



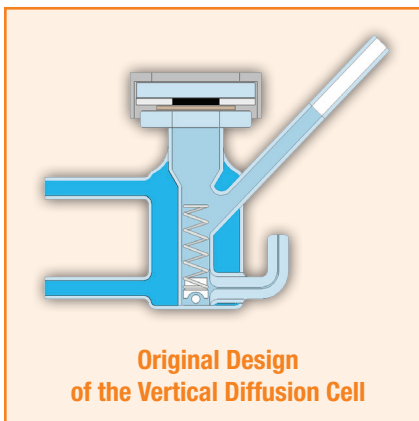
Vertical Diffusion Cells

The Hanson VDC

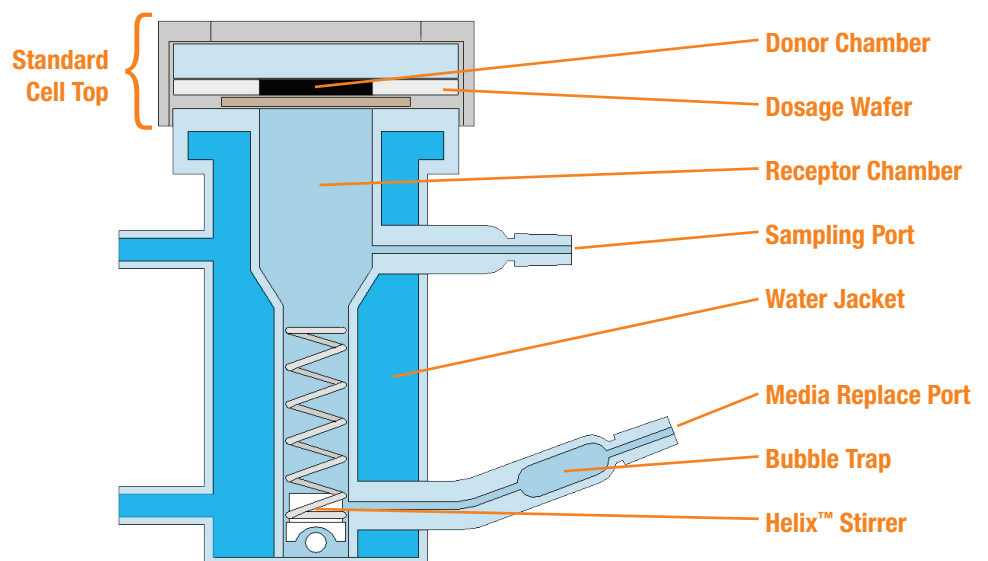
The Vertical Diffusion Cell

The vertical diffusion cell, first popularized by Dr. Thomas Franz, has been applied to a number of skin permeation studies, including topical and transdermal drug delivery formulations, as well as ophthalmics, cosmetics, skin care products, and pesticides. The vertical diffusion cell system is an ideal tool for quality control of topical preparations.

See FDA guideline SUPAC-SS, and USP <1724>.



The **Hanson Vertical Diffusion Cell (VDC)** is designed for accuracy and ease of use, with over thirty years of rigorous industry, university, and regulatory application and collaboration. VDCs are designed to be “occluded” (sealing the donor from air) to minimize any back-diffusion from sampling. VDCs include individualized serial numbers and are readily available in three convenient sizes. Custom VDCs are also available.



Hanson VDC Cross Section

(Standard Cell Top included with each Hanson VDC)



Vertical Diffusion Cells

The Hanson VDC

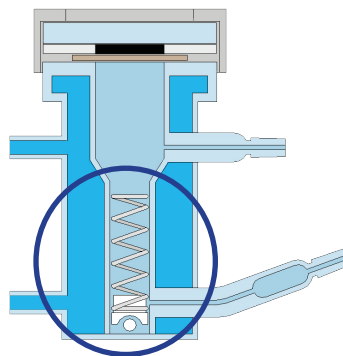
Features & Benefits

- Ideal for quality control of topicals
- Newly redesigned for accuracy and ease of use
- Occluded cell design minimizes back-diffusion
- 3 sizes readily available in either clear or amber glass
- 30+ years of Hanson design research and application
- Manual sampling capability
- Automated sampling capability with the Hanson Vision[®] Microette[™] diffusion test system

