MilliporeSigma

MULTIPLY YOUR SUCCESS

MultiScreen® and Millicell® Plates for Assay Development

State-of-the-art tools for drug discovery research and sample preparation

Millipore®

Preparation, Separation, Filtration & Monitoring Products

This guide for pharmaceutical development, discovery research, molecular biology and sample preparation includes products for screening and cell culture. These products provide proven solutions for a range of applications and are backed by extensive technical support.

For more information

For more information on products and technical support, visit **SigmaAldrich.com/cellculture**

Table of Contents

MULTIPLY YOUR SUCCESS

with MultiScreen® and Millicell® plates

In academic and industry research as well as in drug discovery, the need to simultaneously process multiple samples while conserving reagents and resources continues to increase. The demand for more sensitive detection limits coupled with higher sample throughput and smaller volume assays is critical to progress in basic research and pharmaceutical development, accelerating advances in any laboratory where multisample applications are essential. Multiwell plates enable simple, rapid, automation-compatible preparation and analysis of multiple samples to fulfill the requirements of life science, environmental, analytical, clinical, forensic, diagnostic and industrial workflows.

MultiScreen® plates meet specific performance criteria for sample preparation and assay methodology requiring low nonspecific binding of protein and drug analytes, solvent compatibility, and sample throughput. MultiScreen® plates are used to prepare and collect samples for analysis and miniaturize assays in 96- or 384-well formats, while Millicell® products offer the versatility of 6, 12, 24, or 96 wells for cell culture applications. The following pages introduce plate technology developed for reliable and robust assays, cell growth, sample handling, sample incubation, and precision transfer of filtrate.

MultiScreen® and Millicell® plates: integral tools in the drug discovery process

In the drug discovery workflow, MultiScreen® plates are particularly useful in the processes upstream of preclinical development—target selection, lead discovery, and lead optimization—where a large number of samples are analyzed. During later-stage clinical trials, MultiScreen® plates once again prove critical in the workflow, with the need for bioanalysis of large numbers of clinical samples driving demand for increased sample throughput.

Perhaps the most critical screening factor in the drug discovery process is the quantification of a compound's specific affinity for a particular target, such as a cellular receptor, NME [new molecular entity], or NCE [new chemical entity]. Whether the process is carried out as a primary screening method during optimization, development, or control stages for large compound libraries, or as a secondary screening tool to rank compounds for binding affinity, there will be a requirement for throughput, automation compatibility, and precision analyses (i.e. receptor-ligand binding). The same is true in research labs, where the ability to test and analyze many samples at once is important for accelerating discovery.

MultiScreen® applications in the pharmaceutical and research workflows include:

Target Identification / Selection

- Target binding assays
- ELISA and ELISpot assays
- Bead-based assays
- Transport assays
- Migration / invasion / chemotaxis assays

Lead Discovery / Optimization

- ADME Testing
- Solubility and PAMPA assays
- Toxicology assays

MultiScreen®$_{HTS}$ Filter Plates made for automation

The standardized feature design of MultiScreen®$_{HTS}$ filter plates meets the universal automation standards for microplates as determined by the American National Standards Institute, Inc (ANSI) and the Society for Laboratory Automation and Screening (SLAS), parts 1-2004 through 4-2004. These consensus design elements are critical for use in programming systems that allow the plate to be easily gripped and moved around robotic decks and stackers, and to interact with other high-capacity handling and analysis equipment. Features of the automation plate series include rigid side walls to accommodate barcode labeling that facilitates ease of tracking when processing or storing numerous samples. Recessed underdrains permit efficient stacking and shuttling of plates in automated systems, and prevent cross-contamination—an attribute that is particularly important for radiometric assays. Wells are completely isolated to prevent signal crosstalk.

A comprehensive selection of ready-to-use plates for diverse applications

MultiScreen® plates are offered in a broad selection of stock configurations. Plates with 96- and 384-well capacity are fabricated using a diverse range of housing materials to ensure compatibility with varied media formulations. Plates are manufactured for both low and high protein binding, and feature exceptional signal-to-noise ratios.

MultiScreen® and Millicell® Filter Plate Features by Application

Membrane Type:	Durapore® membrane (PVDF)	MCE (Mixed cellulose ester)	Immobilon®-P membrane (PVDF)	PTFE	Isopore™ membrane (Polycarbonate)	Specialty Membranes
Common applications	Sample prep DNA binding Clinical diagnostics Protein kinase	ELISpot	ELISpot DNA binding Protein binding Lipid kinase assay	Total drug analysis Solubility testing In-plate protein precipitation	Cell growth Caco-2 assay Epithelial cell culture Solubility testing Migration, Invasion, Chemotaxis assays	Receptor binding assays Protein kinase assay DNA purification Cell harvesting assay
Membrane characteristics	Low protein/ nucleic acid binding	High protein/ nucleic acid binding	High protein/ nucleic acid binding	Organic solvent-resistant	translucent for visualization	glass fiber, paper
Pore sizes	0.22–1.2 µm	0.45 µm	0.45 µm	0.45 µm	0.4–8.0 µm	
Hydrophilic/ Hydrophobic	both	hydrophilic	hydrophobic	both	hydrophilic	hydrophilic
Sterile/ Non-sterile	both	both	both	non-sterile	both	non-sterile
Plate color	clear white opaque	clear opaque	styrene Barex® copolymer acrylic	solvent-resistant clear	clear	opaque

Contact your local Account Manager to determine which combinations of plate housing and membrane can be manufactured.

MultiScreen® Solid Plates made for assays and storage

Highest quality microplates for consistent performance

MultiScreen® assay and storage plates are offered in a selection of materials, colors, plate treatments, and plate formats so that you can select the optimal plate for your needs. Polystyrene plates in clear, black, and white colors provide superior performance in absorbance, luminescent, fluorescent, and radiometric assays. Polypropylene plates offer high chemical resistance and thermal stability for storage and liquid handling applications. Our 96-well and 384-well solid bottom MultiScreen® assay and storage plates can be depended on for quality and consistency.

Solid MultiScreen® plates for assays, collection, and storage

	MultiScreen® polystyrene plates	MultiScreen® polypropylene plates
Common applications	Luminescent, fluorescent, and absorbance assays, biochemical assays, ELISA	Collection, storage, liquid handling
Plate color	Clear, Black, White	Natural
Well shape	V-bottom, U-bottom, Flat bottom	V-bottom, U-bottom, Flat bottom
Format	96-well and 96 stripwell formats	96-well and 384-well formats
Specialty	Medium-binding and High-binding options for protein and antibody coating for ELISA applications	Free of detectable DNase, RNase, human DNA; non-pyrogenic

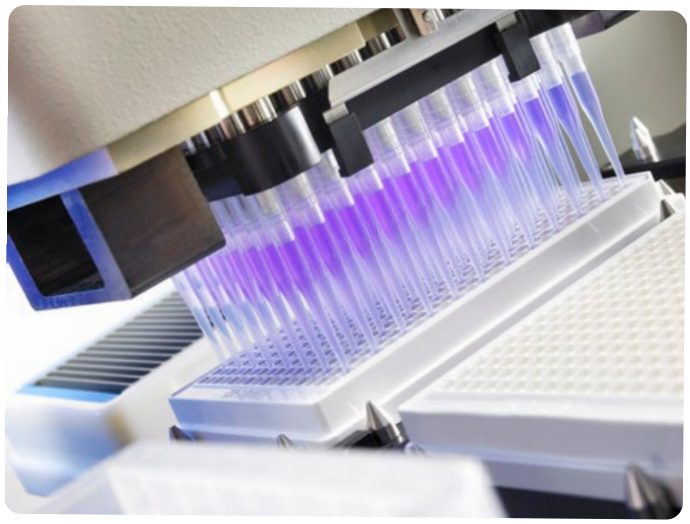
Product optimization options

We offer innovative plate customization* approaches to ensure implementation of the most robust, reproducible and efficient application processes for drug discovery or other industrial assay development. These tailored partnerships are built on communication with dedicated and expert field staff to develop an understanding of unique project needs.

Attributes that may be customized include:

- Membrane type and pore size
- Number of reaction wells
- Plate material
- Plate/receiver assembly combinations
- Sterilization
- Plate lot reserve

*Please contact your local Account Manager regarding minimum order volumes that may be required for custom products.



Lot-specific evaluation

Depending upon specified application requirements, or where exceptional consistency in plate performance is required, we offer a range of solutions for lot-specific evaluation. Please contact your local Account Manager to learn more about this service.

Labeling/barcoding

Process traceability is essential in drug development, and has become increasingly important in both academic and industrial research applications. These needs are quickly and efficiently addressed in plate-based applications by custom barcoding. We offer a barcode option for all MultiScreen®$_{HTS}$ plates. The placement and format of the barcode is selected by the customer for optimal efficiency with processing and analysis equipment configurations.

Barcode labeling advantages:

- Each plate is uniquely identified
- Origin and manufacturing are traceable
- Facilitates quality documentation
- Customer determines label features

Quality documentation

We offer full traceability of the manufacturing process for our products with quality documentation that meets ISO9001 certification standards.

Packaging

Specific product packaging configurations are also available as a custom option. Plates may be packaged up to ten per sleeve, and sterile plates are offered in single-plate pouch packaging.

Production scale up and logistics support

For scaling up application needs, we offer conversion of customer processes to increase the number of reaction wells for increased throughput. These projects are managed via close communication between the customer, our field application specialists, R&D, and product management. Our logistics support enables us to reserve specific product lots and to service delivery dates specified by the customer.

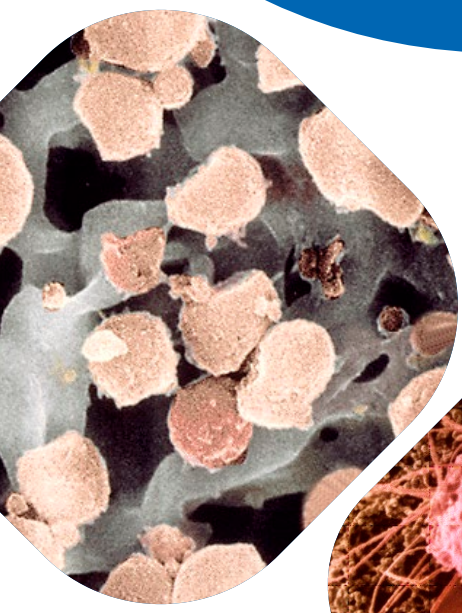
Cell-Based Assays

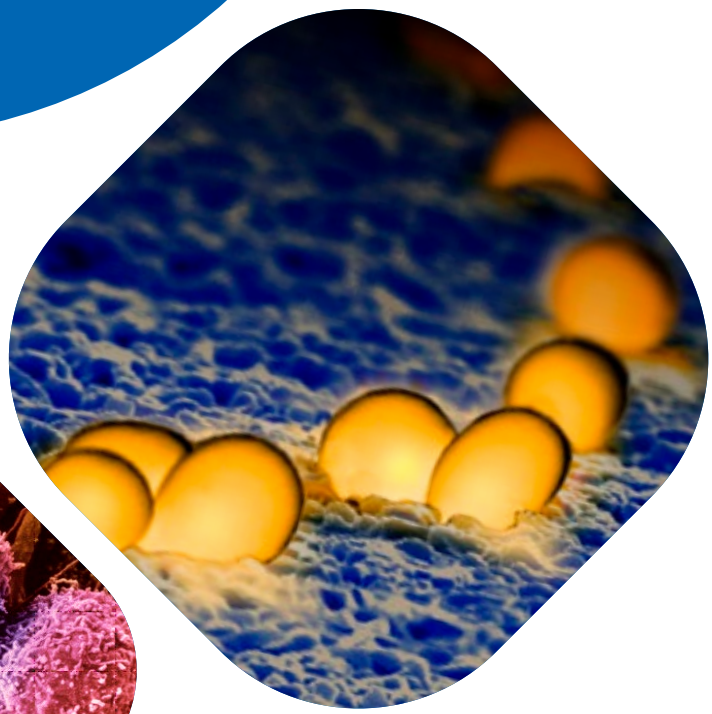
Cell-based assays are vital for direct and indirect detection of biological processes and the understanding of disease mechanisms. In therapeutic development, cell-based assays play an important role in both primary and secondary screening studies of promising drug compounds.

Our filter-based technology provides reliable, high precision assay methodology for suspension or adherent cell lines, as well as whole organism models.

We provide filter plates and cell culture inserts developed to work effectively with sensitive detection and imaging systems. These products are optimized for a range of applications including transport assays, migration/invasion/chemotaxis assays, and whole organism screening.

- MultiScreen®$_{HTS}$ filter plates for ELISpot
- MultiScreen®-MIC filter plates for Migration, Invasion and Chemotaxis
- MultiScreen®-MESH filter plates
- Millicell® 24- and 96-well filter plates for drug transport assays
- Millicell® standing and hanging inserts





ELISpot Assays

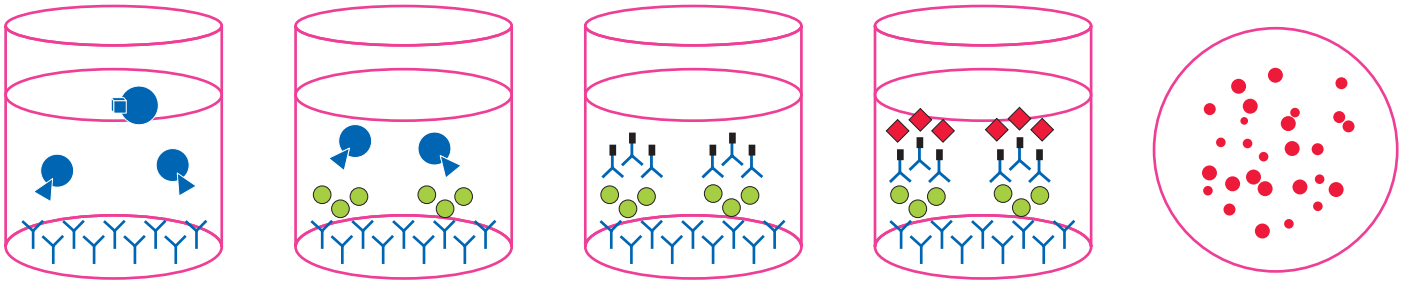
Quantify soluble biomarkers secreted by individual cells

The ELISpot (enzyme-linked immunospot) assay was first described decades ago as a useful assay for the detection of specific immune responses on a single cell level. Since that time, the assay has been optimized through the introduction of specifically designed antibodies, automated reader systems and 96-well ELISpot membrane plates.

MultiScreen® and MultiScreen®$_{HTS}$ filter plates provide high protein-binding capacity with low background staining, reliable sensitivity and high lot-to-lot reproducibility. The plates are designed for enhanced imaging on a range of systems including Zeiss and AID imaging devices. They also have a removable underdrain to allow for easy membrane access.

- Consistent lot-to-lot performance
- Uniform distribution of spots
- Automation-compatible

ELISpot Assay Procedure for the Detection of Cytokines in Response to a Stimulus



1. 2. 3. 4. 5.

cells

capture antibodies

cytokines

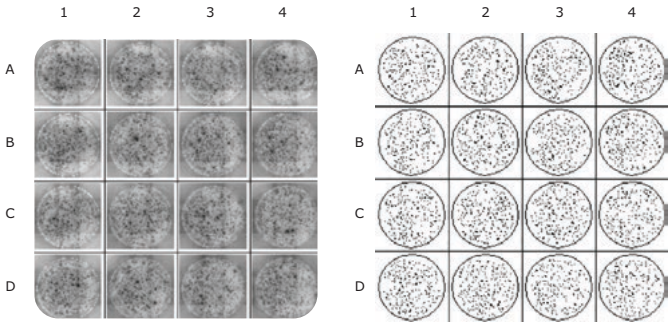
detection antibodies

avidin-enzyme conjugate

1. Coat membrane with antibodies. Add immune cells and incubate.
2. Responding cells produce cytokines.
3. Wash to remove cells. Add biotinylated antibodies.
4. Add avidin-enzyme conjugate.
5. Add chromogenic substrate. Each responding cell produces one spot.

Uniform and Reproducible Spots

Optimized Membrane Gives Consistent Results Even in Corner and Edge Wells



A. Photomicrograph

B. Digital image

	1	2	3	4
A	599	601	649	605
B	509	649	631	598
C	584	607	609	618
D	619	550	605	625

C. Spot number by well location

These images represent the number of cells secreting IFN-γ in response to PHA-L stimulation of Human Peripheral Blood Mononuclear cells (HPBMC). The wells were seeded with 50,000 cells and developed using BCIP/NBT-Plus substrate. The wells were imaged with the Zeiss KS ELISpot imaging system. Typical MultiScreen®$_{HTS}$-IP filter plate variability expressed by coefficient of variation (%CV)* is less than 10%.

* %CV = (SD/mean)*100.

