



# Delicious Details

Finest products for food and beverage labs

# »There is no love sincerer than the love of food.«

*George Bernard Shaw*

Nourishing the world in the 21st century requires new ideas – from drought-tolerant crops with high protein yields to streamlined processes in food production and quality control.

Nurturing ideas to grown-up solutions requires determination, passion and excellent tools. Eppendorf's tools for the laboratory have been among the finest and best for more than 70 years. Let us sort out the details of your daily lab challenges – so you have the peace of mind to focus on the science of the food of tomorrow.



## **Food research**

The amount of arable land is not growing with the world population. Thus, applied research has to show ways to increase nutrient levels in crops, optimize crop rotation or make crops more drought tolerant. The seasonal crop samples needed for this research are invaluable.



## **Food production**

Downstream processing of food has to be optimized to minimize nutrient loss. Nutrient levels have to be tested before and after new processing steps. Heating, cooling, packaging – everything can have an influence on the quality of food and beverages.



## **Food analysis**

Food analysis and food quality control require reproducible workflows – in every detail. Only the best lab products give you the confidence in the data you need. Your results can make a big difference.



# Humanity Grows— as Does Malnutrition

Until the year 2100 there will be ten billion people living on this planet, according to UN estimates. One of the biggest challenges for the 21st century is feeding this steadily increasing population. Crop yields for corn, rice, wheat and soy would have to double during the coming 35 years. Due to the fact that even today arable land is scarce and getting scarcer, food research all over the world has to pave the way to nutrient-rich and drought-tolerant crops. As a result of a steady increase in consumption of meat and dairy products, an even higher production of animal feed is required and crop demand is therefore rising dramatically.



It is an immense task to supply humanity with safe and high-energy food. For food production to keep up with the dynamic and steep rise in population, efficient production, efficient processes and rigorous testing are thoroughly needed. Eppendorf contributes to this task, being an established partner in food research, testing and production.

With its wide product range Eppendorf provides solutions for the requirements within the labs of the food industry. Ranging from the search for new varieties and high-protein plants to bioprocessing on an industrial production scale, Eppendorf offers one of the world's leading technology combining scalable bioprocess hardware products with corresponding modern software solutions.

Thus, Eppendorf technology is state of the art in all types of life science research and testing settings –from basic laboratory applications to highly specialized cell and molecular biology applications as well as in governmental food monitoring. Again and again bacteria, yeasts, fungi or pesticides are evidenced with Eppendorf technology when investigating agencies are checking foodstuff. Sometimes

contaminated food is life-threatening and, as has been seen during the past few years, more and more food scandals have happened. This in itself shows how important controlling is. The British Food Standards Agency investigated 1,714 incidents in 2011, compared to 1,505 in 2010 and 1,208 in 2009. Even a global supermarket chain just announced they will triple their food safety spending after fox meat was found in one of their products.

However, safe food is also imperative for sustainability because when contaminated or spoilt food has to be destroyed on a large scale, the goal of feeding ten billion people becomes difficult to attain.

The development of modern food safety testing procedures is extremely important and ongoing. A big milestone was the implementation of the Food Safety Modernization Act in the US in 2011 as it will lead to state-of-the-art food testing that will result in a push for modernization in food testing laboratories all over the world.

Eppendorf's user-friendly and reliable products are designated to help with these future challenges.



Verification of foreign DNA  
(bacteria, GMO, etc.)

Enrichment



Preparation



Purification and extraction



Quantification and analysis



Amplification and detection



Storage





Easypet®



Serological pipets



Shakers



CO2 Incubators



Fermentors



Pipettes and tips



Tubes and plates



Centrifuges



Thermomixers



Centrifuges



Pipettes and tips



Tubes and plates



Automation



Photometers



Cuvettes



Microvolume cuvette



Reader plates



Thermocyclers



PCR consumables



Photometers



Cuvettes



Documentation



Freezers



Concentrators



Freezer boxes



Deepwell plates



SafeCode System



## Enrichment

Enrichment is optional, depending on your assay and your cells of interest. However, as the first step in your workflow, it can be of utmost importance. If the enrichment does not work properly, all downstream steps will be at risk.



