making a difference

HIGH THROUGHPUT MADE EASY

THINCERT®

96 Well HTS Insert

Scale up your membrane-based cell culture applications

greiner BIO-ONE

Discover the next level of efficiency with the ThinCert® 96 well HTS insert

BOOST EFFICIENCY & CUT COST

Membrane-based ThinCert® cell culture inserts are widely recognised for their effectiveness in advanced cell and tissue culture applications. The inserts enable in-vitro testing of specific tissue models (e.g., endothelia and epithelia) in drug transport and permeability studies, migration and invasion assays or co-cultures using air-lift and submerged culture methods. They are extensively employed in cancer research and drug discovery, representing an ethically, scientifically and economically advantageous alternative to animal testing.

In response to the demand for high-throughput applications, Greiner Bio-One has expanded its ThinCert® portfolio to include a new 96 well HTS insert line, complementing the existing 6, 12, and 24 well offerings.

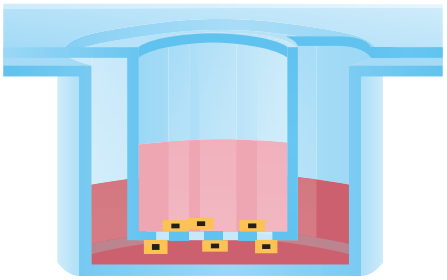
This expansion not only facilitates highly parallelised product application but also enables additional miniaturisation, leading to reduced consumption of cells, media, and reagents, thereby resulting in significantly lower costs per assay.

KEY FACTS

- **96 well system for high-throughput applications**
- **Polycarbonate membrane with pore sizes of 0.4 µm, 3 µm or 8 µm**
- **Automation-friendly design**
- **Reduced wicking effect**
- **High membrane flatness for reproducible cell culture conditions**