Ordering Information

MultiScreen®$_{HTS}$ 96-well Filter Plates*

Description	Plate material/ color	Qty/Pk	Sterile	Cat. No.
MultiScreen®$_{HTS}$-HA plates with MCE membrane	Styrene/clear	10	Yes	**MSHAS4510**
MultiScreen®$_{HTS}$-IP plates with Immobilon®-P membrane	Acrylic/clear Acrylic/clear Acrylic/white Acrylic/white	10 50 10 50	Yes No Yes No	**MSIPS4510** **MSIPN4550** **MSIPS4W10** **MSIPN4W50**
MultiScreen® plates with Immobilon®-P membrane without underdrain	Acrylic/white No underdrain	10	Yes	**MAIPSWU10**
MultiScreen®$_{HTS}$ plates with Immobilon®-P-FL membrane, with underdrain (suitable for Fluorescent ELISpot)	Acrylic/white	10	Yes	**S5EJ104I07**

* Classic MultiScreen® plates are also available for ELISpot assays. Contact technical service for information on catalogue numbers.

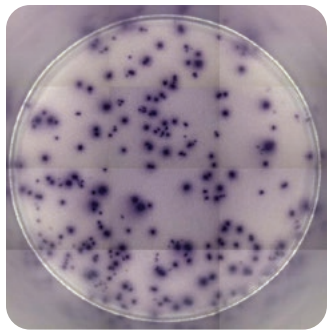


Image of typical ELISpot well. The spots are clear, focused and easy to distinguish. Photo courtesy of ZellNet Consulting, Inc.

8-well strip

Description	Plate material/ color	Qty/Pk	Sterile	Cat. No.
MultiScreen® 8-well strip with Immobilon®-P membrane	Acrylic/Clear	10	Yes	**M8IPS4510**

Accessories

Description	Qty/Pk	Cat. No.
Plate sealing tape, opaque	100	**MATAH0P00**
MultiScreen® 8-Well Strip Support Frame	10	**M8IPFRAME**

Featured Resources

IFN-γ ELISpot Assays on MultiScreen®-IP Filter Plates Technical Note

The ELISpot (Enzyme Linked Immuno-Spot) assay provides an effective method of measuring the antibody or cytokine production of immune cells on the single cell level. The popularity of this assay has seen resurgence in recent years as researchers attempt to gain a better understanding of immune responses in a variety of applications. This protocol is an example of a typical ELISpot assay for quantifying the number cells producing interferon-gamma (IFN-γ) in response to antigen or non-specific activation using phytohemagglutinin (PHA). It may be optimized as necessary for other applications.

To access this technical note and other information and resources on ELISpot, including the white paper: ELISpot assays: state-of-the-art tools for functional analysis of cellular immunology, visit our website at **SigmaAldrich.com/elispot**

Membrane-Based Cell Assays

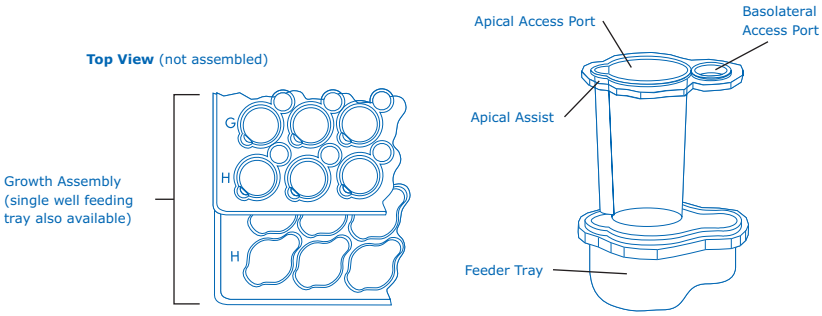
Smart design for smart research

For studying the roles of growth factors such as cytokines, signal transduction factors such as kinases, and phosphatases and other bioactive compounds, use Millicell® membrane-based cultureware to promote the natural growth of adherent and suspension cell lines. In contrast with traditional plastic cultureware that provides a flat 2D surface, membrane-based cell culture environments encourage growth that more closely mimics the *in vivo* environment, with 3D access to nutrients and the adjacent cellular and extracellular milieu. Optimized membranes promote cell cultures with structure and function that more closely mimic their *in vivo* counterparts, leading to more biologically relevant results for applications including primary and secondary screening, transport assays, toxicity screening, cell signaling, cell proliferation and ADME drug safety studies.

The Millicell® Cell Culture product family includes 24-well and 96-well insert plates, as well as hanging and standing single-well inserts. Each platform is available with a selection of membranes to support a range of applications.

- Optimized membranes for reliable monolayer formation
- Easy access to both apical and basolateral cell surfaces
- Transparent membranes for easy optimal visual monitoring of cell growth
- Choice of device platforms available

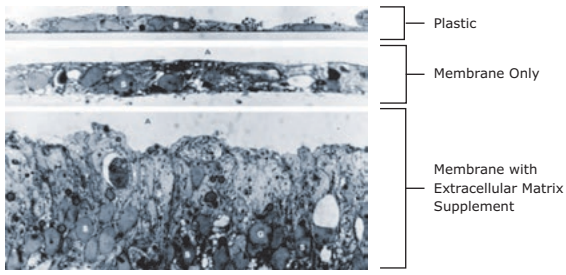
Millicell® multiwell cell culture plates



These automation-compatible plates incorporate a patented design to maintain assay integrity and prevent monolayer disruption, contamination or damage during analysis. The 96-well growth assemblies include a choice of 96-well or single-well feeder trays. The format is also available in a 24-well design.

A comparison of Sertoli cells grown on various surfaces. This seminal publication demonstrates that cells grown on our membranes impregnated with reconstituted basement membrane (RBM) form tall, columnar monolayers with ovoid or pyramidal nuclei that more closely mimic *in vivo* growth.

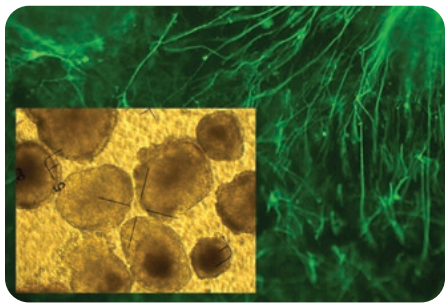
Byers SW, Hadley MA, Djakiew D, Dym M. Growth and characterization of polarized monolayers of epididymal epithelial cells and Sertoli cells in dual environment culture chambers. J Androl. 1986 Jan-Feb;7(1):59-68.



Plates and Inserts by Application Type: Recommended membranes and pore sizes

Filter Codes

Code	Membrane Type	Membrane Material
CM	Biopore™	Hydrophilic PTFE
HA	MF-Millipore™	Mixed cellulose esters
PCF	Isopore™	Polycarbonate
PET	PET	Polyethylene terephthalate



Neuron differentiation of embryonic stem cells in Millicell® -24, 1 µm PET filter plates. Murine embryonic stem cells were formed into suspended embryoid bodies (EBs), then transferred to Millicell® -24, 1 µm PET for attachment and differentiation. Neural differentiation after retinoic acid treatment of attached EBs was confirmed by anti-neurofilament immunofluoresence. (Insert: Inverted phase contrast imaging through membrane of live EBs in medium.)

Application	Standing Insert (pore size, µm)	Hanging Insert (pore size, µm)	24-Well Plate (pore size, µm)	96-Well Plate (pore size, µm)
Angiogenesis	PCF (3, 8)	PET (3, 5, 8)	PCF (3, 5, 8)	MultiScreen® MIC Plate (3, 5, 8)
Cell Proliferation	PCF (0.4)	PET (0.4, 1)	PCF (0.4) PET (1)	PCF (0.4) PET (1)
Cell Surface Receptors	PCF (0.4) HA (0.45) CM (0.4)	PET (0.4, 1)	PCF (0.4) PET (1)	PCF (0.4) PET (1)
Chemotaxis	PCF (3, 8)	PET (3, 5, 8)	PCF (3, 5, 8)	MultiScreen® MIC Plate (3, 5, 8)
Co-culture	PCF (0.4) CM (1)	PET (0.4, 1)	PET (1) PCF (0.4)	PCF (0.4) PET (1)
Migration/Invasion	PCF (8,12)	PET (5, 8)	PCF (5, 8)	MultiScreen® MIC Plate (5, 8)
Epithelial Cell Growth	PCF (0.4) HA (0.45)	PET (0.4, 1)	PCF (0.4) PET (1)	PCF (0.4) PET (1)
Feeder Layers	PCF (0.4, 3, 8)	PET (all)	PCF (all) PET (1)	PCF (0.4) PET (1)
Fluorescent Detection/ Immunohistochemistry	PCF (all) CM (0.4)	PET (all)	PCF (all) PET (1)	PCF (0.4) PET (1)
In Vitro Fertilization	CM (0.4)	PET (1)	PET (1)	PET (1)
In Vitro Toxicology	PCF (0.4) CM (0.4) HA (0.45)	PET (0.4, 1)	PCF (0.4) PET (1)	PCF (0.4) PET (1)
Microbial Attachment	PCF (0.4) CM (0.4) HA (0.45)	PET (0.4, 1)	PCF (0.4) PET (1)	PCF (0.4) PET (1)
Organotypic	Organotypic (0.4)			
Phase Contrast Microscopy	CM (0.4)	PET (0.4, 1, 3, 8)	PET (1)	PET (1)
Polarized Protein Secretions	PCF (0.4) CM (1)	PET (0.4, 1)	PCF (0.4) PET (1)	PCF (0.4) PET (1)
Polarized Uptake	PCF (0.4) CM (0.4) HA (0.45)	PET (0.4, 1)	PCF (0.4) PET (1)	PCF (0.4) PET (1)
Transport/Permeability	PCF (0.4)	PET (0.4, 1)	PCF (0.4) PET (1)	PCF (0.4) PET (1)
Tumor Cell Metastasis and Invasion	PCF (8,12)	PET (5, 8)	PCF (5, 8)	MultiScreen® MIC Plate (5, 8)

Biopore™ PTFE Membrane

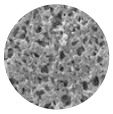
For low protein binding, live cell viewing, and immunofluorescent applications.

This optically transparent membrane exhibits little or no background fluorescence compared with other membrane matrices. It can be optimized for low protein-binding and low fluorescence applications, and is suitable for attachment-dependent cells if it is coated with an extracellular matrix.

Isopore™ PCF Membrane

For growth of attachment-dependent cells without matrix.

This hydrophilic polycarbonate membrane is tissue culture-treated to allow growth of attachment-dependent cells without the use of extracellular coating matrix (ECM). It is especially recommended for transport/permeability applications.



MF-Millipore™ MCE Membrane

For exceptional anatomical and functional polarization.

This Triton®-free membrane can be used for cell surface receptor, *in vitro* toxicology, microbial attachment, and polarized uptake assays. When compared to plastic, cells had two- to three-fold higher densities and a more cuboidal morphology with rounded nuclei.

PET Membrane

For growth of attachment-dependent cells without matrix.

This track-etched, thin film membrane is translucent or optically clear for better cell visualization and monitoring of the cell monolayer. It is tissue culture treated to promote cell attachment and growth.

Millicell® Inserts and Plates

For microporous membrane-based cell culture

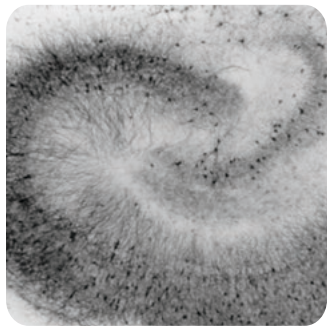
Natural Cell Growth

Cells grown *in vivo* live in a three-dimensional environment and can access nutrients from every side. In contrast, traditional plastic culture plates force cells to grow on a smooth, two-dimensional surface, leading to flattened nuclei and activity that may not reflect *in vivo* conditions.

Millicell® inserts and plates feature membranes that allow easy access to both the apical and basolateral sides of cells. This encourages three-dimensional growth and provides a more accurate *in vitro* model than traditional plastic plates. Membrane inserts enable more options for co-culture studies.

Benefits

- Improved cell morphology
- Better cell differentiation
- More intracellular organelles
- Higher cell densities



Hippocampal explant grown on Millicell® organotypic insert in 1.5 mM Hanks buffer.

Millicell® Cell Culture Inserts: Proven over decades of research

Millicell® inserts are available in three sizes for 24-, 12- or 6-well plates. Hanging Millicell® inserts provide an additional level of flexibility for users who need to remove inserts for media feeding, changes and monolayer analysis.

Plate Designs Simplify Cell Culture Assays and Analysis

Both the 24-well and 96-well cell culture insert plates incorporate patented design features for high performance cell-based assays. The plates simplify handling of multiple samples simultaneously, maintain assay integrity and prevent monolayer disruption, contamination or damage during analysis. The assemblies include a choice of a multi-well or single-well feeder tray.

Millicell® Hanging Inserts

- For co-culturing and permeability assays
- Unique design allows easy basolateral access and less risk of contamination
- Optically clear and translucent PET membrane available in 3 well sizes and up to 5 pore sizes

Millicell® Standing Inserts

- Promotes excellent cell growth and provides an exceptional opportunity for cell studies
- Available with Biopore™ (PTFE) membrane, MF-Millipore™ (mixed cellulose esters) membrane, and polycarbonate membrane, 5 pore sizes, and 2 well sizes

Millicell® Organotypic Standing Insert

- For high cell viability and superior study of three dimensional explant structures
- Shorter profile allows inserts to fit inside a standard petri dish
- The optically clear Biopore™ (PTFE) membrane provides high viability–for as long as 40 days–and excellent trans-membrane oxygen transport

Ordering Information

Millicell® Standing Cell Culture Inserts

Individually sterile packaged

Membrane	Pore size	Optical	Inner Diam.	Growth Area	Format	Qty/Pk	Cat. No.
Organotypic Biopore™ PTFE Membrane (5 mm height)*	0.4 µm	Clear**	27 mm	4.2 cm^2	6-well	50	**PICM0RG50**
Biopore™ PTFE Membrane*	0.4 µm	Clear**	27 mm	4.2 cm^2	6-well	50	**PICM03050**
			10 mm	0.6 cm^2	24-well	50	**PICM01250**
MF-Millipore™ MCE Membrane	0.45 µm	Opaque	27 mm	4.2 cm^2	6-well	50	**PIHA03050**
			10 mm	0.6 cm^2	24-well	50	**PIHA01250**
Isopore™ PCF Membrane (TC-treated)	0.4 µm	Translucent	27 mm	4.2 cm^2	6-well	50	**PIHP03050**
	0.4 µm	Translucent	10 mm	0.6 cm^2	24-well	50	**PIHP01250**
	3 µm	Translucent	10 mm	0.6 cm^2	24-well	50	**PITP01250**
	8 µm	Translucent	10 mm	0.6 cm^2	24-well	50	**PI8P01250**
	12 µm	Translucent	10 mm	0.6 cm^2	24-well	50	**PIXP01250**

* For adherent cells, this membrane needs to be coated with an extracellular matrix.
** Membrane is clear when wet.