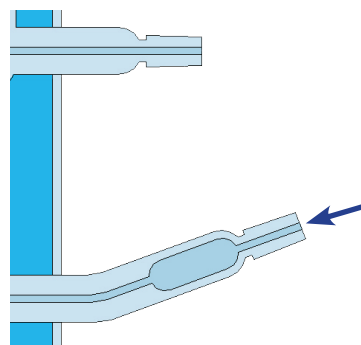


The Vision Microette Diffusion Test System

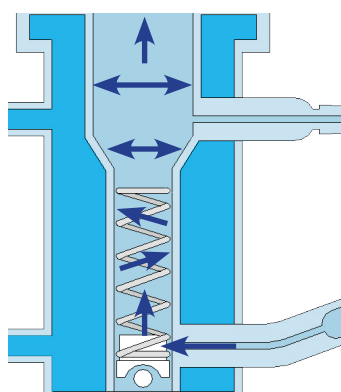
How Do You Sample with a VDC?



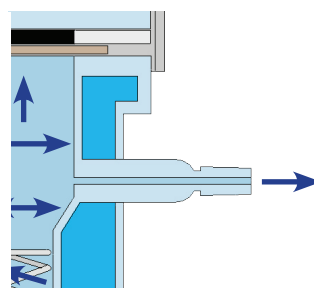
1. The Helix stirrer is stopped to prevent media from mixing.



2. New media is slowly pushed into the VDC through the media replace port.



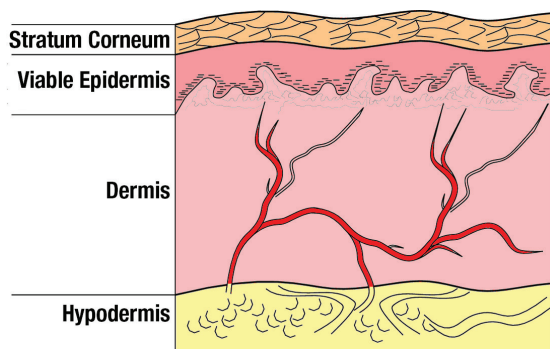
3. The VDC is pressurized by the new media.



4. A sample is pushed from the VDC through the sampling port.

Why Use Topicals and Diffusion Cell Testing?

- Topicals offer the shortest route between the treatment area and application point.
- Topicals often provide a faster relief of symptoms.
- Diffusion cell testing mimics the process of topicals diffusing into the skin.
- Diffusion cell testing helps determine release rate.



Layers of the Human Skin

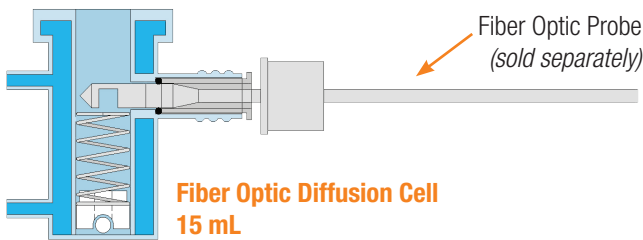


Vertical Diffusion Cells

The Hanson VDC

Custom & Special Application VDCs

Custom VDCs and special application VDCs, like the Hanson Fiber Optic Diffusion Cell, are also available from Hanson Research. Contact us with your requirements, and we will be happy to assist you with your needs.

