DIFFUSION TEST SYSTEMS

The Vision Microette system automates sampling from groups of six Hanson Vertical Diffusion Cells (VDCs) for extensive unattended tests and handles surfactants, saline, and hydroalcoholic receptor solutions. The Vision Microette is an ideal research and quality control tool for the study of topical and transdermal drug delivery formulations, as well as ophthalmics, cosmetics, skin care products, and pesticides.

VISION® MICROETTE™ AUTOMATED TEST SYSTEM

1. Programmable Circulating Waterbath
2. Vision® Mircoette™
3. 6-Cell Drive System
4. Vision® AutoFill™

1. 2. 3. 4.

MANUAL DIFFUSION TESTING

The Hanson **6-Cell Manual Diffusion Test System** is a startup vertical diffusion cell test system ideal for manual use and sampling. It is adaptable for later addition of the Vision Microette autosampler. The Manual Diffusion Test System includes:

- 6-Cell Drive System
- 6 Vertical Diffusion Cells
- Jacketed Beaker for Media Replacement
- Supply Kit with Manual Sampling Syringe

58-001-401
6-Cell Manual Diffusion Test System w/ 4 mL Cells, Clear
58-001-411
6-Cell Manual Diffusion Test System w/ 4 mL Cells, Amber
58-001-402
6-Cell Manual Diffusion Test System w/ 7 mL Cells, Clear
58-001-412
6-Cell Manual Diffusion Test System w/ 7 mL Cells, Amber
58-001-403
6-Cell Manual Diffusion Test System w/ 12 mL Cells, Clear
58-001-413
6-Cell Manual Diffusion Test System w/ 12 mL Cells, Amber

AUTOMATED DIFFUSION TESTING

The Vision Microette Automated Test System requires:

- Vision® Mircoette™
- Vision® AutoFill™
- 6-Cell Drive System
- 6 Vertical Diffusion Cells
- Programmable Circulating Waterbath

59-101-003
Vision Microette Autosampler, Single-Group
59-101-002
Vision Microette Autosampler, Multi-Group

61-201-001
AutoFill Collector

58-001-420
6-Cell Drive System, MicrottePlus/Vision Microette

58-001-430
Waterbath, Programmable Circulating, 115 V, Vision Microette
(requires firmware ver. 2.11)
58-001-431
Waterbath, Programmable Circulating, 230 V, Vision Microette
(requires firmware ver. 2.11)

SINGLE-GROUP VS. MULTI-GROUP

The Vision Microette includes two models: a versatile "Multi-Group" system that can automate up to 3 groups of VDCs, and a lower cost "Single-Group" system that automates 1 group of VDCs.

To expand the Multi-Group system from 1 group of VDCs to more, an additional 6-Cell Drive System, 6 VDCs, and Vision AutoFill is required.

US Patents; CE / CSA / RoHS compliant

6 CELLS SINGLE-GROUP SETUP

Vision Microette Single-Group setup automates sampling from 1 group of 6 VDCs (6 cells total).

12 CELLS MULTI-GROUP SETUP

Vision Microette Multi-Group setup automates sampling from 2 groups of 6 VDCs (12 cells total).

18 CELLS MULTI-GROUP SETUP

Vision Microette Multi-Group setup automates sampling from 3 groups of 6 VDCs (18 cells total).