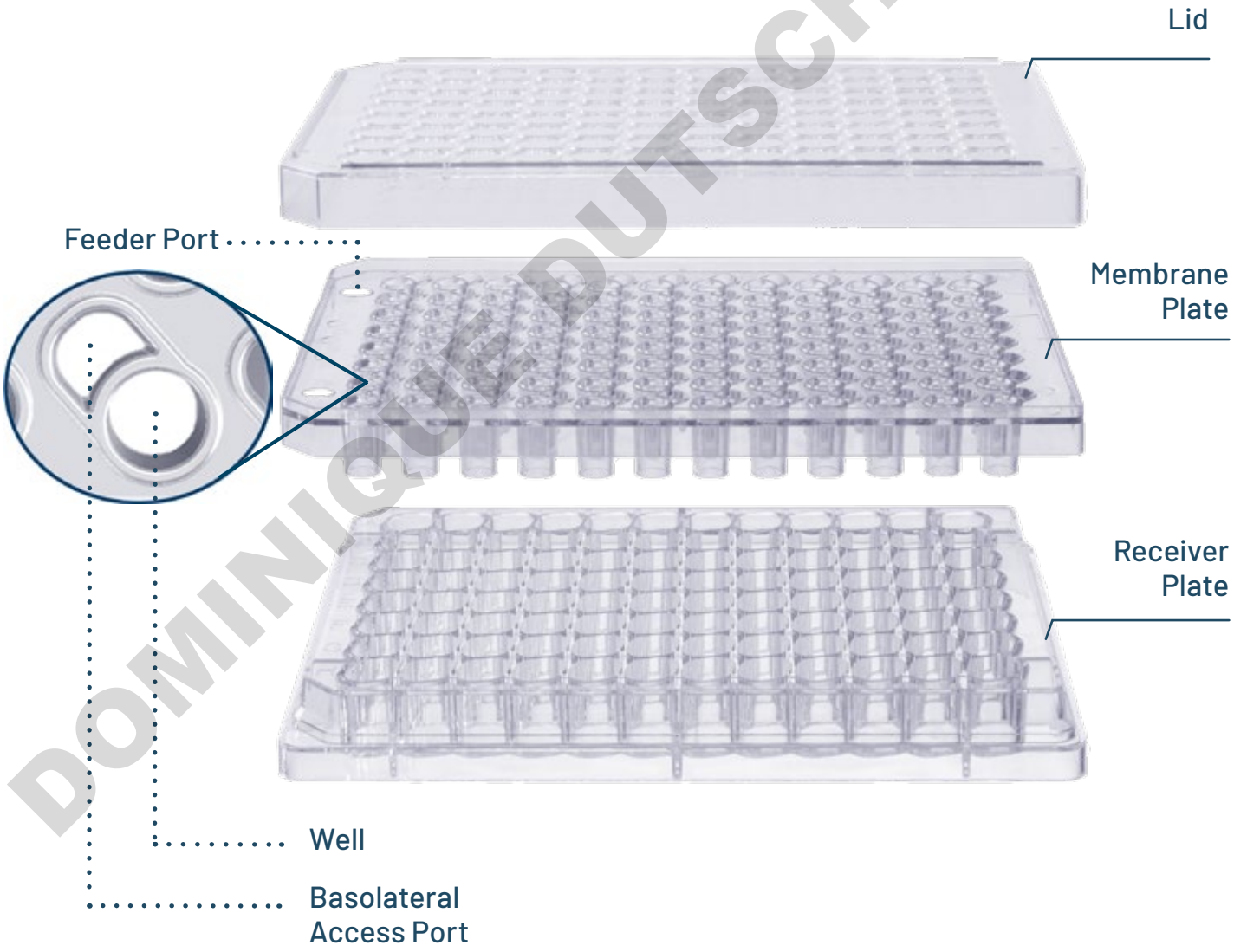
ThinCert® 96 Well HTS Insert

Featuring 96 independent dual-compartment chambers, each separated by a semi-permeable barrier, enabling optimal cell growth and inter-compartmental interactions



MORE INFORMATION

THINCERT®
96 WELL HTS SYSTEM



DESIGNED TO MAKE A DIFFERENCE

The two-component system consists of a 96 well porous membrane plate manufactured entirely from polycarbonate (PC) and a corresponding polystyrene (PS) receiver plate. The PC membrane, treated for tissue culture, enables optimal exchange of nutrients and substances, mimicking in vivo-like conditions to support ideal cell growth, monolayer formation, and tissue differentiation.

The ports have been carefully optimised to ensure convenient access to the lower (basolateral) compartment, facilitating usability with pipettes, automated liquid handling robots, and electrodes for transepithelial electric resistance (TEER) measurements. Through precise and well-centered fitting of the membrane plate, wicking* is minimised, and stable and reproducible assay conditions are maintained.

For preparatory cell culture, particularly for transport and permeability studies, a single-well **feeder plate** is available. Using the two feeder ports in the membrane plate allows for a one-step media change, effectively minimising both handling effort and the potential for contamination. Ensuring uniform conditions across all wells, the feeder plate helps reduce well-to-well variability. Additionally, it significantly reduces the risk of wicking* during cultivation. The feeder plate is available in two configurations: with a cross-shaped media stabiliser or without.

* Wicking: Undesired formation of a liquid bridge between upper and lower compartment due to capillary forces within the narrow space between membrane and receiver plate.

- **Tissue-culture treated PC membrane for optimal cell growth**
- **Basolateral ports for easy access to receiver plate**
- **Compatible with common TEER electrodes**
- **Feeder plate with optional media stabiliser**

