



WHEATON®

CELLine™ Bioreactors

Membrane Culture Flasks for Antibody and Protein Production

Questions & Answers

What customers would use the CELLine Flasks?

The CELLine bioreactor is currently used by small to large biotech and pharmaceutical companies, major university core laboratories, college cell culture laboratories, cancer research companies, diagnostic companies, and antibody/life science chemical suppliers.

Why are these customers using the CELLine Flasks?

The majority of CELLine Flasks are used for generating antibodies and recombinant proteins through suspension cell culture. The most popular device for this application is the CELLine 1000. Some customers also use them for stem cell expansion (CELLine 350), plant cell cultivation, exosome production, insect cell cultures and viral infection cultures.

What are the alternatives to CELLine Flasks?

CELLine flasks can be used in place of many in vitro cell culture technologies and antibody generation through mice ascites. One CELLine flask can take the place of a dozen laboratory mice, small spinner flasks or hundreds of static tissue culture plates or T flasks. There are other small membrane cell culture devices on the market but require hardware and do not perform as well.

How Does the CELLine Flasks work?

The CELLine Flasks have two compartments. The top compartment is for bulk cell culture medium storage. The bottom compartment is the cell growth chamber. The two chambers are separated by a dialysis membrane. This membrane allows nutrients to passively diffuse to the cell growth chamber. The bottom of the cell growth chamber is lined with a gas permeable membrane. This membrane allows for sufficient oxygen and carbon dioxide exchange for high density cell culture.

What advantages do the CELLine Flasks offer?

- 1) **Super concentration of cells and proteins in the cell compartment** – This allows for high density cultures, reduced requirement for exogenous growth factors such as FBS, and a simplified lower volume purification of the protein or antibody of interest.
- 2) **Reduced handling requirements** – By storing the media in a large compartment above the cell culture compartment this eliminates the tedious medium refreshing. The dialysis membrane ensures the proper concentration of metabolites in the cell culture compartment.
- 3) **High density cultures** - One of the major limiting factors in cell growth is available oxygen. The placement of the gas permeable membrane at the bottom of the device allows the cells to be extremely close to the point of gas diffusion. The more cells the device can sustain the higher the concentration of proteins or antibodies of interest.

- 4) **Simplicity of the flask** – The device operates on the same principles as dialysis machine and a heart/lung machine without any equipment, or complicated operating procedures. Most cell culture laboratories have a biological safety cabinet and a CO₂ incubator, which is the only required equipment for operation.

What should I be looking for?

Tissue culture plates, media bottles, spinner flasks, T-flasks, CO₂ incubators, serological pipettes, biological safety cabinets.

Are there any related WHEATON products?

Wheaton offers cryogenic vials for cell storage, pipettes that could be used with this device, large scale CO₂ incubators, pumps and tubing for media transfer.

What cell densities and titer concentrations are expected?

- Recommending Seeding Densities are $1 - 2 \times 10^6$ viable cells/mL.
- The CELLine 1000 has a 15 mL cell compartment.
- The flask can reach a cell concentration of 4×10^8 Viable cells/ml that yields anywhere from 1 - 5 mg/mL of antibody.
- For optimal performance cells should be harvested when viability reaches 40%.
- The system can then be re-inoculated.
- Feeding and harvesting schedule depends on the cell line, the seeding density, and the target titer amount.

What cell lines have been used in the CELLine Flask?

Murine Hybridoma, CHO, NS0, SF, HEK, BHK, stem cell and plant cell cultures. We are always on the lookout for new applications so please let us know if you discover anything new.

Is the flask reusable?

With increased use of the flask the risk of contamination or membrane damage is a possibility. There has been no indication of decreased membrane performance over time due to binding or clogging. Some customers continue to run the flask as long as required and other will rinse with sterile buffer or saline solutions and store at lower temperatures for reuse.

What is the best way to introduce the CELLine flasks to our customers?

If a customer is working with small scale cell culture it would be good to demonstrate the steps of use in person with the customer. After this discussion has taken place we can ship them a sample for trial. The more you work with your customers with the sample flask the better the success rate of implementation.