MULTI-GROUP EXPANSION KIT

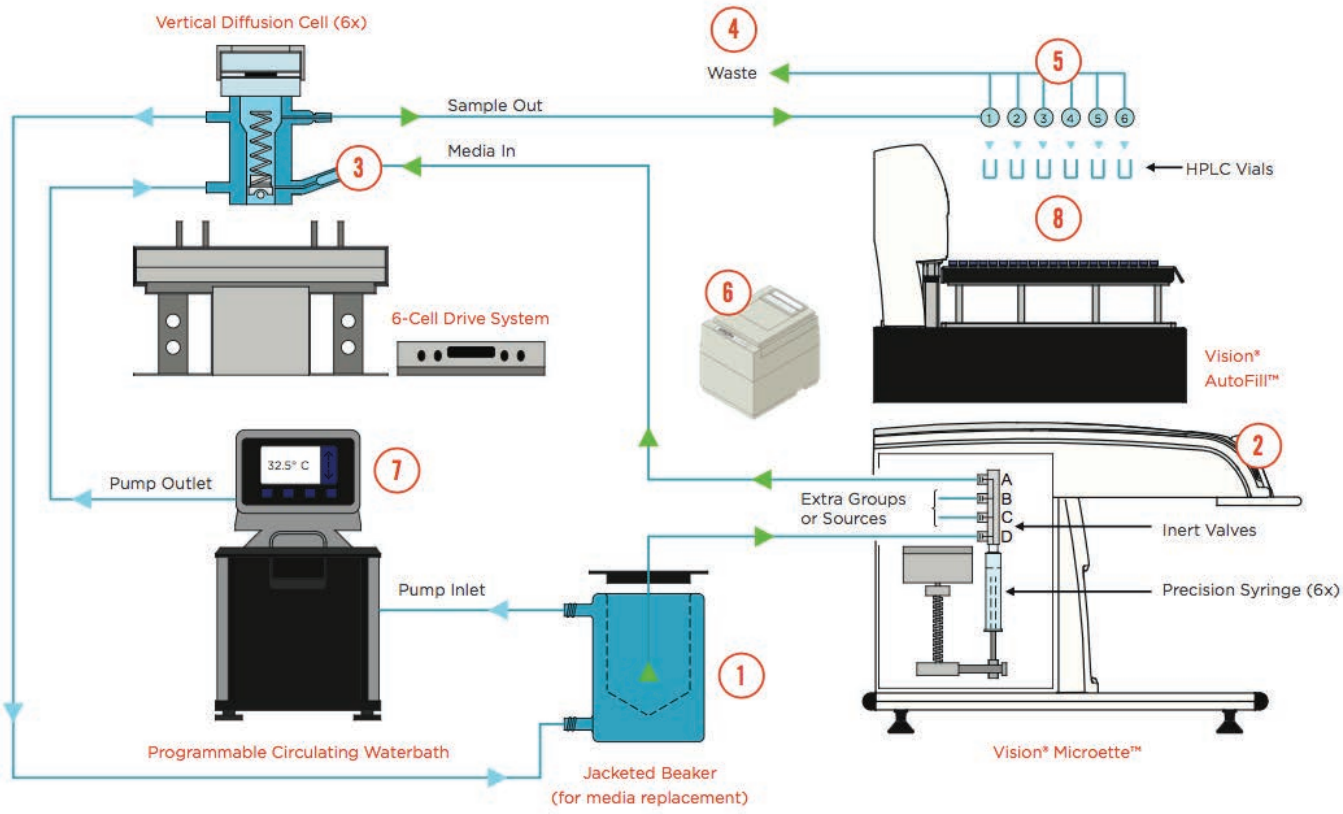
58-001-720 Expansion Kit, Multi-Group (order 1 per additional 6-cell group)

SYSTEM ACCESSORIES

The Startup Tool Kit provides all the tools needed to prepare vertical diffusion cells for a diffusion test. It includes an applicator to apply dosages to the cell top and cleaning tools that conveniently extract media from the cells without the need to remove the cells from the stand.

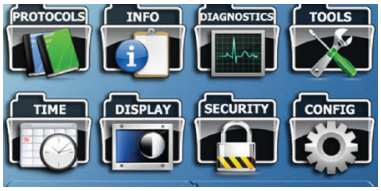
58-001-721 Startup Tool Kit, 115 V
58-001-722 Startup Tool Kit, 230 V
59-107-012 Cell Cleaning Adapter Kit
59-107-011 Needle Cleaning Adapter Kit (6/pk)
58-001-716 Check Valves for Manual Diffusion Cell System (100/pk)
91-030-155 Syringe, Manual Sampling, 1 mL, Manual Diffusion
91-030-150 Vials w/ Pre-Cut Septum, HPLC, UPLC, 12 mm x 32 mm (100/pk)
91-030-062 Membrane for Cells, 25 mm diam x 0.45 micron (100/pk) (filter media: hydrophilic polysulfone)

HOW THE AUTOMATED SYSTEM WORKS



1. The system is set up by filling each Hanson Vertical Diffusion Cell (VDC) with heated deaerated receptor solution from the Jacketed Beaker. The dosage wafer with membrane is filled with the formulation and placed on top of the VDC to start the test.