Experience a new dimension of electronic pipetting. Pipetting speed is controlled simply with the tips of your fingers allowing you to experience more sensitive control of the meniscus.



## Preparation

In food analysis, the primary material can come from a vast variety of sources and bring along a lot of unique challenges. Cooling, heating, mixing, spinning – all or any of these steps can be necessary. The one thing that combines all these steps is the pipette.



Electronic pipettes allow fatigue-free pipetting and minimize pipetting errors. Where high sensitivity and reproducibility are essential, ep Dualfilter T.I.P.S.® build the perfect system with Eppendorf pipettes for contamination-free pipetting by practically 100 % retention of aerosols and biomolecules.



Easytip®

- > Greater meniscus control through smooth speed setting
- > Long cordless runtime by lithium polymer rechargeable battery
- > Operation while recharging is possible
- > Autoclavable adapter for sterile applications
- > Fatigue-free pipetting by light-weight and ergonomic design



Serological pipets

- > Easy volume determination by clear graduations
- > Easy pipet identification by color code
- > Convenient storage and usage by smart packaging
- > USP Class VI-compliant
- > Sterility assurance level of 10<sup>-6</sup>
- > Non-cytotoxic and certified absence of detectable pyrogens, DNA, RNase, and DNase



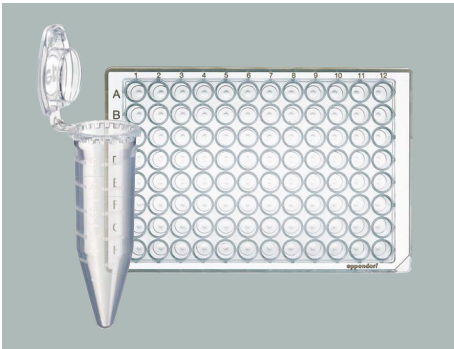
Biological Shaker Innova® S44i

- > Stackable – up to three units for maximum space saving
- > Higher flask capacity in a smaller footprint – grow more cells in less space
- > The new proprietary Eppendorf X-Drive with semi-automatic counterbalance technology provides smooth and uniform agitation
- > Shaking speeds between 20–400 rpm (+/- 1 rpm)



Pipettes and tips

- Electronic pipettes**
  - > Intuitive operating concept for quick and easy work
  - > Fatigue-free pipetting
  - > Powerful rechargeable battery
- Pipette tips**
  - > Contamination-free pipetting with ep Dualfilter T.I.P.S.
  - > Maximum reproducibility by ultrahomogeneous surface of epT.I.P.S.® LoRetention



Tubes and plates

- > Highest sample integrity due to the usage of high quality virgin raw material and the avoidance of any plasticizers, slip agents, and biocides during manufacturing
- > Five purity grades available
- > OptiTrack®: Faster well identification and less pipetting errors via high-contrast alphanumeric labeling



Thermomixers

- > Two-in-one instruments for combined incubating and mixing
- > Superior mixing performance due to 2D Mix-Control
- > Simple and intuitive operation using pre-defined temperature keys
- > Eppendorf ThermoTop® reliably prevents condensation





## Purification and Extraction

DNA needs to be extracted and purified before it can go into analysis. This step is especially crucial – if DNA is lost or a bias for certain DNA regions occurs, it can never be correct in the following steps. Also, PCR inhibitors need to be separated here to guarantee powerful amplification of the target DNA and to avoid false-negative results.



Ramp up your capacity to 48 tubes in a very small footprint. The aerosol-tight rotor helps to prevent contamination.



## Quantification and Analysis

Only a reliable analysis of your DNA concentration and integrity allows you start the following steps with the correct concentrations. Additionally, this analysis will show the quality of the previous steps.



Never get lost in our software: Help boxes in five different languages guide you to your result!



