

User Guide

Nonsterile 33 mm Millex® Syringe Filters

Millex®-LG, LCR, GV, HV, GN, HN, GP, HP, FG, FH

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
FG	0.20 µm hydrophobic PTFE	Filtration of organic solutions
FH	0.45 µm hydrophobic PTFE	Filtration of 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	*	Chemical	*	Chemical	*
Acetic acid, glacial	1	Formic acid (50%)	1, 3	Ozone (10 ppm in water)	
Acetone	2, 3	Freon® (TF or PCA) solvent		Paraldehyde	
Acetonitrile	3	Gasoline	3	Perchloroethylene	1, 3
Ammonium hydroxide	1, 3	Glycerine (glycerol)		Petroleum based oils	3
Ammonium sulfate (saturated)	2, 3	Helium		Petroleum ether	3
Amyl acetate	3	Hexane	3	Phenol (10%)	
Amyl alcohol		Hydrochloric acid	1	Potassium hydroxide	1, 3
Benzyl alcohol		Hydrofluoric acid	1	Pyridine	1, 2, 3
Boric acid		Hydrogen		Silicone oils	
Butyl alcohol		Hydrogen peroxide (3%)		Sodium carbonate (aqueous solution)	1,3
Cellosolve® (ethyl) solvent	3	Hypo (sodium thiosulfate)	3	Sodium chloride (2 M)	
Chloroform	1, 3	Isobutyl alcohol		Sodium hydroxide (3 N)	1,3
Cyclohexane	3	Isopropyl acetate	3	Sulfuric acid (3 N)	1
Cyclohexanone		Isopropyl alcohol		Tetrahydrofuran	3
Dimethylacetamide	2, 3	Kerosene	3	Toluene	3
Dimethylformamide	2, 3	Lactic acid (50%)	1, 2, 3	Trichloroacetic acid (aqueous solution)	1, 3
Dimethylsulfoxide	2, 3	Methyl alcohol		Trichloroethane	1, 3
Dioxane	3	Methylene chloride	1, 3	Trichloroethylene	1, 3
Ethers	3	Methyl ethyl ketone	2, 3	Trifluoroacetic acid	1, 3
Ethyl acetate	3	Methyl isobutyl ketone	2, 3	Urea (8 M)	3
Ethyl alcohol		Mineral spirits	3	Xylene	3
Ethylene glycol		Nitrogen			
Formaldehyde					

* **1 Not compatible with GN and HN**
2 Not compatible with GV and HV
3 Not compatible with GP and HP

How to Use 33 mm Millex® Syringe Filters

WARNINGS:

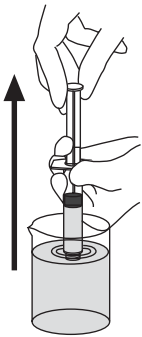
- The 33 mm Millex® syringe filter is intended for laboratory use only and is not a medical device for direct patient care applications.
- Do not use with syringes smaller than 10 mL because pressures in excess of the maximum pressure rating may be reached, potentially causing damage to the filter unit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

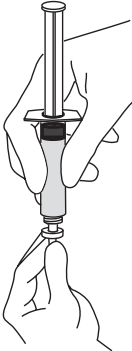
CAUTIONS:

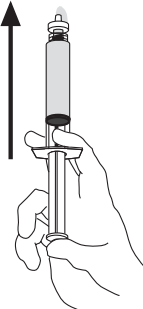
- Do not use the syringe filter at temperatures above 45 °C (113 °F).
- Do not use the same 33 mm syringe filter to filter solutions in both directions.
- Do not reuse the syringe filter.
- Do not use the syringe filter to filter emulsions or suspensions.
- Perform a binding study before use if there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

Instructions for Use

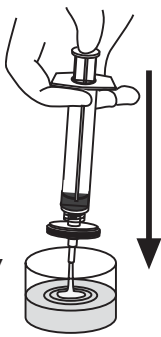
1. Fill the syringe with the solution to be filtered.


2. Attach the syringe to the 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

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

Performance

Membrane Type	Typical Flow Rate at 21 °C and 2.1 bar (30 psi)		Bubble Point	Solvent
	Flow Rate (mL/min)	Pressure (bar)		
LG	185 mL/min	≥ 2.8 bar (≥ 41 psi)	Water	
LCR	438 mL/min	≥ 1.5 bar (≥ 22 psi)	Water	
GV	94 mL/min	≥ 3.4 bar (≥ 50 psi)	Water	
HV	423 mL/min	≥ 1.5 bar (≥ 22 psi)	Water	
GN	75 mL/min	≥ 3.0 bar (≥ 43 psi)	Water	
HN	169 mL/min	≥ 2.2 bar (≥ 32 psi)	Water	
GP	240 mL/min	≥ 4.3 bar (≥ 63 psi)	Water	
HP	480 mL/min	≥ 2.0 bar (≥ 29 psi)	Water	
FG	259 mL/min	≥ 0.8 bar (≥ 12 psi)	Methanol	
FH	407 mL/min	≥ 0.6 bar (≥ 8 psi)	Methanol	

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

You can purchase these products on-line at SigmaAldrich.com/products.

Syringe filter	Ring Color	50/pk	250/pk	1000/pk
Millex®-LG, hydrophilic PTFE 0.20 µm	Light Blue	SLLG033NS	SLLG033NB	SLLG033NK
Millex®-LCR, hydrophilic PTFE 0.45 µm	Light 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
Millex®-FG, hydrophobic PTFE, 0.20 µm	Red	SLFG033NS	SLFG033NB	SLFG033NK
Millex®-FH, hydrophobic PTFE, 0.45 µm	Red	SLFH033NS	SLFH033NB	SLFH033NK

Notice

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