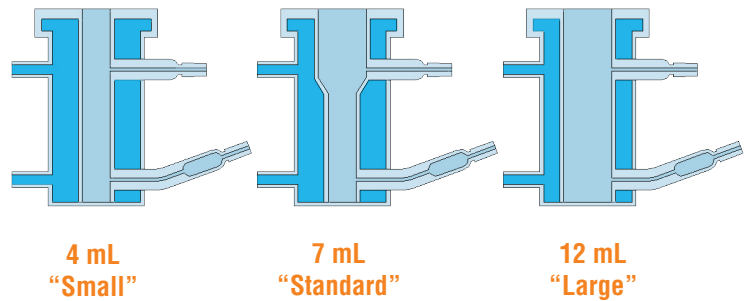
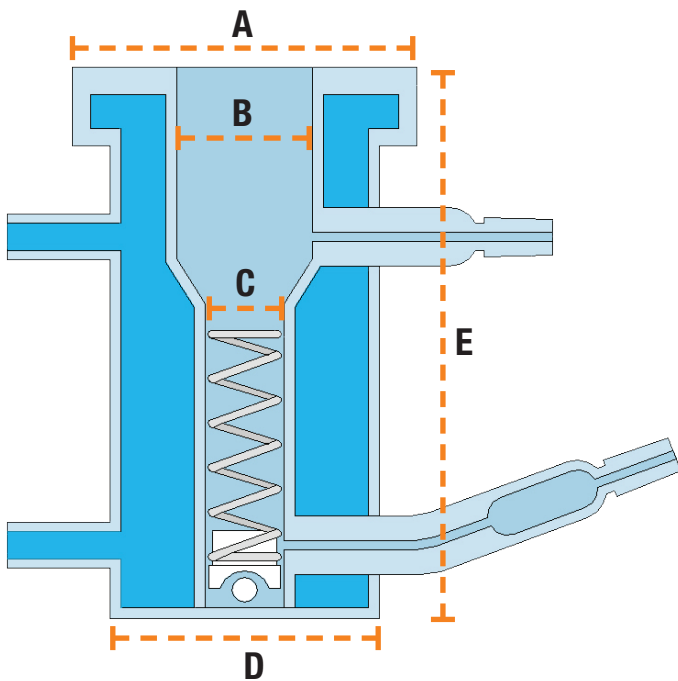


A purchase of a **Hanson VDC** not only includes a precision glass cell with receptor chamber, sampling and media replace ports, and an outside water jacket for temperature control, but also:

1. a **Standard Cell Top** with donor chamber,
2. a **Clamp Assembly** that ensures placement of the Standard Cell Top,
3. a **Dosage Wafer**, and
4. a **Helix Kit**.

VDC Colors & Sizes

VDCs are available in amber or clear colors, as well as small, standard, and large sizes, or custom sizes upon request. The 7 mL standard size VDC is recommended by FDA for topicals.



DIM	For Cell Type		
	4 mL	7 mL	12 mL
A	Ø38 mm	Ø38 mm	Ø38 mm
B	Ø9 mm	Ø15 mm	Ø15 mm
C	Ø9 mm	Ø9 mm	Ø15 mm
D	Ø30 mm	Ø30 mm	Ø30 mm
E	61 mm	61 mm	61 mm



Vertical Diffusion Cells

Cell Tops

Standard Cell Top



The **Standard Cell Top** is included with a Hanson VDC. It is occluded to minimize back diffusion during the sampling process.

Open Cell Top with Cap



The **Open Cell Top with Cap** is easily adaptable to the Hanson VDC. The cap can be removed between sampling time points to add or remove material.

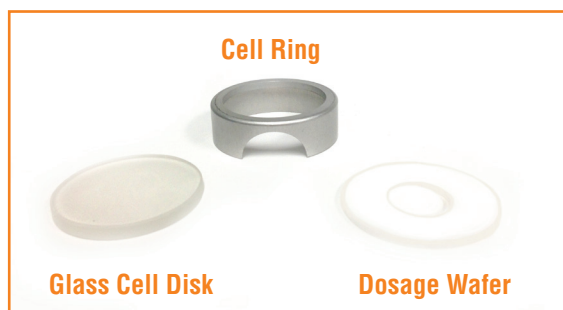
Best used for **viscous materials** such as:

- Creams
- Ointments
- Gels

Best used for **less viscous materials** such as:

