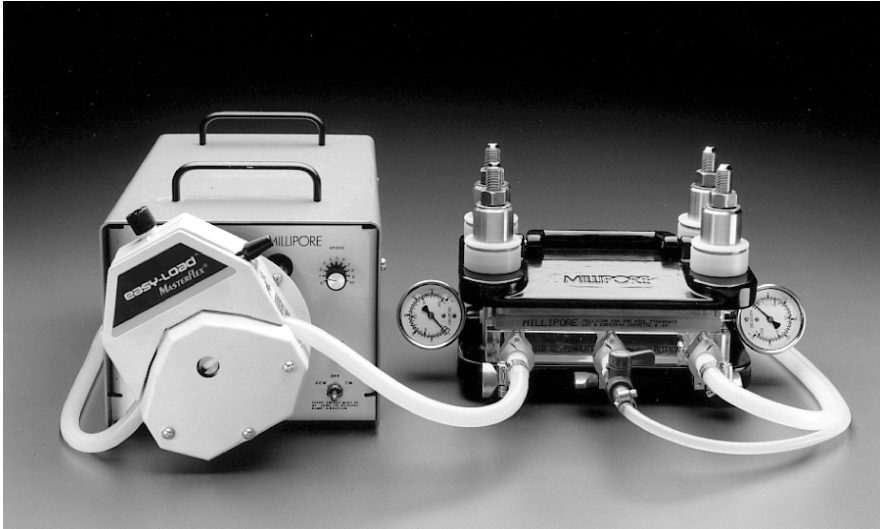


# Pellicon<sup>®</sup> Laboratory Systems, Holders and Assemblies

For versatile tangential flow filtration on the benchtop



## Process Small to Medium Volumes with Reliable Scale Up

The Pellicon 2/Pellicon cassette systems are versatile tangential flow filtration (TFF) devices for use in the laboratory, pilot plant or small-volume production facility. The systems use Pellicon 2/Pellicon cassette filters, which are available in a range of ultrafiltration and microporous membranes. The Pellicon 2/Pellicon system's design allows the total filter area to be varied from 2.5 m<sup>2</sup> (27 ft<sup>2</sup>) to 5 m<sup>2</sup> (54 ft<sup>2</sup>) in a single holder, with only a change of a pump. Using the Pellicon 2/Pellicon cassette system, tangential flow filtration processes can be developed and scaled up on the laboratory bench top from 1 liter to over 500 liters without additional manifolding or filter holders. Pellicon

cassette systems have the lowest hold-up volume of commercially available bench-top TFF systems, approximately 10 mL/m<sup>2</sup> of installed filter area after flushing. Low hold-up volume maximizes the yields and recovery of valuable products.

Pellicon 2/Pellicon filter systems contain all the equipment needed for tangential flow microporous filtration or ultrafiltration. Feed and product containers need only be connected. Millipore offers a selection of Pellicon 2/Pellicon filter holders, fitting/tubing sizes, and pumps to serve a wide variety of laboratory applications. Each system provides the flexibility required to filter different volumes with a variety of membranes. Consult the Systems Capability Chart on the following page to select a system for your needs.

When process volumes increase beyond 500 liters, Millipore's TFF experience will help you scale up and transfer directly to large scale Pellicon cassette Systems or to Helicon<sup>™</sup> ultrafiltration systems, which ever suits your process and products best.

Pellicon 2/Pellicon systems are designed, developed, and manufactured in accordance with a Quality Management System approved by an accredited registering body to an ISO<sup>®</sup> 9000 Quality Systems Standard.

## Typical Applications

- Clarification of cells
- Concentration of virus suspensions
- Desalting of protein solutions
- Buffer exchanges of polysaccharide solutions

## For Information On

Pellicon Filter Systems .....	see page 2
Pellicon Acrylic Holder and Assemblies .....	see page 4
Pellicon Steel Holder and Assemblies .....	see page 6
High Resolution Tangential Flow Systems .....	see page 7
Pellicon System Accessories and Spare Parts for Holders and Pumps .....	see page 7

## Pellicon Filter Systems with Pumps

- A selection of complete benchtop systems for tangential flow microporous filtration and ultrafiltration.
- Multiple applications
- Low hold up volumes for high product recoveries
- Interchangeable selection of fittings
- New Easy-Load™ pumps with quick connections for changing system capability

Pellicon Filter Systems contain all the equipment needed for tangential flow microporous filtration or ultrafiltration. Feed and product containers need only be connected. Millipore offers a selection of Pellicon filter holders, fitting/tubing sizes, and pumps to serve a wide variety of laboratory applications. Each system provides the flexibility required to filter different volumes with a variety of membranes.

