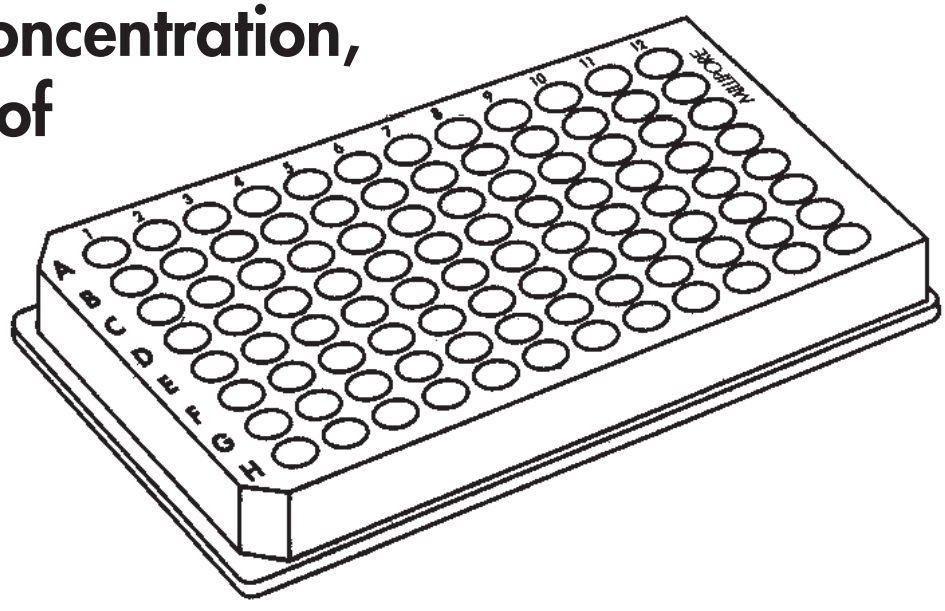
MultiScreen® Filter Plates with Ultracel®-10 Membrane

For use in the separation, concentration, desalting, and preparation of proteins and other biomolecules



- For research use only
- Single use only

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PR02166, Rev. A, 07/06

Contents

Introduction

The MultiScreen filter plate with Ultracel-10 membrane is a single-use 96-well filter plate for the processing of aqueous biological solutions in the 0.1 to 0.4 mL volume range. The filter plate is for use in a centrifugal pressure mode only, and is compatible with standard centrifuge microtiter plate swinging bucket rotors. It is designed to fit with a 96-well microtiter receiver plate for use in ultrafiltrate collection.

The MultiScreen filter plate with Ultracel-10 membrane has been developed and is QC-released for protein removal prior to sample analysis and for sample purification, concentration and desalting of biological solutions. The low binding ultrafiltration membrane used in this product has a 10,000 Dalton nominal molecular weight limit (NMWL) as determined with the protein solute marker Cytochrome c (12,500 Daltons). Cytochrome c is > 95% retained.

The MultiScreen filter plate with Ultracel-10 membrane can be used with conical 100 µL, standard 300 µL or 700 µL well microtiter deep well receiver plates.

Materials Required

The MultiScreen filter plage with Ultracel-10 membrane (see Figure 1) and microtiter plate storage lids are included. In addition, the user must supply the following items:

- Centrifuge capable of a minimum of 2000 × g-force with a swinging bucket rotor and 96-well plate carrier. **Do not use this plate with vacuum filtration.**
- Pipetters or robotic liquid handlers for transferring 300 µL and 25 µL and 10 µL volumes.
- 96 well microtiter plate receiver tray, i.e.:

  Greiner® 300 µL plate (for use with sample volumes of up to 300 µL), polypropylene, cat. no. 651201

  Greiner 700 µL deep well plate (for use with sample volumes of up to 500 µL), polypropylene, cat. no. 786201

  Greiner 150 µL conical well plates (for use with filtrate volumes less than 30 µL), cat. no. 652270

