



## User Guide

### Non-Sterile 4 mm Millex® Syringe Filters

Millex®-FG, FH, GV, HV, LG, LH



For laboratory use only

### Introduction

This document provides chemical compatibility information, operating steps, and specifications for non-sterile 4 millimeter (mm) Millex® syringe filters. These filters are recommended for filtering volumes up to 1 milliliter (mL) to remove particles prior to instrumentation analysis. The single-use, disposable filter removes particles larger than the membrane's rated pore size.

The Millex® syringe filter consists of a membrane sealed in a polyethylene housing. For details on the type of membrane in your Millex® filter unit, refer to the table below. The stepped outlet facilitates filtration into small vials or vial inserts by eliminating air locks. Where required by the application, the outlet also allows a Luer connection to be made.

Filter	Membrane	Application
FG	0.2 µm hydrophobic PTFE (polytetrafluoroethylene)	Removal of fine particles from organic solutions, also venting applications
FH	0.45 µm hydrophobic PTFE	Clarification of organic solutions
GV	0.22 µm hydrophilic PVDF (polyvinylidene fluoride)	Removal of fine particles from aqueous, protein-containing, or mild organic solutions
HV	0.45 µm hydrophilic PVDF	Clarification of aqueous, protein-containing, or mild organic solutions
LG	0.2 µm hydrophilic PTFE	Removal of fine particles from aqueous, protein-containing, or organic solutions
LH	0.45 µm hydrophilic PTFE	Clarification of aqueous, protein-containing, or organic solutions

### Chemical Compatibility

Millex® syringe filters are compatible with aqueous, mild organic, and organic solutions. You can use them to filter the agents listed in the following table. This information was developed from technical publications, materials suppliers, and laboratory tests, and is believed to be accurate and reliable.

### Chemical Compatibility, continued

However, because of variability in temperature, concentrations, exposure time, and other factors beyond our control that may affect the use of the unit, no warranty is provided or implied with respect to such information. Agents not listed below should be tested with the Millex® syringe filter prior to use.

#### Chemical

Acetic acid, glacial	Cyclohexane	Hydrogen	Perchloroethylene
Acetone <sup>1</sup>	Dimethyl sulfoxide <sup>1</sup>	Hydrogen peroxide (3%)	Petroleum based oils
Amyl acetate	Ethers	Isobutyl alcohol	Phenol (10%)
Amyl alcohol	Ethyl acetate	Isopropyl acetate	Pyridine <sup>1</sup>
Benzene	Ethylene glycol	Kerosene	Silicone oils
Benzyl alcohol	Formaldehyde	Methyl ethyl ketone	Sulfuric acid (3 N)
Boric acid	Freon® (TF or PCA) solvent	Methyl isobutyl ketone	Tetrahydrofuran
Brine (sea water)	Gasoline	Mineral spirits	Toluene
Butyl alcohol	Glycerine (Glycerol)	Nitrobenzene	Trichloroethane
Carbon tetrachloride	Helium	Nitrogen	Trichloroethylene
Cellosolve® (ethyl) solvent	Hydrochloric acid	Ozone (10 ppm in water)	Trifluoroacetic acid
	Hydrofluoric acid	Paraldehyde	Xylene

<sup>1</sup> Not compatible with GV and HV

The 4 mm syringe filters can be used to filter the agents listed below for low extractable HPLC instrumentation analysis applications.

**NOTE:** It is recommended that you discard the first 1 mL, or rinse with 1 to 2 mL of primary solvent before sample filtration.

Acetonitrile	Dimethylformamide <sup>1</sup>	Hexane	Methylene chloride
Chloroform	Dioxane	Isopropyl alcohol	Pentane
Dimethylacetamide <sup>1</sup>	Ethyl alcohol	Methyl alcohol	Petroleum ether