Millicell® Hanging Cell Culture Inserts

With PET membrane, individually blister packaged and sold in packs of 48

Pore Size (µm)	Pore Density (pores/ cm^2)	Optical Clarity	6-well Cat. No.	12-well Cat. No.	24-well Cat. No.
0.4	100 x 10^6	Translucent	**PTHT06H48**	**PTHT12H48**	**PTHT24H48**
	4 x 10^6	Clear	**PCHT06H48**	**PCHT12H48**	**PCHT24H48**
1.0	22 x 10^6	Translucent	**PLRP06H48**	**PLRP12H48**	**PLRP24H48**
	2 x 10^6	Clear	**PTRP06H48**	**PTRP12H48**	**PTRP24H48**
3.0	2 x 10^6	Translucent	**PTSP06H48**	**PTSP12H48**	**PTSP24H48**
	0.6 x 10^6	Clear	**PCSP06H48**	**PCSP12H48**	**PCSP24H48**
5.0	0.6 x 10^6	Translucent	**PTMP06H48**	**PTMP12H48**	**PTMP24H48**
8.0	0.2 x 10^6	Translucent	**PTEP06H48**	**PTEP12H48**	**PTEP24H48**
	0.06 x 10^6	Clear	**PCEP06H48**	**PCEP12H48**	**PCEP24H48**

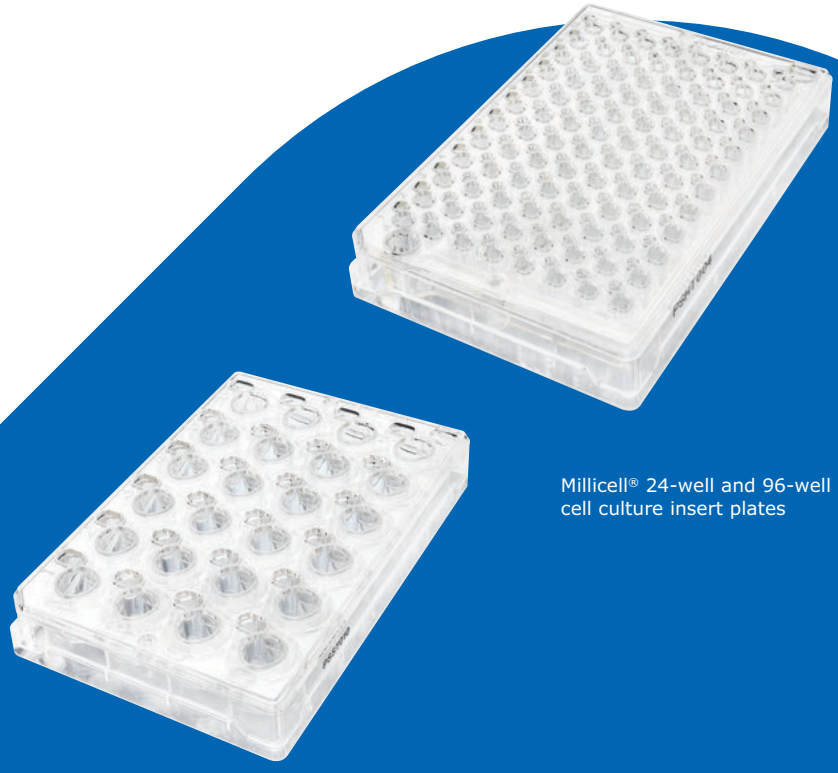
Ordering Information

Millicell®-24 Well Cell Culture Insert Plate Assemblies

Description	System Components	Membrane pore size	Qty/Pk	Cat. No.
Millicell®-24 cell culture insert plates	24-well cell culture plate, single-well feeder tray, 24-well receiver tray and lid	PCF (0.4 µm)	1	**PSHT010R1**
		PET (1.0 µm)	1	**PSRP010R1**
		PCF (3 µm)	1	**PSST010R1**
		PCF (5 µm)	1	**PSMT010R1**
		PCF (8 µm)	1	**PSET010R1**
	24-well cell culture plate, 24-well receiver tray and lid	PCF (3 µm)	5	**PSST010R5**
		PCF (5 µm)	5	**PSMT010R5**
		PCF (8 µm)	5	**PSET010R5**
	24-well cell culture plate, single-well feeder tray and lid	PCF (0.4 µm)	5	**PSHT010R5**
		PET (1.0 µm)	5	**PSRP010R5**
Accessories				
24-well receiver trays with lids			5	**PSMW010R5**
Single-well feeder trays with lids			5	**PSSW010R5**
96-well receiver trays with lids			5	**MACAC0RS5**

Millicell®-96 Well Cell Culture Insert Plate Assemblies

Description	System Components	Membrane pore size	Qty/Pk	Cat. No.
Millicell®-96 cell culture insert plates	96-well cell culture plate, single-well feeder tray, 96-well receiver tray and lid	PCF (0.4 µm)	1	**PSHT004R1**
		PET (1.0 µm)	1	**PSRP004R1**
	96-well cell culture plate, 96-well receiver tray and lid	PCF (0.4 µm)	5	**PSHT004S5**
	96-well cell culture plate, single-well feeder tray and lid	PCF (0.4 µm)	5	**PSHT004R5**
		PET (1.0 µm)	5	**PSRP004R5**

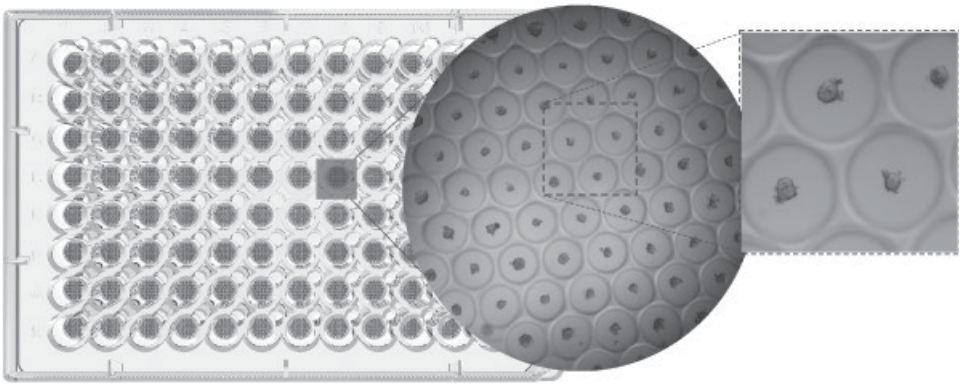


Millicell® 24-well and 96-well cell culture insert plates

For 3D Cell Culture Applications

For cellular applications like cancer studies, regenerative medicine, and experimental drug discovery, 3D models can be more relevant than 2D models as these cultures more closely replicate *in vivo* structures. Our comprehensive portfolio of 3D cell culture tools includes several 3D cell culture plates that support consistent culture from cell seeding to imaging and analysis.

Millicell® Microwell Plates



Millicell® Microwell 96-well plates are a ready-to-use solution that support reliable and reproducible organoid culture. Based on an array of ultra-dense microwells in hydrogel, users can generate single organoids in each microcavity without a solid extracellular matrix. With a microwell size to fit any organoid model, users can scale up 3D culture models in the thousands.

- Spheroids and organoids form in a single focal plane for the easy implementation of automated high throughput imaging.
- High optical clarity PEG hydrogel allows users to go from cell seeding to analysis in one plate.
- Microwells allow for standardized organoid culture and screening applications.

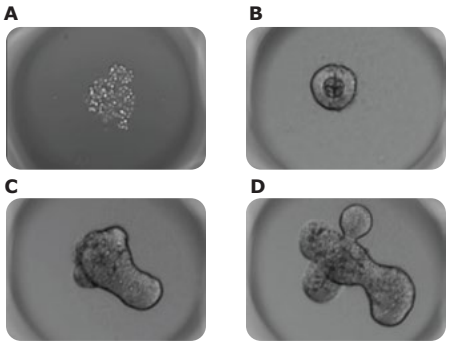


Figure 1. Brightfield images of mouse intestinal organoids on **A**) hour 1, **B**) 2 days, **C**) 3 days, and **D**) 4 days after seeding on Millicell® Microwell plates.

Millicell® Microwell plate microwell size for different cell lines and applications

400µm	600µm
• Hu colorectal carcinoma cell line HCT116 • Hu iPSC-derived colon organoids • Colorectal cancer (CRC) organoids • CRC organoids + T cell killing • Immune cell co-cultures (i.e., CAR T-cells and bispecific abs cell therapies)	• Primary hepatocytes + stellate cells • HepRG and HepG2 cells • Blood Brain Barrier (BBB) models with endothelial cells, pericytes, and astrocytes • Liver organoids • Stomach, pancreas, and CRC cells

Ordering Information

Description	No. of Microwells	Cat. No.
Millicell® Microwell 96-well 400µm plates	121*	**MC96U4005**
Millicell® Microwell 96-well 600µm plates	55*	**MC96U6005**

* Indicates maximum possible number of microwells per well. Exact number may differ slightly from well to well, and may vary by 7% fewer.

Millicell® Ultra-Low Attachment Plates

Millicell® Ultra-low Attachment 96-well plates promote the self-assembly of uniform spheroids in a scaffold-free, high throughput environment. Coated with a unique, non-binding ultra-hydrophilic polymer to facilitate natural spheroid formation, the plates provide superior 3D cell culture for any cell type or application.

- High optical clarity plates are suitable for brightfield imaging and confocal microscopy.
- Compatible with high throughput and liquid robotic systems.
- Stable, non-cytotoxic, and cell non-adhesion surface promotes single spheroid formation in each well.

For more information, visit: **SigmaAldrich.com/millicell**

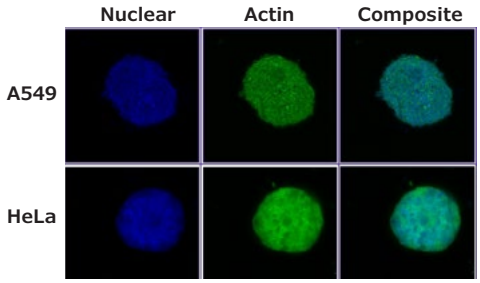
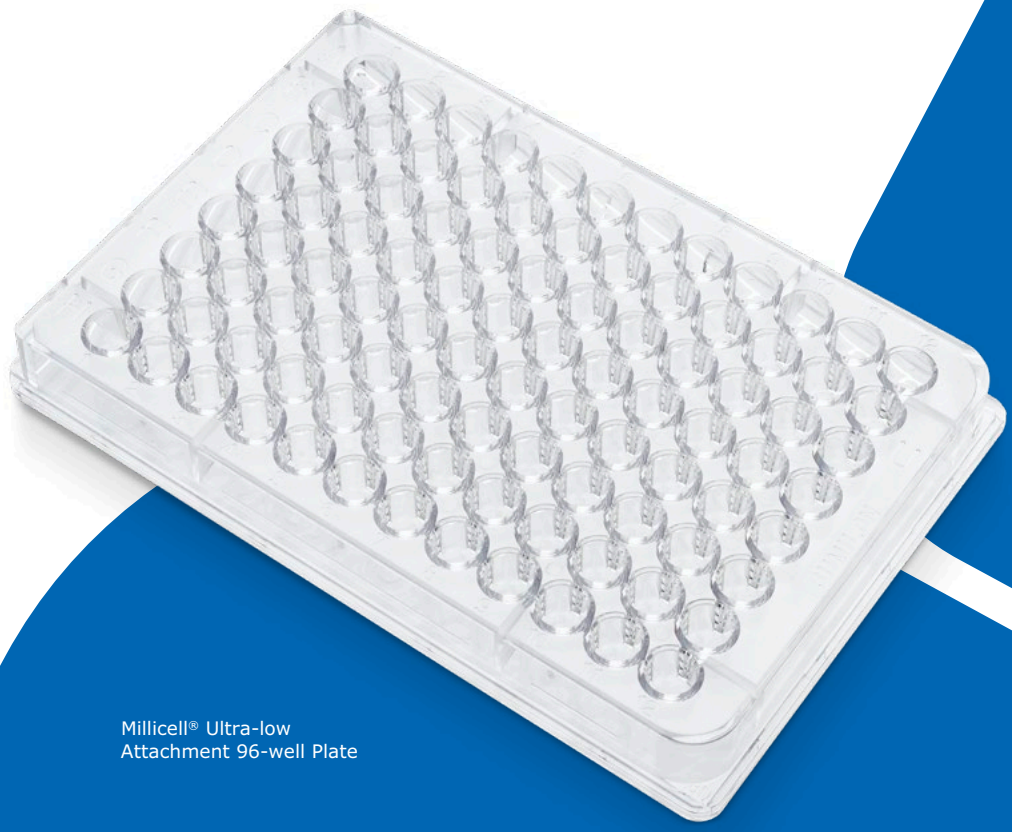


Figure 2. A549 and HeLa spheroids were imaged using confocal microscopy. The Millicell® ULA plates are recommended for confocal imaging at less than 20x objectives.

Ordering Information

Description	Cat. No.
Millicell® Ultra-low Attachment 96-well Plates	**MC96ULA20**



Millicell® Ultra-low
Attachment 96-well Plate

Migration, Invasion and Chemotaxis (MIC)

Cell migration is stimulated and directed by interaction of cells with the extracellular matrix (ECM), neighboring cells, or chemoattractants. Cell migration participates in morphogenic processes, wound healing and tumor metastasis.

Cell-based assays enable researchers to simulate the barriers invaded by, and conditions encountered by, normal and metastatic cells *in vivo*. The traditional Boyden chamber assay for cell migration uses a hollow plastic chamber, sealed at one end with a porous membrane. MultiScreen®-MIC filter plates provide a high throughput format for this assay. This chamber is suspended over a larger well which may contain medium and/or chemoattractants. Cells are allowed to migrate through the pores, to the other side of the membrane. Migratory cells are then stained and counted. In QCM™ cell invasion assays, a Boyden chamber system is layered with an ECM solution that occludes the membrane pores, blocking non-invasive cells from migrating through it.

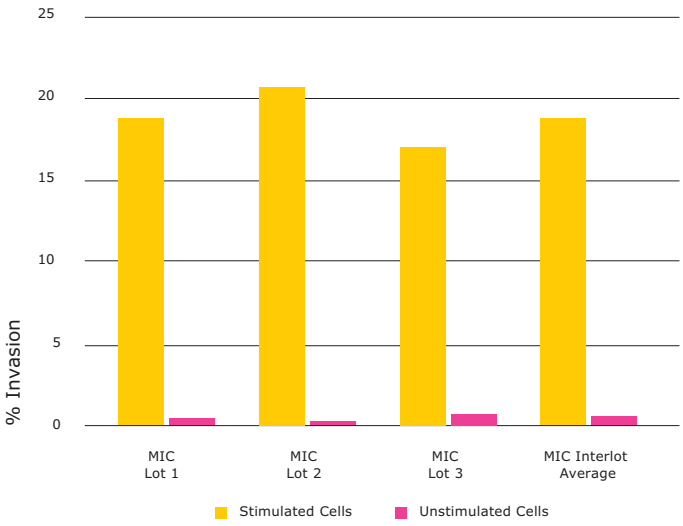
MultiScreen® — MIC Filter Plates maximize results with up to 96 Boyden chambers per plate.

The MultiScreen®-MIC filter plate provides a reliable, versatile platform for a range of cell-based screening assays including migration, invasion, chemotaxis, co-culture, angiogenesis and transmigration. Plates and kits are available in a range of pore sizes to support assays with suspension and adherent cell lines and support cell growth for co-culture and transmigration assays. Results show that the plates demonstrate high assay consistency with little inter-assay variability. The plates are provided sterile to support longer incubation times and enable assay setup and analysis in the same device.

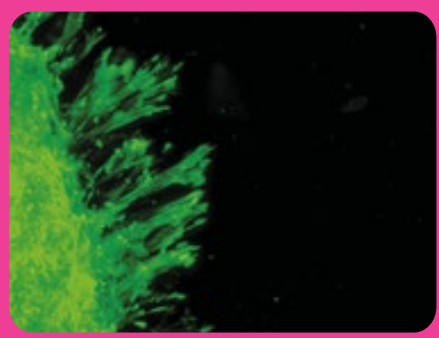
MultiScreen®-MIC filter plates are designed for broad assay compatibility and are available in three membrane pore sizes. The 96-well plates increase throughput 4x over 24-well systems, without sacrificing membrane surface area.

- Use with adherent or suspension cells
- Polycarbonate membrane available in 3, 5 and 8 µm pore sizes
- Pre-assembled kits available

Invasion Profile using MultiScreen®-MIC Filter Plates with 8 µm Membrane



Percent invasion exhibited by MDA-MB-231 cells in response to 10% serum-containing medium (stimulated cells) or 0.2% BSA-containing medium (unstimulated cells) as a chemoattractant is shown. Plates were seeded with 50,000 cells/well. Invasion assays were carried out over a period of 24 hours at 37°C. Invaded cells for MultiScreen®-MIC filter plates were quantified using KS300 cell-counting software on a Zeiss Axioplan® 2 microscope with an automated stage.



Cancer drug discovery efforts are increasingly focused on pre-screening lead compounds in functional cell-based assays. Many drugs under development are directed at altering the migration and invasion properties of cancer cells and studying cell-cell interactions with endothelial cells such as HUVECs (Human Umbilical Vein Endothelial Cells) in co-culture, angiogenesis, and transmigration assays. The MultiScreen®-MIC family of filter plates with 3, 5 and 8 µm-pore polycarbonate membranes are validated and QC released to support these assays with adherent and suspension cell lines.

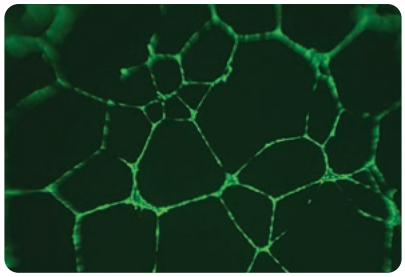
Pore Size Selection

Pore size determination depends entirely on the average diameter of the cells to be used in your assay. The average diameter of cells for cell lines or primary cells is typically available from the cell supplier, but may also be determined by literature search. The following chart illustrates pore size choices; these reflect assays performed by our scientists and our customers. For more information, please contact technical service.

