



ThinCert™ Tissue Culture Inserts

Application Guideline

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Application Guideline

1. Membrane Features

- Wide range of pore sizes consisting of 0.4 μm , 1.0 μm , 3.0 μm and 8 μm
- Translucent (in general high pore density, e.g. large number of pores per cm^2) and transparent (in general low pore density, e.g. moderate number of pores per cm^2) membranes available
- Produced from USP class VI certified PET capillary pore membranes and polystyrene housings
- Physical surface treatment for optimal cellular attachment and growth
- Detached membranes remain flat for advanced light or electron microscopy applications \rightarrow Fig. 1
- Uniform, consistent pore size with no occurrence of doublets or triplets, max. pore size tolerance only \pm 10 % \rightarrow Fig. 2

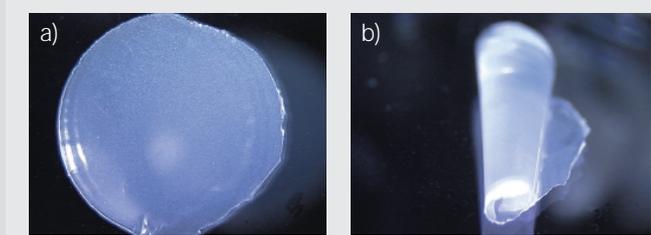


Figure 1: Detached PET membranes stay flat after being detached from PS housings a), whereas competitive PC membranes curl up after detachment b).

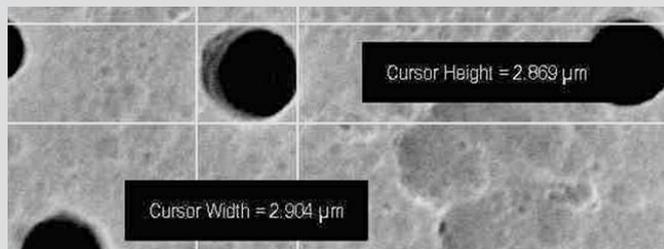


Figure 2: Electron micrograph showing the check of pore dimensions on a 3 μm capillary pore membrane.

2. Application Hints – Which Membrane to Use

2.1. General Guideline

- Small pore sizes (0.4 and 1.0 μm in diameter) for co-cultivation as well as transportation, secretion, and diffusion studies of small molecules
- Larger pore sizes (3.0 and 8.0 μm in diameter) for migrational, chemotactic, and metastasation experiments
- Transparent membranes suitable for light and electron microscopy
- Translucent membranes suitable for electron microscopy and very well suited for TEER
- Membranes with pore sizes of 1.0 μm or lower usually represent insuperable cell barriers (dependent on cell size)

2.2. Suitability of the membranes

	0.4 μm transparent	0.4 μm translucent	1.0 μm transparent	3.0 μm transparent	3.0 μm translucent	8.0 μm translucent
light microscopy	+	-	+	+	-	+
electron microscopy	+	+	+	+	+	+
immunocytochemistry	+	-	+	+	-	+
trans epithelial electric resistance (TEER)	+	+	+	+	+	+
transport/diffusion/secretion of small molecules	+	+	+	+	+	+
transport/diffusion/secretion of large molecules (e.g. macromolecules, viruses)	-	-	-	+	+	+
co-cultivation	+	+	+	-	-	-
cell retention/cell barrier function	+	+	+	-	-	-
migration/chemotaxis/metastasation	-	-	-	+	+	+