2. A given protocol is activated to initiate the start. On program command, the Helix™ stirrer stops. *The Vision Microette saves up to 25 protocols for sampling volumes, and time points, including advanced routines for cell dilution and other requirements.*



3. A selected aliquot of fresh replacement media is injected from a precision syringe pump in the Vision Microette through the VDC's media replace port into its receptor chamber. *This forces an exact equal amount from the VDC to be extracted through the sampling port to the Vision AutoFill.*

4. A rinse cycle just before each sampling cycle ejects contents of the sample tube to waste. *This cleans the sample lines prior to sampling and collection.*

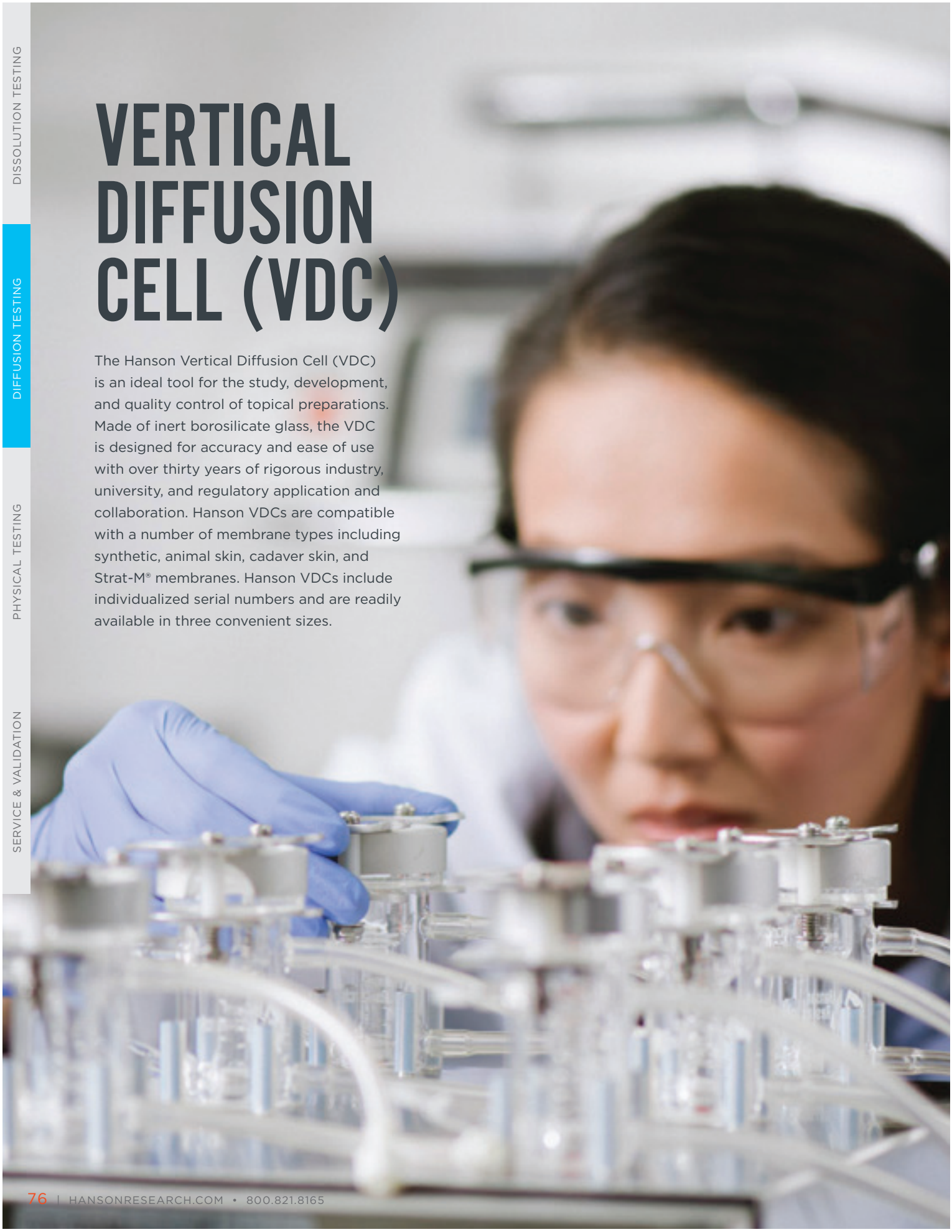
5. Sample aliquots are collected and archived in pre-cut septum HPLC vials in the Vision AutoFill. When each sampling point is complete, the Helix stirrer starts again to restore homogeneity.