Cell Name	Cell Type	Pore Sizes	Assays typically performed
MDA-MB-231	Invasive breast cancer cell line (human)	5 or 8 µm	5 or 8 µm used in chemotaxis or invasion assay
MCF7	Non-invasive breast cancer cell line (human)	5 or 8 µm	5 or 8 µm used in chemotaxis or invasion assay
HT1080	Invasive fibrosarcoma cell line (human)	5 or 8 µm	5 or 8 µm used in chemotaxis or invasion assay
NIH3T3	Non-invasive fibroblast cell line (mouse)	5 or 8 µm	5 or 8 µm used in chemotaxis or invasion assay
HUVEC (Human umbilical vein endothelial cells)	Endothelial cells	3 or 5 or 8 µm	3 or 5 or 8 µm in chemotaxis, invasion, angiogenesis or transendothelial migration assays
HMVEC/HMEC (Human dermal microvascular)	Endothelial cells	5 or 8 µm	5 or 8 µm in chemotaxis, invasion, angiogenesis or transendothelial migration assays
PMN	Polymorphonuclear neutrophils	1 or 3 µm	1 or 3 µm in chemotaxis assays
	Primary stromal cells	8 µm	No information available
	Epithelial cells	3 or 5 µm	No information available
HCASMC	Human coronary artery smooth muscle cells	5 µm	No information available
Hepatic stellate cells	Myofibroblast	5 µm	No information available

Proven Tube Formation for Angiogenesis Assays: Plates support *in vitro* angiogenesis assays with HUVEC cells

MultiScreen®-MIC Filter Plates with 5 µm Membrane



Angiogenesis (vessel formation) experiments were performed using HUVEC (human umbilical vein endothelial cells) on 5 µm MultiScreen®-MIC filter plates pre-coated with extracellular matrix (400 µg/well). Plates were seeded with 10,000 cells/well. Cells were labeled with 8 mg/mL of Calcein AM fluorescent label. Tube formation was imaged with Zeiss Axiovision® software.

Ordering Information

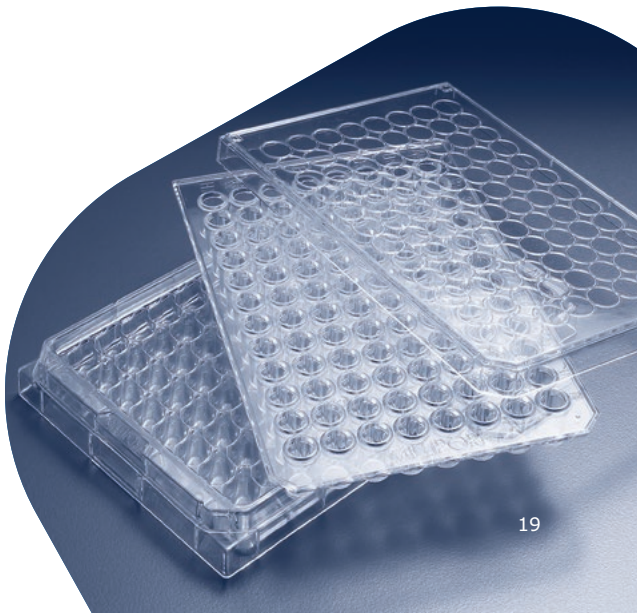
MultiScreen®-MIC Filter Plate System

Description	Pore size	Qty/Pk	Cat. No.
MultiScreen®-MIC Filter Plates	3 µm	10	**MAMIC3S10**
MultiScreen®-MIC Filter Plates	5 µm	10	**MAMIC5S10**
MultiScreen®-MIC Filter Plates	8 µm	10	**MAMIC8S10**

Includes 96-well receiver plates housed in single-well trays, with lids. All parts are sterilized.

Accessories

Description	Qty/Pk	Cat. No.
Single-well culture tray	10	**MAMCS0110**
96-well receiver plate	10	**MAMCS9610**



Cell Migration and Invasion Multiwell Assays*

Description	Pore Size	Plate Format	ECM Coating	Detection	No. of Tests	Cat. No.
Chemotaxis Cell Migration Assays	8 µm	24-well	None	Colorimetric	24	**ECM508**
		24-well		Fluorometric	24	**ECM509**
		96-well		Fluorometric	96	**ECM510**
	5 µm	24-well		Colorimetric	24	**ECM506**
		24-well		Fluorometric	24	**ECM507**
		96-well		Fluorometric	96	**ECM512**
	3 µm	24-well		Colorimetric	24	**ECM504**
		24-well		Fluorometric	24	**ECM505**
		96-well		Fluorometric	96	**ECM515**
Haptotaxis Cell Migration Assays	8 µm	24-well	Fibronectin	Colorimetric	24	**ECM580**
		24-well	Collagen I	Colormetric	24	**ECM582**
	5 µm	24-well	Laminin vials	Colorimetric	24	**ECM220**
		24-well		Fluorometric	24	**ECM221**
Millicell® µ-Migration Assay Kit	NA	4 slides of 3 wells		NA	12	**MMA205**
Millicell® µ-Angiogenesis Assay Kit	NA	5 slides of 3 chambers each		NA	15	**MMA125 MMA130**
Cell Invasion Assays	8 µm	24-well	ECMatrix™	Colorimetric	12	**ECM550**
		24-well		Colorimetric	24	**ECM554**
		96-well		Fluorometric	96	**ECM555**
		24-well	Collagen I	Colorimetric	24	**ECM551**
		24-well		Fluorometric	24	**ECM552**
		96-well		Fluorometric	96	**ECM556**
Endothelial Cell Migration Assays	3 µm	24-well	Fibronectin	Colorimetric	24	**ECM200**
		24-well		Fluorometric	24	**ECM201**
Endothelial Cell Invasion Assays		24-well	ECMatrix™	Colorimetric	24	**ECM210**
		24-well		Fluorometric	24	**ECM211**
Leukocyte Transendothelial Migration	3 µm	24-well	Fibronectin	Colorimetric	24	**ECM557**
Tumor Cell Transendothelial Migration	8 µm	24-well		Colorimetric	24	**ECM558**
QCM™ Invadopodia Gelatin Degradation Assay (Green)	NA	NA	FITC-Gelatin*	Fluorometric	32	**ECM670**
QCM™ Invadopodia Gelatin Degradation Assay (Red)	NA	NA	Cy3-Gelatin*	Fluorometric	32	**ECM671**
3D Collagen Culture Kit	NA	NA	Collagen I		1 kit	**ECM675**

*FITC-Gelatin and Cy3-Gelatin are provided but not pre-coated.

Cell-ECM Adhesion Assays

Description	Fluorometric Kit Cat. No.	Colorimetric Kit Cat. No.
Integrin Cell Adhesion Array Kit		**ECM530**
β Integrin Cell Adhesion Array Kit	**ECM534**	**ECM531**
α / β Integrin Cell Adhesion Array Combo Kit	**ECM535**	**ECM532**

For assistance with selection or availability, please contact technical service.

Toxicity Using Whole Organism Models

High throughput flies, worms and fish

Multicellular organisms including *Drosophila*, nematodes and zebrafish embryos provide effective *in vivo* models for assessing biological responses to toxic stimuli, including toxicity studies carried out during new compound evaluation.

The MultiScreen® MESH system includes a 96-well nylon mesh-bottom filter plate and a 96-well tray. The plates are constructed of optically clear plastic to facilitate use with imaging microscopes.

The protocol is simple. Add the organisms to the wells, apply the target compound, and measure the effects.

- Complete screening system includes filter plate and receiver tray
- Clear plates for use with microscopic analysis
- Can be used for de-clumping cells prior to flow cytometric analysis

MultiScreen® MESH filter plates provide a complete system for target screening and other applications by evaluating new compounds using multicellular organisms as the *in vivo* model. They are routinely used in pharmaceutical and agropharma discovery for assays measuring paralysis, cytotoxicity and death.

Ordering Information

MultiScreen® MESH Filter Plate System

Plate Type	Pore size	Qty/Pk	Cat. No.
*MultiScreen® MESH Filter Plates	20 µm	10	**MANMN2010**
	40 µm	10	**MANMN4010**
	60 µm	10	**MANMN6010**
	100 µm	10	**MANM10010**

*Provided with MultiScreen® Transport Receiver plate

Accessories

Description	Qty/Pk	Cat. No.
MultiScreen® transport receiver plate	50	**MATRNPS50**
Single-well cell culture tray	10	**MAMCS0110**
96-well cell culture tray	10	**MAMCS9610**

Biochemical Assays

Biochemical assays are amongst the primary techniques used in life science research and compound screening. MultiScreen® assay plate and filter plate technologies provide the basis for highly sensitive luminescent, fluorescent, absorbance, and radiometric detection methods.

- MultiScreen® and MultiScreen®$_{HTS}$ 96- and 384-well filter plates
- MultiScreen®$_{HTS}$+ Hi Flow 96-well filter plates
- MultiScreen® polystyrene 96-well assay plates

Enzyme Assays

MultiScreen® Filter Plates for Enzymatic Assays

Tried and true

MultiScreen® filter plates, available in a range of membrane and plate materials, set the standard for filtration-based enzyme assays. These versatile systems are widely used for kinase, phosphatase, protease and endonuclease assays, as well as second messenger assays such as cAMP, cGMP, phosphodiesterase (PDE), Nitric Oxide (NO), Ca^{2+} and inositols.

The filtration-based protocol produces specific, reliable results that are well-referenced in peer-reviewed publications.

- Designed for in-plate radiometric analysis
- Liquid scintillation cocktail-compatible
- Variety of filters available for a range of techniques
- Easy scale-up from 96- to 384-well assays

Recommended Filter Types for Enzyme Assays

- Low protein-binding Durapore® membrane
- High protein-binding mixed cellulose esters membrane
- High protein-binding Immobilon®-P membrane

MultiScreen®$_{HTS}$+ Hi Flow Filter Plates

Improved sensitivity and increased flow for critical radioactive bioassays

Our MultiScreen®$_{HTS}$+ filter plates are characterized by their unique, nylon mesh backing. This feature allows better washing, ensuring low background and improved signal-to-noise ratios.

MultiScreen®$_{HTS}$+ Hi Flow 96-well filter plates have an identical construction to our 384-well filter plates, making scale-up easy.

The MultiScreen®$_{HTS}$+ plate design also diminishes non-specific binding and reduces variability in both background and signal intensities. Testing showed a three-fold decrease in well-to-well variability and improved signal-to-noise ratio over traditional filter plates. You'll also achieve higher throughput, greater assay sensitivity and flexibility in detection.

- Eliminates "air-locking"
- Fast, uniform flow
- Decreases well-to-well variability
- Improved signal-to-noise ratio
- Improved quantitative recovery
- More efficient washing

MultiScreen® Solid Plates for Enzymatic Assays

High quality plates for consistent results

Our MultiScreen® solid assay microplates provide consistent results using luminescent, fluorescent, and colorimetric detection methods.

- Low plate background for high sensitivity assays
- Excellent optical properties for precise optical measurements
- High quality manufacturing for reliable, reproducible data
- Choose from a selection of formats, plate colors, well shapes, and plate treatments for optimal results

Recommended MultiScreen® Solid Plates for Enzyme Assays

- Clear polystyrene plates for absorbance and colorimetric assays
- Black polystyrene plates for high signal luminescence assays and fluorescence assays
- White polystyrene plates for low signal luminescence assays and TR-FRET assays

Receptor Binding Assays (GPCRs)

Increased accuracy and better reproducibility with filter-plate binding assays

Receptor binding assays are critical for cell signaling research and for lead identification and subsequent lead characterization stages of drug discovery and development. Typically, receptor binding assays using filter-based technology are used to separate and quantify the ligand-bound and ligand-free populations of drug targets. For sensitivity and specificity, radiolabeled known drugs are frequently used in competitive binding assays. The assay is designed as a competitive inhibition assay using the radiolabeled known drug/ligand-receptor interaction to screen chemical or natural product libraries for more effective NCEs (new chemical entities). These quantitative binding parameter determinations indicate the minimal effective drug concentrations.

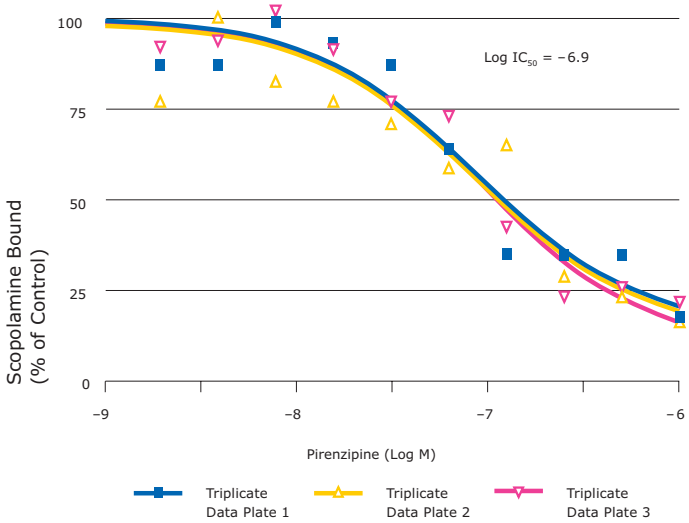
Using MultiScreen®$_{HTS}$ filter plates for determining these quantitative binding parameters enables a more accurate and reliable alternative to homogeneous assays. They are widely used in high throughput screening campaigns and provide a reliable platform that incorporates a range of glass fiber filters to retain the receptor and “bound” ligand fraction.

Because these filter plates can be operated using a vacuum manifold, the bound fractions are easily collected from the top of the plate, making characterization convenient. In addition, MultiScreen®$_{HTS}$ filter plates facilitate use with gripper arms and are compatible with microplate scintillation counters.

For cell harvest applications that require numerous washes and batch pretreatment with polyethyleneimine (PEI), MultiScreen® harvest plates are recommended.

- Highly sensitive and specific radiometric assays
- Compatible with liquid scintillation cocktail
- Easy scale-up from 96-well to 384-well assays
- Designed for use with automated equipment

Optimized Design for Quality Results



384-well Displacement Binding of Human Muscarinic M1 Receptor

Radioligand binding displacement binding assays were performed with a constant radiolabeled scopolamine concentration (0.6 nM) and serial dilutions of unlabelled pirenzipine as compared to a control binding experiment without unlabelled pirenzipine (% of Control). Here, displacement binding was done with 4.38 µg receptor preparation in 100 µL/well. Results presented are from three separate experiments each performed in triplicate wells. Relative affinity values (IC_{50}) were determined by fitting displacement binding inhibition values by non-linear regression using Prism™ data software. All data points are the average of triplicate experiments.

Ordering Information

MultiScreen®$_{HTS}$ filter plates for automated workflows

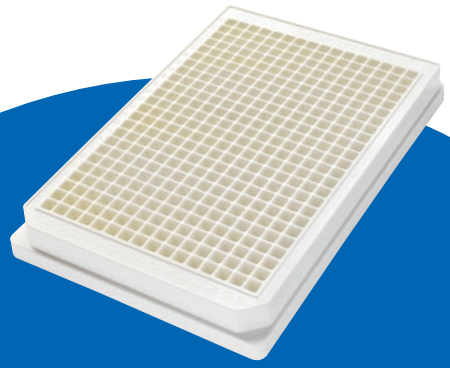
Plate	Plate membrane/filter	Membrane/filter properties	Pore size	Qty/ Pk	Cat. No.	
					96-well	384-well
MultiScreen®$_{HTS}$-GV plates	Hydrophilic Durapore® PVDF	Low-binding	0.22 µm	50	**MSGVN2B50**	
MultiScreen®$_{HTS}$-HV plates	Hydrophilic Durapore® PVDF	Low-binding	0.45 µm	10	**MSHVN4B10**	**MZHVN0W10**
				50	**MSHVN4B50**	**MZHVN0W50**
MultiScreen®$_{HTS}$-DV plates	Hydrophilic Durapore® PVDF	Low-binding	0.65 µm	50	**MSDVN6B50**	
MultiScreen®$_{HTS}$-BV plates	Hydrophilic Durapore® PVDF	Low-binding	1.2 µm	50	**MSBVN1B50**	
MultiScreen®$_{HTS}$-IP plates	Hydrophobic Immobilon®-P PVDF membrane	High protein-binding	0.45 µm	10	**MSIPN4B10**	
				50	**MSIPN4B50**	
MultiScreen®$_{HTS}$-HA plates	Hydrophilic mixed cellulose esters (MCE)	High protein-binding	0.45 µm	50	**MSHAN4B50**	
MultiScreen®$_{HTS}$-FB plates	Glass fiber filter (GF/B)	Hi Flow	1.0 µm	10		**MZFBN0W10**
				50	**MSFBNXB50**	**MZFBN0W50**
MultiScreen®$_{HTS}$-FC plates	Glass fiber filter (GF/C)	Hi Flow	1.2 µm	10		**MZFCN0W10**
				50	**MSFCNXB50**	**MZFCN0W50**

MultiScreen® filter plates with easily removable underdrain

Plate	Plate membrane/filter	Membrane/filter properties	Pore size	Qty/ Pk	Cat. No.	
					96-well	384-well
MultiScreen®-FB plates	Glass fiber filter (GF/B)	Hi Flow	1.0 µm	50	**MAFBN0B50**	
MultiScreen®-FC plates	Glass fiber filter (GF/C)	Hi Flow	1.2 µm	50	**MAFCN0B50**	
MultiScreen®-BV plates	Hydrophilic Durapore PVDF	Low-binding	1.2 µm	50	**MABVN0B50**	
MultiScreen®-IP plates	Hydrophobic Immobilon-P PVDF membrane	High protein-binding	0.45 µm	50	**MAIPN0B50**	