<sup>1</sup> Not compatible with GV and HV

### How to Use 4 mm Millex® Syringe Filters

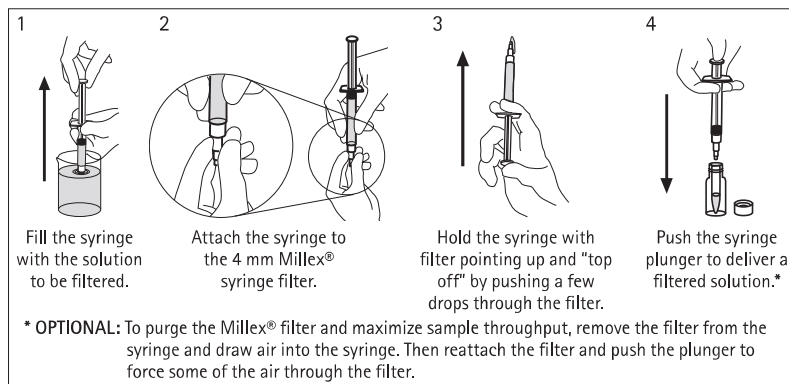
#### WARNINGS:

- The 4 mm Millex® syringe filter is intended for laboratory use only and is not a medical device for direct patient care applications.
- Do not use with syringes smaller than 10 mL because pressures in excess of the maximum pressure rating may be reached, potentially causing damage to the syringe filter and/or personal injury.

#### CAUTIONS:

- Do not use the syringe filter at temperatures above 45 °C (113 °F).
- Before filtering protein-containing solutions, evaluate binding of sample to filter.
- Do not use the same syringe filter to filter solutions in both directions.
- Do not reuse the syringe filter.

## How to Use 4 mm Millex® Syringe Filters, continued



## Specifications

<b>Housing</b>	High density polyethylene
<b>Membrane</b>	
FG, FH	Fluoropore™ hydrophobic PTFE
GV, HV	Durapore® hydrophilic PVDF
LG, LH	LCR hydrophilic PTFE
<b>Dimensions</b>	
Inlet to outlet	19.7 mm (0.78 in.)
Diameter	6.4 mm (0.25 in.)
Filtration surface area	0.1 cm <sup>2</sup> (0.016 in <sup>2</sup> )
<b>Pore size</b>	
FG, LG	0.2 µm
GV	0.22 µm
FH, LH, HV	0.45 µm
<b>Temperature limit</b>	45 °C (113 °F) maximum
<b>Pressure limit at 25 °C</b>	14 bar (200 psi) differential
<b>Filtration volume</b>	≤ 1 mL
<b>Hold-up volume</b>	≤ 10 µL after air purge that exceeds bubble point of membrane
<b>Typical flow rate at 25 °C and 2.1 bar (30 psi)</b>	
FG	4.5 mL/min (methanol)
FH	10.9 mL/min (methanol)
GV	1.7 mL/min (water)
HV	5.7 mL/min (water)
LG	3.8 mL/min (water)
LH	8.3 mL/min (water)
<b>Connections</b>	Female Luer-Lok™ inlet Stepped male Luer-slip outlet

## Product Ordering Information

This section lists the catalogue numbers for 4 mm non-sterile Millex® syringe filters. See the Technical Assistance section for contact information. You can purchase these products on-line at [www.millipore.com/products](http://www.millipore.com/products).

4 mm Millex® Syringe filter	100/pk	1000/pk
Millex®-FG, hydrophobic PTFE membrane, 0.2 µm	SLFGR04NL	
Millex®-FH, hydrophobic PTFE membrane, 0.45 µm	SLFHR04NL	
Millex®-GV, hydrophilic PVDF membrane, 0.22 µm	SLGVR04NL	SLGVR04NK
Millex®-HV, hydrophilic PVDF membrane, 0.45 µm	SLHVR04NL	SLHVR04NK
Millex®-LG, hydrophilic PTFE membrane, 0.2 µm	SLLGR04NL	
Millex®-LH, hydrophilic PTFE membrane, 0.45 µm	SLLHR04NL	SLLHR04NK

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## Technical Assistance

For more information, contact the office nearest you. In the U.S., call 1-800-221-1975. Outside the U.S., go to our web site at [www.millipore.com/offices](http://www.millipore.com/offices) for up-to-date worldwide contact information. You can also visit the tech service page on our web site at [www.millipore.com/techservice](http://www.millipore.com/techservice).

## Standard Warranty

The applicable warranty for the products listed in this publication may be found at [www.millipore.com/terms](http://www.millipore.com/terms) ("Conditions of Sale").



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