No media stabiliser

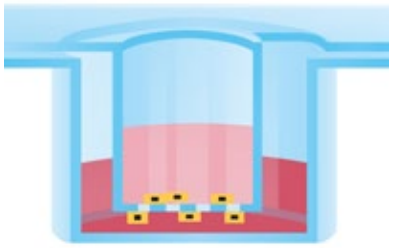
Cross-shaped media stabiliser

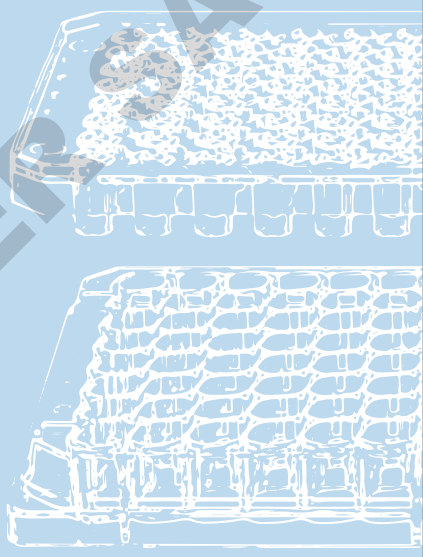
FEEDER PLATE

Designed for preparatory cell culture work in transport and permeability studies

MAIN APPLICATIONS

MIGRATION / INVASION ASSAYS

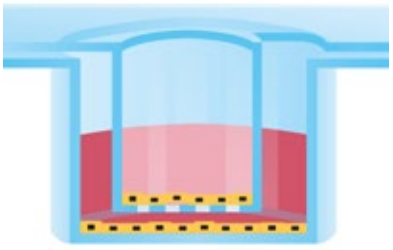




Cell migration and invasion are crucial in various physiological and pathological events like morphogenesis, tissue repair, inflammation, and tumorigenesis. In-vitro assays for studying cell migration are essential for understanding biological mechanisms and developing therapeutic interventions.

The filter assay, a standard in-vitro model, employs a two-compartment system where cells migrate from an upper compartment through a porous membrane into a lower compartment, following a chemoattractant gradient.

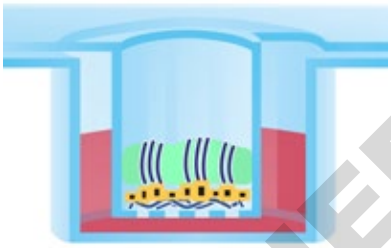
CO-CULTURES



Co-culture studies involve the cultivation of two or more different types of cells or microorganisms in the same environment, allowing scientists to explore the dynamic interactions that occur between them. These studies provide insights into various biological processes, including cell signalling, proliferation, differentiation and the restoration of hetero-cellular functions (e.g., blood-brain barrier).

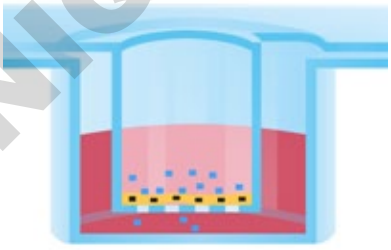
ThinCert® 96 well HTS insert offers a versatile platform for seeding cells in both the upper and lower compartments facilitating the exchange of molecules between these cell populations through its membrane.

AIR-LIQUID-INTERFACE CELL CULTURE



Air-liquid interface cell culture (ALI) enables the creation of robust and functional 3D in vitro human airway cell models, mimicking respiratory tract epithelia. Cells are exposed to air on the apical side while receiving nutrients and differentiation factors through a porous membrane from the culture medium. These models allow researchers to explore physiological and pathological aspects of the respiratory tract.

TRANSPORT STUDIES



Transport studies are vital for pharmaceutical research and toxicology, offering insights into drug permeability, barrier integrity, and transport mechanisms. These investigations, including ADME (Absorption, Distribution, Metabolism, and Excretion), are critical for understanding drug efficacy and safety. Specifically, drug transport studies focus on how drugs move across biological barriers like cell membranes or tissue layers, helping predict pharmacokinetic behaviour and optimise drug formulations.

SELECTING THE RIGHT MEMBRANE AND PORE SIZE

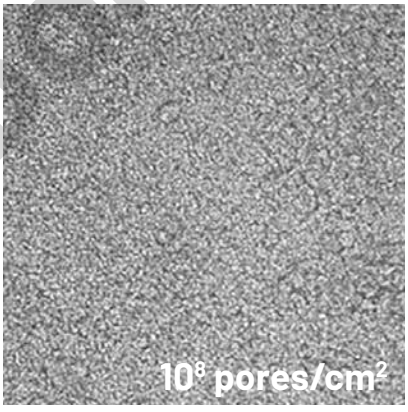
When considering membrane selection for ThinCert® applications, it is crucial to choose the appropriate pore size to suit the specific experimental requirements.