MultiScreen® solid assay plates

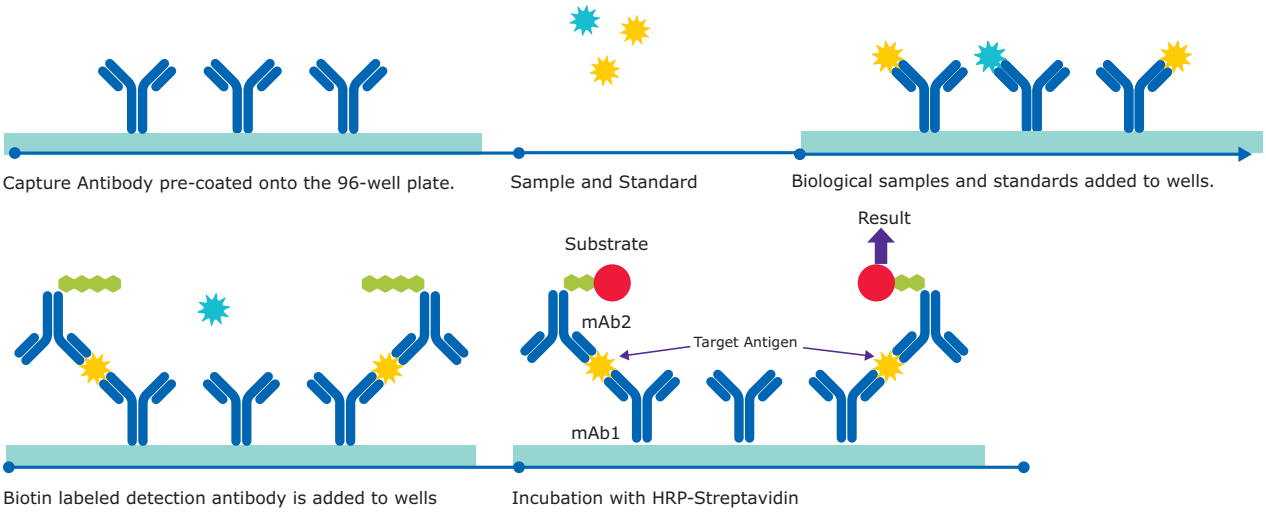
Plate	Material	Color	Well	Qty/Pk	Cat. No.
MultiScreen® 96-well polystyrene V bottom clear	Polystyrene	Clear	V-Bottom	100	**MSSCNVX00**
MultiScreen® 96-well polystyrene U bottom clear	Polystyrene	Clear	U-bottom	100	**MSSCNUX00**
MultiScreen® 96-well polystyrene flat bottom clear	Polystyrene	Clear	Flat bottom	100	**MSSCNFX00**
MultiScreen® 96-well polystyrene flat bottom white	Polystyrene	White	Flat bottom	40	**MSSWNFX40**
MultiScreen® 96-well polystyrene flat bottom black	Polystyrene	Black	Flat bottom	40	**MSSBNFX40**



MultiScreen®$_{HTS}$ 384-well FC filter plate

ELISAs

High sensitivity detection in flexible plate formats for developing your own ELISA assays



ELISAs (enzyme-linked immunosorbent assays) remain a gold standard for detection and quantitation of proteins, antibodies, and other analytes in serum, plasma, blood, cell, tissue, and other sample types. These assays are widely used in basic research, cell signaling, biomarker validation, drug discovery, vaccine development, biologics manufacturing, QC testing, and diagnostic applications. In a typical ELISA, high binding microplates are coated with antibody, antigen, or sample. Assays are configured to detect target analytes by exploiting antibody-analyte binding interactions in a non-competitive or competitive assay format. The absolute levels of analyte in a sample can be quantitated by interpolating the value of unknowns from a standard curve.

Plate coating is a critical step in an ELISA that largely impacts assay sensitivity. In general, higher plate binding capacities correlate to more sensitive ELISAs with lower limits of detection. MultiScreen® medium-bind and high-bind polystyrene microplates were developed for optimal performance in ELISA applications. Offered in standard 96-well and 96-well stripwell formats, MultiScreen® medium-bind and high-bind plates are suitable for research, clinical, and diagnostic applications.

- High quality manufacturing standards for consistency and reproducibility
- High-binding plates have a polystyrene surface that has been specifically treated to provide a hydrophilic surface for increased protein binding
- Medium-binding plates have a less hydrophilic polystyrene surface, and are therefore more suitable for coating non-polar proteins and peptides
- Flat bottom wells enable precise optical measurements
- 96-well stripwell format option has individual wells that can be broken off separately to adjust the number of assays or tests based on number of samples

MultiScreen® plates for ELISA assays

Plate	Material	Color	Format	Binding	Qty/Pk	Cat. No.
MultiScreen® 96-well polystyrene flat bottom clear ELISA high binding	Polystyrene	Clear	96-well	High bind	40	**MSEHNFX40**
MultiScreen® 8-well strip 96-well ELISA high binding	Polystyrene	Clear	Stripwell	High bind	100	**M8CHNFX00**
MultiScreen® 8-well strip 96-well ELISA medium binding	Polystyrene	Clear	Stripwell	Medium bind	100	**M8CMNFX00**

ADME/Compound Profiling

We have taken the lead in the development of new screening technology for adsorption characteristics at a higher throughput level. These novel methodologies for absorption (both cell- and non-cell-based transport) and solubility correlate well with standard methodologies.

The 96-well assay platforms offer a high level of predictability and are proven for use in absorption and solubility testing.

- MultiScreen® filter plates for solubility determination
- MultiScreen® filter plates for permeability determination, including PAMPA (parallel artificial membrane permeability assay)

Aqueous Solubility Assay

Automation-compatible, predictive solubility testing

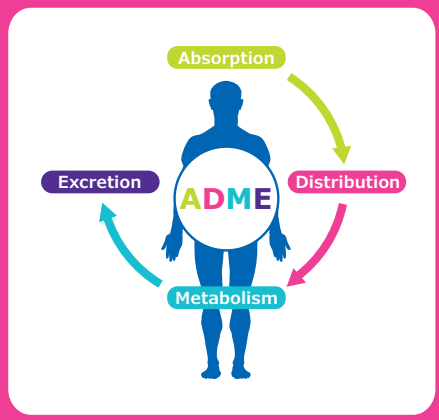
Determining water solubility is an important early step in the drug discovery and development process. Insoluble precipitates have been shown to cause false positives in bioassays, potentially wasting valuable resources. Water solubility also influences absorption and thus can be used to help predict the ADME properties of a molecule.

Our 96-well and 384-well MultiScreen®$_{HTS}$ filter plates have made early-stage solubility screening possible. Compared to traditional shake-flask methods, multi-well filter plate methods use low amounts of compounds and are reliable, automatable and fast.

The MultiScreen®$_{HTS}$-PCF filter plate incorporates filtration-based technology to provide a robust, automation-compatible solubility assay. The plates demonstrate fast flow rates, good retention of particulates that can interfere with analysis and low non-specific binding. Results are highly reproducible and correlate with published literature values.

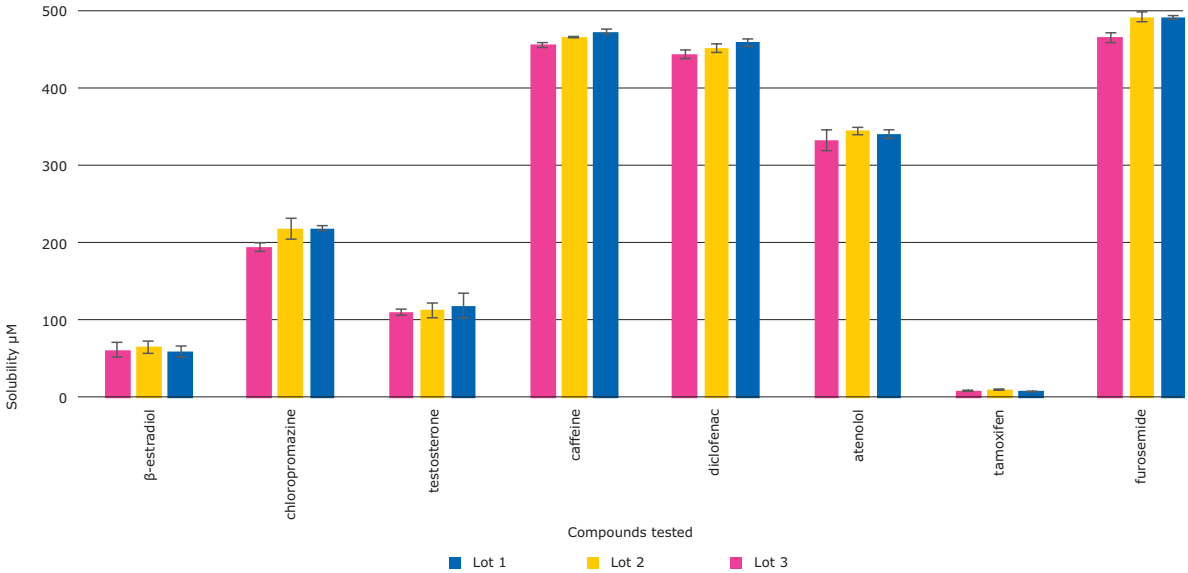
Unlike other high throughput methods, this method measures the compound in solution.

- Results correlate with shake-flask standards
- Reproducible results
- 90-minute screening protocol
- High compound recovery



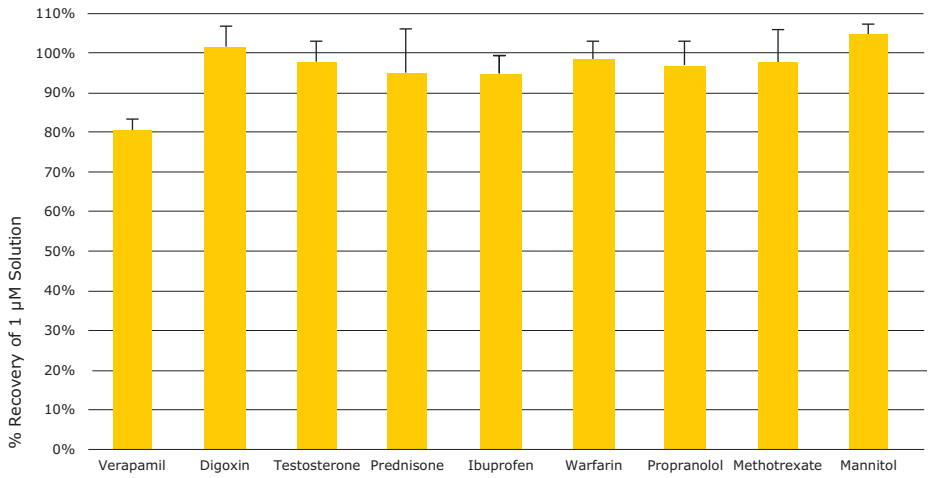
The current attrition and failure rate of candidate drugs at the ADME (absorption, distribution, metabolism and excretion) testing stage of drug development is driving the need for earlier compound profiling for drug-like properties. Early-ADME information assists in the selection and optimization of pharmaceutical properties in parallel with compound screening for activity.

Solubility Data for Three Different Lots of Plates



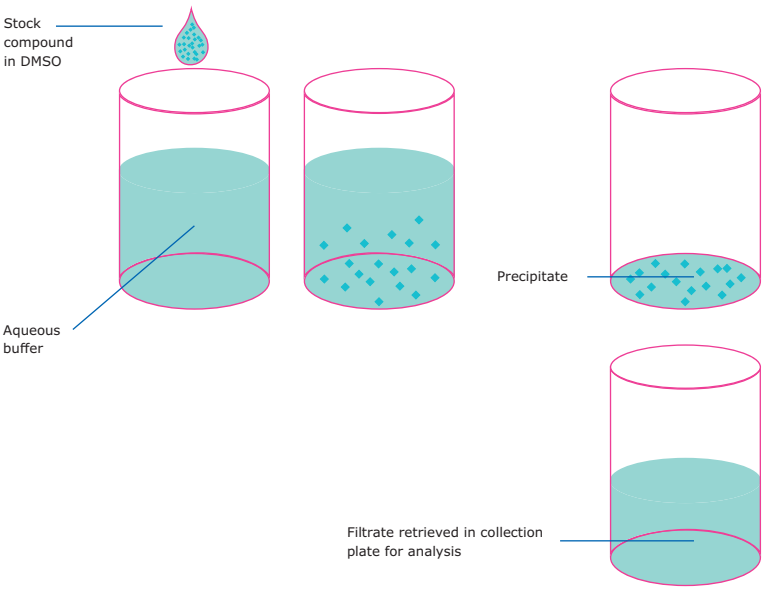
190 µL universal buffer was dispensed into solubility test plates, followed by addition of 10 µL of test compound dissolved in DMSO (final drug concentration: 500 µM in DMSO + Buffer). Following 90 minutes of shaking, 100 µL of filtrate was transferred to a UV-compatible plate for absorbance measurement. Drug concentration in solution was calculated based on the standard curve.

Validated for High Drug Recovery – The MultiScreen®$_{HTS}$-PCF filter plate incorporates low-binding membrane and low-binding plate materials to yield the high drug recovery needed for solubility results.



Soluble drugs were dissolved in 5% DMSO/PBS at 1 µM, incubated in the MultiScreen®$_{HTS}$-PCF filter plate and filtered into a receiver plate. The results are reported as percent drug recovery as determined by radiometric analysis.

Filtration-based Solubility Results in Less than 4 Hours



1. Add compound dissolved in organic solvent to aqueous buffer.
2. Shake for 90 minutes to allow insoluble compound to precipitate.
3. Apply vacuum to filter solution into collection plate. Precipitates remain on membrane. Analyze filtrate in collection plate to quantitate amount

The MultiScreen®$_{HTS}$-PCF filter plate is tested to ensure reliable, discrete filtrate transfer with no crosstalk. The plate can be incubated for 6 hours or longer with shaking and without drip-out. As soon as vacuum is applied, the wells empty in less than 1 minute.

Ordering Information

Description	Pore size	Qty/Pk	Cat. No. 96-well	Cat. No. 384-well
*MultiScreen®$_{HTS}$-PCF filter plate	0.45 µm	10 50	**MSSLBPC10** **MSSLBPC50**	—
MultiScreen® Solvinert™ filter plate	0.45 µm	10 50	**MSRLN0410** **MSRLN0450**	—
MultiScreen®$_{HTS}$-HV filter plates	0.45 µm	10 50	**MSHVN4510** **MSHVN4550**	**MZHVN0W10** **MZHVN0W50**
MultiScreen®$_{HTS}$-GV filter plates	0.2 µm	10 50	**MSGVN2210** **MSGVN2250**	—
MultiScreen® Solvinert™ Deep Well filter plate	0.45 µm	10	**MDRLN0410**	—

* Formerly MultiScreen®$_{HTS}$-Solubility filter plate

Required Equipment

Description		Qty/Pk	Cat. No.
MultiScreen®$_{HTS}$ vacuum manifold		1	**MSVMHTS00**
Vacuum pump kit	(115 V/60 Hz) (220 V/50 Hz) (100 V/50-60 Hz)	1	**WP6111560** **WP6122050** **WP6110060**

Accessories

Description	Qty/Pk	Cat. No.
96-well collection plate clear, non-sterile	100	**MSCPNPS00**
96-well collection plate for UV analysis, non-sterile	40	**MSCPNUV40**
96-well deep well receiver plate, non-sterile	50	**MDCPN2M50**
96-well V-bottom Collection Plate	100	**MSCPNPP00**

Non-Cell-Based Absorption Assays

Efficient, reproducible drug characterization

MultiScreen® filter plates for PAMPA and permeability assays yield effective, predictive results that correlate well to both *in vitro* Caco-2 and *in vivo* human absorption values. The assays are easy to set up and the results are highly reproducible. The plates are treated to create 96 artificial biomembranes with drug compounds introduced for passive permeability testing.