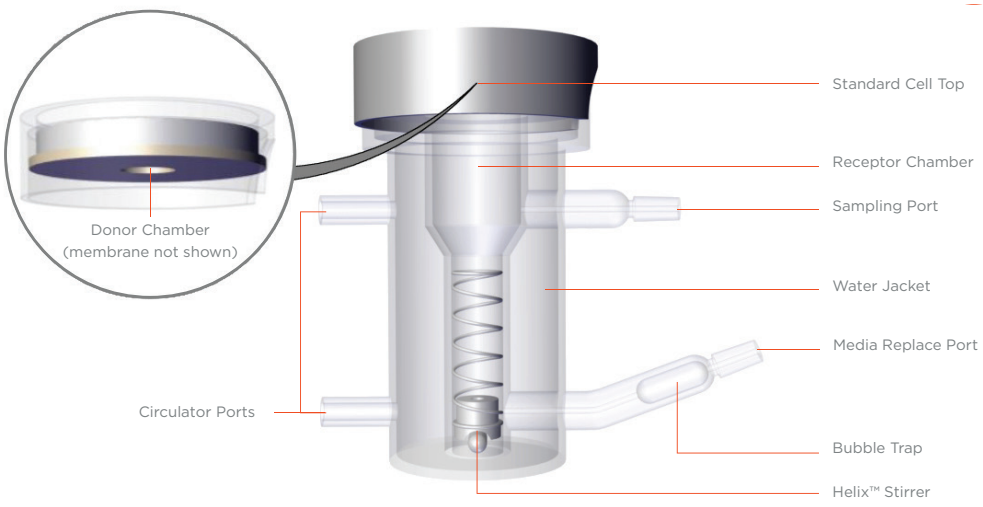
6. This sampling and collection sequence continues for each programmed time point until the end of the test. The serial or network (PostScript) printer provides an ongoing status report of all test operating conditions.

7. Throughout the test, the Programmable Circulating Waterbath maintains controlled temperature in the Jacketed Beaker and each VDC (typically 32 °C for skin permeation studies).

VERTICAL DIFFUSION CELL (VDC)

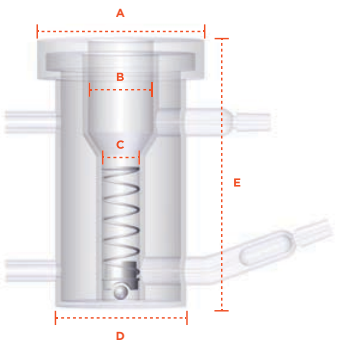
The Hanson Vertical Diffusion Cell (VDC) is an ideal tool for the study, development, and quality control of topical preparations. Made of inert borosilicate glass, the VDC is designed for accuracy and ease of use with over thirty years of rigorous industry, university, and regulatory application and collaboration. Hanson VDCs are compatible with a number of membrane types including synthetic, animal skin, cadaver skin, and Strat-M® membranes. Hanson VDCs include individualized serial numbers and are readily available in three convenient sizes.





FEATURES:

- Ideal for topical and transdermal drug delivery formulations, ophthalmics, cosmetics, skin care products, and pesticides
- "Occluded" design seals the donor from air to minimize any back-diffusion from sampling
- Water jacket covers entire receptor chamber for temperature consistency
- Bubble Trap catches bubbles before they enter VDC and affect the diffusion rate
- Circulator ports provide connections to ensure cell-to-cell temperature uniformity
- Shorter sampling port reduces dead volume
- Clamp Assembly holds the cell top in place while providing even cell-top pressure
- Purchase of a Hanson VDC includes Standard Cell Top and Clamp Assembly
- Automated sampling capability with the Vision® Microette™ diffusion test system
- USP <1724> compliant



	Cell Type		
	4 mL	**7 mL**	**12 mL**
A	38 mm	38 mm	38 mm
B	9 mm	15 mm	15 mm
C	9 mm	9 mm	15 mm
D	30 mm	30 mm	30 mm
E	61 mm	61 mm	61 mm

Hanson VDCs are available in the three standard sizes in amber or clear glass, or in custom sizes upon request. The 7 mL "Standard" VDC is recommended by the US FDA for topicals.