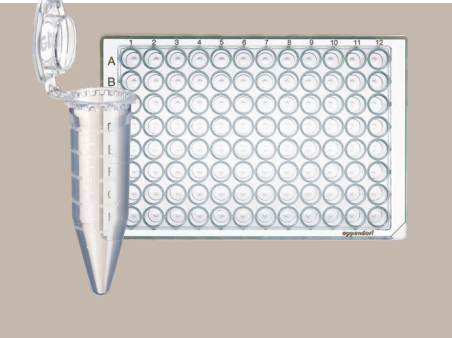
### Centrifuges and rotors

- > Small footprints and low access heights
- > Large variety of centrifuges and rotors available
- > Eppendorf QuickLock® – System for quickly opening and closing the rotor lid
- > PTFE-coated rotors for increased chemical resistance available



### Automation

- > epMotion® systems are available in three sizes, all designed with minimal footprint to fit your throughput
- > Self-checking robotic system, that reduces startup time
- > High precision dispensing tools for 0.2 to 1000 µL in one or eight channels (autoclavable)
- > Flexibility for filter- and bead-based extraction protocols
- > Drag-and-drop-based software
- > Many qualified methods available



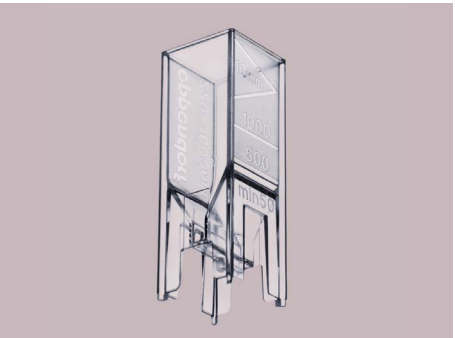
### Tubes and plates

- > Eppendorf LoBind® Tubes and Plates minimize sample loss
- > High *g*-Safe® centrifugation stability
- > User-friendly lid design of the Eppendorf Tubes® allows one-handed operation



### Photometers

- > Data transfer via USB interface
- > Xenon flash lamp with very long service life
- > Help box with explanation of each individual step in five languages
- > Direct printer port available
- > Perform UV/Vis, Vis, fluorescence or kinetic measurements



### Cuvettes

- > Individually packed cuvettes with lot specific certified quality to guarantee highest purity
- > Cuvettes in reclosable boxes for convenient access and filling
- > Different volumes from 1.5 µL up to 4,500 µL
- > Perform UV/Vis, Vis, fluorescence or kinetic measurements in our cuvettes



### Microvolume cuvette

- > Microvolume measuring cell for measuring 1.5–10 µL sample volumes
- > Low self-absorption (≤0.05 A @ 260 nm)
- > Simple cleaning to minimize the risk of sample carry-over
- > Hydrophobic surface coating on quartz glass for precise formation and positioning of the sample volume

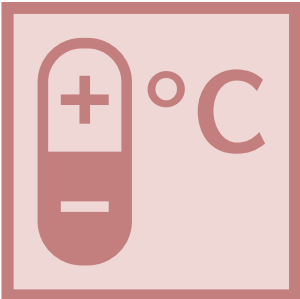


## Amplification and Detection

The power of PCR with its logarithmic amplification is still unbeaten in life sciences. A billion copies of the same molecule at your hands for analysis. That's where you can make sure you do not have unwanted organisms in your food. Getting these results quickly means a lot in food production and delivery.



Speed and hence time-saving is essential in most food laboratories. Thermocycler blocks made of solid silver give your PCR the speed you need.



## Storage

In a world of HACCP and increased public awareness of food scandals, storage of samples plays a very important role. Thus, more and more samples will be stored longer and longer. More freezer capacity is needed and samples need to be stored at defined conditions, maybe for decades to come!



Smart engineering and highly effective insulation give you the same freezer capacity at a smaller footprint.



### Mastercycler® X50

- > Extremely fast heating and cooling rates (up to 10° C/s)
- > Masterful Engineering: 2D gradient technology, extremely high block homogeneity, virtually no edge effect
- > Software with touch display
- > Connect up to 10 Mastercyclers directly or up to 50 using the Cyclemanager X50 software



### PCR consumables

- > Thin-walled polypropylene wells guarantee optimum heat transfer to the sample
- > Rigid frame and barcode option makes these plates the perfect fit for automation and high throughput
- > Certified free of any detectable human DNA, DNase, RNase, and PCR inhibitors



