PERMEGEAR

...the standard for your lab.

Equipment that measures permeation through membranes

Diffusion 101

If diffusion studies are new to you, perhaps you've been assigned one and you have no idea where to begin, please visit our website **www.permegear.com** and read Diffusion Cell Basics for terms, definitions and background information. Once you have an idea of how to proceed but feel some additional guidance would be helpful, you can download our Diffusion Testing Fundamentals primer to help you learn what is required for a proper study and begin to design one. For comprehensive membrane and selection guidance, all the documents below are also available on our website for download.

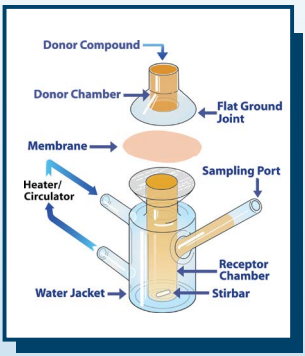
- PermeGear's Guide To Choosing A Membrane
- Membrane Films
- Membrane Filters
- Membrane Dialysis

For more information, or to request a quote, please e-mail us at: **support@permegear.com**

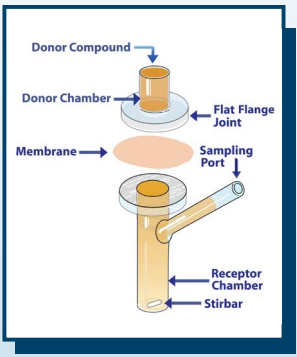
Franz Cells

PermeGear vertical glass diffusion cells are classic Franz Cells. Standard orifice diameters are 5mm, 7mm, 9mm, 11.28mm, 15mm, 20mm and 25mm, other diameters are custom. The word “orifice” as it refers to a Franz Cell is the area at the top of the receptor chamber that is exposed to the membrane or device through which transport or permeation is being studied. Corresponding volumes from 5ml to 20ml are standard. Clamping is achieved through o-ring joints, flat ground (ground o-ring) joints and flat flange joints. We manufacture our own clamps for the most popular Franz Cell models. Our clamps are all stainless steel and much easier to use than clamps from other suppliers.

We welcome requests for custom cells!



Jacketed Franz Cell

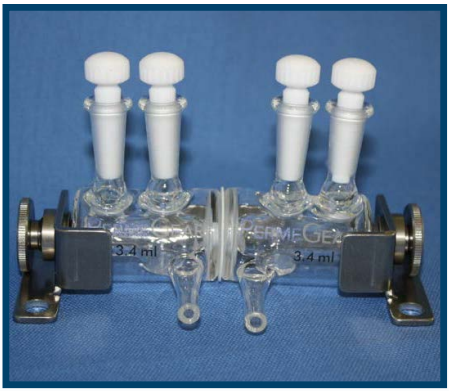


Unjacketed Franz Cell

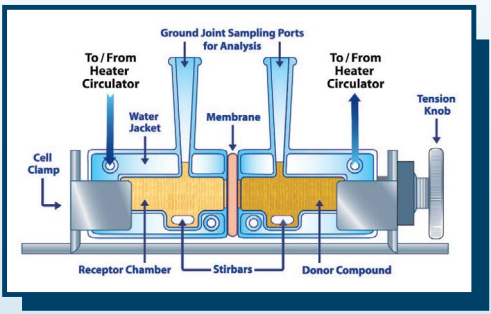
PermeGear offers ISO compliant Franz Cell calibration paperwork, as well as serial numbers on the cells and donor chambers. If you would like to perform an in-house calibration, we offer the appropriate ISO compliant paperwork. For more information, or to request either or both of these services, please e-mail us at: support@permegear.com

Side-Bi-Side Cells

PermeGear makes three different classes of Side-Bi-Side Cells. The smallest class includes the most common Side-Bi-Side Cells having orifice diameters from 5mm to 15mm. The medium size class has



orifice diameters up to 25mm. The largest class has orifice diameters between 15mm and 60mm. In all classes of Side-Bi-Side Cells available volumes are dependent on orifice diameter and other factors. Our Side-Bi-Side Cells come with stoppers and stirbars, they do not come with Cell Clamps.