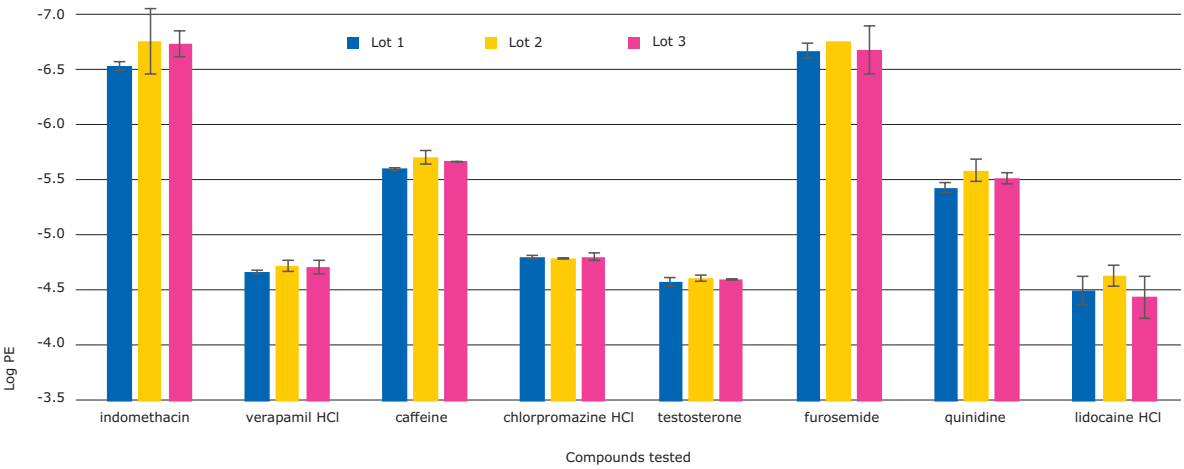
MultiScreen® Permeability Assays

This fast, predictive assay correlates well to human data. Setup is easy and results are available in 8 hours. This assay is ideal for large library classifications, rank ordering of compounds and the identification of problem components. Polymer membrane is impregnated with a hexane/hexadecane (HDM) layer.

MultiScreen® PAMPA Assays

This 16-hour assay demonstrates high correlation to human values. It is best suited for oral absorption predictive values of charged drugs and predictive values for permeability results of charged compounds. Artificial biomembranes are created by coating the filter with lipid.

- Rapid absorption screening tools for transcellular compounds prior to Caco-2 assays
- Results correlate with human absorption values
- Automation-compatible



PAMPA assay for eight common pharmaceuticals. 200 µL of 5% DMSO in PBS was dispensed to each well of the acceptor plate. 150 µL of drug in 5% DMSO in PBS was added to the wells in donor plate, for a final drug concentration 500 or 250 µM. Following a 5 hr. incubation, 100 µL each of donor and acceptor solution was transferred to UV compatible plate and absorbance was measured at 260 nm. Concentrations of drug in donor and acceptor plates were calculated using standard curves.

Ordering Information

Description	Qty/Pk	Cat. No.
MultiScreen®-IP filter plate for PAMPA assays		
with underdrain	50	**MAIPN4550**
w/o underdrain	10	**MAIPNTR10**
MultiScreen®$_{HTS}$ filter plate for PAMPA assays		
with underdrain	50	**MSIPN4B50**
w/o underdrain	10	**MSIPN4B10**
MultiScreen® permeability plate	10	**MPC4NTR10**

Accessories

Description	Qty/Pk	Cat. No.
MultiScreen® transport receiver plate	50	**MATRNPS50**
MultiScreen® acceptor PTFE receiver plate	1	**MSSACCEPT0R**

Sample Preparation

Multiwell plates enable simple, rapid, automation-compatible sample preparation, collection, and storage for life science, environmental analysis, clinical, forensic and industrial quality control, meeting the demands of lower detection limits and higher throughput.

MultiScreen® plates meet specific performance criteria for sample preparation methodology requiring low nonspecific binding of protein and drug analytes, solvent compatibility and sample throughput.

- MultiScreen® Solvinert™ filter plates
- 96- and 384-well MultiScreen®$_{HTS}$ filter plates
- Filter plates for genomic sample prep
- Polypropylene plates for collection and storage

Microporous Sample Preparation

Efficient filtration for better downstream analysis

Automation-compatible MultiScreen® filter plates that contain a microporous membrane are ideal for clarifying samples or separating suspensions in diverse workflows, including sample clean-up prior to instrument analysis, removal of cellular debris, extraction of natural products and bead washing for immunoassay procedures.

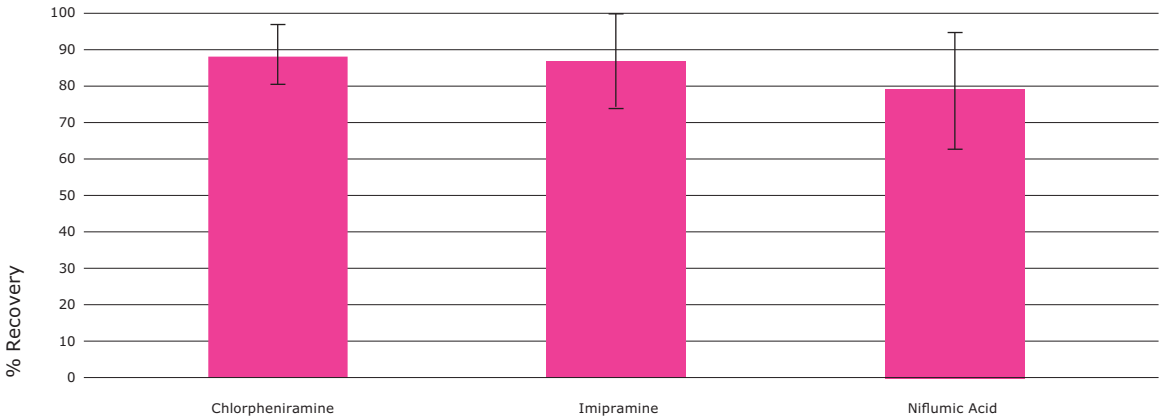
For general sample prep, protein precipitation assays with solvents, bead cleavage assays, and quantitative filtrate transfer suitable for instrumental analysis, we recommend MultiScreen® Solvinert™ filter plates. These plates contain hydrophobic or hydrophilic PTFE membranes, which provide low extractables, low binding and high recoveries. Other MultiScreen® filter plates or membranes may be selected for specific attributes such as high or low protein binding, and varying pore sizes suitable for your application.

Benefits of MultiScreen® Solvinert™ filter plates:

- Solvent compatibility
- High bead recovery
- Low nonspecific reactivity

MultiScreen® Solvinert™ Filter Plates Provide Higher Recovery

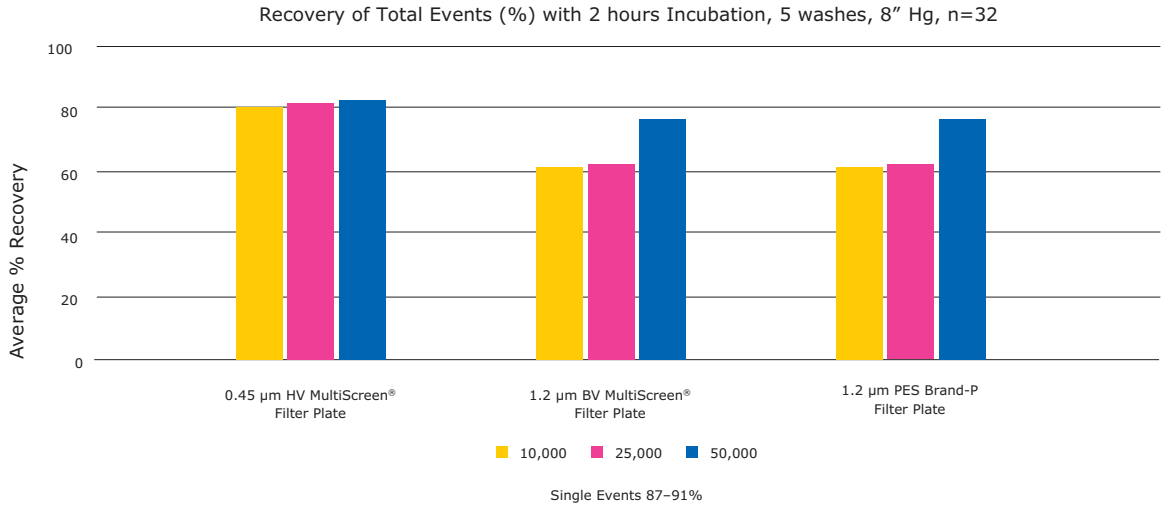
High recovery of drug following protein precipitation



Compounds were spiked at 250 ng/mL into human plasma. 300 µL of acetonitrile was added to individual wells followed by 100 µL of spiked plasma. Solvinert™ plates were covered, then vortexed for 5 minutes, and sample filtered using vacuum into a collection plate. 300 µL of water was added to the filtrate and, after mixing, 10 µL of sample was injected onto LC-MS/MS. Analyte recovery was calculated using a standard curve.

MultiScreen®$_{HTS}$ Filter Plate Performance

High bead recovery



Filter plates were challenged with either 10,000, 25,000 or 50,000 Luminex® microspheres (beads) per well. Incubation time was 2 hours, with 5 washes at 8” Hg (n=32). The greatest microsphere recovery was achieved with the smaller pore sized filter plate. When using the 0.45 µm MultiScreen®$_{HTS}$ filter plate, sample acquisition time is expected to be reduced.

Ordering Information

MultiScreen® filter plates with PTFE membrane: For filtration of organic solvents

Plate type	Pore size	Well volume	Qty/Pk	Cat. No.
Hydrophilic	0.45 µm	0.5 mL	10 50	**MSRLN0410** **MSRLN0450**
Hydrophobic	0.45 µm	0.5 mL	10 50	**MSRPN0410** **MSRPN0450**
Hydrophilic	0.45 µm	1.8 mL	10	**MDRLN0410**
Hydrophobic	0.45 µm	1.8 mL	10	**MDRPN0410**
Hydrophobic with pre-filter	0.45 µm	1.8 mL	10	**MDRPNP410**

MultiScreen® High Volume filter plates

Description	Pore Size, µm	Plate color	Plate material	Sterile	Qty/Pk	Cat. No.
Plates with Hydrophilic Durapore® membrane	0.45	96	Polypropylene	No	25	**MVHVN4525**
Glass Fiber membrane	1.2	96	Polypropylene	Yes	25	**MVFCN1225**

MultiScreen®$_{HTS}$ filter plates with Durapore® membrane: For high bead recovery and low protein binding

			Cat. No.	
Plate type	Pore size	Qty/Pk	96-well	384-well
MultiScreen®$_{HTS}$-BV	1.2 µm	10 50	**MSBVN1210** **MSBVN1250**	—
MultiScreen®$_{HTS}$-HV	0.45 µm	10 50	**MSHVN4510** **MSHVN4550**	**MSHVN0W10** **MSHVN0W50**
Multiplex filter plate*	1.2 µm	2	**MX-PLATE**	—

*Opaque filter plate with white lid to prevent photo-bleaching of sensitive beads

MultiScreen®$_{HTS}$ filter plates with Polycarbonate membrane: For aqueous, small molecule filtration and sample prep

Plate type	Pore size	Qty/Pk	Cat. No.
*MultiScreen®$_{HTS}$-PCF	0.45 µm	10 50	**MSSLBPC10** **MSSLBPC50**

*Previously MultiScreen®$_{HTS}$-Solubility

MultiScreen®$_{HTS}$ filter plates with glass fiber filter: Clarification of cellular debris or particulate-laden samples

			Cat. No.	
Plate type	Pore size	Qty/Pk	96-well	384-well
MultiScreen®$_{HTS}$-FB	1.0 µm	10 50	**MSFBN6B10** **MSFBN6B50**	**MZFBN0W10** **MZFBN0W50**
MultiScreen®$_{HTS}$-FC	1.2 µm	10 50	**MSFCN6B10** **MSFCN6B50**	**MZFCN0W10** **MZFCN0W50**

MultiScreen®$_{HTS}$ filter plates for lysate clearing: For aqueous, small molecule filtration and sample prep

Plate type	Pore size	Qty/Pk	Cat. No.
MultiScreen®$_{HTS}$-NA	–	10 50	**MSNANLY10** **MSNANLY50**

Resin-Based Separations

Custom mini-columns in a 96-well format

MultiScreen® column loaders let you combine the cost savings of bulk media with the convenience of 96-well filtration plates. Ideal for economical, high-throughput bioassays, four different sizes cover a wide range of assays. All 96 wells are loaded simultaneously and uniformly, thereby eliminating the need for pipetting slurries or using prepacked columns.

MultiScreen® filter plates with Durapore® PVDF membrane provide a low-binding, inert support for resin/bead-based separations. Plates are available in several pore sizes. Choose one that works for your resin.

- Make custom mini-columns
- Wide variety of membrane pore sizes and media compatibility
- Ideal for clean-up of DNA sequencing reactions

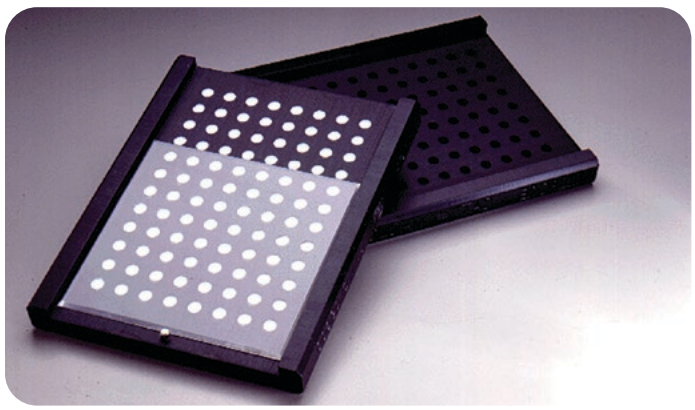
Ordering Information

Column Loaders

Description	Qty/Pk	Cat. No.
Column loader - 25 µL	1	**MACL09625**
Column loader - 45 µL	1	**MACL09645**
Column loader - 80 µL	1	**MACL09680**
Column loader - 100 µL	1	**MACL09600**
Scraper for column loader	3	**MACL0SC03**
Centrifugal alignment frame	4	**MACF09604**

Filter Plates

Description	Pore size	Qty/Pk	Cat. No.
MultiScreen®-HV filter plates	0.45 µm	10 50	**MAHVN4510** **MAHVN4550**
MultiScreen®-BV filter plates	1.2 µm	50	**MABVN1250**
MultiScreen®$_{HTS}$ (clear) filter plates	0.45 µm	10 50	**MSHVN4510** **MSHVN4550**
	1.2 µm	10 50	**MSBVN1210** **MSBVN1250**
MultiScreen®$_{HTS}$ (opaque) filter plates	0.45 µm	50	**MSHVN5B50**
	1.2 µm	50	**MSBVN1B50**



Genomics Sample Prep

Classic purity with next-generation throughput

DNA Template Prep and Sequencing Reaction Cleanup

Montage® genomics kits and MultiScreen® filter plates incorporate size exclusion technology for purifying products of polymerase chain reaction (PCR), bacterial artificial chromosome (BAC) preparations and plasmid preparations, as well as cleaning up 96- and 384-well sequencing reactions. Products for standard bind-wash-elute protocols are also available.

PCR Clean-up

Montage® PCR filter plates offer fast, automatable solutions for high-throughput PCR purification. The plates are available in 96- and 384-well formats, including a micro 96-well format for small volume PCR product purification.

- High purity and high recovery
- Fast processing times
- > 99.5% primer removal
- MultiScreen® $PCR_{\mu 96}$ microwell filter plate recommended for small volumes (20 - 150 µL)

Ordering Information

PCR Clean-Up

Description	Qty/Pk	Cat. No.
MultiScreen®$_{PCR\mu 96}$ filter plates	10	**LSKMPCR10**
	50	**LSKMPCR50**
MultiScreen®$_{PCR96}$ filter plates	10	**MSNU03010**
	50	**MSNU03050**

Description	Qty/Pk	Cat. No.
MultiScreen®$_{PCR384}$ filter plates	10	**S384PCR10**
	50	**S384PCR50**
MultiScreen®$_{HTS}$-FB filter plates	10	**MSFBN6B10**
	50	**MSFBN6B50**

Plasmid and BAC Minipreps

This Montage® kit yields clean and reproducible DNA in 50% less time than traditional methods. Easy to use, the kit involves no bind-wash-elute or centrifugation steps.

The kit includes all the reagents and disposable materials needed to purify plasmid, BAC, fosmid and cosmid DNA in a 96-well format.

- No centrifugation or precipitation
- Excellent purity, yields and reproducibility
- Sequencing-grade quality DNA with no alcohol precipitation

Ordering Information

Plasmid/BAC Minipreps

Description	Qty/Pk	Cat. No.
*Montage® Miniprep$_{96}$ kit	4	**LSKP09604**
	24	**LSKP09624**
MultiScreen®$_{HTS}$-FB filter plate	10	**MSFBN6B10**
	50	**MSFBN6B50**

Description	Qty/Pk	Cat. No.
MultiScreen®$_{HTS}$-NA filter plate for lysate clearing	10	**MSNANLY10**
	50	**MSNANLY50**
MultiScreen®$_{HTS}$ filter plate, Plasmid	50	**MSNUPSD50**

*Includes 96-well filter plates

Sequencing Reaction Cleanup

Size-exclusion technology for high pass rates and long reads

Montage® and MultiScreen®$_{HTS}$ sequencing reaction clean-up plates incorporate patented size exclusion membranes to yield highly purified sequencing reaction products. In addition to eliminating centrifugation steps, filter plates do not require filtrate collection or column packing. Available in 96- and 384-well formats, the plates use a vacuum-driven protocol and are automation-compatible.