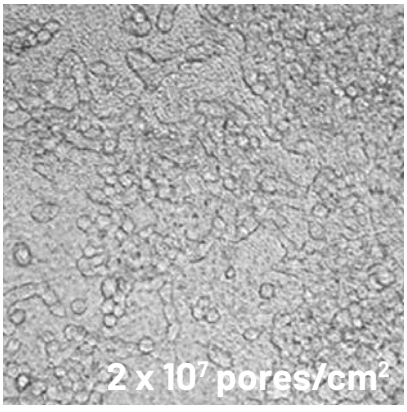
Polycarbonate (PC) membranes provide an excellent substrate for cell adhesion and growth. PC has proven to be advantageous in transportation assays by maintaining consistent transepithelial electrical resistance over a long time.

Small pore sizes, such as the 0.4 µm versions, are ideal for co-cultivation, as well as for transportation, secretion, and diffusion studies involving small molecules.

Combining high membrane permeability with best possible transparency, the special 0.4 µm pore size version is specifically designed for applications requiring both high diffusion rates and the ability to monitor cells and contamination. This is achieved through a unique pore arrangement and a high pore density of 2 x 10^7/cm^2.

Additionally, a product version with a translucent membrane and a pore density of 1 x 10^8/cm^2 complements the portfolio for experiments requiring the highest diffusion rates without the need for imaging.





Pore density
Comparison of PC membranes with different pore sizes

Larger pore sizes, such as 3.0 µm and 8.0 µm in diameter, are more suitable for migrational, chemotactic, and metastasis experiments. The selection of pore size is relative to the size of the investigated cells, ensuring that the pores in the membrane are small enough to prevent the passive passage of cells while being large enough to facilitate their active migration. For instance, customarily, 3 µm pores are employed for leukocytes, while 8 µm pores are preferred for epithelial and tumor cells. It is important to note that membranes with pore sizes of 0.4 µm typically act as insurmountable barriers for cells. Therefore, careful consideration of pore size is essential to ensure the success of experiments and accurate interpretation of results.

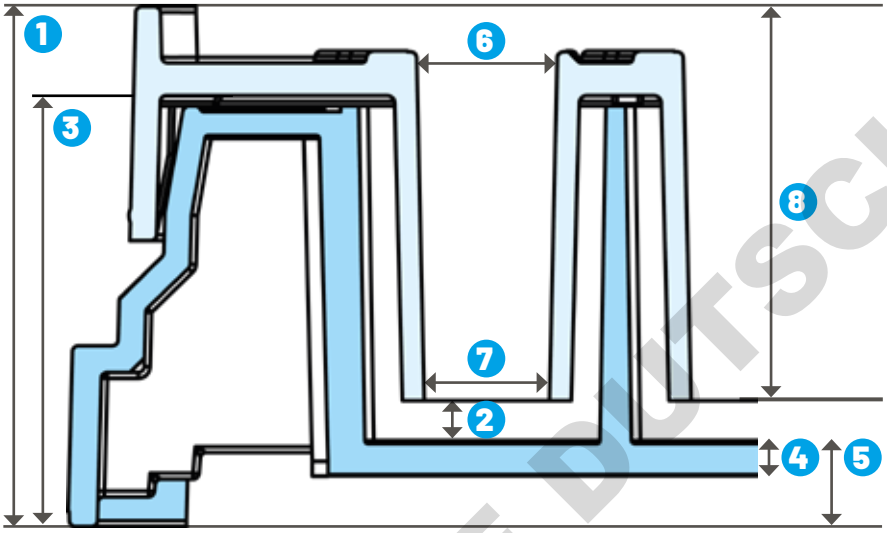
The following table presents frequently employed cell types along with their suggested membrane specifications. However, we recommend performing experiments with a range of pore sizes, including control groups, to determine the most suitable size for your cell cultures and particular needs.