VERTICAL DIFFUSION CELLS – COMPLETE

(includes Standard Cell Top, Helix Kit, and Clamp Assembly)

4 ML "SMALL"

58-001-451
Vertical Diffusion Cell, 9 mm orifice, 4 mL vol, "Small" (serialized)

58-001-452
Vertical Diffusion Cell, 9 mm orifice, 4 mL vol, Amber, "Small" (serialized)

7 ML "STANDARD"

Recommended by US FDA for topicals

58-001-455
Vertical Diffusion Cell, 15 mm orifice, 7 mL vol, "Standard" (serialized)

58-001-456
Vertical Diffusion Cell, 15 mm orifice, 7 mL vol, Amber, "Standard" (serialized)

12 ML "LARGE"

58-001-459
Vertical Diffusion Cell, 15 mm orifice, 12 mL vol, "Large" (serialized)

58-001-460
Vertical Diffusion Cell, 15 mm orifice, 12 mL vol, Amber, "Large" (serialized)

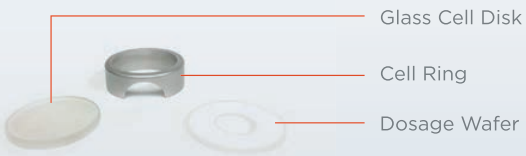
VERTICAL DIFFUSION CELLS – SPARE PARTS

58-001-467 Helix Kit (for 4 mL and 7 mL VDCs)
58-001-468 Helix Kit (for 12 mL VDCs)
58-001-453 Vertical Diffusion Cell, 4 mL, Clear (cell only)
58-001-454 Vertical Diffusion Cell, 4 mL, Amber (cell only)
58-001-457 Vertical Diffusion Cell, 7 mL, Clear (cell only)
58-001-458 Vertical Diffusion Cell, 7 mL, Amber (cell only)
58-001-461 Vertical Diffusion Cell, 12 mL, Clear (cell only)
58-001-462 Vertical Diffusion Cell, 12 mL, Amber (cell only)

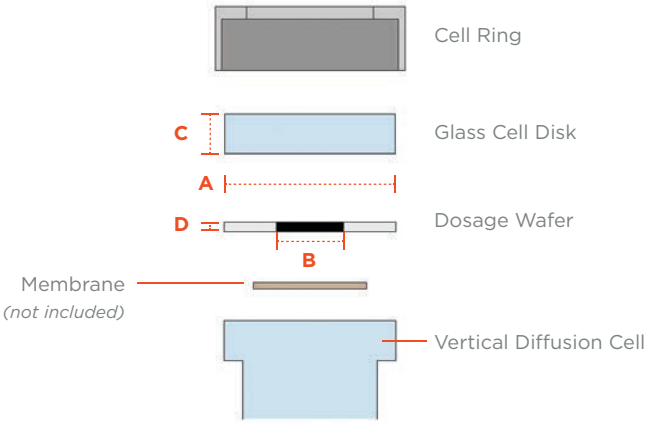
STANDARD CELL TOP

The Standard Cell Top is included with a Hanson VDC. It is occluded to minimize back diffusion during the sampling process. A membrane is applied to one side of the dosage wafer, and the dosage is applied to the opposite side in the donor chamber. This cell top is best used for viscous materials such as creams, ointments, and gels.

STANDARD CELL TOP COMPONENTS



	Cell Type		
	4 mL	**7 mL**	**12 mL**
A	38 mm	38 mm	38 mm
B	9 mm	15 mm	15 mm
C	4 mm	4 mm	4 mm
D	1.5 mm	1.5 mm	1.5 mm

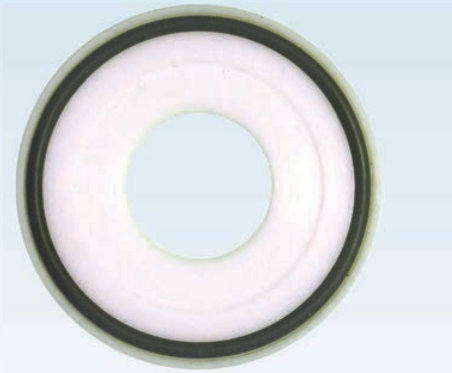


STANDARD CELL TOPS – INDIVIDUAL COMPONENTS

58-001-507 **Cell Ring**
58-001-506 **Glass Cell Disk**
58-001-518 **Dosage Wafer, 9 mm** (for 4 mL VDCs)
58-001-521 **Dosage Wafer, 15 mm** (for 7 mL and 12 mL VDCs)
58-001-450 **Clamp Assembly**