- Lotions

Standard Cell Top Components



Open Cell Top with Cap Components



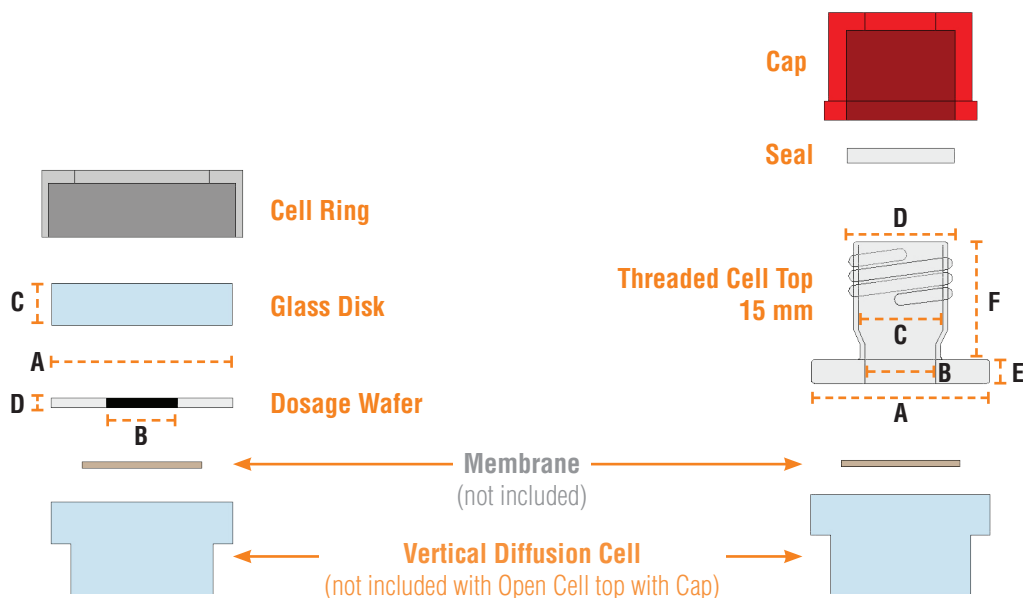


Vertical Diffusion Cells

Cell Tops

Standard Cell Top

Open Cell Top with Cap



DIM	For Cell Type		
	4 mL	7 mL	12 mL
A	Ø38 mm	Ø38 mm	Ø38 mm
B	Ø9 mm	Ø15 mm	Ø15 mm
C	4 mm	4 mm	4 mm
D	1.5 mm	1.5 mm	1.5 mm

DIM	For Cell Type		
	4 mL	7 mL	12 mL
A	Ø38 mm	Ø38 mm	Ø38 mm
B	Ø9 mm	Ø15 mm	Ø15 mm
C	Ø9 mm	Ø18 mm	Ø18 mm
D	Ø12 mm	Ø22 mm	Ø22 mm
E	6 mm	6 mm	6 mm
F	30 mm	30 mm	30 mm

Standard Cell Top

Description	For Cell Type		
	4 mL	7 mL	12 mL
Cell Ring	58-001-507	58-001-507	58-001-507
Glass Cell Disk	58-001-506	58-001-506	58-001-506
Dosage Wafer	58-001-518	58-001-521	58-001-521

