

## User Guide

Nonsterile 33 mm Millex®  
Syringe FiltersMillex®-LG, LCR, GV, HV,  
GN, HN, GP, HP,

For laboratory use only



## Introduction

This document provides chemical compatibility information, operating steps, and specifications for the nonsterile 33 millimeter (mm) Millex® syringe filter with male Luer-slip outlet. This syringe filter is recommended for filtering 10–100 milliliter (mL) volumes 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 polypropylene housing. For details on the type of membrane in your Millex® syringe filter, refer to the table below.

Filter	Membrane	Application
LG	0.20 µm hydrophilic PTFE (polytetrafluoroethylene)	Filtration of protein-containing solutions and aqueous or organic solutions
LCR	0.45 µm hydrophilic PTFE	Filtration of protein-containing solutions and aqueous or organic solutions
GV	0.22 µm PVDF (polyvinylidene fluoride)	Filtration of protein-containing solutions and aqueous or mild organic solutions
HV	0.45 µm PVDF	Filtration of protein-containing solutions and aqueous or mild organic solutions
GN	0.20 µm nylon	Filtration of aqueous or organic solutions
HN	0.45 µm nylon	Filtration of aqueous or organic solutions
GP	0.22 µm PES (polyethersulfone)	Filtration of protein-containing solutions and aqueous or mild organic solutions
HP	0.45 µm PES	Filtration of protein-containing solutions and aqueous or mild 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. 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 in the following table should be tested with the Millex® syringe filter prior to use.

**NOTE:** For low extractable HPLC instrumentation analysis applications, it is recommended that you discard the first 1 mL or rinse with 1 to 2 mL of primary solvent before sample filtration.

## Chemical Compatibility, continued

## Chemical

Acetic acid, glacial <sup>1</sup>	Formaldehyde	Nitrogen
Acetone <sup>2,3</sup>	Formic acid (50%) <sup>1,3</sup>	Ozone (10 ppm in water)
Acetonitrile	Freon® (TF or PCA) solvent	Paraldehyde
Ammonium hydroxide <sup>1,3</sup>	Gasoline	Perchloroethylene <sup>1,3</sup>
Ammonium sulfate (saturated) <sup>2,3</sup>	Glycerine (glycerol)	Petroleum based oils
Amyl acetate <sup>3</sup>	Helium	Petroleum ether
Amyl alcohol	Hexane	Phenol (10%)
Benzyl alcohol	Hydrochloric acid <sup>1</sup>	Potassium hydroxide <sup>3</sup>
Boric acid	Hydrofluoric acid <sup>1</sup>	Pyridine <sup>1,2,3</sup>
Butyl alcohol	Hydrogen	Silicone oils
Cellosolve® (ethyl) solvent	Hydrogen peroxide (3%)	Sodium carbonate (aqueous solution) <sup>1,3</sup>
Chloroform <sup>1,3</sup>	Hypo (sodium thiosulfate) <sup>3</sup>	Sodium chloride (2 M)
Cyclohexane	Isobutyl alcohol	Sodium hydroxide (3 N) <sup>1,3</sup>
Cyclohexanone <sup>2,3</sup>	Isopropyl acetate <sup>3</sup>	Sulfuric acid (3 N) <sup>1</sup>
Dimethylacetamide <sup>2,3</sup>	Isopropyl alcohol	Tetrahydrofuran <sup>3</sup>
Dimethylformamide <sup>2,3</sup>	Kerosene	Toluene
Dimethylsulfoxide <sup>2,3</sup>	Lactic acid (50%) <sup>1,2,3</sup>	Trichloroacetic acid (aqueous solution) <sup>1,3</sup>
Dioxane <sup>3</sup>	Methyl alcohol	Trichloroethane <sup>1,3</sup>
Ethers <sup>3</sup>	Methylene chloride <sup>2,3</sup>	Trichloroethylene <sup>1,3</sup>
Ethyl acetate <sup>3</sup>	Methyl ethyl ketone <sup>2,3</sup>	Trifluoroacetic acid <sup>1,3</sup>
Ethyl alcohol	Methyl isobutyl ketone <sup>2,3</sup>	Urea (8 M) <sup>3</sup>
Ethylene glycol	Mineral spirits	Xylene

<sup>1</sup> Not compatible with GN and HN    <sup>2</sup> Not compatible with GV and HV    <sup>3</sup> Not compatible with GP and HP

## How to Use 33 mm Millex® Syringe Filters

## WARNINGS:

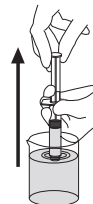
- The 33 mm Millex® syringe filter is intended for laboratory use only and is not a medical device for direct patient care applications.
- Do not use with syringes smaller than 10 mL because pressures in excess of the maximum pressure rating may be reached, potentially causing damage to the filter unit and/or personal injury.