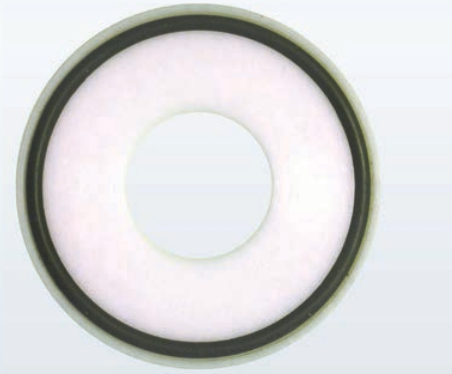
VERTICAL DIFFUSION CELL TESTING WITH THE STRAT-M® MEMBRANE

Hanson Research has worked with EMD Millipore to develop a special dosage wafer for the Hanson Vertical Diffusion Cell (VDC) to accommodate the EMD Millipore Strat-M® membrane. This synthetic, non-animal based model for transdermal diffusion testing is predictive of diffusion in human skin without lot-to-lot variability, safety, and storage requirements.



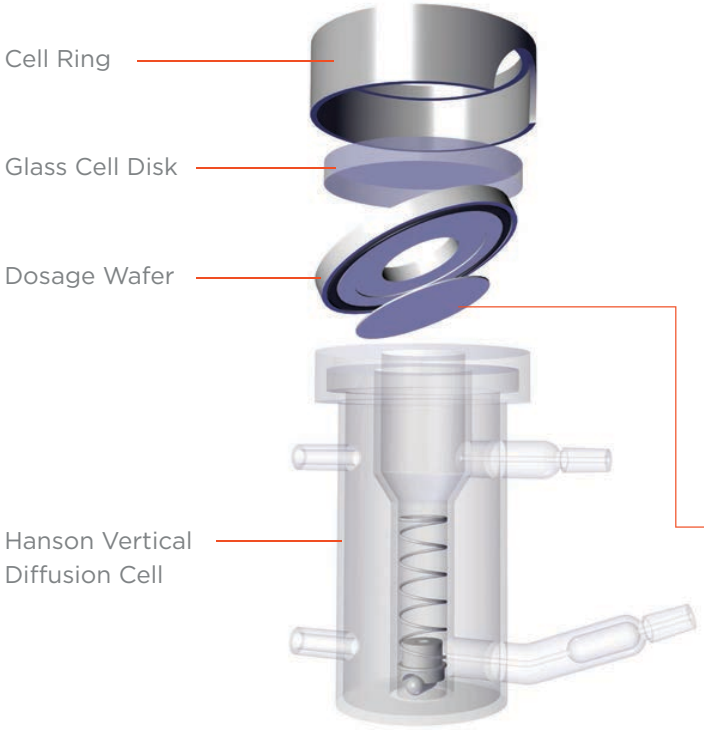
DOUBLE THICK DOSAGE WAFER, STRAT-M®

The Hanson VDC dosage wafer for the Strat-M® membrane is specifically designed to readily accommodate the EMD Millipore 25 mm Strat-M® membrane. The wafer is double thick, with a 3 mm deep dosage area, and also includes a unique and proprietary Hanson O-ring design to effectively secure the Strat-M® membrane in the VDC device without any leakage problem.



DOUBLE THICK DOSAGE WAFER, NO LEAK

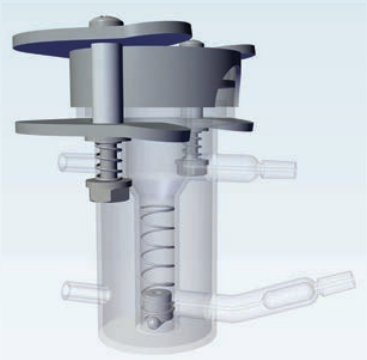
Hanson Research has also developed a similar double thick dosage wafer for use with other synthetic membrane types. The “No-Leak” dosage wafer includes a similar O-ring seal to minimize any leakage problems that analysts have experienced when working with the VDC. The double thick dosage area (3 mm deep) accommodates the infinite dose requirement for semisolid diffusion testing of creams, ointments, and gels.



Diffusion through **Strat-M®** membrane is predictive of diffusion through human skin for a wide range of substances:

- Active pharmaceutical ingredients (API)
- Cosmetic actives
- Formulations
- Personal care products
- Pesticides
- Chemicals

Membranes such as the Strat-M® membrane are applied to the bottom side of the Hanson VDC dosage wafer to act as a screen between the donor and receptor chambers.