Open Cell Top with Cap

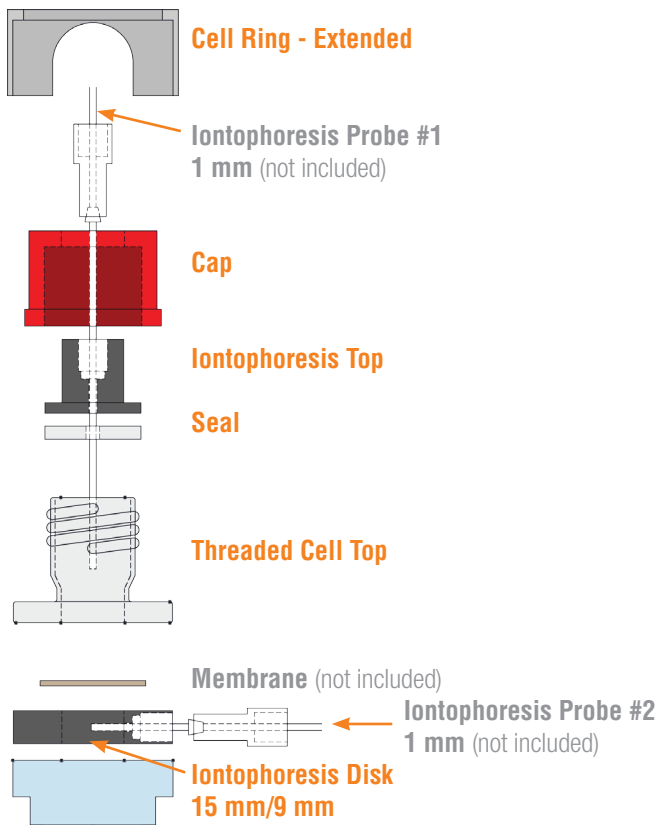
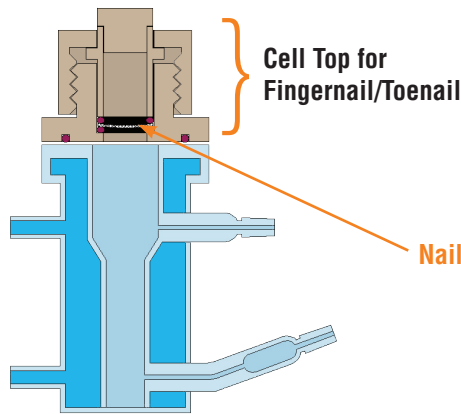
Description	For Cell Type		
	4 mL	7 mL	12 mL
Threaded Cell Top	58-001-530	58-001-531	58-001-531
Amber Threaded Cell Top	58-001-548	58-001-549	58-001-549



Vertical Diffusion Cells Cell Tops

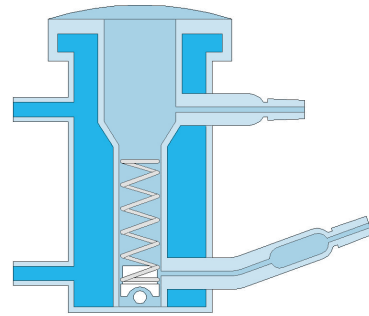
Custom & Special Application Cell Tops

Custom and special application cell tops are also available from Hanson Research. Contact us with your requirements, and we will be happy to assist you with your needs.

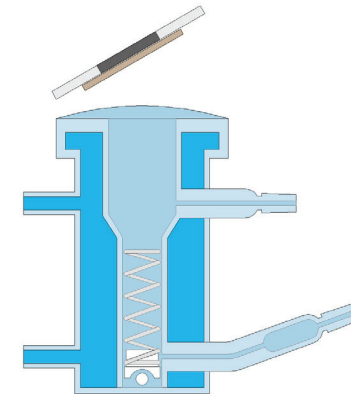


Iontophoresis Cell Top Diagram

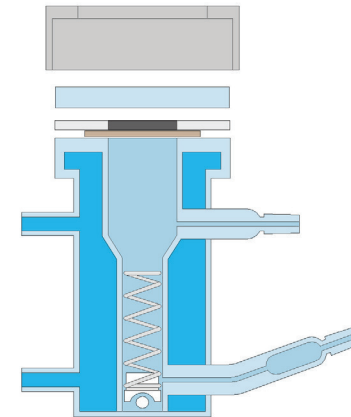
How Do I Apply a Standard Cell Top?



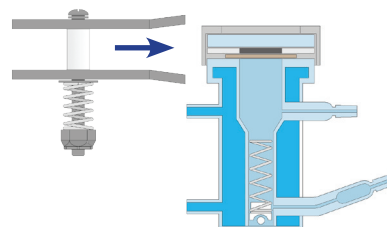
1. Fill the VDC with media as shown.
A positive meniscus should form at the top of the VDC.