Consult the System Capability Chart (page 3) to select a system for your needs.

## Applications

Clarification, concentration, desalting, and buffer exchange of solutions of proteins and other biopolymers; cell and virus harvest; concentration, washing and depyrogenation of solutions of low molecular weight solutes.

## System Specifications

4 L/min low retentate volume system, Catalogue No. XX42 PLK 50/XX42 PLK 60

Pump Materials	Head: stainless steel rotor; polysulfone, polyester, anodized aluminum body Drive: painted steel housing	
Pump	4 – 13 L/min easy-load peristaltic tubing pump with 6 mm (1/4") I.D. silicone tubing, 7.5 m (25')	
Connections	Holder: 3/4" sanitary clamp adapters Tubing: 1/4" hose barb adapters with quick connections; clamps and gaskets included; 1/4" hose barb ball valve for permeate	
Maximum Inlet Pressure (4 – 50 °C)	Holder: 7 bar (100 psi) Tubing: 2.8 bar (40 psi) intermittent; 1.4 bar (20 psi) for 30–40 hrs at top speed	
Dimensions	Length: 71 cm (28"); Width: 50 cm (19 1/2") Height: 25 cm (10")	
Shipping Weight	Approximately 40 kg (90 lbs)	
Voltage	115 VAC/60 Hz	XX42 PLK 60
	230 VAC/50 Hz	XX42 PLK 50

13 L/min standard Pellicon system, Catalogue No. XX42 PEL 50/XX42 PEL 60

Pump Materials	Head: stainless steel rotor; polysulfone, polyester, anodized aluminum body. Drive: painted steel housing.	
Pump	4 – 13 L/min easy-load peristaltic tubing pump with 12.7 mm (1/2") I.D. silicone tubing, 7.5 m (25')	
Connections	Holder: 3/4" sanitary clamp adapters Tubing: 1/2" hose barb adapters with quick connections; clamps and gaskets included; 1/4" hose barb ball valve for permeate	
Maximum Inlet Pressure (4 – 50 °C)	Holder: 7 bar (100 psi) Tubing: 2.8 bar (40 psi) intermittent; 1.4 bar (20 psi) for 30–40 hrs at top	
Dimensions	Length: 71 cm (28"); Width: 50 cm (19 1/2") Height: 25 cm (10")	
Shipping Weight	Approximately 40 kg (90 lbs)	
Voltage	115 VAC/60 Hz	XX42 PEL 60
	230 VAC/50 Hz	XX42 PEL 50

16 L/min high-pressure Pellicon system, Cat. No. XX42 PPK 50/XX42 PPK 60

Pump Materials	Head: 303 stainless steel, carbon vanes Drive: painted steel housing	
Pump	1.6 – 16 L/min rotary vane Procon pump, with 12.7 mm (1/2") O.D., hard-wall tubing	
Connections	Holder: 3/4" sanitary clamp adapters Tubing: 1/2" tubing fitting adapters with quick connections; clamps and gaskets included; 1/2" sanitary clamp diaphragm valve Pump: 1/2" tubing fitting adapters	
Maximum Inlet Pressure	Holder: 7 bar (100 psi) (4 – 50 °C)	Tubing and Pump: 7 bar (100 psi)
Dimensions	Length: 71 cm (28") Width: 50 cm (19 1/2") Height: 25 cm (10")	
Shipping Weight	Approximately 40 kg (90 lbs)	
Voltage	115 VAC/60 Hz 230 VAC/50 Hz	XX42 PPK 60 XX42 PPK 50

