	n/a	3 base units, resp. 6 vessels	Up to 6 base units	Up to 6 base units
Sterilisation	Autoclave	Autoclave	Autoclave or LabCIP (microbial version)	Autoclave

TECHNICAL DATA

Specifications subject to change

Incubation shakers		
Minitron	Multitron Standard	Multitron Pro / Cell
800 x 623 x 700 mm	1070 x 880 x 550 mm	1070 x 880 x 550 mm
2 x 5 L	6 x 5 L	6 x 5 L
12 kg	19 kg	19 kg
Up to 2 units can be stacked	Up to 3 units can be stacked	Up to 3 units can be stacked
20–400 min ⁻¹ depending on load and stacking	20–400 min ⁻¹ depending on load and stacking	20–400 min ⁻¹ depending on load and stacking
25 mm / 50 mm	25 mm / 50 mm	3/12.5 /25/50 mm
5 °C above RT to 65 °C 16 °C below RT to 65 °C with cooling; Minimum temperature 4 °C	6 °C above RT to 65 °C 12 °C below RT to 65 °C (with top cooling) 13 °C below RT to 65 °C (with lateral cooling) Minimum temperature 4 °C	6 °C above RT to 80 °C typically to 65 °C 20 °C below RT (with lateral cooling); 13 °C below RT (with top cooling); Minimum temperature 4 °C
Temperature and rotational speed	Temperature, rotational speed, timer	Temperature, rotational speed, timer
Cooling, CO ₂ regulation, humidification, LED	Cooling	Cooling, humidification, CO ₂ regulation, LED
Up to 85 % non-condensing	Up to 85 % non-condensing	Up to 85 % non-condensing
115/230 V ± 10 %, 50/60 Hz	115/230 V ± 10 %, 50/60 Hz	115/230 V ± 10 %, 50/60 Hz

Specifications subject to change

Pilot bioreactors			
Labfors 5 BioEtOH	Techfors-S	Techfors	Terrafors
3.9 L	15 L, 30 L, 42 L	up to 1000 L	15 L
1–2.5 L	3–10 L / 5.3 L–20 L / 6–30 L	up to 660 L	3–4 kg solid materials/semi-solid substrates or 7 L liquid
515 x 515 x 1050 mm	850 x 700 x 1800 mm	Depending on specification	990 x 970 x 1650 mm
300 min ⁻¹	Bacterial version: 1200 min ⁻¹ Cell version 300 min ⁻¹	Depending on specification	10 min ⁻¹
5 °C above coolant to 70 °C	5 °C above coolant to 80 °C and up to 130 °C for sterilisation	Up to 90 °C for temperature control and up to 135 °C for sterilisation	5 °C above coolant to 60 °C and up to 130 °C for sterilisation
5 MFCs 2 min ⁻¹ (vvm)	Up to 4 MFCs	Depending on specification	Up to 4 MFCs
3 fixed, 1 variable, optional 2 additional variable	3 fixed, optional 2 additional variable	3 fixed (acid, base, anti-foam) 1 variable (feed1), optional 1 additional	3 fixed (acid, base, anti-foam) optional 2 additional
10 mm 2x 12 mm (Pg13.5) 3x 19 mm 4x 40 mm 1x	Top plate: 19 mm max. 9x Vessel bottom: 12 mm 1x 25 mm max. 5x	Depending on specification	19 mm 1x
OPC XML DA	OPC XML DA	OPC XML DA	OPC XML DA
Up to 6 base units	n/a	n/a	n/a
Autoclave	Sterilisation-in-Place	Sterilisation-in-Place	Sterilisation-in-Place

We will find the right solution for you. Always.

Every bioprocess is different – and sometimes very special. To help make your project a success, we offer custom-made versions of all devices.

Whether you want special stirrers and spargers on the Labfors 5 or another rpm on the Multitron with special needs with regard to loading – we review every customer request with regard to feasibility.

All of the economic, technical and production-related aspects will be discussed with you to offer you a solution which meets your expectations.

Visit www.infors-ht.com to find your local INFORS HT representative who will be happy to discuss your project with you.



We have extensive knowledge of bioprocess technology. And we like to share it.



With 10 affiliates and 52 distributors worldwide, we are nearby. For a truly personal consultation.



Our service and technical support are first-rate. This means you're on the safe side.



Brochures, application notes and much more are available to you. Help yourself!

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