2. Place the Dosage Wafer/Membrane down on one edge of the VDC and roll on.
This helps prevent bubbles from being trapped under the membrane.



3. Place the Glass Cell Disk and Cell Ring on top of Dosage Wafer/Membrane.



4. Hold cell top in place and slide on the Clamp Assembly.



Vertical Diffusion Cells

Ordering Information

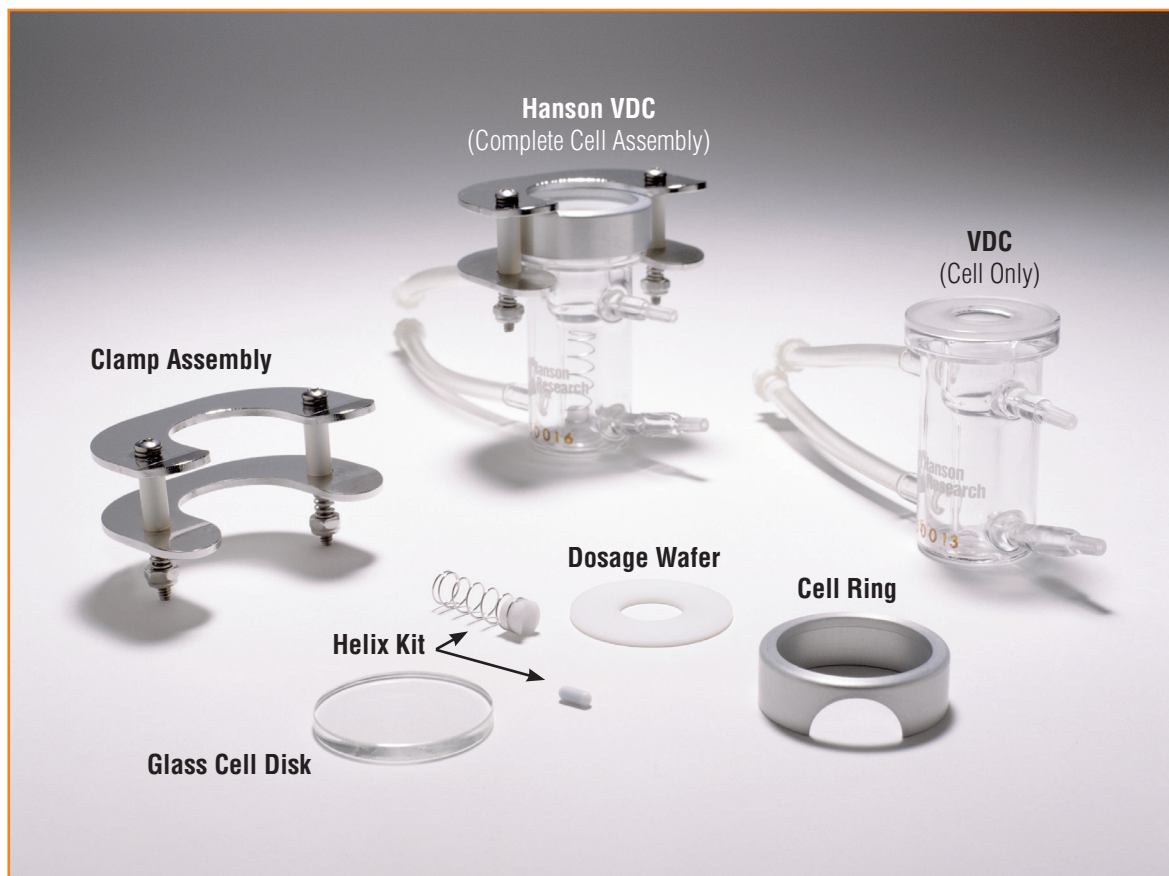
Complete cell assemblies include receptor chamber and clamp, dosage wafer (300 mg “infinite dose”), sampling and media replace ports, outside jacket for temperature control, and Helix stirrer. Each cell includes an individual serial number; volumes listed are nominal value. *Ordering 1 extra cell with each group of 6 is strongly recommended.*

Please consult Hanson Research for special cell requirements.