### Pellicon System Capability Chart

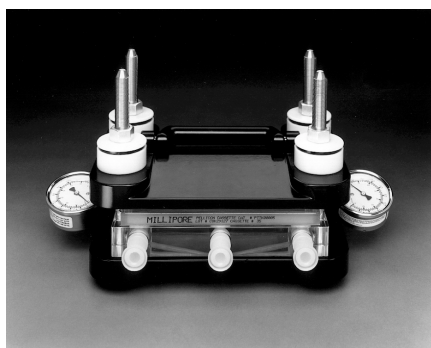
Filtration Rates* (L/h)	Minimum Working Volume (L)	Maximum Installable Filter Area m <sup>2</sup> (ft <sup>2</sup> )	Maximum Pump Crossflow (L/min)	Maximum Pump Pressure bar (psi)	Pump Type	Catalogue Number	
						110 VAC	230 VAC
0.5 – 28	0.25	0.23 (3)	4	2 (30)	peristaltic	XX42PLK60	XX42PLK50
0.50 – 90	0.50	0.93 (10)	13	2 (30)	peristaltic	XX42PEL60	XX42PEL50
1.5 – 150	0.75	1.3 (15)	16	7 (100)	rotary vane	XX42PPK60	XX42PPK50

\*Lowest rate is within minimum area and 10 L/m<sup>2</sup>/hr flux (e.g. concentrated proteins at 4 °C).  
Highest rate is with maximum area and 00 L/m<sup>2</sup>/hr flux (e.g. bacterial cell harvest).

### Ordering Information

Description	Catalogue No.
Pellicon Cassette System, 4L/min low retentate volume system, 115V	XX42 PLK 60
Pellicon Cassette System, 4L/min low retentate volume system, 230V	XX42 PLK 50
System includes: 1 Pellicon cassette acrylic low retentate volume holder, 1 variable speed pump with head 64 cm (25") 1/4" ID silicone tubing, 1 Pellicon holder fitting kit with easy assembly instructions	
Pellicon Cassette System, 13L/min with easy load pump, 115V	XX42 PEL 60
Pellicon Cassette System, 13L/min with easy load pump, 230V	XX42 PEL 50
System includes: 1 Pellicon cassette acrylic holder 1 variable speed pump with head 64 cm (25") 1/2" ID silicone tubing (12.5 L/min max). For tubing capable of 8 L/min max, order XX802GS25 (silicone) or XX802GT50 (Tygon). 1 Pellicon holder fitting kit with easy assembly instructions	
Pellicon Cassette System, 16L/min with Procon pump, 115V	XX42 PPK 60
Pellicon Cassette System, 16L/min with Procon pump, 230V	XX42 PPK 50
System includes: 1 Pellicon cassette acrylic holder 1 variable speed pump with head, tubing and tubing/NPT adapters 1 Pellicon holder fitting kit with easy assembly instructions tubing hose barb adapters with quick connections	

## Pellicon 2 Cassette Filter Acrylic Holder



### Description

Pellicon 2 cassette filter acrylic holders operate a selection of filters and membranes for tangential flow microporous filtration and ultrafiltration. In a few minutes to a few hours 1 to 500 liter batches can be filtered. The holders offer multi-application capability, and as much as 10 times the linear scale-up of filter area in a single holder. (Increased pump capacity is required for scale-up.) Low hold-up volumes provide high-product recoveries. An interchangeable selection of fittings and pumps is available with easy connections for changing system capability without buying a new system. Pellicon filter holders contain and operate Millipore's wide selection of membranes which are available in Pellicon 2 Mini, Maxi, and Cassettes.

### Holder Capacity (filter area)

#### Standard holder

- 0.5 – 2.3 m<sup>2</sup> (5–25 ft<sup>2</sup>) as shipped, expandable to 4.6 m<sup>2</sup> (50 ft<sup>2</sup>) with long tie rods XX42POL64.
- Up to 500 liter batches with long tie rods

#### Low retentate volume holder

- 0.46 m<sup>2</sup> (5 ft<sup>2</sup>) as shipped
- Minimum working volume of 50 mL for filtering 1–10 liter batches

### Components

Pellicon cassette acrylic holder assembly with 3/4" sanitary clamp adapters, clamps, and gaskets.

### Specifications

#### Materials

Wetted: acrylic manifold with polypropylene adapter fittings and silicone sanitary gaskets

Non-wetted: nylon-coated aluminum pressure plates; 316 stainless steel tie rods and washers; nylon-encapsulated 301 stainless steel holder compression assemblies; silicon bronze nuts.

#### Dimensions

Length: 28 cm (11")

Width: 19 cm (7.6")

Height: 25 cm (10")

#### Connections

Standard holder:

- 1/4" NPTF pressure gauge connections
- 3/4" sanitary clamp adapters, clamps and gaskets included.

