

# *miniPERM*®

Bioreactor for protein production



## Bioreactor for protein production

- High cell densities
- High product concentration
- Easy handling
- Multiple harvesting
- Range of cell culture volumes



### Applications

- Hybridoma cells
- Transfected cells
- Biomass production
- Virus-producing cells
- Entomological cells
- Plant cells

miniPERM® is an easy-to-handle bioreactor for the cultivation of cells in high densities and simultaneous production of cell products, e.g. monoclonal antibodies.

Depending on the cell line, cell densities of more than  $10^7$  cells/ml and product concentrations of several mg/ml can be obtained.

miniPERM® is ideal for the cultivation of a variety of cell types. Accordingly, both suspension cells and adherent cells can be cultivated in the miniPERM® in high densities.

As an alternative to stationary tissue and roller bottle cultures as well as fermentor systems miniPERM® provides the possibility of producing high-concentration cell cultures in small volumes.

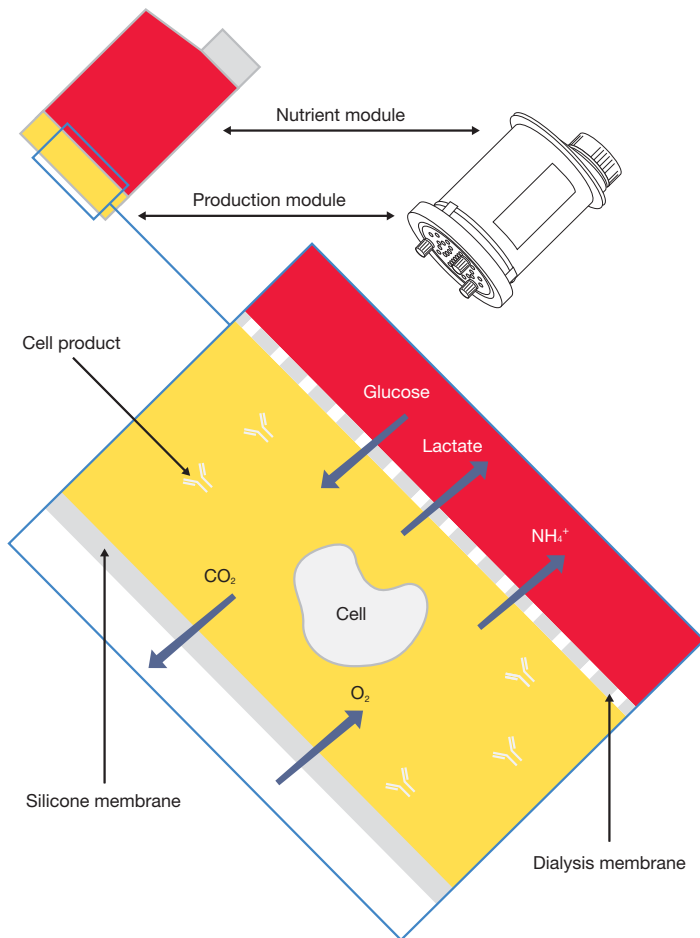
## Universal Turning Device

For optimal supply of nutrients and removal of metabolic waste products in the miniPERM® bioreactor, cells are kept in suspension by continuous rotation. During cultivation in a Universal Turning Device in a CO<sub>2</sub> incubator at a relative air humidity of 70% the miniPERM® bioreactor is rolled in a horizontal position and along its longitudinal axis.

The Universal Turning Device can accommodate up to four miniPERM® bioreactors.



## Function



The miniPERM® bioreactor is a membrane-based two-compartment system.

A dialysis membrane subdivides the culturing chamber of the miniPERM® bioreactor into a production module (optionally 5, 35 or 50 ml cell culture volume) and nutrient module (400 ml medium volume).

The small pore size of the dialysis membrane (MWCO 12.5 kD) prevents both the cells and released cell products from passing through the membrane. These are accumulated to high cell densities and product concentrations in the production module.

Simultaneously, the metabolites released from the cells diffuse through the dialysis membrane from the production module into the nutrient module to be diluted or neutralized in the medium.

The outer side of the production module consists of a thin  $\text{O}_2$ - and  $\text{CO}_2$ -permeable silicone membrane for optimal gas exchange.

## Different cell culture volumes

Adding to the range of possible applications miniPERM® production modules are available in a variety of cell culture volumes.