VDC with Clamp Assembly

In most cases, Strat-M® membrane correlates more closely to human skin than do animal skin models commonly used for in vitro screening of transdermal formulations. And because it is a synthetic test model with low variability and no special storage or hydration requirements, Strat-M® membrane simplifies experimental design and data analysis.

Double Thick Dosage Wafers are designed to work with the 58-Series Hanson Vertical Diffusion Cell (VDC) – consult your local Hanson representative for full details on diffusion cell testing.

59-104-110
Dosage Wafer, Strat-M, Double Thick w/ O-Ring, 9 mm x 3 mm
(for 4 mL VDCs)

59-104-120
Dosage Wafer, Strat-M, Double Thick w/ O-Ring, 15 mm x 3 mm
(for 7 mL and 12 mL VDCs)

59-104-130
Dosage Wafer, No-Leak, Double Thick w/ O-Ring, 9 mm x 3 mm
(for 4 mL VDCs)

59-104-140
Dosage Wafer, No-Leak, Double Thick w/ O-Ring, 15 mm x 3 mm
(for 7 mL and 12 mL VDCs)

Required for Double Thick Dosage Wafers:

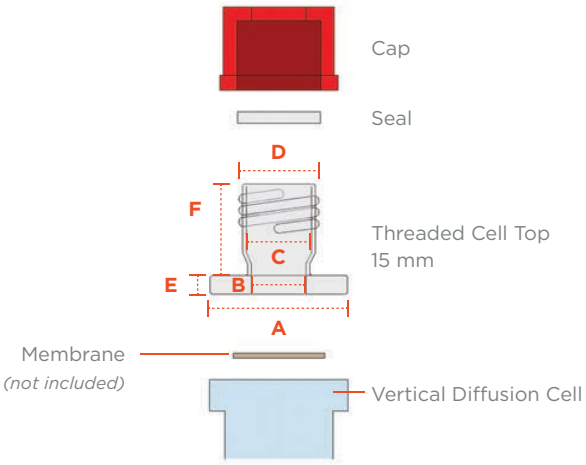
59-104-150
Clamp Assembly for Double Thick Dosage Wafer

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. It is best used for less viscous materials because the cell top can be assembled prior to applying the dose. The larger donor chamber also allows more donor material to be used.

OPEN CELL TOP WITH CAP COMPONENTS

	Cell Type		
	4 mL	**7 mL**	**12 mL**
A	38 mm	38 mm	38 mm
B	9 mm	15 mm	15 mm
C	9 mm	18 mm	18 mm
D	12 mm	22 mm	22 mm
E	6 mm	6 mm	6 mm
F	30 mm	30 mm	30 mm



OPEN CELL TOPS

58-001-530 Open Cell Top w/ Cap, 9 mm, Glass (2 mL capacity; for 4 mL VDCs)
58-001-548 Open Cell Top w/ Cap, 9 mm, Glass, Amber (2 mL capacity; for 4 mL VDCs)
58-001-531 Open Cell Top w/ Cap, 15 mm, Glass (6 mL capacity; for 7 mL and 12 mL VDCs)
58-001-549 Open Cell Top w/ Cap, 15 mm, Glass, Amber (6 mL capacity: for 7 mL and 12 mL VDCs)

CUSTOM APPLICATIONS

Novel dosage forms are being researched everyday throughout various scientific industries. Hanson Research's team of development engineers can design special cells and cell tops to accommodate custom applications such as in-situ fiber optics, non-viscous dosage forms, permeation through fingernails and toenails, iontophoresis and much more. Hanson can support your unique application.

SPECIAL APPLICATION CELLS & CELL TOPS

58-001-472 **Cell, Fiber Optic Diffusion, 15 mm** (Special Order–min order 6) (Fiber Optic Probe not included)
58-001-473 **Cell, Fiber Optic Diffusion, 15 mm, Amber** (Special Order–min order 6) (Fiber Optic Probe not included)
58-001-471 **Cell Top, Finger/Toe Nail Holder, 10 mm, PEEK** (Special Order–min order 6) (cell not included)
58-001-707 **Cell Top Kit, Iontophoresis, 9 mm** (set/6) (Special Order–min order 6) (for 4 mL VDCs)
58-001-708 **Cell Top Kit, Iontophoresis, 15 mm** (set/6) (Special Order–min order 6) (for 7 mL and 12 mL VDCs)
58-001-571 **Patch Support** (replaces Glass Cell Disk and Dosage Wafer to allow for air circulation at top of patch)