Low retentate volume holder:

- 1/4" NPTF pressure gauge connections,
- 3/4" sanitary clamp adapters; clamps and gaskets included

### Recommended Feed Flow

4 – 33 L/min/m<sup>2</sup> of installed filter area (flow depends on filter screen and channel type)

### Maximum Feed/Retentate Flow (Water Viscosity)

Standard holder: 80 L/min

Low retentate volume holder: 8 L/min

### Minimum Retentate Working Volume

(With 0.5 m<sup>2</sup> (5 ft<sup>2</sup>) area filter and 4 feet of 6.4 mm (1/4") I.D. tubing in feed/bleed arrangement)

Standard holder: 120 mL

Low retentate volume holder: 50 mL

Recoverable concentrate volume varies with filter area, tubing length and diameter.

### Temperature Range

4 – 50 °C

### Maximum Inlet Pressure

7 bar (100 psi)

### Shipping Weight

11 kg (24 lbs)

### Ordering Information

Description	Catalogue No.
Pellicon Cassette Filter Acrylic Holder, standard	XX42 P00 60
Pellicon Cassette Filter Acrylic Holder, low retentate volume	XX42 PRV 60

Holders are supplied with a socket wrench and operating manual. Pressure gauges must be ordered separately (XX42 000 75) or are included as components of Pellicon fitting kits. A list of Pellicon holder components and spare parts is also available.

## Pellicon 2 Cassette Filter Acrylic Holder Assemblies

### Description

Pellicon 2 filter holder assemblies contain all equipment needed for connection to an existing peristaltic tubing pump for tangential flow microporous filtration or ultrafiltration. These assemblies are recommended for the expansion of existing Pellicon 2 systems or for connection to an existing tubing pump with the required flow capability listed below. The assemblies also provide the added convenience of a spare filter holder that can be dedicated to a particular application. NOTE: Pump is not included. For ordering information on pumps offered separately, please refer to Accessories and Spare Parts for Pellicon Systems, Holders and Assemblies.

### Assembly Capacity (filter area)

#### Standard assembly

0.1–0.28 m<sup>2</sup> (1–3 ft<sup>2</sup>) if operated with 6.4 mm (1/4") I.D. tubing

0.1–0.46 m<sup>2</sup> (1–5 ft<sup>2</sup>) if operated with 9.5 mm (3/8") I.D. tubing

0.2–0.92 m<sup>2</sup> (2–10 ft<sup>2</sup>) if operated with 12.7 mm (1/2") I.D. tubing

#### Low retentate volume assembly

0.1–0.28 m<sup>2</sup> (1–3 ft<sup>2</sup>) with 6.4 mm (1/4") I.D. tubing pump only

### Specifications

#### Materials

##### Wetted

acrylic manifolds  
polypropylene fittings  
PVC valve  
316 stainless steel pressure gauges  
silicone sanitary gaskets

##### Non-wetted

nylon-coated aluminum pressure plates  
316 stainless steel tie rods and sanitary clamps  
nylon-encapsulated 301 stainless steel holder compression assemblies  
silicon bronze nuts

#### Dimensions

Length: 44 cm (17 1/2")

Width: 20 cm (8")

Height: 25 cm (10")

#### Maximum Inlet Pressure (4 – 50 °C)

Holder: 7 bar (100 psi)

Tubing: 2.8 bar (40 psi) intermittent; 1.4 bar (20 psi) for 30–40 hrs at 600 rpm pump speed

#### Shipping Weight

Approximately 13 kg (29 lbs)

### Connections

Low Retentate Volume Holder: 3/4" sanitary clamp adapters

Standard Holder: 3/4" sanitary clamp adapters

Feed/Retentate Tubing: choice of 6.4 mm (1/4") or 12.7 mm (1/2") I.D. tubing hose barb adapters with quick connections

Permeate Tubing: 1/4" tubing hose barb ball valve assembly, clamps and fittings included

### Ordering Information

Description	Catalogue No.
Low Retentate Volume Assembly (for 4 L/min pump)	XX42 PRK 60
Includes: Pellicon low retentate holder fitting kit for 6.4 mm (1/4") I.D. tubing	
Standard Pellicon Assembly (for 8 and 13 L/min pumps)	XX42 PSY 60
Includes: Pellicon standard holder	

All assemblies include holder, two glycerin-filled stainless steel pressure gauges (0–7 bar, 0–100 psi dual scale), permeate ball valve, holder-to-tubing adapter fittings, clamps and gaskets, quick-assembly instructions and operating manual.