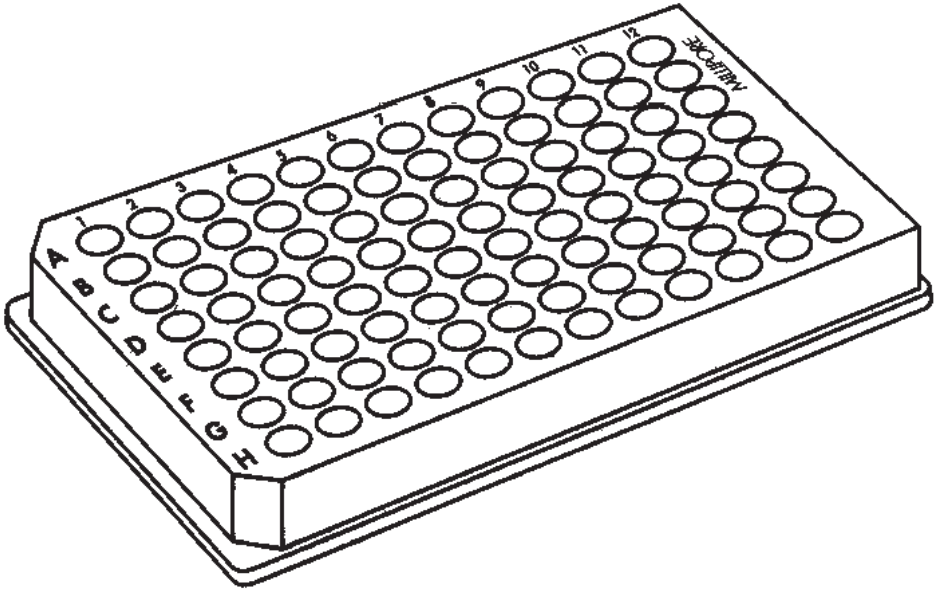

Figure 1. MultiScreen filter plate with Ultracel-10 membrane.

Specifications

Filter plate well capacity	500 µL
Maximum centrifugal speed	3000 × g
Dimensions, filter plate	
Length	123.4 mm
Width	82.7 mm
Depth	14.6 mm
Membrane area	0.28 cm^2
Materials of Construction	
Filter plate	Polyolefin
Membrane	10,000 NMWL Regenerated Cellulose

Limitations and Precautions

- Centrifuge at a temperature range of 4 to 37 °C.
- The MultiScreen filter plate with Ultracel-10 membrane may exhibit a variance in flow properties with viscous, particle-laden samples such as serum. Depending on the centrifuge, wells on the outside edges (i.e., rows A, B, G, and H) of the filter plate will tend to filter slightly faster than those on the inside of the plate. This will NOT interfere with data analysis or assay results (see Table 1 and Figure 2).
- This product is recommended for use in initial starting volumes of 100–500 microliters, but is limited to the volume capacity of the 96-well receiver plate. For samples exceeding 300 µL (up to 500 µL), use of a deep well plate will ensure that the receiver plate will contain all of the ultrafiltrate. For samples generating an ultrafiltrate less than 50 µL the use of a small volume conical well plate is recommended.

Limitations and Precautions, continued

- The ultrafiltrate volume generated can be increased by using a larger starting volume of sample or more centrifuge spin time. Use of a 500 µL sample of serum or plasma (versus recommended 300 µL) will generate a larger ultrafiltrate volume (See Table 1 and Figure 3).
- MultiScreen Ultracel-10 plates are designed for centrifugal pressure mode only. **Do not use this plate with vacuum filtration.**
- Centrifuge microtiter plate carriers (plate bucket) must be flat to provide uniform support during centrifugation. If the carrier base is not flat, performance may be compromised.