### miniPERM® classic 'High density culture 35 ml'

The production module has a cell volume of 35 ml and is ideally suited for production in laboratories or research.

### miniPERM® HDC 50 'High density culture 50 ml'

The HDC 50 with a cell culture volume of 50 ml is suited for the large-scale production of proteins and biomass.

### miniPERM® HDC 5 'High density culture 5 ml'

The HDC 5 production module with a volume of 5 ml is particularly suited for a small though quick protein production.

### miniPERM® SM 'Adherent cells'

The miniPERM® SM production module is designed to cultivate adherent cells such as HEK and COS cells. In this system, cells adhere to two integral stationary matrices. The growth surface is 240 cm<sup>2</sup>.

As soon as a cell product is released, it is supplied into the production module. For the proliferation of biomass, the cells can be harvested from the stationary matrix after opening the production module at the end of the cultivation process.



## Bioreactor and accessories

**miniPERM® bioreactors are available in the following options:**

- **miniPERM® sterile:**

Combined production and nutrient module, sterile, for single use only

- **miniPERM® reusable:**

The nutrient module is autoclavable and designed for multiple use. The production module is available as a sterile product for single use only.

- **miniPERM® accessories**

The following accessories are available for easy handling of the miniPERM® bioreactor during cultivation: sterile single-use syringe (2 ml, 50 ml), sterile tubes, Luer needle, septum port, miniPERM® stand, antiFOAM® (defoaming agent), cellPROTECT® (cell protector).

- **miniPERM® Start-up Support Kit**

The Start-up Kit includes all accessories required for inoculation, sampling and harvesting.

## Ordering Information - miniPERM®

	miniPERM® classic		miniPERM® HDC 50		miniPERM® HDC 5		miniPERM® SM	
	Order No.	Packaging	Order No.	Packaging	Order No.	Packaging	Order No.	Packaging
Bioreactor, sterile	94.6001.059	12	94.6077.121	12	94.6077.118	12	94.6077.618	12
Test Kit*, sterile	94.6077.009	1	94.6077.122	1	94.6077.119	1	94.6077.609	1
Production Module, sterile	94.6001.055	12	94.6077.017	12	94.6077.116	12	94.6077.616	12
Nutrient Module	94.6001.153	4						

\*4 Bioreactors + \*\* Start-up Support Kit

Order No.	miniPERM® Accessories	Packaging (bag/box)
94.6001.153	Nutrient Module for miniPERM®, autoclavable	4
94.6001.054	Stand for miniPERM®	4
94.6001.038	Screw Cap for Production Module, autoclavable	12
94.6001.036	Screw Cap for Production Module, sterile	6
94.6001.057	Screw Cap for Nutrient Module, autoclavable	30
94.6077.037	Screw Cap for Nutrient Module, sterile	16
74.4312	Septum Ports, sterile	100
94.6077.135	Luer Syringe Needles 25 G x 5/8" (0.5 x 16 mm), sterile	100
94.6077.136	Single use 2 ml Luer Syringe, sterile	100
94.6077.137	Single use 50 ml Luer Lock Syringe, sterile	60
94.6077.138	Filling Tube 5", Luer, sterile	100
94.6077.320	antiFOAM®, sterile, 100 ml	1
94.6077.041	cellPROTECT®, sterile, 100 ml	1
94.6001.094	Start-up support kit**	1
	• Single use 50 ml Luer Lock Syringe, sterile	8
	• Single use 2 ml Luer Syringe, sterile	20
	• Filling Tube 5", Luer, sterile	8
	• Luer Syringe Needles 25 G x 5/8", sterile	20
	• Septum Ports, sterile	6
	• Stand for miniPERM®	1
	• cellPROTECT®, 1 ml, sterile	1
	• antiFOAM®, 5 ml, sterile	1

Order No.	Universal Tuning Device Accessories	Packaging
94.6077.360	Adapter for Centrifuge Tubes, 12 x 15 ml	1
94.6077.361	Adapter for Centrifuge Tubes, 5 x 50 ml	1
94.6077.362	Adapter for Reagent Vessels 48 x 1.5/2.0 ml	1
94.6001.000	Tray, Rocking Device	1

Order No.	Universal Turning Device	Packaging
94.6001.061	Universal Turning Device 115 / 230 V	1

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