See USP <1724> for further information.

Vertical Diffusion Cell (VDCs) *(Complete Cell Assemblies)*

<i>p/n</i>	<i>Description</i>
58-001-451	Vertical Diffusion Cell, 9 mm Orifice, 4 mL vol, “ Small ”
58-001-455	Vertical Diffusion Cell, 15 mm Orifice, 7 mL vol, “ Standard ” <i>(recommended by FDA for topicals)</i>
58-001-459	Vertical Diffusion Cell, 15 mm Orifice, 12 mL vol, “ Large ”
58-001-452	Vertical Diffusion Cell, 9 mm Orifice, 4 mL vol, Amber, “ Small ”
58-001-456	Vertical Diffusion Cell, 15 mm Orifice, 7 mL vol, Amber, “ Standard ” <i>(recommended by FDA for topicals)</i>
58-001-460	Vertical Diffusion Cell, 15 mm Orifice, 12 mL vol, Amber, “ Large ”





Vertical Diffusion Cells

Ordering Information

Special Application Cells & Cell Tops *(Special Order)*

p/n	Description
58-001-471	Diffusion Cell Top—Finger/Toenail Holder, 10 mm, PEEK <i>(cell not included; min order 6)</i>
58-001-472	Fiber Optic Diffusion Cell, 15 mm <i>(F/O probe not included, min order 6)</i>
58-001-473	Fiber Optic Diffusion Cell, 15 mm, Amber <i>(F/O probe not included, min order 6)</i>
58-001-707	Iontophoresis Cell Top Kit, 9 mm <i>(set/6) (for 4 mL cell; cell not included)</i>
58-001-708	Iontophoresis Cell Top Kit, 15 mm <i>(set/6) (for 7 mL & 12 mL cell; cell not included)</i>
58-001-571	Patch Support <i>(replaces Glass Cell Disk and Wafer to allow for air circulation at top of patch)</i>

Cell Accessories & Spare Parts

p/n	Description
58-001-450	Clamp Assembly
58-001-453	Vertical Diffusion Cell, 4 mL, Clear <i>(cell only)</i>
58-001-454	Vertical Diffusion Cell, 4 mL, Amber <i>(cell only)</i>
58-001-457	Vertical Diffusion Cell, 7 mL, Clear <i>(cell only)</i>
58-001-458	Vertical Diffusion Cell, 7 mL, Amber <i>(cell only)</i>
58-001-461	Vertical Diffusion Cell, 12 mL, Clear <i>(cell only)</i>
58-001-462	Vertical Diffusion Cell, 12 mL, Amber <i>(cell only)</i>
58-001-467	Helix Kit, 9 mm <i>(for 4 mL & 7 mL cell)</i>
58-001-468	Helix Kit, 15 mm <i>(for 12 mL cell)</i>
58-001-506	Glass Cell Disk
58-001-507	Cell Ring
58-001-518	Dosage Wafer, 9 mm <i>(for 4 mL cell)</i>
58-001-521	Dosage Wafer, 15 mm <i>(for 7 mL & 12 mL cells)</i>
58-001-556	Dosage Wafer, Double Thick, 9 mm x 3.0 mm <i>(for 4 mL cell)</i>
58-001-551	Dosage Wafer, Double Thick, 15 mm x 3.0 mm <i>(for 7 mL & 12 mL cells)</i>
91-030-062	Membranes, 25 mm diam, 0.45 micron (100/pk) <i>(recommended)</i>
59-107-012	Cell Cleaning Adapter Kit, Vision Microette and MicroettePlus <i>(recommended spare)</i>
58-001-529	PVC Cell Top w/ ¼-28 Port <i>(fits both 9 mm & 15 mm cells, a convenient service tool that holds a temperature probe inside your VDC while you validate VDC temperature)</i>