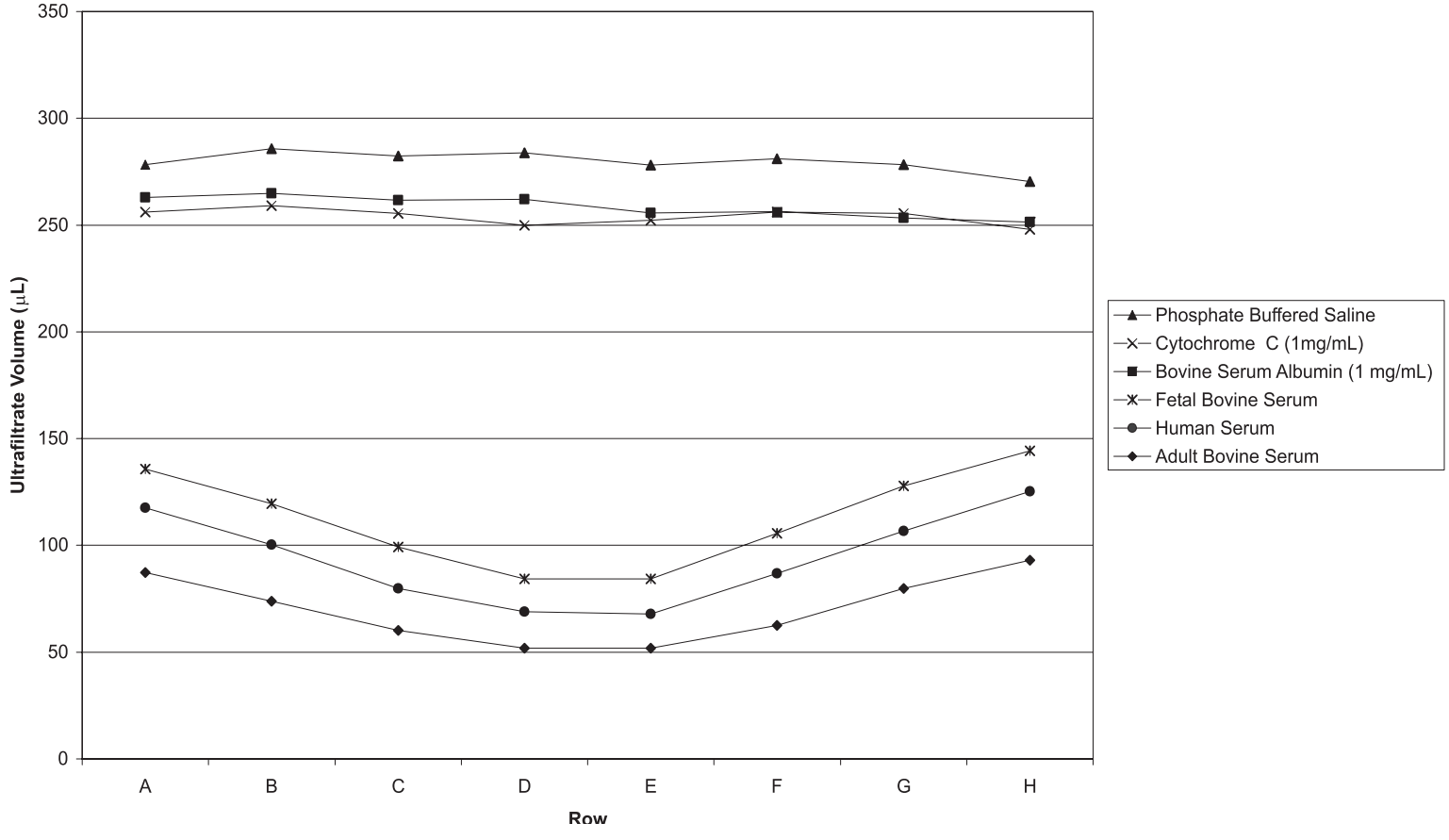

Figure 2. Ultrafiltration volume versus receiver plate well position for various sample types with starting volumes of 300 µL centrifuged at 3000 × g at 25 °C for 60 minutes spin time.

Operation and Performance Guidelines

The MultiScreen filter plate with Ultracel-10 membrane is operated in a centrifugal pressure mode at a recommended temperature of 4 to 37 °C and g-force of 2000 to 3000 × g. When mounted on top of a microtiter receiver plate, the MultiScreen filter plate with Ultracel-10 membrane will fit into all standard microtiter plate swinging bucket rotors.