+* very well suited

+ suitable

- not suitable

Table 1: Suitability chart of the different ThinCert™ membrane types

2.3. Applications in Detail

- **Co-cultivation:**
secretion of growth-factors or cytokines by feeder-layers, ligand-receptor interaction studies, viral infection, bacterial infection, cellular communication, endocrine stimulation, clonal expansion
Recommended membranes:
0.4 µm transparent, 0.4 µm translucent, 1.0 µm transparent
- **Chemotaxis:**
directed cellular migration towards (positive taxis, chemo-attraction) or away (negative taxis, chemorepulsion) from a stimulus/agent, transepithelial migration, motility of macrophages, motility of dendritic cells, metastatic potential, invasion assays
Recommended membranes:
3.0 µm transparent, 3.0 µm translucent, 8.0 µm translucent
- **Transport studies:**
 - a) small molecules: drug/metabolite transport via cellular barriers, transport across cell monolayers, transport via bronchial, gastrointestinal or other epithelia, CACO-assays, toxicology
Recommended membranes:
0.4 µm transparent, 0.4 µm translucent, 1.0 µm transparent
 - b) large molecules/particles: transport of large macromolecules, viruses or metabolites
Recommended membranes: 1.0 µm transparent, 3.0 µm transparent, 3.0 µm translucent, 8.0 µm translucent
- **Primary cell/tissue culture:**
 - a) salivary glands, hippocampal slices, tumor tissue slices etc.
Recommended membranes: 0.4 µm transparent, 0.4 µm translucent, 1.0 µm transparent, 3.0 µm transparent, 3.0 µm translucent, 8.0 µm translucent
 - b) skin models
Recommended membrane: 0.4 µm translucent
 - c) in vitro fertilization studies
Recommended membranes: 0.4 µm transparent, 1.0 µm transparent, 3.0 µm transparent

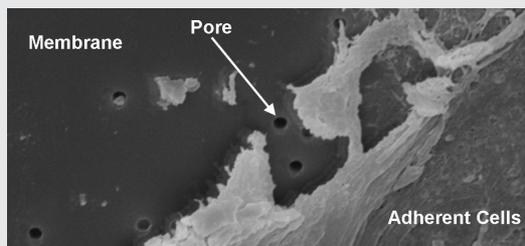


Figure 3: Electron micrograph of human osteosarcoma cells on ThinCert™ membrane. By courtesy of Department of Oral and Maxillar Facial Surgery, University Hospital Freiburg.

