CELLine

Two-Compartment Bioreactor for Efficient Cell Cultivation

Description
The CELLine bioreactor is a disposable, two-compartment cultivation device suitable for many cell culture applications, e. g. the production of monoclonal antibodies on a laboratory scale. Two different sizes of the CELLine are available: CELLine CL350 and CL 1000. Details are listed below.

Introduction
Efficient cell cultivation is dependent on an optimal supply of oxygen and nutrients, as well as an efficient removal of inhibiting metabolic waste products. In static cell culture the optimal balance of these factors is not given. These limitations lead to a reduced cell growth and are unfavorable for achieving high levels of protein expression.

Features & Benefits
The two-compartment bioreactor CELLine is designed to overcome these limitations by dividing the bioreactor into a medium compartment and a cell compartment. A semi-permeable membrane (10 kDa MWCO) between the compartments allows small molecules to diffuse from one compartment to the other. Higher molecular weight molecules secreted by the proliferating cells are retained within the cell compartment. This results in a continuous flow of nutrients into the cell compartment and a concurrent removal of any inhibitory waste products.

The cell compartment and the medium compartment are individually accessible which enables the cells to be supplied with fresh medium according to their individual needs.

In addition, the bottom of the cell compartment is made of a gas permeable membrane which ensures an optimal oxygen supply to and carbon dioxide exchange from the cell culture. All together, this bioreactor construction allows optimal maintenance of the cells at quasi in vivo cultivation conditions. These conditions enable cells to proliferate to very high densities within the cell compartment.

Application
The CELLine is perfectly suited for a wide range of applications involving suspension cell culture, like monoclonal antibody production or long-term continuous culture maintenance. The unit is optimised for cultivation of hybridoma, CHO (Chinese hamster ovary) cells, NSO (mouse myeloma) cells, SF (*Spodoptera frugiperda*, insect cells) cells and many more.

High Cell Density Cultivation
With the two-compartment technology of CELLine, deficiencies in nutrition or oxygenation are problems of the past. Therefore, cell densities inside the cell compartment are usually between 10^7 to 10^8 cells per ml which is about two magnitudes higher than with conventional static cell culture techniques.

High product concentrations
Benefiting from the high cell densities, product concentrations achieved in CELLine are in the range of 1 to 5 mg per ml, making the bioreactor most suitable for antibody expression in hybridomas, protein expression in transfected cell lines, or virus production. Product concentrations in the cell compartment of CELLine are in most cases 50 – 100 times above those found in static cell culture disposables, such as flasks and roller bottles.

Long-term, continuous culture maintentance
Separate access to the medium compartment of CELLine allows for continuous delivery and efficient oxygenation of the cells, thus enabling the user to perform continuous studies on a specific cell culture, or to benefit from a consistent protein production over several weeks.