To minimize evaporation of sample prior to analysis and during centrifugation, the top of the MultiScreen filter plate with Ultracel-10 membrane should be covered with the lid.

General Operating Procedure

1. Mount the MultiScreen filter plate on top of a standard microtiter plate (for sample volumes up to 300 µL) or on top of a deep well plate (for sample volumes up to 500 µL).
2. Load samples into the filter plate using a standard multichannel pipetter or liquid handling instrument.

General Operating Procedure, continued

3. Place the loaded assembly into the centrifugal plate carrier and centrifuge up to 3000 × g for desired spin time. Refer to Table 1 and Figure 4 for additional information regarding centrifugation guidelines for different spin times and sample types. Starting with more volume will increase the volume of ultrafiltrate generated. The wells of the MultiScreen filter plate can handle up to 500 µL of sample (requires deep well receiver plate).
4. To recover the sample ultrafiltrate, remove the Ultracel-10 filter plate from the microtiter receiver plate. The ultrafiltrate is ready for analysis or storage.
5. Recover the retentate after ensuring it is well mixed (concentrated protein layer may form on the membrane during filtration). Avoid touching the membrane with the pipette tip as this will clog the pipetter.

Table 1. Final ultrafiltration volumes by receiver plate row for various sample types and times at 25 °C and 3000 × g with 300 µL starting volume.

Spin Time	Sample Type	Average Ultrafiltrate Volume (µL) by Row							
		A	B	C	D	E	F	G	H
15	ABS	45	39	32	26	28	30	38	44
	BSA	125	128	122	136	115	126	124	120
	Buffer	132	142	176	140	136	138	131	123
	Cyto c	122	131	124	119	118	123	124	117
	FBS	79	70	57	43	42	54	67	72
	Human	64	55	43	33	33	43	54	61
30	ABS	68	57	45	37	37	47	60	68
	BSA	199	220	217	212	200	205	192	185
	Buffer	208	235	226	228	227	223	212	193
	Cyto c	199	237	226	210	221	222	211	196
	FBS	110	97	76	62	62	83	100	112
	Human	92	77	61	49	47	64	81	93

Spin Time	Sample Type	Average Ultrafiltrate Volume (µL) by Row							
		A	B	C	D	E	F	G	H
60	ABS	87	74	60	52	52	63	80	93
	BSA	263	265	262	262	256	256	253	252
	Buffer	278	286	282	284	278	281	278	271
	Cyto c	256	259	256	250	252	256	256	248
	FBS	136	120	99	84	84	106	128	144
	Human	118	100	80	69	68	87	107	125
90	ABS	108	84	72	65	65	75	92	105
	BSA	271	268	268	274	269	269	267	265
	Buffer	291	295	292	293	291	293	291	287
	Cyto c	269	266	268	266	265	265	264	266
	FBS	154	138	118	107	105	125	144	160
	Human	133	113	95	87	83	101	120	138

ABS = Adult Bovine Serum
BSA = Bovine Serum Albumin
Buffer = Phosphate Buffered Saline
Cyto c = Cytochrome c
FBS = Fetal Bovine Serum
Human = Human Serum

