ESF 100 G/200 G

External Spin Filter for cell culture

Compatible with a wide range of bioreactors

Operation in external loop

Clogging by cells minimized

Cleanable and autoclavable

The ESF 100 G and 200 G, BBI's **E**xternal **S**pin **F**ilters can be used with bioreactors from 2 to 50 liter scale for long term perfusion of mammalian cells. The success of the new design has been demonstrated using many types of suspension cells.

Filtration by stainless steel spinfilters is a commonly used unit operation to separate cells from the depleted culture medium.

The **E**xternal **S**pin **F**ilter is mounted in a glass housing separate from the bioreactor vessel and is connected to it by an external loop. It can be operated in combination with any type of benchtop and pilot scale bioreactor.

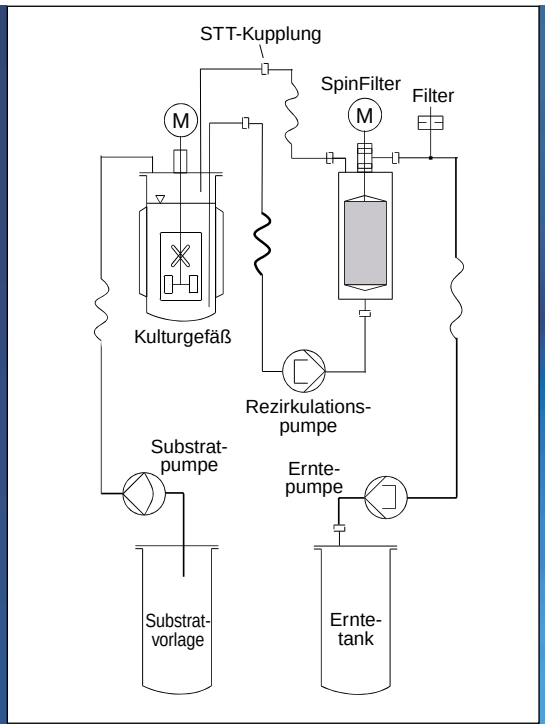
The external set-up of the spinfilter is an innovative approach to continuously perfusing medium through a cell culture bioreactor.

This version of the technology has some major advantages compared to internal spinfilter devices. It simplifies operation and improves flexibility by its modular design.

The safe and reliable operation of BBI's **E**xternal **S**pin **F**ilters has been proven from pilot to industrial scale.

ESF 100 G/200 G External Spin Filter for cell culture

- **Robust design of stainless steel filters**
- **Wide range of filter mesh sizes available**
- **Interchangeable filter elements during perfusion**
- **Easily scaleable regardless of the overall vessel design**
- **Validatable cleaning procedures for stainless steel filter materials**



The patented filter material is made of a multilayer stainless steel woven wire cloth (US patent 4.691.744).

The ESF 100 G and ESF 200 G consist of a glass vessel, a head plate with lip sealed hollow shaft and the rotating filter element.

The drive motor is mounted on top of the housing. The complete set-up of the ESF 100 G is fixed to a laboratory stand, the ESF 200 G is free standing.

The connections to and from the ESF 100 G and 200 G are made by flexible tubings. The culture medium which contains cells and product is recirculated through the **E**xternal **S**pin **F**ilter by means of a peristaltic pump. The cells are separated from the product containing medium by the filter.

The rotating filter in the solid housing is properly sized in order to create a defined fluid flow pattern in the annular gap between filter and housing. The Taylor vortices that are formed prevent the filter surface from being fouled by cell particles and high molecular weight components.

This perfect design provides the right conditions for extended periods of operation.

Special Features:

- The dimensions of an **E**xternal **S**pin **F**ilter can be optimised and are not effected by the overall vessel design.
- The rotation speed of the spinfilter can be controlled independently from the vessel's agitation speed.
- The liquid level in the vessel can be varied during spinfilter operation.
- The operating volume of the bioreactor vessel is not reduced by the presence of the spinfilter.
- Suitable mesh sizes for suspension cells are 5, 10 and 20 µm.

Applications:

- Suspension Cells
- Hybridoma Cells
- Insect Cells

BBI's in-house cell culture experts in combination with international collaborators have proved the **E**xternal **S**pin **F**ilter during many experiments with a variety of cell lines over periods of 60 days.

- Validatable cleaning procedures for stainless steel spinfilters are available on request.

Schwarzenberger Weg 73–79 · D-34212 Melsungen
Tel. +49 (56 61) 71-34 00
Fax +49 (56 61) 71-37 02
e-mail bbi.info@bbraun.com
http://www.bbraunbiotech.com

G 03.02.00/1