## Pellicon 2 Cassette Filter Stainless Steel Holder and Assembly



### Description

The stainless steel Pellicon 2 filter holder is designed for sanitary applications. The holder can be used to expand existing cassette ultrafiltration (CUF) systems or to replace existing holders in CUF systems. (Pump capacity in CUF systems must be increased if filter area is increased.) The stainless steel Pellicon filter holder assembly contains all the equipment needed to connect to an existing sanitary pump and piping for tangential flow microporous filtration or ultrafiltration.

### Holder and Assembly capacity (filter area):

2.3 – 4.6 m<sup>2</sup> (25–50 ft<sup>2</sup>) as shipped

0.1 – 2.3 m<sup>2</sup> (1 – 25 ft<sup>2</sup>) with short tie rods XX42POL63

up to 500 – 1000 liter batches\* with long tie rods (as shipped)

\*For larger batches, contact your Millipore Systems Specialist for information on process-scale Pellicon holders and systems.

### Assembly Components

Pellicon cassette stainless steel holder plus:

- 3/4" sanitary clamps and silicone gaskets
- (2) sanitary pressure gauges with 1 1/2" sanitary clamps and silicone gaskets
- (1) 3/4" sanitary permeate diaphragm valve
- (1) 3/4" sanitary retentate diaphragm valve
- (3) 3-ft lengths of 3/4" O.D. braid-reinforced PVC tubing with sanitary clamp fittings
- (4) 3/4" sanitary x 1/2" hose barb stainless steel adapters

Note: Pump not included with holder or assembly.

### Materials

Wetted: 316L stainless steel, silicone sanitary gaskets, PTFE valve diaphragm

Non-wetted: 316 stainless steel clamps and gauges, silicone bronze nuts, nylon-encapsulated 301 stainless steel holder compression assemblies

### Dimensions

Holder:  
Length: 28 cm (11")  
Width: 19 cm (7.6")  
Height: 25 cm (10")

Assembly:  
Length: 28 cm (11")  
Width: 38 cm (15")  
Height: 25 cm (10")

### Connections

3/4" sanitary fittings: 1 1/2" sanitary fittings for gauges (Gauges, clamps, and gaskets included in assembly only.)

### Specifications

#### Recommended Feed Flow

4 – 33 L/min/m<sup>2</sup> of installed filter area (flow depends on filter screen and channel type)

#### Maximum Feed/Retentate Flow (Water Viscosity)

80 L/min

#### Temperature Range

Operating 4 – 50 °C

Holder without pressure gauges and filters can be autoclaved; holder with gauges cannot be steamed in place. Nylon-encapsulated holder compression assemblies can be autoclaved if loosened.

Pellicon filters cannot be steamed or autoclaved.

#### Maximum Inlet Pressure (4 – 50 °C)

7 bar (100 psi) inlet and transmembrane

#### Shipping Weight

24 kg (52 lbs)

### Ordering Information

Description	Catalogue No.
Pellicon Cassette Filter Stainless Steel Holder	XX42 P00 80
Pellicon Cassette Filter Stainless Steel Holder Assembly	XX42 POK 80

## High Resolution Tangential Flow Systems

To operate Pellicon Cassette Systems in high-resolution tangential-flow (HRTF) mode, Millipore recommends installing a peristaltic pump to control filtrate flow. The HRTF technique can improve the separation of soluble proteins from: 1) suspended solids during clarification with microporous membranes, 2) viruses during virus diafiltration with ultrafiltration membranes. The correct pump head and tubing will depend upon the amount of filter area being used. The pumps are not included with the Pellicon system assemblies described above and must be ordered separately, along with the Pellicon HRTF adapter, which easily installs onto the permeate port of Pellicon holders to allow flux and transmembrane pressure control with a peristaltic permeate metering pump. Instructions for operating Pellicon systems with two pumps are provided in the Operating Manual shipped with each Pellicon Filter Holder.

## Accessories and Spare Parts for Pellicon Systems, Holders and Assemblies

Millipore offers two pumps for operating 0.1–1.3 m<sup>2</sup> (1–15 ft<sup>2</sup>) of filter area in Pellicon holders. One is a peristaltic tubing pump with easy-load head, the other is a non-sanitary rotary carbon-vane pump which can produce higher pressures (up to 7 bar/100 psi). Tubing for the peristaltic pump is available in several sizes and materials. Millipore's Pellicon fitting kits contain the pressure gauges, fittings, clamps, valves and instructions to connect these pumps to a Pellicon holder. All key components of Pellicon holders and fitting kits are also available as spare parts.