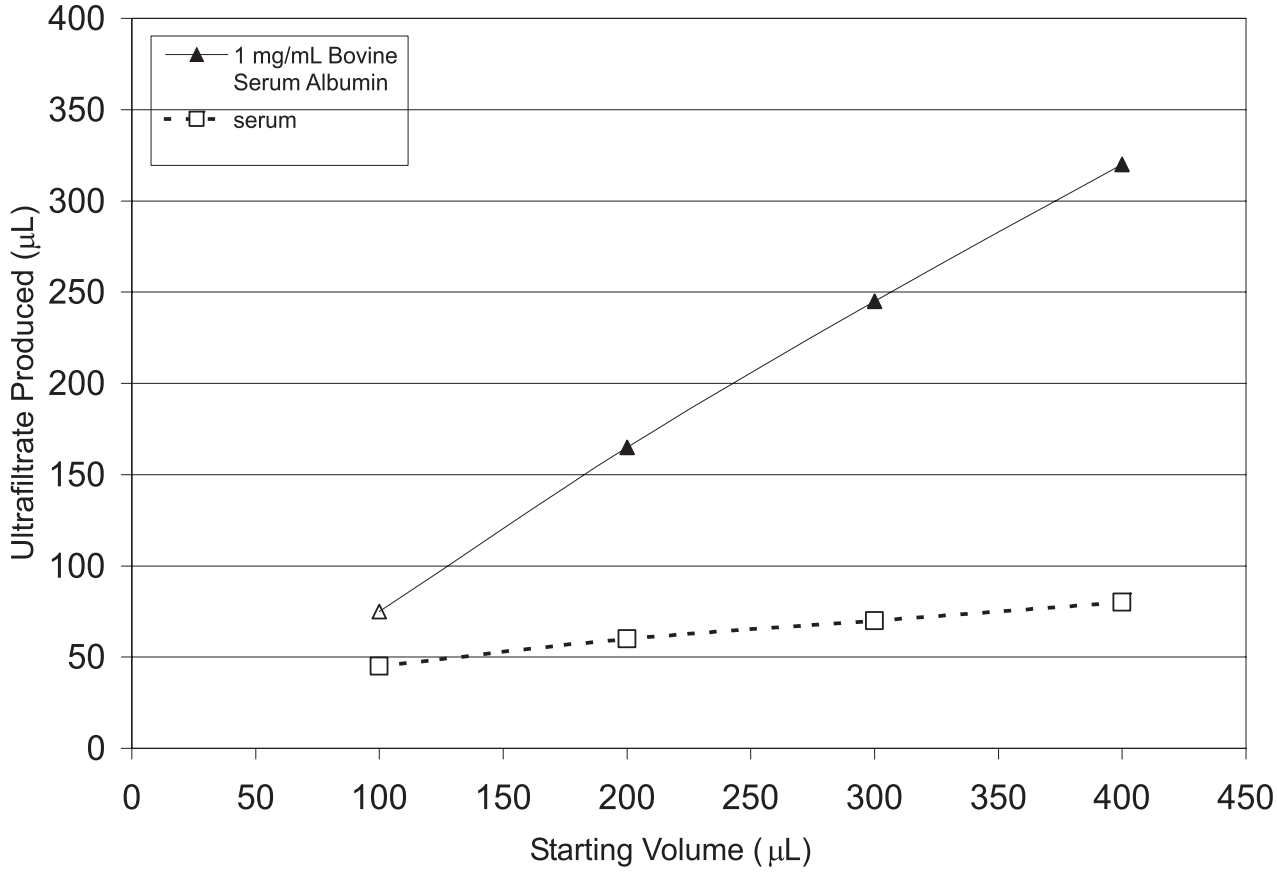

Figure 3. Typical ultrafiltration volumes produced for a dilute protein solution (1 mg/mL bovine serum albumin) and a concentrated protein solution (serum) with different starting volumes (at 3000 × g, 37 °C, for 60 minutes).