3. Filling Volume Charts for Hydrodynamical Balance (Fig. 4)

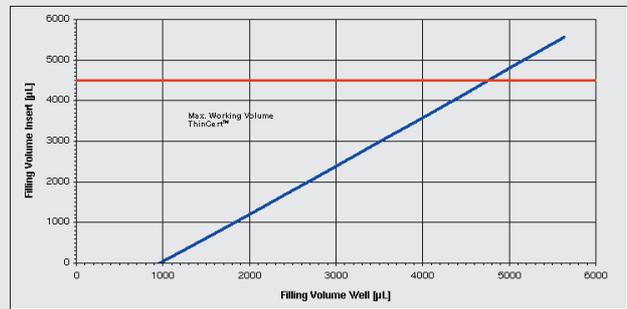


Figure 4a: Filling Volume chart for hydrodynamical balance of 6 well ThinCert™

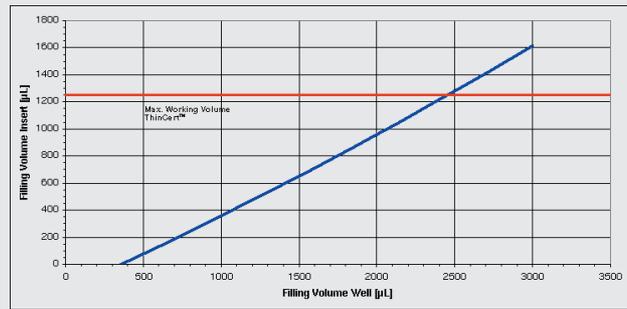


Figure 4b: Filling Volume chart for hydrodynamical balance of 12 well ThinCert™

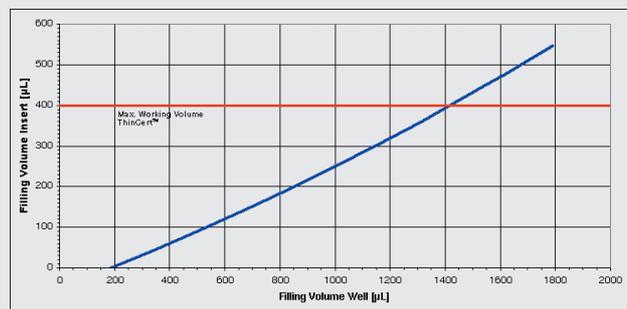


Figure 4c: Filling Volume chart for hydrodynamical balance of 24 well ThinCert™

4. Technical Details

ThinCert™ Size	6 Well	12 Well	24 Well
Culture Surface [mm ²]	452.4	113.1	31.2
Working Volume ThinCert™ [ml]	1.0-4.5	0.3-1.25	0.06-0.4
Working Volume Well [ml]	1.8-4.7	0.9-2.45	0.4-1.3



ThinCert™ Cell Culture Inserts 6 Well, 12 Well, 48 Well

- Eccentric in-well positioning: large aperture for ease of pipette access
- Scalloped ThinCert™ upper edges allow better pipetting angle and minimised risk of contamination
- Self-lift mechanism: ThinCert™ glides upwards when a pipette is inserted into the well
- Hanging geometry always ensures a minimum distance and no contact between the membrane and the base of the well
- Individual, sterile blister packing for max. flexibility
- Multiwell plates include: compatible with all standard multiwell plates
- Available for 6, 12 and 24 well tissue culture plates

DNase-free
RNase-free
human DNA-free
non-Pyrogenic

non-cytotoxic



							
6 w e l l	Cat.-No.	657 640	657 641	657 610	657 630	657 631	657 638
	Membrane material	PET	PET	PET	PET	PET	PET
	Pore size [µm]	0.4	0.4	1.0	3.0	3.0	8.0
	Pore density [cm ²]	1 x 10 ⁸	2 x 10 ⁶	2 x 10 ⁶	0.6 x 10 ⁶	2 x 10 ⁶	0.15 x 10 ⁶
	Optical membrane properties	translucent	transparent	transparent	transparent	translucent	translucent
	TC surface treatment/Sterile	+/+	+/+	+/+	+/+	+/+	+/+
	Multiwell plates/ThinCert™ per box	4/24	4/24	4/24	4/24	4/24	4/24



							
12 w e l l	Cat.-No.	665 640	665 641	665 610	665 630	665 631	665 638
	Membrane material	PET	PET	PET	PET	PET	PET
	Pore size [µm]	0.4	0.4	1.0	3.0	3.0	8.0
	Pore density [cm ²]	1 x 10 ⁸	2 x 10 ⁶	2 x 10 ⁶	0.6 x 10 ⁶	2 x 10 ⁶	0.15 x 10 ⁶
	Optical membrane properties	translucent	transparent	transparent	transparent	translucent	translucent
	TC surface treatment/Sterile	+/+	+/+	+/+	+/+	+/+	+/+
	Multiwell plates/ThinCert™ per box	4/48	4/48	4/48	4/48	4/48	4/48



							
24 w e l l	Cat.-No.	662 640	662 641	662 610	662 630	662 631	662 638
	Membrane material	PET	PET	PET	PET	PET	PET
	Pore size [µm]	0.4	0.4	1.0	3.0	3.0	8.0
	Pore density [cm ²]	1 x 10 ⁸	2 x 10 ⁶	2 x 10 ⁶	0.6 x 10 ⁶	2 x 10 ⁶	0.15 x 10 ⁶
	Optical membrane properties	translucent	transparent	transparent	transparent	translucent	translucent
	TC surface treatment/Sterile	+/+	+/+	+/+	+/+	+/+	+/+
	Multiwell plates/ThinCert™ per box	2/48	2/48	2/48	2/48	2/48	2/48