Size-exclusion technology eliminates variability in sequencing reaction cleanup. Because there is no alcohol precipitation, there is no risk of salts or ethanol affecting final sequencing results. Pass rates are consistently high and results are reproducible. The 96-well Montage® kit includes all the reagents needed for sample processing.

- 10-minute vacuum-based protocol
- Compatible with a variety of templates
- Optimized for use with BigDye® chemistries

Ordering Information

Sequencing Reaction Clean-Up

Description	Qty/Pk	Cat. No.
*Montage® $_{SEQ96}$ Sequencing Reaction Cleanup Kit	1	**LSKS09601**
	4	**LSKS09604**
	24	**LSKS09624**
MultiScreen® $_{SEQ384}$ filter plates	10	**S384SEQ10**
	50	**S384SEQ50**
MultiScreen®-HV filter plates for gel-based cleanup	10	**MSHVN4510**
	50	**MSHVN4550**

*Includes 96-well filter plates and injection solution

Accessories

Description	Cat. No.
Montage® wash solution, 500 mL	**LSKSBW500**
Montage® injection solution, 500 mL	**LSKSIS500**

Sample Storage

MultiScreen® polypropylene microplates are ideal storage plates for samples and compound libraries. These inert plates are resistant to common chemical solvents such as DMSO and offer high temperature resistance.

- Biologically inert
- Broad chemical compatibility
- High temperature resistance from -196 °C to + 121°C
- V-bottom plates have conically tapered wells for better sample recovery
- U-bottom plates have wells without sharp corners for better suspension

MultiScreen® plates for sample storage

Plate	Material	Color	Format	Well	Qty/Pk	Cat. No.
MultiScreen® 96-well polypropylene V bottom natural	Polypropylene	Natural	96-well	V-bottom	100	**MSPNNVX00**
MultiScreen® 96-well polypropylene U bottom natural	Polypropylene	Natural	96-well	U-bottom	100	**MSPNNUX00**
MultiScreen® 96-well polypropylene flat bottom natural	Polypropylene	Natural	96-well	Flat bottom	100	**MSPNNFX00**
96-well Collection Plate	Polypropylene	Natural	96-well	Flat bottom	40	**MSCPNUV40**
MultiScreen® 384-well polypropylene V bottom natural	Polypropylene	Natural	384-well	V-bottom	100	**MZPNNVX00**

Accessories

MultiScreen® filter plates are accompanied by optimized plate accessories. This section provides information on the MultiScreen® vacuum manifold, products for radiometric binding assays, and ordering details for recommended receiver and analysis plates.

- Vacuum Filtration
- Voltohmmeter
- Radiometric Assays
- Centrifugation and Chromatography
- Collection Plates

MultiScreen®$_{HTS}$ Vacuum Manifold

Crosstalk-free for superior reproducibility

The MultiScreen®$_{HTS}$ Vacuum Manifold is designed to improve filter-based assay performance and reliability. The manifold supports a wide variety of MultiScreen® filter plate platforms, including standard and HTS versions of 96-well and 384-well filter plates for bioassays and deep-well Solvinert™ filter plates for sample preparation.

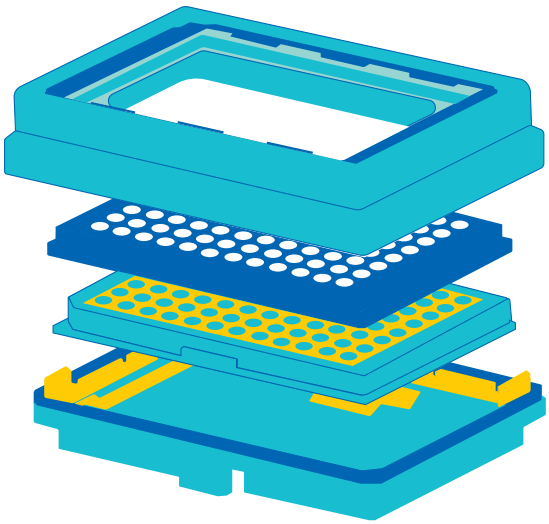
The manifold configuration is easily adapted to accommodate filter-to-waste or collection assays. For those assays where filtrate collection is required, the MultiScreen®$_{HTS}$ Vacuum Manifold incorporates DirectStack™ technology. This feature eliminates gaps between flow directors and receiver wells to increase assay reliability and eliminate crosstalk. The direct stacking of plates also makes vacuum initiation effortless.

The MultiScreen®$_{HTS}$ Vacuum Manifold is also ideally suited for automation. The compact size of the manifold base is modeled on ANSI/SBS standards for microplates to fit most robot deck locations. The manifold collar is lightweight and features a groove for easy handling by robotic gripper systems. If additional precision is needed for placement of the collar during assembly/disassembly routines, a collar holder accessory is available.

- DirectStack™ technology enables crosstalk-free filtrate collection
- Configurations for deep-well or standard receiver plates
- ANSI/SBS compliant footprint allows for easy robotic deck integration
- Solvent-resistant

MultiScreen®$_{HTS}$-FC filter plate (MZFCN0W10) and MultiScreen®$_{HTS}$ Vacuum Manifold with 384-well droplet trap array inserted.

DirectStack™ Technology Improves Assay Reliability



Manifold Collar

MultiScreen®$_{HTS}$Filter Plate

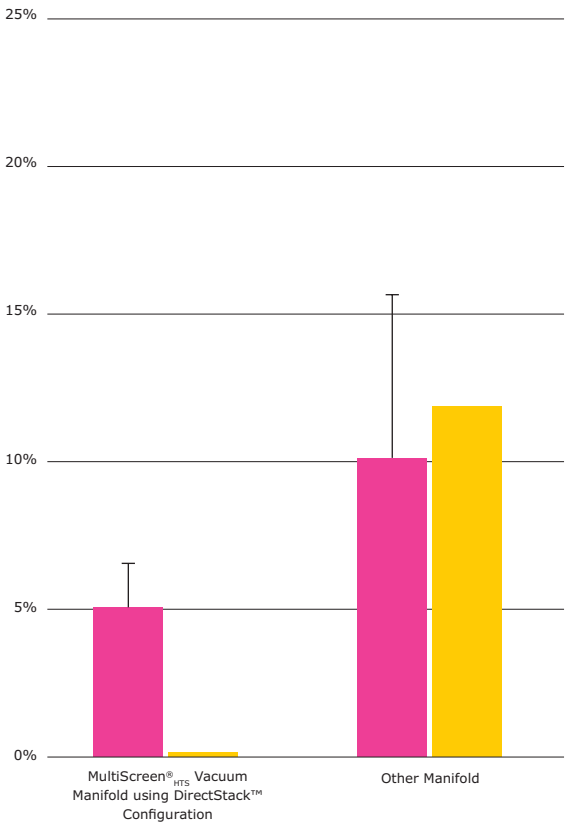
Collection Plate

Manifold Base

Plate-on-plate stacking eliminates gaps between flow directors and receiver wells in applications that require filtrate collection. The manifold also accommodates a deep well system (if both receiver and filter plate are deep well, a deep well collar is required to accommodate plate-on-plate stacking).

Low Crosstalk

MultiScreen®$_{HTS}$ vacuum manifold with DirectStack™ feature enhances 384-well filter plate performance

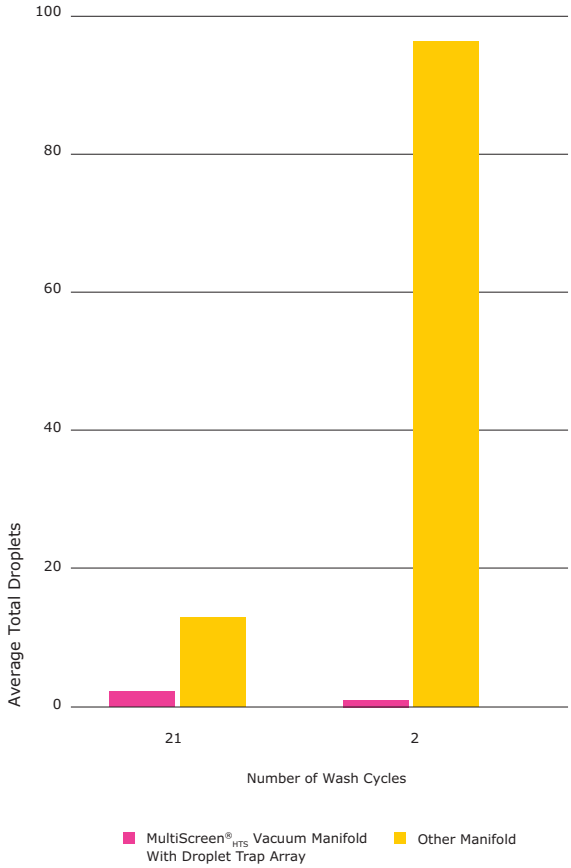


*A filtrate crosstalk event is defined as any buffer-only well location with >2% fluorescent signal.

Data shown are for MultiScreen®$_{HTS}$ 384 well filter plates (n=4). %CV was determined by microplate spectrophotometer absorbance measurement of dye in aqueous buffer. Filtrate crosstalk was determined by filtering a checkerboard pattern of fluorescent dye containing and buffer-only containing wells into a 384-well collection plate and reading in a Tecan Spectrafluor™ Plus plate reader.

Droplet-free Sample Processing

MultiScreen®$_{HTS}$ vacuum manifold eliminates droplets in 384-well sample processing



When filtering to waste in retentate analysis applications such as receptor ligand binding, hanging droplets can pose a cross-contamination risk in plate stacks waiting for analysis or from the work surface. Total droplets is a count of small droplets present on the automation deck and of droplets counted on a paper towel blot of the filter plate bottom. Droplets are virtually eliminated by the MultiScreen®$_{HTS}$ manifold's unique droplet trap accessory. Data shown are for MultiScreen®$_{HTS}$ 384 well filter plates on the $_{HTS}$ manifold (n=2) versus a 384-well plate on an "other" manifold. Average total droplets are per 384-well plate.

Vacuum Filtration

MultiScreen®$_{HTS}$ Vacuum Manifold

Description	Qty/Pk	Cat. No.
MultiScreen®$_{HTS}$ vacuum manifold standard kit (includes manifold base, standard collar, gaskets, gasket inserts, all tubing, valves and pressure gauge)	1	**MSVMHTS00**
Accessories/Replacement Parts:		
Droplet Trap Array	1	**MSVMHTS0A**
Deep Well Collar, includes gaskets and collar gasket frame	1	**MSVMHTS0D**
High Volume Collar	1	**MSVMHTSHV**
Collar Holder, for automation	1	**MSVMHTS0H**
Collar Gasket Frame	1	**MSVMHTS0F**

For adaptors and replacement parts, contact technical service or visit **SigmaAldrich.com**

MultiScreen® Vacuum Manifold for Classic Filter Plates

Description	Qty/Pk	Cat. No.
MultiScreen® Resist Vacuum Manifold (includes manifold base, standard ring with gaskets, support grid, all tubing, valves and pressure gauge)	1	**MAVM0960R**

Vacuum Manifold Kits

Includes: MultiScreen®$_{HTS}$ Vacuum Manifold, chemical duty pump (choose appropriate voltage), vacuum flask, stoppers and Millex® filter

Description	Qty/Pk	Cat. No.
Vacuum pump kit (115 volts, 60Hz)	1	**MSVMKIT01***
Kit Components:		
Chemical duty pump (115 volts, 60Hz)	1	**WP6111560**
Vacuum flask, 1 L	1	**XX1004705**
#8 Silicone stoppers, 9.5 mm hole	5	**XX2004718**
Millex®-FA filter	10	**SLFA05010**

*Contact customer service for pricing and availability.

Millicell® ERS 3.0 Digital Voltohmmeter

The Millicell® ERS 3.0 streamlines data capture with intuitive, user-friendly enhancements. Achieve more stable measurements using a self-standing, in-well probe. Keep track of your results with real-time, on-instrument voltage or resistance data recording. Simplify analysis across wells and between experiments using a cloud-based application. Obtain consistent readings with low noise, greater resolution, and high accuracy. Optimize your transepithelial electrical resistance experiments with the Millicell® ERS 3.0.

- Intuitive touchscreen interface
- On-instrument data logging and background subtraction
- Export results via ethernet, USB drive, or upload to cloud
- Corded power or battery pack power source for use on the bench or in the hood
- Adjustable electrode, compatible with a wide variety of cell culture inserts, including Millicell® inserts and plates
- Built-in sensor to measure and record media temperature
- Resistance range of 0 – 100 kΩ, with 1 Ω resolution

Ordering Information

Description	Cat. No.
Millicell® ERS 3.0 Digital Voltohmmeter Instrument	**MERS03000**
Includes:	
Millicell® ERS 3.0 Digital Voltohmmeter	
Millicell® ERS 3.0 Standard Adjustable Electrode (for 6-, 12-, 24-well plates)	
Millicell® ERS 3.0 Wi-Fi® USB Dongle	
Millicell® ERS 3.0 Power Cord	
Millicell® ERS 3.0 Verification Device	
Accessories	
Battery for Millicell® ERS 3.0	**MERS03BAT**
Millicell® ERS 3.0 Standard Adjustable Electrode (for 6-, 12-, 24- well plates)	**MERS03SAP**
Millicell® ERS 3.0 96-well Electrode	**MERS0396P**
Millicell® ERS 3.0 Verification Device	**MERS03VER**
Foot Pedal Accessory for Millicell® ERS 3.0	**MERS03PED**
Cloud Software Subscription	
Free six month trial	**MERS03CLTRIAL**
Annual subscription	**MERS03CL1YR**
5-Year license	**MERS03CL5YR**
10-Year license	**MERS03CL10YR**

For more information about the Millicell® ERS 3.0, please visit:
SigmaAldrich.com/millicell-ers

Millicell® DCI Digital Cell Imager

Assess your cell cultures with ease. The Millicell® DCI Digital Cell Imager provides quick, objective determination of common cell culture parameters including confluency, cell count, and morphology. Save time and conserve precious culture sample with in-vessel measurement. Track and record cell culture data using streamlined data management web tools. Analyze cell growth trends with instant access to historical data for more consistent cell cultures.

- Reduced user bias for more consistent cell cultures
- Hemocytometer or in-vessel measurement
- Two-click image capture
- Convenient, web-based cloud service for data analysis, storage, and archiving

Ordering Information

Description	Cat. No.
Millicell® DCI Digital Cell Imager	**MDCI10000**
Includes:	
Millicell® DCI Device	
Millicell® DCI Wi-Fi® USB Dongle	
Millicell® DCI Power Cord	
Replacement Accessories	
Millicell® DCI Power Supply (compatible with Millicell® ERS 3.0 instrument)	**MDCI1PWRSUP**
Millicell® DCI Wi-Fi® USB Adapter (compatible with Millicell® ERS 3.0 instrument)	**MDCI1USBD0N**

For more information about the Millicell® DCI Digital Cell Imager, please visit:
SigmaAldrich.com/millicell-dci

Radiometric Assays

Scintillation Counting in Vials

Components Needed: Punch, Vial Carrier and Punch Tips
Note: Punch and vial carriers are included in the punch kits

Punch Kits: includes punch and carrier racks	Qty/Pk	Cat. No.
MultiScreen® punch kit for 7 mL vials (includes multiple punch, MAMP09608, and 2 carrier racks for 7 mL vials, MACR08127)	1	**MAPK8960A**
MultiScreen® punch kit for 4 mL vials (includes multiple punch, MAMP09608, and 2 carrier racks for 4 mL vials, MACR08124)	1	**MAPK8960B**
MultiScreen® punch kit for 12 x 75 mm tubes (includes multiple punch, MAMP09608, and 2 carrier racks for 12 mm x 75 mm tubes, MACR81275)	1	**MAPK8960C**
MultiScreen® multiple punch (includes punch with punch carrier slide for MultiScreen® Classic 96-well filter plates: No vial rack included)	1	**MAMP09608**

Punch Tips	Qty/Pk	Cat. No.
MultiScreen® disposable punch tips	5 x 10	**MADP19650**

For adaptors and replacement parts, contact technical service or visit **SigmaAldrich.com**

Scintillation Counting in Plates

Plate Adaptors	Qty/Pk	Cat. No.
Packard TopCount® adapter for MultiScreen®$_{HTS}$ 96-well filter plates	50	**MSTPCWH50**
384-well clear plate liner for PE MicroBeta Trilux® liquid scintillation counter	50	**MZMBNCL50**

Centrifugation and Chromatography

Description	Qty/Pk	Cat. No.
MultiScreen® column loader, 25 µL	1	**MACL09625**
MultiScreen® column loader, 45 µL	1	**MACL09645**
MultiScreen® column loader, 80 µL	1	**MACL09680**
MultiScreen® column loader, 100 µL	1	**MACL09600**
MultiScreen® column loader Scraper	3	**MACL0SC03**
MultiScreen® centrifuge alignment frame, blue, aqueous applications	4	**MACF09604**

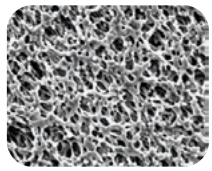
Sealing Tape

Description	Qty/Pk	Cat. No.
Sealing tape, opaque	100	**MATAH0P00**
Sealing tape, clear	100	**MATAHCL00**

Appendix

Ordering Guide for MultiScreen® Plates and Millicell® Assay Systems

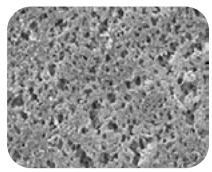
PVDF Membrane



The Durapore® membrane provides high flow rates and throughput, low extractables and broad chemical compatibilty.