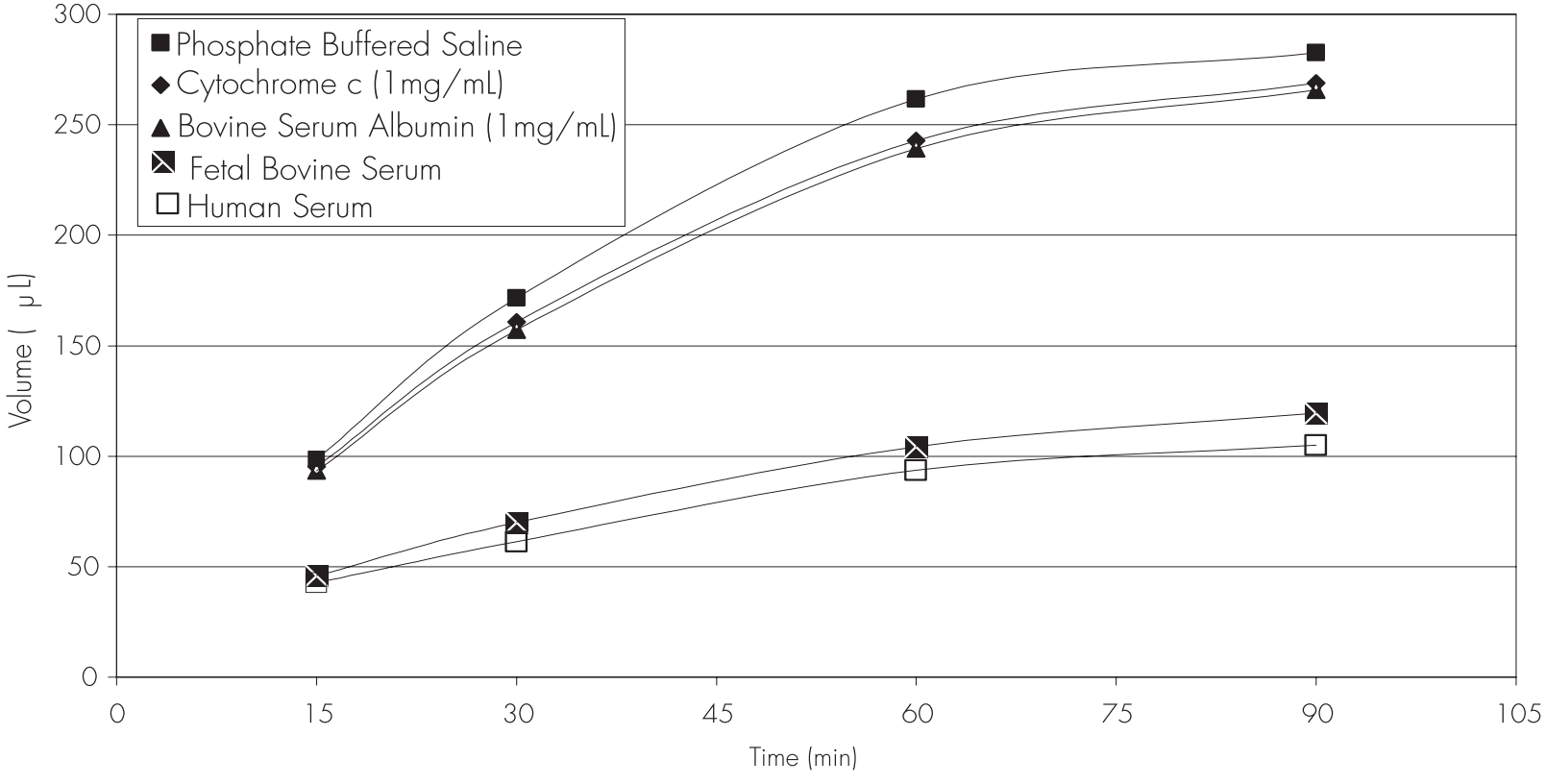

Figure 4. Typical filtrate volume versus spin time. This graph shows the effect of 2000 × g centrifuge time on ultrafiltrate volume for different media with an initial sample volume of 300 µL. Ultrafiltrate volumes are lower for samples with higher protein concentrations such as serums.

Product Ordering Information

This section lists the catalogue numbers for MultiScreen Filter Plates with Ultracel-10 Membranes and related accessories. See the Technical Assistance section for information about contacting Millipore. You can also buy Millipore products on-line at www.millipore.com/purecommerce.

Description	Qty/Pk	Cat. No.
MultiScreen Filter Plate with Ultracel-10 Membrane	10/pk	MAUF 010 10
Accessories		
Millipore Solvinert Collection Plate for UV analysis	100/pk	MSCP NPP 00
Millipore Deep Well Collection Block	50/pk	MDCP N2M 50
Greiner 150 µL conical well plates for filtrate <30 µL		652270
Greiner 300 µL plate for samples up to 300 µL		651201
Greiner 700 µL deep well plate for samples up to 500 µL		786201

Technical Assistance

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