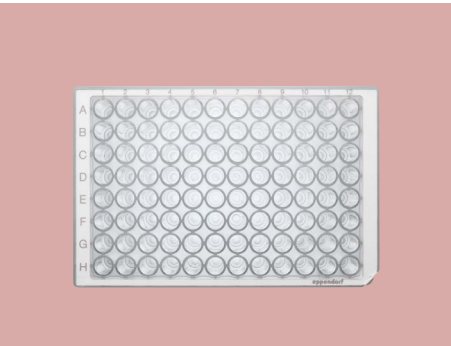
### Photometers

- > Data transfer via USB interface
- > Xenon flash lamp with very long service life
- > Help box with explanation of each individual step in five languages
- > Direct printer port available
- > Perform UV/Vis, Vis, fluorescence or kinetic measurements



### CryoCube® ULT Freezers

- > More storage capacity with equal size
- > Quick temperature pull down and recovery times
- > Advanced lock and alarm features for improved sample security



### Deepwell plates

- > OptiTrack®: Faster well identification and less pipetting errors via high-contrast labeling
- > RecoverMax®: Optimized well geometry for maximum sample recovery
- > Robust and precise design allows automation and enables a high *g*-Safe® centrifugation stability



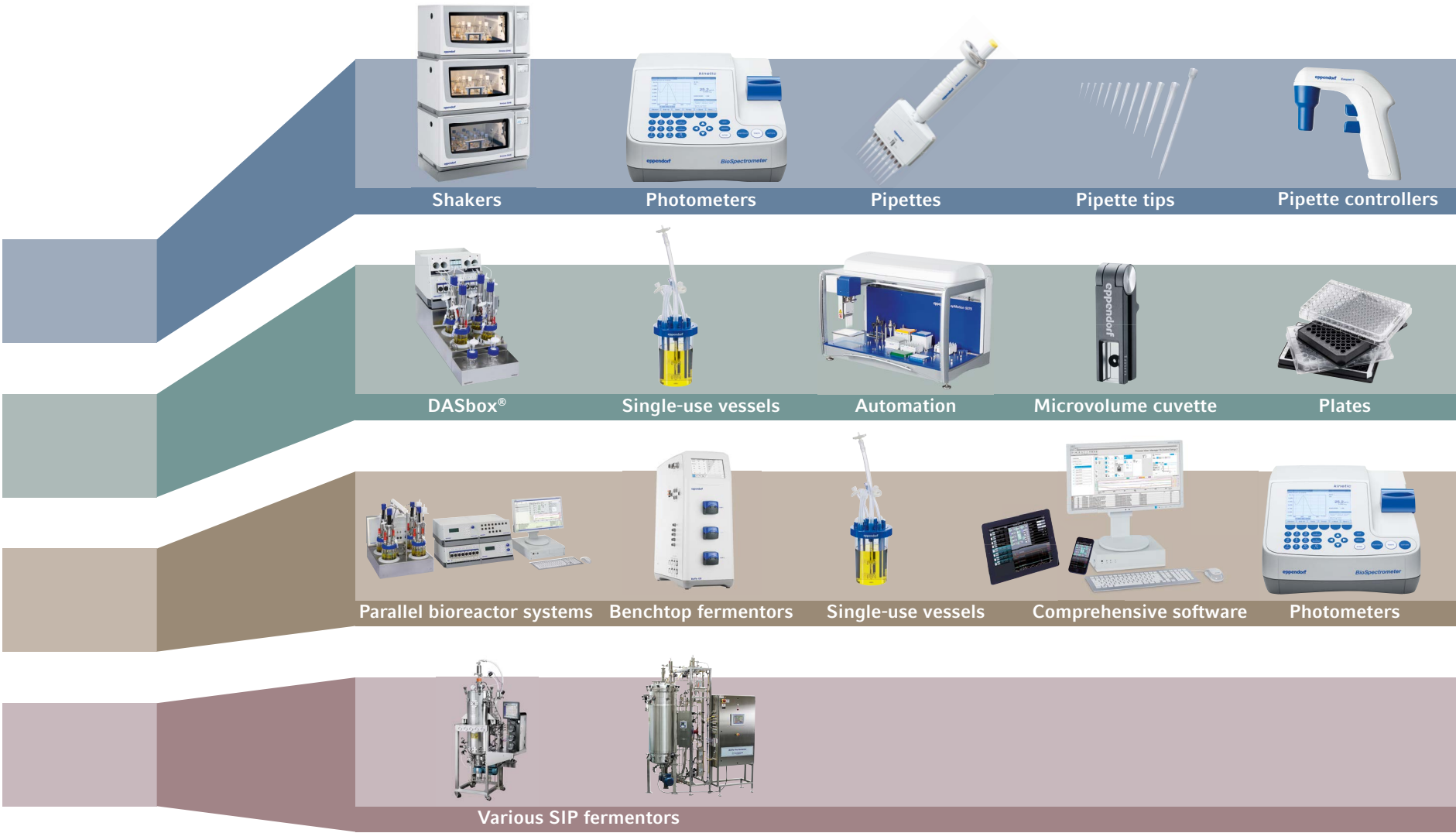
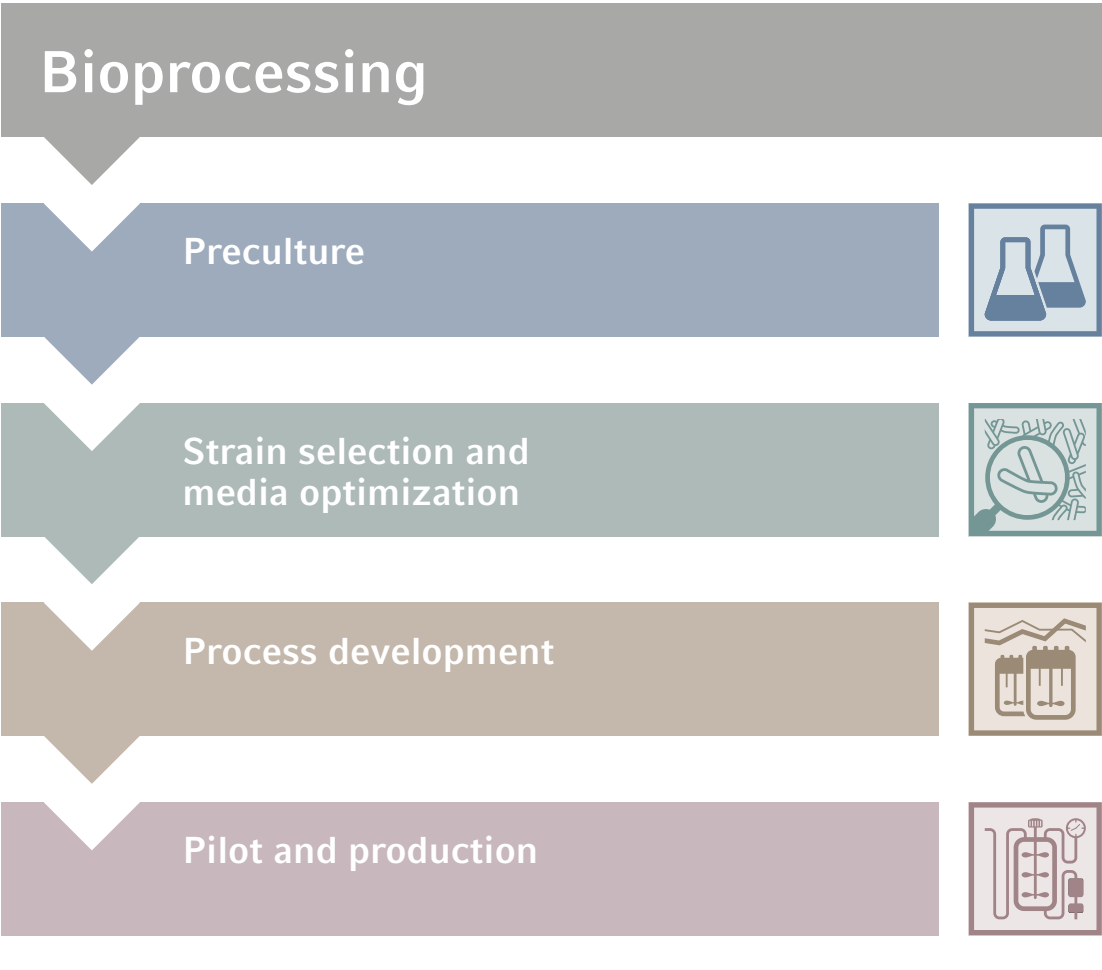
### Concentrator plus

