

# Simplify Sample Prep and Protect Analytical Equipment Using Syringe Filters

- Cost-effective, reliable filtration.
- Protect analytical columns and instruments.
- Achieve more reproducible analyses.



The importance of clean sample extracts in maintaining analytical instrumentation cannot be overstated. Particulates commonly found in extracts can quickly damage instrument components, causing costly down time and repair. Chromatographic columns, injectors, detectors, and small diameter tubing are easily plugged by particulates. Even if plugging does not occur, the slow accumulation of particles over time can affect flow rates and create interferences that reduce overall reproducibility. Clean extracts will greatly extend the life of costly chromatographic columns and replacement parts, particularly for HPLC systems.

Sample clean-up to remove particulates can be accomplished through the use of inexpensive and easy-to-use syringe filters. These membranes vary in properties and should be selected based on matrix and solvent characteristics (Table I). With a female luer lock inlet and male slip outlet, the syringe filter easily fits onto the end of the disposable syringe containing the sample, as shown in Figure 1. The extract is gently pushed through the filter into a sample vial for injection, removing damaging particulates from the final extract. This connection can be further strengthened by using a syringe with a luer lock tip, creating a more secure connection that can withstand higher filtration pressure.

With a variety of syringe filters available, understanding the role of diameter, pore size, and membrane will aid in proper selection. Sample volume will determine the choice of diameter, ensuring that the filter is not overloaded. Porosity is dependent on application and, in the case of HPLC, the particle size of the column packing. Table II provides guidelines for selecting filter porosity and size. Use these guides to select the right filter for your application. Investing in inexpensive syringe filters is a cost-effective way to reduce variability and protect expensive equipment.

**Figure 1** Rugged, cost-effective syringe filters simplify sample prep and protect analytical columns and instruments.



**Table I** Membrane selection guide.

Membrane	Properties	Applications	Incompatible with
Nylon	hydrophilic, chemically resistant, low protein binding	bases, HPLC solvents, alcohols, aromatic hydrocarbons	acids, aggressive halogenated hydrocarbons, proteins
PTFE	hydrophobic, temperature resistant	organic solvents, acids, alcohols, bases, aromatics	don't use with aqueous samples without pre-wetting (to avoid high backpressure)
PVDF	hydrophilic, low protein binding	alcohols, acids, biomolecules	acids, bases, esters, ethers, ketones
Cellulose Acetate	hydrophilic, chemically & temperature resistant	sterile applications, aqueous solutions	organic solvents

Cellulose Acetate, Nylon, PVDF - hydrophilic applications  
PTFE - hydrophobic applications

**Table II** Porosity and size selection guide.

Size	Sample volume	Porosity	HPLC column compatibility
13mm ID	1-10mL	0.2 $\mu$ m	Use with $\leq 3\mu$ m packings, or to remove microbial growth
25mm ID	10-100mL	0.45 $\mu$ m	Use with $> 3\mu$ m packings

## Top 12 Reasons to Use Restek Syringe Filters

- 1 Protect any analytical system.
- 2 Extend HPLC column lifetime.
- 3 Achieve more reproducible analyses.
- 4 Variety of membranes, porosities, and diameters available.
- 5 FREE 5 filter sample packs available. Add “-248” to the part number.
- 6 Luer lock inlet provides strong, leak-tight syringe connection to withstand filtration pressure.
- 7 Rugged construction—autoclaveable to 121°C for 30 minutes (75psi).
- 8 Color coded by membrane and porosity, for easy identification.
- 9 Reusable storage container.
- 10 Disposable syringes also available.
- 11 Fast delivery!
- 12 **LOW, LOW PRICES.**

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Other Trademarks:  
Botox (Allergan, Inc.),  
NORM-JECT (Henke-Sass,  
Wolf GmbH Ltd.)

### Syringe Filters (Now with luer-lock inlet)

- Variety of filter types, porosities, and diameters.
- Color coded for easy identification.
- Reusable storage container for 100-pk.
- Quantity break pricing, for greater savings.



Size	Porosity	Color	qty.	cat.#
<b>Cellulose Acetate</b>				
13mm	0.22µm	green	100-pk.	26156
13mm	0.45µm	blue	100-pk.	26155
25mm	0.22µm	green	100-pk.	26158
25mm	0.45µm	blue	100-pk.	26157
<b>Nylon</b>				
13mm	0.22µm	yellow	100-pk.	26146
13mm	0.45µm	pink	100-pk.	26147
25mm	0.22µm	yellow	100-pk.	26148
25mm	0.45µm	pink	100-pk.	26149
<b>PTFE (polytetrafluoroethylene)</b>				
13mm	0.22µm	purple	100-pk.	26142
13mm	0.45µm	orange	100-pk.	26143
25mm	0.22µm	purple	100-pk.	26144
25mm	0.45µm	orange	100-pk.	26145
<b>PVDF (polyvinylidene fluoride)</b>				
13mm	0.22µm	brown	100-pk.	26150
13mm	0.45µm	red	100-pk.	26151
25mm	0.22µm	brown	100-pk.	26152
25mm	0.45µm	red	100-pk.	26153

Cellulose Acetate, Nylon, PVDF - hydrophilic applications

PTFE - hydrophobic applications

### NORM-JECT® Syringes

NORM-JECT® syringes are latex-free, contain no rubber, no silicone oil, styrene or DEHP and are DNA-free. These syringes are the choice for any situation needing an inert, nonreactive syringe. Because of their composition, they are indicated for chromatography, nuclear medicine, amniocentesis, IVE, embryo transfer, and many laboratory procedures. They are more chemically resistant than rubber-tipped syringes and are manufactured from only laboratory grade polypropylene and polyethylene. These unique plastic syringes have a positive safety stop to prevent accidental spills. NORM-JECT® syringes are individually sterile strip packed.



Description	qty.	cat.#
1mL Tuberculin <sup>1</sup>	100-pk.	22766
3mL Luer Slip Centric Tip	100-pk.	22767
5mL Luer Slip Centric Tip <sup>2</sup>	100-pk.	22768
10mL Luer Slip Eccentric Tip <sup>2</sup>	100-pk.	22769
20mL Luer Slip Eccentric Tip <sup>2</sup>	100-pk.	22770
30mL Luer Slip Eccentric Tip	50-pk.	22771
50mL Luer Slip Eccentric Tip <sup>2</sup>	30-pk.	22772
3mL Luer Lock Tip	100-pk.	22773
5mL Luer Lock Tip <sup>2</sup>	100-pk.	22774
10mL Luer Lock Tip <sup>2</sup>	100-pk.	22775
20mL Luer Lock Tip <sup>2</sup>	100-pk.	22776
30mL Luer Lock Tip	50-pk.	22777
50mL Luer Lock Tip <sup>2</sup>	30-pk.	22778

<sup>1</sup>Dose saver design with low dead space plug on the piston to minimize waste—recommended for Botox®.

<sup>2</sup>The 5mL has graduations to 6mL, 10mL has graduations to 12mL, 20mL has graduations to 24mL and 50mL has graduations to 60mL.



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