Description	Product	Pore Size, µm	Plate color	Plate material	Sterile	Qty/Pk	Cat. No.
Plates with hydrophilic Durapore® PVDF membrane	MultiScreen®$_{HTS}$ filter plates	0.22	96	acrylic	No	10	**MSGVN2210**
					No	50	**MSGVN2250**
					Yes	10	**MSGVS2210**
		0.22	96	Barex®/TiO2	No	50	**MSGVN2B50**
		0.45	96	styrene	No	10	**MSHVN4510**
					No	50	**MSHVN4550**
					Yes	10	**MSHVS4510**
		0.45	96	Barex®/TiO2	No	10	**MSHVN4B10**
					No	50	**MSHVN4B50**
		0.65	96	styrene	No	10	**MSDVN6510**
					No	50	**MSDVN6550**
		0.65	96	Barex®/TiO2	No	50	**MSDVN6B50**
		1.2	96	styrene	No	10	**MSBVN1210**
					No	50	**MSBVN1250**
					Yes	10	**MSBVS1210**
		1.2	96	Barex®/TiO2	No	50	**MSBVN1B50**
	MultiScreen®$_{HTS}$ 384-well filter plates	0.45	384	SAN/TiO2	No	10	**MZHVN0W10**
					No	50	**MZHVN0W50**
Plates with hydrophobic Immobilon®-P PVDF membrane	MultiScreen®$_{HTS}$ filter plates	0.45	96	acrylic	No	10	**MSIPN4510**
					No	50	**MSIPN4550**
					Yes	10	**MSIPS4510**
		0.45	96	acrylic	Yes	10	**MSIPS4W10**
					No	50	**MSIPN4W50**
		0.45	96	Barex®/TiO2	No	10	**MSIPN4B10**
					No	50	**MSIPN4B50**
	MultiScreen®$_{HTS}$ IP Filter Plate, 8-well strips	0.45	96		No	10	**M8IPS4510**

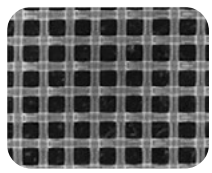
MCE Membrane



Biologically inert mixtures of cellulose acetate and cellulose nitrate have made MF-Millipore® membranes one of the most widely-used membranes in analytical and research applications.

Description	Product	Pore Size, µm	Plate color	Plate material	Sterile	Qty/Pk	Cat. No.
Plates with hydrophilic MCE membrane	MultiScreen®$_{HTS}$ filter plates	0.45	96	styrene	No	10	**MSHAN4510**
					No	50	**MSHAN4550**
					Yes	10	**MSHAS4510**
		0.45	96	Barex®/TiO2	Yes	10	**MSHAS4B10**
					No	50	**MSHAN4B50**

Nylon



Nylon net filters are compatible with a wide range of solvents and are good for crude separations of large cell clumps or whole organism assays.

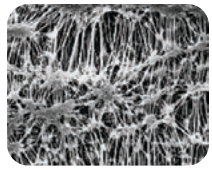
Description	Product	Pore Size, µm	Plate color	Plate material	Sterile	Qty/Pk	Cat. No.
Plates with nylon mesh filter	MultiScreen® MESH filter plates	20	96	styrene	No	10	**MANMN2010**
		40			No	10	**MANMN4010**
		60			No	10	**MANMN6010**
		100			No	10	**MANM10010**

Key

Plate Colors		
96	384	96
Clear or natural	White	Opaque

PTFE Membrane

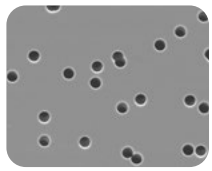
Fluoropore™ membrane is a PTFE membrane bonded to a high density polyethylene support.



Description	Product	Pore Size, µm	Plate color	Plate material	Sterile	Qty/Pk	Cat. No.
Solvent-resistant filter plates (500 µL)	Hydrophilic MultiScreen® Solvinert™ plates	0.45	96	polyolefin copolymer	No No	10 50	**MSRLN0410** **MSRLN0450**
	Hydrophobic MultiScreen® Solvinert™ plates	0.45	96	polyolefin copolymer	No No	10 50	**MSRPN0410** **MSRPN0450**
Solvent-resistant deep well filter plates (2 mL)	Hydrophilic MultiScreen® Deep Well Solvinert™ plates	0.45	96	polyolefin and cyclic olefin copolymers	No	10	**MDRLN0410**
	Hydrophobic MultiScreen® Deep Well Solvinert™ plates	0.45	96	polyolefin and cyclic olefin copolymers	No	10	**MDRPN0410**
		0.45 with pre-filter	96	polyolefin and cyclic olefin copolymers	No	10	**MDRPNP410**

Polycarbonate Membrane

Isopore™ membrane is a polycarbonate, track-etched filter recommended for all analyses in which the sample is viewed on the surface of the membrane.



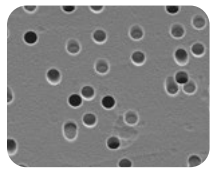
Description	Product	Pore size, µm	Plate color	Plate material	Sterile	Qty/ pk	Cat. No.
Cell culture insert plates	24-well cell culture plate, single-well feeder tray, 24-well receiver tray and lid	0.4 3.0 5.0 8.0	24	styrene	Yes Yes Yes Yes	1 1 1 1	**PSHT004R1** **PSST010R1** **PSMT010R1** **PSET010R1**
	24-well cell culture plate, 24-well receiver tray and lid	3.0 5.0 8.0	24	styrene	Yes Yes Yes	5 5 5	**PSST010R5** **PSMT010R5** **PSET010R5**
	24-well cell culture plate, single-well feeder tray and lid	0.4	24	styrene	Yes	5	**PSHT010R5**
	96-well cell culture plate, single-well feeder tray, 96-well receiver tray and lid	0.4	96	styrene	Yes	1	**PSHT004R1**
	96-well cell culture plate, 96-well receiver tray and lid	0.4	96	styrene	Yes	5	**PSHT004S5**
	96-well cell culture plate, single-well feeder tray and lid	0.4	96	styrene	Yes	5	**PSHT004R5**
Plates with Polycarbonate Membrane	MultiScreen®$_{HTS}$ filter plates	0.4	96	styrene	No	10 50	**MSSLBPC10** **MSSLBPC50**

Key

Plate Colors		
96 Clear or natural	384 White	96 Opaque

Polyester Membrane

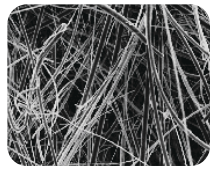
Polyester, track-etched membranes are optically clear, support cell growth and are recommended for assays requiring analysis of cells.



Description	Product	Pore size, µm	Plate color	Plate material	Sterile	Qty/pk	Cat. No.
Cell culture insert plates	24-well cell culture plate, single-well feeder tray, 24-well receiver tray and lid	1.0	24	styrene	Yes	1	**PSRP010R1**
	24-well cell culture plate, single-well feeder tray and lid	1.0	24	styrene	Yes	5	**PSRP0105R**
	96-well cell culture plate, single-well feeder tray, 96-well receiver tray and lid	1.0	96	styrene	Yes	1	**PSRP004R1**
	96-well cell culture plate, single-well feeder tray and lid	1.0	96	styrene	Yes	5	**PSRP004R5**

Specialty Membranes and Filters

Specialty membranes and filters are available for a variety of applications.



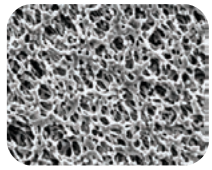
Description	Product	Pore Size, µm	Plate color	Plate material	Sterile	Qty/Pk	Cat. No.
Plates for lysate clearing	MultiScreen®$_{HTS}$-NA filter plates	—	96	styrene	No	10	**MSNANLY10**
					No	50	**MSNANLY50**
Plates with glass fiber filter	MultiScreen®$_{HTS}$ + Hi Flow plates	1.0	96	Barex®/TiO2	No	50	**MSFBNXB50**
		1.2			No	50	**MSFCNXB50**
	MultiScreen®$_{HTS}$ filter plates	1.0	96	Barex®/TiO2	No	10	**MSFBN6B10**
					No	50	**MSFBN6B50**
		1.2			No	10	**MSFCN6B10**
					No	50	**MSFCN6B50**
	MultiScreen®$_{HTS}$ 384-well filter plates	1.0	384	SAN/TiO2	No	10	**MZFBN0W10**
					No	50	**MZFBN0W50**
		1.2			No	10	**MZFCN0W10**
					No	50	**MZFCN0W50**
Harvest plates with glass fiber filter	Harvest plates with 100 µL wells	1.0	96	Barex®/TiO2	No	60	**MAHFB1H60**
		1.2			No	60	**MAHFC1H60**

Key

Plate Colors		
96	384	96
Clear or natural	White	Opaque

Classic MultiScreen® Filter Plates

Various membranes are found in MultiScreen® Classic Filter plates with easily removable underdrains.



Description	Pore Size, µm	Plate color	Plate material	Sterile	Qty/Pk	Cat. No.
Plates with hydrophilic Durapore® membrane	0.22	96	styrene	Yes	10	**MAGVS2210**
	0.45	96	styrene	No	10	**MAHVN4510**
	0.45	96	styrene	No	50	**MAHVN4550**
	0.65	96	styrene	No	50	**MADVN6550**
	1.2	96	Barex®/TiO2	No	50	**MABVN0B50**
	1.2	96	styrene	No	50	**MABVN1250**
Plates with Immobilon®-P membrane	0.45	96	styrene	No	50	**MAIPN4550**
	0.45	96	styrene	Yes	10	**MAIPS4510**
	0.45	96	acrylic	Yes	10	**MAIPSWU10***
	0.45	96	Barex®/TiO2	No	50	**MAIPN0B50**
	0.45	96	acrylic	Yes	10	**S2EM004M99**
Plates with glass fiber filters	1.0	96	Barex®/TiO2	No	50	**MAFBN0B50**
	1.2	96	Barex®/TiO2	No	50	**MAFCN0B50**
Plates with MCE membrane	0.45	96	styrene	Yes	10	**MAHAS4510**
		96		No	50	**MSHAN4550**

*This plate does not come with an underdrain.

MultiScreen® High Volume Filter Plates

Description	Pore Size, µm	Plate color	Plate material	Sterile	Qty/Pk	Cat. No.
Plates with Hydrophilic Durapore® membrane	0.45	96	Polypropylene	No	25	**MVHVN4525**
Glass Fiber membrane	1.2	96	Polypropylene	Yes	25	**MVFCN1225**

MultiScreen® Ultrafiltration Plates with Ultracel® membrane

Plate	Plate membrane	NMWL (Nominal Molecular Weight Limit)	Qty/Pk	Cat. No.	
				96-well	384-well
MultiScreen® Ultrafiltration Plate with Ultracel®-10 membrane	Ultracel® Regenerated Cellulose (RC)	10 kDa	5	MAUF01005	

Key

Plate Colors		
96	384	96
Clear or natural	White	Opaque

MultiScreen® Solid Assay Plates

Plate	Material	Color	Format	Well	Qty/Pk	Cat. No.
MultiScreen® 96-well polystyrene V bottom clear	Polystyrene	Clear	96-well	V-bottom	100	MSSCNVX00
MultiScreen® 96-well polystyrene U bottom clear	Polystyrene	Clear	96-well	U-bottom	100	MSSCNUX00
MultiScreen® 96-well polystyrene flat bottom clear	Polystyrene	Clear	96-well	Flat bottom	100	MSSCNFX00
MultiScreen® 96-well polystyrene flat bottom white	Polystyrene	White	96-well	Flat bottom	40	MSSWNFX40
MultiScreen® 96-well polystyrene flat bottom black	Polystyrene	Black	96-well	Flat bottom	40	MSSBNFX40
MultiScreen® 96-well polystyrene flat bottom clear ELISA high binding	Polystyrene	Clear	96-well	Flat, High bind	40	MSEHNFX40
MultiScreen® 8-well strip 96-well ELISA high binding	Polystyrene	Clear	96-well stripwell	Flat, High bind	100	M8CHNFX00
MultiScreen® 8-well strip 96-well ELISA medium binding	Polystyrene	Clear	96-well stripwell	Flat, Medium bind	100	M8CMNFX00

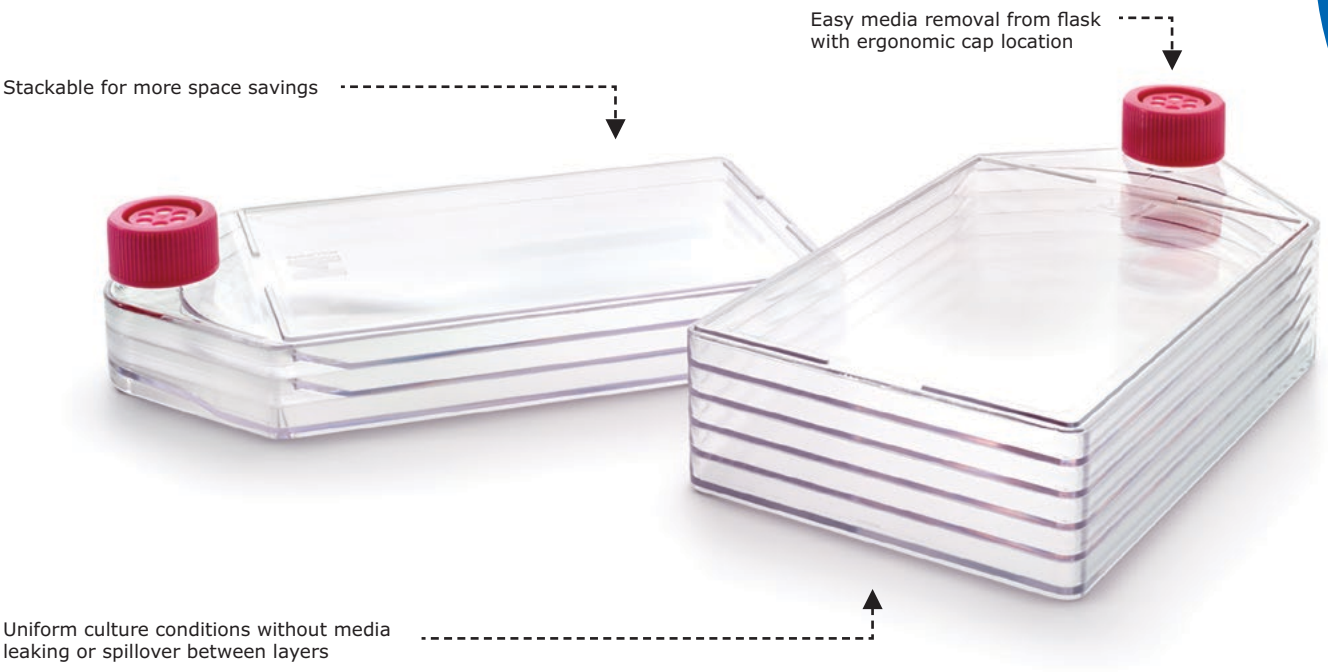
MultiScreen® Polypropylene Plates

Plate	Material	Color	Format	Well	Qty/Pk	Cat. No.
MultiScreen® 96-well polypropylene V bottom natural	Polypropylene	Natural	96-well	V-bottom	100	MSPNNVX00
MultiScreen® 96-well polypropylene U bottom natural	Polypropylene	Natural	96-well	U-bottom	100	MSPNNUX00
MultiScreen® 96-well polypropylene flat bottom natural	Polypropylene	Natural	96-well	Flat bottom	100	MSPNNFX00
MultiScreen® 384-well polypropylene V bottom natural	Polypropylene	Natural	384-well	V-bottom	100	MZPNNVX00

Millicell® HY Multilayer Culture Flask

Multitask with our multilayer flask and be more productive.

Culture more cells in the same space and environment as traditional T-flasks by growing cells on multiple layers — the Millicell® HY 3- and 5-layer flasks offer 600 and 1000 cm^2 of total surface area, respectively. You'll get consistently high cell yields and uniform health across all layers with the same volume of medium per unit area as traditional T-flasks. The low profile of the flasks allows for a comfortable fit under microscopes for monitoring cell health and confluency.



Description	No. of Layers	Total Surface Area (cm^2)	Qty/Pk	Cat. No.
Millicell® HY Flask (stem cell tested)	3	600	16	**PFHYS0616**
	5	1000	8	**PFHYS1008**

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