- > Extremely quiet operation <50 dB(A)
- > Chemical-resistant, maintenance-free PTFE diaphragm pump eliminates the need for changing pump oil
- > Small footprint saves valuable bench space
- > Brushless induction drive and chemical-resistant, stainless steel chamber for trouble-free operation



> Take a look at our workflow video: [www.eppendorf.com/food](http://www.eppendorf.com/food)









## Preculture

Precultures are the link between molecular modification and bioprocessing. The stackable Innova® 44/44R shakers fulfill all demands of user-friendly and reliable shake-flask cultivation. Its triple-eccentric drive mechanism provides worry-free, 24/7 shaking and the large LCD panel displays all pertinent parameters.



Reliable culturing results with the stackable and user-friendly Innova 44/44R shakers for highest throughput at minimal space



## Strain Selection and Media Optimization

Whether searching for an advanced yeasts in brewery, proper bacteria in dairy industry or a powerful production strain for nutrition supplements the DASbox® is the superior tool for screening. Small working volumes, parallel operation of twelve and more bioreactors and applying Design of Experiments allow for fast, reliable and cost-effective processing.



DASbox Mini Bioreactor System – The parallel advantage for strain selection in food and beverage industries

**Biological Shaker Innova® S44i**

- > Stackable – up to three units for maximum space saving
- > Higher flask capacity in a smaller footprint – grow more cells in less space
- > The new proprietary Eppendorf X-Drive with semi-automatic counterbalance technology provides smooth and uniform agitation
- > Shaking speeds between 20–400 rpm (+/- 1 rpm)

**Photometers**

- > Data transfer via USB interface
- > Help box with explanation of each individual step in five languages
- > Perform UV/Vis, Vis, fluorescence or kinetic measurements
- > Minimized stray light effects to perform highly reproducible OD<sup>600</sup> measurements

**Pipettes**

- Pipettes**
- > Ultralight pipettes according to Eppendorf PhysioCare concept
  - > Fully autoclavable pipettes available
  - > Fixed-volume pipettes and multichannel options available
- Pipette tips**
- > Contamination-free pipetting with ep Dualfilter T.I.P.S.®

**DASbox® Mini Bioreactor System**

- > 60–250 mL working volume
- > Precise control of 4, 8, 12 or more bioreactors in parallel
- > Optimal tool for Design of Experiments (DoE)
- > Fully liquid-free exhaust condensation
- > Fully mass flow-controlled gas mixing
- > Available with single-use vessels

**Automation**

- > epMotion systems are available in three sizes, all designed with minimal footprint to fit your throughput
- > Self-checking robotic system that reduces startup time
- > High precision dispensing tools for 0.2 to 1000 µL in one or eight channels (autoclavable)
- > Flexibility for to fit to your specific workflow. Open to all consumables, mixing, vacuum and heating and cooling options
- > Drag-and-drop-based software

**Microvolume cuvette**

- > Microvolume measuring cell for measuring 1.5–10 µL sample volumes
- > Low self-absorption (≤0.05 A @ 260 nm)
- > Simple cleaning to minimize the risk of sample carry-over
- > A defined angle for folding the sides of the cuvette guarantees reproducible handling



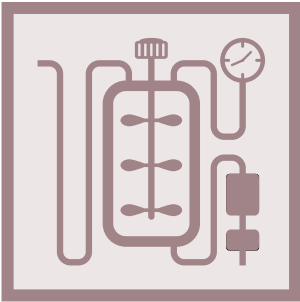


## Process Development

Modern bioprocess development takes increasing numbers of experiments and generated data into account. Our smart and flexible DASware® Software Suite offers peace of mind: It enables comprehensive data and information management, interconnectivity of bioreactors with external lab devices, Design of Experiments (DoE), and remote control.



Accelerate your bioprocess development with DASware Software Suite – the intelligent solution for comprehensive data and information management



## Pilot and Production

Production processes in the food and beverage industries are multifaceted and constantly evolving. The modular design of the Eppendorf stainless steel fermentors facilitates these process requirements by allowing the addition or removal of options at any time – at an impressive volume range up to 1200 L.