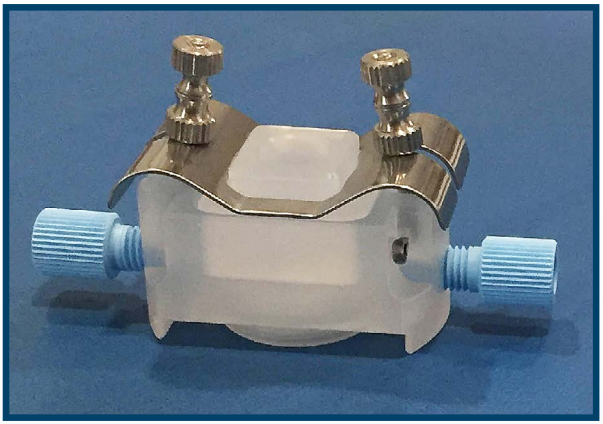


Side-Bi-Side Cells are easily customized with different volumes, additional porting, and amberization. They are well suited to iontophoresis studies.

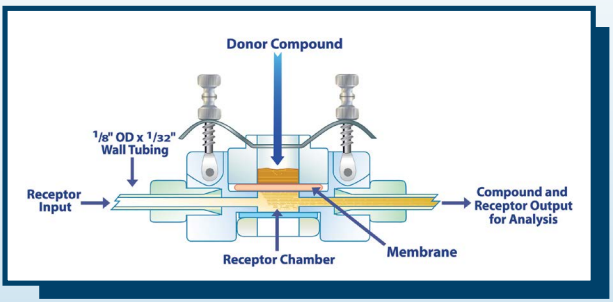
After a membrane is placed between the cell halves, the Cell Clamp is placed around them. The adjusting knobs are then gently tightened to hold the glass halves and membrane or device together. The assembly is then located over the stirring magnets of an H-Series Stirrer by placing the holes in the clamp over pins on the top of the stirrer.

In-Line Cells

PermeGear In-Line Cells may be thought of as flow type Franz Cells with very small receptor volumes. In-Line Cells are available with orifice diameters from 5mm to 15mm. Standard In-Line Cells have donor chambers open to the air, occluded donor chambers are available.



In-Line Cells are are made from the plastic Kel-F which is the 3M product or Neoflon which is the Daikin product. In-Line Cells have a unique clamping system which features user preset, repeatable, secure clamping of tissue



or membranes. Clamping is achieved with a stainless steel spring that applies pressure preset by the user to the upper surface of the donor compartment for leakproof clamping. The cell design locates the orifice diameters within .1mm of each other. HPLC connectors are used to connect the cells to 1/16 ID tubing.

Automated Systems

PermeGear's ILC07 Automated Diffusion System incorporates In-Line Cells, a peristaltic pump, a fraction collector, and a heater/circulator into a versatile system for analyzing diffusion over time. Collection vials are at the option of the user, racks for 20ml 28mm diameter scintillation vials are provided. Adapters are available to allow the use of many different vials popular with many HPLC autosamplers. Because of varied requirements, vials must be provided by the user, PermeGear will supply appropriate racks.

PermeGear's ILC07 Automated Diffusion Systems are based on the continuous flow principle. A multi-channel peristaltic pump draws receptor solution from a reservoir through a distribution manifold and sends it to the In-Line Cells. The cell temperatures are adjusted by a heater/circulator that pumps water through the Cell Warmer in which the In-Line Cells are located. After filling the receptor chambers of the cells and purging the system of bubbles, a formulation containing the subject compound is placed in the donor chambers. From that time, fluid is collected in the vials of the fraction collector at user set time intervals. The vials are taken for analysis manually after the sampling times have elapsed.

The ILC07 Automated System is a compact assembly of integrated components. Its footprint is 27" deep by 29" wide. Once the system is set up, no space on either side of it is required for operation.

Stirrers

PermeGear stirrers are made to hold our different types of diffusion cells. V-Series stirrers are for Franz cells and H-Series stirrers are for Side-Bi-Side cells. All stirrers are constructed from 1/16" (1.5mm) thick stainless steel. Motors in our stirrers run at 600 rpm in the U.S. and Japan and at 500 rpm everywhere else.

Research Services

PermeGear maintains a research laboratory equipped with all the cell types and systems that are available on this website. Although not GLP compliant, our services are ideal for preliminary or supplementary research providing feasibility testing, compound screening, and proof of concept projects. PermeGear has extensive experience with in vitro membrane transport research involving the percutaneous penetration and permeation of a wide variety of active pharmaceutical ingredients (APIs). This background includes feasibility screening, formulation optimization, permeation enhancement, iontophoresis, and in vitro release testing.

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