## Ordering Information

Description	Catalogue No.
Easy-load tubing pump, variable speed, 0.16–1.3 L/min (includes drive and head)	
115V	XX80 ELO 00
230V	XX80 EL2 30
Spare pump head for Easy-Load Pump	XX80 ELO 01
Rotary vane pump, variable speed, 1.6–16 L/min (includes drive, pump head, tubing and adapters)	
115V	XX81 4V0 00
230V	XX81 4V2 30
Tubing for Easy-Load Pump	
6 mm (1/4") I.D., 7.5 m (25 ft) Silicone	XX80 1GS 25
6 mm (1/4") I.D., 7.5 m (25 ft) Tygon	XX80 1GT 25
9.5 mm (3/8") I.D., 7.5 m (25 ft) Silicone	XX80 2GS 25
9.5 mm (3/8") I.D., 1.5 m (50 ft) Tygon	XX80 2GT 50
12.7 mm (1/2") I.D., 7.5 m (25 ft) Silicone	XX80 3GS 25
12.7 mm (1/2") I.D., 1.5 m (50 ft) Norprene	XX80 3GN 50
Fitting Kits	
For Easy-Load pump and low-retentate volume holder	XX42 PK1 60
For Easy-Load pump and standard holder	XX42 PK2 60
For rotary-vane pump and standard holder	XX42 PK4 60
Replacement acrylic manifold plates	
4 holder compression assemblies	XX42 P00 66
4 tie rod spacers, stainless steel	XX42 000 66
4 bronze nuts	XX42 000 69
1 retentate tubing clamp, Hoffman style	P14109
1-3/4" TC x 3/4" TC braid-reinforced vinyl hose, 1 m (3 ft) long	XX42 19T 03
1 socket wrench handle, ratchet-style	XX42 000 76
1 socket, 15/16" long	XX42 000 61
1 top plate	XX42 POT 68
1 standard manifold bottom	XX42 POB 68
1 standard manifold, low-retentate volume	XX42 PRB 68
Tie rods for acrylic holders	
4 short tie rods for 25 ft <sup>2</sup> operation, 20.3 cm/8"	XX42 POL 65
4 long tie rods for 50 ft <sup>2</sup> operation, 26.7 cm/10-1/2"	XX42 POL 64
Tie rods for stainless steel holders	
4 short tie rods for 25 ft <sup>2</sup> operation, 15.9 cm/6-1/4"	XX42 POL 63
4 long tie rods for 50 ft <sup>2</sup> operation, 22.2 cm/8-3/4"	XX42 POL 62
Spare fittings for Pellicon assemblies and systems	
4 tri-clamps, 3/4" stainless steel	XX42 T19 00
4 TC gaskets, 3/4" silicone	XX42 T19 01
4 TC gaskets, 3/4" EDPM	XX42 T19 02
Fitting adapters, polypropylene	
4-3/4" TC x 1/4" NPTM	XX42 T19 06
4-3/4" TC x 1/2" NPTM	XX42 T19 13
4-3/4" TC x 1/2" NPTF	XX42 T19 F3
4-3/4" TC x 1/4" hose barb	XX42 T19 H6
4-3/4" TC x 1/2" hose barb	XX42 T19 HB

Description	Catalogue No.
Permeate ball valve 1-3/4" TC x 1/4" hose barb	XX42 V19 H6
Retentate diaphragm valves 1-3/4" TC, polypropylene, PTFE diaphragm	XX42 V19 TD
1-3/4" TC, 316 SS, PTFE diaphragm	XX42 V19 SS
Flowmeters	
1 retentate flowmeter, 1.8 – 18 L/min	XX42 PFR 181
1 permeate flowmeter, 0.4 – 4 L/min	XX42 PFP 04

## To Place an Order or Receive Technical Assistance

For additional information call your nearest Millipore office.

In the U.S. and Canada, call toll-free **1-800-MILLIPORE (1-800-645-5476)**

In the U.S., Canada and Puerto Rico, fax orders to **1-800-MILLIFX (1-800-645-5439)**

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