Smart and flexible solutions in production – the New Brunswick™ BioFlo® Pro line of sterilize-in-place (SIP) fermentors



### Parallel Bioreactor Systems

- > Parallel operation of four, eight and more independent bioreactors
- > 0.2–3.8 L working volume
- > User-friendly temperature control options
- > Modular design of control units for flexible system configurations
- > Precise control of all critical process parameters
- > Variable speed pumps
- > Thermal mass flow-controlled gas mixing



### BioFlo® 120

- > Wide variety of autoclavable and single-use vessels
- > Auto Culture modes offer process control at the touch of a button
- > Minimal footprint
- > Flexible universal connections for analog sensors or digital Mettler Toledo® ISM® sensors



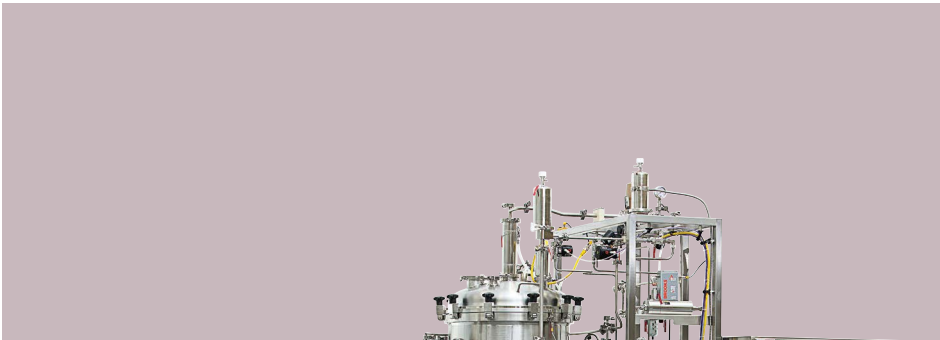
### DASware®

- > Remote monitoring and control of bioprocesses
- > Seamless integration of external lab devices to the bioreactor
- > Integration into process control systems and corporate historians
- > Applies Design of Experiments (DoE)
- > Comprehensive information management
- > Usable on various 3rd party bioreactor control units



### BioFlo® 610

- > Pilot to production scale fermentor
- > Sterilization-in-Place technology
- > 16–100 L working volume
- > Small footprint and mobile skid for simplified transport
- > Diverse range of specialized impellers
- > Validation packages available
- > ASME-rated pressure vessel



### BioFlo® Pro

- > Large scale industrial system
- > Sterilize-in-place technology
- > 45–1200 L working volume
- > Modular design with several field-upgradeable options for easy customization
- > Multiple impeller and gas flow options
- > Validation packages available
- > ASME-rated pressure vessel
- > Small footprint with multiple orientation possibilities





99.9

Percent of deliveries are correct\*

Eppendorf offers comprehensive services beyond the products. Highly qualified experts at Eppendorf take care of logistics, training and other services to make your lab more efficient.

100  
service offerings

15  
years of training

**Logistics**

Especially labs with high throughput need on-time delivery. This is even more important for high-running consumables. Our logistics experts are very successful in getting the right products to you on time – no matter where you are.

Various logistic hubs and warehouses allow us to manage incoming orders efficiently – so you get your order as fast as possible.

**epServices**

Eppendorf has more than 100 globally standardized service products. From pipette calibration to preventive maintenance and our Rotor Assurance Program, we can help you to make sure our products work in pristine conditions in your labs.

From a Quick Check to a Premium Performance Plan package – you can choose from different levels of maintenance and service according to your needs. Just let us know how we can help you and enter a world of possibilities.

**Eppendorf Training Center (since 1997)**

Optimally serviced premium products alone do not guarantee reliable results. The operator’s experience is just as important. With the innovative Eppendorf Training Center, we extend your knowledge and, thus, assure your professional future. In the easy-to-understand and active environment of our practice-oriented seminars, you will learn the operation of our devices, understand specific workflows and receive important hints to run applications in your lab properly. Our experienced application specialists will support you in small groups. Learn something new or brush up your knowledge. Certificates for successful participation will be provided.

\*Deliveries out of Eppendorf’s central warehouse in Hamburg, Germany. »Correct« means that the shipment contains the correct amount of all ordered products and is shipped to the correct address.

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