Application	Cell type (examples)	Recommended pore size [µm]
Transport and permeability studies	Caco-2	0.4
	MDCK	0.4
Toxicity testing	Fibroblasts	3
	Human Bronchial Epithelial Cells	0.4
Tissue engineering	Skin model	0.4 / 3
Migration assays	Endothelial cells (HUVEC, HMVEC)	3 / 8
	Dendritic cells (BMDC)	3 / 8
	Neuronal cells	3
	Leukocytes (Macrophages, Monocytes)	3 / 8
	Lymphocytes (B cells, T cells)	3
	Epithelial fibroblasts	8
	Fibrosarcoma cells (HT1080, NIH3T3)	8
Invasion assays	Melanoma (M-3, B16F10)	8
	Osteoblasts	8
	Endothelial cells	3 / 8
Co-culture	Stem cells, neuronal cells	0.4

AUTOMATION MADE EASY

Plates are designed to seamlessly integrate with both automated and manual liquid handling processes, as well as with commercially available TEER electrodes.

Detailed dimensions for automation adjustments can be found below.



Ref.	Component	Description	Dimension [mm]
1	Assembled system	Total height (membrane and receiver plate)	17.80
2	Assembled system	Distance between receiver well and membrane	1.70
3	Receiver plate	Height	14.20
4	Receiver plate	Bottom thickness	1.10
5	Receiver plate	Well bottom elevation (rim bottom to inner site of receiver well)	2.80
6	Membrane plate	Well diameter top	4.75
7	Membrane plate	Well diameter bottom	4.22
8	Membrane plate	Height	13.30

PRODUCT OVERVIEW

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ThinCert® 96 Well HTS Insert Systems

Growth area: 14 mm², Working volume (well of membrane plate): 15 - 160 µl, Working volume (well of receiver plate): 120 – 300 µl, Lid: yes, condensation rings

Item no.	Pore density	Ø Pores	Optical features of membrane	Surface treatment	Sterile	Membrane plate	Receiver plate	Feeder plate (media stabiliser)	Feeder plate (w/o mediastabiliser)	Qty. inner / outer
655640	1 x 10^8/cm²	0.4 µm	translucent	TC	+	•	•			1 / 5
655641	2 x 10^7/cm²	0.4 µm	**optimised transparency**	TC	+	•	•			1 / 5
655642	1 x 10^8/cm²	0.4 µm	translucent	TC	+	•	•	•		1 / 3
655643	2 x 10^7/cm²	0.4 µm	**optimised transparency**	TC	+	•	•	•		1 / 3
655644	1 x 10^8/cm²	0.4 µm	translucent	TC	+	•	•		•	1 / 3
655630	2 x 10^6/cm²	3 µm	transparent	TC	+	•	•			1 / 5
655680	1 x 10^5/cm²	8 µm	transparent	TC	+	•	•			1 / 5

Receiver plates for ThinCert® 96 Well HTS Insert

Working volume: 120 – 300 µl, Lid: yes, condensation rings

Item no.	Growth area	Surface treatment	Sterile	Qty. inner / outer
655169	-	non-treated	+	8 / 32
655167	53 mm²	TC	+	8 / 32

Feeder plates for ThinCert® 96 Well HTS Insert

Working volume: 20 - 30 ml, Lid: yes, condensation rings

Item no.	Media stabiliser	Surface treatment	Sterile	Qty. inner / outer
670640	+	non-treated	+	1 / 5
670641	-	non-treated	+	1 / 5

INTERESTED IN FURTHER INFORMATION ABOUT THINCERT® 96 WELL HTS INSERT?

Application note
"High-throughput in-vitro airway modelling with ThinCert® 96 Well HTS Insert"

Application note
"High-throughput cell migration assay with ThinCert® 96 Well HTS Insert"

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