## CAUTIONS:

- Do not use the syringe filter at temperatures above 45 °C (113 °F).
- Do not use the same 33 mm syringe filter to filter solutions in both directions.
- Do not reuse the syringe filter.
- Do not use the syringe filter to filter emulsions or suspensions.
- Perform a binding study before use if there is a concern about loss of analyte (proteins, nucleic acids, active pharmaceuticals) due to binding.

## Instructions for Use

1



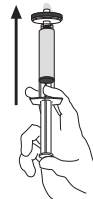
Fill the syringe with the solution to be filtered.

2



Attach the syringe to the 33 mm Millex® syringe filter.

3



Hold the syringe with filter pointing up and "top off" by pushing a few drops through the filter.

4



Push the syringe plunger to deliver the filtered solution.

**Optional:** To purge the syringe filter and maximize sample throughput, remove the Millex® filter from the syringe and draw air into the syringe. Then reattach the Millex® filter, and push the plunger to force some of the air through the filter.



## Specifications

<b>Housing</b>	Polypropylene
<b>Membrane</b>	
LG, LCR	Hydrophilic PTFE
GV, HV	Hydrophilic Durapore® PVDF
GN, HN	Hydrophilic Nylon
GP, HP	Hydrophilic Millipore Express® PES
<b>Dimensions</b>	
Inlet to outlet	27 mm (1.1 in.)
Diameter	33 mm (1.3 in.)
Filtration surface area	4.5 cm <sup>2</sup> (0.7 in. <sup>2</sup> )
<b>Pore size</b>	
GV, GP	0.22 µm
LG, GN	0.20 µm
LCR, HV, HN, HP	0.45 µm
<b>Temperature limit</b>	45 °C (113 °F)
<b>Connections</b>	Female Luer-Lok™ inlet, male Luer-slip outlet
<b>Pressure limit at 21 °C</b>	8.6 bar (125 psi) differential
<b>Filtration volume</b>	10–100 mL
<b>Hold-up volume</b>	≤ 80 µL after air purge at pressure that exceeds bubble point of the membrane

## Performance

Membrane Type	Typical Water Flow Rate at 21 °C and 2.1 bar (30 psi)	Bubble point
LG	185 mL/min	≥ 2.8 bar (≥ 41 psi)
LCR	438 mL/min	≥ 1.5 bar (≥ 22 psi)
GV	94 mL/min	≥ 3.4 bar (≥ 50 psi)
HV	423 mL/min	≥ 1.5 bar (≥ 22 psi)
GN	75 mL/min	≥ 3.0 bar (≥ 43 psi)
HN	169 mL/min	≥ 2.2 bar (≥ 32 psi)
GP	240 mL/min	≥ 4.3 bar (≥ 63 psi)
HP	480 mL/min	≥ 2.0 bar (≥ 29 psi)

## HPLC Certification

Millex®-LG, LCR, GN, and HN syringe filters are tested for UV-absorbing extractables. HPLC analysis of 1 mL samples of both acetonitrile and water collected after discarding the first 1 mL of solvent showed no peaks greater in intensity than 0.004 AUFS (after the column frontal volume) at either 214 nm or 254 nm.

Representative samples of all lots manufactured are tested.

## Product Ordering Information

This section lists the catalogue numbers for 33 mm nonsterile Millex® syringe filters. You can purchase these products on-line at [www.millipore.com/products](http://www.millipore.com/products), or see contact information below.

Syringe filter	Color	50/pk	250/pk	1000/pk
Millex®-LG, PTFE 0.20 µm	Blue	SLLG033NS	SLLG033NB	SLLG033NK
Millex®-LCR, PTFE 0.45 µm	Blue	SLCR033NS	SLCR033NB	SLCR033NK
Millex®-GV, PVDF, 0.22 µm	Yellow	SLGV033NS	SLGV033NB	SLGV033NK
Millex®-HV, PVDF, 0.45 µm	Yellow	SLHV033NS	SLHV033NB	SLHV033NK
Millex®-GN, Nylon 0.20 µm	Purple	SLGN033NS	SLGN033NB	SLGN033NK
Millex®-HN, Nylon 0.45 µm	Purple	SLHN033NS	SLHN033NB	SLHN033NK
Millex®-GP, PES, 0.22 µm	Green	SLGP033NS	SLGP033NB	SLGP033NK
Millex®-HP, PES, 0.45 µm	Green	SLHP033NS	SLHP033NB	SLHP033NK

## Notice

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## Contact Information

For the location of the office nearest you, go to [www.millipore.com/offices](http://www.millipore.com/offices).

## Technical Assistance

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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